

## **Fungi of Mount Shasta.**

**(1936—1951).**

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### **Introduction.**

In a recent paper (9) certain brief notes were published concerning the ecology of the fungi of Mt. Shasta. These notes were limited to a discussion of the fungi in relation to the Merriam Life Zones, along with a few other brief items. In order to present a more detailed picture of the mycobiota of the mountain the following paper will present a few notes on the vegetation zones of the mountain followed by a host index to the fungi and a systematic list of the fungi including a discussion of the place of each species in the mycobiota in so far as known from the writer's collections and observations between 1936 and 1942 and in 1946 and 1947. Additional collections found in various herbaria, references in the literature, and a few collections made by the writer since 1947 are included to present as complete a picture as possible.

It is thought that Mt. Shasta forms a good basis for such a report since it is an isolated peak and the fungi and flowering plants (2, 6, 10) which grow upon it have been collected co-extensively during eight summers during which the writer lived at Horse Camp as custodian of the Shasta Alpine Lodge for the Sierra Club of California.

### **The Area Covered.**

#### **Location.**

Mt. Shasta, a dormant volcano of the Cascade Range, is located in south central Siskiyou Co., in northern California. The limits within which collections have been made most intensively include the area above 4000 feet. In general, this is bounded on the west, south and east by a series of connecting roads through the chaparral between Mount Shasta, McCloud, Widow Springs and the Military Pass. From Andesite to Black Butte Station the area is bounded by the Southern Pacific Railroad, and between Black Butte Station and Mount Shasta by lanes through the brush fields east of Black Butte. This area roughly includes about 100 sections of land. It falls within the Mt. Shasta Recreation Area of the Shasta National Forest. The elevation

differential in the area is 4000 to 14,161 feet although few fungi have been collected above 10,000 feet.

Less than five per cent of the surface of the mountain is covered by vegetation directly affected by irrigation from springs and creeks which form meadows.

### Vegetation Zonation.

To understand further the several habitat types found on the mountain the following summary of vegetation zonation is presented. This summary follows, as closely as possible, Daubenmire's system (17).

#### Alpine Zone

In the sense of Daubenmire (17) an „alpine tundra“ occurs on the mountain but this is limited to sparse and scattered growth of numerous herbs and low woody perennials. If this zone is understood as including only that growth above the White Bark Pine zone then no shrub formation occurs in it. If it includes that growth above economic timberline, then, in association with white bark pines which occur as low shrubs, several of the shrubs associated with the white bark pines occur in it. The zone reaches from a ragged line of from 8000—10,000 feet to the summit of the mountain at 14,161 feet although flowering plants have not been found above 13,000 feet and the upper parts of the mountain appear to be inhabited solely by such plant life as thermal algae, red snow, and some lichens. Two principal types of habitat occur for plants: open sandy or gravelly lava flats which may be level or inclined, and cracks between boulders and beside rocks where moisture is held longer than in exposed places, While *Draba breweri* has been reported from as high as 13,000 feet, the highest record for a flowering plant on the mountain, no species is confined to this zone since all species found in it have also been found in the White Bark Pine zone and some species even as low as the Shasta Fir-Mountain Hemlock zone. In this zone springs and streams support no vascular vegetation.

Above the limits of woody plant growth, including white bark pines of a foot or less in height, few or no areas exist which contain the proper conditions for meadow or tundra formation. Water melting from the snow percolates so rapidly that no sod-forming plants have been able to become established. In some sandy openings in boulder fields, especially on gentle slopes where fragments of pumice bombs color the ground yellow, *Carex breweri* forms meadowlike patches; this plant forms clumps which enlarge year after year but the clumps are scattered in areas occupied by this species. Possibly this is the initial stage in a succession leading to a meadow. In the Shasta Fir-Mountain Hemlock and White Bark Pine zones *Juncus parryi*

inhabits more sheltered areas which remain covered with snow banks longer than less sheltered areas.

*Phyllodoce empetriformis* forms loose mats on level places or steep hillsides and gullies which receive a small amount of moisture from seepage after the snow has melted. However, in the colonies observed, except in the meadows to be described below, little soil, and no meadow had formed. The same conditions in a more restricted manner accompany colonies of the shrubby *Pentstemon menziesii* var. *davidsonii*, *Lutkea pectinata* and *Saxifraga tolmiei*.

At the moist side of rocks and boulders where a soil has formed through protection from wind erosion and evaporation of soil moisture numerous plants grow throughout the rock slopes from 8000 to 13,000 feet, although more and more sparsely above 10,000 feet. Other plants grow in more open places where the mountainside has formed a talus slope. Such conditions are common below 9000 feet and especially in the following zone.

#### White Bark Pine Zone.

This zone includes that area on the mountain in which trees occur at the highest altitude reached by woody plants even though at that altitude white bark pines may be no taller than six inches. Quantitative studies have not been made but by observation more than ninety per cent of the „forest“ of this zone is composed of *Pinus albicaulis*. This zone follows ridges up to 10,000 feet and in some valleys remains as low as 8000 feet. In between these widely varying types of habitat the areas unfavorable for white bark pine growth are occupied by sparse vegetation of the Alpine zone. Particularly on the west and north slopes of Shastina this zone is best developed. Here on more or less gentle slopes uninterrupted by stream beds the forest forms a densely matted thicket ten feet high and gradually reduced to less than a foot high above. In these thickets, as elsewhere in this zone, dead branches of the trees throughout the snowless season are hard, dry and brittle.

On ridges and in valleys a few stunted Shasta firs occur with the white bark pines while one tree of *Abies concolor* has been observed on a ridge south of Horse Camp in this zone. Where hemlocks (*Tsuga mertensiana*) grow on the mountain they penetrate into this zone especially above Panther Creek, above Squaw Valley Creek, and north of Diller Canyon on Shastina. A number of shrubs also occurs in this zone. They may be found on exposed slopes as in the case of *Juniperus communis* var. *montanus*, they may form colonies isolated from the conifers by local conditions as in the case of certain large mats of *Holodiscus discolor* var. *glabrescens*, or they may occur in colonies intermingled with the white bark pines such as the mats of *Arctostaphylos nevadensis* and *Castanopsis sempervirens* in the

area between Cascade Gulch and Squaw Valley Creek. Occasional plants of *Haplopappus bloomeri* var. *angustatus* also occur in this zone. On the north bank of Diller Canyon a long tongue of chaparral pushes to the upper limits of this zone. This tongue includes representatives of most of the chaparral species to be found on the mountain. *Cercocarpus ledifolius* occurs in this zone on the north side of Shastina as does the only colony of *Populus tremuloides* on the mountain.

Below timberline, and in the timberline area, occasional springs occur around the mountain. Of these the highest occur above Horse Camp and above Panther Creek Meadows. Eight springs have been found in the area between Cascade Gulch and Squaw Valley Creek. One spring occurs in Diller Canyon and a number of springs along the bank of Mud Creek Canyon irrigate hanging gardens. The flow from these several springs is small and percolates within a few feet to a hundred feet or more from the source.

Squaw Valley Creek meadows originate in springs near the central part of this zone. Additional springs increase the flow of the stream as it descends through the meadows.

### **Shasta Fir-Mountain Hemlock Zone.**

#### **Shasta Fir Association.**

#### **Shasta Fir-Mountain Hemlock Association.**

This is the most extensive zone on the principal slopes of the mountain. It is the Mt. Shasta version of Daubenmire's Fir-Mountain Hemlock zone of the Cascades. It comprises a forest belt extending at times for nearly 3000 feet in altitude. On the southwest side of the mountain the Shasta fir forms a pure stand penetrated only by an occasional specimen of *Pinus monticola* (only one has been observed in the southwest quadrant of the mountain) and by occasional species from zones above and below. From above, occasional white bark pines reach down into favorable habitats among the Shasta firs where they attain a greater size than in their own zone. Those species from below will be discussed later. In certain areas, especially at Panther Creek Meadows, Squaw Valley Creek meadows and north of Diller Canyon, the Shasta firs are partially or completely replaced by *Tsuga mertensiana*. These occur in dense stands, as scattered individuals, or as about half of the forest constituents in a mixture of Shasta fir. West of Mud Creek Canyon there is a mixed conifer forest in which *Pinus monticola* and hemlock occur with the Shasta firs in about equal quantity. There may be other such instances, where moisture relations and other factors permit. The best of these mixed forests lies between 7000 and 8000 feet on the north side of the mountain on the west bank of Bolam Creek where all the zones appear to be

pushed together. Here *Pinus monticola*, *Pinus albicaulis*, *Pinus contorta* var. *latifolia*, *Pinus ponderosa* and *Juniperus communis* var. *montana* grow together with the Shasta firs (*Abies magnifica* var. *shastensis*). An explanation of these mixed forests can best be made after more careful quantitative and qualitative studies of these colonies have been made.

In the Shasta Fir — Mountain Hemlock Zone a number of local variations produce special tree- shrub associations, or small grassy openings in the forest which could be termed dry meadows. Along small streams originating from springs or in the beds of which the water table is sufficiently high (in the case of intermittent streams) *Acer glabrum* and, sometimes, *Salix scouleriana* and *Cornus californica* form stream-bottom associations. In the heather meadows *Phyllodoce empetrifomis*, *Kalmia polifolia* and *Vaccinium caespitosum* form an association which, at times, affects the bed of the stream by building up the bank of the stream. On the south side of Red Butte and in Mud Creek Canyon occur colonies of *Sambucus racemosus*.

Occasional openings occur in the Shasta fir forest. These may be related to the topography of the mountain, and appear to be related to the glacial pattern, although this is obscured by the great accumulation of lava sand and dust probably of morainal character which characterize the soil of these openings. In general, these openings, which range in size from a few hundred feet in diameter to a quarter mile in length and breadth, are characterized by the presence of two species of grasses, *Stipa occidentalis* and *Elymus elymoides* (*Sitanion hystrix*). Forbs are also present. In those openings near Panther Creek Meadows above the Snowline Highway the dominant herb is *Polygonum davisiae*. In none of smaller openings is there enough herbage to present a horse with a good day's grazing. The grasses occur in scattered clumps and do not form a sod. In such a large dry meadow as the one between Panther Creek Meadows and Wagon Camp at the west end of Gray Butte *Haplopappus bloomeri* var. *angustatus* occurs; this shrub also occurs in similar sandy openings at the east base of the mountain near the Mountainhouse Creek devastated area.

Extensive mats of *Arctostaphylos nevadensis* cover the ground in the climax forests of this zone. Apparently here it, too, is climax in contrast to the seral role assigned it by Oosting and Billings (27) in their description of the Red Fir forests of the Sierra Nevada. In this paper it is indicated that mountain manzanita is an invader after fire. On Mt. Shasta there is little or no evidence of this species invading burned areas exclusively since it is universal throughout this zone especially where Shasta firs form pure stands with no obvious evidence of having been burned. Both Shasta fir and mountain manzanita appear in the zone with old, mature, young and

seedling plants. Shrub invaders after fire are more commonly representatives of the seral chaparral to be described below.

Occasionally colonies of shrubs, especially of chaparral shrubs, occur in this zone. This is particularly true of locations which have lost their tree cover through extensive logging, or through the action of fires as a result of logging operations at lower elevations or as a result of lightning. Occasional individuals or colonies of chaparral shrubs may penetrate into the Shasta fir zone because of favorable local factors such as exposed ridges, gully walls, etc. Occasional shrubs have migrated up partially wooded slopes to the limits of this zone as in the case of the association observed on the north side of Diller Canyon where a tongue of chaparral has penetrated to the White Bark Pine zone.

Of the springs noted under the White Bark Pine zone only a few overlap into the Shasta Fir zone and these occur mainly along Mud Creek Canyon where hanging gardens are formed along them on the precipitous canyon wall. One spring occurs on a tributary of Cascade Gulch and it percolates within a hundred feet of its source.

The springs which form the source of Panther Creek originate at the upper edge of this zone and springs both along the course of this stream and of Squaw Valley Creek increase the flow of water in these streams through this zone. If springs did not increase the flow of water in these streams percolation would reduce the extent of the meadows along them. The source of the spring water is melting snow; meadows and creeks are less extensive following winters of light snowfall.

Two large heather meadows occur on the mountain. They lie in the valleys of Panther Creek and Squaw Valley Creek. They possess a number of local variations but their pattern in general is the same. Through the meadow, in a meandering fashion and a times building its bed above the surrounding meadow, the clear creeks flow. The creeks are lined by large patches of heather, laurel and huckleberry. This situation occurs throughout the Shasta Fir zone. Panther Creek meadows are characterized by two large and one small meadow area separated by cascades through Shasta fir-mountain hemlock woods. Squaw Valley Creek meadows are characterized by three long narrow meadows separated by cascades, through similar forests, along which heather also grows. In addition to the springs in which the streams and meadows have their origin a number of spring and seepage areas occur along the meadows and cascades which increase the amount of water in the creek and which are characterized by local variations in the meadow plants. The most prominent of these variations is the swale of mountain rush in a depression east of Red Butte along one end of which Squaw Valley Creek flows.

### **Abies Concolor zone**

At the lower limit of the Shasta Fir zone occurs an area of transition between it and the zone to be discussed next. This Zone is characterized especially in the area between Diller Canyon and Mud Creek Canyon by a predominance of Shasta fir and *Abies concolor*. Locally Douglas fir, ponderosa pine, sugar pine and incense cedar may occur here.

Since this transition occurs on the lower part of the more inclined slopes of the mountain few opportunities are available for meadow openings. However, the Wagon Camp meadows occur mostly in, or just below, this zone. More than in the Shasta Fir zone above, the chaparral penetrates into this area. One unusual shrub association occurs in this area; it is the patch of *Vaccinium occidentale* which dominates the boggy part of the Wagon Camp swamp, hardly more than a quarter acre in extent.

The best development of this zone lies on the southwest slope of the mountain between Cascade Gulch and Wagon Camp. It can be best seen along the Sisson Southern Trail.

This zone, which on a quantitative basis may later be better considered as an ecotone, is quite narrow where it exists, although where favorable places for the growth of *Abies concolor* occur, tongues of this transition extend into the Shasta Fir zone. This is especially true where *Abies concolor* groves have replaced patches of chaparral on favorable slopes. Chaparral extends up into the Shasta Fir zone locally where fire has burned off the forest. When a grove of seedlings of white fir grow up they smother out the chaparral forming an island or tongue of white firs in the chaparral or at the edge of the Shasta Fir zone.

### **Sierra mixed Conifer Zone.**

Ponderosa Pine — Sugar Pine — Douglas Fir —  
Incense Cedar Association.

This zone includes the lower forested slopes of the mountain, except on the north side, and probably at one time occupied those areas now covered with chaparral. Depending on logging conditions, or upon peculiarities of growth, isolated stands of one or more of the species of this zone occur locally. The zone includes *Pinus ponderosa*, *Pinus jeffreyi*, *Abies concolor*, *Pseudotsuga taxifolia*, *Pinus lambertiana* and *Libocedrus decurrens*. Depending upon conditions of logging and fire, tongues of forest reaching down into the chaparral are composed of one or more of these species. On more rugged hill sides and slopes all these species occur together as in the valley of Squaw Valley Creek and in the bed of Mud Creek Canyon where the bed fans out above the dam. While the valley of Cascade Gulch con-

tains a fairly mixed forest of these species, a lava flow just north of it contains a predominance of incense cedar and Douglas fir. At Bear Springs Jeffrey pine and incense cedar predominate, while that portion of Squaw Valley Creek below the McCloud water supply intake contains a Douglas fir-white fir forest, the most luxuriant forest on the mountain. On the north side of the mountain east of Bolam Creek this zone extends above its altitudinal limits of the south side (5500 ft.) to about 7000 feet where it blends with the Shasta Fir zone as noted above. On the northeast side of the mountain, where Military Pass is formed between the mountain and Whaleback or Black Crater, a volcanic ridge to the north, *Pinus contorta* var. *latifolia* has assumed control of a considerable area of rolling land. This lodgepole pine grove is surrounded on more level places with the ponderosa pine forest while above it merges into the Shasta fir forest. On the south side of the mountain occur several colonies of knobcone pine (*Pinus attenuata*) in this zone. The trees are scattered and rarely form a solid stand.

In the Sierra Mixed Conifer zone occur the several springs on the southwest and south sides of the mountain with which most visitors are familiar: Bear Springs, at which a large grassy meadow occurs, MacBride Springs and Widow Springs, at both of which are Public Camps. Also in this zone the spring at the base of Squaw Valley Creek forms the intake for the McCloud water supply. Near Black Butte Station, north of Black Butte and near Weed, is a small spring in a group of conifers which percolates near its source.

#### S e r a l C h a p a r r a l A s s o c i a t i o n .

Portions of the Mixed Conifer Zone are composed of a seral (secondary), rather than a climax (primary), chaparral. Tongues of this scrub reach up into the Shasta Fir zone and even to the White Bark Pine zone. It covers the gentler slopes of the mountain giving them the aspect, from a distance, of a green rolling plain. From the Widow Springs area west and north to the west slopes of Shastina this scrub includes a number of shrubs of which the most conspicuous are *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla* and *Prunus emarginata*. From somewhat north of Cascade Gulch to the Military Pass this chaparral includes *Purshia tridentata*. Creeks and springs in this area are characterized by *Salix scouleriana*, *Cornus nuttallii*, as well as, occasionally, isolated trees or groves of trees of the zone and other shrub species. This occasional occurrence of trees among the chaparral, in isolated colonies, on rock outcroppings or along creeks, with intervening charred snags or sawed stumps, leads to the conclusion that the chaparral forms a temporary cover as a result of intensive logging and burning of the area. This is especially true of the area south of Diller Canyon.



In the area occupied by the chaparral occur springs from which flow large volumes of water. Above 4000 feet on the mountain the more important of these is the one at Howard which forms the water supply for the City of Mount Shasta. The big springs which enter the Sacramento, McCloud, Pit and Shasta Rivers are not considered here since they occur below 4000 feet.

The recent republication (19) of a report of an ascent of Mount Shasta in 1856 indicates that even in the gold rush days before intensive logging started in the area there was a chaparral vegetation between the community now known as Mount Shasta and the lower forests of yellow and sugar pines.

The U. S. Forest Service has started to reclaim, with some success, some of these chaparral covered areas by planting ponderosa pine seedlings in the area through which the Shasta Snowline Highway crosses the chaparral.

#### Ponderosa Pine Association.

On the north side of the mountain, below 6500 feet, between Inconstance and Bolam Creeks, occurs a large stand of *Pinus ponderosa* in which the forest is open and no other trees occur. It is a tongue of forest reaching up into the Mixed Conifer Zone. It has been logged but not completely and fires have occurred in it more recently than in other forests on the mountain itself. The south and west sides of the mountain, even as low as 3500 feet at the City of Mount Shasta, show no sign of having had a purely ponderosa pine forest since isolated groves of trees in the chaparral and villages are composed of more than one Sierra Mixed Conifer Zone species.

#### Cercocarpus-Purshia Association.

On the north side of the mountain, between the Lava Parks and the Military Pass, thus occupying a larger base than the previous zone, the lower slopes of the mountain, down to below 4000 feet, are covered with a shrub formation which appears to be an extension of the Juniper-Pinon Zone, or at least a transition between the Sierra Mixed Conifer Zone and the Juniper-Pinon Zone. On the open lava parks and the sandy areas at the base of the mountain the area is covered mostly with *Purshia tridentata* and *Cercocarpus ledifolius*. The former also grows in the chaparral on the southwest side of the mountain, especially near MacBride Springs, south of the lava parks. The latter also occurs as far up the mountain as the „Ghost Forest“ of the White Bark Pine zone near the upper end of one of the lava parks. At the lower edge of this area on the mountain occur occasional shrubs of *Artemisia tridentata*, occasional trees of *Juniperus californica* var. *utahensis*, and *Pinus ponderosa*, colonies of *Chrysothamnus nauscosus* var. *occidentalis*, and scattered shrubs or low trees of *Quercus chrysolepsis*. The Juniper-Pinon Zone

extends north into the Shasta Valley at somewhat lower elevations and northeast along the base of Whaleback or Black Crater where the juniper occurs in fairly well developed woodlands.

### Host Index.

The following list is not considered complete and further collections may add to the list of species of various fungi, and add to the lists of hosts on which fungi occur here. It consolidates previously published lists and notes (1, 2, 5, 6, 8, 9, 10, 13, 14, 15, 19, 24), and includes data from at least two other lists of collections made in California and the western states.

### ON TREES.

*Abies concolor*. — *Aleurodiscus amorphus* — *Auricularia auricularis* — *Clavaria abietina* — *Cryptoporus volvatus* — *Dasyscypha arida* — *Echinodontium tinctorum* — *Fomes officinalis* — *Fomes pinicola* — *Ganoderma applanatum* — *Guepiniopsis alpinus* — *Helvella californica* — *Herpotrichia nigra* — *Hirschioporus abietinus* — *Hypoderma robustum* — *Hypodermella abietis-concoloris* — *Hypoxyton diathrauston* — *Lophodermium autumnale* — *Merulius bellus* — *Merulius ravenelii* — *Mycena griseoviride* — *Mycena lilacifolia* — *Phlebia albida* — *Phlebiella candidissima* — *Poria ferrea* — *Pucciniastrum goeppertianum* — *Rhizomorpha subterranea* — *Serpula americana* — *Solenia candida* — *Spongiporus leucospongia* — *Stereum rugisporum*.

*Abies magnifica* var. *shastensis* — *Acremonium ?verticillatum* — *Aleurodiscus amorphus* — *Aleurodiscus roseus* — *Armillaria mellea* — *Aurantioporellus alboluteus* — *Bertia moriformis* — *Cenangium* sp. — *Chaetomium murorum* — *Chloridium* sp. — *Ciboria rufo-fusca* — *Clavaria ?decurrens* — *Clavaria pinicola* — *Clithris crispa* — *Coniophora olivaceus* — *Corticium bicolor* — *Corticium corrugé* — *Corticium cremoricolor* — *Corticium galactinum* — *Corticium luridum* — *Corticium radiosum* — *Corticium scutellare* — *Corticium* spp. — *Crepidotus* sp. — *Cryptoporus volvatus* — *Cylindrocolla* sp. — *Dacrymyces deliquescens* — *Dasyscypha agassizii* — *Dasyscypha arida* — *Dasyscypha serinella* — *Dendryphium pini* — *Durella ?compressa* — *Echinodontium tinctorum* — *Flammula penetrans* — *Fomes annosus* — *Fomes nigrolimitatus* — *Fomes officinalis* — *Fomes pinicola* — *Fomes subroseus* — *Fusicoccum bacillare* — *Ganoderma oregonense* — *Geopyxis cupularis* — *Gibbera* sp. — *Gloeophyllum sepiarium* — *Guepiniopsis alpinus* — *Herpotrichia nigra* — *Hirschioporus abietinus* — *Humaria scutellata* — *Hyaloscypha atomaria* — *Hypoderma abietinum* — *Hysterium acuminatum* var. *alpinum* — *Hysterographium formosum* — *Lachnellula chrysoptthalma* — *Laetiporus sulphureus* — *Lasiochaeria vermiculata* — *Lentinus* sp. — *Lophodermium piceae* — *Melomastia shastensis* — *Merulius atropurpureus* — *Merulius bellus* — *Merulius ceracellus* — *Merulius fugax* — *Merulius ravenelii* — *Mollisia shastensis* — *Mycena griseoviride* — *Mycena lilacifolia* — *Mycocacia alboviride* — *Odontotrema minus* — *Oidium magnisporum* — *Ollula pezizoidea* — *Patellea umbrorum* — *Patinella abietina* — *Paxillus panuoides* — *Pellicularia flavescens* — *Peniophora pallidula* — *Peniophora (near) subulata* — *Peniophora cornosa* — *Peniophora exima* — *Peniophora* spp. — *Periconia* sp. — *Phlebia albida* — *Phlebiella candidissima* — *Photiata*

*involuta* — *Phoma* sp. — *Pleurotus petalloides* — *Poria albolutescens* — *Poria asiatica* — *Poria ferrea* — *Poria ferrugineo-fusca* — *Poria ferruginosa* — *Poria lenis* — *Poria sinuosa* — *Poria subincarnata* — *Poria tenuis* — *Poria versipora* — *Poria xantha* — *Porodaedalea pini* — *Pseudohydnum gelatinosum* — *Rhizomorpha subterranea* — *Scleroderris ?abieticola* — *Sepedonium chrysospermum* — *Serpula americana* — *Solenia candida* — *Sphaeridium luteum* — *Spongipellis borealis* — *Spongiporus leucospongia* — *Stagonospora* sp. — *Stereum rugisporum* — *Stilbum tomentosum* var. *ovalisporum* — *Tomentella* sp. — *Trechispora brinkmannii* — *Trichoderma viride* — *Trichoscyphella tenuipilosa* — *Trichosphaeria solaris* — *Trichothecium roseum* — *Tulasnella fuscoviolacea* — *Tulasnella* sp. — *Verticillium* sp.

*Juniperus occidentalis*. — *Fulvifomes juniperinus*.

*Libocedrus decurrens*. — *Arthrobotryum spongiosum* — *Cryptoporus volvatus* — *Dacrymyces deliquescens* — *Dothiorella magnifruca* — *Fomes amarus* — *Gymnosporangium libocedri* — *Humaria scutellata* — *Peniophora* sp. — *Solenia candida* — *Stigmatea sequoiae* — *Tryblidiella macrospora*.

*Pinus albicaulis*. — *Cephalosporium* sp. — *Dasyscypha arida* — *Dasyscypha agassizii* — *Dasyscypha serinella* — *Guepiniopsis alpina* — *Hypodermella* sp. — *Hysterographium formosum* — *Lentinus lepideus* — *Lophodermina nitens* — *Mycosphaerella* sp. — *Neopeckia coulteri* — *Patinella albo-viridis* — *Phoma harknessii* — *Sclerotium* sp. — *Spongiporus leucospongia* — *Trichothecium roseum* — *Tympanis pithya*.

*Pinus attenuata*. — *Dacrymyces deliquescens* — *Merulius bellus* — *Thyrenula* sp. — *Tyromyces caesius*.

*Pinus contorta* var. *latifolia*. — *Cronartium comptoniae*.

*Pinus lambertiana*. — *Armillaria mellea* — *Dasyscypha arida* — *Fomes officinalis* — *Lophodermium pinicolum*.

*Pinus ponderosa* (including *Pinus jeffreyi*). — *Aleurodiscus amorphus* — *Corticium ?centrifugum* — *Corticium pellicularia* — *Cronartium pyriforme* — *Cryptoporus volvatus* — *Dacrymyces deliquescens* — *Dacrymyces palmatus* — *Elytroderma deformans* — *Hypodermella medusa* — *Lentinus lepideus* — *Lophodermium pinicolum* — *Merulius vastator* — *Pellicularia subcoronata* — *Pellicularia vaga* — *Peniophora gracillima* — *Peniophora sanguinea* — *Peniophora* sp. — *Poria rufa* — *Serpula americana*.

*Pinus ponderosa* boards at Horse Camp (8000 ft.). — *Acanthonitschkia coloradense* — *Acremonium verticillatum* — *Guepiniopsis alpina* — *Hysterium acuminatum* var. *alpinum* — *Tyromyces caesius*.

*Pseudotsuga taxifolia*. — *Cryptoporus volvatus*.

*Quercus kelloggii*. — *Aleurodiscus roseus* — *Corticium* spp. — *Dacrymyces deliquescens* — *Cytidia* sp. — *Odontia cristulata* — *Pellicularia* sp. — *Peniophora cinerea* (group) — *Peniophora ?incarnata* — *Stereum ?hirsutum* — *Tremella mesenterica*.

*Tsuga mertensiana*. — *Aurantio-porellus alboluteus* — *Clithris ?crispa* — *Corticium corrugae* — *Dasyscypha agassizii* — *Dasyscypha serinella* — *Fomes annosus* — *Fomes nigrolimitatus* — *Fomes officinalis* — *Fomes pinicola* — *Guepiniopsis alpina* — *Herpotrichia nigra* — *Hysterium acuminatum* var. *alpinum* — *Lentinus* sp. — *Merulius bellus* — *Poria lenis* — *Poria tsugina* — *Poria vaporaria* — *Serpula americana* — *Spongiporus leucospongia* — *Stereum rugisporum*.

## ON SHRUBS AND SMALL TREES.

*Acer glabrum*. — *Auricularia auricularis* — *Cryptosporella acerina* — *Lachnum bicolor* — *Massarinula lignorum* — *Septoria circinata* — *Septoria curvispora* — *Septoria marginata*.

*Amelanchier pallida*. — *Gymnosporangium libocedri*.

*Arctostaphylos nevadensis*. — *Aleurodiscus diffusus* — *Cryptostictis arbuti* — *Exobasidium vaccinii* — *Exobasidium vaccinii-uliginosii* — *Gloniella lapponica* — *Mollisia shastensis* — *Phyllosticta amicta* — *Pucciniastrum sparsum* — *Rosellinia subsimilis* — *Tapesia ?fusca* — *Tapesia melaleucoides* var. *vaccinii*.

*Arctostaphylos patula*. — *Aleurodiscus diffusus* — *Aleurodiscus fruticetorum* — *Aleurodiscus roseus* (complex) — *Corticium* sp. — *Cryptostictis arbuti* — *Dacrymyces deliquescens* — *Dasyscypha nivea* — *Exobasidium vaccinii-uliginosii* — *Fomes ignarius* var. *arctostaphyli* — *Godronia castanopsidis* — *Hymenochaete tabacina* — *Odontia crustosa* — *Patella californica* — *Peniophora* sp. — *Pucciniastrum sparsum* — *Rosellinia subsimilis* — *Spongiporus leucospongia* — *Stereum hirsutum*.

*Artemisia tridentata*. — *Puccinia absinthii*.

*Berberis piperiana*. — *Cumminsia mirabilissima*.

*Castanopsis chrysophylla*. — *Dothidella janus* — *Godronia castanopsidis* — *Hymenochaete tabacina* — *Lachnum bicolor* — *Taphrina castanopsidis*.

*Castanopsis sempervirens*. — *Rutstreemia* sp.

*Ceanothus velutinus*. — *Aleurodiscus fruticetorum* — *Cytidia stereoides* — *Dasyscypha succinea* — *Hymenochaete sprete* — *Hymenochaete tabacina* — *Hypoxyton serpens* — *Lachnum bicolor* — *Peniophora* spp.

*Cercocarpus ledifolius*. — *Coriolus versicolor* — *Corticium* spp. — *Cytidia stereoides* — *Dacrymyces deliquescens* — *Dasyscypha flammea* — *Merulius bellus* — *Peniophora cinerea* (group) — *Peniophora ?incarnata* — *Poria ?tenuis*.

*Chrysothamnus nauseosus* var. *occidentalis*. — *Epochnium isthomorphum* — *Macrophoma chrysothamni* — *Puccinia grindeliae*

*Crataegus douglasii*. — *Gymnosporangium libocedri*.

*Haplopappus bloomeri* var. *angustatus*. — *Dasyscypha flammea* — *Dasyscypha aplopappi* — *Dasyscypha salmonea* — *Lophiostoma brenckleanum* — *Mollisia hysterioides* — *Puccinia grindeliae* — *Rosellinia riminicola* — *Teichospora megastega*.

*Holodiscus discolor* var. *glabrescens*. — *Helotium ?virgultorum* — *Pyronelia sirodesmoides*.

*Juniperus communis* var. *montanus*. — *Herpotrichia ?nigra* — *Lophodermina juniperina*.

*Kalmia polifolia*. — *Venturia kalmiae*.

*Phyllodoce empetrifomis*. — *Belonopsis* sp. — *Leciographa dispersa* — *Patinella abietina*.

*Polygonum shastense*. — *Ustilago shastense*.

*Populus tremuloides*. — *Melampsora albertensis*.

*Prunus demissa*. — *Dibotryon morbosum* — *Septoria pruni* — *Taphrina confusa*.

*Prunus marginata*. — *Dasyscypha succinea* — *Polyporus elegans* — *Taphrina flectens*.

*Prunus subcordata*. — *Taphrina pruni-subcordatae*.

*Purshia tridentata*. — *Cytidia stereoides* — *Dacrymyces deliquescens* — *Orbilia coccinella* — *Peniophora* spp. *Peniophora assimilis* — *Thyridaria californica*.

*Quercus chrysolepis*. — *Corticium* sp. — *Dacrymyces deliquescens* — *Stereum ?hirsutum*.

*Rhamnus purshiana*. — *Cylindrosporium rhamni* — *Septoria variegata*.

*Rosa gymnocarpa*. — *Phragmidium rosae-californicae*.

*Rubus leucodermis*. — *Phragmidium imitans*.

*Rubus occidentalis*. — *Phragmidium occidentale*.

*Salix scouleriana*. — *Lophium dolabriforme* — *Melampsora ribesii-purpurae* — *Patellea californica* — *Solenia anomala* — *Stereum ?hirsutum* — *Torula ?crustacea* — *Tremella mesenterica*.

*Salix sitchensis*. — *Melampsora arctica*.

*Sambucus glauca*. — *Exosporium penduculatum*.

*Sambucus racemosus*. — *Brachysporium oosporum* — *Corticium corrugae* — *Lasmeniella alpina*.

*Symphoricarpos acutus*. — *Puccinia crandallii*.

*Vaccinium caespitosum*. — *Exobasidium vaccinii* — *Pucciniastrum goeppertianum* — *Pucciniastrum myrtillii*.

*Vaccinium membranaceum*. — *Pucciniastrum myrtillii*.

#### ONGRASSES, SEDGES AND RHUSES.

*Agrostis exarata*. — *Erysiphe graminis*

*Agrostis thurberiana*. — *Hendersonia* sp. — *Leptosphaeria microscopica* — *Pleospora herbarum* — *Scelobelonium melanosporum*.

*Agrostis* sp. — *Cladosporium herbarum* — *Leptosphaeria vagans* — *Mycosphaerella agrostidis*.

*Bromus carinatus*. — *Puccinia glumarum* — *Ustilago bullata*,

*Bromus marginatus*. — *Scolecotrichum graminis*.

*Bromus tectorum*. — *Ustilago bullata*.

*Carex amplexans*. — *Puccinia caricis*.

*Carex bolanderi*. — *Phyllosticta caricis*.

*Carex brainerdii*. — *Puccinia extensicola*.

*Carex breweri*. — *Phoma caricis* — *Phoma herbicola*.

*Carex fracta*. — *Cladosporium herbarum* — *Mycosphaerella tasiana* — *Septoria lunelliana*.

*Carex kelloggii*. — *Puccinia caricis*.

*Carex multicaulis*. — *Cintractia caricis* — *Metasphaeria sepalorum* — *Puccinia atrofusca*.

*Carex nigricans*. — *Cintractia caricis*.

*Carex spectabilis*. — *Cintractia caricis* — *Cintractia externa* — *Leptosphaeria* sp. — *Pleospora elynae*.

*Carex whitneyi*. — *Puccinia caricis*.

*Carex* spp. — *Cladosporium herbarum* — *Hendersonia distans* — *Leptosphaeria vagans* — *Phialea* sp. — *Puccinia atrofusca*.

*Elymus elymoides* (*Sitanion hystrix*). — *Cladosporium herbarum* — *Erysiphe graminis* — *Leptostromella hysterooides* f. *graminicolum* — *Puccinia glumarum* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Ustilago spegazzinii* var. *agrestis*.

*Elymus glaucus*. — *Puccinia glumarum* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Urocystis agropyri* — *Ustilago striaeformis*.

*Elymus glaucus* var. *jepsonii*. — *Puccinia glumarum*.

*Elymus hansenii* (*Sitanion hansenii*). — *Puccinia glumarum* — *Puccinia pattersoniana* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Ustilago spegazzinii* var. *agrestis*.

*Glyceria elata*. — *Scolecotrichum graminis*.

*Holcus lanatus*. — *Puccinia rubigo-vera*.

*Juncus balticus* var. *montanus*. — *Arthrimum cuspidatum* — *Leptosphaeria* sp. — *Leptosphaeria caricinella* — *Leptosphaeria junciseda* — *Lophium* sp. — *Mycosphaerella tulasnei* — *Pleospora* sp. — *Pleospora trichostoma* — *Scelobelonium melanospermum*.

*Juncus mertensiana*. — *Pleospora elycae*.

*Juncus orthophyllus*. — *Leptosphaeria culmorum* — *Leptosphaeria junciseda* — *Leptosphaeria michotii* — *Typhula* sp.

*Juncus parryi*. — *Aposphaeria mollis* — *Bifusella acuminata* — *Dothidella junci* — *Metasphaeria sepalorum* — *Uromyces junci*.

*Juncus* spp. — *Cladosporium herbarum* — *Heteropatella umbilicata*.

*Luzula subcongesta*. — *Septoria minuta*.

*Melica californica*. — *Septoria nodorum*.

*Phleum alpinum*. — *Leptosphaeria typharum* — *Leptosphaeria vagans* — *Mycosphaerella tulasnei* — *Mycosphaerella* sp.

*Phleum* sp. — *Cladosporium herbarum*.

*Poa pratensis*. — *Arthrimum cuspidatum* — *Erysiphe graminis* — *Dendryphium* sp. — *Helminthosporium vagans* — *Puccinia poae-sudeticae*.

*Stipa californica*. — *Clathrospora cookei* — *Leptosphaeria heterospora* — *Ustilago spegazzinii* var. *agrestis*.

*Stipa columbiana* var. *nelsonii*. — *Stagonospora simplicior*.

*Stipa occidentalis*. — *Ascochyta oudemansii* — *Scolecotrichum graminis* — *Ustilago williamsii*.

*Trisetum spicatum*. — *Cladosporium herbarum* — *Leptosphaeria heterospora* — *Leptosphaeria microscopica* — *Leptosphaeria vagans* — *Mycosphaerella tulasnei* — *Puccinia rubigo-vera*.

## ON HERBS

*Agoseris gracilens*. — *Heteropatella umbilicata*.

*Agoseris grandiflora*. — *Puccinia hieracii*.

*Agoseris heterophylla*. — *Puccinia hieracii*.

*Agoseris scorzoneraefolia*. — *Puccinia hieracii*.

*Allium validum*. — *Apiosporella minuli* — *Heterosporium allii* — *Mycosphaerella schoenoprasii* — *Mycosphaerella tassiana* — *Pezizella helotioides* — *Uromyces aterrimus* — *Uromyces aureus*.

*Anaphalis margaritacea*. — *Uromyces amoenus*.

*Anemone occidentalis*. — *Clathrospora diplospora* — *Pleospora permunda* — *Scelobelonium melanosporum* — *Urocystis sorosporioides*.

*Aquilegia formosa*. — *Puccinia rubigo-vera* var. *agropyri*.

*Arabis* sp. — *Puccinia monoica*.

*Arabis platysperma*. — *Microthyrium microscopicum* — *Pleospora permunda* — *Puccinia monoica* — *Sirexipula wyomingensis* — *Sphaerotheca macularis*.

