

**First report of *Neocampanella blastanos*,  
a rare and resupinate member of the family Marasmiaceae  
(Basidiomycota, Agaricales)  
from Mayotte (France, Indian Ocean)**

Bernard DUHEM<sup>a</sup> & Bart BUYCK<sup>b</sup>

<sup>a</sup>Muséum national d'histoire naturelle, Direction des collections,  
Herbier Mycologie (PC), Case Postale n° 39,  
57, rue de Cuvier, F- 75231 Paris cedex 05  
email : duhem@mnhn.fr

<sup>b</sup>Muséum national d'histoire naturelle, Département de Systématique et Évolution  
Case Postale n° 39. UMR 7205, 57, rue de Cuvier, F- 75231 Paris cedex 05  
email : buyck@mnhn.fr

**Abstract** – Two specimens of *Neocampanella blastanos* (Boidin & Gilles) Nakasone, Hibbet & Goranova, 2009 (Basidiomycota, Agaricales), collected in Mayotte (France, Comoros archipelago, Indian Ocean), are described and illustrated and briefly compared to morphologically similar taxa. This uncommon, probably pantropical species is characterized by a thin, resupinate and adhesive basidiome that is first white, then whitish to pale beige. It is characterized by a monomitic structure, hyphae with clamps and a multitude of crystals, scattered capitate leptocystidia, numerous dendrohyphidia and subfusiform to pyriform basidiospores.

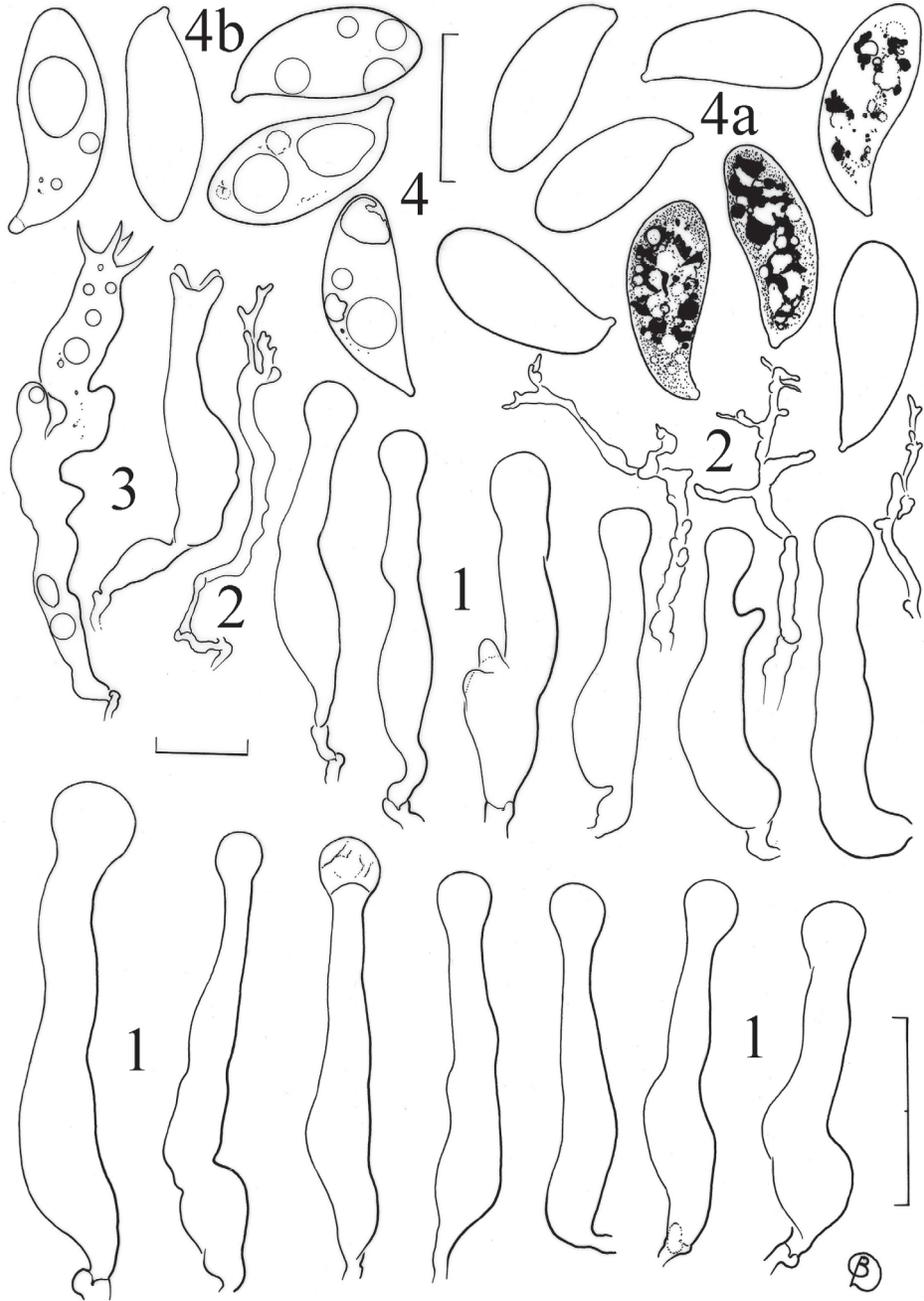
**corticoid fungi / *Dentocorticium* / *Dendrothele* / taxonomy / *Tetrapyrgos***

