

Franzpetrakia, a new Genus of Ustilaginales.

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With Plate I.

In the month of September 1954, an inflorescence smut on *Microstegia* species was collected in Mussorie hills, north India, which on detailed morphological examination proved to represent an undescribed genus of the *Ustilaginales*. Infection in the field was quite sparse and most of the diseased plants had disintegrated. An account of the morphological studies in relation to systematic position of smut is presented in this paper.

Infection is culmicolous and all the inflorescences are parasitised. In the smutted inflorescence the spikelets are destroyed and the mass of spores are covered by a greyish-white membrane composed of host cells. Microscopic examination of the sorus morphology indicated that there is a central columella composed of host tissue, traversed by vascular strands. Some short peg-like secondary branches are also formed from the main columella. The chief differentiating character of the genus is the presence of structure termed as 'elaters' in this paper which are functionally identical with the elaters present in the sporophytes of Bryophytes like *Aneura*, *Pellia* and others. These elaters are developed from the strands of hyphae lining the columella, to which they are attached and free on the other side. (Fig. 1.) The elaters are formed by hyphae thrown into close spirals and under the microscope appear like a watch-spring (Fig. 2.). These spirally coiled elaters traverse the spore mass. When the sorus is mature, the outer enveloping membrane ruptures, and the spore mass is exposed on the elaters in the form of a brush. The elaters are attached on one side to the columella and free on the opposite end, and show hygroscopic movements in wet weather conditions in the same way as elaters in Bryophytes. The spores which are exposed and held over on the elaters get dispersed by wind currents.

Mature spores are violet-brown, spherical and areolate, measuring 10 to 14 μ with a mean of 11 μ . Chlamydospores germinated readily

when placed on slides incubated in moist chamber at 24° C. The germ tube protrudes out after 24 hours incubation, becoming 2 to 3 septate and develop sporidia both laterally and terminally. No conjugating sporidia have been observed but production of secondary sporidia by budding takes place in most of the cases. The spore germination conforms to the type present in the *Ustilaginaceae*.

As regards the systematic position of the fungus, it represents an undescribed genus of *Ustilaginaceae*. The main distinguishing character of genus is the presence of hyphoid elaters attached on one end to the columella and free at other end, arranged in the same way as bristles in a wire brush. In no other smut genera such a character is present though structures of a different kind are present in *Farysia* Racib which was called *Elateromyces* by B u b a k. The structure of sorus in this genus has been described in detail by Thirumalachar (1950) who showed that the tuft of hair-like bristles at the top of the sorus are multilayered hyphal strands separating the groups of spore-bearing regions. These hyphal strands of *Farysia* are of a different type altogether and bear no resemblance to the elaters of the fungus on *Microstegia*. The smut on *Microstegia* species represents an undescribed genus for which the name *Franzpetrakia* is proposed, respectfully dedicated in honour of the world renowned Mycologist Dr. Franz Pet rak, Vienna, on the occasion of his 70th birthday.

Franzpetrakia Thirumalachar and Pavgi, gen. nov.

