

A TAXONOMIC INVESTIGATION OF *MYCENA* IN CALIFORNIA

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A Taxonomic Investigation of *Mycena* in California

Mycena is a very large, cosmopolitan genus with members described from temperate and tropical regions of both the Northern and Southern Hemispheres. Although several monographic treatments of the genus have been published over the past 100 years, the genus remains largely undocumented for many regions worldwide. This study represents the first comprehensive taxonomic investigation of *Mycena* species found within California. The goal of the present research is to provide a resource for the identification of *Mycena* species within the state, and thereby serve as a basis for further investigation of taxonomic, evolutionary, and ecological relationships within the genus. Complete macro- and microscopic descriptions of the species occurring in California have been compiled based upon examination of fresh material and preserved herbarium collections. The present work recognizes a total of 61 *Mycena* species occurring within California, sixteen of which are new reports, and 3 of which represent previously undescribed taxa.

I certify that this abstract is a correct representation of the content of this thesis.

Dr. Dennis E. Desjardin (Chair, Thesis Committee)

Date

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TABLE OF CONTENTS

Introduction	1
History and Nomenclature	2
History of the Genus in North America	5
Methods and Materials	7
Taxonomically Informative Characters	
Macromorphological characters	9
Micromorphological characters	14
Key to California Sections of <i>Mycena</i>	18
Taxonomic treatment of the sections of <i>Mycena</i>	
section <i>Oregonenses</i>	23
section <i>Fragilipedes</i>	24
section <i>Luculentae</i>	50
section <i>Rubromarginatae</i>	56
section <i>Sanguinolentae</i>	67
section <i>Galactopoda</i>	71
section <i>Longisetae</i>	74
section <i>Heimales</i>	75
section <i>Aciculae</i>	80
section <i>Adonidae</i>	82
section <i>Lactipedes</i>	87
section <i>Hygrocyboideae</i>	89
section <i>Fuliginellae</i>	96
section <i>Basipedes</i>	100
section <i>Amictae</i>	103
section <i>Insignes</i>	105
section <i>Supinae</i>	107
section <i>Polyadelphia</i>	109
section <i>Sacchariferae</i>	111
section <i>Mycena</i>	115
section <i>Calodontes</i>	125
section <i>Testudini</i>	128
section <i>Intermediae</i>	130
section <i>Cinerellae</i>	132
section <i>Filipedes</i>	141
Literature Cited	151
Species Index	157

INTRODUCTION

The recent increase in issues of biodiversity, especially those pertaining to the management and conservation of natural resources, underscores the need for baseline knowledge of the organisms functioning in our ecosystems. Unlike mammals, birds, and plants, which appear to be fairly well documented for much of the Northern Hemisphere, groups such as fungi remain relatively unknown for many regions due to their ephemeral nature, and the numerous difficulties that have traditionally been associated with their identification. One such difficulty is the lack of accessible, up-to-date monographs including keys to species identification and detailed species descriptions. Commonly, when monographs do exist for a given group or genus, they tend to cover a very large geographic area and therefore include a high number of species, often making it difficult to identify a given collection to a single species with any degree of certainty. Fortunately, recent investigations have been published which document the diversity of distinct groups and genera of Agaricales within the restricted range of California (Thiers, 1997; Shanks, 1997; Methven, 1997; Desjardin, 1987; Kerrigan, 1986). However, many more genera are relatively poorly known taxonomically, and remain to be investigated.

The genus *Mycena* (Pers. Fr.) Roussel, which is a member of the large family Tricholomataceae, remains largely undocumented in California, as well as many other regions of the United States. The genus is characterized by a white spore print; smooth, hyaline spores; adnate to arcuate or decurrent lamellae; a thin membranous pileus; intricate cystidia; and a hypodermium composed of large, inflated hyphae. Members of the genus are almost exclusively saprotrophic, the exception being a single species [*M. citricolor* (Ber. & Curt.) Sacc.] reported to be pathogenic on *Coffea* (Singer, 1986), and two species reported to form mycorrhizal associations with distinct species of the Orchidaceae (Guo et al., 1997). In the field, the basidiomes of *Mycena* species are commonly encountered growing upon the debris of conifers and woody angiosperms, decaying logs and branches, lignicolous on the bark of living trees, in soil, and more rarely (at least in California) on the debris of ferns, grasses, or other herbaceous plants, or among mosses or grasses.

The most recently published material relating to the genus within California is limited to Dr. Alexander Smith's monograph on North American species of *Mycena*, published in 1947, and R. A. Maas Geesteranus' (1992) investigation of *Mycena* species described from the northern hemisphere. However, both of these works pertain to a very large geographic range, and neither attempt to present a complete survey of the *Mycena* species found within California. The aim of the present investigation is to present a taxonomic survey of the genus within the state, thereby providing a resource for the identification of *Mycena* species. For this investigation, I have compiled macro- and microscopic descriptions for all species encountered in California, complete with artificial keys to the species, line drawings of the pertinent micromorphological features, and information on range, phenology, and habitat.

California's large geographic size and diverse assemblage of habitats provides ample opportunities for a very species-rich fungal component. Because *Mycena* species are typically found in association with woody plants, either on the debris, decaying wood, or living bark, this study focused on the forested regions of the state. Collections were made primarily from the following geographic regions as defined by Hickman (1993): the San Francisco Bay Area, Central Coast, South and North Coast Ranges, Klamath Ranges, northern Sierra Nevada Foothills, and the northern High Sierra Nevada. I made collections from 12 counties (Contra Costa, Del Norte, Humboldt, Madera, Marin, Mendocino, Monterey, San Francisco, San Mateo, Sierra, Sonoma, Yuba), and examined material from an additional 11 counties (Los Angeles, Napa, Toulumne, Trinity, San Diego, Santa Barbara, Santa Cruz, Shasta, Siskiyou, Solano, Yolo), as well as material from Oregon, Washington, and Michigan.

During the course of this study I made approximately 150 collections of *Mycena* species, and examined an additional 250-300 collections made by other investigators. My results indicate that a minimum of 59 *Mycena* species occur within California, distributed over 25 sections within the genus. In addition to these species are 3 varietal taxa, and 2 species which are suspected to occur in California but which were not encountered during this study. Fifteen species are first reports for California. Three species were previously undescribed and have been given provisional names.

HISTORY AND NOMENCLATURE

Persoon (1797) first used the name *Mycena* to designate a section of the large genus *Agaricus*. Within the section, Persoon placed those species of *Agaricus* characterized by a thin, membranous pileus with sulcate margins, and a hollow, glabrescent stipe. In a subsequent publication, Persoon (1801) further refined the section to include small, delicate species, with convex, persisting pilei, and unicolorous, non-deliquesting lamellae. Persoon did not consider spore color as a character in his segregation of the species into a section of *Agaricus*.

The section was first elevated to generic rank by Roussel (1806) in his *Flore Calvados*. Roussel treated several species in detail, and listed additional taxa by their French common names with references to Bulliard's corresponding illustrations (Donk, 1962). Gray (1821) also recognized *Mycena* at the generic level in his *Natural Arrangement of British Plants*, and in the past has often been cited as the first author to do so (Smith, 1947; Maas Geesteranus, 1980, 1992a; Singer, 1986).

Although *Mycena* had been elevated to generic rank, Fries (1821) re-established Persoon's placement of the group as a section [tribus] of *Agaricus*. With the exception of restricting the section to white or pale spored taxa, Fries' concept of the section was essentially the same as that of Persoon (1801). In his later and most widely used work, *Hymenomycetes Europaei*, Fries (1874) further defined his concept of *Mycena* as follows: "Stipes fistulose, cartilaginous. Pileus

submembranous, ±striate, pileus at first conic- or paraboloid-cylindric due to an initially straight margin, clasping or lying flat against the upper portion of the stipe. Lamellae not decurrent (only barely so with a hooked tooth). Epiphytic or radicate, slender, subcampanulate, barely umbilicate."

[*"Pileus submembranaceous, plus minus striatus, primitus conico- l. parabolico-cylindricus ob marginem primitus rectum, stipitem sursum attenuatum amplectentem l. parallelo - adpressum. Lamellae haud decurrentes (tantum denticulo uncinatae). Epiphyti l. radicati, graciles, subcampanulati, vix umbilicati."*]

Fries (1874) also subdivided the section into nine subsections (subtribes) based largely on the macromorphological characters of the stipe. These included: *Lactipedes*, containing species which exude a colored or milky latex; *Glutinipedes*, containing species with a viscid stipe; *Basipedes*, characterized by species with a basal disk or bulb; *Calodontes*, containing species with lamellar edges more deeply colored than the lamellar sides; *Insititiae*, composed of species with stipe bases inserted (insititous) on the substrate; *Adonidae*, composed of white to brightly pigmented species with unicolorous lamellae; *Rigipedes*, containing species with firm, rigid stipes; *Fragilipedes*, containing species with fragile stipes; and *Filipedes*, composed of species with flaccid, filiform stipes.

Lange (1914) recognized *Mycena* at the generic level, and was the first investigator to incorporate the use of micromorphological characters into his treatment of the genus. Emphasizing the characteristics of the basidiospore cell walls, Lange subdivided the genus into two subgenera; *Eumycena* composed of those species with smooth basidiospores, and *Mycenella* composed of those species with warted basidiospores. *Eumycena* was further subdivided into three sections according to the shape, ornamentation, or lack of cystidia on the lamellar edge: *Ciliatae*, containing those species with smooth, generally tapered cystidia; *Granulatae*, containing species with ornamented, generally broad and apically rounded cystidia; and *Gummosae*, containing species which lack cystidia on the lamellar edge. In his species treatments, Lange was one of the first investigators to include information regarding the size and shape of basidiospores and cystidia, as well as indicating the number of spores borne per basidia.

Kühner (1926) indicated the artificial nature of Lange's classification of the genus, stating that numerous species, such as *M. rosella* (Fr.) P. Kumm., which are characterized by dimorphic cystidia (i.e. both smooth and ornamented forms), could be placed into either of Lange's cystidiate sections of the sub-genus *Eumycena*. Attempting to segregate the genus into more natural groups, Kühner subdivided *Mycena* into two sub-genera: *Eumycena*, containing species in which the stipe was continuous with the pileus, and which generally had rhizoids at the stipe base; and *Insiticia*, containing species in which the stipe was distinct from the pileus, which lacked rhizoids, and had stipes bases insititous on the substrate.

In a later work, Kühner (1938) revised his classification of the genus,

emphasizing the microchemical reactions of the basidiospores and tissues with iodine (Melzer's Reagent). Regarding the macromorphological characters of his previous classification (1926) as secondary, Kühner re-segregated *Mycena* into two subgenera, *Eu-Mycena* and *Para-Mycena*, based upon the amyloid or inamyloid nature of the basidiospores. *Eu-Mycena* was composed of species whose basidiospores produced an amyloid reaction in the presence of iodine, while *Para-Mycena* was composed of species with inamyloid basidiospores. Kühner's classification of the genus incorporated, often in somewhat modified forms, some of the sections (subtribes) and subgenera of both Fries (1874) and Lange (1914).

Smith (1947) was the first American mycologist to strongly emphasize micromorphological characters in his concept of the genus in *North American Species of Mycena*. Unlike Kühner (1938), Smith primarily emphasized the characteristics of the cystidia, basidiospore, and pileus trama morphology, and considered the microchemical color reactions of the basidiospores and tramal tissues with iodine as secondary. In his monograph, Smith subdivided the genus into four subgenera: *Mycenella* Lange, containing those species with roughened or ornamented basidiospores; *Pseudomycena*, containing small, delicate species with stipes that terminate in a basal disk or bulb, and with a stipe which is readily separable from the pileus; *Glutinipes*, containing species with viscid or glutinous layer on the stipe surfaces; and *Eumycena*, containing species with smooth basidiospores, and stipes lacking both a viscid to glutinous surface and a basal disk or bulb. Smith further divided the subgenera into sections and subsections, and these into stirps, in an attempt to group small clusters of closely related species. While many of Smith's sections and subsections overlapped with the groupings of Kühner, the characters each of these authors emphasized resulted in very different classifications of the genus.

Several of the sections and subgenera recognized by Lange (1914), Kühner (1938), and Smith (1947) have been segregated from *Mycena* and elevated to generic rank. Singer (1938a) recognized Lange's subgenus *Mycenella* as a segregate of *Mycena* on the basis of the group's ornamented to roughened basidiospores. Similarly, *Hemimycena* (= *Para-Mycena* Kühner) was segregated by Singer (1938b) due to the inamyloid nature of the basidiospores and non-dextrinoid nature of the pileus trama. *Hydropus*, a subgroup of Kühner's *Spuraie*, was also elevated to generic rank by Singer (1942) on the basis of the broad elements composing the pileipellis, the non-dextrinoid nature of the pileus trama, and the presence of watery exudate.

Singer (1951, 1962, 1975, 1986) published several infrageneric classifications of *Mycena* and numerous other allied genera. In his final classification of the Agaricales, Singer (1986) considered *Mycena* a member of *Tribus Mycenae* of the Family Tricholomataceae. Singer subdivided the genus into 15 sections, 12 subsections, and numerous stirps based upon a comprehensive assemblage of both macro- and micromorphological characters, as well as the microchemical reactions of both the basidiospores and tissues in iodine and other reagents. The classification proposed by Singer is that which is

followed by many mycologists today.

Most recently, Maas Geesteranus (1992b) has published an extensive investigation of the *Mycena* species described from the northern hemisphere. Expanding upon Singer's (1975, 1986) classification, Maas Geesteranus further subdivides the *Mycena* species of the northern hemisphere into 38 sections on the basis of macro- and micromorphological characters, and microchemical reactions of the tissues and basidiospores with iodine. Like Singer, Maas Geesteranus considers *Hemimycena*, *Hydropus*, and *Mycenella* as distinct genera. Additionally, Maas Geesteranus has reduced Smith's subgenus *Pseudomycena* to a synonym of section *Sacchariferae* Kühn. Due to the thorough nature of Maas Geesteranus' (1992b) treatment of species from North America, and his invaluable comparisons of American and European species concepts, his infrageneric classification of *Mycena* is the one followed in the current treatment.

History of the genus in North America.

In addition to Smith, numerous other mycologists have made valuable contributions to the taxonomic understanding of *Mycena* in North America. Some of the earliest reports dealing with the genus from North America are published as species lists pertaining to a particular region or state. Schweinitz (1822) accounted for a total of 25 species in *Agaricus* subgenus *Mycena*, in his *Synopsis fungorum Carolinae superioris*, and an additional 20 species in *Synopsis Fungorum in America Boreali media degentium* (1834). Curtis (1867) reported 21 species of *Mycena* from North Carolina in his *Catalogue of the Indigenous and Naturalized Plants of the State*. Harkness & Moore (1880) published a list of fungi encountered in California in their *Catalogue of Pacific Coast Fungi*. The list included a total of nineteen *Mycena* species, of which ten are recognized in the present treatment.

A great deal of information on *Mycena* species from North America can be found in the numerous publications of C.H. Peck, spanning the period of 1872-1915. During his career as the New York state botanist, Peck reported and described numerous species of *Mycena*, primarily from the eastern, but also the midwest and western United States.

In *North American Flora*, Murrill (1916a) used the generic names *Galactopus* Earle and *Prunulus* (Cesalp.) Gray sensu Earl to represent taxa clearly belonging to *Mycena* as recognized by other investigators. Into *Galactopus*, Murrill placed those *Mycena* species that exuded a colored or hyaline fluid when cut or broken. Of the four taxa Murrill included, two [*G. rugodiscus* (Peck) Murrill; *G. succosus* (Peck) Murrill] are currently recognized as members of the genus *Hydropus*, while the remainder [*G. haematopus* (Pers.) Earle; *G. sanguinolentus* (Alb. & Schw.) Murrill] are both recognized as belonging to *Mycena*. Into *Prunulus*, Murrill placed those *Mycena* species which did not exude latex when cut or broken. Murrill included a total 106 taxa in *Prunulus*, of which 52 were previously undescribed. However, in a manuscript published the

same year as *North American Flora*, Murrill (1916b) transferred the taxa he had described as *Prunulus* species into *Mycena*.

Murrill (1916a) treated numerous species from the Pacific Coast, of which seven were reported as occurring in California [*G. haematopus* (Pers.) Earle; *P. elegantulus* (Peck) Murrill; *P. caesiialbus* Murrill; *P. occidentalis* Murrill; *P. plumbeibrunneus* Murrill; *P. abramsii* Murrill; *P. longipes* Murrill]. An additional five species from California were briefly mentioned in his doubtful species section [*M. amicta* (Fr.) Quél.; *M. californiensis* (Berk. & Curt.) Sacc.; *M. heimalis* (Osbeck) P. Karst; *M. iris* (Berk.) Quél.; *M. rugosa* (Fr.) Quél.]. Of these 12 taxa, the current work recognizes four as valid species occurring within the state [*M. haematopus* (Pers.: Fr.) P. Kumm., *M. abramsii* (Murrill) Murrill; *M. amicta* (Fr.) Quél.; *M. californiensis* (Berk. & Curt.) Sacc.].

Adopting a Friesian classification of the genus, Kauffman (1918) treated 38 species of *Mycena* in *The Agaricaceae of Michigan*. In many of his species descriptions, Kauffman included information on the microscopic characteristics of the basidiospores and cystidia. Similarly, Beardslee and Coker (1924) adopted a Friesian concept of the genus in *The Mycenae of North Carolina*. The authors recognized and treated forty-two species of *Mycena*, complementing most with photographs of basidiomes, detailed species descriptions, and in many cases line drawings of the micromorphological features. As indicated by Smith (1947), the numerous photographs and line drawings included in Beardslee and Coker's monograph made it the most illustrated contribution to the knowledge of North American *Mycena* up to that point in time.

Although he treated mainly European species, Kühner (1938) also included a fair number of *Mycena* species from North America in *Le Genre Mycena*. Kühner's treatments included detailed species descriptions, line drawings of the micromorphological characters, and discussions comparing the taxa with other similar species, as well as comparing his observations of the species with those of other investigators.

However, it is Smith (1947) who has made the largest contribution to our present knowledge of North American species of *Mycena*. In his monograph, Smith recognized a total of 218 species from the United States and Canada, and an additional 19 from the American tropics. Smith presented detailed species descriptions of both the macro- and micromorphological characters, including the microchemical reactions of the basidiospores and tissues with iodine, line drawings of the cystidia and basidiospores, habitat associations, geographic ranges, and thorough discussions emphasizing the definitive characteristics of each species and how they may be differentiated from other closely related taxa.

In preparing material for his monograph, Smith did a great deal of collecting from the Pacific Northwest in the mid to late 1930's. His collecting in this region focused primarily on the Olympic Peninsula of northwestern Washington, and the Cascade Range of central Oregon and northern California. Smith also made a large number of collections from locations in the coastal and Klamath ranges of California in Del Norte and Humboldt counties. From California alone, Smith reported the presence of eighty one taxa [80 species + 1

variety] of *Mycena*, seven of which were previously undescribed. Since the publication of Smith's monograph, 35 of the taxa reported from California have been transferred to other genera [*Hydropus*, *Mycenella*, *Hemimycena*, *Resinomyce*, *Chromosera*], determined to be *nomen dubia*, reduced to varietal status, or reduced to synonyms of other species.

Additional authors who have recently made valuable contributions to the knowledge of *Mycena* in North America include S. A. Redhead and D. E. Desjardin. Redhead (1980, 1984a, 1984b, 1985, 1986, 1993) has authored several publications relating to *Mycena* species in both Canada and the United States. Desjardin (1993, 1995, 1997) has published several manuscripts relating to the genus in North America, including a synopsis of the worldwide members of *Mycena* section *Sacchariferae* Kühn ex.Singer.

METHODS AND MATERIALS

Specimens for this investigation were collected by Dr. Dennis E. Desjardin and myself from locations throughout California during the period of October 1995 through June 1999. Due to the large geographic size of California, and the time limitations placed upon the completion of this project, it was not possible to adequately sample all of the numerous habitats present within the state. Most collections were made from Monterey County northward to the border of California with Oregon. Extensive collecting was done within the northern Coast Ranges and the northern Sierra Nevada. For the most part collections were made from state parks and forests, national parks and forests, and county maintained open space preserves. Collections made by myself and Dr. Desjardin were used to compile macromorphological descriptions. Whenever fresh material was not available, macromorphological descriptions were compiled from the literature.

Due to the ephemeral nature of agaric sporocarps, collecting trips were made whenever prevailing weather conditions seemed favorable for their production. Field collections consisted of a minimum of three sporocarps, which were removed from the substrate, using a knife blade or trowel when necessary, and placed in wax paper bags or plastic boxes for transport to the laboratory. In the field, habitat type, associated plants, substrate, relative abundance, and distribution of the specimens collected were noted. When possible, the specimens were photographed *in situ* with color transparency film using a 35 mm Nikon F3, FE2 or Canon EOS1N camera fitted with a macro lens, utilizing natural and/or artificial light.

Upon return to the laboratory, notes were made on the macromorphological features of the fresh material. Whenever possible colors were compared with a standardized color source, Kornerup and Wanscher (1978), and are cited in the text in parentheses as page, column, row. When a range of color was observed, the colors are cited with a hyphen between the colors representing the limits of the color range. For example, (7-8B3-5) refers to

the colors on pages 7 and 8, column B, rows 3, 4, and 5. In those descriptions that were adapted from the literature, color names placed in quotations refer to Ridgway (1912). Terminology for the macromorphological features follows Snell and Dick (1971), Largent (1986), and Vellinga (1988). Macromorphological characters noted include: shape, size, color, and surface properties of the pileus and stipe; thickness and color of the pileus context; number, arrangement, color, and type of attachment of the lamellae to the stipe; odor and taste as displayed by the pileus; and the presence of any latex. Once all observations were made on the fresh material, the collection was dried in a plant drier or food dehydrator, and then placed in boxes for herbarium storage.

Micromorphological features were studied using an Olympus CH30 compound microscope. Terminology for the micromorphological features follows Snell and Dick (1971), Largent *et. al.* (1977), and Vellinga (1988). All observations were made from dried material wetted in 100% ethanol, and revived and mounted in 3% KOH or distilled H₂O. In most cases the material was stained with Congo Red in an attempt to make the hyphal walls more apparent. All material was also stained with Melzer's Reagent to test for amyloid and dextrinoid reactions. Drawings of micromorphological features were made with the use of an attached drawing tube. In all line drawings, spores are shown at 2000X their natural size, basidia, cystidia and any other micromorphological features are shown a 1000X.

Three primary sections were used to make all micromorphological observations. Tissues and cells of the pileus surface and trama, as well as the lamellar sides and edges were studied from radial sections of the pileus from the margin to approximately midway or even completely to the disc depending on the size of the pileus. When necessary, cross sections of the lamellae were made to observe the lamellar trama and lamellar sides. Features of the stipe surface and trama were observed by making a scalp section of the stipe.

Basidiospores were measured as viewed in profile; spore length includes the hilar appendage. For each collection examined, a minimum of 25 spores were measured whenever possible, and the following statistical values were calculated: \bar{x} = mean spore length by mean spore width for all spores measured for a given species; Q = the ratio of spore length/spore width, expressed as a range for all spores measured; \bar{q} = the mean of all Q values. The length of basidia, cystidia, and terminal cells was measured from the first septum to the apex of the cell. Sterigmata were not included in the measurement of basidia length. The diameter of basidia, cystidia, and all hyphae were measured at the broadest portion of the cell. In those cases where cystidia or terminal cells passed apically or laterally into numerous appendages, the appendages were not included in the measurement of the cell length and diameter unless so noted in the description. When present, apical and/or lateral appendages were measured independently of overall cell dimensions. All measurements represent the minimum and maximum dimensions observed. Measurements placed in parentheses represent dimensions that were deemed to be outside of the normal range, but were observed more than once in a single specimen, or in more than

one collection.

In addition to the collections made by Dr. Desjardin and myself, collections from the following herbaria were examined: Farlow Herbarium (FH), Humboldt State University (HSC), University of Michigan (MICH), New York State Museum (NYS), and San Francisco State University (SFSU). Unless otherwise noted utilizing the abbreviations above, all collections cited in the "Material Examined" portions of this work are deposited at the Harry D. Thiers Herbarium of San Francisco State University (SFSU). The following is a list of abbreviations of initials used to designate some of the more common collectors of specimens investigated in this study:

DED - Dennis E. Desjardin

BAP - Brian A. Perry

AHS - Alexander H. Smith

HDT - Harry D. Thiers

TAXONOMICALLY INFORMATIVE CHARACTERS

Macromorphological characters

PILEUS:

Shape and size:

Within *Mycena* pileus shape ranges from convex to conical, including the shapes intermediate between these two extremes, i.e. hemispherical, paraboloid, and campanulate. The margin is generally straight and often appressed against the stipe in very young specimens. Most species tend to exhibit a range of pileus shapes and the character is therefore of only limited taxonomic value. However, some species, such as *Mycena pura* (Pers.: Fr.) P. Kumm., are often characterized by the presence of a distinct umbo, while other species such as *Mycena clavicularis* (Fr.) Gillet, may be characterized by the presence of a central depression giving the pileus an umbilicate appearance. In such instances the pileus shape may be of greater taxonomic value.

Pileus size in *Mycena* ranges from approximately 1 mm in several of the tiniest species, up to 7 cm in some of the more robust species such as *M. galericulata* (Pers.: Fr.) Gray and *M. overholtsii* A.H. Sm. & Solh. Size can be of taxonomic value only in its relation to the overall stature or robustness of the basidiomes. Those species with relatively broad pilei tend to be larger, more robust species, whereas those with relatively narrow pilei tend to be smaller, more delicate species. Several sections within the genus are characterized by the diminutive stature of their species' basidiomes, and pileus size has been used by at least one author (Smith, 1947) as a key character in distinguishing these sections. At the species level, size is of limited taxonomic value due to the

large ranges displayed by many species and the subsequent overlap in size among taxa.

Pileus surface:

The pileus surface may be dry, moist, viscid, or even glutinous. Such characterizations can be of great taxonomic value. Several sections within the genus are characterized by the presence of a viscid to glutinous pileal surface, presumably due to the gelatinization of the cells composing the pileipellis. In several of the sections whose members are known to occur in California, portions of the pileus surface may be peeled from the pileus as a thin gelatinous layer. Care must be taken however when assessing the nature of the pileus surface. Those species with viscid to glutinous pilei may appear dry if the basidiomes have dried out due to climatic conditions. Although microscopic examination is the only certain method of determining if a dried out pileus was actually viscid or glutinous when it was fresh, the nature of the pileus can often be determined to have been viscid or glutinous by a distinctive shininess to the dried out pileus (as in *M. nivicola* Perry, Blair and Desjardin *sp. nov.*), or the presence of dirt and/or other debris tending to stick to the pileus surface. A pileus may also lose its viscid or glutinous properties if exposed to excessive amounts of rain. In such a situation the collector may not be able to determine the true nature of the pileus unless young basidiomes not exposed to excessive precipitation, and therefore still viscid or glutinous, have also been collected.

The pileus surface may also be glabrous, pruinose, granulose, floccose, or even covered with minute spines. Because a large majority of *Mycena* species occurring in California tend to have glabrous pileal surfaces, any derivation from this condition may be of significant taxonomic value. As with the viscid or glutinous pilei, care must also be taken when assessing the nature of those pilei that are granulose or covered with minute spines. Like the gelatinous component, granules or spines may be removed through exposure to excessive rainfall. The precautions stated above apply here also.

Pileus color:

Although it may be quite variable, pileus color is a very important character in *Mycena*. Within the genus, pileus coloration ranges through gray, brown, yellow, orange, red, violaceous, green, and even entirely white. Generally, coloration is darkest in the disk portion and lightens gradually towards the pileal margin. In the pellucid-striate species, the attachment of the lamellae to the underside of the pileus creates a series of darker (often the same shade as the disk) radial lines interspersed with regions of lighter coloration. A large majority of *Mycena* species exhibit a hygrophanous pileus. Care must be taken to note the pileus coloration of fresh, moist specimens as well as any color changes that occur as moisture is lost from the pileus. Pileus coloration may also vary with specimen maturity and expansion of the pileus, care should be

taken to note the color of both immature and mature pilei whenever possible.

Pileus context:

The pileus context tends to be fairly thin, and is not a taxonomically informative character for most *Mycena* species. Context coloration is generally concolorous with the pileus, slightly paler, or pallid.

Odor and taste:

Odors in *Mycena*, which can usually be judged by smelling the lamellae or crushing a portion of the pileus context, may be alkaline (bleach-like), raphanoid, nitrous, iodoform, rancid, sweet, or indistinctive. Most odors are only present in fresh specimens, and will often be absent only an hour or less after collecting the material. However, some species, such as *M. filipes* (Bull.: Fr.) P. Kumm., have been reported to retain distinctive odors even after the specimens have been thoroughly dried (Maas Geesteranus, 1984, 1992). Due to the ephemeral and subjective nature of these odors, they are not given any significant taxonomic value in this monograph, but can be quite useful in the overall process of identification.

Like odor, taste of the pileus context is a character that can generally be judged only from fresh material. Species of *Mycena* may be raphanoid, farinaceous, rancid, nut-like, or indistinctive. Taste is also not given any significant taxonomic value in this monograph, but may be of some use in the overall identification process.

LAMELLAE:

The manner of lamellar attachment to the stipe is an important taxonomic character within *Mycena*. The lamellae may be adnate, ascending-adnate and with or without a subdecurrent tooth, arcuate, decurrent, and more rarely, nearly free. Of the species found within California, the majority tend to have ascending-adnate lamellae. As with other characters, care must also be taken when determining the manner of lamellar attachment. The lamellar attachment of some species may change as the pilei mature and expand. For example, the lamellae of *M. overholtsii* A.H. Sm. & Solh. are initially ascending in young specimens, but become decurrent as the pilei expand with maturity. In a few species, such as *M. adscendens* (Lasch) Maas Geest. and *M. amicta* (Fr.) Quél., the lamellae tend to secede from the stipe and form a pseudocollarium as the pilei expand.

Lamellar color, especially that of the edges, can be an extremely valuable taxonomic character. Color of the lamellar faces generally ranges from white to gray, and in many species may contain distinctive tones of other colors such as orange, pink, or brown. Some species, such as *M. maculata* P. Karst., develop sordid bruises or stains on the lamellae as the basidiomes mature. The color of

the lamellar edges may be concolorous with the lamellar sides, paler than the lamellar sides, or another color entirely. Within California, because relatively few species are characterized by the presence of differently colored lamellar edges, this feature can be extremely useful in establishing the identity of a given collection. Several species within California are characterized by the presence of a gelatinized lamellar edge which is separable as an elastic-like thread.

The size and spacing of the lamellae ranges from narrow to moderately broad, and from subdistant to close. The presence or absence of lamellulae may affect the appearance of lamellar spacing. For this reason it is useful to count the number of lamellae that extend from the pileus margin to the stipe, and the number of series of lamellulae in between. The number of lamellae reaching the stipe may be as few as 5, or up to 30 or more, and is generally represented as a range of values. Lamellulae, when present, generally range from 1-3 series or tiers, and may vary between basidiomes. A series consists of one set of lamellulae of more or less equal length.

STIPE:

Size and shape:

Stipe size varies with overall basidiome stature. Diameter ranges from less than 1 mm in some of the more diminutive species, up to as much as 8 mm in the more robust species such as *M. pura* (Pers.: Fr.) P. Kumm. Stipe length ranges from approximately 5 mm to 125 mm. Smith (1947) reported the stipe diameter to be one of the most accurate gauges of overall basidiome stature. He noted that the stipes of even the most slender forms of the generally robust species will have thicker stipes than those of the diminutive species. Smith also noted that stipe diameter is one of the least variable macroscopic characters within a species.

In cross section, stipe shape ranges from terete to slightly flattened, and more rarely once-cleft. Most species in California have equal stipes, at least in the upper portion. The base may be equal, slightly broadened, and even bulbous in a few species.

Attachment to substrate:

Most species of *Mycena* found within California are attached to the substratum by means of hyphal strands. Of the California species, only *M. oregonensis* A.H. Sm. is distinctively inserted into the substrate, and even then the species is characterized by the presence of basal fibrils. Many sections within the genus are characterized by the presence of a distinct basal disk or radiating patch of mycelium attaching the stipe base to the substrate. Many species, such as *M. galericulata* (Pers.: Fr.) Gray, will develop long rooting stipes often referred to as pseudorhiza. Such rooting stipes are generally broadest at the substrate surface, and become narrower as they penetrate the

substrate. A similar situation commonly occurs in which the stipe deeply penetrates the substratum, but does not form a tapered root-like structure. Many of the sierran species associated with the spring snowmelt, such as *M. amicta* and *M. overholtsii*, often form long strigose stipes of \pm equal diameter, that may grow quite deeply into their woody substrata. A non-tapering stipe of this sort would not be considered a pseudorhiza.

Stipe surface:

The stipe surface exhibits the same variation in its characters as does the pileus. The stipe surface may be dry, moist, viscid, or glutinous, and can range from glabrous to pruinose, granulose, appressed fibrillose, or minutely pubescent. The topology of the stipe surface may be smooth, or more rarely characterized by distinct longitudinal striations or lesions, as in *M. galopus* (Pers.: Fr.) P. Kumm. The basal portion of the stipe may be glabrous or strigose with fine to coarse fibrils. As with the pileus surface, characters of the stipe surface may be affected by exposure to excessive rainfall or drying out, as well as excessive handling.

Stipe color:

Like the stipe surface, stipe color exhibits a range similar to that of the pileus. The stipe may be concolorous with the pileus, paler, or another color entirely. In California, the common situation is for the stipe to retain some of the coloration of the pileus, whether it be a darker or paler shade. In many species, the stipe apex tends to be paler than the lower portion. Like the pileus, stipe coloration often changes as the basidiomes mature and/or dry out.

LATEX:

The presence of colored or whitish latex can be a very useful in distinguishing several sections of *Mycena* within California. Members of sections *Galactopoda* and *Sanquinolentae* are characterized by the presence of reddish to orangish red latex, while those of section *Lactipedes* are characterized by the presence of whitish latex. In most cases, the presence of latex can be determined in fresh material by cutting or breaking a portion of the stipe. In some species such as *M. haematopus* (Pers.: Fr.) P. Kumm., breaking any portion of the basidiome will result in the exudation of latex. In species such as *M. galopus* however, the latex may be quite scant and is best observed at the stipe base as the basidiomes are removed from the substrate. In some instances it may be necessary to squeeze the stipe, thereby causing it to exude any latex that is present. The absence or presence of latex will become exceedingly difficult to determine as the basidiomes lose moisture. With dried material the presence of latex can best be determined by an abundance of laticiferous hyphae in the stipe trama, which generally contain some form of intracellular, granular or oleiferous

contents.

Micromorphological characters

BASIDIOSPORES:

A majority of the *Mycena* species present within California are characterized by ellipsoid or pip-shaped basidiospores. For this reason, those species which possess cylindrical or subglobose to globose basidiospores can be easily separated. Spore size appears to be fairly consistent within species, and at times may be useful in distinguishing between very similar or closely related species when a distinct gap in basidiospore sizes is observed. With the exception of those species of sections *Oregonensis*, *Aciculae*, *Adononidae*, *Longisetae*, and *Heimales*, all species thus far collected from the state are known to have basidiospores that produce an amyloid reaction in the presence of Melzer's reagent. The amyloid reaction ranges from very weak to quite strong, depending on the species. In those species with a weakly amyloid basidiospores, the reaction is often visible only when the spores are observed in mass. Basidiospores of all *Mycena* species are smooth, thin-walled, and hyaline.

BASIDIA:

Basidia shape ranges from narrowly to broadly clavate, and as such is of little taxonomic value. Size ranges from smaller than 20 μm in length to greater than 40 μm . However, because basidia are often difficult to isolate and measure within a mount, and because size ranges can be quite large within a given species, size is of limited taxonomic value. Basidia may be either tetrasporic or bisporic, with rare monosporic or trisporic forms occasionally observed, and with or without basal clamp connections. The majority of species within California are tetrasporic, and for this reason the bisporic species may be easily identified. However, in a few species, such as *M. filopes* (Bull.: Fr.) P. Kumm. and *M. metata* (Fr.) P. Kumm., both tetrasporic and bisporic forms are commonly encountered. In cases such as these, it has often been found that two spored forms tend to produce larger basidiospores than do the tetrasporic forms, and that bisporic basidia frequently lack clamp connections.

CYSTIDIA:

Cystidia shape, ornamentation, and location are some of the most informative characters used in identification of *Mycena* species. As defined by Smith (1947), a cystidium in *Mycena* is any sterile cell present in the hymenium (lamellar sides) or along the lamellar edge. Those on the lamellar edge are termed "cheilocystidia," while those of the lamellar sides are termed

"pleurocystidia." Cystidium-like cells may include the terminal cells and any other differentiated cells of the stipe cortical and pileipellis hyphae. Those of the stipe cortical hyphae have been termed "caulocystidia" by many investigators, while those of the pileipellis have been termed "pileocystidia." An additional type of sterile cell arising from the pileipellis of some species, characterized by thickened cell walls, and a long, pointed shape, are termed "setae." In the present work, I have chosen to use "terminal cells" in reference to these differentiated cells of the stipe cortical and pileipellis hyphae, and reserve the terms cheilocystidia and pleurocystidia for those sterile cells present in the hymenium.

A very large diversity of cystidia shape and ornamentation are observed within *Mycena*. Cystidia shape ranges from cylindrical through clavate, ellipsoid, globose, sphaeropedunculate, fusoid, lageniform, and utriform. These cells may be smooth, or more commonly covered with varying degrees of ornamentation. The simplest forms include smooth, cylindrical cheilocystidia, such as those of *M. amicta*, while the more complex forms include the ornamented and branching cystidia such as those seen in *M. tenax* A.H. Sm. In this investigation, very short, cylindrical to pointed, simple ornamentations are termed "diverticula," while the longer, cylindrical to coarse or inflated, often curved and/or branching forms are termed "excrescences" and "projections" depending on their length. Ornamentations may be distributed over the entire surface of the cystidia, or restricted to the apex or central portion of the cell. Additionally, ornamentations may be evenly or unevenly spaced on the cystidia surface. Within *Mycena*, cystidia size appears to be fairly constant among collections of the same species. However, size does not appear to be of very significant taxonomic value.

Within California, all of the *Mycena* species thus far encountered are characterized by the presence of cheilocystidia. In some species, such as *M. galopus*, the cheilocystidia commonly project well beyond the lamellar edges and are therefore very easy to distinguish, while in other species, such as *M. acicula* (Schaeff.: Fr.) P. Kumm, the cheilocystidia project very little, and may be somewhat difficult to resolve. In such cases, it is often necessary to crush the material being viewed in order spread apart the lamellar edge to make the cheilocystidia visible. The lamellar edge may be composed entirely of cheilocystidia, termed a sterile edge due to the lack of reproductive cells, or it may be composed of cheilocystidia intermixed with basidia. In species which are characterized by the presence of a separable, gelatinous lamellar edge, such as *M. vulgaris* (Pers.: Fr.) P. Kumm., the cheilocystidia tend to arise from loosely associated hyphae that are embedded in a thick gelatinous layer. In those species characterized by differently colored lamellar edges, the cheilocystidia generally possess internal (intervacuolar) pigments which may be visible as granular cell contents or they may be dissolved and apparent as a distinct coloration to the cell's cytoplasm.

Unlike cheilocystidia, pleurocystidia are not found in all *Mycena* species known from California, and their presence may therefore be of significant taxonomic value. When present, pleurocystidia may be morphologically identical to the cheilocystidia or quite distinct. In *M. tenax* A.H. Sm. for example, the

cheilocystidia are ±clavate in shape and covered with numerous, simple to branched excrescences, while the pleurocystidia are fusiform in shape and entirely smooth. In some species, forms intermediate between the two types are commonly observed. The distribution of pleurocystidia on the lamellar sides ranges from abundant to scattered or rare, depending upon the species or even the collection. In some species, such as *M. rosella* (Fr.) P. Kumm., the pleurocystidia may contain internal pigments similar to those described in the cheilocystidia above.

UNIVERSAL VEIL:

The members of section *Sacchariferae* Kühn. ex. Singer are the only species of the genus known to produce a universal veil. In those species of the section that occur in California [*M. adscendens* (Lasch) Mass Geest., and *M. alphitophora* (Berk.) Sacc.] the veil is present as a thin non-contiguous layer of thin-walled cells covered with short, pointed ornamentations, termed "acanthocysts," which are borne terminally on narrow, thin-walled hyphae that arises from the pileipellis (Desjardin, 1995). It is the presence of these cells that give the pilei of these taxa their characteristic granular or furfuraceous appearance.

PILEIPELLIS:

The pileipellis of most *Mycena* species are, as a rule, a cutis of smooth to ornamented, narrow to inflated hyphae, and can be of significant taxonomic value. In sections *Sacchariferae* and *Testudini* however, the pileipellis of primordia (*Sacchariferae*) or mature basidiomes (*Testudini*) is a subhymeniform to hymeniform layer of acanthocysts or inflated, lentiform cells respectively. Like the cystidia, the ornamentations of the pileipellis hyphae range from simple diverticula to quite long, cylindrical to coarse or inflated, often branched excrescences and projections. In those species with a viscid to glutinous pileus surface, the pileipellis hyphae are often characterized by gelatinizing cell walls, and/or may be embedded in gelatinous matter. Similarly, in those species with a separable, gelatinous pellicle, the pileipellis hyphae are characteristically suspended in a thick gelatinous layer. In some species, such as those of section *Sacchariferae*, terminal cells may be differentiated from the other hyphae and be of considerable taxonomic value (see above).

TRAMAL TISSUES:

Mycena is characterized by the presence of a hypodermium composed of inflated, thin-walled, non-gelatinized hyphae. In all but a few species, such as *M. acicula* (Schaeff.: Fr.) P. Kumm., and *M. oregonensis* A.H. Sm., the hypodermium produces a dextrinoid reaction in the presence of Melzer's reagent.

Pileus and lamellar tramal tissues may be composed of inflated cells similar those of the hypodermium, composed of less inflated cells, or composed of a combination of inflated and cylindric cells. Stipe tramal tissues in all taxa observed are composed of inflated, thin-walled, hyaline, non-gelatinized hyphae. Tramal tissues appear to be relatively similar in most taxa and are therefore of limited taxonomic value. However, in taxa characterized by the presence of latex, the stipe and pileus tramal tissues commonly contain laticiferous hyphae which often contain pigmented, granular or oleiferous contents.

STIPE CORTICAL HYPHAE:

The morphology of the stipe cortical hyphae and terminal cells is of considerable taxonomic value. Like the pileipellis, the hyphae of the cortical layer of the stipe may be smooth or densely ornamented. In those taxa with viscid stipes, the cortical hyphae may have gelatinized cell walls or may be embedded in a gelatinous layer. When present, terminal cells may be similar to the cortical hyphae from which they arise, or strongly differentiated. In many taxa the terminal cells are similar to the cheilocystidia in shape and size, while in others they are quite distinct.

ARTIFICIAL KEY TO THE SECTIONS OF *MYCENA* PRESENT IN CALIFORNIA

- 1. Lamellar edge a different color or more intensely colored than lamellar sides
 2
- 1. Lamellar edge concolorous with lamellar sides or paler 8
 - 2. Pileus brightly colored, some shade of red, pink, yellow, or orange 3
 - 2. Pileus coloration darker, with a distinct brown and/or gray component
 6
- 3. Spores inamyloid, lamellar trama non-dextrinoid
 sect. Oregonenses ***Mycena oregonensis***
- 3. Spores amyloid, lamellar trama dextrinoid 4
 - 4. Pleurocystia absent
 sect. Fragilipedes ***Mycena citrinomarginata***
 - 4. Pleurocystidia present 5
- 5. Pleurocystidia with simple apical excrescences
 **sect. Luculentae subsect. Elegantes**
- 5. Pleurocystidia smooth **sect. Luculentae subsect. Rosellae**
 - 6. Stipe not exuding a colored latex when cut or broken
 **sect. Rubromarginatae**
 - 6. Stipe exuding a colored latex (red, reddish brown, orange) when cut or
 broken 7
- 7. Stipe exuding a reddish brown to orangish latex; cortical hyphae of the stipe
 diverticulate with simple to furcate excrescences; the stipe not turning black
 when dried **sect. Sanguinolentae**
- 7. Stipe exuding a dark reddish latex; cortical hyphae of the stipe smooth; the
 stipe generally turning black when dried
 sect. Galactopoda ***Mycena haematopus***
- 8. Spores inamyloid 9
- 8. Spores amyloid 12
- 9. Stipe arising from a basal disc; pileipellis hyphae embedded in gelatinous
 matter, giving rise to long, thick-walled setae
 sect. Longisetae ***Mycena longiseta***
- 9. Stipe not arising from a basal disc, pileipellis hyphae not embedded in
 gelatinous matter, and not giving rise to thick-walled setae 10

- 10. Pileus white to some shade of brown
 **sect. Hiemales subsect. Omphaliarae**
- 10. Pileus brightly colored, some shade of red, pink, orange, or yellow . . . 11

- 11. Stipe cortical hyphae densely diverticulate; hypodermium composed of
 pseudoparenchymatous cells sect. Aciculae ***Mycena acicula***
- 11. Stipe cortical hyphae smooth; hypodermium composed of globose to ovoid
 cells (not pseudoparenchymatous) **sect. Adonidae**

- 12. Stipe exuding a milky white to watery white latex when cut or broken
 sect. Lactipedes ***Mycena galopus***
- 12. Stipe not exuding a white latex when cut or broken, but may exude a
 colorless hyaline fluid 13

- 13. Pileus covered with a separable, gelatinous pellicle (pileipellis hyphae
 therefore embedded in a distinct layer of gelatinous matter) 14
- 13. Pileus without separable, gelatinous pellicle 18

- 14. Lamellar edge separable as an elastic-like thread, or the cheilocystidia
 embedded in an obvious gelatinous mass 15
- 14. Lamellar edge not separable as an elastic-like thread; or the
 cheilocystidia not embedded in a gelatinous mass 16

- 15. Stipe generally with some yellowish coloration; pleurocystidia absent
 **sect. Hygrocyboideae**
- 15. Stipe lacking yellowish coloration; pleurocystidia generally present or if
 absent, the cheilocystidia dendroid and highly branched apically
 **sect. Fuliginellae**

- 16. Stipe arising from a pubescent basal disc; stipe white to whitish
 sect. Basidpedes ***Mycena stylobates***
- 16. Stipe not arising from basal disc; stipe not white 17

- 17. Stipe partially blue to bluish green (often present only as colored fibrils at
 extreme base), at least in young specimens, the surface not viscid or
 glutinous sect. Amictae ***Mycena amicta***
- 17. Stipe lacking blue to bluish green tones, the surface viscid to glutinous
 when moist sect. Insignes ***Mycena quinaltensis***

- 18. Spores globose to subglobose 19
- 18. Spores ellipsoid to amygdaliform, or cylindric 20

19. Basidiomes corticolous on coniferous or hardwood trees
 sect. Supinae ***Mycena corticalis***
19. Basidiomes growing on leaves and other herbaceous debris
 sect. Polyadelphia ***Mycena culmigena***
20. Pileus surface distinctly granular to furfuraceous or floccose, whitish to grayish; hyphae of the pileipellis giving rise to inflated, ±globose to pyriform terminal cells which are covered with short diverticula or spinules **sect. Sacchariferae**
20. Pileus surface not distinctly granular to furfuraceous or floccose, or if so, pileipellis hyphae lacking inflated, ornamented terminal cells 21
21. Hyphae of the pileipellis and stipe smooth, or with very rare, scattered excrescences 22
21. Hyphae of the pileipellis and stipe not at the same time smooth, one or both covered with some form of excrescence 25
22. Cheilocystidia covered with excrescences
 sect. *Mycena* ***Mycena maculata***
22. Cheilocystidia smooth 23
23. Basidiomes lignicolous, typically growing in dense caespitose clusters; the lower half of the stipe clothed in thick, whitish tomentum
 sect. Fragilipedes ***Mycena overholtsii***
23. Basidiomes lignicolous or terrestrial, typically not growing in dense caespitose clusters; the stipe lacking thick whitish tomentum 24
24. Basidiomes frequently with purplish, violaceous, or pinkish coloration; spores ellipsoid and relatively narrow (< 5µm); stipe cortical hyphae not embedded in gelatinous matter
 sect. Calodontes subsect. *Purae* ***Mycena pura***
24. Basidiomes typically grayish to brownish in color; spores broadly ellipsoid (> 6µm); stipe cortical hyphae embedded in gelatinous matter sect. Fragilipedes ***Mycena excisa sensu A.H. Sm.***
25. Cheilocystidia smooth; rounded or tapered apically, or forming mucronate/rostrate apex or elongated neck, occasionally with more than one apical tip or necks 26
25. Cheilocystidia entirely to partially covered with few to numerous, simple to branched, cylindric, coarse, or inflated excrescences (these forms occasionally intermixed with smooth cheilocystidia) 27

26. Cheilocystidia and pleurocystidia often greatly protruding from lamellar edges and sides; abundant laticiferous hyphae present in stipe tissues, containing granular or oleiferous contents
 sect. Lactipedes ***Mycena galopus***
26. Cheilocystidia and pleurocystidia not greatly protruding; stipe tissues lacking abundant laticiferous hyphae **sect. Fragilipedes**
27. Cheilocystidia embedded in a removable, gelatinous lamellar edge; the pileipellis a hymeniform monolayer of pedicillate, lentiform to clavate cells
 sect. Testudini ***Mycena gaultheri***
27. Cheilocystidia not embedded in a removable, gelatinous layer; the pileipellis a cutis of typically narrow, cylindric hyphae, which may be smooth or covered with excrescences 28
28. Pleurocystidia, and some proportion of the cheilocystidia, fusiform to lageniform in shape and centrally covered with few to numerous, evenly or unevenly spaced, simple excrescences; more rarely smooth; often with slightly thickened walls sect. Intermediae ***Mycena latifolia***
28. Pleurocystidia and cheilocystidia not as above 29
29. Cheilocystidia covered with ±evenly spaced, typically short (<10µm) and simple, rarely branched excrescences 30
29. Cheilocystidia covered with ±unevenly spaced, short to quite long, cylindric to coarse, typically branching excrescences, and/or apically branching or passing into few to numerous, cylindric to coarse excrescences/projections .
 31
30. Stipe surface (and in some instances the pileus) viscid to glutinous when wet; pileipellis and stipe cortical hyphae embedded in gelatinous matter
 sect. Cinerellae ***Mycena clavicularis***
30. Stipe surface not viscid to glutinous when wet; pileipellis and stipe cortical hyphae not embedded in gelatinous matter **sect. Filipedes**
31. Cheilocystidia apically passing into one or several, cylindric, often furcate necks, or giving rise apically and/or somewhat laterally to one or several, cylindric, often branching excrescences, generally intermixed with smooth, often fusoid to lageniform cheilocystidia **sect. Fragilipedes**
31. Cheilocystidia entirely or apically covered with or branching into few to numerous, simple to branched, cylindric to quite coarse and/or inflated excrescences, rarely intermixed with smooth, basidiole-like cheilocystidia
 32

- 32. Basidiomes larger, the majority of the pilei typically 20 mm or greater in diameter **sect. *Mycena***
- 32. Basidiomes small, the majority of the pilei typically less than 20 mm in diameter 33

- 33. Pileipellis hyphae not typically embedded in a gelatinous layer (if so then pleurocystidia present); pleurocystidia present or absent **sect. *Cinerellae***
- 33. Pileipellis hyphae embedded in a thin to quite thick subgelatinous layer; pleurocystidia absent sect. *Mycena* ***Mycena pusilla***

Mycena section Oregonenses Maas Geest., Proc. Kon. Ned. Akad. Wentensch. C. 93(2): 182. 1990

Basidiomes small to medium sized. Pileus surface moist, glabrescent, lacking a separable gelatinous pellicle, yellowish to deep orange. Context thin, yellowish. Lamellae adnate, becoming decurrent with a tooth, yellowish, orangish, or whitish, the edge concolorous or more intensely colored. Stipe hollow, surface yellowish pruinose, not glutinous, concolorous with the pileus or paler, the base covered with yellowish fibrils. Odor and taste indistinct.

Basidiospores lacrymoid, smooth, inamyloid. Basidia 4-spored, clavate, clamped. Cheilocystidia variously shaped, with a rounded apex, with yellowish contents, clamped. Pleurocystidia similar. Pileipellis a cutis; hyphae covered with excrescences, clamped. Cortical hyphae of the stipe smooth, clamped; terminal cells variously shaped, with yellowish contents.

On needles, leaves, and other debris of conifers and hardwoods.

Type species: *Mycena oregonensis* A. H. Sm.

Mycena oregonensis A. H. Sm., Mycologia 28: 413. 1936.

≡ *Mycena siskiyouensis* A. H. Sm., Mycologia 28: 414. 1936.

Pileus 2-10 mm, convex to paraboloid, or bluntly conical, expanding to broadly convex in age, occasionally with a small papilla or umbo; the margin appressed against the stipe when young, often becoming eroded with age, pellucid-striate; surface faintly pruinose at first, glabrescent, dull, dry, hygrophanous; young specimens deep yellow to deep orange (4-6A8), margin concolorous to yellow (3-4A7), in age the disc often remaining deep orange (5A7-8) or fading to deep yellow (4A7-8). **Context** thin, concolorous with pileus.

Lamellae adnate, 10-12 reaching the stipe, subdistant with 1-3 series of lamellulae, moderately broad to broad, yellow (3-4A5-6) to deep orange (5A7-8); edges entire, concolorous with sides. **Stipe** 14-35 X 0.5-1.0 mm, central, terete, equal; surface yellow-pruinose to yellow-hispid overall, glabrescent below, dry; deep orange (4-6A8) to deep yellow (3-4A7-8); the base covered with yellowish fibrils.

Basidiospores 6.8-9.6(-10.4) X 3.2-4.0(-4.4) μm [$x^{\bar{\bar{}}}$ = 8.0 \pm 0.9 X 3.7 \pm 0.3 μm , Q = 1.7-2.8, $q^{\bar{\bar{}}}$ = 2.2 \pm 0.2, n = 80 spores], lacrymoid, smooth, inamyloid.

Basidia 16.8-22.4 X 5.6-6.4 μm , 4-spored, rarely 2-spored, clavate to narrowly clavate, with sterigmata 2.4-5.6 μm in length, clamped, hyaline. **Cheilocystidia** 15.2-44.8 X (4.0-)6.4-10.8 μm , clavate to \pm fusoid or utriform, with a rounded apex, occasionally wavy in outline or almost strangulated, smooth, with yellowish contents, thin-walled, clamped. **Pleurocystidia** similar, generally not as abundant as cheilocystidia and often infrequent. **Pileipellis** a cutis; hyphae (1.6-)2.4-6.4(-8.0) μm diam, clamped, thin-walled, hyaline, composed of both narrow cylindrical cells and shorter broader cells, covered with simple, cylindrical to more coarse and/or somewhat inflated excrescences, 1.5-9.5 X 1.0-5.0 μm ; terminal cells variable, 20.0-39.0 X 4.8-15.2 μm , generally similar to hyphae, and usually with

large inflated protuberances or side branches up to 11.2 µm diam, often clavate, and occasionally slightly inflated and covered with numerous cylindrical diverticula. **Hypodermium** composed of large inflated cells, non-dextrinoid, filled with yellowish contents. **Lamellar trama** non-dextrinoid. **Stipe tissues** monomitic, parallel, non-dextrinoid; cortical hyphae (1.5-)2.4-5.6 µm diam, smooth, clamped, thin-walled, hyaline; terminal cells clavate, globose, or similar to hymenial cystidia, 17.0-44.5 X 5.0-18.5 µm, often folded to one side, filled with yellowish contents, generally occurring in large clusters.

Habit, habitat, and distribution. Gregarious to scattered on leaves, needles, bark and twigs of coniferous and hardwood trees. Known from the United States (Smith, 1947) and Europe (Maas Geest, 1990). In California the species is common during the fall and winter months throughout North Coast ranges and Sierra Nevada foothills.

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 9 November 1991, DED 5384; same location, 18 October 1997, BAP 145; Redwood National Park, ~ 2 miles west of Hiouchi on state route 199, 17 October 1997, BAP 150; Gasquet, Panther Flat Campground, 16 November 1997, DED 6679. Yuba Co.: Bullard's Bar Recreation Area, Schoolhouse Campground, 23 January 1997, BAP 102.

Commentary. The macro- and microscopic descriptions are based upon my examinations of the collections listed above.

Mycena oregonensis is one of the more intensely colored *Mycena* species commonly encountered in forested regions of Northern California.

