

## ADDITIONS TO FUNGI OF MADRAS—V

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### 26. *Guignardia nilagiriaca* Ramakrishnan, T. S. and K. sp. nov.

Spots amphigenous, yellowish green, orbicular, without a definite margin; *spermagonia* red, amphigenous, innate, deep-seated, ostiolate, with numerous, hyaline, slender, rod shaped, spermatia, which in mass appear reddish; *spermagonia*  $118-158 \times 122-160 \mu$  and spermatia  $4-12 \times 1 \mu$ . *Perithecia* of same size as *spermagonia*, black, ostiolate; *asci* cylindrical-clavate, hyaline, 8-spored,  $52-62 \times 8-12 \mu$ ; *ascospores* uniseriate or irregular, oblong, hyaline, one-celled,  $8-12 \times 4-6 \mu$ ; paraphyses absent.

On living leaves of a Papilionaceous plant, Kallar (Coimbatore), 7-VIII-1947, T. S. Ramakrishnan and K. Ramakrishnan.

Maculae amphigenae, orbiculares, flavo-viredes; *spermagonia* rubra, amphigenia, innata, ostiolata.  $118-158 \times 122-160 \mu$ ; spermatia numerosa, hyalina, tenua, baculo-formia, massa spermatiorum rubra,  $4-12 \times 1 \mu$ , *Perithecia* nigra, ostiolata; *asci* cylindric-clavati, hyalini, octosporiati,  $52-62 \times 8-12 \mu$ ; *ascosporidia* oblonga, hyalina, unicellata  $8-12 \times 4-6 \mu$ ; paraphyses absunt.

In vivis foliis Papilionaceae species, Kallar (Coimbatore), 7-VIII-1947, T. S. Ramakrishnan et K. Ramakrishnan.

The leaf spot is irregularly studded with numerous pink or red *spermagonia* in the early stages. As the spot enlarges fresh *spermagonia* develop along the margin of the spot while those in the centre turn black. Thus a mixture of red and black fructifications can be seen on the same spot. The contents of the young *spermagonia* appear red with innumerable rod-shaped spermatia. These are pushed out of the *spermagonia* in masses, as bright red tendril-like outgrowths. Side by side with these are older fructifications in which several multicellular filamentous structures project from the base of the loculus. In these the basal cells are stouter while those at the apex are attenuated resembling trichogynes. Further the apical attenuated portion does not easily stain with eosin. The tips of these filaments project out through the ostiole. The exact nature and function of these structures

are being studied. Mixed with these filaments are numerous hyaline outgrowths from the lining of the cavity. At a later stage when the fructifications have turned black, asci can be noticed originating from the base of the cavity. Typical paraphyses are absent but remnants of the abovementioned filamentous outgrowths can be seen near the ostiole (Plate II *d, e, f*).

The isolated formation of unilocular perithecia without typical paraphyses and the presence of hyaline one-celled ascospores indicate that the fungus belongs to the genus *Guignardia*. The genus *Guignardia* is used here in the sense of *G. Bidwellii* (Ellis) Viala and Rav. (Chardon, *et al.*, 1940).

27. *Catacauma elæocarpi* Ramakrishnan, T. S. and K. sp. nov.

Stromata epiphyllous, black, shiny, more or less circular, up to 0.5 cm. in diam., scattered, centre raised, almost intra-epidermal, multiloculate; locules ostiolate, round or slightly flattened; *asci* fusiform, 8 spored, hyaline,  $62 \times 18 \mu$  ( $51-71 \times 17-20 \mu$ ); *ascospores* irregularly arranged, hyaline, one celled, oblong,  $16.5 \times 6.6 \mu$  ( $13-19 \times 5-9 \mu$ ); paraphyses filiform.

On living leaves of *Elæocarpus munroi* Mast. Coonoor (Nilgiris), 10-X-1947, T. S. Ramakrishnan.

Stromata epiphylla, nigra, micantia, circiter orbicularia, usque 0.5 cm. diam., sparsa, intraepidermia, multiloculata; *asci* fusiformi, clavati, octosporiati,  $62 \times 18 \mu$  ( $51-71 \times 17-20 \mu$ ); *ascosporidia* oblonga, hyalina,  $16.5 \times 6.6 \mu$  ( $13-19 \times 5-9 \mu$ ); paraphyses filiformes.

In vivis foliis *Elæocarpi munroii* Mast. Coonoor (Nilgiris), 10-X-1947, T. S. Ramakrishnan.