*Arabis platysperma* var. *howellii*. — *Micosphaerella tassiana*.

*Arnica longifolia* ssp. *myriadenia*. — *Apiosporella alpina*.

*Arnica mollis*. — *Sphaerotheca macularis* var. *fuliginea*.

- Arnica viscosa*. — *Hysteropezizella* sp. — *Lachnum setigerum*  
 — *Leptosphaeria doliolum* — *Leptosphaeria heterospora* — *Phoma* sp. —  
*Pleospora anthyllidis* — *Pleospora herbarum* — *Titaea* sp. — *Typhula* sp.  
*Asarum hartwegii*. — *Puccinia asarina* — *Synchytrium asari*.  
*Asclepias cornuta*. — *Cercospora clavata*.  
*Aster occidentalis*. — *Puccinia extensicola* var. *asteris*.  
*Aster shastensis*. — *Coleosporium solidaginis* — *Heterosphae-*  
*ria* sp. — *Pleospora ambigua* var. *ambigua* — *Pyrenophora hispida* —  
*Septoria shastensis*.  
*Brickellia grandiflora*. — *Puccinia subdecora*.  
*Brunella vulgaris*. — *Linospora brunellae*.  
*Calochortus nudus*. — *Puccinia calochortii*.  
*Calyptridium umbellatum* var. *caudicifera*. — *Uro-*  
*myces spragueae*.  
*Cardamine bellidifolia* var. *pachyphylla*. — *Puccinia*  
*cruciferae*.  
*Castilleja arachnoidea* var. *shastensis*. — *Nectriella*  
*pedicularis* — *Phoma herbarum* — *Pleospora* sp. — *Sphaeropsis micro-*  
*spora*.  
*Castilleja miniata*. — *Clathrospora diplospora* — *Heteropa-*  
*tella umbilicata* — *Typhula* sp.  
*Castilleja pinctorum*. — *Pleospora permunda* — *Pyrenophora*  
*fenestrata*.  
*Chamaesaracha nana*. — *Puccinia chamaesarachae*.  
*Chimaphila umbellata*. — *Pucciniastrum pyrolae*.  
*Cicuta occidentalis*. — *Puccinia cicutae*.  
*Circaea pacifica*. — *Puccinia circaeae*.  
*Claytonia siberica*. — *Ramularia claytoniae*.  
*Clematis ligusticifolia*. — *Puccinia rubico-vera* var. *agro-*  
*pyri*.  
*Comandra umbellata*. — *Puccinia comandrae*.  
*Cryptantha affinis*. — *Erysiphe cichoracearum*.  
*Cycladenia humulis*. — *Pleospora permunda*.  
*Cymopterus terebinthinus*. — *Puccinia jonesii* var. *cy-*  
*mopteri* — *Puccinia pseudocymopteri*.  
*Delphinium pauciflorum*. — *Ramularia delphinii*.  
*Dodocatheon* sp. — *Puccinia melanconioides*.  
*Epilobium adenocaulon*. — *Pucciniastrum pustulatum*.  
*Epilobium angustifolium*. — *Pucciniastrum pustulatum*.  
*Epilobium clavatum*. — *Puccinia scandica*.  
*Epilobium hornemannii*. — *Sphaerotheca epilobii*.  
*Epilobium lactiflorum*. — *Sphaerotheca epilobii*.  
*Epilobium ? minutum*. — *Puccinia vagans*.  
*Eriogonum inornatus*. — *Erysiphe cichoracearum*.  
*Eriogonum latifolium* ssp. *nudum*. — *Uromyces intricatus*.  
*Eriogonum marifolium*. — *Belonioscypha campanula* — *Ery-*  
*siphe polygوني* — *Mollisia shastensis* — *Phoma eriogoni* — *Uromyces*  
*intricatus*.  
*Eriogonum pyrolae-folium*. — *Cytospora eriogoni* — *Mol-*  
*lisia shastensis*.  
*Eriogonum umbellatum* ssp. *polyanthum*. — *Uromyces*  
*intricatus*.  
*Eupatorium occidentale*. — *Pleospora herbarum*.

*Euphorbia crenulata*. — *Melampsora euphorbiae-gerardianae*  
— *Uromyces proeminens* var. *proeminens*.

*Euphorbia serpyllifolia*. — *Uromyces proeminens* var. *proeminens*.

*Fragaria californica*. — *Ramularia tulasnei*.

*Fritillaria atropurpurea*. — *Phyllosticta fritillariae*.

*Gayophytum diffusum*. — *Puccinia vagans* var. *gayophytii*.

*Gayophytum ramosissimum*. — *Puccinia vagans* var. *gayophytii*.

*Gilia aggregata*. — *Heteropatella conglutinata*.

*Godetia quadrivulnera*. — *Puccinia vagans*.

*Habenaria unalaschensis*. — *Aecidium graebnerianum*.

*Hieracium* sp. — *Puccinia sejuncta*.

*Hieracium albiflorum*. — *Puccinia hieracii*.

*Hieracium cynoglossoides* var. *nudicaule*. — *Entyloma compositarum* — *Sporobolomyces roseus*.

*Hieracium gracile*. — *Puccinia hieracii*.

*Hulsea nana*. — *Typhula* sp.

*Hypericum perforatum*. — *Uromyces hyperici*.

*Iliamna bakeri*. — *Phoma* sp. — *Pleospora herbarum*. — *Selenophoma linicola*.

*Kelloggia galioides*. — *Phyllosticta crustosa*.

*Lathyrus lanzswertii* var. *aridus*. — *Ascochyta pisi* — *Macrosporium puccinioides* — *Septoria astragali* — *Uromyces fabae*.

*Ligusticum grayi*. — *Heteropatella umbilicata* — *Nyssopsora echinata* — *Pleospora permunda* — *Puccinia ligustici* — *Septoria aromatica* — *Synchytrium aureum*.

*Lilium columbianum*. — *Uromyces holwayi*.

*Linium micranthum*. — *Melampsora lini*.

*Lotus torreyi*. — *Ovularia lotophaga*.

*Lupinus albicaulis* var. *shastensis*. — *Apiosporella alpina* — *Hysteropezizella* sp. — *Leptosphaeria maculans* — *Leptosphaeria planiuscula* — *Phyllosticta ferax* — *Pleospora amplispora* — *Pleospora balsamorrhizae* — *Pleospora compositarum* — *Pleospora gigaspora*.

*Lupinus latifolius*. — *Uromyces occidentalis*.

*Lupinus obtusilobus*. — *Diplodia lupini* — *Hysteropezizella* sp. — *Leptosphaeria millefolii* — *Mycosphaerella aquilegiae* — *Pleospora balsamorrhizae* — *Pleospora gigaspora* — *Rhynchostoma exasperans* — *Septoriella* sp. — *Typhula* sp.

*Madia gracilis*. — *Coleosporium madaiae*.

*Mimulus tilingii*. — *Ramularia mimuli*.

*Mitella pentandra*. — *Puccinia heucherae*.

*Monardella odoratissima*. — *Phyllosticta monardellae* — *Placosphaeria shastensis* — *Pleospora diplospora* — *Pleospora permunda* — *Puccinia menthae* — *Stemphyllium* sp.

*Oxyria digyna*. — *Puccinia oxyriae*.

*Osmorhiza chilensis*. — *Puccinia pimpinellae*.

*Pedicularis densiflora*. — *Puccinia rufescens* — *Ramularia obducens*.

*Pentstemon deustus* ssp. *deustus*. — *Puccinia pentstenomis*.

*Pentstemon gracilentus*. — *Heteropatella umbilicata*. — *Pleospora permunda* — *Scelobolonium melanosporum*.

*Pentstemon menziesii* var. *davisonii*. — *Dimerum alpinum* — *Puccinia palmeri*.



- Pentstemon newberryi* — *Puccinia palmeri*.  
*Pentstemon shastensis*. — *Ramularia pentstemonis*.  
*Phacelia leucophylla*. — *Pestalotia* sp.  
*Phacelia mutabilis*. — *Erysiphe cichoracearum*.  
*Phlox douglasii*. — *Dasyscypha phlogis* — *Lophodermium phloxii* — *Macrophoma cylindrospora* — *Mollisia hysterioides* — *Pleospora tragacanthae* — *Puccinia douglasii*.  
*Phoradendron libocedri*. — *Botryosphaerostroma viscii*.  
*Potentilla flabellifolia*. — *Taphrina potentillae*.  
*Potentilla glandulosa* ssp. *nevadensis*. — *Marssonium potentillae* — *Taphrina potentillae*.  
*Potentilla gracilis* ssp. *nuttallii*. — *Phragmidium investiae*.  
*Pyrola dentata* var. *integra*. — *Pucciniastrum pyrolae*.  
*Pyrola picta*. — *Pucciniastrum pyrolae*.  
*Ramischia secunda*. — *Pucciniastrum pyrolae*.  
*Salvia sonomensis*. — *Puccinia mellifera*.  
*Saxifraga tolmiei*. — *Sirexipula wyomingensis*.  
*Senecio aronicoides*. — *Ramularia senecionis* var. *carniolica*.  
*Senecio triangularis*. — *Mycosphaerella tassiana*.  
*Silene douglasii* var. *douglasii*. — *Diplodina silenes* — *Pleospora balsamorhizae* — *Pleospora herbarum* — *Ustilago violacea*.  
*Silene grayi*. — *Ustilago violacea*.  
*Sisymbrium altissimum*. — *Albugo candida*.  
*Smilacina stellata*. — *Cylindrosporium smilacinae* — *Heterosporium* sp.  
*Stellaria longipes*. — *Melampsorella cerastii*.  
*Stephanomeria lactucina*. — *Puccinia harknessii*.  
*Streptanthus orbiculatus*. — *Nemosphaera shastensis* — *Typha* sp.  
*Taraxacum officinale*. — *Puccinia hieracii* — *Sphaerotheca macularis* var. *fuliginea*.  
*Tellima grandiflora*. — *Puccinia heucherae*.  
*Tritelia ixioides* var. *analina*. — *Heterosporium allii*.  
*Trifolium involucreatum* var. *fimbriatum*. — *Polythrincium trifolii*.  
*Veratrum californicum*. — *Botrytis cinerea* — *Cylindrosporium veratrinum* — *Diplodia veratri* — *Hendersonia* sp. — *Humaria scutellata* — *Laetinaevia veratri* — *Mycosphaerella tassiana* — *Pleospora* sp. — *Phyllosticta melanoplaca* — *Puccinia veratri* — *Typhula* sp.  
*Veronica alpina* var. *unalaschensis*. — *Peronospora grisea*.  
*Vicia americana*. — *Erysiphe polygoni* — *Uromyces fabae*.  
*Viola adunca* var. *longipes*. — *Puccinia violae*.  
*Viola lobata*. — *Puccinia effusa*.  
*Viola purpurea*. — *Phyllosticta nigrescens* — *Sphaerotheca macularis*.

#### ON FERNS

- Athyrium americanum*. — *Hysterium magnisporum*. — *Typhula* sp.  
*Athyrium filix-foemina* var. *californicum*. — *Uredinopsis copelandii*.  
*Cryptogramma acrostichoides*. — *Typhula* sp.  
*Cystopteris fragilis*. — *Hyalospora polypodii*.  
*Pteridium aquilinum* var. *pubescens*. — *Cryptomycina pteridis* — *Gloeosporium pteridis* — *Uredinopsis macrosperma*.

## ON FUNGI.

*Acanthonitschkia coloradense*. — *Dasyscypha acanthonitschkiae*.

*Armillaria zelleri*. — *Diplocladium majus*.

*Fomes pinicola*. — *Hypocrea citrina*.

*Ganoderma oregonense*. — *Hypomyces aurantius*.

*Puccinia atrofusca*. — *Darlucula filum*.

*Puccinia rubigo-vera*. — *Darlucula filum*.

*Uromyces fabae*. — *Darlucula filum*.

## ON INSECTS.

*Musca* sp. — *Entomophthora muscae*.

## ON CLOTH.

*Cladosporium herbarum*. — *Stemphyllium consortiale*.

## ON ORGANIC DEBRIS NEAR SUMMIT.

*Cladosporium herbarum*. — *Mucor* sp. — *Penicillium* sp.

## ON HUMUS, DUFF, LITTER.

*Agaricus arvensis* — *Amanitopsis vaginata* — *Armillaria zelleri* — *Astraeus hygrometricus* — *Astraeus pteridis* — *Boletus albidus* ssp. *eupachypus* — *Boletus frustosus* — *Bovista pila* — *Calodon amicum* — *Calvatia craniiformis* — *Calvatia fumosa* — *Calvatia sculpta* — *Calvatia subcretacea* — *Calbovista subsculpta* — *Cantharellula umbonata* — *Clavaria conjuncta* — *Clavaria obtusissima* — *Clavaria secunda* — *Clavaria subdecurrens* — *Clitocybe* ssp. — *Coltricia perennis* — *Coprinus comatus* — *Cortinarius* (near) *aurifolius* — *Cortinarius cotoneus* — *Cortinarius heterosporus* — *Cortinarius orichalceus* — *Crucibulum laeve* — *Discina ancilis* — *Cyttarophyllum cucullata* — *Cyttarophyllum polytrichoides* — *Geastrum coronatum* — *Helvella californica* — *Helvella caroliniana* — *Hygrophorus gliocyclus* — *Hygrophorus russula* — *Hygrophorus vernalis* — *Laccaria* sp. — *Lamprospora leiocarpa* — *Longula texensis* — *Melanoleuca* sp. — *Montagnea arenarius* — *Mycena alcalina* — *Mycena gracilis* — *Mycena griseoconica* — *Mycena griseoviride* — *Mycena laevigata* — *Naucoria* sp. — *Naematoloma fasciculare* — *Omphalina rustica* — *Caloscypha fulgens* — *Paxina nigrella* — *Pholiota trachyspora* — *Psathyrella atrifolia* — *Psathyrella* sp. — *Rhodophyllum* sp. — *Russula delicata* — *Sarcosphaera amplissima* — *Secotium nubigenum* — *Secotium pingue* — *Stropharia sienna* — *Tricholoma rhizoideum* — *Tulostoma tuberculatum* — *Suillus* sp. — *Xerocomus miniato-olivaceus*.

## HYPOGAEOUS.

*Abstoma reticulatum* — *Archangiella lactarioides* — *Archangiella magna* — *Elasmomyces alpinus* — *Elasmomyces echinosporus* — *Endogone lactiflua* — *Endogone* sp. — *Gautieria monticola* — *Gymnoglossum elasmomycetoides* — *Hydnangium parksii* — *Hydnotrya variiformis* — *Hymenogaster remyi* — *Hymenogaster tener* — *Hysterangium darkeri* — *Hysterangium phillipsii* — *Hysterangium separabile* — *Melanogaster tuberiaeformis* — *Melanogaster variegatus* — *Pompholyx occidentalis* — *Rhizopogon brunescens* — *Rhizopogon exiguus* — *Rhizopogon occidentalis* — *Rhizopogon pannosus* — *Rhizopogon provincialis* — *Rhizopogon rubescens* — *Rhizo-*

*pogon separabilis* — *Sedecula pulvinata* — *Scleroderma bovista* — *Scleroderma hypogaeum*.

#### ON DUNG

*Patella coprinaria* — *Rhyarobius monascus* — *Sordaria bombarioides* — *Sporormia australis*.

#### ISOLATED FROM SOIL

*Aspergillus fumigatus* — *Cephalosporium* sp. — *Chaetomium succineum* — *Coniothyrium fuckelii* — *Curvularia inaequalis* — *Mortierella pusilla* — *Mucor hiemalis* — *Penicillium ?notatum* — *Penicillium lanosum* — *Penicillium raistrickii* — *Penicillium* spp. — *Sporotrichum* sp. — *Trichoderma viride* — *Verticillium terrestre*.

#### Preliminary Isolations of Soil Fungi.

On Feb. 17, 1947, George Nyland, then in the Dept. of Plant Pathology, The State College of Washington, plated out in replicates of eight in 1 : 10,000 dilutions on malt agar five samples of soil collected on Mount Shasta in the summer of 1946. The writer made the subsequent examination of the plates and found the following fungi:

| Date    | Source                           | pH of soil | No. of colonies | Fungi  |
|---------|----------------------------------|------------|-----------------|--|
| 6-21-46 | Forest, 7000 ft.                 | 5.5        | 2,250,000       | <i>Aspergillus fumigatus</i><br><i>Coniothyrium fuckelii</i><br><i>Fusarium</i> sp.<br><i>Mortierella pusilla</i><br><i>Penicillium ?notatum</i>                                   |
| 7-16-46 | Sedge clumps<br>10,000 ft.       | 6.1        | 3,750,000       | <i>Cladosporium herbarum</i><br><i>Penicillium ?notatum</i><br><i>Penicillium</i> spp.<br><i>Streptomyces</i> sp.<br><i>Verticillium terrestre</i>                                 |
| 8-26-46 | Sedge Clumps<br>9,500 ft.        | 5.9        | 1,250,000       | <i>Penicillium ?notatum</i><br><i>Penicillium</i> spp.<br><i>Verticillium terrestre</i>  |
| 8-26-46 | Summit of Shastina<br>12,335 ft. | 5.5        | 10,000,000      | <i>Mucor hiemalis</i><br><i>Penicillium ?notatum</i><br><i>Penicillium</i> spp.<br><i>Trichoderma viride</i>   |
| 8-29-46 | Heather meadow<br>7600 ft.       | 5.6        | 900,000         | <i>Aspergillus fumigatus</i><br><i>Chaetomium succineum</i><br><i>Curvularia inaequalis</i><br><i>Penicillium ?notatum</i><br><i>Penicillium</i> spp.<br><i>Trichoderma viride</i> |

The number of colonies reported is the approximate number of colonies per gram air dry soil based on the average of eight plates.

pH was determined by a Beckman pH meter. The *Curvularia* was determined by J. Walton Groves, the *Chaetomium* by L. W. Ames, the *Mortierella* and *Mucor* by R. W. Emerson, and the other species by the writer. The following habitat notes are given:

1. In Shasta fir forest along the Horse Camp-Wagon Camp Trail under duff. The soil was associated with the roots of *Allium tribracteatum*. Shasta Fir Zone.

2. Isolated clumps of *Carex breweri* occur near the top of a ridge north of Horse Camp at the upper limits of the White Bark Pine zone. Soil was obtained from around one of these clumps.

3. In the basin at the head of Cascade Gulch between Shasta and Shastina there has been no meadow formed but occasional plants dot the area. Clumps of *Carex breweri* are scattered through this basin and around them is formed the closest approximation of a soil in the area.

4. Sand and gravel were obtained from the summit of Shastina. Evidently mold spores are deposited here by winds which continually blow over the mountain. The only growth in the area above 12,000 feet consists of crustose lichens on the rocks. Probably at this elevation frost occurs every night.

5. Panther Creek Meadows was described above. The tested sample came from the lower part of the middle meadow.

### Explanation of Species List.

That part of the mountain in the southwest quadrant with its apices between Horse Camp at 8000 feet and the 10,000 foot level on the west bank of Mud Creek Canyon, and with its bases between Mount Shasta, McCloud and Mud Creek Dam, is the area which has been most intensively studied and collected. This will be evident throughout the following notes.

Notes are spotty on the mycological history of Mt. Shasta localities. This is because collections and notes were spotty on the basis that once a species was collected its presence in that locality was established and little more information was desirable. A study of Gilbert (18), however, has convinced the writer of the fallacy of this idea.

It will be noted that it was not possible to be in all localities of all stations in all zones in all of the eight summers the writer has spent at Horse Camp, nor was it possible to visit some localities more than once a year, if that often. However, such locations as the Sisson Southern Trail and the area through which it passes; and the Horse Camp-Wagon Camp Trail, Wagon Camp, Bear Springs, the Wagon Camp Road and McCloud Avenue, were visited frequently during the period he was on the mountain.

The frequency of observation of the species is partially indicated by collection numbers. This, then, is incomplete since over-abundant collecting would overburden the herbarium facilities of both the writer and his exchange correspondents. The frequency of occurrence of individuals is roughly indicated in only a few cases.

The dates of collection of the species are listed here in an attempt to partially establish the phenology of the species. Phenology will vary for each species as the dates of the season vary with the intensity of the snow pack. While complete phenologic data are available for certain individual collections not enough collections of a species are available over a period of time in the same season in the same locality for a complete presentation of this point for each species. The phenology of the species goes beyond the collection of merely mature material, but where available notes will be given.

Constancy of species is indicated only by the series of years listed under the dates of collection. These data are not complete since all species were not collected in all years although in many cases fruit bodies were present.

Data concerning abundance will be given with each species based on the following indices:

- I. Very abundant.
- II. Abundant.
- III. Common.
- IV. Rare.
- V. Very rare.

These indices in roman numerals will be supplemented by a series of indices in letters. One or more combinations of the above numerals and the letters listed below will appear with each species.

- A. On coniferous, woody, substrata.
- B. On broadleaf, woody, substrata.
- C. On herbaceous substrata.
- D. On humus, duff or litter.
- E. On animals and insects.
- F. On other fungi.

If adventitious species exist on the mountain it is as a result of reaching the area with an adventitious host as in the case of *Albugo candida* on *Sisymbrium altissimum*. Wind blown spores, or spores carried by other means, may not necessarily produce adventitious species if a species can become established at a certain station. This observation, of course, is based on the hypothesis that all species adaptable to a certain set of environmental conditions can eventually be found in many, if not all, of the stations with these conditions. The presence of *Cladosporium herbarum* on fabric at the summit of the mountain, and of this species as well as at least one species each of *Penicillium*, *Mucor* and an unidentified fungus on a discarded

hamburger sandwich at the three mile post on the Summit Trail at 13,000 feet, may indicate the presence of adventitious species for it is not certain that these fungi survive throughout the year at these elevations where freezing temperatures probably occur throughout part of each day of the year.

Specific geographic distribution will be considered in connection with only a few of the species listed. Most distributions will be indicated in a general or an incomplete manner since Saccardo's *Sylloge Fungorum* and most monographs consulted for this information list it in a general manner rather than in specific terms.

Further information is added for most species. At the suggestion of R. F. Daubenmire, the dominant vascular plants associated with the collections are listed.

Most of the collections cited prior to 1946 were made by the writer; most of those made between 1946 and 1950 by the writer and his wife, Vivian G. Cooke; and in 1951 by these two and their nephew Ronald E. Binegar. Collections made by others are noted where they have come to our attention through herbarium specimens or isolated literature reference. It is possible that additional collections not cited here may be found in herbaria not yet studied by the writer.

Specimens distributed in the writer's exsiccatum "Mycobiota of North America" will be indicated: "Exs. 1". This series is now distributed to twentyfive herbaria in North America, Europe and India.

In the case of molds of overwintering herbage, of certain grass leaf diseases and of certain wood inhabiting fungi, especially in the following genera, no record was kept in the writer's notebooks (1937—1941) of the determinations made. Thus no specific data on the frequency of occurrence, seasons and collections are presented for collections of these genera made prior to 1946. These genera include: *Aposphaeria*, *Cladosporium*, *Dendryphium*, *Hendersonia*, *Heteropatella*, *Leptosphaeria*, *Lophium*, *Mycosphaerella*, *Oidium*, *Pellicularia*, *Phoma*, *Pleospora*, *Pyrenophora*, *Rhynchostoma*, *Scelobelonium*, *Scolecotrichum*, *Sepedonium*, *Septoriella*, *Sphaeridium*, *Sphaeropsis*, *Stemphyllium*, *Tilachlidium* and *Titaea*. In the indicated years species of the genera were found in one or more of the indicated number of collections: 1937: 25; 1938: 12; 1939: 10; 1940: 17; 1941: 15.

A complete series of species (except hypogaeous ones) in many of the cited numbers is on file at the Herbarium of the University of California. Partial sets are filed at the Herbarium of the University of Cincinnati; the Mycological Collections, Bureau of Plant Industry, Beltsville, Maryland; the Herbarium of Oregon State College; the Farlow Herbarium, and the Herbarium of the New York Botanical Garden. All collections of *Gasteromycetes* examined by S. M. Zeller prior

to his death are in his herbarium now at the New York Botanical Garden. Duplicates studied by various authorities are in the herbaria of the various institutions with which they are associated.

Among mycologists who have assisted in identifying the following species are: L. W. Ames, Lee Bonar, Edith K. Cash, Maxwell S. Doty, R. W. Emerson, G. W. Fischer, H. M. Gilkey, J. Walton Growes, A. E. Jenkins, B. B. Kanouse, D. H. Linder, G. W. Martin, J. H. Miller, L. W. Miller, A. J. Mix, L. O. Overholts, D. P. Rogers, Ruth Remsberg, F. J. Seaver, A. H. Smith, Rolf Singer, Roderick Sprague, J. A. Stevenson, L. E. Wehmeyer, S. M. Zeller, G. L. Zundel. In addition, E. Garton Linsley, Division of Entomology and Parasitology, University of California, identified the beetle *Dacne picca*.

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## Systematik List of the Fungi of Mt. Shasta.

### I. Myxomycetes.

A report on 127 collections of 47 species has been published separately (Cooke, 12).

### II. Phycomycetes.

#### A. Oomycetes.

##### 1. Chytridiales.

##### a) Synchytriaceae.

*Synchytrium asari* Arth. & Holw. — On *Asarum hartwegii*. — 5000—5500 feet, Sierra Mixed Conifer zone.

Collections: 13329, 14661, 20239, 20350, Exs. 71. Dates: 14 July 1939; 19 July 1940; 10, 25 Julz 1947. Abundance III, C. Associates: *Pinus ponderosa*, *Abies concolor*, *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: On at least three species of *Asarum* in Minnesota, Wisconsin, California; Mt. Shasta.

*Synchytrium aureum* Schroet. — On *Ligusticum grayi*. Below the rush swale, Squaw Valley Creek meadows, 7500 ft.

Abundance: V, C. — Collected once. Associates: *Phyllodoce empetri-formis*, *Kalmia polifolia*, *Tsuga mertensiana*. Distribution: On about 100 hosts in Europe and North America; Mt. Shasta.

#### *Saprolegniales*.

##### *Saprolegniaceae*.

*Saprolegnia* sp. — At the Shasta Alpine Lodge the cooling system during 1936—1941 and in 1946 and 1947 consisted of a series



of three tubs into the upper of which a continuous stream of water from the water supply spring was directed. The first tub, used for drinking and cooking, overflowed into the second, used for a cooler for submerged foods and floating vegetables, which in turn overflowed into the third, used for washing hands. This flowed into a small creek which runs for a couple of hundred feet before percolating and which irrigated about a hundred square feet of sod. In the second tub vegetables were kept fresh for from one to three weeks. After 6—10 days in cracks of tomato skins or over the surface of Italian squash, a saprolegniaceous fungus produced a luxuriant growth which, if allowed to grow for three weeks, would completely cover the concerned vegetable with a dense mass of white mycelium. No adequate way has been found as yet to get the fungus to a competent authority for identification. Possibly more than one species is involved. Probably this species, and others, could be obtained from similar situations in other mountainous regions.

#### *Peronosporales.*

##### *Albuginaceae.*

*Albugo candida* (Pers.) Roussel. — On *Sisymbrium altissimum*. — With the host following the Shasta Snowline Highway up to MacBride Springs, 4000—5000 feet. See Cooke (11).

Collections: 15507, 15600, 15652, 20085, Exs. 121. Dates: 11 June, 25, 31 July 1941; 27 June 1947; seen in other years. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On more than 70 cruciferous hosts in North and South America, Europe, Asia and Africa; Mt. Shasta.

##### *Peronosporaceae.*

*Peronospora grisea* (Ung.) d. By. — On *Veronica alpina* var. *unalaschensis*. — Sierra Mixed Conifer Zone, Wagon Camp, 5700 ft.

Collection: 20327; Date: 18 July 1947; Abundance: V, C. Associates: *Mimulus*, *Epilobium*, *Veratrum*, *Allium*, *Habenaria*.

#### *Zygomycetes.*

##### *Mucorales.*

A number of molds attack foods kept for more than three or four days without frequent boiling. This occurs usually during the warm weeks in late July and in August. No attempt has been made to isolate and identify these.

##### *Mucoraceae.*

*Mucor hiemalis* Wehmer. — Isolated from soil, summit of Shastina, 12,335 ft. Date: 26. Aug. 1946, isolated 17 Feb. 1947. Associates: *Penicillium* spp., crustose lichens on rocks. Distribution: Europe, Greenland, Canada, six states in the United States, Mt. Shasta.

*Mortierellaaceae.*

*Mortierella pusilla* Oud. — Isolated from soil, Shasta fir woods, 7000 ft. Date: 21 June 1946, isolated 17 Feb. 1947. Associates: *Allium tribracteatum*, *Abies magnifica* var. *shastensis*. Distribution: Europe, Canada, Mt. Shasta.

*Endogonaceae.*

*Endogone lactiflua* Berk. — *Endogone* sp. — Hypogaeous, Shasta Fir zone near Horse Camp, 8000 ft. Collections: *E. lactiflua*: 13295; *E. sp.*: 13294, 13303. Dates: *E. lactiflua*: 28 June 1939; *E. sp.*: 28 June, 5 July 1939. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*. Distribution: *E. lactiflua*: Europe, New England, California; Mt. Shasta.

*Entomophthorales.*

*Entomophthoraceae.*

*Entomophthora muscae* (Cohn) Fres. — Found once on dead flies on a window, Shasta Alpine Lodge, Horse Camp, 8000 ft. Collection: 7612; Date: 1 Sept. 1936; Abundance: V, E. Distribution: North America, Europe, Greenland.

**Ascomycetes.**

**Hemiascomycetes.**

*Exoascales.*

*Exoascaceae.*

*Taphrina castanopsidis* Ell. & Ev. ex Jenkins. — On *Castanopsis chrysophylla*. — Although the Sisson Southern Trail was in constant use by the writer from 1936 to 1941 this fungus was not observed during the intervening years. It was collected once in 1936 and was found to be abundant in 1941. Again in 1947 it was common around the base of the mountain. In the chaparral and on scattered shrubs up to 6000 feet.

Collections: 8610, 15654, 15724, 20229, 20302, 20351, 20401, Exs. 139. M. A. Howe, July 1894. Dates: July 1894; 30 July 1936; 31 July, 18. Aug. 1941; 10, 17, 25 July, 8. Aug. 1947. The 1936 collection consisted of 10 leaves. In 1941 one collection consisted of 303 leaves from several shrubs in one colony. These shrubs are evergreen, retaining their healthy leaves for several years. Abundance: II, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Calaveras Co.; Mt. Shasta, Siskiyou Co., Calif.

*Taphrina confusa* (Atk.) Gies. — On *Prunus demisa*. — Scattered colonies of this deciduous shrub in the chaparral are occasionally infected by this fungus which causes witches brooms on which the leaves are curled. These brooms may produce healthy leaves in subsequent years. Shasta Snowline Highway and old snowline road, 4500 feet.

Collections: 15506, 16638. Dates: 7 June 1941, 29 May 1942. Abundance: III, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: North America; Mt. Shasta.

*Taphrina flectens* Mix. — On *Prunus emarginata*. — On the mountain this species is occasional on locally abundant shrubs in the chaparral. It forms small to large witches brooms.

Collections: 10212, 10282, 13252, 13255, 13323, Exs. 25. Dates: 15 July, 22. Aug. 1938; 16 June, 7 July 1939. Frequently observed in 1940, 1941, 1942, 1946 and 1947. Abundance: II, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Western North America; Mt. Shasta.

*Taphrina potentillae* (Farl.) Johans. — On *Potentilla glandulosa* ssp. *nevadensis*. — Near a spring and along a dry creek above Wagon Camp, Shasta Fir zone; MacBride Springs, Sierra Mixed Conifer zone. Infection mild but all leaves on a plant may be infected. Collections: 8581, 14626, 15587, 20331, Exs. 115, 115-A. Dates: 16 July 1937, 5 July 1940, 18 July 1941, 18 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*; *Libocedrus decurrens*, *Pinus ponderosa*.

On *Potentilla flabellifolia*. — A few leaves on one plant infected, South Gate springs, 8250 feet, White Bark Pine zone.

Collections: 20282. Date: 10 July 1947. Abundance V, C. Associates: *Carex spectabilis*, *Lutkea pectinata*, *Mimulus tilingii*. Distribution: On several species of *Potentilla* in Scandinavia, Great Britain, North America; Mt. Shasta.

*Taphrina pruni-subcordatae* (Zeller) Mix. — On *Prunus subcordata*. — Collected on shrubs along the old snowline road below MacBride Springs where a colony is occasionally attacked. In 1946 large witches brooms were formed on which all leaves were deformed. In 1947 there was no sign of diseased material on shoots from these brooms.

Collections: 14724, 18117, Exs. 72. Dates: 15 Sept. 1940, 26 June 1946. Abundance: III, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Oregon, California; Mt. Shasta.

## E u a s c o m y c e t e s .

### Plectomycetes.

#### Eurotiales.

#### Eurotiaceae.

*Aspergillus fumigatus* Fres. — Isolated from soil from Shasta Fir forest and from Panther Creek Meadows, Shasta Fir zone, 7000 and 7600 feet.

Dates: 21 June, 29. Aug. 1946. Isolated 17 Feb. 1947. Associates: *Abies magnifica* var. *shastensis*; *Phyllodoce empetriformis*, *Kalmia poli-*

*folia*. Distribution: Europe, North and South America; Mt. Shasta.

*Penicillium* spp. (including *P. ?notatum*). — Isolated from the soils indicated in the table.

*Penicillium lanosum* Westling. — Isolated from soil collected at Wagon Camp in 1948.

*Penicillium raciborskii* Zaleski. — Isolated from soil collected at Wagon Camp in 1948.

### *Erysiphales*.

#### *Erysiphaceae*.

*Erysiphe cichoracearum* DC. ex Méral. — On *Cryptantha affinis*. — A small host colony was infected near Wagon Camp. Collections: 8617. Date: 6 Aug. 1937. Abundance: IV, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Erigeron inornatus*. — Observed annually throughout the range of the host below MacBride Springs and Bear Springs in the chaparral.

Collections: 13380, 20390, Exs. 19. Dates: 4. Aug. 1939, 1 Aug. 1947. Abundance: II, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

On *Phacelia mutabilis*. — Near Wagon Camp.

Collections: 20423. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Prunus emarginata*, *Ceanothus velutinus*. Distribution: Cosmopolitan.

*Erysiphe graminis* DC. ex Méral. — On *Agrostis exarata*. — Causing a mild infection in the Bear Springs area.

Collection: 13331, Exs. 20. Date: 7 July 1939. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*.

On *Poa pratensis*. — Causing a mild infection at Horse Camp.

Collections: 10214, 13398, 18433, Exs. 26. Dates: 15 July 1938, 20. Aug. 1939, 2. Sept. 1946. Abundance: II, C. Associates: *Abies magnifica* var. *shastensis*.

On *Elymus elymoides*. — Causing a fairly heavy infection on some plants in the vicinity of Horse Camp.

Collections: 13397, 18432, Exs. 27. Dates: 20 Aug. 1939, 4. Sept. 1946. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*. Distribution: Cosmopolitan.

*Erysiphe polygoni* DC. ex Méral. — On *Eriogonum marifolium*. — Infection rare on this common host. At 7500 ft., below Horse Camp.

Collections: 13360, 20398. Dates: 26 July 1939, 8 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*.

On *Arabis platysperma*. — Complete infection on one host colony along the Sisson Southern Trail in Shasta Fir woods at 7000 feet.

Collection: 20470, Exs. 251. Date: 22 Aug. 1947. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*.

On *Vicia americana*. — Usually common in dryer portions of Wagon Camp Meadows and MacBride Springs areas. Collection: 13346, Exs. 21. Date: 21 July 1939. Abundance: I, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Cosmopolitan.

*Sphaerotheca epilobii* (Lk.) Duby. — Common on plants around springs. Wagon Camp and Sisson Southern Trail Springs. Collections: 8616, 20410. Dates: 6 Aug. 1937, 8 Aug. 1947. Abundance: IV, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Veratrum californicum*.

On *Epilobium lactiflorum*. — Covering a host colony near a spring along Squaw Valley Creek, 8000 ft. Collection: 13316, Exs. 21. Date: 24 Aug. 1939. Abundance: V, C. Associates: *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*. Distribution: On more than seven species of *Epilobium* in Europe; Mt. Shasta.

*Sphaerotheca macularis* (Wallr. ex Fr.) W. B. Cke. — On *Viola purpurea*. — A large host colony along trail above Wagon Camp was heavily infected. Collections: 10288, 13403, Exs. 22. Dates: 8 Sept. 1938, 22 Aug. 1939. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*. Distribution: Cosmopolitan.

*Sphaerotheca macularis* var. *fuliginea* (Schlecht. ex Fr.) W. B. Cke. — On *Arnica mollis*. — While the host is common at Panther Creek and Squaw Valley Creek meadows infection has been observed only at the latter location. Collections: 10298, 13415, Exs. 23. Dates: 8 Sept. 1938, 24. Aug. 1939. Abundance: II, C. Associates: *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*.

On *Taraxacum officinale*. — Observed on only several plants at Wagon Camp. Collection: 20428. Date: 15. Aug. 1947. Abundance: V, C. Associates: Herbaceous plants of Wagon Camp meadows. Distribution: On more than eleven host genera, wide spread.

#### *Perisporiaceae.*

*Dimerium alpinum* W. B. Cke. — On *Pentstemon menziesii* var. *davidsonii*.

The host normally inhabits exposed places in the timberline region and in the White Bark Pine zone where it finds shelter on the moist side of rocks and moisture near seepage areas. While it occurs in other locations of a more exposed nature, in this type of location whole colonies become blackened with the fungus. These habitats are subject to prolonged periods of cover by the annual snow pack. At these times the relative humidity is very high although the

temperatures are low. These conditions are reversed in the summer with the high insolation characteristic of higher elevations with little or no shade from forest cover. Observed throughout the southwest quadrant between 8500 and 9500 feet.

Collections: 8601, 10252, 15711, 18314 (type), 20479, 28301. Dates: 28 July 1937, 28 July 1938, 14. Aug. 1941, 30 July 1946, 28 Aug. 1947, 2 July 1951. Abundance: III, B. Associates: *Eriogonum marifolium*. Distribution: Known only from these collections; British Columbia.

## Pyrenomyces.

### Sphaeriales.

#### Sordariaceae.

*Sordaria bombarioides* Awd. — On horse dung.

A specimen collected by Harkness at Mt. Shasta, Calif., was cited by Griffiths in "North American Sordariaceae", Mem. Torr. Bot. Cl. 11: 43. 1901. This must have been obtained on the mountain for the name of the community at its base was not changed from Sisson's to Mount Shasta until 1925.

On deer dung. — Shasta Fir woods on ridge between Horse Camp and Panther Creek Meadows.

Collection: 28295. Date: 2 July 1951. Abundance: IV. Associate: *Abies magnifica* var. *shastensis*. Distribution: Widespread.

