

## *Taiwanascus samuelsii* sp. nov., an addition to *Niessliaceae* from the Western Ghats, Kerala, India

Kunhiraman C. Rajeshkumar<sup>1</sup>, and Amy Y. Rossman<sup>2</sup>

<sup>1</sup>National Facility for Culture Collection of Fungi, Agharkar Research Institute, G.G. Agarkar Road, Pune, India; corresponding author e-mail: rajeshfungi@gmail.com

<sup>2</sup>Systematic Mycology & Microbiology Laboratory, Agriculture Research Service, United States Department of Agriculture Service, Beltsville, Maryland, USA

**Abstract:** A new species of *Taiwanascus*, *T. samuelsii*, was collected from southern parts of Western Ghats on dead branches of *Anacardium occidentale* and is described. The new cleistothecial ascomycete is different from the type and only species in *Taiwanascus*, *T. tetrasporus*, in cleistothecial size, setae, and ascospore characteristics.

**Key words:**  
*Ascomycota*  
Cleistothecia  
*Hypocreales*  
Stellate setae

**Article info:** Submitted: 12 January 2013; Accepted: 19 March 2013; Published: 4 April 2013.

### INTRODUCTION

The southern parts of the Western Ghats are rich and diverse in fungi due to the diverse forest ecosystem, geography, and climatic conditions. Many new microfungi were reported from this locality by mycologists at the National Fungal Culture Collection of India (NFCCI) (Rajeshkumar *et al.* 2010, 2011a, b, 2012). During early November 2011 an expedition was made to natural forests and plantations of Karadka village and adjoining areas (specifically northern Kerala) where no mycologists have ever surveyed for microfungi. During this survey, we discovered a rare specimen of *Niessliaceae* that forms cleistothecial ascomata with stellate setae.

The family *Niessliaceae* was established by Kirschstein (1939) to accommodate a group of taxa having small, dark, superficial, saprobic, setose perithecioid ascomata. Later, the new genus *Taiwanascus* (Sivanesan & Chang 1997) was described with the following characteristics: cleistothecial ascomata with aseptate setae, brown, thick-walled, straight, smooth, and more or less 2–6 times dichotomously branched at their apex with the upper branchlets possessing somewhat darkly thickened, minute denticles. Sivanesan & Chang (1997) also proposed a new family name *Taiwanascaceae* that was later synonymised with the *Niessliaceae* (Lumbsch & Huhndorf 2007). The characteristics of the only known species, *T. tetrasporus*, were consistent with those of the *Niessliaceae* (Samuels & Barr 1997).

### MATERIAL AND METHODS

Cleistothecia were observed on the surface of a dead twig under a Nikon binocular stereo microscope (Model

SMZ-1500 with Digi-CAM, Japan). For morphotaxonomic studies and photomicrographs, Carl Zeiss (AXIO Imager 2, Germany) and Olympus (Model CX-41, Japan) microscopes were used. Asci and ascospores were mounted in lactic acid with cotton blue and measured using an ocular micrometer with 30 observations per structure (Crous *et al.* 2009). The measurements were also confirmed with the software available with the Carl Zeiss microscope. The material is deposited in the Ajrekar Mycological Herbarium (AMH 9575).

### TAXONOMY

***Taiwanascus samuelsii* Rajeshkumar & Rossman, sp. nov.**

MycoBank MB803434  
(Figs 1–2)

**Etymology:** *samuelsii*, named in honour of Gary G. Samuels, Mycologist (USDA-ARS, Beltsville, MD), for his scientific contribution to this fungal family.

**Diagnosis:** Ascospores 5.5–10.5 × 2.5–4.0 μm, ovoid, ellipsoidal to cylindrical, unlike those of *T. tetrasporus* with ascospores filiform or aculeate, 15–30 μm long, 1.0–1.5 μm thick.

**Type:** **India:** *Kerala State:* Kasaragod, Karadka, on *Anacardium occidentale*, 5 Nov. 2011, *K.C. Rajeshkumar* (AMH 9575 – **holotype**).

