



ISSN:0976-4933  
Journal of Progressive Science  
Vol.04, No.01, pp 74-79 (2013)

## ***Mycovellosiella fabaecola* sp.Nov. cuasing leaf-spot on *Crotolaria juncea***

**Arvind Kumar and Bhanu pratap**

**Department of Botany**

**Ghazipur PG College Ghazipur (UP), India**

Email -pintoomail2012@gmail.com

### **Abstract**

*This is the description of the new species Mycovellosiella fabaecola, a cercospoidal hyphomycete, associated with leaf spots on Crotolaria juncea, (Papilionaceae) an impotant plant for fibre with multiple uses in India as well as other countries. This new species was compared to other forms of Mycovellosiella earlier reported from same family of the host and is recognize as a new taxon.*

**Keywords-** Foliicolous, *Mycovellosiella*, Taxonomy.

### **Introduction**

*Crotolaria juncia* L. (Popularly known as Sunn-hemp), an Asiatic species is the second importance to jute as a source of bast fiber in India, where it has been grown since prehistoric times. It has now spread to many tropical countries where it is grown for fodder or green manure, or as a fiber crop. At present, sunn hemp is grown as a commercial fiber crop in India and to lesser extent in Bangladesh and Pakistan. Sunn hemp is essentially a cordage fibre and is used in the manufacture of ropes, twins, cords, and marine cordage (Fishing nets). It also finds application in the manufacture of sailcloth, canvas, matting, sacking and rope soles of Shoes and Sandals, etc. In shipbuilding, the fibers are employed for closing the seams (Marine oakum) and for similar purposes. In the United Kingdom and the United State, sunn hemp fibers are made into cigarette paper, tissue paper and other high quality papers. There are no published records of leaf spot disease caused by hyphomycete genus *Mycovellosiella*. The foliicolous hyphomycete genus *Mycovellosiella* Rangel was redefined and expanded by Ellis (1971) and Deighton (1974). Since then a large number of species have been added to this genus as a result this is now one of the most well-known and established genera among the Cercosproid fungi. It characterized by causing occasional leaf spots but often only an intermediate chlorotic area on the upper surface of the leaf, commonly hypophyllous effuse caespituli, immersed primary mycelium, stroma usually absent or poorly developed, secondary mycelium external, arising from new hyphae which penetrate a stoma, usually much branched, often climbing leaf hairs or forming rope like structures, conidiophores mostly arising terminally and as lateral branches of secondary mycelium, conidiogenous cells integrated, terminal with thickened or pigmented scars, conidia one to multiseptate, more or less colorless to dipper olivaceous brown and usually smooth walled and often markedly catenate, bearing a thickened and pigmented hilum and terminal and lateral scars.

## Materials and methods

Specimens were collected during Dec- Jan 2005-06. Scrape mounts of infected portions were prepared in lactofuscin (Charmichael (1995).and glycerin separately. Prepared mount were examined with the help of trinocular microscope by using different eye pieces (15 x) and objectives (10x 40x, 100x) combinations. Characteristic structures of the fungus were measured. Photographs were also taken in support of camera lucida drawings with Nikon E-600, Trinocular microscope with attached digital camera (Model, COOLPIX E-995) by using combination of 10x eye-piece and 40x objective. DIC (Differential Image Contrast) were also taken to most of the interesting structures with another Trinocular microscope of Zeiss (Model, AXIOSKOP 2 PLUS and Axiocam HRC Camera). Fungus was identified based on complete list of literature reports, and holotype specimen was deposited in HCIO, New Delhi, India.

