

A NEW RUST ON *DALBERGIA PANICULATA* ROXB.

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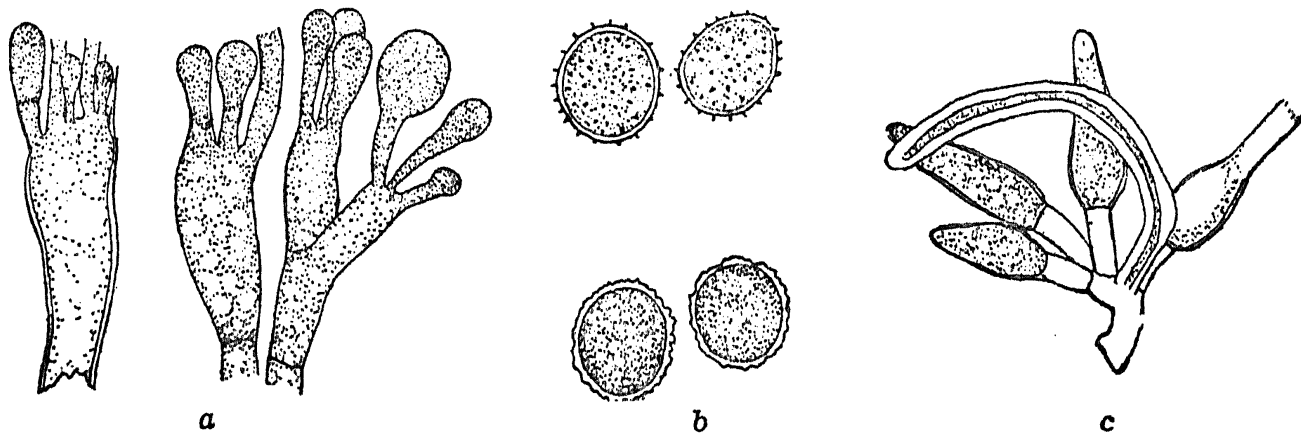
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IN 1946 the writers collected a rust on *Dalbergia paniculata* Roxb. from Walayar (Malabar District, South India). An examination of the fresh material of the rust indicated that it was different from those already recorded on related hosts and it is described below as being new.

