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ADDITIONS TO FUNGI OF MADRAS—VIII

BY

T. S. RAMAKRISHNAN, F.A.SC., AND K. RAMAKRISHNAN

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By T. S. Ramakrishnan, F.A.Sc., and K. Ramakrishnan
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(67) *Cystopus molluginicola* Ramakrishnan, T. S. and K., sp. nov.

Sori hypophyllous, circular or irregular, isolated or confluent, raised, white, 0·5–2 mm. diam.; conidiophores cylindric, straight or flexuous, hyaline; conidia globose, subglobose or oblong, without a median annular thickening, hyaline, 15 × 14 μ (11–20 × 11–16); oospores numerous in the mesophyll of the leaf and the cortex of the peduncle, 52 μ (42–60) in diam.; epispore dark brown with irregular reticulations.

Soris hypophyllis, rotundis vel irregularibus, sparsis vel confluentibus, inflatulis, albidis, 0·5–2 mm. diam.; conidiophoris cylindricis, rectis vel flexuosis, hyalinis; conidiis globosis, subglobosis vel oblongis, sine incrassatis annulo medio, hyalinis, 15 × 14 μ (11–20 × 11–16); oosporis numerosis, in foliis et pedunculis hospitis, globosis, 52 μ (42–60) diam.; episporio fusco brunneo, irregulariter reticulato.

On living leaves and peduncles of *Mollugo nudicaulis* Lam. (Aizoaceæ), Coimbatore, 16-9-1948, T. S. Ramakrishnan.

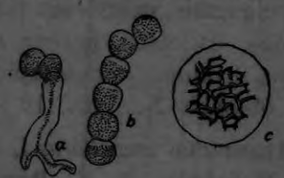

Fig. 1. *Cystopus molluginicola*—*a*. conidiophore and conidia; *b*. a chain of conidia; *c*. portion of oospore showing the reticulate markings on the epispore × 275.

The incidence of infection is conspicuous in July-August and November-December. The lowest leaves are the first to be affected. With the development of the oospores the upper surface of the leaf becomes brown in colour and these coloured portions are slightly raised. The oospores can be easily seen as black dots when the leaf is viewed against light. Oospore formation is seen in the peduncle also.

Two species of *Cystopus* have been recorded on plants belonging to the Aizoaceæ, *C. trianthemæ* (Wils.) Sacc. and Trott., on *Trianthema portulacastrum* from Mexico and *C. austro-africanus* (H. and P. Syd.) Sacc. and

Trott., on *Aizoon rigida* from South Africa (Saccardo, 1912, 1926). The fungus under study differs from the former in the absence of the median annular thickening for the conidium and the smaller size of the oospore. It differs from the latter in having irregular reticulations on the episopore of the oospores instead of papillæ.

(68) *Glomerella artocarpi* Delacr.

Saccardo, P. A., *Syll. Fung.*, 1913, **22**, 77.

Syn., *Glœosporium artocarpi* Delacr. in Saccardo, *Syll. Fung.*, 1906, **18**, 454.

On living leaves of *Artocarpus integrifolia* L. (Moraceæ), Thondamuthur (Coimbatore), 10–11–1948, T. S. Ramakrishnan and K. Ramakrishnan.

The conidial stage alone was observed. The fungus produces irregular brown spots on the leaves and causes their premature shedding.

(69) *Mycosphærella agapanthi* Ramakrishnan, T. S. and K., sp. nov.

Spots amphigenous, elongated, grey coloured with reddish margin; perithecia amphigenous, black, globose, wall membranous, dull brown, ostiolate; asci hyaline, subglobose to oblong, wall thickened at the apex, 36 × 21 μ (25–50 × 14–29); ascospores oblong, 2-celled, hyaline, 19 × 5 μ (14–25 × 4–7).

Maculis amphigenis, elongatis, canis cum margine rubroso; peritheciis amphigenis, nigris, globosis, ostiolatis, pariete membranaceo, fuscentibus; ascis globosis vel oblongis, hyalinis, pariete apice densato, 36 × 21 μ (25–50 × 14–29); ascosporis oblongis 2-cellatis, 19 × 5 μ (14–25 × 4–7).

On living leaves of *Agapanthus umbellatus* L. Heril. (Liliaceæ), Botanical Gardens, Ootacamund, 26–5–1948, T. S. Ramakrishnan and K. Ramakrishnan.

