

Notes on some Cercosporae of India-VII.

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With plates IV—V.

Further collections of *Cercospora* species collected from different places in India have been studied in detail and some of the species which are either new records for India or new to Science are presented in this paper.

Cercospora patelii nom. nov.

Syn. *Cercosporella leucadis* Uppal, Patel & Bhide in Indian Phytopath. **2**: 177—178, 1949.

Leaf spots angular, greyish-brown, 4 to 10 mm. in diameter, hypophyllous, yellow areas on upper leaf surface corresponding with leaf spots below. Stroma usually absent or composed of a few brown cells. Conidiophores arising from strands of hyphae, medium olivaceous-brown, short and stumpy, closely grouped, unbranched and unseptate, rounded at the apex, $14-29 \Rightarrow 2.8-6 \mu$. Conidia hyaline, obclavate to cylindric, slightly curved, 1—8-septate, septa indistinct, rounded at the apex, obtruncate at base, $14-57 \Rightarrow 2.8-5 \mu$. Hab. On leaves of *Leucas ciliata* Benth., Mahabaleshwar, Bombay, 4. 4. 1954, leg. M. J. Thirumalachar. (Fig. 1).

This species was previously reported by Uppal et al. from the same locality under the name *Cercosporella leucadis*. Though they reported conidiophores as being yellowish-brown developing from a dematiaceous mycelium they failed to recognise it as *Cercospora*. *Cercosporella leucadis* needs to be transferred under *Cercospora*, but since the specific epithet *Cercospora leucadis* has already been used for another species on *Leucas mollissima* (*C. laucadis* Thirum. & Govindu), the present fungus is named *C. patelii*, named in honour of Dr. M. K. Patel, *C. vestita* Ramakr. described on *Leucas vestita* from India is a different species.

Cercospora canescens Ell. & Mart. Amer. Nat. **16**: 1003, 1882.

Leaf spots circular to irregular, with pale-brown to greyish centre and surrounded by a pinkish border, 5 to 12 mm in diameter. Fruiting amphigenous, stroma consisting of few brown cells. Conidiophores arising in dense fascicles, dark olivaceous-brown, unbranched, 1—10-septate, irregularly geniculate, $28-166 \Rightarrow 2.8-4.2 \mu$. Conidia hyaline,

acicular, whip-like, attenuated to an acute point, 1—30-septate, $33-166 \Rightarrow 2.4-3.5 \mu$.

Hab. On leaflets of *Phaseolus trilobus*, Chatushringi, Poona, 18. 7. 1954, leg. M. J. Thirumalachar. *Phaseolus trilobus* is a new host species for the fungus (Fig. 3).

Cercospora bidentis Tharp Mycologia 9: 108, 1917.

Leaf spots distinct, circular to irregular, 5 to 8 mm. in diam., often coalesce to form large irregular patches. Spots amphigenous, medium brown to dingy-grey. Fruiting bodies mostly epiphyllous, stroma absent or composed of few brown cells. Conidiophores arise in fascicles divergent from base, olivaceous to medium brown, unbranched, 1—4-septate, with constrictions at the region of septa, abruptly geniculate, tip subhyaline, base somewhat bulbous, $28-100 \Rightarrow 2.8-4.2 \mu$. Conidia hyaline, acicular, slightly curved or straight, tip attenuated to an acute point, 1—20-septate, $57-128 \Rightarrow 2.8-3.5 \mu$.

Hab. On leaves of *Bidens pilosa* L., Empress Gardens, Poona, 12. 6. 1954, leg. M. J. Thirumalachar (Fig. 4).

The above description closely agrees with that given by Tharp.

Cercospora chloroxyli Ramakr. & Reddy. Proc. Indian Acad. Sci. Sect. B. 35: 121, 1952.

Leaf spots hypophyllous, circular to irregular, often coalescing to form large patches, greyish-white to dull brown on the lower surface, with black fruiting bodies arranged in groups. Stromata subepidermal, consisting of dark-brown cells. Conidiophores medium to olivaceous brown, compactly grouped, short and stumpy, unseptate, unbranched, $11-42 \Rightarrow 2.8-5.7 \mu$. Conidia subhyaline to pale brown, obclavate to obcylindric, blunt at tip, 1—8-septate, septa indistinct, $14-64 \Rightarrow 2.8-4.2 \mu$.

Hab. On leaves of *Chloroxylon switenia* DC., Kallar, Madras, 25. 1. 1953, leg. H. C. Govindu. (Fig. 2).

