



OCCURRENCE OF CERCOSPOROIDE IN MEDICINAL PLANTS OF MADHYA PRADESH

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ABSTRACT

The consequence of vegetation as a chief source of therapeutic agents has unspecified greater importance during the recent years because of the extraordinary revitalization in use of plants for health care throughout the world. This has resulted in the large-scale exploitation of some medicinal plants as raw material for pharmaceuticals. Fungal invasion of medicinal plants causes two damages in many ways, first it reduces yield (roots, stem, leaves and seeds) of the plants and secondly reduces the quality of the product as fungal invasion releases toxins and break up the constituents of plants (Mukherji and Bhasin, 1986). During 2004-2005 periodical survey of different places of Madhya Pradesh (Chitrakoot, Seoni, Narsinghpur, Bilaspur) and the neighborhood of Jabalpur were made within a radius of about 15-20 km. The correct identity of the medicinal plant is important to protect their medicinal value from the damage. Therefore, a study was undertaken to record new fungi for the country/state using flora of Madhya Pradesh. In the present research paper twenty-one Cercosporoid were recorded in medicinal plants are enumerated for the state as new host records.

Key Words : Cercosporoide and medicinal plants.

Medicinal plants have been used by man from prehistoric times. The Aryans of the Indus valley wrote three treatises viz., the **Regveda** (2000 BC), **Atharvaveda** (2000-1000 BC) and **Ayurveda** (100-600 BC) which mentioned several medicinal plants and their uses (Chopra, *et al.*, 1956). Approximately over 60% of all pharmaceuticals are plant based. Chemically, depending on their active principles, plant may have

alkaloids, glycosides, steroids or other groups of compound which may have marked pharmaceutical actions as anticancerous, antimalarial, antihelminthic or antidycentric (Husain, 1993). These drugs are derived from trees, shrubs and herbs and even for primitive kinds of plants which do not fall into the above categories. They are made from flower, fruits, leaves, stem, roots and seeds (Maheshwari, 2000).

Large quantities of these valuable plants get spoiled due to diseases while they are in the field or while in storage before processing (Butler, 1918). Therefore, correct identification and taxonomy of the associated fungi is most needed/important to protect the plants and product from the damage, and to keep their pharmaceutical property and commercial value (Janardhanan, 2002).

The kingdom fungi is an important component of biodiversity. The biological diversity in the biosphere is regarded as common heritage of mankind (UNEP, 1992). To work with the biological diversity of tropical fungi is an immense task due to the vastness of the subject and the lack of comprehensive data. The tropical fungus flora, still only partly and inadequately mapped, is yet extremely rich and diverse and has special relevance to us.

The total number of fungal species on earth is estimated from empirical and theoretical studies (Howksworth, 1997) as 1.5 million, of which less than 8 per cent are currently known. This number indicates an estimated number of fungal 'morph' on earth. Since most species have been and are still being described on phenotypic basis only.

MATERIALS AND METHODS

The spotted leaves/plants parts with spots and fungal growth were collected and brought to laboratory for examination and identification. The symptoms of disease/fungal growth were noted. An extra care was taken for supplementing the subsidiary details in order to clarify the exact location from where the particular specimen was collected.

In order to have the correct identity of the host plant it was always made a point to collect a few flowers and fruits of the host plants. The same locality was visited twice in a week. After the collection, the specimens were sorted out according to the host identity.

Symptoms were studied in detail with respect to exact colour of the spotted leaves/colony colour, shape, size and position. The surface scraping and sections of specimens were prepared and examined to investigate the causal organism/fungus associated, by light

microscopy for the morphological details, mounted in water or 5% lactophenol for clear visibility of the spore (Bisby, 1953).

Conidia and conidiophores were removed from the host surface by pressing the later against cellotape (wonder) and stuck to microscope slide. The specimens were strained in cotton blue and mounted in lactophenol. For different dimension at least 50-100 measurements were recorded except in scanty material, unusual spore dimensions are given in parenthesis.

The taxonomic detail of each fungus was recorded by making photomicrographs. The identifications were made by using recent literature. Comparisons were made with the allied Taxa to justify, the distinct identification of the species described in this work. The following collections were made and studied during present investigation.

The importance of fungi as new record for the state or new host was confirmed by monographs/indices and current journals.

