

## Parasitic Fungi from North India — IX

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Several interesting parasitic fungi were collected at Darjeeling, a summer hill resort in West Bengal situated in the Himalayan foot hills (2170 m a.s.l.), and identifications of some of them are reported in this paper. Portions of type materials are deposited at The Commonwealth Mycological Institute, Kew, England.

1. *Ampelomyces quisqualis* Ces. in Bot. Zeit. 10: 301, 1852; Rogers in Mycologia 51: 96—98, 1959.

Parasitic on hyphae and conidia of *Sarcinella prunicola* Pavgi and Singh on *Prunus persica* (L.) Batsá. at Darjeeling, W. B. on 25 November, 1965. Leg. U. P. Singh. (IMI 113598).

The fungus parasitizes the superficial hyphae and conidia of a species of *Sarcinella*, recently collected at Darjeeling. Free hand vertical sections of the host leaves through infection spots reveal the pycnidia of the mycoparasite masked by the dark brown conidia of the host fungus. The hyaline spores are released from the pycnidia on gently pressing the sections under cover glass. Parasitism of this mycoparasite has been so far described and reported on members of Erysiphaceae in their conidial stages, while the present collection apparently constitutes a new host fungus as well as a new record of its occurrence in India.

2. *Aulographum maculare* B. and Br. in British Fungi n. 968, tab. 16, f. 21; Saccardo in Sylloge Fungorum 2: 730, 1883.

On living leaves of *Quercus incana* Roxb. at Darjeeling, W. B. on 24. November, 1964. Leg. U. P. Singh. (IMI 113599).

Occurrence of the species has not so far been reported from India.

3. *Centrospora mitragynae* Deighton, Pavgi and Singh sp. nov.

Leaf spot none. Caespituli hypophyllous, yellow, thinly effuse, covering angular vein-limited areas up to 5 mm wide without definite margin, often confluent and covering wide areas of the leaf. Primary mycelium internal: hyphae abundant, colorless, smooth, branched, septate, 2—4  $\mu$  wide, often more densely aggregated into a weft (hardly to be termed a stroma) in the substomatal cavities but sometimes not. A few hyphae penetrate the stoma and develop into the conidiophores. Conidiophores in fascicles of up to 12, arising direct from the hyphae which

penetrate the stoma and later from a proliferating group of cells lying just above the stoma and arising from the base of the earliest-formed conidiophores, almost colorless with a slight chlorinous tinge, simple or sometimes branched, divergent, substraight, subgeniculate above, smooth, septate, up to  $45\ \mu$  long,  $3\text{--}6\ \mu$  wide. Conidial scars conspicuous but unthickened, slightly convex,  $2.5\text{--}3\ \mu$  diam., the older ones situated on a slight lateral prominence or shoulder and lying at a slight angle or at right angles to the main axis of the conidiophore or sometimes parallel with the axis. Conidiophores also arise as lateral erect branches of the secondary mycelial hyphae. Secondary mycelium sometimes produced as branches from the base of a conidiophore fascicle; hyphae colorless, septate, unbranched,  $2.5\text{--}3\ \mu$  wide, bearing conidiophores as lateral branches. Conidia almost colorless (faintly chlorinous) smooth, cylindric or slightly subulate, straight or very slightly curved or undulate, with an obtuse apex, the basal cell very slightly tapered to the unthickened, slightly convex hilum,  $4\text{--}8$  septate,  $45\text{--}88\ \mu$  long,  $4\text{--}5.5\ \mu$  wide.

On living leaves of *Mitragyna parvifolia* Korth. at Varanasi, U. P. on 25 December, 1965. Leg. M. S. P a v g i and U. P. S i n g h. Type (MSP no. 353) (IMI 117356). (Figs. 1 to 3).

Maculae nullae. Plagulae hypophyllae, flavidae, tenuiter effusae, angulosae, margine indefinitae, usque ad 5 mm latae, saepe confluentes. Stroma non evolutum. Conidiophora usque ad 12 in fasciculo ex hyphis paucis per stoma penetrantibus orta, subhyalina (levissime chlorina), simplicia vel interdum ramosa, divergentia, subrecta, sursum subgeniculata, levis, septata, usque ad  $45\ \mu$  longa,  $3\text{--}6\ \mu$  lata. Cicatrices conidiales conspicuae, leniter convexae, non incrassatae,  $2.5\text{--}3\ \mu$  diam. Conidia subhyalina (levissime chlorina), levia, cylindrica vel leniter subulata, subrecta vel lenissime curvata vel undulata, apice obtusa, cellula basali in hilo non incrassato lenissime attenuata,  $4\text{--}8$  septata,  $45\text{--}88\ \mu$  longa,  $4\text{--}5.5\ \mu$  lata.