Macroscopically, the species is characterized by the diminutive size of its basidiomes, and the vivid yellowish to deep orangish coloration of the pileus, lamellae, and stipe. Microscopically, the species is distinguished by its rather narrow, inamyloid and lacrymoid spores, smooth cystidia with yellowish contents, and the large, inflated protuberances typically arising from the pileipellis hyphae and terminal cells. Both Smith (1947) and Kühner (1938) placed the taxon within subsection *Aciculae* alongside another intensely pigmented species, *M. acicula* (Schaeff.: Fr.) P. Kumm. Maas Geesteranus (1990, 1992b) however, citing the differences that exist between these taxa (see discussion under *M. acicula*), segregated *M. oregonensis* from section *Aciculae*, designating it as the type species of section *Oregonenses*.

Maas Geesteranus (1990, 1992b) also reports that European collections of *M. oregonenses* have thus far been predominantly 2-spored, and that European specimens typically have pilei which are much more orange or even reddish orange in color.

Mycena section Fragilipedes (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5: 105. 1872.

Basidiomes small to large. Pileus variously shaped; surface dry, moist, or lubricous when wet in some species, typically pruinose initially, glabrescent, ±hygrophanous, variously colored, whitish, citrine, ochraceous, grayish, grayish-brown, black, olivaceous, rarely suffused with purplish to violaceous tones. Context thin. Lamellae ascending, adnate to nearly free, with or without a decurrent tooth, ventricose, white to grayish or grayish-brown; the edge convex, concolorous with the sides or more intensely colored, and then some shade of yellow, brown, or green. Stipe central, hollow, fragile to firm or cartilaginous; surface dry to moist or lubricous when wet, pruinose, the lower portion glabrescent, variously colored, range similar to that of the pileus; the base covered with coarse fibrils, rooting in some species. Odor absent, indistinct, raphanoid, nitrous, or alkaline. Taste mild, indistinct, or raphanoid.

Basidiospores ellipsoid to nearly cylindric, smooth, thin-walled, amyloid. Basidia 2- or 4-spored, clamped or clampless. Cheilocystidia variously shaped, smooth or covered with excrescences, clamped or clampless, often forming a sterile lamellar edge. Pleurocystidia similar or absent. Pileipellis a cutis; hyphae smooth or covered with excrescences, clamped or clampless. Stipe cortical hyphae smooth or covered with excrescences, clamped or clampless; terminal cells variously shaped when present.

On wood and other debris of conifers and hardwoods, on humus, among grasses, or in *Sphagnum* bogs.

Type species: *Mycena stipata* Maas Geest. & Schwöbel

Key to the California species of section *Fragilipedes*.

- 1. Basidiomes large and robust, forming dense caespitose clusters on decaying wood; the stipe bases clothed in a thick, whitish tomentum
 *M. overholtsii*
- 1. Basidiomes not large and robust, not forming dense caespitose clusters on wood; the stipe bases with or without coarse fibrils, but not clothed in a thick whitish tomentum 2
 - 2. The pileipellis and stipe cortical hyphae both ±smooth and embedded in gelatinous matter 3
 - 2. The pileipellis and stipe cortical hyphae not both at the same time smooth and embedded in gelatinous matter 4
- 3. Pleurocystidia present; basidiospores greater than 10 X 5.5 µm
 *M. excisa* sensu A. H. Sm.
- 3. Pleurocystidia absent; basidiospores less than 8.5 X 4.5 µm
 *M. laevigata*
- 4. Basidiomes lacking clamp connections (or with pseudoclamps) 5
- 4. Basidiomes with clamp connections 6

- 5. Cheilocystidia utriform to lageniform or clavate, smooth
..... *M. deceptor*
- 5. Cheilocystidia lageniform to clavate or ±irregular, with one or more apical
necks and/or giving rise to excrescences *M. vitilis*
- 6. Basidiomes typically with some yellowish color to the pileus, lamellar
edges and/or sides, or stipe, more rarely entirely white
..... *M. citrinomarginata*
- 6. Basidiomes typically lacking yellowish coloration, generally grayish to
brownish (if entirely white, then growing on twigs of *Sequoia*
sempervirens) 7
- 7. Basidiomes typically growing on or near ferns and fern debris; the stipe
pale ash gray to white *M. fragillima*
- 7. Basidiomes typically growing on wood or woody debris; the stipe darker
grayish to grayish brown (rarely white, and if so then growing on wood of
Sequoia sempervirens) 8
- 8. Stipe cortical hyphae typically with large, inflated terminal cells and/or
narrower cells giving rise to one or more inflated, often quite long
excrescences *M. leptoccephala*
- 8. Stipe cortical hyphae lacking large, inflated terminal cells, those present (if
any) similar to hyphae and/or covered with narrow excrescences 9
- 9. Pileus of young basidiocarps distinctly minutely pruinose, mature
basidiocarps often retaining some pruinosity; ~12 lamellae reaching the
stipe; somewhat diminutive species growing on dead branches and trunks of
fallen or standing conifers, rarely hardwoods; rarely entirely white and
then growing on wood of *Sequoia sempervirens* *M. subcana*
- 9. Pileus of young basidiocarps glabrous or canescent, if pruinose then soon
glabrescent; 13 or more lamellae reaching the stipe; more robust species
typically growing on decaying wood and debris of conifers and hardwoods
..... 10
- 10. Pileus and stipe surface initially covered with a bluish sheen due to
presence of hoary bloom; basidiospores up to 10.4 µm in length; odor
indistinct, not alkaline *M. alnicola*
- 10. Pileus and stipe lacking bluish sheen; basidiospores often larger, up to
12.8 (-14.4) µm in length in some species; odor alkaline, pleasant, or
indistinct 11
- 11. Cheilocystidia variable, typically fusoid and intermixed with broadly-
clavate to obovoid forms *M. aff. murina*
- 11. Cheilocystidia fusiform, lageniform, or irregular-clavate, not intermixed with
broadly-clavate to obovoid forms 12

12. . . . Cheilocystidia fusoid-ventricose to lageniform, typically with a single elongated neck, rarely with 2-3 simple apical excrescences; pleurocystidia often present, similar to cheilocystidia *M. abramsii*
12. . . . Cheilocystidia irregular-clavate to \pm fusiform or \pm lageniform, typically narrowed apically into one to several, cylindric to coarse, simple or branched excrescences; pleurocystidia absent *M. alcaliniformis*

Mycena overholtsii A. H. Sm. & Solh., Madroño 12: 106. 1953.

Basidiomes large, forming dense caespitose clusters. **Pileus** 19-50 mm diam, convex to subumbonate, expanding to plano convex or applanate, the margin occasionally recurved in age, pellucid-striate; surface moist to lubricous, shiny, glabrous, smooth or finely striate, hygrophanous; dark blackish fuliginous initially, soon fading to pale grayish brown (7-8D-E3), becoming pallid with moisture loss. **Context** thick (up to 4 mm), grayish. **Lamellae** adnate initially, subdecurrent to decurrent with age, close to subdistant with 2-3 series of lamellulae, moderately broad, breadth up to 4.5 mm, whitish to pale brownish gray (7-8D2), the edges entire, concolorous or whitish. **Stipe** 40-120 X 2-7 mm, central, terete, hollow, enlarged towards the base; surface dull, moist to dry, smooth, the lower portion covered with a thick whitish tomentum, glabrous above; pale grayish to cream colored (3-5B2) near the apex, darker below and often becoming reddish brown. **Odor** sweet or yeasty. **Taste** mild.

Basidiospores 6-8(-8.5) X 3.5-4 μ m [$\bar{x} = 7.0 \pm 0.7$ X 3.6 ± 0.3 μ m, Q = 1.5-2.5, $q = 1.9 \pm 0.2$, n= 26 spores], narrowly ellipsoid, smooth, thin-walled, amyloid, typically collapsed in dried material. **Basidia** 22-34 X 5-6 μ m, 4-spored, narrowly clavate, clamped, sterigmata up to 4 μ m in length; basidioles similar or cylindric. **Cheilocystidia** 15-49(-65) X 2.5-6(-9) μ m, \pm cylindric to narrowly clavate and typically with a tapered apex, to narrowly utriform or subfusiform, occasionally strangulated, rarely with a claviform to capitulate apex, clamped, the walls slightly thickened; intermixed with basidia, scattered to abundant along lamellar edge, occasionally occurring in clusters, typically projecting beyond basidia and basidioles. **Pleurocystidia** rare to absent, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.5-5 μ m diam, embedded in a thin layer of gelatinous matter and/or appearing gelatinized, clamped, smooth but giving rise to few or numerous, simple to branched, short to rather long, typically narrower excrescences or side branches. **Hypoderm** composed of inflated cells or scarcely differentiated, subgelatinized, brownish vivescent in Melzer's reagent. **Lamellar trama** composed of interwoven, broad, cylindric hyphae; subhymenium gelatinous, brownish-vivescent in Melzer's reagent. **Stipe cortical hyphae** 1.5-3.5 μ m diam, gelatinized, clamped, smooth but giving rise to scattered excrescences, 2-7 X 1.5-2 μ m, and occasionally side branches up to 55 X 4.5 μ m, with slightly thickened walls; terminal cells up to 7 μ m diam, similar to hyphae, furcate, or somewhat irregular in shape, occasionally giving rise to one or more simple, cylindric excrescences.

Habit, habitat, and distribution. Densely caespitose on decaying conifer logs at high elevations in the High Sierra Nevada, Cascade Ranges, and Rocky Mountains, associated with melting snow in the spring and early summer months. *Mycena overholtsii* may also be present in Newfoundland (see comments below).

Material examined. California. Calaveras Co.: State Highway 4, near Camp Connell, 20 May 1992, HDT 54192. Sierra Co.: Yuba Pass, 2 June 1996, BAP 041; Weber Lake Rd., ~4.5 mi north of junction with state Highway 49 at Yuba Pass, 2 June 1997, BAP 119.

Commentary. The macro- and microscopic descriptions are based upon my observation of the material listed above with additional information adapted from Smith & Solheim (1953).

The relatively large basidiome size, densely tomentose, often connate stipes and specific habit easily distinguish *Mycena overholtsii* from other lignicolous *Mycena* species. Microscopically the species is distinguished by its rather small, easily collapsed spores, simple cheilocystidia (and pleurocystidia when present), and gelatinized, relatively smooth pileipellis and stipe cortical hyphae. The species appears to be quite common throughout the higher elevations of our western mountains (Smith & Solheim, 1953), and may also be present in Newfoundland. In the High Sierra Nevada, the species is commonly encountered growing on thoroughly soaked *Abies concolor* and *A. magnifica* logs protruding from melting snow banks.

Redhead (pers. comm.) has indicated that the correct name for this species appears to be *Mycena semivestipes* (Peck) A. H. Sm. non *sensu* A. H. Sm. *Omphalina semivestipes* Peck was based on a collection made from Newfoundland in May on rotting wood. Smith's (1947) concept of *M. semivestipes* is that of a species occurring in the fall and early winter on fallen hardwood logs and stumps in the eastern deciduous forests of the United States and Canada. Although not reported in the original protologue of *O. semivestipes* (Peck, 1895), the boreal nature of Newfoundland indicates that the substrate of the holotype was most likely coniferous wood (Redhead, pers. comm.). Smith's concept of the species may better represent *Omphalina curvipes* Peck or *M. subalcalina* Atkinson in Douglas, both of which he considered synonyms of *M. semivestipes*. Maas Geesteranus (1988c, 1992b) also investigated the holotype material of *O. semivestipes* as well as another collection from the United States. Maas Geesteranus notes the similarities of *M. semivestipes* and *M. overholtsii*, but states that the two species can be distinguished based on the differences in their stipe coverings (tomentose base in *M. semivestipes*), odor (strongly nitrous or subfarinaceous in *M. semivestipes*), and habitat (hardwoods). It should be noted however, that the protologue of *O. semivestipes* indicates that the lower half or the stipe is clothed in tomentum, and no mention is made of the type collections odor.

Mycena excisa (Lasch) Gillet *sensu* A. H. Sm., N. Am. Sp. *Mycena* p. 303. 1947.

Pileus 15-35 mm diam, broadly conical to obtusely campanulate, becoming broadly umbonate to nearly flat with age; the margin occasionally incurved at first, opaque when moist, sometimes faintly translucent; surface dry initially, densely pruinose, glabrescent, soon polished and moist, becoming radially rugulose at maturity, the disc blackish "fuscous", the margin paler and with brown tones, fading to dark gray or sordid grayish brown with age. **Context** thin, tough, cartilaginous, grayish brown. **Lamellae** broadly and deeply adnexed, close to subdistant, in age becoming ventricose and broad, white, becoming faintly fuscous or grayish; the edges whitish or grayish. **Stipe** 30-50 X 2-3 mm, central, equal, tough, cartilaginous, often compressed and twisted, hollow; surface entirely white pruinose initially, glabrescent and polished in age, fuscous below a pallid apex. **Odor and taste** none.

Basidiospores (9.6-)10.4-12(-13.6) X (5.6-)6-7.2 μm [$x^{\bar{}} = 11.1 \pm 0.8$ X 6.5 ± 0.5 μm , $Q = 1.5-2.0$, $q^{\bar{}} = 1.7 \pm 0.1$, $n = 25$ spores], broadly ellipsoid, smooth, thin-walled, amyloid. **Basidia** 29.6-32.8 X 8-8.9 μm , 4-spored, clavate, clamped, sterigmata up to 7.2 μm in length; basidioles similar. **Cheilocystidia** 48.8-69.6 X (5.6-)12.8-16.8 μm , \pm fusiform and with a rounded apex, to broadly lageniform, clamped, mixed with basidia. **Pleurocystidia** similar, abundant. **Pileipellis** a cutis; hyphae 2.4-6.4 μm diam, clamped, smooth, embedded in gelatinous matter (when rehydrated in KOH). **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of elongate, inflated cells (similar to those typically encountered in the medullary hyphae of the stipe), brownish vinescent in Melzer's reagent. **Stipe cortical hyphae** 1.6-3.6 μm diam, clamped, smooth, embedded in gelatinous matter (when rehydrated in KOH); terminal cells similar.

Habit, habitat and distribution. Gregarious on soil and debris (presumably of conifers). Collected in the fall from the Klamath Ranges of Northwestern California.

Material examined. California. Siskiyou Co.: Siskiyou National Forest, 6 November 1937, AHS 8474.

Commentary. The macroscopic description is adapted entirely from Smith (1947). The microscopic description is based upon my examination of collection AHS 8474.

Mycena excisa sensu A. H. Sm. presents an interesting taxonomic problem. Maas Geesteranus (1988, 1992b) described a new species, *Mycena coracina*, based on a Smith collection from Michigan (AHS 6299; MICH) identified as *M. atrocyanea*. Into synonymy with this new taxon, Maas Geesteranus placed *M. excisa* sensu A. H. Sm. However, upon examination of the holotype material of *M. coracina* and the single existing collection of *M. excisa* from California (AHS 8474; MICH), it is clear that these two collections do not represent the same species. Apparently Maas Geesteranus did not examine AHS 8474 in his investigation of Smith's collections of *M. excisa*. The California collection of *M. excisa* differs from the holotype material of *M. coracina* in the presence of smooth pileipellis and stipe cortical hyphae, which is embedded in gelatinous matter when

rehydrated in KOH. The California collection of *M. excisa* agrees well with Smith's (1947) description of the species. It would appear that Smith's concept of *M. excisa*, which includes a pileipellis embedded in gelatinous matter, does not belong under *M. coracina*.

According to Maas Geesteranus (1988, 1992b) the true concept of *M. excisa* (Lasch) Gillet remains unclear due to the lack of a type specimen and should probably be considered a nomen dubium. If this is true then what does Smith's concept of the species, which does not fit under *M. coracina*, represent? The situation becomes even more difficult upon examination of a collection of *M. excisa* from Washington (AHS 2574; MICH) which does not represent the same taxon as the California collection of *M. excisa*, or *M. coracina*. The Washington collection has diverticulate pileipellis hyphae which is not embedded in gelatinous matter, yet Smith cites both collections in his description of the species. Since Smith does not mention whether the pileipellis or stipe cortical hyphae are smooth or diverticulate in his description, it is impossible to determine which (if either) he considered characteristic of the species.

Although it is unlikely that the above situation will be resolved without a more intensive investigation of Smith's collections of *M. excisa*, I have included the present description, the microscopic portion of which is based solely on the California collection, in the hopes that additional material of this taxon will be collected and identified.

Mycena laevigata (Lasch) Gillet, Les. Hymén. p. 274. 1876.

≡ *Agaricus laevigatus* Lasch, Linnaea 3: 388. 1828.

≡ *Mycena galericulata* var. *laevigata* (Lasch) P. Kumm., Führ. Pilzfr. p. 111. 1871.

= *Agaricus levidensis* Britzelm., Bot. Zbl. 73: 208. 1898.

= *Mycena vulgaris* var. *caespitosa* Kauffman & A. H. Sm., Pap. Mich. Acad. Sci., Arts and Letters 17: 186. 1933.

= *Mycena pseudo-vulgaris* Kühner, Le Genre *Mycena*, p. 393. 1938.

= *Mycena pseudoalnicola* Singer, Beih. Nova Hedwigia 29: 133. 1969.

Pileus 10-30(-45) mm diam, convex to paraboloid or hemispherical, with or without an umbo, rarely with a slight central depression, often becoming flattened with age; the margin connivent initially, opaque to ±pellucid-striate; surface moist to lubricous or subviscid when wet, glabrous, rugulose to sulcate or striate, occasionally distinctly viscid, shiny; whitish to pure white, the disc occasionally pale fuscous gray to watery gray or pale bluish gray when young, soon whitish to pure white overall, with age discoloring to cream or ochraceous and often developing yellowish brown to rusty brown stains. **Context** thin, flaccid, cartilaginous, white. **Lamellae** ascending-adnate, with a decurrent tooth, 15-25 reaching the stipe, close, breadth up to 4 mm, dorsally intervenose, white, often with cream to pale incarnate tones, occasionally developing reddish brown spots with age; the edges entire, white or concolorous with the sides. **Stipe** 20-70(-100)

X 1-3 mm, central, terete, \pm equal, hollow, cartilaginous; surface lubricous to somewhat viscid when wet, shiny, smooth, minutely puberulous initially, glabrescent, the base and/or apex watery gray to bluish gray initially, whitish elsewhere, soon fading to watery grayish white or pure white overall; the base rooting, densely covered with whitish fibrils. **Odor and taste** not distinctive.

Basidiospores 5.6-7.6(-8.0) X 3.2-4.4 μm [$x^- = 6.9 \pm 0.6$ X 3.7 ± 0.3 μm , Q = 1.6-2.2, $q^- = 1.9 \pm 0.1$, n = 36 spores], ellipsoid, smooth, thin-walled, amyloid.

Basidia (18.4-)19.2-28 X 4.8-6.4 μm , 4-spored, narrowly clavate, clamped, sterigmata up to 4 μm in length; basidioles similar. **Cheilocystidia** 13.6-43.2 X 4.8-11.2 μm , narrowly fusiform to sublageniform, the apex often drawn into a simple or pointed neck, more rarely with a rounded apex or \pm clavate, smooth, occasionally with a single, simple cylindrical projection, clamped, mixed with basidia or forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.6-4.8 μm diam, clamped, \pm gelatinized, embedded in gelatinous matter, smooth or with occasional solitary to scattered, cylindrical, simple to branching excrescences, 1.6-20 X 1.2-2.0 μm . **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of cylindrical hyphae and larger cells similar to those of the hypodermium, brownish-vinescent in Melzer's reagent. **Stipe cortical hyphae** 1.6-4 μm diam, clamped, typically embedded in gelatinous matter but this often difficult to observe, gelatinized, \pm smooth, with rare to infrequent, cylindrical, simple excrescences, 1.6-20 X 1.2-3.2 μm ; terminal cells similar to hyphae, forked or with one or more excrescences similar to those of hyphae.

Habit, habitat and distribution. Caespitose to subcaespitose on decaying wood of conifers. Known from California, Oregon, Washington, Colorado, Michigan, Tennessee and New York in the United States, and Ontario in Canada (Smith, 1947). Also reported from Europe and Japan (Maas Geesteranus, 1988, 1992b). In California the species has been collected in the fall months from the Outer North Coast and Klamath Ranges.

Material examined. California. Humboldt-Trinity Co.: Mad River, 9 December 1935, AHS 3919 (MICH). **Oregon.** Linn Co.: Santiam Pass Rd., Detroit, 31 October 1941, AHS 18188 (MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947) and Maas Geesteranus (1988b, 1992b). The microscopic description is based upon my observations of the collections listed above.

Mycena laevigata appears to be a rare fungus within California, with the only identified collection being that made by Smith in 1935 and housed at MICH. Based on additional collections housed at MICH, the species appears to be much more abundant in Oregon. Macroscopically, the species is easily distinguished by its pale coloration and typically lubricous to viscid pileus and stipe surface. Microscopically, the small spore size, and \pm smooth pileipellis and stipe cortical hyphae which are at the same time gelatinized and embedded in a gelatinous layer help to distinguish this species from the numerous other members of section *Fragilipedes* found in California and elsewhere.

Maas Geesteranus (1988b, 1992b) questioned Smith's report of *M. laevigata* from North America due to the grayish coloration Smith indicated for the pileus disc of young specimens. Such a condition has apparently not been observed in European material representing *M. laevigata*. Additionally, Maas Geesteranus' description of the species, which is based entirely upon his observations of European collections, states that the pileipellis hyphae of *M. laevigata* are not diverticulate. My observations of the North American collections however, indicate that excrescences are occasionally found on the pileipellis hyphae. It is certainly possible that Smith's concept of *M. laevigata* represents an undescribed taxon which differs from the European *M. laevigata*, but any decision will have to await a more thorough comparison of the European and North American collections.

Mycena deceptor Maas Geest., Proc. K. Ned. Akad. Wet. Ser. C 91(1): 73. 1988. = *Mycena debilis* (Fr.) Quél. *sensu* A. H. Sm., N. Am. Sp. *Mycena*, p. 130. 1947.

Pileus 4-8 mm diam, obtusely conical to convex, soon becoming broadly conical to campanulate; the margin straight, occasionally flaring with age; surface moist, glabrous, pellucid-striate to the disc, becoming sulcate; pale vinaceous brown, sordid brown, or grayish brown, fading to paler grayish or sordid brown.

Context very thin, delicate. **Lamellae** adnate, subdistant, 14-22 reaching the stipe, moderately broad, whitish or with grayish tones; the edges pallid to very faintly brownish. **Stipe** 15-40 X 0.5-0.75 mm, central, equal, terete, hollow, very fragile; surface glabrous, concolorous with the pileus, the base similar or with a few scant white fibrils. **Odor and taste** not distinct.

Basidiospores 9.6-12(-12.8) X 4.8-6.4 μm [\bar{x} = 11.0 \pm 0.8 X 5.5 \pm 0.4 μm , Q = 1.6- 2.5, q = 2.0 \pm 0.2, n = 50 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 21.5-37 X 8-9 μm , 4-spored, clavate, clampless, sterigmata 4-6.5 μm in length; basidioles similar. **Cheilocystidia** 27-83 X 9-14.5 (-16) μm , utriform to lageniform or clavate, typically projecting beyond lamellar edge, clampless; mixed with basidia. **Pleurocystidia** rare to absent, similar to cheilocystidia when present. **Pileipellis** a cutis; hyphae 1.6-4.0(-5.6) μm diam, clampless, giving rise to scattered, cylindric, simple or branched, short to quite long excrescences, 2.4-31.2 X 1.6-2.0 μm . **Lamellar trama** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Stipe cortical hyphae** 1.6-3.6 μm diam, smooth, clampless; terminal cells abundant, variously shaped, 3-8 μm diam, typically giving rise to one or more lateral, cylindric to inflated projections, 3.2-52 X 2.4-10.4 μm .

Habit, habitat, and distribution. "Scattered on sod in pastures or in open stands of conifers" (Smith, 1947). In California it has been collected in the fall from the North Coast and Klamath Ranges. Also known from Washington and Michigan (Smith, 1947).

Material examined. California. Humboldt Co.: Orick, 4 December 1935, AHS 3753 (MICH). Siskiyou Co.: Siskiyou National Forest, 6 November 1937,

AHS 8493 (MICH). **Washington.** Clallam Co.: Joyce, 21 October 1935, AHS 3273 (MICH).

Commentary. The macroscopic description is adapted from Smith (1947) with a additional information from Maas Geesteranus (1988, 1992b). The microscopic description is based upon my investigation of the collections listed above.

Mycena deceptor appears to represent another species of section *Fragilipedes* that is rare within California. The specimens investigated in this study are the only two collections currently known from the state. Smith (1947) stated that specimens of *M. deceptor* (as *M. debilis*) tend to closely resemble *M. capillaripes* due to the typically vinaceous coloration of the pileus. These species can easily be differentiated macroscopically however by the distinctive pink to red or violet punctate dots that develop on the lamellar sides in *M. capillaripes*, as well *M. capillaripes* distinctive alkaline to nitrous odor.

Microscopically, *M. deceptor* is most likely to be confused with *M. leptocephala* within California due to the similarities these taxa share in the cheilocystidia and terminal cells of the stipe cortical hyphae. Both taxa are typically characterized by at least some cheilocystidia (and pleurocystidia when present) that range from clavate to lageniform, and terminal cells which typically give rise to one or more, long and often inflated lateral projections. Aside from the characters mentioned in the key, these taxa can be differentiated macroscopically by the lack of vinaceous coloration in *M. leptocephala*, as well as this species distinctive alkaline to nitrous odor. Microscopically these taxa can be differentiated by the lack of clamps in the pileipellis and stipe cortical hyphae of *M. deceptor*.

Mycena vitilis (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5: 106. 1872.

≡ *Agaricus vitilis* Fr., Epicr. Syst. Mycol. p. 113, 1838.

= *Mycena subplicosa* P. Karst, Acta Soc. Fauna Flora Fenn. 9(1): 2. 1893.

= *Mycena adhaerens* Velen., Ceské Houby p. 306, 1920.

= *Mycena barbata* Velen., Ceské Houby p. 306. 1920.

= *Mycena filopes* (Bull.: Fr.) P. Kumm. *sensu* Kühner, Le Genre *Mycena*, p. 504. 1938.

Pileus 5-20(-22) mm diam, conical to campanulate, expanding with age, with or without a small umbo; the margin entire, occasionally flaring with age, pellucid-striate, slightly striate to sulcate; surface initially canescent, soon glabrous, slightly lubricous when moist, becoming polished when dry, hygrophanous, brownish gray to light brown or dark brown on the disc, paler to grayish towards the margins, fading to pale grayish or nearly white. **Context** thin, up to ~1 mm thick, whitish to grayish, occasionally dark brown directly under the disc. **Lamellae** ascending-adnate, with or without a small decurrent tooth, 14-23 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow (up to 1.5 mm), white to pale gray, rarely developing brownish or reddish brown tones or

stains; edges entire, concolorous to white. **Stipe** 31-120 X <1-2 mm, central, terete, equal or widening slightly towards base, hollow, cartilaginous, straight or curving near base; surface smooth, pruinose to puberulous at the apex, glabrous below, lubricous to nearly viscid when wet, becoming polished when dry, pale grayish to whitish at the apex, pale grayish brown to brownish below; the base more or less rooting in the substrate or attached to sticks & leaves, covered with whitish fibrils. **Odor and taste** not distinct.

Basidiospores 8.8-12(-13.6) X 5.6-8(-8.8) μm [$x^{\text{---}}$ = 11.1 \pm 0.9 X 6.7 \pm 0.6 μm , Q = 1.4-2.0, $q^{\text{---}}$ = 1.7 \pm 0.1, n = 100 spores], ellipsoid to broadly ellipsoid, smooth, thin-walled, amyloid. **Basidia** 25.4-32 X 9.5-12.8 μm , 4-spored, broadly clavate, clampless, sterigmata up to 7 μm in length; basidioles similar.

Cheilocystidia 20.8-54.4 X 4.8-16 μm , lageniform to clavate or \pm irregular, apically narrowing or giving rise to one or more cylindric, simple to furcate necks, or giving rise laterally and/or apically to simple or branched, cylindric to quite coarse excrescences, 1.6-25.6 X 1.6-4 μm , more rarely lacking excrescences and then \pm clavate, clampless, forming a sterile lamellar edge. **Pleurocystidia** absent.

Pileipellis a cutis; hyphae 1.6-6.4 μm diam, clampless, gelatinized, covered with scattered to crowded, short to long, cylindric, simple to highly branched excrescences which tend to form dense masses, 1.6-16+ X 1.2-1.6 μm .

Hypodermium composed of inflated cells, up to 37.6 μm diam, dextrinoid.

Lamellar trama similar. **Stipe cortical hyphae** 1.6-6.6 μm diam, clampless or with scattered pseudoclamps, gelatinized (in KOH) or embedded in gelatinous matter, smooth; terminal cells similar, occasionally branched.

Habit, habitat and distribution. Scattered to gregarious or subcaespitose on woody debris or soil in both coniferous and hardwood forests. Known from North America and Europe. In the United States it has been reported from California, Oregon, Washington, Michigan and New York (Smith, 1947). In California *M. vitilis* has been collected in the fall and winter months from the North Coast and San Francisco Bay Area.

Material examined. California. Contra Costa Co.: Walnut Creek, Shell Ridge Open Space, 7 December 1996, BAP 093; same location, 7 December 1996, BAP 094; same location, 7 December 1996, BAP 098; Castle Rock Regional Park, 28 January 1997, BAP 105.

Commentary. The macroscopic description is based on notes taken on the collections listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1988c, 1992b). The microscopic description is based on my observations of the collections listed above.

Mycena vitilis represents one of the easier to recognize members of section Fragilipedes found within California. The smooth, gelatinized stipe cortical hyphae, lack of clamps, relatively large spores, and distinctive cheilocystidia help distinguish *M. vitilis* from other brownish, odorless species in the section. *Mycena vitilis* is interesting in that it was one of the few *Mycena* species that was encountered in abundance in the oak woodland habitats that are so characteristic of the eastern San Francisco Bay Area. Within these habitats, which are very

exposed to the sun due to the lack of a closed canopy, *M. vitilis* was rarely encountered with the pileus or stipe in a moist or lubricous condition. Instead, the pileus and stipe surface were generally very dry and polished, only revealing the gelatinized nature of these tissues when the material was rehydrated for microscopic investigation.

Mycena citrinomarginata Gillet, Les Hymén. p. 266, pl. 457 fig. 2. 1874.

=*Mycena avenacea* var. *citrinomarginata* (Gillet) Arnolds, Bibliotheca Mycol. 90: 191. 1982.

=*Mycena citrinolamellata* G. Herpell, Hedwigia 52: 369. 1912.

=*Mycena citrinomarginata* var. *citrinolamellata* (G. Herpell) Killerm., Denkschr. Bayer Bot. Ges. Regensb. 18: 102. 1931.

=*Mycena flavicitrina* (Murrill) Murrill, Mycologia 8: 220. 1916.

=*Mycena citrinomarginata* var. *cedretorum* (Maire) Malençon, C.r. Soc. Sci. Nat. Phys. Maroc. p. 23. 1959.

=*Mycena olivaceobrunnea* A. H. Sm., Mycologia 29: 330. 1937.

=*Mycena citrinomarginata* var. *truncigena* Kühner, Le Gen. *Mycena* p. 412, 686. 1938.

Pileus 4-20 mm diam, broadly paraboloid to campanulate or obtusely conical; margins often flaring in age, the edges entire or eroded; surface dull, moist, smooth, less commonly sulcate, glabrous, pellucid-striate, hygrophanous; color variable, pale yellowish (4A4), orangish yellow (4B7), grayish yellow (4B-C4-6), brownish yellow, brownish orange (6C-D5-7), light brown, olive to olive brown (3-4D-E4), rarely entirely white, the disc often darker and with more pronounced brownish tones, becoming paler with moisture loss, the disc often retaining some brownish coloration. **Context** thin, <1 mm, concolorous with the pileus or paler.

Lamellae ascending-adnate, generally with a short decurrent tooth, 14-22 reaching the stipe, close to sub-distant with 1-2 series of lamellulae, narrow (1-3 mm), often becoming intervenose with age, whitish to grayish, rarely with pink to orangish tones; the edges pale yellowish, yellowish orange, yellowish brown, sordid yellowish brown, or concolorous with the sides, convex. **Stipe** 26-62 X <1-2 mm, central, terete, equal or slightly broader towards the base, hollow, straight or curved towards the base; surface dry or moist, dull or with a slight sheen, smooth, entirely minutely puberulous, glabrescent, often minutely pruinose at apex; grayish yellow (4B3-5), yellowish brown (5D4-5), light brown, brownish orange (6C4-6), or olivaceous gray, rarely entirely white, often paler towards the apex; the base covered with whitish fibrils or with mycelioid patches. **Odor** indistinct to slightly alkaline. **Taste** indistinct.

Basidiospores (7.6-)8.0-14.4 X (4.0-)4.6-5.6(-6.0) μm [$\chi^2 = 10.7 \pm 1.6$ X 5.2 ± 0.4 μm , $Q = 1.7-2.8$, $q^2 = 2.1 \pm 0.2$, $n = 150$ spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 24.0-34.4 X 7.2-9.6 μm , 4-spored (also apparently 2-spored, see commentary), clavate, clamped or clampless, sterigmata up to 8 μm in length; basidioles similar. **Cheilocystidia** 16.8-52.8 X 6.4-16.8 μm , fusiform,

fusoid-lageniform, clavate, or irregular-clavate, often with one to several apical, rarely lateral, cylindrical to coarse, simple or branched excrescences, 1.6-19.2 X 1.2-6.4 μm , the clavate forms often with a single, apical nipple, clamped or clampless, mixed with basidia. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.6-5.6 μm diam, thin-walled, clamped or clampless, covered with cylindrical, simple or branched excrescences, 2.8-9.6+ X 1.2-1.9 μm , which tend to form dense masses. **Hypodermium** composed of inflated, \pm globose to oblong cells, brownish-vinescent in Melzer's reagent. **Pileus trama** a thin layer of \pm cylindrical hyphae, 2.4-6.4 μm diam, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of cylindrical cells intermixed with inflated, \pm globose to oblong cells, 3.2-12 μm diam, brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae 1.6-4.0 μm diam, thin-walled, clamped or clampless, sparsely to densely covered with cylindrical, simple to furcate excrescences 1.6-20.8 X 1.3-2.4 μm ; terminal cells similar to hyphae and/or slightly broader (up to 7.2 μm diam) and more densely diverticulate, excrescences similar to those of hyphae; cortical hyphae also frequently giving rise to long, cylindrical, unbranched, thick-walled cells which cover the stipe surface.

Habit, habitat, and distribution. Solitary to scattered or gregarious on conifer needles and other herbaceous debris in grassy areas under conifers and hardwoods, among mosses, or on humus in coniferous woods. Also reported from humus and fallen leaves in hardwood stands (Smith, 1947), moss covered tree trunks and the decaying bark of a standing tree (Maas Geesteranus, 1988, 1992b). In California it has been collected in the Fall months under *Picea sitchensis* (Bong.) Carrière and other conifers in the North Coast and Outer North Coastal Ranges, and in the Spring and Fall months in grassy seepage areas under *Pinus contorta* Loudon, *Abies concolor* (Gordon & Glend.) Lindley, and *Alder* spp. in the northern High Sierra Nevada.

Material examined. California. Del Norte Co.: Crescent City, 31 October 1937, AHS 8277 (as *M. olivaceobrunnea*; MICH). Humboldt Co.: Trinidad, 12 November 1937, AHS 8663 (MICH). Sierra Co.: Hwy. 89, Chapman Creek Campground, 9 October 1993, DED 5940; same area, 5 June 1997, BAP 125; along road to Packer Lake, 3 June 1997, BAP 121; same area, 10 June 1999, BAP 208. **Washington.** Clallam Co.: Lake Crescent, 22 October 1935, AHS 3279 (as *M. olivaceobrunnea*; paratype; MICH).

Commentary. The macroscopic description is based upon my observations of collections BAP 121, 125, and 208 when in the fresh condition, with additional information adapted from Smith (1947), and Maas Geesteranus (1988, 1992b). The microscopic description is based upon my observations of the collections listed above.

During the course of this investigation, *M. citrinomarginata* appeared to be most common during the spring months in the northern High Sierra Nevada, especially on the grassy margins of seepage areas under *Pinus contorta*, *Abies concolor* and *Alder* spp. No collections were made by the author during

numerous forays to the North Coast and Outer North Coast Ranges from which the species has previously been reported. The species can be very similar to *M. olivaceomarginata* in both macro- and microscopic characters, please see the commentary under that species for a detailed discussion. Smith (1947) recognized smaller sized and smaller spored collections of *M. citrinomarginata* as a distinct species, *M. olivaceobrunnea*. Although the spores of both collections of *M. olivaceobrunnea* examined were slightly smaller than collections identified as *M. citrinomarginata*, I feel that spore size, like basidiome color and cheilocystidia shape, can be quite variable within *M. citrinomarginata*. For this reason I have chosen to follow Maas Geesteranus (1988, 1992b) in treating *M. olivaceobrunnea* as a synonym of *M. citrinomarginata*.

As discussed by Smith (1947) the cheilocystidia of *M. citrinomarginata* can be extremely variable, with a single collection displaying all of the various forms discussed above, or displaying only the smooth, fusoid forms. The latter condition was certainly the case with the collections made from the Sierra Nevada which, in addition to the common fusoid forms, rarely displayed cheilocystidia with an apical excrescence or furcate apex. Collection AHS 8663 on the other hand, is characterized by cheilocystidia which typically have long, branching excrescences which tend to form dense masses, similar to those more commonly observed in *M. olivaceomarginata*. Smith (1947) attributes this variability in the types of cheilocystidia present to the age of the basidiomes examined, with the irregular cystidia characterized by long excrescences being more common in old or mature pilei. I am somewhat hesitant to accept this idea however, as I have examined several collections from the Sierra Nevada which all contained mature basidiomes and which are all characterized by the lack of irregular, ornamented cheilocystidia. Smith (1947) also attributes coloration to the habit of the basidiomes, with those growing in open areas tending to be lighter in color than those found in the deep shade of more densely canopied areas. As I have not seen fresh material from a number of different habitats, I am unable to comment on this idea.

An additional character which appears to be somewhat variable among collections is the presence of clamp connections. Both Maas Geesteranus (1988, 1992b) and Gulden and Jenssen (1982) report the presence of clamps in all tissues of the collections they examined. In several of the collections I examined however, clamps were typically found in the stipe cortical hyphae, but were absent (or so rare as to appear absent) from other cells such as the pileipellis hyphae, basidia, and cheilocystidia. Additionally, Smith (1947) reports the presence of 2-spored basidia in both *M. citrinomarginata* and *M. olivaceobrunnea*. In the current investigation, only a single collection examined (BAP 125) was found to contain 2-spored basidia.

Several of the collections from the Sierra Nevada are characterized by the presence of long, broad, thick-walled cells arising mid-cell from the stipe cortical hyphae, a condition not observed in the collections from the northern portion of the state, or noted by previous investigators. A few thick-walled structures were observed in collection AHS 8277, but I was unable to determine if these originated from the stipe cortical hyphae. These structures presumably represent the minute

hairs observed on the stipe surface, which tend to disappear as the basidiome matures and/or with handling. The cells are quite conspicuous in fresh or carefully collected material however. The fact that these structures have not been noted by previous investigators is somewhat puzzling.

Mycena fragillima A. H. Sm., Mycologia 31:269. 1939.

Pileus (5-)15-35 mm diam, obtusely conical, in age becoming broadly campanulate to almost planar; margin of young specimens appressed against the stipe, often flaring slightly as the pilei expand; surface initially covered with a faint bloom, soon becoming shiny, moist to watery, pellucid-striate, dark watery gray to pale watery gray, hygrophanous, fading to pale cinerous with moisture loss.

Context very thin, watery, gray to pallid. **Lamellae** adnate, often with a short decurrent tooth, tending to be close in larger pilei, distant to subdistant in smaller pilei, narrow, pale grayish; the edges smooth, whitish. **Stipe** (30-)90-150 X (1-)1.5-2(-3) mm, central, terete, fragile, equal or with a slightly bulbous base, generally decumbent; surface minutely pubescent at first, glabrescent, pale watery gray, the base covered with white, strigose hairs. **Odor and taste** indistinct.

Basidiospores 8.8-12.0(-12.8) X (4.4-)4.8-6.0(-6.4) μm [$\bar{x} = 10.3 \pm 0.9$ X 5.4 ± 0.4 μm , $Q = 1.5-2.3$, $q = 1.9 \pm 0.2$, $n = 93$ spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 22.4-31.2 X 6.4-8.8 μm , 4-spored, clavate, clamped, sterigmata 4.0-7.2 μm in length; basidioles clavate, similar to basidia.

Cheilocystidia (24.0-) 28.0-64.0 X 8.0-12.8 μm , lageniform to fusoid, more rarely clavate, generally smooth, occasionally with 1-3 prominent lateral and/or apical excrescences, 4.8-13.6 X 2.0-4.0 μm , clamped, mixed with basidia.

Pleurocystidia present, scattered, similar to cheilocystidia, more rarely absent.

Pileipellis a cutis; hyphae 1.6-7.2 μm diam, clamped, covered with cylindric to slightly coarse, simple to branched excrescences which may be quite long, 1.6-31.2 X 1.2-2.8 μm . **Hypodermium** composed of inflated cells, vivescent to brownish-vivescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, brownish-vivescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, brownish-vivescent in Melzer's reagent; cortical hyphae 2.0-5.2 μm diam, clamped, smooth, rarely with a few scattered, simple excrescences; terminal cells up to 8.0 μm diam, generally with one to several, short to fairly long, lateral excrescences.

Habit, habitat, and distribution. Gregarious on and around ferns (*Polystichum munitum*), fern debris or soil. Known from California, Idaho, Washington, and Oregon. Most common during November and December.

Material examined. California. Humboldt Co.: Orick, 2 May 1935, AHS 3716 (MICH); same location, 3 December 1935, AHS 3749 (Holotype: MICH); same location, 5 December 1935, AHS 3802 (MICH); Trinidad, 11 November 1935 (MICH).

Commentary. The macroscopic description of this species is adapted

from Smith (1939, 1947). The microscopic description is based upon my examinations of the collections listed above.

Mycena fragillima appears to be a relatively rare fungus within California. To the best of my knowledge the only identified collections known from California are those made by Smith and housed at MICH. In his later treatment of *M. fragillima*, Smith (1947) emphasizes the fragile nature of the basidiomes stating that this character, taken with the delicately pubescent stipe surface, readily identify the species. Smith also indicates that small forms of *M. fragillima* are likely to resemble *Mycena debilis* sensu A. H. Sm. (= *M. deceptor* Maas Geest.), but can be distinguished based on differences in spore size. Microscopically, the cheilocystidia and terminal cells of the stipe cortical hyphae of *M. fragillima* are very similar to those of *Mycena leptcephala* (Pers.: Fr.) Gillet. As indicated by Maas Geesteranus (1988, 1992b) however, there are several characters which do appear to separate these taxa. In addition to the fragile nature of *M. fragillima*, the species is characterized by a pale watery gray stipe, indistinct odor, and appears to commonly be encountered growing among ferns or upon fern debris. *Mycena leptcephala* is typically characterized by less fragile basidiomes, an alkaline odor, a darker grayish to grayish-brown stipe, and is not known to grow among ferns or upon fern debris.

Mycena leptcephala (Pers.: Fr.) Gillet, Les Hymén. p. 267. 1874.

≡ *Agaricus leptcephalus* Pers., Icon. Desc. Fung. 2: 48. 1800.

= *Mycena ammoniaca* (Fr.) Quél., Champ. Jura et Vosges, p. 106. 1872.

= *Mycena chlorinella* (J.E. Lange) Singer, Annals. Mycol. 34: 430. 1936.

= *Mycena kauffmaniana* A. H. Sm., N. Am. Sp. *Mycena* p. 260. 1947.

= *Mycena metata* (Fr.) Quél. sensu J. Shroet., Kühner, Le Genre *Mycena* p. 468. 1938.

Pileus 5-30(-40) mm diam, paraboloid to obtusely conical or campanulate, expanding to broadly obtusely conical or broadly campanulate with age; the margin incurved initially, becoming straight or somewhat flared in age, the edges often eroding; surface dull, moist, often minutely canescent initially, soon glabrescent, smooth, striatulate to shallowly sulcate or pellucid-striate, subhygrophanous; the disc grayish brown (6E2-5 to 7D2-3), dark grayish brown (5-8F3-4), dark gray (1-4F1-2), or nearly black, fading in age to dark grayish brown (5F2-3), grayish brown (6-7D-E3), pale brownish gray (5-6C2 to 6D3), pale gray, or pale grayish white, the striations often remaining darker, the margin concolorous or paler, the very edge often whitish to pale gray. **Context** thin, concolorous with pileus or paler. **Lamellae** ascending-adnate, often with a short decurrent tooth, convex, 14-25 reaching stipe, narrow to moderately broad (up to 3 mm), close to subdistant with 1-3 series of lamellulae, whitish to gray (4D2-3) or dark gray (8-9E1-2); the edges concolorous or paler. **Stipe** (10-)30-85 X (0.5-)1-3 mm, central, terete, rarely compressed or once cleft, equal or with a slightly enlarged base, hollow; surface moist or dry, dull or shiny, smooth, entirely or

apically minutely pruinose to canescent or fibrillose, glabrescent below the apex; brownish gray (4D2-4) to dark grayish brown (6-8F3-4), or dark gray; the base covered with scant to dense, whitish tomentum or fibrils. **Odor** mildly to strongly alkaline, nitrous, raphanoid, or indistinct. **Taste** indistinct.

Basidiospores (7.2-)7.5-12(-12.8) X 4.8-6.0(-6.4) μm [$x^- = 10.1 \pm 1.2$ X 5.3 ± 0.4 μm , $Q = 1.4-2.5$, $q^- = 1.9 \pm 0.2$, $n = 137$ spores], \pm ellipsoid to nearly lacrymoid, smooth, thin-walled, amyloid. **Basidia** 20.8-34.4 X 7.2-8.8 μm , 4-spored, clamped or clampless, clavate, sterigmata 3.2-6.4 μm in length; basidioles similar. **Cheilocystidia** 16.8-64(-95.2) X 7.2-16.0 μm , fusoid, lageniform and often with a very long neck, or clavate, smooth, clamped or clampless, forming a sterile lamellar edge or mixed with basidia. **Pleurocystidia** abundant to rare or absent, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-4.8(-10) μm diam, clamped or clampless, occasionally somewhat gelatinized, covered with cylindric to slightly coarse, simple to branched excrescences, 1.6-13.6 X 1.6-3.2 μm . **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of cylindric hyphae, 3.0-8.0 μm diam, intermixed with inflated cells similar to those of hypodermium, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, brownish-vinescent in Melzer's reagent; cortical hyphae 1.6-4.0 μm diam, clamped or clampless, thin-walled, smooth or with solitary to scattered, \pm inflated excrescences, 2.4-5.6 X 1.6-4.8 μm ; terminal cells 24.0-80.0 X 8.0-20.0 μm , variable, abundant, clamped, cylindric to broadly clavate, subglobose, or \pm sphaeropedunculate, the cylindric and clavate forms generally giving rise to few or numerous, simple or branched, \pm inflated excrescences, 2.4-7.2 X 1.6-5.6 μm , often also giving rise to a single, long, tapered or rounded excrescence up to 56 μm in length, the longer excrescences occasionally with slightly thickened walls.

Habit, habitat, and distribution. Scattered to gregarious on soil, humus, woody debris, decaying wood, and living bark of conifers and hardwoods. Known from Europe, North America, and Japan. In California the species has been collected from the San Francisco Bay Area, North Coast, Outer North Coast Ranges, and Klamath Ranges, August to November.

Material examined. California. Del Norte Co.: Crescent City, Lake Earle Dr., 25 October 1990, DED 4991; Redwood National Park, Hwy. 199, ~2 miles SW of Hiouchi, 17 October 1997, BAP 152; Gasquet, Panther Flat Campground, 16 November 1997, DED 6685; same location, 16 November 1997, DED 6686; same location, 16 November 1997, DED 6688. Humboldt Co.: Hwy. 1, ~8 miles north of Trinidad, 17 October 1997, BAP 138; Big Lagoon, 9 November 1997, BAP 172. Mendocino Co.: Jackson State Forest, Road 409, 23 November 1991, DED 5416. San Francisco Co.: SFSU campus, 24 August 1990, DED 4976; same location, 18 November 1997, BAP 183.

Commentary. The macroscopic description is based upon notes taken on the collections listed above when fresh. The microscopic description is based upon my observations of the collections listed above.

In addition to the characters used to distinguish *M. leptocephala* in the key,

inflated terminal cells and/or excrescences and often alkaline odor, the species can also be characterized by its often very dark gray to nearly black pileus coloration, frequently pale grayish to whitish pileus edge, and rather persistent, dark striations. As discussed by Smith (1934), *M. leptocephala* macroscopically resembles *M. piceicola* in many characteristics, especially the presence of a pallid pileus edge. These two taxa can be distinguished easily however on the basis of their very different cheilocystidia, which tend to have long, finger-like excrescences in *M. piceicola*.

Gulden and Jenssen (1982) report the absence of clamp connections in the material they examined from southern Norway. Smith (1947) did not mention clamps in his treatment of the species, but Maas Geesteranus (1988b, 1992b) in his re-examination of several of Smith's collections reports the absence of clamps in a single collection (AHS 32-446), while they are present in the others he examined. A similar situation was encountered in the present investigation, with all but one of the collections examined (BAP 183) containing clamp connections. It appears that while clamp connections are the more common situation in the North American material of the species, the occurrence of clampless forms should not be unexpected.

Mycena subcana A. H. Sm., N. Am. Sp. *Mycena*, p. 73. 1947.
=*Mycena brevipes* sensu A. H. Sm., Mycologia 29: 353. 1937.

Pileus (4-)10-25(-30) mm diam, ovoid initially with a straight margin, becoming obtusely conical, campanulate, or convex, remaining so when expanded; surface minutely pruinose in young specimens, glabrescent for the most part, often retaining some pruinosity in age, dull, moist or dry, pellucid-striate, hygrophanous; the disc dark grayish ("deep neutral gray") to dark grayish brown (6-7F3), fading to pale gray ("pallid neutral gray"), occasionally pale grayish brown ("pale drab gray") overall, the margin grayish ("pallid neutral gray") to grayish brown (6E3). **Context** thin, pale gray. **Lamellae** ascending-adnate, ~12 reaching the stipe, close to subdistant with 1-2 series of lamellulae, often distant at maturity, narrow to moderately broad, occasionally becoming intervenose, white to pale grayish; the edges concolorous. **Stipe** 15-35 X 1-3 mm, central, terete, equal, often with an enlarged base, hollow, tough; the surface dull, dry, canescent initially, soon glabrous, the base covered with white strigose fibrils or downy mycelium; concolorous with the pileus or nearly white, the apex typically paler, the base occasionally developing sordid purplish-brown stains in age. **Odor and taste** not distinct.

Basidiospores 8-11.2(-12) X (4.8-)5.2- 6.4(-7.2) μm [$x'' = 9.5 \pm 1.1 \times 5.8 \pm 0.6 \mu\text{m}$, $Q = 1.3-2.3$, $q'' = 1.7 \pm 0.2$, $n = 75$ spores], broadly ellipsoid to ellipsoid, smooth, thin-walled, hyaline, amyloid. **Basidia** (18.4-)20.8-32 X 7.2-8.8 μm , 4-spored, clavate, clamped, the sterigmata 4-6.4 μm ; basidioles similar.

Cheilocystidia 16.8-82.4 X 7.2-16 μm , fusoid to lageniform or clavate, the lageniform type often with very long tapered necks, occasionally with more than

one apical neck, smooth, clamped, mixed with scattered to rare basidia.

Pleurocystidia absent or very rare, fusoid. **Pileipellis** a cutis; hyphae 2-4.8 (-7.2) μm diam, clamped, covered with cylindric, simple or branched, short to long excrescences which tend to form dense masses, 1.6-24 X 1.2-2 μm .

Hypodermium composed of inflated cells, brownish-virescent in Melzer's reagent. **Lamellar trama** similar. **Stipe cortical hyphae** 2-4 μm diam, clamped, covered with cylindric, simple to furcate excrescences, 1.6-7.2 X 1.2-1.6 μm , more rarely smooth; terminal cells similar to hyphae or slightly broader, 3.2-5.6 μm diam, covered with similar excrescences.

Habit, habitat and distribution. Solitary to gregarious on both dead branches and trunks of fallen or standing conifers and more rarely hardwoods (*Lithocarpus* sp., *Alnus* sp.). In California it has been collected in the fall from the North Coast and Klamath Ranges. Also known from Oregon and Washington (Smith, 1947).

Material examined. California. Siskiyou Co.: Siskiyou National Forest, 15 November 1937, AHS 8752 (Holotype, MICH). Del Norte Co.: Darlingtona, 26 November 1937, AHS 9096 (Paratype, MICH). Mendocino Co.: Jackson State Forest, along Road 409, 23 November, 1991, DED 5421.

Commentary. The macroscopic description is adapted from Smith (1947) with additional information from notes taken on collection DED 5421. The microscopic description is based upon my observations of the collections listed above.

As indicated by Smith (1947) the distinguishing characteristics of *M. subcana* are its tendency to grow upon sticks, branches, and trunks that are typically suspended off the forest floor, as well its broadly ellipsoid spores. In addition to these characters, the pruinose nature of pileus surface, canescent stipe surface, and often greatly elongated apical necks of the cheilocystidia should help to distinguish *M. subcana* from other members of section *Fragilipedes* one is likely to encounter in California. Smith (1947) also indicates the presence of a pale to white form of the species growing on redwood twigs in northern California. I have encountered a similar form on several occasions during very wet periods growing at head level and well above on senescent branches of redwood which are still attached to the tree. Smith states that the single collection of the pale form he made was characterized by slightly narrower spores (4-5 μm) and cheilocystidia with one or more greatly elongated necks, both of which agree well with the somewhat broader concept of the species presented here.

Mycena alnicola A. H. Sm., Contrib. Univ. Mich. Herb. 5: 23. 1941.

Pileus 5-25 mm diam, hemispheric to subcampanulate when young, with or without a tiny umbo, soon expanding to obtusely conical, campanulate, or convex, the margin appressed initially, pellucid-striate when moist; surface initially covered with a dense bloom, glabrescent, soon polished and moist, becoming striate to sulcate with age; initially with a bluish sheen due to bloom, disc brownish

gray (7D2) to grayish brown (6-7E3; "benzo brown") or dark grayish brown (6F3; "fuscous"), the margin pale brownish gray ("light drab") to pale grayish ("drab gray"), scarcely hygrophanous with moisture loss, tending to dry in situ to grayish brown overall. **Context** thin, fragile, gray. **Lamellae** ascending-adnate, usually lacking a decurrent tooth, 20-30 reaching the stipe, close to subdistant, narrow to moderately broad (up to 2 mm), white to "pale gull gray"; edges even, concolorous with the sides. **Stipe** (7-)13-60 X (1-)1.5-2 mm, central, terete, \pm equal, occasionally with a slightly enlarged base; surface initially covered with a dense bloom, glabrescent, soon polished and moist, initially pale grayish with a bluish cast ("dark Quaker drab" to "dark mouse gray"), concolorous with the pileus at maturity, the apex often remaining pale; the base covered with sparse, white fibrils. **Odor** indistinct. **Taste** mild.

Basidiospores 8.0-10.4 X 5.2-6.4 μm [$x^- = 8.6 \pm 0.6$ X 5.6 ± 0.3 μm , $Q = 1.3-1.8$, $q^- = 1.5 \pm 0.1$, $n = 61$ spores], ellipsoid to broadly ellipsoid, smooth, thin-walled, amyloid. **Basidia** (20.8-)23.2-36 X 8-9.2 μm , 4-spored, clavate, clamped, sterigmata up to 6.4 μm in length; basidioles similar. **Cheilocystidia** 19.2-40.8(-59.2) X (7.2-)8-12.8 μm , broadly fusoid, sublageniform, or \pm clavate, the apex broadly rounded or with one or two short, cylindric excrescences, mixed with scattered basidia or forming a sterile lamellar edge. **Pleurocystidia** absent to rare or scattered, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-4(-7.2) μm diam, clamped, covered with cylindric, simple to branched excrescences which tend to form dense masses, 1.6-5.6 X 1.2-3.2 μm . **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells and broad, cylindric hyphae, brownish-vinescent in Melzer's reagent. **Stipe cortical hyphae** 1.6-3.2 μm diam, clamped, covered with cylindric to slightly course (rarely inflated, see commentary), simple to furcate excrescences, 2-7.6 X 1.2-2.8 μm ; terminal cells abundant, similar to hyphae or slightly broader, up to 5.6 μm diam, covered with excrescences similar to those of hyphae or slightly longer, up to 16 μm in length.

