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1. Mouchacca, P. J., *Revue de Mycol.*, 1973, 38, 102.

USTILAGO CONSIMILIS SYDOW— A NEW RECORD FROM MANIPUR

DURING a visit to Imphal in October, 1975, a species of Smut Fungus, parasiting on the inflorescence axis of *Narenga porphyrochroma* (Hance) Bor (*Poaceae*), was collected from Kongba Khetri Leikai, Imphal, Central Manipur District, Manipur. The disease manifests itself as a markedly hypertrophied portion, 0·6–1 cm. in diameter, at the apex of the culm just above the last node, completely checking further development of the inflorescence. Sori, completely destroying the inflorescence and part of the axis, are being covered by the leaf sheath partly, 2–3 in number, pseudo-membranous, which later flasks away after drying up of the culm exposing sooty black spore masses partly. Columella, 0·3–6 cm. in diameter, tapering upwards or quite long as the sorus.

Some of these spores on being examined microscopically in a drop of distilled water and by Ellis Method (cited from Chamberlain[2]) revealed a species of *Ustilago*, spores being spherical to elliptical in shape; spore chestnut brown in colour, 3·5–6·5 μ in diameter; expore, thick with smooth surface; endospore thin and delicate. The pathogen has been deposited at C.M.I., Kew, England (IMI—199505) and indentified as *Ustilago consimilis* Sydow. The germination potential of the spores was studied by employing methods described earlier[2, 3, 6, 7] but failed to germinate. Ainsworth and Sampson[1] indicate factors which may be of considerable practical importance in germination studies. Duran and Safeeulla[3] state—"Although smut spores are generally considered to germinate failrly readily on agar media, optimum conditions vary from species to species". Mordue and Johnston[4] stated that smut spores should reach full maturity on host plant otherwise only a low proportion of viable spores can be expected. A perusal of literature revealed *N. porphyrochroma* is a new host of *U. consimilis*[5] and hence a new record for Manipur.

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1. Ainsworth, G. C. and Sampson, K., *The British Smut Fungi*, C.M.I., Kew, England, 1950, p. 137.
2. Chamberlain, C. J., *Methods in Plant Histology*, 5th Edition, University of Chicago Press, Chicago, Illinois, 1932, p. 266.
3. Duran and Safeeulla, *Mycologia*, 1968, 60, 231.
4. Mordue and Johnston, Personal Communication, 1976.
5. Mundkur, B. B. and Thirumalachar, M. J., *Ustilaginales of India*, C.M.I., Kew, England, 1952, p. 26.
6. Ramalingam, A. and Rati, E., *Curr. Sci.*, 1974, **43**, 60.
7. Thirumalachar, M. J., *J. of Indian bot. Soc.*, 1940, **19**, 71.

MICROSPOROGENESIS AND MALE GAMETOPHYTE IN *CYNODON DACTYLON*

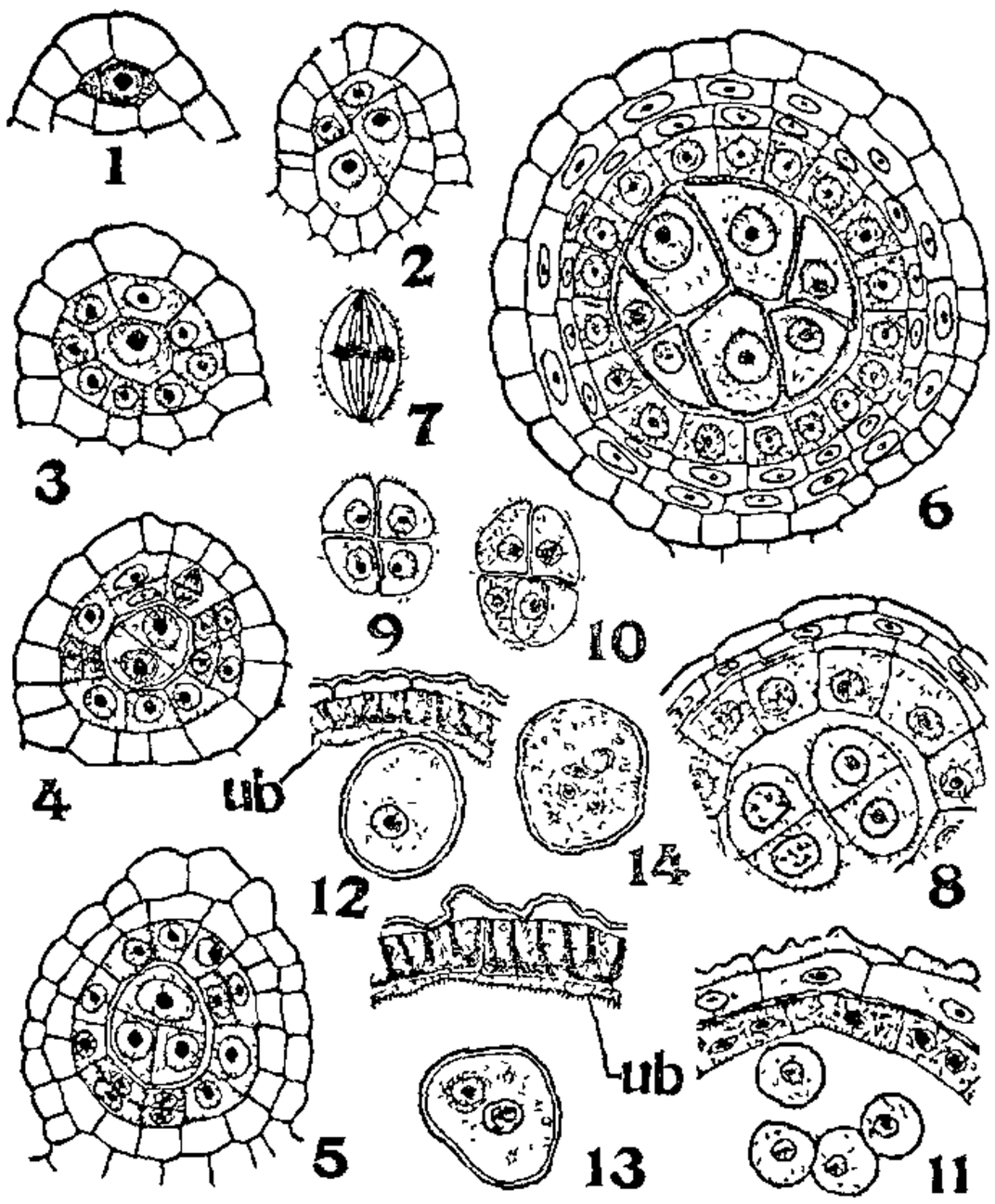
THE spikelets of *Cynodon dactylon* were fixed in FAA and pretreated with 10% of HF before processing for microtomy. The anther is tetrasporangiate. A hypodermal archesporial cell differentiates in microsporangium (Fig. 1). Sometimes, a plate of archesporial cells may be seen (Fig. 2). The mode of anther wall development (Figs. 2–6, 8, 11–13) is of the monocotyledonous type (Batygina[1]). During development the endothecium develops lignin thickenings in the form of finger-like projections from the base towards apex and also free from each other (Figs. 12, 13). It is, therefore, of grass type (Untawale and Bhasin[3]).

