SOME REMARKS ON THE GENUS « GEASTER » MICH. FROM URUGUAY

By KAREL CEJP
(CHECOSLOVAQUIA)

SUMARIO

Nota sobre el género « Geaster » en el Uruguay. — El autor estudia las especies uruguayas del género *Geaster*, estableciendo la presencia de *Geaster asper* (Micheli) Lloyd, *Geaster mammosus* Fries, y *Geaster umbilicatus* Fries ; indica además las principales características de estas especies típicas de la micoflora americana.

Some time ago Prof. Velenovsky gave me some fungi from Uruguay for determination. He had received them from his correspondents abroad. Among these fungi there were also three species of the genus *Geaster*, very characteristic of the mycoflore of America. Unfortunately the localities of the material given to me were not described. I only know that the recolts had been made principally in the vicinity of Montevideo and the rest of the material had apparently been sent by the Botanical Museum of Montevideo. As from South America we still know but few representatives of this beautiful genus, I publish the descriptions of the three species from Uruguay, which contribute to our knowledge of their distribution in America. The last mycological work of Spegazzini (10) on the fungi of Paraguay mentions four species of the genus *Geaster,* among, which *Geaster albidus* from the affinity of *G. arenarius* Lloyd is new. Coker and Couch (2) who in studying the *Gasteromycetes* of the Western United States and Canada had at their disposal a huge herbarium material, especially from American herbariums, and among them also from the largest herbarium of its kind, the collections of Lloyd, do not men-

tion finds from Uruguay for the distribution of these species and mention only for *Geaster mammosus Fr.* a specimen of the vicinity of Tucumán, in the Argentine from the collections of Leon Castillon.

Geaster asper (Micheli) Lloyd

Lloyd, *Myc. Notes,* nº 151 (1901), *The Geastrae,* Bull. nº 5 (1902). — Hollós, *Term. Füzetek* 25 (1902), *Gasterom. Ung.* (1904). — Coker and Couch, *Gasterom.* (1928). — Alexandri, *Contrib.* p. 19 (1932).

Lycoperdon stellatum Purhon, *Midl. Fl.* 3.

Geaster campestris Morgan, *The genus Geast., Amer. Natur.* (1887). — Saccardo, *Sylloge* VII (1888). — Hollós, *Új. adat. Magy. Gomb. ism.* 9 (1898-99).

Geaster pseudomammosus Hennings, in *Hedwigia,* 39 (1900).

Geaster pseudocristatus Hollós, in *Mathem. Term. Ert.,* 1901, *Gasterom. Ung.* (1904).

Geaster granulosus Cragin, in *Bull. Washburn.* p. 40.

Diagnosis (after Coker and Couch, 2):

Plants submerged until mature, the mycelium universal; rays with a spread of 2,5-3,5 cm (up to 5 cm, Morgan), hygroscopic, rigid, 8-10, rarely more, involute or spreading when dry, outer surface covered at first and rather persistently with sandy earth mixed with flocculent mycelium, this slowly flaking off or wearing away on exposure, leaving the surface pale and smooth; fleshy layer adnate, usually continuous, dark brown to blackish; base concave below and elevating the spore sac which is subglobose with a short thickish stalk, the surface gray to brown and covered with wartlike particles; mouth strongly and pretilly sulcate, seated in a depressed zone, concolorous or darker, at times nearly black.

Spores (of a plant from Lincoln, Nebrasca), spherical, distictly warted, 4,5-6,5 μ. Capillitium threads straight, up to 5 μ thick.

Vicinity of Montevideo, IV . 1933, VI . 1933.

Geaster asper is an interesting species and its revision in Europe would be desirable. Hollós (**4, 5**) and Endry (3) mention it several times from Hungary, each time under a different name, but their specimens represent evidently one and the same species characterized by the shape of the mouth and by the spore sac

being rough as if strewn with fine sand. The chaos between different species of the genus *Geaster* is due to the fact that the original descriptions were published in very rare periodicals which are almost inaccessible, mostly in Hungarian, and so it can be explained why many species were described again under different names by several mycologists.

