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Achroiostachys bambusicola (Stachybotryaceae, Hypocreales) – A novel species of achrois fungus reported from Tansa Wild Life Sanctuary (Western Ghats), Maharashtra, India

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ABSTRACT

A new species of *Achroiostachys. bambusicola* (Stachybotryaceae, Hypocreales) *is* discovered from Western Ghats of India is illustrated, described and compared with related taxa. *A. bambusicola* is distinguished by their hyaline, smooth, thin-walled, single, uniseptate conidiophores, biseriate conidigenous cells and in having solitary or aggregated, biguttulate, cylindrical to elongated, smooth walled, hyaline, conidia. The species was named as *Achroiostachys bambusicola* after collecting it from Bamboo leaves.

Key words: Hypomycetes, biguttulate, biseriate

1. INTRODUCTION

The asexual genus *Achroiostachys* (Ac.) was established by L. Lombard & Crous in 2016 with *A.humicola* as a type species for a group of *Stachybotrys*-like fungi under family *Stachybotryaceae*. Members of this genus are distinguished by macronematous, mononematous erect, solitary or grouped, unbranched or rarely branched, thin-walled, hyaline, mostly smooth, 1–3-septate conidiophores bearing apical cluster of 2–6 hyaline, elongate to ampulliform, smooth to slightly verrucose with a somewhat protruding apical opening conidiogenous cells which in turn produces aseptate, hyaline, smooth, ellipsoidal to limoniform to globose to subglobose, guttulate conidia (L. Lombard & Crous 2016). As per the latest records (Index Fungorum, 2021) only 06 species have been published under the generic name viz. *A.aurantispora* Lombard & Crous 2016, *A.betulicola* Lombard & Crous 2016, *A.humicola* Lombard & Crous 2016, *A.levigata* Lombard & Crous 2016, *A. phyllophila* Lombard & Crous 2016 and *A.saccharicola* Lombard & Crous 2016 (Lombard & Crous, 2016). As evident from literature the species of

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Achroiostachys grow on various substrates such as rhizospheric roots, soil, dead twigs and are distributed in the tropical and temperate regions of the world. During our ongoing survey in Tansa Wild life Sanctuary (Maharashtra), a species with morphological characteristics of genus *Achroiostachys* were collected from leaves of Bamboos.

Tansa wildlife sanctuary is located in Thane, Maharashtra. The Wild life Sanctuary area is large and is well supported by southern tropical moist deciduous type of vegetation, consequently withholding large microfungal diversity. In our study of foliicolous fungi from this area, a species with morphological characters of *Achroiostachys* were collected which is divergent from the previously described species and is therefore proposed herein as a new species.

2. METHODOLOGY

The Bamboo leaves infested with the fungus was first observed under the stereomicroscope. The raised pure fungi were then grown on different culture media, viz. Malt Extract Agar and Potato Dextrose Agar, Vegetative hyphae grew on medium on 7 d but did not sporulate and culture died. The fungal structures were taken superficially from the leaves with a needle and transferred to lactophenol slide. Lastly, the slides were stuck down with DPX. Photographs and microscopic details were captured using (OLYMPUS CX 41 aided with Digi-CAM) microscope. All microscopic characters were determined on the basis of measurements of 15 mature conidia and 15 conidiophores mounted in lactophenol. Measurements of the fungal structures were taken from the microscope.

3. RESULTS AND DISCUSSIONS

Taxonomy

Achroiostachys bambusicola Dubey sp. nov.

Mycobank- MB840832.

Saprobic on leaves of Bambusa sp. Sexual morph: undetermined. Asexual morph: hyphomycetous. Colonies on the substrate surface are effuse, usually pale yellow. Stroma none. Setae and hypophodia absent. Mycelium superficial with smooth, pale brown or hyaline, septate, unbranched or rarely branched, 2 µm wide hyphae. Conidiophores macronematous, mononematous, single, smooth, uniseptate, hyaline, thin – walled, often simple, unbranched, straight or flexuous, 90 – 110 × 4 - 8 µm, 7-8 µm wide at the apex and nearly 10 µm wide at the base, bearing a cluster of phialides at the tip. Conidiogenous cells determinate, terminal, 3-5, monophialidic, elongated, hyaline, smooth walled, aseptate, 15 - 20 × 8 - 10 µm. Sometimes secondary phialides are also observed which measures same as primary phialides. Conidia erect, solitary, cylindrical to elongated, smooth walled, biguttulate on maturity, often accumulated as bulky shining heads in white, 10.5 – 14.5 × 3.6 – 6.3 µm (12.3 x 5.8, n=15).

Holotype

On the leaves of *Bambusa bambos* (L.) Voss (Poaceae), Tansa WLS, Thane Dist., Maharashtra, India, 18.10.2012, RD, 200386 BSI (WC).

Etymology

Species name, based on the name of host.

