

PARASITIC FUNGI FROM NORTH INDIA - V

by

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(with 21 figs.)

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In continuation with the earlier paper (3), observations on 16 more parasitic fungi are presented in this paper. Type materials are being deposited in the Herb. Crypt. Indiae Orient., Indian Agricultural Research Institute, New Delhi and Commonwealth Mycological Institute, Kew, England.

1. *Peronospora aestivalis* SYDOW ex GÄUMANN, in Beiträge zur Krypt. Fl. Schweiz. **5**: 200, 1923.

On living leaves of *Melilotus alba* DESR. at Varanasi, U. P. on 26 December, 1962. Leg. U. P. SINGH. (MSP no. 286).

This fungus occurs widespread in this area and has so far not been recorded from the eastern districts of the State of Uttar Pradesh.

2. *Peronospora pisi* SYDOW ex GÄUMANN, in Beiträge zur Krypt. Fl. Schweiz. **5**: 209, 1923.

On living leaves of *Pisum sativum* L. at Varanasi, U. P. on 29 December, 1950. Leg. M. S. PAVGI. (MSP no. 287).

3. *Peronospora variabilis* GÄUMANN, in Beiträge zur Kryptog. Fl. Schweiz. **5**: 226, 1923.

On living leaves of *Chenopodium album* L. at Varanasi, U. P. on 20 December, 1951. Leg. M. S. PAVGI. (MSP no. 264).

This fungus is widespread in the area and often provides good specimen for class instruction.

4. *Erysiphe graminis* DC. var. *hordei* MARCHAL, in Compt. Rend. Acad. Sci. **135**: 210—212, 1902.

On living leaves of *Hordeum vulgare* L. at Varanasi, U. P. on 18 February, 1952. Leg. M. S. PAVGI. (MSP no. 288).

Infection by the fungus appears rather late in the season when

the crop is in the grain developing stage and the temperature is on a gradual rise day by day. No development of cleistothecial stage has so far been observed in the fields except on one occasion when they remained immature until the crop was harvested.

5. *Phyllactinia subspiralis* (SALMON) BLUMER, in Beiträge zur Krypt. Fl. Schweiz. p. 399. 1933.

On living leaves of *Dalbergia sissoo* ROXB. at Varanasi, U. P. on 15 January, 1951. Leg. M. S. PAVGI. (MSP no. 266).

The host is extensively planted throughout the country as roadside tree and is very much valued for its excellent timber. The tree is often lopped for fodder and the fallen leaves are collected for compost and fuel in the rural areas. The powdery mildew makes its appearance in early November with the fall in temperature. Abundant cleistothecia develop on the undersurface of the leaves, inciting a severe leaf drop before January every year.

6. *Septogloeum acaciae* SYDOW, in Ann. Mycol. 12: 489, 1914.

On living leaflets of *Acacia arabica* WILLD. at Varanasi, U. P. on 20 September, 1951. Leg. M. S. PAVGI. (MSP no. 267).

This fungus appears rather rare in occurrence and sparsely distributed. It has so far been collected from Coimbatore in South India (4) and Kalpi in M. P. (5). This collection forms a new record for Uttar Pradesh.

7. *Cercospora baliospermi* sp. nov.

Infection foliicolous; leaf spots scattered, irregular, dark brown, 2 to 10 mm in diameter and surrounded by a chlorotic tissue. Fruiting amphigenous. Stroma substomatal, well developed, cells 4 to 9 μ in diam. Conidiophores olivaceous brown, straight to irregular, base truncate, sometimes septate, fasciculate and 17.6 to 28.6 $\mu \times 3.3$ to 5.5 μ . Conidia subhyaline, subcylindrical to obclavate, thin walled, nonguttulate, 0 to 4 septate and measuring 27.5 to 62.5 $\mu \times 3.3$ to 5.5 μ .

On living leaves of *Baliospermum montanum* MUELL. at Sahdol, M. P. on 9 October, 1963. Leg. U. P. SINGH. TYPE (MSP no. 268). (Figs. no. 1 to 3).

