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Sawantomyces– A New hyphomycetes genus from Western Ghats, India

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ABSTRACT

A new Genus and species *Sawantomyces indica* was collected from the spathe of *Cocos nucifera* L. of Arecaceae from Sawantwadi Taluka of Sindhudurg District situated in the Western Ghats of Maharashtra. Morphologically this new genus can be differentiated from similar genera like *Petrakia, Pseudopetrakia, Ernakulamia, Piricauda, Manoharachariella, Pseudoacrodictys, Acrodictys* and *Tamhinispora* by having blackish brown, mostly obpyriform, dictyoseptate, muriform, sessile conidia, with 1-6 long apical appendages arising from different loci on upper part of the conidium. At mature stage conidia are associated with 2-4 septate germ tubes at the basal area.

Key Words: Anamorphic fungi, Appendages, Dematiaceous, Dictyoseptate

INTRODUCTION

Older than the Himalaya mountains, the mountain chain of the Western Ghats represents geomorphic features of immense importance with unique biophysical and ecological processes. It also has an exceptionally high level of biological diversity and endemism and is recognized as one of the world's eight 'hottest hotspots' of biological diversity. The forests of the site include some of the best representatives of non-equatorial tropical evergreen forests anywhere that supports many rare and new forms of fungi. During 2012, surveys were conducted to explore the microfungal diversity in natural forests Western Ghats of Maharashtra (Dubey and Moonambeth, 2013). One of the surveys in evergreen patches of Sawantwadi Tal. in Sindhudurg Dist. of Maharashtra occasioned in the collection of a uncommon dematiaceous hyphomycete subsequently determined to be a new genus. The present study describes and illustrates this unusual dematiaceous hypho-mycete collected from the Sawantwadi Tal. of Sindhudurg District. of Maharashtra, India.

MATERIALS AND METHODS

The fungal samples were brought to the BSI laboratory. Measurements of the conidia were made of material mounted in distilled water and material fixed in lactic acid and cotton blue solution. Digital images were made using Digital color CCD Camera (Nikon DS Fi1) attached to a Nikon eclipse 50i microscope with interference optics. The type specimens (holotype) have been deposited at Botanical Survey of India, Herbarium, Pune (MH), India. Descriptions and nomenclatural details are deposited in MycoBank.

Sawantomyces Dubey and Moonnambeth Gen. nov. MB 807345 (Plate.1).

Colonies effuse, blackish brown, occurs on natural substrate, overgrowing, old, aggregated, found in association with colonies of *Sporochisma* sp. Mycelium mostly semi- immersed or immersed. Stroma none. Setae and hypopodia absent. Conidiophores absent; conidiogenous cells sessile, intercalary in hyphae; Initially conidia found in clump on host tissue, solitary, dry, simple, sessile, mostly obpyriform or sometimes oval, muriform, dictyoseptate, light brown, moderately thick walled, smooth walled, the apical zone growing meristematically and possess 0-2 setae; Mature conidia, dark brown to black, often opaque or light brown near the base, dictyoseptate, smooth walled, mostly obpyriform sometimes oval, with apical appendage and basal germ tubes. Apical appendages rudimentary to well developed, arising from apical region of conidia, 1-6, dark brown, septate, straight, not diverging, slightly flexous, stiff and long; Basal

