



Research article

Alternaria polypodiicola, a new foliicolous fungus discovered on *Microsorium punctatum* from Uttar Pradesh, India

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Abstract: *Alternaria polypodiicola* sp. nov., is described, illustrated and discussed, causing foliar disease on a pteridophytic plant *Microsorium punctatum* (*Polypodiaceae*) from Uttar Pradesh, India. The present species was compared with closely similar species based on morphological characters. This species is characterized by having well developed stromata, unbranched and shorter conidiophores with shorter smooth conidia. A key is provided to all species of *Alternaria* reported on *Polypodiaceae*. The description and nomenclatural novelty details were deposited in Mycobank.

Keywords: Taxonomy - Foliicolous - Hyphomycetes - *Microsorium* - *Alternaria* - New species.

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INTRODUCTION

Microsorium punctatum (L.) Copel. is a small evergreen ornamental pteridophytic plant belongs to family *Polypodiaceae* of Plant kingdom. It is a common fern species in Africa and Asia and occurs naturally in various forest types of tropics and subtropics from sea level up to 2800 m elevation (Nooteboom 1997, Bosman 1991). The plant shows good medicinal properties. The leaf and juice are used as purgative, diuretic and for healing wounds (May 1978, Sharma & Pegu 2011).

During the regular observation of plants of the BSIP garden, Lucknow, the living leaves of *Microsorium punctatum* exhibiting foliar blights was encountered. However, it differs morphologically from previously described *Alternaria* species and therefore is proposed here as new based on critical microscopic examination and comparison of morphological features with those of the closely similar forms. The details description and illustration of *Alternaria polypodiicola* is presented here.

MATERIALS AND METHODS

The diseased plant leaves samples were collected from BSIP Campus, Lucknow during September 2012. The photographs of the infection spots were taken by using a Sony DSC-5730 camera during the time of collection. The collected samples were carried to the laboratory and processed by following the standard techniques (Castañeda-Ruiz 2005, Hawksworth 1974, Savile 1962). The sun dried and pressed leaf specimens were placed in air tight polyethylene bags and then kept in ziplock polythene bag along with collection details. The surface scrapping and free hand cut sections of infected leaf samples were taken through infection spots and mounted in cotton-blue lactophenol mount mixture for microscopic examination. Detailed observations of morphological characters were carried out by means of an Olympus CX31 light microscope (400×) and measurement was done by micrometry. Morphotaxonomic determination was made with the help of current literature pertaining to *Alternaria*. The holotype specimen has been deposited in Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute, Pune, India future reference. Description and nomenclatural detail were deposited in MycoBank (www.Mycobank.org). The systematics position of the taxa is given in accordance with Cannon & Kirk (2007), Kirk *et al.* (2008), Seifert *et al.* (2011), Farr & Rossman (2015) and the Index Fungorum (www.indexfungorum.org; accessed 30 April 2015).

RESULTS

Taxonomic descriptions

Alternaria polypodiicola Sham. Kumar & Raghv. Singh sp. nov. (Fig. 1, 2)

Mycobank MB 817343

Anamorphic fungus, hyphomycetes, Foliicolous, Infection spots amphigenous, initially circular to irregular (5–25 mm diam.), brown, but later on severe infection it spreading on entire surface of the leaves. *Colonies* amphiphyllous, effuse, brown. *Mycelium* internal. *Stromata* present (15µm in diam), pseudoparenchymatous. *Conidiophores* macronematous, fasciculatus (5–7 in a fascicle), straight to curved, simple, cylindrical, unbranched, thick walled, smooth, 1–3 septate, brown, 10–55 × 3–5 µm. *Conidiogenous cells* integrated, terminal, monotretic, scars thickened. *Conidia* simple, acropleurogenous, solitary to catenate, dry, smooth obclavate to ellipsoidal to ovoid (muriform), rostrum present, 2–4 transversely septate and 2–3 obliquely septate, brown, base obtuse, 20–50 × 10–18 µm, hilum thickened (1.5–2.0 µm), germinating conidium present.

Material examined: India, Uttar Pradesh, Lucknow, BSIP Campus, on living leaves of *Microsorium punctatum* (L.) Copel. (*Polypodiaceae*), 2nd September, 2012, coll. Shambhu Kumar, AMH-9515 (holotype).

Etymology: The specific epithet *polypodiicola* in reference to host family.

Teleomorph: Undetermined.



Figure 1. *Microsorium punctatum*: **A**, Host Plant; **B**, Infection spots on upper surface of leaf (Scale bars: B = 20 mm); **C**, Infection spots on lower surface of leaf.

Identification key to *Alternaria* spp. reported on *Polypodiaceae*

- | | |
|---|-------------------------|
| 1 Stromata absent..... | 2 |
| 1* Stromata present..... | 3 |
| 2 Conidiophores up to 50 × 3–6 µm, branched..... | 4 |
| 2* Conidiophores up to 115 × 4–6 µm, simple or unbranched..... | 5 |
| 3 Conidiophores 10–55 µm × 3–5 µm, unbranched..... | 6 |
| 4 Conidia 20–63 × 9–18 µm, 8 transversely septate and several obliquely septate, verruculose..... | <i>A. alternata</i> |
| 5 Conidia 22–95 × 8–19 µm, 4–7 transversely septate and several obliquely septate, verruculose..... | <i>A. tenuissima</i> |
| 6 Conidia 20–50 × 10–18 µm, 2–4 transversely septate and 2–3 obliquely septate, smooth..... | <i>A. polypodiicola</i> |

DISCUSSION

Perusal of literatures indicated that there was no record of *Alternaria* on this host (Farr & Rossman, 2015, Bilgrami *et al.* 1991, Jamaluddin *et al.* 2004). *Alternaria polypodii* (invalidly published) on *Polypodium* sp. and *Alternaria* sp. on *Platyserium bifurcatum* and *Platyserium* sp. from Florida (Farr & Rossman 2015) have been reported on *Polypodiaceae* which were very similar to *A. alternata*. From India, *A. alternata* was previously reported on *Polypodium vulgare* L. (Narang *et al.* 1978) from Allahabad and *A. tenuissima* (Kunze ex Pers)

Wilt. on *Polypodium multilineatum* L. (Kanaujia *et al.* 1978) from Faizabad respectively on the family *Polypodiaceae*. Therefore, the present fungus was compared with these two earlier reported species.