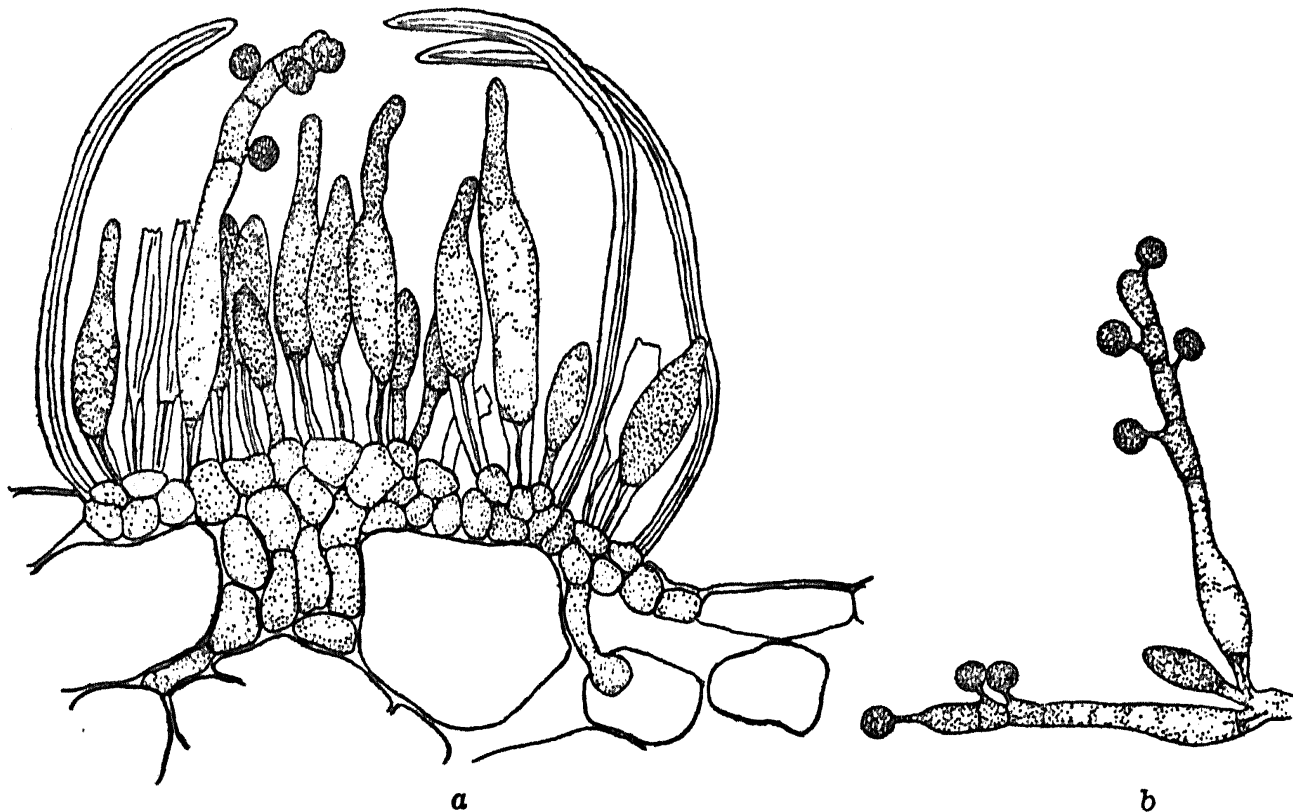
The uredia are hypophyllous or caulicolous, small and bright yellow. The sori develop just below the epidermis which is burst through by the sporogenous cells. The urediospores are globose or subglobose, stipitate, borne on short stalks which originate from the apices of cylindric branched or simple basal cells (Text-Fig. 1 a). Each basal cell gives rise to varying numbers of pedicellate urediospores. Two kinds of urediospores can be distinguished. One type has thin hyaline wall with prominent echinulations while the other has a thicker wall with less pronounced echinulations. Both have yellow contents. The proportion of the two kinds of spores varies in different sori and sometimes only the second type is present. The spores measure $15 \times 13 \mu$ ($12-19 \times 9-14 \mu$). On the twigs also the sorus develops below the epidermis and bursts through this layer exposing the spores. In the tissues of the branch the hyphæ are seen to extend as far as the pith region (being present in the cortex and vascular tissue also) which suggests that the mycelium may remain in the tissue producing new crops of sori for a long time.

Telia appear as buff to ochraceous buff, waxy, pulvinate, gregarious crusts amphigenously on the leaves and sometimes on the stem. The teliospores are seen in old uredia also. The exact place of origin of the telium is difficult to determine. It seems to be intra epidermal forming a two to three-layered tissue from which basal cells project out above the level of the epidermis. There is no evidence of the epidermis being pushed aside or burst through. It is difficult to clearly differentiate the epidermal cells in the region of the sorus, but vague outlines of the epidermal cells containing the lower cells of the sorus can be made out in portions of the sorus. Each basal cell gives rise to varying numbers of stipitate, oval to clavate, one-celled smooth and thin-walled teliospores. Incurved thick-walled paraphyses with narrow central lumen are found along the margin and



TEXT-FIG. 1. (a) Basal cells of uredia, (b) Uredispores $\times 500$, (c) Paraphysis and Feliospores from common basal cell $\times 300$.

other portions of the telia. The origin of the paraphysis can be traced to the same basal cell which produces the teliospores (Text-Fig. 1 c). The teliospores measure $15-30 \times 10-15 \mu$ (average 19×12). They germinate immediately producing promycelia which are direct outgrowths of the apices of the spores. The promycelium is four-celled and one round basidiospore is produced from each cell. The rust is a hemi form since it has only II and III stages.



TEXT-FIG. 2. (a) Section through a telium $\times 530$ (b) Germinating teliospores $\times 350$.

Maravalia achroa (Syd.) Arth. and Cumm. has been recorded on *Dalbergia sissoo*. Type specimen of this material was obtained through the courtesy of Mr. J. F. Dastur from the Indian Agricultural Research

Institute, New Delhi and examined. It was found that the telia of this rust were not paraphysate. The formation of the basal cells producing clusters of teliospores was not evident. Cylindrical basal cells developing groups of urediospores were not seen. In these characters it differs from the rust under study.