Habit, habitat, and distribution. Caespitose to gregarious or scattered on decaying wood of *Alnus* and *Abies* spp., and the peeling bark of living *Arbutus menziesii* Pursh. Known only from Washington, Oregon, California, Idaho, and Michigan. In California it has been collected in the Fall on *Arbutus menziesii* from the Central Coast and San Francisco Bay Area.

Material examined. California. Marin Co.: Mt. Tamalpais State Park, Lake Lagunitas, 17 December 1992, DED 5578. **Washington.** Jefferson Co.: Olympic Mountains, "bottom" - Clearwater River, 5 September 1939, AHS 13237. Whatcom Co.: Mt. Baker, Boulder Creek Trail, 3 September 1941, AHS 16581.

Commentary. The macroscopic description is adapted from Smith (1947) and notes included with DED 5578. The macroscopic description is based on my observations of the collections listed above.

Mycena alnicola appears to be another member of section *Fragilipedes* that is rare within California, represented by only collection DED 5578. Maas Geesteranus (1988, 1992b) questioned whether or not *M. alnicola* truly represents

a distinct species from *M. abramsii*. However, as indicated by Smith (1947) *M. alnicola* can be distinguished by the distinct bluish cast to young stipe and pilei which is due to the presence of a bloom, as well as the small spores of this species. Additionally, *M. alnicola* lacks the alkaline to raphanoid or nitrous odor which is often associated with specimens of *M. abramsii*. Maas Geesteranus viewed the characteristic growth of *M. alnicola* on *Alnus* sp. as distinguishing, disregarding collection AHS 16582 from his description due to this collection's growth on the wood of *Abies*. However, additional collections made by Smith and housed at MICH (AHS 165, 16581, 23823, 49010, 66335), as well as collection DED 5578, are reported to have been growing on woody substrata of additional hardwoods and conifers. It appears the substrate preferences of *M. alnicola* are not as strict as the species name implies.

Upon initial inspection of the collections listed above, I was tempted to leave collection AHS 13247 out of the description due to the presence of rather large, inflated excrescences on the stipe cortical hyphae (up to 12 μm in diam), relatively broader pileipellis hyphae (up to -9.6), and cheilocystidia which almost exclusively lacked the short excrescences found in a majority of the cystidia of other collections examined. However, given that the collection was used in compiling Smith's (1947) description of the species, coupled with the fact that I have not examined numerous collections, I have decided to retain AHS 13247 in formulating my description of the species with the assumption that it represents the variability that most likely exists among specimens of *M. alnicola*.

Mycena aff. murina (Murrill) Murrill, Mycologia 8: 221. 1916

≡ *Prunulus murinus* Murrill, N. Am. Flora 9: 331. 1916.

Pileus 9-17 mm diam, hemispheric, expanding to broadly convex; margins incurved to straight, the edges crisped to crenate; surface dry, dull, appressed fibrillose, smooth, becoming striate in age, pellucid-striate; pale grayish brown (6B2, orange gray), fading to pale grayish. **Context** thin, white. **Lamellae** ascending-adnate, 12-17 reaching the stipe, subdistant with 1-2 series of lamellulae, narrow (up to 3 mm), white; the edges concolorous with sides, smooth. **Stipe** 14-46 X 1-2 mm, central, terete, tapered slightly towards base, hollow; surface dry, with a slight sheen, innately fibrillose, pruinose at first, soon glabrescent, grayish brown, the apex whitish, the base covered with white fibrils which may radiate outward, attaching the stipe to the substrate. **Odor** mild. **Taste** not distinct.

Basidiospores 8.8-9.6(-10.4) X 5.6-6.0(-6.4) μm [\bar{x} = 9.4 \pm 0.5 X 5.7 \pm 0.3, Q = 1.5-1.9, \bar{q} = 1.7 \pm 0.1, n = 25 spores], ellipsoid, thin-walled, amyloid.

Basidia 26.4-38.4 X 8.0-8.8 μm , 4-spored, clavate, clamped, sterigmata up to 8 μm in length; basidioles similar. **Cheilocystidia** 32.0-46.4 X 10.4-20.0 μm ; quite variable in shape, \pm fusoid, clavate, broadly clavate, or \pm obovoid, typically giving rise apically, rarely laterally, to 1 or several (up to 8), simple to branched, \pm cylindrical excrescences, 2.4-17.2 X 1.2-2.4 μm , appearing somewhat gelatinized

when mounted in water, clamped, thin-walled or with slightly thickened walls, forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 2.0-3.6 μm diam, clamped, covered with cylindric, simple to branched excrescences, 1.6-8.8 X 1.2-1.6 μm , which tend to form dense masses.

Hypodermium composed of inflated, globose to ovoid cells, brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae 2.4-3.6 μm diam, clamped, walls slightly thickened, covered with short, cylindric, simple excrescences, 1.6-4.0 X ~1.2 μm ; terminal cells similar to hyphae or slightly broader, up to 4.8 μm diam, densely covered with excrescences similar to those of hyphae.

Habit, habitat, and distribution. Scattered on decaying wood of *Picea sitchensis* (Bong.) Carrière.

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, BAP 149.

Commentary. The macro- and microscopic descriptions are based upon my observation of the single collection listed above.

This collection appears to belong to the group of taxonomically problematic species which includes *M. murina* (Murrill) Murrill, *M. aetites* (Fr.) Quél., *M. stannea* (Fr.) Quél., and possibly other species of section *Fragilipedes*. Smith (1947) treated all of these taxa under the single name *M. stannea*, stating that differences observed between collections of these taxa are merely variations of a single species. Under *M. stannea*, Smith included "any medium-sized fragile gray *Mycena* growing on the ground, with spores 8-11 X 5-7 μm , and with scattered to rare ventricose pleurocystidia (if any are present), which may or may not be furnished with obtuse protuberances. The pileus is hygrophanous, and no distinctive odor or taste is evident... The variation in the shape of the cystidia is similar to that found in *M. citrinomarginata*." Maas Geesteranus (1983) considers *M. stannea* (Fr.) Quél. to be a nomen dubium, and treats both *M. murina* and *M. aetites* as distinct taxa (1988b, 1992b). Maas Geesteranus distinguishes these species by the lack of bluish-gray (i.e., murinous?) coloration to the pileus of *M. aetites*, as well as this species lack of lamellae decurrent with a tooth, more gramineous habit, and other characters which Smith undoubtedly assumed to be mere variations of a single species. Microscopically, Mass Geesteranus' treatments of these two species is nearly indistinguishable with the exception of pileipellis and stipe cortical hyphae which tends to become gelatinized in *M. aetites*, as well as this species often slightly courser cystidial and stipe cortical hyphae excrescences.

It should be noted however that there appears to be some confusion regarding the "murinous" coloration of the pileus and stipe of *M. murinus* in Murrill's original description of the species (1916, as *Prunulus murinus* Murrill). Maas Geesteranus (1988b, 1992b) who based his macroscopic description of the species on Murrill's description and his own observations of numerous dried collections, states that the pileus and stipe are gray with a slight bluish tint. However, murinous as defined in Snell and Dick (1971), refers to colors in

Ridgeway (1912) and other color guides such as Mouse Gray (plate LI in Ridgeway), which ranges from light to dark brownish gray, or drab, and contain no traces of blue. To my knowledge it is not known whether Murrill used a color guide in formulating his descriptions, but based on the color of Mouse Gray in Ridgeway, I do not feel there is any reason to believe that Murrill's species is characterized by the presence of blue tints on the pileus and stipe as indicated by Maas Geesteranus.

Microscopically, the California material is more in agreement with Maas Geesteranus' concept of *M. murina* due to its lack of gelatinizing pileipellis and stipe cortical hyphae. Macroscopically however, the California material differs from *M. murinus* in its lack of the questionable bluish tones that characterize the piles and stipe, and its lack of a blackish stipe base as indicated by Murrill in his original description. The California material differs macroscopically from Maas Geesteranus' concept of *M. aetites* in its lack of an acidulous to raphanoid odor, lack of grayish lamellae, and growth on coniferous wood (*M. aetites* is a species of lawns and meadows). Rather than describe the California material as new species based upon a single collection, which I feel would only exacerbate the confusion surrounding *M. murina* and *M. aetites*, I have chosen to treat the California taxon as undecided with close affinities for both species. Hopefully, additional collections will be made from California in the future which will help to resolve this confused situation.

Mycena abramsii (Murrill) Murrill, Mycologia 8: 220. 1916.

=*Prunulus abramsii* Murrill, N. Am. Flora 9: 338. 1916.

=*Mycena mirata* Velen., České Houby p. 323. 1920.

=*Mycena praecox* Velen., České Houby p. 325. 1920.

Pileus 5-30 mm diam, paraboloid to conical, obtusely conical or campanulate, expanding with age, margin incurved at first, often flaring in age, entire to eroded; surface dull, moist or dry, pruinose, glabrescent, smooth or somewhat sulcate, pellucid-striate, hygrophanous; grayish brown to dark grayish brown (3-7F3-5) or dark brown (7F6-7), occasionally with olivaceous or yellowish tones on the disc, paler and/or more grayish towards the margin, fading to pale grayish with moisture loss, the disc and striations often remaining dark. **Context** thin, concolorous with the pileus or pale grayish. **Lamellae** adnate to ascending-adnate, often with a short decurrent tooth, 16-24 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow to moderately broad (up to 2.5 mm), white to pale grayish; the edges concolorous or paler. **Stipe** 16-80(-125) X 1-3 mm, central, terete, equal or with a slightly broader base, hollow, often exuding watery fluid when cut or broken; surface dry, smooth, upper portion pruinose to canescent, soon glabrescent and shiny, gray to brownish gray (6-8E1-2), light to dark grayish brown (5-6D3-4), or dark brown, the apex often pale grayish; the base covered with whitish fibrils. **Odor** indistinct or alkaline. **Taste** indistinct.

Basidiospores (8.4-)8.8-12.8(-14.4) X 4.8-6.4 (-8.0) μm [$\bar{x} = 10.6 \pm 1.1$ X 5.8 ± 0.7 μm , $Q = 1.4-2.7$, $q = 1.8 \pm 0.2$, $n = 225$ spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 23.2-38.4 X 6.4-10.0, 4-spored (but 1-, 2-, and 3-spored forms rarely encountered), clavate, clamped, sterigmata up to 5.6 μm in length; basidioles similar. **Cheilocystidia** (17.6-)24.8-66.4 X 7.2-15.2 μm , \pm lageniform, fusoid-ventricose, or \pm clavate with one to several, short to fairly long, cylindrical excrescences, 2.0-12.0 X 1.2-2.4 μm , clamped (see commentary), thin-walled, hyaline, mixed with basidia or forming a sterile lamellar edge. **Pleurocystidia** absent to rare or abundant, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-4.8 μm , clamped, covered with simple or branched, cylindrical to slightly coarse, short to long excrescences, 1.6-27.2(-12.8) X 1.2-3.2 μm , which are often somewhat gelatinized. **Hypodermium** composed of inflated cells, up to 48.0 μm diam, brownish-vinescent in Melzer's reagent. **Lamellar** trama subregular, composed of slightly inflated to inflated cells, brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae 1.6-4.8 μm diam, clamped, smooth to sparsely or densely covered with short, simple or rarely branched, cylindrical excrescences, 1.6-5.6 X 1.2-2.0 μm ; terminal cells similar or slightly broader, smooth or covered with excrescences similar to those of hyphae.

Habit, habitat, and distribution. Solitary to gregarious or subcaespitose on herbaceous debris and decaying wood of conifers and hardwoods. Known from North America, Europe and Iceland (Maas Geesteranus, 1988). In California the species has been collected in the fall from the San Francisco Bay Area, South Coast Ranges, North Coast Ranges, and the Northern High Sierra Nevada, and in the spring from the Cascade Ranges and Northern High Sierra Nevada.

Material examined. California. Humboldt Co.: Redwood National Park, Rugg Grove, 8 November 1997, DED 6668. Lassen Co.: Lassen Volcanic National Park, 29 June 1965, HDT 12822. Marin Co.: Samuel P. Taylor State Park, 16 November 1997, BAP 182. Santa Barbara Co.: Santa Barbara, 9 January 1940, Rea Herbarium 295 (MICH). Sierra Co.: Hwy. 49, "Steele Gulch", near Yuba Pass, 18 May 1986, HDT 49792; Gold Lake Rd., Gray Eagle Lodge area, 8 June 1995, DED 6285; Hwy. 49, Chapman Creek Campground, 4 June 1997, BAP 122; same location, 4 October 1997, BAP 130. **Michigan.** Oakland Co.: Oak Hill Rd., 17 June 1937, AHS 6344 (MICH). **Oregon.** Multnomah Co.: Portland, 25 October 1954, AHS 49505 (MICH).

Commentary. The macroscopic description is based on my observations of several of the collections listed above in the fresh condition, with additional information adapted from Smith (1947). The microscopic description is based upon my investigations of the collections listed above.

Mycena abramsii is a rather non-descript, grayish to brownish *Mycena* frequently encountered in the forested regions of the north coast and northern Sierra Nevada of California. In my opinion, the species best characterized by its typically \pm lageniform to fusoid-ventricose cystidia, and lack of inflated stipe cortical hyphae terminal cells such as those found in *M. leptcephala*, with which *M.*

abramsii may be confused. Maas Geesteranus (1988, 1992b) states that the copious amounts of watery fluid exuded from the stipe when cut or broken are a distinctive feature of *M. abramsii*. While Smith (1947) mentions the watery nature of the stipe in his treatment of the species, he does not cite this character as distinctive for the species. Murrill (1916), in his description of the species (as *Prunulus abramsii* Murrill), does not mention the presence of any watery fluid in the stipe tissues. I was unable to demonstrate the presence of any watery exudate, beyond the very small amount produced by any *Mycena* when the stipe is squeezed or pinched, in the fresh material collected during this investigation. Although Maas Geesteranus (1988, 1992b) does state that this phenomena is "rarely demonstrable in specimens only a few hours after collecting," I feel that perhaps he is placing a bit too much weight on its presence. While a watery exudation may well be present in many individuals of this species, I imagine that the amount and presence of this fluid is quite dependent upon the age of the specimens as well as prevailing climatic conditions of the habitat from which it was collected.

Collection HDT 12822 was unique in its presence of 1-, 2-, and 3-spored basidia, exceptionally long sterigmata (up to 12.8 μm), as well as both clamped and clampless tissues. All other collections examined contained 4-spored basidia and clamp connections.

Mycena alcaliniformis (Murrill) Murrill, Mycologia 8: 220. 1916.

=*Prunulus alcaliniformis* Murrill, N. Am. Flora 9: 331. 1916.

=*Mycena subsupina* A. H. Sm., Mycologia 29: 340. 1937.

=*Mycena vexans sensu* Murrill, Mycologia 4: 168. 1912.

Pileus 5-29 mm diam, convex to obtusely conical, paraboloid, or campanulate, expanding with age; margin appressed against the stipe initially, becoming straight to uplifted; surface dull, moist or dry, glabrous, smooth, becoming sulcate to striate, pellucid-striate, hygrophanous; grayish brown (6-7E3-4), to brown (6E8), dark brown (5-8F4-6), or dark reddish brown (7E5-6) on the disc, the margin concolorous or paler, fading entirely to grayish brown or pale grayish. **Context** thin, concolorous with the pileus to pallid or white. **Lamellae** ascending-adnate, with or without a short decurrent tooth, 13-22 reaching the stipe, close to subdistant with 1-2 series of lamellulae, narrow to moderately broad (up to 3.5 mm), white to pale grayish; the edges entire, concolorous with the sides or paler. **Stipe** 10-79(-122) X 0.5-2 mm, central, terete, \pm equal, hollow; surface dry or moist, with a slight sheen, pruinose at the apex, glabrous below, dark brown to grayish and \pm concolorous with the pileus, the apex white to pale gray, the base covered with whitish mycelium, often only scarcely so. **Odor** indistinct, pleasant, or alkaline. **Taste** indistinct or sweet.

Basidiospores 8-12 X 4.8-6.4(-7.2) μm [\bar{x} = 10.2 \pm 0.9 X 6.0 \pm 0.5 μm , Q = 1.4-2.0, q = 1.7 \pm 0.1, n = 125 spores], ellipsoid, smooth, thin-walled, amyloid.

Basidia 22.0-34.8(-37.6) X 7.7-10.0 μm , 4-spored, clavate, clamped, sterigmata

up to 7.2 μm in length; basidioles similar. **Cheilocystidia** 22.4-64.8 X 8-16 μm , clavate, irregular-clavate, \pm fusiform, or \pm lageniform, typically narrowed apically into one or several, cylindrical to coarse, short to long, simple or more rarely branched excrescences, 1.6-19.2 X 1.2-4.8 μm , thin-walled, clamped, forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.6-7.2 μm diam, clamped, covered with cylindrical, simple to branched excrescences, 1.6-17 X 1-2.5 μm ; terminal cells similar to hyphae. **Hypodermium** composed of inflated, globose to ovoid cells, up to 24.0 μm diam, brownish-vinescent in Melzer's reagent. **Lamellar trama** subregular, composed of inflated cells and narrower hyphae, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, brownish-vinescent in Melzer's reagent; cortical hyphae 1.6-4 μm diam, clamped, smooth to densely covered with simple to occasionally furcate, cylindrical excrescences, 1.2-10.4 X 1.2-2.4 μm ; terminal cells similar to hyphae or slightly broader, up to 6.0 μm diam

Habit, habitat, and distribution. Gregarious to caespitose on the debris and decaying wood of conifers. Known from United States. In California it has been collected during the fall months from the North Coast and Klamath Ranges, and from the northern High Sierra Nevada during the spring.

Material examined. California. Del Norte Co.: Redwood National Park, ~2 miles south of Hiouchi, 18 October 1997, BAP 157. Mendocino Co.: Navarro River Redwoods State Park, Hwy. 128, ~12 from junction with Hwy. 1, 22 November 1997, BAP 184. Sierra Co.: Hwy. 49, Chapman Creek Campground, 3 June 1996, BAP 042; same location, 5 June 1997, BAP 127; same location, 5 June 1997, BAP 128; Sierra Nevada Field Campus, 6 June 1996, BAP 048.

Commentary. The macroscopic description is based upon my examination of the collections listed above in the fresh condition, with additional information adapted from Murrill (1916) and Smith (1947). The microscopic description is based upon my examinations of the collections listed above.

As discussed by Maas Geesteranus (1988, 1992b), *M. alcaliniformis* proves to be yet another difficult taxon of section *Fragilipedes*. In his treatment of the species Maas Geesteranus separates *M. alcaliniformis* from *M. citrinomarginata* on the basis of the former species lack of yellowish lamellar edges, cartilaginous stipe, pleasant odor, and apparent lack of stipe cortical hyphae terminal cells. Aside from these characters, Maas Geesteranus (1988) states that he finds little to "separate this species from the very variable *Mycena citrinomarginata*." A very similar situation was encountered in the current investigation. Aside from the lack of yellowish lamellar edges in the collections of *M. alcaliniformis* I investigated, as well as a general overall lack of yellow in basidiome coloration, I was able to find very little by which to separate these collections from those I have decided to treat as *M. citrinomarginata*. Murrill (1916), Smith (1947) and Maas Geesteranus (1988, 1992b) all cite the pleasant odor and sweet taste of *M. alcaliniformis* as distinctive features of the species. In the material I investigated however, the odor ranged from indistinct to mildly alkaline, and the taste was always observed to be indistinct. In none of these

collections did I encounter odors or tastes that I would describe as pleasant or sweet respectively. Additionally, all collections examined in the current investigation were characterized by the presence of stipe cortical hyphae terminal cells, conflicting with Mass Geesteranus' report of their absence in his treatment of the species (1988, 1992b).

Based on these complications, I am tempted once again to expand the already variable concept of *M. citrinomarginata* (see commentary under *M. olivaceomarginata*, section *Rubromarginatae*) to accommodate the specimens I have treated here as *M. alcaliniformis*. To expand the concept of this species however, especially without a critical investigation of the holotype material of *M. alcaliniformis* would, I believe, only add to the confusion regarding *M. citrinomarginata*. Until I am able to perform such an investigation, I have chosen to treat these taxa which lack yellowish coloration and may at times be characterized by a pleasant odor and sweet taste, as a separate species.

***Mycena* section *Luculentae* Maas Geest., *Pesoonia* 11: 101.1980.**

Basidiomes medium sized. Pileus surface dry to moist, generally somewhat lubricous when wet, the margin or entire pileus brightly colored (yellowish, orangish, reddish, or pink), at least when young. Context thin. Lamellae adnate, generally with a decurrent tooth; the edge convex, generally more intensely or differently colored, more rarely concolorous. Stipe central, hollow or solid, fragile to cartilaginous; surface dry, entirely or apically pruinose, glabrescent, variously colored but always with yellowish, orangish, or pinkish tones. Odor and taste not distinctive.

Basidiospores ellipsoid, smooth, amyloid. Basidia 4-spored, clavate, clamped. Cheilocystidia clavate, fusiform, or narrowly utriform, often with a long, narrowed base, clamped, with colored contents, the upper portion covered with few to numerous, generally simple, cylindrical excrescences, more rarely smooth. Pleurocystidia similar to cheilocystidia or lacking excrescences, with colored contents. Pileipellis a cutis; hyphae covered with short to long, simple to variously branched excrescences, generally somewhat gelatinized. Stipe tissues parallel, monomitic; cortical hyphae smooth or covered with generally simple excrescences.

Growing on fallen needles and debris of conifers, more rarely on fallen leaves and debris of hardwoods.

Type species: *Mycena aurantiomarginata* (Fr.) Quél.

Key to the California species of section *Luculentae*.

1. Pileus with distinctive pinkish to pale reddish tones; lamellar sides often

- developing punctate reddish dots in age; pleurocystidia smooth
 *M. rosella* [subsect. *Rosellae*]
1. Pileus with distinctive reddish orange, orangish or yellowish tones; lamellar sides not developing punctate dots in age; pleurocystidia covered with excrescences 2
 2. Pileus disc brownish, olivaceous, or brownish orange, the margins orangish to yellowish orange; lamellar edges generally orange to yellowish orange; basidiomes generally not retaining bright coloration upon drying *M. aurantiomarginata* [subsect. *Elegantes*]
 2. Piles lacking brownish or olivaceous tones, entirely orangish red, orangish or yellowish; lamellar edges generally orangish red; basidiomes retaining bright coloration upon drying out
 *M. strobilinoidea* [subsect. *Elegantes*]

Mycena* section *Luculentae* subsection *Rosellae Singer ex. Maas Geest.
 Basidiomes with same features described above for section *Luculentae*.
 Pleurocystidia smooth.

Mycena rosella (Fr.) P. Kumm. var. ***rosella***, Führ. Pilzk. p. 109. 1871
 ≡ *Agaricus rosellus* Fr., Syst. Mycol. 1: 151. 1821.
 ≡ *Omphalia rosella* (Fr.) Gray, Nat. Arr. Br. Plants 1: 613. 1821.

Pileus 3-21 mm diam, hemispherical to convex or campanulate, campanulate to broadly- or plano-convex in age, often with a small papilla or umbo, more rarely with a shallow central depression; margin incurved at first, pellucid-striate, often striate, especially in age, edges entire to eroded; surface moist, lubricous, or slightly viscid, often delicately pruinose or fibrillose at first, soon glabrescent, dull but often becoming polished with moisture loss; deep pink (11A7), pale red (rosy) (7-9A3-4), grayish red (7-8B4-6), brownish red (9-10C7-6), or brown (6D6-8), generally paler towards the margins, fading in age to pale pinkish (7-8A2-3), or pinkish gray, the margins and disc frequently developing brownish yellow or yellowish tones. **Context** thin, whitish to pale pinkish.

Lamellae ascending-adnate, with a decurrent tooth, (11-)14-19(-24) reaching the stipe, close to subdistant with 1-2 series of lamellulae, narrow to moderately broad (up to 2.5 mm), pale pinkish (7-8A2-3) to pale orangish white (5-6A2), generally becoming minutely punctate with reddish dots; the edge convex to straight, dark pinkish to red, often becoming more pronounced with moisture loss. **Stipe** 13-67 X 0.5-1.5(-2.5) mm, central, equal, terete, hollow; surface dry, slightly polished, the apex generally pinkish to reddish pruinose or puberulous, glabrous below; pinkish brown (9D5-4) to grayish red (7-8A-C3-4), often with yellowish brown tones, the apex generally paler; the base covered with often sparse, whitish fibrils.

Odor indistinct or weakly raphanoid. **Taste** indistinct.

Basidiospores 8.0-9.6(-10.4) X 4.0-5.2 μm [$\bar{x} = 9.1 \pm 0.6$ X 4.6 ± 0.3 , $Q = 1.8-2.3$, $q = 2.0 \pm 0.1$, $n = 50$ spores], ellipsoid, smooth, strongly amyloid. **Basidia** 23.2-31.2 X 6.4-7.6 μm , 4-spored, clavate, clamped, sterigmata 4.0-5.6 μm in length; basidioles similar. **Cheilocystidia** 20.8-65.6 X 8.0-22.4 μm , clavate to fusiform, the upper portion covered with few to numerous, unevenly spaced, generally simple, cylindrical to coarse or inflated excrescences, 1.2-13.6 X 0.8-4.0 μm , some of the fusiform cheilocystidia often lacking excrescences and smooth, with reddish contents, clamped. **Pleurocystidia** abundant, similar to the smooth, fusiform cheilocystidia, with reddish contents, clamped. **Pileipellis** a cutis; hyphae 1.6-8.0 μm diam, clamped, gelatinized, covered with short, cylindrical, simple excrescences, 1.2-5.6 X 0.8-1.6 μm , and giving rise to longer, simple to branched side-branches up to 20.8 X 1.2-2.4 μm . **Hypodermium** composed of inflated cells, dextrinoid. **Pileus trama** composed of inflated and cylindrical cells, dextrinoid. **Lamellar trama** composed of inflated cells, dextrinoid. **Stipe tissues** monomitic, parallel; cortical hyphae 1.6-4.0 μm diam, clamped, gelatinized, smooth or covered with scattered, cylindrical, generally simple excrescences, 1.2-8.0 X 1.2-1.6 μm ; terminal cells inflated, 4.4-11.2 μm diam, covered with unevenly spaced excrescences similar to those of hyphae or larger, up to 14.0 X 2.0 μm .

Habit, habitat, and distribution. Gregarious to scattered on needles and other debris of conifers. In California, I have collected *M. rosella* in the fall from the North Coastal Ranges, Klamath Ranges, and the Sierra Nevada. In addition to California, the species has been reported from Michigan, Idaho, Washington, and Oregon in the United States; Nova Scotia and Ontario in Canada (Smith, 1947); and Europe (Maas Geesteranus, 1986).

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, BAP 144. Humboldt Co.: Redwood National Park, Rugg Grove, 19 October 1997, BAP 162; same location, 8 November 1997, BAP 166; same location, 7 November 1998, BAP 201; Big Lagoon, 9 November 1997, BAP 175. Sierra Co.: Chapman Creek Campground, 4 October 1997, BAP 134. Yuba Co.: Bullard's Bar Recreation Area, Schoolhouse Campground, 7 Dec. 1991, DED 5428.

Commentary. The macroscopic description is based upon notes taken on the collections listed above, complemented by Smith (1947). The microscopic description is based upon my examination of the collections listed above.

Mycena rosella is characterized macroscopically by the pinkish to pale reddish tones of the pileus, stipe, and lamellar edges, as well as the punctate reddish dots that tend to develop on the lamellar sides of many specimens. Microscopically, *M. rosella* is characterized by the presence of ornamented cheilocystidia (which may or may not be mixed with some smooth forms), and smooth pleurocystidia. Other California species of *Mycena* that are also characterized by reddish tones to the pileus, stipe, and lamellar edges include: *M. sanguinolenta*, *M. californiensis*, *M. haematopus*, and *M. capillaripes*. With the exception of *M. capillaripes*, *M. rosella* can be distinguished from these other taxa by its lack of colored latex and a comparison of the cystidia. *Mycena*

sanguinolenta exudes a reddish latex when the stipe is broken, and is characterized by smooth, fusiform cheilocystidia and pleurocystidia that generally have a sharply pointed apex. *Mycena californiensis* exudes a reddish to orangish red latex, and is characterized by cheilocystidia with few to numerous knob- or finger-like projections. Additionally, *M. californiensis* has only been observed to grow on the fallen leaves and debris of *Quercus* spp., a habit not observed in *M. rosella*. *Mycena haematopus* exudes a deep reddish latex when cut or broken, and is characterized by smooth, fusiform cheilocystidia and a lignicolous habit. *Mycena capillaripes* can be distinguished from *M. rosella* by the former species smooth, fusiform to ±clavate or narrowly utriform cheilo- and pleurocystidia.

Mycena* section *Luculentae* subsection *Elegantes Singer ex. Maas Geest., Persoonia 11: 101. 1980.

Basidiomes with the same features described above for section *Luculentae*. Pleurocystidia covered with generally simple, cylindrical excrescences.

Mycena aurantiomarginata (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5: 240. 1872.

≡ *Agaricus aurantiomarginatus* Fr., Syst. Mycol. 1: 113. 1821.

≡ *Mycena elegans* var. *aurantiomarginata* (Fr.) Cejp, Publ. Fac. Sci. Univ. Charles 104: 66. 1930.

Pileus 6-23 mm diam, obtusely conical to campanulate or paraboloid, expanding to nearly plane in age, occasionally with a broad, low umbo; margins straight to incurved, pellucid-striate, striatulate, often flaring slightly in age or becoming eroded; surface dull, moist to dry, often somewhat lubricous when wet, glabrous; disc brownish orange (6C-D5) to brown (6E6-7) or dark brown (5-6F5-6), often with olivaceous tones, remaining so or fading to grayish- or yellowish brown (6E3-4), the margins brownish orange, orangish (5A-B5-6), or yellowish orange (4B-C6-8), typically with brown striations over lamellae, fading to pale brownish orange (5C3-4) or orangish gray (5B2). **Context** thin, concolorous with the pileus or more brownish. **Lamellae** ascending adnate, generally with a small decurrent tooth, 18-26 reaching the stipe, close with 1-3 series or lamellulae, narrow to moderately broad (up to 2 mm), pale orange (5A2-3) to orange (5-6A-B6-7) when young, becoming grayish yellow (4C5-6), or grayish brown in age; the edges convex, orange to yellowish orange (4-5A6-8), often concolorous in the younger, more intensely colored specimens. **Stipe** 24-71 X <1-2.5 mm, central, terete, equal or with a slightly broader apex and/or base, hollow; surface dry, slightly shiny, minutely orangish to yellowish pruinose at apex, glabrous below, the upper portion light yellow (4A5-6) to grayish yellow (4B6-7), or light orange (5A4-6), yellowish brown (5E5-6) to grayish brown (6D-E3) or brown (6D-E4-6) below; the base covered with orangish, yellowish, or grayish-white fibrils. **Odor** and taste not distinctive.

Basidiospores (8.0-)9.0-10.5(-11.5) X (4.5-)5-6 μm [$\bar{x} = 9.6 \pm 0.8 \times 5.2 \pm 0.4 \mu\text{m}$, $Q = 1.6-2.1$, $q = 1.8 \pm 0.4$, $n = 33$ spores], ellipsoid, smooth, amyloid. **Basidia** 19-30 X 6-7.5 μm , clavate, clamped, sterigmata up to 6 μm in length; basidioles similar. **Cheilocystidia** 17-64 X 7-17 μm , \pm clavate to broadly clavate, often with a long, narrowed base, more rarely somewhat irregular in shape or with additional apical heads, clamped, with orangish contents, the upper portion covered with evenly spaced, short, simple, cylindrical excrescences, 1-5 X <1-2 μm , the irregular forms frequently with larger, often branched excrescences, generally forming a sterile lamellar edge, more rarely mixed with basidia. **Pleurocystidia** present, similar to the normal shaped cheilocystidia. **Pileipellis** a cutis; hyphae cylindrical to inflated, or with inflated bulges, 2-10(-13.0) μm diam, clamped, slightly gelatinized, sparsely to densely covered with cylindrical, short to long, simple and branching excrescences, 1-33 X <1-2 μm , the longer forms tending to form dense masses. **Hypodermium** of inflated cells, vinescent to brownish vinescent in Melzer's reagent. **Pileus trama** composed of inflated cells and cylindrical hyphae, vinescent to brownish vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, vinescent to brownish vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 1.5-4.5 μm diam, clamped, smooth or with scattered, cylindrical, simple, rarely furcate excrescences, 1.5-5(-12) X 1-2 μm ; terminal cells clavate, subcylindrical, or irregular, 5-10 μm diam, often occurring in clusters, covered with scattered excrescences similar to those of hyphae.

Habit, habitat, and distribution. Scattered to gregarious on conifer debris, more rarely on hardwood debris. In California *M. aurantiomarginata* is fairly common to the coniferous and mixed evergreen forests of the coastal ranges. Also known from Oregon and Washington in the United States, (Smith, 1947), as well as Europe and North Africa (Maas Geesteranus, 1986).

Material examined. California. Del Norte Co.: Redwood National Park, Rugg Grove, 19 October 1997, BAP 161; same location, 8 November 1997, BAP 164. Mendocino Co.: Jackson State Forest, Rd. 409, 23 November 1991, DED 5417; same location, 23 November 1996, BAP 077.

Commentary. The macroscopic and microscopic descriptions are based upon my examinations of the specimens listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1986).

Mycena aurantiomarginata is characterized the brownish to olivaceous pileus disc, bright, brownish orange to orangish or yellowish orange margins, and orangish to yellowish orange lamellar edges (which may appear concolorous in younger specimens with more intensely colored lamellar sides). Smith indicated the close relationship of this species to *M. chloranthoides* Maas Geest. (= *M. elegans* (Fr.) Quél. sensu A. H. Sm.), and stated that the latter could be distinguished by its sulfur yellow lamellar edges. To this I would add the overall more yellowish coloration of *M. chloranthoides*, as well as the tendency of the lamellae and the stipe to develop sordid purplish stains, and the lack of smooth stipe cortical hyphae.

Mycena strobilinoidea Peck, Rep. (Annual) New York State Mus. Nat. Hist. 45: 23. 1893.

= *Prunulus strobilinoidea* (Peck) Murrill, N. Am. Flora 9: 337. 1916.

Pileus 10-20 mm diam, acutely to obtusely conical, often expanding to campanulate; the margin appressed against the stipe in young specimens, becoming slightly crenate, often flaring somewhat in age, pellucid-striate when moist, somewhat sulcate at maturity; surface moist, lubricous, glabrous, not hygrophanous; "grenadine red" to "flame scarlet," fading to "cadmium yellow" or "capucine yellow," or occasionally whitish. **Context** thin, pliant, yellowish.

Lamellae ascending-ascending, with a slight decurrent tooth, subdistant, 15-20 reaching the stipe, breadth 2-3 mm, yellow to "light salmon orange," the edge "flame scarlet," at least in young specimens. **Stipe** 30-40 X 1-2 mm, central, equal, terete, hollow or solid, pliant, cartilaginous; the surface orange-pruinose toward the apex, glabrescent; "orange chrome" to "orange," or paler; the base covered with orange fibrils. **Odor** and taste not distinctive.

Basidiospores 7.5-9.0(-9.5) X 4.5-5.5(-6.0) μm [$x'' = 8.2 \pm 0.5 \times 5.0 \pm 0.3 \mu\text{m}$, $Q = 1.4-1.9$, $q'' = 1.7 \pm 0.1$, $n = 75$ spores], ellipsoid, amyloid. **Basidia** 23-36 X 7-8 μm , 4-spored, clavate, clamped, sterigmata up to 7 μm in length; basidioles similar. **Cheilocystidia** 25-53 X 7-15 μm , \pm clavate to narrowly utriform with an elongated apical portion, generally with a long, narrowed base, clamped, with yellowish or orangish hyaline contents, the upper portion covered with \pm evenly spaced, simple, cylindrical excrescences, 1-3 X 1-1.5 μm , often giving rise apically to 1 or several, longer, simple to branched, cylindrical to quite coarse or inflated excrescences, 3.5-14.0(-25) X 1.5-5.0 μm ; mixed with basidia. **Pleurocystidia** similar. **Pileipellis** a cutis; hyphae 2-6.5(-8) μm diam, clamped, slightly gelatinized, covered with scattered to closely spaced, cylindrical, simple excrescences 1.5-12 X <1-2 μm , and giving rise to numerous, long, narrower side branches, 1.5-2.5 μm diam, which are branched and covered with excrescences, and which tend to form dense masses, some portions of hyphae \pm smooth and giving rise to scattered side branches. **Hypodermium** of inflated, elongated and \pm compact cells, brownish vivescent in Melzer's reagent. **Pileus trama** composed of similar cells intermixed with cylindrical hyphae, brownish vivescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, brownish vivescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, vivescent to brownish vivescent in Melzer's reagent; cortical hyphae 2-5 μm diam, clamped, covered with cylindrical, simple, rarely furcate excrescences, 1-6 X <1-2 μm , more rarely smooth (see commentary below); terminal cells 4-10 μm diam, similar to the hyphae, \pm clavate, or similar to the cheilocystidia, densely covered with excrescences similar to those of hyphae, occasionally giving rise to longer, coarse, often branched excrescences near the apex.

Habit, habitat, and distribution. Gregarious on the fallen needles of conifers. I have examined material collected in the fall months from the Klamath and Cascade Ranges in California, and from the Cascade ranges in Washington.

The species has also been reported in the late summer and fall from Massachusetts, Michigan and Oregon in the United States, and British Columbia in Canada (Smith, 1947).

Material examined. California. Siskiyou Co.: Marble Mountains Wilderness Area, Haypress Meadow, 29 September 1979, D.L. Largent 7816 (HSU); same location, 26 October 1981, CMS 106 (HSU). Trinity Co.: Big Bar Rd., T. Baroni 802 (HSU). **Washington.** Mt. Rainier National Park, Carbon River, 14 October 1967, D.L. Largent 3093 (HSU).

Commentary. The macroscopic description is adapted from Smith (1947). The microscopic description is based upon my observations of the collections listed above.

Within California, *Mycena strobilinoidea* appears to be common only to the Klamath and Cascade ranges in the northernmost portion of the state. Based upon Smith's observation (1947) that the species is most abundant at elevations above 2500 feet, *M. strobilinoidea* would not be unexpected in the Sierra Nevada and associated foothills. To my knowledge however, no collections have yet been made from these regions.

Macroscopically, *M. strobilinoidea* is characterized by the vivid reddish orange to orangish yellow coloration of the basidiomes which is generally retained as the specimens dry out. Similarly colored species found within California include *M. oregonensis*, *M. aurantiidisca*, *M. adonis*, and *M. acicula*. All of these taxa can be distinguished from *M. strobilinoidea* by the presence of inamyloid spores and smooth cheilocystidia.

In one of the collections examined (T. Baroni 802), sphaeropedunculate cheilocystidia covered with a few scattered, cylindric excrescences were observed intermixed with the normal clavate to narrowly utriform type. In another collection (DLL 3093) smooth stipe cortical hyphae was observed intermixed with hyphae covered with excrescences. The smooth hyphae was generally present as the cells directly preceding the terminal cells.

Mycena* section *Rubromarginatae Singer ex. Maas Geest., *Persoonia* 11: 106. 1980.

Basidiomes small to medium sized. Pileus surface pruinose or glabrous, dry but often becoming more or less lubricous when moistened, typically hygrophanous; coloration variable, ranging from grayish to brownish or grayish brown, and typically suffused with pinkish, reddish, violaceous, yellowish, or olivaceous shades, to darker brownish, blackish brown, or dark violaceous. Context thin. Lamellae ascending or adnate, typically with a short decurrent tooth, white to grayish, often suffused with pinkish and/or brownish tones; the edges marginate, pinkish, reddish, reddish brown, violaceous brown, or dark violet, more rarely partially or entirely concolorous or paler than lamellar sides. Stipe central,

hollow, usually slender and fragile; surface pruinose at least at the apex, glabrescent or glabrous below, dry; coloration variable, whitish to grayish or grayish brown, frequently suffused with pinkish, reddish, or violaceous tones, often changing color with age; the base covered with fibrils, occasionally rooting in substrate. Odor indistinct, nitrous, or raphanoid. Taste indistinct or raphanoid.

Basidiospores ellipsoid, smooth, thin-walled, amyloid. Basidia 4-spored, rarely 2-spored, clavate, clamped (clampless in 2-spored forms). Cheilocystidia variously shaped, typically clavate, fusiform, lageniform, or irregular, with pinkish, reddish, violaceous, or brownish contents, smooth or covered with relatively few, often coarse excrescences, generally clamped. Pleurocystidia rare or absent. Pileipellis a cutis; hyphae generally clamped, smooth and/or covered with simple to coarse excrescences. Stipe cortical hyphae similar.

Growing on the debris and decaying wood of conifers and hardwoods, on the bark of dead and living conifers, on the cones of *Pinus* spp., on lawns, and *Sphagnum*.

Type species: *Mycena rubromarginata* (Fr.: Fr.) P. Kumm.

Key to the California species of *Mycena* section *Rubromarginatae*.

- 1. Lamellar sides becoming punctate with pinkish, reddish, or violaceous brown dots (at least when dried); pleurocystidia abundant and protruding *M. capillaripes*
- 1. Lamellar sides without punctate dots; pleurocystidia absent 2
 - 2. Basidiomes typically with distinct purplish coloration; cheilocystidia excrescences if present short, less than 10 µm; stipe cortical hyphae and pileipellis hyphae gelatinized or embedded in gelatinous matter *M. purpureofusca*
 - 2. Basidiomes typically with distinct brownish coloration; cheilocystidia typically with one to several, often longer excrescences, up to 40 µm; stipe cortical hyphae and pileipellis hyphae not gelatinized or embedded in gelatinous matter 3
- 3. Basidiomes growing in grass; the pileus and stipe often with yellowish tones; pileipellis and stipe cortical hyphae lacking inflated and/or coarse excrescences *M. olivaceomarginata*
- 3. Basidiomes growing on woody or herbaceous debris; the pileus and stipe lacking yellowish tones; pileipellis and stipe cortical hyphae with inflated and/or coarse excrescences *M. bulliformis* nom. prov.

Mycena capillaripes Peck, Rep. (Annual) New York State Mus. Nat. Hist. 41: 63. 1888.

≡ *Prunulus capillaripes* (Peck) Murrill, N. Am. Fl. 9: 328. 1916.

= *Mycena plicosa* var. *marginata* J. E. Lange, Dansk Bot Ark. 1(5): 18. 1914

= *Mycena langei* Maire, Bull. Trimest. Soc. Mycol. Fr. 44: 39. 1928.

= *Mycena rubromarginata* sensu Pearson, Naturalist p. 46-47. 1955.

Pileus 6-24 mm diam, obtusely conical, expanding to broadly conical or campanulate in age, often with a small umbo or papilla; the margin straight, often becoming uplifted with age; surface moist to dry, glabrous, smooth, occasionally becoming striate to sulcate with age, dull, pellucid-striate when moist, hygrophanous; at first grayish brown (7C-D3-4) to dark reddish brown (8F4-6) overall, disc remaining so in age or fading to reddish gray (6-7B2-3) or reddish brown (8D4-5), the margins fading to pale grayish brown (6C-D3), becoming paler and often developing incarnate tones upon drying out. **Context** thin (up to 1 mm), gray to grayish-brown. **Lamellae** ascending-adnate, often with a short decurrent tooth, 16-20 reaching the stipe, close to subdistant with 1-2 series of lamellulae, narrow (up to 2.5 mm), often becoming dorsally intervenose; pale grayish white to pale pinkish brown (6-7C3), punctate with pinkish brown, reddish brown, or pinkish violet beads, at least when dried; the edge pinkish brown, reddish brown or violet brown, often present as a series of disjunct beads. **Stipe** 20-72 X 1-2.5 mm, central, terete, ±equal, hollow; the surface smooth, dry, shiny, pruinose to puberulous above, glabrous below, the base covered with whitish fibrils; grayish brown (6-7C-D3), not infrequently with orange or pink tones, the apex often paler, grayish white to white. **Odor** alkaline or nitrous. **Taste** raphanoid, unpleasant.

Basidiospores 8.4-11.2(-12.8) X (4.0-)4.8-6.4(-7.2) μm [$x'' = 9.8 \pm 0.8$ X 5.2 ± 0.6 μm, Q = 1.4-2.5, $q'' = 1.9 \pm 0.3$

], ellipsoid, amyloid, smooth, thin-walled. **Basidia** 23.0-32.8 X 7.2-8.0 μm, 4-spored, clavate, clamped, with sterigmata 4.0-7.2 μm in length; basidioles similar.

Cheilocystidia 28.8-84.0 X 5.6-16.0 μm, fusiform to ±clavate, more rarely narrowly utriform, smooth, often with an irregular bulge or even furcate apically, thin-walled, clamped, generally with reddish, granular contents (which may dissolve in KOH). **Pleurocystidia** abundant and much protruding, similar to cheilocystidia. **Pileipellis** a cutis of loosely associated hyphae; hyphae 2.4-5.6 μm diam, clamped, thin-walled, hyaline, covered with short to long, simple to branched, cylindrical excrescences, 1.6-30.4 X 1.2-2.4 μm. **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Pileus trama** and lamellar trama composed of inflated cells, forming a continuous layer with the hypodermium, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, brownish-vinescent in Melzer's reagent; cortical hyphae 2.4-4.0 μm diam, clamped, smooth to sparsely diverticulate, excrescences cylindrical, simple, straight to curved, more rarely furcate and/or slightly inflated, 1.6-7.2 X 1.6-3.2 μm; terminal cells similar to hyphae or broader, up to 8.0 μm diam, with few to fairly numerous excrescences similar to those of hyphae, occasionally forked or split near the apex.

Habit, habitat and distribution. Gregarious on needles of conifers and occasionally on the litter of hardwoods. In California, the species appears to be found almost exclusively in association with *Pinus* spp., often carpeting the ground with hundreds of basidiomes. Common throughout the coastal pine forests of California, November through February.

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, BAP 142. Marin Co.: Point Reyes National Seashore, Limantour Ridge, 29 November 1991, DED 5423. Mendocino Co.: Jackson State Forest, road 408, 23 November 1991, DED 5415; Jackson State Forest, Albion-Little River Rd., near airport, 24 November 1996, BAP 090.

Commentary. The macroscopic description is based upon notes included with the DED collections listed above and my observations of fresh material, with additional information adapted from Maas Geesteranus (1986, 1992b) and Smith (1947). The microscopic description is based upon my examination of the collections listed above.

The pinkish to reddish coloration of the lamellar edges and faces, strong alkaline odor, terrestrial habit, and apparent preference for the needles of *Pinus* spp., make *M. capillaripes* one of the easier marginate California mycenas to recognize in the field. Microscopically, the species is best distinguished from the other members of the section *Rubromarginatae* by the presence of abundant, protruding pleurocystidia, a feature lacked by both *M. purpureofusca* and *M. olivaceomarginata*.

I have encountered fruitings of *M. capillaripes* containing hundreds of basidiomes throughout the coastal forests of Northern California. Although the species has been reported to grow on the fallen needles of various conifers such as *Pinus*, *Picea*, and *Juniperus* (Maas Geesteranus, 1986, 1992b), as well as the fallen leaves of *Quercus* (Maas Geesteranus, 1986, 1992b), and on humus and moss in oak woodlands (Smith, 1947), I have only encountered the species growing on the fallen needles of *Pinus* spp. within California. Whether or not this apparent substrate preference is common throughout California however, remains to be seen.

Mycena purpureofusca (Peck) Sacc., Syll. Fung. 5: 255. 1887.

=*Agaricus purpureofuscus* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 38: 85. 1885.

=*Prunulus purpureofuscus* (Peck) Murrill, N. Am. Flora 9: 333. 1916.
=*Agaricus atromarginatus* var.(?) *pseudo-janthinus* Fr., Monogr. Hym. Suec. 1: 198. 1854.

=*Mycena atromarginata* var. *fuscopurpurea* P. Karst., Bidr. Känn. Finl. Nat. Folk 32: 99. 1879.

=*Mycena sulcata* Velen., Ceské Houby p. 302. 1920.

Pileus 5-26 μm diam, conical to campanulate, often with a small, acute umbo, typically expanding with age; the margin even to crenate or crisped, striate

to sulcate, pellucid-striate; surface glabrous, often finely fibrillose initially, dry to moist, dull; the disc dark purplish red (12F5-6) to dark violet brown (10-11F4-8) initially, fading with age to reddish brown, paler violet brown (8-9F4-9) or grayish brown (11D3), paler towards the margin, grayish purple (12E4) to grayish violet brown (10-11E4-8), grayish brown (11D2), or grayish red (8-9C4-5), fading to pale reddish or pinkish gray (7-9B-C2-3). **Context** thin, somewhat cartilaginous or pliant, concolorous with the pileus, pallid, or whitish. **Lamellae** ascending-adnate, 18-30 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow to moderately broad (up to 2.5 mm), white to grayish, more rarely suffused with pinkish or purplish tones in age; the edges convex, purplish to violet brown or reddish brown, rarely lacking purplish to violaceous tones and concolorous with sides. **Stipe** 33-hundreds X 1-2.5 mm, central, terete, equal or with a slightly enlarged base, hollow, fragile; surface dry, dull to shiny, pubescent to pruinose overall in young specimens, entirely to centrally glabrescent; more or less concolorous with the pileus, the apex often paler; the base covered with short to long, whitish fibrils. **Odor and taste** somewhat raphanoid or indistinct.

Basidiospores (8.0-)8.8-12.0(12.8) X (6.0-)6.4-8.0 μm [$\bar{x} = 10.3 \pm 0.9$ X 6.9 ± 0.5 , $Q = 1.2-1.8$, $q^- = 1.5 \pm 0.1$, $n = 142$ spores], broadly ellipsoid, smooth, thin-walled, amyloid. **Basidia** 21.6-33.6 X 8.0-10.4 μm , 4-spored, clavate, clamped, with sterigmata 4.8-8 μm ; basidioles similar. **Cheilocystidia** 22.4-52.8 X 5.6-16(-19) μm , quite variable in shape, utriform, lageniform, fusiform, clavate, or \pm irregular, clamped, smooth for the most part, often splitting apically and/or giving rise to 1 or more, cylindric to coarse excrescences, 5.6-8.0 X 1.6-4.0, with violaceous to blackish or brownish contents when mounted in water; typically forming a sterile lamellar edge, more rarely mixed with basidia. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.6-6.4 μm diam, clamped, thin-walled, embedded in gelatinous matter, smooth and covered with closely spaced to scattered, cylindric, lump-like, or coarse and \pm inflated, simple to branched excrescences, 1.6-18.4 X 1.6-4.8(-6.4) μm . **Hypodermium** composed of inflated, \pm globose to ovoid cells, brownish-vinescent in Melzer's reagent. **Pileus and lamellar trama** composed of inflated, \pm globose to ovoid cells, brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae 1.6-4.8 μm diam, embedded in a thin gelatinous layer, clamped, smooth or covered with scattered, cylindric, lump-like, or \pm inflated excrescences, 1.6-8.0 X 2.0-6.4 μm ; terminal cells similar to hyphae or slightly broader, up to 11.2 μm diam

Habit, habitat, and distribution. Scattered to gregarious on coniferous wood and cones (*Pinus* spp.), rarely encountered on hardwoods. Common throughout the coniferous and mixed evergreen forests of California. Also known from North Carolina, Tennessee, New York, Michigan, Montana, Idaho, Washington, and Oregon in the United States, Ontario in Canada (Smith, 1947), and Europe (Maas Geesteranus, 1992b)

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, BAP 148. Marin Co.: Point Reyes National Seashore,

Limantour Ridge, 21 November 1991, DED 5398; Mt. Tamalpais State Park, Simmons Trail, 3 January 1992, DED 5443; Mt. Tamalpais State Park, Lake Lagunitas, 13 December 1993, DED 5966; Mt. Tamalpais State Park, Old Stove Trail, 27 November 1996, J. R. Blair 257. Mendocino Co.: Jackson State Forest, along Rd. 409, 23 November 1991, DED 5409; same location, 23 November 1991, DED 5410; same location, 23 November 1991, DED 5418; Jackson State Forest, junction of Rds. 408 & 409, 23 November 1996, BAP 084; Van Damme State Park, Pygmy Forest area, 24 November 1996, BAP 086. Yuba Co.: Bullard's Bar Recreation Area, Schoolhouse Campground, 7 December 1991, DED 5431.

Commentary. The macroscopic description is based upon my observations of fresh material and notes included with the DED and J. R. Blair collections listed above. The microscopic description is based upon my observations of the collections listed above.

Mycena purpureofusca is one of the more common mycenas of the coniferous and mixed evergreen forests of California. Macroscopically, the species is characterized by the purplish to violaceous tones of the pileus, stipe, and lamellar edges, and a lignicolous growth habit. Other *Mycena* species reported from North America which are also characterized by violaceous to reddish marginate lamellae and a lignicolous growth habit include *M. haematopus* (Pers.: Fr.) P. Kumm., *M. rubromarginata* (Fr.: Fr.) P. Kumm., *M. renati* Quél., and *M. sanguinolenta* (Alb. & Schw.: Fr.) P. Kumm. (on cones of *Pinus* species). *Mycena purpureofusca* can be distinguished easily from both *M. haematopus* and *M. sanguinolenta* by the former taxon's lack of colored latex, the typically more reddish coloration of the pilei and stipe of the two later taxa, and numerous other microscopic differences (see commentary on *M. californiensis*). A similar situation holds for *M. renati* and *M. rubromarginata*, both of which are characterized by pilei which are typically much more reddish brown in color, and in the case of *M. renati*, a yellowish stipe. It should be noted however that Maas Geesteranus (1986, 1992b) recognizes *M. elegantula* var. *inflata* A. H. Sm. and *M. rubromarginata* var. *laracis* A. H. Sm., which are characterized by reddish to purplish or grayish stipes respectively, as synonyms of *M. renati*.

Microscopically, *M. purpureofusca* is characterized by pileipellis and stipe cortical hyphae that are embedded in gelatinous matter, and which typically give rise to coarse and/or inflated excrescences. Similar excrescences are found on the pileipellis and stipe cortical hyphae of *M. renati*; in this taxon, however, neither of these tissues are embedded in gelatinous matter. Maas Geesteranus (1986, 1992b) states that clamp connections are rare in *M. purpureofusca*. Quite an opposite situation was revealed in my investigation of the California material, in which clamp connections were the normal condition rather than the exception.

Mycena olivaceomarginata (Masseé apud W. B. Cooke) Masseé f.
olivaceomarginata, Br. Fung. Flora 3: 116. 1893.

≡ *Agaricus olivaceomarginatus* Masee apud W. B. Cooke, Handk. Br. Fungi, 2nd ed. p. 369. 1890.

≡ *Mycena avenacea* var. *olivaceomarginata* (Masee apud Cooke) Rea, Br. Basidiomyc. p. 374. 1922

= *Mycena plicosa sensu* Ricken, Blatterp, Fasc. 13-14: 441. 1915.

= *Mycena avenacea* (Fr.) Quél. sensu Kühner, Le Genre *Mycena*. p. 413. 1938.

Pileus 9-21 mm diam, hemispherical to conical or bluntly conical, expanding to campanulate, convex-umbonate or remaining obtusely conical; margins often inflexed, the edges smooth, becoming eroded in age; surface dull, moist or dry, smooth or sulcate, glabrous, pellucid-striate to disc; disc dark brown (6E-F5-8) to brown (6E5-6) or yellowish brown (5-6E5-6), occasionally fading to yellowish gray (4A-B4) with moisture loss, the margin ranging from yellowish brown (5D-E4) to grayish brown (6D4), or pale grayish brown with reddish tones (8D-E3-4), drying pale grayish with yellowish brown tones. **Context** thin, up to 1 mm thick, concolorous with the pileus. **Lamellae** adnate to ascending-adnate, generally with a small decurrent tooth, 16-20 reaching the stipe, close with 1-2 series of lamellulae, narrow, gray to whitish gray, often with pinkish tones; the edges marginate, ranging from pale pink or yellowish pink and with or without brownish tones, to pale reddish brown or pinkish purple. **Stipe** 35-69 X 0.75-3 mm, central, terete, equal or with a slightly flared apex, hollow; surface moist, dull or with a slight sheen, smooth, pruinose to subpubescent overall, glabrescent below; the apex ranging from pale grayish and with or without pinkish tones to pinkish yellow or yellow (3A2-3), the remainder light yellowish brown (5D-E4-5) to grayish or grayish brown (6C-D4); the base covered with appressed, white tomentum. **Odor and Taste** indistinct or strongly raphanoid.

