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Reflections on the genus Vanakripa, and a description of V. ellipsoidea sp. nov.

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Abstract: The genus Vanakripa (hyphomycetes) is reviewed based on the examination of type specimens, and V. ellipsoidea sp. nov. is described on submerged wood from Hong Kong. Vanakripa is characterized by punctiform sporodochial colonies, micronematous conidiogenous cells and pigmented conidia with vermiform separating cells. Vanakripa is compared with similar genera, and a synopsis of its morphological characters is provided.

Key Words: aquatic fungi, freshwater, lignicolous, mitosporic fungi, systematics

INTRODUCTION
Submerged wood in freshwater environments supports a high diversity of fungi and several novel taxa have been described from tropical and subtropical regions (Hyde and Goh 1998, Tsui et al 2001). During our investigation of lignicolous fungi in freshwater habitats in Hong Kong (Tsui et al 2000), we collected an interesting mitosporic fungus that we named Vanakripa sp. We examined type material of all Vanakripa species from National Mycological Herbarium of Canada (DAOM), and as a result accept three species in Vanakripa, including Vanakripa ellipsoidea sp. nov. described in this paper.

TAXONOMY
Vanakripa ellipsoidea K. M. Tsui, Goh et K. D. Hyde, sp. nov.

Colonies on natural substratum sporodochialibus, 150–180 μm diam, scattered, black (Figs. 1, 2). Mycelium mostly immersed in the substratum, composed of septate, hyaline hyphae. Conidiophores micronematos, ca 15–20 × 2 μm, hypha-like, short cylindrical, aseptate, simple or sparsely branched, smooth, hyaline (Figs. 1, 2). Conidiogenous cells integrated, terminal, determinate. Separating cells 30–72 × 11–16 μm, hyaline, clavate to vermiform. Conidia 33–42 × 20–25 μm, acrogenous, solitary, ellipsoid to broadly fusiform, with a rounded tip, smooth, dark brown to black, aseptate, smooth-walled (Figs. 3–10). Conidial secession rhexolytic (Figs. 11, 12). Single spore isolation was attempted but not successful.

Etymology. The Latin ellipsoidea, in reference to the shape of the conidia.


Colonies on natural substratum sporodochialibus, punctiform, scattered, black (Fig. 13). Conidiophores micronematosi, indistinct, borne on superficial hyphae. Conidiogenous cells integrated, terminal. Separating cells 20–40 × 4–5 μm, hyaline, vermiform (Figs. 14–16). Conidia acrogenous, 7–10 × 4–6 μm, ovoid to broadly fusiform, smooth, brown to dark brown, aseptate (Figs. 17, 18). Conidial secession rhexolytic.

Specimen examined. INDIA. GOA STATE: Cotigao Wildlife Sanctuary, on dead twig, 28 July 1991, D. J. Bhat (DAOM 214617, HOLOTYPE).

Colonies on natural substratum sporodochialibus, fusiform, scattered, black. Conidiophores micronematosi, indistinct, hyaline. Separating cells hyaline, vermiform, 18–70 × 6–8 μm, smooth (Figs. 19, 20). Conidia acrogenous, 33–40 × 19–23 μm, ellipsoidal to broadly fusiform, with a submedian septum, smooth, dark brown to black, basal cell pale brown (Figs. 21, 22). Conidial secession rhexolytic.
FIGS. 1–12. Light (1, 2) and differential interference contrast micrographs of Vanakripa ellipsoidea (from holotype). 1, 2. Colonies on wood (light micrographs). 3–10. Conidia bearing vermiform separating cells. 11, 12. Separating cells with frills of detached conidiogenous cells. Scale bars: 1–2 = 300 μm, 3 = 70 μm, 4–12 = 20 μm.

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<th>Species</th>
<th>Conidia</th>
<th>Separating cells</th>
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<tr>
<td><em>V. ellipsoidea</em></td>
<td>33–42 × 20–25 μm, ellipsoidal, aseptate</td>
<td>30–72 × 11–16 μm, vermiform</td>
</tr>
<tr>
<td><em>V. gigaspora</em></td>
<td>33–40 × 19–23 μm, ellipsoid, with a submedian septum</td>
<td>18–70 × 6–8 μm, vermiform</td>
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<tr>
<td><em>V. parva</em></td>
<td>7–10 × 4–6 μm, ovoid to broadly fusiform, aseptate</td>
<td>20–40 × 4–5 μm, vermiform to cylindrical</td>
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Specimen examined. INDIA. GOA STATE: Molem Wildlife Sanctuary, on dead twig. 30 Jul 1991, D. J. Bhat (DAOM 214616, HOLOTYPE).

Notes. Vanakripa currently includes V. gigaspora Bhat, W. B. Kendr. et Nag Raj and V. parva Bhat, W. B. Kendr. et Nag Raj (Bhat and Kendrick 1993). Vanakripa ellipsoidea produces black conidia with hyaline, obpyriform separating cells and is a third species in the genus. Vanakripa ellipsoidea differs from V. gigaspora in having aseptate conidia, and is distinguished from V. parva in having ellipsoidal and consistently larger conidia.

We have examined type material of V. parva and V. ellipsoidea and considered that the obpyriform conidiogenous cells described by Bhat and Kendrick (1993) do not in fact proliferate or produce conidia. It is possible that the conidiophores in Vanakripa are micronematous and barely distinguishable from the vegetative hyphae. The tips of conidiophores are then blown out to form separating cells which bear conidia (sensu Pirozynski 1963). The separating cells may detach from the conidia during their release. However, further ontogeny studies are required to resolve the mechanism of conidial production. Conidium-bearing separating cells at the base of conidia are typically found in Beltrania Penz., Beltraniosis Bat. & J. L. Bezerra and Beltraniella Subram. (Pirozynski 1963), and have also been observed in Berkleasmium corticola (Karst.) Moore (Moore 1959, Sharma 1980), Canalisporium caribense (Hol.-Jech. et Mercado) Nawawi et Kuthub., C. elegans Nawawi & Kuthub. (Goh et al. 1998) and Oncopodium paspali R. F. Castañeda Ruiz, Guarro et Cano (Ruiz et al. 1997). These taxa are commonly found in freshwater habitats (Goh et al. 1998, Tsui et al. 2000), and it would therefore be interesting to establish whether the vesicular separating cells are adaptations for conidial dispersal and floatation.

Vanakripa resembles Berkleasmium Zobel, Canalisporium Nawawi & Kuthub. and Dictyosporium Corda under a stereomicroscope, in having punctiform, shiny sporodochial colonies on the natural substratum. These genera also have micronematous conidiophores and pigmented conidia. When examined under higher magnification, Berkleasmium and Canalisporium are, however, easily distinguished because their conidia are muriform (Moore 1959, Goh et al. 1998). Dictyosporium is characterized by cheiroid conidia with multiple columns of cells, which lack separating cells attached at the base of conidia (Goh et al 1999).

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LITERATURE CITED


