

FUNGI FROM CHILE I. SOME GASTEROMYCETES AND AGARICALES

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SUMMARY

Thirteen species of Gasteromycetes are reported for Chile, seven of them for the first time for this country and one of them, *Geastrum jurei* Lazo, new to science. Also, there are reported three species of Agaricales new to science, *Hygrocybe gomez-millasii* Lazo, *Xeromphalina pumanquensis* Moser and *Cortinarius pumanquensis* Moser.

GASTEROMYCETES

Studies of the Gasteromycetes of Chile have been published by a number of authors including those of Bertero (1828), Montagne (1850), Spegazzini (1887, 1910, 1917, 1921), Espinosa (1916, 1917), Zeller and Dodge (1929, 1936), Horak (1964a, b) Horak and Moser (1966) and Singer (1969). Mujica and Vergara (1945, 1961) and Mujica and Oehrens (1967) list about 80 species reported up to now. When one considers the variety of climatic and soil conditions and the size and latitudinal extent of the country, this number is probably quite modest and undoubtedly there are many more species still unreported.

In the last few years I have collected many fungi in the central and southern part of Chile (Lazo, 1971), and though I was mainly interested in the Agaricales, occasionally I also collected a few Gasteromycetes. The localities where I collected Gasteromycetes are: 1. Jardín Botánico Nacional, Viña del Mar, Prov. Valparaíso, located at about sea level, with an annual rainfall averaging 450 mm, soils rich in organic matter, and native and exotic trees and herbaceous plants. 2. Quebrada del Agua, La Viñita, Pumanque, Prov. Colchagua, with an average rainfall of 750 mm, soils rich in organic matter, and with native trees and herbaceous plants exclusively. 3. Forests of *Pinus radiata* D. Don and *Eucalyptus* spp. located in the outskirts of El Tabo, Prov. Santiago, at sea level and with soils rather poor in organic matter. 4. Fundo

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La Rinconada, Maipú, Prov. Santiago, an extensive area with different soil types and an average rainfall of about 340 mm. Collections were also made close to some roads as stated in the descriptions. From the southern part of Chile I mention here only *Scleroderma flavidum* Ellis et Everh.

The collections are all deposited in the Estación Experimental Agronómica of the University of Chile, Santiago (EEA) and in the New York Botanical Garden (NY).

Species reported for the first time for Chile are indicated with an asterisk.

SECOTIACEAE

SETCHELLOGASTER TENUIPES (Setch.) Pouzar, Česká Mykol. 12: 34. 1958. FIG. 1

Secotium tenuipes Setch., J. Mycol. 13: 239. 1907.

Gastrocarp 12–32 × 10–28 mm, reddish brown to brick color, subglobose to ovoid, truncate at the base. Peridium reddish brown, glabrous, dry. Gleba ochraceous brown, loculate, lamelloid in some specimens. Stipe 10–22 × 2–3 mm, concolorous with the pileus and paler in the upper part. Columella continuous with the stipe and widened in the upper portion of the peridium. Volva none. Context fleshy. Odor very aromatic and reminiscent of the smell of the wet soil. Taste slightly almond-like.

Spores 13–17.2 × 8.6–10.8 μ , rusty brown, ornamented, ellipsoid to subovoid.

Habitat: on soil among the grasses or mosses in a forest of *Eucalyptus* spp. and *Pinus radiata*.

Distribution: central Chile; U. S. A. (California, Oregon).

Material examined: ET-16, Forests of El Tabo, Prov. Santiago, August 1966. August 1971 (EEA, NY).

HYDNANGIACEAE

HYDNANGIUM SODERSTROEMII Lagerh. in Pat. et Lagerh., Bull. Soc. Mycol. France 9: 142. 1893. FIG. 2

Gastrocarp 22–35 mm broad, pinkish ochre, subglobose. Peridium thin. Gleba pallid pink whitish with small sinuous chambers. Odor none in mature specimens but in the very young ones there is a slight moldy smell. Taste none.



FIG. 1. *Setchelliogaster tenuipes*, $\times 1$.

FIG. 2. *Hydnangium soderstroemii*, $\times 1$.

Spores 12.9–17.2 μ , very slightly yellowish in KOH, globose but a few of them slightly oval, strongly echinate, with thick walls, non-amyloid. Basidia 47.5–58.3 \times 10.8 μ , with granular contents, 2-spored. Sterigmata 4–8.5 μ long. Hyphae with clamp connections. Cystidia none.

Habitat: on soil among the grasses and mosses in a forest of *Eucalyptus* spp. and *Pinus radiata*.