FIG. 2. *Mycosphaerella agapanthi*—asci and ascospores × 275.

The spots commence as small grey drying areas on either side of the leaf. These increase in size and assume a spindle-shaped appearance with a reddish margin. The perithecia are very small and subepidermal but no deep seated.

(70) *Physalospora cordiæ* Ramakrishanan, T. S. and K., sp. nov.

Spots indefinite, amphigenous, irregular, yellowish green, turning brown on drying; perithecia minute, black, crowded in the middle of the spot, but separate, innate, reaching up to the lower epidermis, uniloculate, ostiolate; asci cylindrical with rounded apex, 68 × 15 μ (43–90 × 7–21), paraphysate, paraphyses coloured orange; ascospores 8, uniseriate, or irregular, hyaline elliptical, 1-celled, 15 × 8 μ (12–16 × 6–9).

Maculis indefinitis, amphigenis, irregularibus, subflavo viridibus, fusco colore post exsicationem; peritheciis minutis, nigris, medio macularum aggregatis, sed distinctis, innatis, epidermati inferiori attigentibus, uniloculariibus, ostiolatis; ascis cylindricis, apice rotundatis, 68 × 15 μ (43-90 × 7–21), paraphysatis, paraphysibus aurantiaceis; ascosporis 8, uniseriatis vel irregularibus, hyalinis, ellipticis, unicellularibus, 15 × 8 μ (12–16 × 6–9).

On living leaves of *Cordia obliqua* Willd. (Boraginaceæ), Walayar, 15–1–1948, T. S. Ramakrishnan and K. Ramakrishnan.

FIG. 3. *Physalospora cordiae*—*a*. perithecia × 50; *b*. asci and ascospores × 250.

The perithecia appear as black, shining hemispherical protrusions on both sides of the leaf. The wall is thick and dark brown at the top and bottom. The asci gelatinise on maturity and in old perithecia the cavity is filled with the loose ascospores. These are extruded through the ostiole and often collect in waxy, cream coloured masses above the ostiole. The ascospores also have a gelatinous envelope.

Phyllachora caffra Syd. has been recorded on *Cordia caffra* from Natal, Africa (Theissen and Sydow, 1915). But the fungus under study is considered different on account of the gelatinisation of the ascus wall and the differences in the measurements of the asci and ascospores.

(71) *Catacauma elettariæ* Ramakrishnan, T. S. and K., sp. nov.

Spots present or not, when present oval, brown with whitish centre, amphigenous; stromata epiphyllous, black, shining, formed in parallel rows, conical with one or rarely more loculi, between the epidermis and palisade; asci cylindric with a small foot, hyaline, 65 × 15 μ (51–70 ×

12–18); ascospores 8, hyaline, 1-celled, biseriate, oblong, 20 × 7 μ (15–24 × 6–9).

Maculis ovalibus, brunneis, amphigenis; stromata epiphylla, micantia, conica, uni-vel pluriloculata, subepidermia; asci cylindrici, brevipedicellati, hyalini, 65 × 15 μ (51–70 × 12–18); ascosporidia 8, hyalina, unicellata, biseriata, oblonga, 20 × 7 μ (15–24 × 6–9).

On living leaves of *Elettaria cardamomum* Matt. (Zingiberaceæ), Papanasam (Tinnevelly), 15–5–1949, K. Sundaram Pillai.

FIG. 4. *Catacauma elettariae*—*a*. stroma and loculus × 63; *b*. asci × 275.

The fungus is definitely a *Catacauma* as seen from the position of the stroma and the 1-celled hyaline ascospores. The stromata are very minute and appear like black shining dots.

Butler and Bisby (1931) have recorded *Placostroma elettariæ* (B. and Br.) Theiss. and Syd., on cardamom from Bangalore. Theissen and Sydow (1915), who described this fungus on *Elettaria floribunda* from Ceylon based their description of the fungus on Berkeley and Broome's (1875) diagnosis of *Dothidea elettariæ*. The fungus under study agrees with *Placostroma elettariæ* except for the fact that the spores are 1-celled in the former. These spores have usually two vacuoles divided by a central isthmus of protoplasm containing a nucleus. Even when seen with the aid of an oil immersion objective no central septum was seen. It has not been possible to see the type specimen of *Placostroma elettariæ* but the fungus under study cannot belong to this genus as the spores are distinctly 1-celled.