The tapetum is of secretory type, single-layered and the nuclei in some of the cells divide mitotically forming two nuclei (Figs. 8, 11). In a mature anther, the cells of the tapetum persist as a thin band adhering to the inner wall of the endothecium. These cells develop Ubisch bodies on their tangential walls (Figs. 12, 13).

The primary sporogenous cells give rise to microspore mother cells after undergoing one or two divisions (Fig. 6). These cells round off and undergo successive meiotic divisons (Figs. 7–10) resulting only in isobilateral and decussate tetrads (Figs. 9, 10). Unlike the condition in *Eleusine africana* where all types of tetrads are described (Mahalingappa[2]). A thin layer of callose which is present around the microspore mother cell disappears by the time microspores are formed (Figs. 6–11).

The male gametophyte is somewhat round in shape with a smooth thin exine and a thin intine and the nucleus is lying towards a side due to the presence of

a vacuole (Fig. 12). As the pollen grain develops further the nucleus divides forming a large vegetative cell (Fig. 13). Later, the generative cell divides forming two small male cells which are round in shape (Fig. 14). Meanwhile, the vegetative nucleus loses its shape and takes dark stain showing signs of degeneration. The pollen grains are shed at 3-celled stage.



FIGS. 1–14. T.S. of anther. Fig. 1. An archesporial cell. Fig. 2. A plate of archesporial cells. Fig. 3. Sporogenous cell surrounded by primary parietal layer. Fig. 4. Periclinal division of primary parietal layer. Fig. 5. Periclinal division of inner secondary parietal layer. Fig. 6. Microspore mother cells surrounded by wall layers. Fig. 7. Microspore mother cell at metaphase. Fig. 8. Dyads; note prominent tapetum and the degenerating middle layer. Figs. 9, 10. Isobilateral and decussate tetrads. Fig 11. Microspores with binucleate tapetal cells. Figs. 12, 13. One- and two-celled pollen grains; note lignaceous thickenings. Fig. 14. 3-celled pollen grain (All figures, × 320).

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1. Batygina, T. B., Teriokhin, E. S., Alimova, G. K. and Yakovlev, M. S., *Bot. Zh., Kyyiv*, 1963, **48**, 1108.
2. Mahalingappa, M. S., *Embryological Studies in Some Members of Gramineae*, Ph.D. Thesis, Karnatak University, Dharwad, India, 1976.
3. Untawale, A. G. and Bhasin, R. K., *Curr. Sci.*, 1973, **42**, 398.

THANATEPHORUS CUCUMERIS, CAUSING DAMPING-OFF AND COLLAR ROT IN SUNFLOWER

DURING July–August 1977, large number of sunflower seedlings were observed to die due to root and collar rot, at G. K. V. K. Campus Farm of the University of Agricultural Sciences, Bangalore. In certain patches the germination was affected; a close observation of such patches revealed seed decay and pre-emergence damping-off. Where disease occurred on young seedlings a clear girdling and rotting of the basal portions of the stem at the collar region was noticed. Such plants collapsed and died. Isolations from the affected portions of the diseased seedlings yielded consistently a fungus with non-sporulating, septate, buff cottony mycelium. The fungus was pathogenic to sunflower and produced similar symptoms when inoculated artificially. Isolations from these inoculated plants yielded the same fungus. The pathogen was identified as *Rhizoctonia* state of *Thanatephorus cucumeris* (Frank) Donk and the culture is deposited in CMI (IMI 223515).

There are reports of *Rhizoctonia bataticola* infecting sunflower from India and abroad. However, there is no report of the occurrence of *R. solani* (Imperfect state of *Thanatephorus cucumeris*) on sunflower from India and this constitutes first record.

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OBSERVATIONS ON THE PACHYTENE CHROMOSOMES OF *SOLANUM INDICUM* VAR. *MULTIFLORA*

AMONG the spinous Solanums, many of which are of economic importance[1,2], only a few have been subjected to cytological analyses[3–8]. Studies were therefore initiated in this direction and our observations