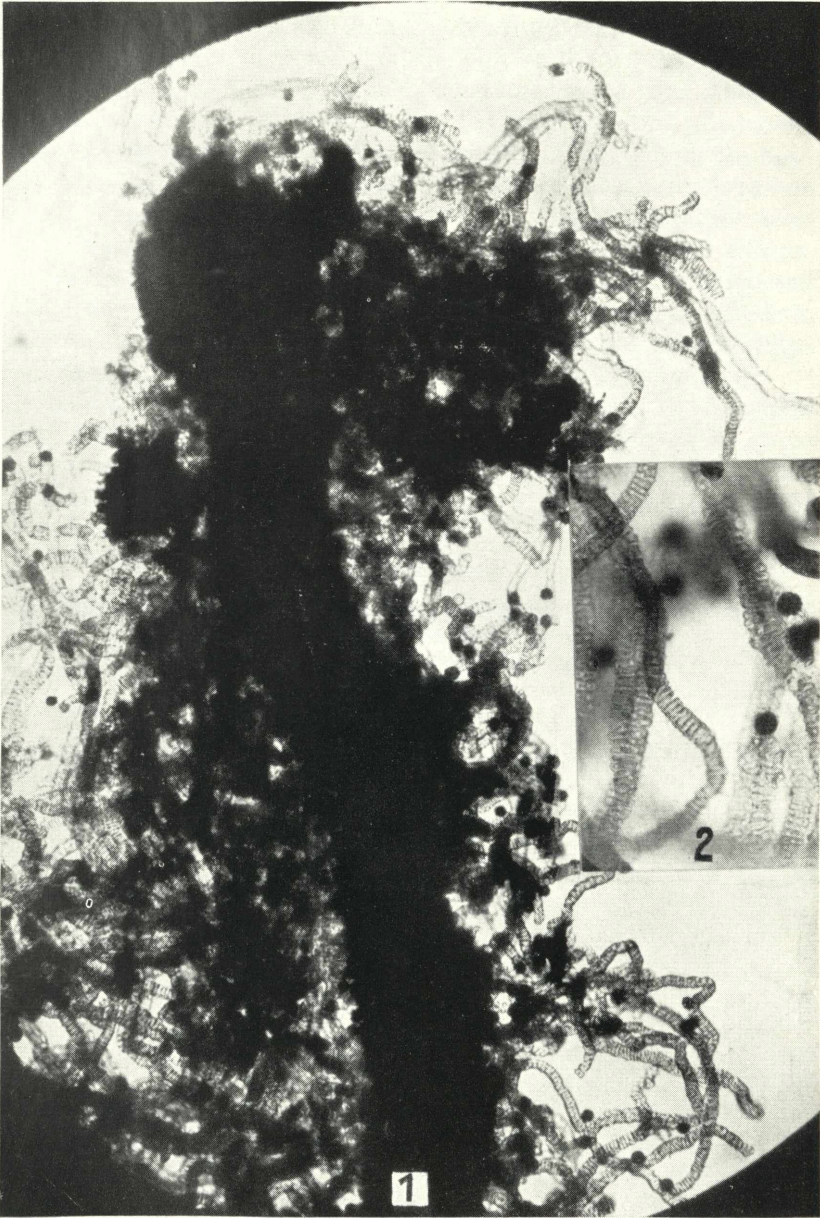
Sori covered by the host membrane, with a central columella of host tissue. Sterile filamentous hyphae spirally coiled and functioning as "elaters" attached to the columella and free at the other end; spores at maturity exposed on the elaters and getting dispersed as on a "brush"; chlamydo-spores coloured, germinating by promycelia which are septate and bear sporidia laterally and terminally as in *Ustilaginaceae*.

Type species: *Franzpetrakia microstegiae*.

Sori tunica matricis induti, columella centrali, e matricis textura formata et hyphis spiraliter convolutis, elaterii modo operantibus, postice ad columellam affixis, antice liberis, sporas in maturitate radiatim ejicientibus praediti; chlamydo-spores coloratae, plus minusve globosae; sporidiola in promycelio septato acro- et pleurogena.

Franzpetrakia microstegiae. Thirumalachar and Pavgi sp. nov.

Sori in the inflorescence, 5—10 mm. long, exposing a dusty spore mass at maturity on a brush-like structure, covered with a greyish-white membrane of host tissue and enclosing a central columella composed of host cells. Columella with short secondary branches, protruding out of the sorus, with numerous elaters attached radially and giving the appearance of "brush". Elaters are made of long



spirally coiled hyphae, 700 to 2,000 μ long, attached to the columella on one side and traversing the sorus and free at the other end. Chlamydospores reddish-brown, subglobose to spherical, 10 to 14 μ in diameter with a mean of 11 μ ; episporio reticulate and areolate; germination by septate promycelium bearing both laterally and terminally sporidia, which are hyaline, elliptic, 6–9 \Rightarrow 2.5 μ .

Sori inflorescentiam omnino occupantes, 5–10 mm. longi, in maturitate sporarum massam pulverulentam radiatim ejicientes, tunica matricis textura viridi-albida formatii induti, columella centrali etiam e matricis textura formata, processibus nonnullis brevibus instructa et hyphis numerosis, 700–2000 μ longis, spiraliter convolutis, elaterii modo operantibus, postice ad columellam affixis, antice liberis praediti; chlamydosporae rufo-brunneae, subglobosae vel globosae, 10–14 μ , plerumque ca. 11 μ diam.; episporio reticulato et areolato, promycelio septato, sporidiola acro- et pleurogena, ellipsoidea, hyalina, 6–9 μ longa, 2.5 μ lata generante germinantes.

Hab.: in the inflorescence of *Microstegia* species. — Mussorie Hills, U. P. September 1954, leg. M. S. P a v g i, (type).

In conclusion we wish to thank Dr. Franz P e t r a k, Vienna, for kindly translating the diagnosis of the new genus and species to Latin.

Explanation of plate I.

Fig. 1. Photomicrograph of the sorus showing columella and the attached elaters (spores have been removed by washing).

Fig. 2. Enlarged view of the elaters and spores.

Literature cited.

Thirumalachar, M. J. (1950). Notes on some Indian Ustilagineae I, *Lloydia* 13: 165–172.

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