New genera of fungi — XII[1]): Hybogaster.

By Rolf Singer (Buenos Aires, Argentina)

During the work carried out under the auspices of the Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, Argentina, and dedicated primarily to the ecology of the ectotroph populations in Southern South America, special attention was given to the mycological flora of the *Nothofageta* in Southern Argentina and Soth Chile. These regions are particularly rich in secotiaceous fungi and *Hymenogastrineae* in general as has been known since Thaxter's visits in the region of Valdivia and Punta Arenas, and has been confirmed by the dicsovery of *Thaxterogaster*, several interesting species of the *Hydnangiaceae*, *Austrogaster*, *Weraroa*, etc. by the present author.

In a forest on the east slope of the Cordillera Pelada (west of the town Unión, Valdivia, Chile), with *Nothofagus* (*N. dombeyi* and *N. alpina)* dominating, strongly mixed with conifers and other large dicotyledonous trees (*Saxegothaea*, *Podocarpus*, *Weinmannia*, *Laurelia*, *Flotowia*, *Drimys*, *Pseudopanax*, *Eucryphia* we observed during the fall fruiting period and at a point about 600 m. above sea level near a place called „Chivería", a fungus growth which at first glance appeared to be *Bondarzewia guaitecasensis* [2]) inasmuch as it grew at the base of *Nothofagus dombeyi* much in the same manner as that common root parasite of *Nothofagus*. It was observed and described in fresh condition by the present author in company of Dr. Kubitzki, Dr. R. E. de la Sota, Sr. G. Sarmiento, and photographed by Dr. M. Moser.

Closer observation disclosed the fact that the specimen in question was not the fructification of a polypore but a secotiaceous gastromycete of the astrogastraceous series (*Hydnangiaceae*) recently revised by this author in collaboration with Dr. A. H. Smith (1960). Since it carried abundant latex, it was compared with the genera *Zelleromyces and Arcangeliella*, but it differs from both genera by

---

[1]) Earlier parts of this series have been published as follows: I. *in* Mycologia 36: 358—368. 1944. — II. *in* Lloydia 8: 139—144. 1945. — III. *in* Mycologia 39: 77—89. 1947. — IV. *in* Mycologia 40: 262—264. 1948. — V. *in* Mycologia 43: 598—604. 1951. — VI. *in* Lilloa 23: 255—258. 1951. — VII. *in* Mycologia 48: 719—727. 1956. — VIII. *in* Persoonia 2: 407—415. 1962. — IX. *in* Lloydia 21 45—47. 1958. — X. *in* Sydowia 11: 320—322. 1957 (published 1958). — XI *in* Sydowia 16: 260—262. 1962 (1963).

[2]) **Bondarzewia guaitecasensis** (Henn.) Wright comb. nov. (*Polyporus guaitecasensis* Henn., Ofvers. K. Vet.-Akad. Förhandl. 1900: 319. 1900; = *Bondarzewia perniciosa* Sing., Mycologia 45: 884. 1953).

its internal structure and its enormous size. It is here described as new genus and species of the family Hydnangiaceae.

Hybogaster gen. nov. Fructificatio epigaea, grandis; hyphis crassitunicatis et laticiferis praesentibus; structura dendroidea ramoso-submultipileata; peridio tenui; consistentia carnoso-subtenaci; superficie gibboso-protracta ubi rami steriles peridium jungunt; latice abundant; sphaerocystibus nullis; sporis subglobosis, echinatis, amylaceis. Ad basin truncorum arborum. Typus generis: *H. giganteus* Sing.

Hybogaster giganteus Sing. spec. nov.