Basidiospores hundreds-12.8(-16) X 5.2-6.4(-7.2) μm [$x^{\bar{\bar{}}}$ = 11.4 \pm 1.2 X 6.0 \pm 0.4 μm , Q = 1.7-2.7, $q^{\bar{\bar{}}}$ = 1.9 \pm 0.2, n = 50 spores], ellipsoid to broadly ellipsoid, the larger forms typically broader at apex, smooth, thin-walled, amyloid.

Basidia 25.6-34.4 X 8.0-8.4 μm , 4-spored, clavate, clamped, sterigmata 4.0-5.6 μm in length; basidioles similar, typically with long, tapered bases.

Cheilocystidia 16.8-53.6 X 5.6-11.2 μm , \pm clavate to irregular, giving rise apically and generally laterally to 1 or several, cylindrical to coarse, simple to branching excrescences, 2.4-17.6 X 1.6-4.0 μm ; thin-walled, clamped, mixed with basidia or forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 2.4-4.8 μm diam, clamped, covered with and giving rise to cylindrical, simple and branching excrescences and side-branches, which tend to form dense, difficult to resolve masses, 1.2-2.0 μm diam **Hypodermium** composed of highly inflated, globose to ovoid cells, vivescent in Melzer's reagent. **Stipe cortical hyphae** 2.4-4.0(-5.6) μm diam, clamped, covered with scattered to fairly closely spaced, cylindrical, simple excrescences, 1.6-8.8 X 1.2-2.4 μm ; terminal cells similar to hyphae or broader, up to 8.8 μm diam, densely covered with excrescences similar to those of hyphae.

Habit, habitat, and distribution. Gregarious and subcaespitose on lawn. In California it is known only from the two collections listed below, both made in

San Francisco County. The species is described from Europe.

Material examined. California. San Francisco Co.: San Francisco, Stoneston Apartments near SFSU, 10 December 1992, DED 5570; San Francisco, near intersection of Font and Gonzalez Avenues, 16 November 1997, BAP 180.

Commentary. The macroscopic description is based upon notes included with collection DED 5570, and my observations of collection BAP 180. The microscopic description is based upon my examinations of both collections listed above.

As discussed by Maas Geesteranus (1986), *M. olivaceomarginata* is a highly variable species which may be encountered in a number of differently colored forms, many of which have been considered varieties of *M. avenacea* (Fr.) Quél. by previous investigators, or as different species entirely. Although initially reluctant to transfer all of these varieties to forms of *M. olivaceomarginata*, Maas Geesteranus (1986) did so in the interest of cleaning up a rather confused nomenclatural situation. Into synonymy with *M. olivaceomarginata*, he placed *M. avenacea* (Fr.) Quél. sensu Kühner and several of its varieties which he treated as various color forms of the species. Upon examining Kühner's description of *M. avenacea*, I am inclined to agree with Maas Geesteranus' placement of this taxon into synonymy with *M. olivaceomarginata*. The California material of the species fits quite well with Maas Geesteranus' concept of the type form of *M. olivaceomarginata*.

To my knowledge, *M. olivaceomarginata* is known from California by only the two collections examined in this study. Smith (1947) used Kühner's concept of *M. avenacea* to accommodate his single collection made in Warrensburg, New York (AHS 733, MICH). However, as pointed out by Maas Geesteranus (1986), Smith describes the presence of numerous pilocystidia arising from the pileipellis of this collection, a condition I have not observed in the collections examined from California, or noted by Kühner (1938) or Maas Geesteranus (1986, 1992b). For this reason I am inclined to follow Maas Geesteranus' hesitation in accepting Smith's report of the species from the New York, which would be the first report of the species from the United States. However, two additional collections exist (AHS 31696, Lange M. 803; MICH), both of which were made in Michigan. Unfortunately these collections were not examined during the present investigation.

It should be noted that it is with some reservation that I retain *M. olivaceomarginata* as a separate species from *M. citrinomarginata* Gillet. The two collections examined in this study agree well with Maas Geesteranus' concept of *M. olivaceomarginata*. However, the collections are also very similar to Maas Geesteranus' concept of *M. citrinomarginata* both macro- and microscopically, with the exception of their reddish to pinkish lamellar edges. Maas Geesteranus (1988, 1992b) indicates that the lamellar edges of *M. citrinomarginata* are yellowish, but states that the species is very close to *M. olivaceomarginata*. Maas Geesteranus also indicates that aside from the wider ecological range of *M.*

citrinomarginata (*M. olivaceomarginata* is restricted to lawns in his concept of the species), the two taxa can be told apart by the abundant stipe cortical hyphae terminal cells in *M. citrinomarginata*, which are typically absent or very rare in *M. olivaceomarginata*. Although the California material of *M. olivaceomarginata* was collected from lawns, stipe cortical hyphae terminal cells were quite abundant in both collections.

Gulden and Jenssen (1982), in their investigation of alpine *Mycena* species of Norway, indicate that aside from the darker coloration of *M. olivaceomarginata* (as *M. avanacea* (Fr.) Quél. *sensu* Kühner), especially on the lamellar edge, there is hardly any difference in their material of the two species, which was collected from the same herb-willow scrub habitat in different years. Additionally, as discussed by Kühner (1938) and Maas Geesteranus (1988, 1992b), Oort (1928) stated that perhaps *M. citrinomarginata* is nothing more than a color variety of *M. olivaceomarginata*. Unfortunately, Oort (1928) had not seen fresh material of *M. citrinomarginata*. Kühner (1938) retained the two taxa as separate species. Following Kühner, Maas Geesteranus (1988, 1992b) prefers to retain the two species as distinct, but admittedly close, taxa at the same level.

Both Smith (1947) and Maas Geesteranus (1988) emphasize that *M. citrinomarginata* is a highly variable species, especially in regard to its pileus coloration. Although I do believe that *M. olivaceomarginata* could simply represent a darker color variation of *M. citrinomarginata*, and I have been tempted to include both species together under a more variable concept of *M. citrinomarginata*, I think it is prudent to retain the two as separate species until more material can be collected and studied. Additionally, although I feel these two species are much too similar to be treated in different sections, I have chosen to follow Maas Geesteranus (1988, 1992b) and treat *M. citrinomarginata* as a member of section *Fragilipedes* rather than expand the limits of section *Rubromarginatae* to accommodate the yellow lamellar edges of this species. Once a more thorough investigation of these taxa is made, the proper sectional placement can be determined.

Mycena bulliformis Perry and Desjardin *nom. prov.*

Pileus 10-25 mm diam, obtusely conical to paraboloid, expanding with age; the margin slightly inflexed initially, edges crisped; surface dull, dry, covered with a hoary bloom when fresh, glabrescent, striate to sulcate in age; the disc violet brown (11F4) to deep grayish red or grayish violet (12-13E5-6) initially, becoming more grayish brownish-red to brownish violet with age, the margin paler, grayish red (9C3). **Context** thin, white. **Lamellae** ascending-adnate, subdistant with 1 or more series of lamellulae, narrow to moderately broad (up to 2.5 mm); white to buff, often with pinkish tones, the edges violet to violet-brown. **Stipe** 25-72+ X 2-3 mm, central, terete, hollow; surface dull to shiny, dry, smooth, the apex pruinose initially, glabrescent; whitish with pink tones, at least at apex, becoming grayish to brownish gray at the base with age; the base covered with short, whitish fibrils.

Odor mild or musty. **Taste** mild to unpleasant.

Basidiospores 9.6-12.2(-12.6) X (5.6-)6.2-7.7(-8.1) μm [$\bar{x} = 11.0 \pm 0.9$ X 6.8 ± 0.5 μm , $Q = 1.4-1.9$, $q = 1.6 \pm 0.1$, $n = 50$ spores], ellipsoid to broadly ellipsoid, smooth, thin-walled, amyloid. **Basidia** 27-37 X 7.2-9.6(-11.3) μm , 4-spored, clavate, clamped, sterigmata up to 8.8 μm in length; basidioles similar. **Cheilocystidia** 24-59 X 7.2-16 μm , narrowly to broadly clavate, fusoid, or irregular, apically narrowed into or giving rise to 1 (and then \pm lageniform) to several, short to quite long, cylindrical to \pm coarse, simple or branched excrescences, 4-41.6 X 2.4-4 μm ; thin-walled, filled with brownish, granular contents when mounted in water or Melzer's reagent; forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 2.4-4.8(-8.1) μm diam, clamped, smooth and covered with generally coarse, inflated, more rarely cylindrical, often furcate excrescences, 2.0-15.2 (-50) X 1.6-6.4 μm diam; hyphae filled with copious oily droplets, or with reddish brown, granular contents when mounted in water or Melzer's reagent. **Hypodermium** composed of inflated, elongate cells, brownish-vinescent in Melzer's reagent. **Pileus and lamellar trama** similar to hypodermium. **Stipe tissues** monomitic, parallel, brownish-vinescent in Melzer's reagent; cortical hyphae 2.0-3.2 μm diam, clamped, thin-walled, smooth and covered with scattered to densely spaced, lump-like to strikingly inflated, often coarse excrescences, 3.2-22 X 3.2-9.6 μm ; terminal cells numerous, up to 8.8 μm diam, covered with excrescences similar to those of hyphae.

Habit, habitat, and distribution. Known from two localities within Mt. Tamalpais State Park, Marin Co., California. One collection (DED 5614) was found growing in caespitose clusters on the bark of living *Pseudotsuga menziesii*, a second collection (J. R. Blair 270) was found growing under *Arctostaphylos glandulosa* (possibly on buried wood?).

Material examined. California. Marin Co.: Mt. Tamalpais State Park, Bernstein Trail, Rock Springs area, 22 December 1992, DED 5614 (Holotype; SFSU); Mt. Tamalpais State Park, Simmons Summit south, 13 December 1996, J. R. Blair 270.

Commentary. The macroscopic description is based upon notes included with the collections listed above.. The microscopic description is based upon my observations of the collections listed above.

Mycena bulliformis is most likely to key out to *M. rubromarginata* (Fr.: Fr.) P. Kumm. in Maas Geesteranus (1986, 1992b), and definitely belongs in sect. Rubromarginatae due to the violaceous lamellar edges, reddish to violaceous tones on the pileus, and lack of latex. Microscopically, the species resembles *M. rubromarginata* in the shape of its cheilocystidia, but differs in the shape and size of both the pileipellis and stipe cortical hyphae excrescences. *Mycena rubromarginata* is characterized by more or less narrow, cylindrical, and very long pileipellis excrescences. *Mycena bulliformis* has pileipellis excrescences which are generally shorter and more or less coarse and/or inflated. This species also has some pileipellis hyphal strands which are smooth, a condition not reported in

M. rubromarginata. The stipe cortical hyphae and terminal cells of *M. bulliformis* are also covered with scattered to dense, strikingly inflated or more rarely cylindrical excrescences. *Mycena rubromarginata* is characterized by stipe cortical hyphae with short, cylindrical excrescences.

The cheilocystidia of *M. bulliformis* resemble those of *M. rubromarginata*, but the pileipellis and stipe cortical hyphae resemble another taxon of section Rubromarginatae, *M. renati* Quél. In addition to differently shaped cheilocystidia, the latter species is also characterized by slightly smaller spores than those of *M. bulliformis*, as well as a distinct yellowish coloration to the stipe. *Mycena bulliformis* is also quite similar macroscopically to the more brownish collections of *M. purpureofusca*, but can be distinguished from this taxon by its more ornamented cheilocystidia and lack of pileipellis and stipe cortical hyphae embedded in gelatinous matter.

Mycena* section *Sanguinolentae Maas Geest., Proc. Kon. Ned. Akad. Wetensch. C. 91(4): 389. 1988.

Basidiomes small to medium sized. Pileus surface pruinose, glabrescent, one species of the section becoming slightly lubricous when wet, coloration in various shades of reddish brown, at least on the disc. Context thin, brownish. Lamellae tender, ascending-adnate, with a decurrent tooth, ventricose, at first whitish to pale dingy ochraceous, darkening with age, the edge convex, dark reddish brown or purplish brown. Stipe hollow, fragile to firm, pruinose to puberulous at least towards the apex, glabrescent for the most part, exuding a dull orange or reddish brown latex when cut or crushed, dark reddish brown in various shades below the apex, not turning black in the herbarium, the base covered with coarse pale or colored fibrils. Odor and taste indistinct or raphanoid

Spores ellipsoid, smooth, amyloid. Basidia 4-spored, more rarely 2-spored, clavate, clamped. Cheilocystidia fusiform and apically narrowed to form a slender neck, or \pm clavate with assorted knob- or finger-like projections, with reddish brown contents, clamped. Pleurocystidia similar, if present. Pileipellis a cutis; hyphae clamped, covered with simple cylindrical to branched excrescences. Stipe cortical hyphae clamped, covered with simple to furcate excrescences; terminal cells or caulocystidia similar in shape to cheilocystidia, or diverticulate and similar to cortical hyphae.

Growing among leaf litter and branches of both hardwood and coniferous trees.

Type species: *Mycena sanguinolenta* (Alb. & Schw.: Fr.) P. Kumm.

Key to the California members of Section *Sanguinolentae*.

1. Cheilocystidia generally fusiform, typically apically narrowed into one or more necks, acute, smooth or with occasional small diverticula; generally growing on the decayed wood or debris of conifers *M. sanguinolenta*
1. Cheilocystidia contorted-clavate to irregular in shape, with irregular knob-like diverticula and/or numerous long, cylindrical apical projections; generally growing on the leaves and fruits of *Quercus* spp. *M. californiensis*

Mycena sanguinolenta (Alb. & Schw.: Fr.) P. Kumm. **var. *sanguinolenta***, Führ. Pilzk. p. 108. 1871.

≡ *Agaricus sanguinolentus* Alb. & Schw., Consp. Fung. p. 196. 1805.

≡ *Agaricus sanguinolentus* Alb. & Schw.: Fr., Syst. Mycol. 1: 149. 1821.

≡ *Galactopus sanguinolentus* (Alb. & Schw.: Fr.) Murrill, N. Am. Flora 9: 319. 1916.

= *Mycena subsanguinolenta* A. H. Sm., Mycologia 31: 280. 1939.

Basidiomes putrescent. **Pileus** 3-18.5 mm diam, convex, paraboloid, conical, or campanulate, with or without a small umbo, often expanding with age; margins straight or uplifted; surface dull, dry to slightly lubricous when moistened, pruinose at first, glabrescent, striate to more or less sulcate, pellucid-striate; reddish brown (8E7-6) to dark reddish-brown (8-9F6-8) when young, margin soon fading to brown or pale reddish-brown (7-8D5), in age disc generally remaining dark, extreme edge often staining or bruising violet brown (10E-F8). **Context** thin, up to ~1 mm, concolorous with pileus or paler. **Lamellae** ascending-adnate to adnexed, often decurrent with a small tooth, close to subdistant, with 1-3 series of lamellulae, moderately broad (1.0-3.0 mm), becoming intervenose, white to pale gray, often developing pink tones; the edges marginate, brownish-red (10D8-7). **Stipe** 27-75 X <1-1.5 mm, central, terete, equal or slightly broader towards the base, hollow; surface smooth, dry, dull or polished, glabrous or puberulent with brownish-red hairs; pale reddish-brown (8D4-5) to reddish-brown (8E6-8), generally paler towards apex, the base covered with a dingy grayish-white tomentum, exuding a dark reddish-brown latex when cut or crushed. **Odor** and taste indistinct.

Basidiospores (8.0-)8.8-11.2(-12.4) X 4.8-5.6(-6.4) μm [$\bar{x} = 9.8 \pm 0.8 \times 5.4 \pm 0.4 \mu\text{m}$, $Q = 1.5-2.1$, $q = 1.8 \pm 0.1$, $n = \text{hundreds spores}$], ellipsoid, with a pronounced hilar appendage, smooth, thin-walled, hyaline, amyloid. **Basidia** 25.6-33.6 X 7.2-9.6 μm , 4-spored, clavate, with plump sterigmata 4.8-5.6 μm in length, clamped or clampless; basidioles clavate. **Cheilocystidia** 30.0-57.6 X 6.5-12.0(-16.0) μm , fusiform, generally with a sharp, pointed apex, occasionally forked, rarely with few coarse lateral excrescences, thin-walled, clamped or clampless, with reddish brown contents which dissolve easily in KOH, intermixed with basidia or composing a sterile lamellar edge. **Pleurocystidia** similar, often remaining broader towards the apex, lacking reddish-brown contents, not generally as abundant as cheilocystidia, occasionally absent altogether.

Pileipellis a cutis; hyphae 1.5-4.8 μm diam, thin-walled, clamped or clampless,

covered with cylindric diverticula, 2.4-14.5 X 1.2-2.4 μm , and giving rise to more complex side branches which often form dense masses. **Hypodermium** composed of large, dextrinoid, often globose cells. **Lamellar trama** brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, dextrinoid; cortical hyphae 1.6-5.2 μm diam, thin-walled, clamped or clampless, sparsely covered with cylindric excrescences, 1.6-6.4 X 1.2-2.4 μm ; terminal cells similar to cheilocystidia, or similar to hyphae, and covered with few to numerous cylindric or coarse excrescences, often with apex slightly broader than rest of cell; medullary hyphae broader. **Laticiferous hyphae** present in stipe, 2.4-7.2 μm diam, generally with slightly refractive, yellowish contents (KOH).

Habit, habitat, and distribution. Gregarious on needles, cones, and other soil debris under conifers. Known from North America, Europe and Japan. Common throughout coastal California, October to February.

Material examined. California. Del Norte Co.: Crescent City, 31 October 1937, AHS 8272 (MICH); Siskiyou National Forest, 11 November, 1937, AHS 8619 (MICH). Humboldt Co.: near Big Lagoon, approx. 8 mi north of Trinidad on Hwy. 101, 17 October 1997, BAP 136. Sonoma Co.: Salt Point State Park, 25 November 1995, BAP 027.

Commentary. The macro- and microscopic descriptions are based upon my examination of the collections listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1988).

Mycena sanguinolenta is a fairly common species of the coastal coniferous forests throughout California. Macroscopically the species is characterized by the reddish-brown coloration of the pileus, stipe and lamellar edge, the presence of reddish-brown latex exuded by fresh specimens, and growth on the decaying wood and debris of conifers. Microscopically, *M. sanguinolenta* is characterized by fusiform cheilocystidia, pleurocystidia, and stipe cortical hyphae terminal cells, which often form a sharp, pointed apex; and the presence of laticiferous hyphae in the stipe trama.

Smith (1939) described the very similar species, *M. subsanguinolenta*, separating the taxon from *M. sanguinolenta* based on its lack of pleurocystidia, smaller spore size, and pronounced yellowish coloration of the pileus, stipe and latex. Smith (1947) reported both species growing in great abundance in northern California. However, upon examination of the holotype material and other collections of *M. subsanguinolenta*, Maas Geesteranus (1988) considers the taxon a synonym of *M. sanguinolenta*, stating that the spore sizes of the *M. subsanguinolenta* collections are well within the range of those reported for *M. sanguinolenta*. Maas Geesteranus also reports that pleurocystidia may be quite rare or even absent entirely in European collections of *M. sanguinolenta*, and that yellowish specimens of *M. sanguinolenta* have been encountered in Europe intermixed with the more common reddish-brown specimens. During the current investigation, no specimens with yellowish coloration to the pileus, stipe or latex were encountered. Although pleurocystidia were rare in several of the collections examined, none lacked them entirely.

Mycena californiensis (Berk. & M.A. Curtis) Sacc., Syll. . Fung. 5: 255. 1887.

≡ *Agaricus californiensis* Berk. & M.A. Curtis, Proc. Amer. Acad. Arts 4: 112. 1860.

= *Mycena elegantula* Peck, Bull. Torrey Bot. Club 22: 199. 1895.

Basidiomes gregarious to subcaespitose, putrescent. **Pileus** 6-20 mm, obtusely conical to campanulate when young, generally with incurved margins, remaining so with age or expanding to broadly campanulate at maturity, occasionally becoming convex-umbonate; margin entire when young, often becoming wavy or crenate with age, sometimes splitting, striate or striatulate, extreme edges often staining or bruising darkly, pellucid striate; surface dull, moist to dry, glabrous; at first disc dark brown (8F5-6) to reddish brown (9D-F7-8), in age ranging from brownish red (8C6-8) to reddish brown (8D-F5-8), margin generally lighter, grayish red (8C4-6) to reddish brown (8D-E5-7), or brownish orange (7C5-6) when young, in age fading to grayish orange (6B3) or brownish orange (6C3). **Context** thin, concolorous with pileus or paler, often staining dark reddish. **Lamellae** ascending-adnate to adnate, often with a short decurrent tooth, 15-20 reaching the stipe, close to subdistant with 1-2 series of lamellulae, moderately broad (1-3 mm), convex; white to pinkish buff, edges reddish brown (9C-D8), reddish orange, or brownish orange. **Stipe** 29-130 X 1-2 mm, central, terete, ±equal, rarely compressed or cleft, dull to shiny, moist to dry, hollow, apex glabrous to pruinose, glabrous below, base covered with strigose to downy tomentum ranging from buff to some shade of orange or pink; apex brownish orange to light brown (7C-D5-8), reddish brown (8D5-6), or grayish red (8C4-6), some fading in age to lighter brownish orange (5-6C4-6), base concolorous or slightly darker; tissue exuding a brownish orange (7C6-8) to reddish brown (9-10D8) or violet brown (11F7-8) latex when cut.

Basidiospores 8.0-12.0(-13.0) X 4.0- 6.0(-6.7) µm [\bar{x} = 9.7 ± 0.8 X 5.2 ± 0.5, Q = 1.4-2.4, q = 1.9 ± 0.2, n = 366 spores], ellipsoid to amygdaliform, smooth, thin walled, hyaline, weakly to moderately amyloid. **Basidia** 26.0-37.5(-48.0) X 7.0-10.5 µm, clavate, 4-spored, rarely mixed with 2-spored forms, clamped; basidioles clavate, similar to basidia. **Cheilocystidia** 16-50 X 6.5-28.0 µm, ranging from contorted-clavate with assorted knob-like projections to irregular in shape, generally with a clavate lower portion and an apical or sublateral portion branching into numerous cylindrical projections, these often branching themselves, 1.5-18.8(-30.0) X 1.5-6.5(-8.0), thin-walled, clamped, with brownish contents that stain darkly in Melzer's reagent. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.5-5.0(-7.0) µm diam, interwoven, clamped, thin-walled, non-gelatinous to subgelatinous, hyaline, inamyloid, covered with abundant cylindrical excrescences, 1.5-11.8(-16.5) X 1.5-2.8 µm; terminal cells slightly inflated, otherwise similar to hyphae. **Hypodermium** of inflated cells, 7.0-38.5 µm diam, thin-walled, hyaline, dextrinoid, non-gelatinous; often intermixed with laticiferous hyphae up to 6.5 µm diam, containing brown granular contents. **Lamellar trama** dextrinoid, occasionally with laticiferous hyphae as in

hypodermium. **Stipe tissues** monomitic, parallel; cortical hyphae 1.5-6.5 μm diam, cylindrical, thin walled, clamped, covered with scattered to numerous cylindric and occasionally branched excrescences, 2.0-7.0(-14.0) X 1.0-2.5 μm ; terminal cells slightly broader, 3.8-5.0 μm diam, covered with excrescences; medullary hyphae broader, 4.5-22.0 μm diam, smooth, thin-walled, hyaline; laticiferous hyphae common, 2.8- 8.0(-11.8) μm diam, usually containing brown granular contents.

Habit, habitat, and distribution. Gregarious to scattered, often subcaespitose, on leaves and fruits of *Quercus agrifolia* Nee, *Q. lobata* Nee and *Q. kelloggii* Newb. Abundant and common in the coastal oak woodlands of California.

Material examined. California. Contra Costa Co.: Shell Ridge Open Space, 7 Dec. 1996, BAP 097. Los Angeles Co.: near Pasadena, 22 Dec. 1894, A.J. McClatchie 810 (Holotype of *M. elegantula*: NYS). Marin Co.: Audubon Canyon Ranch, Picher Canyon, 8 Nov. 1979, C. Calhoun 79-910; Audubon Canyon Ranch, Volunteer Canyon, 19 Nov. 1981, C. Calhoun 81-2597; Corte Madera, Deer Run Road, 11 Dec. 1992, DED 5571; Fairfax, Pine Mountain Fire Road, 1 Feb. 1992, DED 5523; Mt. Tamalpais State Park, Lake Lagunitas, 13 Dec. 1993, DED 5963; Olampali State Historic Park, 2 Dec. 1997, BAP 193; Point Reyes National Seashore, Limantour Ridge, 17 Oct. 1981, HDT 43780; same location, 12 Oct. 1981, L. Swaidon 36. Santa Barbara Co.: Santa Barbara, 14 Jan. 1939, Rea Herbarium 16 (MICH); same location, 8 Jan 1940, Rea Herbarium 290 (MICH); La Chacuma, 27 Nov. 1964, HDT 11803. San Diego Co.: Lake Henshaw, San Luis Rey Campground, 10 Mar. 1970, HDT 25052. San Mateo Co.: Wunderlich County Park, Bear Gulch Trail, 26 Nov. 1985, M.T. Siedl 725; San Francisco Watershed, 23 Nov. 1964, HDT 11795; same location, 25 Nov. 1974, HDT 33061. Solano Co.: Mare Island, 13 Jan. 1856, Herbarium of the U.S. North Pacific Exploring Expedition No. 11 (Isotype of *Agaricus californiensis*: FH). Yolo Co.: State Highway 16, 3 mi. west of Rumsey, 15 Nov. 1981, Showers s.n..

Commentary. *Mycena californiensis* is a common component of the oak woodlands of coastal California. The species is characterized by the reddish brown tones to the pileus, stipe, and lamellar edges, and the presence of deep reddish to orangish red latex. Although most of the collections examined were associated with the leaves and fruits (acorns) of *Quercus agrifolia*, the species has also been collected on the leaves of *Q. lobata* and *Q. kelloggii*.

The cheilocystidia of *M. californiensis* may be quite variable in shape and size. Investigation of the isotype material of *M. californiensis* (Perry and Desjardin, 1999) revealed the presence of generally clavate cheilocystidia with 3-5 apical to sublateral finger- or knob-like excrescences, 3-10 X 2-4 μm . The holotype of *M. elegantula* contains cheilocystidia very similar to those seen in the isotype of *M. californiensis*, but also contains some forms that are more apically diverticulate. Other collections observed in this study revealed a large range of excrescence lengths, reaching up to 18.8 μm . It was quite common to observe the entire range of cheilocystidia shapes and sizes within a single collection or

even a single basidiome.

Investigation of existing herbarium collections of *M. elegantula* indicate that many of the specimens from both SFSU and MICH actually represent *M. sanguinolenta*, and *M. purpureofusca* (Peck) Sacc. *Mycena californiensis* can be differentiated from these other taxa by a comparison of the cheilocystidia and substrate. While *M. sanguinolenta* is characterized by the presence of reddish latex, this species is also characterized by fusiform cheilocystidia lacking apical outgrowths. The cheilocystidia of *M. californiensis* are irregular in shape, and have never been observed to be fusiform. Also, all examined California collections of *M. sanguinolenta* appear to be restricted to growth on decaying wood or debris of conifers. *Mycena californiensis* appears to be restricted to the leaves and debris of *Quercus* spp., and has never been observed to be lignicolous. *Mycena purpureofusca* differs from *M. californiensis* in the coloration of the fruiting bodies, which is generally more violaceous in *M. purpureofusca*, in the absence of pigmented latex, in forming clavate to utriform cheilocystidia, and in growth on coniferous wood. *Mycena rubromarginata* (Fr.: Fr.) P. Kumm. is another species that may superficially resemble *M. californiensis*. However, *M. rubromarginata* differs in both habit and cheilocystidia shape, and does not contain colored latex.

It is evident from examination of the type material of *M. elegantula* and the work of Maas Geesteranus (1986, 1992b), that A. H. Smith's concept of *M. elegantula* does not agree with the type material of the species. Smith (1947) reported *M. elegantula* as having clavate to fusoid ventricose cheilocystidia, occasionally with several finger-like projections, and he reports the species as occurring on decayed conifer wood. Although my investigation of the type material of *M. elegantula* revealed the presence of contorted-clavate cheilocystidia, it contains none that are fusoid-ventricose. The type material of *M. elegantula*, collected from southern California (Los Angeles Co.), is also clearly associated with leaves of *Q. agrifolia*. Investigation of numerous specimens determined by Smith as *M. elegantula*, revealed that his concept of the species (Smith, 1947) was much too broad, encompassing several taxa superficially resembling this species. Maas Geesteranus (1986, 1992b) reported similar findings from his investigation of Smith's material.

Mycena* section *Galactopoda (Earle) Maas Geest., Proc. Kon. Ned. Akad. Wetensch. C. 91(4): 396. 1988.

Basidiomes medium-sized to large. Pileus surface densely pruinose at first, glabrescent, brownish flesh-colored, darker at the disc. Context thin. Lamellae ascending-adnate, ventricose, initially whitish, becoming pinkish; the edge concolorous or reddish. Stipe central, hollow, fragile; surface pruinose, glabrescent for the most part; exuding a red latex when cut or broken; initially

whitish, becoming brownish flesh-colored, turning black when dried, the base covered with whitish fibrils. Odor indistinct. Taste indistinct or bitter.

Basidiospores ellipsoid, amyloid, smooth. Basidia 4-spored, clavate, clamped. Cheilocystidia fusiform, the apex narrowed into a slender neck, hyaline or with reddish brown contents, clamped, generally forming a sterile edge. Pleurocystidia similar if present. Pileipellis a cutis, hyphae covered with excrescences and diverticulate side branches, clamped. Stipe cortical hyphae smooth, clamped; terminal cells variable, ± clavate to irregular, with few to numerous coarse excrescences, or similar to cheilocystidia.

On decaying wood of both conifers and hardwoods.

Type species: *Mycena haematopus* (Pers.: Fr.) P. Kumm.

Mycena haematopus (Pers.: Fr.) P. Kumm., Fürh. Pilzk. p. 108. 1871.

≡ *Agaricus haematopus* Pers., Obs. Mycol. 2: 56. 1799. (*Agaricus haematopus* Pers.: Fr., Syst. Mycol. 1:149. 1821.)

≡ *Galactopus haematopus* (Pers.: Fr.) Earle, Bull. N. Y. Bot. Gard. 5: 426. 1909.

= *Mycena haematopus* var. *marginata* J. E. Lange, Dansk Bot. Ark. 1(5): 20. 1914.

Pileus 6-38(-50) mm diam, paraboloid to campanulate, often becoming broadly campanulate or convex; margins appressed against the stipe at first, extending beyond lamellae to form a sterile band, crisped at first, becoming eroded or split with age; surface initially densely pruinose and dry, soon glabrescent, remaining dry or becoming moist to lubricous, dull or shiny, smooth, translucent-striate at maturity, hygrophanous; disc brown (7E5-8) to reddish brown or violet brown (9-11E-F5-6), vinaceous gray to brownish gray (8-9D2-5) towards the margin, often staining violet brown with age, extreme margin pale gray to white. **Context** up to 2.5 mm thick under disc, concolorous with pileus or paler, but staining violet brown immediately as latex is exuded. **Lamellae** anadexed to ascending-adnate with a short decurrent tooth, 14-30 reaching the stipe, close to subdistant with 1-3 series lamellulae, moderately broad (up to 3 mm), white to pale gray or vinaceous gray, developing reddish brown stains with age; edges concolorous or scarcely to entirely dark reddish to reddish brown. **Stipe** 20-95(-140) X 1-3(-5) mm, central, terete, equal to slightly enlarged at apex and/or base, hollow, fragile; surface moist to dry, smooth, initially densely covered with pallid to reddish pruina or minute hairs, soon glabrescent, the base covered with whitish to grayish fibrils; reddish brown to violet brown (9-10D-E3-6, 10E-F7-8, 11E-F5-6), or reddish gray (11B2), often paler at apex; exuding a dark reddish-brown to violet brown latex when cut or broken (entire basidiome). **Odor** indistinct. **Taste** indistinct or bitter.

Basidiospores 8.8-11.2(-12.0) X 5.6-7.2 µm [x^- = hundreds±0.8 X 6.3±0.4; Q = 1.4 - 2.0, q^- = 1.6±0.1; n = 94 spores], ellipsoid to broadly ellipsoid, or amygdaliform, smooth, thin-walled, amyloid. **Basidia** 25.6-38.5 X 8.0-9.6 µm, 4-spored, clavate, clamped, sterigmata 2.4-8.8 µm in length; basidioles similar,

clavate. **Cheilocystidia** 37.6-71.2 X 7.2-14.8(-18.0) μm , fusiform, apices generally protruding well beyond lamellar edge, smooth, thin-walled, hyaline or with reddish brown contents, clamped, abundant, generally forming a sterile edge, rarely mixed with scattered basidia. **Pleurocystidia** similar to cheilocystidia, generally not as abundant. **Pileipellis** a cutis, hyphae 1.0-5.2 μm , clamped, thin-walled, hyaline, \pm smooth but giving rise to numerous, coarsely diverticulate side branches which form dense masses. **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed inflated cells similar to those of the hypodermium, vinescent in Melzer's reagent. **Stipe tissue** monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 1.6-5.6 μm diam, smooth, clamped, thin-walled, hyaline; terminal cells 23.2-101.6 X 6.4-16.8 μm , abundant, quite variable, \pm clavate and often with a short apical projection, irregular, with few to numerous coarse excrescences, or \pm fusiform and similar to cheilocystidia; medullary hyphae broader. **Laticiferous hyphae** 4.0-9.6 μm diam, abundant in hypodermium, pileus trama, lamellar trama, and stipe, contents brownish to black, granular, or often appearing slightly refractive.

Habit, habitat, and distribution. Solitary, gregarious, or caespitose on decaying wood of both conifers and hardwoods. Known from the United States, Canada, Europe, and Japan. In California it is common throughout the North Coast Ranges, Cascade Ranges and northern High Sierra Nevada, October to February.

Material examined. California. Calaveras Co.: Calaveras Big Trees State Park, 26 May 1966, HDT 16622. Contra Costa Co.: Castle Rock Regional Park, 28 January 1997, BAP 107. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, BAP 146. Mendocino Co.: Navarro River Redwoods State Park, along state route 128, approx. 12 miles east of junction with Hwy. 1, 22 November 1997, BAP 188. Monterey Co.: Toro Regional Park, 9 February 1997, BAP 112. Napa Co.: Cleary Reserve, 24 November 1963, HDT 10826.

Commentary. The species description is based upon my observations of the fresh and dried material, with additional information adapted from Smith (1947) and Maas Geesteranus (1988, 1992b).

Mycena haematopus is one of the more common and easily recognized mycenae of California. The species is characterized by the extension of the pileus margin beyond the lamellae, reddish coloration of the pileus and stipe, growth on decaying wood, and abundant dark reddish to reddish brown latex. In my opinion, the extension of the pileus beyond the lamellae is one of the most useful characters to distinguish *M. haematopus* from other reddish, often lignicolous mycenae. *Mycena sanguinolenta*, another California species with reddish latex and reddish coloration to the pileus and stipe, lacks the extended pileus margin, and has diverticulate stipe cortical hyphae. *Mycena californiensis*, also a reddish species with reddish to orangish-red latex, appears to be restricted to growth on the leaves, fruits and other debris of *Quercus* spp., and has \pm clavate cystidia with numerous knob- or finger-like projections.

Mass Geesteranus (1988, 1992b) uses the blackening of the stipe when

dried as a distinguishing character for *M. haematopus* and section Galactopda. My observations however, indicate that this is not always the case. Of the numerous *M. haematopus* collections housed at SFSU, many, but by no means all, had stipes that apparently turned black when the material was dried. This character is no doubt useful in the identification of *M. haematopus*, but in my opinion should not be given much weight.

Mycena section Longisetae A. H. Sm. ex Maas Geest., Proc. Kon. Acad. Wetensch. C. 86(3): 418. 1983.

Basidiomata small. Pileus surface covered with a separable gelatinous pellicle, hispidulous due to presence of long setae-like cells arising from pileipellis, grayish to whitish. Lamellae ascending, adnate or free, gray to white. Stipe surface setulose to hispidulous, lacking bluish coloration, arising from a pubescent basal disc. Odor none. Taste not distinct.

Basidiospores ellipsoid, smooth, inamyloid. Basidia 2- or 4-spored, clampless or clamped. Cheilocystidia some form of clavate, fusoid or obovoid, with a single, narrow neck or several apical projections, or smooth, clampless or clamped. Pleurocystidia absent. Tramal tissues brownish-vinescent in Melzer's reagent. Pileipellis a cutis, hyphae embedded in gelatinous matter, covered with excrescences and with smooth portions.

Type species: *Mycena longiseta* Höhn.

Mycena longiseta Höhn., Sber. K. Akad. Wiss. Wien (Math.-naturw. Kl.) 118(1): 282. 1909.

=*Mycena codoniceps* Cooke sensu Kühner, Botaniste 17: 86. 1926.

=*Mycena codoniceps* sensu Kühner var. *aciculata* A. H. Sm., Mycologia 29: 344. 1937.

Pileus 1-5 mm diam, convex to obtusely conical; surface dull, dry, hispidulous to setulose, often glabrescent with age, pellucid-striate, becoming sulcate, grayish in various shades to whitish, also reported to be dark bluish gray.

Context very thin. **Lamellae** ascending, adnate or free, up to 14 reaching the stipe, subdistant with one series of lamellulae, narrow to moderately broad, gray to white; the edges concolorous or white. **Stipe** 10-30 mm in length, filiform, central, terete; surface entirely hispidulous to setulose or glabrous, translucent to white or grayish; arising from a pubescent to hispidulous basal disc. **Odor** absent. **Taste** not distinct.

Basidiospores 7.2-9.6 X 3.0-4.4 μm [$\bar{x} = 8.3 \pm 0.5 \times 3.9 \pm 0.2 \mu\text{m}$, $Q = 1.8-2.5$, $q = 2.1 \pm 0.1$, $n = 50$ spores], narrowly ellipsoid, smooth, thin-walled, inamyloid. **Basidia** 13.6-17.6 X 6.5-8.8 μm , 2- or 4-spored, clavate, rather stout, clamped or clampless. **Cheilocystidia** 11-30 X 6-13.5 μm , \pm clavate, fusoid, or

nearly sphaeropedunculate, smooth or apically narrowed into one or more, simple necks, 5.6-15 X <1-1.2 μm , clamped or clampless, forming a sterile lamellar edge or mixed with basidia. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 2-6.5 μm diam, embedded in gelatinous matter, clamped or clampless, those cells near the upper surface of the pileipellis typically shortened and broader, covered with short and simple to longer and occasionally branched excrescences, 1.2-15.5 X <1-1 μm , the hyphae of the lower portions typically narrow and smooth, giving rise to numerous, narrower side branches; giving rise to long, pointed, thick-walled, hyaline setae, 70-200 μm long, which typically have a bulbous base or gradually broaden basally, 6.8-20 μm diam, and which penetrate the upper surface of the pileipellis. **Pileus trama** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** similar. **Stipe cortical hyphae** smooth, clamped or clampless; giving rise to numerous thick-walled or solid setae similar to those of the pileus, 50-225 (-300) μm long.

Habit, habitat and distribution. Solitary to gregarious on fallen leaves, needles, cones, and other debris of conifers, hardwoods, and herbaceous plants. In California, the species has thus far been collected in the fall and winter months from the Central and North Coastal Ranges.

Material examined. California. Mendocino Co.: Novarro River Redwoods State Park, alongside Highway 128, 22 November 1997, DED 6704. Monterey Co.: Fort Ord, 9 February 1997, BAP 116. **Washington.** Clallam Co.: Olympic National Park, Mt. Angeles, 5000 ft., 28 June 1939, AHS 14650 (MICH). Pierce Co.: Mt. Rainier National Park, Green Lake, 18 September 1952, AHS 40013 (MICH).

Commentary. The macroscopic and microscopic descriptions are based upon my examination of the collections listed above, with additional information adapted from Smith (1947) and Mass Geesteranus (1983b, 1992b).

The long, thick-walled setae of the pileus and stipe are by far the most distinguishing features of *M. longiseta*. As indicated by Smith (1947) however, it is often difficult to see the structures without the aid of a hand lens. Additionally, the setae tend to become appressed with age, giving the surface of the stipe and pileus a glabrous appearance. The cheilocystidia are quite variable in shape, with some basidiomes producing distinctly smooth forms, while others produce forms with one or more apical necks, all within a single collection. The presence or absence of clamps appears to follow a similar pattern.

Mycena* section *Heimales Konr. & Maubl., Ic. Sel. Fung. 6: 274. 1934.

Basidiomes small to medium sized. Pileus surface pruinose to glabrous, lubricous to dry; blackish brown to grayish brown, or whitish. Context thin. Lamellae white to grayish. Stipe central, hollow; surface pruinose to glabrous, whitish, pallid, or brownish, rarely bright yellow in young specimens; the base

always covered with fibrils.

Basidiospores ellipsoid to globose, smooth, inamyloid. Basidia 2-spored and clampless, or 4-spored and clamped, clavate. Cheilocystidia variously shaped, forming a sterile lamellar edge or mixed with basidia, clamped or clampless. Pleurocystidia similar to cheilocystidia or absent. Pileipellis a cutis; hyphae clamped or clampless, generally covered with excrescences, more rarely smooth. Lamellar trama weakly dextrinoid to non-dextrinoid. Stipe cortical hyphae clamped or clampless, covered with excrescences or smooth.

Among mosses, herbaceous debris, on wood, or on moss covered tree trunks.

subsection *Omphaliariae* Kühner ex Maas Geest., *Persoonia* 11: 115. 1980.

Basidiomata with the characteristics described above for section *Heimales*. The lamellae horizontal to arcuate, the edges straight to concave.

Type species: *Mycena speirea* (Fr.: Fr.) Gillet

Key to the California species of subsection *Omphaliariae*.

1. Spores globose to subglobose, or broadly ellipsoid; basidia 4-spored; growing on the wood of *Thuja occidentalis* (cedar) or other conifers
..... *M. clavata*
1. Spores ellipsoid to amygdaliform; basidia generally 2-spored; growing on the trunks or woody debris of hardwoods and conifers *M. speirea*

Mycena clavata (Peck) Redhead, *Mycologia* 78(4): 523. 1986.

≡ *Omphalia clavata* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 51: 285. 1899.

=? *Mycena phaeophylla* Kühner, *Le Genre Mycena* p. 590. 1938.

= *Mycena thujina* A. H. Sm., *N. Am. Sp. Mycena* p. 361. 1947.

Pileus 4-15 mm diam, convex to broadly convex, the disc becoming flattened in age, with or without a shallow, central depression; the margin straight to decurved, faintly striatulate when moist, ± crenate at times; surface moist, minutely pruinose at first, soon glabrescent and polished, subhygrophanous; grayish to deep dull grayish brown, fading to pale cinnamon brown or buff ("bister" with "snuff brown" margins, or "bister" overall and fading to "clay color" to "cinnamon buff," occasionally fading to "cinnamon" or "pinkish cinnamon" before losing moisture). **Context** thin, concolorous with pileus. **Lamellae** arcuate to decurrent, 14-19 reaching the stipe, close to subdistant with 1-2 series of lamellulae, narrow to moderately broad, whitish or tinged cinnamon buff; the edges concolorous, entire or minutely fimbriate. **Stipe** (20-) 30-70 X 1-1.5 mm, terete, hollow, cartilaginous-fragile; surface initially pruinose, soon glabrescent and polished; concolorous with the pileus; the base echinulate-strigose with white fibrils. **Odor** and taste absent.

Basidiospores 6.8-8.8(-9.6) X 5.6-6.4(-8.0) μm [$\bar{x} = 8.1 \pm 0.7 \times 6.1 \pm 0.7$ μm , $Q = 1.1-1.6$, $q = 1.3 \pm 0.1$, $n = 75$ spores], globose to subglobose, or broadly ellipsoid, smooth, thin-walled, inamyloid. **Basidia** 24.0-32.0 X 6.4-8.0 μm , clavate, clamped, sterigmata up to 4.0 μm in length; basidioles similar. **Cheilocystidia** 25.6-53.6 X 6.4-11.0, \pm lageniform to narrowly ventricose, the narrowed apical portion often curved and/or furcate, smooth, clamped, occasionally with a hyaline droplet presumably exuded by and enclosing the apex; mixed with basidia. **Pleurocystidia** absent or confined to the region near the lamellar edge, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-5.6 μm diam, clamped, covered with cylindric to slightly coarse, simple to branched, short to quite long excrescences, 2.4-30.4 X 1.6-3.2 μm , which often form dense masses. **Hypodermium** composed of inflated cells, yellowish brown to very weakly brownish-vinescent in Melzer's reagent. **Pileus trama** composed of inflated and cylindric cells, yellowish brown in Melzer's reagent. **Lamellar trama** similar. **Stipe tissues** parallel, monomitic, yellowish brown or weakly brownish-vinescent in Melzer's reagent; cortical hyphae 2.0-4.0 μm diam, clamped, giving rise to scattered, cylindric to coarse, short to quite long excrescences, 3.2-34.4 X 2.4-5.6 μm ; terminal cells similar to the cheilocystidia or the coarser excrescences of the cortical hyphae.

Habit, habitat, and distribution. Solitary to scattered on logs of *Thuja* spp. (cedar) and other conifers. To my knowledge *M. clavata* has only been collected within California from Humboldt Co. It has also been reported from New York (Peck, 1899), and Michigan (Smith, 1947) in the United States, and from Ontario in Canada (Smith, 1947).

Material examined. United States. California. Humboldt Co.: Trinidad, 30 November 1935, AHS 3672 (as *M. thujina*, MICH); Humboldt State Park, 30 November 1956, AHS 55141 (as *M. thujina*, MICH). **Canada. Ontario.** Lake Timagami, 2 September 1936, AHS 4444 (as *M. thujina*, Holotype, MICH).

Commentary. The macroscopic description was adapted from Smith's (1947) description of *M. thujina*, his notes on collections AHS 3672 and AHS 55141, and Peck's original description of *Omphalia clavata*. The microscopic description is based upon my examinations of the collections listed above.

Mycena clavata appears to be a rare fungus within California, as well as throughout the rest of its range. The only known collections from California are those of A.H. Smith made in Humboldt County during the 1930's and 50's (as *M. thujina*). Smith examined the type material of *Omphalia clavata*, and indicated the superficial similarity of the species to members of section Omphaliariae. However, Smith felt that his investigation of the type material indicated that the taxon was possibly a member of *Marasmius*, and that further studies of fresh material were necessary to determine its true relationships. Redhead (1986) conducted a more thorough investigation of the type material of *Omphalia clavata*, and determined that the species was identical to *M. thujina*. Additionally, Redhead (1986) investigated a collection of *M. phaeophylla* Kühner, and feels that this taxon is also most likely a synonym of *M. clavata*.

Mycena speirea (Fr.: Fr.) Gillet, Les Hymén. p. 280. 1874.

Key to the California forms of *Mycena speirea*.

- 1. Stipe apex whitish to grayish, lacking yellowish tones
..... *M. speirea* f. *speirea*
- 1. Stipe apex or entire stipe pale yellow to yellowish green, at least in young specimens
..... *M. speirea* f. *camptophylla*

Mycena speirea* (Fr.: Fr.) Gillet f. *speirea

- ≡ *Agaricus speireus* Fr., Obs. Mycol. 1: 90. 1815. (Syst. Mycol. 1: 159. 1821)
- ≡ *Omphalina speirea* (Fr.: Fr.) Quéll., Flore Mycol. Fr. p. 197. 1888.
- ≡ *Hemimycena speirea* (Fr.: Fr.) Singer, Revue Mycol. 3: 195. 1938.
- = *Mycena latebricola* P. Karst., Bidr. Känn. Finl. Nat. Folk. 32: 117. 1879.
- = *Mycena perpusilla* Velen., České Houby p. 307. 1920.
- = *Omphalia tenuistipes* J.E. Lange, Dansk Bot. Ark. 6(5): 16. 1930
- = *Omphalia speirea* var. *tenuistipes* (J.E. Lange) J.E. Lange, Flora Agar. Dan. 2: 62. 1937.

Pileus 3-10 mm diam, hemispherical to convex or planoconvex, seldom with a small papilla or shallowly umbilicate; the margins typically straight in young specimens, striate to shallowly sulcate, pellucid-striate; surface moist to dry, lubricous when moistened, minutely canescent to finely pruinose or subrugulose at first, glabrescent; disc light brown to yellowish brown (5-6D4-5) or grayish brown (5-6C-D3), fading in age to pale grayish buff or pale yellowish brown, the margin paler, yellowish white (4A2) to whitish. **Context** very thin, pale. **Lamellae** horizontal to arcuate, broadly adnate to decurrent, 9-15 reaching the stipe, subdistant with 1-2 series of lamellulae, moderately broad (up to 3 mm), white to whitish gray; the edge straight to concave, concolorous. **Stipe** 12-37 X 0.5-1 mm, central, terete, equal; surface dull, dry, pruinose to puberulose overall, the lower portion glabrescent; white to pale grayish white, or with brownish tones, the base becoming grayish to yellowish brown in age or remaining pale, typically arising from and to some degree covered with, long, strigose white fibrils. **Odor and Taste** not distinct or mildly farinaceous.

Basidiospores 8.5-11.5 X 4.5-6.5 μm [$x^{\text{---}}$ = 9.7 \pm 0.8 X 5.3 \pm 0.3 μm , Q = 1.4-2.4, $q^{\text{---}}$ = 1.8 \pm 0.2 μm , n = 85 spores], ellipsoid to amygdaliform or \pm lacrymoid, with a prominent hilar appendage, smooth, thin-walled, inamyloid. **Basidia** 23.2-33.0 X 5-7 μm , narrowly clavate, 2-spored, rarely 4-spored (see comments below), clampless, sterigmata up to 6 μm in length; basidioles similar. **Cheilocystidia** 17-48 X 4-6.5 μm , subcylindric, subclavate, subfusiform, or narrowly utriform, all forms also occurring as \pm irregular in shape, often furcate apically or giving rise to 1-several knob-like protuberances, the central portion of

the cell occasionally with a slight bend and/or knob like protuberance, clampless; forming a sterile lamellar edge or intermixed with rare, scattered basidia.

Pleurocystidia absent. **Pileipellis** a cutis; hyphae 2-4.5(-7) μm diam, clampless, slightly gelatinized, covered with simple to branched, cylindric to coarse or inflated excrescences, 2-22 X 1.5-4(-6) μm ; terminal cells abundant, similar to hyphae.

Hypodermium of inflated cells which are \pm rectangular in side view, weakly dextrinoid to non-dextrinoid. **Pileus trama** composed of cylindric hyphae, weakly dextrinoid to non-dextrinoid. **Lamellar trama** composed of interwoven, inflated cells, weakly dextrinoid to non-dextrinoid. **Stipe tissues** weakly dextrinoid to non-dextrinoid; cortical hyphae 2.5-6 μm diam, clampless, giving rise to numerous, mostly simple, more rarely furcate, subcylindric protuberances, 5-51 (and much longer) X 2.5-8 μm ; terminal cells similar to protuberances, often curved; both protuberances and terminal cells often with slightly thickened walls.

Mycena speirea f. camptophylla (Berk.) Kühner, *Le Genre Mycena* p. 587. 1938.

≡ *Agaricus camptophyllus* Berk., *Engl. Flora* 5(2): 62. 1836.

≡ *Omphalia camptophylla* (Berk.) Sacc., *Syll. Fung.* 5: 329. 1887.

≡ *Hemimycena camptophylla* (Berk.) Singer, *Annals Mycol.* 41: 123. 1943.

≡ *Marasmiellus camptophyllus* (Berk.) Singer, *Lilloa* 22: 302. 1951.

≡ *Mycena camptophylla* (Berk.) Singer, *Ark. Bot.* II 4: 384. 1959.

Similar to *Mycena speirea f. speirea*, but the stipe apex or entire stipe pale yellow to yellowish white (3A2-3), or greenish yellow, which typically fades to whitish overall

Habit, habitat, and distribution. Solitary to scattered or gregarious on bare or moss covered bark of hardwood and coniferous trees, on cones and other woody debris in moist areas. In California it has been collected in the fall from North Coast and Klamath Ranges, and in the spring from the northern High Sierra Nevada. Also reported from Washington and Michigan in the United States (Smith, 1947), as well as Europe, northern Africa and Japan (Maas Geesteranus, 1991, 1992b).

Material examined. California. Humboldt Co.: Rockefeller Forest, 9 November 1997, DED 6672. Mendocino Co.: Navarro, along Hwy. 128, 23 November 1991, DED 5411. Sonoma Co.: Bohemian Grove near Monte Rio, 27 November 1996, DED 6580. Sierra Co.: SFSU Field Campus, 13 June 1984, DED 2909; Hwy. 49, Chapman Creek Campground, 5 June 1997, BAP 129.

Commentary. The macroscopic description is based upon notes taken on collections DED 5411, DED 6672, and BAP 129, with additional information adapted from Smith (1947) and Maas Geesteranus (1991, 1992b). The microscopic description is based upon my examinations of the collections listed above.

The two forms of *Mycena speirea* found within California appear to be

equally common, and cannot be separated by any means other than the stipe coloration. It should be noted however, that those populations or individuals of *M. speirea f. camptophylla* that are characterized by only a yellowish stipe apex, can easily be mistaken for *M. speirea f. speirea* once the yellowish coloration of the stipe has faded to whitish. Additionally, in collection DED 6672, only some of the young specimens tended to develop a yellowish stipe apex, while the remainder were characterized by white to grayish white stipes. Although Smith (1947) agreed with Kühner's treatment of the species as a *Mycena*, he did not recognize *f. camptophylla* as distinct from *f. speirea* due to the inconsistent yellowish coloration of the stipe, stating that when present, the yellowish coloration fades quickly and can easily be overlooked (Kühner, 1938). While both forms have been treated in the present work, my observations are in line with those of Smith and call into question the recognition of *M. speirea f. camptophylla* as a distinct form of the species.

Macroscopically the species is characterized by its diminutive stature, horizontal to arcuate lamellae, and lignicolous habit. *Mycena clavata*, which can also be characterized by arcuate lamellae and a lignicolous habit, can generally be distinguished from *M. speirea* by its lack of any yellowish coloration to the pileus or stipe, and lack of a pale pileus margin. Microscopically, *M. speirea* is easily identified by the rather simple cheilocystidia, ellipsoid, amygdaliform, or \pm lacrymoid spores with a prominent hilar appendage, \pm rectangular cells of the hypodermium, and the large excrescences and terminal cells of the stipe cortical hyphae which tend to develop thickened walls. Although the basidia are typically 2-spored, 4-spored forms are occasionally encountered (Smith, 1947; Maas Geesteranus, 1991, 1992b). Collection DED 6672 was observed to contain rare 1-, 2-, and 4-spored basidia in addition to the more abundant 2-spored forms.

Mycena* section *Aciculae Kühner ex Singer, Sydowia 15: 65. 1962.

Basidiomes fairly small. Pileus surface pruinose, glabrescent, often slightly lubricous when wet, bright orange, becoming paler with age or moisture loss. Context concolorous with the pileus. Lamellae ascending-adnate, orangish yellow, becoming pale, edge whitish. Stipe hollow, puberulous, slightly viscid, orangish yellow, becoming pale, the base covered with white fibrils.

Basidiospores fusiform-elliptical, smooth, inamyloid. Basidia 4-spored (rarely 3-, 2- or 1-spored), clavate, clamped. Cheilocystidia fusiform to clavate, smooth, clamped. Pleurocystidia similar. Pileipellis a cutis; hyphae diverticulate, clamped. Hypodermium composed of inflated, pseudoparenchymatous cells. Lamellar trama non-dextrinoid. Cortical hyphae of the stipe densely diverticulate, clamped.

Growing on debris of conifers and hardwoods.

Type species: *Mycena acicula* (Schaeff.: Fr.) P. Kumm.