Distribution: wide (central Chile; U. S. A.; Europe).

Material examined: ET-17, forests of El Tabo, Prov. Santiago, August, 1966, August, 1971, (EEA, NY).

SCLERODERMATACEAE

* SCLERODERMA FLAVIDUM Ellis et Everh., J. Mycol., 1: 88. 1885.

Spores 9–13 μ , ferruginous brown, globose, strongly echinate with spines up to 0.6 μ long. Capillitium 4.4–6.5 μ in diam, hyaline, smooth, scarcely septate.

Habitat: on soil in the border of a Nothofagus forest.

Distribution: southern Chile; Australia; New Zealand; North America.

Material examined: LLAN-82, Llanacura close to the river, Prov. Valdivia, May, 1969 (EEA, NY).

NIDULARIACEAE

* CYATHUS OLLA Batsch ex Pers., Syn. Meth. Fung., 237. 1801.

Peziza olla Batsch, Elench. Fung. 1: 127. 1763.

Material examined: RI-05, Fundo La Rinconada, Maipú, Prov. Santiago, August, 1963 (EEA).

* CYATHUS STERCOREUS (Schw.) De Toni in Sacc., Syll. Fung., VII: 40. 1888.

Nidularia stercorea Schw., Trans. Amer. Philos. Soc., n.s. 4: 235. 1835.

Spores 32 \times 30 μ , hyaline, subglobose, smooth.

Habitat: on the soil where manure has been spread. Very common in open fields where there are cows, also in greenhouses.

Distribution: cosmopolitan.

Material examined: RI-14, greenhouse at the Estación Experimental Agronómica, Universidad de Chile, Maipú, Prov. Santiago, February 1966 (EEA), (Det. H. C. Brodie).

LYCOPERDACEAE

* VASCELLUM PRATENSE (Pers. em. Quél.) Kreis. Feddes Repert. 64: 159. 1962.

Utraria pratensis Quél., Champ. Jura Vosg. 2: 368. 1873.

Lycoperdon pratense Pers., Syn. Meth. Fung., 142. 1801.

Spores 4.5 μ in diam, globose, minutely spiny, with a short pedicel. Paracapillitium 4.3 μ in diam, branched.

Habitat: on soil in pastures.

Distribution: widespread.

Material examined: ET-8, El Tabo (close to the border of the main road), Prov. Santiago, July, 1966 (EEA, NY).

* BOVISTA COLORATA (Peck) Kreis., Feddes Repert. 69: 201. 1964.

Lycoperdon coloratum Peck, Annual Rep. New York State Mus. 29: 46. 1878.

Spores 4.3 μ in diam, globose, smooth. Capillitium 4.5 μ in diam, transition type, pale brownish, branched dichotomously, not pitted. Hyphae without true septa. Spores in dry specimens have a chocolate odor.

Habitat: on the soil among the grasses or in decaying plant debris in or out of the forest.

Distribution: cosmopolitan.

Material examined: VI-03, Jardín Botánico Nacional, Viña del Mar, Prov. Valparaíso, July, 1963 (EEA), VI-05, Jardín Botánico Nacional, Viña del Mar, Prov. Valparaíso, September, 1963 (EEA), (Det. V. Demoulin).

GEASTRACEAE

GEASTRUM MINIMUM Schw., Schriften Naturf. Ges. Leipzig 1: 116. 1882.

Gastrocarp 21–26 mm broad. Exoperidium split in 6–8 unequal acute rays sometimes with the tips slightly incurved, mycelium layer with debris incrustated. Fibrillose layer whitish. Pseudoparenchymatic layer brownish ochraceous. Pedicel very short. Endoperidium globose, whitish to slightly grayish. Peristome fimbriate, slightly conical, grayish, not delimited (in one specimen no peristome was present). Gleba brown.

Spores 4.3–4.8 μ , brownish, globose, warty-rough, short pedicellate. Capillitium 4.2 μ broad, brownish red to purplish, scarcely branched, smooth, not septate and with small protuberances.

Habitat: on soil among mosses and grasses.

Distribution: very wide.

Material examined: PU-118, La Viñita, Pumanque, Prov. Colchagua, July, 1967 (EEA).

* *GEASTRUM FLORIFORME* Vitt., Monogr. Lycoperd., 23–24. 1842 (ut *Geaster*).

Material examined: PTE-1, close to the road from Santiago to Puente Alto, Prov. Santiago, May, 1962 (EEA), (Det. J. Wright).

GEASTRUM FORNICATUM (Huds. ex Pers.) Hook. in Curt., Fl. Londinensis 4: 575. 1821.