As per Index Fungorum, 2021 a total of six species are reported under the genus, Review of pertinent literature reveals that the present taxon is dissimilar from other existing 06 species in having some unique characters viz. single, unbranched and uniseptate conidiophores which are having swollen apical and basal ends, uniseriate to biseriate and larger and wider (15 - 20 × 8 -10 µm) conidiogenous cells and finally solitary to aggregated biguttulate, larger (10.5 – 14.5 × 3.6 – 6.3 µm) conidia. The above said characters are missing in in earlier reported species. A comparative account of all species of *Achroiostachys* is provided in Table no.1, which clearly indicates the relevance of establishment of new species i.e. *Achroiostachys bambusicola*.

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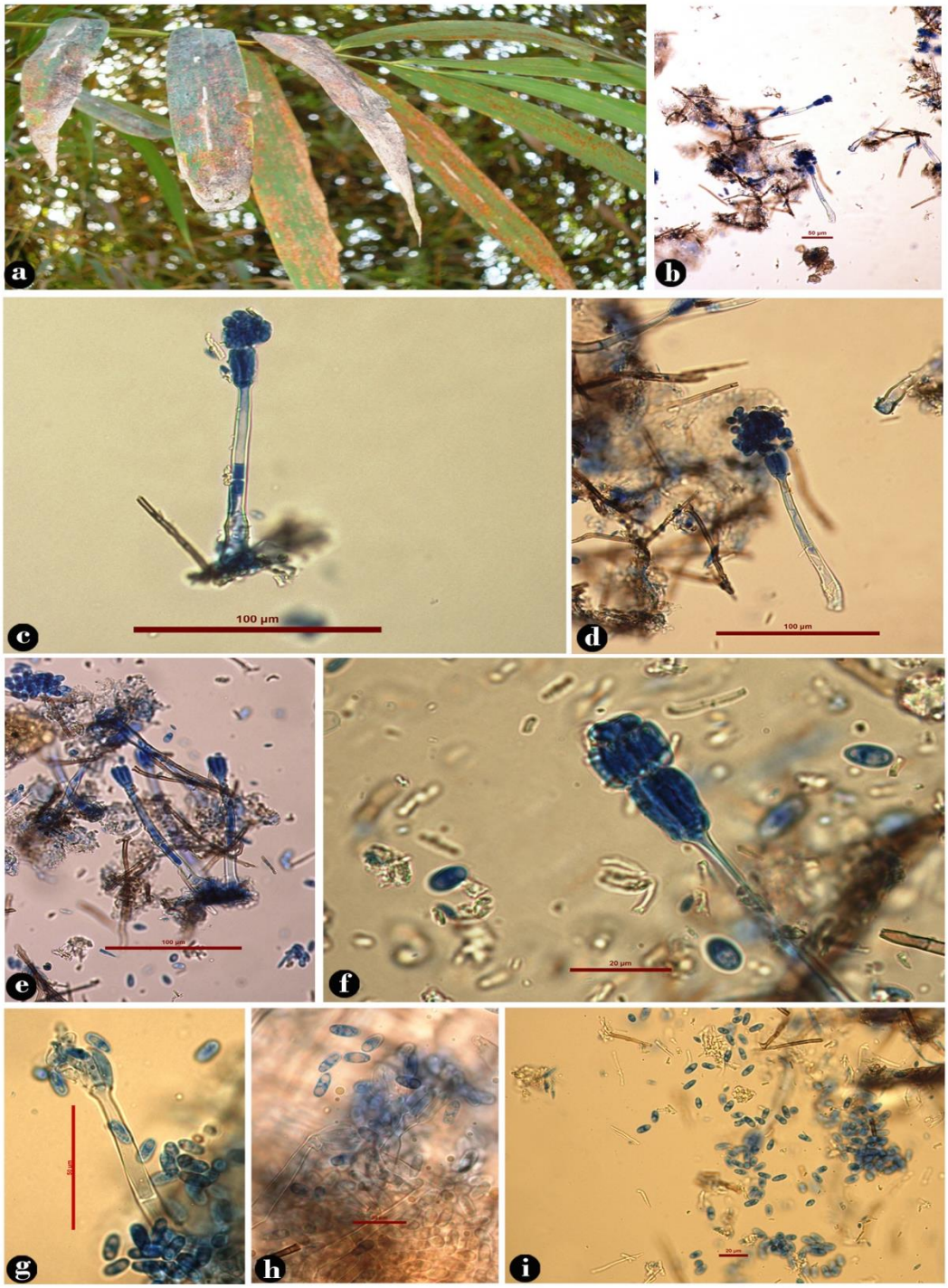

Fig.1 ***Achroiostachys bambusicola*** (a). Infected leaves of Bamboos (b)colonies(c-e)Hyaline conidiophores, conidiogenous cells and conidia (f) Apical portion with Primary and secondary phialides (g) Primary phialides (h-i) guttulated conidia { scale bar=: b,g = 50 µm, c,d,e = 100 µm, f,h,i =20 µm}