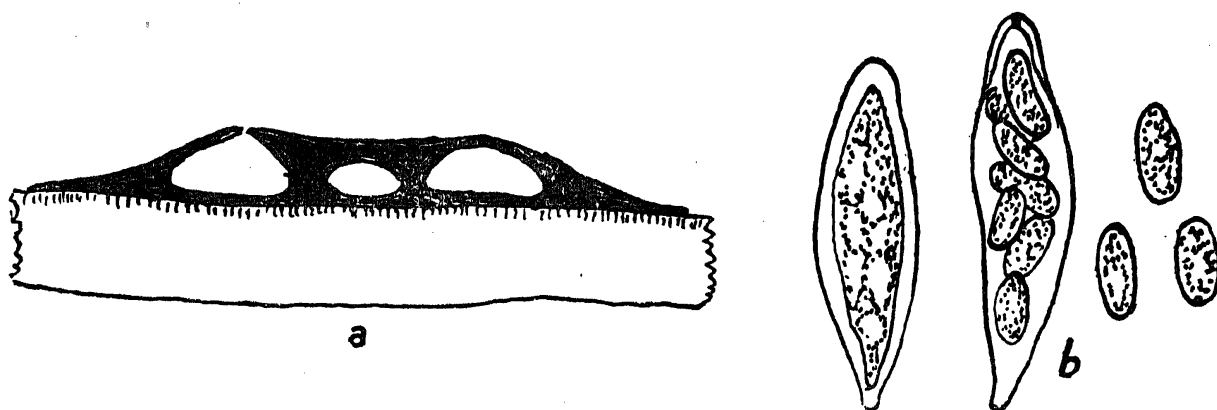


FIG. 1. *Catacauma elæocarpi*.—*a*. Section of leaf showing stroma and perithecia (diagrammatic). *b*. asci and ascospores  $\times 400$ .

In sections of the leaves the stroma is present as a dark mass between the palisade tissue and the epidermis and also filling the latter. In some places extensions of plates of hyphæ can be recognised in the palisade tissue. However a sharp dark distinctive limit is visible above the palisade cells

denoting the stroma. Consequently the fungus has to be included in the *Scirrhineæ* in the genus *Catacuma*.

*Phæodothiopsis elæocarpi* (Racib.) Theiss. and Syd. has been described by Theissen and Sydow (1915) on *E. angustifolia* from Java. Though this resembles *Catacuma* to some extent, its spores are two celled and brown in colour, and therefore different from the fungus under study. Four species of *Phyllachora* have also been described by the same authors on Tiliaceous hosts. But these differ in the position and size of the stromata, from the present fungus. No species of *Catacuma* has been recorded on this genus and therefore the fungus under study is considered to be a new species.

28. *Ustilago shiraiana* P. Henn.

Saccardo, P. A., *Syll. Fung.*, 1902, 16, 369.

Butler, E. J., and Bisby, G. R., *Fungi of India*, 1931, 50.

Pattersen, F. W., and Charles, V. K., *Phytopath.*, 1919, 6, 351-56.

On young shoots of *Arundianaria wightiana* Nees. Tiger Hill, Ootacamund (Nilgiris), 20-V-1947, T. S. Ramakrishnan and T. V. Subramanian.

The sori are formed at the ends of young shoots. They are caulicolous and enclosed between the sheaths of the older leaves. The sheaths of the young leaves in the sorus region are sometimes destroyed. No covering of fungal origin is evident in the sorus. The spore mass is dark brown and pulverulent. The spores are globose to subglobose or elliptic, smooth,  $7-10 \times 6-10 \mu$ . The spores easily separate from one another and are tawny olive in colour with granular contents.

All the shoots in one clump were affected while in a neighbouring clump there was no infection indicating the systemic nature of infection. This is a new host for this smut.

29. *Ustilago sporoboli-tremuli* Ramakrishnan, T. S. and K. sp. nov.

Sori caulicolous 2-3 mm. long, enclosed inside leaf-sheaths at the ends of young shoots, without a covering of fungal tissue; spore mass black, semi-agglutinated and semi-powdery; spores separate easily, cinnamon brown, subglobose, epispore up to  $1 \mu$  in thickness, punctate when examined under oil immersion,  $16 \times 15 \mu$  ( $14-19 \times 14-17 \mu$ ).

On shoots of *Sporobolus tremulus* Kunth. Chettipalayam, Coimbatore, 17-VII-1934, N. Kitchi Naidu.

Soris cauliculis, 2-3 mm. longis, massa sporarum nigra, pulverulenta; sporis cinnamomeo brunneis, subglobosis,  $16 \times 15 \mu$  ( $14-19 \times 14-17 \mu$ ), episporio usque  $1 \mu$  crasso, subtiliter punctate.

In caulibus *Sporoboli tremuli* Kunth. Chettipalayam, Coimbatore, 17-VII-1934, N. Kitchi Naidu.

Clinton (1904) has recorded three species of *Ustilago*, viz., *U. vilfae*, *U. sporoboli*, and *U. hypodites* on this genus from America. Of these the first two are ovaricolous with prominently verrucose or tuberculate spores. *U. hypodites* has sori surrounding the internodes but the spores measure 4–7 $\mu$ . It is obvious that the smut under study is different from the above species. Zundel (1938) has described *U. Schlechteri* P. Henn. on *Sporobolus* sp. from Natal. But this smut affects the inflorescence and has smaller spores (7–10 $\mu$ ).

30. *Uræcium nothopegiæ* Ramakrishnan, T. S. and K. sp. nov.

*Pycnia*, *uredia* and *telia* not known; *æcia* uredinoid, hypophyllous, subepidermal, deep seated; *æciospores* pedicellate, oblong, reniform or angular, one celled, light brown in colour, 15  $\times$  8 $\mu$  (12–18  $\times$  6–10 $\mu$ ), finely verrucose.

On living leaves of *Nothopegia* sp. near Naduvattam (Nilgiris), 21-V-1947, T. S. Ramakrishnan and T. V. Subramanian.

*Pycnia*, *uredia* et *telia* ignota; *æcia* uredinoidea, hypophylla, subepidermate, profunde immersa; *æciosporidia* pedicellata, oblonga, reniformia, vel angularia, leviter brunneo colore, cum una cellula, subtiliter verrucosa, 15  $\times$  8 $\mu$  (12–18  $\times$  6–10 $\mu$ ).

