

## Studies on some Fungi of Maharashtra-India-I.

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With Plate III—IV.

Some interesting Fungi Imperfecti have been collected from time to time in different parts of Maharashtra state. These are either new to science or new records for Maharashtra. The type materials of the new species have been deposited in Herb. Crypt. Indiae Orientalis. New Delhi, in Herb C.M.I. Kew. England and in the Mycological Division, U.S.D.A., Beltsville, Maryland, USA.

### 1. *Asperisporium dalbergiae* Patil & Thirum. sp. nov.

Leaf spots hypophyllous, confluent, stroma subepidermal, 40—60  $\mu$  in diameter erumpent; conidiophores short, erect, simple, fasciculate, light brown, 0 to 1 septate, uniform diameter, bluntly rounded at tip, later becoming geniculate; conidia, measuring 30—55  $\times$  4—6  $\mu$  acrogenous, minutely echinulate, brown, one-septate, not constricted at the septa, ovoid, and the base with a conspicuous, dark prominent scar, 14—23  $\times$  6—9 (17  $\times$  7)  $\mu$ .

Maculae hypophyllae, confluentes; stroma sub epidermide evolutum, 40—60  $\mu$  diam., erumpens; conidiophora breviuscula, recta, simplicia, fasciculata, pallide brunnea, continua vel uniseptata, antice obtuse rotundata, postice geniculata; conidia acrogena, ovoidea, brunnea, uniseptata, ad septum non constricta, minute echinulata, postice papillula obscura, conspicue prominula praedita, 14—23  $\times$  6—9 (17  $\times$  7)  $\mu$ .

Hab. on living leaves of *Dalbergia sympathetica* Nirumo, Amboli (Ratnagiri), Maharashtra, 27th Jan. 1962. Leg. B. V. Patil (Type). Figs. 1—2.

### 2. *Cercospora elaeodendronis* Patil & Thirum. sp. nov.

Leaf spots circular, zonate, greyish-brown, 2—6 mm. in diameter, often coalescing, mostly hypophyllous, stromata of compactly grouped cells in substomal space, 20—50  $\mu$  in diam.; conidiophores dark-brown, septate, unbranched, straight to undulate, blunt at apex, 20—51  $\times$  3—4  $\mu$ , conidia subhyaline, obclavate to cylindric, straight or curved, 2—6 septate, obtruncate at base and blunt at apex, 29—85  $\times$  2.5—3.5  $\mu$ .

Maculae plerumque hypophyllae, orbiculares, zonatae, griseo-brunneae, 2—6 mm diam., saepe confluentes, tunc etiam majores; hypostro-

mate sub stomatibus evoluta, 20—50  $\mu$  diam.; conidiophora obscure brunnea, simplicia, septata, recta vel plus minusve undulata, antice obtusa, 20—51  $\times$  3—4  $\mu$ ; conidia angustissime obclavata vel cylindracea, recta vel curvula, 2—6-septata, postice truncata, antice obtusiuscula, 29—85  $\times$  2.5—3.5  $\mu$ .

Hab. on leaves of *Elaeodendron roxburghii* Wight and Arn. (Celastraceae) Mangi-Tungi (Nasik) 31st Aug. 1960. Leg. B. V. Patil (Type). Figs. 5—6.

3. *Cercospora imperatoriae* Baudys & Picbauer Var. *indica* var. nov.

Leaf spots circular, 2—5 mm in diameter, dark brown, with greyish white centre; stromata well developed in substomal space, 20—26  $\mu$  across; conidiophores pale brown, septate, unbranched, geniculate 19—45  $\times$  5  $\mu$ , conidia subhyaline, acicular, 1—15 septate, obconically truncate at base, acute at tip, 34—94  $\times$  2.5—3  $\mu$ .

Maculae orbiculares, obscure brunneae, in centro griseo-albidae, 2—5  $\mu$  diam.; hypostromate sub stomatibus bene evoluta, 20—26  $\mu$  diam.; conidiophora pallide brunnea, septata, simplicia, geniculata, 19—45  $\times$  5  $\mu$ ; conidia acicularia, subhyalina, 1—15-septata, postice truncata, antice acutiuscula, 34—94  $\times$  2.5—3  $\mu$ .

Hab. on leaves of *Peucedanum grande* Clarke (Umbelliferae), Gawandara (Nasik) 12th Aug. 1961, leg. B. V. Patil (Type).