(72) *Phyllachora glycosmidis* Petch.

Petch, T., in *Ann. Roy. Bot. Gard. Peradeniya*, 1917, **6**, p. 3, 227.

Saccardo, P. A., *Syll. Fung.*, 1926, **24**, 602.

On living leaves of *Glycosmis cochinchinensis* Pierre. (Rutaceæ), Burliar (Nilgiris), 22–7–1948, T. S. Ramakrishnan and K. Ramakrishnan.

It has not been possible to see the type specimen but the present fungus agrees with the description of *P. glycosmidis*.

FIG. 5. *Phyllachora glycosmidis—a.* ascus and paraphysis × 410; *b.* perithecia × 60.

(73) *Phyllachora gudalurensis* Ramakrishnan, T. S. and K., sp. nov.

Spots indistinct or light brown in colour, amphigenous; stromata amphigenous, black, shining, multiloculate; asci cylindric-clavate, hyaline 103 × 8 μ (66–126 × 6–9), paraphysate, paraphyses filiform; ascospores 8, uniseriate, oblong or spindle-shaped, hyaline, 1-celled, 11 × 6 μ (10–14 × 4–7).

Maculis indistinctis vel levi brunnei colores, amphigenis; stromata amphigena, atra, micantia, multiloculata; asci cylindrici-clavati, hyalini, 103 × 8 μ (66–126 × 6–9), paraphysati, paraphyses filiformes; ascospridia 8, uniseriata, oblonga vel fusiformia, hyalina, unicellata, 11 × 6 μ (10–14 × 4–7).

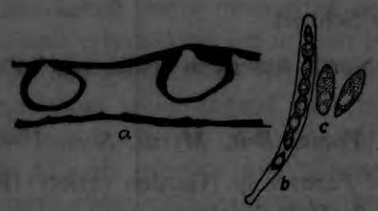

FIG. 6. *Phyllachora gudalurensis—a.* stroma and loculi × 40; *b.* ascus × 270; *c.* ascospores × 570.

On living leaves of *Croton oblongifolius* Roxb. (Euphorbiaceæ), Gudalur (Nilgiris), 17-5-1949, T. S. Ramakrishnan.

The spots are clearly visible in some whereas in others there are no definite spots round the stromata. The stromata themselves appear as isolated black spots being uniformly developed on the lower surface with a number of minute projections. On the corresponding upper surface the stromata appear as groups of black shining dots separated by the discoloured leaf tissue.

Theissen and Sydow (1915) have recorded three species of *Phyllachora* on other species of *Croton* from South Africa and South America. But

the fungus under study differs from them in the measurements of the asci and ascospores.

(74) *Phyllachorella micheliæ* Syd.

Sydow, H., *Ann. Myc.*, 1914, **12**, 489.

This fungus was described on *Michelia nilagirica* Zenk. from the Nilgiris (Sydow, 1914). Only perithecia have been recorded so far. In May 1949 an examination of the diseased leaves showed the development of numerous black, subepidermal pycnidia in groups or isolated and closely associated with the perithecia. The pycnidia were ovate and ostiolate. The pycnidiospores were elliptic to oblong, 1-celled, hyaline, and measured $14 \times 7\,\mu$ (9–18 × 6–9). They were extruded in short whitish filamentous masses from the ostioles. The pycnidial stage resembles a *Macrophoma* and appears to represent the imperfect phase of P. *micheliæ* as judged by the close association of the two fungi. These two stages were observed on the leaves of *Michelia champaka* L. also, growing in the Botanical Gardens at Ootacamund.

(75) *Doassansia hygrophilæ* Thirumalachar, in *Lloydia*, 1946, **9**, 24–30.

On living leaves of *Asteracantha longifolia* Nees. (Acanthaceæ), 21-7-1948, Walayar, T. S. Ramakrishnan and K. Ramakrishnan.

(76) *Entyloma fuscum* Schroet.

Clinton, G. P., "North American Ustilaginæ," *Proc. Bost. Nat. Hist. Soc.*, 1904, **31**, 471.

Mundkur, B. B., *Trans. Brit. Mycol. Soc.*, 1940, **24**, 331.