In vivis foliis *Nothopegiæ* sp. Naduvattam (Nilgiris), 21-V-1947, T. S. Ramakrishnan et T. V. Subramanian.

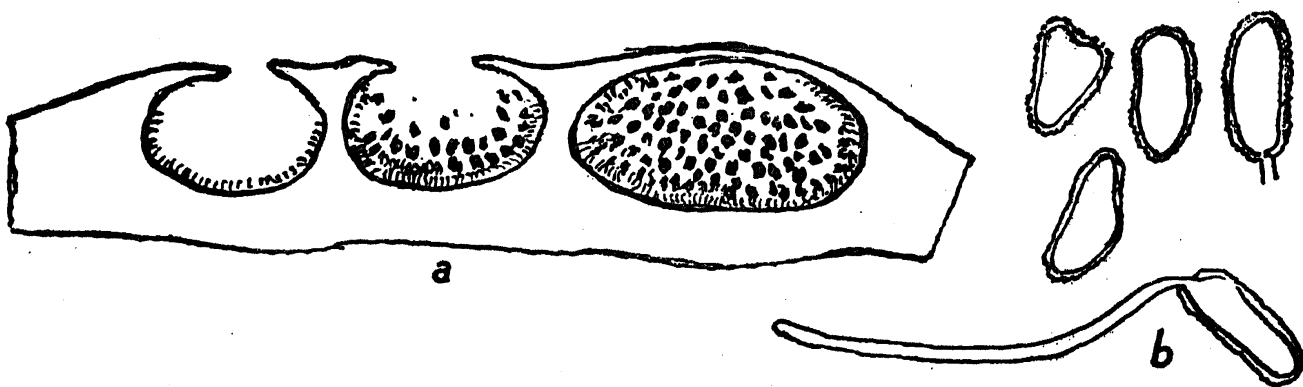


FIG. 2. *Uræcium nothopegiæ*.—a. Section of leaf showing sori (diagrammatic). b. *æciospores* ( $\times$  400).

This rust produces witches broom formations at the ends of shoots or from sides of branches. The hypertrophied growth (Plate I, a) consists of several swollen branches with crowded, reduced and thickened leaves. The shoots are one and a half to twice the thickness of healthy ones of the

same age. The hyphæ of the rust penetrate the tissues of the host, being inter-cellular in the cortex and medullary rays; they are found in the vessels also. The normal leaves are green in colour; but those on the witches broom are light pinkish yellow. There is gradual diminution in the size of the leaves from the base to the apex of the affected branches, those at the apex being reduced to scale leaves.

The æcia are found on the lower surface of the leaves of the witches broom distributed all over the surface (Plate II, *b*). Each æcium is deep seated and the epidermis forms a protruding dome-like arch. The cavity so formed is filled with spores. At a later stage the epidermis splits open forming an oval to round pore in the centre of the dome through which the spores escape. Peridium is absent and the spores are not formed in chains. They are stylosporic. The fructification resembles the æcia described by Arthur (1934) as occurring in the form genus *Uræcium*. Consequently it is included in this genus for the present. No rust has been recorded on this host and this rust is described as a new species, *U. nothopegiæ*.

31. *Puccinia thomasiana* Ramakrishnan, T. S. and K. sp. nov.

Spots amphigenous, circular or irregular, isolated or confluent, light to dark brown on the upper side. *Pycnia*, *æcia* and *uredia* not known. *Telia* caulicolous, hypophyllous, closely crowded, pulvinate, warm sepia coloured, rounded, sub-epidermal, surrounded by the remnants of the epidermis which form a ring. *Teliospores* two-celled, clavate to elliptic, slightly constricted at the septum, ochraceous tawny,  $60 \times 22 \mu$  ( $43-77 \times 14-24 \mu$ ), wall smooth, apex rounded or bluntly pointed, thickened up to  $14 \mu$ ; germ pore one in each cell, apical and below the septum; pedicel hyaline, or lightly coloured, persistent, up to  $80 \mu$  in length.

On living leaves and stem of *Ocimum gratissimum* L. Anamalais, 3-X-1922, N. Kitchi Naidu.

Maculæ amphigenæ, orbiculares vel irregulares, singulares vel confluentes, fulvo vel fusco colore superficie superiore. *Pycnia*, *æcia* et *uredia* ignota; *telia* caulicola, hypophylla, dense aggregata, pulvinata, fusco-rubro colore, rotundata, sub-epidermate. *Teliosperidia* cum duobus cellulis, clavata vel cylindrica, medio leviter constricta, ochraceo-nigricante colore,  $60-22 \mu$  ( $43-77 \times 14-24 \mu$ ) paries levis, apice rotundato vel obtuso, usque ad  $14 \mu$  densatus, foramen germinationis unum in una quaque cellula; pedicellus hyalinus vel leviter coloratus, persistens, usque ad  $80 \mu$  longus.

In ramis et foliis vivis *Ocimi gratissimi* L. Anamalais, 3-X-1922, N. Kitchi Naidu.