## Results and discussion

*Mycovellosiella fabaecola*. Arvind Kumar, sp. nov (Figures-1,Plate, A-F,DIC images A-C) Maculae hypophylleae, brunneae, primocirculares vel irregulares, discretiae, 7-15 mm latae, deinde coalscentes et extensae per totum folii at angulares effusae vel coalscentes ad per totum folii, Coloniae hypophyllae, pallide brunneae. Mycelium plerumque, superficiale, hyphae externae, septatae, ramosae, laevia, funiculars vel pilos foliorum ascendentes, olivaceous vel pallide brunneae usque 2-5  $\mu$ m latae. Stromata superficialia, pseudoparenchymatosa, pallide brunnea, 10-12.5 $\mu$ m diam. Conidiophora superficialia in fasciculo exstromatibus vel exhyphis superficialibus, lateriter oriunda, micronematos, mononematos, nonramosa vel ramosae, tenuitunicata, laevia erecta, recta vel flexuosa, cylindrical, 1-4 transverse septate, interdum geniculate, pallide brunnea vel brunnea, 17.5-102.5 $\mu$ m longa et 2.5-5  $\mu$ m lata. Conidiogenae in conidiophoris, incorporatae, polyblasticae, terminals cylindricae,, cicatricibus incrassati. Conidia solitaria, holoblastica, sicca, acropleurogena, simlicia vel ramosa, subcylindrica ad leniter obclavata, recta vel curvata, 1-5 transverse septate, tenuitunicata, laevia, pallide olivacea, apice acuta vel obtuse, basi obconico vel conico truncata, hilo conspicuo, et leniter incrassato, 15-72.5 $\mu$ m longa et 2.5-6  $\mu$ m lata. In foiiis vivis *Crotolarae juncinae* L (Papilionaceae), Aurvedic Garden, BHU, Varanasi U.P. India, Jan 2006, Leg . Arvind Kumar, MPL 116 Isotypus, HCIO 45298 Holotypus.

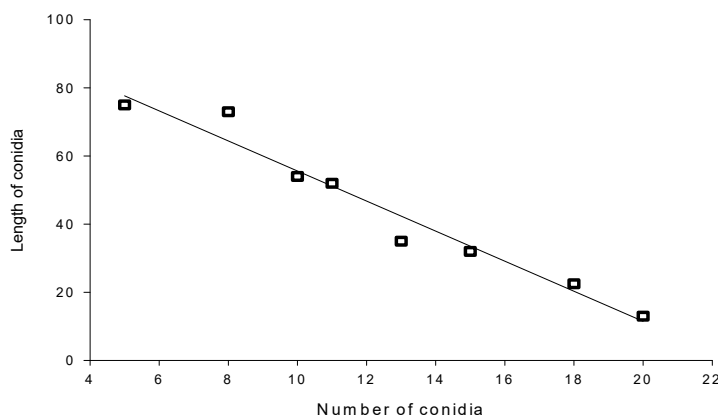


Fig. Statistical relationship between **No of Conida** and **Length of conidia** in *M. fabaecola*

