

Some new or interesting graminicolous *Melanotaenium* species from India.

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With Plate III.

1. A leaf-smut disease of *Paspalum geminatum*

Paspalum geminatum Stapf. is a grass commonly growing in humid low-lying situations. An interesting leaf-streak disease incited by a smut was collected at Pimpri during September and October. The symptoms incited appear as elongated, non-erumpent, dull grayish-black streaks, 0.5–2 mm. wide and 1–3 cm. long. The streaks which are often discrete and well separated become confluent at times to form large diffuse patches extending over a considerable area on the leaf surface. Besides leaves, the fungus incites small diffuse infection patches on the flowering shoot. These when numerous and closely set impart a blackish tinge to the entire inflorescence stalk (Fig. 1). However, floral infection has not been observed.

Microscopic examination of the infected parts reveals the presence of numerous closely packed dark-brown chlamydospores distributed chiefly in the parenchyma cells surrounding the vascular bundles. The chlamydospores are subglobose to spherical with a hyaline hyphal appendage in some cases (Fig. 2), reddish-brown in mass and measure $8.8-15.5 \times 8.5-14.5 \mu$. They germinate in water in 36–48 hours forming a promycelium which developed a terminal whorl of sporidia (Fig. 3).

Regarding the identity of the fungus, it needs to be compared with *Entyloma speciosum* Schroet. & Henn. recorded in India by Thirumalachar and Pavgi (1952) on *Paspalum flavidum* A. camus. They however pointed out that the dark brown colour of the chlamydospores to be a character more in agreement with *Melanotaenium* than *Entyloma*. In the present study, the smut on *P. geminatum* appears more allied to *Melanotaenium brachiariae* Viegas in its spore measurements and germination. *M. brachiariae* has been recorded on *Brachiaria distachya* Stapf. by several workers in India. (Mundkur and Thirumalachar, 1952). The fungus is presented as a new variety of *M. brachiariae* to indicate the minor differences in symptoms and spore measurements.

Melanotaenium brachiariae Viegas var. *paspalidii* var. nov.

Sori in leaves, leaf-sheaths and flowering shoots, inciting formation of elongated, non-erumpent coalescing streaks on leaves and diffuse

dull gray patches on flowering shoot; chlamydospores intercellular in mesophyll grouped around the vascular bundles and angular due to mutual compression, globoid, subglobose to angular with a hyphal appendage in some cases, reddish-brown, $8,8-15,5 \times 8,5-14,5 \mu$.

Sori foliicoli et culmicoli, in foliis strias plus minusve elongatas, tectas, saepe confluentes, in culmis maculas obscure griseas efficientes; chlamydosporae in mesophyllo circa fasciculos vasorum evolutae, globosae vel subglobosae, e mutua pressione plus minusve angulosae et irregulares, rubescenti-brunneae, $8,8-15,5 \times 8,5-14,5 \mu$.

Hab. On *Paspalum geminatum* Stapf. Pimpri, Poona, 9-10-1956 (Type).

2. A new leaf smut disease of *Apluda aristata* L.

On leaves of *Apluda aristata* L. a leaf smut was collected in the vicinity of Yercaud, which on examination proved interesting. Infection appears as small, linear to rectangular dull gray non-erumpent spots with a pale-yellow peripheral zone. The spots are 3-6 mm. long and 1-4 mm. wide and often due to mutual coalescence appear irregular. Microscopic examination shows numerous closely aggregated intercellular chlamydospores in the mesophyll. Individual chlamydospores are angular to subglobose, thick-walled, dark-brown, $7,5-15 \mu$ (with a mean of $11,4 \mu$).

A comparison with other *Melanotaenium* species has indicated that the fungus is undescribed.

Melanotaenium apludae Thirum. & Srinivasan sp. nov.

Sori in leaves as discrete linear or rectangular dull gray non-erumpent spots 3-6 mm long and 1-4 mm wide often becoming irregular through confluence. Chlamydospores dark brown, thick-walled, angular to subglobose, $7,5-15 \mu$.

Sori in foliis maculas lineares vel angulares, obscure griseas, tectas, 3-6 mm. longas, 1-4 mm. latas, saepe confluentes, tunc plus minusve irregulares efficientes; chlamydosporae obscure brunneae, subglobosae, saepe plus minusve angulosae, $7,5-15 \mu$ diam., episporio crasso.

Hab. On *Apluda aristata* L. Yercaud (South India) 11-1-1957. (Type).

3. A leaf-gall inciting *Melanotaenium* on *Sporobolus* sp.

On a patch of *Sporobolus tremulus* Kunth plants growing at Vadgaon, Bombay State, an interesting leaf spot inciting smut disease was collected during the months of July and August. Infection appears as minute, black, tar-like pustules on the under-surface of the leaves. 2-5 mm in diameter, raised and covered by a thin-membrane (Fig.4). Rupture of the covering membrane at maturity releases the chlamydospores in an agglutinated mass.

