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TWO NEW RECORD OF PHYTOPATHOGENIC FUNGUS *PASSALORA* FROM MADHYA PRADESH, INDIA

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ABSTRACT

The present paper describe two new records of foliicolous fungus genus namely *Passalora concors* and *Passalora dioscoreae* on *Solanum melongena* (Solanaceae) and *Dioscorea esculenta* (Dioscoreaceae) respectively are described, illustrated and compared with allied taxa. All these two records were collected from district Tikamgarh of Madhya Pradesh.

Keywords : Cercosporoid, Foliicolous, Hyphomycetes, *Passalora*, Tikamgarh

Introduction

During a periodic survey of foliar fungi in Tikamgarh district of M.P. which is situated at 24.9642N-78.9288E with an altitude of 210-314 above sea level, no. of samples were collected having foliar fungi infections in which the species of *Passalora* was recognized. *Passalora* Fr. is true Cercosporoid genus with clear status and widely distributed through out the world. This fungus causes many serious leaf spots on host plants covering cereals, trees shrubs, grasses ornamental & weed plants. However they causes the severe infection which damage the plants that results in qualitative and quantative reduction of the yield of plants. *Passalora* is characterized by producing dematiaceous conidiophores and phragmosporous conidia with conspicuous conidial scars and hilia. The reports of new species, new records & addition of *Passalora* in India described by Rai & Kamal (1988), Srivast *et al.* (1994,1995), Singh *et al.* (1996, 1997, 1999, 2004, 2008), Srivastava *et al.* (1994), Kumar *et al.* (2011, 2013, 2017). Upon critical microscopic examination and comparison of morphotaxonomic features with those of allied forms, a new records of *Passalora* were found severely infected with *Passalora* spp. which were described and illustrated here viz; *Passalora concors* and *Passalora dioscoreae* on *Solanum melongena* (Solanaceae) and *Dioscorea esculenta* (Dioscoreaceae) respectively, are collected from Madhya Pradesh.

Materials and Methods

The sample of infected leaf spots with distinct symptoms were collected from the diversified area of Tikamgarh District of Madhya Pradesh. These samples were dried to make herbarium sample of which a part is deposited in Ajrekar Mycological Herbarium (AHM) at MAC's Agharkar Research Institute Pune as holotype, an isotype retained in the departmental herbarium for further reference. Microscopic slides were prepared by surface scrubbing and free-hand cut section using lacto-phenol and cotton blue as

mounting agent separately and as well as in combination on glass slides. The photographs were taken by using a Trinocular weswox microscope with aided Digi- CAM. Line drawings were made with the help of a camera lucida and micrometry.

Result

Taxonomy

Passalora concors (Casp.) Braun & Crous Fig.1-2

Leaf spots amphigenous, circular to irregular, pale olivaceous, spreading on the whole leaf surface, .01 to 5 mm diam. Colonies amphiphylous, brown to dark brown, effuse. Mycelium internal, unbranched, septate, olivaceous brown, smooth walled. Stromata well developed, pseudoparenchymatous, dark brown, 10-40×17-60µm. Conidiophores arising singly or in fascicles of 1-17 from stromata, mononematous, smooth walled, unbranched, divergent, straight to geniculate-sinuuous, cylindrical, tapering to a rounded or obtuse apex, 0-6 septate, olivaceous brown 30-140× 3-7µm. Conidiophores reduced to conidiogenous cells, integrated, terminal, dark brown, conidiogenous loci conspicuous, slightly thickened, darkened. Conidia dry, acropleurogenous, solitary, smooth walled, obclavate-cylindric to cylindric, curved, simple, 1-6 septate, apex rounded to obtuse, base obconicotruncate, light brown, 10-86×7-10µm, germinating conidia present, hila conspicuous, darkened and slightly thickened.

Type: On living leaves of *Solanum melongena* L. (Solanaceae) Putrikhera (M.P) India, Oct 2018; Leg Anu Singh BBC Herb No. 113 Isotype, AMH 10157 holotype

Discussion: Through survey of literature there is only three species of *Passalora* viz. *P. brachycarpa* (Sydow) Braun & Crous, *P. concors* (Casp.) Braun & Crous and *P. tarrii* (Deighton) Braun & Crous have been reported on same host species.

