

Some New or Interesting Fungi II.

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In an earlier paper the writer (1948) gave an account of some of the fungi collected in South India. Further studies have since then been made on several other fungi collected in different places, an account of which is presented here.

***Cercospora* *Azimae* Thirumalachar & Narasimhan sp. nov.**

Infection spots circular to polygonal, 2 to 4 mm in diameter, sparse, cinnamon-yellow in the centre and brownish-red along the margin. Conidiophores mostly epiphyllous, fasciculate, emerging through the stoma, clavate-cylindric, geniculate, 28—34 μ . long and 2—3 μ . broad; conidia clavate-cylindric, hyaline, acute at both ends, 1 to 3-septate, measuring 12.5—25 μ $\approx$ 1.5—2 μ .

Hab. on the leaves of *Azima tetracantha* Lam. (*Salvadoraceae*), Channapatna, Mysore, India, 11—9—1949, leg. M. J. Thirumalachar.

Maculae circulares vel angulosae, sparsae, 2—4 mm diam., cinnamomeo-luteae in centro, rubro-brunneae ad marginem. Conidiophora plerumque in epiphylloriunda, fasciculata, e stomatibus emergentia, clavato-cylindracea, geniculata, 28—34 μ longa, 2—3 μ lata; conidia clavato-cylindracea, hyalina utrinque acuta, 1—3-septata, 12.5—25 μ $\approx$ 1.5—2 μ .

Hab. In foliis *Azimae tetracanthae* Lam.

Azima tetracantha, a member of the *Salvadoraceae* is a common thorny shrub growing in extremely dry situations. The fungus incites the formation of brownish frog eye spots with a whitish centre, which represents the fruiting structure. As far as is known, no species of *Cercospora* has been recorded on this host species.

***Cercospora* *Thespesiae* Thirumalachar & Narasimhan sp. nov.**

Infection spots blackish-brown on the upper surface, circular to polygonal, 2—3 mm in diameter. Fruiting bodies hypophyllous, developing from a brownish-yellow stroma, 31—37 μ $\approx$ 12.5—19 μ .

wide. Conidiophores hyaline flexuous, unbranched, 3—5-septate, tapering at the apex, $31-37 \approx 3 \mu$. Conidia acicular, rounded at both ends, hyaline, 1—3-septate, $25-31 \approx 1.5-2.5 \mu$.

Hab. On leaves of *Thespesia populnea* Cav., Lakkavalli, Mysore, 14—10—1945, leg. M. J. Thirumalachar.

Maculae nigrae, epiphyllae, circulares vel angulosae, 2—3 mm diam. Caespituli hypophylli, ex hypostromatibus minusculis, stomatibus innatis oriundi; conidiophora hyalina, flexuosa, 3—5-septata, antice acutata, $31-37 \approx 3 \mu$. Conidia acicularia, hyalina, utrinque, obtusa, 1—3-septata, $25-31 \approx 1.5-2.5 \mu$. Hab. in foliis *Thespesiae populneae* Cav.

Cercospora Triumphettiae Thirumalachar & Narasimhan sp. nov.

Forming mildew-like patches on the lower leaf surface, diffuse, greyish-white infection patches, appearing orange-yellow to brownish on the upper surface. Hyphae emerging from the stomata, partly spreading on the sides. Stroma obscure; conidiophores simple, geniculate, hyaline, $25-31 \approx 4.5-6 \mu$; conidia clavate-cylindric, produced acrogenously, hyaline, broader at the base than at the apex, acute at tip, 2—8-septate, measuring $28-75 \approx 4.5-6.2 \mu$.

Hab. on leaves of *Triumfetta rhomboidea* Jacq., Bangalore, 18—12—1948, leg. M. J. Thirumalachar.

Maculae hypophyllae, erysiphoidae, diffusae, griseo-albae. Hyphae e stomatibus emergentes, partim ad latera diffusae. Stroma nullum. Conidiophora simplicia, geniculata, hyalina, $25-31 \approx 4.5-6 \mu$. Conidia clavato-cylindracea, acrogena, hyalina, antice attenuata et acutata, 2—8-septata, $28-75 \approx 4.5-6.2 \mu$.

Hab. in foliis *Triumfettiae rhomboideae* Jacq.