*Sporormia australis* Speg. — On deer dung. — Shasta fir forest on ridge between Horse Camp and Panther Creek Meadows. Collection: 28296. Date: 2 July 1951. Abundance: IV. Associate: *Abies magnifica* var. *shastensis*. Distribution: Argentina, Ontario, Mt. Shasta.

#### Chaetomiaceae.

*Chaetomium murorum* Corda. — Isolated by G. W. Martin from piece of wood of Shasta fir sent for study of Myxomycete plasmodium. Horse Camp, 8000 ft.

Date: Sept. 1941. Isolated after incubation in moist chamber 7 Dec. 1945, G.W.M. 6259. Det. J. W. Groves. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Mt., Shasta.

*Chaetomium succineum* Ames and *Chaetomium* sp. — Isolated from soil from Panther Creek Meadows.

Date: 29 Aug. 1946. Isolated 17 Feb. 1947. Distribution: *C. succineum*. Known only from this collection.

#### Diaporthaceae.

*Cryptosporella acerina* L. E. Wehmeyer. — On *Acer glabrum*. — A few branches of shrubs below the Sisson Southern Trail Spring were infected.

Collection: 20413 (type). Date: 8 Aug. 1947. Abundance: IV, B. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Pinus pon-*

*derosa*, *Pinus lambertiana*. Distribution: Known only from this collection.

### Xylariaceae.

*Hypoxylon diathrauston* Rehm. — (*Creosphaeria pinea* Petrak). — On *Abies concolor*. — On bark of twigs and branches of fallen tree along the Sisson Southern Trail at 6500 feet.

Collection: 20179, Exs. 255. Date: 27 June 1947. Abundance: IV, A. Associates: *Abies concolor*. Distribution: Tyrol, Austria; Mt. Shasta.

*Hypoxylon serpens* Pers. ex Fr. — On *Ceanothus velutinus*. — Common on dead branches wherever the host is smothered out by young colonies of *Abies concolor* and *Pinus ponderosa*.

Collections: 18100, Exs. 211. Date: 28 June 1946. Abundance III, B. Associates: *Abies concolor*, *Pinus ponderosa*. Distribution: Europe, Siberia, Borneo, North and South America; Mt. Shasta.

*Rosellinia riminicola* Rehm. — On *Haplopappus bloomeri* var. *angustatus*. — Common on dead branches in the Horse Camp area, 8000 ft.

Collections: 18083, 18177, Exs. 212. Dates: 27 June, 7 July 1946. Abundance: III, B. Associates: *Arctostaphylos nevadensis*, *Abies magnifica* var. *shastensis*. Distribution: Europe, Mt. Shasta.

*Rosellinia subsimilis* Sacc. — On *Arctostaphylos nevadensis*. — Occasional branches carry fruit bodies, Horse Camp, 8000 ft.

Collection: 18184. Date: 8 July 1946. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis*.

On *Arctostaphylos patula*. — Covering dead branches in the chaparral along the lower end of the Sisson Southern Trail, 4500 ft.

Collection: 19296, Exs. 256. Date: 7 April 1947. Abundance: IV, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Finland, Mt. Shasta.

### Hypocreales.

#### Hypocreaceae.

*Hypomyces aurantius* (Pers.) Fckl. — On *Ganoderma oregonense*. — Large conks of the host fungus have been found in the season following their emergence in somewhat disintegrated condition. The hymenial surface of some of these conks was covered with this disease. Beetles which eat the *Canoderma* seem to leave the *Hypomyces* to some other agent of decay.

Collections: 10127, 20058, 20296. Dates: 20 June 1938; 22 June, 16 July 1947. Abundance: IV, F. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Cuba, North America; Mt. Shasta.

Specimens of *Spongiporus leucospongia* collected on an old White Bark Pine sign post high above timberline along the Summit Trail had turned a color characteristic of the early stages of this

fungus. However, it had not fruited and no attempt was made to culture it.

*Hypocrea citrina* (Pers.) Fr. — On *Fomes pinicola*. — Occasional conks of the host occurring on Shasta fir are infected with small colonies of this fungus. Panther Creek Meadows, 7600 ft. Collection: 28258. Date: 1 July 1951. Abundance: V, F. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Ceylon, Tasmania, Europe, North America; Mt. Shasta.

### Lophiostomatales.

#### Lophiostomataceae.

*Lophiostoma brenckleanum* Sacc. — On *Haplopappus bloomeri* var. *angustatus*. — Found once at Horse Camp, 8000 ft. Collection: 18181. Date: 8 July 1946. Abundance: V, B. Associates: *Abies magnifica* var. *shastensis*. Distribution: North Dakota; Mt. Shasta.

#### Microthyriaceae.

*Microthyrium microscopicum* Desm. — On *Arabis platysperma*. — On dead stems of previous year, south side of Red Butte, 8000 ft.

Collection: 25584. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*. Distribution: New Zealand, Europe, North America; Mt. Shasta.

### Dothideales.

#### Dothideaceae.

*Dothidella janus* (Berk. & Curt.) Hoehn. — On *Castanopsis chrysophylla*. — Occasional throughout the range of the host, but occasionally abundant on single branches or on a colony of shrubs. Collections: 8510, 10114, 10236, 16635, Exs. 28, 28, 28—A, 25698. Dates: 26 June 1937; 17 June, 22 July 1938; 30 May 1942; 26. Aug. 1949. Abundance: I, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: California, Oregon, Washington, New Mexico, Texas, Florida, Mt. Shasta.

*Dothidella junci* (Fr.) Sacc. — On *Juncus parryi*. — Ascostromata found on most of the culms of occasional clumps in the vicinity of Horse Camp.

Collections: 10303, 18032, Exs. 40—A. Dates: 17 Sept. 1938, 24 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, California; Mt. Shasta.

*Dothidella trifolii* (Pers. ex Fr.) Bayl.-Ell. & Stan. — On *Trifolium involucreatum* var. *fimbriatum*. — The imperfect stage, *Polythrincium trifolii*, was found once on the host which is widespread in Bear Springs meadow.



Collection: 14694, Exs. 74. Date: 2 Aug. 1940. Abundance: IV, C. Associates: *Lotus obtusifolius* var. *torreyi* and other herbs. Distribution: On more than 11 species of *Trifolium* in Europe, Siberia, North America, Mt. Shasta.

*Stigmatea sequoiae* (Cke. & Harkn.) Ell. & Ev. — On *Libocedrus decurrens*. — Reported on drying leaves at Sisson (now Mount Shasta), Aug. 1894, by W. C. Blasdale. N. Am. Fung. 3222. Fung. Col. 719.

### *Mycosphaerellaceae.*

*Mycosphaerella aquilegiae* Ell. & Galw. — On *Lupinus obtusilobus*. — Abundance: V, C. Distribution: Europe, Mt. Shasta.

*Mycosphaerella schoenoprasii* (Awd.) Wehm. — On *Allium validum*. — On overwintered herbage, Panther Creek Meadows.

Collection: 20453. Date: 15 Aug. 1947. Abundance IV, C. Associates: Streamside herbs including *Mimulus*, *Arnica*, etc. Distribution: Europe, Wyoming, Mt. Shasta.

*Mycosphaerella lassiana* (Not.) Johans. — On *Allium validum*. — On overwintered herbage around springs above Wagon Camp, 6200 ft.

Collection: 18008. Date: 21 June 1946. Abundance: V, C. Associates: *Arnica* and other spring stream herbs.

On *Arabis platysperma*. — On overwintered stems, Sisson Southern Trail, 7000 ft.

Collection: 20480. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*.

On *Carex fracta*. — With *Cladosporium herbarum* on overwintered leaves, MacBride Springs.

Collection: 19289. Date: 7 April 1947. Abundance: IV, C. Associates: *Libocedrus decurrens*, *Rubus parviflorus*.

On *Phleum alpinum*. — On overwintered herbage around springs above Panther Creek Meadows.

Collection: 18405. Date: 27 Aug. 1946. Abundance: V, C. Associates: *Carex spectabilis*, *Juncus* spp., *Hieracium gracile*.

On *Senecio triangularis*. — On overwintered herbage, lower Panther Creek Meadows.

Collections: 25643. Date: 25 Aug. 1949. Abundance: IV, C. Associates: Streamside vegetation.

On *Veratrum californicum*. — On overwintered stems along lower Panther Creek.

Collection: 25640. Date: 25 Aug. 1949. Abundance: IV, C. Associates: streamside vegetation. Distribution: On at least 51 monocot and 58 dicot hosts, panarctic.

*Mycosphaerella tulasnei* Jacz. — On *Juncus balticus* var. *montanus*. — On *Trisetum spicatum*. — Abundance: IV, C. Distribution: Europe, North America, Mt. Shasta.

*Mycosphaerella* sp. — On *Pinus albicaulis*. — On cone scales on ridge above Horse Camp, 9000 feet. Collection: 18254. Date: 16 July 1946. Abundance: V, A.

### Pseudosphaeriales.

#### *Pseudosphaeriaceae.*

*Acanthonitschkia coloradense* Cash & Davidson. — On *Abies magnifica* var. *shastensis*. — On *Pinus ponderosa* boards. — Found on both substrata in the Horse Camp area, 8000 ft. Fir branches on which this grew were recent falls. The unpainted boards had been in use for about 8 years.

Collections: 18201, 18348, 18369. Dates: 10 July, 10, 17 Aug. 1946. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

*Apiosporella alpina* Wehm. — On *Arnica longifolia* ssp. *myriadenia*. — Lower end of the Panther Creek meadow area, 6500 ft. Collection: 20445. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Allium validum*, *Arnica mollis*. Distribution: Wyoming, Mt. Shasta.

*Apiosporella mimuli* Wehm. — On *Allium validum*. — Lower portion of Panther Creek Meadows, 7000 ft. Collection: 20451. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Arnica* spp., streamside herbs. Distribution: Wyoming, Mt. Shasta.

*Apiosporella* sp. — On *Lupinus albicaulis* var. *shastensis*. — Common on overwintered herbage, Horse Camp-Wagon Camp Trail, 7000 ft. Collection: 18007. Date: 21 June 1946. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*.

*Bertia moriformis* (Tode ex Fr.) de Not. — On *Abies magnifica* var. *shastensis*. — On exfoliating bark of dead branches, Sisson Southern Trail, 7500 ft. Collection: 15595, Exs. 118. Date: 23 July 1941. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Java, Siberia, North America, Mt. Shasta.

*Dibotryon morbosum* (Lib.) Theiss. & Syd. — On *Prunus demisa*. — Only one colony has been observed to be infected, in the chaparral, old snowline road, 4500 ft. Collection: 18115, Exs. 210. Date: 28 June 1946. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: North America, Mt. Shasta.

*Clathrospora cookei* Wehmeyer. — On *Stipa californica*. — On overwintered culms and leaves, Horse Camp.

Collection: 18095 (type). Date: 27 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Mt. Shasta, Mt. Rainier.

*Clathrospora diplospora* (Ell. & Ev.) Wehm. — On *Anemone occidentalis*, *Castilleja miniata*, *Monardella odoratissima*. — Scattered through the White Bark Pine zone above 8500 ft. above the basin of Panther Creek Meadows, and around Horse Camp at 8000 ft. in the Shasta Fir zone.

Collections: 18094, 20284, 20285. Dates: 27 June 1946, 10 July 1947. Abundance: III, C. Associates: *Pinus albicaulis*, *Abies magnifica* var. *shastensis*. Distribution: Kansas, Mt. Shasta.

*Gibbera* sp. — On *Abies magnifica* var. *shastensis*. — On branches near Horse Camp associated with a pink mold.

Collection: 18333. Date: 31 July 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*.

*Herpotrichia nigra* Hart. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Juniperus communis* var. *montanus*, *Tsuga mertensiana*.

This fungus commonly occurs on young trees of Shasta fir and mountain hemlock where those trees grow outside of or above the taller timber, in such places as at the edge of economic timberline and avalanche areas which are becoming reseeded. It is a "smothering" fungus and as such is of economic importance since it kills the branches on which it grows. It also occurs on needles in the Shasta fir litter. It has also been found enveloping branches of the shrub juniper which lie near the ground on outcroppings in the White Bark Pine zone. In occasional pockets on lava slopes in the Squaw Valley Creek area occasional trees of White Fir are heavily attacked; Sierra Mixed Conifer zone. Its habitat is in the region of heaviest and longest snow packs.

Collections: on Shasta fir: 10137, 10299, 18044, 18354; on mountain hemlock: 15758; on juniper: 18249, 18409; on white fir: 20234. Dates: 20 June, 10 Sept. 1938; 28 Aug. 1941; 24 June, 16 July, 10, 29 Aug. 1946; 10 July 1947. Also observed throughout the season in each year between 1936 and 1942 and in 1946 and 1947. Abundance: III, A. Associates: All conifer species. Distribution: Iceland, Greenland, Swedish Lappland, Sweden, Norway, Europe, North America, Mt. Shasta.

*Lasiosphaeria vermicularia* (Nees) Cke. — Collected once in 1937 on Shasta fir slash, Horse Camp.

Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Carolina, California, Mt. Shasta.

*Leptosphaeria doliolum* (Pers.) Cel. & de Not. — On *Arnica viscosa*. — Found once at Horse Camp, 8000 ft.

Abundance: IV, C. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: On 15 dicots in Europe, Carolina, Mt. Shasta.

*Leptosphaeria heterospora* (Not.) Niessl. — On *Arnica viscosa*, *Poa epilis*, *Stipa occidentalis*, *Trisetum spicatum*. — On overwintered herbage in the Horse Camp basin area between 8000 and 9500 feet.

Collections: 18095, 20219, 20223, 20477. Dates: 27 June 1946; 2 July, 28 Aug. 1947. Abundance: III, C. Associates: Plants of timberline and White Bark Pine zone. Distribution: Europe, Mt. Shasta.

*Leptosphaeria maculans* (Desm.) Ces. & de Not. — (*L. sowerbyi* (Fckl.) Sacc.; near *L. galeobdolonis* Feltg.) — On *Lupinus albicaulis* var. *shastensis*. — Covering and blackening entire stems and branches, ridge south of Horse Camp, 8000 ft.

Collection: 2294, Exs. 253. Date: 16 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Mt. Shasta.

*Leptosphaeria michotii* (West.) Sacc. — On *Juncus orthophyllus*. — Near Horse Camp Springs, 8250 ft.

Abundance: V, C. Associates: *Mimulus tilingii*, *Juncus mertensianus*. Distribution: On one each of a grass, sedge and rush, Europe; Mt. Shasta.

*Leptosphaeria microscopica* Karst. — On *Agrostis thurberiana*, *Trisetum spicatum*. — In the Horse Camp area, 8000—8250 ft.

Abundance: IV, C. Associates: *Mimulus tilingii*, *Juncus* spp. Distribution: On six grasses in northern Europe; Mt. Shasta.

*Leptosphaeria millefolii* Fckl. — On *Lupinus obtusilobus*. — Forming blackened areas over entire stems and plants in the Horse Camp area, 8000 ft. During the first year of growth of this fungus it remains sterile on the living host.

Collection: 18199, Exs. 225. Date: 10 July 1946. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Central Europe; Mt. Shasta.

*Leptosphaeria ?planiuscula* (Reiss.) Ces. & de Not. — On *Lupinus albicaulis* var. *shastensis* — On overwintering herbage along the Horse Camp-Wagon Camp Trail, 7000 ft.

Collection: 18007. Date: 21 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Germany, Switzerland, Finland; Mt. Shasta.

*Leptosphaeria typharum* (Desm.) Karst. — On *Phleum alpinum*. — On overwintered culms and leaves at a small spring above Panther Creek meadows, 8500 feet.

Collection: 18405. Date: 29 Aug. 1946. Abundance: IV, C. Associates: *Mimulus tilingii*, *Carex* spp., *Juncus* spp. Distribution: Europe, Mt. Shasta.

*Leptosphaeria vagans* Karst. — (*L. caricinella* Karst.; *L. junciseda* Karst.) — On *Agrostis* sp., *Carex* sp., *Juncus balticus* var. *montanus*, *Juncus orthophyllus*, *Phleum alpinum*, *Trisetum spicatum*. — On overwintered herbage in spring areas in the upper Shasta fir zone, timberline areas and White Bark Pine zone. Collections: More than 10 collections, Exs. 68. Abundance: III, C. Associates: Herbs of springs areas. Distribution: Panarctic, Mt. Shasta.

*Melomastia shastensis* Earle. — On *Abies magnifica* var. *shastensis*. — Collected by E. B. Copeland on Shasta fir in 1904. Only published record found occurs in Bull. N. Y. Bot. Gard. 1904: 292. Apparently this was collected in the vicinity of Horse Camp, or at some point along the route of the Sisson Southern Trail in the Shasta Fir zone.

Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Mt. Shasta.

*Metasphaeria sepalorum* Vleugel. — On *Juncus parryi*, *Carex multicaulis*. — In contrast to most species in this group this species develops in a stroma-like structure usually on the perianth segments but also occasionally on the peduncles and scapes.

Collections: 10303, 18167, 24055, 25637. Dates: One collection each in 1938, 1940 and 1941; 3 July 1946, 5 July 1948; 25 Aug. 1949. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: On 3 species of *Juncus* and 1 of *Luzula*, Iceland, Spitzbergen, Swedish Lapland, Sweden; Medicine Bow Mts., Wyoming; Cascade Peaks in Oregon and Washington; Tioga Pass and Mt. Shasta, California.

*Neopeckia coulteri* (Pk.) Sacc. — On *Pinus albicaulis*.

This "smothering fungus" occurs only on white bark pine on Mt. Shasta. It is fairly common and looks as if some tent caterpillar had formed a dense brown web on the infected branch of the infected tree. Its occurrence is scattered and nowhere can the death of individuals over large areas (as in the case of the "ghost forest" caused by *Arceuthobium campylopodum* f. *cyanocarpum* on the same host) rather than just twigs or branches, be attributed to the smothering action of this fungus.

Collections: 8599, 10250, Exs. 35. Dates: 28 July 1937, 28 July 1938. Observed throughout the season in each year between 1936 and 1942 and in 1946 and 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Western North America, Europe, Mt. Shasta.

*Linospora brunnellae* Ell. & Ev. — On *Prunella vulgaris*. — Collected at Sisson (Mt. Shasta) by M. A. Howe (118), July 24—Aug. 10, 1894. Record based on a specimen at the New York Botanical Garden.

*Massarinula lignorum* L. E. Wehmeyer. — On *Acer glabrum*. — On trees along the usually dry creek below the Sisson Southern Trail spring, 6500 ft.

Collection: 20403 (type). Date: 8 Aug. 1947. Abundance: V, B. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Pinus lambertiana*. Distribution: Known only from the type collection.

*Pleospora anthyllidis* Auersw. — On *Arnica viscosa*. — Abundance: IV, C. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: On two hosts in Europe; Mt. Shasta.

*Pleospora balsamorhizae* Tracy & Earle. — On *Lupinus albicaulis* var. *shastensis*, *Lupinus obtusilobus*. — Occasionally found on pieces of overwintered herbage in litter. Horse Camp area and Wagon Camp-Horse Camp Trail, Shasta Fir zone. Abundance: III, C.

On *Silene douglasii* var. *douglasii*. — On overwintered herbage, north side of Mt. Shasta above Bolam Station, Shasta Fir zone. Collection: 25660. Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*, *Pinus ponderosa*. Distribution: Southern Colorado, Mt. Shasta.

*Pleospora ambigua* (Berl. & Bres.) Wehmeyer var. *ambigua*. — On *Lupinus albicaulis* var. *shastensis*.

Collection: 15739. Date: Aug. 1941. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*.

On *Aster shastensis*.

Collection: 18234. Date: Aug. 1946. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

*Pleospora elynae* (Rab.) Ces. & de Not. — On *Carex spectabilis*, *Juncus mertensianus*. — On overwintered herbage in the spring area above Horse Camp and in the South Gate springs, 8000—8250 ft.

Collections: Collected once in 1937; 18427. Dates: 1937, 2 Sept. 1946. Associates: Herbs of the meadows. Distribution: On 17 species of *Juncus* and *Gramineae*: Greenland, Spitzbergen. Scandinavia, Switzerland, Arctic America, Mt. Shasta.

*Pleospora gigaspora* Karst. — (*Pleospora amplispora* Ell. & Ev.) — On *Lupinus albicaulis* var. *shastensis*, *Lupinus obtusilobus*. — On overwintered herbage in the Horse Camp area and along the Horse Camp-Wagon Camp Trail.

Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: on *Eriophorum*, *Elymus*, *Hypochaeris*, *Lupinus* in Lappland, Denmark, Siberia, Washington, Mt. Shasta.

*Pleospora herbarum* (Pers.) Rab. — On *Agrostis thurberiana*, *Arnica viscosa*, *Eupatorium occidentale*, *Iliamna bakeri*, *Silene douglasii*.

On overwintered herbage from 4500 ft. in the chaparral along the Sisson Southern Trail and above Hotlum Station, to the Horse Camp

area at 8000 ft. Abundance: II, C. Distribution: On at least 15 monocot and dicot herbs; Europe, Siberia, Java, New Zealand, America, Pan-arctic, Mt. Shasta.

*Pleospora permunda* (Cke.) Sacc. — On *Anemone occidentalis*, *Arabis platysperma*, *Castilleja pinetorum*, *Cycladenia humilis*, *Ligusticum grayi*, *Monardella odoratissima*, *Pentstemon gracilentus* (Exs. 36). Abundance: I, C. Associates: Hosts scattered throughout most zones. Distribution: On dead stems in California, Mt. Shasta.

*Pleospora tragacanthae* Rab. — On *Phlox douglasii*. — On plants along the south side of Red Butte, 8000 ft. Collection: 25613. Date: 24 Aug. 1949. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

*Pleospora* spp. — On *Aster shastensis*, *Castilleja arachnoidea* var. *shastensis*, *Juncus mertensianus*, *Lupinus albicaulis* var. *shastensis*, *Veratrum californicum*.

On overwintered herbage in most locations on the mountain as yet unidentified species of *Leptosphaeria* and *Pleospora* seem to be quite common. Abundance: II, C.

*Pyrenophora fenestrata* Pk. — On *Castilleja pinetorum*. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Utah, Mt. Shasta.

*Pyrenophora hispida* (Niesl.) Sacc. — On *Aster shastensis*.

Abundance: V, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On stems in Europe; Mt. Shasta.

*Pyrenophora trichostoma* (Fr.) Fckl. — On *Juncus balticus* var. *montanus*.

Abundance: V, C. Distribution: On grass stems in Europe; Mt. Shasta.

*Teichospora chevalieri* Karst. — Collected on a dry piece of coniferous wood at Bear Springs, 5000 ft.

Collection: 15577—A. Date: 18 July 1941. Abundance: V, A. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*. Distribution: Europe, Mt. Shasta.

*Teichospora megastega* Ell. & Ev. — On *Haplopappus bloomeri* var. *angustatus*. — On woody branches at Horse Camp, 8000 ft.

Collection: 20438. Date: 15 Aug. 1947. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Western North America, Mt. Shasta.

*Thyridaria californica* Rehm. — On *Purshia tridentata*. — In the chaparral along the Military Pass road a mile north of Andesite Station on the north side of the mountain.

Collection: 19414. Date: 9 April 1947. Abundance: IV, B. Associates: *Cercocarpus ledifolius*, *Arctostaphylos patula*. Distribution: Los Angeles Co., California; Mt. Shasta.

*Trichosphaeria solaris* (Cke. & Ell.) Ell. & Ev. — On *Abies magnifica* var. *shastensis*.

Collection: 15565. Date: 16 July 1941. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Eastern North America, California, Mt. Shasta.

*Venturia kalmiae* Peck. — On *Kalmia polifolia*. — In the heather meadows at Panther Creek Meadows.

Collection: 20449. Date: 15 Aug. 1947. Abundance: V, B. Associates: *Phyllodoce empetriformis*, *Vaccinium caespitosum*. Distribution: New York, Mt. Shasta.

Note: A number of species of ascomycetous fungi develop perfect stages on dead herbaceous material. Usually the herbaceous material can be assigned to the plant which produced it. Following the frosts at the end of August or in early September the host part dies and is soaked by the rains, the water melting from hail storms, sleet or snow cover. The dead or dying host parts, which were perfectly healthy and without sign of fungus infection prior to the frosts, thus become thoroughly water soaked and, when not frozen, present excellent habitats for fungi. From November to June, in normal years, these plant parts are covered by the snow pack, although snowfall starts as early as September as low as 8000 feet, the elevation of these observations. During the period of the pack the plant remains under it are probably well watered and evidently well insulated against freezing; a very high relative humidity is probably characteristic of such habitats. Within two weeks after the pack has melted the herbage has become thoroughly dry and brittle. Thus these mature fungi, with which are associated imperfect species, which may or may not be their imperfect stages, probably developed under the snow pack.

### Hysteriales.

#### *Hysteriaceae.*

*Glioniella lapponica* Karst. — On *Arctostaphylos nevadensis*. — On dead branches and twigs near the upper limits of the range of the host in the Horse Camp area.

Collections: 15639, 18189, 20455, Exs. 207. Dates: 26 July 1941, 8 July 1946, 15 Aug. 1947. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Lappland, Mt. Shasta.

*Hysterium acuminatum* Fr. var. *alpinum* Rehm. — Collected on wood of *Abies magnifica* var. *shastensis*, on bark of *Tsuga mertensiana* and on boards of *Pinus ponderosa*, Horse Camp area and Panther Creek Meadows, 7600—8000 ft.

Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Tyrol, Mt. Shasta.



*Hysterium magnosporum* Ger. — On *Athyrium americanum*. — Although it was looked for at intervening periods this species has been collected only in 1937 and 1946 on overwintered stalks in Horse Camp Creek where a large host colony occurs. Collections: 8565, 18152-A, Exs. 33, 33-A. Dates: 7 July 1937, 2 July 1946. Abundance: IV, C. Associate: *Cryptogramma acrostichoides*. Distribution: New York, California, Mt. Shasta.

*Hysterographium formosum* (Cke.) Sacc. — Collected on white bark pine and Shasta fir twigs which were dead and which were either still on the tree or had just fallen to the ground. The fungus fruited on the bark. Around the flat below Horse Camp, 8000 ft.

Collections: On Shasta fir: 8512, 8531, Exs. 34; on white bark pine: 8527, 8600, 18246. Dates: 22, 26 June, 28 July 1937; 16 July 1946. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: California, Mt. Shasta.

*Lophium dolabriforme* Wallr. — On *Juncus balticus* var. *montanus*. — A few hysterothecia were found to be scattered among other fungi on overwintered culms at Horse Camp. Abundance: V, C. Distribution: Germany, Switzerland, Mt. Shasta.

## Discomycetes.

### Helotiales.

#### *Dermateaceae.*

*Hysteropezizella* spp. — Possibly two species occur on overwintered herbage, one on *Lupinus obtusilobus*, the other on *Arnica viscosa*. — Abundance: IV, C.

*Laetinaevia veratri* Cash. — On *Veratrum californicum*.

On overwintered herbage and stems in wet places at Wagon Camp, 5700 ft.

Collection: 18009. Date: 21 June 1946. Abundance: V, C. Associates: Meadow herbs. Distribution: Known only from this locality.

*Tympanis pithya* (Karst.) Karst. — On *Pinus albicaulis*. — Found in the Horse Camp area on bark of twigs following the winter's snow pack.

Collections: 8530, 8535, 8538, 8543, 8598, 18043, Exs. 259. Dates: 26, 29 June, 28 July 1937; 24 June 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Northern Europe, Western North America, Mt. Shasta.

#### *Phacidiaceae.*

*Bifusella acuminata* (Ell. & Ev.) Bonar & W. B. Cke. — On *Juncus parryi*. — The culms of many clumps of this host are commonly found covered with this fungus after the melting of the snow

pack. Collections have been made throughout the timberline region on the southwest side of the mountain.

Collections: 10303, 18090, Exs. 181. Dates: 10 Sept. 1938, 27 June 1946. Abundance: II, C. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: On *Juncus* in Colorado; on *Juncus parryi* on most of the Cascade Peaks; Mt. Shasta.

*Clithris crispa* (Pers.) Rehm. — On *Abies magnifica* var. *shastensis*. — This species is found on dead Shasta fir wood either as small black slits on the wood when dry or as grey cups when moistened by melting snow. It is also found on blackened areas on old wood throughout the range of the host.

On *Tsuga mertensiana* (Bong.) Sarg. — Found once on wood south of Red Butte at 7500 feet.

Collections: One collection in 1941; 18308, 18269-B, 18356, 18357, 18416, 20272, 25625, 25635, 28243 Dates: 1941; 19, 29 July, 10, 29 Aug. 1946; 10 July 1947; 24 Aug. 1949; 1 July 1951. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Europe, Western North America, Mt. Shasta.

*Cryptomycina pteridis* (Rebent. ex Fr.) v. Hoehn. — On *Pteridium aquilinum* var. *pubescens*. — Found only once and then with *Ramularia pteridis* at Wagon Camp in fir woods near the meadows, 5700 ft.

Collection: 20431. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Siberia, Europe, North America; Mt. Shasta.

*Elytroderma deformans* (Weir) Darker. — On *Pinus ponderosa*. — A specimen was reported by W. D. Wagener in the Forest Pathology Herbarium in the San Francisco field office (97725), collected by K. A. S a l m a n, 2 June 1934 at Stevens Pass, Tennant, Siskiyou Co., Calif. In the herbarium of J. S. B o y c e are specimens from Goosenest Mountain and Pilgrim Creek Nursery, Siskiyou Co., California.

On *Pinus jeffreyi*. — A specimen was reported by G. D. D a r k e r in the herbarium of the office of Forest Pathology, San Francisco, collected by E. P. M e i n c k e, Sh. D. 4, from Sisson Tavern Park, "Shasta Co." (now Mount Shasta, Siskiyou Co.), Calif.

*Hypoderma ?abietinum* Ell. & E. — On Shasta fir bark at Horse Camp, 8000 ft.

Collection: 18162. Date: 3 July 1946. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

*Hypoderma robustum* Tub. — On *Abies concolor*. — The most common needle cast found on the mountain. The needles on a number of branches of several trees on the lava flow terminating at MacBride Springs, and along the Sisson Southern Trail just south of the flow, were infected.

Collections: 13419, 20348, 20409, Exs. 69; Darker reported a collection in the herbarium of the San Francisco field of Forest Pathology, J. S. Boyce (Sh (1) E 6) from Shasta, Siskiyou Co., California. Dates: 25 Aug. 1939; 25 July, 8 Aug. 1947. Abundance: III, A. Associates: *Libocedrus decurrens*, *Pseudotsuga taxifolia*. Distribution: Southern California to Southern British Columbia; Mt. Shasta.

*Hypodermella* sp. — On *Pinus albicaulis*. — Found on dead wood at Horse Camp and on a ridge south of Horse Camp, 8000—8500 ft. Collections: 18240, 20227. Dates: 13 July 1946, 10 July 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*.

*Hypodermella abietis-concoloris* (Mayr) Dearness. On *Abies concolor*. — According to Darker (16) material collected "near Mt. Shasta, Cal." prior to 1896 was the basis of this species.

*Hypodermella medusa* Dearn. — On *Pinus ponderosa*. — Darker (16) reports a specimen (SH. D. 3) in the herbarium of the San Francisco office of Forest Pathology from near Antelope Ranger Station, Siskiyou Co., Calif.

*Lophodermina autumnalis* (Darker) Tehon. — On *Abies concolor*. — Along the Mud Creek Dam road, south side of the mountain, at 4000 ft. about a mile above McCloud.

Collection: 19335. Date: 8 April 1947. Abundance: V, A. Associates: *Pinus ponderosa*, *Libocedrus decurrens*. Distribution: Nova Scotia, Ontario, Quebec, Michigan, Utah, Wyoming, Oregon, California, Mt. Shasta.

*Lophodermina juniperina* (Fr.) v. Hoehn. — On *Juniperus communis* var. *montanus*. — Killing older needles on branches of the host in a small colony on the north side of Gray Butte near the South Gate.

Collection: 16806. Date: 8 Sept. 1942. Abundance: IV, A. Associate: *Pinus albicaulis*. Distribution: Europe, North America, Mt. Shasta.

*Lophodermina nitens* (Darker) Tehon. — On *Pinus albicaulis*. — Not forming an needle cast in the usual sense but found on leaves fallen from older parts of branches. The imperfect stage precedes, the perfect stage follows, overwintering.

Collections: 8501, 10200, 18017, 18260, Exs. 53. Dates: 24 June 1937; 13 July 1938; 23 June, 16 July 1946. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: North America, Mt. Shasta.

*Lophodermium phloxii* Bonar & W. B. Cke. — On *Phlox douglasii*. — Found in two seasons and then covering a number of plants in a large colony on a flat below the Lodge at Horse Camp and on several plants on gravel slopes above the Lodge. In a previous year *Macrophoma cylindrospora* (Desm.) Berl. & Vogl. was common in the same area and might be the imperfect stage although no cultures were attempted. The latter appeared to be parasitizing healthy plants

while the former was found on dead branches and leaves on dead plants.

Collections: *Macrophoma*: 8553; *Lophodermium*: 10185, 18172, 25613, Exs. 152. Dates: 7 July 1937, 5 July 1938, 7 July 1946. Abundance: IV, C. Associates: *Antennaria geyeri*, *Abies magnifica* var. *shastensis*. Distribution: *Macrophoma*: Europe, Mt. Shasta; *Lophodermium*: Known only from Mt. Shasta.

*Lophodermium piceae* (Fekl.) v. Hoehn. — On *Abies magnifica* var. *shastensis*. — On needles on trees between Panther Creek Meadows and Wagon Camp, 7000 feet.

Collection: 20435. Date: 15 Aug. 1947. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Eastern and western North America, Mt. Shasta.

*Lophodermium pinicolum* Tehon. — On *Pinus lambertiana*, *Pinus ponderosa*. — Common on fallen branches along the Sisson Southern Trail between 5000 and 5500 feet.

Collections: 18364, 18365. Date: 16 Aug. 1946. Abundance: III, A. Associates: *Abies concolor*, *Pseudotsuga taxifolia*. Distribution: Japan, New Zealand, Europe, North America, Mt. Shasta.

*Odontotrema minus* Nyl. — Forming areas of black spots on silvered, weathered, unpainted, hand-hewn boards of Shasta fir in Horse Camp installations.

Collections: 13425, 18001, 18269-A, Exs. 213. Dates: 13 Sept. 1939; 16 June, 19 July 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Germany, Tyrol, Finland, Mt. Shasta.

#### Orbiliaceae.

*Orbilium coccinella* (Som.) Karst. — On *Purshia tridentata*. — North side of Mount Shasta about a mile north of Andesite Station, 5000 feet.

Collection: 19413. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius*, *Arctostaphylos patula*. Distribution: Northern and Central Europe, Mt. Shasta.

#### Patellariaceae.

*Leciographa dispersa* Syd. — On *Phyllodoce empetri-formis*. — Found once at the water supply spring above Horse Camp. Collection: 20462. Date: 20 Aug. 1947. Abundance: V, B. Associates: Herbs of the spring meadow. Distribution: Europe, Mt. Shasta.

*Tryblidiella macrospora* Bonar & Cash. — On *Libocedrus decurrens*. — Found once on branches at Bear Springs, 5000 ft. Collection: 26797. Date: 1 July 1950. Abundance: V, A. Associates: *Pinus ponderosa*, *Abies concolor*. Distribution: California; Mt. Shasta.

*Hyaloscyphaceae.*

*Hyaloscypha atomaria* (Starb.) Nannf. — On Shasta fir logs at Horse Camp, 8000 feet. Observed only when the wood was still wet from melting snow.

Collections: 18060, 20058, 20367, 20369. Dates: 25 June 1946; 22 June, 24 July 1947. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Lachnum bicolor* (Bull. ex Fr.) Karst. — On *Acer glabrum*, *Castanopsis chrysophylla*, *Ceanothus velutinus*. — Found on dead twigs and branches of these shrubs lying partially buried in litter at the base of the plants.

Collections: 15722, 15728, 20023. Dates: 18 Aug. 1941, 20 June 1947. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Europe, Iceland, China, North America, Mt. Shasta.

*Lachnum setigerum* (Phil.) Lindau. — On *Arnica viscosa*. — On the bases of stems of the host after overwintering under snow packs, especially where a large number of such herbaceous stems occur together.

Collections: 15623, Exs. 154. Date: 28 July 1941. Abundance: IV, C. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: Western North America, Mt. Shasta.

*Helotiaceae.*

*Belonioscypha campanula* (Fr.) Rehm. — On *Eriogonum marifolium*. — On several plants at 8100 ft. Following the snow pack small, pink, immature, later large, brown, mature fruit bodies found on overwintered peduncles.

Collection: 10198, Exs. 156. Date: 13 July 1938. Abundance: V, C. Associates: *Polygonum shastense*, *Arnica viscosa*. Distribution: Germany, Finland, Mt. Shasta.

*Cenangium* sp. — On *Abies magnifica* var. *shastensis*. — On dead branches along the Sisson Southern Trail at 7500 ft.

Collections: 18350, 18355. Date: 10 Aug. 1936. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*.

*Ciboria rufo-fusca* (Web.) Sacc. — On *Abies magnifica* var. *shastensis*. — On cone scales in litter at Horse Camp.

Collection: 20134. Date: 25 June 1947. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Germany, Mt. Shasta.

*Dasyscypha acanthonitschkia* Cash & Davidson. — On *Acanthonitschkia coloradensis*. — Occasional on ponderosa pine boards used in construction of unpainted cabins at Horse Camp, 8000 ft. Boards were in use 8 years.

Collection: 18369. Date: 17 Aug. 1946. Abundance: V, F. Associate: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

*Dasyscypha agassizii* (Berk. & Curt.) Sacc. — On *Abies magnifica* var. *shastensis*, *Pinus albicaulis*, *Tsuga mertensiana*. — Occasional on wood throughout the Shasta Fir and Withe Bark Pine zones.

Collections: Collected twice in 1939; 18048, 18165, 18421, 20486, 25605, Exs. 67. Dates: 1939; 25 June, 3 July, 29 Aug. 1946; 28 Aug. 1947; 24 Aug. 1949. Abundance: III, A. Associates: The coniferous hosts within their respective associations. Distribution: New England, Wisconsin, California, Mt. Shasta.

*Dasyscypha aplopappi* Cash. — On *Haplopappus bloomeri* var. *angustatus*. — Common on dead branches of this small shrub after the snow melts in June at Horse Camp.

Collections: 18082, 18175, 18180 (type). Dates: 27 June, 7, 8 July 1946. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this locality.

*Dasyscypha arida* (Phil.) Sacc. — On *Abies magnifica* var. *shastensis*. — This is the commonest discomycete in the Horse Camp area. It does not form cankers but it does fruit on living stunted Shasta firs at the upper limits of the main forest of the Shasta Fir zone. In these places it fruits abundantly on parts of trees injured by the snow pack in which cases it may complete the destruction of the infected parts. It also occurs on parts of trees injured by avalanches.

