

## Notes on some Indian Ustilagineae - X.

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Since the publication of previous paper (Sydowia 1967), several new collections of smut fungi have been made in several places in India, and an account of these studies are presented here. The type material of the new species have been deposited in Herb. Crypt. Orient., New Delhi, Herb. C. M. I., Kew England, and Mycology Division of Plant Industry Station, Beltsville, Maryland, U.S.A. The authors wish to express their deep gratitude to Dr. F. Petrak for kindly giving us the Latin diagnoses of new species described in this paper.

1. *Sphaelotheca arthraxonis* (Pat.) Zundel in Ustilaginales of the world, Penn. State College P. 140, 1953.  
Syn. *Ustilago arthraxonis* Pat. in Jour. Bot. (Paris) 11, 346, 1897.  
*Sphaelotheca arthraxonis* Mishra, Mycologia 49, 259, 1957.  
Hab. in the inflorescence of *Arthraxon lancifolius* Hochst., Musorie, Uttar Pradesh, 28th Oct., 1955, leg. M. S. Pavgi No. 1247. Figs. 1—3.
2. *Sphaelotheca inayati* (Syd. & Butler) Mundkur & Thirum. Lloydia 13, 172, 1950, and Ustilaginales of India, C. M. I., p. 16, 1950.  
Hab. in ovaries of *Iseilema prostratum* Anders. at Rajatalab, Banaras, 28 Nov., 1955, leg. M. S. Pavgi, 1248. Figs. 7—9.
3. *Sphaelotheca furcata* (Pat. & Har.) Maire in Zundel, Ustilaginales of the world, Penn. State College, p. 92, 1953.  
Syn. *Ustilago furcata* Pat. & Har. in Jour. Bot. (France), 14, 530, 1900.  
Hab. In ovaries of *Ischaemum* sp. at Castle Rock, S. Kanara, leg. K. M. Saifeeulla No. 1249 Figs. 10—12.
4. *Sphaelotheca chrysopogonicola* Mundkur. & Thirum. in Myc. Paper No. 40 C. M. I., p. 2, 1951.  
Hab. in the inflorescence of *Chrysopogon acicularis* Trin. Leg. H. C. Govindu, Patna, Bihar, Dec. 1, 1952, Figs. 4 to 6.
5. **Thecaphora spermacoces** Thium. & Pavgi sp. nov.  
Sori in the ovaries, destroying all of them in the inflorescence forming slightly hypertrophied, ovate, pinkish brown bodies, upto 1 mm

in diameter, half-covered by the persistent glumes and styles over the ovaries, enclosing dusty, coal black spore mass. Mature spore balls globoid, cinnamon brown, containing 5 to 12 spores in each ball, 28.6 to 40  $\mu$  in diameter with a mean of 34  $\mu$ . Spores pale cinnamon brown, globose to polyhedral and measuring 14.3 to 23  $\mu$  in diameter with a mean of 18.2  $\mu$ . Episporae medium thick, smooth and bearing a tuft of aciculate processes at the free end. Spores within the ball semi-polygonal and smooth.

In the ovaries of *Spermacoce hispida* Linn. at Pimpri, Poona, 8th October, 1955. Leg. M. J. Thirumalachar. No. 1251 (Type) (Figs. 13 to 15).

Sori plerumque ovaria inflorescentiae omnia occupantes eaque sub-hypertrophice deformantes, tunc ovoidei, roseolo-brunnei usque ad 1 mm diam., glumis et stylis persistentibus semitecti; sporarum maturarum globuli cinnamomei, e sporis 5—12 compositi, 28.6—40  $\mu$ , plerumque ca. 34  $\mu$  diam.; sporae exteriores singulae pallide cinnamomeae, globosae vel angulosae, 14.3—23  $\mu$ , plerumque ca. 18.2  $\mu$  diam., episporio crassiusculo, levi, in apice libero caespitulo appendicularum aciculiformium praedito; sporae interiores semipolygonales, leves.

#### 6. *Ustilago pimprina* Thirum. & Pavgi sp. nov.

Sori infecting most of the ovaries in panicle, completely destroying them and forming minute inconspicuous, dirty green, slightly hypertrophied bodies, less than half mm., half-covered by the outer glumes, rupturing irregularly to expose brownish black powdery spore mass. Mature spores reddish brown, globose to subglobose, oval and measuring 10 to 14.3  $\mu$  in diameter with a mean of 11.7  $\mu$ . Episporae thick and densely verrucose.