Cercospora Triumphettiae Syd. reported on the same host genus is known to occur in Uganda, East Africa and is a separate fungus.

Ramularia Mimosae Stevens & Dal.

Hab. On leaves of *Mimosa pudica* L., Bangalore, 15—9—1949, leg. M. J. Thirumalachar.

The fungus forms white patches on the upper surface of the leaves often involving the entire leaf surface and presenting the appearance of an *Oidium* infection. The fungus was first reported by Stevens and Dalbey from Puerto Rico (1919) and though very common, has not been recorded in India before.

Helminthosporium albizzicolum Thirumalachar & Narasimhan sp. nov.

Infection spots 1—2 mm in diameter, polygonal to irregular, often grouped in concentric rings, greyish-brown on the upper sur-

face, brownish-red and somewhat sunken on the lower side; Conidiophores developing from compact group of hyphae emerging out of the stoma, one-septata at the base, straight or slightly curved, $28-44 \Rightarrow 4.5-6 \mu$. Conidia acrogenous, pyriform, prolongate at the apex, rounded at the base, pale, cinnamon-brown, mostly 3-septate, not constricted at the septa, measuring $23.5-34 \Rightarrow 8-9 \mu$.

Hab. on leaves of *Albizzia Lebbek* Benth., Tirupati, South India, 10-1-1946, leg. M. J. Thirumalachar.

Maculae 1-2 mm diam. angulosae vel omnino irregulares, saepe anulos concentrice dispositos formantes, griseo-brunneae in epiphylo, brunneo-rubrae in hypophyllo et parum impressae; conidiophora e stomatibus emergentia, ad basim uniseptata, recta, vel tenuiter curvata. Conidia acrogena, pyriformia, antice saepe rostrata, postice rotundata pallide cinnamomeo-brunnea, laevia, plerumque 3-septata, $23.5-34 \Rightarrow 8-9 \mu$.

Hab. in foliis *Albizziae Lebbek* Benth.

In the type of symptoms produced, the fungus resembles to some extent *Helminthosporium Albizziae* Petch, reported to occur in Ceylon, and Uganda on leaves of *Albizzia*, which however is now shown to be *Camptomeris Albizziae* (Petch) Mason, (Hansford 1943), a member of the *Tuberculariaceae*. Further, the spores of this fungus are verruculose in contrast to the smooth ones of the species under study. The spores are pyriform and one to three-septate and superficially resemble those of *Piricularia*.

Helminthosporium Erythrinae Thirumalachar & Narasimhan sp. nov.

Infection spots circular to irregular, 3-5 mm in diameter, often associated with a *Septoria* species on the same infection spot. Conidiophores brownish-yellow, arising in clusters and extruding out of the stomata, $32-42 \Rightarrow 4-5 \mu$, simple, bearing conidia both terminally and laterally. Conidia straight, or vermiform or coiled, 4-8-septate, pale cinnamon-brown, rounded at the apex and flat at the base, measuring $39-62 \Rightarrow 8 \mu$.

Hab. on the leaves of *Erythrina suberosa*, Kemmangundi, Mysore, 8-10-1949, leg. M. J. Thirumalachar.

Maculae orbiculares vel angulosae, 3-5 mm diam. ad marginem parum elevatae. Conidiophora brunnescenti-lutea, e stomatibus acervatim emergentia, $32-42 \Rightarrow 4-5 \mu$, simplicia; conidia acropleurogena, recta, vermiformiter vel spiraliter curvata, 4-8-septata, pallide cinnamomeo-brunnea, antice rotundata, postice truncata, $39-62 \Rightarrow 8 \mu$.

Hab. in foliis *Erythrinae suberosae*.

The fungus differs from *Helminthosporium extensum* Petch, *H. inversum* Sacc. reported on the same host genus. While most of the conidia are straight or slightly curved, several of them have been found to be helicoid and similar to those occurring in *Helicomina* described by Olive (1948). Since a small percentage of the spores show such coiling, the writer prefers to place the fungus under *Helminthosporium* rather than *Helicomina*.

Helminthosporium Ravenelii Curt. et Berk. in Grevillea 3: 102, 1875. — Hab. on the spikelets of *Eragrostis pilosa* Beauv., Nandi Hills, Mysore, 20—10—1945, leg. M. J. Thirumalachar.