Habitat in foliis vivis *Mitragynae parvifoliae* Korth. ad Varanasi, U. P. 25 decembris, 1965. Leg. M. S. P a v g i et U. P. S i n g h. Typus (MSP no. 353) (IMI 117356).

The genus *Centrospora* was established by Neergaard in 1942 with *C. ohlsenii* Neergaard as its type species. Five species were added later, amongst which *C. macrospora* and *C. bromi* are now considered synonymous with *C. acerina* (Hartig Newhall. *C. acerina* is a serious rot incitant in several plants of economic value (3, 5, 6, 7). All the species described so far have been reported parasitic on various plants, while a saprophytic species has recently been reported on decaying leaves of *Prunus* species (3).

The present species incites infection symptoms on the host similar to those by a few of the species of *Centrospora*. Microscopic examination of free hand sections through the infection spots revealed the morphology

of conidiophores and conidia typical of *Centrospora*, but different in development and morphology of the conidia and hence is being described as species new to science.

4. *Cylindrosporium leucosceptri* Keissler in Osten. Bot. Zeitschr. p. 124, 1924.

On living leaves of *Leucosceptrum cannum* Sm. at Darjeeling, W. B. 24 November, 1964. Leg. U. P. Singh. (IMI no. 113593).

The fungus incites infection on the leaves. Leaf spots are epiphyllous, circular to irregular, scattered but occasionally coalescent, chalky white later turning ashen grey. The acervuli are epiphyllous, numerous, subepidermal and erumpent with hyaline, simple and stumpy conidiophores. The conidia are hyaline, mostly filiform, rarely allantoid, tapering, 1—6 septate, smooth and thin-walled with a truncate base and measuring  $37.5 \times 2.5$ — $5 \mu$ . Occurrence of this fungus has not hitherto been reported from India making this a new record for the country.

5. *Sarcinella prunicola* sp. nov.

Infection foliicolous; spots epiphyllous, irregular, sooty brown, velvety, scattered, often coalescent into bigger patches, slightly raised over the general leaf surface with the corresponding lower surface turning brown. Dark brown, circular to angular cells produced subcuticularly forming the stroma. Conidiophores very small, often indistinct. Conidia dark brown, one to many-celled, subcylindrical to globoid, smooth and thick-walled, measuring  $19.8$ — $55 \mu$  in diam.

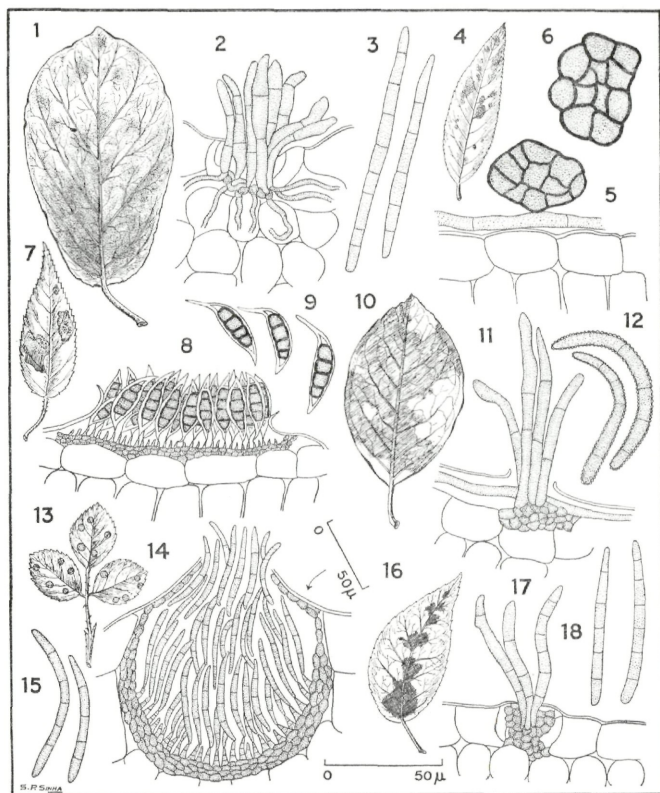
On living leaves of *Prunus persica* (L.) Batch. at Darjeeling, W. B. on 24 November, 1964. Leg. U. P. Singh. Type (MSP no. 354; IMI 113598) (Figs. 4—6).

