©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.a

Additions to the Fungi of Raipur (Mathya Pradesh)-I*

By S. R. Chowdhury

Department of Botany, College of Science, Raipur, India

(With 2 figs.)

Efforts are afoot in Madhya Pradesh (India) to make a systematic collection and description of parasitic and saprophytic fungi of various groups occurring on wild as well as cultivated plants. A series of papers have been published (a few listed under reference) by the author to accomplish such studies at Raipur (M. P.).

The present paper — the first contribution of a new series — adds ten more species to the fungus flora of Raipur, of which a few are new species, others new to India and some familiar ones occur on new hosts.

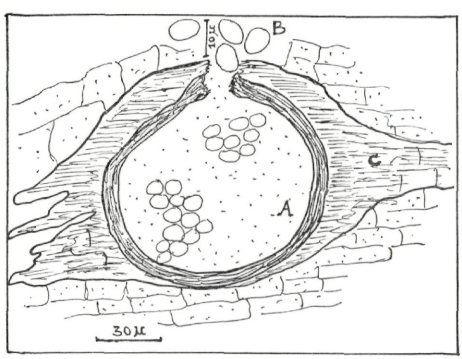

Fig. 1. *Protomyces najadis* Chowdhury. — A) Chlamydospore — B) Endospores — C) Surrounding, dark gal-tissues

1. **Protomyces najadis** Chowdhury sp. nov.

On the living leaves of *Najas graminea* Del. (Najadaceae), Dudadhari, December '65, leg. K. S. Ú n n i.

*) The paper was read in the 37th. annual session of the National Academy of Sciences, India, held at Ahmedabad (Gujrat) from 1st. to 4th. February, 1968. The research is financed by the University Grants Commission, New Delhi.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

Symptoms of the disease: the disease starts with the appearance of minute dots on both the surfaces of leaves, involving the stem and leaf-sheaths as well. The dots get elongated into dark-brown to blackish-brown streaks; rendering the affected tissues necrotic, and extending along the length of the affected organs it gets converted ultimately into ill-defined, slightly upraised isolated galls, enclosed by dead dark-brown tissues. The chief veins are also traversed.

The causal organism: galls only on leaves and stems, upto 2 × 0.5 mm. in dimensions, brown to dark-brown in colour, elongated along the length of the organ, with dark-brown periphery at maturity, with rounded or pointed ends, slightly raised, light-brown when young; mycelial hyphae scanty or becoming evanescent, hyaline, with granulated protoplasm, uniformely wide, at times showing swellings, upto 2 μ wide, long slander thread-like or sometimes as thin, broken fragments dispersed in the gall, septate, branching sparse; Chlamydospores single, globose, 17 to 160 μ, average 120 μ in diam. or oval, 100—192 × 79—144 μ, average 154 × 97 μ, walls golden-brown, upto 15 μ thick, protoplasm highly dense and granular when young converting into spores at maturity; endospores non-motile, hyaline, of varying shaphes, thin-walled, 4.6—10.6 μ, average 7 μ when spherical or globose, 6.2—11.2 × 3.7—6.2 μ, average 8.2 × 5.2 μ when ovoid (Fig. 1).

So far no *Protomyces* has been described on any species belonging to Najadaceae nor it seems to match any of the recorded species of *Protomyces*. It is, therefore, being described here as a new species.

Protomyces najadis Chowdhury sp. nov.

Gallae solum in foliis et caulibus insidentes, usque ad 2 × 0.5 mm dimensione, colore brunneo ad fusco (atro-brunneo), secus longitudinem organ elongatae, finibus rotundatis aut acutis, leviter prominentes, pallidae-brunneae in juventute, fusca peripheria in maturitate; hyphae myceliales angustae aut evanescentes, hyalinae, protoplasmate granulato, uniformiter latae, interdum praebentes tumores, usque ad 2 μ latae, longae graciles, filiformes aut interdum quam rupta fragmenta tenua disperata in galla, septatae, sparsim ramificantes; chlamydosporae singulares, globosae, 17—160 μ, plus minusve 120 μ diametro, aut ovales 100—192 × 79—144 μ, plus minusve 154—97 μ, parietes aureobrunneae, usque ad 15 μ crassae, protoplasma maxime densum et granulatum in juventute, convertens ad sporae in maturitate; endosporae nonmobiles, hyalinae, forma variante, pariete tenui, 4.6—10.6 μ, plus minusve 7 μ si sphaericae, aut globosae, 6.2—11.2 × 3.7—6.2 μ, plus minusve 2.2—5.2 μ si ovoideae.

Super foliis et caulibus viventibus plantae *Najas graminea* Del., Dudadhari, Decembro '65, legit K. S. Ú n n i.

Holotypus depositus est in Herb. I. M. I. sub numero 118102.

