

**HYDNANGIUM NIGRICANS VAR. LONGISPINOSUM,  
A NEW HYPOGEOUS FUNGUS FROM MADAGASCAR**

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On July 7, 1980, the author collected a semi-hypogeous gasteromycete at Andasibe, Malagasy (=Madagascar). Drying of the specimen was improvised on filter paper. Three days later a second specimen was collected at the same locality. Unfortunately the latter was totally destroyed by insects during the process of drying. The remaining specimen was studied in the laboratory of the Centraalbureau voor Schimmelcultures at Baarn, Netherlands. It appeared to be the first hypogeous macromycete recorded from Madagascar. As it showed a close resemblance to the South African *Hydnangium nigricans*, which according to Singer & Smith (1960) is closely related to *Octavianina nigrescens* (Zeller) Sing. & A. H. Sm., a comparison of the author's specimen was made with the type material of these species.

The fungus from Madagascar appeared to be conspecific with *H. nigricans*; only differing by its coarser spore ornamentation. A new variety is therefore proposed.

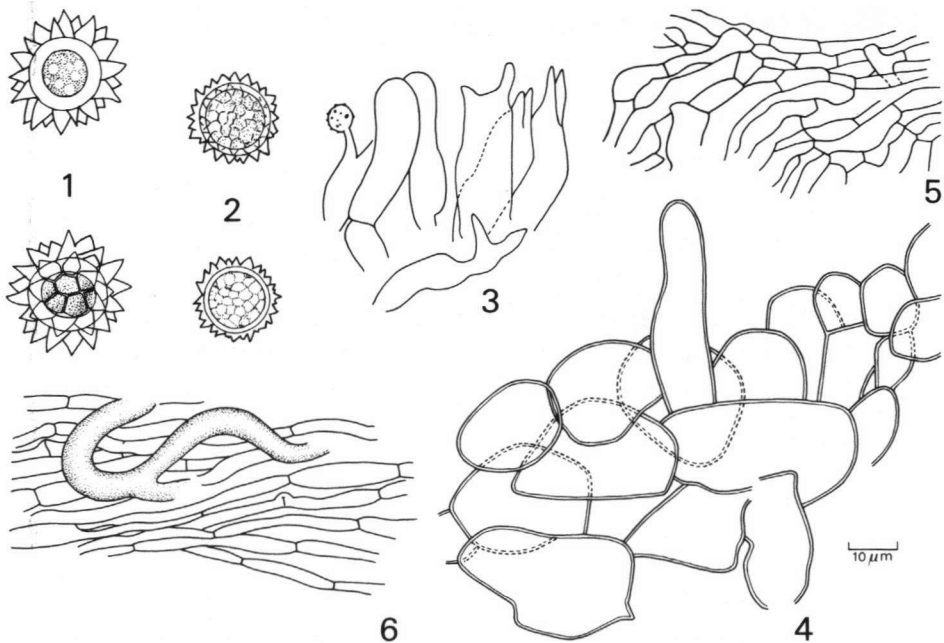
***Hydnangium nigricans* Kalchbr. var. *longispinosum***

Vries, var. nov.—Figs. 1–7

Basidioma sessile, gasteroideum, depresso-globosum, opaco-pallide-brunneum, parte subterranea cremera, in statu sicco umbrina, 20 × 20 × 25 mm, columellam et basim sterilem carens, contexto homoiomero, loculis sinuosis, minutis praeditum. Peridium brunneum, in solutione FeSO<sub>4</sub> nigrescens, pseudoparenchymaticum, cellulis inflatis, tenuitunicatis, brunneis, 16–40 μm latis, paulatim in hyphas, 2.5–12 μm latis, transientibus compositum. Gleba straminea ad ochracea, in statu sicco spadicea, in solutione FeSO<sub>4</sub> olivaceo-cinereascens. Contextus centralis dissepimentorum pallide griseus. Dissepimenta 85–120 μm lata. Mediostratum hyphis parallelibus, hyalinis, 2.5–5.0 μm latis compositum. Cellulae magnae, inflatae, in dissepimentibus dispositae, sphaerocytas simulantes. Fibulae adsunt. Basidia 2-sporifera, subcylindracea, 33–42 × 8–15 μm. Sterigmata subuliformia, 6–10 × 2–3.5 μm. Cystidia nulla. Hyphae oleiferae in peridio et dissepimentibus sinuosae, non septatae, 2.5–10 μm latae, in solutione cresylicae caeruleae caerulescentes, in solutione sulfovanillini non colorantes. Basidiosporae statismosporicae, orthotropicae, globosae, forte dextrinoideae, pariete ad 6.3 μm crassa, spinis conicis, 6–8.5 μm altis, 3.4–4.8 μm latis dense obtectae, 21.5–30.5 μm (orn. incl.), interdum appendicem sterigmatis gerentes, aream glabram carentes. Faries et spinae sporarum in solutione sulfobenzaldehydi forte viridescentes, in solutione sulfovanillini forte purpurascens, in 30% KOH pallide lutescentes. Latex absens. Odor nulla.