**Table 1 A comparative synopsis of *M.mucunae*, *M.desmodigena* and *M.fabaecola* sp.nov.**

Species	Lesions	Mycelium/Stromata	Conidiophores	Conidia
<i>M.mucunae</i> (Kharwar, Singh, and Chaudhary, 1996)	Hypophyllous, grey Irregular, primarily Smaller later spreading.	Superficial, branched, Olivaceous, 2-3um wide./Superficial poorly developed, pseudoparen- chymatous Pale brown 10.5-16um diam.	Superficial, arising singly or in fascicles straight to slightly curved unbranched thin and smooth walled light olivaceous brown 20.	Conidia solitary, catenate in simple chains pale olivaceous, unbranched 2-6 transversely septate obclavate-cylindrical 19- 84x1.5-5 um.
<i>M.desmodigena</i> (Kharwar, Singh and Chaudhary, 1999).	Amphiphylous sometime hypophyllous subcircular to irregular vein limited, dark brown upto 6-20 um.	Superficial pale brown upto 1.5-3.5 um wide./stromata absent.	Arising singly, superficial, semimacronematous to macronematous, pale brown to brown, erect to procumbent more or less flexuous 0-2 septate rarely branched 3.5-35 um long 2.5-5 um wide.	Solitary to catenate in Unbranched or branched chains some times dichotomously branched at apex, cylindrical to obclavate subulate to olivaceous brown 0-7 transversely septate, base obconicotruncate, hilum slightly thickened, apex rounded or sub acute, 4-95 um long, 2.5-5 um wide.
<i>M.fabaecola</i> sp.nov.	Hypophyllous primarily circular to irregular coalescing and spreading on whole leaf surface greenish brown upto 7-15 mm diam.	Superficial, external hyphae septate branched forming rope like structures ascending leaf hairs light olivaceous 2-5 um wide/stromata few superficial, pseudoparenchymatous brown 15x17 um diam	Arising superficially in fascicles from stromata or singly from external hyphae, macronematous, unbranched to branched straight to flexuous 1-4 septate pale olivaceous to olivaceous brown 17.5-102.5um long 2.5- 5um wide.	Solitary simple to branched some times branching in H shape subcylindrical to slightly obclavate 1-5 transversely septate light olivaceous apex acute to subobtusate, base obconic to conicotruncate, hilum distinct and slightly thickened 15-72.5um and 2.5-6 um wide.

On living leaves of *Crotalaria juncia* L. (Papilionaceae), Aurvedic Garden, Banaras Hindu University, Varanasi, U.P. India, Jan-2006, Leg. Arvind Kumar, MPL BHU 116 isotype, HCIO 45 298 holotype. A literature review concerning *Mycovellosiella*, revealed that no species of this genus has been described on this host. However, based on leaf spots mycelium, conidiophores and conidia it exhibit some resemblances to *M.mucunae* (Kharwar *et.al.*, 1996) and *M.desmodigena* (Kharwar and Narayan, 1999). A comparative account of the present collection with above describe species is given in table 1. Lesions hypophyllous, primarily circular to irregular, discrete, upto 7-15mm wide later coalescing and spreading on whole leaf surface grayish brown. Colonies hypophyllous, light brown. Mycelium mostly superficial, external hyphae septate, branched forming rope like structures ascending leaf hairs, light olivaceous, 2-5um wide. Stromata, superficial, pseudoparenchymatous, pale brown, 10-12.5um diam. Conidiophores arising superficially in fascicles from stromata or singly from external

hyphae, macronematous, mononematous, unbranched to branched, thin and smooth walled, erect, straight to flexuous, cylindrical 1-4 transversely septate, some times geniculate, pale olivaceous to olivaceous brown, 17.5-102.5µm long and 2.5-5 µm wide.