2. *Colletotrichum capsici* (Syd.) Butl. & Bisby, in The

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

fungi of India, Imp. Coun. Agri. res., India, Sci. Monog. 1, *18:* 237, 1931.

(a) On leaves of *Jatropha glandulifera* Roxb. (Euphorbiaceae), College garden, December '66, leg. S. R. C h o w d h u r y.

(b) On living stems of *Basella alba* L. (Chenopodiaceae), Katora Talab, December '66, leg. S. R. C h o w d h u r y.

Symptoms of the disease: (a) on the leaves of *Jatropha glandulifera* discoloured specks first appear on upper surface later becoming muddy-brown delimited by brown margin followed by yellowish zone. At maturity spots attain ash-colour dotted with black fruiting bodies. Spots coalesce but midrib is untraversed.

b) on green stems of *Basella alba* discoloured streaks appear first which extend linearly aquiring ash-colour at maturity dotted by small black fructifications. The stems and leaves dry premature losing chlorophyll and are thus devalued economically.

The causal organism: acervuli dark-brown, confluent, superficial, upto 150 μ in width; setae brown, simple septate, scattered; conidia hyaline, single celled, falcate, 10.6—20 × 2—2.5 μ, average 15 × 2.3 μ.

Colletotrichum capsici has been found to parasitise on various host plants. C h o w d h u r y (1966) reported it on leaves of C a l a d i u m s p. from Raipur. *Jatropha glandulifera* and *Basella alba* are new host records for the fungus. The specimens have been deposited in the Herb. I. M. I., Nos. 125191 a & 125196 a respectively.

3. *G l o m e r e l l a c i n g u l a t a* (Stonem.) Spauld. & Schr., in Syll. Fung. *XVII,* 573, 1905.

(a) On living leaves of *Artabotrys odoratissimus* Br. (Anonaceae)

(b) On living leaves of *Jatropha glandulifera* Roxb. (Euphorbiaceae), College garden, December '66, leg. S. R. C h o w d h u r y,

(c) On living stems of *Basella alba* L. (Chenodiaceae), Katora Talab, December '66, leg. S. R. C h o w d h u r y.

Symptoms of the disease: (a) discoloured patches appear on the leaves of *Artabotrys odoratissimus* first, which spreading irregularly attain muddy-brown central area with minute black dot-like fructifications enclosed by distinct thick blackish-brown halo, followed by yellow zone, spots coalesce rarely while midrib remains untraversed.

(b) on leaves of *Jatropha glandulifera,* water-soaked spots become muddy-brown with small black acervuli surrounded by irregular brown margin at the maturity.

(c) on *Basella alba* stems the initial light-brown patches turn into ash-colour at maturity bounded by irregular dark-brown, upraised halo. Usually lesions are elongated which coalesce.

The causal organism: acervuli dark-brown, discoid, setose, 90—160 μ wide with setae dark-brown, septate, erect; conidiophores hyaline, simple; conidia single-celled, hyaline, elliptical to ellipsoid-cylindrical with rounded ends, straight, 7.8—15.7 × 2.6—4 μ, average 12.6 × 3 μ.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

Only the imperfect stage viz *Colletotrichum gloeosporioides* Penz. was present.

Chowdhury (1967) and Hasija (1963) have recorded this fungus on the leaves of *Plumeria acutifolia* and *Citrus medica* respectively.

Artabotrys odoratissimus, Jatropha glandulifera and *Basella alba* are new host records.

The specimens have been deposited in the Herb. I. M. I., Nos. 125186, 125191 b and 125196 b respectively.

4. *Alternaria tenuissima* (Nees) Wiltshire, in Trans. Brit. mycol. soc. *18:* 157, 1933.

(a) on inflorescence of *Sorghum vulgare* Pers., Ganj area, December '66, leg. Chowdhury.

(b) on leaves of *Tagetes* sp. (Compositae), Katono Talab, December 1966, leg. Chowdhury.

(c) on leaves of *Curcuma longa* L. (Zingiberaceae), Rampura, November 1966, leg. Chowdhury & Diwan.

Symptoms of the disease: (a) on the fruit-walls and glumes dark-brown powdery mass deposits. The grains get infected and remain undeveloped. The pedicels and peduncles are not affected.

(b) discoloured specks on leaves of *Tagetes sp.* get necrotic, at length converting into ash-coloured dotted spots which freely coalesce. The involucre and other floral parts are also attacked which ultimately, along with the leaves, are completely blighted.

(c) spots on leaves of *Curcuma longa* arise as small colourless structures, later becoming brownish bounded by brown, irregular margins. The fructifications appear as small black dots on both surfaces. Under severe conditions of the attack leaves turn brown and dry up.