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Table 1- Comparative account of species reported under the genus *Achroiostachys*

Characters	*A. aurantispora*	*A. betulicola*	*A.humicola*	*A. levigata*	*A.phyllophila*	*A. sacchariicola*	*A. bambusicola*
Conidiophores	single or in groups, unbranched, erect, straight, 1–2-septate, slightly thick walled towards the base, smooth, hyaline and glassy, mostly 70–100 × 2.5–3.5 µm, bearing a whorl of 5–9 conidiogenous cells	single or in groups, unbranched, erect, straight, 1–3-septate, thin-walled, smooth, hyaline, 35–85 × 3–5 µm, bearing solitary or a whorl of 2–4 conidiogenous cells.	single or in groups, unbranched, erect, straight, 1–2-septate, thin-walled, smooth, hyaline, 30–65 × 3–5 µm, bearing a whorl of 2–6 conidiogenous cells.	single or in groups, hyaline, unbranched, erect, straight, 1–2-septate, thin-walled, smooth, 30–75 × 3–5 µm, bearing a whorl of 2–3 conidiogenous cells.	single or in groups, mostly unbranched, erect, straight, 1–3-septate, thin walled, smooth, hyaline, 40–70 × 3–5 µm, bearing a whorl of 2–6 conidiogenous cells.	single or in groups, unbranched, erect, straight, 1–3(–4)-septate, thin walled, smooth, hyaline, 55–140 × 3–5 µm, bearing a whorl of 2–6 conidiogenous cells.	single, unbranched, smooth, uniseptate, hyaline, thin – walled, erect, straight or mostly flexuous, sometimes bulbous at the apex, 90 – 110 × 4 - 8 µm, 7-8 µm wide at the apex and nearly 10 µm wide at the base, bearing a whorl of 3-5 conidiogenous cells.
Conidiogenous cells/Phialides	Elongate ampulliform to ventricose or clavate, hyaline, smooth, 10–13 × 3.5–4.5 µm, narrowing to a short neck about 1 µm wide. Conidial mass slimy, pale orange.	Elongate ampulliform to subcylindrical, hyaline, smooth, 8–11- 3–5 µm, with a somewhat protruding apical opening.	Elongate, ampulliform to ventricose, hyaline, smooth, 7–12 × 3–5 µm, with a somewhat protruding apical opening.	Elongate ampulliform to ventricose, hyaline, smooth, 9–15 × 3–5 µm, with a somewhat protruding apical opening.	Elongate ampulliform to ventricose, hyaline, smooth, 6–13 × 3–4 µm, with a somewhat protruding apical opening.	Elongate, ampulliform to ventricose to subcylindrical, hyaline, smooth, 9–12 × 3–4 µm, with a somewhat protruding apical opening.	Elongate, subcylindrical to cylindrical, 3 -5, monophialidic, hyaline, smooth walled, aseptate, 15 - 20 × 8 -10 µm with a somewhat protruding apical opening. Sometimes secondary phialides are also observed which measures same as primary phialides.

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Conidia	Aseptate, ellipsoidal, sometimes flattened on one side, smooth, hyaline, (7–)7.5–8.5(–10) × 4–5 µm (av. 8 × 4 µm), containing 1–2 large guttules, with an inconspicuous basal hilum and a rounded apex.	Aseptate, globose to limoniform to ellipsoidal, smooth, hyaline, (7–)9–11(–12) × (5–)5.5–6.5(–7) µm (av. 10 × 6 µm)	Aseptate, globose to limoniform, smooth, hyaline, (7–)7.5–8.5(–10) × (5–) 5.5–6.5(–7) µm (av. 8 × 6 µm), containing 1–2 large guttules, rounded at both ends or with rounded base and acute apex.	Aseptate, globose to limoniform, smooth, hyaline, (7–)8.5–9.5(–10) ×(6–)6.5–7.5(–8) µm (av. 9 × 7 µm), containing 1–2 large guttules, with rounded base and acutely rounded apex.	Aseptate, ellipsoidal to limoniform, smooth, hyaline, (8–)8.5– 9.5(–10) × 3–4 µm (av. 9 × 3 µm), containing several small guttules, with rounded base and acutely rounded apex.	Aseptate, acrogenous, ellipsoidal, smooth, hyaline, (7–)7.5–8.5(–10) × 3–4 µm (av. 8 × 3 µm), containing several small guttules, rounded at both ends.	Aseptate, solitary or aggregated as large glistening heads in white, cylindrical to elongated, smooth walled, hyaline, aseptate, biguttulate, 10.5 – 14.5 × 3.6 – 6.3 µm (12.3 x 5.8, n=15)

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Conflicts of interest:

The authors declare no conflict of interest.

Ethical approval

The ethical guidelines for plants & plant materials are followed in the study for species collection & identification.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

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