Hab.: Basidioma vertice emergente in terra argillacea, viatica, in silva frondosa tropicale, prope Andasibe (=Perinet), Rep. Dem. Malagasy (=Madagascar), 7.VII.1980.

Typus: Partes speciminis holotypici (*de Vries* 762) in Herbario Lugduno Batavorum (L), Hollandiae, in herbario J. M. Trappei, Corvallis, Oregon, Americae Septentrionalis, in herbario The New York Botanical Garden (NY), New York, Americae Septentrionalis et in herbario autoris conservantur.



Figs. 1-6. *Hydnangium nigricans* var. *longispinosum*, microscopical characters. — 1, 2. Basidiospores of var. *longispinosum* (in 1) compared with basidiospores of var. *nigricans* (in 2). — 3. Basidia. — 4. Outer peridial layers. — 5. Inner peridial layers. — 6. Oleiferous hyphae in gleba.

Basidioma sessile, depressed-globose, pale dull brown with cream-white hypogeous part, 'Burnt Umber' (Kornerup & Wanscher, 1978, 6F6) when dry, 20 × 20 × 25 mm, lacking columella and sterile base, with homoiomerous texture and small, sinuous locules. Peridium brown, turning black in FeSO<sub>4</sub> solution, pseudoparenchymatous, consisting of several layers of closely appressed, thin-walled, more or less isodiametrical, 16-40 μm wide, brown cells. Inner layers plectenchymatous, composed of 2.5-12 μm thick, hyaline hyphae. Gleba straw-yellow to ochre-yellow, 'Sunburn' (Kornerup & Wanscher, 1978, 6D5) when dry, turning dark olivaceous grey in FeSO<sub>4</sub>. Tramal plates 85-120 μm thick, with pale grey mediostratum composed of a bundle of parallel, 2.5-5.0 μm thick, hyaline, septate hyphae. Large, swollen cells in tramal plates resemble sphaerocytes. Clamp connections present. Basidia 2-spored, subcylindrical, 33-42 × 8-15 μm. Sterigmata awl-shaped, 6-10 × 2-3.5 μm. Cystidia not observed. Oleiferous hyphae in septal and deep peridial trama sinuous, aseptate, 2.5-10 μm thick, turning blue in cresyl blue and very pale yellow in sulfobenzaldehyde, not stained with sulfovanilline. Basidiospores statismosporic, orthotropic, globose, strongly dextrinoid, 21.5-30.5 μm (incl. ornamentation) with an up to 6.3 μm thick spore wall, covered with 6-8.5 μm high, 3.4-4.8 μm broad conical spines. Sterigmal appendage occasionally present. 'Plage' area absent. Spore wall and spines turning dark purple in sulfovanilline, dark blue green in sulfobenzaldehyde and pale yellow in 30% KOH. Latex absent. Odour none.

HABITAT.—Partly erumpent in a steep, loamy side of a jungle track in a primeval, tropical rainforest at Andasibe (=Perinet), Rep. Dem. Malagasy (=Madagascar), 7.VII.1980.