- Mycena acicula*** (Schaeff.: Fr.) P. Kumm., Führ. Pilzk. p. 109. 1871.
 = *Agaricus acicula* Schaeff., Fung. Icon. 4: 52. 1774.
 = *Agaricus acicula* Schaeff.: Fr., Epicr. Syst. Mycol. p. 114. 1838.
 = *Marasmiellus acicula* (Schaeff.: Fr.) Singer, Lilloa 22: 301. 1951.
 = *Trogia acicula* (Schaeff.: Fr) Corner, Monogr. Cantharell. Fungi p. 194. 1966.
 = *Agaricus coccineus* Scop., Flora Carniol. 2: 436. 1772.
 = *Mycena phoeniceus* (Brig. jun.) Sacc., Syll. Fung. 5: 257. 1887.
 = *Agaricus flavominiatus* Berk., Hook. J. Bot. 4: 103. 1852.
 = *Mycena punicans* (Britz.) Sacc., Hym. Südbayern 4: 147. 1885.
 = *Mycena amabalissima* sensu Murrill, Mycologia 5: pl. 92, fig. 8. 1913.

Pileus 2-10 mm diam, hemispherical to paraboloid, occasionally with a small umbo, flattening with age, margin appressed against the stipe when young, often flaring or becoming slightly recurved with age; surface smooth, pruinose with white granules, glabrescent, pellucid-striate, slightly viscid when moist, deep orange red (8A8) when young, fading in age to orange, very pale salmon, or yellowish (4A7), margin yellowish. **Context** thin, orange red beneath the pileus, yellowish above the stipe. **Lamellae** ascending-adnate, 9-16 reaching the stipe, close to subdistant with 2-3 series of lamellulae, moderately-broad, deep orangish yellow or whitish, often more intensely colored near the base and paler towards the edge; the edges whitish, convex. **Stipe** 7-60 X 0.5-1.0 mm, central, terete, hollow; surface smooth, minutely white puberulous, glabrescent, slightly viscid, orangish yellow to yellow (3A8), fading with age, the base covered with white fibrils. **Odor and taste** indistinct.

Basidiospores 8.8-12.0 X 3.2-4.0 μm [$\bar{x} = 10.6 \pm 0.8 \times 3.7 \pm 0.3 \mu\text{m}$, Q = 2.3-3.8, $\bar{q} = 2.9 \pm 0.3$, n = 25 spores], fusiform-elliptical, smooth, thin-walled, inamyloid. **Basidia** (16.0-)17.6-25.6(-28.8) X 6.0-7.2 μm , 4-spored, rarely 1-, 2-, or 3-spored, clavate, clamped, sterigmata 2.4-4.4 μm long; basidioles similar or narrowly clavate. **Cheilocystidia** 16.0-24.0 X 3.2-6.4(-9.6) μm , fusiform to \pm clavate, often with a narrowed apex, smooth, thin-walled, clamped, not protruding, intermixed with scattered basidia; lamellar edge (and sides) tending to be gelatinized, often in the form of large clumps. **Pleurocystidia** similar. **Pileipellis** a cutis; hyphae 1.6-3.6 μm diam, clamped, thin-walled, hyaline, covered with mostly cylindrical to \pm clavate excrescences, 1.0-13.6(-16.0) X 1.0-4.0 μm , which tend to form dense gelatinized masses (the gelatin often dissolving in KOH). **Hypodermium** a layer of inflated, pseudoparenchymatous cells, non-dextrinoid, remaining yellowish in Melzer's reagent. **Lamellar trama** non-dextrinoid, remaining yellowish in Melzer's reagent. **Stipe tissue** monomitic, parallel, non-dextrinoid; cortical hyphae 1.6-4.8 μm diam, clamped, thin-walled, hyaline, often with smooth portions, but for the most part covered with simple to branched, cylindrical or coarse, often \pm inflated excrescences, 1.2-23.0 X 1.6-4.8 μm , embedded in gelatinous matter which typically remains as large granular

clumps adhering to the cortical hyphae.

Habit, habitat, and distribution. Solitary, gregarious or subcaespitose on woody and herbaceous debris. Known from North America, Europe and Africa. In California it is commonly found on debris of hardwoods and conifers throughout the North and Central Coast Ranges, Sierra Nevada Foothills, and High Sierra Nevada, October to February.

Material examined. California. Del Norte Co.: Jedediah Smith Redwoods State Park, 18 October 1997, BAP 156; Gasquet, Panther Flat Campground, 16 November 1997, DED 6683. Marin Co.: Audubon Canyon Ranch, Volunteer Canyon, 19 November 1981, Calhoun 81-2581. Mendocino Co.: Laytonville, Trouette property, 10 November 1997, BAP 178. Monterey Co.: Toro Regional Park, 9 February 1997, BAP 111. San Mateo Co.: San Francisco Watershed, 10 January 1966, HDT 14669.

Commentary. The macroscopic description of this species is adapted from Smith (1947) and Maas Geesteranus (1990, 1992b), with additional observations made from fresh material. The microscopic description is based upon my examinations of the collections listed above.

Mycena acicula is characterized by the vivid coloration of the pileus and stipe, fusoid-elliptical spores, hypodermium composed of pseudoparenchymatous cells, and the diverticulate cortical hyphae of the stipe which is embedded in gelatinous matter. *Mycena oregonensis* A. H. Sm. is another intensely colored California species that superficially resembles *M. acicula*, but can be distinguished easily by the lack of the characters mentioned above, as well a viscid stipe and pale lamellar edge.

Mycena* section *Adonidae (Fr.) Quél., Mém. Soc. Emul. Montbél. II5: 103. 1872.

Basidiomata small to medium sized. Pileus surface finely pruinose or appearing glabrous, lubricous when moist or not; brightly colored, red, orange, pink, yellow, rarely white. Context thin, concolorous with the pileus. Lamellae ascending-adnate, with a decurrent tooth, red, pink, cream to white, the edge paler. Stipe fragile, hollow; the entire surface pruinose to minutely puberulous; orange, yellowish, or white, the base covered with whitish fibrils. Odor and taste indistinct or absent.

Basidiospores ellipsoid, inamyloid, smooth. Basidia 4-spored and clamped or 2-spored and clampless, clavate. Cheilocystidia generally fusiform, mixed with basidia or forming a sterile lamellar edge, clamped or clampless. Pleurocystidia similar if present. Pileipellis a cutis; the hyphae covered with simple to furcate excrescences, clamped or clampless. Lamellar trama not vinescent in Melzer's reagent (non-dextrinoid). Stipe cortical hyphae smooth, clamped or clampless; the terminal cells clavate or similar to the cheilocystidia.

In soil among moss and grass, on decayed wood and other plant debris.

Type species: *Mycena adonis* (Bull.: Fr.) Gray

Key to the CA species of section *Adonidae*

1. Pileus at first red, orange-red, bright pinkish red, (rarely white), pallescent or fading to orange to yellowish orange; margins fading to paler or white; stipe delicately pink, white or yellowish; stipe cortical hyphae gelatinized, not brownish-vinescent in Melzer's reagent *M. adonis*
1. Pileus at first deep orange to orangish red, lacking pinkish tones, fading to pale orange or bright yellow at the disc; margins fading to pale orange, pale yellowish and generally whitish eventually; stipe yellow to yellowish white, fading to white; stipe cortical hyphae not gelatinized, turning brownish-vinescent in Melzer's reagent *M. aurantiidisca*

Mycena adonis (Bull.: Fr.) Gray, Nat. Arrang. Br. Pl. 1: 620. 1821.

≡ *Agaricus adonis* Bull., Hist. Champ. Fr. p. 445. 1792/93.

≡ *Hemimycena adonis* (Bull.: Fr.) Singer, Anns. Mycol. 41: 123. 1943.

≡ *Marasmiellus adonis* (Bull.: Fr.) Singer, Lilloa 22: 301. 1951.

= *Mycena roseocandida* (Peck) Sacc., Syll. Fung. 5: 262. 1887.

= *Mycena amabalissima* (Peck) Sacc., Syll. Fung. 9: 37. 1891.

= *Mycena roseipallens* (Murrill) Murrill, Mycologia 8: 221. 1916.

Pileus 3-22 mm, conical to campanulate, often becoming plano-convex in age; margin initially appressed against the stipe, often flaring or becoming recurved with age; surface slightly lubricous when moist, glabrous, slightly pellucid-striate initially, smooth or shallowly sulcate, hygrophanous; at first scarlet, orange-red, bright pinkish-salmon, incarnate, or more rarely white, becoming orange to yellowish orange, with age or fading to orange buff or white, paler to white towards the margin. **Context** thin, up to 1 mm, concolorous with the pileus or paler. **Lamellae** ascending-adnate with a tooth, 12-24 reaching the stipe, close to subdistant with 2-3 series of lamellulae, narrow (1-2.5 mm), becoming ribbed and dorsally intervenose, yellowish, pinkish or white; the edges convex, concolorous with sides or white. **Stipe** 14-50 X 0.5-2 mm, central, equal, terete, hollow, often curving towards the base; surface smooth, entirely minutely puberulous at first, glabrescent with age, occasionally granular to floccose in the upper portion; pale yellow, orange, with pink to reddish tones, or entirely white, the colors often more pronounced at the apex, pallescent with age, turning whitish or developing yellowish tones, the base often sordid yellowish or brownish, the base covered with whitish fibrils, often only sparsely so. **Odor and taste** indistinct.

Basidiospores (6.4-)7.2-8.0(-8.8) X 3.2-4.8(-5.2) μm [$x^{\bar{\bar{}}}$ = 7.7 \pm 0.6 X 4.2 \pm 0.6 μm , Q = 1.4-2.5, $q^{\bar{\bar{}}}$ = 1.8 \pm 0.2, n = 40 spores] (basidia 4-spored); 8.0-9.6(-10.4) X 4.8-5.6(-6.0) μm [$x^{\bar{\bar{}}}$ = 8.9 \pm 0.7 X 5.1 \pm 0.5 μm , Q = 1.4-2.4, $q^{\bar{\bar{}}}$ = 1.8 \pm 0.2,

n = 75 spores] (basidia 2-spored), ellipsoid to broadly ellipsoid, with a pronounced hilar appendage, smooth, thin-walled, hyaline, inamyloid. **Basidia** 22.5-30.5(-32.0) X 5.6-8.0 µm, with sterigmata 2.0-3.2 µm in length, both 4-spored and 2-spored forms observed, 4-spored basidia clamped, 2-spored without clamps, clavate or narrowly clavate; basidioles cylindric to clavate. **Cheilocystidia** 32.0-55.2 X (6.0-)8.0-13.0 µm, ±fusiform, abundant to scattered, mixed with basidia, clamped or clampless, often with a hyaline, exudative drop at the apex which may or may not contain embedded spores. **Pleurocystidia** similar. **Pileipellis** a cutis; hyphae 2.0-6.0 µm, clamped or clampless, thin-walled, hyaline, sparsely to densely covered with simple or highly branched, cylindric to slightly coarse excrescences, 1.2-12.0 X 1.2-2.5 µm. **Hypodermium** composed of large inflated cells, clamped or clampless, thin-walled, hyaline, non-dextrinoid. **Lamellar trama** non-dextrinoid. **Stipe tissue** monomitic, parallel, non-dextrinoid; cortical hyphae (1.5-)2.5-5.5 µm diam, smooth, clamped or clampless, thin-walled, hyaline, gelatinized; terminal cells 17.5-29.0 X 4.0-15.5 µm, generally abundant, at least near the apex, sphaeropedunculate, clavate, or ±cylindric with a slightly enlarged apex; medullary hyphae broader.

Habit, habitat and distribution. Gregarious to scattered on leaf and needle debris, bark, and twigs of conifers and hardwoods. Known from North America, Europe, Algeria, and Tenerife. In California, it has been collected during the fall and winter months from the North Coast and Central Coast Ranges, and the northern High Sierra Nevada.

Material examined. California. Humboldt Co.: Orick, 2 December 1935, A.H. Smith 3711 (MICH). Marin Co.: Muir Woods National Monument, 6 December 1966, Madden 699; Audubon Canyon Ranch, above Volunteer Canyon, 4 December 1982, Calhoun 82-3497. Sierra Co.: Yuba Pass, 15 October 1972, HDT 30135. **Washington.** King Co.: Snoqualmie National Forest, Tamalpus Lake Trail, 16 October 1988, DED 6861.

Commentary. The macroscopic description of this species is adapted completely from Smith's (1947) descriptions of *M. adonis* and *M. amabilissima*, and Maas Geesteranus (1990, 1992b) description of *M. adonis*. The microscopic description is based on my own observations of the collections listed above.

Mycena adonis from the Pacific Northwest presents an interesting problem. Smith (1947) reported both *M. adonis* and *M. amabilissima* from California, Oregon and Washington, separating the two species on the basis of pileus, stipe and, lamellar coloration. *Mycena adonis* as described by Smith, is characterized by a scarlet pileipellis that fades to orange or yellowish orange, has yellowish or weakly pink lamellae, and a pale yellowish stipe. *Mycena amabilissima* as described by Smith has a light coral red (bright pinkish red) pileus that fades to white, has weakly pinkish to white lamellae, and a pinkish or white stipe that only develops yellowish tones at the base with age. Smith's description of *M. amabilissima* agrees well with that given by Murrill (1916) of *M. amabilissima* from the Pacific coast. However, Mass Geesteranus (1990, 1992b) treats *M. amabilissima* as a synonym of *M. adonis* in his description, clearly indicating his

opinion that *M. adonis* is characterized by distinctly reddish to pinkish coloration to the pileus, and only develops yellowish shades on the stipe. Based on this information, it would appear that Smith's (and Murrill's) concept of *M. amabilissima* actually represents *M. adonis*, and that Smith's concept of *M. adonis* represents a possibly undescribed species.

This situation raises the question of what are the characters of the true *M. adonis*, which is represented by Bulliard's illustrations (*Agaricus adonis* Bull.) and no description (Maas Geesteranus 1990, 1992b). Fries' (1821) description of the taxon, taken from Bulliard's illustrations, states the pileus coloration is "*variat roseo, albo, flavascente, viridi.*", indicating both reddish and yellowish, as well as greenish components to the pileus. Maas Geesteranus (1990, 1992b) mentions a green pileus in one of the specimens in Bulliard's illustration, stating that he chose to exclude the specimen from the illustrations representing the type of *M. adonis*. He apparently excluded any with yellowish tones to the pileus as well. Unfortunately, there is no information in Saccardo's description referring to the color of the stipe or lamellae. While it does not give any clue to which concept of *M. adonis* is correct, Saccardo's description does validate Smith's observation of yellowish tones to the pileus.

It is apparent that a more thorough investigation of fresh material is necessary to determine if *M. adonis* and *M. amabilissima* from the Pacific coast are indeed separate species or represent a single taxon more variable than either of those presented by Smith or Maas Geesteranus. Unfortunately these taxa are fairly rare, at least in California, which makes any such investigation difficult. For the time being however, I feel it is prudent to expand the limits of *M. adonis* to accommodate the concepts of both Smith and Maas Geesteranus, and accept *M. amabilissima* as a synonym.

Mycena aurantiidisca (Murrill) Murrill, Mycologia 8: 220. 1916.

≡ *Prunulus aurantiidisca* Murrill, N. Am. Flora 9: 336. 1916.

Pileus 3-11.5 mm diam, conical to obtusely conical or campanulate, often expanding with age; margins at first incurved, soon becoming decurved, pellucid-striate; surface dull, moist to dry, minutely pruinose, glabrescent, smooth, more rarely striate; disc at first deep orange (6-7A-B7-8) to bright reddish orange (8-9A-B8), soon fading to pale orange (5-6A4-8) or pale yellow (2-4A4-6), margin paler, pale yellow (4A3-7), pale orange (5A6-8), or yellowish white (3A2-3), often fading to nearly white. **Context** thin, concolorous with the pileus. **Lamellae** ascending-adnate to adnexed, often with a short decurrent tooth, 12-20 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow to moderately broad (up to 1.5 mm), convex, pale orange (5A2-4), pale yellow (2-3A2-3) or white; edges concolorous. **Stipe** 15-46 X <1-1.5 mm, central, terete, equal or with a slightly broader base, hollow; surface minutely pruinose overall, glabrescent below, smooth, moist or dry, dull or with a slight sheen, occasionally translucent, yellow (4A5-6), pale yellow (1-2A3-4) or yellowish white (2-3A2) initially, often fading to

white overall or only towards apex; the base covered with white fibrils. **Odor and taste** indistinct.

Basidiospores 6.0-8.8(-9.6) X 3.2-4.6 μm [$\bar{x} = 7.5 \pm 0.8 \times 3.6 \pm 0.3$, $Q = 1.5-2.5$, $q = 2.0 \pm 0.2$, $n = \text{hundreds spores}$], ellipsoid, smooth, thin-walled, inamyloid. **Basidia** 19.0-25.0 X 5.6-6.4 μm , 4-spored, clavate, clamped, sterigmata up to 4.0 μm in length; basidioles similar. **Cheilocystidia** 27.2-56.0 X (4.8-)7.2-9.6 μm , fusiform to almost lageniform, smooth, clamped, the apex generally covered with a drop of hyaline or slightly refractive exudative material, which may or may not be full of embedded spores, mixed with basidia, protruding. **Pleurocystidia** similar, generally abundant, protruding. **Pileipellis** a cutis; hyphae 2.4-6.4 μm diam, clamped, sparsely to densely diverticulate, excrescences cylindric to slightly coarse or inflated, simple to branched, 2.4-16.0 X 1.2-3.2(-4.8) μm , not infrequently becoming somewhat gelatinized. **Hypodermium** yellowish or weakly vivescent in Melzer's reagent. **Lamellar trama** yellowish in Melzer's reagent. **Stipe tissues** monomitic, brownish-vivescent in Melzer's reagent; cortical hyphae 1.5-4.0, smooth, rarely with a few scattered simple, cylindric projections, clamped; terminal cells 16.0-48.0 X 5.6-12.0 μm , similar to hymenial cystidia and often curved to one side, or \pm sphaeropedunculate, smooth, generally occurring in clusters.

Habit, habitat, and distribution. Gregarious to scattered on debris of both conifers and hardwoods. Known from Idaho, Washington, Oregon and California. In California it has been collected throughout the North and Central Coast Ranges. Smith (1947) reported the species to occur in both the spring and fall, but to my knowledge it has only been collected during the fall months in California.

Material examined. California. Del Norte Co.: Six Rivers National Forest, 20 October 1965, HDT 13695; Jedediah Smith Redwoods State Park, 19 Nov. 1965, HDT 14304; Redwood National Park, Rugg Grove, 24 October 1992, DED 5548; same location, 19 October 1997, DED 6662; same location, 8 November 1997, BAP 165. **Humboldt Co.:** Prairie Creek Redwoods State Park, 9 November 1991, DED 5383; same location, 9 November 1991, Kris M. Shanks 154. **Mendocino Co.:** Jackson State Forest, near Mendocino, 4 February 1961, HDT 8714; Laytonville, Trouette property, 23 November 1997, BAP 192.

Commentary. The macroscopic description is based upon notes taken on the fresh material by Desjardin and myself. The microscopic description is based upon my examinations of the dried material.

Mycena aurantiidisca is characterized macroscopically by the vivid, deep orange to reddish orange coloration of the pileus in young specimens, which fades to pale orange or bright to pale yellow. Microscopically the species is characterized by inamyloid spores and a hyaline droplet generally exuded at the apex of the hymenial cystidia. Smith (1947) reported that the pileus margins of *M. aurantiidisca* often fade to whitish as the pilei mature. My investigation revealed a similar situation in all of the California collections. As the basidiomes mature, they are generally encountered with a bright to pale yellowish disc surrounded by

a whitish margin. *Mycena aurantiidisca* can be distinguished from *M. adonis* by its lack of scarlet red to bright pink coloration, lack of gelatinized stipe cortical hyphae, and lack of occasional 2-spored basidia and/or basidiomes.

Mycena* section *Lactipedes (Fr.) Quél., Champ. Jura Vosges p. 107. 1872

Basidiomes small to medium sized. Pileus surface pruinose, glabrescent, slightly viscid or lubricous when moist, gray, gray-brown, dark brown, or almost black, rarely white. Context thin. Lamellae ascending-adnate, with a short subdecurrent tooth, ventricose; white, becoming grayish or brownish with age, occasionally flushed pink or developing sordid stains, the edge convex, whitish. Stipe hollow; the surface pruinose, glabrescent, dry; whitish, gray-brown, dark brown to almost black, the base covered with whitish fibrils; exuding a milky white to watery white fluid when cut or broken. Odor raphanoid, indistinct, or absent. Taste raphanoid, indistinct, or bitter in one species.

Basidiospores ellipsoid to almost cylindrical, amyloid, smooth. Basidia 4-spored and generally clamped or 2-spored and clampless, clavate. Cheilocystidia fusiform, sublageniform, clavate or irregular in shape, smooth or covered with coarse excrescences. Pleurocystidia similar to the normal-shaped cheilocystidia or absent. Pileipellis a cutis; hyphae covered with simple to branched excrescences. Stipe cortical hyphae covered with simple to branched excrescences; the terminal cells smooth or diverticulate.

On debris and moss covered trunks of coniferous and hardwood trees.

Type species: *Mycena galopus* (Pers.: Fr.) P. Kumm.

Mycena galopus (Pers.: Fr.) P. Kumm. **var. *galopus***, Führ. Pilzk. p. 108. 1871.

≡ *Agaricus galopus* Pers., Obs. Mycol. 2: 56. 1799.

=*Mycena lactescens* (Schrad.) J. Schroet., Krypt. Flora Schles 31(1): 632. 1889.

=*Hiatula europaea* P. Karst., Meddn. Soc. Fauna Flora Fenn. 16: 91. 1890.

=*Mycena balanicola* Velen., Ceske Houby p. 324. 1920.

=*Mycena copiosa* Cejp, Publ. Fac. Sci. Univ. Charles 104: 103. 1930.

=*Mycena fusco-ocula* A. H. Sm., Mycologia 29:338. 1937

Basidiomes gregarious to scattered, putrescent. **Pileus** 6-22 mm diam, paraboloid, conical or obtusely conical, often expanding to campanulate; margins entire at first, becoming crisped or crenate and curled outward, pellucid-striate; surface glabrous, dull, moist or dry, striate, hygrophanous; dark grayish-brown overall when young, dark brown to beige at disc, striae slightly paler, remainder ranging from brown to grayish-brown, light grayish-beige to whitish-beige, or even light gray. **Context** thin, up to 1 mm thick under disc, white or concolorous with the pileus. **Lamellae** ascending-adnate, often with a slight decurrent tooth,

occasionally ventricose, close to subdistant with 1-3 series of lamellulae, narrow to moderately broad (1-2 mm), white to light gray, often developing brown tones; edges entire, concolorous. **Stipe** 41-108 X 1-3.5 mm, central, terete, equal above a slightly enlarged base, hollow; surface smooth, dull, dry, glabrous or minutely pruinose above, base covered with long white fibrils; grayish brown overall when young, fading above to pale whitish gray; often with small elongate white lesions; fresh material exuding white to watery white latex when cut or broken, especially at the base.

Basidiospores 8.8-14.4(-16.5) X 4.4-7.7 μm [\bar{x} = 11.6 \pm 1.2 X 5.6 \pm 0.6 μm , Q = 1.6-3.0, q = 2.1 \pm 0.2, n = 296 spores], ellipsoid to amygdaliform, smooth, thin-walled, hyaline, amyloid. **Basidia** 26.3-38.5 X 7.7-10.3 μm , 4-spored, clavate, clamped, sterigmata 2.2-9.9 μm in length; basidioles clavate, 27.5-35.2 X 7.7-8.8 μm . **Cheilocystidia** 30.6-80.8 X 7.1-14.4 μm , more or less fusiform, occasionally splitting or branching towards apex, more rarely with a few cylindrical to coarse excrescences, 1.6-14.1 X 1.6-3.2 μm , thin-walled, clamped, hyaline, abundant and strongly protruding, intermixed with basidia. **Pleurocystidia** similar, strongly protruding. **Pileipellis** a cutis; hyphae 1-4.8 μm diam, clamped, thin-walled, hyaline, densely covered with simple, cylindrical, occasionally branching excrescences, 1.6-9.6 X 1.0-1.6 μm , which tend to form dense, difficult to resolve masses; terminal cells similar to hyphae or branching into numerous, diverticulate side branches. **Hypodermium** composed of inflated cells, 18.8-46.5 μm diam, dextrinoid, thin-walled, hyaline. **Lamellar trama** irregular, composed of inflated cells and narrow hyphae, dextrinoid. **Stipe tissues** monomitic, parallel, dextrinoid; cortical hyphae 1.6-4.8 μm diam, clamped, smooth to sparsely or densely covered with simple, cylindrical excrescences, 1.0-7.1 X 1.2-3.3 μm ; terminal cells cylindrical to fusiform, generally smooth, occasionally covered with excrescences, clamped, thin-walled, hyaline; medullary hyphae broader, up to 23 μm diam, thin-walled, hyaline; laticiferous hyphae abundant, filled with oily or occasionally granular contents which are often yellowish.

Habit, habitat, and distribution. Gregarious to scattered on leaf and needle litter or in soil. In California it is abundant and common throughout the North and Central Coast Ranges, and the San Francisco Bay Area, October to February. Known from the United State, Canada, Europe, and Japan (Smith, 1947; Maas Geest. 1988, 1992b)

Material examined. California. Contra Costa Co.: Shell Ridge Open Space, 7 December 1996, BAP 095. Del Norte Co.: Redwood National Park, approx. 2 mi. north of Hiouchi, 17 October 1997, BAP 154. Humboldt Co.: Rugg Grove, Redwood National Park, 18 October 1997, BAP 158; same location, 8 November 1997, BAP 167. Marin Co.: Phoenix Lake, 30 November 1963, HDT 10876; Muir Woods National Monument, 29 November 1966, Madden 640; Audubon Canyon Ranch, Volunteer Canyon, 28 November 1982, Calhoun 82-3478; same location, 4 December 1982, Calhoun 82-3531. Mendocino Co.: Jackson State Forest, 1 December 1974, HDT 33156; same location, 18 October 1975, HDT 33202; Northern California Coast Range Preserve, 1 November 1975,

HDT 35322; Jackson State Forest, Hwy. 408 near Mendocino Woodlands Camp, 21 November 1993, DED 5952; Jackson State Forest, junction of roads 408 & 409, 23 November 1996, BAP 079; Van Damme State Park, Pygmy Forest area, 24 November 1996, BAP 087; same area, 24 November 1996, BAP 088; same area, 24 November 1996, BAP 089; Laytonville, Trouette property, 10 November 1997, BAP 176. San Mateo Co.: Salt Point State Park, 25 November 1972, HDT 30727; same location, 25 November 1972, HDT 30797; San Francisco Watershed, 25 November 1974, Halling 202; Edgewood County Park, December 1996, BAP s.n. Sonoma Co.: Bohemian Grove near Monte Rio, 27 November 1997, DED 6581.

Commentary. The macroscopic description is based upon my observations of fresh material. The microscopic description is based upon my examination of the collections listed above.

Mycena galopus is one of the more common mycenas of the coastal ranges of California, especially the *Sequoia sempervirens* forests. I have often encountered the species in troops of up to hundreds or more, arising from the debris at the bases of redwood trees. The species can be recognized easily, at least in coastal California, by the brownish disc that fades to off-white or white towards the margins, the whitish latex generally exuded by the stipe, and the growth habit. *Mycena galopus* is the only species currently known from California that exudes a whitish latex.

Smith (1937) described *M. fusco-ocula* from material collected in Washington and California, and indicated the similarity of the species to *M. galopus*. Smith felt the placement of the species in synonymy with *M. galopus* was unjustified due to discrepancies in the characteristics of the stipe. *Mycena fusco-ocula* was observed by Kauffman to have an elastic stipe with a subviscid surface, and to lack latex of any form in the fresh condition. However, Smith reported the presence of scattered hyphae in the stipe containing granular contents (laticiferous hyphae) similar to those observed in *M. galopus*. During the course of this investigation I made several collections in which latex was not observed, or produced only scantily when the stipe base was broken and immediately squeezed. Yet all of these collections contained laticiferous hyphae and were otherwise indistinguishable, both macro- and microscopically, from those collections exuding generous amounts of latex. Although I am unable to account for the elastic stipe and subviscid surface observed by Kauffman, based on my observations I am inclined to agree with Maas Geesteranus' placement of *M. fusco-ocula* in synonymy with *M. galopus*.

***Mycena* section *Hygrocyboideae* (Fr.) Singer, Beih. Sydowia 7: 49. 1973.**

Basidiomes medium sized. Pileus surface viscid to lubricous, covered with a separable, gelatinous pellicle, coloration variable, often yellowish. Context thin. Lamellae ascending-adnate, with a decurrent tooth, whitish, grayish, yellowish, or

pale citrine, more rarely with pinkish tones; the edge separable as an elastic-like thread. Stipe central, hollow, viscid when moist, typically with yellowish coloration, often with or developing reddish stains, especially near the base. Odor indistinct, farinaceous, iodoform, or rancid. Taste indistinct, farinaceous, or rancid.

Basidiospores ellipsoid to amygdaliform, smooth, amyloid. Basidia 2- or 4-spored (rarely 1-, or 3-spored), clavate, clamped or clampless. Cheilocystidia clavate to ±irregular, apically and often laterally giving rise to few or numerous, short to quite long, variously shaped excrescences, clamped or clampless, embedded in gelatinous matter, forming a sterile edge. Pleurocystidia absent. Pileipellis a cutis; hyphae embedded in gelatinous matter, clamped or clampless, smooth or with rare, scattered excrescences, the terminal cells and side branches branching into and/or giving rise to numerous excrescences. Hyphae of the cortical layer of the stipe embedded in gelatinous matter, clamped or clampless, smooth, the terminal cells variously shaped, giving rise apically and often laterally to few to numerous, variously shaped excrescences.

Growing on the herbaceous debris and decaying wood of conifers and hardwoods, among mosses, or grasses.

Type species: *Mycena epipterygia* (Scop.: Fr.) Gray

Key to the California species of *Mycena* section *Hygrocyboideae*.

1. Pileus typically with deep olivaceous coloration at maturity; the lower portion of the stipe reddish to reddish brown; cheilocystidia apically narrowed into one or two, tapered and somewhat pointed excrescences; basidiomes lignicolous on conifer logs and woody debris, associated with melting snow banks in the Sierra Nevada and Cascade Ranges during the spring and summer months *M. nivicola* nom. prov.
1. Pileus typically lacking deep olivaceous colors, typically yellowish to yellowish white or yellowish gray; the lower portion of the stipe with or without reddish stains in age; cheilocystidia covered with few to numerous, simple to branched excrescences; basidiomes not associated with melting snow banks 2
 2. Basidiomes lacking rancid-farinaceous taste; pileus, tissues and stipe not developing sordid brownish stains or coloration *M. epipterygia* var. *epipterygia*
 2. Basidiomes with a rancid-farinaceous taste; pileus, tissues, and stipe base developing sordid brownish stains or coloration in age *M. epipterygia* var. *viscosa*

Mycena nivicola Perry and Desjardin nom. prov.

Pileus 7-32 mm diam, conical to campanulate; the margins incurved in

young specimens, pellucid-striate; surface viscid but occasionally becoming dry with exposure (in such cases the surface becoming viscid to tacky when moistened), smooth, glabrous, covered with a separable gelatinous pellicle, hygrophanous; pale yellowish with olivaceous tones when young and buried in substrate, becoming olivaceous to olivaceous brown and with or without yellowish tones (4-5E3-6), often with a darker disc, occasionally developing more yellowish tones with moisture loss, more rarely becoming reddish olivaceous with moisture loss. **Context** up to 3 mm thick under disc, whitish to pale yellowish or yellowish green. **Lamellae** ascending-adnate, with a small decurrent tooth, 25-29 reaching the stipe, close with 1-2 series of lamellulae, moderately broad (up to 2 mm), white to grayish white or pale yellowish white, the edges concolorous. **Stipe** 40-140 X 1-5 mm, central, terete, \pm equal, hollow; surface viscid but quickly drying with exposure, shiny or dull, smooth, entirely to apically covered with a whitish pruinosity or canescence initially, glabrescent below, the base (where visible) white tomentose, typically covered with adhering substrate debris; pale yellow to lemon yellow (1-3A2-5), often fading with age, the apex often paler or whitish, the base white in young specimens, becoming dark reddish brown (8E6-8) in age. **Odor** indistinct. **Taste** indistinct to slightly farinaceous.

Basidiospores (9.2-)9.6-12(-12.8) X (5.2-)5.6-7.2(-7.6) μm [$x^{\bar{\bar{}}}$ = 10.9 \pm 0.8 X 6.2 \pm 0.5 μm , Q = 1.4-2.2, $q^{\bar{\bar{}}}$ = 1.8 \pm 0.1, n = 223 spores], ellipsoid to broadly ellipsoid, thin-walled, smooth, amyloid. **Basidia** 31.2-44.0(-57.6) X 8-9.6(-11.2) μm , 4-spored, clavate, clamped, with sterigmata 3.2-4.4 μm in length; basidioles similar. **Cheilocystidia** 24.4-57.6 X 5.6-8 μm , commonly with a clavate to bulbous base and apically extending into one, occasionally two, short to long tapered, often rather pointed excrescences, more rarely \pm lageniform, the lower portion often with one to several, short, cylindric excrescences, occasionally lacking excrescences altogether and then \pm clavate, clamped, mixed with basidia, embedded in a gelatinous layer. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.2-4.0 μm diam, embedded in a gelatinous layer, clamped (clamps often loop-like), smooth, rarely with a few scattered diverticula, the terminal cells typically enlarged somewhat, much branched and/or covered with cylindric to slightly coarse excrescences, 1.2-9.6 X 1.2-3.2 μm . **Hypodermium** composed of inflated cells, up to 24.8 μm diam, dextrinoid. **Lamellar trama** dextrinoid, composed of interwoven hyphae. **Stipe cortical hyphae** 1.2-3.2 μm diam, embedded in gelatinous matter, clamped (clamps often loop-like), often appearing coiled, smooth, rarely with a few scattered, cylindric excrescences; terminal cells 20.8-88 X 4.8-12 μm , lageniform or with a bulbous to \pm clavate or irregular basal portion and typically extending apically into one, occasionally two, long, tapered excrescences, the lower portion frequently with one to several, relatively short, cylindric to coarse excrescences, clamped.

Habit, habitat, and distribution. Gregarious to subcaespitose on wood or woody debris of conifers (typically buried) near melting snow banks. Common to the *Abies/Pinus* forests of the High Sierra Nevada and Cascade Ranges, April to June.

Material examined. California. Amador Co.: Silver Lake Campground, Hwy 88, 18 May 1985, HDT 49040. Calaveras Co.: Poison Creek Picnic Ground, 8 May 1976, Halling 1334. El Dorado Co.: Crystal Basin, Hwy 50, 6 May 1972, HDT 28801. Madera Co.: Beasore Rd., Bass Lake area, 25 April 1997, BAP 118. Sierra Co.: Gold Lake Rd., north of Gold Lake, 3 June 1991, DED 5075 (Holotype; SFSU); Yuba Pass, 2 June 1996, BAP 040; same location, 4 June 1996, BAP 046; Weber Lake Rd., ~4.5 mi from junction with Hwy 49 at Yuba Pass, 2 June 1997, BAP 120. Siskiyou Co.: Mt. Shasta, 29 May 1972, HDT 28886; Red Fir Flat, Mt. Shasta, 16 May 1976, Halling 1354. Toulumne Co.: Pinecrest Lake, 22 May 1970, HDT 25328.

Commentary. The macroscopic description is based upon notes included with the collections made by DED and BAP listed above. The microscopic description is based upon my examinations of the collections listed above.

Mycena nivicola is herein proposed as a new species of section Hygrocyboideae. For years investigators have collected this taxon, commonly identified as *M. griseoviridis* (= *M. epipterygia* var. *griseoviridis* sensu Maas Geesteranus), at higher elevations in the Sierra Nevada of California during the spring months. Based upon my investigations, I have chosen to segregate this taxon from *M. griseoviridis* due to macroscopic, microscopic, and substrate differences that exist between the material found in California and that found growing in eastern North America. At the outset of this investigation it was suspected that *M. griseoviridis* would be a distinct species from the spring taxon commonly collected in the Sierra Nevada. The holotype of *M. griseoviridis* was collected under *Quercus* sp. during the fall in Michigan, while the California material is found only in the spring, growing at high elevations on or near decaying wood of *Abies* spp., and associated with the moisture produced by melting snow banks near which it is commonly encountered.

Additionally, it was also suspected that *M. griseoviridis* var. *cascadensis*, described from Washington as a summer (spring at higher elevations) fruiter on *Abies* sp. logs was more than likely the same taxon commonly encountered in the Sierra Nevada. Investigation of the holotype material of *M. griseoviridis* (AHS 15498, MICH), several additional collections from Michigan (AHS 6159, 6165, 15516; HDT 512), numerous CA collections, and the holotype of *M. griseoviridis* var. *cascadensis* (AHS 16656; MICH) revealed that with the exception of spore size, the micromorphology of all three taxa is much too similar to be useful in delimiting these species. *Mycena griseoviridis* has smaller spores overall ($\bar{x} = 9.5 \times 6.0$), than *M. nivicola* ($\bar{x} = 11.0 \times 6.2$). Oddly enough, var. *cascadensis* has spores within the same size range as type variety. Macroscopically, *M. nivicola* can be differentiated from *M. griseoviridis* by the former species lack of a "conspicuously white-pruinose" pileus surface, lack of greenish coloration to the lamellae, and lack of strong farinaceous taste and odor.

To sum up these results, the characters differentiating *M. griseoviridis* and *M. nivicola* are substrate/habitat type, season during which the fungus fruits, spore size, and the macroscopic characters mentioned above. The placement of

var. *cascadensis*, which has not been found in California and is therefore not treated here, remains uncertain. Maas Geesteranus (1989, 1992b) indicates that he felt the excrescences of the cheilocystidia and stipe cortical hyphae terminal cells were much coarser in var. *cascadensis* than in var. *griseoviridis*, but remained reluctant to decide whether to accept var. *cascadensis* as an independent variety or simply a form of var. *griseoviridis*.

Mycena epipterygia (Scop.: Fr.) Gray var. ***eipiterygia***, Nat. Arr. Br. Pl. 1: 619. 1821.

≡ *Agaricus epipterygius* Scop., Fl. Carniol., 2nd ed, 2: 455. 1772.

= *Mycena citrinella* (Pers.: Fr.) P. Kumm., Führ. Pilzk., p. 109. 1871.

= *Mycena paludicola* (Murrill) Murrill, Mycologia 8: 221. 1916.

= *Mycena viscosa* var. *iodolens* A. H. Sm., N. Am. Sp. *Mycena*, p. 423. 1947.

Pileus 9-25 mm diam, paraboloid to conical or campanulate, flattening with age, weakly to prominently umbonate, the margin appressed against the stipe initially, becoming more or less crenate, occasionally lacerated in age; surface finely pruinose at first, soon glabrous, viscid, smooth to striate or shallowly sulcate, pellucid-striate, covered with a separable gelatinous pellicle; pale grayish citrine ("old gold"), yellowish gray (4B5-6; "mustard yellow"), pale yellow (3A2-4), pale grayish brown, pale sepia brown, or more rarely whitish, occasionally developing pinkish, grayish, or olivaceous tones, fading with age, the margin concolorous or paler, often fading to pale gray with age. **Context** thin, concolorous with the pileus or paler. **Lamellae** ascending-adnate, typically with a decurrent tooth, 14-23 reaching the stipe, subdistant with 2 series of lamellulae, narrow (up to 2 mm), whitish at first, becoming pale grayish to very pale sepia grayish, occasionally developing pinkish tones; the edges smooth, gelatinized, separable as an elastic-like thread, straight to convex, concolorous with the sides or pallid. **Stipe** 45-80 X 1-2 mm, central, terete, equal, hollow, somewhat pliant; surface smooth, pruinose at apex, glabrous below, viscid to tacky; yellowish (1-2A4-7; "Lemon Chrome") to citrine initially, gradually fading to whitish, often only were exposed, occasionally bruising or developing sordid brownish tones with age. **Odor** indistinct, faintly fragrant, farinaceous, or disagreeable to rancid when cut or crushed. **Taste** indistinct or rancid.

Basidiospores 9.0-12.0(-13) X 5-7 μm [$\bar{x} = 10.8 \pm 0.9 \times 6.1 \pm 0.5 \mu\text{m}$, $Q = 1.4-2.2$, $q = 1.8 \pm 0.2$, $n = 80$ spores] in 4-spored specimens, 12-16 X 5-7 μm [$\bar{x} = 13.3 \pm 0.2 \times 6 \pm 0.6 \mu\text{m}$, $Q = 1.9-2.6$, $q = 2.2 \pm 0.2$, $n = 20$ spores] in 2-spored specimens, ellipsoid, smooth, thin-walled, amyloid. **Basidia** 25-37 X 7-9 μm , 4-spored, rarely 1-, 2-, or 3-spored (see comments), clavate, clamped, sterigmata up to 6 μm in length; basidioles similar. **Cheilocystidia** 10-55 X (3-)6.5-11 μm , arising from loosely associated hyphae embedded in a thick, gelatinous layer, \pm clavate to cylindrical or irregular, rarely with more than one apical head, the apical portion covered with or branching into numerous, unevenly spaced, cylindric to slightly coarse, simple and branched excrescences which

tend to form dense masses, 2-13(-22) X 1-2(-4) μm ; clamped, forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** an ixocutis; hyphae 1-3(-4) μm diam, clamped, embedded in a thick gelatinous layer, the lower strands \pm smooth, with a few scattered, simple excrescences, 2-4 X 1.5-2 μm , the upper strands and terminal cells branching into (often dense and unresolvable) masses of narrower hyphae which is covered with cylindric, simple to furcate excrescences, 1.5-9 X 1-1.5 μm . **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** similar. **Stipe cortical hyphae** 1-3.5 μm diam, clamped (clamps typically loop-like), embedded in a gelatinous layer, gelatinized, smooth, rarely with solitary or scattered, short cylindric excrescences, often coiled and/or appearing kinked; terminal cells 9-36(-50) X 3-10(-14) μm , similar to cheilocystidia, occasionally with slightly inflated portions and/or more than one apical head, covered with unevenly spaced, cylindric to slightly coarse, simple or branched excrescences, 1.5-12.5 X 1-3 μm .

Habit, habitat, and distribution. Solitary to scattered or gregarious on fallen needles and other debris of conifers, among mosses, or on the decaying wood of conifers. Also reported to rarely occur on the decaying wood of Angiosperms (Maas Geesteranus, 1989, 1992b). Common in the North Coast Ranges during the fall months.

Material examined. California. Del Norte Co.: Gasquet, Panther Flat Campground, 16 November 1997, DED 6681. Humboldt Co.: Redwood National Park, Davidson Rd., 7 November 1992, DED 5568; Redwood National Park, Rugg Grove, 8 November 1997, BAP 163. Marin Co.: Phoenix Lake, 3 December 1960, HDT 8544. Mendocino Co.: California Coastal Range Preserve, 1 November 1975, Halling 1053.

Commentary. The macroscopic description is based upon notes taken on the collections listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1989, 1992b). The microscopic description is based upon my examinations of the collections listed above.

The California material of var. *epipterygia* is apparently unique in its growth upon the decaying wood and woody debris of conifers. Smith (1947) reports the species as growing under conifers, and Maas Geesteranus reports the species from humus in mixed woods, on acid soil, mossy lawns, fallen conifers needles, and rarely upon decaying hardwoods. Several of the collections examined in this investigation had initially been identified as *M. epipterygia* var. *lignicola*, presumably due to their growth on woody substrata. Upon examination of the dried material and included notes however, it was determined that these collections represent *M. epipterygia* var. *epipterygia* based upon the paler coloration of the pilei, lack of yellowish coloration in the lamellae, and longer excrescences present on the stipe cortical hyphae terminal cells.

It should be noted that aside from the few distinguishing characteristics listed above, there are very few features remaining that one may use to easily differentiate var. *epipterygia* from var. *lignicola*. Spore size as reported in Smith (1947) and Maas Geesteranus (1989, 1992b), as well as that determined in my

investigation, is much too variable to be of any use. A similar situation is found in the shape and size of both the cheilocystidia and their excrescences.

Mycena epipterygia* var. *viscosa (Maire) Ricken *sensu* A.H. Smith, Blätterp. p. 419. 1915.

≡ *Mycena viscosa* Maire, Bull. Soc. Mycol. Fr. 26: 162. 1910.

= *Mycena epipterygia* var. *laeviga* *sensu* Maire, Bull. Soc. Mycol. Fr. 24: 56. 1908.

Pileus 8-10 mm diam, ovoid initially, becoming obtuse to convex, often broadly expanded or slightly umbonate in age; margin initially appressed against the stipe, becoming lacerated or crenate as the pileus expands, occasionally flaring; surface white pruinose initially, glabrescent, smooth, often becoming sulcate-striate in age, shiny, viscid, covered with a separable gelatinous pellicle; coloration variable, typically yellowish gray, yellowish or greenish gray, becoming sordid brownish in age. **Context** thin, tenacious, concolorous with the pileus, sordid reddish in age. **Lamellae** adnexed to adnate, often with a distinct decurrent tooth, 18-26 reaching the stipe, subdistant, with 2 series of lamellulae, narrow to moderately broad; whitish, yellowish, or with greenish gray tones, the edges pallid, even, often developing reddish brown stains in age. **Stipe** 30-70(-100) X 1-2(-3) mm, central, equal, straight to somewhat flexuous, tenacious; surface faintly pruinose overall initially, soon glabrous and shiny, glutinous; entirely lemon-yellow or tinged greenish-yellow, the base typically reddish in age. **Taste** rancid farinaceous, strong. **Odor** farinaceous (cucumber-like), strong.

Basidiospores 9.2-10.4 X 5.6-6.4(-6.8) [$\bar{x} = 9.7 \pm 0.5$ X 6.3 ± 0.3 μm , Q = 1.3-1.7, $q = 1.6 \pm 0.1$, n = 25 spores], nearly amygdaliform to subovoid, smooth, thin-walled, amyloid. **Basidia** 28.0-35.2 X 6.0-9.6 μm , 2- or 4-spored (see comments), clavate, clamped; basidioles similar. **Cheilocystidia** 16.8-42.4(-60) X 4.4-9.2(-14.4) μm , \pm clavate and apically covered with unevenly spaced, cylindric to coarse, simple or branched excrescences, 2.0-23.2 X 1.2-2.8 μm ; clamped, occurring at the ends of a mass of interwoven hyphae embedded in a thick gelatinous layer, up to 150 μm thick, forming a sterile lamellar edge.

Pleurocystidia absent. **Pileipellis** an ixocutis; hyphae 1.6-3.2 μm diam, clamped, embedded in thick gelatinous layer, covered with scattered, cylindric excrescences, and giving rise to \pm erect side branches which are highly diverticulate, 2.0-29.6 X 1.2-2.0 μm . **Hypodermium** composed of inflated cells, weakly brownish-vinescent in Melzer's reagent. **Lamellar trama** similar. **Stipe cortical hyphae** 1.2-2.4 μm diam, clamped, embedded in a gelatinous layer (which dissolves in KOH), smooth; terminal cells \pm similar to the cheilocystidia or more highly branched, or rather long and cylindric with several inflated portions up to 8 μm diam, all forms covered with and/or branching into cylindric to slightly coarse, simple and branched excrescences up to 30.4 X 1.2-2.0 μm , clamped.

Habit, habitat, and distribution. Gregarious under *Quercus* spp. and *Pinus* spp., typically occurring late in the fall. In addition to California, Smith

(1947) reported the species from Alabama, Tennessee, Michigan, and Oregon. The holotype was collected in Europe on the decaying stumps of *Abies* and *Pinus* species.

Material examined. California. Humboldt Co.: Orick, 2 December 1935, AHS 3712 (MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947). The microscopic description is based upon my examination of the collection listed above with additional information adapted from Smith (1947).

It is not without some uncertainty that the present author includes this taxon under the name *M. epipterygia* var. *viscosa*. As discussed by Maas Geesteranus (1989, 1992b), Smith's taxon differs from the European concept of the species, which is a taxon with an initially grayish white to grayish brown pileus, mild odor, and 4-spored basidia. An additional difference noted by Maas Geesteranus (1989, 1992b) is that the terminal cells of the stipe cortical hyphae he observed in the Smith collections (AHS 3712, AHS 18118) are quite different than those found in the neotype of var. *viscosa*.

However, the characteristic taste and odor of the American material of var. *viscosa*, as well as the distinctive sordid brownish stains and coloration that typically develop on the basidiomes, readily distinguish this taxon from the other variety of *M. epipterygia* found within the state. Without these distinguishing characters I would be tempted to consider Smith's concept of var. *viscosa* as simply another synonym of the type variety.

Mycena* section *Fuliginellae (A. H. Sm. ex Singer) Maas Geest., Proc. Kon. Ned. Akad. Wetensch. C. 83: 406. 1980.

Basidiomes medium sized. Pileus surface viscid, covered with a separable gelatinous pellicle; grayish to grayish brown, pallid or white. Context pliant. Lamellae broadly adnate, ascending or arcuate, white to grayish, the edge separable as an elastic like thread. Stipe hollow, tenacious; surface glutinous to viscid, the apex pruinose to puberulous, glabrous below; grayish to grayish brown or white, never yellow. Odor and taste indistinct, farinaceous, or rancid.

Basidiospores ellipsoid, smooth, amyloid. Basidia 4-spored, clavate, clamped. Cheilocystidia clavate to cylindric, apically branching into numerous excrescences or covered with unevenly spaced, coarse excrescences, clamped. Pleurocystidia present in all but one species. Pileipellis a cutis, hyphae smooth to diverticulate, clamped, embedded in gelatinous matter. Lamellar trama vinescent to brownish-vinescent in Melzer's reagent. Cortical hyphae of the stipe smooth or sparsely diverticulate, clamped, gelatinized, embedded in gelatinous matter; terminal cells variously shaped, generally diverticulate.

On coniferous wood, needles and other debris.

Type species: *Mycena vulgaris* (Pers.: Fr.) P. Kumm.

Key to the CA species of section Fuliginellae

1. Lamellae ascending-adnate, never arcuate or decurrent. Pleurocystidia present, fusiform to subcylindrical *M. tenax*
1. Lamellae adnate, becoming arcuate to decurrent with age. Pleurocystidia absent *M. vulgaris*

Mycena tenax A. H. Sm., Mycologia 28: 414. 1936.

Pileus 11-37 mm, broadly paraboloid to campanulate, often becoming broadly campanulate in age; margins incurved in young specimens, straight in mature basidiomes and often becoming upturned in age, edges entire or eroded; surface moist to slightly viscid, glabrous, striate, at least when young, often becoming smooth with age, dull, pellucid striate, brown to dark brown over the disc (6E-F 5-7), brown to grayish brown away from disc (6-7E4), gray towards margins and as it dries out. **Context** thin, up to 1 mm, concolorous with pileus, often paler over stipe. **Lamellae** ascending-adnate with a decurrent tooth, 19-26 reaching the stipe, close with 1-3 series of lamellulae, moderately broad (1.5-4.5 mm), white to pale gray, occasionally brownish gray in upper portions (5-6D3), often developing brownish spots or bruises; edges convex, concolorous, separable as an elastic, gelatinous thread. **Stipe** 31-70 X 1.5- 4.5 mm, central, terete or flattened, occasionally somewhat twisted, equal or slightly enlarged towards base; surface moist, shiny, very tacky, smooth, pruinose at apex, glabrous below, light brown to brownish gray (5-6D-E2-4) or brown (6-7E4), apex often paler, base with scant, white to pale gray tomentum. **Odor** farinaceous, rancid-farinaceous, also of pecans. **Taste** farinaceous with a disagreeable aftertaste.

Basidiospores 7.5-9.5 X 4-4.8 μm [$\bar{x} = 8.2 \pm 0.5 \times 4.5 \pm 0.3$, $Q = 1.5-2.2$, $Q^- = 1.8 \pm 0.1$, $n = 182$ spores], ellipsoid, smooth, hyaline, amyloid. **Basidia** 24.0-36.8 X 6.5-7.2 μm , 4-spored, narrowly clavate, clamped; basidioles narrowly clavate. **Lamellar edge** composed of loosely associated hyphae embedded in a gelatinous matrix, hyphae giving rise to cheilocystidia or occasionally cheilocystidia and basidia. **Cheilocystidia** 17.6-59.2 X (6.4-)9.5-24.0 μm (overall size), clavate to irregular, apically to sublaterally covered with cylindric to irregular, often branching excrescences, 1.6-13.5(-15.2) X 1.6-3.2 μm , clamped, forming a sterile lamellar edge or occasionally intermixed with basidia, rare forms similar to pleurocystidia and forms intermediate between pleurocystidia and cheilocystidia occasionally observed. **Pleurocystidia** 36.8-85.5 X 6.5-15.5(-17.5) μm , fusiform to subcylindrical, narrowed at base, apical portion often constricted into a nipple, rarely branching into 2 or more arms, clamped. **Pileipellis** an ixocutis; hyphae 1.5-4 μm diam, clamped, thin-walled, embedded in a gelatinous layer, smooth to sparsely covered with simple, rarely branched, cylindric excrescences, 1.6-7.2 X 1.2-2.4 μm ; terminal cells slightly broader and generally covered with cylindric,

often branched excrescences. **Hypodermium** of inflated, dextrinoid cells; overlaying a subpellicle of loosely associated hyphae embedded in a gelatinous matrix. **Stipe tissue** monomitic; cortical hyphae 1.0-3.2 μm diam, clamped, loosely associated in gelatinous layer, smooth or sparsely covered with cylindrical excrescences, 2.0-6.0 X 1-1.6 μm , thin walled; terminal cells slightly broader and covered with cylindrical to irregular, often branched diverticula, 1.6-12.0 X 1.6-3.2 μm , often very similar to cheilocystidia in shape and size; medullary hyphae broader, up to 31.2 μm diam, thin-walled, hyaline, dextrinoid.

Habit, habitat, and distribution. Gregarious and abundant (carpeting) on soil debris in *Picea sitchensis* (Bong.) Carrière and *Sequoia sempervirens* (D. Don) Endl. forests of the North Coast Ranges. In California, *M. tenax* has been collected from both Del Norte and Humboldt Counties, but specimens have been observed in the redwood forests as far south as Marin Co. November through February.

Material examined. California. Del Norte Co.: Crescent City, 30 October 1937, A. H. Smith 8250 (MICH); same location, 7 December 1937, A. H. Smith 9483 (MICH). Humboldt Co.: Rugg Grove, Redwood National Park, 8 November 1997, BAP 169; same location, 19 November 1997, DED 6663; Prairie Creek State Park, 20 November 1965, HDT 14420; Patrick's Point State Park, 21. November 1965, HDT 14447; Trinidad, 11 December 1935, A. H. Smith 3936 (MICH).

Commentary. The macroscopic description is based upon my observations of the collections listed above with additional information adapted from Smith (1947). The microscopic description is based upon my examinations of the collections listed above.

The distinctly gelatinous lamellar edge, pileus and stipe tissues, in combination with the gelatinized subpellicle and distinctive odor and taste of *M. tenax* make this species one of the easier mycenae to recognize. Additional species found in California that are characterized by a separable, gelatinous pellicle and lamellar edge include *M. vulgaris* (see below) and several species of section Hygrocyboideae. In addition to the characters used in the key above, *M. tenax* can be distinguished easily from *M. vulgaris* based on the former species distinct cheilocystidia and stipe cortical hyphae terminal cells. Macroscopically, *M. tenax* can be distinguished from those species of section Hygrocyboideae present within the state by the former species lack of yellowish or greenish coloration to the stipe, pileus or lamellae, and microscopically by the latter species lack of pleurocystidia, and numerous other differences.

Mycena vulgaris (Pers.: Fr.) P. Kumm., Führ. Pilzk. p. 108. 1871.

≡ *Agaricus vulgaris* Pers., Neues Mag. Bot. 1: 104. 1794

≡ *Prunulus vulgaris* (Pers.: Fr.) Murrill, N. Am. Flora 9: 326. 1916.

= *Mycena melleidisca* (Murr.) Murrill, Mycologia 8: 221. 1916.

= *Mycena militaria sensu* A. H. Sm. (as *M. militaris*), N. Am. Sp. *Mycena* p. 432.

1947.