Infectionis maculae foliicolae, dispersae, irregulares, fusce brunneae, 2—10 mm diam. circumdatae textibus chloroticis. Fructificationes amphigenae. Stroma substomatatale, bene evolutum, cellulis 4—9 μ diam. Conidiophora olivaceo-brunnea, recta vel irregularia, truncata ad basim, interdum septata, fasciculata et 17.6—28.6 \times 3.3—5.5 μ . Conidia subhyalina, subcylindrica vel obclavata, parietibus tenuibus, non guttulata, 0—4 septata, magn. 27.5—62.5 \times 3.3—5.5 μ .

In foliis viventibus *Baliospermi montani* MUELL. ad Sahdol, in M. P. die octobris 9, 1963; leg. U. P. SINGH. TYPUS (MSP no. 268).

The host is a xerophytic perennial weed growing vigorously in

rainy season. The present collection probably records the only *Cercospora* species parasitic on this host reported so far.

8. *Diplodia saccharicola* sp. nov.

Infection usually foliicolous, on leaf sheaths also. Spots conspicuous, epiphyllous, often amphigenous, scattered, surrounded by reddish brown margin with a greyish center. Pycnidia dark brown, partially immersed, erumpent, simple, globose, ostiolate and 112.5 to $137.5 \mu \times 80$ to 132.5μ . Conidiophores simple and hyaline. Conidia dark chocolate brown, bicelled, ellipsoid to ovoid and measuring 8.8 to $11.1 \mu \times 5.0$ to 6.6μ .

On living leaves of *Saccharum spontaneum* L. at Varanasi, U. P. on 20 March, 1964. Leg. M. S. PAVGI TYPE (MSP no. 269). (Figs. no. 4 to 6).

Infectionis maculae foliicolae, et in vaginis foliorum, conspicuae, epiphyllae, saepe amphigenae, dispersae, circumdatae margine rubro-brunneo, centro griseo. Pycnidia fusce brunnea, partim immersa, erumpentia, simplicia, globosa, ostiolata, 112.5 — 137.5×80 — 132.5μ . Conidiophora simplicia, hyalina. Conidia fusce castaneo-brunnea, bicellularia, ellipsoidea vel ovoidea, magn. 8.8 — 11.1×5.0 — 6.6μ .

In foliis viventibus *Sacchari spontanei* L. ad Varanasi, 20 martii, 1964; leg. M. S. PAVGI. TYPUS (MSP no. 269).

Occurrence of another species of *Diplodia* viz. *D. cacaoicola* P. HENNINGS inciting a stem and base rot in sugarcane (*Saccharum officinarum* L.) has been reported from India (1). The present species is distinct from it both in symptoms and morphology of the fruiting structures.

9. *Cercospora humilis* sp. nov.

Infection foliicolous, leaf spots mostly epiphyllous, scattered, dark brown, 2 to 5 mm, often coalescent. Stroma poorly developed, substomatal. Conidiophores light brown, straight to irregular, often branched and fasciculate with truncate base, septate, measuring 22 to $99 \mu \times 3.3$ to 5.5μ . Conidia subhyaline, subcylindrical to obclavate, thin walled, 0 to 14 septate, with blunt apices and measuring 30.8 to $129.8 \mu \times 2.2$ to 5.5μ .

On living leaves of *Sida humilis* WILLD. at Varanasi, U. P. on 5 April, 1963. Leg. U. P. SINGH. TYPE. (MSP no. 270). (Figs. no. 7 to 9).

Infectionis maculae foliicolae, ut plurimum epiphyllae, dispersae, fusce brunneae, 2—5 mm diam, saepe coalescentes. Stroma paupercule evolutum, substomatatale. Conidiophora pallide brunnea, recta vel irregularia, saepe ramosa et fasciculata, ad basin truncata, septata, 22 — 99×3.3 — 5.5μ . Conidia subhyalina, subcylindrica vel obclavata, parietibus tenuibus, 0—14 septata, apicibus obtusis 30.8 — 129.8×2.2 — 5.5μ .

In foliis viventibus *Sidae humilis* WILLD. ad Varanasi, die 5 aprilis, 1963; leg. U. P. SINGH. TYPUS. (MSP no. 270).

