Some new or interesting graminicolous Melanotaenium species from India.

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With Plate III.

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

Paspalidum 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 × 8,5—14,5 μ. 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 *Paspalidum 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 symtoms 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—15,5×8,5—14,5 μ.

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—15,5×8,5—14,5 μ.

Hab. On *Paspalidum 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 μ (with a mean of 11,4 μ).

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 μ.

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 μ 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 chlamydospores 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 × 10,5—14,5 μ (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 × 10,5—14,5 μ, germinating by promycelium with 6—8 apical sporidia.

Sori in foliis pustulas griseo-nigrescentes, verruciformes, 2—5 mm diam. metientes, membrana propria inclusas efficientes; chlamydosporae intercellulares, postea in massulas irregulares conglutinatae, 11—17 × 10,5—14,5 μ, 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.

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Explanation of Plate III.

Figs. 1—3: *Melanotaenium brachiariae* var. *paspalidi*. — 1: Symptoms on leaves and flowering shoot of *Paspalidum geminatum* (× ¾). — 2: Chlamydospores (× 950). — 3: Germination of chlamydospore (× 950).

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