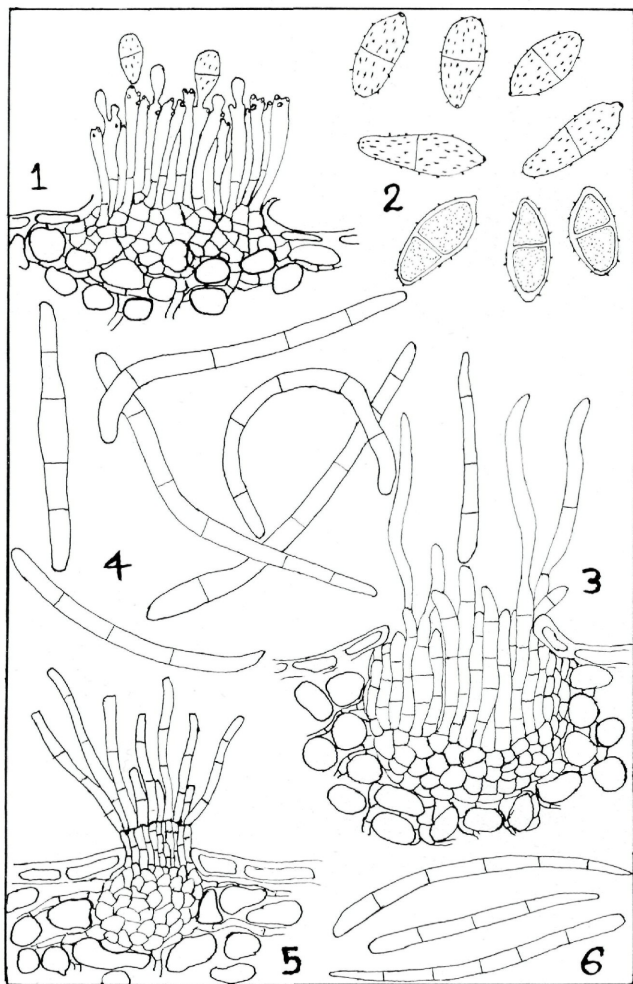
The spores are narrower than those of *C. imperatoriae*.

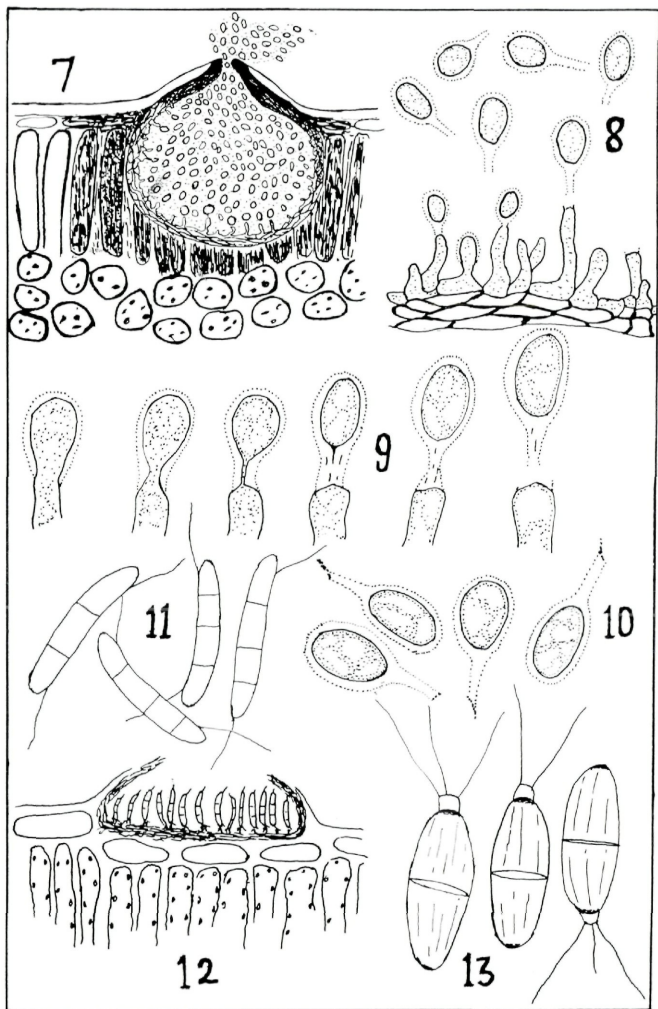
4. *Cercoseptoria micheliae* Patil & Thirum. sp. nov.