– *Passalora ajrekari* (Syd) U. Braun. *Ann. Mycol.* 12: 202, 1914; *Sacc. Syll. Fung.* 25: 875, 1931; Chupp, 1953, p. 211; Vasudeva, 1963, p. 34. Conidiophors, straight, cylindric 1-septate, bearing single conidia with dark prominent scar, 27.54 – 39.69 x 4.05 – 4.86 um av 32.40 x 4.05 um, scar 3.24 mm. Conidia, hyaline to sub, hyaline obclavate cylindric, straight to slightly bent tapering upward, 32.4 – 50.22 x 4.05 – 4.86 um, av. 37.00 x 4.86 um. **Habitat** upon the leaves of *Jatropha curcas* L. (Euphorbeaceae), collected from the Medicinal Garden, J.N. University, Jabalpur, M.P., dated 24-01-2005, Leg by- P. K. Gupta. **HCIO. 47951, Remark:** In the present collection conidiophores are slightly larger than the original description (15-30 x 3.55 um). This is first record for state.

– *Pseudocercospora blumeae* (Thumen) Deighton, *Revue. Mycol.* 2: 38, 1880; Saccardo, *Syll. Fung.* 4: 445, 1886; Sydow & McRae, *Ann. Cryptog. Exot.* 2: 263, 1929; Chupp, 1953, p. 124; Vasudeva, 1963, p. 53. **Habitat** upon the leaves of *Blumea lacera* DC (Asteraceae), from Medicinal Garden, JNKVV,

Jabalpur, M.P., 23-12-2004, Leg by P.K. Gupta **HCIO No. 47944, Remark:** In the present collection conidiophores are slightly larger than the original description. This is first record for state.

– *Cercospora apii s.lat*, *Curr. Sci.* 27(7): 260-261, 1958. **Habitat** upon the living host *Blumea lacera* DC (Asteraceae), Medicinal Garden, JNKVV, Jabalpur, M.P., 23-12-2004, Leg by P.K. Gupta, **HCIO. No 47945, Remark:** Das (1958) described this species from Sambalpur, Orissa. The present collection match with the original description therefore, identified as *Cercospora blumeicola* Das. This is first record for the state.

– *Cercospora apii s.lat*, *Grevillea*, XII ; 31, 1883; Saccardo, *Syll. Fung.* IV ; 452, 1886. **Habitat** upon the lead the living host *Diplocyclos palmatus* (L.) Jeffery (Syn. *Bryonia palmata* L. *Bryonopsis laciniosa*) P.G. Hostel, J.N. University, Jabalpur, M.P., 15-12-2004, Leg – P.K. Gupta, **HCIO. No. 47935, Remark:** This species has been reported on several species of cucurbits (Bilgrami *et al.*, 1981). It has been reported on *Bryonopsis laciniosa* (*Diplocyclos palmatus*) from Jabalpur (Agarwal and Hasija, 1964), hence, this forms first record from the state.

– *Pseudocercospora cocculi* (Syd.) Deighton, *Ann. Cryptog. exot.* 2 264, 1929; Chupp, 1953, p. 387; Vasudeva, 1963, p. 86; Thirumalachar and Chupp, *Mycologia*, 40: 355, 1948. **Habitat** winning the living wage host *Cocculus hirsutus* Linn Diels. (Menispermaceae), Arogyadham, Chitrakoot M.P., 16-11-2004, Leg by P.K. Gupta. **HCIO. No. 47919. Remark:** In the present collection conidia are slightly larger than the original description (Conidia 25-75 x 5-6 um). The species *C. cocculi* first recorded by Agarwal & Sharma (1973). This is second record for the state of Madhya Pradesh.

– *Passalora dioscoreae* (Ellis & G Martin) U. Braun, *Trans. III acad. Sci.* 10: 255, 1917; Saccardo, *Syll. Fung.* 25: 874, 1931; Thirumalachar & Chupp, *Mycologia*, 40: 354, 1948; Chupp, 1953, p. 196; Vasudeva, 1963, p. 68. **Habitat** upon the existing host *Dioscorea* sp. (Dioscoreaceae), Botanical Garden, J.N. University, Jabalpur, M.P., 25-11-2004, Leg by

P.K. Gupta. **HCIO. No. 47941. Remark:** In the present collection, conidiophores are slightly larger and conidia are slightly smaller than the original description (Conidiophore 50-80 x 4-5 um; conidia 70-100 x 6 um). The present collection is new record for state.

– *Cercospora apii s. lat*. *Mycologia*, 9: 109, 1917; Saccardo, *Syll. Fung.* 25: 907, 1931; Chupp, 1953, p. 305; Vasudeva, 1963, p. 102; Chowdhury, *Lloydia*, 20: 298, 1957. **Habitat** upon the living host *Erythrina suberosa* Roxb. (Leguminosae), Medicinal garden, JNKVV, Jabalpur, M.P., 23-11-2004, Leg by P.K. Gupta. **HCIO. No. 47949. Remark:** In the present collection, conidiophores are slightly larger than the original description (Conidiophores, 40-75 x 5 mm). This constitutes new record for the state.