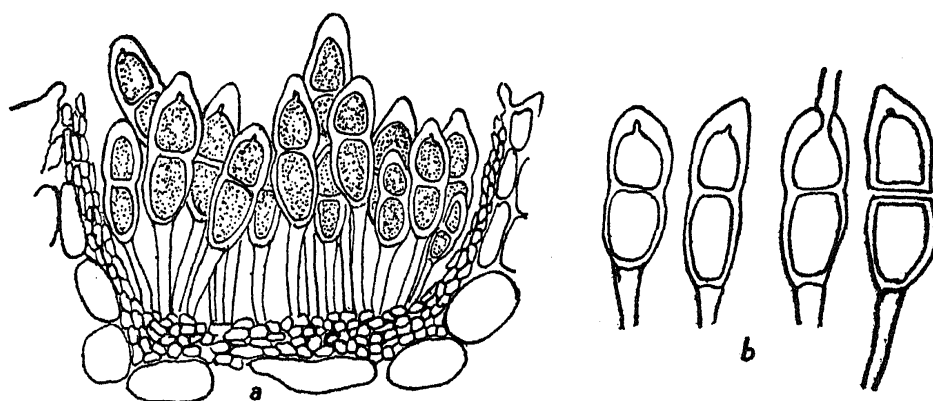


FIG. 3. *Puccinia thomasiana*.—a. Section through telium ( $\times 200$ ), b. teliospores ( $\times 250$ ).

The telia are in crowded circular groups. They are developed in deep seated cuplike depressions lined by a plectenchymatous tissue of small cells. A ring formed by the remnants of the host tissue which has been burst through is clearly visible round the telium. When scrapings from old telia were examined it was found that several of the teliospores separated into one-celled portions along the septum. Teliospores are capable of immediate germination (*in situ*) as shown by the remnants of the basidia emerging through the germ pores in some of the teliospores.

Two species of *Puccinia* have been recorded on *Ocimum*. *P. ocimi* has been described by Doidge (1926) on *O. suave*, and *O. americanum* from South Africa. Thirumalachar (1941) has observed *P. leiocarpum* on *O. adscendens* from Mysore. Butler and Bisby (1931) have mentioned *Aecidium ocimi* on leaves of *O. cannum* from *Koilpatti*, Madras. Thirumalachar considered this to be the æcial stage of *P. leiocarpum*. It must however be mentioned that the host plant in this collection has been erroneously named *O. cannum*. It is *O. adscendens*, and the record of the rust on *O. cannum* should be revised. The rust under study is not *P. leiocarpum* as the teliospores are much bigger. They are even longer than those of *P. ocimi*. Doidge has stated that the telia of *P. ocimi* are caulicolous and hypophyllous often interspersed with the æcia. In the present fungus æcia have not been observed. The telia are both caulicolous and hypophyllous. The infected portion of the stem becomes swollen and is studded with closely arranged telia. The comparative measurements of the teliospores of the two rusts are given below.

	Teliospores	Thickness of apex
<i>P. ocimi</i> (Doidge)	40–60 $\times$ 16–24 $\mu$	up to 8.5 $\mu$
<i>Puccinia</i> on	43–77 $\times$ 14–24 $\mu$	11.5 (10–14 $\mu$ )
<i>O. gratissimum</i>	(mean 60 $\times$ 22 $\mu$ )	

The longer teliospores with thicker apices and the absence of æcia, show that this rust is different from *P. ocimi*. It is described as a new species, *P. thomasiana* in honour of Mr. K. M. Thomas, Government Mycologist, Coimbatore.

32. *Puccinia tweediana* (Speg.) Ramakrishnan, T. S. and K. comb. nov.

*Pycnia* not known; rust spot amphigenous, circular, dark brown on the upper surface; *æcia* hypophyllous, crowded in the spot, cupulate, with orange contents; peridial cells polygonal, thick-walled hyaline, prominently verrucose,  $25 \times 18 \mu$  ( $17-29 \times 13-21 \mu$ ); *æciospores* subglobose, catenulate, light yellow, wall smooth or very finely verrucose,  $17.5 \times 14 \mu$  ( $14-19 \times 10-18 \mu$ ); *uredia* absent; *telia* rare, mixed with the *æcia*, hypophyllous, sub-epidermal, appearing as chocolate coloured raised pustules; *teliospores* stipitate, two celled, clavate, apex obtuse, thickened up to  $8.5 \mu$ , slightly constricted at the septum,  $47 \times 17 \mu$  ( $32-56 \times 12-20 \mu$ ), yellowish brown in colour, wall smooth; pedicel hyaline.

On living leaves of *Dicliptera cuneata* Nees. Yercaud (Salem District), 27-V-1947, G. Rangaswamy.

*Pycnia* ignota; maculæ amphigenæ, orbiculares, superiori superficie fusco colore; *æcia* hypophylla aggregata, cupulata, citri colore, luteas substantias continentia; peridii cellulæ polygonæ, cum denso pariete, hyalinæ, prominenter verrucosæ,  $25 \times 18 \mu$  ( $17-29 \times 13-21 \mu$ ); *æciosporida* subglobosa, catenulata, leniter flavicolore, pariete polito vel belle verruculoso; *uredia* absunt; *telia* rara, cum æciis mixta, hypophylla, subepidermate, ut prolatae pustulæ cacaotico colore apparentia; *teliosporidia* stipitata, cum duobus cellulis, clavata, apice obtuso incrassatis  $8.5 \mu$ , medio leviter constricta,  $47 \times 17 \mu$  ( $32-56 \times 12-20 \mu$ ), flavo brunneo colore, paries levis, pedicellus hyalinus.