Presently *Passalora brachycarpa* is recombined into another genus *Distomycovellosiella brachycarpa* (Syd.) U. Braun, C. Nakash, Videira & Crous (2017). Therefore, this collection is liable to compared with *Passalora concors*. This description and illustration of present collection is very close to earlier described species. Proposed collection having

amphigenous leaf spots, where as they are hyphogenous in earlier described species. Present collection have longer conidiophores and well developed stromata, are minor differences due to ecological conditions. Hence, it is treated as new fungal record for state.

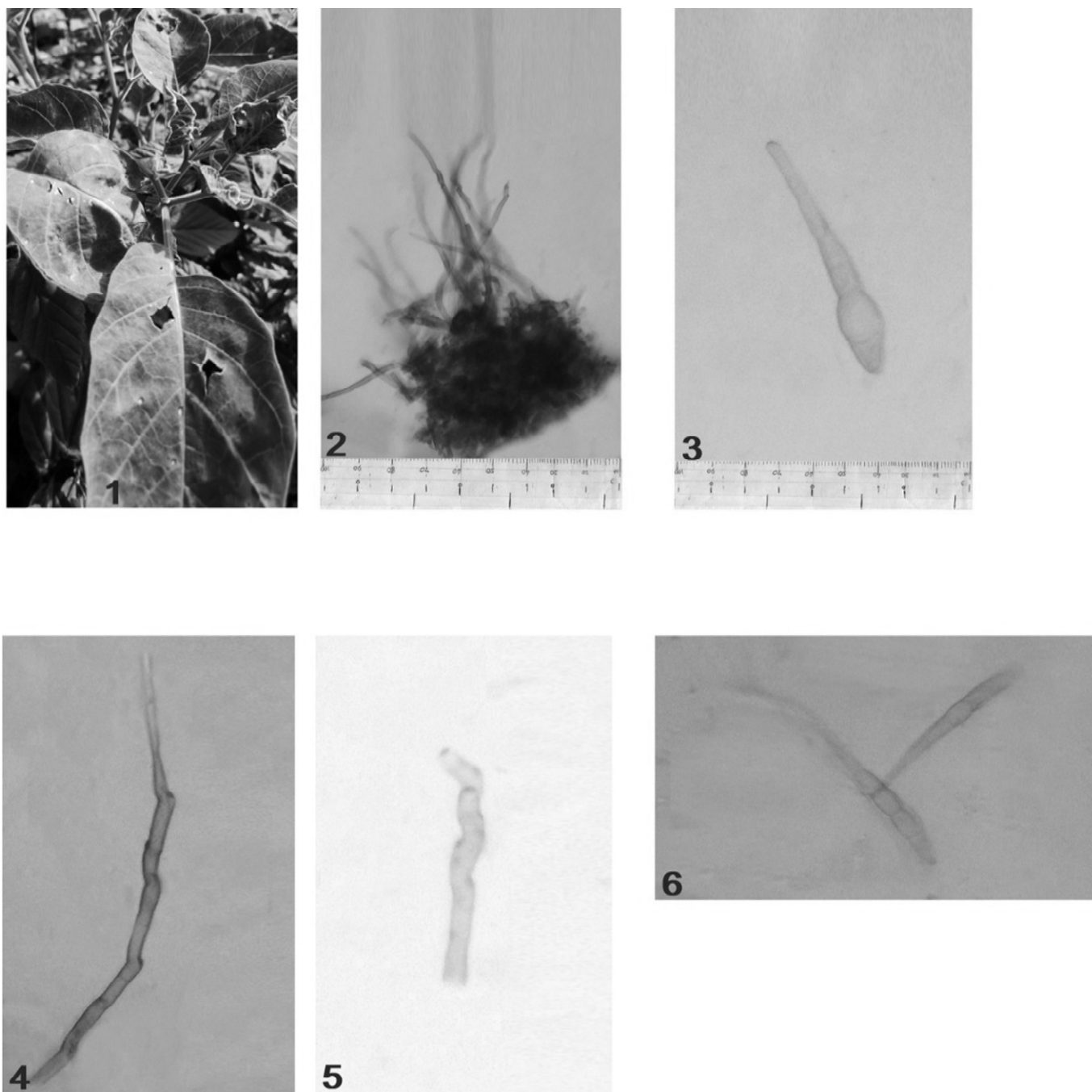


Fig.1 : *Passalora concors* (Casp.) Braun & Crous on *Solanum melongena* L.