Lycoperdon fornicatum Huds. ex Pers., J. Bot. Paris 2: 26. 1809.

Material examined: VI-70, Jardín Botánico Nacional, Viña del Mar, Prov. Valparaíso, July, 1967 (EEA NY).

GEASTRUM SACCATUM Fr., Syst. Mycol. III: 16–17. 1829.

Material examined: VI-7, Jardín Botánico Nacional, Viña del Mar, Prov. Valparaíso, July, 1966 (EEA, NY).

Geastrum jurei Lazo, sp. nov.

FIG. 3

Carposoma fornicatum. Exoperidium 26 mm latum, 15 mm altum, in 5 radios acutos fissum, arena et quisquiliis extra dense adhaerentibus; stratum fibrillosum durum, extra lucidum, pallide ochraceum, intra castaneum; stratum pseudoparenchymaticum satis tenue, subviolaceo-fuscum, fractum, praecipue in radiis, ligneum tactu. Pedicellus compressus 2 × 4 mm diam, 2 mm altus, glaber, cremoricolor. Endoperidium depresso sphaericum, 9 mm latum, 8 mm altum, eodem ut strato pseudoparenchymatico colore, glabrum; peristomium late conicum, sericeum, leniter radiatim plicatum (sed non sulcatum), perpallide cinereo-cinnamomeum, ab endoperidio colore solum bene delimitatum.

Sporae 5-5.5 μ latae, livido-rubrae, sphaericae, verrucis depressis irregularibus ornatae. Capillitium 5-8 μ crassum, livido-rubrum, membranis tenuibus, septis nullis, ramificationibus nullis visis.

Habitat in solo arenoso prope litus maris.

Holotypus mense Februario anni 1966 in solo arenoso prope litus maris non procul ab oppido Algarrobo provinciae chilensis Valparaíso sub numero AL-01 a F. Nome lectus, siccus ab auctore inspectus, in Herbario New York Botanical Garden (NY) depositus. Professoris Ricardo Jure M. dedicatus est.



FIG. 3. *Geastrum jurei*, $\times 21$.

Fornicate. Exoperidium 26 mm broad, 15 mm high, split into five broadly acute rays; outer surface strongly incrustated with sand and debris; fibrillose layer hard, on the outside shining, pale ochraceous, on the inside chestnut; pseudoparenchymatic layer rather thin, dark brown with a violaceous tinge, cracked, especially on the rays, woodlike hard. Pedicel 2 \times 4 mm broad and 2 mm high, compressed, glabrous, cream colored. Endoperidium round, 9 mm broad and 8 mm high, depressed, concolorous with the pseudoparenchymatic layer, glabrous; peristome broadly conical, silky, slightly radially wrinkled (but not

sulcate), very pale greyish brown. Peristome indefinite, but due to its color well distinguished from the endoperidium.

Spores 5–5.5 μ broad, reddish brown, globose, with warts that are short and irregular. Capillitium 5–8 μ in diam, reddish brown, thin walled, nonseptate, no branches seen.

Habitat: on sandy soil close to the beach.

Material examined: AL-01. Algarrobo, Prov. Valparaíso. February, 1966, (Holotypus, NY).

This description has been prepared from dry material.

Observations: According to the characteristics of the exoperidium *G. jurei* belongs to the section *Perimyceliata* Staněk. Only one specimen has been collected and studied so far, but even on this basis it is clear that this fungus is sharply separated from other known fornicate species. *Geastrum smardae* Staněk and *G. welwitschii* Mont. belong to the section *Basimyceliata*, *G. quadrifidum* Pers. ex Pers. has a clearly defined peristome and *G. fornicatum* (Huds. ex Pers.) Hook. in Curt. has a peristome concolorous to the endoperidium. From the literature *G. dissimile* Bottomley appeared to be related, however after examination of the type (K 14515) this species proved to be different not only by a more sulcate mouth but also by other macroscopical and microscopical characters (smaller spores with acute spines).

MYRIOSTOMA COLIFORME (Dicks. ex Pers.) Corda, Anleitung Stud. Mycol., 204. 1842.

Geastrum columnatum Lev., Ann. Sci. Nat. Bot., Sér. 3 5: 161. 1846.

Material examined: RI-020, Hacienda La Rinconada, Maipú, Prov. Santiago, September, 1966 (EEA).

AGARICALES

All these Agaricales have been collected in the "Quebrada del agua," La Viñita, Pumanque, Prov. Colchagua. The collections are all deposited in the New York Botanical Garden (NY) and in the Lehrkanzel für Mikrobiologie der Universität, Innsbruck, Austria (IB).