Plate A



Plate B; Plate A-B are Leaf Spots



Plate C



Plate D; Plate C and D Culture

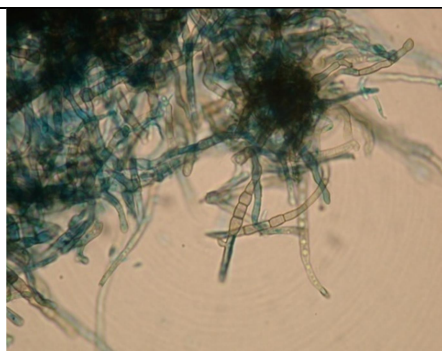


Plate E. Mycelium in culture

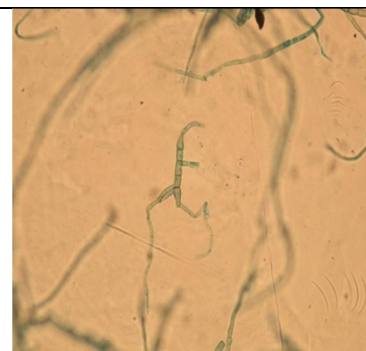


Plate F. Germinating Conidia



DIC Images-A- Mycelium

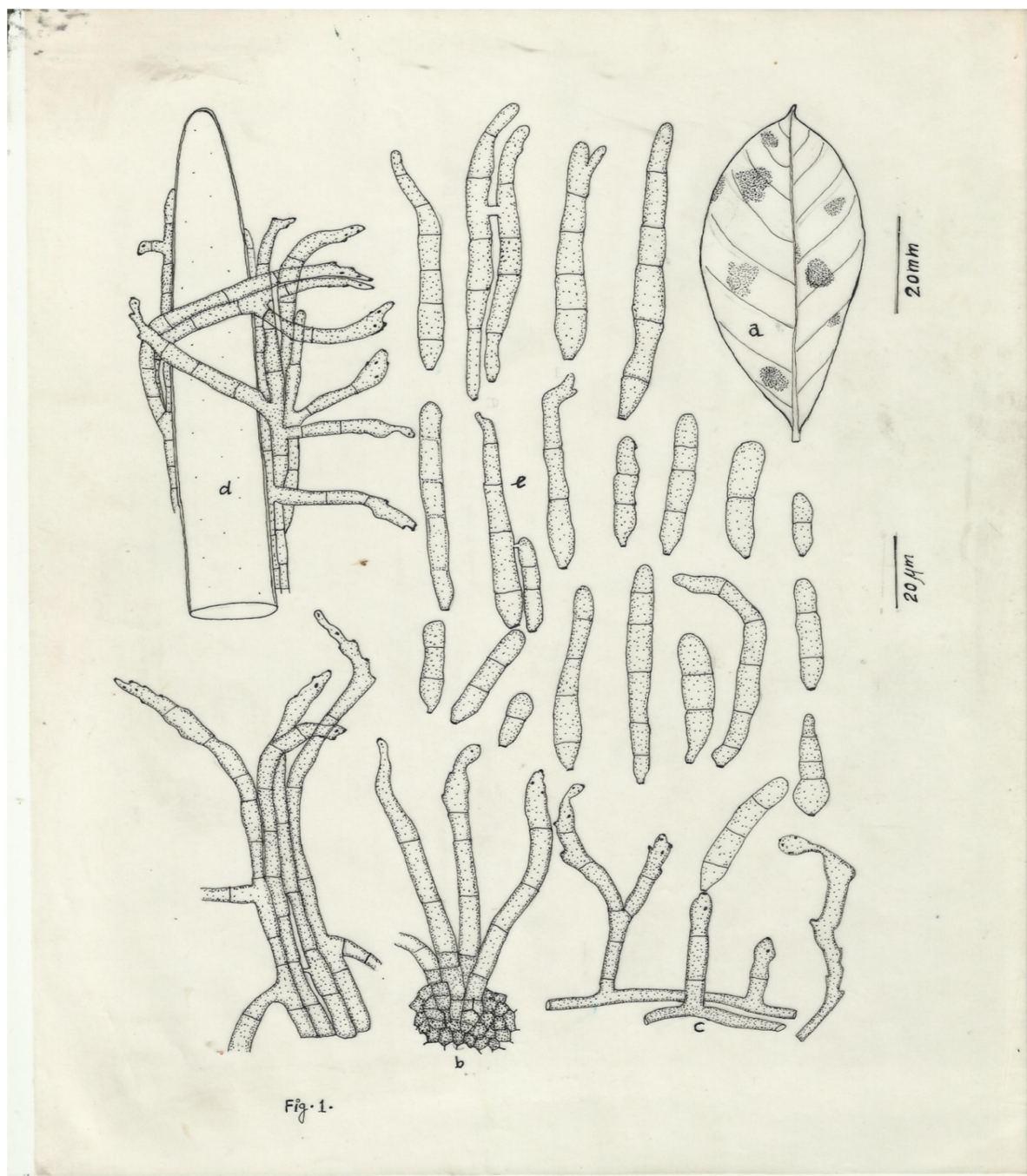


B- Group of Conidia



C-Single conidium

Conidiogenous cells integrated, terminal, polyblastic, cylindrical, cicatrized, scars slightly thickened. Conidia solitary, holoblastic, dry, acropleurogenous, simple to branched, subcylindrical or slightly obclavate, straight to curved, 1-5 transversely septate, thin and smooth walled, light olivaceous, apex acute to obtuse, base obconico to conico truncate, hilum distinct and slightly thickened, 15-72.5µm long and 2.5-6µm wide. In Culture: Slow-growing ( up to 16 mm in 12 days); raised centre of whitish brow, aerial mycelium overlaying a compact pseudostromatic portion composed of brown moniliod cells, periphery flat and gray; very late sporulation.