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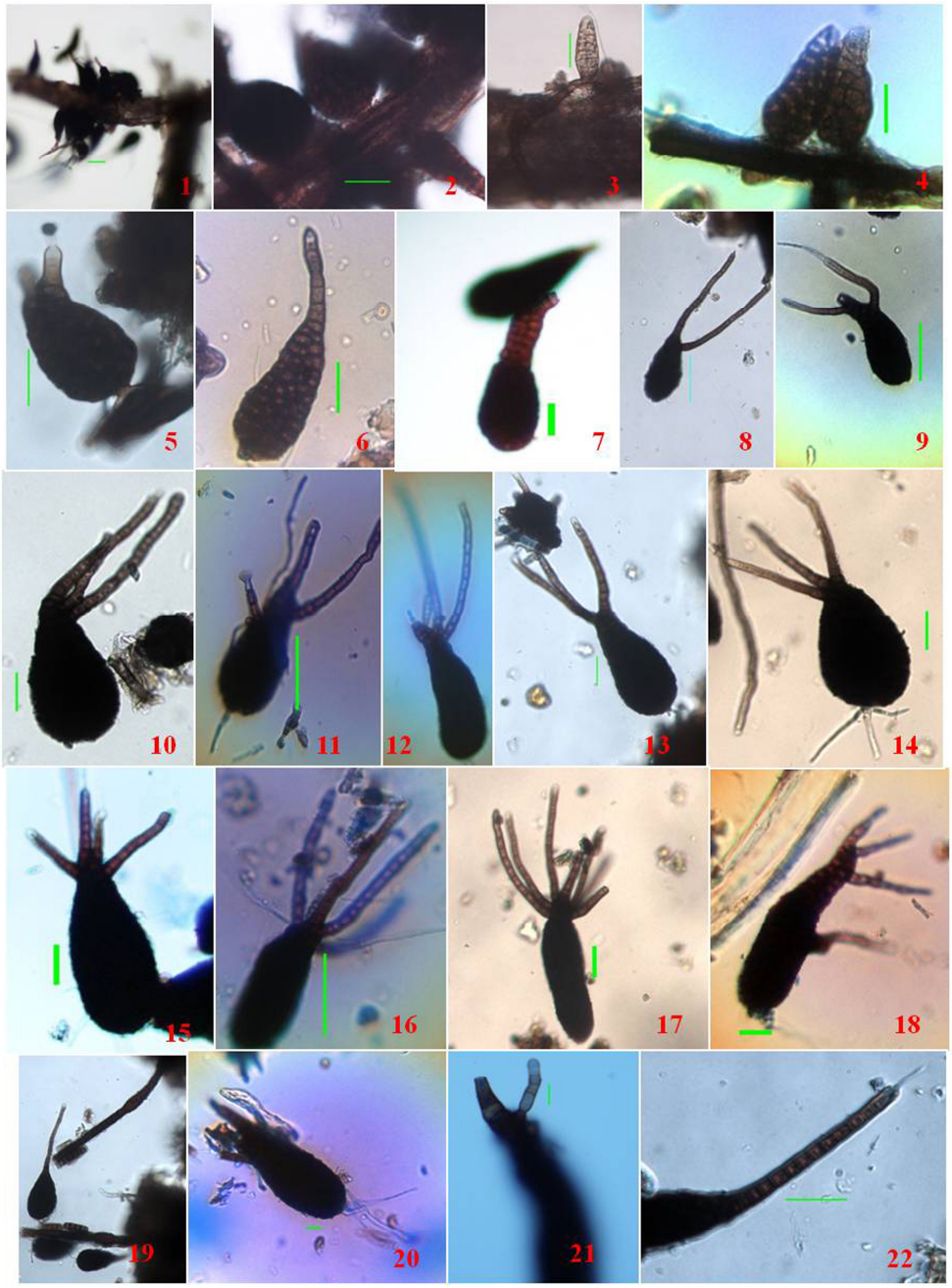

Plate-1.

Sawantomyces indica Gen. et sp.nov.- (1). Colony; (2-5) Attachments of sessile conidia directly on hyphae.; (6-17). Variation in no. of appendages on apical end of Conidia.; (18). Conidia with a middle setae.; (19). Colony of the genus associated with *Sporochisma* sp.; (11, 14, 20) Conidia having basal germ tubes.,(21). Attachments of apical appendages.; (22). Mersitematic development of apical appendages. (Bar scale= 20 µm).

unipolar germination with hyaline, thin, septate, branched germ tubes; sometimes 1-2, dark brown, septate, appendages is also observed in the middle part of conidia.

Sawantomyces indica Dubey and Moonnambeth sp.nov. MB 807346 (Plate.1)

Colonies effuse, blackish brown; hyphae closely ad pressed to the host tissue, pale brown to dark brown, smooth walled, 3.33 - 5.06 µm thick, light brown to brown; conidia dark brown to black, sessile, dictyoseptate, 20- 90 celled, the cells arranged in 8-21 transverse rows, smooth walled, obpyriform; 25.5 – 121 µm long and 16.04 - 25 µm wide at the broadest part; Apical appendages arising from the apical portion of conidia, 0 - 6, rudimentary to well-developed, dark brown, straight, slightly flexous, stiff, long, not diverging, 3- 21 septate, 27 x 135 - 3.02 x 4.70 µm; basal part of conidia with 1- 2 hyaline, septate, branched, flexous, upto 30 µm long, thin germ tubes.