In the ovaries of *Arundinella* sp. at Pimpri, Poona, in October, 1958, leg. M. J. Thirumalachar. No. 1252 (Type) (Figs. 16—18).

Sori ovaria paniculae plurima occupantes, saepe omnino destruentes et in corpuscula obscure viridula, vix  $\frac{1}{2}$  mm diam., metientia hypertrophice deformantia, glumis exterioribus semitecti, postea irregulariter disrumpentes et sporarum massam pulverulentam brunneo-atram ostendentes; sporae maturae globosae, subglobosae vel ovoideae, brunneae 10—14.3  $\mu$ , plerumque ca. 11.7  $\mu$  diam., episporio crassiusculo, dense verruculoso praeditae.

#### 7. *Entyloma chloridis* Thirum. & Pavgi sp. nov.

Sori in the leaves and leaf sheaths appearing as purplish-black linear streaks along the veins, often coalescent to form patches, 0.5—5 mm long, slightly raised. Spores chiefly in the mesophyll as globoid masses. Mature spores dark olive brown, globose to subglobose, oval, often irregularly polyhedral and measuring 10 to 14.3  $\mu$  in diameter

with a mean of 10.6  $\mu$ . Episporae thick and smooth but having two to three blunt pyramidal processes.

In living leaves of *Chloris barbata* Sw. at Pimpri, Poona; 8 October, 1955. Leg. M. J. Thirumalachar. No. 1253 (Type) (Figs. 19—22).

Sori in foliis earumque vaginis secus nervos strias lineares, purpureo-nigrescentes, saepe confluentes, parum prominulas, 0.5—5 mm longas, formantes; sporae imprimis in mesophyllo acervatim ortae, in maturitate obscurae olivaceae, globosae, subglobosae vel ovoideae, saepe irregulariter angulosaee, 10—14.3  $\mu$ , plerumque ca. 10.6  $\mu$  diam.; episporio levi crassiusculo, verruculis 2—3 obtuse pyramidalibus praedito.

8. *Melanotaenium brachiariae* Viegas var. **montanae**  
Thirum. & Pavgi var. nov.

Sori in the leaves and leaf sheaths, forming blackish linear streaks, 0.5 to 1 mm long, often coalescent to form spots. Spore masses in the mesophyll surrounding the vascular tissues forming an irregular sheath. Mature spores pale olive brown, irregularly globoid to polyhedral and measuring 5 to 12.9  $\mu$  in the diameter with a mean 8.8  $\mu$ . Episporae thick and smooth.

In the living leaves and leaf sheaths of *Panicum montana* Roxb. at Parasnath, Bihar; on 25th February, 1955. Leg. A. S. Yadav. No. 1254. (Type) (Figs. 23 to 25).

Sori in foliis earumque vaginis strias lineares, nigrescentes 0.5—1 mm longas formantes, saepe confluentes, tunc maculas efficientes; sporae in mesophyllo vasorum fasciculos cingentes et quasi vaginam irregularem formantes; sporae in maturitate pallide olivaceae, irregulariter globosae vel polyedricae, 5—12.9  $\mu$ , plerumque ca. 8.8  $\mu$  diam.; episporio crassiusculo, levi.

9. *Melanotaenium oreophilum* Sydow in Ann. Mycol. 33: 367, 1935; in Mundkur Sci. Monogr. I. C. A. R. 12: 17, 1938; in Mundkur and Thirumalachar Ustilaginales of India, C. M. I. pp. 71, 1952.