**Résumé** – Deux spécimens de *Neocampanella blastanos* (Boidin & Gilles) Nakasone, Hibbet & Goranova, 2009 (Basidiomycota, Agaricales), récoltés à Mayotte (France, Archipel des Comores, Océan Indien), sont décrits et illustrés et brièvement comparés avec des espèces similaires. Cette espèce, peu commune mais probablement largement répandue dans les régions tropicales, est caractérisée par un mince basidiome corticioïde étalé, adhérent, blanc puis blanchâtre à beige clair, à structure monomitique, aux hyphes bouclées avec une multitude de cristaux, des leptocystides éparses à extrémité capitée, de nombreuses dendrophyses et des spores subfusiformes à piriformes.

**champignon corticioïde / *Dentocorticium* / *Dendrothele* / taxinomie / *Tetrapyrgos***

## INTRODUCTION

This species was originally described in the genus *Dentocorticium* (Parm.) M. J. Larsen & Gilbertson 1974 by Boidin & Gilles (1998), based on collections from the Central African Republic and the island of La Réunion (France, Indian Ocean), the locality of the type collection.



Figs 1-4. *Neocampanella blastanos*. 1. Capitulate leptocystidia. 2. Surface dendrohyphidia. 3. Two basidia. 4. Spores: 4a: PC0085388 (BBVH 10.234) & 4b: PC0085389 (BBVH 10.242). Scale bars: 1 = 20  $\mu\text{m}$ , 2 & 3 = 10  $\mu\text{m}$ , 4a & 4b = 10  $\mu\text{m}$ .



Fig. 5. *Neocampanella blastanos* in situ (PC0085388, photo B. Buyck).

Boidin & Gilles (l.c.) compared their *D. blastanos* essentially to two other species: *Corticium ampullosporum* G. H. Cunn. 1954 and *Dendrothele subfusispora* Burdsall & Nakasone 1983. Although Stalpers (1985) considered the former to be a likely synonym of *Dendrothele alba* Viegas 1939, Nakasone & Burdsall (2011) recently recombined it as a good and distinct species in *Dendrothele* Höhn. & Litsch. 1907, whereas *Dendrothele alba* itself has since been recombined in *Epithele* Pat. 1900 (Boidin *et al.* 1996). The second species, *D. subfusispora*, was not considered a true *Dendrothele* by Boidin *et al.* (1996) because it grows on dead wood, whereas species of *Dendrothele sensu stricto* are growing on the bark of living trees. It was recently recombined in *Epithele* by Hjortstam & Ryvarden (2005).