Pileus 4-20 mm diam, convex to paraboloid, occasionally with a conical umbo, flattening with age and often developing a central depression; margin initially straight to slightly incurved, becoming wavy in age, pellucid-striate; surface glabrous, viscid when moist, covered with a separable gelatinous pellicle; dark gray to dark grayish brown or dark brown when fresh (7-9F3), gradually fading to brown, grayish brown (6-7E4-5), or brownish beige. **Context** thin, pallid gray to pale brown. **Lamellae** adnate, becoming arcuate to decurrent with age, 13-25 reaching the stipe, close to subdistant with 1-2 series of lamellulae, moderately broad, pale gray (6-7E2) to brownish gray (9-10D1); the edges smooth, gelatinized and separable as an elastic like thread, pallid. **Stipe** 13-35(-60) X <1-1.5 mm, central, terete, equal, hollow; surface apex glabrous to finely puberulous, glabrous below, glutinous to viscid or tacky, covered with a separable gelatinous pellicle; pale to dark grayish brown (5-6E4), generally whitish or pale gray at the apex; the base covered with strigose, whitish hairs. **Odor** and taste indistinct, raphanoid, farinaceous or disagreeable.

Basidiospores (7.2-)7.6-8.8 X 4.0-4.8 μm [$\bar{x} = 8.0 \pm 0.3 \times 4.4 \pm 0.3 \mu\text{m}$, $Q = 1.5-2.2$, $q = 1.8 \pm 0.1$, $n=50$ spores], ellipsoid, smooth, thin walled, hyaline, weakly to moderately amyloid. **Basidia** 23.0-33.5 X 6.5-8.0 μm , clavate, 4-spored, clamped, sterigmata up to 4.8 μm in length; basidioles similar.

Cheilocystidia 16-32 X 2.8-4.0 μm , born at the ends of loosely associated hyphae that are embedded in a thick gelatinous layer, \pm cylindric to narrowly clavate, giving rise apically, more rarely laterally, to numerous, long, cylindric, branching excrescences up to 28 X 0.8-1.6 μm , forming dense gelatinized masses, clamped, forming a sterile lamellar edge. **Pleurocystidia** absent.

Pileipellis a cutis; hyphae embedded in a thick gelatinous layer, 1.6-4.8(-8.0) μm diam, gelatinized, clamped, smooth, the upper layers tending to be covered with cylindric, straight or curved excrescences, 1.6-6.4 X 1.2-1.6 μm , and highly branched, diverticulate side branches which form dense coralloid masses.

Hypodermium composed of inflated cells, vinescent to brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated and cylindric cells, vinescent to brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic; cortical hyphae 1.2-4.8 μm diam, clamped, smooth, gelatinized, embedded in a gelatinous layer, tortuous, frequently branching; terminal cells covered with cylindric, simple to branched excrescences, 2.4-10.4 X 1.2-1.6 μm , more rarely smooth.

Habit, habitat, and distribution. On needles and other debris of conifers. In California it has been collected from the North Coast Ranges and the northern High Sierra Nevada, October to November.

Material examined. California. Del Norte Co.: Crescent City, 17 November 1937, AHS 8830 (MICH). Sierra Co.: Sierra Nevada Field Campus, San Francisco State University, 5 October 1997, BAP 135. Siskiyou Co.: Siskiyou National Forest, 11 November 1937, AHS 8616 (MICH).

Commentary. The macro- and microscopic descriptions are adapted from

Smith (1947) and Maas Geesteranus (1992b), with additional information from my own observations of both fresh and dried material.

Mycena vulgaris appears to be a somewhat rare fungus in California. In addition to the collections listed above, the only other material from the state which I am aware of is a single collection made by Smith (AHS 8451) from Del Norte county. The distinctly gelatinized, separable pileus and stipe surface and lamellar edge make it unlikely that the species could be easily overlooked or misidentified. The only additional species found within the state which are characterized by a gelatinous, separable pileus surface and lamellar edge are those discussed above for *M. tenax*. Like *M. tenax*, *M. vulgaris* can be distinguished easily from these taxa based upon the latter species unique macro- and microscopic characters.

Mycena* section *Basipedes (Fr.) Quél., Champ. Jura Vosges p. 109. 1871.

Basidiomata small to medium sized. Pileus surface glabrous, pruinose, centrally hispid or covered with spinules, covered with a separable, gelatinous pellicle; grayish white to pale grayish brown. Lamellae ascending-adnate, often seceding from the stipe to form a pseudocollarium, whitish to grayish. Stipe surface glabrous or with scant pubescence in the lower portion, whitish to faintly grayish; arising from pubescent basal disc. Odor and taste indistinct or unknown.

Basidiospores ellipsoid to elongated, smooth, amyloid. Basidia 4-spored, clamped or clampless. Cheilocystidia clavate to obpyriform, or ±irregular in shape, with few to numerous, cylindric to rather coarse excrescences, more rarely lacking excrescences altogether, clamped or clampless. Pleurocystidia presumed to be absent in all species. Pileipellis a cutis; hyphae smooth or covered with excrescences, clamped or clampless. Hymenophoral trama brownish-vinescent in Melzer's reagent. Cortical hyphae of the stipe smooth or covered with excrescences, clamped or clampless; terminal cells generally long and tapered.

On needles, leaves, and debris of conifers and hardwoods; also the dead culms of grasses and the base of an *Alnus* sp.

Type species: *Mycena stylobates* (Pers. Fr.) P. Kumm.

Mycena stylobates (Pers.: Fr.) P. Kumm., Führ. Pilzk. p. 108. 1871.

≡ *Agaricus stylobates* Pers., Syn. Meth. Fung. p. 390. 1801. (*Agaricus stylobates* Pers: Fr., Syst. Mycol. 1: 153. 1821.)

≡ *Pseudomyцена stylobates* (Pers.: Fr.) Cejp., Publ. Fac. Sci. Univ. Charles 104: 150. 1930.

= *Mycena dilatata* (Fr.: Fr.) Gillet, Les Hymén. p. 261. 1874.

= *Pseudomyцена dilatata* (Fr.: Fr.) Cejp., Publ. Fac. Sci. Univ. Charles 104: 147. 1930.

=*Pseudomyцена caricina* Velen., Novit. Mycol. Noviss. p. 31. 1947.
=*Mycena discopus sensu* Pat., Tab. Anal. Fung., fasc. 7: 49. 1889.
=*Mycena stylobates* var. *acicola* (Jungh.) Höhn. *sensu* Höhn., Sber. K. Akad. Wiss. Wien (Math. -naturw. Kl.) 118(1): 1466. 1909.
=*Mycena clavicularis sensu* J. E. Lange, Dansk. Bot. Ark. 1(5): 27. 1914.

Pileus 2-10 mm diam, convex to obtusely conical, expanding to broadly conical or plano-convex, occasionally developing a central depression, pellucid-striate to sulcate at maturity; surface viscid, moist or dry, covered with a separable, gelatinous pellicle which may or may not be obvious, minutely squarrose under magnification, glabrescent; pale gray to pale brownish gray (5-6C3) or pale grayish brown (6D2-3), fading to pale grayish white or nearly white. **Context** very thin, pallid. **Lamellae** ascending-adnate to adnexed, (8-)14-19 reaching the stipe, close to subdistant with 1-3 series of lamellulae, moderately broad (-1.5 mm), ventricose, often seceding from the stipe and forming a pseudocollarium, whitish to grayish white; the edges concolorous. **Stipe** (5-)13-47 X 0.5-1 mm, central, terete, equal; surface puberulous or pruinose overall, entirely or centrally glabrescent, polished; whitish to grayish; arising from a well developed, striate, whitish-ciliate basal disc up to 2 mm in diam **Odor** and taste not distinctive.

Basidiospores (8.0-)8.8-10.0(-11.2) X 4.0-4.8(-5.2) μm [$\bar{x} = 9.4 \pm 0.8 \times 4.4 \pm 0.3$, $Q = 1.9-2.5$, $q = 2.1 \pm 0.1$, $n = 48$ spores], ellipsoid to narrowly ellipsoid, weakly to moderately amyloid, smooth, thin-walled, hyaline. **Basidia** 16-22.4 X 8.0-8.8 μm , 4-spored, broadly clavate, clamped, sterigmata up to 4.8 μm in length. **Cheilocystidia** 16-60 X 5.6-11.2 μm , clavate, fusoid, or \pm ventricose-rostrate, often giving rise apically and occasionally laterally to one or more (up to 7) additional, cylindrical or coarse excrescences, 2.4-27.2(-41.6) X 1.2-4.8 μm , more rarely lacking apical excrescences and then \pm clavate, clamped, thin-walled, hyaline, forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1-4 μm diam, with swollen portions up to 7 μm diam, clamped, embedded in a thick gelatinous layer, the hyphae comprising the lower portion of the pileipellis typically narrow and smooth, those of the upper portion more or less densely covered with short, narrow diverticula, and cylindrical, simple or rarely branched excrescences, 1.2-15.2 X 0.8-1.6 μm . **Hypodermium** composed of inflated cells, brownish vinescent in Melzer's reagent. **Pileus and lamellar trama** composed of inflated cells similar to those of hypodermium, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 4.0-7.2 μm diam, smooth, clamped; terminal cells 13-50 X 6-13 μm , similar to hyphae, fusoid, or \pm lageniform with a broad bulbous base and long tapered apex, clamped, typically occurring in fasciculate clusters on lower portion of stipe, often quite difficult to locate or absent entirely; medullary hyphae broader, up to 24.0 μm diam, clamped. **Basal disc** centrally composed of inflated, \pm globose to ellipsoid cells, which are often intermixed with cylindrical, encrusted hyphae, 3-4 μm diam; marginally composed of filamentous, smooth, cylindrical hyphae up to 10 μm diam, terminating in long cells which are apically

tapered to form a narrow, rounded point.

Habit, habitat, and distribution. Solitary to scattered or gregarious on dead needles and leaves of conifers, hardwoods, grasses and ferns. In California it has been collected in the fall from the North Coast Ranges. Smith (1947) reported the species from Tennessee, Michigan, Idaho, Pennsylvania, and Washington in the United States, and Nova Scotia and Ontario in Canada. Beardslee and Coker (1924) reported the species from North Carolina. Maas Geesteranus (1983b, 1992b) reports the species from Europe and North Africa.

Material examined. California. Humboldt Co.: Hwy. 101, ~8 mi north of Trinidad, 17 October 1997, BAP 140. Marin Co.: Point Reyes National Seashore, Limantour Ridge, 1 November 1992, DED 5558. **Washington.** Clallam Co.: Olympic National Park, Lake Crescent, 6 July 1939, AHS 14819 (MICH).

Commentary. The macroscopic description of this species is adapted from Smith (1947), Redhead (1981), Maas Geesteranus (1983b, 1992b), and notes on the fresh material. The microscopic description is based upon my examination of the collections listed above.

The separable, gelatinous covering of the pileus appears to be a somewhat variable and/or easily overlooked character in *M. stylobates*. Neither Smith (1947) or Redhead (1981) report the presence of such a layer in their macroscopic descriptions of the species. In his notes on collection DED 5558, Desjardin reports the pileus as being covered by a thin gelatinous pellicle which is very difficult to remove due to the fragile nature of the pileus. Both Smith and Redhead however, report the hyphae of the pileipellis as being either embedded in a thick gelatinous layer or becoming gelatinized when mounted in water or KOH. Microscopic investigation of DED 5583 and AHS 14819 revealed that both collections contained pileipellis hyphae embedded in a thick gelatinous layer.

Mycena stylobates appears to be a somewhat rare fungus in California, to my knowledge known only from the two collections listed above. Within California *M. stylobates* is most likely to be confused with *Mycena adscendens* (Lasch) Maas Geest., which is another small grayish brown to whitish species that arises from a basal disc and tends to form a pseudocollarium. However, *M. adscendens* is actually a more delicate species (pileus up to 4 mm diam, stipe up to 18 X 0.5 mm), that has a pileus with a granular or furfuraceous surface, two-spored basidia, and lacks a pileipellis with hyphae embedded in a gelatinous layer. Smith (1947) mentions the similarity of *M. stylobates* to *M. coprinoides* Karsten. However, Maas Geesteranus (1981) investigated the type of *M. coprinoides* and states that the species is not a *Mycena* at all, but rather a member of the genus *Coprinus*.

Mycena* section *Amictae A. H. Sm. ex. Maas Geest., Proc. Kon. Ned. Akad. Wetensch. C. 87(2): 134. 1984.

Basidiomes medium sized. Pileus surface covered with a separable, viscid pellicle; entirely or marginally blue to bluish green when young. Lamellae ascending-adnate to adnate; whitish or grayish, the edge not formed by a gelatinous, elastic-like thread. Stipe surface pruinose to puberulous; initially and at least partially blue to bluish green. Odor and taste indistinct.

Basidiospores ellipsoid or globose, amyloid, smooth. Basidia 4-spored, clamped. Cheilocystidia cylindrical to subfusiform, simple, clamped. Pleurocystidia absent. Pileipellis a cutis; the hyphae embedded in a gelatinous layer, highly branched, clamped. Caulocystidia subfusiform, sublageniform or cylindrical, clamped.

On decaying wood and other plant debris.

Type species: *Mycena amicta* (Fr.) Quél.

Mycena amicta (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5: 243. 1872.

≡ *Agaricus amictus* Fr., Syst. Mycol. 1: 141. 1821.

≡ *Mycena iris* var. *amicta* (Fr.) Quél., Ench. Fung. p. 38. 1886

= *Mycena iris* (Berk.) Quél., Mém. Soc. Emul. Montbél. II 5: 243. 1872.

= *Mycena limbata* (Lasch) Sacc., Syll. Fung. 5: 274. 1887.

= *Mycena mirabilis* (W. B. Cooke & Quél.) Masee, Br. Fung. Flora 3: 93. 1893.

[non *M. mirabilis* (Singer) O.K. Miller, Mich. Bot. 9: 29. 1970.]

= *Mycena amicta* var. *leucopsis* P. Karst, Bidr. Känn. Finl. Nat. Folk. 32: 549. 1879.

= *Mycena amicta* var. *incongruens* (Britz.) Lindau, Hedwigia, Generalregister 1-50: 96. 1911.

= *Mycena incongruens* (Britz.) Sacc. Trav. apud Sacc., Syll. Fung. 20: 148. 1911.

= *Mycena calorhiza* Bres., Fung. Trid. 1: 9. 1881.

= *Mycena caerulescens* J. Schroet., Krypt. Flora Schles. 3(1): 634. 1889.

= *Mycena amicta* var. *truncata* P. Karst, Acta Soc. Fauna Flora Fenn. 9: 4. 1893.

= *Mycena vestita* Velen., Ceske Houby p. 307. 1920.

Pileus 3-11 mm diam, obtusely conical to paraboloid, expanding to broadly obtusely conical or campanulate; margin slightly incurved at first, becoming straight, pellucid-striate; surface subviscid, lubricous or moist when fresh, smooth or striate, at first finely pruinose, glabrescent, separable as a gelatinous layer; disc at first dark brown (7-8F3-7), soon fading to pale grayish brown (5C-D4), the margins lighter brown (7E5-6) to grayish, fading to whitish gray, white or buff, the disc, margins or both often with bluish tints or entirely bluish, often hygrophanous from the disc outward, such that the disc becomes paler than the margins.

Context thin, concolorous with the pileus or paler. **Lamellae** ascending-adnate to adnate, rarely with a short decurrent tooth, 18-24 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow (up to 1.5 mm), convex, often pulling away from the stipe and forming a pseudocollarium (most obvious in dried material); gray to pale grayish brown, or white; edges concolorous or slightly

paler. **Stipe** 17-105 X <1-2 mm, central, terete, ±equal, hollow; surface minutely pruinose overall, glabrescent below, smooth, dry, dull to shiny; gray to brownish gray (5-6D2-4; 6-7E3-5), the base with short bluish or white fibrils; often deeply rooting. **Odor** and taste indistinct.

Basidiospores 7.2-8.8(-9.2) X 4.0-4.8 μm [$\bar{x} = 8.3 \pm 0.5$ X 4.4 ± 0.3 , Q = 1.7-2.2, $q = 1.9 \pm 0.1$, n = 75 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** (15.2-)17.6-28.8 X 6.0-7.6 μm, clavate, often rather stout, clamped, sterigmata 3.2-7.2 μm in length; basidioles similar. **Cheilocystidia** (20-)25.6-55.2 X 4.0-8.8 μm, ±cylindric, narrowly fusiform or clavate, clamped. **Pleurocystidia** absent. **Pileipellis** an interwoven cutis embedded in a thick gelatinous layer; hyphae 1.6-4.8 μm diam, clamped, smooth for the most part, often with a few scattered, simple, cylindric excrescences, 1.9-5.6 X 1.2-2.4 μm; the hyphae often giving rise to few or numerous, erect, ±cylindric terminal cells, 31.2-62.4 X 2.8-4.0 μm, which often have 1-2 cylindric excrescences, or are apically furcate. **Hypodermium** brownish-vinescent to vinescent in Melzer's reagent. **Pileus trama** and lamellar trama composed of cells similar to those of hypodermium, brownish-vinescent to vinescent in Melzer's reagent. **Stipe tissue** monomitic, parallel, brownish-vinescent in Melzer's reagent; cortical hyphae 2.4-6.4 μm diam, smooth, clamped, thin-walled; giving rise to numerous, cylindric or ±fusoid, often very large terminal cells, 26.4-134.4 X 3.2-20.0 μm, that may occur in dense clusters or cover the surface entirely (at least at apex), generally borne perpendicularly and much protruding from the stipe surface, not infrequently with slightly thickened walls.

Habit, habitat, and distribution. Gregarious, scattered, solitary or more rarely caespitose, on decayed wood or woody debris in soil of coniferous and more rarely, hardwood forests. Known from North America and Europe. In California this species is commonly found in both the spring and fall months (see commentary) in the North and Central Coast Ranges and the northern High Sierra Nevada.

Material examined. California. Del Norte Co.: Redwood National Park, Hwy 199, approx. 2 mi W of Hiouchi, 18 October 1997, BAP 151; Redwood National Park, Rugg Grove, 19 October 1997, BAP 159. Humboldt Co.: Big Lagoon, 8 November 1998, BAP 202. Mendocino Co.: Jackson State Forest, junction of roads 408 & 409, 23 November 1996, BAP 081. Sierra Co.: Tahoe National Forest, Hwy. 49 near Bassets, 7 June 1993, DED 5743; Tahoe National Forest, south side of Hwy. 49, approx. 7 mi E of the SFSU Sierra Nevada Field Campus, 3 June 1996, BAP 043; Tahoe National Forest, Mills Peak Rd., 6 June 1996, BAP 050; Tahoe National Forest, Chapman Saddle Rd, 3 June 1996, BAP 051.

Commentary. The macroscopic and microscopic descriptions are based upon my observations of the collections listed above.

Mycena amicta is a common component of both the coniferous and mixed evergreen forests of the northern and central coast ranges of California, and the coniferous forests of the Sierra Nevada. Although I have not collected *M. amicta*

from the Cascades, the species would not be unexpected throughout the range. It is interesting to note that in the alpine coniferous forests the fruiting of this species appears to be strictly associated with the springtime snow melt, and has not yet been observed in such habitats during the fall months. In the coastal ranges of California the opposite condition prevails, with *M. amicta* present during the fall months only. In the Sierra Nevada, the species is often found growing under the bark of decaying logs of both *Abies* and *Pinus* spp., with the stipes deeply rooting into the decaying wood. On the coast however, *M. amicta* is generally found growing on woody debris and cones in the soil or on buried wood.

Macroscopically, *M. amicta* can be recognized most easily by the often bluish coloration of the pileus and especially the stipe base, the presence of an often lighter colored disc, the separable, gelatinous pellicle of the pileus, and the fine pubescence of the stipe surface. In the absence of any of the above characters, such as in dried specimens, the species can best be identified by the gelatinized pileipellis, the narrow, simple cheilocystidia, and the abundant, large stipe cortical hyphae terminal cells.

Mycena section Insignes Maas Geest., Proc. Kon. Ned. Akad. Wetensch. C. 92(3): 343. 1989.

Basidiomes medium-sized to large. Pileus surface viscid, glabrous or pruinose; black-brown, gray-brown, or whitish. Context thin. Lamellae arcuate or ascending-adnate, whitish, the edge concolorous, not gelatinized. Stipe hollow, the surface glabrescent, pruinose or puberulous towards the apex, viscid; concolorous with the pileus or whitish, the base generally covered with fibrils.

Basidiospores ellipsoid, amyloid, smooth. Basidia 4-spored, clavate, clamped. Cheilocystidia fusiform, lageniform, subclavate, smooth or covered with a few coarse excrescences, clamped. Pleurocystidia similar or absent. Pileipellis hyphae embedded in gelatinous matter, smooth or diverticulate, clamped. Lamellar trama generally, brownish vivescent in Melzer's reagent. Hyphae of the cortical layer of the stipe embedded in gelatinous matter, smooth or diverticulate; the terminal cells smooth or branched.

On conifer needles and other herbaceous debris.

Type species: *Mycena insignis* A. H. Sm.

Mycena quinaultensis Kauffman apud A. H. Sm., Mycologia 27: 589. 1935.

Pileus 10-40 mm diam, obtusely conical to obtusely campanulate, more rarely convex, becoming campanulate with age, umbonate, frequently with a small papilla; the margin appressed against the stipe in young specimens, often recurved in age; surface viscid to glutinous, at least in young specimens, glabrous, sulcate to wrinkled, pellucid-striate; the entire pileus black-brown

initially, pallescent, the margins fading to yellowish brown or light brown (5D-E5) and eventually orangish white to orangish gray (5A-B2), the umbo remaining darker. **Context** thin, whitish. **Lamellae** ascending-adnate, developing a short decurrent tooth, 15-18 reaching the stipe, subdistant to distant, narrow (up to 3 mm), often slightly ventricose, whitish at first, becoming pallid to grayish; the edges concolorous. **Stipe** 40-70 X 1.5-2.5(-3) mm, central, equal, terete, hollow; surface glabrous, viscid to glutinous when moist; concolorous with the pileus, often paler at the apex, the base covered with coarse, white fibrils. **Odor and taste** indistinct.

Basidiospores 8.0-10.8(-11.2) X 4.0-5.2(-5.6) μm , [$\bar{x} = 9.4 \pm 1 \times 4.6 \pm 0.4$, $Q = 1.8-2.6$, $q = 2.1 \pm 0.2$, $n = 100$ spores], ellipsoid, smooth, thin-walled, amyloid, often only weakly so. **Basidia** (27.2-)33.0-44.0 X 7.0-9.5 μm , 4-spored, clavate, clamped, sterigmata up to 5.6 μm in length; basidioles similar to cylindrical. **Cheilocystidia** 58-130 X 7-19 μm , subcylindric to sublageniform, generally with a long, narrowed base, smooth, hyaline, the walls frequently thickening slightly in the mid to lower portions, clamped, mixed with basidia, protruding well beyond lamellar edge. **Pleurocystidia** similar, abundant, protruding. **Pileipellis** a thin cutis; hyphae 1.5-4.5 μm diam, embedded in gelatinous matter (see commentary), smooth, clamped. **Hypodermium** yellowish to yellowish brown in Melzer's reagent. **Lamellar trama** yellowish to yellowish brown in Melzer's reagent, composed of cylindrical hyphae and inflated cells. **Stipe tissues** monomitic, parallel, yellowish brown in Melzer's reagent; cortical hyphae 1.5-4.0 μm diam, clamped, smooth, embedded in gelatinous matter (see commentary), hyaline; terminal cells similar to hyphae or slightly broader at apex, 4.0-10.4 μm diam, often curved or curled, more rarely branched.

Habit, habitat, and distribution. Densely gregarious on needles of *Thuja plicata* D. Don, *Pseudotsuga menziesii* (Mirbel) Franco, and *Sequoia sempervirens* (D. Don) Endl. Known from California, Oregon and Washington. In California, *M. quinaultensis* has only been collected from Del Norte and Humboldt counties. However, the species would not be an unexpected component of the *Pseudotsuga* and *Sequoia* forests further south. Occurring in both the spring and fall, generally more abundant in the fall.

Collections examined. California. Del Norte Co.: Crescent City, 30 October 1937, AHS 8184 (MICH); same location, AHS 8264 (MICH). Humboldt Co.: Orick, 6 December 1937, AHS 9457 (MICH); Humboldt State Park, 30 November 1956, AHS 56118 (MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947) and Maas Geesteranus (1992b). The microscopic description is based on my observations of the dried material.

The gelatinous layer of both the pileus and stipe, which Smith reported to generally be present at least on the stipes of young, fresh specimens, may be very difficult to discern in the dried material. Smith reported that the gelatinous layer of stipe cortical hyphae could be demonstrated "not at all or only with great care" from the dried material. Maas Geesteranus reported that the gelatinous

nature of both the pileipellis and stipe hyphae could easily be demonstrated in young, dried basidiomes. In my examinations, the pileipellis hyphae was distinctly embedded in a thin gelatinous layer in 3 of the 4 collections examined. However, in none of the collections was the stipe cortical hyphae observed to be embedded in gelatinous matter.

Mycena quinaultensis is the only member of section *Insignes* thus far reported from California. In the field, *M. quinaultensis* is most likely to be confused with *M. tenax*. However, *M. quinaultensis* can be differentiated easily from *M. tenax* by the lack of a separable, gelatinous pellicle, lack of a removable, gelatinized lamellar edge, and the lack of a distinctive, somewhat disagreeable odor. Microscopically, *M. tenax* differs from *M. quinaultensis* in the presence of a gelatinous lamellar edge, and cheilocystidia covered with excrescences.

Mycena* section *Supinae Konr. & Maubl., Ic. Sel. Fung. 6: 274. 1934.

Basidiomata small to medium sized. Pileus surface pruinose or puberulous to minutely floccose, glabrescent, coloration variable. Context thin. Lamellae adnate, rarely ascending-adnate, horizontal to arcuate, \pm concolorous with the pileus, pallescent; the edge paler to whitish, pinkish brown in one species. Stipe surface pruinose or puberulous to floccose, glabrescent, the base covered with white fibrils.

Basidiospores subglobose to globose, amyloid, smooth. Basidia 4-spored and clamped or 2-spored and clampless. Cheilocystidia clavate to irregular in shape, with evenly to unevenly spaced, short to quite long, simple to flexuous excrescences. Pleurocystidia absent. Pileipellis a cutis; the hyphae covered with warts or cylindric excrescences. Stipe cortical hyphae covered with excrescences.

Corticolous on coniferous and hardwood trees.

Type species: *Mycena supina* (Fr.) P. Kumm.

Mycena corticalis A. H. Sm., Mycologia 31: 268. 1939.

Pileus 3-12 mm diam, hemispherical to paraboloid, margins occasionally becoming upturned; surface glabrous, sulcate, moist or dry, dull, pellucid-striate, hygrophanous; grayish-brown to brown (7E4-6), fading to pale whitish gray with moisture loss. Context thin, <1 mm, concolorous with the pileus. **Lamellae** decurrent, 10-13 reaching the stipe, subdistant with one series of lamellulae, moderately broad (up to 2 mm), white to pale gray; the edges smooth, concolorous. **Stipe** 5-23 X 0.5-1.0 mm, terete, equal or enlarged slightly towards base (up to 2.5 mm), central, hollow; surface smooth, apex pruinose, glabrous below, moist to dry, with a slight sheen, with inconspicuous white tomentum at point of attachment to substrate; concolorous with the pileus (7E4-5), the apex

pale gray to white, more rarely the entire stipe pale. **Odor and taste** indistinct.

Basidiospores (8.8-)9.6-10.8(-11.2) X 7.2-8.8(-9.2) μm [$x^{\bar{}} = 10.1 \pm 0.7$ X 7.6 ± 0.7 μm , $Q = 1.2-1.5$, $q^{\bar{}} = 1.3 \pm 0.1$, $n = 45$ spores], subglobose to globose, smooth, thin-walled, hyaline, weakly amyloid. **Basidia** (24.8-)32.0-48.0 X 8.8-11.2 μm , 4-spored, clavate, clamped, sterigmata 5.6-10.4(-15.2) in length; basidioles similar. **Pleurocystidia** absent. **Cheilocystidia** 15.2-36.0 X 4.0-6.4 μm , \pm narrowly clavate to irregularly cylindrical, often with more than one head apically and more rarely laterally, giving rise to one or several short to quite long, generally branching excrescences, 1.6-36.0 X 1.2-2.4 μm , which tend to form dense tangled masses, thin-walled, hyaline, clamped. **Pileipellis** a cutis; hyphae 1.2-4.8 μm diam, thin-walled, clamped, densely covered with short, narrow, simple to branched excrescences, 1.6-6.4 X 1.2-1.6 μm , which tend to form dense coralloid masses. **Hypodermium** composed of inflated hyphae, brownish-vinescent in Melzer's reagent. **Pileus trama** composed of cylindrical hyphae, 3.8-9.6 μm diam, clamped. **Lamellar trama** composed of interwoven cylindrical hyphae, 2.4-4.0 μm diam, clamped, vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 1.6-2.8 μm diam, thin-walled, clamped, covered with cylindrical, simple to branched excrescences, 1.6-7.2 X 0.8-1.2 μm ; terminal cells similar to the hyphae or slightly broader, occasionally branched, covered with excrescences.

Habit, habitat and distribution. On bark of *Thuja plicata* D. Don, *Calocedrus decurrens* (Torrey) Florin and dead branches of *Sequoia sempervirens* (D. Don) Endl. To my knowledge, this species has only been collected from two locations in California, one in the North Coast Ranges and the other in the Sierra Nevada Foothills. November to January, rare.

Material examined. California. Mendocino Co.: Navarro River Redwoods State Park, 22 November 1997, BAP 186. **Yuba Co.:** Schoolhouse Campground, Bullard's Bar Recreation Area, 23 January 1996, BAP 101.

Commentary. The macro- and microscopic description are based upon my observations of the collections listed above.

Mycena corticalis appears to be somewhat rare species within California. To my knowledge the material investigated in this study represents the only collections currently known from the state. Smith (1938) described the species from Oregon on the bark of logs and trees of *Thuja plicatila* which "lacked a covering of Bryophytes." The material examined in this study was collected from two additional substrates, the bark of *Calocedrus decurrens* (incense cedar) and *Sequoia sempervirens* (redwood), which also lacked a covering of bryophytes.

In Smith's original description of the species (1938) he reported the spores as amyloid (hyaline to pale bluish), but later (1947) stated that this condition was present only in the freshly dried material, and that upon rechecking the spores of the holotype at a later date, found them to be hyaline to very pale yellow and hence inamyloid or only very weakly amyloid. The collections examined in this investigation, which had been dried for a period of up to 1 year prior to investigation, proved to be weakly but distinctly amyloid in one collection (BAP

186), and very weakly amyloid when seen in mass in another collection (BAP 101), but otherwise appearing inamyloid. Mass Geesteranus (1984, 1992b) reported that the spores of the collections he examined stained grayish in Melzer's Reagent (weakly amyloid) and the basidia were observed to exude a faint bluish or violaceous gray color into the surrounding medium, a condition which he indicates in his experience always corresponds to an amyloid reaction of the spores.

Mycena* section *Polyadelphia Singer ex. Maas Geest., *Persoonia* 11: 103. 1980.

Basidiomes small to minute. Pileus surface dry, typically not becoming lubricous when moist, pruinose to somewhat granular, glabrescent; white, pale yellowish brown, pale grayish brown, pink, or somewhat purplish to violaceous. Context thin. Lamellae few, ascending, adnate, typically with a decurrent tooth, similar to the pileus in color or white, the edge concave, occasionally becoming convex with age, concolorous or white. Stipe central, hollow; surface minutely canescent to pruinose, glabrescent, the base often conspicuously puberulous; similar in coloration to the pileus or white, several species initially dark but soon pallescent, rarely black; instititious or attached to the substrate by a radiating whorl of mycelial strands or plaque. Odor and taste not distinct or absent.

Basidiospores ellipsoid, nearly cylindric or subglobose, smooth, amyloid. Basidia 2-spored and clampless or 4-spored and clamped, clavate. Cheilocystidia typically clavate, covered with evenly to unevenly spaced, simple, cylindric excrescences. Pleurocystidia absent. Pileipellis a cutis; hyphae ±densely diverticulate, producing inflated regions and diverticulate terminal cells in several species. Pileipellis and lamellar trama tissues dextrinoid. Stipe cortical hyphae ±densely diverticulate, several species producing inflated, diverticulate terminal cells.

Growing on fallen, senescent leaves of hardwoods, herbaceous plants, fern fronds and rhizomes.

Type species: *Mycena polyadelphia* (Lasch) Kühner

Mycena culmigena Maas Geest., *Proc. Kon. Ned. Akad. Wetensch. C.* 89(2): 164. 1986.

= *Mycena juncicola* (Fr.) Gillet *sensu* A. H. Sm., *Mycologia* 28: 425. 1936.

= *Mycena juncicola* (Fr.) Gillet *sensu* Redhead, *Can. J. Bot.* 59: 584. 1981.

Pileus 0.5-3.5 mm diam, conical to convex or campanulate, often with a small central umbo or papilla; margin decurved; surface dull, dry, pruinose on the disc initially, minutely pruinose to glabrous elsewhere, entirely glabrescent with age, striate to sulcate, subpellucid when fresh, becoming opaque with moisture loss; pale pink to grayish pink overall initially, or with purplish to vinaceous tones,

fading to white overall or retaining some color on the disc. **Context** very thin, fragile. **Lamellae** ascending, broadly adnate, 6-12 reaching the stipe, distant with 0-1 series of lamellulae, narrow to moderately broad, white, pale pinkish, or pale pinkish gray; the edges concolorous or white. **Stipe** 2-12 X 0.1-0.4 mm, central, filiform; surface minutely canescent to minutely pruinose, glabrescent, becoming polished, white overall or with pinkish tones; the base attached to the substrate by an inconspicuous plaque of radiating, grayish to grayish brown or vinaceous brown hyphae, up to 1 mm in diam **Odor** not distinct.

Basidiospores (9.5-)10-12 X 4-5 μm [$\bar{x} = 10.9 \pm 0.7 \times 4.4 \pm 0.4 \mu\text{m}$, $Q = 2.0-2.9$, $q = 2.5 \pm 0.2$, $n = 50$ spores], narrowly lacrymoid (i.e. inequilateral in profile), smooth, thin-walled, weakly amyloid. **Basidia** 19-28 X 7-9.5 μm , 4-spored, clavate, clamped, sterigmata up to 4 μm in length; basidioles similar. **Cheilocystidia** 14-30 X 8-18 (-24) μm , clavate to broadly clavate, more rarely somewhat irregularly clavate, with a narrow pedicel or nearly sessile, clamped, the upper portions densely to sparsely covered with evenly or unevenly spaced, short, simple, cylindric excrescences, 1.5-3 X <1-1.5 μm , and often giving rise to one or more additional longer, cylindric or slightly irregular, rarely branched excrescences, up to 9 X 1.5-2 μm . **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 3-8 (-10) μm diam, clamped, densely covered with short, simple, cylindric excrescences, 1.5-6 X <1-1 μm , and giving rise to narrower side branches/excrescences, 2-2.5 μm diam, which are diverticulate and branched; terminal cells \pm clavate, covered with diverticula; all underlain by a layer of smooth, gelatinized hyphae that are often highly branched. **Hypodermium** composed of inflated, cylindric, dextrinoid cells. **Pileus and lamellar trama** similar. **Stipe tissues** parallel, monomitic, dextrinoid; cortical hyphae 1.5-5.5 μm diam, clamped, covered with short, simple, cylindric excrescences <1-4 X <1-1 μm , rarely giving rise to additional, scattered, longer excrescences which are simple to branched, up to 15 X 1.5 μm ; terminal cells similar to hyphae, broader, or similar to the cheilocystidia, 25-78 X 4-12 μm , covered with excrescences. **Basal plaque** composed of large, inflated, clampless or clamped, thick-walled cells (up to 1.75 μm), 6-29 μm diam, which appear to be an extension of the stipe medullary hyphae and become increasingly narrower and shorter, eventually giving rise to radiating, cylindric to somewhat tortuous hyphae, 1.5-6 μm diam, with thin to slightly thickened cell walls, and forming long, typically aseptate, rarely septate and clamped cells; thickened cell walls hyaline to yellowish or pale brownish yellow; some portions of hyphae typically embedded in a brownish, resinous mass and often difficult to resolve.

Habit, habitat, and distribution. Gregarious to scattered on senescent leaves of sedges, in moist areas. Known from California, Oregon and Washington. In California it has been collected in the fall months from the Outer North Coast Ranges.

Material examined. California. Humboldt Co.: Prairie Creek State Park, 9 November 1991, DED 5381. Mendocino Co.: Jackson State Forest, Rd. 408 near Mendocino Woodlands Camp, 21 November 1993, DED 5947. Jackson

State Forest, along Mendocino Woodlands Rd, off Rd. 408, 18 November 1995, DED 6314. **Oregon.** Douglas Co.: Lake Takenitch, 17 November 1935, AHS 3512 (Holotype; MICH).

Commentary. The macroscopic description is based upon notes accompanying collections DED 5381 and DED 6314, with additional information adapted from Smith (1926, 1947) and Redhead (1981). The microscopic description is based upon my examination of the collections listed above.

Smith (1936, 1947) first reported the occurrence of this species (as *M. juncicola*) from North America based on material he had collected in Oregon and Washington. Redhead (1981) later reported the species (as *M. juncicola*) from Canada. Upon re-examination of Smith's material (AHS 3512, MICH), Maas Geesteranus felt the North American material differed significantly from the European collections examined, and described Smith's taxon as the new species *M. culmigena*. The two taxa are reported to differ (Maas Geesteranus, 1986b) by *M. culmigena*'s typically paler coloration of the pileus, lamellae, and stipe (lacking any brownish or blackish tones), regularly and symmetrically shaped cheilocystidia (lacking globose proliferations), larger spores, and clampless, pigmented, very thick-walled cells composing the basal plaque.

The California material appears to conform fairly well to Mass Geesteranus' description of *M. culmigena*, but lacks the brown pigmentation reported to be present in the thickened cell walls of the hyphae comprising the basal plaque, and although rare, clamp connections were observed to be present on some of the basal plaque hyphae. It should be noted that Mass Geesteranus' microscopic description of *M. culmigena* is based entirely on his examination of the holotype collection (Smith 3512). Although the holotype was borrowed from MICH for the current investigation, the basal plaque was not observed due to the scarce amount that remains of the collection.

***Mycena* section *Sacchariferae* Kühner ex Singer, Sydowia 15: 65. 1962.**

Basidiomes small. Pileus convex, obtusely conical or campanulate, expanding to broadly convex, with a universal veil forming spines, granules or floccons; margins generally striate to sulcate at maturity; surface dull, granulose to floccose, the granules or floccons white, yellow, brownish, or fulvous; surface under ornamentation whitish, pale yellow, grayish, or grayish brown. Lamellae ascending-adnate to nearly free, absent or poorly developed in several species, often forming a pseudocollarium; white, the edges concolorous. Stipe central, terete; surface dry, granulose, furfuraceous, puberulous or pilose, white; with or without a basal disc. Odor and taste indistinct or unknown.

Basidiospores globose, ellipsoid or cylindric, smooth, thin-walled, hyaline, amyloid. Basidia 4-spored or 2-spored, broadly clavate, clamped or clampless. Cheilocystidia variously shaped, smooth or with apical spinulae and/or

excrescences. Pleurocystidia absent. Pileipellis of primordia formed from a subhymenium layer of acanthocysts; pileipellis of mature basidiomes a cutis; the hyphae cylindric to inflated, smooth to densely spinulose, terminating in broadly clavate to vesiculose acanthocysts. Universal veil formed of densely spinulose acanthocysts or cheroocytes. Stipe cortical hyphae smooth. Caulocystidia smooth to partially or densely spinulose.

On wood, woody debris, leaf litter, and fern rhizomes.

Type species: *Mycena adscendens* (Lasch) Maas Geest.

Key to the California members of section *Sacchariferae*

1. Stipe arising from a basal disc; lamellae tending to secede from the stipe and form a pseudocollarium; basidia 2-spored *M. adscendens*
1. Stipe not arising from a basal disc; lamellae not forming a pseudocollarium; basidia typically 4-spored *M. alphitophora*

Mycena adscendens (Lasch) Maas Geest. **var. *adscendens***, Proc. Kon. Ned. Akad. Wetensch. C. 84: 211. 1981.

≡ *Agaricus adscendens* Lasch, Linnaea 4: 536. 1829.

= *Agaricus tenerrimus* Berk. in Hook., Engl. Flora 5(2): 61. 1836.

≡ *Mycena tenerrima* (Berk.) Quél., Mém. Soc. Emul. Montbél. II 5: 109. 1872.

≡ *Prunulus tenerrimus* (Berk.) Murrill, N. Am. Flora 9: 322. 1916.

≡ *Pseudomyцена tenerrima* (Berk.) Cejp, Publ. Fac. Sci. Univ. Charles 98: 32. 1929.

= *Agaricus farinellus* Feltgen, C. R. Soc. Natn. Luxemburg 16: 145. 1906.

= *Mycena tenerrima* var. *salicis* Derbsch & Schmitt., Nat. Landsch. Saarland 3: 530. 1987. (not validly published; no latin diagnosis)

Pileus 1-3.5 mm diam, hemispheric to convex or campanulate, occasionally somewhat flattened apically, opaque to pellucid-striate; surface dry, dull, densely furfuraceous to granulose, occasionally somewhat glabrescent with age, striate to sulcate, rarely smooth; pale grayish with a whitish margin, fading to white overall with age. **Context** very thin. **Lamellae** ascending-adnate, 7-12 reaching the stipe, distant with 1-2 series of lamellulae, broad (-0.5 mm), seceding from the stipe and typically adhering to one another to form a pseudocollarium, white; the edge convex, concolorous. **Stipe** 10-30(-60) X 0.1-0.5 mm, central, terete, hollow, gradually widening towards the base; surface dry, polished, hispidulous towards the base, pruinose to hispidulous, and occasionally glabrescent above; translucent-white, the base tending to develop grayish or yellowish tones in age; arising from a poorly to well developed, hispidulous, white basal disc. **Odor** none.

Basidiospores 8-10 X 5-7 µm [\bar{x} = 9.1 ± 0.5 X 5.5 ± 0.5 µm, Q = 1.3-2, α = 1.6 ± 0.2, n = 70 spores], broadly ellipsoid to nearly subglobose, smooth, thin-

walled, amyloid. **Basidia** 16.5-23 X 7-8 μm , 2-spored (rarely 1- or 3-spored), broadly clavate, stout, clamped, sterigmata up to 5 μm in length, yellowish in Melzer's reagent; basidioles similar. **Cheilocystidia** 13-36(-46) X 6-11(-14) μm , clavate to broadly clavate or subglobose, the apex typically drawn out into a slender, tapered neck, less commonly mucronate or with a rounded apex, rarely with a forked and/or more than one apical neck, clamped, inflated portion of the cell sparsely to densely covered with short, cylindric spinulae, 0.5-2 X 0.5-1 μm , basal portion and neck smooth, occasionally lacking diverticula entirely, yellowish in Melzer's reagent; forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis, hyphae composed of cylindric and short, inflated cells, 2-12 μm diam, clamped, inamyloid, non-dextrinoid, sparsely to \pm densely covered with short, simple diverticula, 1-3 X 0.5-1 μm ; giving rise to broadly clavate, globose, or sphaeropedunculate, acanthocyst terminal cells, 8-24 μm diam, clamped, densely covered with short spinulae, 0.5-2 X 0.5-1 μm ; pileipellis of primordia a hymeniform to subhymeniform layer of acanthocysts. **Hypodermium** composed of inflated, \pm ovoid cells, dextrinoid. **Pileus and lamellar trama** hyphae similar. **Stipe tissues** monomitic, parallel, dextrinoid; cortical and medullary hyphae hardly differentiated, 2-12 μm diam, smooth, clamped, non-gelatinous; giving rise to long, smooth, \pm lanceolate to cylindric-acuminate terminal cells, 20-110 X 3-16 μm , hyaline, clamped. **Basal disc** covered externally with cells similar to the terminal cells of the stipe hyphae, typically shorter and borne terminally on chains of short, somewhat inflated cells; composed internally of inflated hyphae, clamped.

Habit, habitat, and distribution. Solitary to scattered on woody debris of hardwoods and conifers. Known from Europe, North America, South America, and the Hawaiian Islands. Within the continental United States the species has been reported from California, Oregon, and Washington (Smith, 1947). In California, the species has been collected during the fall and winter months from the North Coast Ranges and San Francisco Bay Area.

Material examined. California. Humboldt Co.: Redwood National Park, Davidson Rd., 24 October 1992, DED 5553; Big Lagoon area, 17 October 1997, DED 6637. Mendocino Co.: Jackson State Forest, along Road 409, 23 November 1991, DED 5412. San Francisco Co.: campus of San Francisco State University, 22 January 1993, DED 5641; Golden Gate Park, 28 January 1993, DED 5656.

Commentary. The macroscopic description is based upon notes included with collections DED 5412, 5641 and 6637, with additional information adapted from Smith (1947) and Maas Geesteranus (1983b, 1992b). The microscopic description is based upon examination of the collections listed above, with additional information adapted from Desjardin (1995).

Aside from the characters utilized in the key above, *Mycena adscendens* var. *adscendens* is characterized by its pale grayish to white pileus with a furfuraceous to granulose surface, cheilocystidia with diverticulate inflated portions and typically rostrate to mucronate apices, and the long, smooth terminal cells of the stipe cortical hyphae. Within California, it is unlikely that *M.*

adscendens var. *adscendens* will be confused with other *Mycena* species. *Mycena alphitophora* (Berk.) Sacc., the only additional member of section Sacchariferae currently known from the state, is easily distinguished macroscopically from *M. adscendens* in that the former species typically has a larger pileus and lacks a basal disc, and differs microscopically by its typically 4-spored basidia, differently shaped cheilocystidia, and ornamented stipe cortical hyphae terminal cells. *Mycena longiseta* Höhn. (section Longisetae), another rather small species characterized by a basal disc, can easily be distinguished from *M. adscendens* by the presence of long, thick-walled setae which cover the pileus, stipe, and basal disc surfaces.

Desjardin (1995) reports that acanthocyst terminal cells which had been scraped from the pileipellis surface and plated on malt extract agar (MEA), germinated in seven days. Desjardin speculates that when these acanthocyst cells are disarticulated in situ, they may function as asexual propagules.

Mycena alphitophora (Berk.) Sacc., Syll. Fung. 5: 290. 1887.

≡ *Agaricus alphitophorus* Berk., J. Linn. Soc. 15: 48. 1877.

≡ *Prunulus alphitophorus* (Berk.) Murrill, N. Am. Flora 9: 339. 1916.

= *Mycena microstena* Singer, Fieldiana 21: 81. 1989.

Pileus (1-)3-10 mm diam, initially ellipsoid to paraboloid with incurved margins, becoming convex to campanulate, the margins typically flaring in age; surface striate to sulcate, dry, densely white-furfuraceous to granular, often becoming glabrescent towards the margin; pileus grayish under the granular coating, fading to whitish gray with moisture loss. **Context** very thin, grayish. **Lamellae** ascending-adnate (narrowly) to free, approximately 18 reaching the stipe, close to subdistant with 1 series of lamellae, narrow (up to 0.75 mm), occasionally somewhat ventricose, white to grayish; edges entire, concolorous. **Stipe** 20-47 X <1 mm, central, terete, equal to slightly broadened at base; surface densely white-puberulous to hirsute; white to pale grayish. **Odor and taste** indistinct.

Basidiospores 7.5-12 X 4.5-6.8 μm [$\bar{x} = 10.4 \pm 0.8 \times 5.8 \pm 0.4 \mu\text{m}$, Q = 1.6-2.0, $q = 1.8 \pm 0.1$, n = 25 spores], ellipsoid, smooth, amyloid. **Basidia** 12.0-22.5 X 7-10 μm , 2- and 4-spored, clamped (clamps typically difficult to resolve), sterigmata 3.2-5.6 μm in length. **Cheilocystidia** 16-37.6 X 4.8-21.6 μm , clavate, broadly cylindric, sphaeropedunculate, or \pm globose, densely covered with evenly spaced, short, cylindric spinulae, <0.8-1.6 X <0.8 μm , clamped; forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** composed of chains of short, narrow to greatly inflated cells, 3.2-15 μm diam, thin-walled, hyaline, densely covered with short, cylindric spinulae similar to those of cheilocystidia.

Hypodermium composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** similar. **Stipe tissues** monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae smooth, thin-walled, hyaline, clampless; terminal cells 14.5-175(-300) X 9.5-14.5 μm , clavate to cylindric, abundant, thin-

walled, hyaline, densely covered for most of their length with short, cylindrical spinulae similar to those of cheilocystidia, often sparsely covered apically; those located at the basal portions of the stipe broadly clavate, 28-50 X 12-30.5 µm, densely spinulose.

Habit, habitat, and distribution. Gregarious to scattered on fern debris, conifer needles, leaves, and the woody debris and moss covered trunks of dicotyledons. Known in California from a single collection found growing on a moss covered trunk of a living *Betula* sp. in the North Coastal Ranges. In North America the species has been reported (as *M. osmundicola* Lange) from Alabama, North Carolina, Tennessee, New York, Ohio, Michigan, and Washington in the United States, and from Ontario and British Columbia in Canada (Smith, 1947). *Mycena alphitophora* has also been reported from South America, Europe, Africa, Sri Lanka, Japan, Caribbean, and the Hawaiian Islands (Desjardin, 1995).

Material examined. California. Mendocino Co.: Jackson State Forest, Road 409, Aleuria Glen area, 23 November 1996, BAP 085.

Commentary. The macroscopic and microscopic descriptions are based upon my examinations of the collection listed above, with additional information adapted from Smith (1947), Maas Geesteranus (1983b, 1992b), and Desjardin (1995).

Although *Mycena alphitophora* is reported to be the most widely distributed member of section Sacchariferae (Desjardin, 1995), the species is quite rare and/or easily overlooked within California. The species is characterized macroscopically by its grayish pileus which is covered with a layer of white granules, ascending to often free lamellae, the white-puberulous to hirsute stipe surface, and lack of a basal disc. Microscopically *M. alphitophora* is characterized by its apically rounded cheilocystidia, and long, spinulose terminal cells of the stipe cortical hyphae. Maas Geesteranus (1983b, 1992b) and Desjardin (1995) both report the basidia of *M. alphitophora* as 4-spored, and indicate a smaller spore size range of 7.5-10 X 4.5-5.5 µm. Smith (1947; as *M. osmundicola*) however, also reported the presence of 2-spored forms, but indicated a size range similar to that given by both Maas Geesteranus and Desjardin. In the single collection investigated in the current study a large majority of the basidia present were 2-spored, which may account for the larger range of spore sizes observed. *Mycena alphitophora* can easily be distinguished from macroscopically similar species by the characters discussed under *M. adscendens*.

Mycena* section *Mycena

Basidiomes fairly small to large. Pileus surface glabrous to pruinose, the pruinosity soon disappearing when present, often becoming lubricous when moistened, hygrophanous or not; coloration variable, generally some shade of gray, brown, or black, less frequently whitish, occasionally developing reddish

brown to purplish brown stains or spots in age. Context thin except under the disc. Lamellae ascending, adnate to somewhat sinuate, often decurrent with a small tooth, generally elastic-tough, often ventricose; whitish, grayish, or grayish brown, developing pale pinkish or vinaceous tones in some species, developing reddish brown stains or spots in others; the edge convex, concolorous with the sides or paler. Stipe central, hollow, firm to cartilaginous (except in one species), generally elastic-tough; surface pruinose, at least at the apex, glabrescent, not lubricous in most species; typically concolorous with the pileus, paler to white at the apex, the lower portion developing reddish brown tones or stains in some species, suffused with bluish or purplish tones in others; the base more or less covered with fibrils, often forming a pseudorhiza. Odor and taste variable.

Basidiospores ellipsoid, amyloid, smooth. Basidia 4-spored and clamped, or 2-spored and clampless, clavate. Cheilocystidia typically clavate to irregular-clavate, covered with ±unevenly spaced, cylindric to coarse, simple to branched excrescences. Pleurocystidia present or absent. Pileipellis a cutis; hyphae smooth or covered with excrescences. Hypodermium, pileus-, and lamellar trama brownish vinescent in Melzer's reagent. Stipe cortical hyphae smooth or covered with excrescences.

Typically growing on wood of conifers and hardwoods, less frequently on leaves, needles and other debris.

Type species: *Mycena galericulata* (Scop.: Fr.) Roussel

Key to California species of section *Mycena*.

- 1. Basidiomes typically growing in troops on fallen conifer needles or among mosses; the stipe base not forming a pseudorhiza 2
- 1. Basidiomes solitary, gregarious, or in large caespitose clusters; lignicolous on decaying wood and/or the bark of living trees; the stipe base often forming a pseudorhiza 3
 - 2. Basidiomes small (5-10 mm diam); the pileipellis embedded in a thick gelatinous layer (up to 65 µm thick); pleurocystidia absent *M. pusilla*
 - 2. Basidiomes larger (20-35 mm diam); the pileipellis not embedded in a thick gelatinous layer; pleurocystidia present *M. piceicola*
- 3. Lamellae generally developing reddish-brown spots or stains in age; basidiomes typically growing in caespitose clusters; the pileipellis and stipe cortical hyphae smooth, or with rare, scattered excrescences . . . *M. maculata*
- 3. Lamellae not developing reddish-brown spots or stains in age; basidiomes solitary, gregarious, or in caespitose clusters; the pileipellis and stipe cortical hyphae densely covered with excrescences *M. galericulata*

Mycena pusilla A. H. Sm., Mycologia 31: 277. 1939.

Pileus 5-10 mm diam, convex to obtuse, the disc slightly flattened, \pm expanding with age, becoming applanate and with or without an umbo; margin appressed against the stipe at first, often flaring with age and faintly scalloped, pellucid-striate to the disc when moist; surface initially hoary, soon glabrous and shiny, lubricous when wet; young specimens pale watery gray with a whitish margin, fading slowly to pallid cinerous overall in age. **Context** thin, membranous, pliant, pallid to grayish. **Lamellae** ascending-adnate, 18-20 reaching the stipe, close, rather broad (up 3 mm), often somewhat ventricose, white; the edges even, concolorous. **Stipe** 25-40 X \sim 1 mm, equal, terete, hollow; surface hoary in young specimens, soon glabrous and shiny, lubricous but not viscid, tough; whitish at the apex, darker grayish brown below; the base scarcely strigose. **Odor and Taste** not distinctive.

Basidiospores (7.2)7.6-8.4(-8.8) X 4-4.8 μ m [\bar{x} = 8.0 \pm 0.3 X 4.2 \pm 0.3 μ m, Q = 1.6-2.1, q = 1.9 \pm 0.1, n = 50 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 20-29.2 X 6.4-8 μ m, 4-spored, clavate, sterigmata up to 4.8 μ m in length; basidioles similar. **Cheilocystidia** 15.2-44.8 X 4-12 μ m, clavate to somewhat irregular, clamped, apically covered with numerous, \pm unevenly spaced, cylindrical to slightly coarse, simple to branched, finger-like excrescences, 1.6-17.6 X 1.2-2 μ m; forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.6-5.6 μ m diam, clamped, embedded in a thin to rather thick subgelatinous layer, up to 65 μ m thick, much branched and giving rise to scattered excrescences and narrower (than hyphae) side branches, 1.6-26.4 X 1.2-2.4 μ m, the side branches tending to form dense gelatinized masses. **Hypodermium** composed of inflated cells, weakly brownish-vinescent in Melzer's reagent. **Pileus trama** of inflated and cylindrical hyphae, weakly brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, weakly brownish-vinescent in Melzer's reagent. **Stipe cortical hyphae** 1.6-4 μ m diam, often somewhat gelatinized, clamped, with smooth portions and covered with cylindrical, mostly simple, occasionally furcate excrescences, 1.6-16 X 12-2 μ m; terminal cells similar or slightly broader, generally more densely covered with excrescences.

Habit, habitat, and distribution. In troops on moss and fallen conifer needles under *Pseudotsuga menziesii* (Mirbel) Franco. In California, it has been collected in the fall months from North Coast Ranges. Known from California and Oregon (Smith, 1947).

Material examined. California. Del Norte Co.: Siskiyou National Forest, 11 November 1937, AHS 8620 (Holotype, MICH); Crescent City, 17 November 1937, AHS 8836 (MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947). The microscopic description is based upon my examination of the holotype (AHS 8620) and collection AHS 8836.

