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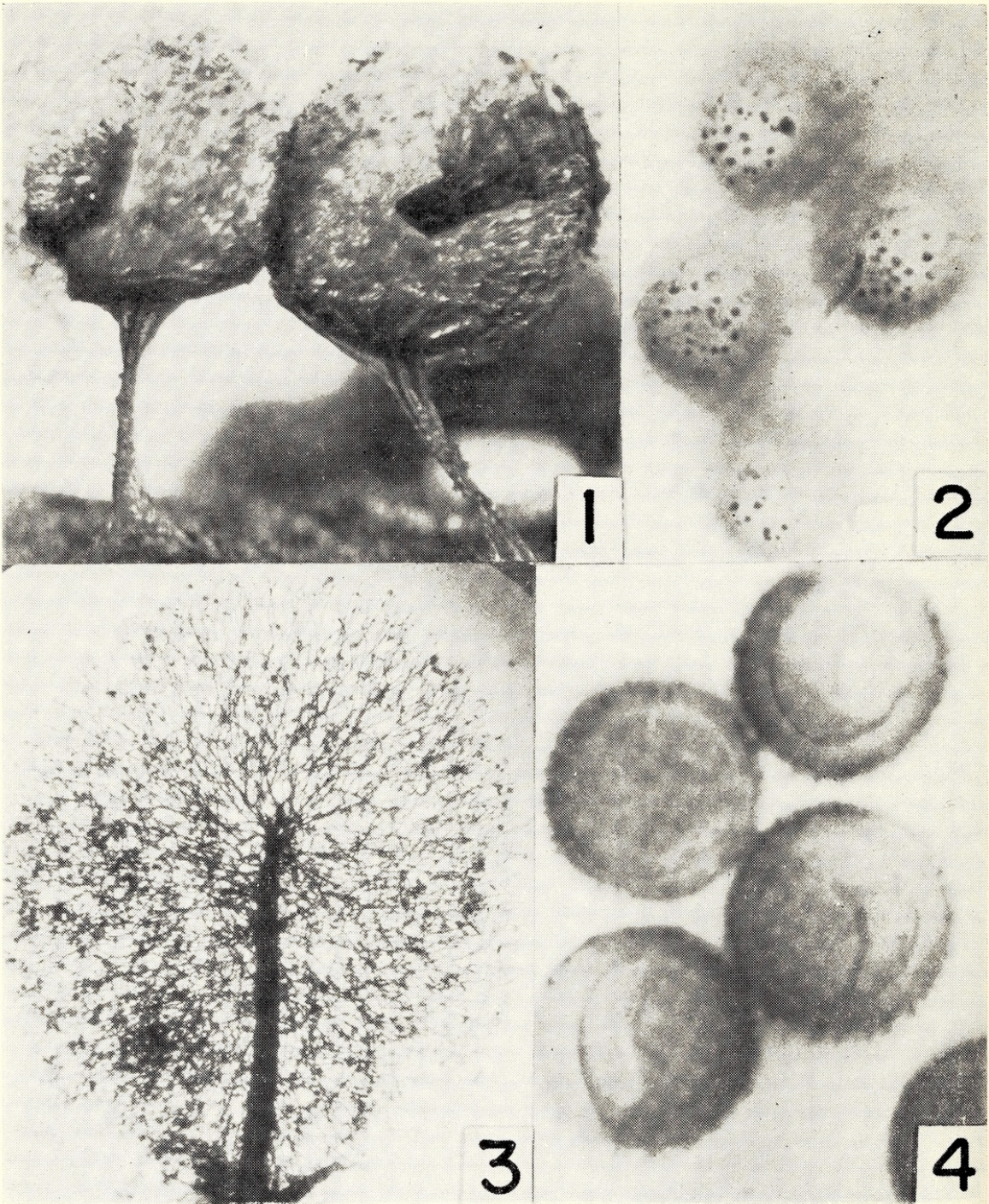
CONCERNING THE VALIDITY OF LAMPRODERMA
ECHINOSPORUM

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In 1924 Meylan described *Lamproderma echinosporum* on the basis of several collections from the Jura Mountains of Switzerland. This species was a typical snowline Myxomycete, i.e., found only at high elevations near the melting snow. Lister (1925) did not mention this taxon in her monograph, probably because it was described too late to be included in her work. In 1924 Macbride and Martin recognized the species as valid, but apparently did not have any material for observation. Dennison (1945), however, placed *L. echinosporum* under the heading of doubtful species. She had no material for study and on the basis of the description, she thought it was very close to *L. echinulatum* (Berk.) Rost. Hagelstein (1944) and Martin (1949) did not include it in their monographs because it was not reported from North America. During my work in the western United States, I have made five collections of a species which does not fit any of the generally recognized taxa, but which match perfectly with five of Meylan's collections of *L. echinosporum*. These five collections were obtained on loan from the Musée de Botanique, Lausanne, Switzerland. I believe that *L. echinosporum* is a good species and my collections (3601, 3668, 6240, 8284, 8286) apparently represent the first time that this taxon has been reported from the Western Hemisphere. All of my collections are from northern California and 8284 has been deposited in the University of Iowa Herbarium.

Meylan did not specifically designate a type collection and his species diagnosis was, in my opinion, incomplete. Thus, I am designating his April, 1923 collection from Prise as the lectotype and including a detailed English description with accompanying paragraphs dealing with the major characteristics and relationships of this taxon.

