

Narasimhella, a new Genus of the Gymnoascaceae

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With Plates XXXVI—XXXVII.

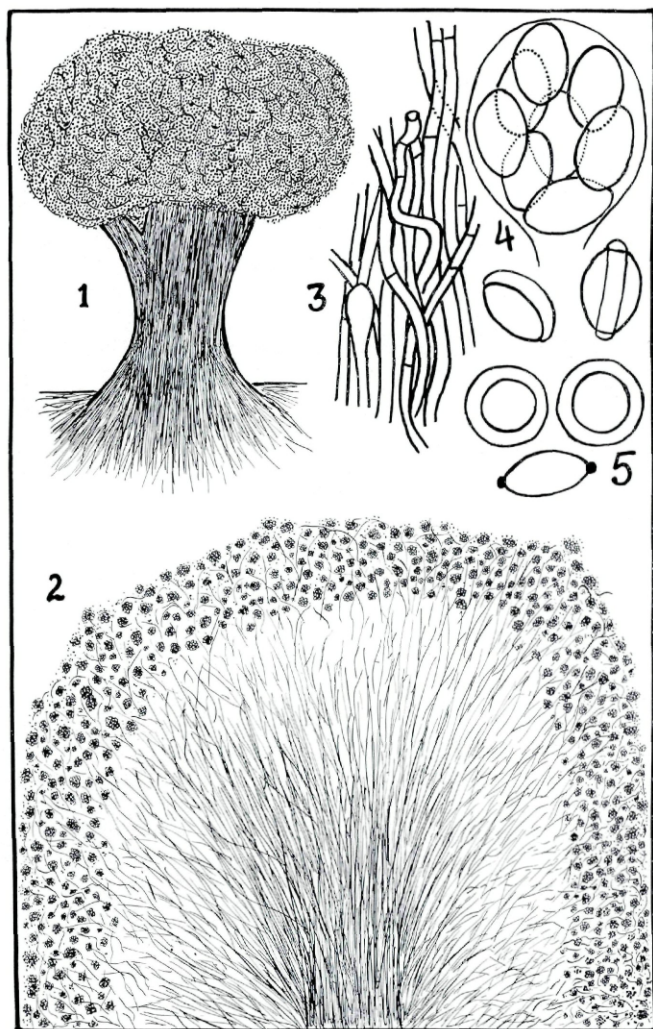
During the course of studies on soil fungi, several members of the *Gymnoascaceae* were isolated. One of these was unusual type, possessing stipitate fruiting bodies without any peridium (Figs. 1 & 2). This condition has quite unlike that of any other member of the *Gymnoascaceae* and resembled that of *Onygenaceae*, where the fruiting bodies are stalked. The members of the *Onygenaceae* usually grow on decomposing nails, feathers, hooves, etc. and have fruiting bodies which are covered by a firm peridium. This character is totally absent in the species under study. Patouillard (1905) described a fungus with stipitate fruiting body under the name *Rollandina*. He thought it to be a member of the *Gymnoascaceae*, but Benjamin (1956) who examined the type material emended the generic description and suggested that it is more nearly related to the *Onygenaceae*.

