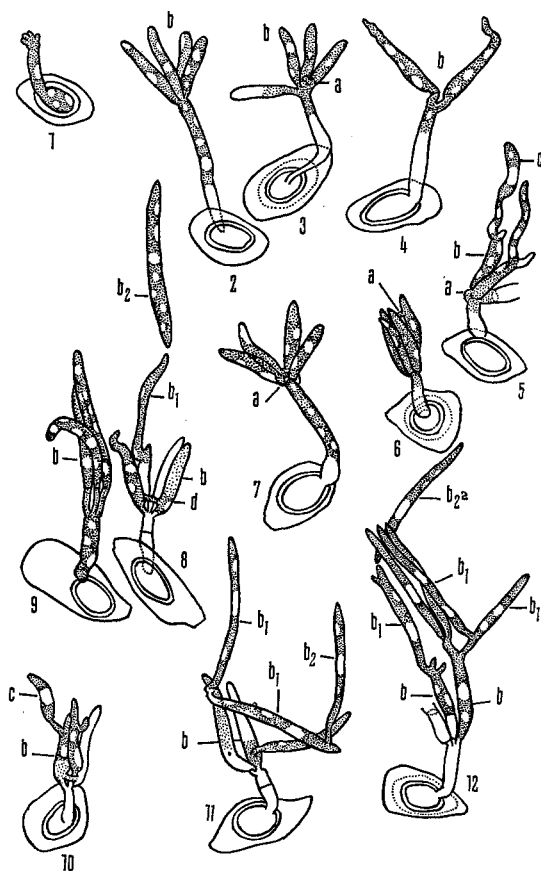


Repeating Sporidia in *Jamesdicksonia obesa* (Ustilaginales)¹

The smut fungus *Jamesdicksonia obesa* (THIRUMALACHAR et al.²) inciting tar-like follicular encrustations of *Dicanthium annulatum* Stapf. was collected from a seriously affected pasture land in Daulatabad (Maharashtra) in January 1966. Studies on the germination of the teliospores revealed the unique phenomenon of repeating sporidia with the formation of secondary and even tertiary crops of sporidia by this fungus which is unknown in the Ustilaginales. A brief report of this interesting phenomenon is made in this paper.

Materials and methods. Teliospores obtained by scrapings from mature sori were germinated in condensed water according to the technique described by THIRUMALACHAR³, stained with cotton blue and mounted in lactophenol.

Results. Teliospores from mature sori germinate without dormancy, within 48 h. The promycelium emerges through 1 min crack in the inner layer of the epispore piercing the outer gelatinous layer (Figure 1) usually in the form of a stout unbranched tube of varying length (12.5–57.6 μ) possessing a width of approximately 4 μ . The promycelium is usually single celled, rarely 2 celled and produces at its tip primary sporidia on short cylindrical sterigmata (Figure 2). The primary sporidia are cylindrical, thick, 3–4 in number (Figures 2 and 3) rarely 2 (Figure 4). The primary sporidia pair in situ through the development of copulation bridges (Figure 3a) produced generally near the base, rarely further up (Figure 6a).



Jamesdicksonia obesa. (1) Teliospore producing a promycelium; (2 and 3) promycelium with 4 sporidia; (4) promycelium with 2 sporidia; (5) copulation bridges between primary sporidia; (6) copulation bridge produced at the distal end; (7–12) repeating sporidia with secondary and tertiary crops of sporidia. a, copulation bridges; b, primary sporidia; b₁, secondary sporidia; b₂, tertiary sporidia; c, crescent-shaped conidia.

With the formation of 3 sporidia, 1 of them copulates with the promycelium of the mother spore (Figure 5). After pairing, one of the pairs starts disintegrating and the other germinates producing either a short crescent-shaped conidium (Figures 5c and 10c) or a long tubular secondary sporidium (Figure 11 b₁). Both conidia and secondary sporidia were di-karyotic as revealed in cytological preparations. The primary sporidia were invariably mono-karyotic haploid.

A unique mode of repeating sporidia has been observed. The secondary sporidium at one or more places gives rise to long cylindrical sporidia at the end of short cylindrical sterigmata (Figures 11 and 12 b₁). These secondary sporidia thus formed may in turn give rise to a tertiary crop of sporidia in the same manner while still attached to the mother sporidium (Figures 8, 11 and 12 b₂). The secondary and tertiary sporidia are much longer and more acicular (18–40 μ) than the primary sporidia (14–25 μ) and can be clearly distinguished morphologically.

The primary sporidia are persistent and have not been observed to separate from the mother promycelium. The conidia and secondary sporidia, on the other hand, are forcibly abjected. This phenomenon of repeating sporidia is not apparently influenced by any special environmental conditions like temperature and nutrition and could be observed at different temperatures and nutrient media.

Discussion. The phenomenon of repeating sporidia and consequent production of secondary and tertiary crops of sporidia has not so far been reported in any smut fungus and is a unique feature of *Jamesdicksonia obesa*. It is also significant that the primary sporidia could be clearly distinguished from the secondary and tertiary sporidia in respect of habit, morphology, dimensions and even nuclear status.

Such a phenomenon designated as repeating conidia has been reported in members of the entomophthorales in the genera *Entomophthora*, *Conidiobolus* and *Basidiobolus* by DRECHSLER⁴ and recently by SRINIVASAN and THIRUMALACHAR⁵ and in the genus *Repitobasidium* (Hobasidiomycetes) by ERIKSSON⁶, the latter being known as 'repeating basidia'.

Observations made by the writer are contradictory to the original report by THIRUMALACHAR et al.², who observed the formation of 4–8 sporidia by a single promycelium and failure of pairing between primary sporidia⁷.

Zusammenfassung. Erstmals wird bei einem Getreidepilz, *Jamesdicksonia obesa*, beobachtet, dass die Primärsporidien ungeschlechtlich kopulierend halbmondförmige Konidien oder eine gleichbleibende Zweit- und Drittgeneration von Sporidien erzeugen.

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² M. J. THIRUMALACHAR, M. S. PAVGI and M. M. PAYAK, *Mycologia* 52, 475 (1960).

³ M. J. THIRUMALACHAR, *Indian bot. Soc.* 19, 71 (1940).

⁴ C. DRECHSLER, *Mycologia* 57, 913 (1965).

⁵ M. C. SRINIVASAN and M. J. THIRUMALACHAR, *Mycologia* 59, 698 (1967).

⁶ J. ERIKSSON, *Symb. bot. ups. l.* 16, (1958).

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