Maculae epiphyllae, dispersae, irregulares, saepe confluentes et plus minusve accrescentes, fuligineae, velutinae, leniter elevatae, subtus brunneae; stroma subcuticulare, e cellulis orbicularibus vel angulosis compositum; conidiophora brevissima, saepe indistincta; conidia irregulariter subcylindracea vel subglobosa obscure brunnea, continua vel multiloculata, levia, episporio crassiusculo,  $19.8$ — $55 \mu$  diam.

The genus *Sarcinella* Saccardo was established in 1877 as a member of fam. Dematiaceae with *S. heterospora* Saccardo as the type species. Several species have since been added to the genus. Barnett (1) considers species of this genus as saprophytic in habit. Comparative observations on the morphology of development and spores indicate its identity with the genus *Sarcinella*. The fungus under study does not resemble any of the species known so far in the morphology of spores and mode of infection and is, therefore, proposed a new species. Only two species have been recorded from India earlier.

6. *Seiridium indicum* sp. nov.

Infection foliicolous; leaf spots angular, scattered, often coalescent, greyish brown and surrounded by dark brown margin. Sporodochia epiphyllous, black pin head-like, scattered, subcuticular and slightly raised above the leaf surface. Conidiophores very small and hyaline. Conidia crescent-shaped, usually 6-celled; four middle cells being dark brown, thick-walled and terminal ones being subhyaline, smooth, bearing



Infection on the host part, hypostroma or pycnidium, conidiophores and typical conidia of: Figs. 1—3. *Centrospora mitragynae*; Figs. 4—6. *Sarcinella prunicola*; Figs. 7—9. *Seiridium indicum*; Figs. 10—12. *Stennella schizandrae*; Figs. 13—15. *Septoria rosae*; Figs. 16—18. *Cercospora oxyphylla*.



a hyaline, stiff ciliate process at each end; conidia measuring 22—30.8 (rarely 33  $\mu$ )  $\times$  7.7—8.8  $\mu$  and the ciliate processes straight to sub-straight, tapering to a blunt end and measuring 4.4—11  $\times$  1—1.8  $\mu$ .

On living leaves of *Spirea micrantha* H. f. at Darjeeling, W. B. on 25 November, 1964. Leg. U. P. Singh. Type (MSP no. 355; IMI 113602) (Figs. 7—9).

Maculae dispersae, saepe confluentes, brunneo-viridulae, obscure brunneo-marginatae; acervuli epiphylli, dispersi, subcuticulares, lenissime elevati; conidiophora brevia; conidia fusioidea, utrinque attenuata, plerumque 5-septata, levia, loculis mediis obscure brunneis, loculis extremis subhyalinis, acuminatis et oblique ciliatis, 22—30.8  $\mu$ , raro usque ad 33  $\mu$  longa, 7.7—8.8  $\mu$  lata; cilia 4.4—11  $\times$  1—1.8  $\mu$ .

Since establishment of the genus several species have been added. The present species, however, does not resemble any of them in the morphology of spores and type of infection on the host parts and is therefore, being proposed as new. This forms the first record of the genus for the country.

#### 7. *Stenella schizandrae* sp. nov.

Infection foliicolous; spots hypophyllous, diffuse, sooty black, scattered forming moldy patches, usually coalescent, later covering the entire leaf surface with the corresponding upper surface being chlorotic. Fruiting hypophyllous. Dark brown hyphae formed superficially. Stroma poorly developed with dark brown, polygonal cells formed subepidermally. Conidiophores dark brown, arising on the creeping hyphae, unbranched, 2—5 septate, walls serrate, slightly attenuated with blunt apices and measuring 47.5—100  $\times$  3—5  $\mu$ . Conidia dark brown, allantoid, rarely cylindrical, 1—13 septate, with rounded tips and articulate walls and measuring 19.8—118.8  $\times$  3.3—5.5  $\mu$ .

On living leaves of *Schizandra grandiflora* Hook. f. and Thoms. at Darjeeling, W. B. on 24 November, 1964. Leg. U. P. Singh. Type (MSP no. 356; IMI 113590) (Figs. 10—12).