– *Cercospora apii s. lato*. *Ceiba*, 1: 173, 1950. **Habitat** upon the living leaves of *Ocimum officinalis* Linn. (Labiatae), ATIC, JN University, Jabalpur, M.P., 01-02-2005, Leg by P.K. Gupta, **HCIO. No. 47942. Remark:** In the present collection, conidiophores are slightly small and wide, than the original description (Conidiophore 28-165.6 x 3.5 – 5.5 um) while conidia small and narrow (72-180 x 3.6 um). The present collection is new for the state.

– *Acarocybella jasminicola* (Hansf.) M.B.Ellis. *Arch. Inst. Biol. Veg. Rio de. T.* 3: 93, 1936; Mundkur and Ahmad, I.M.I., *Mycol. Pap.* 18: 10, 1946; Patel, Kamat and Bhide, *Indian Phytopath.* 2: 148, 1949; Thirumalachar & Chupp, *Mycologia*, 40: 356, 1948; Chupp, 1953, p. 416; Vasudeva, 1963, p. 126. **Habitat** upon the foliage of *Jasminum arborescens* Roxb (Oleaceae) 16-11-2004, Arogyadham, Chitrakoot, M.P., Leg by P.K. Gupta, **HCIO. No. 479925. Remark:** The species was earlier recorded by Mundkur & Ahmad (1946) on *J. malabaricum* Wight and on *J. sambac* Ait from Maharashtra, Agarwal and Hasija (1972) from Madhya Pradesh. The present collection is record from the state.

– *Cercospora lantanae – indicae* Munjal, Lal and Chona. *Indian Phytopath.* Vol. 12: 134, 1959. **Habitat** upon the living host leaves of *Lantana camara* Linn (Verbenaceae), Medicinal garden, J.N. University Jabalpur, M.P., 15-12-2004, Leg by N. D. Sharma,

HCIO. No. 47932, Remark: In the present collection conidia are smaller (50-90 x 4-5 um) and conidiophores are slightly larger (30 x 3 um) than the original description hence present collection is new for the state.

– *Cercospora apii* s. lat. *Indian Phytopath.* 12: 119, 1959. **Habitat** upon the living leaves of *Abutilon indicum* (L.) Sweet (Malvaceae), Botanical Garden, J.N. University, Jabalpur, M.P., 29-01-2005, Leg by P.K. Gupta, **HCIO. No. 47934, Remark:** Chiddarwar (1959) recorded this species from Poona, Maharashtra State. The present collection is new record for the state.

– *Pseudocercospora nyctanthes* (Roy) U. Braun. *Trans. Brit. Mycol. Soc.* 51: 164-65, 1968. **Habitat** upon the leaves of *Nyctanthes arbor tristis* Linn. (Oleaceae), collected from the Medicinal Garden, J.N. University Jabalpur, M.P., 15-01-2005, Leg by N.D. Sharma, **HCIO. No. 47920, Remark:** Roy (1968) described this species from Barbheta Assam. The present collection match with the description therefore identified as *C. nyctanthis* Roy. This is first record for the state.

– *Cercospora apii* s. lat. *Philipp, J. Sci.*, LXXX, p. 174, 1941. **Habitat** upon the living leaves of the *Operculina turpethum* Linn. *Silva Manso* (Convolvulaceae). Collected from the Medicinal Garden, JNKVV, Jabalpur, M.P., 08-12-2004, Leg by P.K. Gupta, **HCIO. NO. 47950, Remark:** Gupta & Verma (1986) described this species from Gorakhpur, U.P. The present collection match with the description therefore, identified as *Cercospora operculinae* Mendoza. This is first record for the state.

– *Pseudocercospora pogostomonis* (Singh & Kamal) U. Braun. *Indian Phytopath.* 14: 188-189, 1961. **Habitat** upon the leaves of *Pogostemon plectranthoides* Desf. (Labiatae), Medicinal Garden, J.N. University, Jabalpur, M.P., 28-03-2005, Leg - P.K. Gupta, **HCIO. No. 47961, Remark:** Munjal *et al.* (1961) collected and described this species from Khandala (Bombay). In the present collection the conidia are larger than the original collection (15 - 77x 3-5 um).

– *Cercospora ranjita* (S. Chowdhury) Deighton. S. Chowdhury [stat. anam.], *Lloydia* 21(3): 155 (1959) [1958]. (S. Chowdhury) Deighton [stat.

anam.], *Mycological Papers* 140: 151 (1976). **Habitat** upon the living host leaves of the *Gmelina arborea* Linn. (Verbenaceae), collected from the Medicinal Garden, JNKVV, Jabalpur, M.P., 30-10-2004, Leg by P.K. Gupta, **HCIO. No. 47915, Remark:** The species *Cercospora rangita* earlier recorded by Chowdhury (1958) from Lohing Assam, hence this is first record from the state.