The fungus studied by us has been collected in the type locality during the same period of the year. Though *Chloroxylon switenia* is taxonomically placed under Rutaceae, Chupp stated (Monogr. of the genus *Cercospora* p. 502—503, 1953) that the description of *C. chloroxyli* closely agrees with that of *C. subsessilis* Syd. on *Melia azedarach* (Meliaceae) except for the fact that the conidia and conidiophores in *C. chloroxyli* are broader ($5-7 \mu$) as given by Ramakrishnan and Reddy. The conidia and conidiophores in *C. subsessilis* are $2-4 \mu$ broad. While the type material of *C. chloroxyli* was not available, the topotype studied by us shows conidia $2.8-4.2 \mu$ broad, thus bringing it nearer to *C. subsessilis*.

***Cercospora pavettae-tomentosae* sp. nov.**

Infection spots angular to irregular, numerous, dark-brown to black, 5—12 mm. in diam., often coalescing to form patches; fruiting

bodies appearing as black dots, amphigenous; stromata well developed, dark brown, 25—70 μ in diameter. Conidiophores dark olivaceous brown, compactly grouped, short and stumpy, blunt at apex, unbranched rarely 1—3-septate, 7—28.5 \Rightarrow 4—5.7 μ . Conidia subhyaline, to pale brown, obclavate to cylindric, 1—6-septate, 14—57 \Rightarrow 2.8—5.7 μ .

Hab. On leaves of *Pavetta tomentosa*, Mahabaleshwar, 4. 3. 1954, leg. M. J. Thirumalachar. (Fig. 5).

Maculae angulares vel irregulares, numerosae, obscurae brunneae vel nigrae, 5—12 mm. in diam., interdum confluentes. Caespituli amphigeni, hypostromatibus bene evolutis, 25—70 μ diam., obscurae brunneae. Conidiophora obscurae brunneae, fasciculata, non ramosa interdum 1—3-septata, antice obtusa, 7—28.5 \Rightarrow 4—5.7 μ . Conidia subhyalina vel pallide brunnea, obclavata vel cylindrica, 1—6-septata, 14—57 \Rightarrow 2.8—5.7 μ .

While there is no record of any *Cercospora* species parasitic on the host genus *Pavetta*, Hansford (Proc. Linn. Soc. London, **158**: 50, 1947) reported *C. balladynae* Hansf. as parasitic on *Balladyna* sp. on *Pavetta*. There is as yet no authentic record of a *Cercospora* parasitising other fungi according to Chupp (l. c.).

***Cercospora conyzoides* sp. nov.**

Leaf spots amphigenous, indefinite or irregular brown patches. Stroma absent or consisting of few brown cells. Conidiophores fasciculate, pale olivaceous brown, subhyaline at tip, unbranched, 1—7-septate, often constricted, 28—71 \Rightarrow 2.8—4.2 μ . Conidia hyaline, obclavate to cylindric, somewhat fusiform, 1—6-septate, acute at tip, 14—48.2 \Rightarrow 2—3 μ .

Hab. On leaves of *Ageratum conyzoides*, Nandi, Mysore, 10. 2. 1954.

Maculae dispersae, irregulares, brunneae. Caespituli amphigeni, hypostromata minuta, e cellulis paucis composita. Conidiophora fasciculata, pallide olivaceo-brunnea, antice subhyalina, simplicia, 1—7-septata, interdum constricta, 28—71 \Rightarrow 2.8—4.2 μ . Conidia hyalina, obclavata vel cylindrica, fusiforma, 1—6-septata, antice acuta, 14—48.2 \Rightarrow 2—3 μ . (Fig. 6).

The fungus is distinct from *C. aciculina* Chupp and *C. perfoliata* Ell. & Evr. both known on *Ageratum conyzoides*. In *C. aciculina* the conidiophores are shorter (10—35 μ) and conidia are longer (40—100 μ) than in *C. conyzoides*. Infection spots are effuse and the conidiophores are non-fasciculate in *C. perfoliata* which is a different fungus.

Cercospora viticis Ell. & Evr. Jour. Mycol. **3**: 18, 1887.

Leaf spots circular to irregular, 2 to 8 mm. in diameter, greyish-white, surrounded by pinkish margin, infection spots often coalescing to form large irregular patches. Fruiting chiefly epiphyllous, stroma

well developed, consisting of dark brown cells, $20-45\ \mu$ in diameter. Conidiophores dark brown to olivaceous-brown, unbranched, 1-2-septate, pale and narrow towards the apex, $14-36 \div 2-3\ \mu$. Conidia subhyaline, pale olivaceous, obclavate to cylindric, truncate at base, acute at tip, 1-8-septate, $14-57 \div 2-4\ \mu$.