Mycena pusilla appears to be a relatively rare fungus within California. To my knowledge, no identified collections exist in either of the herbaria at HSU and SFSU. The species small stature, subgelatinous pileipellis, and lack of

pleurocystidia, distinguish *M. pusilla* from the other members of section *Mycena* present within California with which it may be confused, namely *M. piceicola* A. H. Sm. As noted by Maas Geesteranus (1985, 1992b), the stature and cheilocystidia of *M. pusilla* are similar to certain members of section *Filipedes*, especially *M. atroalboides* (Peck) Sacc. However, *M. atroalboides* can be separated from *M. pusilla* macroscopically by the former species lack of a lubricous pileus and stipe, as well *M. atroalboides* tendency to develop sordid spots or stains on its lamellae and stipe base. Microscopically, these species can be separated by the presence of a subgelatinous pileipellis and often gelatinized stipe cortical hyphae in *M. pusilla*, as well as the presence of pleurocystidia in *M. atroalboides*.

Mycena piceicola A. H. Sm., *Mycologia* 31: 273. 1939.

Pileus 20-35 mm diam, ovoid to obtusely conical when young, becoming broadly convex or broadly ovoid with age; the margins appressed against the stipe in very immature forms, occasionally becoming wavy with age, pellucid-striate when moist; surface lubricous, initially hoary-pruinose, glabrescent, becoming polished, subhygrophanous; "fuscous" or "hair brown," the margin generally paler and occasionally whitish, the disc fading to "drab" or sordid ashy gray with a pallid margin. **Context** thin, fragile, watery gray. **Lamellae** adnate, developing a slight decurrent tooth, 15-18 reaching the stipe, close to subdistant, narrow (up to 2.5 mm), intervenose, whitish to pallid or grayish; the edges even, pallid. **Stipe** (20-)40-60(-80) X 1.5-2 mm, central, equal or with a slightly broader base, hollow, fragile, generally straight; surface initially covered with a hoary bloom, soon glabrescent and polished, somewhat translucent; dark bluish gray initially, quickly fading to "drab" or sordid grayish brown below, the apex pallid; the base covered with coarse, white fibrils. **Odor** slight, subfarinaceous, and hardly distinctive. **Taste** mild.

Basidiospores 7.2-9.6(-10.4) X 4.0-4.8(-5.6) μm [$\bar{x} = 8.4 \pm 0.7$ X 4.6 ± 0.3 μm , $Q = 1.5-2.2$, $q = 1.8 \pm 0.1$, $n = 50$ spores], \pm ellipsoid, often broader at the apex, smooth, thin-walled, amyloid. **Basidia** 23.2-32 X 6.8-8.8 μm , 4-spored, clavate, clamped, sterigmata up to 7.2 μm in length; basidioles similar.

Cheilocystidia 18-52 X 4-8(-13.6) μm , narrowly clavate to \pm cylindric, clamped, apically, and more rarely laterally, producing several to numerous, cylindric to slightly coarse, finger-like or branching excrescences, 1.6-16 X 1.2-2.4 μm , more rarely clavate and covered with \pm evenly spaced, cylindric, short excrescences and generally 1-3, cylindric to slightly coarse, larger excrescences; mixed with basidia or forming a sterile edge. **Pleurocystidia** scattered to rare, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-4.0(-6.4) μm diam, clamped, covered with cylindric, short and simple to quite long and highly branched excrescences, 1.6-24 X 1.2-2.4 μm , the longer forms tending to form dense, often erect masses. **Hypodermium** composed of inflated cells, brown-vinescent in Melzer's reagent. **Pileus trama** composed of inflated cells and narrower, cylindric hyphae, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of

inflated cells, weakly brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic; cortical hyphae 1.6-4.0 μm diam, clamped, smooth for the most part, with scattered, cylindric, simple to furcate excrescences, 1.6-10.4 X 1.2-1.6 μm ; terminal cells similar to hyphae or broader, up to 9.6 μm diam, often spilt or branched apically, covered with excrescences.

Habit, habitat, and distribution. Gregarious or in troops of hundreds of basidiomes on the fallen needles of *Picea* spp. and more rarely *Pseudotsuga* spp. In California it has been collected in the fall months from the North Coast and Klamath Ranges. Also known from Oregon, Washington and Michigan (Smith, 1947).

Material examined. California. Siskiyou Co.: Patrick Creek, Siskiyou National Forest, 26 November 1937, AHS 9070 (MICH). **Oregon.** Lane Co.: Siltcoos Lake, 13 November 1935, AHS 3449 (Holotype, MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947). The microscopic description is based upon my examination of the two collections listed above.

Although Smith (1947) reported *M. piceicola* growing in troops of hundreds of basidiomes, the species appears to be a somewhat rare fungus within California. During the length of this study, I did not encounter the species on any of the numerous forays made to the northern portions of the state. In addition to the single collection from California examined in this investigation, only 2 other collections made from state are known to exist (AHS 8740 & 8814; MICH).

Smith (1947) indicated that the colors and color changes of both the pileus and stipe are the most distinctive characters of the species macroscopically. Microscopically, Smith indicated that the species can be distinguished from closely related species such as *M. metata* and *M. hudsoniana* by its smaller cheilocystidia, and from *M. subplicosa* [= *M. atroalboides* (Peck) Sacc.] by its lack of pleurocystidia. However, while *M. hudsoniana* may infrequently be characterized by a small majority of cheilocystidia somewhat similar to those of *M. piceicola*, the common type for this species, as well as *M. metata*, are clavate to obpyriform or globose cells covered with evenly spaced, short, simple excrescences. Additionally, the results of my investigation as well as those of Maas Geesteranus (1985, 1992b), indicate the presence of rare to scattered pleurocystidia in *M. piceicola*, a condition obviously not observed by Smith. However, the species can be separated from *M. atroalboides* macroscopically by the color differences of the pileus and stipe as well as the lack of sordid stains on the lamellae and stipe bases that often develop on mature specimens of *M. atroalboides*. Microscopically, the cystidia of *M. atroalboides* are clavate and apically covered with simple to branched excrescences, while the majority of those in *M. piceicola* are typically narrowly clavate to subcylindric and give rise to numerous finger-like or branching excrescences.

In the current work, *Mycena hudsoniana* (not treated), *M. metata*, and *M. atroalboides* are all recognized as belonging in section *Filipedes* as circumscribed by Maas Geesteranus (1984, 1992b). Maas Geesteranus (1985, 1992b) included

M. piceicola in section *Mycena* with some reservation. The species is unique among the other members of the section in its fragile stipe, the typically narrow-clavate to cylindrical cheilocystidia, and the presence of pleurocystidia, a character that is lacking in the remainder of the section.

Mycena maculata P. Karst., Meddn Soc. Fauna Flora Fenn. 19: 89. 1890.
=*Mycena rugosoides* Peck, Bull. New York State. Mus. Nat. Hist. 67: 22. 1903.
=*Mycena alcalina* sensu Ricken, Blätterp. Deutschl. p. 440. 1915.
=*Mycena occidentalis* (Murrill) Murrill, Mycologia 8: 221. 1916.
=*Mycena parabolica* sensu Bresadola, Icon. Mycol. 5: 238. 1928.

Pileus 11-35 mm diam, conical to obtusely conical initially, becoming campanulate to broadly convex, or \pm applanate to plano-concave with age, generally with a distinct umbo; the margin connivent to the stipe in young specimens, often becoming reflexed to upturned as the pileus expands, , opaque to pellucid-striate, often to the disc; surface dull, moist to lubricous, glabrous, rarely minutely pruinose, generally striate to sulcate, or with delicate wrinkles, hygrophanous; dark grayish brown (6-7E3-5) to dark brown (7-8F3-4) or blackish brown overall or with a paler margin, fading to pale grayish brown (5-6D3) or pale gray (5B2), often with yellowish tones, developing sordid to dark reddish brown (8F7-8) spots and/or stains in age. **Context** up to 3 mm thick under disc, thin elsewhere, watery concolorous with pileus or whitish. **Lamellae** adnate to ascending-adnate, generally with a short decurrent tooth, 17-30 reaching the stipe, close to subdistant with 1-3 series or lamellulae, narrow to moderately broad (up to 4 mm), occasionally becoming dorsally intervenose, whitish to pale gray, developing sordid to dark reddish brown spots and/or stains; the edge convex, concolorous. **Stipe** 35-95(-130) X 1-4 mm, central, terete, rarely cleft or twisted, hollow, \pm equal, occasionally with a long pseudorhiza, cartilaginous; surface dull to shiny, moist or dry, rarely subviscid when wet, the upper portion glabrous for the most part, occasionally pruinose; apex white to pale grayish, pale grayish brown (5-6D3) to grayish brown (6-7E-F3) below, the base or entire stipe developing reddish brown to purplish brown stains in age; the base sparsely to densely white strigose. **Odor** not distinct to faintly farinaceous. **Taste** similar.

Basidiospores 9-10.5 X 5-6.5 μm [\bar{x} = 9.4 \pm 0.5 X 5.5 \pm 0.4 μm , Q = 1.5-2.0, q = 1.7 \pm 0.1, n = 100 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 27-39 X 6-9 μm , 4-spored, clavate, clamped, sterigmata up to 6 μm in length; basidioles similar. **Cheilocystidia** 19-37 X 5-13 μm , clavate, contorted-clavate, or \pm irregular in shape, clamped, entirely or apically covered with unevenly spaced, cylindrical to coarse or knob-like, simple to branched, short to quite long excrescences, 1-25(-35) X 1-4 μm ; mixed with basidia. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.5-6 μm diam, clamped, embedded in a thin gelatinous layer, smooth or covered with scattered, cylindrical, simple or rarely branched excrescences, 1-13.6 X 1-2 μm . **Hypodermium** composed of inflated hyphae, vivescent to brownish-vivescent in Melzer's reagent. **Pileus trama**

composed of inflated and cylindric hyphae, vinescent to brownish-vinescent in Melzer's reagent. **Lamellar trama** similar. **Stipe cortical hyphae** 1.5-5 µm diam, clamped, often gelatinized or embedded in a thin gelatinous layer, smooth or with rare, scattered excrescences, 2.5-5 X 1.5-2 µm; terminal cells similar or slightly broader, occasionally furcate to branched, or covered with more numerous excrescences.

Habit, habitat, and distribution. Caespitose and more rarely gregarious on wood and debris of both conifers and hardwoods. Common and abundant during the fall and winter months throughout the forested regions of California. In North America the species has also been reported from Oregon, Washington, Colorado, Tennessee, Michigan, New York and North Carolina in the United States, and from Ontario in Canada (Smith, 1947). The species has additionally been reported from Europe (Maas Geesteranus, 1985, 1992b) and North Africa (Malençon & Bertault, 1975).

Material examined. California. Marin Co.: Mt. Tamalpais State Park, Simmons Trail, 3 January 1992, DED 5442. Mendocino Co.: Jackson State Forest, junction of Roads 408 and 409, 13 December 1990, DED 5020; same location, 23 November 1996, BAP 080; same location, 22 November 1997, BAP 189. Humboldt Co.: Prairie Creek State Park, Cal Barrel Rd., 8 November 1997, DED 6669; same location, 4 November 1995, BAP 023

Commentary. The macro- and microscopic descriptions are based upon the collections listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1985, 1992b).

The typically caespitose habit and development of reddish- to purplish brown stains on the lamellae, stipe, and pileus, make *Mycena maculata* one of the more easily recognizable mycenas found in California. Smith (1947) stated that the species is usually gregarious to subcaespitose in northeastern North America, and generally caespitose along the Pacific coast. Such was certainly the situation with the specimens examined in this investigation, with most collections forming large caespitose clusters of up to 10 or more basidiomes. Additionally, as indicated by Smith (1947) the presence and size of a pseudorhiza varies according to the substrate upon which the basidiomes are growing. On a hard surface, such as the bark of living trees and fallen hardwoods, a pseudorhiza may be lacking entirely, whereas in a relatively soft surface, such as a well decayed conifer log, the pseudorhiza may be present and penetrate the substrate for several centimeters. Along with *M. galopus*, *M. maculata* is one of the more commonly encountered species throughout the North and Central Coast Ranges, and the San Francisco Bay Area.

Within California, *M. maculata* is most likely to be confused with *M. galericulata*. Aside from the macroscopic characters mentioned above which distinguish *M. maculata*, the two species can be distinguished microscopically by the slightly larger spores, as well as the more abundant and complex excrescences of the pileipellis and stipe cortical hyphae of *M. galericulata*.

Key to the California varieties of *Mycena galericulata*.

1. Pileus and stipe distinctly brown to grayish brown
..... *M. galericulata* var. *galericulata*
1. Pileus and stipe whitish to pale avellaneous, the pileus disc often with pale brownish tones *M. galericulata* var. *albida*

- Mycena galericulata*** (Scop.: Fr.) Roussel, Flore Calvados, ed. 2: 64. 1806.
= *Agaricus galericulatus* Scop., Flora Carniol., 2nd ed. 2: 455. 1772.
= *Agaricus galericulatus* Scop.: Fr., Syst. Mycol. 1: 143. 1821.
= *Mycena galericulata* (Scop.: Fr.) Gray, Nat. Arr. Br. Plants. 1: 619. 1821.
= *Marasmius galericulatus* (Scop.: Fr.) Schulz., Verh. Zool.-Bot. Ges. Wien. 16: 44. 1866.
= *Prunulus galericulatus* (Scop.: Fr.) Murrill, N. Am. Flora 9: 336. 1916.
= *Agaricus pseudoclypeatus* Bolt., Append. Hist. Fung. Halifax. p. 154. 1791.
= *Mycena galericulata* var. *aestiva* (Pers.: Fr.) P. Karst, Meddn Soc. Fauna Flora Fenn. 16: 90. 1888.
= *Mycena galericulata* var. *communis* (Pers.) Fayod, Annali Accad. Agric. Torino 35: 84. 1893.
= *Mycena galericulata* var. *praemorsa* (Pers.) Eliade, Acta Bot. Horti Bucurest. p. 248. 1965.
= *Agaricus galericulatus* var. *clypeolatus* Pers., Mycol. Eur. 3: 246. 1828.
= *Mycena galericulata* var. *fulva* Gillet, Les Hymén. 1876.
= *Mycena galericulata* var. *livida* Gillet, Les Hymén. 1876.
= *Mycena galericulata* var. *spadicea* Gillet, Les Hymén. 1876.
= *Mycena radicatella* (Peck) Sacc., Syll. Fung. 5: 275. 1887.
= *Agaricus pseudoclypeatus* var. *radicans* Schulz., Verh. Zool.-Bot. Ges. Wien. 28: 428. 1879.
= *Mycena galericulata* var. *sparsa* Bres. & Schulz. apud Schulz., Hedwigia 24: 133. 1885.
= *Agaricus rugatoplicatus* Schulz., Verh. Zool.-Bot. Ges. Wien. 29: 500. 1880.
= *Agaricus rugatulosus* Schulz., Verh. Zool.-Bot. Ges. Wien. 29: 499. 1880.
= *Agaricus galeriformis* Schulz., Verh. Zool.-Bot. Ges. Wein. 30: 493. 1881.
= *Mycena maxima* Jacobasch, Verh. Bot. Ver. Brandenb. 33: XI. 1892.
= *Mycena berkeleyi* Masee, Br. Fungus-Flora 3: 104. 1893.
= *Collybia ligniarius* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 45: 145. 1901.
= *Prunulus ligniarius* (Peck) Murrill, N. Am. Flora, 9: 333. 1916.
= *Mycena galericulata* var. *fulvella* Sacc., Flora Ital. Cryptog. 1(Hym. 1): 275. 1915.
= *Mycena adirondackensis* (Murrill) Murrill, Mycologia 8: 220. 1916.
= *Collybia dentata* (Murrill) Murrill, Mycologia 8: 218. 1916.

- =*Mycena atridisca* (Murrill) Murrill, *Mycologia* 8: 220. 1916.
 =*Mycena magna* (Murrill) Murrill, *Mycologia* 8: 220. 1916.
 = *Mycena atkinsoni* House, *Bull. New York State Mus. Nat. Hist.* 219-220: 233. 1920.
 =? *Mycena atrofusca* Velen., *Ceské Houby*. p. 320. 1920.
 =*Mycena cimarica* Velen., *Ceské Houby*. p. 321. 1920.
 =*Mycena galericulata* var. *furcata* Velen., *Ceské Houby*. p. 316. 1920.
 =*Mycena galericulata* var. *pruni* (Velen.) Hruby, *Hedwigia* 70: 300. 1930.
 =*Mycena vernalis* Velen. *Ceské Houby*. p. 316. 1920.
 =*Mycena rugulosiceps* (Kauffman) A. H. Sm., *Mycologia* 29: 342. 1937.
 =*Mycena subviscida* Kauffman & A. H. Sm., *Pap. Mich. Acad. Sci.* 17: 184. 1933.
 =*Mycena subinclinatus* (Murrill) Murrill, *Mycologia* 30: 371. 1938.
 =*Mycena galericulata* f. *abietina* Konr. & Maubl., *Agaricales (Agariciac.)* p. 311. 456. 1948. [no Latin diagnosis]

Pileus 18-50(-60) mm diam, conical to campanulate, expanding to convex, applanate, or plano-convex with age, generally with a pronounced umbo; the margin typically incurved at first, soon spreading, often splitting or becoming uneven with age, pellucid striate; surface glabrous, moist to lubricous, generally ±radially rugulose or shallowly sulcate; the disc brown (6-7E5-6) to dark brown (5-6F5-8), or grayish brown, often with yellowish tones, paler towards the margin, grayish brown (6C-D3) to pale sordid brown (6C-E4) or "buff brown," often with yellowish tones. **Context** thin, thicker under the disc, watery brownish or pallid. **Lamellae** ascending-adnate, generally decurrent with a short tooth, 22-39 reaching the stipe, close with 1-3 series of lamellulae, moderately broad (2-7 mm), becoming dorsally intervenose, whitish to pale whitish gray, frequently developing pale pinkish tones in age; edges convex, concolorous. **Stipe** 25-125 X 2.5-6.5 mm, central, terete or slightly compressed, equal or with a broader base, hollow, cartilaginous, occasionally twisted, often forming a long pseudorhiza up to 6 cm in length; surface generally dry and somewhat shiny, smooth or twisted-striate, minutely pruinose at the apex, glabrous below; the apex whitish, pale to darker grayish brown (6-8E3-5) below, often with yellowish tones; the base ±densely covered with whitish fibrils. **Odor** indistinct, farinaceous, or raphanoid. **Taste** similar.

Basidiospores (8-)9-11(-12) X 6-7.5(-8) µm [$\bar{x} = 10.2 \pm 0.7 \times 6.7 \pm 0.5$ µm, Q = 1.3-1.7, $q = 1.5 \pm 0.1$, n = 50 spores], ellipsoid to broadly ellipsoid, guttulate, smooth, thin-walled, amyloid. **Basidia** 32-40(-50) X 7-9 µm, 4-spored and clamped, or 2-spored and clampless, clavate, sterigmata up to 10 µm in length in the 4-spored forms, and up to 16 µm in the 2-spored forms; basidioles similar or narrowly clavate. **Cheilocystidia** 25-45 X 6.5-11(-15) µm, clavate to irregular-clavate or irregular, often somewhat constricted apically and/or giving rise to additional lateral or apical heads, entirely or apically covered with numerous, unevenly spaced, cylindrical, simple to branched excrescences, 1.5-13(-35) X 1-2 µm, clamped (4-spored forms) or clampless (2 spored forms); forming a

sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a cutis; hyphae 1.5-5.5 μm diam, clamped or clampless, appearing gelatinized or embedded in a thin gelatinous layer, covered with cylindric, short to quite long, simple to branched excrescences, 1-20 X <1-1.5 μm , which tend to form dense masses.

Hypodermium composed of inflated cells, brownish-vinescent in Melzer's reagent. **Pileus trama** composed of inflated cells and cylindric hyphae, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic, brownish-vinescent in Melzer's reagent; cortical hyphae 1.5-4 μm diam, clamped or clampless, covered with cylindric, simple to furcate, more rarely branched excrescences, 1.5-9.5 X 1-2 μm ; terminal cells similar, up 7 μm in diam **Laticiferous hyphae** containing hyaline contents occasionally present in the pileus, lamellar, and stipe tramal tissues.

Habit, habitat, and distribution. Scattered, gregarious, subcespitate or solitary on decaying wood of hardwoods and conifers. Found throughout the forested regions of California during the fall and winter months. Smith (1947) reported the species from Alabama, Tennessee, Pennsylvania, Maine, Massachusetts, New York, Illinois, Michigan, Missouri, and Washington in the United States, and from Ontario and Manitoba in Canada. The species is also known from Europe and has been reported from Iceland, Kashmir, Sikkim, and Japan (Maas Geest, 1985).

Material examined. California. Mendocino Co.: Van Damm State Park, Pygmy Forest area, 24 November 1996, BAP 091. Sierra Co.: Tahoe National Forest, Chapman Saddle Rd., 10 October 1998, BAP 195.

Commentary. The macro- and microscopic descriptions are based upon the collections listed above, with additional information adapted from Smith (1947) and Maas Geesteranus (1985, 1992b).

As noted by both Smith (1947) and Maas Geesteranus (1985, 1992b), and indicated by the large number of reported synonyms, *Mycena galericulata* is a remarkably variable species which has historically been misidentified by numerous investigators. Fortunately, within California there are relatively few *Mycena* species present with which to confuse *M. galericulata*. The lignicolous habit of the species, combined with the robust stature of the basidiomes, characterize *M. galericulata* in the field. *Mycena maculata*, which also forms robust, lignicolous basidiomes, can be distinguished from *M. galericulata* macroscopically by the tendency of the lamellae, pileus, and stipe of the former species to develop reddish brown stains in age. Microscopically, *M. maculata* may be distinguished from *M. galericulata* by the relatively smooth hyphae of the pileipellis and stipe cortical layer, as well as this species slightly smaller spores.

Mycena galericulata* var. *albida Gillet, Hym.: 276. 1876.

=*Mycena sudora* (Fr.) Gillet, Les Hymén. p. 273. 1874.

=*Mycena galericulata* var. *albida* Sacc., Flora Ital. Crypt. 1[pars 1: 275. 1915]

fasc. 15: 1359. 1915.

=*Mycena longipes* (Murrill) Murrill, *Mycologia* 8: 220. 1916.

=*Mycena galericulata* var. *candicans* Velen., *Ceské Houby* p. 316. 1920.

Pileus and stipe whitish to pale avellaneous, the disc often with brownish tones; the lamellae white. Otherwise similar to the type variety.

Commentary. I have not had the opportunity to examine any dried material of *M. galericulata* var. *albida*, nor have I encountered it in the field. The brief description given above is adapted from Maas Geesteranus (1992b) and Murrill (1916). The variety is included in the current treatment because Murrill described *M. longipes* from Muir Woods National Park, Marin Co., California. Smith (1947) examined the holotype collection of *M. longipes*, as well as several additional collections made from California, Washington, and Michigan, but felt he had failed to secure enough material to make a critical study of the species. Maas Geesteranus however, upon his examination of the type material, stated that the diagnostic characteristics of the material do not differ in any way from those of *M. galericulata*, and that the very pale coloration indicates that Murrill's collection belongs to var. *albida*. It is interesting to note however, that Murrill described *M. longipes* as growing on leaf-mold, whereas *M. galericulata* is a lignicolous species. Both Smith (1947) and Maas Geesteranus (1985) indicate that the basal portion of the stipe is missing from Murrill's collection. Presumably the material was growing on some form of buried wood, and that portion of the stipe was broken off as the collection was made.

Mycena* section *Calodontes (Fr. ex. Berk.) Quél., *Mém. Soc. Emul. Montbél.* II 5: 102. 1872.

Subsection *Puræ* (Konr. & Maubl.) Maas Geest., *Persoonia* 11: 112. 1980.

Basidiomes medium to large sized, often somewhat collybioid in stature. Pileus surface glabrous, dry to moist, generally becoming lubricous when moistened, coloration variable, often with violaceous or purplish tones. Context thin, often thicker under pileus disc, concolorous with the pileus or paler. Lamellae decurrent to adnexed or adnate, often with a decurrent tooth, whitish or similar to the pileus coloration; the edges concolorous with the sides, paler, or whitish. Stipe central, hollow, fragile to firm or tough, coloration variable, often with violaceous or purplish tones. Odor and taste raphanoid or indistinct.

Basidiospores \pm ellipsoid, smooth, amyloid. Basidia 4-spored, clavate, clamped. Cheilocystidia \pm clavate, ellipsoid, utriform, fusiform, subcylindrical, or sphaeropedunculate, apically broadly rounded, generally smooth, clamped, with colorless contents; forming a sterile lamellar edge or not. Pleurocystidia similar, abundant to rare. Pileipellis a cutis; hyphae smooth for the most part, clamped. Stipe cortical hyphae smooth, clamped; terminal cells similar to the cystidia,

cylindrical (similar to the hyphae), slender-clavate, or more rarely furcate.
Growing on herbaceous and woody debris in soil.

Type species: *Mycena pura* (Pers.: Fr.) P. Kumm.

Mycena pura (Pers.: Fr.) P. Kumm., Führ. Pilzk. p. 107, 110. 1871.

≡ *Agaricus purus* Pers., Neues Mag. Bot. 1: 101. 1794.

≡ *Agaricus purus* Pers.: Fr., Syst. Mycol. 1: 151. 1821.

≡ *Mycenula pura* (Pers.: Fr.) P. Karst., Meddn Fauna Flora Fenn. 16: 89. 1890.

≡ *Prunulus purus* (Pers.: Fr.) Murrill, N. Am. Flora 9: 332. 1916.

For a complete list of reported synonyms and published forms and varieties see Maas Geesteranus (1989, 1992b).

Pileus 7-38 mm diam, convex to campanulate, expanding to plano-convex, often becoming applanate, generally with a broad umbo which may or may not be surrounded by a depression; the margins initially straight, becoming uplifted and eroded with age, pellucid-striate when moist; surface smooth, glabrous, moist to dry, dull or shiny, hygrophanous; color exceedingly variable, purplish gray (14E2-3), violet gray (15-16C-E2-3), dark violet (15F5-7), reddish gray (12D3), reddish brown (8-9E3-5), grayish brown (9D3), pale brownish gray (6C3), pale grayish orange (6B2), grayish (14E1), pale grayish white to white, and with or without pinkish, violaceous or purplish tones, the margins concolorous or paler, the disc often developing yellowish tones in age, generally fading to grayish, often retaining violaceous, purplish, or brownish tones. **Context** thin above lamellae, up to 3.5 mm thick under disc, concolorous with the pileus or white. **Lamellae** ascending-adnate to adnexed, with a short decurrent tooth, 22-39 reaching the stipe, close with 1-3 series of lamellulae, moderately broad (up to 7 mm), convex, often transversely intervenose, grayish (14-17B1), pale purplish- to violet gray (14-17B-C2), pale grayish brown (6C-D3) to brownish gray (8-9C2), faintly pink, or white; the edge smooth or uneven, concolorous with the sides, paler, or whitish. **Stipe** 29-70(-110) X 2-7 mm, central, terete or compressed, equal above a slightly enlarged base, hollow; surface moist or dry, dull or with a slight sheen, smooth, pruinose to furfuraceous, more rarely somewhat scabrous near apex, glabrescent centrally; purplish gray to violet gray (13-16C-E2-3), grayish (14-15B-E1), grayish brown (7D-E3) to brownish gray (8C-D2), or pale pink overall, often with a paler or whitish base; the base covered with whitish to yellowish fibrils. **Odor and Taste** raphanoid or indistinct.

Basidiospores (7.2-)7.6-9.6 X 3.2-4.8 μm [$\bar{x} = 8.5 \pm 0.6 \times 3.8 \pm 0.4 \mu\text{m}$, $Q = 1.8-2.8$, $Q^{-} = 2.3 \pm 0.2$, $n = 75$ spores], narrowly ellipsoid to cylindric, smooth, thin-walled, amyloid. **Basidia** 23.2-30.4 X 6.0-7.2 μm , narrowly clavate to clavate, clamped, sterigmata up to 5.6 μm in length; basidioles similar or cylindric.

Cheilocystidia 31.2-72 X (8.0-)10.4-20 μm , utriform, \pm clavate, ellipsoid, or fusiform with a rounded apex, generally with a short to quite long, narrowed base, the apex occasionally with a small, \pm cylindric projection, clamped, mixed with

basidia or forming a sterile lamellar edge, generally projecting well beyond edge. **Pleurocystidia** similar, abundant. **Pileipellis** a cutis; hyphae 2.4-7.2 μm diam, gelatinized, frequently embedded in a gelatinous layer, smooth, rarely with a few scattered, cylindric excrescences, 3.2-4.0 X 1.2-1.6 μm . **Hypodermium** vinescent to brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of cylindric and inflated hyphae, vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 1.6-6.8 μm diam, smooth, clamped; terminal cells abundant, 27.2-88 X 7.2-14.4(-20.8) μm , clavate to broadly clavate, ellipsoid, or mucronate, more rarely similar to hyphae; laticiferous hyphae often present, contents refractive.

Habit, habitat, and distribution. Solitary, scattered, gregarious, or caespitose on woody & herbaceous debris in soil. A very cosmopolitan species with forms and varieties thus far described from North America, South America, Europe, Japan, India, Tibet, and Malaysia. In California, I have commonly found *M. pura* throughout the Klamath, North, and Central Coast Ranges, the Sierra Nevada Foothills, and the northern High Sierra Nevada; October to February, also occurring with the spring snow melt in the High Sierra Nevada.

Material examined. California. Del Norte Co.: Redwood National Park, Rugg Grove, 19 October 1997, BAP 165-A. Humboldt Co.: Along Hwy 101, approx. 8 mi north of Trinidad, 15 October 1997, BAP 139; Crescent City, Charm Lane, 18 October 1997, BAP 141. Marin Co.: Point Reyes National Seashore, Limantour Ridge, 29 November 1991, DED 5424. Mendocino Co.: Jackson State Forest, Road 409, 23 November 1991, DED 5419; same location, 23 November 1991, DED 5420. Monterey Co.: Jack's Peak Regional Park, 9 February 1997, BAP 115. Sierra Co.: Hwy 49, Yuba Pass, 2 October 1993, DED 5932; Hwy 49, SFSU Field Campus, 5 June 1997, BAP 126; same location, 10 October 1998, Kelly P. Collins 98-51; Hwy 49, Chapman Creek Campground, 4 October 1997, BAP 132.

Commentary. The macro- and microscopic descriptions are based upon my observations of the collections listed above.

As indicated by Smith (1947) and Maas Geesteranus (1989b, 1992b), few *Mycena* species display the exceedingly variable sporocarp coloration as that observed in *M. pura*. Numerous varieties and forms have been described to account for the variation observed throughout the species cosmopolitan distribution. Maas Geesteranus (1989b, 1992b) gives a thorough accounting of the varieties and forms described from the northern hemisphere, and recognizes several distinct forms of the species. The present author however tends to agree with Smith (1947), who states that "In addition to these so called color varieties one usually finds numerous intergradations between them, so that, although one quickly learns to distinguish the species, he soon gives up trying to distinguish any subdivisions of it." Of the California specimens examined in this investigation, several appeared to fit nicely the description of *M. pura f. violacea* (Gillet) Maas Geest. given by Maas Geesteranus (1989b, 1992b). Similarly, a few of the collections seemed to fit the description of *M. pura f. pura*. However, most of

these collections shared characteristics common to both of these forms as well as that of an additional form; *M. pura* f. *multicolor* (Bres.) Kühner. In my opinion the color variations observed within the California collections are not consistent enough to warrant the recognition of distinct forms of *M. pura*.

Macroscopically, *M. pura* is characterized by rather robust, somewhat collybioid basidiomes and a typically umbonate pileus. Within California, the majority of *M. pura* individuals or populations encountered will have basidiomes with some form of violaceous or purplish coloration. Microscopically the species is distinguished by the often large and projecting cheilocystidia, similar, abundant pleurocystidia, amyloid spores, and more or less smooth pileipellis hyphae that are often embedded in a gelatinous layer and/or easily separable when mounted in water or KOH. *Mycena pura* is the only member of section Calodontes thus far encountered in California.

Mycena pura is commonly reported as a toxic species, causing symptoms similar to muscarine poisoning.

Mycena* section *Testudini Redhead & Norvell, Mycotaxon 66: 104. 1993.

Basidiomes small. Pileus surface gelatinous. Lamellae forming a pseudocollarium. Stipe glabrous, with a turbinate base. Basidiospores amyloid. Basidia 4 spored. Cheilocystidia clavate, diverticulate, the basal portion gelatinized. Pileipellis a hymeniform layer of lentiform, pedicilate, diverticulate cells. Tramal tissues dextrinoid. Hyphae clamped.

Type species: *Mycena gaultheri* A. H. Sm.

Mycena gaultheri A. H. Sm., N. Am. Sp. *Mycena* p. 51. 1947.

Pileus 1-3(-4) mm diam, obtusely conical to convex, expanding to applanate or plano-convex in age; the margin straight at first, pellucid-striate with broad, dark striations when moist, becoming somewhat plicate as it fades, the edges scalloped; surface moist, dull, glabrous; uniformly citrine-yellow to sordid yellowish brown ("Isabella") on the disc with buff colored ("cream buff") margins. **Context** membranous, not fragile. **Lamellae** adnate initially, 7-9 reaching the stipe, soon seceding and forming a scalloped pseudocollarium around the stipe apex, moderately broad, distant with 0-1 series lamellulae, pallid; the edges even, concolorous. **Stipe** 20-40 X <1 mm, straight to flexuous; surface glabrous and polished towards the apex, minutely pruinose below, pale sordid yellow grading to peach or salmon colored towards the base, the apex pallid to whitish; arising from a flat, strigose-hairy basal disc or turbinate swelling. **Odor and Taste** not distinctive.

Basidiospores 8.3-9.9 X 3.9-4.5 µm (excluding apiculus), ellipsoid, hyaline, smooth, amyloid. **Basidia** 18-21 X 7.2-8.1 µm, mostly 4-spored, less frequently 1-, 2-, and 3- spored, clamped. **Cheilocystidia** 13.5-36 X 7.7-16 µm,

embedded in a removable, gelatinized layer, clavate to irregular-clavate, apically covered with mostly short and several longer, simple to branched excrescences, clamped, occasionally secondarily septate basally, the basal portion and subtending hyphae gelatinized; forming a sterile lamellar edge. **Pleurocystidia** absent. **Pileipellis** a hymeniform monolayer of pedicellate, lentiform to clavate cells, 17-30 μm diam, which are densely diverticulate on the exposed surfaces; arising from ascending hyphae, 1.5-3 μm diam, embedded in a thick gelatinous layer (30-50 μm). **Pileus trama** composed of inflated, dextrinoid hyphae, 9-21 μm diam, separated from the gelatinized layer of the pileipellis by a slightly denser layer of hyphae, clamped. **Lamellar trama** composed of inflated cells, 9-22 μm diam, dextrinoid. **Stipe trama** parallel, dextrinoid, hyphae 5-18 μm diam, clamped. **Stipe cortical hyphae** smooth, non-gelatinized, with rare, scattered, globose outgrowths; separated from a disc-like pad of tissue in the pileus composed of cylindrical hyphae, 3-5 μm diam, which itself is surrounded by a layer of broader cells which intergrade with the pileus and lamellar tramal tissues. **Basal disc** composed of radially ascending short cells, up to 25 μm diam, lacking a well defined margin, fringed by thin-walled, obtuse hairs, up to 100 X 5-10 μm , which are generally covered with granular encrustation.

Habit, habitat, and distribution. Solitary or in groups of two or more basidiomes on decaying leaves of *Gaultheria shallon* Pursh, and among herbaceous debris amid *G. shallon*, *Cornus canadensis* L., and *Berberis nervosa* Pursh beneath *Tsuga heterophylla* (Raf.) Sarg., *Pseudotsuga menziesii* (Mir.) Franco, and *Acer circinatum* Pursh. Known from only two localities; Mt. Angeles in the Olympic Mountains of Washington, and the Bull Run Watershed of Mt. Hood National Forest, Oregon. Rare.

Commentary. The species description is adapted entirely from Smith (1947) and Redhead & Norvell (1993). Although *Mycena gaultheri* has not yet been encountered in California, it is included in the current treatment as a taxon suspected to occur within the state due to its apparent association with *Gaultheria shallon*, the range of which extends throughout the Klamath, North, and Central coastal ranges. Until recently *M. gaultheri* was known only from the holotype collection, made from the Olympic Mountains of Washington in September of 1941. Redhead and Norvell (1993) however, published a re-description of the fungus based upon two collections made in 1991 from the Mt. Hood National Forest of Oregon.

Smith (1947) placed *M. gaultheri* in section Basipedes, presumably due to the presence of a basal disc, and a separable pileus and stipe as indicated in his key to the subgenera of *Mycena* (p. 43). Although he was not able to examine the holotype material, Maas Geesteranus (1980, 1992b) excluded the species from section Basipedes based upon Smith's supposed failure to note whether or not *M. gaultheri* was characterized by the presence of a separable pileus and stipe, as well as cheilocystidia that differ significantly from those common to the remaining members of the section. Maas Geesteranus (1986b, 1992b) later placed the species in section Polyadelphia. Upon redescribing the species, Redhead &

Norvell (1993) excluded *M. gaultheri* from section Polyadelphia based upon the abruptly differentiated tissues found at the stipe apex in this species, as well as the smooth stipe cortical hyphae. Redhead & Norvell additionally excluded *M. gaultheri* from section Basipedes as redescribed by Maas Geesteranus (1983, 1992b), due to this species' vivid coloration, hymeniform pileipellis, regularly ornamented cheilocystidia, lack of caulocystidia, and turbinate basal swelling. To account for the unique features of *M. gaultheri*, Redhead and Norvell (1993) proposed the new section Testudini.

Mycena* section *Intermediae Kühner ex Maas Geest., Persoonia 11: 104. 1980.

Basidiomes medium sized to fairly large. Pileus surface pruinose and glabrescent or glabrous in all stages, lubricous when moistened, in several species covered with a partially detachable gelatinous pellicle, ±hygrophanous; variously colored in shades of gray, the disc portion darker to blackish or blackish brown, the margin paler. Context thin or tending to be thicker under the disc portion of the pileus. Lamellae adnate, decurrent with a tooth or not, ascending or arcuate; grayish to grayish brown or whitish; the edge convex, whitish. Stipe hollow, cartilaginous to fragile; the surface apically pruinose, glabrescent, not lubricous when moistened; grayish to grayish brown; the base generally covered with tomentum or coarse fibrils. Odor farinaceous, raphanoid, or not distinct. Taste generally somewhat similar.

Basidiospores ellipsoid, smooth, amyloid. Basidia 2- or 4-spored, clamped. Cheilocystidia fusiform, lageniform, or clavate, clamped, smooth or covered with diverticula or longer excrescences. Pleurocystidia generally fusiform to lageniform and strongly protruding, apically to laterally covered with diverticula or excrescences. Lamellar trama dextrinoid. Pileipellis a cutis; hyphae smooth to diverticulate, gelatinized. Stipe cortical hyphae smooth to diverticulate.

Growing on fallen needles, leaves, debris, or wood of conifers and hardwoods.

Type species: *Mycena latifolia* (Peck) A. H. Sm.

Mycena latifolia (Pk.) A. H. Sm., Mycologia 27: 599. 1935.

≡ *Agaricus latifolius* Peck, Ann. Rep. New York State Cab. 23: 81. 1872.

≡ *Mycena galericulata* var. *latifolia* (Peck) Sacc., Syll. Fung. 20: 146. 1911.

≡ *Prunulus latifolius* (Peck) Murrill, N. Am. Flora 9: 327. 1916.

= *Mycena pinetorum* J. E. Lange, Dansk. Bot. Ark. 1(5): 30. 1914.

= *Omphalopsis bakeri* Murrill, N. Am. Flora 9: 315. 1916.

= *Omphalia bakeri* (Murrill) Murrill, Mycologia 8: 220. 1916.

Pileus 5-25 mm diam, obtusely campanulate initially, with a straight

margin, becoming broadly campanulate, broadly conical or broadly convex, often expanding with age and with a low, obtuse umbo, more rarely with a shallow, central depression; the margin pellucid-striate, often sulcate; surface minutely pruinose initially, glabrescent, moist to dry, lubricous or occasionally subviscid when moist; blackish to blackish brown or dark gray on the disc, dark or pale gray, sepia gray brown, or with reddish brown tints away from disc, paler to almost whitish at the margin; fading to "olive gray" on the disc or pale cinerous overall in age. **Context** thin, brownish to grayish. **Lamellae** broadly adnate, often with a decurrent tooth, 14-24 reaching the stipe, close to subdistant, rather broad (up to 3 mm), ventricose, occasionally becoming dorsally intervenose, sometimes seceding from stipe and forming a pseudocollarium, gray to grayish brown or whitish; the edges somewhat convex, whitish. **Stipe** 20-50(-70) X 0.5-2 mm, central, terete or compressed, equal or slightly tapered towards the base, hollow, cartilaginous or fragile; the surface dry, shiny, pruinose towards the apex, at least initially, glabrous below; generally \pm concolorous with the pileus or pale gray to pale grayish brown, rarely with slightly pink or violaceous tints, the apex generally whitish; the base covered with whitish to yellowish tomentum or coarse fibrils. **Odor** not distinct to mildly farinaceous. **Taste** farinaceous and possibly somewhat acrid.

Basidiospores 6.4-8.8(-9.6) X 4.0-5.6 μm [$\bar{x} = 7.9 \pm 0.9$ X 4.3 ± 0.3 μm , Q = 1.5-2.2, $q = 1.8 \pm 0.2$, n = 59 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 22.4-26.4 X 6.4-8.0 μm , 4-spored, clavate, clamped, sterigmata 3.2-4.8 μm in length; basidioles similar. **Cheilocystidia** 25.6-92.0 X (5.6-)7.2-11.2(-14.4) μm , \pm fusiform to lageniform or clavate, the fusiform to lageniform type smooth or more commonly with the central, enlarged portion covered with evenly to unevenly spaced, cylindrical, simple excrescences, 1.6-4.0 X 1.2-2.0 μm , and occasionally with slightly thickened walls, the apex often enclosed in and/or exuding hyaline mucilage, in the clavate forms the apical portion covered with evenly to unevenly spaced, cylindrical to slightly coarse, simple to branching excrescences, 1.6-15.2 X 1.2-2.0, clamped; mixed with basidia, all tending to become somewhat gelatinized. **Pleurocystidia** similar to the fusiform or lageniform cheilocystidia, abundant. **Pileipellis** a cutis; hyphae 1.6-4.0 (-5.6) μm diam, clamped, covered with cylindrical to slightly coarse, simple, furcate, or branched excrescences, 2.4-12.0 X 1.2-2.4 μm , which tend to form dense gelatinized masses. **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Lamellar trama** brownish-vinescent in Melzer's reagent. **Stipe tissues** parallel, monomitic; cortical hyphae 2.0-4.0 μm diam, clamped, \pm smooth or covered with scattered, cylindrical to coarse or inflated, simple to branched excrescences, 2.4-29.6 X 1.6-2.4 μm , hyphae and excrescences gelatinized; terminal cells similar to hyphae or covered with a mass of cylindrical to coarse or inflated excrescences.

Habit, habitat, and distribution. Gregarious on fallen conifer needles, often in great quantities. In California it has been collected during the fall months from the North Coast and Klamath Ranges. Also known from North Carolina,

Tennessee, Oregon, and Washington in the United States, and across the continent to Nova Scotia in Canada (Smith, 1947).

Material examined. California. Humboldt-Trinity Co.: North Fork of the Mad River, 9 December 1935, AHS 3907 (MICH). Siskiyou Co.: Patrick Creek, Siskiyou National Forest, 26 November 1937, AHS 9047 (MICH). **Oregon.** Lane Co.: Blue River, 22 October 1937, AHS 8043 (MICH).

Commentary. The macroscopic description of the species is adapted from Smith (1947) and Maas Geesteranus (1986, 1992b). The microscopic description is based upon my examination of the collections listed above.

Mycena latifolia appears to be a somewhat rare fungus in California. The two collections from California examined in this investigation, along with an additional specimen at MICH (not examined; AHS 8818), represent the only identified collections of *M. latifolia* currently known from the state. Smith (1947) indicated that the broad lamellae of *M. latifolia* are the only macroscopic character that one may use to reliably distinguish the species from the numerous other grayish *Mycena* commonly encountered in our forests. Microscopically, *M. latifolia* is easily distinguished from superficially similar species by the fusoid to lageniform pleurocystidia and cheilocystidia which commonly have their mid-portions covered with simple, cylindrical excrescences.

Mycena* section *Cinerellae Singer ex Maas Geesteranus, *Persoonia* 11: 104. 1980.

Basidiomes small to medium sized, \pm omphalioid. Pileus surface initially pruinose, glabrescent, dry to moist or subviscid, generally becoming lubricous when moistened; coloration dull, grayish brown to dark brown, one species with an incarnate tinge, pallescent in age. Context thin. Lamellae ascending to arcuate, generally with or developing a decurrent tooth, white, grayish white or brownish gray, rarely with yellowish tones; the edge concave or somewhat convex, concolorous or whitish. Stipe central, hollow; surface pruinose, at least towards apex, glabrescent, dry to glutinous, dry forms becoming lubricous when moistened in some species; coloration similar to that of pileus, the base covered with or seated on a whorl of fibrils. Odor and taste farinaceous, raphanoid, or indistinct.

Basidiospores ellipsoid, smooth, amyloid. Basidia 4-spored and clamped or 2-spored and with or without clamps, slender-clavate to clavate. Cheilocystidia clavate to \pm irregular, occasionally with flared or subdivided heads, covered with evenly to unevenly spaced, cylindrical to coarse, variously shaped excrescences. Pleurocystidia present or absent. Pileipellis a cutis; hyphae clamped or clampless, covered with excrescences. Lamellar trama brownish-vinescent in Melzer's reagent. Stipe cortical hyphae and terminal cells covered with excrescences.

Among grass and mosses, on *Sphagnum*, on the debris of both conifers

and hardwoods, more rarely on decaying wood or the bark of living trees.

Type species: *Mycena cinerella* (P. Karst.) P. Karst.

Key to the California species of section Cinerellae.

1. Cheilocystidia covered with ± evenly spaced, cylindric to coarse, generally simple excrescences; the stipe viscid to glutinous when moist 2
1. Cheilocystidia with few to numerous, ± unevenly spaced, cylindric to coarse, simple to branched and/or contorted excrescences, more rarely lacking excrescences altogether; the stipe dry, moist, or viscid 3
2. Pileus small, <10 mm diam, brownish to grayish with orange tones; pileipellis hyphae giving rise to side-branches which are embedded in a very thick (up to 170 µm) gelatinous layer; basidiomes often growing on debris of *Arctostaphylos* spp. *M. tamalpaiensis* nom. prov.
2. Pileus typically larger, up to 20 mm diam, brownish to grayish, often with yellow tones; pileipellis gelatinized or embedded in a thin layer gelatinous matter; basidiomes growing on coniferous debris *M. clavicularis*
3. Cheilocystidia with 2 or more very coarse, contorted, often branched excrescences, more rarely lacking excrescences altogether and then ± clavate; the hypodermium underlaid by a thick layer of non-dextrinoid, distinctly gelatinous hyphae *M. subconcolor*
3. Cheilocystidia with one to numerous, cylindric to coarse, simple or branching, often contorted excrescences; the hypodermium not underlaid by a thick layer of gelatinous hyphae 4
4. Cheilocystidia with one to several, short to quite long (-22.4 µm) and highly branched, often coarse and contorted excrescences; pleurocystidia generally present, similar to cheilocystidia; corticolous on living madrone trees (*Arbutus menziesii*); color of pileus and stipe with distinct brown component *M. madronicola*
4. Cheilocystidia with few to numerous, generally short (-10.4 µm), simple to branched, cylindric or coarse excrescences; pleurocystidia absent; growing on needles, leaves, and other debris of conifers and hardwoods, or among moss; color of the pileus and stipe with a distinct grayish to grayish brown component *M. cinerella*

Mycena tamalpaiensis Perry, Blair, & Desjardin nom. prov.

Pileus 4.5-8.0 mm diam, convex with a slight umbo, disc becoming slightly depressed as it matures; margin entire to crisped; surface striate, glabrous, subviscid; grayish-orange (5B3), becoming brownish-orange (6C3) at margin.

Context thin, white. **Lamellae** adnate with a decurrent tooth, with 1 series of

lamellulae, white; the edges concolorous with the sides, entire. **Stipe** 21-30 X 1 mm, central, terete, equal; surface glutinous to viscid, smooth, glabrous; whitish at apex, grayish-orange below, base with a small patch of radiating, brownish-orange mycelium. **Odor** none.

Basidiospores (6.8-)7.2-8.6(-9.0) X 3.6-4.5 μm [$x^{\text{---}}$ = 7.9 \pm 0.6 X 4.1 \pm 0.3, Q = 1.7-2.3, $q^{\text{---}}$ = 2.0, n = 25 spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 22-32 X 6.3-7.2 μm , 4-spored, clavate, clamped, with sterigmata up to 4.5 μm in length; basidioles 19-32 X 4.5-7.2 μm . **Cheilocystidia** 17-36 X 4.5-10.8 μm , clavate with a short to long base, apically covered with numerous, short, evenly spaced, cylindrical excrescences up to 3.6 μm long, which occasionally branch, clamped, forming a sterile lamellar edge. **Pleurocystidia** rare, similar to cheilocystidia. **Pileipellis** an ixocutis, 80-170 μm thick; hyphae 1.8-4.5 μm diam, clamped with swollen portions up to 7.2 μm diam, sparsely to densely covered with short, cylindrical excrescences, up to 3.6 μm long, and giving rise to filamentous branches that extend upwards through a gelatinous matrix, up to 77 X 1-4.5 μm , branches covered with scattered to fairly densely spaced cylindrical excrescences up to 9 μm long. **Hypodermium** composed of interwoven, cylindrical to inflated hyphae, 4.5-23.0 μm diam, brownish to brownish-vinescent in Melzer's reagent. **Pileus trama** composed of \pm radial hyphae, 1.8-13.6 μm diam, clamped, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of hyphae 1.8-10.8 μm diam, with large, clavate terminal cells, 26-67 X 5.4-21.0 μm , brownish-vinescent in Melzer's reagent. **Stipe tissues** brownish-vinescent in Melzer's reagent; cortical hyphae 2.7-4.5 μm diam, gelatinized, clamped, smooth or covered with short, cylindrical excrescences, 1.0-4.5 X 1.0-1.4 μm ; terminal cells 31-41 X 3.6-8.1 μm , clavate, subcylindrical or cylindrical, sparsely to densely covered with short, cylindrical excrescences, up to 3.6 X \sim 1.8 μm .

Habit, habitat, and distribution. Gregarious to scattered on leaves and sticks of *Arctostaphylos hookeri* ssp. *montana* (Eastw.) P. Wells. Known only from the type locality.

Material examined. California. Marin Co.: Mt. Tamalpais State Park, Simmons trail, 13 December 1996, J.R. Blair 264 (Holotype, SFSU).

Commentary. The macroscopic and microscopic descriptions are based upon notes made by the collector, complemented with additional information from my examination of the dried material.

Mycena tamalpaiensis is in many respects quite similar in appearance to *M. clavicularis*. Macroscopically however, *M. tamalpaiensis* is typically a more diminutive species, which lacks grayish lamellae in age, and arises from a small patch of brownish-orange hyphae. Additionally, *M. tamalpaiensis* has thus far only been collected growing on the debris of *Arctostaphylos* spp., while *M. clavicularis* is known to grow on coniferous debris. Microscopically, these species can be distinguished by the very thick, gelatinous pileipellis layer in *M. tamalpaiensis*, as well as this species slightly smaller spores.

Mycena clavicularis (Fr.) Gillet, Les Hymén. p. 257. 1874.

≡ *Agaricus clavicularis* Fr., Syst. Mycol. 1: 158. 1821.

≡ *Prunulus clavicularis* (Fr.) Murrill, N. Am. Flora 9: 330. 1916.

≡ *Mycena epipterygia* f. *clavicularis* (Fr.) Konr. & Maubl., Ic. Sel. Fung. 6: 268. 1937.

Pileus 5-20 mm diam, convex, becoming broadly convex to plano-convex in age, rarely nearly plane, not infrequently with a shallow central dimple, occasionally with a small umbilicus or umbo, and then initially campanulate, pellucid-striate, striate to sulcate in age; margin decurved; surface dry to moist or viscid, glabrous; grayish brown (7E3-4), to dark brown (6F4-8), or dark yellowish brown (5F4-5) at first, disc remaining so in age or fading to pale grayish brown (6D3) or yellowish brown (5E4-8), margin fading to yellowish brown or pale yellowish brown (5D4). **Context** thin, watery concolorous with the pileus or pallid. **Lamellae** ascending to horizontal, adnate with a conspicuous decurrent tooth, becoming subdecurrent in age, close to subdistant with 1-2 series of lamellulae, broad (-3 mm), at first white to pale grayish white, darkening in age to pale orangish gray or pale brownish gray (5E5-8); edges convex, concolorous with the sides or whitish. **Stipe** 18-60 X 0.5-1.5 mm, central, equal, terete, hollow, somewhat pliant; surface viscid to glutinous when wet, glabrous, shiny, polished when dry, yellowish gray (4B2-5) to yellowish brown (5E4-6), the apex white to pale grayish white, the base covered with whitish fibrils. **Odor** absent or not distinctive. **Taste** mild.

Basidiospores 8.0-10.4(-11.2) X 4.0-5.6 μm [$x^{\bar{\bar{}}}$ = 9.2 \pm 0.8 X 4.8 \pm 0.4 μm , Q = 1.8-2.2, $q^{\bar{\bar{}}}$ = 1.9 \pm 0.1, n = 57 spores], ellipsoid, often with a slightly broader apex, hyaline, smooth, thin-walled, amyloid. **Basidia** 25.6-29.6(-41.6) X 6.4-8.0 μm , 4-spored, clavate, clamped, sterigmata up to 5.6 μm in length; basidioles similar. **Cheilocystidia** 20-48 X 6.4-12(-18.4) μm , \pm clavate, occasionally forming more than 1 head, more rarely contorted-clavate to irregular, the upper portion covered with \pm evenly spaced, cylindric to coarse, generally simple, more rarely furcate to branched excrescences, 1.6-8.0 X 0.8-2.4 μm , clamped, forming a sterile edge. **Pleurocystidia** similar to cheilocystidia, scarce to abundant. **Pileipellis** a cutis; hyphae 2.0-4.0(-8.8) μm diam, embedded in gelatinous matter, clamped, covered with cylindric, simple to branched excrescences, 0.8-23.2 X 0.8-1.6 μm . **Hypodermium** composed of inflated cells, weakly vivescent-brown in Melzer's reagent. **Pileus trama** composed of cylindric and inflated cells, vivescent-brown in Melzer's reagent. **Lamellar trama** similar. **Stipe tissues** monomitic, parallel; cortical hyphae 1.6-3.2 μm diam, clamped, embedded in gelatinous matter, scarcely to densely covered with cylindric, simple or more rarely branched excrescences, 0.8-7.2 X 0.8-1.6 μm ; terminal cells generally broader than hyphae, 3.6-6.4(-8.0) μm diam, sparsely to densely diverticulate, excrescences similar to those of hyphae.

Habit, habitat, and distribution. Scattered to gregarious on coniferous debris. Reported from Alabama, N. Carolina, Tennessee, Pennsylvania, New York, Michigan, Washington, Oregon, and California in the United States, and

Nova Scotia and Ontario in Canada (Smith, 1947). Also reported from Massachusetts (Murrill, 1916), and Europe (Maas Geesteranus, 1986). In California the species has been collected during the fall from the outer North Coast Ranges and the Sierra Nevada Foothills. Smith (1947) also reports the species from the Pacific coast in the spring.

Material examined. California. Del Norte Co.: Crescent City, Charm Lane, 18 October 1997, DED 6658. Mendocino Co.: Jackson State Forest, road 409, 13 December 1990, DED 5026; Van Damme State Park, Pygmy Forest area, 19 November 1995, BAP 025. Yuba Co.: Bullard's Bar Recreation Area, Schoolhouse Campground, 7 December 1991.

Commentary. The macroscopic description is based upon observations made by D. Desjardin and myself, the microscopic description is based upon my examination of collections listed above.

Mycena clavicularis can be distinguished from most other members of section Cinerellae found in California by the typically evenly spaced excrescences of the cheilocystidia, viscid to glutinous stipe surface, stipe cortical hyphae that are embedded in gelatinous matter, and the yellowish tones that are often present on the pileus and stipe. *Mycena clavicularis* superficially resembles *M. tamalpaiensis*, but can be differentiated by the former species larger size, lamellae which turn grayish in age, a lack of an exceptionally thick gelatinous pileipellis, and slightly larger spores.