Hygrocybe gomez-millasii Lazo, sp. nov.

FIG. 4

Pileo 10–12 mm lato, subrufo, pro parte violaceo tinctu, conico, usque applanato, ad dimidium diametri striato, valde glutinoso. Lamellis adnatis, albidis

tum pallide rosaceis. Stipite 35–40 mm longo, 2–3 mm crasso, aequali, flavido-aurantiaco, glutinoso. Textura fragilis. Cespitosus. Sporis 8–10 × 5–6 μ , ellipsoideis, hyalinis. Basidiis 38–53 × 8.5–10 μ , 4-sterigmaticis. Sterigmatibus 6–7 μ . Cystidiis nullis.

Habitatio ad terram nudam in loco humido. Holotypus PU-144, leg. W. Lazo, 8. VIII. 1967, prope La Viñita, Pumanque, Prov. Colchagua. In Herbario NY conservatur. Professoris Juan Gómez Millas dedicatus est.

Pileus 10–12 mm broad, brownish red and violaceous in the parts where it is covered by the other caps, glabrous, conic when young appanate and umbonate when old, striate, very viscid, marginal zone and margin whitish pink. Lamellae grayish white when new, pinkish when old, adnate, subdistant. Stipe 35–40 × 2–3 mm, yellowish to orange, sometimes whitish when young, equal, glutinous. Context thin, fragile. Caespitose.

Spores 8–10 × 5–6 μ , hyaline, smooth, ellipsoid. Basidia 38–53 × 8.5–10 μ , hyaline, 4-spored. Sterigmata 6–7 μ long. Cystidia none.

Habitat: on very damp soil, close to and sometimes among the mosses in the forest.

Material examined: PU-144. La Viñita, Pumanque. Prov. Colchagua. August, 1967. (Holotypus, NY).

Xeromphalina pumanquensis Moser, sp. nov.

FIGS. 5, 7

Pileo 9–11 mm lato, applanato-convexo, brunneo-fulvo, sicco, glabro, lamellis luteis, confertis, leviter decurrentibus, acie integris, stipite 21–24 × 1–1.5 mm, obscure brunneo; sporis hyalinis, subcylindraceis vel anguste obovatis, 5–7 × 2.5–3 μ , levibus, basidiis 4-sporigeris, 22–25 × 4.5–5.5 μ , cheilocystidiis numerosis, irregulariter lageniformibus, 30–38 × 7–9 μ , pleurocystidiis \pm fusiformibus, 28–35 × 7–8 μ , epicute e hyphis de 7–10 μ crassis, tunicis incrustatis, pileocystidiis nullis, caulocystidiis irregulariter piliformibus basin versus gradatim incrassatis, crasso-tunicatis. Trama pilei, lamellarum stipitisque in solutione caustica (kali) reactionem laete rubram praebet.

Differentia colorum lamellarum stipitisque notabilis et limitatio abrupta est.

Habitatio in ligno putrido pro parte oblecto humo et muscis radicibusque. Holotypus PU-116, legit W. Lazo, prope La Viñita, Pumanque, Provincia Colchagua, Chile, 27.VII 1967, in Herbario IB conservatur.

Pileus 9–11 mm broad, brownish yellow to orange, appanate convex, dry, smooth, glabrous. Lamellae yellow, close, decurrent, narrow. Stipe 21–24 × 1–1.5 mm, dark brown, dry, equal, slender. The difference between the color of the lamellae and the color of the stipe is remarkable since it starts abruptly at the apex of the stipe.

Spores 5–7 × 2.5–3 μ , hyaline, smooth subcylindric or narrow obovate. Basidia 22–25 × 4.5–5.5 μ , 4-spored. Cheilocystidia 30–38 × 7–9 μ , abundant, irregularly flask-shaped. Pleurocystidia 28–35 × 7–8 μ , \pm

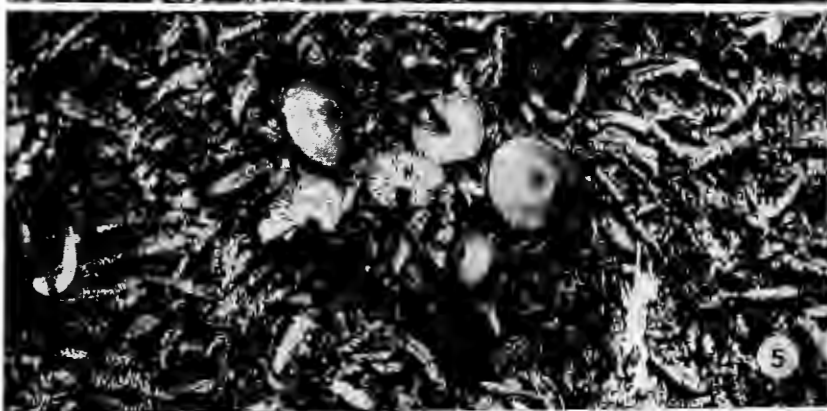


FIG. 4. *Hygrocybe gomez-millasii*, $\times 1.1$.