Infection spots epiphyllous, linear to broadly ovate, greyish white bordered by dark ring surrounded by brownish halo, coalescing to form large patches, the greyish mid-region leaving a shot-hole in the leaf. Sporodochis subepidermal, hyphae aggregating and forming a stroma which bears the conidiophores in compact fascicles, erumpent slightly protruding. Sporodochia 45—70  $\mu$  wide, conidiophores short, septate, pale brown, developing conidia acrogenously; conidia light brown, long, filiform or acicular, measuring 27—53  $\times$  1.5—4  $\mu$ .

Maculae epiphyllae, lineares vel late ovatae, griseo-albidae, obscure marginatae, saepe confluentes, tunc saepe magnam folii partem occupantes, in centro saepe disruptae et perforatae; sporodochia 45—70  $\mu$  diam.; subepidermalia, basi pseudoparenchymatica, sursum prosenchymatica, ex hyphis rectis septatis, in conidiophora dense fasciculata, abruptiuscula sed parum tantum prominula transientibus composita; conidiophora breviuscula, septata, pallide brunnea; conidia acrogena, pallide brunnea, filiformia vel acicularia, 27—53  $\times$  1.5—4  $\mu$ .

Hab. on leaves of *Michelia champac* L. (Magnoliaceae), Panhala (Kolhapur), Maharashtra, 30th Jan. 1962. leg. B. V. Patil.





5. *Macrophoma sapindi* Ramkr. & Sund. Proc. Indian Acad. Sci. Sec. B. XLII. p. 61—1555.

On living leaves of *Sapindus laurifolius* Vahl. (= *S. emarginatus* Vahl.) (Sapindaceae). Daregoan (Nasik) 23rd Sep. 1961. Leg. B. V. Patil.

6. A new genus of *Sphaeropsidales*.

An interesting pycnidial fungus was collected on living leaves of *Ehretia aspera* Roxb., from Nasik, India.

The fungus forms numerous pycnidia on the upperside of the leaf, grouped together in small patches. The pycnidia appear as minute, dark, pin-points, somewhat circular, slightly elevated in mid-region. They are subepidermal, depressed globose, with ostiole which opens out through the upper epidermis. The pycnidial wall is membranous, composed of 3 to 4 layers of pseudoparenchymatous dark brown cells, thickened at the ostiolar region to give the appearance of a clypeus.

The conidiophores are produced from the innermost layer of the pycnidial wall. The cells of this layer are hyaline, which give rise to simple, short, hyaline conidiophores.

The young conidium first appears as a rounded projection from the centre of the conidiophore and with increase in size, its cytoplasmic connection with the conidiophore becomes very attenuated. At this early stage, the conidium consists of two parts, a densely staining central region continuous with the cytoplasm of the conidiophore and an outer, colourless mucilaginous wall. With further development, the cytoplasmic connection with the conidiophore is completely severed although the conidium remains firmly attached by the thick mucilaginous outer wall at its proximal end. As the conidium enlarges in size, the outer wall becomes stretched in the joint region ultimately breaking away at the tip of the distal end of the conidiophore (Fig. 9). Thus a mucoid appendage of the outer wall is formed at the base of the conidium. It somewhat resembles the pedicel of the teliospores in rust fungi. The remnants of the outer transparent wall were seen occasionally at the distal ends of conidiophores after detachment of the conidia.

When detached, the conidia get released in the pycnidial cavity which is filled with gelatinous mass. The outer mucoid walls of the conidia and pycnidial gelatinous mass are hygroscopic, and dispersal of conidia does not take place unless there is sufficient moisture on the leaf surface. In wet weather conditions conidia emerge out through ostiole as spore-tendrils, which soon disintegrates due to the dissolution of the mucilage and conidia are dispersed. The outer wall of the conidium swells in water and dissolves away.

In the possession of a mucoid basal appendage, the fungus somewhat

resembles the genus *Neottiospora* Desm. but the latter has a funnel-shaped appendage, non-ostiolate pycnidia and no mucoid outer wall.

*Anthasthoopa* Subram & Ramakr. has apical appendage and sporodochium-like mound of tissue in the floor of the pycnidium which is not present in the fungus under study. No genus of Sphaeropsidales resembles the present fungus in the mode of conidial development and it is proposed to accommodate it in a new genus.