Host plants examined: On spathe of *Cocos nucifera* L. (Arecaceae), Sawantwadi, Maharashtra; Collected by R. Dubey on 20th January, 2012. The holotype has been housed in Herbarium of Botanical Survey of India, Western Regional Centre, une with collection No. 200375 and Accession No. BSI 132830. Description has also been submitted in Mycobank (MB 807346).

Etymology: The genus is named after the name of place of Collection Sawantwadi and the species is named after the name of country from where it is recorded for the first time.

Teleomorph- Unknown/ Not observed.

Known Distribution- Found in the natural forests of Northern Western Ghats of Maharashtra.

DISCUSSION

Bearing in mind the conidial morphology, *Sawantomyces* can be accommodated in a group proposed by Seifert et al 2011, which includes genera like *Ernakulamia* Subram.(1994), *Pseudoacrodictys* Baker & Morgan Jones (2003) and *Petrakia* Syd & Syd (1913) having dictyoseptate stauroconidium, with 3-5 radiating arms. Another similar group with dictyoseptate conidia, dark paler horns or lobes includes *Biconiosporium* Bat. & Bazzera *Pseudopetrakia* Ellis (1971) and *Manoharachariella* Bagyanarayan et al (2009), *Acrodictys* Ellis (1961), *Shrungabeeja* Rao & Reddy (1981). The conidia of *Sawantomyces* are sessile mostly obpyriform and dark brownish with 1-6 apical appendages which are truly septate (upto 22 septa), brown and arising from different points of the apex of the conidia. It is also unique because at maturity after detachment of conidia from hyphal cells the hyaline, septate germ tube arises from the basal cells of the conidia.

The proposed genus is unique and morphotaxonomically distinct from allied genera like *Pseudoacrodictys, Tamhinispora, Ernakulamia, Pseudopetrakia, Petrakia, Piricauda, Manoharachariella, Biconiosporium.* Morphologically *Sawantomyces* is most allied to *Tamhinispora* and *Ernakulamia.* All the three genera have reduced intercalary conidiogenous cells, conidial appendages and dictyoseptate conidia. However it differs from *Tamhinispora* in shape and size of conidia, arrangement of appendages, number of appendages and number of septation in the appendages and also in having unipolar basal conidial germination. Conidium of *Sawantomyces* is mostly obpyriform with narrow apical end and broad basal end, long stiff, apical appendages arises at different points from the apex of the conidia, whereas in *Tahminispora* conidia are mostly ovoid and apical appendages arise from the tip of the conidia in diverging and radiating form. Secondly conidial appendages are long stiff, straight and not diverging or radiating as found in case of *Tamhinispora*. Moreover the appendages present in *Sawantomyces* are many septate (0-22), whereas in *Tamhinispora*, only 0-7 sepatations have been found in conidial appendages. Besides this the conidia of *Sawantomyces* are very large as compared to *Tamhinispora*. In *Ernakulamia* conidia are irregular in shape and apical appendages arise from different conidial cells (various loci) of upper part of the conidium. In contrast the conidia of *Sawantomyces* are mostly obpyriform and having long septate appendages. Furthermore conidiogenesis is monoblastic and conidial secession is Rhexolytic in *Sawantomyces*, in contrast to Monotretic and Schizoletic in *Ernakulamia*. In *Pseudoacrodictys* the conidiophores are well developed, unbranched, brown with per current proliferations. Similar genus *Manoharachariella*, conidia never have apical appendage, similarly conidiophores are well developed, branched and is almost absent or reduced to intercalary, monoblastic conidiogenous cells in

Sawantomyces. *Petrakia* and *Piricauda* also resemble to *Sawantomyces* in having conidial projections but the presence of stromata and conidiophores separates it from same. *Pseudopetrakia* possess reduced or unbranched conidiophores, 2-4 black sharp apical spines which separates it from other *Sawantomyces*. *Biconiospermum* also varies from *Sawantomyces* in having short, non septate apical arms, whereas the apical appendages of *Sawantomyces* are long, well developed, septate and straight. Above all branched or unbranched germinating tubes are not observed in any of the genera mentioned. All these unique characters separate *Sawantomyces* from other allied genera and bear a separate identity of a new genus.

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