Epigaeus; gastrocarpio tuberoso, lobulato-gibboso, ad apicem umbilicato, subcerebriformi, subisodiametrico, 135 mm cc. diametro, ad basin substipitiformiter contracto; peridio tenui (1 mm. cc. crasso) et in partibus superficieis subnullo et ibi subscrobiculato, ceterum levi, aurantiaco; gleba inter ramos columellares collocata, loculis subminutis, haud lamellatim dispositis, pallide ochraceis vel brunneolis; columella e trunco communi ramariiformiter divisa, ramis crassioribus peridium ubique tangentibus et cum eo confluentibus, nonnullis teretibus, aliis lateraliter dilatatis, albidis vel albis; contextu albido vel albo, lactescente e latice abundante albo immutabili, carnoso-subduriusculo-subtenaci; odore rancido; sapore acri, — Ad basin trunci *Nothofagi dombeyi*. Legit Singer no. M 3229 (BAFC) in Cordillera Costera Chilensi.

Gastrocarp epigeous, tuberiform, lobulate-gibbous, more or less irregularly umbilicate above, almost cerebriform, subisodiametric, about 135 mm. in diameter, at base constricted into a stipe-like (30 × 25 mm) extension where the columella originates; peridium thin (about 1 mm. thick) but in certain parts of the surface — not however in differentiated or well limited portions — almost nil so that in these parts the surface appears almost scrobiculate from the glebal chambers which reach the surface, otherwise smooth, glabrous or subglabrous, continuous, a dull and not very deep orange (a combination of two colors: "tan, heather" and "burnt sienna" M & P); gleba filling the space between the ramifications of the columella, with small (0,2—0,3 mm. diam.) chambers which are not lamellarly arranged, pale ochraceous to pale brownish ("mellow glow" to "Inca gold" M & P), at maturity mostly filled with spores; columella originating in a common fleshy base which corresponds to the stipe-like projection of the base of the gastrocarp and begins to ramify immediately above this sterile base in the manner or a *Ramaria* (*Clavariella*) but with the main branches not erect but rather branching out obliquely to reach the peridial level all over the surface of the gastrocarp and joining the peridium at such areas where the gastrocarp shows the gibbous elevations, which indicates a tendency towards

the multipileate structure (without actually resulting in a multipileate organization of the gastrocarp even at full maturity because the peridium remains confluent and nearly continuous), the branches either terete or laterally broadened, with secundary ramifications which eventually merge into ordinary chamber-walls (tramal plates); context of peridium and columella, stipe and branches white, unchanging, partially whitish and occasionally slightly brownish in age, fleshy-hard and somewhat tough, exuding a milk-like white unchangeable latex in all parts; odor of rancid fat; taste acrid; outer layer of base mixed with humus particles (pseudosclerotioid).

Spores 9,3—10,7 × 8,8—9,7 μ (with ornamentation), globose or more frequently short ellipsoid-subglobose, hyaline or pale yellowish, symmetric or with somewhat eccentric hilar appendage (the latter rod-shaped to noduliform), with seemingly double-"walled" central oil drop, with strong exosporial ornamentation consisting of isolated amylaceous spines which are 1,2—1,8 μ long and up to 1,2 μ broad at base and subacute. Hymenium: Basidia (25)—45—46 × 7,5—8,8 μ, clavate, sometimes with a secundary thickening near the base, interrupted by hyphal ends which may be somewhat forked, generally 4-spored; true cystidia or pseudocystidia in mature gleba not seen. Hyphae of the columella-branches often thick-walled (wall about 1,5 μ thick) to almost solid and often wavy to molinoid, predominantly thinwalled in the tramal plates, the latter with regular structure, its elements slightly interwoven and no spherocysts intermixed, some hyphae with irregular excrescencies or nodules or locally broadened and shortened, interior noticeably well colored in phloxine-KOH mounts, subhymenium densely interlaced, of small thin-walled elements, some elements spherocyst-like and up to 11—12 μ in diameter; laticifers yellow in KOH and ammonia, brown in sulfoformol mounts, fuliginous-brown in sulfobenzaldehyde mounts, other hyphae mostly characteristically opaque and refringent; hyphae of the peridium much like those of the columella, but the external (covering) layer a dense tissue of periclinal hyphae with percurrent trichodermial (divergent) hyphal elements, laticifers, and occasional swollen elements perforating the layer of periclinal hyphae, pale orange in KOH, with rounded-obtuse hyphal ends. Laticifers about 5—9 μ in diameter; hyphal walls inamyloid, clamp connections not seen (but septa rare and difficult to observe).