The causal organism: conidiophores brown, single or in clusters septate, geniculate, simple or branched, amphigenous, 40—157 × 4—6 μ, average 130 × 4.5 μ; conidia brown, muriform, beaded, with 6—8 transverse and 4 longitudinal septa, 36—84 × 8—16 μ, average 57 × 14 μ.

Alternaria tenuissima has been reported by Chowdhury (1967) on leaves of *Cajanus indicus* from Raipur. *Sorghum vulgare, Tagetes sp.* and *Curcuma longa* are new host records for the fungus.

The specimens have been deposited in the Herb. I. M. I., Nos. 125189 a, 125192 b and 125194 respectively.

5. *Nigrospora sphaerica* (Sacc.) Mason, in Sacc. *XXII,* 1490 as *Epicoccum hyalopes* Miyake, 1913; in Trans. Brit. mycol. soc. *12;* 152, 1927.

On inflorescences of *Sorghum vulgare* Pers. (Graminae), Ganj area, December 1966, leg. Chowdhury.

The fungus was found associated with *Alternaria tenuissima,* described under serial No. 4.

The causal organism: conidiophores arise as lateral branches of the

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

hyphae, sub-hyaline, with swollen jar-like terminal cells bearing solitary conidia, upto 3.8 μ in width; conidia spherical to sub-globose, dark brown to black, epispore smooth, 10.5—17.6 μ in diam., average 14 μ.

Nigrospora sphaerica was reported by Chowdhury (1967) on leaves of *Cajanus indicus* from Raipur *Sorghun vulgare* is a new host record for the fungus.

6. **Cladosporium sorghi** Chowdhury sp. nov.

On living inflorescences of *Sorghum vulgare* Pers. (Gramineae), Ganj area, December 1966, leg. S. R. Chowdhury.

Symptoms of the disease: disease first appears as dark-brown powdery mass deposited on the inflorescence giving false appearance of smuts. The whole of the ear gets ultimately blackened, crumpled and grains are not set in. The disease is confined to the floral parts.

The causal organism: conidiophores erect, unbranched, septate, with geniculations, usually in fascicles, with broader base, upto 158 × 5.2 μ in dimensions; conidia borne at the tips of the conidiophores in short chains, oval-elliptic to somewhat cylindrical, brown, one to two-celled, at times 4-celled, epispore smooth, 6.5—10.5 × 2.6—5.2 μ, average 7.9 × 3.7 μ (Fig. 2).

So far none of the species of *Cladosporium* has been reported to occur on any species of *Sorghum*. Moreover, this species of fungus does not seem to match with any of the recorded ones. Hence, it is being described here as a new species.

Conidiophora erecta, inramosa, septata, cum geniculationibus, vulgo in fasciculis, base latiore, usque ad 158 × 5.2 μ dimensiones; conidia portata ad apices conidiophorarum in catenis brevibus, ovalia-elliptica vel eliquentum cylindrica, brunnea, uni- vel bicellularia, nonnumquam tetracellularia, episporium laeve, 6.5—10.5 × 2.6—5.2 μ, plus minusve 7.9 × 3.7 μ.

Super viventibus inflorentiis plantae *Sorghum vulgare* Pers., Ganj regione, India, Decembero 1966, leg. S. R. Chowdhury.

Holotypus depositus est in Herb. I. M. I., No. 125190.

7. *Cercospora curcumae* Govindu & Thirum., in Sydowia *10:* 275, 1956.

On living leaves of *Curcuma longa* L. (Zingiberaceae), November 1966, Rampura, leg. Chowdhury.

Symptoms of the disease: the disease appears as small brown to blackish spots surrounded by irregular boundary. The affected tissues dry up. The spots coalesce.

The causal organism: stroma upto 45 μ in diam., amphigenous; conidiophores olivaceous-brown, rarely branched, septate, in fascicles, geniculate, 100—200 × 3—5.5 μ, average 155—4.5 μ; conidia hyaline, cylindric, septate, tapering toward tip, truncate at the base, 52—184 × 2—4 μ, average 134 × 2.8 μ.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

Cercospora curcumae was first recorded by Govindu & Thirum. (1956) from Bangalore. This is the first record from the state of Madhya Pradesh. The specimen has been deposited in the Herb. I. M. I., No. 125195.

8. *Curvularia verruculosa* Tandon & Bilgrami, in Curr. Sci. *31*, 6: 254, 1962.

On inflorescences of *Sorghum vulgare* Pers. (Graminae), Ganj area, December 1966, leg. Chowdhury

Symptoms of the disease: on the inflorescence stalk and inside the grains blackish brown granular powdery mass appears which partly spoils the grains as they are covered with the mycelia and the fructifications of the fungus.