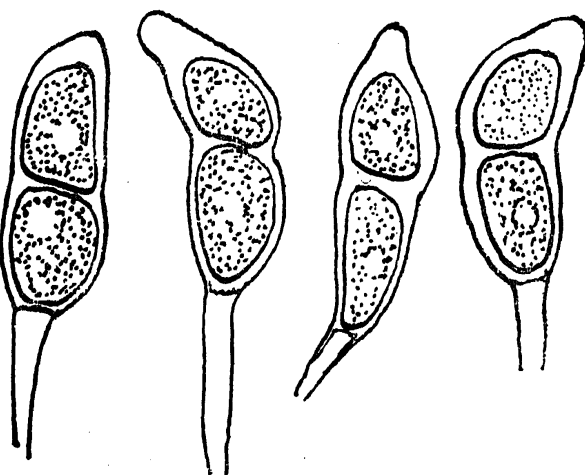


FIG. 4. *Puccinia tweediana*.—Teliospores ( $\times 400$ ).

In vivis foliis *Dicliptera cuneata* Nees. Yercaud (Salem District), 27-V-1947, G. Rangaswamy.

*P. diclipterae* Syd. has been described by H. and P. Sydow (1914) on *D. longiflora* from Formosa. This rust produces only telia, and the teliospores are smaller. In these respects it differs from the rust under study. *Aecidium tweedianum* Speg. has been recorded on *Dicliptera* sp. from India (Butler and Bisby, 1931). A specimen of this rust was obtained from the Herbarium Cryptogammæ Indiæ Orientalis, New Delhi, through the courtesy of Mr. J. F. Dastur, and compared with the rust under study. The æcial stages of the two rusts were found to be identical. In the rust under study the telia are found mixed with æcia. They remain long covered by the epidermis. Owing to the close association of the two stages it is presumed that they are of the same rust. Since the telial stage has now been found the rust is named *Puccinia tweediana*. The two stages occurring on the same host indicate the autoecious nature of this rust.

33. *Puccinia tricholænæ* (Syd.) Ramakrishnan, T. S. and K. comb. nov.

Syn. *Diorchidium tricholænæ* Syd., *Ann. Myc.*, 1912, 10, 33.

Doidge, E. M., *Bothalia*, 1926, 2, 138.

*Uredia* amphigenous, mostly hypophyllous, subepidermal, erumpent, brown; *urediospores* oval to globose, finely echinulate, yellowish brown; wall thickened near the base, germ pores two to three,  $25 \times 22 \mu$  ( $20-40 \times 20-28 \mu$ ); *telia* amphigenous, mostly hypophyllous, crowded, more or less in lines, subepidermal, epidermis splitting open longitudinally, black; *teliospores* stipitate with long persistent hyaline flexuous pedicels up to  $108 \mu$  long; teliospores two celled, with the septum vertical, sometimes oblique, or horizontal, elliptic to oblong, chestnut brown in colour,  $38 \times 27 \mu$  ( $32-44 \times 24-32 \mu$ ).

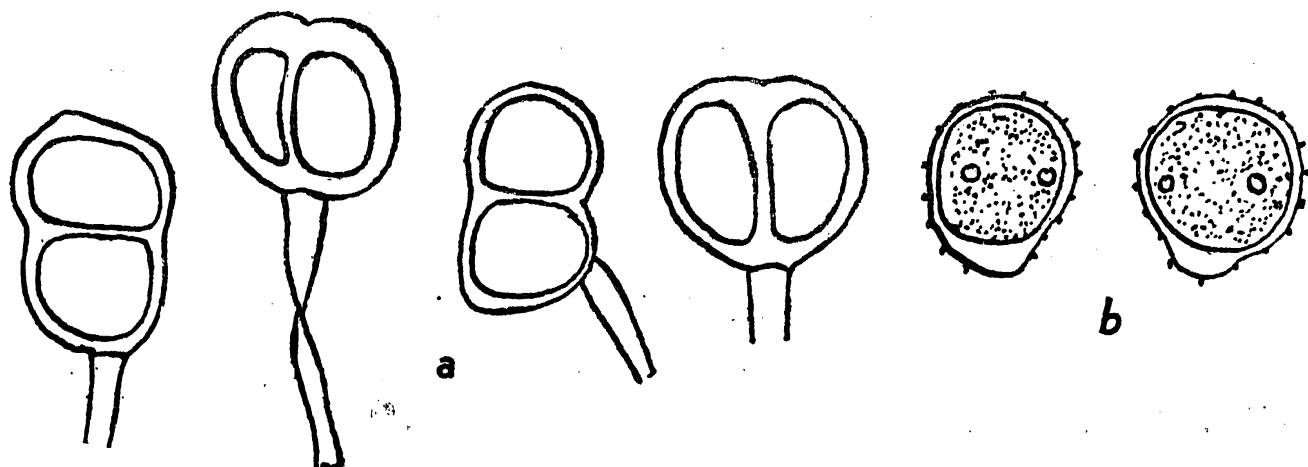


FIG. 5. *Puccinia tricholænæ*.—a. Teliospores, b. Urediospores ( $\times 400$ ).



On living leaves of *Rhynchelytrium roseum* Stapf. (*Tricholæna rosea* Nees.), Coonoor 7-VIII-1942, T. S. Ramakrishnan.