FIG. 5. *Xeromphalina pumanquensis*, $\times 1$.

FIG. 6. *Cortinarius pumanquensis*, $\times 2.1$.

fusiform. Epicutis hyphae 7–10 μ thick. Pileocystidia none. Caulocystidia irregular, hair-like thicker at the base, thick-tunicate. Trama of pileus, lamellae and stipe red in KOH.

Habitat: on decaying wood partially covered with soil among mosses and small roots.

Material examined: PU-116. La Viñita, Pumanque, Prov. Colchagua. July 7, 1967. (Holotypus, IB).

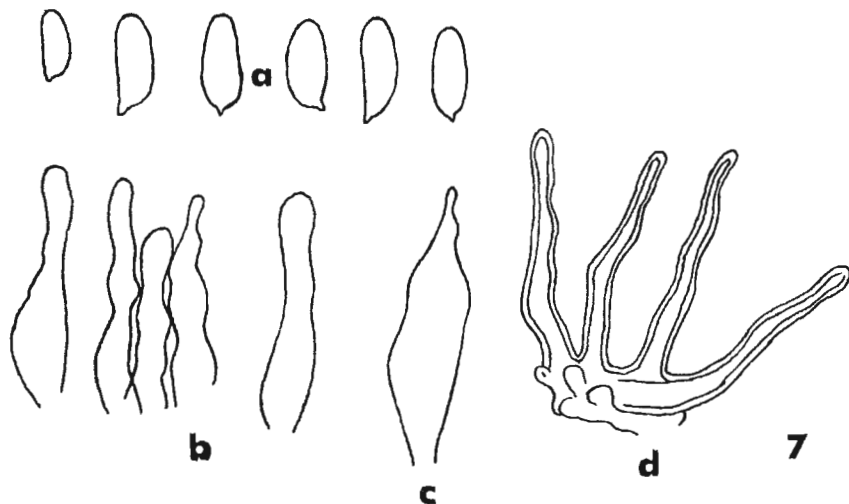


FIG. 7. *Xeromphalina pumanquensis*. a. Spores, $\times 1,800$. b. Cheilocystidia, $\times 900$. c. Pleurocystidia, $\times 900$. d. Caulocystidia, $\times 900$.

Cortinarius pumanquensis Moser, sp. nov.

FIG. 6

Pileo convexo umbonato, 1.8–2.1 cm lato, violaceo-lavendulo, decolorante, glabro, lamellis ochraceo-brunneis, subdistantibus, stipite 3–4 cm \times 5 mm, cylindraceo vel basi leviter subincrassato, violaceo, basin versus albicante, sporis polymorphibus, ellipsoideis usque amygdaliformibus vel anguste subcylindraceis, 7–9.5 \times 4.5–6 μ , sublevibus usque punctato-verrucosis, basidiis tetrasterigmaticis, 28–32 \times 6–7 μ , cystidiis nullis.

Habitatio in silvis mixtis (*Crinodendron patagua* Molina, *Persea lingue* Nees, *Quillaja saponaria* Molina, *Cryptocarya alba* (Molina) Looser. Holotypus PU-41, leg. W. Lazo, 3. X. 1966, prope La Viñita, Pumanque, provincia Colchagua, Chile, in Herbario IB conservatur.

Pileus 18–21 mm broad, violaceous bluish, decolorated in parts, convex umbonate, smooth, shiny, torn in old specimens, dry. Lamellae brown-ochraceous, broad, somewhat separate, adnate. Stipe 30–40 \times 5 mm, whitish violaceous, equal, robust, smooth, dry. Context fleshy.

Spores $7-9.5 \times 4.5-6 \mu$, ellipsoid amygdaliform or narrow sub-cylindrical, punctate verrucose. Basidia $28-32 \times 6-7 \mu$, 4-spored. Cystidia none.

Habitat: on the soil in mixed forest (*Crinodendron patagua*, *Persea lingue*, *Quillaja saponaria*, *Cryptocarya alba*).

Material examined: PU-41. La Viñita, Pumanque, Prov. Colchagua. September 3, 1966. (Holotypus, IB).

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