– *Cercospora ricinella* Saccardo & Berlese. *Atti R. Inst. Ven. Sci. Lett. Arti.* 6: 3, 721, 1885. Saccardo, *Syll. Fung.* 4: 456, 1886; Chupp, 1956, p. 229; Vasudeva, 1963, p. 174; Uppal, Patel and Kamat, 1935, p. 30; *Dey, Adm. Rep. Agric. Dep. U.P.*, 1945-46, pp. 43-46, 1948; Singh, *Curr. Sci.* 17: 266-67, 1948. **Habitat** Upon the living leaves of *Ricinus communis* L. (Euphorbiaceae), collected from the Vamondehi Nursery, Seoni M.P., 31-10-2004, Leg by P.K. Gupta, **HCIO. No. 47910, Remark:** In the present collection conidia and conidiophores are slightly larger than original description (Conidiophore 60-70 x 4-5 um; Conidia 90-100 x 4-6 um ?

– *Pseudocercospora subsessilis* (Syd. & P. Syd) Deighton. *Annls. Mycol.* 11 ; 329, 1913. *Ann. Crypt. Exot.* 2: 262-272, 1930. Ellis More Demataceous Hyphomycetes, p. 276-277, 1976. **Habitat** upon the leaves of *Azadirachta indica* A. Juss (Meliaceae), collected from the Arogyadham, Chitrakoot, M.P., 16-11-2004, Leg - P.K. Gupta, **HCIO. No. 47904, Remark:** The species *C. subsessilis* Syd. Was earlier recorded by Jain *et al.* (1960) from Jabalpur and Rao (1962) from Hyderabad. This is only second record from the state.

– *Cercospora ternateae* Petch. *Ann. Roy. Bot. Gdn. Peradenia.* 4(5): 306, 190; Saccardo, *Syll. Fung.* 22: 1419, 1913; Chupp, 1953, p. 336; Vasudeva, 1963, p. 195; Sydow & McRae, *Ann. Cryptog. Exot.* 2: 270, 1929. **Habitat** upon the living leaves of the *Clitoria ternatea* L. (Fabaceae), Arogyadham, Chitrakoot, M.P., 16-11-2004, Leg - P.K. Gupta **HCIO. No. 47908, Remark:** In the present collection conidiophores are slightly smaller than the original description (90-200 x 5 um) hence this forms first record for the state of Madhya Pradesh.

– *Cercospora tinosporae* (Lacy & Thirum.) Deighton. *Ann. Mycol.* 14: 372, 1916; Saccardo, *Syll. Fung.* 25: 884, 1931; Chupp, 1953, p. 390; Vasudeva, 1963, p. 198; Thirumalachar and Chupp. *Mycologia*, 40: 361, 1929. **Habitat** upon the living leaves of the *Tinospora cordifolia* (Willd.) Hooke & Thoms (Menispermaceae), collected from the Botanical Garden, JN University, Jabalpur, M.P., 28-10-2004, Leg by P.K. Gupta, **HCIO. No. 47912**, **Remark:** In the present collection conidiophores and conidia are slightly smaller than the original description (Conidiophore, 60-100 x 3-4 um; Conidia 40-50 x 5-6.5 um).

– *Pseudocercospora vitis* (Lev.) Speng. *J. Mycol.* 3: 18, 1887; Saccardo, *Syll. Fung.* 10: 648, 1892; Chupp, 1953, p. 593; Vasudeva, 1963, p. 211; Thirumalachar & Govindu, *Sydowia*. 10: 260, 1956; Govindu & Thirumalachar, *Sydowia*. 10: 276, 1956. **Habitat** upon the living leaves of the *Vitex negundo* Linn. (Verbenaceae), collected from the Arogyadham, Chitrakoot, M.P., 16-11-2004, Leg by P.K. Gupta, **HCIO. No. 47914**, **Remark:** In the present collection conidiophores and conidia are same as original description (Conidiophores 10-15 x 3.5 um, conidia 30-45 x 2.5 um). The present collection is new for the state of Madhya Pradesh.

– *Pseudocercospora withaniae* (Syd. & P.Syd.) Deighton. *Ann. Mycol.* 10: 444, 1912; Saccardo, *Syll. Fung.* 25: 891, 1931; Chupp, 1953, 553, Vasudeva, 1963, p. 215. **Habitat** upon the living host of the *Withania somnifera* Dunal (Solanaceae), collected from Arogyadham, Chitrakoot, M.P., 16-11-2004, Leg by P.K. Gupta, **HCIO. No. 47948**, **Remark:** In the present collection conidiophores and conidia are slightly larger than the original description (conidiophore 15-45 x 2.5 – 5 um; Conidia 35-52 x 2.5-3 um). The present collection is new record for state of Madhya Pradesh.

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