The formation of intra-epidermal telia suggests an affinity to *Mainsia*. Though Jackson (1931) has recorded this genus on species of *Rubus* only, Thirumalachar (1947) has described *M. pterocarpi* on *Pterocarpus marsupium* from South India. In *Mainsia* however, the urediospores develop singly, and not in clusters from free basal cells. Further the epidermal cells in the vicinity of the sori are said to be considerably hypertrophied in *Mainsia*. The rust on *D. paniculata* differs from *Mainsia* in these respects. The production of urediospores and teliospores in clusters from free basal cells indicates relationship to *Scopella*. But in the latter genus the sori are subepidermal and paraphyses have not been recorded in any of the species, whereas in the rust now described the telia are intra epidermal, and paraphysate. Thus it does not conform to any of the known genera of rusts and is therefore accommodated in a new genus *Scopellopsis* because of its resemblance to *Scopella* in the development of free basal cells bearing groups of spores in the uredia and telia. The rust on *D. paniculata* is described as *Scopellopsis dalbergiae*.

Scopellopsis gen. nov. Ramakrishnan, T. S. and K.

Pycnia and *aecia* not known; *uredia* subepidermal, erumpent, hypophyllous and caulicolous; *urediospores* subglobose, echinulate, pedicellate, produced in clusters from stout almost cylindric basal cells; *telia* amphigenous or caulicolous, waxy, intra-epidermal in origin, projecting above the epidermis; *teliospores* stipitate formed in clusters from free basal cells, oval to clavate, one-celled, germinating *in situ*; paraphysate, with incurved almost solid paraphyses.

Type Species: *Scopellopsis dalbergiae* Ramak., T. S. and K. on *Dalbergia paniculata*.

Pycnia et *aecia* ignota; *uredia* subepidermia, erumpentia, hypophylla, caulicola; *urediosporidia* subglobosa, echinulata, pedicellata, producta in racemis ex cella crassa cylindrica simplici vel ramosa; *telia* amphigenia, vel caulicola, ceracea, plurimum intraepidermia, projicientia super epidermem; *teliosporidia* stipitata, formata in racemis singulis cellis, ovalia vel clavata, unicellata, germinantia *in situ*; paraphysata, paraphysibus incurvatis, ferme solidis.

Species typica *Scopellopsis dalbergiae* Ramak., T. S. and K., In vivis foliis et ramis *Dalbergiae paniculatae*.

Scopellopsis dalbergiae Ramakrishnan, T. S. and K., sp. nov.

Pycnia and *æcia* not known; *uredia* bright yellow, hypophyllous sometimes caulicolous, subepidermal, erumpent, minute, gregarious, pulvinate urediospores globose to subglobose, echinulate, with hyaline wall and yellowish contents, $15 \times 13 \mu$, stipitate, formed in clusters from simple or branched, stout, cylindrical cells; telia amphigenous, caulicolous, ochraceous buff, waxy, intraepidermal, spores projecting far above the epidermis; *teliospores* stipitate, formed in groups from free basal cells, oval to clavate $19 \times 12 \mu$ ($14-30 \times 9-15 \mu$) germinating immediately *in situ*; paraphysate, with almost solid incurved paraphyses.

On living leaves and stem of *Dalbergia paniculata* Roxb. Walayar (Malabar), 31-12-46 T. S. Ramakrishnan and K. Ramakrishnan.

Pycnia et *æcia* ignota; *uredia* lucida flava, hypophylla et caulicola, subepidermia, erumpentia, minuta, gregaria, pulvinata; *urediosporidia* globosa vel subglobosa, echinulata, murus hyalini, contenta flavida, $15 \times 13 \mu$, stipitata, producta in racemis ex singulis cellis, crassa, cylindrica, simplici vel ramosa; *telia* amphigena, vel caulicola, silacei lutei colores, ceracea, intraepidermia, sporidia projicientia super epidermem; *teliosporidia* stipitata formata in racemis singulis cellis, ovalia vel clavata, $19 \times 12 \mu$ ($14-30 \times 9-15 \mu$) germinantia *in situ*; paraphysata, paraphyses incurvatis, ferme solidis.

In vivis foliis et ramis *Dalbergia paniculata* Roxb. Walayar (Malabar) 31-12-1946. T. S. Ramakrishnan et K. Ramakrishnan.

Type specimens of the rust have been deposited in the Herbarium of the Government Mycologist, Coimbatore, and in Herb. Crypt. Ind. Orient., New Delhi.

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