Early stages of infection appear in the form of pale-pinkish streaks at the centre of which the smut pustule develops. When

examined by sectioning the differentiation of intercellular chlamydo-spores is observed (Fig. 5). Mature chlamydospores are commonly found aggregated in small groups, globose or somewhat angular due to mutual compression, smooth, thick-walled, $11-17 \times 10.5-14.5 \mu$ (Fig. 6). The chlamydospores germinate in water after 72-96 hours developing a promycelium on which 6-8 sporidia are formed (Fig. 7).

The fungus is an undescribed species of *Melanotaenium* which is named as *M. sporoboli*. Ramakrishnan and Sundaram (1954) studied a smut on *Sporobolus wallichii* and referred it to *Tolyposporella sporoboli* Jackson. Comparative studies with this material indicates that fungus is identical with the species under study and should be referred to *Melanotaenium sporoboli*.

Melanotaenium sporoboli Thirum. & Srinivasan, sp. nov.

Sori in leaves, grayish-black, warty, pustular, 2-5 mm in diameter and enclosed by a covering membrane, chlamydospores intercellular, released as agglutinated mass at maturity, brownish-black, thick-walled, globose or somewhat angular, smooth, $11-17 \times 10.5-14.5 \mu$, germinating by promycelium with 6-8 apical sporidia.

Sori in foliis pustulas griseo-nigrescentes, verruciformes, 2-5 mm diam. metientes, membrana propria inclusas efficientes; chlamydospores intercellulares, postea in massulas irregulares conglutinatae, $11-17 \times 10.5-14.5 \mu$, germinatione promycelium sporidiis apicalibus 6-8 ornatum protrudentes.

Hab. On *Sporobolus tremulus* Kunth. Vadgaon, Bombay State, 11-7-1957.

In conclusion the authors wish to express their gratitude to Prof. Dr. Franz Petrak for kindly giving the Latin diagnosis of the new species.

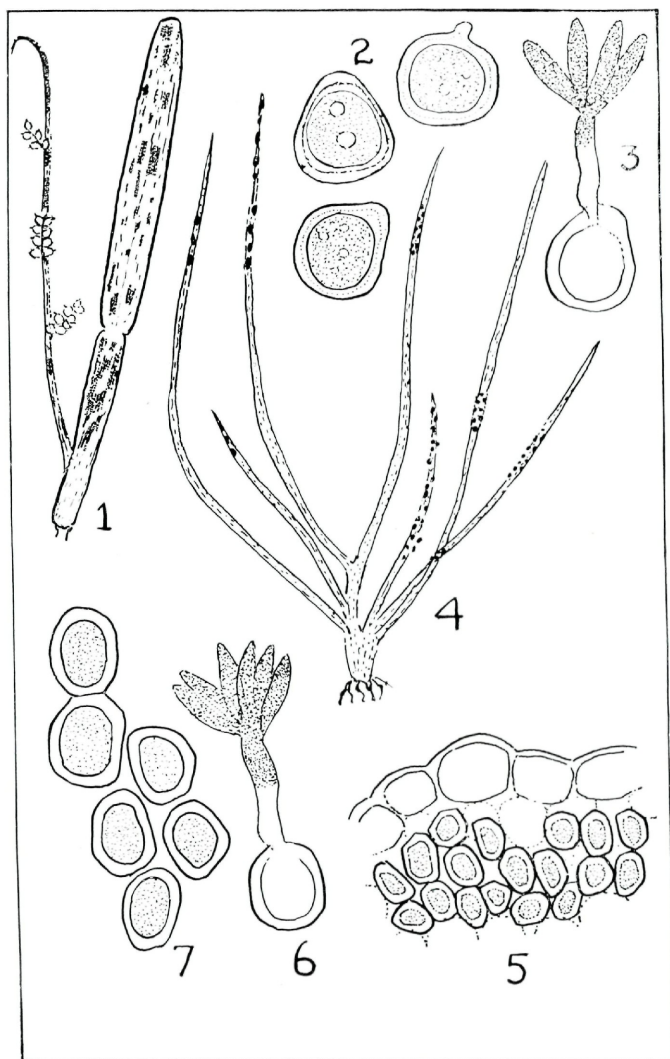
Literature cited.

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 Ramakrishnan, T. S. and N. V. Sundaram, 1954. Additions to Fungi of Madras XXI. Proc. Indian Acad. Sci. 'B', 40: 17-23.
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Explanation of Plate III.

Figs. 1-3: *Melanotaenium brachiariae* var. *paspalidi*. — 1: Symptoms on leaves and flowering shoot of *Paspalidium geminatum* ($\times \frac{3}{4}$). — 2: Chlamydospores ($\times 950$). — 3: Germination of chlamydospore ($\times 950$).

Figs. 4-7: *Melanotaenium sporoboli*. — 4: Symptoms on *Sporobolus tremulus* ($\times 1$). — 5: Showing intercellular chlamydospore formation ($\times 450$). — 6: Mature chlamydospores ($\times 950$). — 7: Germination of chlamydospore ($\times 950$).



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