Sydow (1912) and later Doidge (1926) have recorded *Diorchidium tricholænæ* on this grass from Africa. Thurston (1940) has observed *Puccinia levis* (Sacc. et Bizz.) Magnus on this host from Brazil. *D. Wooddii* Kalch. is the type species on which the genus *Diorchidium* was founded. Sydow (1904) considered that this genus could not be maintained as different from *Puccinia* and revised *D. wooddii* and several other species included in this genus transferring them to *Puccinia*. Nevertheless in 1912 he described the rust on *Tricholæna* as *D. tricholænæ*. Doidge followed the same nomenclature but mentioned that *Diorchidium* is like *Puccinia* in every respect except that the teliospores in the former have vertical septa. She also questioned the retention of *Diorchidium* as a separate genus from *Puccinia* since in many species of the latter genus a tendency for the formation of oblique or vertical walls has been noticed.

Sydow (1912) states that *D. tricholænæ* comes very near to *P. levis* but differs from it in having a higher percentage of spores with vertical or oblique septa. It may be added that *P. levis* was first described as *D. leve* and later changed to *P. levis*. Doidge described *D. tricholænæ* as having urediospores with a basal thickening of the wall and the teliospores of a chestnut brown colour. The teliospores of *P. levis* are described as brown in colour and the thickening of the urediospore wall has not been noticed. The rust under study agrees very closely with *D. tricholænæ* in all characters and is identified as such. It is considered that there is no justification for keeping this rust in the genus *Diorchidium*. In every sorus teliospores with vertical oblique or transverse septa have been observed. The presence of oblique or vertical septa has been recorded in several species of *Puccinia*. Further for this reason many species originally included under *Diorchidium* including the type species have been transferred to *Puccinia* earlier. Therefore this rust is also now revised as *P. tricholænæ*. It has not been recorded from India.

#### 34. *Puccinia baryi* (Berk et Br) Wint.

Saccardo, P. A., *Syll. Fung.*, 1888, 7, 660.

Sydow, H. and P., *Monographia Uredinearum*, 1904, 1, 737.

On living leaves of *Brachypodium sylvaticum* Beauv., Ootacamund, 10-VIII-1947, K. V. Srinivasan.

This is a new record of this rust for India.

35. *Puccinia rhynchosporæ* Syd.

Sydow, H. and P., *Ann. Mycol.*, 1913, **11**, 103.

On living leaves of *Rhynchospora* sp. Sidapur (Coorg), 17-XII-1922, K. M. Thomas.

Only the telia are present. These are hypophyllous often arranged in longitudinal series. The teliospores measure  $33-44 \times 18-22 \mu$ . The apex is rounded sometimes obtuse, thickened, or rarely almost truncated. The apical thickening ranges from 4 to  $9 \mu$ . The pedicel is hyaline and persistent up to  $60 \mu$  in length. This rust agrees with the description of *P. rhynchosporæ* Syd., the only difference being that the mesospores are rare in the present rust while they are said to be numerous in *P. rhynchosporæ*. It is different from *P. angustatioides* R. E. Stone and *P. oblongula* Jack. and Holw., two other rusts recorded on *Rhynchospora*, as the teliospores in the two latter rusts are definitely longer. It is also different from *P. consobrina* Arth. and Holw. as the telia are in rows. Hence it is identified as *Puccinia rhynchosporæ*.

36. *Puccinia coronata* Corda.

Butler, E. J., and Bisby, G. R., *Fungi of India*, 1931, 66.

Arthur, J. C., *Manual of Rusts in United States and Canada*, 1934, 152.

On the stems and leaves of *Avenastrum asperum* C. Fisch, Ootacamund, 10-IX-1947, K. V. Srinivasan.

The rust on this host agrees very closely with *P. coronata* Corda. Both uredia and telia are present. Uredia are paraphysate with capitate paraphyses. The teliospores have a crown of three to ten digitate projections. The spore size agrees with that of *P. coronata*. This is a new host for this rust.

37. *Uromyces loculiformis* Ramakrishnan, T. S. and K. sp. nov.

*Aecia* hypophyllous, solitary or in groups, in yellowish amphigenous spots, cupulate, deep seated; peridium white lacerated at the margins, becoming almost powdery, made up of polygonal, hyaline, prominently verrucose cells,  $34 \times 22 \mu$  ( $24-40 \times 16-28 \mu$ ); *aeciospores* yellowish, globose to subglobose, or polygonal, thin-walled very finely verrucose, catenulate,  $27 \times 20 \mu$  ( $20-32 \times 16-24 \mu$ ); *telia* hypophyllous, mixed with *aecia* or separate, subepidermal long covered by the epidermis, sori divided into compartments by groups of closely arranged, vertical, brown paraphyses; *teliospore* pedicellate, angular, one celled, with the apex thickened up to  $8 \mu$ , yellow to reddish brown  $34 \times 23 \mu$  ( $28-40 \times 16-28 \mu$ ); epispore smooth pedicel persistent concolorous.

On living leaves of *Chlorophytum attenuatum* Baker, Coonoor, 10-X-1947, T. S. Ramakrishnan.

Maculæ amphigenæ, flavo colores; æcia hypophylla, isolata, vel aggregata, cupulata, profunde immersa, peridii cellulæ polygonæ, cum denso pariete, hyaline, prominenter verrucosæ,  $34 \times 22 \mu$  ( $24-40 \times 16-28 \mu$ ), margine albido, lacerato; æciosporis angulato-globosis, catenulatis, flavidis,  $27 \times 20 \mu$  ( $20-32 \times 16-24 \mu$ ) pariete leviter verruculosis.