The host is an annual herbaceous weed growing in waste places and field borders. Four species of *Cercospora* have so far been reported on different species of this host genus (2). The present fungus differs from these either in type of infection and morphology of the fruiting structures or both and is, therefore, accommodated under a new species.

10. *Cercospora crotalariana* sp. nov.

Infection foliicolous; leaf spots dark brown, scattered, variable in size; fruiting mostly epiphyllous, slightly raised over the leaf surface. Stroma well developed, dark brown, substomatal, 13.2 to 44 μ . Conidiophores fasciculate, dark brown in mass, straight to slightly curved, 1 to 3 septate, measuring 27.5 to 46.2 $\mu \times 3.3$ to 5.5 μ . Conidia light brown to subhyaline at the tip, straight to slightly curved, 1 to 7 septate, apically blunt and measuring 19.8 to 52.8 $\mu \times 4.4$ to 5.5 μ .

On living leaves of *Crotalaria medicaginea* LAMK. at Varanasi, U. P. on 20 October, 1963. Leg. U. P. SINGH. TYPE (MSP no. 271). (Figs. no. 10 to 12).

Infectionis maculae foliicolae, fusce brunneae, dispersae, magnitudinis variabilis; fructificationes ut plurimum epiphyllae, paulum elevatae supra foliorum paginam. Stroma bene evolutum, fusce brunneum, substomatale, 13.2—44.4 μ . Conidiophora fasciculata, fusce brunnea in massa, recta vel paulum curvata, semel ad ter septata, magn. 27.5—46.2 \times 3.3—5.5 μ . Conidia pallide brunnea vel subhyalina ad apices, recta vel paulum curvata, 1—7 septata. ad apices obtusa, magn. 19.8—52.8 \times 4.4—5.5 μ .

In foliis viventibus *Crotalariae medicagineae* LAMK. ad Varanasi, die 20 octobris, 1963; leg. U. P. SINGH TYPUS (MSP no. 271)

The host species is a small herbaceous weed usually growing on fallow and waste places and is distributed throughout the country. Four species of *Cercospora* have so far been recorded on this host genus amongst which *C. josensis* SYDOW is considered as a typical *Helminthosporium* by CHUPP (2). The present species differs from them either in the host symptoms and morphology of the hypostroma and conidia or in both and is, hence proposed as a new species.

11. *Cercospora physalidis - minimae* sp. nov.

Infection foliicolous; leaf spots mostly hypophyllous, sometimes amphigenous, dark olivaceous brown, 2 to 5 mm with the corresponding chlorotic surface below. Stroma poorly developed, sunken in substomatal cavity. Conidiophores fasciculate, straight, dark at the base and pale near the apex, geniculate, simple, septate and 22.0 to 63.8 $\mu \times 2.2$ to 5.5 μ . Conidia subhyaline to olivaceous brown, subcylindrical to clavate, 2 to 5 septate, thin walled, blunt

with a truncate base and measuring 21.0 to $103.4 \mu \times 2.2$ to 4.4μ .

On living leaves of *Physalis minima* L. at Varanasi, U. P. on 15 November, 1963. Leg. U. P. SINGH. TYPE (MSP no. 272). (Figs. no. 13 to 15).

Infectionis maculae foliicolae, vulgo epiphyllae, interdum amphigenae, fusce olivaceo-brunneae, 2—5 mm diam., facie opposita chlorotica. Stroma evolutum, immersum in cavitatem substomatalem. Conidiophora fasciculata, recta, fusca ad basim, pallide brunnea prope apicem, geniculata, simplicia, septata et 22.0 — 63.8×2.2 — 5.5μ . Conidia subhyalina, vel olivaceo-brunnea, subcylindrica vel clavata, bis ad quinque septata, parietibus tenuibus, obtusa, basi truncata, 21.0 — 103.4×2.2 — 4.4μ .

In foliis viventibus *Physalidis minimae* L. ad Varanasi, die 15 novembris, 1963; leg. U. P. SINGH. TYPUS (MSP no. 272).

Three species appear to have been described as parasitic on *Physalis* species (2). Comparative observations indicate that the present fungus is distinct from them in the symptoms and the morphology of hypostroma and conidia.

12. *Cercospora alternanthericola* sp. nov.

