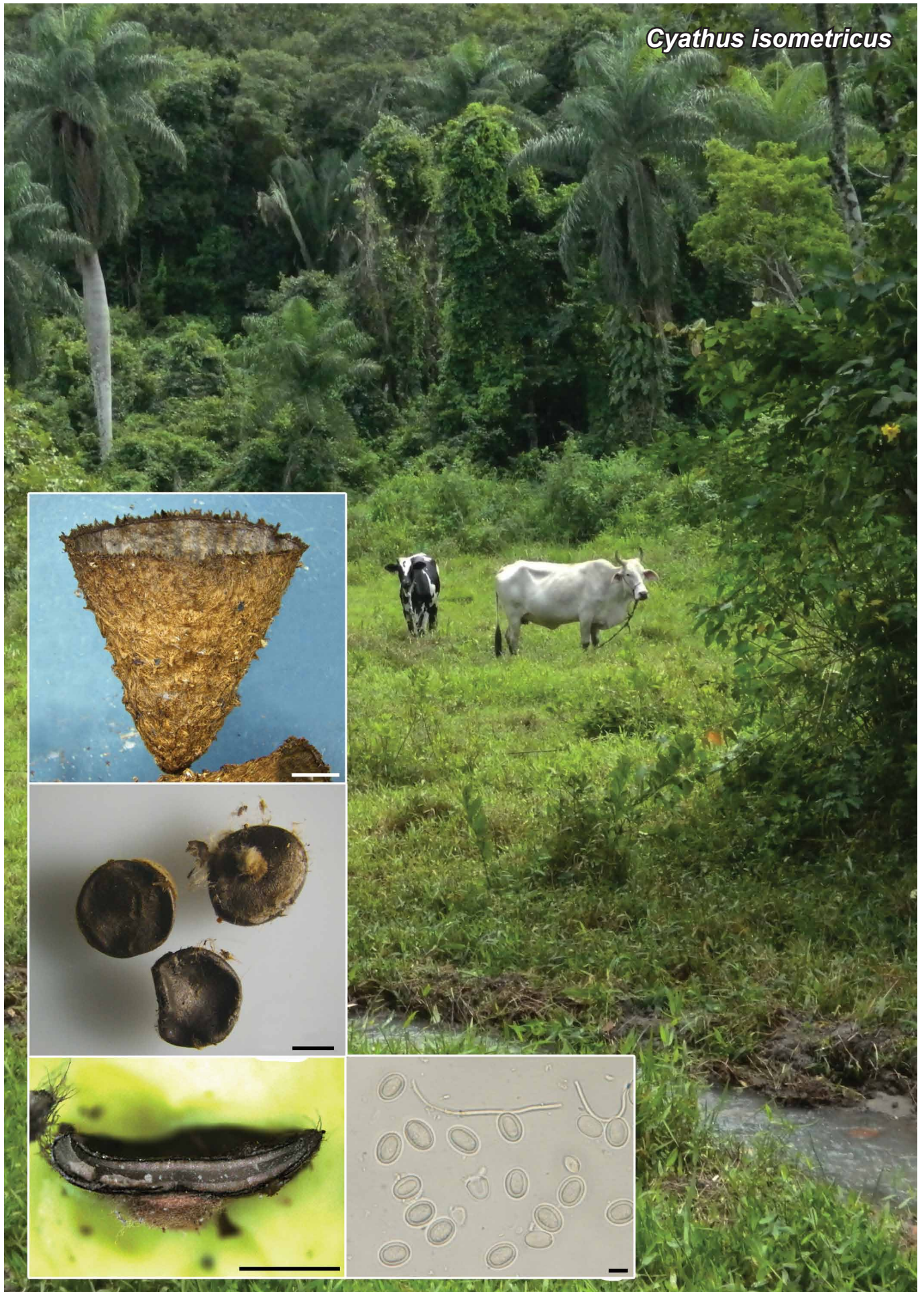


*Cyathus isometricus*



Fungal Planet 631 – 20 December 2017

***Cyathus isometricus* R. Cruz, J.S. Góis, P. Marinho & Baseia, sp. nov.**

**Etymology.** Named in reference to the isometrical dimensions of the basidiomata.

**Classification** — *Nidulariaceae*, *Agaricales*, *Agaricomycetes*.

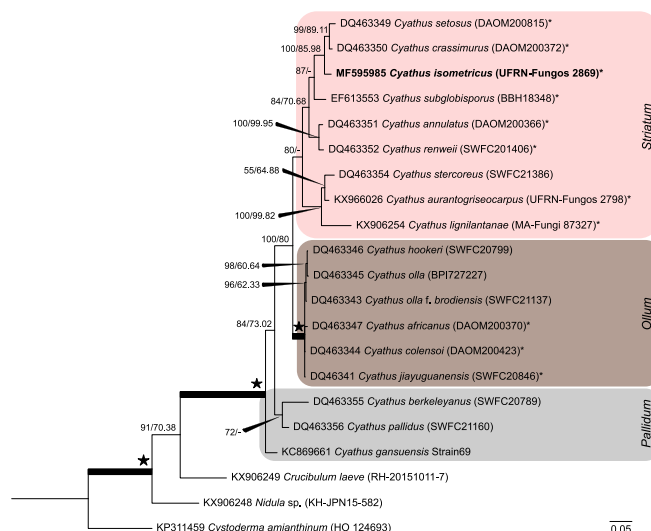
**Basidiomata** infundibuliform to slightly campanulate, 7–11 mm in height, 7–11 mm in width at the upper part, isometrical with straight sides, not expanded in the mouth or forming a pedicel at the base. **Emplacement** 4 mm in width, conspicuous to inconspicuous, brown (7F6 Kornerup & Wanscher 1978). **Exoperidium** woolly (not hirsute), dark reddish brown to brown (6F6–7F6), provided with 0.4–0.75 mm tomentum, arranged in small, irregular and flexible tufts. External wall inconspicuously plicated, with 0.55–0.8 mm between the striae. **Mouth** finely fimbriated to finely setose, in a continuous pattern, 0.1–0.4 mm in height, dark greyish brown to dark brown (6F3–7F5). **Endoperidium** greyish brown (7E3–7F3), inconspicuously plicated, with 0.55–0.8 mm between the striae. Weak but perceptibly bright, slightly contrasting with the exoperidium. **Stipe** and **epiphragm** not observed in the sample. **Peridioles** greyish brown (8F2–8F3), 2.35–2.7 × 2.1–2.5 mm, circular in shape, sometimes angular to irregular, smooth surface, tunic indistinct and provided with double layered cortex: internal cortex black, external cortex greyish brown (8F3) and separated by a thin and compacted hyphal layer, greyish in colour. **Basidiospores** smooth, hyaline, 14–18 × 10–13 µm (L = 16.02; W = 11.42), slightly elliptical to elongated (Q = 1.29–1.62), elliptical in average (Qm = 1.41), apicule absent and spore wall 1.5–3 µm thick.

**Typus.** BRAZIL, Paraíba, Areia, Ecological Reserve Mata do Pau-Ferro, on decaying wood, 23 July 2014, J.O. Souza, D.S. Alfredo & E.S. Sousa (holotype UFRN-Fungos 2869, paratype UFRN-Fungos 2870, ITS and LSU sequences GenBank MF595985 and MF595986, MycoBank MB822200).