Teliis hypophyllis, subepidermalibus, multiloculatis, paraphysisibus, numerosis, coalitis; teliosporidia pedicellata, polygonæ, unicellata, apice incrassatis, usque  $6-8 \mu$ , flavo vel rubrobrunneo colores,  $34 \times 23 \mu$  ( $28-40 \times 16-28 \mu$ ), episporio levi; pedicello persistente, concolores.

In vivis foliis *Chlorophyti attenuati* Baker, Coonoor, 10-X-1947, T. S. Ramakrishnan.

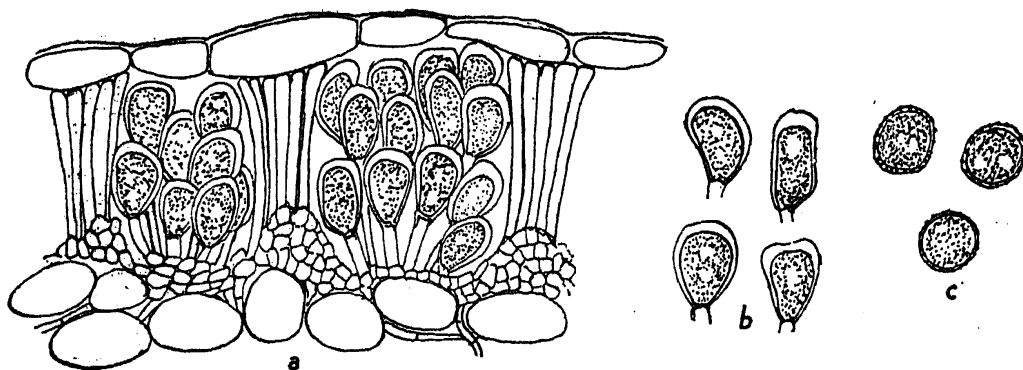


FIG. 6. *Uromyces loculiformis*.—a. Section through telia ( $\times 200$ ), b. Teliospores ( $\times 200$ ), Aeciosporës ( $\times 200$ ).

This rust is found to be different from other species of *Uromyces* recorded on Liliaceous plants in the characteristic appearance of the telia with separation into compartments. The loculate telia resemble those found in some species of *Puccinia*. For this reason this rust is described as a new species and named *U. loculiformis*. It is autoëcious as both telia and æcia are found on the same host.

### 38. *Uromyces wellingtonica* Ramakrishnan, T. S. and K. sp. nov.

*Uredia* amphigenous, but mainly hypophyllous on the lamina and sheath, minute, oval to elongate; *urediospores* pedicellate, subglobose or angled, echinulate, mikado brown to orange cinnamon,  $24 \times 22 \mu$  ( $22-28 \times 20-24 \mu$ ) with 5-6 scattered germ pores; *telia* hypophyllous, oblong to linear, black, long covered by the epidermis; *teliospores* angular, chestnut brown, apex darker coloured, thickened up to  $6 \mu$ , smooth walled,

with the urediospores appearing as minute black dots. This rust has not been recorded from South India.

40. *Dasturella divina* Mundkur and Keshwalla.

Mundkur, B. B. and Keshwalla, K. F., *Mycologia*, 1943, **35**, 201-206.

Thirumalachar, *et al.*, *Bot. Gaz.*, 1947, **108**, 371-79.

On living leaves of *Randia brandisii* Gamb. Walayar, 15-IX-1947, T. S. Ramakrishnan and K. Ramakrishnan and on living leaves of *Randia candolleana* W. and A. Chittor, 22-VIII-1918, C. E. C. Fischer.

The æcial stage of this fungus has been recorded on *Randia dumetorum* Pycnia and æcia closely resembling those formed on the above host were noticed on *Randia brandisii* Gamb. Spots are found on the leaf or witches brooms are developed consisting of erect clusters of branches bearing reduced leaves. On the latter numerous orange coloured æcia are developed, hypophyllously covering the entire lower surface. Pycnia are epiphyllous appearing as black dots, hemispherical and sub-cuticular. Similar æcia have been collected on *R. candolleana* W. and A. The æcial stages of the rusts on these two hosts agree with that of *D. divina*.

41. *Cercospora kallarensis* Ramakrishnan, T. S. and K. sp. nov.

Spots amphigenous, circular or irregular, 0.2-0.5 mm. in diam., isolated or crowded, groups delimited by veins, brown; *conidiophores* hypophyllous, coremioid, densely tufted, one cluster in each spot, originating from a small stroma, unbranched, 3-6 septate,  $100-150 \times 4-6 \mu$ ; *conidia* narrowly obclavate, light olive brown, 1-3 septate, apex obtuse,  $26-60 \times 3-6 \mu$ .