Collections :7582, 7600, 7639, 8515, 8523, 8524, 8534, 8540, 8548, 8549, 8550, 8551, 13311, 13315, 13316, 15595, 15645, 18042, 18351, Exs. 66. Dates: 9, 25 Aug., 10 Sept. 1936; 19, 22, 29 June 1937; 5 July 1939; 23, 29 July 1941; 24 June, 10 Aug. 1946. General: Observed throughout the season from 10 June through 15 September, especially whenever fruit bodies are revived by rain or melting snow, in every year from 1936 through 1948 and on the occasional visits since. Abundance: I, A. Associates: *Pinus albicaulis*, *Tsuga mertensiana*.

On *Pinus albicaulis*.

Collections: 8532, 8539, 18245, 20485. Dates: 26, 29 June 1937; 16 July 1946; 8 Aug. 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

On *Pinus lambertiana*.

Collection: 18370. Date: 16 Aug. 1946. Abundance: IV, A. Associates: *Abies concolor*, *Libocedrus decurrens*.

On *Abies concolor*.

Collections: 8662, 18420, 28329. Dates: 24 Aug. 1937, 29 Aug. 1946; *Abies magnifica* var. *shastensis*.

On *Tsuga mertensiana*.

Collections: 8662, 18420, 28329. Dates: 24. Aug. 1937, 29 Aug. 1946; 3 July 1951. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Western North America, Mt. Shasta.

*Dasyscypha flamma* (Alb. & Schw.) Fr. — On *Cercocarpus ledifolius*. — On dead branches near Andesite Station at 5000 ft. at the north base of the mountain.

Collection: 19399. Date: 9 Apr. 1947. Abundance: V, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

On *Haplopappus bloomeri* var. *angustatus*. — On dead branches in the timberline area above Horse Camp.

Collection: 15596-A. Date: 18 July 1941. Abundance: V, B. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: Europe, Iceland, Ceylon, North America, Mt. Shasta.

*Dasyscypha nivea* Sacc. — On *Arctostaphylos patula*. — Found once on partially buried sticks along the Junction road in a tongue of chaparral extending up to the lower part of the Shasta Fir zone.

Collection: 15723. Date: 18 Aug. 1941. Abundance: V, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Europe, North America, Mt. Shasta.

*Dasyscypha phlogis* Cash. — On *Phlox douglasii*. — On dead branches on plants on west side of Shastina, 9000 ft. and below Horse Camp, 7750 ft.

Collection: 20484 (Type). Date: 27, 28 Aug. 1947. Abundance: V, B. Associates: *Pinus albicaulis*, *Abies magnifica* var. *shastensis*. Distribution: Known only from these collections.

*Dasyscypha salmonea* Cash. — On *Haplopappus bloomeri* var. *angustatus*. — Common on dead branches of this small shrub after the snow melts in June at Horse Camp.

Collections: 18081, 18174, 18179 (type), 27015. Dates: 27 June, 7, 8 July 1946; 28 Sept. 1950. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from these collections.

*Dasyscypha serinella* (Quel.) Sacc. — In a handful of litter from under a mountain hemlock tree in Panther Creek meadows in which the largest percentage of organic matter was hemlock needles, 586 needles had at least one fruit body each of this species; some needles carried as many as four or five cups. Litter of Shasta fir needles at Horse Camp and white bark pine at 9000 feet on ridges above Horse Camp also carried small yellow cups of this species.

Collections: on *Tsuga mertensiana*: 15698, 28324; on *Abies magnifica* var. *shastensis*: 18045; on *Pinus albicaulis*: 18259. Dates: 28 July 1941; 25 June, 16 July 1946; 3 July 1951. Abundance III, A; IV, A; IV, A. Associates: The listed tree species. Distribution: Europe, Mt. Shasta.

*Dasyscypha succinea* (Phill.) Sacc. — On *Ceanothus velutinus*, *Prunus emarginata*. — Collected on the former host along the Junction Road on branches partially buried in litter, and on branches in the chaparral at McCloud Summit on State Route 89. Also

on the latter host on a root dislodged in a road widening operation at Bear Springs.

Collections: 15577-B, 15729-A, 18293. Dates: 18 July, 18 Aug. 1941; 25 July 1946. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Castanopsis chrysophylla*. Distribution: Colorado, Utah, California, Mt. Shasta.

*Durella* [?*compressa* (Pers. ex Fr.) Tul.]. — On dead wood of Shasta fir along the Sisson Southern Trail at about 7000 ft.

Collection: 18269. Date: 19 July 1946. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis*, *Arctostaphylos nevadensis*. Distribution: North America, Mt. Shasta.

*Godronia castanopsidis* Seaver. — On *Castanopsidis chrysophylla*. — Following a light rain a quantity of material of this species was obtained from dead branches in the chapparal along the Junction Road between Wagon Camp and the Snowline Highway. When dry this species is inconspicuous, when moistened its receptacles are bright yellow. Earlier, in connection with a collection of grass, a fragment of a branch of *Arctostaphylos patula* Greene was found with several fruit bodies.

Collections: 13369, 15717, Exs. 157. Dates: 28 July 1939, 18 Aug. 1941. Abundance: IV, B. Associates: *Ceanothus velutinus*, *Arctostaphylos patula*. Distribution: Known only from these collections.

*Helotium ?virgultorum* Vahl. ex Fr. — On *Holodiscus discolor* var. *glabrescens*.

Collection: 20465. Date: 20 Aug. 1947. Abundance: V, B. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: Europe, North America, Mt. Shasta.

*Helotium* sp. — On *Castanopsis sempervirens*. — On dead branches under shrubs on ridges north of Horse Camp at about 8500 ft. Immature.

Collection: 18252. Date: 16 July 1946. Abundance: V, B. Associate: *Holodiscus discolor* var. *glabrescens*.

*Lachnellula chrysophthalma* (Pers. ex Fr.) Karst. — Collected on hand hewn boards of Shasta fir at Horse Camp, and on old withe bark pine wood near Horse Camp.

Collections: Collected once in 1938; 15627. Dates: 1938; 28 July 1941. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: Europe, North America, Mt. Shasta.

*Mollisia hysterioides* Cash. — On *Haplopappus bloomeri* var. *angustatus*, *Phlox douglasii*. — Occasional on dead branches of these small shrubs on open flats around Horse Camp, 8000 ft.

Collections: 18173, 18176, 18178 (type). Dates: 7, 8 July 1946. Abundance: V, B. Associates: *Abies magnifica* var. *shastensis*, *Polygonum shastense*. Distribution: Known only from these collections.



*Mollisia shastensis* Cash. — On *Eriogonum pyrolaeifolium*. — Stems of this host develop underground and on death of the host become exposed. The plant grows in Alpine zone locations and few fungi have been found on it. North Ridges, 9000 ft. Collections: 20483, 20605 (type). Dates: 28 Aug., 4 Sept. 1947. Abundance: V, C. Associates: *Agoseris monticola*, *Hulsea nana*.

On *Arctostaphylos nevadensis*. — On branches of shrubs between Horse Camp and Panther Creek Meadows. Collection: 20456. Date: 15 Aug. 1947. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from these collections.

On *Eriogonum marifolium*. — South side of Red Butte, 8000 ft. Collection: 25614. Date: 24 Aug. 1949. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

*Patellea californica* Rehm. — On *Arctostaphylos patula*, *Salix scouleriana*. — On dead branches in a tongue of chaparral in the lower Shasta Fir zone, 6000 ft., intersected by the Junction Road; and along the old Sisson Southern Trail, 4500 ft. Collections: 15735, 19304. Dates: 18 Aug. 1941, 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: California, Mt. Shasta.

*Patellea umbrorum* (Fr.) Seaver. — On rotten conifer wood at Wagon Camp. Collection: 20427. Date: 15 Aug. 1947. Abundance: V, A. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Europe, North and South America, Mt. Shasta.

*Patinella abietina* (Cke.) Sacc. — On *Abies magnifica* var. *shastensis*. — On dead branches at Horse Camp, 8000 ft. Collection: 18225. Date: 10 July 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*.

On *Phyllodoce empetriformis*. — On dead branches along Causeway below Horse Camp Springs, 8100 ft. Collections: 18309, 20462. Dates: 30 July 1946, 20 Aug. 1947. Abundance: IV, B. Associates: *Eriogonum marifolium*, *Polygonum shastense*. Distribution: California, Mt. Shasta.

*Patinella atro-viridis* Rehm. — On *Pinus albicaulis*. — A large dry branch of the host found at 9000 ft. in the White Bark Pine zone on ridges north of Horse Camp was covered with this species. Collection: 18258, Exs. 215. Date: 16 July 1946. Abundance: IV, A. Associate: *Pinus albicaulis*. Distribution: Tyrol, Mt. Shasta.

*Pezizella helotioides* Starb. — On *Allium vailidum*. — On overwintered leaves in a spring area above Wagon Camp, 5800 ft. Collection: 18008-A. Date: 21 June 1946. Abundance: V, C. Associates:

*Abies magnifica* var. *shastensis*, *Arnica mollis*. Distribution: Sweden, Mt. Shasta.

*Phialea* sp. — A number of small brown cups were collected on leaves of a species of *Carex* from around the base of a clump along the Horse Camp-Wagon Camp Trail at about 7000 ft.

Collection: 15740. Date: 18 Aug. 1941. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*.

*Rutstroemia* sp. — On *Castanopsis sempervirens*. — On dead branches under shrubs in the White Bark Pine zone near Horse Camp.

Collection: 18252. Date: 16 July 1946. Abundance: V, B. Associates: *Arctostaphylos nevadensis*, *Hollodiscus discolor* var. *glabrescens*.

*Scelobelonium melanosporum* (Rehm) v. Hoehn. — On overwintered stems, petioles and peduncles of *Agrostis thurberiana*, *Anemone occidentalis*, *Juncus balticus* var. *montanus* and *Pentstemon gracilentus*.

Collections: Collected at least five times between 1936 and 1942; 18311, Exs. 68. Dates: 1936—1942; 30 July 1946. Abundance: III, C. Associates: Plants of the Shasta Fir and White Bark Pine zones. Distribution: Europe, Western North America, Mt. Shasta.

*Scleroderris ?abieticola* Zeller & Gooding. — On Shasta fir bark on a tree along the Sisson Southern Trail at 7500 ft.

Collection: 18350. Date: 10 Aug. 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Oregon, California; Mt. Shasta.

*Sclerotinia* sp. — Two small specimens were obtained in the heather meadows at Panther Creek meadows at about 7500 ft.

Collection: 15625. Date: 28 July 1941. Abundance: V, D. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*, *Vaccinium caespitosum*.

*Tapesia fusca* (Pers. ex Fr.) Fckl. — On *Ceanothus velutinus*. — On twigs of the host partially buried under undisturbed debris along the Junction road.

On *Arctostaphylos nevadensis*. — Specimens referred tentatively to this species from Horse Camp.

Collections: 15729-A, 18185. Dates: 18 Aug. 1941; 8 July 1947. Abundance: V, B. Associates: *Arctostaphylos patula*, *Castanopsis chrysophylla*, *Abies magnifica* var. *shastensis*. Distribution: Europe, Iceland, Siberia, Alaska, Panama, North America, Mt. Shasta.

*Tapesia melaleucoides* var. *vaccinii* Rehm. — On *Arctostaphylos nevadensis*. — On dry twigs of shrubs along a ridge below Horse Camp, 8000 ft.

Collections: 15639-B, 18185. Dates: 26 July 1941, 8 July 1946. Abundance: IV, B. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Michigan, Mt. Shasta.

*Trichoscyphella tenuipilosa* Cash. — On *Abies magnifica* var. *shastensis*. — South side of Red Butte, 7500 ft.

Collection: 25605. Date: 24 Aug. 1949. Abundance: V, A. Associate: *Tsugt mertensiana*. Distribution: Eastern Washington, Mt. Shasta.

### Pezizales.

#### *Pezizaceae.*

*Discina ancilis* (Pers.) Sacc. — On the soil near Shasta fir logs, on soil around various buildings at Horse Camp, 8000 ft., on soil under ponderosa pines at 5500 ft. Specimens on various kinds of coniferous litter and duff have been collected from between 5000 and 8000 ft. In 1946 material was collected on sawdust, and on burned and unburned soil under a woodpile.

Collections: 8619, 10118, 10157, 10161, 10175, 10179, 10183, 10187, 10190, 10196, 10262, 15515, 15516, 15536, 15681, 18014, 18027, 18150, 18169, 20137, 28289, Exs. 223. Dates: 6 Aug. 1937; 17, 24, 26 June, 1, 3, 5, 6, 7, 8, 29 July 1938; 12 June, 9 July, 7 Aug. 1941. 22, 23 June, 2, 5 July 1946; 25 June 1947; 3 July 1951. Abundance: II, D. Associates: Conifer trees of all zones. Distribution: Europe, North America, Mt. Shasta.

*Geopyxis cupularis* (L.) Sacc. — On rotten wood near Wagon Camp, 5700 ft.

Collection: 20427. Date: 15. Aug. 1947. Abundance: V, A. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Geopyxis vulcanalis* (Pk.) Sacc. — One colony was found on fir duff along the Sisson Southern Trail, 6500 feet.

Collection: 15529. Date: 3 July 1941. Abundance: V, D. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: New York, Wyoming, Oregon, California, Mt. Shasta.

*Humaria scutellata* (L. ex Fr.) Fckl. — Small colonies of this red cup were found on a Shasta fir log in the Sisson Southern Trail spring and in a creek at Wagon Camp; on an incense cedar log in a small creek between Bear Springs and Wagon Camp; and on an overwintered prostrate stem of *Veratrum californicum* in Panther Creek Meadows, 5000—7500 feet.

Collections: 8577, 8631, 8655-A, 20412, 25641, Exs. 257. Dates: 9 July, 13, 20 Aug. 1937; 8 Aug. 1947; 25 Aug. 1949. Abundance: IV, A. Associates: Conifers of Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America, Mt. Shasta.

*Lamproderma leiocarpa* (Carr.) Seaver. — Around burned ground in camp fire areas along the Sierra Lodge Ski Trail in Shasta fir woods at about 7250 feet.

Collection: 18149. Date: 2 July 1946. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Western North America, Mt. Shasta.

*Caloscypha fulgens* Boud. — This species grows near melting snow banks on Shasta fir litter and duff although it may also be found in fresh condition in woods from which the snow had melted a month before. It has been observed in all summers from 1937 through 1941 and was especially abundant in 1941. In 1951 large areas were covered with all sizes of fruit bodies several weeks after melting of snow.

Collections: 10156, 10194, 14608, 14613, 15532, 15539, 15544, 15588, 18114, 18413, 28245, 28268, Exs. 135. Dates: 24 June, 8 July 1938; 14 June 1940; 9, 11, 12, 18 July 1941; 28 June, 2 July 1946; 1, 2 July 1951. Abundance: II, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Patella coprinaria* (Cke.) Seaver. — On deer dung. — Shasta fir woods on the ridge between Horse Camp and Panther Creek.

Collection: 28294. Date: 2 July 1951. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, New York to Nebraska, California; Mt. Shasta.

*Paxina nigrella* Seaver. — Found at first in 1938 and then in 1940 just after melting of the snows along the Sisson Southern Trail in deep Shasta fir woods on litter. Later, in 1941, the species was observed in abundance on Shasta fir litter at the edge of melting snow banks near Horse Camp. As the snow would move back a new area of production of these fruit bodies would develop. Five such areas were noted within a hundred feet near a protected snowbank at the edge of a grove of Shasta firs throughout July. Over 100 fruit bodies were collected.

Collections: 10105, 14604, 15531, 15551, 15592, 15626, 15648, 18214, 24054, 28318 Exs. 126. Dates: 11 June 1938; 10 June 1940; 4 July 1948; 3 July 1951. 1941: 9 July, 21 specimens; 14 July, 25 specimens; 21 July, 24 specimens; 28 July, 27 specimens. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Cascade Mountains of Oregon and Washington, Mt. Shasta.

*Peziza violacea* Pers. — On soil near spilled cement at the spike camp at Panther Creek Meadows Public Camp Ground, 7600 feet.

Collection: 15632, Exs. 127. Date: 28 July 1941. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Europe, North America, Mt. Shasta.

*Rhyarobius monascus* Mouton. — On deer dung. — Shasta fir woods on ridge between Horse Camp and Panther Creek. Collection: 28294. Date: 2 July 1951. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, New York, Mt. Shasta.

*Sarcosphaera amplissima* (Fr.) Kanouse. — This species was collected four times in 1941: On sandy soil under a ponderosa pine tree on the north side of the mountain at about 5000 feet, under a ponderosa pine and chaparral shrubs on the southwest side of the mountain at 5500 feet, in Shasta fir duff on a ridge just below Horse Camp at 7800 ft., In 1942 it was found under pines in a lawn in Mount Shasta at 3550 feet. In 1946 it was found under litter in white fir-Shasta fir woods along the Sisson Southern Trail at 6000 feet. In June 1947 it was abundant throughout the Shasta fir forest especially along the Sisson Southern Trail between 6500 and 8000 feet. Collections: 15518, 15523, 15568, 16630, 18113, 20017. Dates: 12, 27 June, 16 July 1941; 30 May 1942; 28 June 1946; 20 June 1947. Abundance: III, D. Associates: Conifers below the White Bark Pine zone. Distribution: Europe, North Africa, North America, Mt. Shasta.

#### *Helvellaceae.*

*Helvella californica* Phill. — Two or three specimens have been noted in each summer from 1936 to 1941 in mossy sod near the Wagon Camp springs at about 5700 ft.; 18 sporophores were found on a water soaked white fir log forming a dam across Squaw Valley Creek at about 6000 feet; found once on a water soaked log of Shasta fir at Panther Creek meadows at about 7500 feet.

Collections: 7593, 8655, 13324, 13353, 15543, 15582, 16631, 20242, 25642. Dates: 21 Aug. 1936; 20 Aug. 1937; 16 June, 7 July 1939; 12, 18 July 1941; 30 May 1942; 10 July 1947; 25 Aug. 1949. Abundance: IV, A, D. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Nevada, Oregon, California, Mt. Shasta.

*Helvella caroliniana* (Bosc.) Nees. — Collected once under ponderosa pines at 5500 feet.

Collection: One specimen found in 1941. Abundance: V, D. Associates: *Pinus ponderosa*, *Arctostaphylos patula*. Distribution: North America, Mt. Shasta.

*Morchella esculenta* (L.) Pers. — Under yellow pines near the Four-Mile post on the Sisson Southern Trail, 5000 feet; in white fir-Shasta fir woods along the Sisson Southern Trail, 6500 feet; in Shasta fir woods at Sand Flats and along the Sierra Lodge Ski Trail at about 7000 feet; and near a cabin at Horse Camp, 8000 feet.

Collections: 15517, 16629, 18112, 18154, 18168, 20012. Dates: 12 June 1941; 30 May 1942; 28 June, 2, 4 July 1946; 20 June 1947. Abundance: IV, D. Associates: Conifers of zones below the White Bark Pine zone. Distribution: Europe, North America, Mt. Shasta.

#### **Tuberales.**

#### *Tuberaceae.*

*Hydnotria variiformis* Gilkey. — Depending on the intensity of the search for this hypogaeous species it is common to

merely occasional. It occurs in rotten Shasta fir logs below or at the soil level, or in the ground near rotting Shasta fir logs. Mostly in the vicinity of Horse Camp at 8000 feet.

Collections: 10217, 13261, 13292, 13332, 13333, 13348, 13307, 13308, 13309, 13371 (type), 14638, 15642, 15676, 18328, 20136, 20188, 28280. Dates: 18 July 1938; 17, 28 June, 5, 13, 20 July 1939; 8 July 1940; 29 July, 7 Aug. 1941; 31 July 1946; 25, 27 June 1947; 3 July 1951. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Timberline areas on peaks in western Oregon; Medicine Bow Mountains, Wyoming; Mt. Shasta.

*Hydnotria tulasnei* Berk. & Br. — A specimen has been tentatively identified as this species. Collected in the timberline region on the southwest side of the mountain. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Michigan, Mt. Shasta.

**Basidiomycetes.**  
**Heterobasidiomycetes.**

**Uredinales.**

*Melampsoraceae.*

*Coleosporium madiae* Cke. — On *Madia gracilis*.

Observed on this host only in the Bear Springs area although the host occurs throughout the chaparral on the southwest side of the mountain between 4000 and 5000 feet.

Collection: 16790. Date: 9 Sept. 1942. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*. Distribution: On 15 carduceous hosts from British Columbia to central California; Mt. Shasta.

*Coleosporium solidaginis* (Schw.) Thuem. — On *Aster shastensis*. — On this host this has been found only on the large form along the Snowline Highway at 4500 feet and on the narrow leafed form the base of Diller Canyon at 5000 feet. The host, however, is found at all elevations and in most dryer areas between 4500 and 9000 feet.

Collection: 15604, Exs. 120. Dates: 25 July 1941; one collection in late August 1940. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Purshia tridentata*. Distribution: On more than 125 species of the Compositae in Mexico, China, Japan, North America, Mt. Shasta.

*Cronartium comptoniae* Arth. — On *Pinus contorta* var. *latifolia*. — Blister galls were formed on trees in the host colony at Military Pass on the northeast side of the mountain.

Collection: 10283. Date: 22 Aug. 1938. Abundance: IV, A. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On 12 species of *Pinus* in North America; Mt. Shasta.

*Cronartium pyriforme* (Pk.) Hedgc. & Long. — On *Pinus ponderosa*. — Reported from Shasta Springs by Blasdale, 1919.

*Hyalopsora polypodii* (Pers.) Magn. — On *Cystopteris fragilis*. — A colony of the host in the upper Wagon Camp spring area is regularly heavily infected.

Collections: 8620-B, 9198, 20319, Exs. 38. Dates: 8 Aug. 1937, 18 July 1947. Abundance: IV, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: On more than two hosts in Alaska, Japan, Europe, northern North America, Mt. Shasta.

*Melampsora albertensis* Arth. — On *Populus tremuloides*. — Reported by Blasdale, 1919, from Dunsmuir, in the Sacramento Canyon.

*Melampsora arctica* Rostr. — On *Salix sitchensis*. — One shrub of the host, observed so far only in Mud Creek Canyon, was completely covered by this species.

Collection: 13385, Exs. 2. Date: 10 Aug. 1939. Abundance: III, B. Associates: *Salix* spp., *Abies concolor*, *Pinus ponderosa*. Distribution: On at least 15 species of *Salix* in boreal regions of Europe and North America; Mt. Shasta.

*Melampsora lini* (Pers.) Lév. — On *Linum micranthum*. — The colony of this annual host which occurs near the Water Supply spring above Howard was heavily infected in 1941. Other colonies of the host through the chaparral area were uninfected.

Collection: 15575, Exs. 125. Date: 18 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On at least 12 species of *Linum* in Europe, Japan, New Zealand, North America, Mt. Shasta.

*Melampsora euphorbiae-gerardianae* W. Müll. — On *Euphorbia crenulata*. — A specimen collected by E. P. Meincke, L. E. Ekvall and L. S. Gill near McCloud, 16 June 1924, is filed in the San Francisco field office of Forest Pathology, No. 29873.

*Melampsora ribesii-purpurae* Kleb. — On *Salix scouleriana*. — This host in common along drainage areas throughout the chaparral below 5000 feet and occurs along creeks to some extent above that elevation. Its worst enemy is the oyster scale which kills out the larger shrubs. This rust occurs occasionally on isolated shrubs on the leaves of which it forms small, barely noticeable pustules in contrast to the large bright orange ones of *M. arctica*.

Collection: 14674, Exs. 81. Dates: 8 Aug. 1940. Observed in other years. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*, *Cornus nuttallii*. Distribution: On at least 14 species of *Salix* in Europe, Western Canada and the United States; Mt. Shasta.

*Melampsorella cerastii* (Pers.) Schroet. — On *Stellaria longipes*. — The colony of this host which occurs at Bear Springs was infected in 1939.

Collection: 13256, Exs. 59. Date: 16 June 1939. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*. Distribution: On at least 13 species of *Cerastium* and *Stellaria* in Europe, Siberia, Japan, Mexico, North America, Mt. Shasta.

*Pucciniastrum goeppertianum* (Kuehn.) Kleb. — On *Vaccinium caespitosum*. — In Panther Creek meadows under hemlock and Shasta fir large colonies of this dwarf shrub are completely or only partially infected. It has not been found on conifers where the infection on *Vaccinium* occurs between 7500 and 8000 feet. Collections: 8647, 13329, 13410, 20454, 25619, 25647, Exs. 13. Dates: 17 Aug. 1937; 13 July, 24 Aug. 1939; 15 Aug. 1947; 24, 25 Aug. 1949. Also seen in intervening years. Abundance: II, B. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*, *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

On *Abies concolor*. — Mature trees along a lane between McCloud and Squaw Valley Creek spring between 4000 and 5000 feet were heavily infected on needles on at least the lower branches; also heavily infecting all of several young trees near MacBride Springs, 5000 feet.

Collections: 18277, 20352. Dates: 25 July 1946, 25 July 1947. Abundance: III, A. Associates: *Pseudotsuga taxifolia*, *Libocedrus decurrens*. Distribution: On at least 12 species of *Vaccinium* and on several conifers in Mexico, Europe, Japan, North America, Mt. Shasta.

*Pucciniastrum myrtilli* (Schum.) Arth. — On *Vaccinium caespitosum*. — Collected once on a colony of the host in Panther Creek meadows.

Collection: 13410, Exs. 14. Date: 24 Aug. 1939. Abundance: V, B. On *Vaccinium membranaceum*. — Collected once on a colony of the host in Panther Creek meadows.

Collection: 25609. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Kalmia polifolia*, *Phyllodoce empetriformis*, *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: On at least 28 ericaceous hosts in Europe, Asia, Japan, North and South America, Mt. Shasta.

*Pucciniastrum pustulatum* (Pers.) Diet. — On *Epilobium adenocaulon*. — Seen and collected only once on a colony of the host along Squaw Valley Creek below the McCloud intake. Here it had parasitized most of the plants in the colony.

Collection: 14676, Exs. 85. Date: 8 Aug. 1940. Abundance: V, C. Associates: *Abies concolor*, *Pseudotsuga taxifolia*.

On *Epilobium angustifolium*. — Common in the vicinity of Bear Springs in 1947.

Collection: 20473, Exs. 262. Date: 22 Aug. 1947. Abundance: IV, C.



Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: On at least 20 onagraceous hosts in Europe, Siberia, Japan, New Zealand, North America, Mt. Shasta.

*Pucciniastrum pyrolae* (Pers.) Schroet. — On *Pyrola dentata* var. *integra*. — On a large colony of this host along the Sisson Southern Trail in Shasta fir woods.

Collections: 18231, 20414. Dates: 12 July 1946, 8 Aug. 1947. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*.

On *Pyrola picta*. — On small colonies of the host in Mud Creek Canyon, in Squaw Valley Creek canyon and along the Sisson Southern Trail. Reported by Blasdale (1919) from Sisson (now Mount Shasta). Collections: 16654, 20236, 20417. Dates: 2 July 1942, 10 July, 8 Aug. 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer and Shasta Fir zones.

On *Chimaphila umbellata*. — Along Squaw Valley Creek at 5500 feet, and along the Sisson Southern Trail at 6000 feet. While the host is common the rust is rare.

Collections: 20241, 20416. Dates: 10 July, 8 Aug. 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer zone and White Fir zone.

On *Ramischia secunda*. — Along the Sisson Southern Trail. Also reported by Blasdale (1919) from Sisson.

Collection: 20418. Date: 8 Aug. 1947. Abundance: V, C. Associate: *Abies concolor*. Distribution: On at least 11 pyrolaceous species in Europe, Japan, North America, Mt. Shasta.

*Pucciniastrum sparsum* (Wint.) Fisch. — On *Arctostaphylos nevadensis*. — Abundant on several shrubs along Squaw Valley Creek at about 6500 feet. With *Exobasidium vacciniū-uliginosii*. Collection: 20256. Date: 10 July 1947. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis*.

On *Arctostaphylos patula*. — Seen only on the McCloud (south) side of the mountain where it was collected on each of two years in the chaparral along a road below the Squaw Valley Creek spring. It infects, and apparently kills, the leaves of an entire shrub. It was not ascertained whether this action thus kills the host or merely weakens its succeeding growth. Reported by Blasdale (1919) from Sisson, the type locality of *Uredo copelandii* Syd., a synonym.

Collections: 14683, 15762, Exs. 86. Dates: 8 Aug. 1940, 28 Aug. 1941. Abundance: IV, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*, *Pinus attenuata*. Distribution: On at least five ericaceous species in Europe and Japan and from Alaska to Southern California and Mexico; Mt. Shasta.

*Uredinopsis copelandii* Sydow. — On *Athyrium filix-femina* var. *californicum*. — Based on a collection made by E. B. Copeland near Sisson (Mount Shasta) near the west base of the

mountain. Found more recently at the big spring at the foot of Squaw Valley Creek canyon, and in the Wagon Camp bog.

Collections: E. B. Copeland; 20232, 2-314, Exs. 265. Dates: 13 Aug. 1903; 10, 18 July 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer and White Fir zones. Distribution: Siskiyou and Humboldt Counties, Yosemite National Park, California; Bermuda; Mt. Shasta.

*Uredinopsis macrosperma* (Cke.) Magn. — On *Pteridium aquilinum* var. *pubescens*. — Found on fronds on the bluff at the foot of Squaw Valley Creek Canyon, 5000 feet. Reported from Sisson by Blasdale (1919).

Collection: 20233, Exs. 266. Date: 10 July 1947. Abundance: V, C. Associates: *Pseudotsuga taxifolia*, *Abies concolor*. Distribution: On at least three species of *Abies* and three species of *Pteridium* in Japan, Asia, Africa, North and South America, Mt. Shasta.

#### Pucciniaceae.

*Aecidium graebnerianum* P. Henn. — On *Habenaria leucostachys*. — Found only once in the Wagon Camp bog, 5700 ft. Collection: 20316. Date: 18 July 1947. Abundance: V, C. Associates: *Abies* spp., *Libocedrus decurrens*. Distribution: On at least six species of *Habenaria* and one of *Orchis*, Southern Alaska to Southern California; Mt. Shasta.

*Cumminsiiella mirabilissima* (Pk.) Nannf. — On *Berberis piperiana*. — At the one time when the colony of this host on the lava flow above Hotlum Station was visited all the leaves on a number of scattered plants were mildly infected.

Collection: 14657. Date: 27 June 1940. Abundance: V, B. Associates: *Purshia tridentata*, *Cercocarpus ledifolius*. Distribution: On at least seven species of *Berberis* (including *Mahonia*) in Europe, Central America, North America; Mt. Shasta.

*Gymnosporangium libocedri* (P. Henn.) Kern. — On *Libocedrus decurrens*. — Trees at Bear Springs were found in several seasons to have the telial stages on the leaves of at least their lower branches.

Collections: 13399, 20303, Exs. 1. Dates: 22 Aug. 1939, 18 July 1947, observed in intermediate years. Abundance: III, A. Associates: *Amelanchier pallida*, *Pinus jeffreyi*.

On *Amelanchier pallida*. — Pycnia and aecia were observed abundantly on leaves, branches, peduncles, flowers and fruits on shrubs in the chaparral, at Bear Springs and at Widow Springs.

Collections: 8572, 8585, 14623, 16662, 18282, 20304, Exs. 37, 37-A. Dates: 9, 16 July 1937; 5 July 1940; 2 July 1942, 25 July 1946; 18 July 1947; Observed throughout each summer from 1936 to 1948 and at occasional subsequent visits. Abundance: II, B. Associates: *Libocedrus decur-*

*rens*, *Pinus jeffreyi* at Bear Springs and Widow Springs; shrubs of the chaparral at other points.

On *Crataegus douglasii*. — Infecting leaves, branches, flowers and young fruits of trees along a creek in Mount Shasta, 3550 feet. Collection: 15501. Date: 3 June 1941. Abundance: II, B. Associates: *Libocedrus decurrens*, *Pinus ponderosa*, *Abies concolor*.

Reported as *Aecidium blasdaleanum* Diet. & Holw. on *Crataegus rivularis* (a synonym of *C. douglasii*) from Shasta Springs and Sisson by Blasdale (1919). Specimens of *Gymnosporangium blasdaleanum* (Diet. & Holw.) Kern are filed in the Holway rust herbarium at the University of Minnesota.

Distribution: On at least 13 pomaceous species and *Libocedrus decurrens* in western Oregon and northern California; Mt. Shasta.

*Gymnosporangium biseptatum* Ell. — On *Libocedrus decurrens*. — A specimen collected at Sisson by W. C. Blasdale in Aug. 1884 was distributed in Ellis and Everhart, North American Fungi No. 3248.

*Nyssopsora echinata* (Lév.) Arth. — On *Ligusticum grayi*. — In the upper portions of Squaw Valley Creek, 8000—8500 feet, this fungus occurred on many leaves, stems and peduncles of the host. While the host occurs in the Squaw Valley Creek and Panther Creek basins as low as 5000 feet, infection by this pathogen has not been observed below 7500 feet.

Collections: 10297, 13384, 25615, Exs. 3. Dates: 8 Sept. 1938, 10 Aug. 1939, Aug. 1949. Abundance: III, C. Associates: *Pinus albicaulis*, *Tsuga mertensiana*. Distribution: On at least 11 umbelliferous species in western North America; Mt. Shasta.

*Phragmidium imitans* Arth. — On *Rubus leucodermis*. — Reported from Sisson and Shasta Springs on cultivated raspberry by Blasdale (1919).

*Phragmidium ivesiae* Syd. — On *Potentilla gracilis* ssp. *nuttallii*. — Several plants were infected along a street in Mount Shasta.

Collection: 15509, Exs. 144; Date: 16 June 1941. Abundance: V, C. Associates: Street weeds and garden plants. Distribution: On at least 24 rosaceous species west of the Mississippi in Canada and the United States; Mt. Shasta.

*Phragmidium occidentale* Arth. — On *Rubus parviflorus*. — Although the host is scattered through the chaparral this fungus has been found on it only in isolated instances especially along the road below the Squaw Valley Creek spring above McCloud; and along an old lane near the Mount Shasta Municipal spring, 4000 feet.

Collections: 14675, 20301, Exs. 82. Dates: 8 Aug. 1940, 18 July 1947. A specimen collected by E. B. Copeland at Sisson was distributed

by Sydow in his exsiccatum „Uredineen“ No. 1789 as indicated by a collection in the Holway herbarium.

*Phragmidium rosae-californicae* Diet. — On *Rosa gymnocarpa*. — Occasional shrubs of the host are infected with both stem and leaf lesions.

Collections: 10159, 14679, 15504, 15683, Exs. 129-A, 129-B. Dates: 24 June 1938; 2 Aug. 1940; 7 June, 8 Aug. 1941. Abundance: III, B. Associates: *Pinus ponderosa*, *Arctostaphylos patula*, *Ceanothus velutinus*. The type of this species was reported on *Rosa californica* from Sisson in Hedwigia 44: 125. 1905. Distribution: On at least eight species of *Rosa* from British Columbia to Southern California; Mt. Shasta.

*Phragmidium rubi-idaei* (DC.) Karst. — On *Rubus parviflorus*. — A specimen collected by W. C. Blasdale, 28 July 1894, at Sisson was distributed in Ellis and Everhart, North American Fungi, No. 3245.

*Puccinia absinthii* Hedw. f. — On *Artemisia tridentata*. — Found on several shrubs on the north side of the mountain near Bolam Station, 5000 ft.

Collection: 25649. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Chrysothamnus nauseosus* var. *occidentalis*, *Pinus ponderosa*. Distribution: On at least 36 species of Composites in Europe, Japan, Central America, Western North America.

*Puccinia asarina* Kunze. — On *Asarum hartwegii*. — Found on occasional plants in rocks on the north side of Cascade Gulch and along Squaw Valley Creek, 5000—6500 feet.

Collections: 20239, 20350. Dates: 10, 25 July 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer Zone and White Fir zone.

On *Asarum lemmonii*. — Reported from Sisson by Blasdale (1919). Distribution: Siberia, Japan, Idaho to British Columbia, south to central California; Mt. Shasta.

*Puccinia atrofusca* (Dudl. & Thomps.) Holw. — On *Carex multicaulis*. — On colonies of the host along the Sisson Southern Trail and the Shasta Snowline Highway, 5000—5500 feet.

Collections: 18267, 20389, Exs. 289. Dates: 19 July 1946; Aug. 1947. Abundance: IV; C. Associates: *Pinus ponderosa*, *Libocedrus decurrens*, *Abies concolor*. Distribution: On at least 22 species of *Aster* and 15 of *Carex* in Asia, Siberia, Japan, western North America; Mt. Shasta.

*Puccinia calochortii* Pk. — On *Calochortus nudus*. — Common on a colony of the host along the Wagon Camp road between Wagon Camp and Bear Springs, 5500 feet.

Collection: 15693, Exs. 130. Date: 8 Aug. 1941. Abundance: IV, C. Associates: *Abies concolor*, *Pinus ponderosa*. Distribution: On at least

14 liliaceous species in Mexico and western North America; Mt. Shasta.

*Puccinia caricis* (Schum.) Schroet. — Collected on three different species of *Carex*:

On *Carex amplexens* once in 1939.

On *Carex kelloggii* at 5500 feet once in 1941; 15612, 25 July 1941. Exs. 131.

On *Carex whitneyi* at 4500 feet once in 1941: 15602, 25 July 1941, Exs. 132; at 6000 feet once in 1946 in White fir-Shasta fir woods: 18232, 12 July 1946; once along the Shasta Snowline Highway at 5500 feet. Abundance: III, C. Distribution: On over 100 sedges in temperate Europe, Asia, Japan, New Zealand, North America, Mt. Shasta.

*Puccinia chamaesarachae* Syd. — On *Chamaesaracha nana*. — Observed every year from 1936 through 1947 on the host colony at Wagon Camp as well as on one below Bear Springs, and occasionally on other colonies of the host between 4000 and 7000 feet. Collections: 8590, 10213, 13257, 13260, 20387, Exs. 4. Dates: 23 July 1937; 15 July 1938; 16 June 1939; 1 Aug. 1947. Abundance: III, C. Associates: Species of zones from Shasta fir to chaparral. Distribution: Nevada, Northern California, Mt. Shasta.

*Puccinia cicutae* Fosch. — On *Cicuta occidentalis*. — Reported from Sisson by Blasdale, (1919).

*Puccinia circaeae* Pers. — On *Circaea pacifica*. — Reported from Sisson by Blasdale (1919).

*Puccinia comandrae* Pk. — On *Comandra umbellata*. — Reported by Blasdale (1919) from Shasta Springs.

*Puccinia crandallii* Pam. & Hume. — On *Symphoricarpos*, along the lane from McCloud to the Squaw Valley Creek spring under pines at 4000 ft.