Smith (1947) indicated that *M. clavicularis* is characterized by its "dry or moist *but not viscid* cap," a condition which differs slightly from the European concept of the species as presented by Maas Geesteranus (1986c, 1992b) in which the pileus is stated to be "dry but readily becoming lubricous when moistened." The dominant condition in the collections examined in the current study was a dry to moist pileus surface, with one collection (BAP 025) having a slightly viscid surface. However, microscopic examination of these collections revealed that all contained pileipellis hyphae that are embedded in gelatinous matter, indicating that these collections could certainly have been viscid or lubricous at some point in the fresh condition.

Mycena subconcolor A. H. Sm., N. Am. Sp. Mycena p. 365. 1947.

Pileus 10-25 mm diam, convex, becoming broadly convex, the disc occasionally developing a slight central depression; the margin connivent at first; surface initially hoary, glabrescent, opaque in young specimens, translucent-striate at maturity, hygrophanous; olivaceous black overall in young specimens, becoming sordid brownish gray at maturity and finally opaque. **Context** thin, grayish. **Lamellae** bluntly adnate, becoming slightly decurrent with age, 18-23 reaching the stipe, subdistant, generally with one series of lamellulae, occasionally strongly intervenose, dull gray (almost concolorous with pileus); edges even, concolorous with the sides. **Stipe** 30-40 X 1-2 mm, equal, cartilaginous; surface glabrous, polished, the lower portion initially dull brownish

gray, becoming stained reddish brown towards the base and finally bister, the apex pallid grayish. **Odor** and taste mild.

Basidiospores 9.6-10.4(-11.2) X (5.2-)5.6-6.4(-6.8) μm [\bar{x} = 10.2 \pm 0.4 X 5.7 \pm 0.3 μm , Q= 1.6-1.9, q = 1.8 \pm 0.09, n = 25 spores], ellipsoid, hyaline, smooth, thin-walled, amyloid. **Basidia** 30-50 X 8-9 μm , 4-spored, clavate, clamped, with sterigmata up to 8 μm in length. **Pleurocystidia** absent. **Cheilocystidia** 28-34.5 X 7.2-9.6 μm , \pm clavate to irregular, simple or giving rise to 2 or more very coarse, contorted, often branched excrescences; not abundant, clamped, mixed with basidia. **Pileipellis** a cutis; hyphae 2-4.8 μm diam, clamped, slightly gelatinized, covered with scattered, cylindrical to quite coarse, simple to branching, often complex excrescences, 2.4-18.4 X 2-3.2 μm . **Hypodermium** composed of inflated cells which often contain brownish, granular contents, brownish-vinescent in Melzer's reagent; underlaid by a thick layer (70-150 μm) of non-dextrinoid, distinctly gelatinous hyphae, 4-10.4 μm diam, cylindrical to slightly inflated, clamped, with granular contents. **Pileus trama** composed of cylindrical and inflated cells, brownish vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells and broadly cylindrical hyphae, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel; cortical hyphae 2-4.8 μm diam, clamped, the clamps often large and loop-like, smooth, rarely with solitary or several cylindrical, simple to branched excrescences, 2-7.2 X 1.6-2 μm ; terminal cells up to 5.6 μm diam, often branched, diverticulate with cylindrical to coarse excrescences that are generally covered with clumps of gelatinous matter and difficult to resolve.

Habit, habitat, and distribution. Scattered on a lawn. Known only from the type locality in Siskiyou National Forest, and possibly Greenland (see commentary). Type specimen collected in November.

Material examined. California. Del Norte Co.: Siskiyou National Forest, Smith River Canyon, Darlingtonia, 6 November 1937, AHS 8465 (Holotype, MICH).

Commentary. The macroscopic description of this species is adapted entirely from Smith (1947). The microscopic description is based upon my observations of the type material with additional information adapted from Smith (1947) and Maas Geesteranus (1986c, 1992b).

Smith (1947) states that *M. subconcolor* is a rather top heavy appearing species which is indistinguishable from *M. cinerella* (i.e., *M. concolor* sensu A. H. Sm and *M. misera* sensu A. H. Sm.) in coloration. Microscopically however, *M. subconcolor* can be easily distinguished from *M. cinerella* and other members of section Cinerellae by the presence of its thick, gelatinized layer directly beneath the hypodermium.

Mycena subconcolor appears to be an extremely rare species. To my knowledge, the only known collection from North America is the holotype. Lange (1955) reported *M. subconcolor* from Greenland, which creates a rather odd distribution for the species.

Mycena cinerella (P. Karst.) P. Karst., Bidr. Känn. Finl. Nat. Folk 32: 113. 1879.

≡ *Agaricus cinerellus* P. Karst., Hedwigia 18: 22. 1879.

≡ *Omphalia cinerella* (P. Karst.) J. E. Lange, Flora Agar. Dan. 2: 61. 1936.

= *Mycena albogrisea* Peck, Bull. New York State Mus. Nat. Hist. 116: 27. 1907.

= *Omphalia grisea* sensu Ricken, Blätterp. p. 399. 1915.

= *Mycena brownii* A. H. Sm., N. Am. Sp. *Mycena* p. 363. 1947.

= *Mycena concolor* (J. E. Lange) Kühner sensu A. H. Sm., N. Am. Sp. *Mycena* p. 370. 1947.

= *Mycena lineata* (Fr.) Quél. sensu A. H. Sm., N. Am. Sp. *Mycena* p. 150. 1947.

= *Mycena misera* (Fr.) A. H. Sm., N. Am. Sp. *Mycena* p. 369. 1947.

= *Mycena serotina* (Peck) A. H. Sm., N. Am. Spec. *Mycena* p. 375. 1947.

Pileus 3-15(-25) mm diam, obtusely conical to hemispherical at first, becoming convex to plano-convex with age, with or without a small umbo, not infrequently with a central depression; margin appressed against the stipe at first, entire or becoming notched to crenate in age, translucent-striate, sulcate; surface faintly pruinose, glabrescent, dry to moist and then somewhat lubricous, hygrophanous; grayish brown or dark sepia brown, fading to pale grayish brown or pale watery gray, occasionally developing a yellowish shade. **Context** thin, watery gray to grayish brown. **Lamellae** adnate to arcuate, developing a decurrent tooth, 13-27 reaching the stipe, close to subdistant with 2-3 series of lamellulae, moderately broad (2-3 mm), occasionally becoming ribbed and dorsally intervenose with age, whitish to gray or brownish gray, occasionally with a slight yellowish cast; the edges concolorous or paler. **Stipe** 20-50 X 0.5-2.5 mm, central, equal or slightly broader at the base, terete or compressed, straight to flexuous, hollow; surface smooth, faintly pruinose, glabrescent, moist to lubricous, shiny; pale grayish to pale grayish brown, pale to whitish at the apex; the base covered with whitish fibrils. **Odor** farinaceous. **Taste** farinaceous or raphanoid.

Basidiospores 7.2-9.6(-10.4) X 4.0-5.2 μm [$x^- = 8.6 \pm 0.7$ X 4.6 ± 0.3 μm , $Q = 1.6-3.2$, $q^- = 1.9 \pm 0.1$, $n = 100$ spores], ellipsoid, hyaline, smooth, thin-walled, amyloid, easily collapsed. **Basidia** 20.8-28.0(-33.6) X (5.6-)6.4-7.6(-8.8) μm , 4-spored (possibly 2-spored, see commentary), clavate, clamped, sterigmata up to 6.4 μm in length, generally with abundant granular contents; basidioles similar. **Cheilocystidia** 12.0-33.6 X 4.0-10.4 μm , slender clavate to clavate or irregular-clavate, clamped, often with granular contents similar to those of basidia, apically and occasionally laterally covered with unevenly spaced, cylindrical to coarse, simple, to branched excrescences, 1.6-10.4 X 1.2-2.4 μm .

Pleurocystidia absent. **Pileipellis** a cutis; hyphae 1.6-4.0(-5.6) μm diam, clamped, often gelatinized, covered with cylindrical to slightly coarse, simple to branched excrescences, 1.6-12.0 X 0.8-1.6(-2.4) μm , which tend to form dense masses. **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Pileus trama** composed of narrow, cylindrical hyphae, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells and narrower, cylindrical hyphae, brownish-vinescent in Melzer's reagent. **Stipe**

tissues monomitic, parallel; cortical hyphae 1.2-3.6, clamped, covered with cylindric, simple to branched excrescences, 1.6-7.2 x 0.8-1.6 µm; terminal cells similar to hyphae or with one or more swollen portions, up to 9.6 µm diam, covered with excrescences.

Habit, habitat, and distribution. Gregarious on needles and other debris of conifers. Also reported to grow among moss and fallen leaves of hardwoods (Maas Geesteranus, 1986c, 1992b). In California it has been collected in the fall from the North Coast Ranges and the northern High Sierra Nevada.

Material examined. California. Humboldt Co.: Trinidad, 27 November 1935, AHS 3622 (as *Mycena lineata*; MICH); same location, 2 December 1935, AHS 3707 (as *Mycena concolor*; MICH); same location, 6 December 1935, AHS 3843 (as *Mycena concolor*; MICH); same location, 10 December 1935, AHS 3918 (MICH); Orick, 7 December 1935, AHS 3881 (as *Mycena misera*; MICH). Sierra Co.: Chapman Creek Campground, 4 October 1997, BAP 131. **Michigan.** Washtenaw Co.: Silver Lake, Dexter, 20 October 1932, AHS 32-637 (as *Mycena misera*; MICH). **Oregon.** Linn Co.: McKenzie Pass, 18 October 1937, AHS 7983 (MICH).

Commentary. The macroscopic description is adapted Smith (1947), Maas Geesteranus (1986), and my own observations of fresh material. The microscopic description is based upon my observations of the collections listed above.

Although the collections examined in this investigation all proved to contain 4-spored basidia, the occurrence of 2-spored collections, including the holotype, have been reported by other investigators (Smith, 1947; Maas Geesteranus, 1986c, 1992b). Smith (1947) even reported a mixture of both 2- and 4-spored basidia on individual pilei from a single collection. Examination of collections AHS 3707 and 3843 (as *M. concolor* J. E. Lange) Kühner sensu A. H. Sm.), and AHS 3622 (as *M. lineata* (Fr.) Quel. sensu A.H Sm.), revealed that these taxa are microscopically indistinguishable from the collections of *M. cinerella* examined in this study and are herein proposed as synonyms.

Mycena madronicola A. H. Sm. is another species that bears some resemblance to *M. cinerella*, but which can be differentiated readily based upon differences in the cheilocystidia of these taxa, the presence of pleurocystidia in *M. madronicola*, and the strictly lignicolous habit of *M. madronicola* (see additional comments under *M. madronicola*).

Mycena madronicola A. H. Sm., Mycologia 31: 269. 1939.

Pileus 5-12 mm diam, obtusely campanulate to convex when young, becoming broadly convex with age, the disc somewhat flattened to slightly depressed, translucent-striate to the disc; margin initially appressed against the stipe; surface moist, initially hoary, glabrescent, becoming ±polished and sulcate with age; "hair brown" to "cinnamon brown," fading to "avellaneous," in age often "vinaceous buff" or grayish. **Context** thin, concolorous with the pileus, pliant,

reviving slightly when moistened. **Lamellae** broadly adnate, developing a subdecurrent tooth or becoming somewhat decurrent in age, 14-20 reaching the stipe, subdistant to distant, narrow to moderately broad (2-2.5 mm), "tilleal buff" to pallid; edges even, concolorous with the sides. **Stipe** 10-20(-36) X ~1 mm, equal above a basal bulb which soon disappears, hollow; surface delicately pruinose, glabrescent, becoming polished and translucent, the base pruinose, inserted on bark; concolorous with the pileus or paler, the apex pallid. **Odor** farinaceous, soon fading. **Taste** mild.

Basidiospores (8.4-)8.8-10.4(-12.0) X (4.4-)4.8-5.6 μm [$\bar{x} = 9.8 \pm 0.7$ X 5.0 ± 0.4 μm , Q = 1.7-2.2, $q^{-1} = 2.0 \pm 0.1$, n = 36 spores], ellipsoid, strongly amyloid. **Basidia** 23.2-31.2 X 7.2-8.8 μm , 4-spored (possibly 2-spored, see commentary), clavate, clamped, sterigmata 2.4-4.8 μm in length; basidioles similar. **Cheilocystidia** 17.6-48 X 3.2-12 μm , slender to broadly clavate, apically giving rise to 1 to several short to quite long, simple or branched excrescences that range from cylindric to coarse and contorted, 2.4-22.4 X 1.2-4 μm , clamped, hyaline, forming a sterile edge or mixed with basidia. **Pleurocystidia** rare to scattered, similar to cheilocystidia. **Pileipellis** a cutis; hyphae 1.6-4 μm diam, clamped, covered with cylindric, simple to branched excrescences, up to 12.8 X 1.2 μm , thin-walled, non-gelatinous, hyaline. **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Pileus trama** composed of cylindric and \pm inflated hyphae, brownish-vinescent in Melzer's reagent. **Lamellar trama** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Stipe tissues** monomitic, parallel; cortical hyphae 1.6-3.2 μm diam, clamped, covered with cylindric, simple to branched, short to very long excrescences, 1.2-41.6 X 1.2-2.4 μm ; terminal cells similar.

Habit, habitat, and distribution. Densely gregarious on the peeling bark of *Arbutus menziesii* Pursh (madrone). Known only from Oregon, November to December.

Material examined. Oregon. Josephine Co.: Cave Junction, 29 November 1937, AHS 9224 (Paratype, MICH); same location, 1 December 1937, AHS 9286 (Paratype, MICH).

Commentary. The macroscopic description is adapted entirely from Smith (1947). The microscopic description is based upon my observations of the two collections listed above.

Although *M. madronicola* has not yet been collected from California, it is included here as a suspected taxon. *Mycena madronicola* appears to be restricted to growth on the bark of *Arbutus menziesii* and is therefore expected to be present throughout the range of this species, which extends from the coastal regions of British Columbia to those of southern California, with populations in the central Sierra Nevada (Petrides & Petrides, 1992). I examined several specimens from both SFSU and HSU identified as *M. madronicola*, unfortunately all of these collections were incorrectly identified and represent taxa other than *M. madronicola*.

Smith (1947) placed *M. madronicola* in stirps Corticola of section

Corticolae, along with *M. corticola* sensu Kühner, *M. pseudocorticola* Kühner, and *M. corticalis* A. H. Sm. (Maas Geesteranus, 1986c, 1992b). However, Maas Geesteranus (1986c) segregates these taxa, placing *M. madronicola* in section *Cinerellae* Singer ex Maas Geest. presumably due to its similarity to *M. cinerella*. Maas Geesteranus places the other 3 taxa in section *Supinae* Konr. & Maubl. due to their globose to subglobose spores. Maas Geesteranus (1986c) states that he is uncertain how to separate *M. madronicola* from *M. cinerella* except for the “meaningless” characters he uses in his key, namely the corticolous habit and the more pronounced brownish coloration of *M. madronicola*. While the two species are undoubtedly very similar microscopically, it is my opinion that the cheilocystidia of *M. madronicola* generally tend to have coarser as well as often longer and more contorted excrescences. I also feel that the apparently strict corticolous habit of *M. madronicola* is anything but meaningless.

Maas Geesteranus (1986c) also reports the presence of 2-spored basidia in at least one basidiome of collection AHS 9224. Although I failed to resolve any 2-spored basidia in my investigations, I did observe pleurocystidia in both collections examined, a condition that neither Smith or Maas Geesteranus observed. The presence of pleurocystidia is another character that may be used to differentiate *M. madronicola* from *M. cinerella*.

***Mycena* section *Filipedes* (Fr.) Quél., Champ. Jura Vosges p. 106. 1872.**

Basidiomes small to fairly large. Pileus surface initially pruinose, glabrescent, dry, moist, or at times slightly viscid. Context thin. Lamellae ascending-adnate, adnate, or notched, often with a decurrent tooth, narrow, occasionally somewhat ventricose; whitish, brownish, olivaceous or greenish, some species developing incarnate tones in age; the edge convex, concolorous with the sides, paler, or citrine to greenish. Stipe fairly long, hollow; surface minutely pruinose to puberulous, glabrescent, not viscid; \pm concolorous with the pileus, some species with bluish to violaceous tones which fade to brownish in age; the base covered with whitish or more intensely colored fibrils. Odor indistinct, raphanoid, alkaline, iodoform, rancid, chemical, or fragrant. Taste similar or indistinct.

Basidiospores ellipsoid, smooth, amyloid. Basidia 2-spored or 4-spored, clavate, generally clamped. Cheilocystidia ellipsoid, subglobose, globose sphaeropedunculate, obovoid, clavate, obpyriform, or \pm irregular shaped, sessile, pedicellate, or with a long stalk, sparsely to densely covered with generally evenly spaced, cylindrical excrescences. Pleurocystidia similar if present. Pileipellis a cutis; hyphae covered with excrescences. Stipe cortical hyphae generally covered with excrescences.

Growing on leaves, needles, and other debris of conifers and hardwoods, herbaceous plant debris, on decaying wood, moss covered trunks of living trees, in mossy or grassy areas, and among herbaceous plants on coastal dunes.

Type species: *Mycena filopes* (Bull.: Fr.) P. Kumm.

Key to the California species of section Filipedes.

1. Pileus and stipe with distinct yellowish tones; stipe base covered with yellow to yellowish green fibrils; lamellar edge often pale yellow to yellowish green
..... *M. chloranthoides*
1. Pileus and stipe generally lacking distinct yellowish tones or only developing them in age; stipe base covered with whitish to whitish gray fibrils; lamellar edge not yellow to yellowish green 2
 2. Cheilocystidia covered with unevenly spaced, simple to branched excrescences *M. atroalboides*
 2. Cheilocystidia covered with ±evenly spaced, generally simple, narrow excrescences 3
3. Cheilocystidia with relatively few excrescences, the majority of the cheilocystidia sessile, forming a thick, sterile lamellar edge; the stipe cortical hyphae giving rise to numerous, generally clavate terminal cells that are entirely or apically densely covered with short simple excrescences; the margin of the pileus often extending beyond the lamellae; the lamellae not developing incarnate tones in age *M. filopes*
3. Cheilocystidia with numerous excrescences, generally with a narrowed or pedicellate base, not forming a thick edge, often intermixed with basidia; the stipe cortical hyphae not giving rise to numerous terminal cells, any present generally similar to hyphae or slightly broader; pileus margin not extending beyond the lamellae; the lamellae often developing incarnate tones in age
..... *M. metata*

Mycena chloranthoides Mass Geest., Proc. Kon. Ned. Akad. Wetensch. C. 87(4): 426. 1984.

=*Mycena elegans sensu* A. H. Sm., Mycologia 28: 420. 1936.

Pileus 9-35 mm diam, convex to obtusely conical, becoming campanulate in age; margins entire or becoming eroded to uneven in age, smooth or shallowly striate, pellucid-striate; surface moist, initially white-pruinose, glabrescent, hygrophanous; disc "dark olive" to dark brown (6-8F5-8), the margins pale clear yellow ("light chalcedony yellow") to light yellowish brown (5-6D4-5), fading to whitish, the entire pileus fading to pale grayish brown as it dries. **Context** thin, up to 1 mm, concolorous with the pileus or watery gray. **Lamellae** ascending-adnate, with or without a decurrent tooth, 20-28 reaching the stipe, close with 1-2 series of lamellulae, narrow to moderately broad (up to 4 mm); at first pale grayish, soon becoming brownish gray to olivaceous gray, often developing sordid purplish-brown stains in age; the edge pale to "pale green yellow." **Stipe** 40-125(-

150) X 1-3 mm, central, terete, equal or with a slightly enlarged base, hollow; surface moist, dull, minutely pruinose at the apex, glabrescent below; olive brown with distinct yellowish tones (4D-E4-5), the apex and base often paler, in age often staining reddish brown from the base upwards; the base covered with yellowish to "pale greenish yellow " fibrils. **Odor** and taste indistinct.

Basidiospores 8.0-9.6(-10.4) X 4.0-5.6 μm [$x^- = 8.8 \pm 0.6 \times 4.9 \pm 0.3 \mu\text{m}$, $Q = 1.6-2.2$, $q^- = 1.8 \pm 0.2$, $n = 125$ spores], ellipsoid, smooth, amyloid. **Basidia** 20.0- 27.2 X 6.8-8, 4-spored, clavate, clamped, sterigmata up to 5.6 μm in length; basidioles similar. **Cheilocystidia** 22-48 x (5.6-)7.2-14.4(-16) μm , slender- to broadly clavate, rarely irregular-clavate and/or split into two heads apically, the upper portion covered with evenly spaced, cylindric, generally short, simple excrescences, 0.8-5.6 X 0.8-1.6 μm , rarely with an additional one to several longer, occasionally furcate excrescences, up to 13.6 μm in length, mixed with scattered basidia, clamped. **Pleurocystidia** similar, scattered to abundant. **Pileipellis** a cutis; hyphae 2.0-5.6 μm diam, clamped, covered with cylindric, simple to branched excrescences which tend to form dense masses, 1.6-10.4 X 1.2-1.6 μm . **Hypodermium** composed of inflated cells, dextrinoid. **Lamellar trama** similar. **Stipe** tissues parallel, monomitic, dextrinoid; cortical hyphae 1.6-5.4 μm diam, clamped, covered with cylindric, simple to branched excrescences, 1.6-12 X 1.2-1.6 μm , which are occasionally covered with gelatinous matter; terminal cells similar to hyphae or slightly broader (-6.4 μm), covered with excrescences.

Habit, habitat, and distribution. Gregarious to scattered on conifer debris. In California it has been collected in the fall and winter from the North Coast, Outer North Coast Ranges, and Klamath Ranges. In addition to California, Smith (1947) reported the species (as *M. elegans*) from Oregon, Washington and Michigan.

Material examined. California. Del Norte Co.: Crescent City, 30 October 1937, AHS 8248 (as *M. elegans*; MICH). Humboldt Co.: Orick, 3 December 1935, AHS 3729 (as *M. elegans*; MICH). Mendocino Co.: Navarro River Redwoods State Park, 22 November 1998, BAP 206. **Oregon.** Douglas Co.: Lake Tahkenitch, 19 November 1935, AHS 3546 (Holotype; MICH). **Washington.** Clallam Co.: Mt. Angeles, 21 September 1941, AHS 17122 (as *M. elegans*; MICH).

Commentary. The macroscopic description is adapted from Smith (1947) and complemented by my observations of collection BAP 206. The microscopic description is based upon my examinations of the collections listed above.

The olivaceous to dark brownish coloration of the disc coupled with yellowish tones of the margins are some of the most distinguishing features of *M. chloranthoides* macroscopically. Other California species that are characterized by a pileus disc with a distinct olivaceous or brownish component and more intensely colored margins include *M. aurantiomarginata*, *M. citrinomarginata*, and *M. olivaceomarginata*. *Mycena aurantiomarginata* can be distinguished easily from *M. chloranthoides* by the latter species more yellowish coloration, the

tendency of the lamellae and stipe to develop sordid purplish stains, and the lack of smooth stipe cortical hyphae. *Mycena olivaceomarginata* and the more variable *M. citrinomarginata* can be distinguished from *M. chloanthoides* by the former species having very different cheilocystidia as well as numerous other macro- and microscopic characters.

Although Mass Geesteranus (1981) originally agreed with Kühner's treatment of *M. elegans* sensu A. H. Sm. as a synonym of *M. chloantha* (Fr.: Fr.) P. Kumm. (1938), he later elevated Smith's concept of *M. elegans* to the species level as *M. chloanthoides*. The characters Mass Geesteranus (1984) uses to separate *M. chloantha* from *M. chloanthoides* include the latter species generally longer excrescences of the stipe cortical hyphae, a higher number of lamellae reaching the stipe, smaller spores, and a different odor and habit. *Mycena chloantha* appears to be restricted to growth among mosses and grasses on coastal dunes. Thus far, *M. chloantha* is known only from Europe.

Mycena atroalboides (Peck) Sacc., Syll. Fung. 5: 276. 1887.

=*Agaricus atroalboides* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 27: 93. 1875.

=*Prunulus atroalboides* (Peck) Murrill, N. Am. Flora 9: 329. 1916.

=*Mycena caesia* Peck, Torrey Bot. Club. 22: 486. 1895.

=*Mycena plicosa* sensu A. H. Sm., N. Am. Sp. Mycologia 27: 599. 1935.

=*Mycena subplicosa* sensu A. H. Sm., N. Am. Sp. *Mycena* p. 280. 1947.

Pileus 5-21.5 mm diam, obtusely conical to paraboloid, the disc often flattened, expanding in age to campanulate, convex, or plano-convex, often with a flattened umbo; the margin often incurved at first, tending to become flared or upturned in age, often eroded or crenate, pellucid-striate; surface moist, dull, smooth to shallowly sulcate, initially covered with a pruinose bloom, glabrescent, hygrophanous; light grayish brown (5-6D3), grayish brown (7F3), brown to dark brown (6-7E-F4-6) or nearly black on the disc, light brown to brown (6D-E3-5) or grayish towards the margin, fading to grayish with moisture loss, the edges often pale grayish to buff. **Context** thin, up to 1 mm thick, concolorous with pileus.

Lamellae ascending-adnate with a short decurrent tooth, 13-20 reaching the stipe, close with 1-3 series of lamellulae, narrow (up to 2.5 mm), white to pale gray, often developing sordid spots in age; the edges concolorous, convex. **Stipe** 25-71(-120) X <1-1.5(-2) mm, central, terete, equal, hollow; surface dry, minutely pruinose overall at first, remaining so at apex, glabrescent and slightly polished below; the apex white to pale gray, concolorous with the pileus or slightly paler below (5-6D2-3), often developing sordid bruises towards base; the base scarcely to densely covered with white fibrils. **Odor** alkaline or raphanoid. **Taste** raphanoid or indistinct.

Basidiospores 7.2-10.4 X 3.2-4.8 μm [$x^{\bar{\bar{}}}$ = 8.6 \pm 0.7 X 4.2 \pm 0.4, Q = 1.7-2.6, $q^{\bar{\bar{}}}$ = 2.1 \pm 0.2, n = 165 spores], ellipsoid, smooth, thin-walled, amyloid.

Basidia 20.0-28.4 X 6.0-7.6 μm , 4-spored, clavate, clamped, sterigmata up to 6.4

μm in length; basidioles similar. **Cheilocystidia** 17.6-47.2 X (6.4-)8.0-18.4 μm , clavate to slightly irregular, rarely with more than 1 \pm rounded head, clamped, the upper portion covered with unevenly spaced, \pm cylindric, simple to branched, straight or curved excrescences, 1.6-14.4 X 1.2-2.0 μm ; forming a sterile lamellar edge. **Pleurocystidia** absent to scattered, similar to cheilocystidia when present. **Pileipellis** a cutis; hyphae 1.6-4.0(-5.6) μm diam, clamped, covered with cylindric, simple to branched, straight or curved excrescences which tend to form dense masses, 1.6-11.2 X 1.2-1.6 μm ; underlaid by a subpellis of \pm smooth, clamped, slightly broader hyphae, 2.4-6.0 μm diam **Hypodermium** composed of inflated cells, brownish-vinescent in Melzer's reagent. **Pileus** trama composed of cells similar to those of hypodermium, brownish-vinescent in Melzer's reagent. **Lamellar** trama similar. **Stipe** tissues monomitic, parallel, vinescent in Melzer's reagent; cortical hyphae 1.6-4.0 μm diam, clamped, covered with scattered to fairly closely spaced cylindric, simple to furcate, more rarely branched excrescences, 1.2-6.4 X 1.2-1.6 μm ; terminal cells up to 5.6 μm diam, densely covered with excrescences.

Habit, habitat, and distribution. Gregarious on conifer debris. In California it has been collected in the fall from the coniferous and mixed evergreen forests of the Klamath Ranges, Outer North Coastal Ranges, and the San Francisco Bay Area. In addition to California, Smith (1947) also reported the species from Michigan, Washington, Tennessee, New York and Idaho in the United states, and British Columbia in Canada.

Material examined. California. Del Norte Co.: Crescent City, 31 October 1937, AHS 8276 (MICH); Gasquet, Panther Flat Campground, 16 November 1997, DED 6684. Humboldt Co.: Prairie Creek State Park, Rugg Grove on Alder Camp Rd., 9 November 1991, DED 5387; Big Lagoon, 9 November 1997, BAP 171; same location 9 November 1997, BAP 173; same location, 9 November 1997, BAP 174. Marin Co.: Muir Woods National Monument, Ocean View Trail, 24 November 1966, Madden 569; Samuel P. Taylor Sate Park, 16 November 1997, BAP 181.

Commentary. The macroscopic description of *M. atroalboides* is based upon observations of fresh material by Desjardin and myself. The microscopic description is based upon my examination of the collections listed above.

Although Smith (1947) described the odor of *M. atroalboides* to be mild or slightly of radish, my observations of the fresh material revealed a fairly distinct alkaline odor to a majority of the collections. It was also my experience that the bloom which is initially present on young pilei disappears rather quickly and is often entirely absent in collections composed of mature specimens.

Maas Geesteranus (1983) considers both *M. plicosa* sensu A. H. Sm. and *M. subplicosa* sensu A. H. Sm. to be misapplied names which actually represent *M. atroalboides*. Although he felt that the two species had little in common, Smith (1947) was well aware of the fact that his concept of *M. plicosa* was likely to key out with *M. atroalboides* due to the sordid stains that tend to develop on the lamellae of both species. However, Smith also felt that the two species could

readily be distinguished by the more numerous pleurocystidia and thicker pellicle of *M. plicosa*. Smith separated *M. plicosa* from *M. subplicosa* on the basis of the latter species' thinner pellicle, less fragile stipe, weaker dextrinoid reaction of the pileus and lamellar trama, and its tendency to develop yellowish tints on the pileus margin. Although I have not had the opportunity to examine any of Smith's collections representing *M. plicosa* or *M. supplicosa*, I am inclined to agree with Maas Geesteranus' assessment of the situation due to the high degree of similarity in Smith's descriptions for all three species, both macro- and microscopic.

Mycena filopes (Bull.: Fr.) P. Kumm., Führ. Pilzk. p. 110. 1871.

≡ *Agaricus filopes* Bull.: Fr., Syst. Mycol. 1: 142. 1821.

= *Mycena filopes* f. *tetraspora* J. E. Lange, Dansk. Bot. Ark. 1(5): 34. 1914.

= *Mycena iodiolens* Lundell, K. Svenska Vet. Akad. Skr. Naturskyddsår 22: 8. 1932.

= *Mycena graveolens* Kauffman & A. H. Sm., Pap. Mich. Acad. Sci. 17: 181. 1933.

= *Mycena vitilis sensu* Ricken, Blätterp. p. 430. 1915.

= *Mycena vitilis* var. *typica* f. *typica sensu* Kühner, Le Genre *Mycena* p. 299. 1938.

= *Mycena amygdalina sensu* Singer, Persoonia 2: 6. 1961.

Pileus 4-21 mm diam, conical to campanulate, more rarely convex; margins incurved at first, entire, becoming eroded, often projecting beyond the lamellae, pellucid-striate, often sulcate in age; surface moist, dull or polished, minutely pruinose at first (visible as a whitish-gray bloom), glabrescent, hygrophanous; disc grayish brown (5-7E3), brown (6-7E4-6), or dark brown (6-7F5-7), the margins pale grayish brown (6D3) or creamy-whitish, extreme edges often light gray, fading to light gray or creamy-white overall with moisture loss.

Context thin, concolorous with the pileus or paler. **Lamellae** ascending-adenate, generally with a decurrent tooth, 18-31 reaching the stipe, close to nearly crowded with 2 series of lamellulae, narrow (up to 3 mm), white to whitish gray, or pale grayish brown; the edge convex to convex-sinuate, concolorous with the sides or paler. **Stipe** 20-103(-150) X 1-2.5 mm, central, terete, equal, hollow; surface moist to dry, minutely pruinose at first, remaining so at apex, glabrescent below, somewhat polished; white to pale grayish at the apex, grayish to grayish brown (6D3-4), brown (6-8E4-5), or dark brown (6F7) below; the base covered with whitish to whitish gray fibrils. **Odor** indistinct or of iodine. **Taste** indistinct.

Basidiospores 10.4-11.2(-12.0) X (-5.6)6.0-6.4(-6.8) µm in 2-spored forms [$x^{\bar{}} = 10.8 \pm 0.4$ X 6.2 ± 0.3 µm, $Q = 1.6-1.9$, $q^{\bar{}} = 1.7 \pm 0.1$, $n = 25$ spores]; 8.0-10.4 X 4.6-6.0 µm in 4-spored forms [$x^{\bar{}} = 8.5 \pm 0.6$ X 4.9 ± 0.4 µm, $Q = 1.4-2.1$, $q^{\bar{}} = 1.7 \pm 0.1$, $n = 66$ spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** (18.4-)22.0-30.4 X 6.4-8.4 µm, 2-spored or 4-spored, clavate, clamped, sterigmata up to 6.4 µm in length; basidioles similar. **Cheilocystidia** 12.0-25.6 X

8.0-16.8(-20) μm , forming a thick sterile edge, \pm ellipsoid, subglobose, globose, or broadly clavate, generally sessile, more rarely with a short, \pm broad pedicel, clamped, the clamps often difficult to resolve, the upper portion covered with relatively few, \pm evenly spaced, cylindric, narrow, simple, generally short excrescences, 1.2-5.6(-18.4) X 0.8-1.2 μm . **Pleurocystidia** absent to rare, similar to cheilocystidia when present. **Pileipellis** a cutis; hyphae 1.6-4.0 μm diam, clamped, densely covered with short, cylindric, narrow excrescences, 0.8-6.4 X 0.8-1.2 μm , occasionally with longer, branched excrescences (-13.6), which tend to form dense masses; terminal cells slightly broader, up to 8 μm diam, densely covered with excrescences. **Hypodermium** composed of inflated cells, dextrinoid. **Pileus and lamellar trama** similar. **Stipe tissues** monomitic, parallel, dextrinoid; cortical hyphae 1.2-4.0 μm diam, clamped, covered with cylindric, generally simple, more rarely furcate excrescences, 1.6-6.4(-8.8) X 0.8-1.2 μm ; terminal cells 20-47.2 X 4.8-16 μm , \pm clavate or similar to hyphae with a swollen, clavate to globose terminus, the apex or entire surface densely covered with \pm evenly spaced, short, cylindric excrescences, 0.8-4.4 X 0.8-1.2 μm .

Habit, habitat, and distribution. Gregarious, scattered, or subcespitose on leaves, needles, and other herbaceous debris under conifers and hardwoods, in mossy areas, and on decaying wood. In California it has been collected in the fall and winter months from the North Coastal and Klamath Ranges, and from the northern High Sierra Nevada in the fall. In addition to California (as *M. iodiolens*), Smith (1947) reports *M. filopes* from Alabama, North Carolina, Tennessee, New York, Ohio, Michigan, Washington, and Oregon. Maas Geesteranus reports the species from Europe and the United States.

Material examined. California. Del Norte Co.: Smith River, 16 November 1937, AHS 8784 (as *M. iodiolens*; MICH). Humboldt Co.: Big Lagoon, 17 October 1997, BAP 137. Mendocino Co.: Navarro River Redwoods State Park, 22 November 1997, BAP 185; same location, 22 November 1997, BAP 187. Sierra Co.: Chapman Saddle Road, ~ 0.5 mi from jct. with Hwy. 49, 10 October 1998, BAP 196; same location, 10 October 1998, BAP 197; same location, 10 October 1998, BAP 198. Siskiyou Co.: Siskiyou National Forest, 15 November 1937, AHS 8750 (as *M. iodiolens*; MICH).

Commentary. The macroscopic description is based upon my observations of fresh material, with additional information adapted from Smith (1947) and Maas Geesteranus (1984). The microscopic description is based upon my examination of the collections listed above.

Maas Geesteranus (1984, 1992b) considers *M. iodiolens* a synonym of *M. filopes*, while Smith (1947), retained the two as separate species, citing the distinctive odor of *M. iodiolens* as well as the tendency of this species pileus to extend beyond the lamellae as characters useful in delimiting these taxa. During the course of this investigation collections were encountered that were characterized by both a pileus margin which extended beyond the lamellae, and which lacked any iodoform odor. Investigation of the Smith's collections from California identified as *M. iodiolens*, revealed that these collections represent the

same species as the more recent collections made during this investigation. Based on these findings, as well as my comparison of the California material with the description of *M. filopes* provided by Maas Geesteranus, I have chosen to follow this author's placement of *M. iodolens* in synonymy in the present work.

Mycena metata (Fr.) P. Kumm., Führ. Pilzk. p. 109. 1871.

≡ *Agaricus metatus* Fr., Syst. Mycol. 1: 144. 1821.

≡ *Mycena filopes* var. *metata* (Fr.) Arnolds, Bibl. Mycol. 90: 199. 1982.

(Not validly published)

= *Mycena phyllogena* (Pers.) Singer, Persoonia 2: 38. 1961.

= *Mycena phenolica* Mez, Jber. Schles. Ges. Vaterl. Cult. (II Abt. Naturw., Zool. Bot. Sect.) 76: 15. 1889.

= *Mycena phyllophila* Velen., České Houby p. 316. 1920.

= *Mycena tenella* f. *solitaria* Oort, Meded. Ned. Mycol. Ver. 16-17: 237. 1928.

= *Mycena metata* f. *sphagnicola* Kotlaba, Česká Mykol. 6: 75. 1952.

= *Mycena vitilis* sensu Bres., Icon. Mycol. 6: pl. 252, fig. 1. 1928.

= *Mycena vitrea* var. *tenella* sensu Kühner, Le Genre *Mycena* p. 289. 1938.

= *Mycena iodolens* var. *tenella* sensu Kühner & Romagn., Fl. Anal. Champ. Sup. p. 102. 1953.

= *Mycena sepia* var. *tenella* (Fr. sensu Arnolds) Arnolds, Bibl. Mycol. 90: 215, 416. 1982. (Not validly published)

Pileus 8-25 mm diam, conic, obtusely conic, or campanulate; margins entire, often becoming flared and split radially, pellucid-striate, occasionally striate at maturity; surface dry to subviscid, initially covered with a faint bloom, glabrescent, hygrophanous; grayish brown (7E-F3) to brown (7D-F4; 7E5-6) on the disc, the margin pale grayish brown (6-7C-D2-3) or paler, in age often developing yellowish or pinkish tones overall **Context** thin, watery brown.

Lamellae ascending-adnate to adnate, often with a short decurrent tooth, 13-26 reaching the stipe, close to subdistant with 1-3 series of lamellulae, narrow to moderately broad (up to 4.5 mm), initially white, soon becoming pale gray to pale grayish brown, often developing pinkish or incarnate tones; the edge convex, concolorous with the sides or paler. **Stipe** 25-100 X 1-2.5 mm, central, terete, equal or with a slightly broader base, hollow; surface smooth, dry, dull or shiny, often appearing translucent, apex glabrous to faintly pruinose, glabrous below; pale grayish brown (6C-D3) to yellowish brown (5E4) or brown (6E4-5), the apex white to pale grayish; the base densely to scarcely covered with whitish fibrils. **Odor** rancid, hardly alkaline, or indistinct. **Taste** indistinct.

Basidiospores 9.2-11.2(-12.2) X 4.8-6.1 μm [$x^- = 10.5 \pm 0.6$ X 5.6 ± 0.4 μm , $Q = 1.5-2.2$, $q^- = 1.9 \pm 0.2$, $n = 95$ spores], ellipsoid, smooth, thin-walled, amyloid. **Basidia** 20-28.8 X 6.4-7.6 μm , 2-, 3-, or 4-spored, clavate, clamped, sterigmata 2.4-8.0 μm in length; basidioles similar. **Cheilocystidia** 18.4-40.8 X 7.2-20.4 μm , clavate to \pm sphaeropedunculate, generally with a narrowed, stipitate base, more rarely sessile, clamped, the upper portion covered with \pm evenly

spaced, cylindric, generally simple, more rarely branched, straight to curved excrescences, 0.8-5.1(-8.8) X 0.8-1.2 μm , thin-walled, forming a sterile edge or mixed with basidia. **Pleurocystidia** similar, abundant to infrequent, more rarely absent altogether. **Pileipellis** a cutis; hyphae 1.6-7.2 μm diam, clamped, covered with short to quite long, simple to highly branched, cylindric excrescences, 1.2-22 X 1-1.6 μm , which tend to form dense masses. **Hypodermium** composed of inflated cells, dextrinoid. **Lamellar** trama similar. **Stipe tissues**, monomitic, parallel, dextrinoid; cortical hyphae 1.6-4.6 μm diam, clamped, covered with cylindric, simple, rarely furcate excrescences, 0.8-5.6(-7.2) X 0.8-1.2 μm ; terminal cells similar to hyphae or slightly broader (-5.6 μm), covered with excrescences.

Habit, habitat, and distribution. Scattered to gregarious on needles, leaves, and other debris of conifers and hardwoods. In California it has been collected in the fall from the North Coastal and Klamath Ranges, and the in the spring from the northern High Sierra Nevada. In addition to California, Smith (1947) reports the species from Pennsylvania, New York, Michigan, Idaho, Washington, and Oregon in the United States, and from Nova Scotia to Ontario in Canada. Maas Geesteranus (1984) reports *M. metata* from Europe.

Material examined. California. Del Norte Co.: Crescent City, 17 November 1937, AHS 8836 (MICH); Gasquet, Panther Flat Campground, 16 November 1997, DED 6682. Humboldt Co.: Big Lagoon, 7 November 1997, BAP 200. Sierra Co.: near Downieville, Hwy 49, 6 June 1993, DED 5739. Siskiyou Co.: Siskiyou National Forest, 11 November 1937, AHS 8624 (MICH).

Commentary. The macroscopic description is based upon observations made by Desjardin and myself on fresh material, with additional information adapted from Smith (1947) and Maas Geesteranus (1984, 1992b). The microscopic description is based upon my examination of the collections listed above.

Aside from the characters used to differentiate *M. metata* and *M. filopes* in the key above, there remains very little by which these species can be easily distinguished from one another. Smith (1947) stated that *M. metata* is characterized by its vinaceous-brown coloration and sharp (but faint) alkaline odor among other characters. Unfortunately these characters do not apply to the majority of the fresh California material examined in this investigation, which typically lack any vinaceous coloration and/or alkaline odor. Smith also states that in the absence of vinaceous coloration (i.e., in more grayish specimens), flesh colored tones are nearly always present once the pileus has faded. While pinkish tones were encountered in the lamellae of most fresh specimens collected, this was by no means true for the pileus, which typically ranged from dingy grayish to pale grayish brown and with or without yellowish tones, only rarely developing pinkish tones. Microscopically however, the collections made during this investigation undoubtedly represent the same species as those collections

LITERATURE CITED

- Beardslee, H. C. and W. C. Coker. 1924. The *Mycenas* of North Carolina. J. Elisha Mitchell Sci. Soc., Vol XL: 49-91, pl. 6-30.
- Curtis, M. A. 1867. A catalogue of the indigenous and naturalized plants of the state. Geological and natural history survey of North Carolina. Part III. Raleigh, North Carolina.
- Desjardin, D. E. 1993. Notes on *Mycena cylindrospora* and *Eomyccenella echinocephala*. Mycologia 85: 509-513.
- Desjardin, D. E. 1995. A preliminary accounting of the worldwide members of *Mycena* sect. *Sacchariferae*. Biblio. Mycol. 159: 1-89.
- Desjardin, D. E., and A. Bessette. 1997. A new *Mycena* from New York. Mycotaxon 62: 299-303.
- Desjardin, D. E. 1987. The agaricales (Gilled Fungi) of California. Tricholomataceae I. Marasmioid fungi: the genera *Baeospora*, *Crinipellis*, *Marasmiellus*, *Marasmius*, *Micromphale* and *Strobilurus*. Mad River Press, Eureka, California. 99 pp.
- Donk, M. A. 1962. The generic names proposed for Agaricaceae. Bieheft zur Nova Hedwigia, Heft 5: 1-320.
- Fries, E. M. 1821. *Systema Mycologicum*, Vol. I. Lundae.
- Fries, E. M. 1874. *Hymenomyces Europaei*. Upsaliae.
- Gray, S. F. 1821. *A Natural Arrangement of British Plants, According to Their Relations to Each Other, Vol. I*. Baldwin, Cradock, and Joy. London.
- Gulden, K. and K. M. Jenssen. 1982. *Mycena* and related genera in alpine habitats of Southern Norway. In Laursen, G. A. and J. F. Ammirati eds. Arctic and Alpine Mycology, the First International Symposium on Arct-Alpine Mycology. University of Washington, Washington. 559 pp.
- Guo, Shun-Xing; Li Fan; We-Qin Cao; Ji-Tang xu; PeiGen Xiao. 1997. *Mycena anoectochila* sp. nov. isolated from mycorrhizal roots of *Anoectochilus roxburghii* from Xishuangbanna, China. Mycologia 89(6): 952-954.
- Harkness, H. W. and J. P. Moore. 1880. *Catalogue of the pacific coast fungi*. California Academy of Sciences. 45 p.
- Hickman, J. C. ed. 1993. *The Jepson manual of higher plants of California*.

University of California Press, Berkeley, California.

Kauffman, C. H. 1918. *The Agaricaceae of Michigan, Vol. I*. Michigan Geological and Biological Survey, Pub. 26, Biol. Ser. 5. Lansing, Michigan.

Kerrigan, R. W. 1986. *The agaricales (Gilled Fungi) of California*. 6. Agaricaceae. Mad River Press, Eureka, California.

Kornerup, A. and J. H. Wanscher. 1978. *Methuen handbook of colour*. 3rd ed. Eyre Methuen, London, 252 pp.

Kühner, R. 1926. Contribution à l'étude des Hyménomycètes et spécialement des Agaricalés. *Le Botaniste* 17: 1-215.

_____. 1938. *Le Genre Mycena (Fries), Etude cytologique et systématique des espèces d'Europe et d'Amérique du Nord*. Encyclopédie Mycologique 10: 1-710, Paul Lechevalier, Ed. Paris.

Largent, D. L. 1986. *How to identify mushrooms to genus I: macroscopic features*. Mad River Press, Eureka, California.

Largent, D.; Johnson, D. and R. Watling (consultant). 1977. *How to identify mushrooms to genus III : microscopic features*. Mad River Press, Eureka, California.

Lange, J. E. 1914. Studies in the Agarics of Denmark. I. General Introduction. The Genus *Mycena*. *Dansk Botanisk Arkiv* 1(5): 1-40.

Lange, M. 1955. Macromycetes. Part 2, Greenland Agaricales. In *Meddelelser om Grønland*. København, C.A. Reitzel.

Maas Geesteranus, R. A. 1980. Studies in Mycenas - 15. A tentative subdivision of the genus *Mycena* in the northern hemisphere. *Persoonia* 11: 93-120.

_____. 1981. Studies in Mycena 26. The mycenas described by P.A. Karsten. *Proc. K. Ned. Akad. Wet. C.* 84: 221-231.

_____. 1983. Studies in Mycenas 73-92. *Proc. K. Ned. Akad. Wet. C.* 86: 385-399.

_____. 1983b. Conspectus of the Mycenas of the Northern Hemisphere - 1, Sections *Sacchariferae*, *Basipedes*, *Bulbosae*, *Clavulares*, *Exiguae*, and *Longisetae*. *Proc. K. Ned. Akad. Wet. C.* 86: 401-421.

- _____. 1884. Conspectus of the Mycenas of the Northern Hemisphere - 3, Section *Filipedes*. Proc. K. Ned. Akad. Wet. C. 87: 414-447.
- _____. 1985. Conspectus of the Mycenas of the Northern Hemisphere - 4, Section *Mycena*. Proc. K. Ned. Akad. Wet. C. 88: 339- 369.
- _____. 1986. Conspectus of the Mycenas of the Northern Hemisphere - 8, Sections *Intermediae*, *Rubromarginatae*. Proc. K. Ned. Akad. Wet. C. 89: 279-310.
- _____. 1986b. Conspectus of the Mycenas of the Northern Hemisphere - 6, Sections *Polyladephia* and *Saetulipedes*. Proc. K. Ned. Akad. Wet. C. 89: 59-182.
- _____. 1986c. Conspectus of the Mycenas of the Northern Hemisphere - 7, Section *Cinerellae*. Proc. K. Ned. Akad. Wet. C. 89: 183-201.
- _____. 1988. Conspectus of the Mycenas of the Northern Hemisphere - 9, Section *Fragilipedes*, species A-G. Proc. K. Ned. Akad. Wet. C. 91: 43-83.
- _____. 1988b. Conspectus of the Mycenas of the Northern Hemisphere - 9, Section *Fragilipedes*, species I-R. Proc. K. Ned. Akad. Wet. C. 91: 129-159.
- _____. 1988c. Conspectus of the Mycenas of the Northern Hemisphere - 9, Section *Fragilipedes*, species S-Z. Proc. K. Ned. Akad. Wet. C. 91: 283-314.
- _____. 1989. Conspectus of the Mycenas of the Northern Hemisphere - 11, Section *Hygrocyboideae*. Proc. K. Ned. Akad. Wet. C. 92: 89-108.
- _____. 1989b. Conspectus of the Mycenas of the Northern Hemisphere - 13, Sections *Calomphilae* and *Calodontes*. Proc. K. Ned. Akad. Wet. C. 92: 477-504.
- _____. 1991. Conspectus of the Mycenas of the Northern Hemisphere - 15, Sections *Heimales* and *Exornate*. Proc. K. Ned. Akad. Wet. C. 94:81-102.
- _____. 1992a. *Mycenas of the Northern Hemisphere. I. Studies in Mycenas and other papers*. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, North Holland. 392 p.

_____. 1992b. *Mycenas of the Northern Hemisphere. II. Conspectus of the Mycenas of the Northern Hemisphere*. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, North Holland. 493 p.

Methven, A. S. 1997. The Agaricales (gilled fungi) of California. Russulaceae II. *Lactarius*. Mad River Press, Eureka, California.

Murrill, W. A. 1916a. North American Flora, Vol. 9: 5. The New York Botanical Garden. New York.

_____. 1916b. *Pleurotus, Omphalia, Mycena, and Collybia* published in North American Flora. Mycologia 8: 218-221.

Oort, A. J. P. 1928. De Nederlandsche Mycena's. Meded. Ned. Mycol. Ver. 16-17: 184-255.

Peck, C. H. 1895. New species of fungi. Bull. of the Torrey Bot. Club. 22: 98-211.

Perry, B. A. and D. E. Desjardin. 1999. *Mycena californiensis* resurrected. Mycotaxon LXXI: 495-505.

Persoon, C. H. 1797. *Tentamen dispositionis methodicae fungorum in classes, ordines, genera et familias*. Lipsiae. 76 p., 4 pl.

_____. 1801. *Synopsis methodica fungorum*. Gottingae. 706 p., 8 pl.

Petrides G. A. and O. Petrides. 1992. *A field guide to western trees: Western United States and Canada*. The Peterson Field Guide Series; 44. Boston, Houghton Mifflin Co. 308 pp.

Redhead, S. A. 1981. Agaricales on wetland Monocotyledoneae in Canada. Can. J. Bot., 59: 574-589.

_____. 1984a. Two fern associated mushrooms, *Mycena Lowhagii* and *M. pterigena*, in Canada. Naturaliste Can. (Rév. Écol. Syst.), 111: 439-442.

_____. 1984b. Additional Agaricales on wetland Monocotyledoneae in Canada. Can. J. Bot., 62: 1844-1851.

_____. 1985. Mycological observations, 4-12: on *Kuehneromyces*, *Stropharia*, *Marasmius*, *Mycena*, *Geopetalum*, *Omphalopsis*, *Phaeomarasmius*, *Naucoria* and *Prunulus*. Sydowia, 37: 246-270.

- _____. 1986. Mycological observations 15-16: on *Omphalia* and *Pleurotus*. *Mycologia*, 78:(4): 522-528.
- Redhead, S. A. and L. L. Norvell. 1993. *Mycena gaultheri* rediscovered after 50 years. *Mycotaxon* 66: 97-104.
- Ridgway, R. 1912. *Colour Standards and Colour Nomenclature*. Published by the author, Washington, D.C. 43 p, 53 pl.
- Roussel, H. F. A. 1806. *Flore du Calvades et des terrains adjacens*. 2nd ed. Caen.
- Shanks, K. M. 1997. The Agaicales (gilled fungi) of California. Tricholomataceae II. *Tricholoma*. Mad River Press, Eureka, California.
- Schweinitz, D. L. 1822. Synopsis fungorum Carolinae superioris. *Shrift. d. Naturf. Ges. zu Leipzig* 1: 20-131.
- _____. 1834. Synopsis fungorum in America boreali media degentium. *Trans. Am. Philo. Soc., N.S.* 4: 141-315.
- Singer, R. 1938a Notulae Systematiaceae Sect. Crypt. *Inst. Bot. Acad. Sc. U.S.S.R.* fasc 10-12: 9.
- _____. 1938b. *Rev. de Mycol.* 3: 194.
- _____. 1942. *Lloydia* 5: 129. 1942.
- _____. 1951. *The "Agaricales" (mushrooms) in modern taxonomy*. *Lilloa* 22: 1-832.
- _____. 1962. *The Agaricales in modern taxonomy*. 2nd ed. J. Cramer, Weinheim, 915 pp.
- _____. 1975. *The Agaricales in modern taxonomy*. 3rd. ed. J. Cramer, Vaduz, 912 pp.
- _____. 1886. *The Agaricales in modern taxonomy*. 4th ed. Koeltz Scirntific Books, Koenigstein, Germany, 981 pp.
- Smith, A. H. 1936. Studies in the genus *Mycena*, III. *Mycologia* 28: 410-430.
- _____. 1939. Studies in the genus *Mycena*, V. *Mycologia* 31: 267-285.
- _____. 1947. *North American species of Mycena*. University of Michigan

Press, Ann Arbor, Michigan.

Smith A. H. and W. G. Solheim. 1953. New and unusual fleshy fungi from Wyoming. *Madroño* 12: 103-109.

Snell, W. H. and E. A. Dick. 1971. *A glossary of mycology*. Harvard University Press, Cambridge, Massachusetts.

Thiers, H. D. 1997. The Agaricales (gilled mushrooms) of California. Russulaceae I. *Russula*. Mad River Press, Eureka, California.

Vellinga, E. C. 1988. Flora Agaricina Neerlandica: critical monographs on families of agarics and boleti occurring in the Netherlands, edited C. Bas et al. Vol. 1: 54-64. Rotterdam.

SPECIES INDEX

Mycena

<i>abramsii</i>	46
<i>acicula</i>	81
<i>adonis</i>	83
<i>adscendens</i>	112
<i>alcaliniformis</i>	48
<i>alnicola</i>	42
<i>alphitophora</i>	114
<i>amicta</i>	103
<i>atroalboides</i>	144
<i>aurantiidisca</i>	85
<i>aurantiomarginata</i>	53
<i>bulliformis</i> (nom. prov.)	64
<i>californiensis</i>	69
<i>capillaripes</i>	58
<i>chloranthoides</i>	142
<i>cinerella</i>	138
<i>citrinomarginata</i>	35
<i>clavata</i>	76
<i>clavicularis</i>	135
<i>corticalis</i>	107
<i>culmigena</i>	109
<i>deceptor</i>	32
<i>epipterygia</i>	93
<i>epipterygia</i> var. <i>viscosa</i>	95
<i>excisa</i> (sensu A. H. Smith)	28
<i>filopes</i>	146
<i>fragillima</i>	38
<i>galericulata</i>	122
<i>galericulata</i> var. <i>albida</i>	125
<i>galopus</i>	87
<i>gaultheri</i>	128
<i>haematopus</i>	72
<i>laevigata</i>	30
<i>latifolia</i>	130
<i>leptocephala</i>	39
<i>longiseta</i>	74
<i>maculata</i>	120
<i>madronicola</i>	140
<i>metata</i>	148
<i>murina</i> (aff.)	44
<i>nivicola</i> (nom. prov.)	91
<i>olivaceomarginata</i>	61

<i>oregonensis</i>	23
<i>overholtsii</i>	27
<i>piceicola</i>	118
<i>pura</i>	126
<i>purpureofusca</i>	59
<i>pusilla</i>	117
<i>quinaultensis</i>	105
<i>rosella</i>	51
<i>sanguinolenta</i>	67
<i>speirea</i>	78
<i>speirea</i> f. <i>camptophylla</i>	79
<i>strobilinoides</i>	55
<i>stylobates</i>	100
<i>subcana</i>	41
<i>subconcolor</i>	126
<i>tamalpaiensis</i> (<i>nom. prov.</i>)	134
<i>tenax</i>	97
<i>vitalis</i>	33
<i>vulgaris</i>	98