The specimens from Uruguay correspond entirely to the description given by Coker and Couch in their book after collections in Nebrasca, U. S. A., and the illustration (pl. 68) corresponds, too, entirely to the South American specimens. According to those authors this species is frequently collected in North America and it is represented in many American herbariums. Lloyd (**6, 7**) mentions it from Kansas, Kentucky and Ohio (Morgan's collections as *G. campestris).* This species was found also in Bohemia by Reisner (**9**) and its collections are mentioned in Velenovsky's study of the Bohemian fungi (**11**). The Bohemian specimens are however remarkably small (Reisner, pl., figs. 6-7). Otherwise the description tallies with the original description of Micheli (**8**) and with the most detailed description in the work of Coker and Couch. Further European finds were made by Alexandri (**1**) in Roumania, but his illustrations do not correspond well to those of *G. asper* by Micheli and Lloyd as they have a fairly long stalk (*l. c.,* fig. 7), whereas the true *G. asper* has but quite a short one (cf. Micheli... pediculo perbrevi donatus).

Geaster mammosus Fries

Fries, *Syst. mycol.* III, p. 17 (1829). — Chevallier, *Fl. Paris* I., p. 359 (1836). — Morgan, *The genus Geast., Amer. Natur.*, p. 16 (1887). — Vittadini, *Monogr. Lycoperd.* 1843, t. I, f. 9. — Smith, in *Gard. Chronicle,* p. 543 (1873). — Lloyd, *The Geastrae, Bull.* nº 5, p. 13 (1902). — Hollós, *Új. adat. Magy. gomb.* p. 9 (1898-99). — De Toni, *Revisio mon. gen. Geasteris,* p. 17 (1887). — Saccardo, *Sylloge* VII, p. 243 (1888). — Coker and Couch, *Gasterom,* p. 119 (1928).

Geastrum hygrometricum var. *anglicum* Persoon, *Syn.* p. 135 (1801).

Lycoperdon corollinus Batsch, *Elenchus Fung.* I, p. 151 (1783).

Lycoperdon recolligens Sowerby, t. 401.

Geaster hygrometricus Massee, *Monogr. Brit. Geast.* t. 4 (p. p.).

Geaster argenteus Cooke, in *Grevillea* 17, p. 75 (1889).

Geaster lugubris Kalchbrenner, *Gasterom. novi vel minus cogn.* (1884), pl. 5, f. 3.

Geaster corollinus (Batsch) Hollós, *Gasterom. Ung.* p. 65, pl. 10, figs. 1-3 (1904). —Reisner, *Ceske hvezdice,* in *Mykologia,* I, p. 104 (1924). — Alexandri, *Contrib.* p. 23 (1932).

Geaster lageniformis Velenovsky, *Ceske houby,* p. 835 (1920-22), non Vittad.

It has generally 7-10 narrow rays which are involute when dry, hard, and reaching down almost to the base. expanded in a humid state, 2,5-5 cm wide, chestnut inside, smooth, ochrous ourside. The spore sac is sessile, without a stalk, compressed, smooth, a yellowish light brown, not cracked, acuminate at the top. The peristome is a low blunt cone, filamentous ciliate, distinctly delimited. Columella short, cylindrical or coniform. This species is very hygroscopic.

Uruguay (locality not given).