Collection: 18280. Date 25 July 1946. Abundance: IV, B. Associate: *Pinus ponderosa*. Distribution: On at least 6 species of *Symphoricarpos*, 8 of *Festuca* and two of *Poa*, Western North America, Mt. Shasta.

*Puccinia cruciferearum* Rud. — On *Cardamine bellidifolia* var. *pachyphylla*. — One plant in a cool, moist spot behind a lava rock at 8500 feet was weakly infected. The host occurs in such isolated locations throughout the White Bark Pine zone. The fungus has been found only once.

Collection: Collected once in 1941. Abundance: V, C. Associates: None. Distribution: On at least two species of *Cardamine* in east Greenland, British Columbia, Wyoming, Utah, California, Mt. Shasta.

*Puccinia douglasii* Ell. & Ev. — On *Phlox douglasii*. — On several plants on a ridge and in a basin south of Horse Camp, 7800—8000 feet.

Collections: 20293, 20497, Exs. 267. Dates: 16 July, 27 Aug, 1947.

Abundance: IV, B. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: On at least 11 species of *Phlox*, New Jersey, Pennsylvania, Western North America, Mt. Shasta.

*Puccinia effusa* Diet. & Holw. — On *Viola lobata*. — Reported by Blasdale (1919) from Dunsmuir.

*Puccinia extensicola* Plowr. — On *Carex brainerdii*. — Covering a clump of this sedge in Mud Creek Canyon at about 6500 feet.

Collection: 13390, Exs. 5. Date: 10 Aug. 1939. Abundance: IV, C. Associate: *Eriogonum umbellatum* ssp. *polyanthum*. Distribution: On over 100 species of sedge in Europe, South America, Western North America; Mt. Shasta.

*Puccinia extensicola* var. *asteris* (Thuem.) Arth. — On *Aster occidentalis*. — Covering a colony of this host along a creek at Wagon Camp, 5700 feet.

Collection: 20422, Exs. 268. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Libocedrus decurrens*, *Abies* spp. Distribution: On many species of *Aster* and *Carex* in Europe, South and North America; Mt. Shasta.

*Puccinia glumarum* (Schmidt) Erikss. & Henn. — On *Bromus carinatus*. — Collected once in the chaparral in 1939. — Abundance: V, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

On *Elymus glaucus*. — Collected once near Wagon Camp. Collection: 13344. Date: 21 July 1939. Abundance: V, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Elymus glaucus* ssp. *jepsonii*. — Collected on the only plant of the host found on the mountain. This plant, found at Bear Springs, was heavily infected.

Collection: 13344-A, Exs. 8. Date: 21 July 1939. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*.

On *Elymus hansenii* (*Sitanion hansenii*). — Collections: 13341, 15585, Exs. 40. Dates: 21 July 1939, 18 July 1940. Abundance: IV, C. Collected on plants in the vicinity of Wagon Camp. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Elymus elymoides* (*Sitanion hystrix*). — Weak to mild infections on scattered to isolated clumps of the grass have been noted in each year at Horse Camp; found once on the north side of the mountain near Bolam Creek Canyon.

Collections: 13397, 15694. Dates: 20 Aug. 1939, 26 Aug. 1949. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least 39 grasses in Europe, North Africa, Japan, South America, western North America; Mt. Shasta.

*Puccinia grindeliae* Pk. — On *Haplopappus bloomeri* var. *angustatus*. — On several shrubs in white fir-Shasta fir woods in

Cascade Gulch on the south side of the lava flow terminating at MacBride Springs, 6000 feet.

Collection: 20339, Exs. 269. Date: 25 July 1947. Abundance: IV, B. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Chrysothamnus nauseosus* var. *occidentalis*. — On several shrubs near Bolam Station, 5000 feet.

Collection: 25652. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Pinus ponderosa*, *Artemisia tridentata*. Distribution: On more than 88 species of Compositae in western North America.

*Puccinia harknessii* Vize. — On *Stephanomeria lactucina*. — Occasional on the host throughout the chaparral.

Collections: 10177, 15653, 20324, Exs. 133. Dates: 1 July 1938, 31 July 1941, 18 July 1947. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On at least 12 cichoraceous species in western North America; Mt. Shasta.

*Puccinia heucherae* (Schw.) Diet. — On *Mitella pentandra*. — Infection was found on one plant near a bridge across Squaw Valley Creek below the McCloud intake at 5000 feet. The host occurs throughout the Squaw Valley Creek and Panther Creek drainage basins from 8000 to below 5000 feet. The fungus has been found also on one colony along Panther Creek below the meadows.

Collections: 14677, 20447, exs. 270. Dates: 8 Aug. 1940, 15 Aug. 1947. Abundance: IV, C. Associates: *Pseudotsuga taxifolia*, *Abies concolor*; *Abies magnifica* var. *shastensis*.

On *Tellima grandiflora*. — A collection made by W. C. Blasdale at Shasta Springs, 7 Aug. 1894, is filed in the Holway herbarium. — Distribution: On at least 45 saxifragaceous hosts in Europe, Eastern Asia, Japan, North America; Mt. Shasta.

*Puccinia hieracii* (Schum.) Mart. — On *Agoseris grandiflora*. — On several plants in the MacBride Springs and Bear Springs areas, 5000 feet.

Collections: 15605, 18102. Dates: 25 July 1941, 28 June 1946. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Purshia tridentata*.

On *Agoseris heterophylla*. — On several plants in the MacBride Springs area.

Collection: 10124. Date: 17 June 1938. Abundance: V, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Purshia tridentata*.

On *Agoseris scorzoneraefolia*. — On two plants on a flat at 9000 feet near the One Mile Post along the Summit Trail above Horse Camp; on a number of plants scattered through colonies of the host in the open lava flats above Panther Creek Meadows.

Collections: 13356, 18406, Exs. 205. Dates: 26 July 1939, 29 Aug. 1946. Abundance: III, C. Associates: *Hieracium gracile*, *Eriogonum marifolium*, *Eriogonum pyrolaefolium*.

On *Hieracium albiflorum*. — On leaves and peduncles of plants near the Municipal Spring at Howard, and in Mud Creek Canyon.

Collections: 13384, 13394, Exs. 7. Dates: 10 Aug. 1939; once in 1941. A specimen in the Holway Herbarium was obtained by Holway at Sisson, 28 May 1894. Abundance: IV, C. Associates: *Pinus ponderosa*, *Libocedrus decurrens*, *Pseudotsuga taxifolia*.

On *Hieracium gracile*. — Near the head of a dry spring in the basin above Panther Creek Meadows near the Painted Cliff.

Collection: 18407, Exs. 206. Date: 29 Aug. 1946. Abundance: III, C. Associates: *Agoseris scorzoneraefolia*, *Juncus mertensianus*.

On *Taraxacum officinale*. — Many adventitious plants at Wagon Camp were heavily infected. Also reported by Blasdale (1919) from Sisson.

Collection: 20312. Date: 18 July 1947. Abundance: IV, C. Associates: *Abies* spp., *Libocedrus decurrens*. Distribution: On at least 60 cichoraceous species in Asia, Bermuda, Europe, Japan, Africa, Australia, New Zealand, South, Central and North America; Mt. Shasta.

*Puccinia jonesii* var. *cymopteri* (Diet. & Holw.) Arth. — On *Cymopterus terebinthinus*. — Common on the colony of this host on the lava flow terminating at MacBride Springs, and in the chaparral near Andesite.

Collections: 13420, 14601, Exs. 8. Dates: 25 Aug. 1939, 4 June 1940. Abundance: III, C. Associate: *Purshia tridentata*. Distribution: On at least eleven umbelliferous species from Wyoming to eastern California and New Mexico; Mt. Shasta.

*Puccinia ligustici* Ell. & Ev. — On *Ligusticum grayi*. — A small colony of this common host was infected along Squaw Valley Creek below the rush swale.

Collections: 13394, 13418, Exs. 41. Dates: 10, 24 Aug. 1939. Abundance: IV, C. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*. Distribution: On at least 18 umbelliferous species in western North America; Mt. Shasta.

*Puccinia melanconioides* Ell. & Holw. — On *Dodotheon* sp. — A specimen in the Holway Herbarium was collected by Holway at Dunsmuir, 30 May 1894.

*Puccinia mellifera* Diet. & Holw. — On *Salvia sonomonensis*. — The host forms large mats in the chaparral in the vicinity of the Sisson Southern Trail and the Snowline Highway. Occasional mats are infected yearly although no infection was seen in 1946.

Collection: 14569, Exs. 83. Date: 19 July 1940. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Quercus kelloggii*. Distribution: On at least seven species of labiates in Nevada and California; Mt. Shasta.



*Puccinia menthae* Pers. — On *Monardella odoratissima*. — Occasional plants of the host are infected by this fungus on different parts of the mountain in different years. The fungus causes mild spotting of the leaves to distortion of the stems and branches. Collections: 8591, 13391, 14624, 20323, 20349, 25658, Exs. 9. Dates: 23 July 1937; 10 Aug. 1939; 5 July 1940; 18, 25 July 1947; 26 Aug. 1949. Abundance: III, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: On at least 50 labiates in North and South America, Europe, Africa, Asia, Japan; Mt. Shasta.

*Puccinia monoica* (Pk.) Arth. — On *Arabis platysperma*. — Infrequently plants of this host are found without flowers. The internodes become elongated and instead of a flower there occurs one bract on which the pustules of the rust occur. This rust has been observed only on the typical variety of the host in the Shasta fir zone although the host reaches the upper timberline as a dwarf variety. Collections: 8576, 8613, 10254, 20330, Exs. 271. Dates: 9 July, 6 Aug. 1937; 29 July 1938; 18 July 1947. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*.

On *Arabis* sp. — On a few plants along the McCloud River Railroad near the Snowline Highway, 4000 ft. Collection: 19321. Date: 8 April 1947. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On at least 26 cruciferous species in the western United States and British Columbia; Mt. Shasta.

*Puccinia oxyriac* Fekl. — On *Oxyria digyna*. — While this host occurs commonly above 8000 feet in moist places sheltered under lava boulders, the fungus has been found only once and that at 10,000 feet on the west side of Shastina.

Collection: 15747, Exs. 134. Date: 21 Aug. 1941. Abundance: V, C. Associates: None. Distribution: Swedish Lappland, Norway, Sweden, Spitzbergen, King William's Land, Iceland, Fäeröes, Great Britain, Tyrol, Alpine Western North America; Mt. Shasta.

*Puccinia palmeri* Diet. & Holw. — On *Pentstemon menziesii* var. *davidsonii*. — While this host is common in the upper timberline region and the White Bark Pine zone this fungus has been found only once on it.

Collection: 15618. Date: 28 July 1941. Abundance: V, B. Associate: *Pinus albicaulis*.

On *Pentstemon newberryi*. — On a colony of this species growing at 5500—6000 feet in Cascade Gulch near the Sisson Southern Trail; and on the few plants growing in Shasta fir woods on the north slope of the ridge south of Horse Camp, 8000 feet.

Collections: 8680, 13387, 15718, 20295, Exs. 42. Dates: 3 Sept. 1937; 10 Aug. 1939; 15 Aug. 1941; 16 July 1947. Abundance: IV, C. Associates: *Pinus ponderosa*, *Abies concolor*; *Abies magnifica* var. *shastensis*.

**Distribution:** On at least 13 species of *Pentstemon* in the western United States.

*Puccinia pattersoniana* Arth. — On *Elymus hansenii*. — Found only once on a small colony of the host in a grove of firs below Wagon Camp.

**Collection:** 15690. **Date:** 8 Aug. 1941. **Abundance:** V, C. **Associates:** *Abies concolor*, *Abies magnifica* var. *shastensis*. **Distribution:** On at least 5 grasses in western North America; Mt. Shasta.

*Puccinia pentstemonis* Pk. — On *Pentstemon deustus* ssp. *deustus*. — Colonies of the host along the Sisson Southern Trail between 4500 and 5000 feet are heavily infected annually.

**Collections:** 10122, 10183, 10191, 10274, 20400, Exs. 10. **Dates:** 17 June, 8 July, 12 Aug. 1938; 8 Aug. 1947. **Abundance:** III, C. **Associates:** *Pinus ponderosa*, *Abies concolor*, *Arctostaphylos patula*. **Distribution:** On at least seven species of *Pentstemon* in western North America and Mexico; Mt. Shasta.

*Puccinia pimpinellae* (Str.) Mart. — On *Osmorhiza nuda*. — Found in 1937 at Wagon Camp on a few plants; in 1947 a heavy infection of this host was noted in the same area.

**Collections:** 8586, 20318, Exs. 272. **Dates:** 16 July 1937, 18 July 1947. **Abundance:** V, C. **Associates:** *Abies concolor*, *Abies magnifica* var. *shastensis*. **Distribution:** On at least 14 umbelliferous species in Europe, Asia Minor, India, Japan, Algeria, North America; Mt. Shasta.

*Puccinia poae-sudeticae* (Westd.) Jørgst. — On *Poa pratensis*. — Occasional on this host in the vicinity of Horse Camp, 8000 ft., and Bear Springs, 5000 ft.

**Collections:** 10277, 15610, 15688. **Dates:** 19 Aug. 1938; 25 July, 8. Aug. 1941. **Abundance:** IV, C. **Associates:** *Abies magnifica* var. *shastensis*; *Libocedrus decurrens*, *Pinus jeffreyi*. **Distribution:** On at least 28 species of grasses in Europe, Japan, New Zealand, Central and South America, Canada, western United States, Mt. Shasta.

*Puccinia pseudocymopteri* Holw. — On *Cymopterus terebinthinus*. — Occasional on the colony of the host on the lava flow terminating at MacBride Springs.

**Collection:** 13421. **Date:** 25 Aug. 1939. **Abundance:** V, C. **Associates:** *Pinus ponderosa*, *Libocedrus decurrens*, *Abies concolor*. **Distribution:** On at least four species of „Pseudocymopterus“ from Montana to New Mexico; Mt. Shasta.

*Puccinia rubigo-vera* (DC.) Wint. — On *Holcus lanatus*. — Completely infecting a group of plants near an irrigation ditch near Mount Shasta at 3550 feet.

**Collection:** 15503. **Date:** 7 June 1941. **Abundance:** II, C.

On *Trisetum spicatum*. — A number of plants near one of the springs at 8250 feet on a ridge above Horse Camp was infected.

Collections: 10285, 20440. Dates: 4 Sept. 1938, 15 Aug. 1947. Abundance: IV, C. Associates: *Mimulus tilingii*, *Juncus mertensianus*. Distribution: On many grasses in Europe and North America, Mt. Shasta.

*Puccinia rubigo-vera* var. *agropyri* (Erikss.) Arth. — On *Aquilegia formosa*. — Several plants growing on the edge of the Bear Springs meadow under incense cedars were infected in one year.

Collection: 8575. Date: 9 July 1937. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*.

On *Clematis ligusticifolia*. — Reported by Blasdale (1919) from Sisson. Distribution: On 35 ranunculaceous species in Europe and North America; Mt. Shasta.

*Puccinia rufescens* Diet. & Holw. — On *Pedicularis densiflora*. — Several colonies in the chaparral near MacBride Springs have been found infected.

Collections: 13296, 14660, 18266, Exs. 84. Dates: 30 June 1939, 19 July 1940; 19 July 1946. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On at least four species of *Pedicularis* in Colorado and California; Mt. Shasta.

*Puccinia scandica* Johanss. — On *Epilobium clavatum*. — About half of a colony of the host near a small spring above Panther Creek Meadows was completely infected and sterilized by this species.

Collection: 13359, Exs. 11. Date: 26 July 1939. Abundance: IV, C. Associates: *Mimulus tilingii*, *Juncus mertensianus*. Distribution: On this species, *E. anagallidifolium*, in Swedish Lapland, Northern Norway, Sweden, Finland, British Columbia, Washington, Utah California; Mt. Shasta.

*Puccinia sejuncta* Syd. — On *Hieracium* sp. — Reported from Sisson by Blasdale (1919).

*Puccinia subdecora* Syd. & Holw. — On *Brickellia grandiflora*. — Usually the lower leaves, sometimes all the leaves, on stems of this host were spotted by pustules of this rust. In the lava flow above Hotlum Station.

Collection: 15746. Date: 22 Aug. 1941. Abundance: V, C. Associates: *Sambucus glaucus*, *Purshia tridentata*, *Cercocarpus ledifolius*. Distribution: Colorado, Utah, Mt. Shasta.

*Puccinia vagans* (DC.) Arth. — On *Clarkia rhombifolia*. — Observed occasionally on host plants in the chaparral.

Collections: 10123, 15576. Dates: 17 June 1938, 18 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*.

On *Epilobium ?minutum*. — A specimen collected 24 June 1937 by V. S. Brown at Mount Shasta is deposited in the herbarium

of the field office of Forest Pathology, San Francisco, No. 87585. Distribution: On at least 15 onagraceous species in Europe, Asia, Japan, Australia, New Zealand, South America, western North America; Mt. Shasta.

*Puccinia vagans* var. *gayophytii* Arth. — On *Gayophytum* spp. — Collected on some and observed on most of the species of this host genus on the mountain from 4000 feet to 8000 feet. In places whole colonies of annual hosts of this genus were infected. Collections: 8587, 10406, 14702, 20314, 25668, Exs. 12. Dates: 16 July 1937, 22 July 1938, 22 Aug. 1940, 18 July 1947, 26. Aug. 1949. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*; *Ceanothus velutinus*, *Arctostaphylos patula*.

On *Gayophytum diffusum*. — Reported by Blasdale (1919) from Sisson. Distribution: On 7 species of *Gayophytum* in western North America; Mt. Shasta.

*Puccinia veratri* Niessl. — On *Veratrum californicum*. — A specimen collected by W. C. Blasdale at Sisson, 1 July 1894, was distributed in the Sydow exsiccatum „Uredineen“ No. 1386. Noted in the Holway Herbarium.

*Puccinia violae* (Schum.) DC. — On *Viola adunca*. — Reported by Blasdale (1919) from Sisson.

*Uromyces amoenus* Syd. — On *Anaphalis margaritacea*. — The host has been found only in Mud Creek Canyon and here this rust occurs on scattered plants between 6500 and 8000 feet.

Collection: 14704, Exs. 87. Date: 22 Aug. 1940. Abundance: IV, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: On *Anaphalis* species in western North America; Mt. Shasta.

*Uromyces aterrimus* Diet. & Holw. — On *Allium validum*. — A specimen collected Aug. 1894 at the base of Mt. Shasta by W. C. Blasdale was distributed in Ellis and Everhart, North American Fungi 3344, Fungi Columbiani No. 861.

*Uromyces aureus* Diet. & Holw. — On *Allium validum*. — Common wherever the host occurs on the mountain: in Panther Creek Meadows, Squaw Valley Creek meadows, Wagon Camp, and hanging gardens of Mud Creek Canyon. Reported by Blasdale (1919) from Sisson.

Collections: 8582, 8614, 10257, 13412, 18403, 20328, Exs. 15. Dates: 16 July, 6. Aug. 1937; 29 July 1938; 24 Aug. 1939; 29 Aug. 1946; 18 July 1947. Abundance: II, C. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*. Distribution: On at least two liliaceous species in northern California; Mt. Shasta.

*Uromyces fabae* (Pers.) d. By. — Occasional colonies of *Vicia americana* and *Lathyrus lanzswertii* var. *aridus* were heavily infected with this rust in the MacBride Springs and Wagon Camp areas. and in the chaparral along the Shasta Snowline Highway.

Collections: 13345, 15606, 15611, 19292, 20306, Exs. 140. Dates: 21 July 1939; 25 July 1941; 7 Apr., 18 July 1947. Abundance: III, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Libocedrus decurrens*; *Arctostaphylos patula*. Distribution: On 36 leguminous species in North America; Mt. Shasta; Cosmopolitan.

*Uromyces holwayi* Lagh. — On *Lilium columbianum*. — A specimen collected by W. C. Blasdale at Sisson in July, 1894, was distributed in Ellis and Everhart, North American Fungi, Second Series, No. 3241, represented in the Holway Herbarium.

*Uromyces hyperici* (Spreng.) Curt. — On *Hypericum perforatum*. — The only colony of this host found on the mountain, in a small meadow near a railroad fill at Howard, was mildly infected with this rust.

Collections: 15682, Exs. 141. Date: 8 Aug. 1941. Abundance: V, C. Associates: *Arctostaphylos patula*, *Pinus ponderosa*, *Pseudotsuga taxifolia*. Distribution: On 16 hypericaceous species in Formosa, South America, Mexico, North America; Mt. Shasta.

*Uromyces intricatus* Cke. — On *Eriogonum latifolium* ssp. *nudum*. — Occasional on this species throughout the chaparral especially along the Sisson Southern Trail on leaves and peduncles.

Collections: 8583, 13382, 14723, Exs. 89. Dates: 16 July 1937, 10 Aug. 1939, 15 Sept. 1940. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*.

On *Eriogonum marifolium*. — Occasional on plants in lava flats in the Horse Camp area.

Collections: 13322, 13409, 20222, 20457, Exs. 17. Dates: 7 July, 22. Aug. 1939; 2 July, 15 Aug. 1947. Abundance: III, C. Associates: *Polygonum shastense*, *Haplopappus bloomeri* var. *angustatus*, *Lupinus obtusilobus*.

On *Eriogonum umbellatum* ssp. *polyanthum*. — Several plants in Mud Creek Canyon had complete infection on leaves, stems and peduncles caused by this rust; the colony on the north side of the mountain was apparently uninfected when observed in 1938, but a collection was made from it in 1949. Collections: 14710, 25697, Exs. 88. Dates: 22 Aug. 1940, 26 Aug. 1949. Abundance: III, C. Associates: *Pinus ponderosa*, *Abies concolor*. Distribution: On at least 43 polygonaceous species in western North America; Mt. Shasta.

*Uromyces junci* (Desm.) L. Tul. — On *Juncus parryi*. — Occasional clumps of the host in the Horse Camp area show mild infection on culms.

Collection: 13389, Exs. 89-A. Date: 10 Aug. 1939. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least 9 rushes in Europe, Central America, Mexico, North America; Mt. Shasta.

*Uromyces lili* Clinton. — On *Lilium columbianum*. — A specimen collected by J. J. Davis at Sisson, July 1894, was distributed by Ellis and Everhart in North American Fungi, No. 3241.

*Uromyces occidentalis* Dietel. — On *Lupinus latifolius*. — A record was reported by Dietel in Hedwigia, Beibl. 42: 98. 1903, from Sisson.

*Uromyces pröeminens* (DC.) Pass. var. *pröeminens*. — On *Euphorbia crenulata*. — Only two of the few host plants sporadically occurring along the new Shasta Snowline Highway have been found infected.

Collection: 14658, Date: 19 July 1940. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

On *Euphorbia serpyllifolia*. — On a colony of this host along the Shasta Snowline Highway in the new pine plantation at about 4000 feet.

Collection: 20393, Exs. 274. Date: 1 Aug. 1947. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On a number of euphorbiaceous hosts in North America; Mt. Shasta.

*Uromyces spragueae* Harkn. — On *Calyptridium umbellatum* var. *caudicifera*. — Occasional colonies or individuals on lava flats and openings in the upper Shasta fir zone and timberline area were completely infected; from 8000—9500 feet. Typical material at lower elevations has not been found infected.

Collections: 13327, 13358, 13395, 18404, 20311, 20424, Exs. 18. Dates: 13, 26 July, 19 Aug. 1939; 29 Aug. 1946; 18 July, 15 Aug. 1947. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: On three species of this genus in Wyoming, Oregon, California; Mt. Shasta.

## Ustilaginales.

### Tilletiaceae.

*Entyloma compositarum* Farl. — On *Hieracium cynoglossoides* var. *nudicaule*. — On a colony along the Squaw Valley Creek spring road at 4000 feet in the chaparral north of McCloud.

Collection: 20230, Exs. 267. Date: 10 July 1947. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On more than 22 different species of Compositae, Europe, North America; Mt. Shasta.

*Urocystis agropyri* (Preuss) Schroet. — On *Elymus glaucus*. — Six leaves on one clump of the host were found infected below Wagon Camp. The area was heavily grazed by migrant herds of sheep. A number of plants were found to be infected in Wagon Camp meadow two years after grazing was discontinued.

Collections: 13401, 20313, Exs. 261. Dates: 22 Aug. 1939, 18 July 1947. Abundance: V, C. Associates: *Abies concolor*, *Abies magnifica* var.

*shastensis*, *Libocedrus decurrens*. Distribution: On more than 11 grasses in Europe and North America; Mt. Shasta.

*Urocystis sorosporioides* Koern. — On *Anemone occidentalis*. — While the host has been found commonly in the timberline region, and observed in all stages of growth, throughout the southwest quadrant of the mountain this fungus has been found only once on a colony of the host in the Shasta Fir zone near an old trail on the west wall of Mud Creek Canyon.

Collection: 14707, Exs. 80. Date: 22 Aug. 1940. Abundance: IV, C. Associates: *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*. Distribution: On at least 10 ranunculaceous species in Greenland, Europe, Massachusetts, Utah, Arizona, California; Mt. Shasta.

### *Ustilaginaceae.*

*Cintractia caricis* (Pers.) Magn. — On *Carex multicaulis*. — This host is common in open Shasta fir woods on slopes but was found infected with this smut prior to 1949 only on the west wall of Mud Creek Canyon; in 1949 this smut was found on several clumps near Squaw Valley Creek Meadows.

Collections: 13393, 14708, 25636, Exs. 64, 64-A. Dates: 16 Aug. 1939, 22 Aug. 1940, 24 Aug. 1949. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

On *Carex nigricans*. — This host is common in the higher springs in the Panther Creek and Squaw Valley Creek basins but the fungus occurs on it infrequently.

Collection: 14705, Exs. 79. Date: 22 Aug. 1940. Abundance: IV, C. Associates: *Carex spectabilis*, *Mimulus tilingii*.

On *Carex spectabilis*. — The host is common around all springs in the higher Panther Creek and Squaw Valley Creek basins. This fungus is very common on it in all locations.

Collections: 13329, 13357, 18408, 25597, Exs. 65. Dates: 13, 26 July 1939; 29 Aug. 1946, 24 Aug. 1949; observed in each summer between 1936 and 1947. Abundance: I, C. Associates: *Carex nigricans*, *Mimulus tilingii*. Distribution: On more than 50 cyperaceous species wherever *Carex* grows; Mt. Shasta.

*Cintractia externa* (Griff.) Clint. — On *Carex spectabilis*. — Collected once at the South Gate springs.

Collection: One collection in 1937. Abundance: V, C. Associates: *Carex nigricans*, *Mimulus tilingii*. Distribution: On two carices in Montana, Nebraska, Wyoming; Mt. Shasta.

*Ustilago bullata* Berk. — On *Bromus carinatus*. — Common on most of the host plants in the chaparral near the Sisson Southern Trail at MacBride Springs.

Collections: 13298, 13343, 13386, Exs. 43. Dates: 30 June, 21, 27 July

1939. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Castanopsis chrysophylla*, *Purshia tridentata*.

On *Bromus tectorum*. — One colony in the chaparral at 4500 feet was heavily infected.

Collections: 15608, 18367, Exs. 142. Dates: 25 July 1941, 16 Aug. 1946. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: On at least 20 species of *Bromus* in Europe, Asia, Australia, South America, District of Columbia, western North America; Mt. Shasta.

*Ustilago shastense* Zundel. — On *Polygonum shastense*. — This shrubby *Polygonum* forms mats on open lava fields in the White Bark Pine and upper Shasta Fir zones. Occasionally the flowers in whole plants are infected by this smut. When this occurs the usually cream to scarlet flowers are turned brown.

Collections: 13381, 18428, 20468, 27017, Exs. 63. Dates: 8 Aug. 1939, 2 Sept. 1946, 20 Aug. 1947, 28 Sept. 1950. Observed in late season weeks in all years throughout the range of the host on the mountain. Abundance: III, B. Associate: *Eriogonum marifolium*. Distribution: Known only from these localities. And a recent collection from 8500 ft. on Lassen Peak.

*Ustilago spagazzinii* var. *agresti* (Syd.) G. W. Fisch. & Hirsch. — On *Elymus hansenii*. — Seen only in the vicinity of Wagon Camp.

Collections: 13342, 18104, Exs. 58. Dates: 21 July 1939, 28 June 1946. Abundance: IV, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Elymus elymoides*. — Common on occasional clumps of this grass in the vicinity of Horse Camp.

Collections: 10300, 13396, 18432, Exs. 59, 62. Dates: 20 Aug. 1939, 17 Sept. 1938, 2 Sept. 1946. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*.

On *Stipa californica*. — Common on occasional clumps of this grass in the vicinity of Horse Camp and in the timberline area on the east side of Bolam Creek Canyon.

Collections: 10302, 18362, 18429, 25696, Exs. 60. Dates: 17 Sept. 1938; 16 Aug., 2 Sept. 1946; 26 Aug. 1949. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least 22 grass hosts in Asia, North Africa, Europe, South and North America; Mt. Shasta.

*Ustilago striaeformis* (West.) Niessl. — On *Elymus glaucus*. — Found once in the dry meadow at MacBride Springs.

Collection: 20184. Date: 27 June 1947. Abundance: IV, C. Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: On many species of grasses in Europe, North America; Mt. Shasta.



*Ustilago violacea* (Pers.) Fckl. — On *Silene grayi*. — Occasional in anthers of the host on lava flats and slopes near Horse Camp, at the head of Cascade Gulch at 9500 feet, and above Panther Creek meadows at 8000—9000 feet.

Collections: 16793, 18377, Exs. 155, 155-A. Dates: 8 Sept. 1942, 26 Aug. 1946. Also observed in the summers from 1936 through 1947 on plants throughout the timberline region at Horse Camp. Abundance: III, C. Associates: *Carex breweri*, *Eriogonum pyrolaeifolium*, *Eriogonum marifolium*, *Juncus parryi*.

On *Silene douglasii*. — On the north side of the mountain along a lane above Bolam Station between 6000 and 8000 feet.

Collection: 25683. Date: 26 Aug. 1949. Abundance: III, C. Associates: *Pinus ponderosa*, *Abies magnifica* var. *shastensis*. Distribution: On at least 10 species of Caryophyllaceae in Asia, Africa, Europe, Greenland, South and North America; Mt. Shasta.

*Ustilago williamsii* (Griff.) Lavrov. — On *Stipa occidentalis*. — On occasional plants along the Horse Camp-Wagon Camp Trail above Wagon Camp.

Collection: 13406, Exs. 61. Date: 22 Aug. 1939. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least 14 grasses in Argentina and the western United States; Mt. Shasta.

### Tremellales.

#### *Tulasnellaceae*.

*Tulasnella fuscoviolacea* Bres. — On rotten Shasta fir wood. Possibly it is more common than this one collection indicates, and other species of this, as well as other resupinate tremellaceous fungi may occur on the mountain.

Collection: 10125. Date: 20 June 1938. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America; Mt. Shasta.

*Tulasnella* sp. — On *Abies magnifica* var. *shastensis*. — On rotten wood in the vicinity of Horse Camp.

Collections: 18139; 18140. Date: 30 June 1946. Abundance: IV, A. Associate: The host.

#### *Dacrymycetaceae*.

*Dacrymyces deliquescens* (Bull.) d. By. — On *Abies magnifica* var. *shastensis*. — Common on logs, branches, twigs and hand hewn boards of Shasta fir throughout the Shasta Fir zone. The imperfect stage is less frequent than the perfect.

Collections: 8513, 14619, 14645, 15556, 18041, 20365. Dates: 19 June 1937; 3, 8 June 1940; 16 July 1941; 24 June, 4 Sept. 1946; 29 July 1947. Seen at other times in every year but only large colonies of fructifications taken. Abundance: II, A. Associate: The host.

On *Arctostaphylos patula*. — In chaparral along the Sisson Southern Trail, 4000—4500 feet.

Collections: 19308, 19318. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*.

On *Cercocarpus ledifolius* Nutt. — On dead wood near Andesite Station, 5000 feet, north side of the mountain.

Collection: 19402. Date: 9 April 1947. Abundance: V, B. Associates: *Purshia tridentata*, *Arctostaphylos patula*.

On *Libocedrus decurrens*. — On rotten wood along the Sisson Southern Trail in the chaparral.

Collection: 19306. Date: 7 April 1947. Abundance: IV, A. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*, *Pinus ponderosa*.

On *Pinus attenuata*. — On dead wood along the Mud Creek Dam Road at 4000 feet about a mile north of McCloud.

Collection: 19342, 19343. Date: 9 April 1947. Abundance: IV, A. Associates: *Libocedrus decurrens*, *Arctostaphylos patula*.

On *Pinus ponderosa*. — On dead wood along the Sisson Southern Trail in the chaparral between 4000 and 4500 feet, and along the Mud Creek Dam Road, a mile north of McCloud at 4000 feet.

Collections: 19302, 19331, 19340. Dates: 7, 8 April 1947. Abundance: IV, A. Associates: *Abies concolor*, *Arctostaphylos patula*.

On *Purshia tridentata*. — On dead sticks a mile north of Andesite Station on the north side of the mountain at about 5000 feet.

Collection: 19410. Date: 9 April 1947. Abundance: V B. Associates: *Cercocarpus ledifolius*, *Arctostaphylos patula*.

On *Quercus chrysolepis*. — On dead wood around the base of a shrub on the lava flows along U.S. 97 about 5 miles northeast of Weed on the north side of the mountain.

Collections: 19418, 19420. Date: 9 April 1947. Abundance: V, B. Associates: Isolated shrubs in the lava blocks.

On *Quercus kelloggii* Newb. — On rotten wood along the Squaw Valley Creek road above McCloud between 4000 and 4500 feet, south side of the mountain. Among the Sisson Southern Trail in the chaparral, 4500 feet.

Collections: 18292, 19311. Dates: 25 July 1946, 7 April 1947. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*; also *Pinus ponderosa* in the first habitat. Distribution: Cosmopolitan, chiefly on coniferous wood; Mt. Shasta.

*Dacrymyces palmatus* (Schw.) Bres. — On *Pinus ponderosa*. — On dead wood along the Mud Creek Dam road at about 4000 feet, north of McCloud on the south side of the mountain.

Collection: 19331. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: North America; Mt. Shasta.

*Guepiniopsis alpina* (Tr. & Earle) Brasfield. — The commonest saprobic fungus on the mountain. It occurs on all forms of dead wood of Shasta fir at all elevations, as well as on dead wood of white bark pine, white fir and montain hemlock, and on boards of ponderosa pine. After light rains in the summer at Horse Camp large numbers of fruit bodies become evident on logs, branches, twigs, hand hewn boards and structural timbers.

Collections: On Shasta fir: 7575, 7627, 8522, 8533, 8541, 10128, 10292, 13319, 18024, 18144, 18349, 18443, 20130, 20380, 28277, Exs. 50. Also observed throughout each season from 1936 to 1947. On *Pinus albicaulis*: 8598. On *Tsuga mertensiana*: 8653, 10291, 15631, 25624, 28322. On *Abies concolor*: 16634. On *Pinus ponderosa* boards at Horse Camp: 18196. Dates: 8 Aug., 1 Sept. 1936; 22, 27, 29 June, 28 July, 17 Aug. 1937; 20 June, 8 Sept. 1938; 5 July 1939; 28 July 1941; 30 May 1942; 23 June, 2, 8 July, 10 Aug., 4 Sept. 1946; 25 June, 29 July 1947; 24 Aug. 1949; 3, 4 July 1951. Abundance: I, A. Associates: Conifers of the zones above the Sierra Mixed Conifer zone. Distribution: Western North America; Mt. Shasta.

#### *Tremellaceae.*

*Pseudohydnum gelatinosum* (Fr.) Karst. — In 1939, 1946 and 1947 several rotten Shasta fir logs near Horse Camp, partially sunken in the ground and thus kept partially moist were pulled apart in search for hypogaeous fungi. This species was found inside some of these logs. Only a few small fruit bodies were found at each time.

Collections: 13267, 13310, 13370, 18079, 20363, 26991, 28272. Dates: 28 June, 5, 31 July 1939; 27 June, 31 July 1946; 27 July 1947; 28 Sept. 1950; 3 July 1951. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Cosmopolitan on coniferous substrata; Mt. Shasta.

*Tremella mesenterica* (S. F. Gray) Pers. — On *Quercus kelloggii*. — Found once on dead wood on shrubs in the chaparral along the Sisson Southern Trail at about 4000 feet.

Collection: 19315. Date: 7 April 1947. Abundance: V, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Europe, Central and North America; Mt. Shasta.

#### *Auriculariaceae.*

*Auricularia auricularis* (S. F. Gray) G. W. Martin. — On *Acer glabrum*, *Abies concolor*. — In 1936 one collection was made on sticks of a frondose species, tentatively assigned to *Acer glabrum*, near the Sisson Southern Trail spring, 6500 feet. In 1947 it was found to be common on a fir log at the base of the zig-zag on this trail at 5000 feet.

Collections: 7606, 19380, Exs. 229. Dates: 25 Aug. 1936, 9 April 1947. Abundance: V, B; IV, A. Associates: *Acer glabrum*, *Prunus emarginata*, *Arctostaphylos nevadensis*, *Abies concolor*, *Abies magnifica* var. *shastensis*; *Pseudotsuga taxifolia*, *Pinus ponderosa*, *Libocedrus decurrens*. Distribution: Throughout North America and Europe on frondose and coniferous wood; Mt. Shasta.

### Homobasidiomycetes.

#### Exobasidiales.

##### Exobasidiaceae.

*Exobasidium vaccinii* (Fckl.) Wor. — On *Arctostaphylos nevadensis*. — Infrequent on this common shrub at the lower limits of its range. At 6000 feet in a valley along the Sisson Southern Trail and at 5000 feet in Mud Creek Canyon.

Collection: 13383. Date: 10 Aug. 1939. Abundance: IV, B. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Pinus ponderosa*, *Pinus lambertiana*, *Pseudotsuga taxifolia*.

On *Vaccinium caespitosum*. — Found once on a stunted plant with *Pucciniastrum goeppertianum* at Panther Creek Meadows.

Collection: 25619. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Phyllodoce empetrifomis*, *Kalmia polifolia*. Distribution: Siberia, Europe, North America; Mt. Shasta.

*Exobasidium vaccinii-uliginosii* Bond. — On *Arctostaphylos nevadensis*. — Until 1947 this disease was found infrequently on this host at the lower limits of its range, 5000—7500 feet. In 1947 this disease was very abundant on this host throughout its range except in the White Bark Pine zone where it was infrequent. Collections: 10235, 13297, 13340, 13388, 16791, 18363, 20334, 20338, 20255, 20294, Exs. 202. Dates: 25 July 1938; 30 June, 14 July, 10 Aug. 1939; 7 Sept. 1942; 16 Aug. 1946; 10, 16, 18, 25 July 1947. Abundance: IV, B; II, B. Associates: Conifers of all zones.

On *Arctostaphylos patula*. — Common on occasional shrubs throughout the chaparral. In good years infected areas present a reddish color because of the abundance of this species.