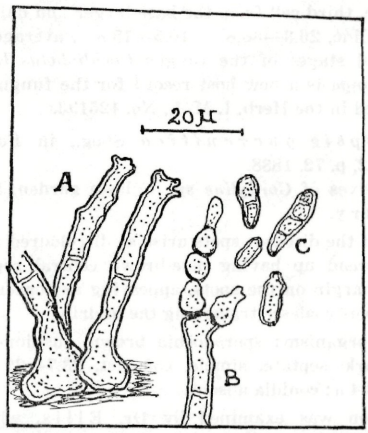

Fig. 2. *Cladosporium sorghi* Chowdhury — A) Conidiophores — B) Catenate conidia attached to conidiophore — C) Conidia

The causal organism: conidiophores light-brown, simple or rarely branched, geniculate usually near the tips, upto 142 × 4.7 μ in dimensions; conidia straight or curved or fusiform, brown, 3-septate, not constricted at the septa, third cell from base larger and darker than others, basal cell hyaline, epispore verruculose, 21—26 × 7—19 μ, average 24 × 12 μ.

Curvularia verruculosa was first described by Tandon & Bilgrami (1962) on leaves of *Typha* sp. *Sorghum vulgare* is a new host record for the fungus and is also a first report from the state of Madhya Pradesh. The specimen has been deposited in the Herb. I. M. I., No. 125188.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

9. *Cochliobolus lunatus* Nelson & Haasis, in Bull. Jard. Bot. Buitenz. 3 Ser. *13* (1) : 127, 1933.

On living leaves of *Curcuma longa* L. (Zingiberaceae), Rampura, December 1966, leg. Chowdhury & Diwan.

Symptoms of the disease: the disease starts as discoloured patches first on the upper surface of the leaves; later spreading irregularly aquires ash-coloured central region enclosed by brown margin. The lesions later freely coalesce and more than half of the lamina gets necrotic losing chlorophyll from margin and tip of the leaf inward.

Causal oroanism: stroma dark-brown, upto 250 μ in dimensions; conidiophores brown, amphigenous, septate, in fasciles, 110—171 × 5.2—6.6 μ, average 132 × 5.8 μ; conidia brown, straight or curved, smooth, 3-septate, third cell from the base larger and darker than others, end cells sub-hyaline, 26.3—36.8 × 10.5—15.8 μ, average 32.3 × 12.6 μ.

Only conidial stages of the fungus *Cochliobolus lunatus* was met with. *Curcuma longa* is a new host record for the fungus. The specimen has been deposited in the Herb. I. M. I., No. 125193.

10. *Pucciniopsis guaranitica* Speg., in Fungi guaranitici Pug. *2*, n. 202, p. 72, 1888.

On living leaves of *Cordyline sp.*, College garden, September 1966, leg. Chowdhury.

Symptoms of the disease: spots arise as discoloured irregular specks, which widely spread up having pale-brown central region surrounded by dark-brown margin on the spots, appearing as concentric, black, granular patches. Spots coalesce traversing the midrib.

The causal organism: sporodochia brown, cushion-like, spreading; conidiophores dark, septate, simple, compact, 23.7—29 × 7.9—10.5 μ, average 25.2 × 9.4 μ; conidia absent.

The specimen was examined by Dr. Ellis, who reported the fructifications of the fungus resembling those of *Pucciniopsis guaranitica* Speg., which is a new fungus record for India. The specimen has been deposited in the Herb. I. M. I., No. 123387.

Acknowledgements

The author is grateful to Dr. G. P. Agarwal, Professor of Botany, Science College, Jabalpur for his valuable suggestions and to Dr. R. C. Agnihotri, Head of the Botany Deptt., College of Science, Raipur, for encouragements. He is also the tankful to the Director of the Commonwealth Mycological Institute, Kew, and to Miss Waterhouse, Drs. Mordue and M. B. Ellis of the C. M. I., Kew for help in the identification of the species and to Prof. Dr. K. Magdefrau, University of Tubingen, Germany, for providing latin renderings of the diagnoses of the new species.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.a

References

Chowdhury, S. R. 1966. Notes on fungi occurring at Raipur (Madhya Pradesh) I. Proc. nat. Acad. Sci., India *36:* 296—302.

— 1967. Notes on fungi occurring at Raipur (Madhya Pradesh) II. Ibid. *37 B.* 139—147.

Hasija, S. K. 1963. Additions to the fungi of Jabalpur (Madhya Pradesh) III. Sydowia *16*: 67—72.

Govindu, H. C. & Thirumalachar, M. J. 1956. Notes on some Cercosporae of India VII. Sydowia *10*: 275.

Tandon, R. N. & Bilgrami, N. S. 1962. A new pathogenic species of genus *Curvularia*. Curr. Sci. *31*: 254.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Sydowia

Jahr/Year: 1969/1970

Band/Volume: 23

Autor(en)/Author(s): Chowdhuri [Chowdhury] S. R.

Artikel/Article: Additions to the Fungi of Raipur (Mathya Pradesh)-I. 46-53