On living leaves of *Papaver* sp. (Garden variety) (Papaveraceæ), Ootacamund, 8–10–1948, T. S. Ramakrishnan.

This smut was observed on the leaves of the garden poppy at the Botanical Gardens, Ootacamund. The spots are amphigenous, brown, circular or irregular. They are covered by white growths on the lower surface. Hyaline filiform, falcate, 1-celled conidia, measuring $10–14 \times 1{\cdot}5–2{\cdot}5\,\mu$, are formed on the spots.

(77) *Melampsora salicis-albæ* Klebh.

Klebhan, H., in *Zeits. Pflanzenkrankh.*, 1902, **12**, 21–22.

Syn. *Melampsora allii-salicis-albæ* Klebh. Sacc., *Syll. Fung.*, **17**, 266.

On living leaves and twigs of *Salix babylonica* L. (Salicaceæ), Botanical Gardens, Ootacamund, 28–5–1948, T. S. Ramakrishnan; on living leaves

and petioles of *Salix tetrasperma* Roxb. Perur (Coimbatore), 1-1-1949, T. S. Ramakrishnan and K. Ramakrishnan.

The uredial stage alone was present on the two hosts as bright orange coloured sori. The identification is tentative as the other stages have not been seen.

(78) *Urediniopsis macrosperma* (Cke.) Magn.

Arthur, J. C., *North American Flora*, 1925, 7 (10), 684-87.

Arthur, J. C., *Manual of the Rusts in United States and Canada*, p. 5, 1934.

Syn. *Urediniopsis pteridis* (Diet. and Holw.) Arthur, in *North American Flora*, 1907, 7, 116.

Milesina pteridis (Diet. and Holw.) Syd. in *Monogr. Ured.*, 1915, 3, 481.

On living leaves of *Pteridium aquilinum* (L.) Kuhn., Anamalais, 30-1-1949, D. Marudarajan and T. S. Ramakrishnan.

FIG. 7. *Urediniopsis macrosperma*—urediospores × 425.

This rust has undergone several changes in nomenclature. In the early description of *Urediniopsis pteridis*, Arthur (1907) has given the description of the uredia as follows:—" urediospores oval or fusiform, 11–18 × 30–58 μ, apex acute, rarely tipped with a short stout beak, wall thin with a few scattered papilla, beside the two sharply defined longitudinal rows of loosely set papilla. In 1925 Arthur reduced *Urediniopsis pteridis* to a synonym of *U. macrosperma*, and in the amended description he states, " the urediospores are obovate or broadly ellipsoid, more or less angular, 14–26 × 26–45μ, wall closely and rather finely verrucose". A further revision of the description made by him in 1934 (Arthur, 1934) agrees closely with the original description (Arthur, 1907).

On the Anamalais and the Nilgiris two rusts are apparently present on this host, one of which is now identified as *U. macrosperma*. This has whitish hypophyllous uredia covered by delicate peridium. The spores are pushed out through a central opening. They are fusiform or oval with an acute apex often tipped with a pointed beak 4–10 μ long. The spores measure 40 × 14 μ (30–51 × 12–17). The wall is colourless and rather closely verrucose. One longitudinal row of close set papillæ is evident,

Teliospores which are rare are seen in the mesophyll cells as delicate, globoid, 1–3 celled hyaline smooth walled structures. This rust agrees with the latest description of *U. macrosperma*.

(79) *Puccinia coronata* Corda.

Sydow, H. and P., *Monogr. Ured.*, 1, 320.

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

Ramakrishnan, T. S. and K., *Proc. Ind. Acad. Sci.*, 1948, **28**, 65.

The æcial stage of this rust was seen on the leaves of *Rhamnus virgatus* Roxb. (Rhamnaceæ) at Nanjanad, Nilgiris, 28–5–1948, T. S. Ramakrishnan and K. Ramakrishnan.

(80) *Uromyces nilagiricus* Ramakrishnan, T. S. and K., sp. nov.