Hab. On leaves of *Vitex altissima*, Bannerghatta, Bangalore, 10. 2. 1952, leg. H. C. Govindu.

***Cercospora portulacae* sp. nov.**

Leaf spots circular to polygonal, greyish-white, distinct, 2-5 mm. in diameter, surrounded by a pale pink coloured zone. Fruiting bodies amphigenous; stroma consists of few brown cells. Conidiophores yellowish brown to subhyaline, thick and stumpy, bulbous at base, rarely 1-3-septate, unbranched, blunt at apex, sinuous along margin, $7-28.5 \div 2.8-5\ \mu$. Conidia obclavate to cylindric, blunt at apex, 1-6-septate, hyaline to subhyaline, $14-42 \div 2.8-4.2\ \mu$.

Hab. On leaves of *Portulaca oleracea* L., Bangalore, 17. 12. 1953, leg. H. C. Govindu. (Fig. 7).

Maculae circulares vel polygonales, 2-5 mm. in diam., in centro griseo-albae, roseo-marginatae. Caespituli plerumque amphigeni. Hypostroma e paucis cellulis compositum; conidiophora flavo-brunnea vel subhyalina, postice bulbosa, raro 1-3-septata, simplicia, antice obtusa, $7-28.5 \div 2.8-5\ \mu$. Conidia obclavata vel cylindrica, 1-6-septata, hyalina vel subhyalina, apice obtusa, $14-42 \div 2.8-4.2\ \mu$.

Only one authentic species of *Cercospora*, *C. talini* H. & P. Syd. has been reported on a member of *Portulacaceae*, *C. portulacae* is a distinctly separate species.

Cercospora sonchi Chupp. in Monogr. genus *Cercospora*, 159-160, 1953.

Leaf spots circular to irregular, 2-10 mm. in diameter, greyish to rusty-brown, becoming greyish above with distinct reddish-brown border. Fruiting amphigenous, stroma composed of few brown cells compactly grouped, 30-55 μ in diameter. Conidiophores medium-brown to olivaceous-brown, divergent from base, subhyaline at tip, irregularly geniculate, unbranched, 1-10-septate, $66-220 \div 3-5.7\ \mu$. Conidia hyaline, acicular, 1-20-septate, acute at tip and truncate at base, $33-220 \div 2.8-4.2\ \mu$.

Hab. On leaves of *Sonchus* sp., Hebbal, Bangalore, 18. 12. 1953, leg. H. C. Govindu. (Fig. 8).

The species referred to here as *C. sonchi* closely resembles the description of the type described by Chupp on *Sonchus oleraceus* from Virginia, U.S.A. Slight differences are, larger size of the conidiophores (30-120 μ as against 66-220 μ in our material) and more conspicuous geniculations.

***Cercospora tagetes-erectae* sp. nov.**

Leaf spots irregular, greyish-white at centre, surrounded by a light-brown to pinkish border. Fruiting amphigenous, stroma subglobose, well developed, composed of dark-brown cells, 25–60 μ in diameter, Conidiophores pale olivaceous-brown, subhyaline at tip, unbranched, 1–6-septate, irregular along margin, subgeniculate, 33–133 \Rightarrow 2.8–5.7 μ . Conidia hyaline, acicular, acute at apex, 1–18-septate, 66–166 \Rightarrow 2.8–4.2 μ .

Hab. On leaves of *Tagetes erecta*, Bangalore, 15. 12. 1953, leg. H. C. Govindu. (Fig. 9).

Maculae irregulares, in centro griseo-albae, roseae vel brunneo-marginatae. Caespituli amphigeni; hypostroma e paucis cellulis compositum, 25–60 μ in diam. Conidiophora pallide olivaceo-brunnea, antice subhyalina, simplicia, 1–6-septata, margine undulata, subgeniculata, 33–133 \Rightarrow 2.8–5.7 μ . Conidia hyalina, acicularia, 1–18-septata, apice acuta, 66–166 \Rightarrow 2.8–4.2 μ .

This fungus is distinctly separate from *C. tagetica* Ell. & Evr. described on the same host genus from United States. *C. tagetica* incites formation of black effuse patches without formation of stroma. The conidia and conidiophores are longer than in the species under study. *C. tagetes-erectae* produces distinct infection spots with stroma and fasciculate conidiophores.

Cercospora ludwigiae Atk. in Jour. Elisha Mitchell Sci. Soc. 8: 58, 1892.