*Dendrothele* is a strongly polyphyletic genus representing some eleven different lineages distributed among Hymenochaetales, Russulales, Corticiales and Agaricales (Goranova 2003). *Neocampanella* Nakasone, Hibbet & Goranova 2009 was described as a new genus that forms a monophyletic group with some pleurotoid and agaricoid members of family Marasmiaceae (Agaricales), in particular species of the genera *Campanella* P. Henn. 1895, *Marasmiellus* Murrill, 1915 and *Tetrapyrgos* E. Horak 1987 (Nakasone *et al.* 2009).

This same clade contains one more resupinate taxon, *Brunneocorticium bisporum* (Burdsall & Nakasone) Nakasone 2009, sole representative of *Brunneocorticium* S. H. Wu 2007 and only known from Taiwan, China and Florida (USA). It differs from the closely related *Neocampanella* essentially in its bisporic basidia and dimitic structure comprising brown skeletal hyphae reminiscent of the genus *Scytinostroma* Donk 1956.

Since its original description (Boidin & Gilles 1998), *N. blastanos* has only been reported from Puerto Rico (Nakasone *et al.* 2009). With this paper, the authors extend its distribution to the island of Mayotte (Duhem & Buyck 2011a-c), part of the Archipelago of the Comoros, situated north-west of Madagascar.

## MATERIAL AND METHODS

All material was collected during a 2010 fungal inventory on the island of Mayotte by B. Buyck and V. Hofstetter (Agroscope de Changins-Wädenswil, Switzerland). The fresh specimens were photographed and tissues collected for later sequencing. All specimens have been deposited in the mycological herbarium of the Natural History Museum in Paris (PC).

Macroscopic observations result from observations on both fresh and dried specimens. Detailed microscopic observations and illustrations are based on thin, freehand sections that were observed in a mixture of a 2-3% (w/v) Potassium solution and a 1% (w/v) aqueous Phloxine B solution, and in some cases later replaced by a Congo SDS solution for optimal coloration of cells and cell walls. Melzer's reagent was used to check for the presence of amyloid or dextrinoid reactions, whereas Cotton blue was used to check for cyanophilic reactions. All measurements are based on 30 spores and give mean values in italic accompanied by their standard deviation. Minimum and maximum values are added between brackets. Values for the length-width ratio (Q) are given in the same format. References.

## DESCRIPTION

*Neocampanella blastanos* (Boidin & Gilles) Nakasone, Hibbet & Goranova, *Botany* 87: 879. 2009. **Figs 1-5**

*Basionym:* *Dentocorticium blastanos* Boidin & Gilles, *Cryptogamie, Mycologie* 19 (3): 193, 1998.

The **basidioma** first appears in the form of very small, strongly adhering, thin, more or less circular spots that grow progressively in diameter and may eventually fuse, forming finally a more or less continuous, thin cover over the substrate measuring approx. 100-150 × 10-20 mm, later becoming sometimes pulvinate by thickening (as in *Dendrothele*), while retaining a very soft consistency. The margin – even under a hand lens – is generally well-delimited, sinuous, rounded to lobed, or developing locally some tiny radial fibrils covered by a furfuraceous deposit. The surface is powdery, white, grayish-whitish to cream, locally developing beige or very pale brown (10YR 8/2-8/3)<sup>1</sup> to pale grayish (10YR 7/1-7/2) tints. **Context** monomitic, composed of very irregular, densely intermixed, tortuous hyphae with clamp connections, typically covered by a multitude of small crystals. **Leptocystidia** emergent from the surface, widely

<sup>1</sup> Munsell Soil-Color Charts 2010.