Maculae hypophyllae, diffusae, fuligineo-atrae, in folii superficie decolorationes flavo-viridulas efficientes, irregulares, saepe confluentes et magnam folii partem occupantes; hyphae obscure brunneae, superficiales; hypostromate subepidermali, pseudoparenchymatico, e cellulis irregulariter angulosis, obscure brunneis composito; conidiophora obscure brunnea, simplicia, 2—5-septata, superne leniter attenuata, apice obtusa, 47.5—100  $\times$  3—5  $\mu$ ; conidia obscure brunnea, tenuiter cylindracea, plus minusve allantoidea, utrinque obtusa, 1—13-septate, 19.8—118.8  $\times$  3.3—5.5  $\mu$ .

Several species have been reported from all over the world since establishment of the genus *Stenella* Sydow in 1930. The present one differs from them all in the symptoms and morphology of fruiting

structures. Occurrence of the fungus genus *Stenella* is being reported for the first time from India.

8. *Septoria rosae* Desm. in Exs. n. 535 in Saccardo, Sylloge Fungorum 3: 485, 1884; Sydow H. & P. and Butler in Ann. Mycol. 14: 213, 1916.

On living leaves of *Rosa americana* (Weitz.) Breit. at Darjeeling, W. B. on 23 November, 1964. Leg. U. P. Singh (IMI 113591) (Figs. 13—15).

This interesting fungus was collected and reported by Sydow and Butler (2) in 1916 and since then there has been no record of its collection from the country. The earlier collection also was from Darjeeling parasitizing an unidentified species of *Rosa*.

9. *Cercospora melochiae* P. Hennings in Hedwigia 43: 395, 1904; Saccardo in Sylloge Fungorum 18: 597, 1906.

On living leaves of *Melochia corchorifolia* L. at Varanasi, U. P. on 29 September, 1965. Leg. U. P. Singh.

The fungus closely resembles *C. melochiae*, to which it is referred. Its occurrence has not hitherto been reported from India.

10. *Cercospora oxyphyli* sp. nov.

Infection foliicolous; leaf spots none to indistinct, dark olive brown, diffuse, hypophyllous patches, often coalescent and covering most of the leaf surface. Fruiting mostly hypophyllous. Stroma poorly developed, composed of few dark brown, polyhedral cells. Conidiophores dark brown, fasciculate, geniculate, often branched, septate and measuring  $38.5-66 \times 4.4-5.5 \mu$ . Conidia light brown, clavate to subcylindric, 1—9 septate, smooth and thin-walled, spore scar present at the base, tip blunt and measuring  $26.5-86.6 \times 2.7-5.5 \mu$ .

On living leaves of *Zanthoxylum oxyphyllum* Edgew. at Darjeeling, W. B. on 24 November, 1964. Leg. U. P. Singh. Type (MSP 357) (Figs. 16—18).

Maculae hypophyllae, olivaceae, diffusae, saepe confluentes et magnam folii partem occupantes; hypostroma minutum, pseudoparenchymaticum, e cellulis irregulariter angulosis, obscure brunneis compositum; conidiophora obscure brunnea, fasciculata, geniculata, saepe ramosa, septata  $38.5-66 \times 4.4-5.5 \mu$ ; conidia anguste obclavata vel subcylindracea, utrinque obtusa, antice paulatim attenuata, 1—9-septata, pallide brunneae,  $26.5-86.6 \times 2.7-5.5 \mu$ .

Few species of *Cercospora* have been described earlier parasitizing this host genus in various parts of the world. The present species differs from them all in one respect or another. The mode of development of infection spots and morphology of the hypostroma, conidiophores and conidia are distinct in all the 3 species.

11. *Cercospora pulchella* T. S. & K. Ramakrishnan in Proc. Indian Acad. Sci. B 34: 163, 1951.

On living leaves of *Indigofera dosua* Hamilt. at Darjeeling, W. B. on 23 November, 1964. Leg. U. P. Singh. (IMI 113589).

This species was first collected and described from Kodaikanal in South India. Its occurrence has not so far been reported from the northern states.

12. *Cercospora withaniae* H. & P. Sydow in Ann. Mycol. 10: 444, 1912; Saccardo in Sylloge Fungorum 25: 891, 1931.

On living leaves of *Withania somnifera* Dunal at Varanasi, U. P. on 25 November, 1965. Leg. U. P. Singh.

13. *Pestalotiopsis planimi* in Bull. Jard. Bot. Brux. 19: 325, 1949.

On living leaves of *Euonymus echinatus* Wall. at Darjeeling, W. B. on 24 November, 1964. Leg. U. P. Singh. (IMI 113603).

This interesting species has not so far been reported from the country and this constitutes the first report of its occurrence here.

#### A c k n o w l e d g e m e n t

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