Collections: 8609, 10234, 13365, 15580, 18365, 20300, 26987, Exs. 24. Dates: 30 July 1937; 22 July 1938; 28 July 1939; 18 July 1941; 16 Aug. 1946; 18 July 1947; 28 Sept. 1950. Abundance: II, B. Associates: *Castanopsis chrysophylla*, *Ceanothus velutinus*. Distribution: Norway, Washington, Oregon, California; Mt. Shasta.

#### Polyporales.

##### Cyphellaceae.

*Solenia ochracea* (Pers.) Fr. — Collected once by W. C. Blasdale on rotten wood at Sisson's, now Mount Shasta, Siskiyou

Co., Calif. It was distributed as No. 292 in his "Fungi of California." Duplicates have been seen from the New York Botanical Garden Herbarium and from the Herbarium of the University of California, No. 671015, under the name of *Solenia stipitata* (Pers.) Fckl. Collected 30 July 1894. Distribution: Europe, North America; Mt. Shasta.

*Solenia anomala* (Pers. ex Fr.) Fckl. — On *Salix scouleriana*. — On bark of branches killed by oyster scale at MacBride Springs.

Collection: 26794. Date: 1 July 1950. Abundance: V, B. Associates: *Libocedrus decurrens*, *Pinus ponderosa*, *Ceanothus velutinus*. Distribution: Europe, North America; Mt. Shasta.

*Solenia candida* Pers. ex Fr. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Libocedrus decurrens*. — Common on rotting wood in rotting logs in the Horse Camp area and along the Mud Creek Dam road above McCloud, 4000, 8000 feet.

Collections: 13265, 13272, 19298, 20218, Exs. 44. Dates: 26 June 1939; 7, 9 April, 1 July 1947. Abundance: III, A. Associates: Conifers of the Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America; Mt. Shasta.

#### *Thelephoraceae.*

*Aleurodiscus amorphus* (Pers.) Rab. ex Cke. — On *Abies concolor*, *Abies magnifica* var. *shastensis*. — On the under side of branches and twigs still on trees between 6000 and 7000 feet in woods near the Shasta Snowline Highway, and at 4000 feet along the Mud Creek Dam road.

Collections: 15614, 15655, 15720, 19334, Exs. 116. Dates: 25, 31 July, 18 Aug. 1941; 8 April 1947. Abundance: III, A. Associates: The host species in the first habitat; *Pinus ponderosa* and *Libocedrus decurrens* in the second. Distribution: Europe, North America; Mt. Shasta.

*Aleurodiscus diffisus* (Sacc.) Burt. — On *Arctostaphylos nevadensis*. — Common on dead branches on a ridge below Horse Camp at about 7600 feet in the Shasta Fir zone.

Collections: 15589, 15638, 16660, 18187, Exs. 117. Dates: 19, 26 July 1941; 3 July 1942; 8 July 1946. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis*.

On *Arctostaphylos patula*. — On several dead sticks in the chaparral along the Junction Road between the Snowline Highway and Wagon Camp at 6000 feet in the lower Shasta Fir zone.

Collection: 15733. Date: 18 Aug. 1941. Abundance: V, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Only on ericaceous shrubs in Manchuria, Siberia, Oregon, Lassen Peak, Mt. Shasta.

*Aleurodiscus fruticetorum* W. B. Cke. — On *Ceanothus velutinus*, *Arctostaphylos patula*. — On dead sticks of shrubs

along the Junction Road between Wagon Camp and the Snowline Highway at 6000 feet, and on dead branches of snow brush on the lava flow on the north bank of Cascade Gulch at about 6000 feet.

Collections: 15717, 15730, 15731, 15732, 15737, 20340. Dates: 15, 18 Aug. 1941; 25 July 1947. Abundances: IV, B. Associates: *Castanopsis chrysophylla*, both *Abies* species. Distribution: Known only from these collections.

*Aleurodiscus roseus* (Pers. ex Fr.) Hoehn. & Litsch. — Material assigned to this complex has been collected on Shasta fir, *Arctostaphylos patula* and *Quercus kelloggii* wood.

Collections: Collected once in 1939; 19307, 19312, 19316. Dates: 1939; 7 April 1947. Abundance: IV, A, B. Associates: Plants of Shasta Fir zone and chaparral associations. Distribution: Europe, North America; Mt. Shasta.

*Corticium bicolor* Pk. — On rotten Shasta fir wood between Panther Creek meadows and Wagon Camp.

Collection: 20488. Date: 15 Aug. 1947. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*.

*Corticium ?centrifiguum* Auctt. — On *Pinus ponderosa*. — On twigs along the Mud Creek Dam road, 4000 feet.

Collection: 19330. Date: 7 April 1947. Abundance: V, A. Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: Europe, Jamaica, North America; Mt. Shasta.

*Corticium corrugae* (Burt) Burt in sched., in Rogers & Jackson. — On *Abies magnifica* var. *shastensis*, *Sambucus racemosus*, *Tsuga mertensiana*. — On bark of trees, logs, sticks and litter in the Horse Camp and Squaw Valley Creek areas, 8000 ft. The Horse Camp area on Mount Shasta or the Wodanthal area on Mt. Adams is the type locality. — This species was collected by E. B. Copeland on Mt. Shasta and distributed in Baker's "Fungi of the Pacific Slope".

Collections: Copeland; 18142, 18444, 20227, 24045, 24060, 25626, 28311. Dates: 1903; 2 July, 4 Sept. 1946; 10 July 1947; 3, 4 July 1948; 24 Aug. 1949; 5 July 1951. Abundance: III, A, B. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Western United States; Mt. Shasta

*Corticium cremoricolor* B. & C. — Collected on rotten Shasta fir wood near Horse Camp.

Collection: One collection in 1937. Abundance: V, A. Associate: The host. Distribution: North America; Mt. Shasta.

*Corticium galactinum* Fr. ?. — On rotten Shasta fir wood near Horse Camp and at Sand Flats.

Collections: 18070, 18137, 20358, ?24052. Dates: 26, 30 June 1946; 29 July 1947; 4 July 1948. Abundance: IV, A. Associate: The host. Distribution: North America, Puerto Rico, Cuba, Japan; Mt. Shasta.

*Corticium luridum* Bres. — On rotten Shasta fir wood at Horse Camp, 8000 ft.

Collections: 20362, 20373, 20382. Date: 29 July 1947. Abundance: IV, A. Associate: The host. Distribution: Italy, Manitoba, Ohio, Mt. Shasta.

*Corticium pelliculare?* Karst. — On *Pinus ponderosa* Dougl. — On needles in litter along the Sisson Southern Trail, 4500 feet.

Collection: 19295. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Finland, Sweden, Bermuda, North America; Mt. Shasta.

*Corticium radiosum* Fr. — On rotten Shasta fir wood near Horse Camp, 8000 feet.

Collections: 18058, 18134, 20061, 20104, 20381. Dates: 25, 30 June 1946; 22, 23 June, 29 July 1947. Abundance: III, A. Associate: The host. Distribution: Europe, North America; Mt. Shasta.

*Corticium* sp. — On *Cercocarpus ledifolius*, *Quercus chrysolepis*, *Quercus kelloggii*. — On rotten wood in chaparral areas.

Collections: 19299, 19398, 19421, 19422. Dates: 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral species.

*Corticium* sp. — On rotten Shasta fir wood at Horse Camp. Collection: 20366. Date: 29 July 1947. Abundance: V, A. Associate: The host.

*Corticium* sp. — On *Quercus kelloggii* Newb. — On rotten wood along the road to Squaw Valley Creek Spring.

Collection: 18288. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus attenuata*, *P. ponderosa*.

*Corticium* sp. — On *Arctostaphylos patula*, *Cercocarpus ledifolius*. — On rotten branches in the chaparral.

Collections: 19309, 19400. Dates: 7, 9 April 1947. Abundance: IV, B. Associates: Shrubs of the chaparral.

*Corticium* sp. — On rotten Shasta fir wood near Horse Camp, 7800 feet.

Collections: 18059, 18211. Dates: 25 June, 10 July 1946. Abundance: IV, A. Associate: The host.

*Corticium* sp. — On rotten Shasta fir wood at Horse Camp. Panther Creek.

Collection: 18329. Date: 31 July 1946. Abundance: V, A. Associate: The host.

*Corticium* sp. — On rotten wood of Shasta fir at Horse Camp, Collections: 20082, 20458. Dates: 28 June, 15 Aug. 1947. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*.

*Corticium* sp. — On rotten Shasta fir wood at Horse Camp. Collection: 24066. Date: 4 July 1948. Abundance: V, A. Associate: The host.

*Corticium* sp. — On rotten Shasta fir wood at Panther Creek meadows, 7500 feet.

Collection: 24066. Date: 4 July 1948. Abundance: V, A. Associate: The host.

*Cytidia stereoides* W. B. Cke. — On *Ceanothus velutinus*, *Cercocarpus ledifolius*, *Quercus kelloggii*, *Purshia tridentata*. — Scattered throughout the chaparral between 4000 and 5000 feet on dead wood of various shrubs on the west and north sides of the mountain. Collections: 18285, 18341, 19329, 19395, 19411. Dates: 25 July, 2 Aug. 1941; 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral shrubs. Distribution: Known only from the listed collections.

*Hymenochaete spreta* Pk. — On *Ceanothus velutinus*. — On rotting branches of shrubs smothered out by *Abies concolor*, along the Sisson Southern Trail, 6500 feet.

Collection: 26989. Date: 28 Sept. 1950. Abundance: IV, B. Associate: *Abies concolor*. Distribution: North America; Mt. Shasta.

*Hymenochaete tabacina* [(Sow.) ex Fr.] Lév. — On *Ceanothus velutinus*. — Chaparral shrubs apparently advanced up the mountain in areas which had been cut over or burned off. As these areas become reseeded with white fir and the firs reach 10—30 feet or more in height they smother these chaparral shrubs. The branches of several such smothered shrubs were found to be covered with this species, 5000—6500 feet.

Collections: 15519, 18098, 18099. Exs. 122. Dates: 27 June 1941; 28 June 1946. Abundance: III, B. Associate: *Abies concolor*, *Pinus ponderosa*.

On *Arctostaphylos patula*. — On dead branches in the chaparral, along the Mud Creek Dam road.

Collection: 19345. Date: 8 April 1947. Abundance: V, B. Associates: *Pinus ponderosa*, *Abies concolor*.

On *Castanopsis chrysophylla*. — On dead branches along the Sisson Southern Trail, 5000 feet.

Collection: 20402. Date: 8 Aug. 1947. Abundance: V, B. Associates: *Pinus ponderosa*, *Abies concolor*, *Pseudotsuga taxifolia*. Distribution: Europe, southern South America, North America; Mt. Shasta.

*Pellicularia flavescens* (Bon.) Rogers. — Collected on rotten Shasta fir wood at Horse Camp once in 1937. Abundance: V, A. Associate: The host. Distribution: Germany, Austria, Poland, Eastern Canada, New England, Florida, Iowa, Missouri; Mt. Shasta.

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\*) The above collections of *Corticium* were submitted for identification to Dr. Jackson before his death. Each group of collections had been assigned a separate designation in reporting on the sendings. The same is true for the records of *Peniophora* which follow. As his students complete studies of this material it is being reported on in the literature.



*Pellicularia subcoronata* (Hoehn. & Litsch.) Rogers. — On rotten wood of *Pinus ponderosa* along the Sisson Southern Trail, 4500 feet.

Collection: 19290. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Germany, North America; Mt. Shasta.

*Pellicularia vaga* (Berk. & Curt.) Rogers. — On *Pinus ponderosa*, *Abies magnifica* var. *shastensis*. — On rotten wood of the former host along the Mud Creek Dam road at 4000 feet; on the latter at Horse Camp, 8000 feet.

Collections: 19364, 24047. Dates: 8 April 1947, 3 July 1948. Abundance: V, A. Associates: Trees of the Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America; Mt. Shasta.

*Pellicularia* sp. — On *Quercus kelloggii* along the Squaw Valley Creek road, 4000 feet.

Collection: 18289. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus ponderosa*, *Arctostaphylos patula*.

*Peniophora assimilis* Jackson & Deardon. — On *Purshia tridentata* branches about a mile north of Andesite Station, 5000 ft. Collection: 19442. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius*, *Arctostaphylos patula*. Distribution: Canada, Mt. Shasta.

*Peniophora chaetophora* (Hoehn.) Hoehn. & Litsch. — On rotten wood of *Tsuga mertensiana* along Squaw Valley Creek at about 8000 ft.

Collection: 20275. Date: 10 July 1947. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Europe, North America; Mt. Shasta.

*Peniophora cinerea* Auctt. — On *Cercocarpus ledifolius*, *Quercus kelloggii*. — Material assigned to this complex was obtained from near Bolam Station, and from along the Squaw Valley Creek Road.

Collections: 18291, 18340. Dates: 25 July, 2 Aug. 1946. Abundance: IV, B. Associates: Species of the chaparral vegetation. Distribution: Africa, Japan, Europe, North America; Mt. Shasta.

*Peniophora cornosa* Burt. — On rotten wood of Shasta fir near Horse Camp, 7800—8000 feet.

Collections: 20207, 20361. Dates: 1, 29 July 1947. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Eastern and western United States; Mt. Shasta.

*Peniophora crassa* Burt ex Peck. — On *Pinus ponderosa*. — On rotten wood along the Sisson Southern Trail, 4500 feet.

Collection: 19286. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Europe, North America, Mt. Shasta.

*Peniophora exima* Jackson & Deardon. — On hand made Shasta fir boards at Horse Camp.

Collections: 18033, 18034 (type). Date: 24 June 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Canada, Mt. Shasta.

*Peniophora gracillima* Ell. & Ev. — On rotten *Pinus ponderosa* wood along the Mud Creek Dam road.

Collection: 19349. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: North America, Mt. Shasta.

*Peniophora incarnata?* (Pers.) Cke. — On *Cercocarpus ledifolius*, *Quercus kelloggii*. — On rotten wood near Bolam Station on the north side of the mountain; and along the Squaw Valley Creek road on the south side of the mountain; 4000—5000 feet.

Collections: 18290, 18342, 19396. Dates: 25 July, 2 Aug. 1946; 9 Apr. 1947. Abundance: IV, B. Associates: Shrubs of the chaparral associations. Distribution: Europe, Japan, North America; Mt. Shasta.

*Peniophora pallidula* Bres. — On rotten Shasta fir wood in the Horse Camp area.

Collection: 18055. Date: 25 June 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Vermont, Michigan, Mt. Shasta.

*Peniophora sanguinea* (Fr.) Hoehn. & Litsch. — On rotten *Pinus ponderosa* wood, Mud Creek Dam road, 4000 feet.

Collection: 19328. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor*, *Libocedrus decurrens*. Distribution: Europe, North America, Mt. Shasta.

*Peniophora* (near) *subulata* (Bourd. & Galz.) Donk. — On rotten Shasta fir log at Horse Camp, 8000 feet.

Collection: 18138. Date: 30 June 1946. Abundance: V, A. Associate: The host. Distribution: Sweden, Austria, France, Ontario, Quebec, British Columbia, Massachusetts, Rhode Island, Ohio, Montana, Idaho, Washington, Oregon, California; Mt. Shasta.

*Peniophora* sp. — On rotten Shasta fir wood at Horse Camp, 8000 ft.

Collection: 18133. Date: 30 June 1946. Abundance: V, A. Associate: The host.

*Peniophora* sp. — On *Arctostaphylos patula*, *Cercocarpus ledifolius*. — On dead wood along the Mud Creek Dam road, and a mile north of Andesite Station, 4000—5000 feet.

Collections: 19338, 19397. Dates: 8, 9 April 1947. Abundance: V, B. Associates: Chaparral shrubs.

*Peniophora* sp. — On bark of *Libocedrus decurrens* north of Andesite Station on the north side of the Mountain.

Collection: 19404. Date: 9 April 1947. Abundance: V, A. Associates: *Pinus ponderosa*, *Cercocarpus ledifolius*.

*Peniophora* sp. — On *Purshia tridentata* branches near Andesite Station.

Collection: 19409. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius*, *Arctostaphylos patula*.

*Peniophora* spp. — On dead wood of Shasta fir and *Ceanothus velutinus*; on the former on ridges north of Horse Camp at 8100 feet; on the latter at the north side of Cascade Gulch at 6000 feet.

Collections: 20214, 20343. Dates: 1, 25 July 1947. Abundance: V, A, B. Associates: Both species of *Abies*.

*Phlebiella candidissima* (Schw.) W. B. Cke. — Common on rotting wood of Shasta fir in the Horse Camp area at 7800 to 8000 feet. Usually this is found in small patches inside of logs because of the lower evaporation rate in such locations contrasted with that on the outside of logs, and the consequent higher humidity. Also at Panther Creek meadows.

Collections: 13271 and other collections between 1936 and 1941, 24061. Dates: 26 June 1939, 7 July 1948. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

On *Abies concolor*. — On rotten wood along the Sisson Southern Trail between 5000 and 6000 feet.

Collections: 19371, 20166, 24061. Dates: 9 April, 27 June 1947. Abundance: IV, A. Associates: *Abies concolor*, *Pinus ponderosa*, *Pseudotsuga taxifolia*. Distribution: North America; Mt. Shasta.

*Stereum ?hirsutum* Willd. ex Fr. — On *Arctostaphylos patula*, *Ceanothus velutinus*, *Quercus kelloggii*, *Quercus chrysolepsis*, *Salix scouleriana*. — On dead wood in chaparral areas on the west and north sides of the mountain, 4000—5000 feet.

Collections: 18096, 18097, 19303, 19314, 19319, 19317, 19423, 19424. Dates: 28 June 1946; 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral shrubs. Distribution: Europe, North America; Mt. Shasta.

*Stereum rugisporum* (Ell. & Ev.) Burt. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — Common on charred and unburned fallen logs in the Shasta Fir zone between Horse Camp and Mud Creek Canyon, and in the White Fir zone along the Sisson Southern Trail. The burned logs apparently resulted from spot lightning fires confined to single trees in the forest. Collections: 10230, 13282, 14703, 18109, 18318, 18418, 18446, 19372, 20045, 20053, 20060, 20105, 20117, 20177, 25633, 28240, 28313, Exs. 45. Dates: 21 July 1938; 28 June 1939; 22 Aug. 1940; 28 June, 31 July, 29 Aug., 4 Sept. 1946; 9 April, 20, 22, 23, 25, 27 June 1947; 24 Aug. 1949; 7 July 1951. Abundance: III, A. Associate: The host species. Distribution: British Columbia; Colorado; Blue Mountains, Oregon; Cascade Mountains; California, Mt. Shasta.

*Tomentella* sp. — On rotting Shasta fir wood at Horse Camp, 8000 ft.

Collections: 20375, 20377. Date: 29 July 1947. Abundance: V, A. Associate: The host.

*Trechispora brinkmannii* (Bres.) Rog. & Jacks. — On rotting Shasta fir wood at Horse Camp.

Collection: 20064. Date: 22 June 1947. Abundance: V, A. Associate: The host.

### *Meruliaceae.*

*Merulius atropurpureus* W. B. Cke. — One collection was made on rotting wood and bark of Shasta fir logs along the Sisson Southern Trail at about 7000 feet.

Collection: 10117 (type). Date: 17 June 1938. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this collection.

*Merulius bellus* Berk. & Curt. — Assignment of the following collections to this species is tentative. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Cercocarpus ledifolius*, *Pinus attenuata*, *Tsuga mertensiana*. On rotten wood of these hosts in Shasta Fir, White Fir, Sierra Mixed Conifer and Chaparral associations between 4000 and 8000 feet.

Collections: 8519, 8564, 13270, 13273, 13289, 15663, 18439, 19341, 19375, 19381, 19399, 20206, 20279, 20372, Exs. 37. Dates: 22 June, 7 July 1937; 26, 28 June 1939; 7 August 1941; 30 June, 4 Sept. 1946; 8, 9 April, 1, 10, 25, 29 July 1947. Abundance: III, A. Associates: Conifers of all zones below the White Bark Pine zone. Distribution: Eastern North America; Mt. Shasta.

*Merulius ceracellus* Berk. & Curt. — Collected on rotting Shasta fir logs at Horse Camp, 8000 feet.

Collection: 10253, Exs. 48. Date: 28 July 1938. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: Eastern North America, New Mexico, Washington, Mt. Shasta.

*Merulius fugax* Fr. — On rotting wood of Shasta fir, Horse Camp.

Collection: 20372. Date: 29 July 1947. Abundance: V, A. Associate: The host.

*Merulius ravenelii* Berk. — On *Abies concolor*, *Abies magnifica* var. *shastensis*. — On rotting wood at Horse Camp, 8000 feet, on the north side of Cascade Gulch, 6000 feet, and at the foot of the Sisson Southern Trail zig-zag, 5000 ft.

Collections: 18135, 18439, 19376, 19383, 20342. Dates: 30 June, 4 Sept. 1946; 9 April, 25 July 1947. Associates: Trees of the Shasta Fir and White Fir zones.

*Merulius vastator* Fr. — On rotting *Pinus ponderosa* log along the Mud Creek Dam road, 4000 feet.

Collection: 19344. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor*, *Libocedrus decurrens*.

*Phlebia albida* Fr. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — Occasionally found on logs throughout forests of these species. In some cases it becomes effused in large patches for a number of feet along the under side of logs with or without bark. Also producing a curtain-like formation hanging down from the under side of logs lying across depressions in the forest floor.

Collections: 10262, 13276, 13288, 15624, 15644, 18088, 18108, 18147, 19383, 20391, 26990, 28262, 28300, 20323, 28325, Exs. 128. Dates: 10 Aug. 1938; 26, 28 Aug. 1939; 28, 29 July 1941; 27, 28 June, 2 July 1946; 1 Aug. 1947; 28 Sept. 1950; 1, 2, 3 July 1951. Abundance: II, A. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*, *Pinus ponderosa*, *Pseudotsuga taxifolia*.

#### Coniophoraceae.

*Coniophora olivacea* (Fr.) Karst. — Collected on rotting wood of Shasta fir logs in the Horse Camp area, 7800—8100 feet.

Collections: One collection in 1937; 18069, 20215, 20385. Dates: 1937; 26 June 1946; 1, 29 July 1947. Abundance: IV, A. Associates: The host. Distribution: Europe, North America, Mt. Shasta.

*Serpula americana* (Burt) W. B. Cke. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Pinus ponderosa*, *Tsuga mertensiana*. — Occasional on fallen logs from 5000 to 8000 feet in all zones between those elevations. It is found most frequently on Shasta fir logs and when growing luxuriantly is subject to attack by numerous small beetles.

Collections: 10231, 13312, 15574, 15629, 18057, 18419, 20176, 20183, 20217, 24050, 25573, 25610 A Exs. 46. Dates: 21 July 1938; 5 July 1939; 12, 28 July 1941; 25 June, 29 Aug. 1946; 27 June, 1 July 1947; 4 July 1948; 24 Aug. 1949. Abundance: II, A. Associates: Conifers of all zones below the White Bark Pine zone. Distribution: Eastern North America, Wyoming, Washington; Mt. Shasta.

#### Clavariaceae.

*Clavaria abietina* Fr. — On very rotten wood of *Abies concolor* along the Sisson Southern Trail at about 5000 feet.

Collection: 19370. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus ponderosa*, *Pseudotsuga taxifolia*. Distribution: Europe, North America; Mt. Shasta.

*Clavaria conjuncta* Pk. — Under Shasta fir duff along the Sisson Southern Trail, along Squaw Valley Creek, and near Horse Camp.

Collections: 20033, 20138, 20163, 20257, 26999. Dates: 20, 27 June, 10 July 1947; 28 Sept. 1950. Abundance: IV, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Clavaria ?decurrens* Pers. — On rotten Shasta fir wood on a ridge north of Horse Camp, 8100 feet.

Collection: 20204. Date: 1 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, Canada, New York, Oregon, Mt. Shasta.

*Clavaria obtusissima* Pk. — Collections have been made in the Sierra Mixed Conifer zone under a ponderosa pine, and along the Sisson Southern Trail in the Shasta Fir zone under duff and litter.

Collections: 15527, 20163. Dates: 27 June 1941; 27 June 1947. Abundance: V, D. Associates: *Pinus ponderosa*, *Arctostaphylos patula*, *Abies magnifica* var. *shastensis*. Distribution: Massachusetts, New York, North Carolina, Alabama, Missouri, Mt. Shasta.

*Clavaria pinicola* Burt. — Found under rotting Shasta fir logs near Horse Camp, 8000 feet.

Collections: 20164, 20216. Dates: 1941; 27 June, 1 July 1947. Abundance: IV, A. Associate: The host. Distribution: Idaho, Oregon, California; Mt. Shasta.

*Clavaria secunda* Berk. & Curt. — Subhypogaeous under *Abies concolor* and Shasta fir duff at 6000 feet along the Sisson Southern Trail.

Collections: 18119, 18230. Dates: 28 June, 11 July 1946. Abundance: V, D. Associates: Both species of fir. Distribution: Europe, New York, North Carolina, Oregon, Mt. Shasta.

*Clavaria subdecurrens* Coker. — On the under side of rotting Shasta fir wood lying on the ground near Horse Camp, 8000 feet.

Collection: 18334. Date: 31 July 1946. Abundance: V, D. Associate: The host. Distribution: New York, Oregon, Mt. Shasta.

*Typhula* sp. — On overwintered herbage on open slopes of the mountain, on grasses in a spring and on overwintered herbage wherever it is kept moist throughout the winter as well as at Wagon Camp, small sclerotia of the *Typhula* type have been found on *Arnica viscosa*, *Athyrium americanum*, *Castilleja miniata*, *Cryptogramma acrostichoides*, *Hulsea nana*, *Juncus orthophyllus*, *Lupinus obtusilobus* and *Veratrum californicum*; 5700—10,000 feet.

Collections: Among others: 15599, 16802, 18009, 18091, 18152, 18311, 20221. Dates: 23 July 1941; 7 Sept. 1942; 21, 27 June, 2, 30 July 1946; 2 July 1947. Abundance: III, C. (Attempts to produce the perfect state in culture have so far been unsuccessful.)

*Hydnaceae.*

*Calodon amicus* Quél. — A colony of 15 specimens of this species was found on the ground in Shasta fir woods under *Arctostaphylos nevadensis* shrubs along the Sisson Southern Trail at 7500 feet. Several years later a half dozen specimens were taken under *Abies concolor* duff on the north side of Cascade Gulch, 6000 feet.

Collections: 13367, 20346, Exs. 56. Dates: 28 July 1939; 25 July 1947. Abundance: IV, D. Associates: *Arctostaphylos nevadensis*, *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Echinodontium tinctorium* Ell. & Ev. — Observed on several trees of Shasta fir and white fir above the 6 mile post along the Sisson Southern Trail at about 6000 feet in the lower Shasta Fir zone; and along the Horse Camp-Wagon Camp Trail at 7000 feet on Shasta firs.

Collections: 10115, 15613, 20333. Dates: 17 June 1937; 25 July 1941; 18 July 1947. Abundance: IV, A. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Western North America, Mt. Shasta.

*Mycoacia alboviride* (Morg.) Miller & Boyle. — Collected on rotten Shasta fir wood at Horse Camp, 8000 feet.

Collection: 13291. Date: 28 June 1939. Abundance: V, A. Associate: The host. Distribution: North America; Mt. Shasta.

*Odontia cristulata* Fr. — On *Quercus kelloggii*. — Collected from several rotting logs and branches of the host along the lane from McCloud to the Squaw Valley Creek spring.

Collections: 18286, 18287. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus attenuata*, *Arctostaphylos patula*. Distribution: Europe, Iowa, Mt. Shasta.

*Odontia crustosa* (Fr.) Quél. — On dead branches of *Arctostaphylos patula* along the Sisson Southern Trail at 4500 feet.

Collection: 19320. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus*, *Castanopsis chrysophylla*. Distribution: Europe, North America, Mt. Shasta.

*Polyporaceae.*

*Aurantioporellus alboluteus* (Ell. & Ev.) Murr. — Common on the under side of decaying Shasta fir logs throughout the Shasta Fir zone. The specimens must be collected within two weeks of the time the snow pack has melted from the logs on which they grow, or the collector will find little more than a pile of red dust under the log — remains from the action of hundreds of tiny beetles (*Dacne picea*) found in every collection made. Immediate fumigation is always necessary.

Collections: 8511, 8552, 10102, 10162, 10173, 10233, 15538, 15564, 18020, 18106, 24040, 24062, Exs. 49. One collection by G. C. Hedgcock. Dates: 3 Oct. 1911; 18 June, 1 July 1937; 11, 28 June, 1, 22 July 1938; 9, 16 July 1941; 23, 28 June 1946; 3, 4 July 1948. Abundance: II, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*, *Tsuga mertensiana*.

On *Tsuga mertensiana*. — Collected once at Squaw Valley Creek meadows.

Collection: 25622. Date: 24 Aug. 1949. Abundance: V, A. Associates: as above. Distribution: New York, Colorado, Oregon, California, Mt. Shasta.

*Coltricia perennis* (L. ex Fr.) S. F. Gray. — Found occasionally on duff in the Shasta Fir, White Fir and Sierra Mixed Conifer zones.

Collections: Several collections in 1937—1941, 20250. Dates: 1937—1941, 10 July 1947. Abundance: IV, D. Associates: Trees of the listed zones. Distribution: Cosmopolitan; Mt. Shasta.

*Coriulus hirsutus* (Fr.) Quél. — Collected once on White Fir near Mount Shasta in June 1941. Abundance: IV, A. Distribution: Asia, Europe, North America; Mt. Shasta.

*Coriulus versicolor* (L. ex Fr.) Quél. — On *Cercocarpus ledifolius*. — Old specimens were found on dead wood near Andesite Station on the north side of the mountain.

Collection: 19401. Date: 9 April 1947. Abundance: V, B. Associates: *Purshia tridentata*, *Arctostaphylos patula*. Distribution: Cosmopolitan; Mt. Shasta.

*Cryptoporus volvatus* (Pk.) Hubbard. — On *Abies concolor*. — In the Sierra Mixed Conifer zone along the Wagon Camp road.

Collection: G. C. Hedgcock; 18116. Dates: 2 Oct. 1911; 28 June 1946. Abundance: IV, A. Associates: *Pseudotsuga taxifolia*, *Pinus ponderosa*.

On *Abies magnifica* var. *shastensis*. — Occasional on fallen logs and standing snags throughout the Shasta Fir zone.

Collections: 7576, 7640, 8517, 8630, 8673, 10208, 14633, 18021, 18375, 20054, 20496, 24064, 25572, 27010, Exs. 77. Dates: 9 Aug., 10 Sept. 1936; 22 June, 13. Aug., 27 Aug. 1937; 15 July 1938; 8 July 1940; 23 June, 16. Aug. 1946; 20 June, 27 Aug. 1947; 4 July 1948; 24 Aug. 1949; 28 Sept. 1950. Abundance: II, A. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*.

On *Libocedrus decurrens* Torr. — Collected by G. C. Hedgcock, 3 Oct. 1911. Abundance: V, A. Associates: *Pinus ponderosa*, *P. lambertiana*, *Abies concolor*.



On *Pinus ponderosa*. — A specimen collected by a ranger in Mt. Shasta in 1938 is filed at the Forest Pathology Collections, Beltsville, Maryland; found once on the north side of the mountain on a tree near timberline on the east side of Bolam Creek Canyon. Collection: 25703; Date: 26 Aug. 1949. Abundance: V, A. Associates: *Pinus lambertiana*, *Libocedrus decurrens*, *Pseudotsuga taxifolia*; *Pinus albicaulis*, *Abies magnifica* var. *shastensis*.

On *Pseudotsuga taxifolia*. — Found once by E. P. Meincke at Shasta Springs, 14 June 1926, according to a specimen filed at the Forest Pathology field office, San Francisco. Shasta fir trees in the Mountainhouse Creek devastated area appear able to survive the building up of gravel around their bases except when attacked by this species. Distribution: Siberia, Japan, North America; Mt. Shasta.

*Fomes amarus* (Hedgc.) Murr. — On *Libocedrus decurrens*. — Collected by G. C. Hedcock at Sisson's, 2, 5 Oct. 1911, Specimen filed at Forest Pathology Collections, Beltsville, Maryland. — A specimen was obtained on a living tree along the Shasta-Lassen Highway (Cal. 89) five miles east of Pondosa in Shasta County. Collection: 25569. Date: 23 Aug. 1949. Abundance: IV, A. Associates: *Pinus ponderosa*, *Abies concolor*. Distribution: With the host in Oregon and California; Mt. Shasta.

*Fomes annosus* (Fr.) Cke. — Infrequent on rotten wood of Shasta fir and Mountain hemlock at Horse Camp, Sand Flats and Panther Creek in the Shasta Fir zone. Collections: 13300, 18002, 18005, 25606. Collected also by Hedcock apparently in the same area. Dates: 2 Oct., 3 Nov. 1911; 5 July 1939; 17, 19 June 1946; 24 Aug. 1949. Abundance: IV, A. Associates: *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*. Distribution: Northern Hemisphere; Mt. Shasta.

*Fomes igniarius* var. *arctostaphyli* Long. — On *Arctostaphylos patula*. — A specimen collected by J. W. Kimmey at Mount Shasta, 6 July 1942, is filed in the San Francisco field office of Forest Pathology. Distribution: Oregon, California; Mt. Shasta.

*Fomes nigrolimitatus* (Romell) Egeland. — On down logs of Shasta fir and mountain hemlock throughout the *Abies-Tsuga* zone.

Collections: 24058, 25610, 28292, 28319, 28320. Dates: 24 Aug. 1949, 2 July 1951. Abundance: IV, A. Associates: The host. Distribution: Europe, North America; Mt. Shasta.

*Fomes officinalis* (Fr.) Lloyd. — Observed on Shasta fir at about 7000 feet along the Sisson Southern Trail, on Sugar Pine along Squaw Valley Creek at about 5500 feet, and on mountain hemlock logs in the draw below Red Butte at 7500 feet. The rot symptoms of other dead wood indicate that the fungus is wider spread than its conks show.

Collections: 15513, 15540, 15764, 18005, 18283, 18410, 18411, 20406, 25570. Dates: 12 June, 11 July, 28 Aug. 1941; 19 June, 25 July, 29. Aug. 1946; 8 Aug. 1947; 23 Aug. 1949. Abundance: III, A. Associates: Coniferous trees of all zones below the White Bark Pine zone. Distribution: Europe, Western North America; Mt. Shasta.

*Fomes pinicola* (Fr.) Cke. — While the rot caused by this species is fairly common, the conks appear infrequently and then usually in an atypical manner. On Shasta fir and mountain hemlock in the *Abies-Tsuga* zone.

Collections: 13411, 15763, 18107, 24056, 25607. Dates: 24 Aug. 1939; 28 Aug. 1941; 28 June 1946; 4 July 1948; 23, 24 Aug. 1949. Abundance: III, A. Associates: Host trees. Distribution: Temperate regions; Mt. Shasta.

*Fomes subroseus* (Weir) Overh. — Occasional on stumps and logs near Horse Camp on Shasta fir, 8000 feet.

Collections: 8520, 8628. Collected by Hedgcock apparently in the same area. Dates: 3, 8 Oct. 1911; 22 June, 13 Aug. 1937. Abundance: IV, A. Associate: The host. Distribution: North America; Mt. Shasta.

*Fulvifomes juniperina* (Schrank) Murr. — On *Juniperus occidentalis*. — This host reaches the mountain at its north base although it forms large groves in the Shasta Valley to the north. A specimen collected in June 1938 was given to the University of California herbarium (539462) by Miss E. E. Morse. It is labeled as collected at Mount Shasta.

*Ganoderma applanatum* (Pers.) Pat. — On *Abies concolor*. — Several conks occurred on a prostrate log near the Squaw Valley Creek spring at 5000 feet.

Collection: 18284. Date: 25 July 1946. Abundance: IV, A. Associates: *Pseudotsuga taxifolia*, *Pinus lambertiana*. Distribution: Cosmopolitan; Mt. Shasta.

*Ganoderma oregonense* Murr. — Found at the base of living trees and on dead stumps and rotting logs of Shasta fir in the Shasta fir zone between 7000 feet in Cascade Gulch and 8000 feet at Horse Camp and between Horse Camp and Panther Creek meadows. Collections: 7588, 8650, 10308, 16794, 18435, 27002, 28347. The largest specimen obtained measured  $42 \times 35 \times 13$  cm. Also collected by Hedgcock apparently in the same area. Dates: 3 Oct. 1911; 9 Aug. 1936; 17 Aug. 1937, 10 Sept. 1938; 7 Sept. 1942; 4 Sept. 1946; 28 Sept. 1950; 4 July 1951. In June 1946 three large old specimens were observed on each of three dead Shasta firs on either felled logs or stumps. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Oregon, California; Mt. Shasta.

*Gloeophyllum sepiarium* (Schaeff. ex Fr.) Karst. — Fruit bodies were obtained from the sawed ends of piled logs of Shasta fir cleared from the Snowline Highway on sapwood seven

years after the trees were cut; on wood at Panther Creek meadows. Collections: 15530, 28282. Dates: 3 July 1941, 1 July 1951. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: North temperate regions; Mt. Shasta.

*Hirschioporus abietinus* (Dicks. ex Fr.) Donk. — On *Abies magnifica* var. *shastensis*. — Common on bark and wood of dead saplings and trees near Horse Camp and throughout the Shasta Fir zone. This form on Shasta firs appears to be much more stunted and atypical in most years in growth than collections made in the Sierra Nevada to the south.

Collections: 8529, 18049, 18352, 18438. Observed a number of times between 1936 and 1947 but material was usually too poor to collect. Collected by Hedgcock in the same general area. Dates: 3 Oct. 1911; 26 June 1937; 25 June, 10 Aug., 4 Sept. 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: On conifers in the northern hemisphere; Mt. Shasta.

*Laetiporus sulphureus* (Bull. ex Fr.) Bond. & Sing. — On *Abies magnifica* var. *shastensis*. — One tree on a ridge between Panther Creek meadows and Horse Camp above the Snowline Highway at 7500 feet was found to have several young fruit bodies between the base and five feet above the ground. In June 1946 a massive fruit body of the previous fall was found on a dead tree near Horse Camp at 8000 feet. New growth of sporophores was initiated on this tree in late August and early September. A tree along the Snowline Highway at about 7000 feet was found to be bearing a large young conk in 1949.

Collections: 16808, 18445, 25715. Dates: 8 Sept. 1942, 4 Sept. 1946, 26 Aug. 1949. Abundance: IV, A. Associates: The host. Distribution: Cosmopolitan; Mt. Shasta.

*Polyporus elegans* (Bull.) Fr. — On *Prunus emarginata*, *Ceanothus velutinus*, and on unidentified sticks in litter. — Found several times from 6500 feet along the Sisson Southern Trail on snowbrush branches killed by advancing groves of *Abies concolor*, to a creek at 3550 feet in Mount Shasta.