The fungus imparts a sooty appearance to the inflorescence of *Eragrostis pilosa* and is abundantly seen in fields after rainy season.

Helminthosporium Wagateae Thirumalachar & Narasimhan sp. nov.

Forming greyish-black patches on the lower leaf surface, stroma in substomatal space, protruding out, brownish-yellow, Conidiophores yellowish-brown, 81—125 μ long and 1.5 to 2.5 μ broad, multiseptate; conidia clavate-cylindric, cinnamon-yellow, rounded at both ends, or often produced at the apex, 2—4-septate, measuring 15.5—28 μ $\Rightarrow$ 3—4 μ .

Hab. on leaves of *Wagatea spicata* Dalz., Balehonnur, Mysore, 12—2—1945, leg. M. J. Thirumalachar.

Maculae griseo-nigrae hypophyllae; conidiophora e hypostromatibus, stomatibus innatis oriunda, luteo-brunnea, 81—125 μ $\Rightarrow$ 1.5—2.5 μ , simplicia, multiseptata. Conidia clavato-cylindracea, cinnamomeo-lutea, utrinque rotundata vel antice saepe elongata, 2—4-septata, non constricta, laevia, 15.5—28 μ $\Rightarrow$ 3—4 μ .

Hab. in foliis *Wagatae spicatae* Dalz.

Cylindrosporium Mappiae Thirumalachar & Narasimhan sp. nov.

Infection spots 1.5 to 2 cm in diameter, subcircular, often coalescing with each other, cinnamon-yellow. Acervuli epiphyllous, pustulate, grouped in the centre of infection patch, waxy, subepidermal, erumpent. Conidiophores in a palisade-like layer, hyaline, 33—40 μ $\Rightarrow$ 3.5 μ . Conidia clavate-cylindric, hyaline, straight or slightly curved at the top, with acute apex and flat at the base indistinctly 1—4-septate, measuring 85—125 μ $\Rightarrow$ 4—4.5 μ .

Hab. on the leaves of *Mappia foetida* Miers, Kemmangundi, Mysore, 27—4—1949, leg. M. J. Thirumalachar.

Maculae 1.5—2 cm diam., subcirculares, saepe confluentes, cinnamomeo-luteae. Acervuli epiphylli, pustulati, in centro macularum aggregati, ceracei, subepidermales, mox erumpentes. Conidiophora in strato basali valliformi oriunda, hyalina, 33—40 μ $\Rightarrow$ 3.5 μ .

Conidia clavato-cylindracea, hyalina, recta vel in apice tenuiter curvata; antice acuta, postice truncata, indistincte 1—4-septata, $85-125 \approx 4-4.5 \mu$.

Hab. in foliis *Mappiae foetidae* Miers.

Septogloeum Mappiae Petch. has been described on the same host species by Petch from Ceylon. The type material of this was not available for comparison and future studies may indicate that the two fungi are one and the same in which case it would be a new combination rather than a new species. The structure of the sorus of the fungus under study however indicates that it is a species of *Cylindrosporium*.

Microstroma Albizziae Syd. in Ann. Mycol. **10**, 263, 1912.

Hab. on the leaves of *Albizzia odoratissima* Benth., Nandi Hills, Mysore, 16—12—1945, leg. M. J. Thirumalachar.

The fungus often occurs in such abundance that it imparts a mildewy appearance for the whole tree. Infected trees get defoliated much earlier than those that are free from infection.

Microstroma Cadabae Thirumalachar & Narasimhan sp. nov.

Infection patches pale-yellow, coalescent with one another, 2—4 cm in diameter; stromata grouped beneath the stomata, pale-yellow, $33-56 \mu$ in diameter. Conidiophores fasciculate, emerging out of the stroma, clavate-cylindric and pale-cinnamon-yellow, $12.5-15.5 \approx 3-4 \mu$. Conidia ovate-cylindric or oblong ellipsoid, hyaline, rounded at both ends, with firm walls, measuring $15.5-23 \approx 4.5 \mu$.

Hab. on the leaves of *Cadaba indica* Lam., Channapatna, Mysore, 11—9—1949, leg. M. J. Thirumalachar.