**Description:** *Ascomata* superficial, gregarious, cleistothecial 77–245 μm diam, globose to subglobose, dark brown *textura*

© 2013 International Mycological Association

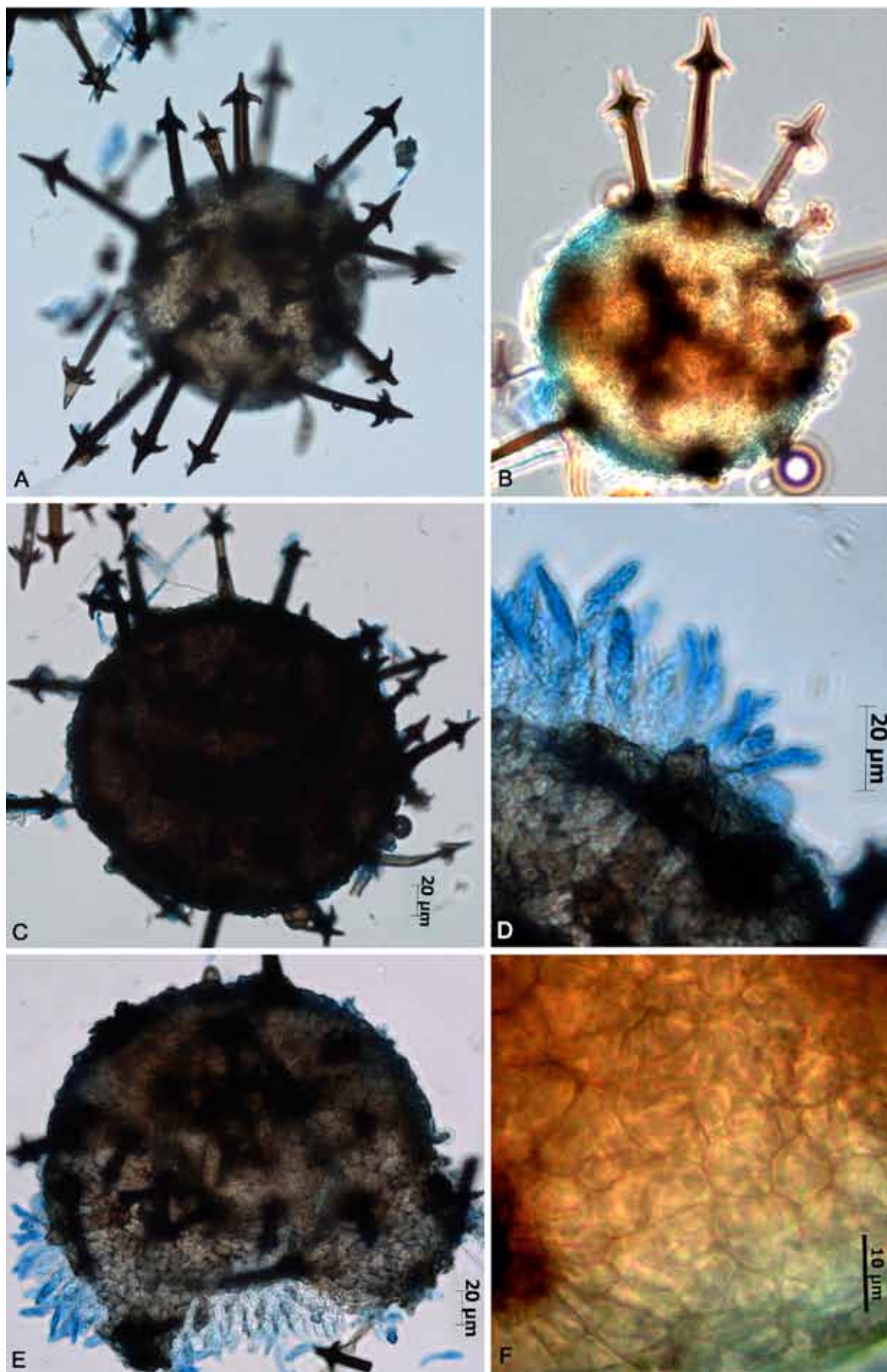
You are free to share - to copy, distribute and transmit the work, under the following conditions:

**Attribution:** You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).

**Non-commercial:** You may not use this work for commercial purposes.

**No derivative works:** You may not alter, transform, or build upon this work.

For any reuse or distribution, you must make clear to others the license terms of this work, which can be found at <http://creativecommons.org/licenses/by-nc-nd/3.0/legalcode>. Any of the above conditions can be waived if you get permission from the copyright holder. Nothing in this license impairs or restricts the author's moral rights.