**Notes** — Following Brodie's (1975) classification, *Cyathus isometricus* has characteristics that would group it both in group I (*olla*) or in group III (*triplex*); in the classification based on phylogenetic data by Zhao et al. (2007), it can be grouped in the clade *striatum*. From Brodie's (1975, 1984) group I (*olla*), *C. isometricus* presents similarities with *C. earlei*, such as the basidiomata measurements, spore size and apicule absent; however, the holotype of *C. earlei* (BPI 703410) shows emplacement with prominent hyphae (cotinous), exoperidium hirsute and endoperidium with platinum bright, both paler in colour (exoperidium 5D7–5D8 and endoperidium 6C2–5C3), small peridioles (1.6–1.97 × 1.45–1.87 mm) brown in colour (5F5), with rugose surface and subhomogeneous double layered cortex. From Brodie's (1975) group III (*triplex*), the new species can be compared with *C. setosus*, a species that groups

**Colour illustrations.** Brazil, Paraíba, Areia, environment near the locality where the type species was collected in the Ecological Reserve Mata do Pau-Ferro; peridium (scale bar = 2 mm); upper view of peridioles (scale bar = 1 mm); cross section showing the double-layered cortex, with internal black cortex, external greyish brown (8F3) cortex, and separated by a thin and compacted greyish hyphal layer (scale bar = 1 mm); basidiospores (scale bar = 10 µm). All images from the holotype, UFRN-Fungos 2869.

with *C. isometricus* and *C. crassimurus* in the phylogenetic analyses (comments below). From the same collection site, *C. isometricus* has morphological similarities with *C. calvescens*, however, the latter can be distinguished by the presence of a pedicel in the basidiomata, tomentum finely woolly (almost glabrous), and the subhomogeneous double layered cortex (Cruz & Baseia 2014). Phylogenetically, *C. isometricus* grouped (PP = 100; MPbs = 85.98) in the clade formed by *C. crassimurus* and *C. setosus*. *Cyathus setosus* presents similar macroscopic measures and woolly exoperidium with short tomentum, and both *C. crassimurus* and *C. setosus* have spores with the same measurements and shape of *C. isometricus*. However, *C. setosus* (holotype DAOM 200815) presents exo- and endoperidium with paler colour than in *C. isometricus* (exoperidium 5E8, endoperidium 5D4–5F6), external wall smooth, smaller peridioles in its width (1.5–2 mm), setose mouth, and double layered cortex with black intermedial layer. For *C. crassimurus* (holotype DAOM 200372), this species has macroscopic small sizes (4–5 × 4–6.5 mm, height by width), peridium with thick and rigid wall, exoperidium smooth, hirsute, endoperidium with platinum bright and paler colour (5C2), and smaller peridioles (1–1.5 × 1–1.5 mm), bronze (5E5).



The 50 % majority rule Bayesian tree was inferred from ITS sequences with the model T92 + G using MrBayes v. 3.2.6 (Ronquist et al. 2012). A maximum parsimony analysis was done (PAUP v. 4.0a156), and similar topology was obtained (not shown). Bayesian posterior probabilities (PP) from 10 M generations, and maximum parsimony bootstrap (MPbs) support values from 10 000 replications and random addition sequences repeated 10 times, are indicated on the branches. The star (★) represents nodes with maximum PP and MPbs. Type species are marked with asterisks (\*) and the new species is in **bold**. The scale bar indicates the estimated number of nucleotide substitutions per site. Sequence alignment is available in TreeBASE (<http://purl.org/phylo/treebase/phylows/study/TB2:S21396>).

Rhudson H.S.F. Cruz, Programa de Pós-graduação em Sistemática e Evolução, Centro de Biociências, Universidade Federal do Rio Grande do Norte, Natal, 59078-970, Brazil; e-mail: rhudsoncruz@yahoo.com.br  
Jefferson S. Góis, Curso de Graduação em Ciências Biológicas, Centro de Biociências,

Universidade Federal do Rio Grande do Norte, Natal, 59078-970, Brazil; e-mail: jeff.gois@outlook.com  
Paulo Marinho, Departamento de Biologia Celular e Genética, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil; e-mail: paulomarinho@hotmail.com

Iuri G. Baseia, Departamento de Botânica e Zoologia, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil; e-mail: iuribaseia@gmail.com