The stromata is present in *A. polypodiicola* while absent in earlier described species. The conidiophores are unbranched and very much shorter ($10\text{--}55 \times 3\text{--}5 \mu\text{m}$) in *A. polypodiicola* while branched and longer (up to $50 \times 3\text{--}6 \mu\text{m}$) in *A. alternata* and *A. tenuissima* (simple or unbranched and up to $115 \times 4\text{--}6 \mu\text{m}$). The Conidia of *A. polypodiicola* are shorter ($20\text{--}50 \times 10\text{--}18 \mu\text{m}$) than both previously described *A. alternata* ($20\text{--}63 \times 9\text{--}18 \mu\text{m}$) and *A. tenuissima* ($22\text{--}95 \times 8\text{--}19 \mu\text{m}$). The conidia of novel species are smooth while verruculose in both the earlier described species. Thus, *A. polypodiicola* is treated as a new species.

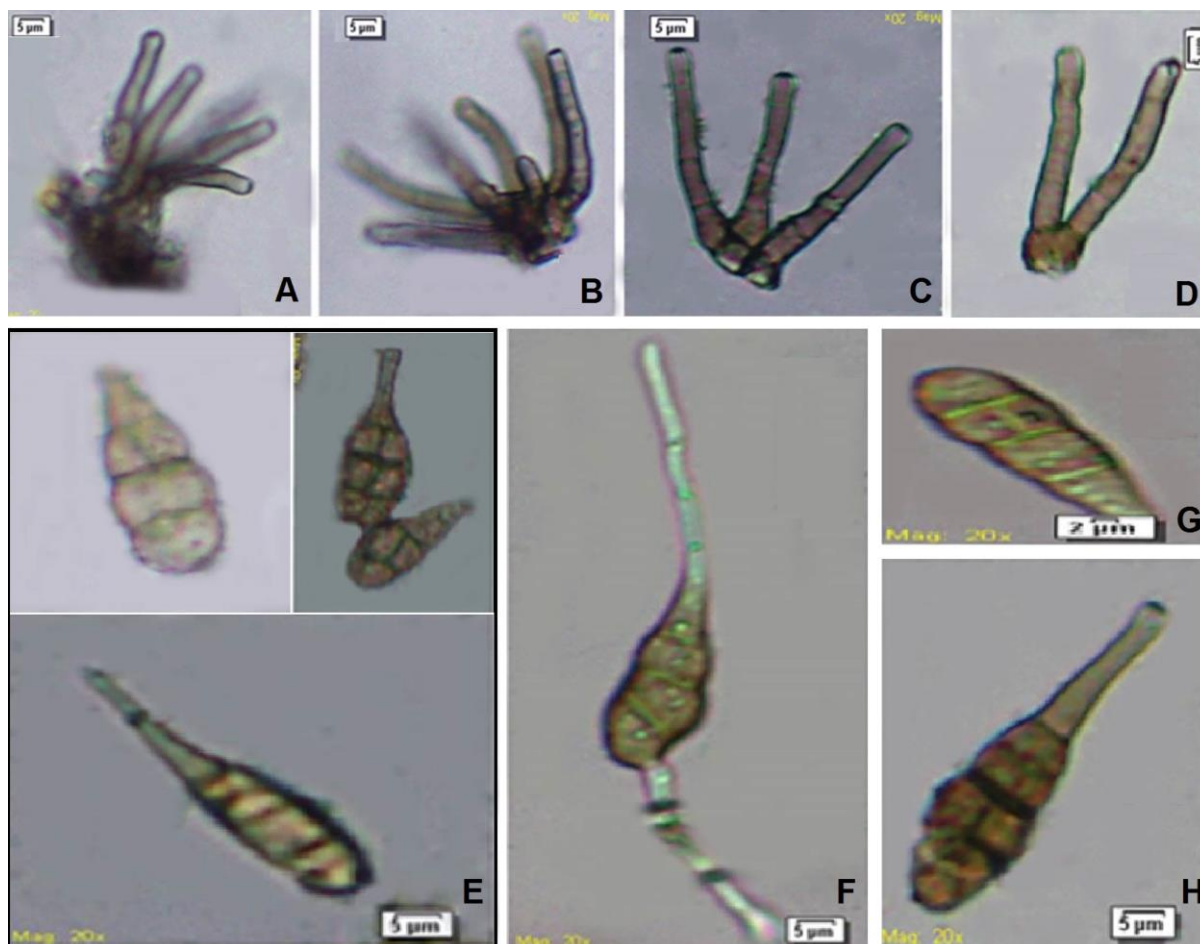


Figure 2. *Alternaria polypodiicola* (AMH-9515, holotype): A–D, Conidiophores; E–H, Conidia. (Scale bars A–H = 5 μm)

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