**Caudophoma Patil & Thirum. gen. nov.**

Pycnidia ostiolate, immersed, with membranous wall, without stroma; conidiophores short, simple, hyaline. Conidia one-celled, hyaline, ovoid to broadly ellipsoid acrogenous, produced singly and each having transparent mucoid outer wall which projects as a blunt pedicel-like appendage. Spore mass embedded in gelatinous matrix and extruded out as cirrhi.

Pycnidia innata, ostiolata, sine stromate; pariete membranaceo, pseudoparenchymatico; conidiophora breviscula, simplicia, hyalina; conidia acrogena, ovoidea vel late ellipsoidea, hyalina, muco hyalino, postice petioli instar protracto obvoluta, maturitate in cirrhis expulsae.

Type species: *Caudophoma ehretiae* Patil & Thirum.

**Caudophoma ehretiae Patil & Thirum. sp. nov.**

Leaf spots not definite, 2—5 mm; pycnidia epiphyllous, subepidermal, globose, ostiolate, erumpent, 70—160  $\mu$  in diameter, wall composed of 3—4 layers, thickened at the ostiolar region. Conidiophores simple, short, hyaline, about 2—4  $\mu$  broad and 20  $\mu$  long. Conidia one-celled, hyaline, ovoid to broadly ellipsoid produced singly and acrogenously with mucoid outer wall projecting as pedicel-like appendage. Conidia 10—16  $\times$  7—10 (13  $\times$  8)  $\mu$ ; outer mucoid wall thickness 1—1.5  $\mu$  and length of the appendage 4—9  $\mu$ .

Maculae indefinitae, 2—5 mm diam.; pycnidia epiphylla, subepidermalia, globosa, ostiolata, prominula, sed vix erumpentia, 70—160  $\mu$  diam.; pariete 3—4-stratoso, in vertice distincte incrassato; conidiophora simplicia, breviscula, hyalina, ca. 20  $\mu$  longa, 2—4  $\mu$  crassa; conidia ovoidea vel ellipsoidea, unicellularia, hyalina 10—16  $\times$  7—10 (13  $\times$  8)  $\mu$ , muco hyalino 1—1.5  $\mu$  crasso, postice petioli 4—9  $\mu$  longi instar protracto obvoluta.

Hab. on living leaves of *Ehretia aspera* Roxb. (Boraginaceae) Chandore (Nasik), 12th Aug. 1961. Leg. B. V. Patil (Type), Figs. 7—9.

7. *Kellermania malabarica* Ramakr. T. S. Proc. Indian Acad. Sci. Sect. B. 32, 205—214, 1950.

On leaves of *Anogeissus latifolia* Wall. (Combretaceae) Bhilwadi (Nasik) 28th Nov. 1960. Leg. B. V. Patil.

### 8. *Discosia wendlandiae* Patil & Thirum. sp. nov.

Infection spots on leaves, 2—6 mm in diameter, mostly circular later on coalescing forming larger irregular spots, chocolate brown in colour. Pycnidia black, epiphyllous, in the inner greyish-white spot, separate, flattened, sub-cuticular to intraepidermal, 60—231  $\mu$  broad, conidiophores short, simple; conidia hyaline, allantoid to fusoid 2—3 septate, with single appendage at each end; wall smooth, measuring 11—19  $\times$  1.5—2  $\mu$ , appendages 6—10  $\mu$  long.

Maculae plerumque orbiculares, 2—6  $\mu$  diam., griseo-brunneae, saepe confluentes, tunc multo majores et irregulares; pycnidia epiphylla, in centro griseo-albido macularum evoluta, subcuticularia vel intraepidermalia, 60—231  $\mu$  diam.; conidiophora simplicia, brevia; conidia cylindracea vel subfusioidea, arcuata vel subrecta, utrinque obtusa, vix vel leniter tantum attenuata, 2—3-septata, levia, 11—19  $\times$  1.5—2  $\mu$ , utrinque cilia unica filiformi 6—10  $\mu$  longa praedita.

Hab. on living leaves of *Wendlandia notoniana* (Rubiaceae) Panhala (Kolhapur) 30th Jan. 1962. Leg. B. V. Patil. Figs. 11—12.

### 9. *Phleospora cassiae* Thirum. & Narasim. Sydowia 4: 70, 1950.

Syn. *P. cassiae* Ramkrish. & Sund. Proc. Indian Acad. Sci. Sect. B. 32: 110, 1950.