1. Leaf spots symptoms on the host 2. Fasciculate conidiophores arising from less developed stromata 3. Conidium with swollen base 4. Solitary conidiophore with thickened, darkened, refractive conidial scars 5. Conidiophore 6. Conidia

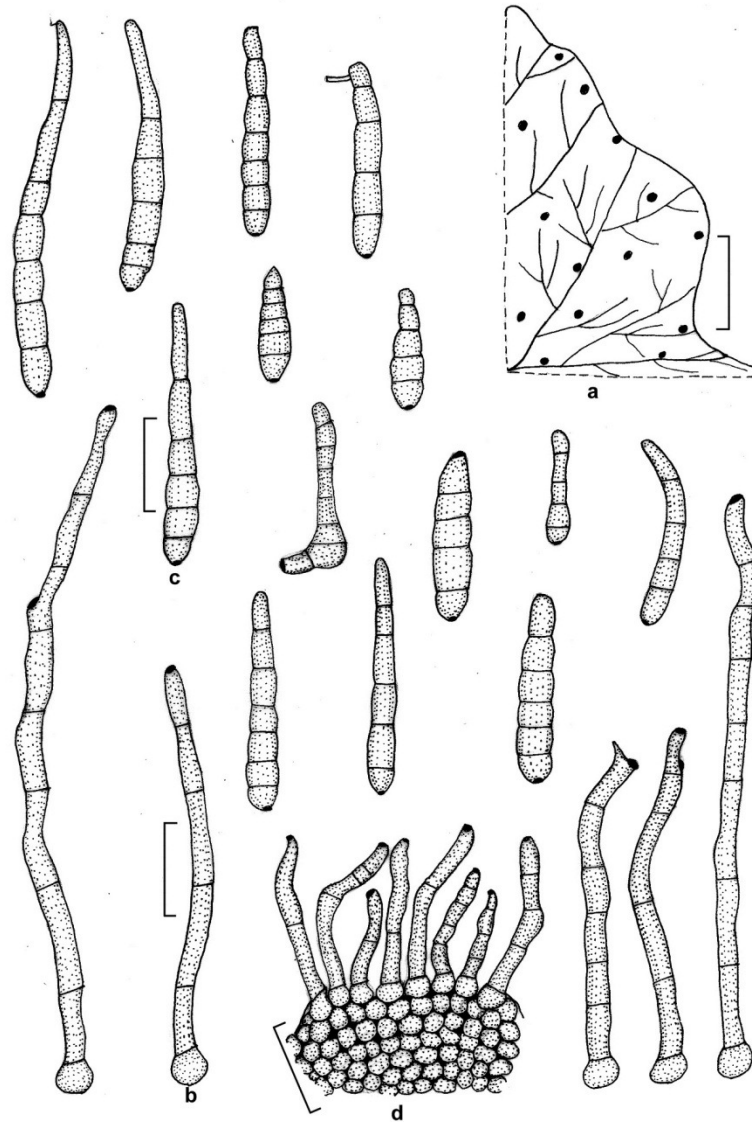


Fig. 2 : *Passalora concors* (Casp.)Braun & Crous

a) Leaf spots b) Conidiophores c) Conidia d) Stromata Bars a=20mm, b-d=10µm.

Passalora dioscoreae (Ellis & Martin) Braun & Crous Fig. 3-4

Leaf spots amphigenous, circular to discrete spots, black in colour, spreading on the whole leaf surface. Caseipituli predominantly amphiphylous, scattered, effused, dark brown to blakish. Mycelium internal, unbranched, septate, smooth walled, light blue. Stromata well developed, pseudoparenchymatous, dark brown, 13-33×15-37µm. Conidiophores arising singly or in fascicles of 1-7 from stromata, unbranched, mononematous, smooth walled, 0-4 septate, divergent, straight and sub-cylindric to moderately geniculate-sinuous 18-146× 5-7µm with a slight taper towards, a rounded apex, brown in colour. Conidiogenous cells intergrated, terminal, straight or rarely once geniculate, monoblastic to polyblastic, conidiogenous loci unthickened, not darkened. Conidia dry, solitary, acropleurogenous, smooth walled, olivaceous brown, sub-cylindrical to fusiform, mostly straight, 1-7 euseptate, oval, ellipsoidal, apex obtuse, base rounded to sub-truncate, 12-93×7-13 µm hila somewhat thickened, darkened, conspicuous.