Chemical characters: KOH (10%) on surface of peridium and on trama deep purple in fresh condition (between 8-E-5 and 8-J-5, M & P).

On the base of a living trunk of *Nothofagus dombeyi* (Mirb.) Oerst. in mixed forest, solitary. Montane vegetation of the Cordillera Costera.

Material studied: Chile: Valdivia: Cordillera Pelada, at the locality "Chivería" at 600 m. alt., between Unión and Mirador, R. Singer no. M 3229 (BAFC), Typus.

The genus *Hybogaster* and its only species differs from both *Zelleromyces* and *Arcangeliella* by the size of the carpophores (several times larger in *Hybogaster* than in the largest fructifications of the other two genera), in its coralloid-submultipileate structure, in the absence of spherocysts as well as clavate epicuticular cells; it differs from *Zelleromyces* in particular also by its habitat (epigeous on the ground of tree trunks), by the spores which are smaller than in all species known to belong in *Zelleromyces*, absence of heteromerous trama, the presence of thick-walled, strongly refractive hyphae and consequently a somewhat tough and hard consistency.

The general appearance, submultipileate structure, colors, spore characters and hyphal structure of this fungus as well as its habitat are very similar to that of *Bondarzewia*. The question whether we have here an example of convergence or an indication of true affinity is as difficult to answer at present as it is vital for far-reaching phylogenetical and systematical conclusions. The author ist not prepared to give an opinion on this question as long as no additional data are available as to the cultural characters and the individual development of both *Hybogaster* and the *Bondarzewiaceae*. On the other hand, it appeared desirable to publish a complete description of the morphological and some chemical characters of the mature stage of *H. giganteus*, and present mycologists with the facts which may lead to new concepts and interpretations. It may, for example, be argued that, in case of true affinity between *Hydnangiaceae* and *Bondarzewiaceae*, the latter might be removed from the Aphyllophorales proper and incorporated in the order Agaricales on the same level as the *Polyporaceae* sensu stricto, the *Russulaceae*, or the genus *Lentinellus*. Any such conclusions would necessarily have to be based on further investigations as to the hiatus that separates the Bondarzewiaceae from other similar polypores and a revision of the delimitation and the scope of this family, comparative studies of mycelial characters and development of the carpophores, perhaps also on studies on cytology and sexual behavior of the species involved. It would also be interesting to find out more about the tree-fungus relation in the case of *H. giganteus* inasmuch as a truly parasitical relation or the demonstration of mycorrhizal relations might considerably influence our judgment on the problem at hand. The author acknowledges the financial and organizatorial assistance received from the Consejo Nacional de Investigaciones Científicas y Técnicas (Buenos Aires) and the Universidad Austral (Valdivia). I also wish to thank Dr. Kubitzky for his advice and collaboration.

Literature cited.

Singer, R. (1951): *Thaxterogaster* — a new link between the *Gastromycetes* and *Agaricales*. Mycologia 43: 215—228.

— (1962: Monographs of South American *Basidiomycetes*, especially those of the east slope of the Andes and Brazil V. *Gastromycetes* with agaricoid affinities (secotiaceous *Hymenogastrineae* and related forms). Boletîn Soc. Argent. Botan. 10: 52—67.

— & A. H. Smith (1960): Studies on secotiaceous fungi IX. The astrogastraceous series. Mem. Torr. Bot. VI. 21: 1—112.

— & J. E. Wright (1959): A new species of the genus Weraroa from South America. Darwiniana 11: 607—610.