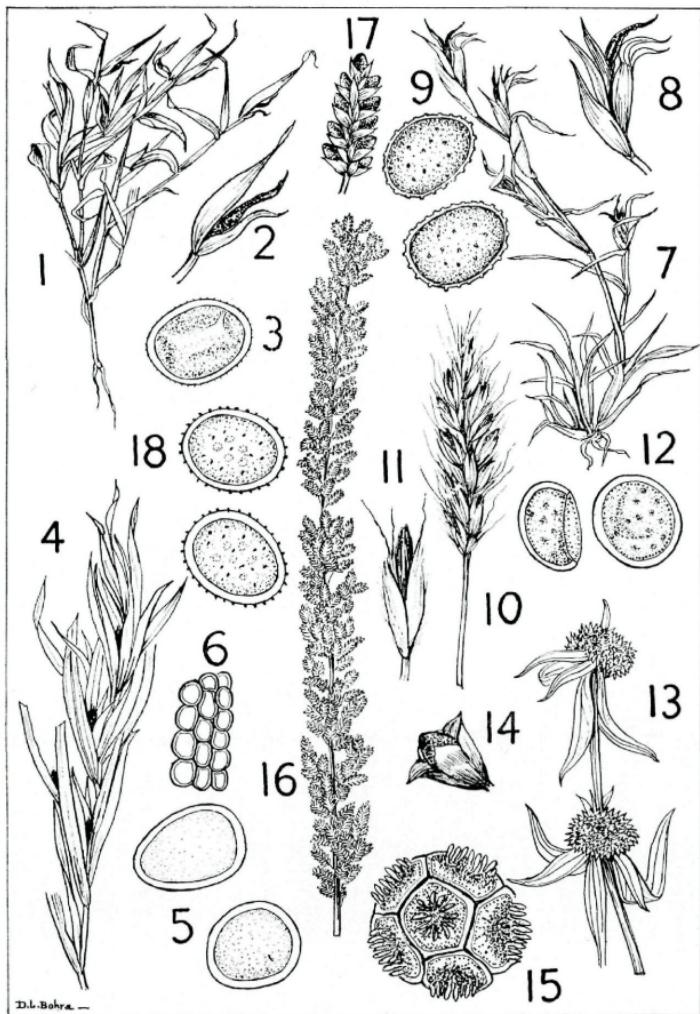
In the stem and fronds of *Selaginella* sp. at Mussoorie, U. P. on 27 October, 1955. Leg. M. S. Pavgi. No. 1257; at Khandala, Poona; September, 1955. Leg. M. J. Thirumalachar. No. 1258.

10. *Tilletia vittata* (Berk.) Mundkur. Brit. Mycol. Soc. 24, 321, 1940. Syn. *Ustilago vittata* Berk. In Gard. Chron. 1853, p. 148, 1853.

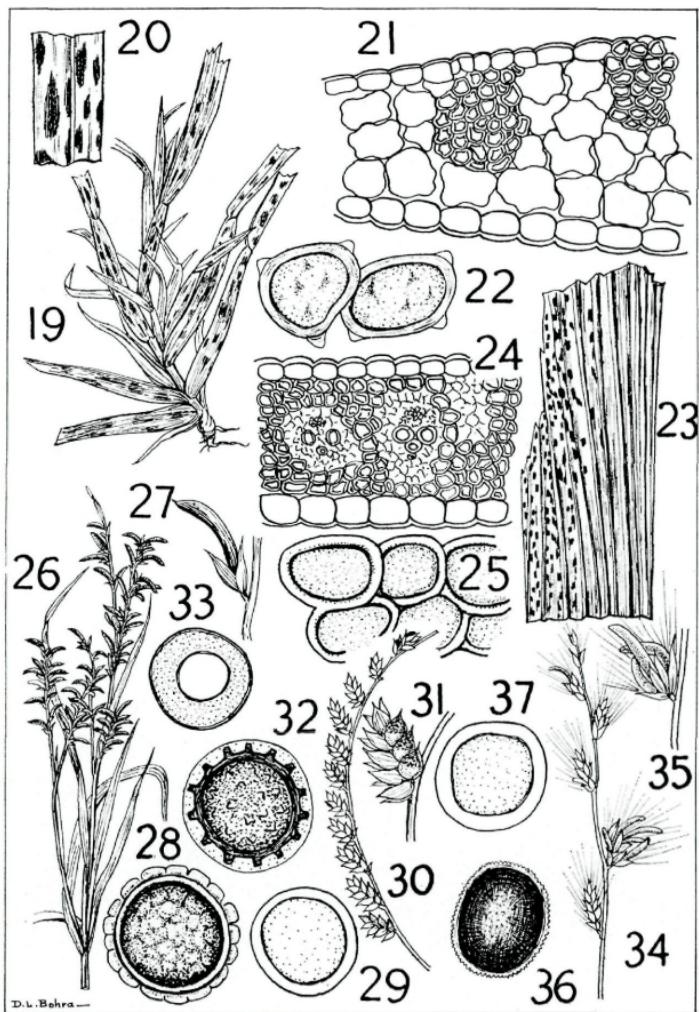
Hab. in ovaries of *Oplismenus burmanii* Beauv., Banaras, U. P. Leg. M. S. Pavgi, 12th Nov., 1956, No. 1255. Figs. 34—37.

11. *Tilletia oplismeni-cristati* Pat. & Har., apud Duran and Fischer. The genus *Tilletia*, Washington State Univer. 1961, p. 87—88.