dispersed, measuring  $30\text{-}53 \times 5.5\text{-}8.6 \mu\text{m}$ , cylindrical, flexuous, irregularly compressed, thin-walled, not encrusted, developing an attenuated neck that abruptly widens into a capitate apex,  $3.8\text{-}9.3 \mu\text{m}$  wide, sometimes developing additional lateral, obtuse protuberances, sometimes with a single adventitious septum, clamped at the base which is narrowly pedicellate (Fig.1). **Dendrohyphidia** (Fig. 2) very abundant, forming an almost continuous layer at the surface of richly and irregularly branched, slender cells abundantly encrusted with small, granular crystalline deposits. **Basidia** mixed with the dendrohyphidia in a cataphytenium,  $35\text{-}43 \times 6.5\text{-}9.5 \mu\text{m}$ , very tortuous-sinuuous and irregular in diameter, 4-spored (Fig. 3). **Spores** measuring  $12.5\text{-}13.22\text{-}14.5 \times 5\text{-}5.6\text{-}6 \mu\text{m}$ ,  $Q = 2.27\text{-}2.36\text{-}2.60$  (for Buyck & Hofstetter 10.234), and  $11\text{-}13.2\text{-}14.8 \times 5.2\text{-}5.75\text{-}6.6 \mu\text{m}$ .  $Q = 1.92\text{-}2.26\text{-}2.69$  (for Buyck & Hofstetter 10.242), amygdaliform, subfusiform or pyriform, strongly attenuated toward the apiculus thereby accentuating the suprahilar depression, rarely ellipsoid, acyanophilous, not amyloid, containing a few large lipid drops or with abundant, small, refringent droplets (Fig. 4a,b).

*Examined material:* Comoros Archipelago (Indian Ocean). Island of Mayotte (France), Botanic garden at Coconi, 90 m alt.,  $12^{\circ}50'05.22''$ ,  $45^{\circ}08'03.39''$ , on bark of rotten wood debris on the soil, 26 January 2010, Buyck B. & Hofstetter V. 10.242 (PC0085389); Benara Forest Reserve, in mesophyl, mid-altitude forest, on rotten wood, 25 January 2010, Buyck B. & Hofstetter V. 10.234 (PC0085388).

## DISCUSSION

Among the resupinate genera that have dendrohyphidia, *Neocampanella blastanos* can be confused with certain *Dendrothele* as already mentioned in the introduction, but shares also similarities with some *Vuilleminia* R. Maire 1902, e.g. *Vuilleminia macrospora* (Bres.) Hjortstam 1987 (Basidiomycotina, Corticiales), which forms identical, although usually smaller basidiomata, and has similar, somewhat longer leptocystidia ( $60\text{-}160 \times 6\text{-}13 \mu\text{m}$ ) with a slightly thickened wall toward the base. The latter species, however, differs in tubular, very long, basally inflated basidia and cylindrical, curved to allantoid spores. Dendrohyphidia are also present in some corticioid species of the genus *Epithele*, which are recognized by large, clavate to stipitate basidia and the presence of sterile hyphal pegs, that are composed of regular or dendroid, thin- or thick-walled hyphae. The generic type, *E. typhae* (Pers.) Pat. 1900, shows genetic affinities to the Polyporaceae (Larsson 2007).

Decomposer fungi seem to have evolved repeatedly from resupinate to finally agaricoid fruiting bodies (Larsson 2007). The two monospecific, corticioid genera *Neocampanella* and *Brunneocorticium* are so far the only resupinate members of the otherwise pleurotoid/cyphelloid to agaricoid Marasmiaceae (Marasmiaceae-1 clade in Nakasone *et al.* (2009)), with which they share similar microscopical features. As such, the dendrohyphidia of these corticioid taxa could be homologous with the diverticulate elements that are observed at the surface of the fruit bodies of the closely related, pleurotoid or agaricoid species in *Campanella*, *Tetrapyrgos* or *Marasmiellus*. Nakasone *et al.* (l.c.) indicated also striking similarities in features of spores and hymenial leptocystidia between some species of *Campanella* and the resupinate *Neocampanella* and *Brunneocorticium*

(the latter genus shares with typical *Dendrothele* also the habitat on bark of living plants).