Rust spot hypertrophied, up to 7 mm. diam.; pycnia amphigenous, subepidermal, oval, 240 × 210 μ; æcia amphigenous, deeply sunk, cupulate, peridium of one layer of polygonal, colourless, thick-walled, verrucose cells; æciospores angular, globose, catenulate, yellowish orange in colour, wall unevenly thickened, highly verrucose, 30 × 25 μ (24–33 × 18–30); uredia wanting; telia amphigenous, chocolate brown, subepidermal, erumpent; teliospores 1-celled, elliptic to rhomboid, narrow towards the base, 36 × 26 μ (30–45 × 21–30) apex rounded, thickened up to 8 μ, orange brown in colour, wall smooth, pedicellate, pedicel hyaline, up to 130 μ long.

Maculis amplificatis, usque 7 mm. diam.; pycnia amphigena, subepidermia, ovalia, 240 × 210 μ; æcia amphigena, profunde immersa, cupulata, cellulis peridiis polygonis, hyalinis, incrassatis, verrucosis; æciosporis angulato globosis, catenulatis luteo colore, episporio inequaliter incrassato, prominenter verrucoso 30 × 25 μ (24–33 × 18–30); uredia ignota; telia amphigena, subepidermia, erumpentia, brunnea; teliosporis unicellularibus, ellipticis vel rhomboidis, basi attenuatis, 36 × 28 μ (30–45 × 21–30) apice rotundato, incrassato usque 8 μ, episporio levi, aurantei brunnei colores, pedicellatis, pedicellis hyalinis, usque 130 μ longis.

On living leaves of *Loranthus* sp. (Loranthaceæ) parasitic on *Citrus reticulata*, Kotagiri, 25–4–1949, D. Marudarajan.

The pycnia and æcia occur on swollen concavo-convex areas. The convexity may be towards either surface. The æcia project as short white columns with lacerated and recurved margins. Telia are not on the same spots as æcia but occur on the same leaf.

Cummins (1931) mentions the occurrence of seven species of *Uromyces* on hosts belonging to the Loranthaceæ. But in all of them the wall of the

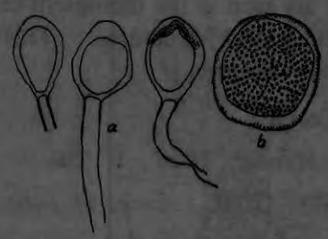

FIG. 8. *Uromyces nilagiricus*—*a*. Teliospores × 270; *b*. aeciospore × 570.

teliospore is either ridged or reticulate and never smooth. In the rust under study the wall of the teliospore is completely smooth and no markings are visible even under the oil immersion objective. It is therefore considered different from those recorded so far.

(81) *Kordyana indica* Gaumn.

Syn. *K. tradescantiæ* (Pat.) Racib. Saccardo, P. A., *Syll. Fung.*, 1902, **16**, 199. Gäumann, E., *Ann. Mycol.*, 1922, **20**, 264. Butler, E. J. and Bisby, G. R., *Fungi of India*, 1931, p. 103.

On living leaves of *Commelina bengalensis* L. (Commelinaceæ), Walayar, 28–8–1948, T. S. Ramakrishnan and K. Ramakrishnan.

Bright yellowish spots are seen on the upper surface of the leaves. Corresponding to these, on the lower surface longitudinal rows of minute white groups of basidia are evident.

(82) *Cercospora careyæ* Ramakrishnan, T. S. and K., sp. nov.

Spots amphigenous, isolated, irregular, brown; hyphæ internal; conidiophores amphigenous, emerging through stomata, straight or bent, up to 4-septate, 70 × 4 μ (57–99 × 3–4·5), brown, apex geniculate; conidia obclavate, straight or curved, 1–4 septate, subhyaline to light brown, 45 × 5 μ (15–84 × 3–6).

Maculis amphigenis isolatis, irregularibus, brunneis; hyphis interioribus; conidiophoris amphigenis, ex stomatibus erumpentibus, rectis vel curvatis usque 4-septatis, brunneis, 70 × 4 μ (57–99 × 3–4·5), apice geniculatis; conidiis obclavatis, rectis vel curvatis 1–4 septatis, subhyalinis vel pallide brunneis, 45 × 5 μ (15–84 × 3–6).

On living leaves of *Careya arborea* Roxb. (Lecythidaceæ), Gudalur, 17–5–1949, T. S. Ramakrishnan.