It is very much like *Astraeus stellatus,* with which it seems to be often mixed up. It is a fairly frequent species, especially in Europe where however it has been described repeatedly under different names. The Bohemian collections revised by Reisner (9) have been correctly determined though the author uses the name of *G. corollinus* introduced by Hollós (4). Velenovsky's determination (11) as *G. lageniformes* Vitt. is not correct as after Reisner's collections the species in question is *G. mammosus* Fr. After Coker and Couch (2), the collections in European herbariums tally well with the American ones. Lloyd's herbarium includes also specimens of this kind from the vicinity of Tucuman, Argentine. On the English specimens W. G. Smith writes in the *Gard. Chronicle,* p. 543 (1873) : There is a plant labelled *G. mammosus* (with no author's name) in the British Museum, but it is not Sowerby's plant, and there is no specimen at Kew. Berkeley, in his Outlines, merely refers to Sowerby's figure as authentic. Corke, however, refers to Micheli's figure (t. 100, f. 3), and doubtfully to Bulliard t. 238 (figs. f, g, h); the latter is a wretched figure, and can hardly Sowerby's plant; it is probably the same with the British Museum specimen.

Geaster umbilicatus Fries

Fries, *Syst. mycol.*, III, p. 14 (1829). — Morgan, *The genus Geast., Amer. Natur.*, fig. 4 (1887). — De Toni, *Revisio mon. gen. Geasteris*, p. 10 (1887). — Coker and Couch, *Gasterom.*, p. 136 (1928).
Geaster striatulus Kalchbrenner sensu Lloyd, *Myc. Notes*, p. 311.
Geaster mammosus Cooke, in *Grevillea*, 2, t. 19, f. 1. — Ellis, *North Amer. Fungi*, n° 110.
Lycoperdon multifidum Retz, Scand., n° 1987.
Geaster ambiguus Hollós, *Gast. Ung.*, p. 59, t. 9, figs. 15-17 (1904).

Diagnosis (after Coker and Couch, 2):

« Plants small, hygroscopic, the button subterranean and when first expanded covered completely without by sandy eart; rays about 7-10, unequal in breath, the delicate, flocculent outer layer intimately mixed with earth and gradually wearing away to leave the rays smooth and glabrous and pale brown to pallid tan, scarcely shining and not as metallic-looking as in *G. mammosus;* fleshy layer rather thin, smooth or more or less rimose, brown to blackish. Spore sac 7-12 mm. thick, sessile, pale tan to dark brown, minutely furfuraceous, until old; peristome pretilly and regularly plicate-sulcate, strongly furfuraceous, particularly below, when fresh, the mouth usually elevated and conical or at times flattened in a despressed zone.

Spores (of plants from New Jersey, Ellis, n° 3472) spherical, faintly warted, 3,5-4 μ thick. Capillitium threads wavy, up to 6,5 μ thick. »

Uruguay, from the vicinity of Rio Negro.

Relatively rare species in Europe and in America. Scandinavia, Hungary, North America (rare, New Jersey, Florida, cf. Coker and Couch), South America : Chile, Brazil (cf. herb. Musei Paris). In the work of Hollós (4) this species is much mixed up, but the illustration given by Hollós of *G. ambiguus* corresponds well to the North American collections and also to the finds from Uruguay.

LITERATURE CITED

1. ALEXANDRI A. V., *Contrib. la cunoasterea Gasteromycetelor din Romania. Acad. Rom., Memor. Sect. Stiint.*, Ser. III, t. 9, Bucuresti 1932.