Type: On living leaves of *Dioscorea esculenta* L. (Dioscoreaceae) Prithvipur (M.P) India; Leg Anu Singh, Jan 2017; BBC Herb No.105 Isotype, AMH 10149 Holotype.

Discussion

It is evident from the literature, *Passalora* species has been reported on same host species *Dioscorea esculenta* L. as *Passalora dioscorea* (Ellis & Martin) Braun & Crous. Therefore, the collection is liable to compared with *Passalora dioscorea*. The description and illustration of proposed species is differ from earlier reported species in having leaf spots smaller in size and colonies are amphiphylous where as the larger leaf spots and hyphophyllous colonies in earlier ones. The conidiophores are longer and wider whereas conidia are shorter and narrower than earlier reported species.

All these comparison make proposed species very similar to earlier described species, therefore it is treated as new fungal record for the state.

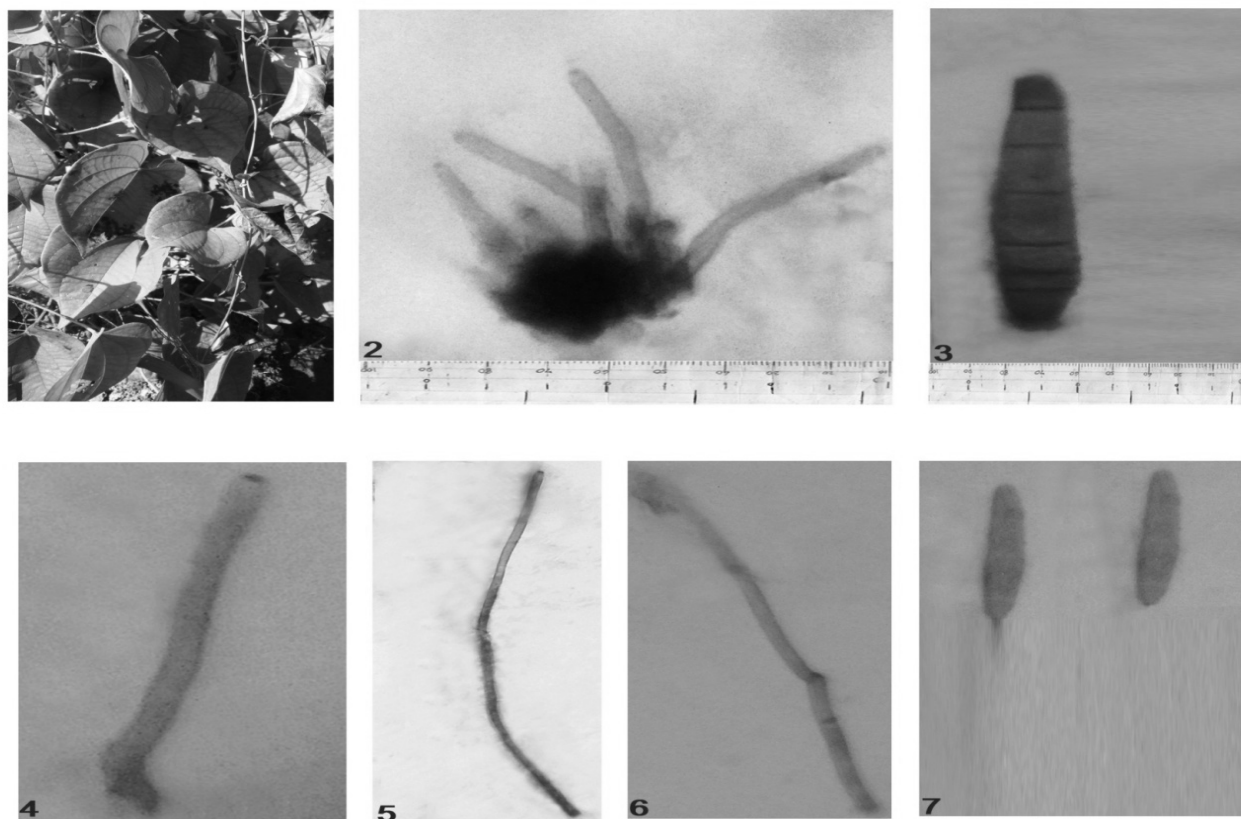


Fig. 3 : *Passalora dioscoreae* (Ellis & Martin) Braun & Crous
1.Leaf spots symptoms on the host**2.** Fasciculate conidiophores arising from stromata **3.** Conidium **4.**Solitary conidiophore **5.** Curved Conidiophore **6.** Conidiophore showing conidial scars **7.** Conidia

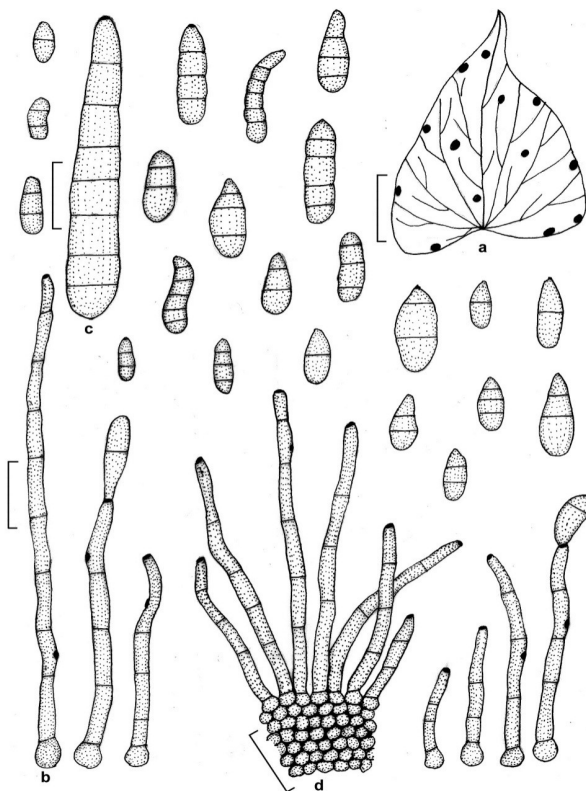


Fig. 4: *Passalora dioscoreae* (Ellis & Martin) Braun & Crous
a) Leaf spots **b)**Conidiophores **c)** Conidia **d)** Stromata Bars a=20mm,b-d=10µm.