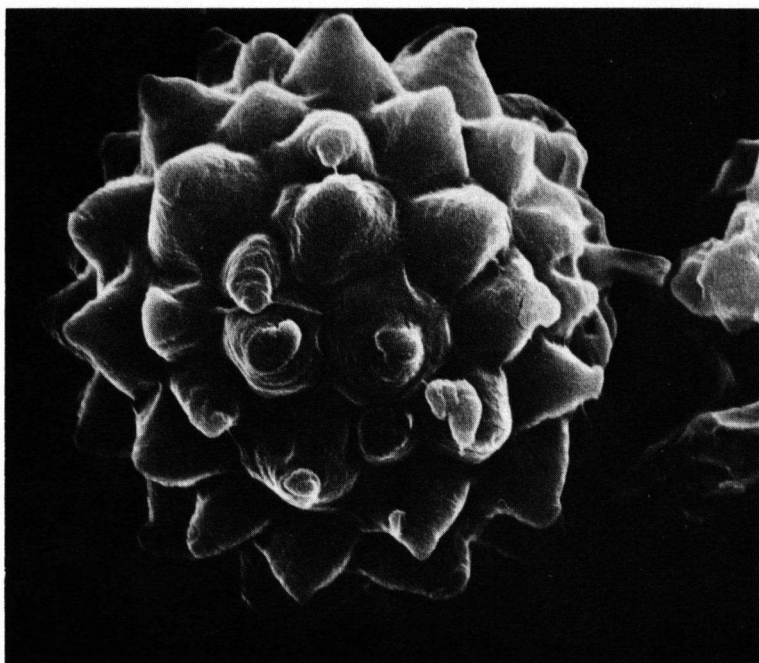


Fig. 7. *Hydnangium nigricans* var. *longispinosum*, scanning electron micrograph of basidiospore ( $\times 4600$ ).

TYPE.—Parts of the type specimen (*de Vries 762*) are conserved in the Rijksherbarium (L) at Leiden, Netherlands, J. M. Trappe's Herbarium at Corvallis, Oregon, U.S.A., the Herbarium of the New York Botanical Garden (NY) and the author's private herbarium.

*Hydnangium nigricans* var. *longispinosum* has generative hyphae with clamp connections and a regular pattern of eusporial ornamentation. The presence of these two characters led Pegler & Young (1979) to distinguish the Hydnangiaceae Gaüm. & B. O. Dodge sensu Pegl. & Young from the Octavianinaceae Locq. ex Pegl. & Young. Because of the nonamyloid myxosporium and the homoiomerous trama they excluded these families from the Russulales Kreisel emend. Pegl. & Young and retained them in a residual order Hymenogastrales G. H. Cunn. *Hydnangium nigricans* var. *longispinosum* differs from *H. nigricans* var. *nigricans* by the much higher spines of the spore wall ornamentation and the greater total spore measurements, the spore body in both varieties being almost equal in size.

Oleiferous hyphae were observed which did not stain in sulfovanilline (sv) and which turned only very pale yellow in sulfobenzaldehyde (sb). The spore wall and its ornamentation, however, stained dark blue green in sb and deep purple in sv. This colour reaction was macroscopically and microscopically very distinct. Only with spores in mass of *H. nigricans* var. *nigricans* could a pale reddish staining of the spore wall and spore ornamentation in sv and an olivaceous grey staining in sb be observed. As Singer (1975) stated that sb and sv must

be used on fresh material, the very poor colour reaction in *H. nigricans* var. *nigricans* was taken to be a result of preservation since 1876.

In order to investigate whether or not the colour reaction seen in var. *longispinosum* could be demonstrated in related fungi, herbarium specimens of *Hydnangium carneum* Wallr. (*de Vries* 724), *Octavianina tasmanica* (Kalchbr.) Pegl. & Young (*de Vries* 740 and 757) and *Laccaria tortilis* (Bolt.) S. F. Gray (coll. van der Aa) and fresh material of *Laccaria laccata* (Scop. ex Fr.) Berk. & Br. were tested. The colour reaction described above was not shown in any of these species. The only change observed was a purple colouring in sv of the trama of the gills of the two species of *Laccaria* and the trama of the septa of *H. carneum*. The colour reaction in sb and sv of the spores of *H. nigricans* var. *longispinosum* did not appear to have been described in connection with hypogeous fungi. Application to fresh material of Hydnangiaceae, Octavianinaceae, and related genera might be of great interest and taxonomic value.

#### ACKNOWLEDGEMENTS

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