Hab. on leaves of *Cassia fistula* L. (Caesalpinaceae) college of Science Garden Nagpur, 18th Nov. 1962, Leg. B. V. Patil.

### 10. *Neobarclaya careyae* Patil & Thirum. sp. nov.

Leaf spots, circular, 2—5 mm. diameter, ash-grey in colour, spots drying and leaving a shot-hole in the leaf.

Pycnidia black, epiphyllous, few, separate, subepidermal, subglobose, ostiolate, 70—128  $\times$  104—230  $\mu$ , wall composed of 3—4 layers of dark-brown cells, 10—18  $\mu$  thick. Conidiophores, short, simple, hyaline, conidia dark, two-celled with hyaline, apical end cells, ellipsoid to fusoid, with two or three hyaline, apical appendages, basal end bearing the abstriction dark-scar, measuring 7—10  $\times$  2.5—3.5  $\mu$ ; appendages 5—10  $\mu$  long hyaline apical end cells 0.5—0.7  $\mu$  long.

Maculae orbiculares 2—5 mm diam., cinereae, postea exarescentes, disrumpentes et perforatae; pycnidia atra, epiphylla, pauca, subepidermalia, subglobosa, ostiolata, 70—128  $\times$  104—230  $\mu$ ; pariete membranaceo, 2—4-stratoso, pseudoparenchymatico, e cellulis 10—18  $\mu$  diam. metientibus composito; conidiophora brevia simplicia, hyalina; conidia ellipsoidea vel late fusioidea, utrinque leniter sed distincte attenuata, recta, obscura, uniseptata, 7—10  $\times$  2.5—3.5  $\mu$ , antice cellula vel papillula minuta, hyalina, 0.5—0.7  $\mu$  longa, ciliis 2—3 hyalinis, filiformibus, rectis vel lenissime curvulis aucta praedita.

Hab. on living leaves of *Careya arborea* Roxb. (Myrtaceae) Trimbak (Nasik) 29th Jan. 1961, leg. B. V. Patil. Fig. 13.

11. *Stigmia diospyri* Patil & Thirum. sp. nov.

Leaf spots 3 mm wide dark-brown, fruiting bodies hypophyllous.

Conidial fructifications in the substomal space. Conidiophores cylindrical, pale brown  $10-22 \times 4-8 \mu$ , straight or bent and towards the apex they end in circular ridges which indicates where the dispersal of conidia has taken place by successive proliferations of the conidiophores; conidia, develop singly as blownout ends of conidiophores, fusoid to clavate with rounded apex and base tapering gradually to a flat scar, 2-9 septate, dark-brown, wall smooth about  $1 \mu$  thick, measuring  $27-65 \times 7-9 \mu$ .

Maculae obscure brunneae, ca. 3 mm diam.; caespituli hypophylli, e stomatibus orti; conidiophora cylindracea, pallide brunnea, recta vel curvula, apicem versus circulariter costata; conidia fusioidea vel obclavata, antice rotundata, postice paulatim in cicatriculam planam attenuata, 2-9-septata, obscure brunnea,  $27-65 \times 7-9 \mu$ ; episporio, levi, ca. 1 mm crasso.

Hab. on living leaves of *Diospyros embryopteris* Pers. (Ebenaceae) Bhilwadi (Nasik) 28th Nov. 1960, leg. B. V. Patil (Type).

We wish to express our gratitude to Prof. Dr. Franz Petrak for kindly giving the Latin diagnoses of new genus and species described in this paper.

Explanation of Plates III—IV.

Plate III.

Fig. 1. Stroma and conidiophores of *Asperisporium dalbergiae*  $\times 600$ . — 2. Conidia  $\times 1000$ . — Fig. 3. Sporodochium of *Cercoseptoria micheliae*  $\times 600$ . — 4. Conidia  $\times 1000$ .

Fig. 5. *Cercospora elaeodendronis*  $\times 600$ . — 6. Conidia  $\times 1000$ .

Plate IV.

Fig. 7. Pycnidium of *Caudophoma ehretiae*  $\times 400$ . — 8. Conidiophores and conidia  $\times 600$ . — 9.—10. and 12. Developmental stages of conidia  $\times 1000$ . Fig. 11. *Discosia wendlandiae* .11. Conidia  $\times 1000$ , 12. Pycnidium  $\times 400$ . — Fig. 13. *Neobarclaya careyae*, Conidia  $\times 2000$ .



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