We expect that continuing inventories and sequencing of more taxa may discover more resupinate species related to Marasmiaceae. This will undoubtedly make it easier to appreciate or delimit generic boundaries between these different morphologies. In this context, it is for example very interesting to observe the parallel and equally striking similarities that exist between the microscopic features of agaricoid and pleurotoid *Tetrapyrgos* and some resupinate *Dendrothele*, such as *D. jacobi* Duhem & H. Michel 2007 or *D. asterospora* Boidin & Gilles 1996 (because of its fruiting on dead wood provisionally retained as synonym of *Xenosperma murrillii* Gilbertson & Blackwell 1987). All these species share the very particular gibbose spores and similar dendrohyphidia that are typically covered with numerous encrusting crystals (Duhem & Michel 2007).

**Acknowledgements.** The field work was funded by the French mycological society through convention N°099/DAF/2009 with the “Direction de l’agriculture et de la forêt” (DAF, Mayotte). The authors extend their gratitude to l’Agroscope de Changins-Wädenswil (Nyon, Switzerland) for laboratory facilities, and to Danny Laybourne (DAF, Mayotte) and Valérie Guiot, Guillaume Viscardi, Abdou Andhume et Ali Bacar Sifari (“Conservatoire botanique national de Mascarin”, CBNM, in Coconi, Mayotte) for field assistance.

## REFERENCES

- BOIDIN J. & GILLES G., 1998 — Contribution à l’étude des genres *Dendrocorticium*, *Dendrodontia* et *Dentocorticium* (Basidiomycotina). *Cryptogamie Mycologie*, 19 (3): 181–202.
- BOIDIN J., LANQUETIN P. & DUHEM B., 1996 — Contribution à la connaissance du genre *Dendrothele* (Basidiomycotina, Aphyllophorales). *Bulletin trimestriel de la Société Mycologique de France* 112 (2) : 87–126.
- DUHEM B. & BUYCK B., 2011a — *Meruliophana mahorensis* gen. et sp. nov. de l’île de Mayotte (France Outre-mer). *Cryptogamie, Mycologie* 32 (2): 135–143.
- DUHEM B. & BUYCK B., 2011b — *Peniophorella viperiformis* sp. nov. de l’île de Mayotte (France), une nouvelle espèce du complexe de *P. praetermissa* (Basidiomycota, Hymenochaetales). *Cryptogamie, Mycologie* 32 (3): 307–313.
- DUHEM B. & BUYCK B., 2011c — *Hyphodermella brunneocontexta* sp. nov. (Basidiomycota, Polyporales) de l’île de Mayotte (France). *Cryptogamie, Mycologie* 32 (4): 413–420.
- DUHEM B. & MICHEL H. 2007 — Deux espèces nouvelles de *Dendrothele*. *Cryptogamie, Mycologie* 28 (1): 39–54.
- GORANOVA G., 2003 — Phylogenetic analyses of rDNA sequences indicate the corticioid genus *Dendrothele* in highly polyphyletic. M.Sc. Thesis, Department of Biology, Clark University, Worcester, Massachusetts, USA.
- HJORTSTAM K. & RYVARDEN L., 2005 — Notes on the genus *Epithele* (Basidiomycotina, Aphyllophorales) from South America. *Synopsis Fungorum* 20: 23–32.
- LARSSON K.-H., 2007 — Re-thinking the classification of corticioid fungi. *Mycological Research* 111 (9): 1040–1063.
- NAKASONE K.K. & BURDSALL H.H., 2011 — The genus *Dendrothele* (Agaricales, Basidiomycota) in New Zealand. *New Zealand Journal of Botany* 49 (1): 107–131.
- NAKASONE K.K., HIBBET D. S. & GORANOVA G., 2009 — *Neocampanella*, a new corticioid fungal genus, and a note on *Dendrothele bispora*. *Botany* 87: 875–882.
- STALPERS J. A., 1985 — Type studies of the species of *Corticium* described by G. H. Cunningham. *New Zealand Journal of Botany* 23 (2): 301–310.
- WU S.-H., WANG D.-M. & TSCHEN E., 2007 — *Brunneocorticium pyriforme*, a new corticioid fungal genus and species belonging to the euagarics clade. *Mycologia* 99 (2): 302–309.