Research Paper

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Vermiculariopsiella papaye sp. nov.- A New Species of Vermiculariopsiella from Western Ghats, India

Biology

KEYWORDS : Anamorphic, fungal diversity, taxonomy

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ABSTRACT

During a survey of microfungi associated to plant debris in a fragment of BSI garden, Pune (MH) in Post Monsoon season, a conspicuous fungus from the genus Vermiculariopsiella Bender (1932) was found on leaf and stem debris of Carica papaya L. The specimen showed differences from previously described taxa. Descriptions and illustrations of morphological characteristics of the species,as well as the taxonomic key for all known species of Vermiculariopsiella are provided.

INTRODUCTION

In 1855 Desmazieres described the new species Excipula immersa on the base of some exsiccate distributed in Plantes Cryptogames de Frances No. 268. Von Hohnel (1918) transferred Excipula immersaDesm. intothe new genus Vermiculariopsis v. Hohnel as V. immersa (Desm.) Hohnel. Succesively Bender (1932) invalidated the genus Vermiculariopsis Torrend and proposed the new name Vermiculariopsiella Bender for the species V. immersa (Desm.) Bender. The setose stromatic conidiomata, phialidic conidium ontogeny, cylindrical phialides with flaring collarettes and unicellular, hyaline conidia with a short papillate protuberance at the base marking the point of detachment are characteristics of Vermiculariopsiella. During the course of studies on micro fungi from Northern Western Ghats of India, we encountered a novel hyphomycetes impacting circular spots on stems and leaf debris of Carica papaya L. The fungus is described and illustrated in this paper.

MATERIAL AND METHODS

Stems of papaya with circular, tiny greyish, symptoms were collected and brought to the laboratory in aluminium packets. Fungal material from leaf spots were carefully scrapped with a fine tipped needle and mounted on a slide containing a drop of lactophenol and examined under microscope. The material was air dried and placed in a labeled paper bags as herbarium specimen.

TAXONOMY

Vermiculariopsiella papayae Dubeysp.nov. (MB808590). (Fig.1).

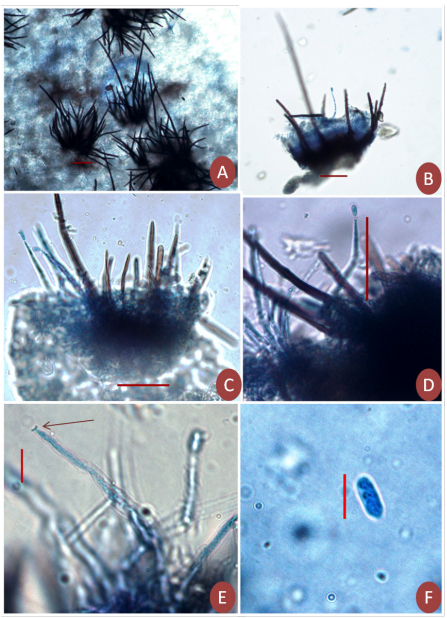

Fig.1- *Vermiculariopsiella papayae* sp.nov.- A Colony., (B & C). Sporodochia bearing seate, conidiophores and conidia., (D) Conidiophores, conidiogenous cells and conidia, (E). Arrow indicating flared collarette., (F). Conidia., Bar –(A-E- 20 µm), (F- 10 µm)

Etymology- species named after the name of Host plant on which it is reported**.**

Colonies on natural substrate effuse, blister to sporodochial, hairy, light brown, amphigenous. Myceliumsuperficial and immersed, branched, septate, composed of smooth pale to dark brown, 2 – 5 µm wide hyphae. Conidiomata sporodochial, setose, scattered, punctiform, sometimes coalescing to form irregular patches with cream mass, 70 – 260 x 110 -170 µm. Stroma consisting of basal brown texura angularis from which setae arises,setae solitary, erect, slightly curved to flexous, 1-2 septate, brown, 55.25 – 260 x 8-8.5 µm; Conidiophores slightly erect, straight or slightly flexous, smooth, septate, brown to dark brown progressively thin walled 40 – 60 x 3 - 4µm. Conidiogenous cells monophialidic, discrete, determinate, narrow, cylindrical, 20-25 x 2.5 - 4µm with a slightly narrow apices and a distinct flared collarette having a channel of 0.5-1 µm. Conidia solitary, aseptate, hyaline, rounded at the tip, slightly narrow at the base, smooth, , 6.61 – 9.5 x 3.57 – 4.5µm.

Material examined: On dead stems of *Carica papaya L.*, Caricaceae Dumort. BSI garden, Pune, Maharashtra,Coll. R. Dubey, on 10.09.2012. The Holotype has been housed in Herbarium of Botanical survey of India, WRC- Pune, Accession No.BSI 133479. Description have been deposited in MycoBank (MB808590).