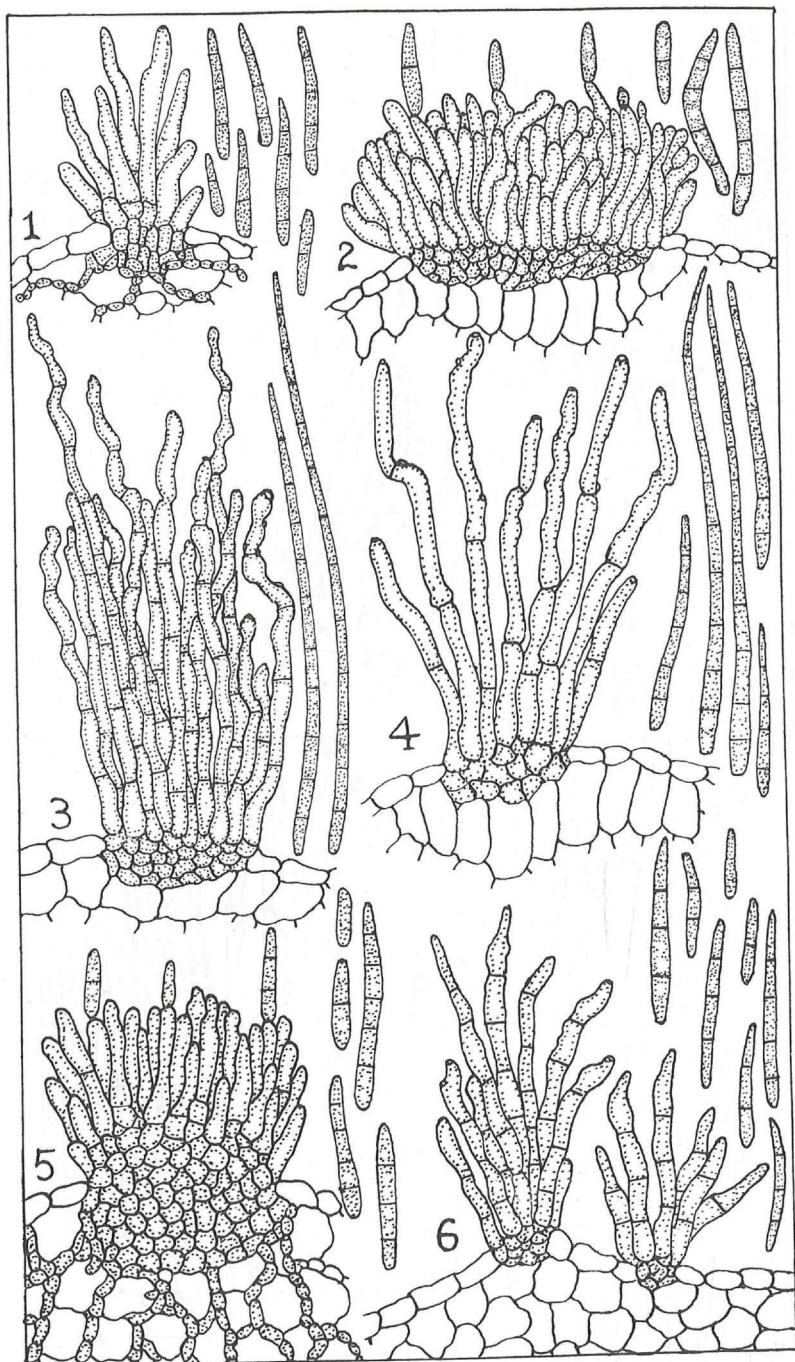
Leaf spots circular to irregular in outline, often coalescing to form large patches, greyish-white at the centre and surrounded by pink coloured border, 1–5 mm. in diameter. Stroma composed of few irregularly composed brown cells in the substomal space. Conidiophores divergent, olivaceous-brown, hyaline to pale olivaceous at the apex, 1–3-septate, unbranched, bulbous at base, subgeniculate, 24–57 \Rightarrow 2.8–5 μ . Conidia hyaline to lightly coloured, acicular, 1–16-septate, obconically truncate at base, subacute at apex, 33–133 \Rightarrow 2.8–3.5 μ .