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References

- Crous, P.W.; Braun (2003). *Mycosphaerella* and its anamorphs and *Passalora* C.B.S Utrecht PP.571
- Deighton, F.C. (1976). Studies on *Cercospora* and allied genera VI. *Pseudocercospora* sp. *Pantospora* Cif. and *Cercoseptoria* Petr. *Mycological Papers* 140,1-168.
- Ellis, M.B. (1976). More dematiaceous hyphomycetes. International Mycological Institute, Surrey, England.
- Kamal (2010). Cercosporoid fungi of India. Bisan Singh, Mahendra Pal Singh Publication, Dehradun (UK) India.
- Kumar, S. and Singh, R. (2015). *Passalora musicola* sp.nov.- a new Indian hyphomycetes. *Sydowia* 67.
- Kumar, S. and Singh, R. (2016). *Passalora caesalpinicola* sp.nov. from India on *Caesalpinia bonduc*. *Mycotaxon*, 131: 25-30.
- Singh, S.K.; Singh, P.N. and Mishra, P. (2008). New species of *Passalora* (Cercosporoid hyphomycete) from Western Ghats, India. *Czech Mycology* 60(2): 243-249.
- Singh, R.; Kumar, S. and Kamal (2011). Two new species of *Passalora* and *Pseudocercospora* from north eastern U.P. , India. *Mycotaxon* 117: 137-143.
- Singh, R.; Chaurasia, B.; Shukla, K. and Upadhaya, P.P. (2012). *Passalora aseptata*, a new Cercosporoid fungus from northeastern Uttar Pradesh, India. *Mycotaxon*, 120: 461-463.
- Singh, R.; Kumar, S.; Saini, D.C.; Upadhyaya, P.P.; Kamal, B.U. (2013). Diversity of *Passalora* on *Ficus*. *Mycological Progress* 12: 637-643.