2. COKER W. C.-COUCH J. N., *The Gasteromycetes of the Eastern United States and Canada.* Chapel Hill 1928

3. Endrey E., *Gasteromyceten aus der Umgebung von Ógyalla und Hódmezövásárhely. Botan.* Közlem. 1911.

4. Hollós L., *Die Gasteromyceten Ungarns.* Leipzig 1904.

5. Hollós L., *Új adatek Magyarország Gombáinak ismeretéhez. Keskeméti reálisk.* 1898-99.

6. Lloyd C. G., *Mycological*, nº 7, 1901.

7. Lloyd C. G., *The Geastrae.* Bulletin nº 5, *Mycol. Series* nº 2, 1902.

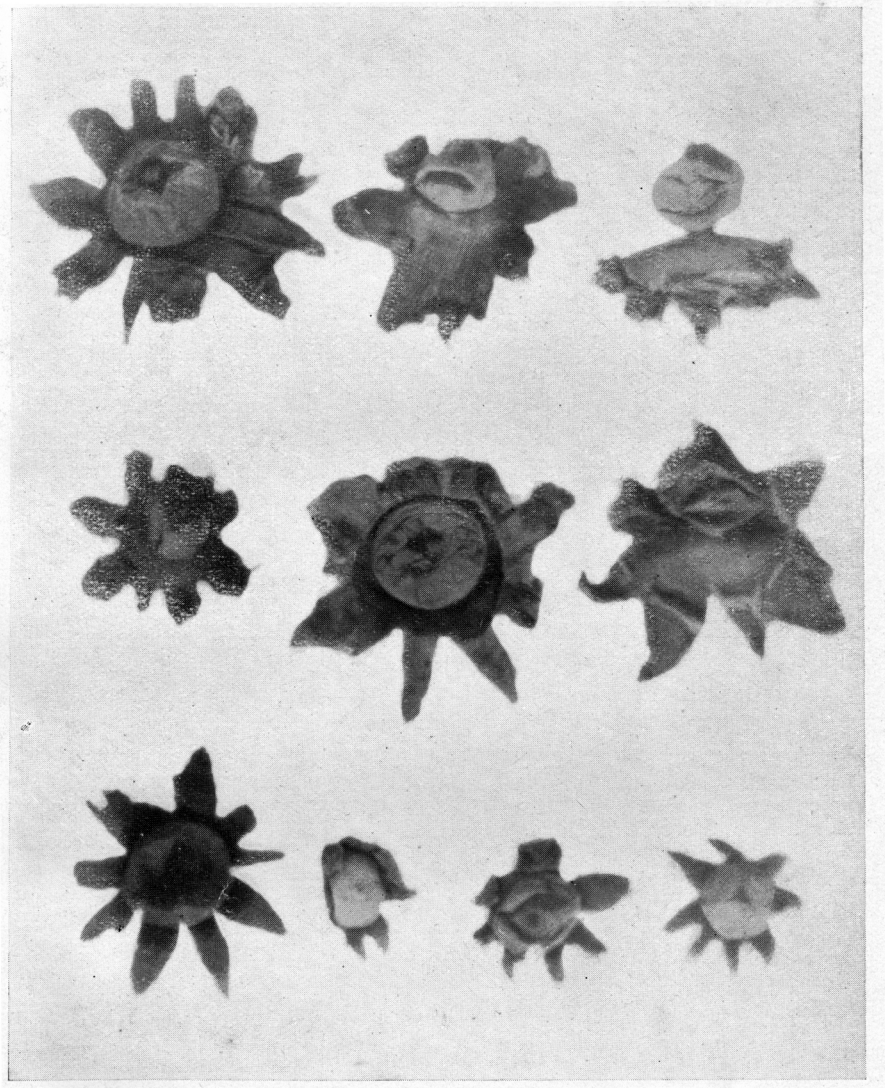
8. Micheli P. A., *Nova plantarum genera*, Florentiae 1729.

9. Reisner O., *Ceské hvezdice. Les espèces du genre Geaster Mich.* en *Boheme. Mykologia*, I, Praha 1924.

10. Spegazzini C., *Fungi Paraguayenses. An. Mus. Nac. Hist. Nat. de Buenos Aires*, 31. 1922.

11. Velenovsky J., *Ceské houby. Les champignons tchéques.* Praha, 1920-22.

Botanical Institute of the Charles University, Praha, Czechoslovakia.



Top and middle : *Geaster asper* (Mich.) Lloyd. Plants from the vicinity of Montevideo ; Bottom : *Geaster mammosus* Fr. Two plants from Uruguay (left). *Geaster umbilicatus* Fr. Two plants from Rio Negro (right).