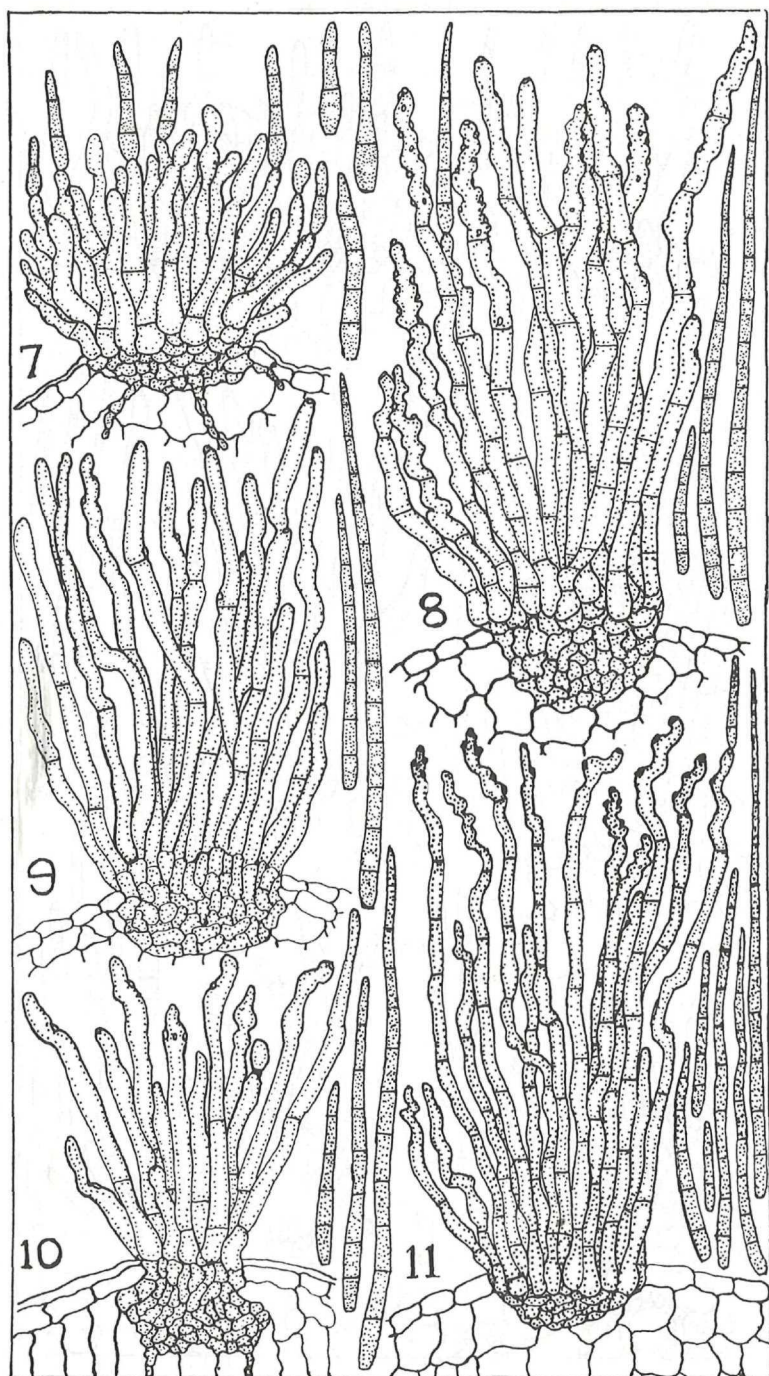
Hab. On leaves of *Ludwigia parviflora*, Hebbal, Bangalore, 15. 12. 1953, leg. H. C. Govindu. (Fig. 10).

Ludwigia parviflora is a marshy plant growing in rice fields. *C. ludwigiae* Atk. has previously been reported only from the United States.

Cercospora polygonacea Ellis. Jour. Mycol. 1: 24, 1885.

Leaf spots subcircular to irregular, 2–5 mm. in diameter, often coalescing with each other to form large patches up to 20 mm. in diameter, greyish-brown at the centre and surrounded by a pale coloured margin. Fruiting amphigenous, stroma composed of few brown cells Conidiophores medium, brown to olivaceous, rarely





branched, 1—10-septate, geniculate, 50—166 \Rightarrow 2.8—4.2 μ . Conidia hyaline, acicular, multiseptate, truncate at base acute at tip, 40—200 \Rightarrow 2.5—4 μ .

Hab. On leaves of *Polygonum chinense*, Nandi Hills, Mysore, 24. 1. 1954, leg. H. C. Govindu. (Fig. 11).

In conclusion, the authors wish to acknowledge their deep gratefulness to Dr. Franz Petrák, Vienna, Austria, for kindly translating the diagnoses of new species into latin.

Explanation of Plates IV and V.

(Magnification about 750.)

Fig. 1. *Cercospora patelii*. — Fig. 2. *C. chloroxyli*. — Fig. 3. *C. canescens*. — Fig. 4. *C. bidentis*. — Fig. 5. *C. pavettae-tomentosae*. — Fig. 6. *C. conyzoides*. — Fig. 7. *C. portulacae*. — Fig. 8. *C. sonchi*. — Fig. 9. *C. tagetes-erectae*. — Fig. 10. *C. ludwigiae*. — Fig. 11. *C. polygonacea*.

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