Collections: 15510, 15511, 15524, 15579, 20189, 20420, 26993. Dates: 7, 27 June, 18 July 1941; 27 June, 8 Aug. 1947; 28 Sept. 1950. Abundance: IV, D. Associates: Trees of the Sierra Mixed Conifer and White Fir zones. Distribution: Europe, North America, Mt. Shasta.

*Poria albolutescens* (Rom.) Egeland. — On rotting Shasta fir wood near Horse Camp, 8100 feet. Collection: 20213. Date: 1 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, Northern North America; Mt. Shasta.

*Poria asiatica* Overh. — On rotting Shasta fir wood at Horse Camp, 8000 feet.

Collection: 18132, 20062. Dates: 30 June 1946, 22 June 1947. Abundance: V, A. Associate: The host. Distribution: Siberia, Western North America; Mt. Shasta.

*Poria ferrea* (Pers.) Bourd. & Galz. — On *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — On rotten wood in the Shasta Fir zone at Horse Camp and along Squaw Valley Creek between 6500 and 8000 feet.

Collections: 18067, 20263. Dates: 26 June 1946, 10 July 1947. Abundance: IV, A. Associates: The host species. Distribution: Europe, North America; Mt. Shasta.

*Poria ferrugineo-fusca* Karst. — On *Abies magnifica* var. *shastensis*. — On rotting wood along Squaw Valley Creek, 6000 feet.

Collection: 20253. Date: 10 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, North America; Mt. Shasta.

*Poria feruginosa* (Schrad. ex Fr.) Karst. — On pieces of logs used as stools at Horse Camp, 8000 feet. Isolated from the rot formed on such stools when they are in contact with the ground. Rotted areas in the case of these logs are covered with brown, felty, masses of mycelium. Similar masses of mycelium have been observed in other localities on the mountain. Isolations were made by Ross W. Davidson.

Collections: 18189, 18434. Dates: 9 July, 4 Sept. 1946. Abundance: IV, A. Associate: The host. Distribution: Europe, North America, Mt. Shasta.

*Poria lenis* Karst. — On *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — Collected occasionally at Horse Camp and Squaw Valley Creek meadows inside rotten logs.

Collections: 8671, 10232, 10287, 13280, 15560, 18136, 18209, 18210, 20269, 24051, Exs. 57. Dates: 27 Aug. 1937; 21 July, 8 Sept. 1938; 26 June 1939; 16 July 1941; 30 June, 10 July 1946; 10 July 1947; 4 July 1948. Abundance: III, A. Associate: The host. Distribution: Finland, North America; Mt. Shasta.

*Poria rufa* (Schrad. ex Fr.) Cke. — In a log of *Pinus ponderosa* near Bolam Creek, 6000 feet, north side of the mountain.

Collection: 10280. Date: 20 Aug. 1938. Abundance: V, A. Associate: *Pinus ponderosa*. Distribution: Europe, North America; Mt. Shasta.

*Poria subincarnata* (Pk.) Murr. — On rotting Shasta fir wood near Horse Camp, 8000 feet.

Collections: 18064, 20063, 20379. Dates: 26 June 1946; 22 June, 29 July 1947. Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

*Poria ?tenuis* (Schw.) Cke. — On *Cercocarpus ledifolius*. — Material collected from several branches of a large shrub on the north

side of the mountain near Andesite Station is referred here tentatively by J. L. Lowe.

Collection: 19403. Date: 9 April 1947. Abundance: IV, B. Associates: *Purshia tridentata*, *Arctostaphylos patula*. Distribution: Europe, North America; Mt. Shasta.

*Poria vaporaria* (Fr.) Cke. — On *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — Collected once at Squaw Valley Creek and once along the Ski Trail below Horse Camp.

Collections: 10290, 18146. Dates: 8 Sept. 1938, 2 July 1946. Abundance: V, A. Associates: The hosts. Distribution: Ceylon, Tasmania, New Zealand, Europe, Cuba, North America; Mt. Shasta.

*Porodaedalea pini* (Thore ex Fr.) Murr. — The form of this fungus referred to as *Trametes pini* var. *abietis* Karst. has been found several times in fruit inside rotting logs of Shasta fir at and near Horse Camp.

Collections: 8516, 8566, 13284, 13285, 15661, 16795, 18067. Dates: 22 June, 7 July 1937; 28 July 1939; 7 Aug. 1941; 7 Sept. 1942; 26 June 1946. Abundance: IV, A. Associates: The host. Distribution: Temperate regions; Mt. Shasta.

*Spongipellis borealis* (Fr.) Pat. — Found once on *Abies concolor* along the Sisson Southern Trail at 6000 feet.

Collection: 20406. Date: 8 Aug. 1947. Abundance: V, A. Associate: The host. Distribution: Australia, Europe, North America; Mt. Shasta.

*Spongiporus leucospongia* (Cke. & Harkn.) Murr. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Arctostaphylos patula*, *Pinus albicaulis*, *Tsuga mertensiana*. — This fungus occurs most commonly on rotting logs of Shasta fir. In an avalanche flat in the lower part of the Horse Camp Creek area most of the prostrate logs had fruit bodies of this species on them in one or more of the years between 1936 and 1947. The fruit bodies are apparently capable of reviving during periods of light rains which occur about once a month during the summer. Apparently they develop preceding or during the snow pack. On a stick, apparently of white bark pine, used as a mile post along the Summit Trail at about 9000 feet, above the limits of woody growth along this trail; this species fruited in 1939. The collection on green manzanita was made under ponderosa pines in the Sierra Mixed Conifer zone and the host stick was unmistakably of the manzanita.

Collections: on Shasta fir: 8568, 10116, 10126, 10134, 10171, 14633-A, 15537, 15545, 15563, 15573, 15643, 18022, 18436, 20106, 20122, 24041, 24057, 28259, Exs. 30-A. Collected once by Hedgecock on the southwest side of the mountain, apparently along the Sisson Southern Trail; on white fir: 10248, 16633, collected once at Sisson by Hedgecock; on white bark pine: 13355; on mountain hemlock: 15760, 18415, 28312; on green manzanita: 15520. Dates: 3, 6 Oct. 1911; 9 July 1937; 17, 20

June, 1, 28 July 1938; 26 July 1939; 8 July 1940; 27 June, 9, 12, 16, 18, 29 July, 28 Aug. 1941; 30 May 1942; 23 June, 29 Aug., 4 Sept. 1946; 23, 25 June 1947; 3, 4 July 1948; 1, 3 July 1951. Abundance: II, A; V, B. Associates: Coniferous trees of all zones. Distribution: Colorado, Wyoming, Montana, Idaho, Washington, Oregon, California; Mt. Shasta.

*Tyromyces caesius* (Schröd. ex Fr.) Murr. — On *Pinus attenuata*, and on a pine board. — On the south side of the mountain above McCloud along the Mud Creek Dam road, and along the Sisson Southern Trail, at 4000 feet.

Collections: 19294, 19350. Dates: 7, 8 April 1947. Abundance: V, A. Associates: Chaparral and Sierra Mixed Conifer zone conifers. Distribution: Europe, North America; Mt. Shasta.

### Agaricales.

#### *Hygrophoraceae.*

*Hygrophorus gliocyclus* Fr. — Collected once in 1941 on Shasta fir duff and litter near melting snowbanks. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, California; Mt. Shasta.

*Hygrophorus russula* (Fr.) Qué. — Collected on Shasta fir and hemlock litter and duff along the Sisson Southern Trail and around snowbanks above Panther Creek meadows.

Collections: 1941; 26798-A, 28333. Dates: 1941, 1 July 1950, 3 July 1951. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Europe, North America; Mt. Shasta.

*Hygrophorus vernalis* A. H. Smith. — A large colony was found in 1941 on humus among procumbent shrubs of *Phyllodoce empetriformis* under mountain hemlock in the Panther Creek heather meadows at about 8000 feet. In July 1948 it was again observed on hemlock-Shasta fir litter and duff in the same meadow.

Collections: 15636, 24069. Dates: 50 specimens obtained 28 July 1941, abundant 4 July 1948. Abundance: IV, D. Associates: *Phyllodoce empetriformis*, *Tsuga mertensiana*, *Abies magnifica* var. *shastensis*. Distribution: Washington, Oregon; Mt. Shasta.

#### *Tricholomataceae.*

*Armillaria mellea* Fr. — Typical rhizomorphs have been observed in connection with frequent windfalls of Shasta fir and sugar pine. No fruit bodies have been observed on the mountain but Ranger Jack Reveal, formerly of the Sacramento District, Shasta National Forest, sent the writer specimens taken from a garbage pit at the Mott yard of the Shasta National Forest at 3000 feet along the Highway between Mount Shasta and Dunsmuir. October 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Pinus*

*lambertiana*, *Pseudotsuga taxifolia*, *Abies concolor*. Distribution: Europe, Asia, Australia, North America; Mt. Shasta.

*Armillaria zelleri* Smith & Stuntz. — On the ground along the Sisson Southern Trail under Shasta firs at about 7500 feet. Collection: 26998. Date: 28 Sept. 1950. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Washington, Oregon, Mt. Shasta.

*Cantharellula umbonata* (Fr.) Singer. — On the ground under duff of Shasta fir along the Sisson Southern Trail at about 7500 feet.

Collection: 27012. Date: 28 Sept. 1950. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Clitocybe* sp. — Several specimens were obtained in ponderosa pine woods near McCloud, 3500 ft.

Collection: 19365. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa*.

*Clitocybe* sp. — A number of mounds were found in pine woods near McCloud. Upon opening them large clusters of up to 45 white mushrooms were found in them. Also found at Horse Camp and along the Sisson Southern Trail under Shasta firs.

Collections: 19367, 20079, 26997. Dates: 8 April, 22 June 1947; 28 Sept. 1950. Abundance: IV, D. Associates: *Pinus ponderosa*; *Abies magnifica* var. *shastensis*.

*Collybia* sp. — Found on occasional Shasta fir stumps and logs near Horse Camp. Until 1947 it was usually found in dry condition for without irrigation from melting snow it dries up quickly.

*Laccaria* sp. — On the ground in pine woods near McCloud, 3500 feet.

Collection: 19363. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa*.

*Lentinus lepideus* Fr. — On *Pinus ponderosa*. — Specimens have been found on old stumps along the Wagon Camp road between Howard and Wagon Camp.

Collections: 8620, 10278, 13400. Dates: 6 Aug. 1937, 19 Aug. 1938, 22 Aug. 1939. Abundance: IV, A. Associates: *Pinus ponderosa*, *Abies concolor*, *Pseudotsuga taxifolia*, *Libocedrus decurrens*.

On *Pinus albicaulis*. — Specimens have been found on prostrate logs on the ridge above Horse Camp in the White Bark Pine zone, and in the upper Squaw Valley Creek meadows in the upper Shasta Fir zone; the first at about 8500 feet and the second at 8000 feet. Specimens of decaying wood collected near the water supply spring above Horse Camp, 8250 feet, and in the South Gate, 8000 feet, contained mycelium of a rot caused by this fungus. The type of rot

observed throughout the White Bark Pine zone indicates that this species is probably wide spread on the mountain.

Collections: 10249, 13414, 20292, ?20466. Dates: 28 July 1938; 24 Aug. 1939; 10 July, 20 Aug. 1947. Abundance: III, A. Associates: *Pinus albicaulis*, *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Siberia, Europe, North America; Mt. Shasta.

*Lentinus* sp. — Sessile specimens have been found on occasional logs of Shasta fir and mountain hemlock especially in the avalanche flat below Horse Camp and at Panther Creek meadows.

Collections: 14620, 14634, 15521, 15533, 15544, 15550, 15562, 15633, 18025, 18145, 18216, 24043, 24046, 24070, 25632, 28299, 28330, 28331. Dates: 3, 8 July 1940; 27 June, 9, 12, 14, 16, 28 July 1941; 23 June, 2, 10 July 1946; 3, 4 July 1948; 24 Aug. 1949; 2, 4 July 1951. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*.

On *Haplopappus bloomeri* var. *angustatus*. — Found only once on dead branches at Horse Camp, 8000 feet.

Collection: 24042. Date: 3 July 1948. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis*.

*Lycophyllum* sp. — Large colonies of this mushroom follow the snowbanks on Shasta fir duff and litter between 6500 and 8000 feet. The mushroom fruits as the snowbank melts away and as soon as the effects of this irrigation evaporate or percolate the mushroom dries up, disappearing within two weeks of its initiation.

Collections: Collected once in 1941, several times in 1946. Abundance: IV, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: In timberline areas throughout the Cascade Mountains, the Blue, Wasatch and Medicine Bow Mountains.

*Melanoleuca* sp. — On collection, 19359, was made along the Mud Creek Dam road above McCloud. Date: 8 April 1947. Abundance: V, D. Associates: *Pinus ponderosa*, *Abies concolor*, *Libocedrus decurrens*.

*Mycena alcalina* (Fr.) Quél. — Twenty-two specimens were found once on a white fir log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.

Collection: 19377. Date: 9 April 1947. Abundance: V, A. Associates: *Pseudotsuga taxifolia*, *Pinus ponderosa*. Distribution: France, North America; Mt. Shasta.

*Mycena gracilis* (Fr.) Quél. — Three specimens were found on ponderosa pine litter along the Mud Creek Dam road above McCloud.

Collection: 19352. Date: 8 April 1947. Abundance: V, D. Associates: *Abies concolor*, *Libocedrus decurrens*, *Pinus ponderosa*. Distribution: France, Manitoba, New York, Michigan, Idaho, Mt. Shasta.

*Mycena griseiconica* Kauffman. — Collected on rotten wood of *Libocedrus decurrens* and *Pinus ponderosa* along the Mud



Creek Dam road at about 4000 feet above McCloud, and near McCloud at about 3500 feet.

Collections: 19356, 19357, 19366. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus ponderosa*, *Abies concolor*, *Libocedrus decurrens*. Distribution: France, British Columbia, Washington, Oregon; Mt. Shasta.

*Mycena griseoviridis* A. H. Smith. — Found in nearly completely decayed piles of debris from Shasta fir and mountain hemlock logs and stumps just as the snow is melting throughout the Shasta Fir zone. Some specimens had pushed up through the snow, others were as much as five feet from the snow but well irrigated. The specimens disappear as soon as the water supplied by the melting snow is gone. Also found at the foot of the zig-zag on the Sisson Southern Trail at 5000 feet on rotten white fir wood.

Collections: 15571, 15651, 18218, 19378, 28244, 28298, 28340. Dates: 14 specimens on 16 July, 39 specimens on 29 July 1941; 10 July 1946; 9 April 1947; 1, 2, 4 July 1951. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*, *Pseudotsuga taxifolia*, *Pinus ponderosa*. Distribution: Olympic Mts., Mt. Adams, Washington; Blue Mountains, Oregon; Mt. Shasta.

*Mycenia laevigata* (Lasch) Quél. — Five specimens were found on a rotten conifer log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.

Collection: 19379. Date: 9 April 1947. Abundance: V, D. Associates: *Abies concolor*, *Pseudotsuga taxifolia*, *Pinus ponderosa*. Distribution: Europe, North America, Mt. Shasta.

*Mycenia lilacifolia* (Pk.) A. H. Smith. — Eighteen specimens were found on a ponderosa pine stump along the Mud Creek Dam road above McCloud at about 4000 feet. Also found in the Horse Camp area commonly on Shasta fir logs.

Collection: 19353. Date: 8 April 1947. Abundance: IV, A. Associates: *Abies concolor*, *Pseudotsuga taxifolia*, *Libocedrus decurrens*; *Abies magnifica* var. *shastense*. Distribution: Ontario, New York, Michigan, Tennessee, Washington, Oregon, Mt. Shasta.

*Omphalina rustica* (Fr.) Quél. — Thirty-four specimens were found on sandy ground in ponderosa pine woods near McCloud, 3500 feet.

Collection: 19362. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa*. Distribution: Europe, North America; Mt. Shasta.

*Pleurotus petaloides* Bull. ex Fr. — Found once on a log of Shasta fir at Horse Camp.

Collection: 13286. Date: 28 June 1939. Abundance: V, A. Associate: The host. Distribution: Europe, North America, Mt. Shasta.

*Tricholoma rhizoideum* A. H. Smith. — Collected once on Shasta fir duff and litter at about 7000 feet along the Sisson

Southern Trail. A large colony followed the exposure of the substratum by melting snow banks. As the substratum dried out the fruit bodies dried up and eventually disappeared.

Collections: One collection in 1941. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: MacKenzie Pass, Oregon; Mt. Shasta.

#### *Amanitaceae.*

*Amanita* spp. — Specimens of what might have been *Amanita phalloides* Fr. occur occasionally on Shasta fir duff at about 7000 feet along the Sisson Southern Trail. In this area and throughout the Shasta fir forest another *Amanita* occurs occasionally. Identification has not been completed.

*Amanitopsis vaginata* Fr. — Occasional specimens have been observed on Shasta fir duff at about 7000 feet.

Collection: 15685. Date: 8 Aug. 1941. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America; Mt. Shasta.

*Pluteus cervinus* Fr. — Found once in the meadow at Bear Springs, 5000 feet.

Collection: 8576-A. Date: 9 July 1937. Abundance: V, D. Associates: *Libocedrus decurrens*, *Pinus jeffreyi*. Distribution: Africa, Ceylon, North America, Europe, Mt. Shasta.

#### *Agaricaceae.*

*Agaricus arvensis* Fr. — One specimen was found under Shasta firs near shrubs of mountain manzanita on a ridge below Horse Camp at about 8000 feet.

Collection: 15569. Date: 16 July 1941. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis*, *Arctostaphylos nevadensis*. Distribution: Ceylon, Europe, North America; Mt. Shasta.

#### *Coprinaceae*

*Coprinus comatus* Fr. — Three mushrooms were found under some white bark pines on the knob above Horse Camp springs. They were long stemmed, most of the stem reaching into the soil below the duff under the pines, 8250 feet.

Collection: 13314. Date: 8 July 1939. Abundance: V, D. Associate: *Pinus albicaulis*. Distribution: Europe, North America; Mt. Shasta.

*Psathyrella atrifolia* (Pk.) Smith. — Six specimens were found scattered on the ground in the chaparral along the old Sisson Southern Trail, 4000 feet.

Collection: 19326. Date: 7 April 1947. Abundance: V, D. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

*Strophariaceae.*

*Flammula graveolens* Pk. — Collected once on rotten Shasta fir wood at Horse Camp in 1941.  
Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

*Flammula penetrans* Pk. — Collected once in 1939 on Shasta fir wood near Horse Camp.  
Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

*Naematoloma fasciculare* (Fr.) Karst. — A cluster of mushrooms was found on humus at the base of a white fir at Wagon Camp.

Collection: 15699. Date: 8 Aug. 1941. Abundance: V, D. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Asia, Europe, North America; Mt. Shasta.

*Pholiota trachyspora* Clements. — Found once in Shasta fir duff at 7000 feet in 1941.  
Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Western North America; Mt. Shasta.

*Stropharia sienna* Kauffman. — One specimen was found near a pine log along the Mud Creek Dam road above McCloud.  
Collection: 19358. Date: 8 April 1947. Abundance: V, D. Associates: *Abies concolor*, *Pinus ponderosa*, *Libocedrus decurrens*.

*Pholiota involuta*. — On a Shasta fir log near Panther Creek meadows, 7500 feet.  
Collection: 28350. Date: 4 July 1951. Abundance: V, A. Associate: The host.

*Cortinariaceae.*

*Cortinarius* (nr. *C. aurifolius*) sp. — Specimens were collected along the Mud Creek Dam road above McCloud at about 4000 feet.  
Collection: 19355. Date: 8 April 1947. Abundance: V, D. Associates: *Pinus ponderosa*, *Libocedrus decurrens*.

*Cortinarius cotoneus* Fr. — Collected once in 1942 on coniferous duff, near Horse Camp.  
Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, California, Mt. Shasta.

*Cortinarius heterosporus* Bres. — Nearly buried in soil under manzanitas along the old snowline road in the chaparral.  
Collection: 19324. Date: 7 April 1947. Abundance: IV, D. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Europe, North America; Mt. Shasta.

*Cortinarius orichalceus* Fr. — Probably nearly buried in the ground under manzanita but kicked out by some animal; in the chaparral along the old snowline road at about 4000 feet.

Collection: 19323. Date: 7 April 1947. Abundance: V, D. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Europe, North America, Mt. Shasta.

*Naucoria* sp. — Sixteen specimens were found on manzanita bark along the old Sisson Southern Trail between 4000—4500 feet.

Collection: 19322. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus*, *Ceanothus chrysophylla*, *Arctostaphylos patula*.

#### *Crepidotaceae.*

*Crepidotus* sp. — Common on branches of Shasta fir in one grove near Horse Camp, 8000 feet, after an early September rain.

Collection: 18448. Date: 4 Sept. 1946. Abundance: IV, A. Associate: The host. Distribution: Identification not complete.

#### *Rhodophyllaceae.*

*Rhodophyllus* sp. — Eight specimens were found on duff in pine woods near McCloud, 3500 feet.

Collection: 19364. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa*.

#### *Paxillaceae.*

*Paxillus panuoides* Fr. — Found on short lengths of Shasta fir logs used as stools in cabins with dirt floors and in cabin yards at Horse Camp, 8000 feet, just after the snow had melted. Also on a ponderosa pine board along the Mud Creek Dam road at about 4000 feet.

Collections: 15535, 18072, 19332. Dates: 9 July 1941, 27 June 1946, 8 April 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*; *Abies concolor*, *Libocedrus decurrens*. Distribution: Africa, Europe, North America; Mt. Shasta.

#### *Boletaceae.*

*Boletus albidus* ssp. *eupachypus* Konrad. — Collected occasionally throughout the Shasta Fir zone especially in the area between Cascade Gulch and Mud Creek Canyon. This species presents a subhypogaeous habit. It grows under the duff pushing up dry segments of the duff and litter as the fruiting bodies expand. Squirrels like it as, apparently do deer. In 1946 it was collected as low as 6000 feet in the White Fir zone and as high as 8000 feet in the Shasta Fir zone near Horse Camp. No mycorrhizal relationship has been established between this species and the firs near which it grows although such a relation is possible. The largest fruit bodies found were 17 cm. in diameter.

Collections: 10281, 10304, 14661, 15721, 18327, 18337, 18338, 18374, 20165, 20231, 20347, 20355, Exs. 203. Dates: 8, 10 Sept. 1938; 8 Aug. 1940;

18 Aug. 1941; 31 July, 2, 19 Aug. 1946; 27 June, 10, 25 July 1947. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis*, *Abies concolor*, *Tsuga mertensiana*. Distribution: France, Nova Scotia, Michigan, Mt. Rainier, Mt. Shasta.

*Boletus frustosus* Snell & Dick. — Collected in the same habitats as the above species. No animals appear to eat this species as is evident in the case of the above species. It is also, in open woods, subhypogaeous, although it has been found exposed on sandy open banks of Mud Creek Canyon.

Collection: 14716. Date: 22 Aug. 1940. Observed during some summers between 1937 and 1941. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Northern Idaho, Northern Nevada, Sierra Nevada mountains, Mt. Shasta.

*Boletus miniato-olivaceus* Frost. — Collected under white fir along the Wagon Camp Road above Bear Springs.

Collections: 14628, 15687. Dates: 5 July 1940, 8 Aug. 1941. Abundance: V, D. Associate: *Abies concolor*. Distribution: Eastern United States; Mt. Shasta.

*Suillus* sp. — Near rotten wood of Shasta fir near Horse Camp, 8000 feet.

Collection: 18449. Date: 4 Sept. 1946. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*.

### *Russulaceae.*

*Russula delica* Fr. — One specimen was found under Shasta fir duff along the Sisson Southern Trail at 7000 feet.

Collection: 27001. Date: 28 Sept. 1950. Associate: *Abies magnifica* var. *shastensis*. Abundance: V, D.

### **Gastromycetes.**

#### *Hymenogasterales.*

The first three orders and some of the genera in other orders are hypogaeous in fruiting habit. Most of the collections on which these names were based were obtained within a mile of Horse Camp in the Shasta Fir zone. Most of the specimens were associated with Shasta fir wood, either being found buried deep inside of logs, or beside logs and rotting sticks buried in the ground. Some were found in the soil and the collections of these were more accidental than planned since there was little or no evidence before the soil was disturbed that fungi grew there. One or two specimens were found on stones or logs, obviously dug up by rodents and left to dry in the sun. The following numbers of hypogaeous specimens were collected in the indicated years: 1937: 5; 1938: 11; 1939: 26; 1940: 21; 1941: 17; 1942: 4.

*Hydnangiaceae.*

*Archangeliella lactarioides* Zeller. — Collection: 1466. Date: 26 July 1940. Abundance: V, D. Distribution: Known only from Mt. Shasta.

*Archangeliella magna* (Parks) Zeller. — Collection: 13363. Date: 25 July 1939. Abundance: V, D. Distribution: Central and northern California; Mt. Shasta.

*Elasmomyces alpinus* (Zeller) Zeller. — Collection: 15797. Date: 7 Sept. 1942. Abundance: V, D. Distribution: Known only from Mt. Shasta.

*Elasmomyces echinosporus* Zeller & Dodge. — Collections: 14700, 14701. Date: 21 Aug. 1940. Abundance: V, D. Distribution: Western North America; Mt. Shasta.

*Hydnangium parksii* Zeller & Dodge. — Collected once in 1938. Distribution: Washington, Oregon, California, Mt. Shasta.

*Hymenogastraceae.*

*Gymnoglossum elasmomycetoides* Zeller. — Collection: 10216. Date: 18 July 1938. Abundance: V, D. Distribution: Known only from Mt. Shasta.

*Hymenogaster remyi* Zeller & Dodge. — Collection: 13376. Date: 31 July 1939. Abundance: V, D. Distribution: High Alps in Europe; Mt. Shasta.

*Melanogastraceae.*

*Melanogaster tuberiaeformis* Corda. — Collection: 15577. Date: 16 Sept. 1941. Abundance: V, D. Distribution: Europe, Idaho, Washington, Oregon, California; Mt. Shasta.

*Melanogaster variegatus* (Vitt.) Tul. — Collections: 13260, 13301, 13302. Dates: 17 June, 5 July 1939. Abundance: IV, D. Distribution: Europe, Western North America; Mt. Shasta.

*Rhizopogonaceae.*

*Rhizopogon brunnescens* Zeller. — Collections: 13305, 13306. Date: 5 July 1939. Abundance: V, D. Distribution: Known only from Mt. Shasta.

*Rhizopogon exiguus* Zeller. — Collection: 13424. Date: 20 Aug. 1939. Abundance: V, D. Distribution: Washington, California, Mt. Shasta.

*Rhizopogon occidentalis* Zeller & Dodge. — Collection: 13264. Date: 26 June 1939. Abundance: V, D. Distribution: Idaho, Washington, Oregon, California; Mt. Shasta.

*Rhizopogon pannosus* Zeller & Dodge. — Collections: 16595?, 16800. Date: 7 Sept. 1942. Abundance: V, D. Distribution: Pacific coast states, Mt. Shasta.

*Rhizopogon provincialis* Tul. — Collection: 14699. Date: 21 Aug. 1940. Abundance: V, D. Distribution: New Zealand, Western Europe, Pacific Coast states; Mt. Shasta.

*Rhizopogon rubescens* Tul. — Collection: 15678. Date: 7 Aug. 1941. Abundance: V, D. Distribution: Cosmopolitan in temperate Zone; Mt. Shasta.

*Rhizopogona separabilis* Zeller. — Collection: 8455. Date: 3 Sept. 1937. Abundance: V, D. Distribution: Oregon Coast, Mt. Shasta.

### Gautieriales.

#### Gautieriaceae.

*Gautieria monticola* Harkn. — Found in large clusters, as many as 40 together as in a hill of potatoes, along the Sisson Southern Trail.

Collections: 13304, 13364, 20192, 20238, Exs. 275. Dates: 5, 25 July 1939; 28 June, 10 July 1947. Abundance: IV, D. Distribution: Washington, Oregon, California, Mt. Shasta.

### Hysterangiales.

#### Hysterangiaceae.

*Hysterangium darkeri* Zeller. — Collection: 15679. Date: 7 Aug. 1941. Abundance: V, D. Distribution: Wasatch Mts., Utah; Mt. Shasta.

*Hysterangium phillipsii* Harkn. — Collection: 13263. Date: 26 June 1939. Abundance: V, D. Distribution: Oregon, California; Mt. Shasta.

*Hysterangium separabile* Zeller. — Collection: 13374. Date: 31 July 1939. Abundance: V, D. Distribution: Europe, North and South America, Mt. Shasta.

### Lycoperdales.

#### Lycoperdaceae.

*Bovista pila* Berk. & Curt. — Collected on Shasta fir duff in the Horse Camp area, 8000 feet.

Collections: 14609, 14611. Date: 14 Aug. 1940. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Canada, United States; Mt. Shasta.

*Calvatia craniiformis* (Schw.) Fr. — A sterile base assigned to this species was found under pines near timberline on the north side of the mountain.

Collection: 25702. Date: 26 Aug. 1949. Abundance: V, D. Associates: *Pinus ponderosa*, *Pinus albicaulis*. Distribution: North America, Mt. Shasta.

*Calvatia fumosa* Zeller. — On the ground under Shasta firs and mountain hemlock, 7500—8500 feet.

Collections: 15522, 15630, 15778, 16799, 18003, 18110, 18190, 18413, 20003, 20037, 20049, 20050, 20080, 20131, 20228, 20287, 20335, 28291. Dates: 27,

28 July, 16 Sept. 1941; 7 Sept. 1942; 17, 28 June, 10 July, 29 Aug. 1946; 17, 20, 22, 25 June, 10, 18 July 1947; 3 July 1951. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Wyoming, Washington, Oregon, Mt. Shasta.

*Calvatia sculpta* Harkn. — Observed on or near rotting Shasta fir wood and on duff and litter in Shasta fir and white fir forests between Horse Camp and Wagon Camp.

Collections: 10237, 13325, 20298, 20299. Dates: 22 July 1938, 7 July 1939, 18 July 1947. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*, *Abies concolor*. Distribution: Cascade range in Washington and Oregon, mountains of California; Mt. Shasta.

*Calvatia subcretacea* Zeller. — Occasional on litter in Shasta fir woods.

Collections: 8661, 10222, 10238, 10272, 14641, 15650, 15665, 15742, 18011, 18111, 18153, 18270, 18414, 20014, 20051, 20336. Dates: 24 Aug. 1937; 18, 22 July, 12 Aug. 1938; 8 July 1940; 29 July, 7, 18 Aug. 1941; 21, 28 June, 2, 19 July, 29 Aug. 1946; 20 June, 18 July 1947. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis*, *Abies concolor*. Distribution:

#### *Geastraceae.*

*Geastrum coronatum* (Schaeff.) Schroet. — Found on soil in a patch of chaparral in the Sierra Mixed Conifer zone at about 5500 feet.

Collection: 15525. Date: 27 June 1941. Abundance: V, D. Associates: *Pinus ponderosa*, *Arctostaphylos patula*. Distribution: Africa, Europe, Mt. Shasta.

*Geastrum mammosum* Pers. — On sandy soil in the chaparral along the old Sisson Southern Trail at about 4000 feet.

Collection: 19301. Date: 7 April 1941. Abundance: IV, D. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Europe, North America; Mt. Shasta.

#### *Mycenastraceae.*

*Calbovista subsculpta* Morse. — On ground at Bear Springs, Wagon Camp and near Squaw Valley Creek just above McCloud, 4000—5700 feet. Reported by Miss Morse from Mount Shasta. Collections: 18012, 19361, 20325. Dates: 21 June 1946; 8 April, 18 July 1947. Abundance: IV, D. Associates: Plants of the Sierra Mixed Conifer and White Fir zones. Distribution: Western North America.

#### *Mesophelliaceae.*

*Abstoma reticulatum* Cunn. — One collection of this hypogaeous species was made near Horse Camp in Shasta fir duff. Collection: 14642. Date: 8 June 1940. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Australia, California; Mt. Shasta.



## Sclerodermatales.

### *Astraeaceae.*

*Astraeus hygrometricus* (Pers.) Morg. — Sterile stellate exoperidia of a fungus corresponding to the exoperidia of this species have been collected in the Cascade Gulch area between 5000 and 7000 feet, and along the Sisson Southern Trail between 7000 and 7500 feet. Mature fruit bodies have been found along the Old Military Highway on the north side of the mountain.

Collections: 8682, 10119, 13251, 18238, 18359, 19406, 19417, 20248. Dates: 3 Sept. 1937; 17 June 1938; 14 June 1939; 12 July, 10 Aug. 1946; 9 April, 10 July 1947. Abundance: IV, D. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*; *Arctostaphylos patula*, *Purshia tridentata*. Distribution: Cosmopolitan; Mt. Shasta.

*Astraeus pteridis* (Shear) Zeller. — Found along the Sisson Southern Trail at 4000 feet in the chaparral, and at 7000 feet in the Shasta fir zone.

Collections: 19291, 20399. Dates: 7 April, 8 Aug. 1947. Abundance: V, D. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*; *Abies magnifica* var. *shastensis*. Distribution: Washington, Oregon, Mt. Shasta.

### *Sclerodermataceae.*

*Pompholyx occidentale* Zeller. — Collections have been obtained from under Shasta fir duff near Horse Camp in the Shasta Fir zone at 8000 feet, and from the forested alluvial area of Mud Creek Canyon above Mud Creek Dam in the Sierra Mixed Conifer zone at 5500 feet.

Collection: 20354. Date: 25 July 1947. Abundance: V, D. Distribution: 2 July 1942. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*; *Pinus ponderosa*, *Abies concolor*, *Pseudotsuga taxifolia*. Distribution: Known only from these collections.

*Scleroderma bovista* Fr. — In a garden at Mount Shasta, 3550 feet.

Collection: 20354. Date: 25 July 1947. Abundance: V, N. Distribution: Africa, Australia, Europe, North & South America; Mt. Shasta.

*Scleroderma cepa* Fr. — On the ground in a lawn at Mount Shasta, 3550 feet.

Collection: 15766. Date: 28 Aug. 1941. Abundance: V, D. Distribution: Cosmopolitan; Mt. Shasta.

*Scleroderma hypogaeum* Zeller. — In a garden at Mount Shasta.

Collection: 15765. Date: 21 Aug. 1941. Abundance: V, D. Distribution: Western Washington and Oregon, Mt. Shasta.

### *Sedeculaceae.*

*Sedecula pulvinata* Zeller. — One collection was made of several specimens buried in the soil under Shasta fir duff in Cascade Gulch below Horse Camp in the Shasta Fir zone at about 7500 feet; one specimen was found on the floor of Mud Creek Canyon above Mud Creek Dam; one specimen was found near timberline on the north side of the mountain east of Bolam Creek at about 8500 feet. Collections: 10307, 14667, 25699. Dates: 10 Sept. 1938, 28 July 1940, 26 Aug. 1949. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis*; *Abies concolor*, *Pseudotsuga taxifolia*, *Pinus ponderosa*; *Pinus albicaulis*. Distribution: Known only from these collections.

### *Tulostomataceae.*

*Tulostoma tuberculatum* White. — One collection of a half dozen specimens was made in a sandy hill along the Sisson Southern Trail just above the cut-off to the spring, Shasta Fir zone at about 6500 feet.

Collection: 14614. Date: 18 June 1940. Abundance: V, D. Associates: Both species of *Abies*, *Ceanothus velutinus*. Distribution: British Columbia, Colorado, Mt. Shasta.

### **Nidulariales.**

#### *Nidulariaceae.*

*Crucibulum levis* (DC.) Kambly & Lee. — One collection was made at Horse Camp of a number of specimens growing on bits of possibly Shasta fir wood in the turf area at the water system. Also found on wood of *Pinus attenuata* along the Mud Creek Dam road above McCloud.

Collections: 15702, 19337, 19347. Dates: 8 Aug. 1941, 8 April 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*; *Pinus attenuata*, *Libocedrus decurrens*. Distribution: Cosmopolitan, Mt. Shasta.

### **Podaxales.**

#### *Secotiaceae.*

*Cyttarophyllum cucullata* (Seaver & Shope) Singer. — Collected on moist soil along the upper Wagon Camp Creek. The specimens were scattered along a hundred feet of moist bank and looked like opening agaric buds.

Collections: 13254, 13320, 13334, 14647, 15700, 20317. Dates: 16 June, 7, 13 July 1939; 5 July 1940; 8 Aug. 1941; 18 July 1947. Abundance: IV, D. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

*Cyttarophyllum polytrichoides* (Zeller) Singer. — Found during most years in the sod near the "well" of the Horse Camp spring. From there it has apparently migrated, possibly by

being carried in the water, to the small turf formed at the Shasta Alpine Lodge. There, rather than being scattered among the rush and grass plants, it was gregarious, more than 100 specimens having been collected at one time in each of two small patches. Two specimens were obtained once in wet sod along Squaw Valley Creek at 7800 feet. Collections: 8607, 13313, 13361, 14718, 15701, 15752, 18315, 20260, 20265, Exs. 136. Dates: Aug. 1936; 20 July 1937; 5, 20 July 1939; 8 Aug. 1940; 8, 24 Aug. 1941; 30 July 1946. Abundance: III, D. Associates: *Juncus orthophyllus*, *Campanula wilkinsiana*. Distribution: Known only from Mt. Shasta.

*Longula texensis* (B. & C.) Zeller. — On the ground along the Sisson Southern Trail in the White Fir zone at about 6000 feet. Collections: 18271, 20407. Dates: 19 July 1946, 8 Aug. 1947. Abundance: V, D. Associate: *Abies concolor*. Distribution: Texas, New Mexico, California, Oregon; Mt. Shasta.

*Montagnea arenaria* (DC.) Zeller. — Twenty specimens were found in 1940 on a sandy hill along the lane leading from Andesite Station to the Military Pass. The conditions at this point are as near desert-like as can be found on the mountain. This area lies on the north side of the mountain. It was found again in 1941 in the same habitat.

Collections: 14602, 15514. Dates: 4 June 1940, 12 June 1941. Abundance: IV, D. Associates: *Cercocarpus ledifolius*, *Purshia tridentata*. Distribution: Transcaucasia, North Africa, Mexico, Texas, New Mexico, Arizona, Oregon, California; Mt. Shasta.

*Secotium nubigenum* Harkn. ex Zeller. — Frequent on rotten Shasta fir logs and on piles of brown remains of Shasta fir logs and stumps in the Shasta Fir zone. At one point near Horse Camp at 7800 feet where a number of Shasta fir logs have reached a very advanced stage of decay in a very large grove of trees, 30—40 specimens at a time have been obtained from logs from which the snow had just melted. In 1946 in a few square feet 85 specimens were found on duff, litter and logs. Frequently specimens are found on logs and rocks apparently set out to dry by squirrels. Occasionally near snow banks the specimens will penetrate through the snow or will flourish in hollows under the snow from which the snow has already melted.

