Stakmania, a new genus of Uredinales from India.

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With plate XXXIV.

A new genus under the Uredinales, *Stakmania* Kamat M. N. & Sathe A. V. gen. nov. has been proposed to accomodate the rust fungus parasitizing *Glochidion hoheneckeri* Bedd., collected from India characterized by subcuticular pycnia, caeomoid aecia, peridiate and paraphysate uredia breaking through a central pore and irregularly arranged one celled sessile teliospores to from early non-erumpent but late erumpent umbonate crusts, with *Stakmania indica* Kamat M. N. & Sathe A. V. sp. nov. as type. Uredia are comparable with those of the primitive genera like *Hyalopsora* and distinguish this fungus from rusts.

During the survey for rusts of Maharashtra State, India, the writer came accross an autoeceous eu-type rust fungus parasitizing plants of *Glochidion hoheneckeri* Bedd., at various Hill Stations in the State, such as Matheran & Mahableshwar. Although pycnial infection was noted almost throughout the year, it was abundent during the months of November and December. Following the pycnial infection and almost, simultaneously accompanying it apeared the aecial sori. The infection then passed to the uredial phase when number of hypophyllous uredial sori appeared and continued upto the months of September — October. The telia were seen developing in the vicinity of old uredia and also within them. They were subepidermal in origin and non-erumpent in early stages but becoming erumpent with the age. Teliospores were one-celled laterally and terminally adherent, irregulary arranged with hyaline or pale brown wall, and were seen germinating immediately after maturation, so that those sori which were in the early non-erumpent stage of development, also showed germinating teliospores. Pycnia were subcuticular, Aecia developed soon after the maturation of the pycnia and were deep seated and of caeoma type (peridium lacking), with aeciospores arranged in short chains. Uredia were hypophyllous. Young and developing uredia appearing as semisphaerical pustules — becoming pyramidal in late stages. The uredial sori when matured were seen breaking through the central pore. In the transverse sections uredia were seen as sub-epidermal, lense shaped, peridiate cavities crowded with liberated urediospores. Urediospores were singly borne either on short stalks or without. Uredia are comparable with those of primitive genera like *Hyalopsora, Pucciniastrum* etc. They, however, differed in

having been provided with club-shaped paraphyses, in the form of enlarged basal cells, which probably help in the liberation of urediospores.

These characters of the present collection of rust are not duplicated in any of the valid genera of rusts of far described. Hence it is proposed here to establish a new genus, namely *Stakmania* Kamat M. N. & Sathe A. V. gen. nov., under Uredinales to accomodate the present collection of rust. A brief description along with Latin diagnoses of the new genus and its type species are presented below.

Stakmania Kamat M. N. & Sathe A. V. gen. nov. (Uredinales) Pycnia subcuticular. Aecia caeomoid, sub-epidermal in origin, erumpent. Uredia sub-epidermal in origin, opening with central pore, peridiate; urediospores singly borne, stalked or sessile, intermingled with paraphyses.

Telia non-erumpent in early stages but becoming erumpent with age, sub-epidermal in origin; teliospores one-celled forming umbonate crusts, laterally and terminally adherent, irregularly arranged, with hyaline or pale brown wall, germ pore obscure, germination without dormancy, basidium external.

Type species: *Stakmania indica* Kamat M. N. & Sathe A. V.

Stakmania Kamat M. N. & Sathe A. V. gen. nov.

Pycnidia subcuticularia; aecidia caeomatoidea, primum subepidermalia, postea erumpentia; uredosori primum sub epidermide evoluti, postea poro aperti, peridio praediti, uredosporae singulatim ortae, stipitatae vel sessiles, paraphysibus intermixtae; teleutosori primum sub epidermales, postea erumpentes umbonate crustacei; teleutosporae a latere et terminaliter cohaerentes, irregulariter dispositae, hyalinae vel pallide brunneae, poro germinationis obscuro praeditae, basidiis externis statim germinantes.

Stakmania indica Kamat M. N. & Sathe A. V. sp. nov.

Pycnia subcuticular, lanceolate, amphigenous, without ostiolar paraphyses, measuring 0.25 mm. in diam. Aecia caeomoid, non-peridiate; mostly hypophyllous, sub-epidermal in origin, deepseated; aeciospores arranged in short chains, sessile oblong to polygonal in shape with thick, verrucose, hyaline wall, mostly with apical thickening, measuring 30.6 × 19.8 μ. — Uredia sub-epidermal in origin, lense shaped, peridiate, paraphysate, erumpent, opening by central pore, measuring 174.5 × 91.5 μ; urediospores singly borne, sub-sessile, oblong, thickwalled, verrucose, hyaline, measuring 17.0—30.6 × 18.0—23.4 μ. Paraphyses club shaped, measuring 11—23 × 13—20 μ. — Telia sub-epidermal in origin, early non-erumpent becoming erumpent with age, measuring 366 ×

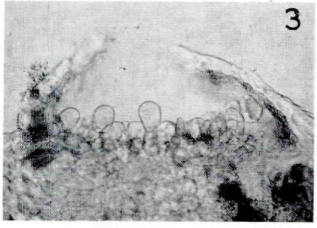
183 μ; teliospores one-celled laterally and terminally adherent, forming umbonate crusts, irregulary arranged, wall thick, hyaline to pale brown, measuring 30.6—36 × 14.4—18 μ; germination without dormancy, basidium external.