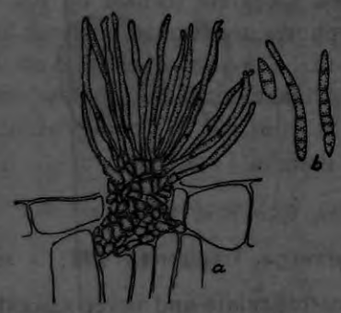

FIG. 9. *Cercospora careyae*—*a*. a cluster of conidiophores; *b*. Conidia × 275.

A small, multicellular stroma is formed in the substomatal space. The stroma projects outside later. After the formation of the conidiophores and conidia the spot presents a smoky brown appearance.

(83) *Cercospora dalbergicola* Ramakrishnan, T. S. and K., sp. nov.

Spots minute, amphigenous, prominent on the lower surface; conidiophores produced in fascicles on small stromata, hypophyllous, fascicles isolated or confluent, septate, sometimes branched, with geniculate apices, 82–123 × 4–7 μ, light brown; conidia usually one-septate, sometimes 2-septate, obclavate, subhyaline, or light brown, 29 × 6 μ (22·37 × 4–8).

Maculis minutis, amphigenis, inferiori superfecie prominentibus; conidiophoris fasciculatis, in parvis stromatibus, fasciculis isolatis vel confluentis, septatis, aliquando ramificatis, cum apicibus geniculatis, fuscatis, 82–123 × 4–7 μ; conidiis habitualiter 1-septatis, aliquando 2-septatis, obclavatis, subhyalinis vel fuscatis, 29 × 6 μ (22–37 × 4–8).

On living leaves of *Dalbergia volubilis* Roxb. (Papilionaceæ), Walayar, 28–7–1948, T. S. Ramakrishnan and K. Ramakrishnan.

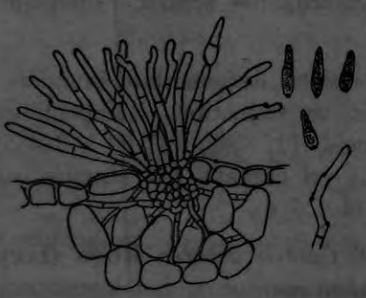

FIG. 10. *Cercospora dalbergicola* conidiophores and conidia × 250.

Greyish brown raised spots are formed on the lower surface. One or more clusters of conidiophores are formed on these and they give a powdery appearance to the growth. *Cercospora sissoo* Syd. has been recorded on *Dalbergia sissoo* from Allahabad, India (Sydow and Mitter, 1933). The fungus under study differs from this in the appearance and measurements of the conidiophores and conidia.

(84) *Cercospora eucalypti* Cke. and Mass.

Saccardo, P. A., *Syll. Fung.*, 1892, **10**, 644.

On living leaves of *Eucalyptus ficifolia* (Myrtaceæ), Ootacamund, 8–7–1948, T. S. Ramakrishnan.

The fungus causes circular to irregular spots with reddish margins on the leaves.

(85) *Cercospora sapindi-emarginati* Ramakrishnan, T. S. and K. sp. nov.

Spots amphigenous, irregular, 2–3 mm. across, yellowish, studded with black dots; conidiophores developed on subepidermal erumpent stromata, amphigenous, bursting through the epidermis, brown, continuous; conidia long-obclavate, many celled, olive brown, 48 × 5 μ (22–105 × 4–7).

Maculis amphigenis, irregularibus, 2–3 mm. diam. flavescentibus, nigris punctatis conspersis; conidiophoris ex subepidermalibus erumpentibus, stromatibus surgentibus, amphigenis, ex epidermate erumpentibus, fuscis, continuis; conidiis, longiobclavatis, pluricellularibus, olivaceo fuscis, 48 × 5 μ (22–105 × 4–7).

On living leaves of *Sapindus emarginatus* Vahl. (Sapindaceæ), Anakapalle, 27–2–1948, T. S. Ramakrishnan.

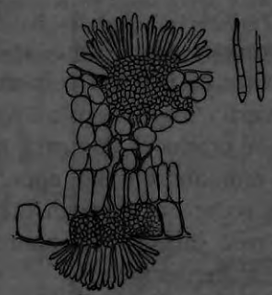

FIG. 11. *Cercospora sapindi-emarginati* conidiophores and conidia × 130.

The spots are often indistinct, but sometimes become whitish. The epidermis covering the stroma is raised like a flap. Portions of the stroma

fill the epidermal cells forming pale brown plectenchymatous growths. Each spot may bear one or more stromata which appear as black dots.