Infection foliicolous; leaf spots smoky brown, scattered, little raised, coalescent, 2 to 4 mm, mostly epiphyllous, later amphigenous. Stroma dark brown, medium developed, substomatal, composed of compact cells 11 to 22μ in diameter. Conidiophores light brown with darker walls, base truncate, fasciculate, septate and measuring 16.5 to $44.0 \mu \times 3.3$ to 5.5μ . Conidia subhyaline to light brown, subcylindrical to obclavate, smooth, 3 to 9 septate, measuring 26.4 to $80.4 \mu \times 2.4$ to 6.3μ .

On living leaves of *Alternanthera sessilis* R. BR. at Varanasi, U. P. on 17 August, 1963, Leg. U. P. SINGH. TYPE (MSP no. 273). (Figs. no. 16 to 18).

Infectionis maculae foliicolae, fuliginoso-brunneae, dispersae, aliquantum elevatae, coalescentes, 2—4 mm vulgo epiphyllae, tum amphigenae. Stroma fusce brunneum, mediocriter evolutum, substomatale, constans e cellulis compacte aggregatis 11— 22μ diam. Conidiophora pallide brunnea, parietibus fuscioribus, truncata ad basim, fasciculata, septata, 16.5 — 44.0×3.3 — 5.5μ . Conidia subhyalina vel pallide brunnea, subcylindrica vel obclavata, levia, bis terve septata, 26.4 — 80.4×2.4 — 6.3μ .

In foliis viventibus *Alternantherae sessilis* R. BR. ad Varanasi, die 17 augusti, 1963; leg. U. P. SINGH. TYPUS (MSP no. 273).

This fungus species is distinct from the two species of *Cercospora* listed by CHUPP (2) and also *Cercospora sessilis* PAVGI & SINGH described recently in part I of this study (Mycopathol. et Mycol. appl.).

13. *Septoria vernoniae* sp. nov.