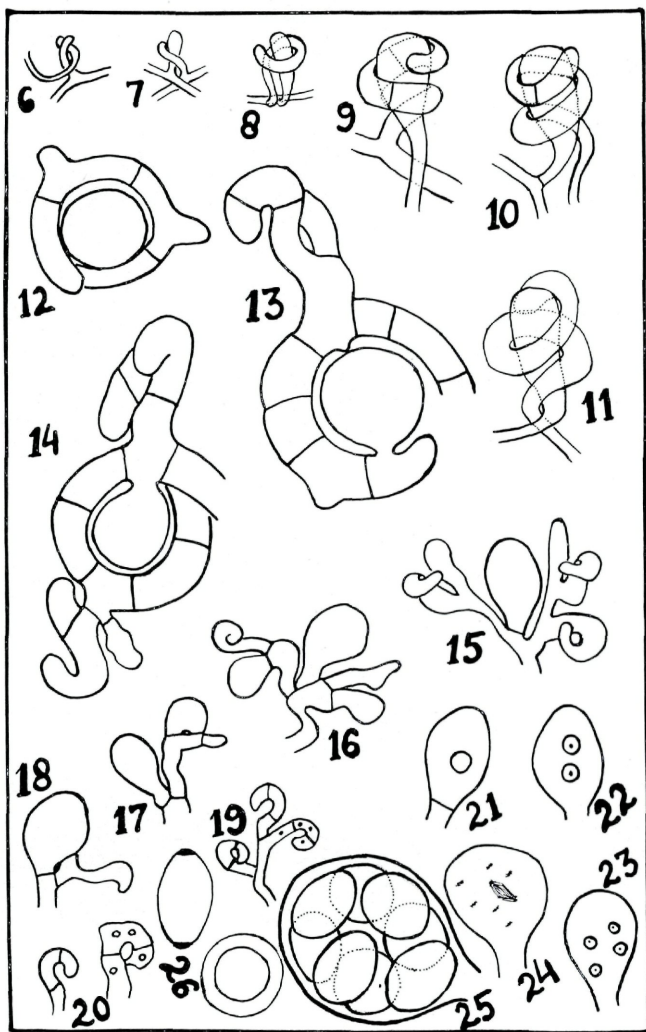
In *Rollandina*, the fruiting bodies are stipitate and the fertile head portion has clusters or glomerules of asci surrounded by hyphae. In the species under study, this grouping into glomerules is totally absent and thus differ from *Rollandina*. The asci are scattered in loose clusters in the hyphal weft of the fruiting body and are comparable in this respect to the condition present in *Pseudoarachniotus*. The presence of well developed sterile stipe and irregularly globular fertile head portion places this fungus in a new genus of the *Gymnoascaceae*, for which the name *Narasimhella* is proposed, named in honour of Dr. M. J. Narasimhan, eminent Indian Mycologist and ardent student of fungi.

Narasimhella Thirum. & Mathur, gen. Nov.

Mycelium septate and branched. Fruiting bodies appearing like miniature *Cantharellus*, yellow to orange-coloured, stipitate, with an irregularly globoid apical fertile portion. Stipe, sterile, firm, continued upwards as sterile central core and marginally grouped ascigerous layers. Asci in clusters, not surrounded by peridial envelopes or grouped into glomerules as in *Rollandina*. Asci globose, ascospores one-celled, hyaline. Type species: *Narasimhella poonensis*.

Mycelii hyphae septatae et ramosae; fructificationes *Cantharello* minuto similes, luteae vel aurantiacae, stipitatae, antice subglobosae et





fertiles; stipes sterilis crassiusculus superne in globulum centralem, extus stratis ascorum circumdatum transiens; asci glomerati, peridio destituti nec ut in *Rollandina* glomerulos formantes; asci globosi; sporae unicellulares, hyalinae.

Narasimhella poonensis Thirum. and Mathur. sp. nov.

Colonies on glucose- yeast agar white at first, spreading, with radial furrows, mycelium hyaline, septate. Fruiting bodies first appearing as pinnotes, growing upwards, upto 10 mm, high, stipitate, with irregularly globoid fertile portion, 5 to 8 mm, in diameter. Stipe firm, composed of compactly grouped hyphae, which continue upwards in the fruiting body to form a central sterile core of radiating hyphae connecting the marginal groups of asci. Ascigerous layer restricted to the margin of apical portion, composed of groups of naked asci, peridial envelopes lacking. Asci thin-walled, $7.5-12 \times 6-9 \mu$, 8-spored. Ascospores with orange-yellow contents, lenticular, ridged, 4.5 to 5.5 μ in diameter, smooth.

Hab. Isolated from soil. Poona. Leg. M. J. Thirumalachar, Aug. 1962, H.A.C.C. 171 type. Type culture deposited in Culture Collections, I.A.R.I. New Delhi, Centralbureau voor Schimmelcultures, Baarn, Holland, American Type Culture Collections, Rockville, Md., U.S.A. and C.M.I., Kew, England.