(86) *Cercospora tylophoræ* Ramakrishnan, T. S. and K., sp. nov.

Spots indistinct, fruiting amphigenous, maroon coloured; conidiophores in fascicles, on the upper surface coming out through the stoma, on the lower surface diffuse from superficial mycelium, septate; conidia cylindric to obclavate, 3–8 celled, 67 × 5 μ (29–122 × 4–7), straight, subhyaline to light brown.

Maculis indistinctis, amphigene fructificantibus, fusco coccineis, rubidulis; conidiophoris in superiori superficie fasciculatis ex stomatibus exeuntibus, diffuso superficiali mycelio in superficei inferiori, septatis; conidiis cylindricoobclavatis, 3–8 cellulatis, erectis, subhyalinis vel fuscatis, 67 × 5 μ (29–122 × 4–7).

On living leaves of *Tylophora asthmatica* W. and A. (Asclepiadaceæ), Walayar, 28-8-1948, T. S. Ramakrishnan and K. Ramakrishnan.

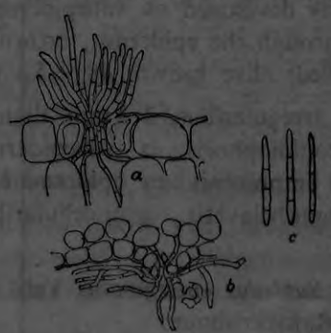

FIG. 12. *a*. Section of leaf showing upper surface; *b*. lower surface; *c*. conidia × 130.

The fungus does not produce any distinct spots. The growth is more prominent on the lower surface as maroon coloured irregular patches. On the upper surface more compact maroon coloured dot-like outgrowths are seen. The internal mycelium produces compact fascicles of conidiophores which emerge through the stomata on the upper surface. On the lower surface, however, the hyphæ come out through the stoma and form a loose growth outside the leaf. From this, conidiophores which are not usually in fascicles are given off at different places.

(87) *Glœosporium zonatum* Ramakrishnan, T. S. and K., sp. nov.

Spots extensive, distinctly zonate, amphigenous, grey to brown; acervuli numerous, amphigenous, but mostly epiphyllous, intraepidermal; conidio-

phores nonseptate, hyaline; conidia cylindric or oblong, straight or curved, 1 celled, hyaline, with rounded ends, 17 × 5 μ (12–21 × 3–6).

Maculæ amphigenæ, zonatæ, brunneæ; acervulis numerosis, amphigenis, sed prominenter epiphyllis, intraepidermalibus; conidiophoris nonseptatis, hyalinis; conidiis cylindricis vel oblongis, rectis vel curvatis, unicellatis, hyalinis, apice rotundatis, 17 × 5 μ (12–21 × 3–6).

FIG. 13. *Gloeosporium zonatum*—conidia × 570.

On living leaves of *Cœlogyne* sp. (Orchidaceæ), Ambillimalai estates, Gudalur (Nilgiris), 16–5–1949, T. S. Ramakrishnan.

The spots extend over a large portion of the leaf and exhibit a number of successive zones limited by wavy dark lines. The aceryuli appear as minute dots and are arranged in concentric circles. The development of the acervulus is mostly within the epidermal cells. The outer walls of the epidermal cells burst open and the spores are exposed. The stroma is dark brown. The spores on germination develop the characteristic appressoria.

(88) *Septoglœum scutiæ* Ramakrishnan, T. S. and K., sp. nov.

Spots minute, amphigenous, dark brown, with a dark raised rim, irregular; acervuli epiphyllous, subepidermal; conidiophores clavate, nonseptate; conidia straight or curved, cylindric to clavate, 1–3 septate, subhyaline, 44 × 2 μ (22–73 × 1·4–2·8).

Maculæ parvæ, amphigenæ, fusci brunnei colores, irregulares; acervulis epiphyllis, subepidermalibus; conidiophoris clavatis, nonseptatis; conidiis rectis vel curvatis, cylindircis vel clavatis, 1–3 septatis, subhyalinis, 44 × 2 μ (22–73 × 1·4–2·8).

On living leaves of *Scutia myrtina* Kurz. (Rhamnaceæ), Kotagiri, 25–4–1949, T. S. Ramakrishnan.