Maculae pallide luteae, confluentes, 2—4 cm in diam. Conidiophora e stomatibus stomatibus innatis oriunda, pallide lutea, $12.5-15.5 \approx 3-4 \mu$, clavato-cylindracea. Conidia ovato-cylindracea, vel oblongo-ellipsoidea, hyalina, utrinque rotundata, $15.5-23 \approx 4.5 \mu$.

Hab. in foliis *Cadabae indicae*.

The *Microstroma* species under study differs from all others so far described. *M. Juglandis* (Bereng.) Sacc. and *M. Pithocolobii* have been previously reported from India.

The conidia germinate readily when placed on drops of water on slides in moist chambers and are seen to develop long germ tubes.

Phleospora Cassiae Thirumalachar & Narasimhan sp. nov.

Producing yellowish-brown infection patches on the upper surface of the leaves, angular, subspherical to irregular, 5—15 mm, in diameter. Pycnidia minute, hypophyllous, subepidermal, applanate,

ostiolate, later opening out broadly, $89-107 \Rightarrow 125-143 \mu$; pycnosporae filiform, hyaline, slightly curved, 2—3-septate, measuring $20-31 \Rightarrow 1.5 \mu$.

Hab. on the leaves of *Cassia fistula* L., Bangalore, 15—12—1948, leg. M. J. Thirumalachar.

Maculae epiphyllae, luteo, brunneae, angulosae, suborbiculares, 5—15 mm diam. Pycnidia minuta, hypophylla, subepidermalia, applanata, ostiolata, postea late aperta, $89-107 \Rightarrow 125-143 \mu$; pycnosporae filiformes hyalinae, parum curvatae, 2—3-septatae, $20-31 \Rightarrow 1.5 \mu$.

Hab. in foliis *Cassiae fistulae* L.

The sorus represents an incompletely formed pycnidium and hence the fungus is placed under *Phleospora* and separating it from *Septoria*. In later stages the pycnidium opens out broadly appearing like an acervulus.

Macrophoma Rotalae Thirumalachar & Narasimhan sp. nov.

Infection spots epiphyllous minute, appearing as black specks; pycnidia epiphyllous, globose, ostiolate, with blackening at the apex, $72-85 \Rightarrow 74-81 \mu$. Pycnosporae ovate-ellipsoid, to subspherical, hyaline, smooth, with granular contents, measuring $12-15 \Rightarrow 7.5-9 \mu$.

Hab. on the leaves of *Rotala aquatica* Lour., Thirthahalli, Mysore, 3—4—1945, leg. M. J. Thirumalachar.

Maculae epiphyllae, minusculae, nigrescentes. Pycnidia epiphylla, globosa, ostiolata, nigrescentia in apice, $72-85 \Rightarrow 74-81 \mu$. Pycnosporae ovatae vel ellipsoideae, hyalinae, laeves, plasmate granulato repletae, $12-15 \Rightarrow 7.5-9 \mu$.

Hab. in foliis *Rotalae aquaticae* Lour.

Rotala aquatica is a common shrub growing on the sandy banks of river beds in South India. The plants are submerged during rainy season and lie exposed during summer. The *Macrophoma* leaf spot fungus on *Rotala aquatica* has been collected from several localities. Its collection is often rendered difficult due to the coating of insect excreta on the leaves.

Stagonospora Brideliae Thirumalachar & Narasimhan sp. nov.

Infection spots epiphyllous, chocolate-brown, sphaerical to polygonal, 1 to 2 mm. in diameter, margin slightly raised. Pycnidia epiphyllous, scattered, erumpent by an ostiole, $107-127 \Rightarrow 100-107 \mu$. Pycnosporae clavate-cylindric, ophuroid, pointed at both ends, 6—7-septate, hyaline, measuring $25-32 \Rightarrow 3-4 \mu$.

Hab. on the leaves of *Bridelia Roxburghiana* Gehrm., Nandi Hills, Mysore, 28—11—1948, leg. M. J. Thirumalachar.

Maculae epiphyllae, brunneae, orbiculares vel angulosae, 1—2 mm diam., margine parum elevatae. Pycnidia epiphylla, dispersa,

erumpentia, ostiolata, $107-125 \approx 100-107 \mu$; pycnosporae clavato-cylindratae, vermiformiter curvatae, utrinque acutae, 6—7—septatae, hyalinae, $25-32 \approx 3-4 \mu$.