Infection foliicolous, necrotic spots scattered, irregularly round,

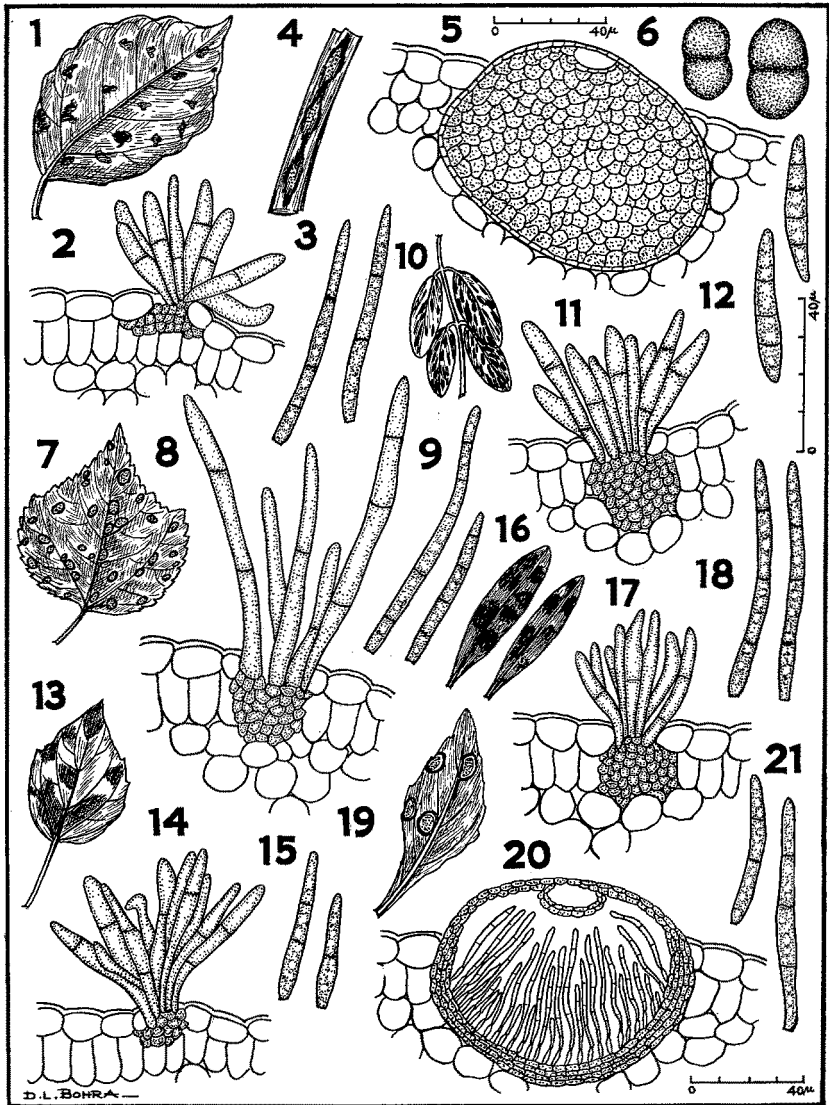


Plate I.

Infection on the host part, hypostroma and typical conidia of: Figs. 1 to 3, *Cercospora bahiospermi*; Figs. 7 to 9, *Cercospora humilis*; Figs. 10 to 12, *Cercospora crotolariana*; Figs. 13 to 15, *Cercospora physalidis - minima*; Figs. 16 to 18, *Cercospora altermanihericola*.

Infection on the host, pycnidium and typical conidia of: Figs. 4 to 6, *Diplodia saccharicola*; Figs. 19 to 21, *Septoria vernoniae*.

3 to 5 mm, reddish brown to dark olive brown. Fruiting epiphyllous. Pycnidia minute, black, subepidermal, erumpent, flattish at the

top and measuring 57.5 to 105 μ in diameter. Conidiophores hyaline, slender. Conidia hyaline, cylindrical to filiform, smooth, thin walled, septate with blunt ends and measuring 15.4 to 43.1 $\mu \times$ 2.2 to 3.3 μ .

On living leaves of *Vernonia cinerea* LESS. at Varanasi, U. P. on 20 October, 1963. Leg. U. P. SINGH. TYPE (MSP no. 277). (Figs. no. 19 to 21).

Infectionis maculae foliicolae, necroticae, dispersae, irregulariter rotundae, 3—5 mm, rubro-brunneae vel fusce olivaceae. Fructificationes epiphyllae. Pycnidia minuta, nigra, subepidermalia, erumpentia, aliquantum complanata ad apicem, magn. 57.5—105 μ . Conidiophora hyalina, gracilia. Conidia hyalina, cylindrica vel filiformia, levia, parietibus tenuibus, septata, apicibus obtusis, magn. 15.4—34.1 \times 2.2—3.3 μ .

In foliis viventibus *Vernoniae cinereae* LESS. ad Varanasi, die 20 octobris, 1963; leg. U. P. SINGH. TYPUS (MSP no. 277).

Review of literature indicates that no species of *Septoria* has hitherto been described parasitizing this host genus and this probably constitutes the first report in this respect.

14. *Corynespora casticola* (BERK. & CURT.) WEI, in Mycol. Pap. Commonw. Mycol. Inst. **34**: 10, 1950.

On living leaves of *Croton sparsiflorus* MORUNG. at Varanasi, U. P. on 21 October, 1951. Leg. M. S. PAVGI. (MSP no. 274).

The fungus is widely distributed in this area and possibly on other hosts as well.

15. *Oidium lini* SKORIE, in Glasnik zu Sumske Pokuse **1**: 108, 1926.

On living leaves of *Linum usitatissimum* L. at Varanasi, U. P. on 6 March, 1953. Leg. M. S. PAVGI. (MSP no. 275).

The powdery mildew appears widely distributed in this area, but has not been reported from Uttar Pradesh so far.

16. *Ramularia tinosporae* LACY & THIRUMALACHAR, in Sydowia, Ann. Mycol. **5**: 126—127, 1951.

On living leaves of *Tinospora cordifolia* MIERS. at Varanasi, U. P. on 22 September, 1952. leg. M. S. PAVGI. (MSP no. 276).

This interesting fungus was first collected and described from the neighboring state of Bihar by LACY & THIRUMALACHAR (loc. cit.). Its occurrence has not so far been reported from Uttar Pradesh.

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