Sori destroying the ovaries, producing long, purplish-grey, horn-like curved, brittle bodies, 3 to 5 mm  $\times$  1 mm, most of the ovaries in a panicle infected. Mature spores dark olive brown, subspherical to glo-









bose, oval, opaque and measuring 14.3 to 16  $\mu$  in diameter with a mean of 15.5  $\mu$ . Epispore thick and ornamented with hyaline to pale yellowish, crenate, scaly (pyramidal) processes upto 1.5  $\mu$  long. Sterile cells numerous, hyaline to tinged yellow, oval to globoid, smooth and measuring 11.5 to 16  $\mu$  in diameter.

In the ovaries of *Digitaria royleana* Prain at Mussoorie, U. P. on 29 October, 1955. Leg. M. S. Pavgi. No. 1256 (Figs. 26 to 29).

#### 12. *Tilletia leptochloae* Thirum. & Pavgi sp. nov.

Sori in the ovaries, few ovaries in the panicle attacked to form dirty green, minute round bodies upto 1 mm. in diameter, half enclosed by the glumes and rupturing irregularly to expose black dusty spore mass. Mature spores subspherical to globose, oval, olive brown and measuring 12.9 to 17.2  $\mu$  in diameter with a mean of 14.7  $\mu$ . Epispore medium thick and ornamented with short blunt triangular processes (Fig. 32). Sterile cells numerous, hyaline, thick walled, globose to sub-globose, occasionally irregular, smooth and measuring the same in diameter as the spores (Fig. 33).

In the ovaries of *Leptochloa filiformis* Nees at Ajmer, Rajasthan, October, 1955. Leg. P. N. Mathur No. 1259 (Type) (Figs. 30 to 33).

Sori ovaria paniculae pauca tantum occupantes, eaque in corpuscula minuta, sordide viridula, globosa, usque 1 mm diam. metientia, glumis semitecta transformantes, tunc disrupentes et sporas atras pulvulentas ostendentes; sporae in maturitate globosae, subglobosae vel ovoideae, 12.9—17.2  $\mu$ , plerumque ca. 14.7  $\mu$  diam.; episporio crassiusculo, verruculis brevibus, obtuse triangularibus obtecto; cellulae steriles numerosae, hyalinæ, crasse tunicatae, globosae vel subglobosae, interdum etiam irregulares, leves, magnitudinem sporarum aequantes.

#### Explanation of Plates

##### Plate XV. Figs. 1—18.

Fig. 1. *Sphaelotheca arthraxonis* on *Arthraxon lancifolius*  $\times 1$ . Fig. 2. Enlarged view of sorus  $\times 4$ . Fig. 3. Teliospore  $\times 2000$ . Fig. 4. *S. chrysopogonica* habit  $\times$  nat. size. Fig. 5. Teliospores  $\times 3000$ . Fig. 6. Pseudomembrane  $\times 1000$ . Fig. 7. *S. inayati* habit. Fig. 8. Sorus enlarged  $\times 5$ . Fig. 9. Teliospores  $\times 2000$ . Fig. 10. *S. fureata* habit. Fig. 11. Sorus enlarged  $\times 3$ . Fig. 12. Teliospore  $\times 3000$ . Fig. 13. *Thecaphora spermatoce* habit. Fig. 14. Sorus enlarged  $\times 10$ . Fig. 15. Spore ball  $\times 1000$ . Fig. 16. *Ustilago pimprina* habit. Fig. 17. Infected spikelets enlarged  $\times 5$ . Fig. 18. Teliospore  $\times 2000$ .

##### Plate XVI. Figs. 19—37.

Fig. 19. *Entyloma chloridis* habit. Fig. 20. Sori in leaves  $\times 4$ . Fig. 21. T. S. through sorus  $\times 250$ . Fig. 22. Teliospores  $\times 2500$ . Fig. 23. *Melanotaenium brachiariae* var. *montanae* habit. Fig. 24. T. S. through sorus  $\times 250$ . Fig. 25. Teliospores  $\times 2000$ . Fig. 26. *Tilletia oplismeni-cristata* habitat. Fig. 27. Sorus enlarged  $\times 5$ . Fig. 28. Teliospore  $\times 1750$ . Fig. 29. Sterile cell  $\times 1500$ . Fig. 30. *Tilletia leptochloae* habit. Fig. 31. Sorus enlarged  $\times 4$ . Fig. 32. Teliospore  $\times 2000$ . Fig. 33. Sterile cell  $\times 2000$ . Fig. 34. *Tilletia vittata* habit. Fig. 35. Sorus enlarged  $\times 4$ . Fig. 36. Teliospore  $\times 2000$ . Fig. 37. Sterile cell  $\times 2000$ .

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