RESULTS &DISCUSSION

Nag Raj (1983) synonymized Oramasia with Vermiculariopsiella considering two varieties: V. immersa var. immersa (Desm.) Bender and V. immersa var. ramosa (B. Sutton) Nag Raj.Chaetopsina ludoviciana JL Crane &Schokn.1982 was transferred toMenisporopsis ludoviciana (JL Crane&Schokn.) Kirk & B. Sutton, 1986 and after that synonymized with V. ludoviciana (Crane &Schokn.)Castaneda, Pipe &Guarro, 1997on the basis of description and original illustrations.In revision of the genus, Nawawiet al. (1990) proposed valid combinations: V. cornuta (Rao & de Hoog) Nawawi, Kuthub. & Sutton, (= Cornuta Gyrothrix V. Rao & de Hoog), V. cubensis(RF Castaneda) Nawawi, Kuthub. &. Sutton (= Oramasia Urries hirsuta var. Cubensis RF-Castañeda) and increased the variety V. immersa (Desm.) Bender var. ramosa (B. Sutton) Nag Raj to species level, V. ramosa(B. Sutton) Nawawi, Kuthub&Sutton based on differences in arrows and sporodochia. Castaneda-Ruiz & Kendrick (1991) proposed the combination of Gyrothrix microsperma (Höhn.) Piroz.toV. microsperma (Hohn.)RF Castaneda & WB Kendr.,however, this combination was not accepted due to lack of conidioma in G. microsperma. Vermiculariopsiella species differ in morphology and dimensions of sporodochia, arrows, conidiogenous cells and conidia. Some species are endophytic, others occur on decaying leaves and submerged plant debris (Ruiz-Castaneda 1986, Rao & de Hoog 1986 Nawawiet al. 1990, Gusmao&Grandi 2002 Keshavaprasad et al. 2003, Puja et al. 2006).

Till date Vermiculariopsiella accommodates sixteen species and three varieties (Anonymous, 2014).Of these four species viz. V.cornuta (Rao & de Hoog) Nawawi, Kuthub. & Sutton 1990; V.

cubensis (Castañeda) Nawawi, Kuthub. & Sutton 1990; V.ramosa (Sutton) Nawawi, Kuthub. & B. Sutton 1990; V. pediculata Hern-Rest, 2013 possesses branched setae. While the remaining species possess unbranched setae. V. spiralis Crous, et al (1995) possesses unbranched spiral setae. The conidiogenous species viz. V. parva, V. elegans,V. indica and V. endophytica, V. pteridis. Dhargalkar&Bhat.2009, V. pediculata(J.L. Cunn.)Hern.-Rest., R.F. Castañeda, Gené&Guarro, 2013 possess indistinct collarettes, produces unbranched setae. V. falcata Nawawi, Kuthub. & Sutton, 1990, V. immersa (Desm.) Bender, 1932, V. parvula Nawawi, Kuthub. & Sutton, 1990, and V. arcicula Pasqual. &Zucconi, 1992 possess distinct collarette. V. falcataproduces falcate, 3 septate hyaline conidia of 36 - 47 x 1.5 - 2µm,V. immersa (Desm.) Bender, 1932 produces aseptate hyaline conidia; V. parvula Nawawi, Kuthub. & Sutton, 1990 produces aseptate hyaline conidia of pointed, slightly curved apex and obtuse and rounded base; V. arcicula Pasqual. &Zucconi 1992 produces aseptate hyaline fusiform conidia of 15 -19.5 x 2.5 - 4 µm.

The newly reported species shows its close resemblance with V. falcata, V. parvula, V. arcicula and V. immersain having distinct flared collarette.But V.arcicula and V.immersa differs from newly reported species in having conidiogenous cells with curved apices, while the reported taxon possess straight apex of conidiogenous cells. The proposed species differs from V. falcatain dimensions of setae, which are longer, in the shape and dimensions of conidia and in neck of conidiogenous cell. At last it differs fromV. parvula in the shape of conidia and in the absence of narrow neck at the apex of conidiogenous cells, whereas V. parvula possess long straight neck at the apex of conidiogenous cells and conidia are hyaline, aseptate, 8-13 x 2-2.5 µm cylindrical with apex slightly curved and pointed and base rounded and obtuse with a slight protuberance on one side, whereas in newly reported speciesthe apex of conidiogenous cells is slightly narrow and straight with a distinct flared collarette and moreover the conidia are aseptate, 6.61 – 9.5 x 3.57 – 4.5µm and cylindrical with rounded apex and narrow base For the above mentioned reasons we propose V. papayae as a new species.

Dichotomous key to the species of *Vermiculariopsiella*

1. Setae unbranched ……..2

1. Setae Branched 11

2. Setae spiral with tapered or rounded apex.....V. spiralis

2. Setae erect, straight or flexuous ……..3

3. Conidiogenous cells with straight apex ……..4

3.Conidiogenous cells with recurved apex……...10

4. Conidiogenous cells with distinct collarettes……..5

4. Conidiogenous cells with inconspicuous collarettes ……..7

5. Conidiogenous cells lacking straight neck at the apex, conidia cylindrical, aseptate with rounded apex and narrow base…… ……..V. papayae sp. n0v.

5. Conidiogenous cells having straight neck at the apex……6

6. Conidia falcate, 3-septate, curved and pointed apex.....V. falcata

6. Conidia cylindrical, aseptate, with slightly curved, pointed apex..... V. parvula

7. Cylindrical Conidia 37-42 × 10-13 µm ……..V. endophytica

7. Conidia cylindrical < 35 µm length ……8

8. Conidia 12-15 µm length .....V. parva

8. Conidia 10-27 x 4-5.5 µm……V. pteris

8. Larger Conidia ……..9

9. Conidia 20-25 × 6-8 µm.....V. elegans

9. Conidia 22-30 × 8-11 µm.....V. indica

10. Fusiform conidia, usually curved, 15 to 19.5 × 2.5 to 38 µm .....V. arcicula

10. Cylindrical conidia, 13.5 to 20.4 × 1.6-1.9 µm.....V. immersa

11. Setae with primary and secondary branches short; terminal cells with an appendix Filiforme .... V. cubensis

12. Setae with dichotomous branching, branches coiled, whip like and curved……..V. pediculata

12 Setae straight with a dichotomous branching .....……..V. ramosa

12. Setae straight with three dichotomous branching.....V. cornuta

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