## Aknowledgement

Authors are thankful to Prof. Kamal, Dept. of Botany Gorakhpur University, Gorakhpur, for suggestions and to the head and coordinator, Centre of Advanced study in Botany Banaras Hindu University, Varanasi, for providing library and laboratory facilities. Authors owe their thanks to Prof. C. M. Chaturvedi, Dept. of Zoology, B.H.U., Varanasi for providing facilities for D.I.C. images and also to University Grants Commission, New Delhi (F.N.3-212/2001,S.R.II) for financial support and to the curator HCIO, New Delhi, for identification and accession numbers of specimens.



## Pathology

Inoculated plants showing disease symptoms ten days after inoculation and symptom diameter increases at very slow rate. After three weeks necrotic lesions were widespread on inoculated leaves, particularly on those inoculated with mycelial suspension. Control plants showing no spots. Isolation from such lesions yielded colonies identical to those as in original host. Although relatively slow-developing under the conditions that predominated during the test, the disease was observed causing considerable damage to the foliage of *Crotalaria juncia* in the field.

## References

1. Bai, J. K. and Cheng, M.Y. (1992). Some new combination of the genus *Cercosporidium*, *Mycovellosiella*, *Pseudocercospora*, in china. *Acta Mycologica Sinica* 11(2): 120-124.
2. Dieghton, F.C. (1974). Studies on *Cercospora* and allied genera. V. *Mycovellosiella* Rangel and a new species of *Ramulariopsis*. *Mycological Papers* 137, 1-71.
3. Deighton FC, 1987 New speies of *Pseudocercospora* , *Mycovellosiella* and new combinations into *Pseudocercocspora* and *Mycovellosiella*. *Transe british mycol. Soc.* 88, 365-391
4. Firdausi, SA, Rai, AN,mishra, AS and Vyas KM (1993). *Mycovellosiella adinae* sp.nov. from India. *Indian Phytopathology* 45 (4) ;451.
5. Kumar, P. and Kamal (1981a). A new species of *Mycovellosiella* from India. *Current Science* 50, 137-138.
6. Kumar, P. and Kamal (1981 b) Two new species of *Mycovellosiella* Rangel from Gorakhpur. *Biological Bulletin of India Current* 3, 117-120.
7. Khan, M.K., Budhathoki, U. & Kamal (1992). New species of *Cercospora* ,*Mycovellosella*, *Phaeosariopsis* . *Indian phytopathology* 45, 26-34.
8. Kharwar RN, Singh P.N. and Chaudary, R .K., (1996)New species of *Mycovellosiella* associated with foliar spots in Nepal. *Mycol. Res.* 100 (6): 689-692.
9. Liu, X & Gua, Y.L. (1988). Studies on the genus *Mycovellosiella* in China. *Mycosystema*1:241-268.
10. Rai A.N., Kamal and Singh, S.K. (1982). A new species of *Mycovellosiella*. *Current Science.* 51:781-782.
11. Rai, A.N., Rai B.and Kamal (1986). A new species of *Mycovellosiella* Rangel from India.*Current Science.* 55:412-413.
12. Warreto .R. W. and Marini S.F.( 2002) *Mycovellosiella robbsii* sp.nov. Causing leaf- spot on *Mimosa caesalpiniaefolia*. *Fitopatol. Bras.* 27

Received on 10.01.2013 and accepted on 12.05.2013