**Fig. 1.** *Taiwanascus samuelsii* (holotype): A–C. Ascomata with stellate setae. D, E. Asci coming out from cleistothecia. F. Textura angularis wall pattern of cleistothecia.

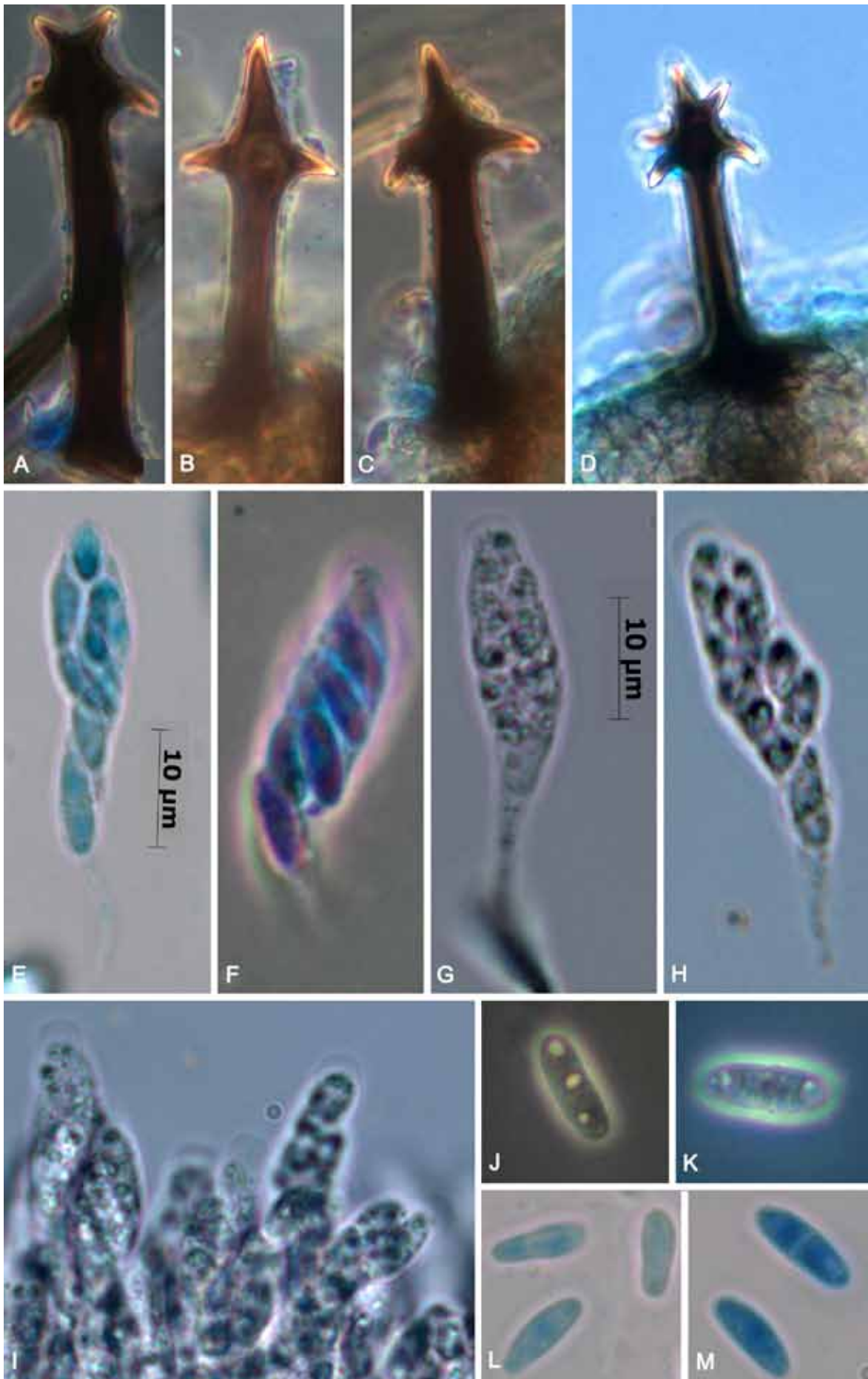


Fig. 2. *Taiwanascus samuelsii* (holotype): A–D. Ascomatal setae/appendages. E–H. Asci with ascospores. I. Asci in group. J–M. Ascospores.