LAMPRODERMA ECHINOSPORUM Meylan. Sporangia (fig. 1) scattered to loosely clustered in small groups of 3-6, sessile or briefly stipitate, broadly ovoid to occasionally globose, 1.0-1.5 mm in diameter, color variable, dark brown to blue, dull, occasionally slightly iridescent; stipes, when present, short, averaging about 1.0 mm in length, shiny brownish-black; peridium membranous, thin, usually long persistent,



FIGS. 1-4. *Lamproderma echinosporum*. 1, sporangia, $\times 30$; 2, spores, $\times 1130$; 3, columella and capillitium $\times 50$; 4, spores, $\times 1740$.

splitting irregularly, covered with numerous depressed, dark brownish-black areas, giving it a mottled appearance, depressed areas circular to slightly elongated, few near the base of the sporangium, becoming plentiful in the upper half; hypothallus poorly developed, discoid, thin, transparent, often merging at the margins into adjacent hypothalli, reddish-brown; columella (fig. 3) black, tapering only slightly towards the truncate or bluntly pointed apex, usually attaining two-thirds the height of the sporangium, often branching at the apex where it forms the

primary branch of the capillitium; capillitium (fig. 3) forming a distinct, dense net, with abundant free ends, dark brown throughout, becoming hyaline only at the extreme tips, arising predominantly from the apex of the columella, threads of predominantly uniform thickness, 2–4 μ in diameter, usually not expanded in the axils, often covered with numerous nodules, averaging 5–10 μ in diameter; spores (figs. 2, 4) globose, dark brown in mass, dusky brown by transmitted light, covered with large irregularly distributed spines, often reaching 1.0 μ in length, including ornamentation, 13–16 μ in diameter; plasmodium unknown.

This species is known only from Switzerland and California. All of the Switzerland collections examined appear to be on herbaceous plant debris while the California collections are all on fallen coniferous twigs.

There is no characteristic that can be used to identify this species in the field. Typically, it forms small fruitings, consisting of only 20–30 sporangia. Small fruitings, however, can be found in several other species of *Lamproderma*. There is, however, one distinctive feature which makes *L. echinosporum* very easy to identify under the stereoscopic microscope, and that is the presence of the dark depressed areas on the peridium. It is interesting that Meylan did not mention the presence of this characteristic in his diagnosis and as far as I can determine, it has not been mentioned by anyone in the literature. In 1919, five years before describing *L. echinosporum*, Meylan described *L. gulielmae* from the mountains of Switzerland. This is the only other species in the genus that also has the dark depressed areas on the peridium. I do not believe, however, that these taxa are closely related. There are many differences which distinguish them. In *L. gulielmae* the sporangia are small, 0.3–0.5 mm in diameter, the peridium is silvery-blue, the stipe, in relation to the size of the sporangium, is long, about four times the diameter of the sporangium, and the capillitium forms a lax net which is distinctly hyaline or pallid. In *L. echinosporum* the sporangia are large, 1.0–1.5 mm in diameter, the peridium is dark brown or blue, the stalk, in relation to the size of the sporangium, is short, about equal to, or less than, the diameter of the sporangium, and the capillitium forms a dense net which is dark brown.

Although Meylan (1924) thought *L. echinosporum* was related to as *L. atrosporum* Meylan, and Dennison (1945) believed it was near *L. echinulatum*, I believe *L. echinosporum* is probably most closely related to *L. sauteri* Rost. These taxa share many characteristics in common. Both have large sporangia, 1–2 mm in diameter; short stalks, 1.0 mm or less in length; peridia that are dull, rarely iridescent; capillitia which form dense dark brown nets; and spore sizes which overlap, 13–16 μ in *L. echinosporum* and 12–15 μ in *L. sauteri*. There are, however, significant differences between these two species. In *L. echinosporum* the peridium is covered with dark depressed areas while *L. sauteri* lacks

this feature entirely. The spores of *L. echinosporum* are uniformly dusky in color and covered with irregularly distributed spines which may reach $1.0\ \mu$ in length, while in *L. sauteri* the spores are dark violet brown and distinctly lighter on one side, and regularly and densely spinulose, the spines attaining only $0.5\ \mu$ in length.

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PERENNATION IN ASTRAGALUS LENTIGINOSUS AND TRIDENS PULCHELLUS IN RELATION TO RAINFALL

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In late winter-early spring (March 15-April 12) of 1965, at a season when precipitation is not predictable, rains of extraordinary frequency and magnitude fell over most parts of south-central Nevada. Rainfall during this period on the Nevada Test Site, Nye Co., was from 2.5 to more than 5 inches at elevations below 5,000 feet, where the communities and flora belong to the Mojave Desert (Beatley, 1969). Late autumn rains the same year were even more extraordinary, and for the 1965 calendar year precipitation totalled 8 to more than 15 inches over the Test Site, with many areas receiving in excess of 10 inches.

A number of biological phenomena following the spring rains, and in the 1966 spring season following the autumn rains, were as exceptional as the rainfall which preceded them. Among these was the appearance in certain areas of conspicuous numbers of seedlings of *Astragalus lentiginosus* Dougl. var. *fremontii* (Gray) Wats. (Leguminosae) and *Tridens pulchellus* (HBK.) Hitchc. (Gramineae) in the spring of 1965, and spectacular flowering populations of the *Astragalus* in the spring of 1966. On permanent study sites located in these areas, year-round environmental measurements and plant data collections in the spring of each



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