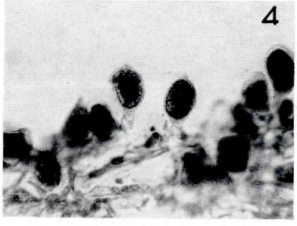
The type of *Stakmania indica* Kamat M. N. & Sathe A. V. was collected by A. V. Sathe on living leaves and twigs of *Glochidion hoheneckeri* Bedd., at Mahableshwar, Maharashtra State, India, in the month of November 1965 and is deposited at M. A. C. S. Mycological Herbarium under M. A. C. S. No. 268 (type), besides Herb. Orientalis, New Delhi & C. M. I. Kew, Surrey, England.

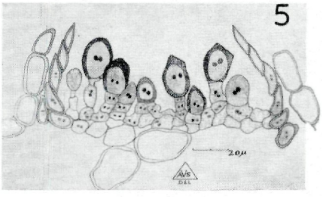
Pycnidia amphigena, subcuticularia, lanceolata, aparaphysata, 0.25 mm diam., aecidia caeomatoidea, plerumque hypophylla, primum subepidermalia, profunde innata, peridio destituta; aecidiosporae catenulatae sessiles, oblongae vel irregulariter angulosae, episporio crassiusculo, verrucoso, hyalino, antice plerumque distincte incrassato praeditae, 30.6 × 19.8 μ; uredosori primum subepidermales, lenticulares, peridio praediti, paraphysati, poro centrali aperti, 174.5 × 91.5 μ; uredosporae singulatim ortae, subsessiles, oblongae, episporio crassiusculo, verruculoso, hyalino praeditae, 17—36.6 × 18—23.4 μ; paraphyses clavulatae, 11—23 × 13—20 μ; teleutosori subepidermales, umbonate crustacei, primum tecti, postea erumpentes, 366 × 183 μ; teleutosporae unicellulares, a latere et terminaliter cohaerentes; irregulariter dispositae, episporio hyalino vel pallide brunneo, 30.6—36 × 14.4—18 μ, basidiis externis statim germinantes.

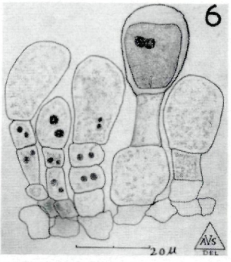
The genus is named after Dr. E. C. Stakman, distinguished Urediologist and Professor Emeritus University of Minnesota, U. S. A. in recognition of his outstanding contributions to the rust fungi.

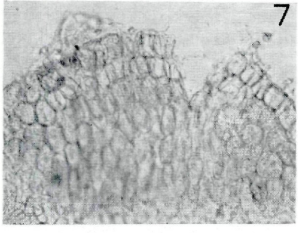
Arthuria glochidionis Gokhle et al., *Bubakia indica* Ramak. T. S. & K. *Bubakia glochidii* (Syd.) Diet & *Phakopsora formosana* H. & P. Sydow are the records of rusts so far reported on *Glochidion* species of which the first two are from India. The present collection of rust differes from *Arthuria* in having peridiate paraphysate uredia and teliospores irregularly arranged and laterally and terminally adherent. The telia of the present fungus clearly exhibit three phases of development. In very early stage they show resemblance to those of *Melampsoridium*. They become like *Phakopsora* as they grow older finally reaching an erumpent stage with umbonate crusts characteristic of *Uredopeltis*, Furthermore, as the teliospores are capable of germination immediately after their maturation (indicated by the synkaryon), telia of any of the three phases show the germinating teliospores. The peridiate and paraphysate uredia, of the present rust fungus, however, are unique and distinguish this rust from other rust genera. Thus the present collection of rust fungus showing caeomoid aecia, peridiate and paraphysate uredia — opening through a central pore-, irregularly arranged

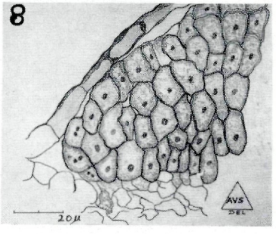












teliospores to form early non-erumpent but late erumpent umbonate crusts finds no place in any of the existing genera of rusts & therefore, is accomidated in the new rust genus *Stakmania.*

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Explaination of Plate:

1. Photomicrograph of T. S. through Aecium showing catenulately arrangement of aeciospores. — 2. Photomicrograph of infected leaf of *Glochidion hoheneckeri* showing telia developing within old uredia. — 3. Photomicrograph showing old uredium. — 4. Photomicrograph showing young uredium. — 5. Camera-lucida drawing of young uredium. — 6. Camera-lucida drawing of old uredium. — 7. Photomicrograph of telium. — 8. Camera-lucida drawing of telium.