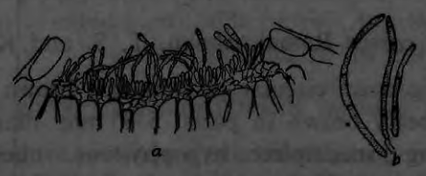

FIG. 14. *Septogloeum scutiae*—*a.* acervulus × 205; *b.* conidia × 425.

The spots are small usually 2 × 1 mm. and appear to be thickened owing to the raised dark margin. Two to four acervuli are formed in each spot. These are reddish brown in colour and remain covered by the epidermis for a long time.

(89) *Discella cedrelæ* Ramakrishnan, T. S. and K., sp. nov.

Spots amphigenous, circular or irregular, with shining black, irregular, flattened or discoid pycnidia arranged around a central straw coloured portion, 2–4 mm. diam.; pycnidia amphigenous, subepidermal, opening irregularly; pycnidiospores pedicellate, oblong, 2-celled, lower cell smaller, subhyaline, smooth, 18 × 9 μ (13–20 × 7–12).

Maculis amphigenis, orbicularibus vel irregularibus, cum pycnidiis fulgenter nigris irregularibus applanatis vel discoideis plus minus in circulism circa centralem stramineam partem dispositis, 2–4 mm. diam.; pycnidiis amphigenis, sub-epidermalibus, irregulariter aperientibus; pycnidiosporis pedicellatis, oblongis, 2-cellularis, ima cellula parviori, subhyalinis, lævibus, 18×9 μ (13–20×7–12).

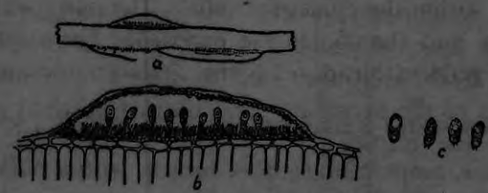

FIG. 15. *Discella cedrelae—a.* section of pycnidia (diagrammatic); *b.* section of a pycndium × 250; *c.* pycnidiospores × 250.

On living leaves of *Cedrela toona* Roxb. (Meliaceæ), Sim's Park, Coonoor, 9–10–1947, T. S. Ramakrishnan.

The spots are many on a leaf. The pycnidia occur like black incrustations irregularly arranged around a central clear portion or as irregular black crusts without a central space. They are very much flattened. The sporiferous portion is arched over by a layer of fungal tissue made up of dark cells. This roof ruptures irregularly and the spores are exposed.

(90) *Phleospora cassiæ* Ramakrishnan, T. S. and K., sp. nov.

Spots amphigenous, circular or irregular, brown to tawney olive, lower surface zonate, buffy brown in parts, 5–35 mm. diam.; pycnidia arranged in concentric rings, incomplete, hypophyllous, subepidermal, with a wide mouth, immersed to half the depth of the leaf; pycnidiospores narrow,

elongated, slightly curved, borne on closely arranged stalks, normally 3-septate, 32 × 4 μ (22–41 × 2–5).

Maculis amphigenis, circularibus, vel irregularibus, fuscoflavo olivaceis, inferiori superficei zonata, luteo fuscis partialiter, 5–35 mm. diam.; pycnidiis concentricis, circulis dispositi hospitis, hypophyllis, subepidermalibus, incompletis, cum lato ostio, usque dimidia partem foliorum immersis; pycnidiosporis angustis, acicularibus, leviter curvatis, dense collocatis pedicellis gestatis, 3-septatis, hyalinis, 32 × 4 μ (22–41 × 2–5).

On living leaves of *Cassia fistula* L. (Cæsalpiniaceæ) on the road from Kallar to Burliar (Nilgiris), 10–11–1946, T. S. Ramakrishnan.

FIG. 16. *Phleospora cassiae*—pycnidiospores × 530.

The spots are found either in the middle or along the margin of the leaflets and may sometimes involve the major portion of the leaflet by coalescence. The lower surface is dotted with concentric rings of small pycnidia. When fresh, gelatinous pinkish masses of spores project through the wide openings of the pycnidia. The affected portions of the leaf dry up quickly and become brittle.

(91) *Septoria graminum* Desm.

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On living leaves of *Digitaria marginata* Link. (Gramineæ), Walayar, 12–11–1948, T. S. Ramakrishnan.

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