Hab. in foliis *Brideliae Roxburghianae* Gehrm.

The fungus incites the formation of minute brown spots which are numerous and scattered. They are easily overlooked due to their association with perisporiaceus fungi which form large sooty patches.

Ascochyta Santali Thirumalachar & Narasimhan sp. nov.

Infection spots on leaves, circular to irregular, yellowish-brown, often with a greyish-white centre, Pycnidia amphigenous, cinnamon-yellow, subglobose, applanate, ostiolate, $100-250 \mu$ broad, $70-107 \mu$ high. Pycnosporae ovate-ellipsoid, rounded at both ends, hyaline, one-septate, $7-10.5 \approx 3-4 \mu$.

Hab. on the leaves of *Santalum album*, L., Nandi Hills, Mysore, 28—11—1948, leg. M. J. Thirumalachar.

Maculae orbiculares vel irregulares, luteo-brunnae, in centro saepe griseo-albescentes. Pycnidia amphigena, cinnamomeo-lutea, subglobosa, applanata, ostiolata, $100-250 \mu$ lata, $70-107 \mu$ alta; pycnosporae ovato-ellipsoideae utrinque rotundatae, hyalinae, 1—septatae, $7-10.5 \approx 3-4 \mu$.

Hab. in foliis *Santali albi* L.

The fungus incites the formation of leaf spots on *Santalum album* a plant of great economic importance. The diseased leaves are exfoliated much earlier than the healthy ones. Field observations indicate that the fungal infection follows sun scald, which appears to be a predisposing factor.

Ramulispora Alloteropsidis Thirumalachar & Narasimhan sp. nov.

Infection patches epiphyllous, linear, to broadly ovate, chalky-white during conidial production and later turning yellowish-brown. Sporodochia substomal, later emerging out and bearing conidiophores above. Conidiophores $12-16.5 \mu$ long, hyaline, developing conidia acrogenously. Conidia hyaline, long, filiform, often with branches, measuring mostly $25 \approx 1.25 \mu$.

Hab. on the leaves of *Alloteropsis cimicina* Stapf, Bangalore, 25—8—1949, leg. M. J. Thirumalachar.

Maculae epiphyllae, lineares vel late ovatae, primum cretaceo-albidae, postea luteolae vel brunneae. Sporodochia substomatalia, postea emergentia, ad superficiem conidiophoris, $12-16.5 \mu$ longis, hyalinis, obiecta. Conidia acrogena, hyalina, filiformia, ramulis 1—2 lateralibus ornata, $25 \approx 1.25 \mu$.

Hab. in foliis *Alloteropsidis cimicinae* Stapf.

Ramulispora Andropogonis described by Miura forms sooty stripes on *Sorghum* species. The fungus has been studied in detail by Olive and Lefebvre (1946). The species on *Alloteropsis ciminia* is a different one and is the first species to be recorded on a member of the *Panicaceae*. The formation of sclerotia following the conidial production has not been observed.

Taphrina laurencia Giesenh.

Hab. on fronds of *Pteris* spec. Kemmangundi. Mysore, 26—4—1949, leg. M. J. Thirumalachar.

The fungus incites remarkable outgrowths on the fronds of *Pteris*, which are fine and branching. The infected fronds with the witches-broom like outgrowths can be mistaken for cases of anisophylly. The distribution of this fungus in India has been recorded by Mix (1949) and Butler & Bisby (1931). It is so far known only from Assam and northern regions of India. The abundance of parasitised fronds noticed by the writer indicates that the fungus is widely distributed on the hill tops of South India.

Taphrina linearis H. & P. Syd. in Ann. Mycol. **12**: 545—576, 1914. — Mix, A. J., Univ. Kansas Sci. Bul. **33**, pp. 167, 1949.

Hab. on the leaves of *Globba marantina* L., Lakkavalli, Mysore, 8—10—1945, leg. M. J. Thirumalachar.

The infection spots appear as reddish-brown streaks and are associated with *Puccinia Globbae* occurring on the same host. The fruiting bodies for the most part are immature.

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