Caespites in agar glucoso-fermentaceo primo albidiae, divergentes radio-sulcati; mycelii hyphae hyalinae, septatae; fructificationes primo minute punctiformes, mox sursum usque ad 10 mm accrescentes, stipitatae, superne globoso-incrassatae, ibique 5—8 mm diam.; stipes crassiusculus ex hyphis dense congestis convolutisque, superne in nucleum centralem transientibus, radio-ordinatis, ascorum acervulos marginales conectentibus compositus; stratum ascigerum in apice tantum ad marginem evolutum, ex acervulis minutis ascorum nudorum peridio carentium compositum; asci tenuiter tunicati, $7.5-12 \times 6-9 \mu$, 8-sporei, subglobosi; sporae plasmate aurantiaco-lutescenti farctae, lenticulares regulariter unicosatae, leves, 4.5—5.5 μ diam.

Cultural characters of the fungus were studied on several media. On glucose yeast agar and potato dextrose agar the growth is quite rapid. The fruiting bodies are developed as irregular crusts due to crowding. When they are dissected out individually, the stipe and the fertile head portion can be seen. On Czapeks agar, the mycelial growth is abundant, but the development of fruiting structures is less pronounced. The optimum temperature for growth was determined to be about 28° C.

Sexual reproduction preceding the development of ascospores was studied both in microtome sections of the fruiting body as well as in teased microscopic preparations which were stained. After the initial development of the young fertile head portion, the differentiation of the male and female structures become demarcated from the parent hyphae. They are borne as lateral branches either on the same hypha or develop on

different hyphae. The two branches are juxtaposed, and the branch developing into ascogonium grows rapidly and coils round the antheridial branch. The ascogonial branch coils clockwise or anticlockwise (Figs. 6 to 11). The antheridial branch so encircled by the ascogonial branch becomes club-shaped, broader at the apex. Both sex organs may get separated off from their parent hyphae by septa at the base. The ascogonium becomes septate and multicellular. Though cytological aspects of fertilization and nuclear fusions have not been observed, the occurrence of pores connecting the antheridium and ascogonial cells were seen in microtome sections (Figs. 13 & 14).

The development of the ascus from the ascogenous hyphae follows the formation of the crozier (Figs. 15 to 20). Secondary croziers are formed from the fusion cell, and by repeated process, results in the formation of cluster of asci. The penultimate cell which produces a pouch-like growth, is binucleate, and the two dicaryons fuse to form the syncaryon. By further development 8 ascospores are formed (Figs 4—5 & 21—26).

The clusters of asci formed lie interspersed within the hyphal weft, and there is no specialised hyphal envelope. The ascospores are liberated by the dissolution of the wall of the ascus, which leaves the ascospores in a mass.

The writers wish to express their thanks due to Dr. F. Petrak for rendering the Latin diagnosis.

Literature cited.

- Benjamin, R. K. (1956): A new genus of the *Gymnoascaceae* with a review of the other genera. *El Aliso*, 3: 301—328.
 Patouillard, M. N. (1905): *Rollandina*, nouveau genre de Gymnoasces. *Bull. Soc. Myc. France*, 21: 81—83.

Explanation of Figures.

Plate XXXVI.

- Fig. 1. Mature stalked fruiting body $\times 20$. — 2. Section of fertile head-portion showing ascigerous layer at periphery. $\times 50$. — 3. Some hyphae of the stalk. $\times 750$. — 4. Ascus $\times 1500$. — 5. Ascospores $\times 1500$.

Plate XXXVII.

- Figs. 6—11: Young sex organs. $\times 1500$. — 12—14. Sex organs in sections. $\times 2500$. — 15—20. Stages in Crozier formation. $\times 1500$. — 21—25. Stages of ascus development $\times 2500$. — 26. Ascospores $\times 2500$.

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