*angularis*. Setae stellate, 80–110 × 10–25 µm, arising from entire ascomata, thick-walled, smooth at base, branched at top with 4–7(–9) branchlets, with acute or pointed apices. *Peridium* thin-walled. *Hamathecium* absent. *Asci* 32.5–44.0 × 7.0–9.0 µm, unitunicate, thin-walled, clavate, eight-spored, apex simple or with a thin apical ring. *Ascospores* 5.5–10.5 × 2.5–4.0 µm, ovoid, ellipsoidal to cylindrical, hyaline or pale yellow, mostly straight, smooth, thin-walled, guttulate, rounded at apex, aseptate or 1-septate.

*Asexual morph*: not observed.

## DISCUSSION

The monotypic genus *Taiwanascus*, with its type species *T. tetrasporus*, is differentiated from *Valetoniella* on its cleistothecial ascomata. Both genera have dark brown setae on the ascomata that are cruciately branched at the apex (Samuels & Barr 1997, Sivanesan & Chang 1997). The non-fissitunicate asci in *T. tetrasporus* each contain four filiform to aculeate ascospores. The type species was collected as a saprotrophic, lignicolous fungus on unidentified angiosperm dead wood from Taipei, Taiwan (Chang WL1018-94, 18 Jan 1994; IMI 364835). This is the first record of the genus *Taiwanascus* from India.

*Taiwanascus samuelsii* is described as new based on the size of its cleistothecia, size and shape of the cleistothecial setae, and ascospore characteristics when compared with *T. tetrasporus*. *Taiwanascus tetrasporus* has cleistothecia 130–150 µm diam with setae that are 2–6 dichotomously branched with minute, apical branchlets, asci with four ascospores, and long fusiform to aculeate ascospores that are 15–30 µm long, 1.0–1.5 µm thick.

## ACKNOWLEDGEMENTS

We are indebted to the Department of Science and Technology (DST), Government of India, New Delhi for providing financial support for setting up the National Facility for Culture Collection of Fungi at Agharkar Research Institute, Pune, India and the Director, Agharkar Research Institute, for providing facilities.

## REFERENCES

- Crous PW, Verkley GJM, Groenewald JZ, Samson RA (eds) (2009) *Fungal Biodiversity*. [CBS Laboratory Manual Series No. 1.] Utrecht: Centraalbureau voor Schimmelcultures.
- Kirschstein W (1939) Über neue, seltene und kritische Ascomyceten und Fungi Imperfecti. II. *Annales Mycologici* **37**: 88–140.
- Lumbsch TH, Huhndorf SM (2007) Outline of *Ascomycota* - 2007. *Mycotax* **13**: 1–58.
- Rajeshkumar KC, Singh PN, Yadav LS, Swami SV, Singh SK (2010) *Chaetospermum setosum* sp. nov. from the Western Ghats, India. *Mycotaxon* **113**: 397–404.
- Rajeshkumar KC, Hepat RP, Gaikwad SB, Singh SK (2011a) *Pilidiella crousii* sp. nov. from northern Western Ghats, India. *Mycotaxon* **115**: 155–162.
- Rajeshkumar KC, Sharma R, Hepat RP, Swami SV, Singh PN, Singh SK (2011b) Morphology and molecular studies on *Pseudocercospora kamalii* sp. nov. a foliar pathogen on *Terminalia* from India. *Mycotaxon* **117**: 227–237.
- Rajeshkumar KC, Kajale S, Sutar SA, Singh SK (2012) *Ellisembia karadkensis* sp. nov. from the Western Ghats, India. *Mycotaxon* **121**: 181–186.
- Samuels GJ, Barr ME (1997) Notes on and additions to the *Niessliaceae* (*Hypocreales*). *Canadian Journal of Botany* **75**: 2165–2175.
- Sivanesan A, Chang HS (1997) A lignicolous ascomycete, *Taiwanascus tetrasporus* gen. et sp. nov., and a new family *Taiwanascaceae*. *Mycological Research* **101**: 176–178.