Collections: 10163, 10174, 10182, 10209, 14605, 14610, 14618, 14646, 15534, 15542, 15552, 15528, 15561, 15572, 15640, 15649 15664, 15759, 18004, 18026, 16798, 18148, 18215, 20066, 20133, 24044, 24067, 28241, 28290, 28315, 28316, 28317, 28341, Exs. 78, 78-A. Dates: 29 June, 1, 6, 15 July 1938; 10, 14 June, 3, 8 July 1940; 3, 9, 12, 14, 16, 18, 26, 29 July, 7, 28 Aug. 1941; 7 Sept. 1942; 19, 23 June, 2, 10 July 1946; 22, 25 June 1947; 3, 4 July

1946; 1, 3, 4 July 1951. Abundance: I, A, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Northern California, Mt. Shasta.

*Secotium pingue* Zeller. — Collected once in a rotten Shasta fir log near Horse Camp.

Collection: 13362. Date: 25 July 1939. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Mt. Baker, Mt. Rainier, Olympic Mts., Washington; Mt. Shasta.

## Fungi Imperfecti.

### Phomales.

#### Phomaceae.

*Aposphaeria mollis* (Lév.) Sacc. — Collected once on overwintered culms of *Juncus parryi* at Horse Camp.

Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: France; Mt. Shasta.

*Ascochyta pisi* Lib. — A heavy infection associated with *Uromyces fabae* was found in 1941 on *Lathyrus lanzswertii* var. *aridus* at MacBride Springs, 5000 ft. Exs. 140.

Abundance: V, C. Associates: *Purshia tridentata*, *Ceanothus velutinus*, *Arctostaphylos patula*.

*Botryosphaerostroma visci* (Sollm.) Petrak. — On *Phoradendron libocedri*. — On fallen branches of the host under incense cedars along the Mud Creek Dam road above McCloud, 4000 feet. Collection: 19351. Date: 8 April 1947. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus ponderosa*, *Abies concolor*.

*Coniothyrium fockelii* Sacc. — Isolated from soils as indicated in the table.

*Cystospora eriogonii* W. B. Cke. — On *Eriogonum pyrolae-folium*. — On dead underground stems in talus slopes between the Summit Trail and South Ridge above Horse Camp at about 9000 feet. Collection: 25631 (type). Date: 12 Aug. 1947. Abundance: V, C. Associates: None in the immediate vicinity. Distribution: Known only from this collection.

*Darlucania filum* (Biv.) Cast. — Associated with the following rusts: *Puccinia rubigo-vera* on *Holcus lanatus* along an irrigation ditch near Mount Shasta, 3500 feet, June 1941. — *Uromyces fabae* on *Lathyrus lanzswertii* var. *aridus* at MacBride Springs, 5000 feet, 1941. — *Puccinia atrofusca* on *Carex whitneyi* along the Shasta Snow-line Highway at about 5500 feet. Abundance: IV, F. Distribution: Europe, Africa, Ceylon, North America; Mt. Shasta.

*Diplodia lupini* Cke. & Harkness. — On *Lupinus obtusilobus*. — On occasional leaves on plants found between 7000—8000 feet on the north side of the mountain.

Collection: 25692. Date: 26 Aug. 1949. Abundance: V, C. Associates:

*Pinus ponderosa*, *Abies magnifica* var. *shastensis*. Distribution: California, Mt. Shasta.

*Diplodia veratri* Earle. — On *Veratrum californicum*. — On rotting stems on swampy ground along Squaw Valley Creek in Shasta fir woods at about 7500 feet.

Collection: 20267. Date: 10 July 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*, *Allium validum*. Distribution: Western North America; Mt. Shasta.

*Diplodina silenae* W. B. Cke. — On *Silene douglasii* var. *douglasii*. — On the north side of the mountain east of Bolam Creek on smutted plants.

Collection: 25660-B. Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Abies concolor*, *Pinus ponderosa*. Distribution: Known only from this collection.

*Dothiorella magnifructa* (Pk.) Petrak & Sydow. — On *Libocedrus decurrens*. — On cones on the ground under trees along the Mud Creek Dam road.

Collection: 19336, Exs. 276. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus attenuata*, *Pinus ponderosa*.

*Hendersonia distans* Brun. — Collected on overwintered leaves of a sedge at Horse Camp. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: France; Mt. Shasta.

*Hendersonia* spp. — Collected on overwintered leaves of *Agrostis thurberiana* and on overwintered stems and sheaths of *Veratrum californicum*.

*Kellermannia alpina* Ell. & Ev. — See *Heteropatella umbilicata*.

*Macrophoma chrysothamni*. W. B. Cke. — On *Chrysothamnus nauseosus* var. *occidentalis*. — Along a lane above Bolam Station at about 5500 feet.

Collection: 25671 A. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Pinus ponderosa*, *Artemisia tridentata*. Distribution: Known only from this collection.

*Macrophoma cylindrospora* (Desm.) Berk. & Vogl. — See *Lophodermium phloxii* Bonar & W. B. Cke.

*Naemosphaera shastensis* Sprague & W. B. Cke. — On *Streptanthus orbiculatus*. — Collected on a number of overwintered stems of this annual host at the lower part of the Horse Camp spring area. Unless the host plant occurred near or in running water this species was not found on it. On the south wall of Cascade Gulch at about 9000 feet in the White Bark Pine zone on open talus slopes most overwintered portions of this herb were found covered with this fungus in 1947.

Collections: 8542, 8578, 8589, 20481, 28303, Exs. 277. Dates: 29 June,

12, 20 July 1937; 28 August 1947; 2 July 1951. Abundance: IV, C. Associates: *Mimulus tilingii*, *Luzula subcongesta*; *Eriogonum marifolium*, *Polygonum shastense*, *Pinus albicaulis*. Distribution: Known only from these collections.

*Phoma caricis* (Fr.) Sacc. — On *Carex brewerii*. — On dead leaves around base of widely scattered clumps on ridge north of Horse Camp at about 10,000 feet.

Collection: 18248. Date: 16 July 1946. Abundance: V, C. Distribution:

*Phoma eriogoni* W. B. Cke. — On *Eriogonum marifolium*. — On occasional plants in South Gate, 8000 feet.

Collection: 25630 (type). Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Eriogonum pyrolaefolium*, *Polygonum shastense*. Distribution: Known only from this collection.

*Phoma harknessii* Sacc. — Collected once on dead pieces of wood of *Pinus albicaulis*. Abundance: V, C. Associate: The host. Distribution: California; Mt. Shasta.

*Phoma herbarum* Westd. — This species occurred on overwintering remains of *Castilleja arachnoidea* var. *shastense* collected at Horse Camp in 1937 and 1946. In 1946 it was also found on *Carex breweri* at 9000 feet in Cascade Gulch and at 9500 feet on ridges north of Horse Camp, as well as on *Juncus parryi* at Horse Camp at 8000 feet.

Collections: 18090, 18198. Dates: 1937; 27 June, 10 July 1946. Abundance: III, C. Associates: Plants of the timberline area. Distribution: On at least 16 monocot and dicot species in Siberia, Europe, America, Mt. Shasta.

*Phoma herbicola* Wehmeyer. — On *Carex breweri*. — On dead leaves around plants on a ridge north of Horse Camp. Collection: 18378. Date: 26 Aug. 1946. Abundance: V, C. Distribution: Wyoming, Mt. Shasta.

*Phoma* spp. — On *Castilleja arachnoidea* var. *shastense*, *Arnica viscosa*, *Lupinus albicaulis* var. *shastensis*. — In the Horse Camp area at timberline, 8000 feet, and in Shasta fir forest along the Horse Camp-Wagon Camp trail, 7500 feet.

Collections: 18007, 18197, 20219. Dates: 21 June, 10 July 1946; 2 July 1947. Abundance: V, C. Associates: *Eriogonum marifolium*, *Polygonum shastense*; *Abies magnifica* var. *shastense*.

*Phoma* sp. — On Shasta fir bark on a tree along the Sisson Southern Trail at 7500 feet.

Collection: 18355. Date: 10 Aug. 1946. Abundance: V, A.

*Phyllosticta amicta* Ell. & Ev. — On *Arctostaphylos nevadensis* Gray. — Forming spots on parts or all of 182 out of 500 of the small sclerophyllous leaves on a branch of this shrub along the Sisson Southern Trail about a half mile below Horse Camp; and on a ridge between Horse Camp and Wagon Camp.

Collections: 8595, 16804, Exs. 51. Dates: 28 July 1937, 8 Sept. 1942. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least three species of *Arctostaphylos* in Oregon and California; Mt. Shasta.

*Phyllosticta caricis* (Fckl.) Sacc. — Forming minor spots on leaves of *Carex bolanderi* in a colony near Horse Camp. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*, *Pinus albicaulis*. Distribution: On at least four carices in Europe, Wisconsin, New York, Mt. Shasta.

*Phyllosticta crustosa* Bonar & W. B. Cke. — On *Kelloggia galioides*. — Seen every year along the Sisson Southern Trail, 4000—6000 feet. Mature material was not collected until 1947. Collection: 20471 (type). Date: 22 Aug. 1947. Abundance: IV, C. Associates: Trees of the White Fir and Sierra Mixed Conifer zones. Distribution: Plumas Co., California, and Mt. Shasta.

*Phyllosticta ferox* Ell. & Ev. — On *Lupinus albicaulis* var. *shastensis*. — Covering all leaves of entire plants or only a few leaves of individual plants in a colony of the host along the Sisson Southern Trail near the upper end of the Horse Camp-Wagon Camp Trail. Also in a Shasta fir forest between Horse Camp and Panther Creek meadows.

Collections: 13405, 20443, Exs. 52. Dates: 22 Aug. 1939, 15 Aug. 1946. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On more than 4 species of *Lupinus* in western North America; Mt. Shasta.

*Phyllosticta fritillariae* Bonar & W. B. Cke. — On *Fritillaria atropurpurea*. Blackening and killing three plants of the host at Wagon Camp. Collection: 15583 (type). Date: 18 July 1941. Abundance: V, C. Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribution: Eastern Washington, Mt. Shasta.

*Phyllosticta melanoplaca* Thuem. — On *Veratrum californicum*. — With *Cylindrosporium* on leaves of a large host colony at Wagon Camp. Collection: 20320. Date: 18 July 1947. Abundance: IV, C. Associates: Both species of *Abies*, *Libocedrus decurrens*. Distribution: Siberia, Europe, Mt. Shasta.

*Phyllosticta monardellae* W. B. Cke. — On *Monardella odoratissima*. — Not forming spots but blackening the entire leaf on most of the leaves of plants above Wagon Camp in Shasta fir woods.

Collections: 13404, Exs. 70. Dates: 22 Aug. 1939. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this collection.

*Phyllosticta nigrescens* Bonar & W. B. Cke. — On *Viola purpurea*. — Not forming spots but blackening entire leaves or parts of leaves on portions of, or on entire plants, in Shasta fir woods above Wagon Camp along the Horse Camp-Wagon Camp Trail. Collections: 13403 (type), 20327, Exs. 281. Dates: 22 Aug. 1939, 11 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*. Distribution: Grouse Mt., Humbolt Co., California; Mt. Shasta.

*Placosphaeria shastensis* Sprague & W. B. Cke. — On *Monardella odoratissima*. — On overwintered stems and peduncles at Horse Camp.

Collection: 8509 (Type), Exs. 31. Date: 24 June 1937. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this collection.

*Rhynchostoma exasperans* Karst. — On overwintered herbage of *Lupinus obtusilobus* at Horse Camp.

Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Finland, Mt. Shasta.

*Selenophoma linicola* T. C. Vanterpool. — On *Iliamna bakeri*. — On exfoliating epidermis of woody stems in the chaparral along the Shasta Snowline Highway about 4500 feet.

Collection: 18233. Date: 12 July 1947. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Saskatchewan, Mt. Shasta.

*Selenophoma donacis* Sprague & A. G. Johnson. — This species occurs occasionally on a few or most of the leaves on clumps of *Elymus glaucus*, *Elymus hansenii* and *Elymus elymoides*. It has been found between 5000 and 9000 feet on the mountain. It is commonest on *Elymus elymoides* and is found frequently at Horse Camp (8000 feet) on most of the clumps of this species in most years.

Collections: 18256, 18257 (and other years). Dates: 16 July 1946 and most years. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis*, *Abies concolor*, *Pinus ponderosa*, *Pinus albicaulis*, *Libocedrus decurrens*. Distribution: Western North America; Mt. Shasta.

*Septoria aromatica* Kabát & Bubák. — On *Ligusticum grayi*. — Collected in Squaw Valley Creek meadows along the creek at about 8000 feet, and on the lower part of Panther Creek at 6500 feet. Collections: 20441. Date: 1941; 15 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*, *Phyllodoce empetriformis*. Distribution: Bohemia; Mt. Shasta.

*Septoria astragali* Rob. & Desm. — On *Lathyrus lanzwertii* var. *aridus*. — Found in the Wagon Camp meadows, 5700 feet. Collection: 20433. Date: 15 Aug. 1947. Abundance: V, C. Associates: Both species of *Abies*, *Libocedrus decurrens*. Distribution: Europe, Mt. Shasta.



*Septoria curvispora* Ell. & Ev. — On *Acer glabrum*. — Collected on leaves of this host by W. C. Blasdale, Aug. 1894, and distributed in Ellis and Everhart: Fungi Columbiani No. 773. Also issued as No. 3270 in North American Fungi where it was cited as a variety of *S. circinata* Ell. & Ev.

*Septoria lunelliana* Sacc. — On *Carex fracta*. — On previous years leaves on large clumps at MacBride Springs, 5000 feet. Collection: 20226, Exs. 278. Date: 3 July 1947. Abundance: IV, C. Associates: *Pinus ponderosa*, *Libocedrus decurrens*. Distribution: North Dakota; Mt. Shasta.

*Septoria marginata* Heald & Wolf. — On *Acer glabrum*. — Occasional in one year on a tangle of host trees along Squaw Valley Creek at about 5500 feet in the Sierra Mixed Conifer zone. This species is considered synonymous with *S. aceris* (Lib.) Berk. & Br. by Gilmen and Archer.

Collection: 14678, Exs. 75. Date: 8 Aug. 1940. Abundance: IV, B. Associates: *Pinus ponderosa*, *Pinus lambertiana*, *Abies concolor*, *Pseudotsuga taxifolia*. Distribution: Western North America; Mt. Shasta.

*Septoria minuta* Schroet. — On *Luzula subcongesta*. — Found once on several clumps in Panther Creek Meadows. Collection: 25638. Date: 25 Aug. 1949. Abundance: V, C. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*, *Allium validum*. Distribution: Greenland, Oregon, Mt. Shasta.

*Septoria nodorum* (Berk.) Berk. — On *Melica californica*. — The *Ascochyta* stage of this species was common on this grass around Wagon Camp meadows.

Collection: 20432, Exs. 279. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Stipa occidentalis*, *Elymus hansenii*, both species of *Abies*. Distribution: Cosmopolitan with the hosts; Mt. Shasta.

*Septoria oudemansii* Sacc. — (*Ascochyta oudemansii* (Sacc.) Sprague & A. G. Johnson). — On *Poa pratensis*. — Found on several leaves of a clump at Horse Camp. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Western North America; Mt. Shasta.

*Septoria pruni* Ell. — On *Prunus demisa*. — Common on a colony of these shrubs in the chaparral along the Shasta Snowline Highway.

Collection: 15603, Exs. 137. Date: 25 July 1941. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: North America, Mt. Shasta.

*Septoria shastensis* Bonar & W. B. Cke. — On *Aster shastensis*. — A colony of this host along the Snowline Highway in the chaparral was completely covered by this species — leaves, petioles, stems, were completely infected.

Collection: 15601 (type), Exs. 153. Date: 25 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: Known only from this collection.

*Septoria variegata* Ell. & Ev. — On *Rhamnus purshiana*. — Collected by W. C. Blasdale, Aug. 1894, at Shasta Springs, and distributed in Ellis and Everhart, North American Fungi No. 3275, and Fungi Columbiani No. 778.

*Septoriella* sp. — One collection of overwintered remains of *Lupinus obtusilobus* had on it a few fruit bodies of a fungus referred to this genus.

*Stagonospora simplicior* Sacc. & Berl. — On *Stipa columbiana* var. *nelsonii*. — Reported by Sprague in *Mycologia* 42: 762—3. 1950.

*Stagonospora* sp. — Found once on chips of Shasta fir in the Horse Camp woodpile.

*Sphaeropsis arctostaphyllii* (Vize) Sacc. — On *Arctostaphylos nevadensis*. — On shrubs on a ridge between Horse Camp and Panther Creek meadows in the Shasta Fir zone.

Collection: 16804. Date: 8 Sept. 1942. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: California; Mt. Shasta.

*Sphaeropsis microscopicum* Tassi. — Collected once at Horse Camp in 1937 on overwintered remains of *Castilleja arachnoidea* var. *shastensis*.

#### Excipulaceae.

*Heteropatella conglutinata* (Ell. & Ev.) Nannf. — On *Gilia aggregata* (Pursh) Spreng. — Collected on dead stems on Mt. Shasta, 15 Aug. 1903, by E. B. Copeland. Determined by Ellis and distributed by Ellis and Everhart in North American Fungi No. 3735.

*Heteropatella umbilicata* (Pers.) Jaap. — On *Agoseris gracilens*, *Aster shastensis*, *Castilleja arachnoidea* var. *shastensis*, *Castilleja miniata*, *Juncus* sp., *Ligusticum grayi*, *Monardella odoratissima*, *Pentstemon gracilentus*. — Sometimes alone and sometimes in association with various species of *Leptosphaeria* and *Pleospora*, among others, this species occurs on overwintered herbage as described under *Leptosphaeria*. While the *Kellermannia alpina* stage is common, the ascigerous stage (*Heterosphaeria*) has not yet been obtained.

Collections: Found in at least five collections made between 1937 and 1940; 18094, 18197, 20284, 20442, 20444, Exs. 28-A. Dates: 1937—1940; 27 June, 10 July 1946; 10 July, 18 Aug. 1947. Abundance: II, C. Associates: Herbaceous plants of the timberline and upper Shasta Fir zone regions. Distribution: On at least 22 species of dicots, panarctic, Afghanistan, Colorado, Wyoming, California; Mt. Shasta.

*Sirexipula wyomingensis* Wehm. — On *Arabis platysperma*, *Saxifraga tolmiei*. — On the former host in open places, on colonies of the latter in niches of lava rocks on the west side of Shastina between 9000 and 9500 feet in the upper White Bark Pine zone.

Collections: 20478, 25584. Dates: 28 Aug. 1947, 24 Aug. 1949. Abundance: V, C. Associate: *Pinus albicaulis*. Distribution: Wyoming, Mt. Shasta.

#### *Leptostromataceae.*

*Leptostromella hysterioides* f. *graminicolum* (de Not.) Sacc. — On *Elymus elymoides*. — On dead leaves around a clump along the ridges north of Horse Camp at about 9500 feet.

Collection: 18256. Date: 16 July 1946. Abundance: V, C. Distribution: Italy, Mt. Shasta.

*Thyrenula* sp. — On fallen needles of *Pinus attenuata* at McCloud Summit on the south flank of Mt. Shasta at 4000 feet along State Route 89.

Collection: 18294. Date: 25 July 1946. Abundance: IV, A. Associates: *Pinus attenuata*, *Arctostaphylos patula*, *Ceanothus velutinus*.

#### *Nectrioidaceae.*

*Nectriella* sp. — On *Castilleja arachnoidea* var. *shastensis*. — Collected once at Horse Camp on overwintered herbage.

Collection: 18313. Date: 30 July 1946. Abundance: V, C. Associates: *Polygonum shastense*, *Eriogonum marifolium*.

*Ollula pezizoidea* Lév. — Collected once at Horse Camp on two dead twigs of Shasta fir.

Collection: 15726. Date: 18 Aug. 1941. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Spain, Mt. Shasta.

#### **Melanconiales.**

##### *Melanconiaceae.*

*Cryptostictis arbuti* (Bonar) Zeller. — Occasional on *Arctostaphylos patula* in the chaparral and infrequent on *Arctostaphylos nevadensis* in the Shasta Fir zone.

Collections: 8567, 8526, 8592. Dates: 26 June, 9, 23 July 1937; seen every year since and collected once in 1941. Abundance: IV, B. Associates: Chaparral shrubs and *Abies magnifica* var. *shastensis*. Distribution: Oregon, California; Mt. Shasta.

*Cylindrosporium rhamni* Ell. & Ev. — The type was collected on leaves of *Rhamnus* sp. at Shasta Springs by W. C. Blasdale, No. 283, possibly in Aug. 1894.

*Cylindrosporium smilacinae* Ell. & Ev. — On *Smilacina stellata*. — Found only once at Wagon Camp and then blackening leaves on a large colony.

Collection: 20315. Date: 18 July 1947. Abundance: IV, C. Associates:

*Libocedrus decurrens*, *Veratrum californicum*. Distribution: Idaho, Mt. Shasta.

*Cylindrosporium veratrinum* Sacc. & Wint. — On *Veratrum californicum*. — Collected only once at Wagon Camp at a time when it caused a heavy infection blackening many leaves in a large colony. It may have been passed up in other years when heavy insect infestations occurred on these plants; also on leaves of plants in the lower part of Panther Creek Meadows.

Collections: 20320, 25639. Dates: 18 July 1947, 25 Aug. 1949. Abundance: IV, C. Associates: *Libocedrus decurrens*, *Smilacina stellata*, *Abies magnifica* var. *shastensis*, *Allium validum*. Distribution: Switzerland, Mt. Shasta.

*Gloeosporium pteridis* Harkn. — On *Pteridium aquilinum* var. *pubescens*. — Found on a number of fronds in the Wagon Camp area at 5700 feet, as well as in the chaparral near Howard at 4200 feet and in the chaparral above McCloud on the south side of the mountain at 4000 feet. The perfect state was found once at Wagon Camp (see *Cryptomycina pteridis*).

Collections: 10258, 13347, 18278, 20430, Exs. 29. Dates: 29 July 1938; 21 July 1939, 27 July 1946; 15 Aug. 1947. Abundance: III, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*. Distribution: North America, Mt. Shasta.

*Marssonina potentillae* (Desm.) Magn. — On *Potentilla glandulosa* ssp. *nevadensis*. — Where the host occurs along streams this species is found occasionally on it. It was collected once at a small spring above Wagon Camp and has been found occasionally at MacBride Springs.

Collections: 14625, 15607, 20225, Exs. 124. Dates: 5 July 1940, 25 July 1941, 3 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis*; *Libocedrus decurrens*, *Pinus ponderosa*. Distribution: Western North America, Mt. Shasta.

*Pestalotia* sp. — On *Phacelia leucophylla* Torr. — On dead stems of overwintered herbage in chaparral near MacBride Springs. Collection: 18275. Date: 12 July 1946. Abundance: V, C. Associates: *Arctostaphylos patula*, *Ceanothus velutinus*.

## Monillales.

### Moniliaceae.

*Acremonium ?verticellatum* Lk. — Found as a pink mold on hand hewn boards of Shasta fir and on ponderosa pine boards at Horse Camp, 8000 feet.

Collection: 18036. Date: 24 June 1946. Abundance: V, A. Distribution: Widespread in soils; Mt. Shasta.

*Botrytis cinerea* Pers. ex Fr. — On *Veratrum californicum* Durand. — Appearing as gray masses on dead stems at Panther Creek Meadows.

Collection: 28327. Date: 2 July 1951. Abundance: IV, C. Associates: Both species of *Abies*, *Libocedrus decurrens*. Distribution: Cosmopolitan, Mt. Shasta.

*Cephalosporium* sp. — Isolated from soil samples.

*Chromosporium* sp. — Pink pustules were found on dead leaves of *Cryptogramma acrostichoides*. Collected once, observed several times.

Collection: 18322. Date: 30 July 1946. Abundance: IV, C. Associate: *Athyrium americanum*.

*Diplocladium majus* Bon. — On *Armillaria zelleri*. — Several specimens in the colony of the host reported above were infected with this mold.

Collection: 26998. Date: 28 Sept. 1950. Abundance: V, F. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

*Oidium mangisporum* Linder. — Collected once on rotten Shasta fir wood at Horse Camp. — Abundance: V, A. Associate: The host. Distribution: Known only from this collection.

*Ovularia lotophaga* Ell. & Ev. — On *Lotus torreyi*. — The type of this species was collected at Sisson, July 1894, by W. C. Blasdale, No. 288.

*Ramularia delphinii* Jaap. — On *Delphinium pauciflorum*. — Collected once on several plants in the dry woodland below Wagon Camp. Not observed since the first collection was made.

Collection: 8574. Date: 9 July 1937. Abundance: V, C. Associates: Both species of *Abies*. Distribution: Switzerland; Mt. Shasta.

*Ramularia mimuli* Ell. & Ev. — On *Mimulus tilingii*. — A large collection was made of plants rather completely covered with this pathogen in a spring above Horse Camp. Also found in Panther Creek meadows. Infected colonies are different from the healthy colonies in size and color. On some leaves pycnidial initials may be indicated by hyphal knots present.

Collections: 16692, 18426, 20448, Exs. 221. Dates: 8 Sept. 1942; 29 Aug. 1946; 15 Aug. 1947. Abundance: IV, C. Associates: *Juncus mertensianus*; *Mitella pentandra*, *Abies magnifica* var. *shastensis*. Distribution: Western United States, Mt. Shasta.

*Ramularia obducens* Thüm. — On *Pedicularis densiflora*. — Collected along a roadside in Mount Shasta. This is the type locality and it is possible that the type collection was made from plants near the one producing this collection. More than 20 leaves were infected.

Collections: Blasdale; 15502, Exs. 148. Dates: 28 July 1894, 7 June 1941. Abundance: V, C. Associates: *Libocedrus decurrens*, *Pinus ponderosa*. Distribution: Germany, Latvia, Mt. Shasta.

*Ramularia nivosa* (Ell. & Ev.) W. B. Cke. & C. G. Shaw. — On *Pentstemon shastensis*. — Found on most of the leaves of several host plants at Wagon Camp.

Collection: 20307 (type of *Ramularia pentstemonis* W. B. Cke.). Date: 18 July 1947. Abundance: IV, C. Associates: Both species of *Abies*, *Libocedrus decurrens*. Distribution: Eastern Washington, Mt. Shasta.

*Ramularia claytoniae* W. B. Cke. — On *Claytonia siberica*. — Found once on a few plants near the Big Springs in the McCloud River southeast of McCloud, about 3500 feet.

Collection: 18279. Date: 25 July 1946. Abundance: V, C. Associate: *Pinus ponderosa*. Distribution: Known only from this collection.

*Ramularia senecionis* var. *carniolica* Jaap. — On *Senecio aronicoides*. — Although this species occurs at most of the localities on the mountain in which the host occurs it is most common at the bottom of the zig-zag on the Sisson Southern Trail. It has also been found in the small meadow between Gray Butte and Red Butte, at Wagon Camp, along the Wagon Camp Road, etc. Infected leaves dry up and disappear before the pycnidium-like knots of hyphae in the lesions have matured.

Collections: 8573, 8584, 10124-A, 10193, 18105, 20305, Exs. 32. Dates: 9, 16 July 1937; 17, 24 June, 8 July 1938; 28 June 1946; 18 July 1947. Abundance: III, C. Associates: Coniferous trees of all zones below the White Bark Pine zone. Distribution: Tyrol, Mt. Shasta.

*Ramularia tulasnei* Sacc. — On *Fragaria californica*. — Occasional at Wagon Camp, 5700 feet.

Collection: 20321, Exs. 282. Date: 8 July 1947. Abundance: IV, C. Associates: Both species of *Abies*, *Libocedrus decurrens*, *Ceanothus velutinus*. Distribution: Europe, North America; Mt. Shasta.

*Sepedonium chrysospermum* (Bull.) Fr. — Collected once on rotten Shasta fir wood at Horse Camp. Abundance: V, A. Associate: The host. Distribution: Siberia, Europe, North America; Mt. Shasta.

*Sporotrichum* sp. — Isolated from soil samples.

*Titaea* sp. — Collected once on overwintered herbage of *Arnica viscosa* above Horse Camp.

*Trichoderma viride* Lk. ex Fr. — On *Abies magnifica* var. *shastensis*, *Arctostaphylos patula*, *Quercus chrysolepis*. — On dead wood of these hosts and isolated from soil Shasta fir woods and the summit of Shastina.

Collections: 18371, 18372, 19310, 19419. Dates: 18 Aug. 1946; 7, 9 April

1947. Abundance: IV, A, B, D. Associates: Plants of Shasta fir and chaparral associations. Distribution: Cosmopolitan, Mt. Shasta.

*Trichothecium roseum* Lk. — Pink specimens turning yellow on drying and purple in KOH were collected on *Pinus albicaulis* wood, on Shasta fir bark, spread over soil and stones near bark, near Horse Camp, 8000 feet.

Collection: 18040. Date: 24 June 1946. Abundance: IV, A, D. Distribution: Asia, Hawaii, Europe, North America; Mt. Shasta.

*Verticillium terrestre* (Lk.) Lindau. — Isolated from soil samples.

#### *Dematiaceae.*

*Brachysporium oosporum* (Cke.) Sacc. — On *Sambucus racemosa* L. — Forming a black mat on dead canes, south side of Red Butte.

Collection: 25628. Date: 24 Aug. 1949. Abundance: V, B. Distribution: Europe, North America, Mt. Shasta.

*Cercospora clavata* Ger. — On *Asclepias cornuta*. — On leaves at Sisson, July 1894. Collected by W. C. Blasdale, distributed by Ellis and Everhart in North American Fungi No. 823, and Fungi Columbiani No. 792.

*Chloridium* sp. — Obtained from rotting wood of Shasta fir near Horse Camp.

Collections: 10077, 18077. Date: 27 June 1946. Abundance: V, A.

*Cladosporium herbarum* Pers. ex Fr. — Collected commonly on the overwintered herbage of most of the plants growing in the vicinity of Horse Camp. Also on *Melica californica* at Wagon Camp, on *Carex fracta* at MacBride Springs, and on *Elymus elymoides* on the north side of the mountain. On a slice of bread left at the 3-Mile post on the Summit Trail at about 13,000 feet. On rind of orange discarded near the 3-mile post along the Summit Trail at 13,000 feet. At this elevation whatever life exists must probably endure daily alternate freezing and thawing throughout the year. On pieces of cloth at Horse Camp and on a piece of cloth at the summit of the mountain. Material at Horse Camp grew on mildewed cloth kept in storage in a wet place for several years, 8000 feet. The piece of cloth at the summit, 14,161 feet was exposed to daily freezing and thawing throughout the year for about 8 years.

Collections: A number of collections and soil isolations in all years collections were made. Also 18,000-A, 18343, 18344, 18346. Dates: All years, 15 June, 6 Aug. 1946. Abundance: II, A, C, D. Associates: All materials over the mountain. Distribution: Cosmopolitan; Mt. Shasta.

*Curvularia inaequalis* (Shear) Boedijn. — Isolated from soil samples.

*Dendryphium* sp. — Collected once on overwintered herbage of *Poa pratensis* at Bear Springs.

*Dendryphium pini* v. Hoehn. — On bark of Shasta fir at Horse Camp.

Collections: 18078, 18079. Date: 27 June 1946. Abundance: V, A. Associate: The host. Distribution: Europe, Mt. Shasta.

*Epochnium isthormorphum* Sacc. — On *Chrysothamnus nauseosus* var. *occidentalis*. — Several branches of one shrub on the lava flow terminating at MacBride Springs were completely blackened, and apparently killed, by this species.

Collection: 13422. Date: 25 Aug. 1939. Abundance: V, B. Associates: *Purshia tridentata*, *Libocedrus decurrens*, *Pinus ponderosa*. Distribution: Washington, California; Mt. Shasta.

*Helminthosporium vagans* Drechsler. — On *Poa pratensis*. — Collected once on a number of leaves of clumps of the host near seepage from the fountain, around the Lodge, and in turf at the water system at Horse Camp, 8000 feet.

Collection: 8594, Exs. 30. Date: 28 July 1937. Abundance: V, C. Associate: *Juncus balticus* var. *montanus*, *Elymus elymoides*. Distribution: North America, Mt. Shasta.

*Heterosporium allii* Ell. & Martin. — On *Tritelia ixiioides* var. *analina*. — Several leaves on a host colony below Wagon Camp were infected.

Collection: 15591. Date: 11 July 1941. Abundance: V, C. Associates: Both species of *Abies*, *Libocedrus decurrens*.

On *Allium validum*. — On overwintered herbage in Panther Creek Meadows.

Collection: 25621. Date: 24 Aug. 1949. Abundance: V, C. Associates: *Phyllodoce empetriformis*, *Kalmia polifolia*. Distribution: North America; Mt. Shasta.

*Heterosporium asperatum* Masee. — On *Smilacina stellata*. — Occuring with *Cylindrosporium smilacinae* on infected leaves of a large host colony at Wagon Camp.

Collection: 20315. Date: 18 July 1947. Associate: *Veratrum californicum*, *Libocedrus decurrens*. Abundance: V, C. Distribution: North America; Mt. Shasta.

*Macrosporium puccinioides* Ell. & Anderss. — On *Lathyrus lanzwertii* var. *aridus*. — Associated with *Uromyces fabae* on at least some leaves of a large diseased colony at MacBride Springs, 5000 feet.

Collection: 15611, Exs. 140. Date: 25 July 1941. Abundance: IV, C. Associates: *Purshia tridentata*, *Ceanothus velutinus*, *Arctostaphylos patula*. Distribution: Montana, Mt. Shasta.

*Peyronelia sirodesmoides* Cif. & Cav. — On *Holodiscus discolor* var. *glabrescens*. — On a dead branch lying on the ground on ridge above Horse Camp at about 9000 feet.



Collection: 18253. Date: 16 July 1946. Abundance: V, B. Associate: *Pinus albicaulis*. Distribution: Haiti, Mt. Shasta.

*Polythrincium trifolii* Kze. — See *Dothidella trifolii* (Pers. ex Fr.) Bayl.-Ell. & Stan.

*Scolecotrichum graminis* (Pers.) Fckl. — Occasional collections of grasses from most parts of the southwest slopes of the mountain between 4500 and 5500 feet included this species. The infected grasses include: *Bromus marginatus*, *Elymus glaucus*, *Glyceria elata*, *Melica aristata*, *Elymus hansenii* and *Stipa occidentalis*; on *Elymus elymoides* at about 8000 feet on the north side of the mountain. Abundance: III, C. Distribution: On many grasses in Europe, North America; Mt. Shasta.

*Stemphyllium consortiale* (Thuem.) Groves & Skolko. — Obtained in cultures made from specimens of cloth on which *Cladosporium* was the only observed fruiting fungus. The isolations were made at the Biological Laboratories, Philadelphia Quartermaster Depot, by the late W. Lawrence White and his staff.

*Stemphyllium* sp. — Following the winter on in-tact fruit heads of *Monardella odoratissima* material assigned here formed a partial black mat. It was found only once at Horse Camp although it was looked for after each snow pack melted.

*Torula ?crustacea?* Schw. — Forming a black covering on the stems of a number of branches of *Salix scouleriana* near the Sisson Southern Trail spring.

Collection: 10158, Exs. 76. Date: 24 June 1938. Abundance: V, B. Associates: *Acer glabrum*, *Abies magnifica* var. *shastensis*. Distribution: North America; Mt. Shasta.

#### *Stilbaceae.*

*Arthrobotryum spongiosum* Hoerl. — Sterile material probably assignable to this species was found on young trees of *Libocedrus decurrens* at MacBride Springs.

Collection: 18268. Date: 19 July 1946. Abundance: IV, A. Associate: *Pinus ponderosa*. Distribution: California; Mt. Shasta.

*Stilbum tomentosum* var. *ovalisporum* A. L. Smith. — Collected several times on rotten Shasta fir wood in the vicinity of Horse Camp; and on mountain hemlock along Squaw Valley Creek.

Collections: 20205, 20270, 20276. Dates: Found in one year before 1941; 1, 10, 29 July 1947. Abundance: IV, A. Associates: The hosts. Distribution: Ceylon, Europe, Cuba, North America, Mt. Shasta.

#### *Tuberculariaceae.*

*Arthrimum cuspidatum* (Cke. & Harkn.) v. Hoehn. — Forming black spots on dead culms of *Juncus balticus* var. *montanus* and on dead leaves of *Carex* sp. at Horse Camp, 8000 feet.

Collection: 18032. Date: 24 June 1946. Abundance: IV, C. Distribution: Denmark, England, Western North America, Mt. Shasta.

*Exosporium pedunculatum* (Ell. & Ev.) W. B. Cke. — On *Sambucus glaucus*. — Pustules were produced from lenticels and cracks in bark on several branches on a shrub at MacBride Springs, 5000 feet.

Collection: 18295, Exs. 208. Date: 25 July 1948. Abundance: IV, B. Associates: *Arctostaphylos patula*, *Salix scouleriana*. Distribution: British Columbia, Washington, California, Mt. Shasta.

*Cylindrocolla* sp. — Collected on Shasta fir wood and boards at Horse Camp. This grows in the form of gelatinous orange hemispheres on the substratum. It was associated with *Guepiniopsis alpina* and may prove to be its imperfect or oidial stage.

*Sphaeridium luteum* v. Hoehn. — Collected once on rotten Shasta fir wood near Horse Camp.

Abundance: V, A. Associate: The host. Distribution: Austria, Mt. Shasta.

#### *Sporobolomycetaceae.*

*Sporobolomyces roseus* Kluyver & Van Neil. — Isolated as a result of attempting to culture spores of *Entyloma compositarum* on *Hieracium cynoglossoides* var. *nudicaule* by George Nyland in the spring of 1948.

Collection: 20230. Date: 10 July 1947. Distribution: Europe, North America, Mt. Shasta.

#### *Mycelia Sterilia.*

*Rhizomorpha subcorticalis*. — *Rhizomorpha subterranea*. — Found occasionally in association with roots and bark of newly fallen trees and on wood of trees blown over or fallen several years before being observed. In all zones below the White Bark Pine zone. See *Armillaria mellea*.

In addition several types of sterile mycelia and sclerotia have been found. White sterile mycelium was found parasitizing a small agaric; brown sterile hyphae were found forming a mat of White Bark Pine needles in litter under trees at Horse Camp. Pycnosclerotia have been found associated with *Scolecotrichum graminis* infections on *Melica aristata*, and similar atrosclerotic masses of tissue have been found in connection with *Ramularia* infections on several hosts and with *Cylindrosporium smilacinae* on *Smilacina stellata*.

Using cultures derived from single ascospores from Mt. Shasta collections of *Clathrospora diplospora* (Ell. & Ev.) Wehm., *Clathrospora elyanae* Rab. and *Leptosphaeria heterospora* (de Not.) Niessl., Simmons (23) obtained cultures assignable to the form species *Alter-naria tenuis* Nees. Morphologically, then, this species is very variable including the imperfect state of many perfect fungi.