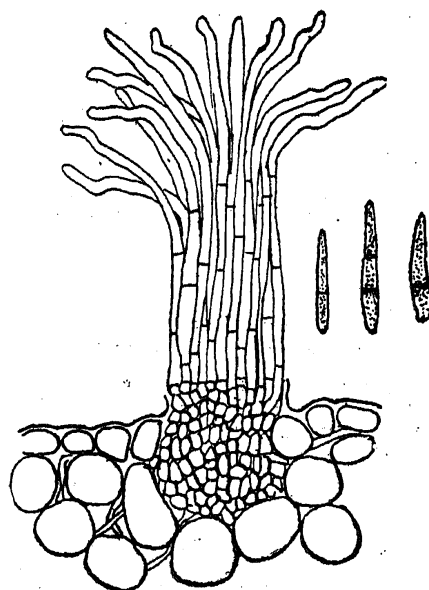


FIG. 8. *Cercospora kallarensis*.—Section of leaf showing conidiophores, conidia ( $\times 200$ ).

On living leaves of *Ficus* sp. Kallar (Coimbatore), 7-VIII-1947, T. S. Ramakrishnan and K. Ramakrishnan.

Maculæ amphigenæ, orbiculares, vel irregulares isolatæ vel aggregate, venis delimitatæ, brunneo colore, 0·2–0·5 mm. diam.; *conidiophora* hypophylla, coremioidea dense fasciculata, una quaque macula unum gerente fasciculum, quod ex parvo stromate oritur simplicia, 3–6 septata, 100–160  $\times$  4–6  $\mu$ ; *conidia* angustati obclavata, leviter olivaceo brunneo colore, 1–3 septata, apice obtuso, 26–60  $\times$  3–6  $\mu$ .

In vivis foliis *Ficus* sp. Kallar, 7-VIII-1947, T. S. Ramakrishnan et K. Ramakrishnan.

The leaves are studded with numerous spots which are clearly visible when the leaf is held against the light. When examined with a lens the coremicid conidiophores can be seen projecting as tufted growths one from the middle of each spot. Each fascicle is more or less compact and straight for nearly two-thirds of the length. Further up the conidiophores are flexuous mostly bending outwards. The spores are predominantly one septate, but conidia with two and three septa are also present. The coremioid nature of the conidiophores is peculiar. Similar conidiophores have been recorded by Solheim (1929) for *C. cercidicola* Ell. But in the fungus under study the conidiophores are simple while they are said to be branched in the other species. This fungus does not resemble any of the recorded species on this or allied hosts and is therefore described as a new species, *C. kallarensis*.

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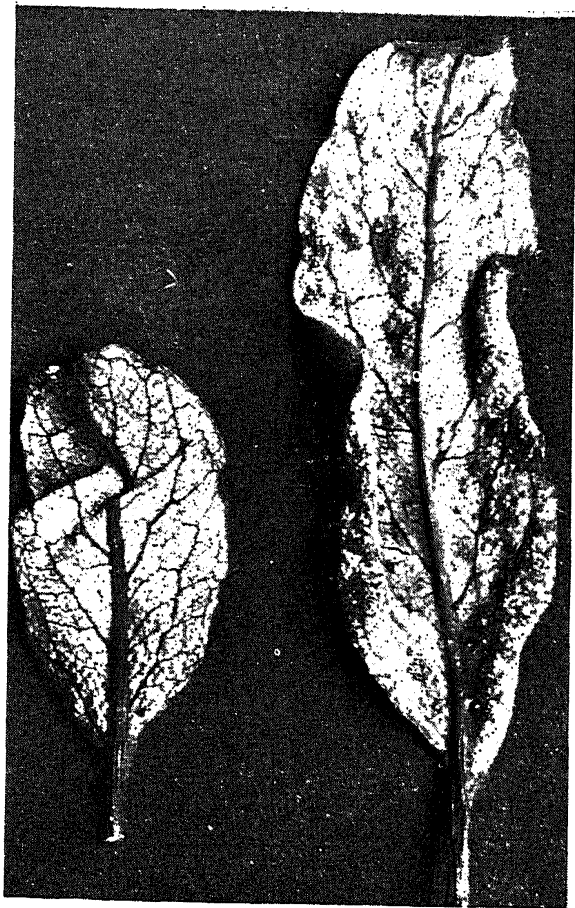
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#### EXPLANATION OF PLATES

- Plate I. (a) Witches' broom on *Nothopegia* sp. (slightly reduced) caused by *Uræcium nothopegiæ*.
- Plate II. (b) Two leaves from a witches' broom showing the sori ( $\times 1\frac{1}{2}$ ).
- (c) Section through an uræcium ( $\times 80$ ).
- (d) Section through an old spermagonium of *Guignardia nilagiriaca* showing the out growths from the wall and the multicellular filaments arising from the base ( $\times 320$ ).
- (e) An old spermagonium dissected out to show the multicellular filaments arising from the base ( $\times 320$ ).
- (f) Section through a perithecium of *Guignardia* ( $\times 320$ ).

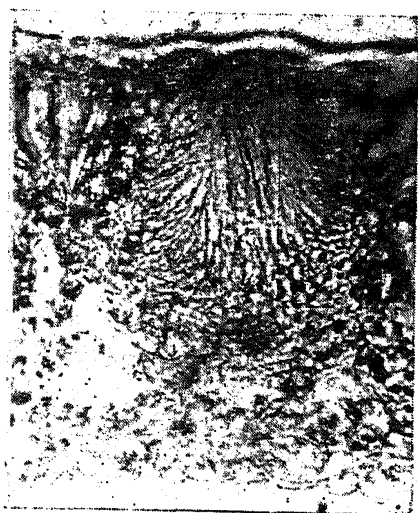




*b*



*c*



*d*



*e*



*f*