New species of *Cryptophialoidea* and *Hughesinia* (hyphomycetes, anamorphic fungi) from Cuba

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Two new hyphomycetes (anamorphic fungi) are described and illustrated based on specimens collected on plant debris from Cuba. *Cryptophialoidea ramosa* sp. nov., found on a dead leaf of *Ocotea nemodaphne*, is unique in having 1-3 times dichotomously branched setiform conidiophores. *Hughesinia verrucosa* sp. nov., collected on a dead stem of *Arthrostylidium* sp., is characterized by conidiophores with verrucose, conspicuous, light brown, frequently percurrent proliferations and verrucose conidia with a protuberant basal cell. Similarities with morphologically close taxa are discussed. A key to the known species of *Cryptophialoidea* is provided.

Key words: anamorphic fungi, Cuba, hyphomycetes, taxonomy.

Introduction

During our continuing surveys of plant litter-borne Hyphomycetes from natural protected areas in Cuba, two new species in the genera *Cryptophialoidea* Nawawi & Kuthub. and *Hughesinia* J.C. Lindq. & Gamundí were found. They are described here as new. The type specimens are deposited at the Mycological Herbarium of the Institute of Ecology and Systematic of Cuba (HACM).

Taxonomy

Cryptophialoidea ramosa Delgado, J. Mena & Gené, **sp. nov.** (Fig. 1)

Coloniae in substrato naturali effusae, brunneae. *Mycelium* partim superficiale, partim immersum ex hyphis ramosis, septatis, laevibus, pallide brunneis compositum. *Conidiophora*

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macronematosa, mononematosa, solitaria, in parte superiore plerumque flexuosa, brunnea, laevia, parietibus crassis, septata, setiformia, superne fertilia, inferne et apices sterilia, apice 1-3 furcato, usque ad 178 μm longa, 5-6.5 μm lata; ramis subulatis, septatis, brunneis. *Zona conidiogenosa* ad mediam altitudinem conidiophora, plus minusve cylindrica, serie solitaria phialidum constans, usque ad 43 μm longa. *Cellulae conidiogenae* monophialidicae, discretae, determinatae, lageniformes, pallide brunneae, 11-16 × 2.5-4 μm, distinctis collarulis infundibuliformibus praeditae. *Phialides* 3-6 in fasciculis discretis aggregatae, valde confertae, omnes apertas in uno latere conidiophororum, fasciculi ad basim scutelliformes. *Conidia* hyalina, laevia, 1-septata, falcata, ad apicem attenuata, ad basim minute rotundata, 18.5-22.5 × 1.0-1.5 μm, in massam mucosam producta.

Colonies on the natural substrate effuse, brown. *Mycelium* partly superficial, partly immersed, composed of branched, septate, smooth-walled, pale brown to brown hyphae. *Conidiophores* macronematous, mononematous, solitary, mostly flexuous in the upper part, brown, smooth, thick-walled, septate, setiform, apex 1-3 times dichotomously branched, up to 178 μm long, 5-6.5 μm wide at the base; branches subulate, septate, brown. *Conidiogenous zone* up to 43 μm long, on the upper half of the conidiophore, more or less cylindrical, comprising a single row of *phialides* closely arranged in discrete bundles and opening on one side of the conidiophore stipe, 3-6 phialides per bundle, with a narrow shield of sterile cells around the base of the phialide bundles,. *Conidiogenous cells* monophialidic, discrete, determinate, lageniform, pale brown, 11-16 × 2.5-4 μm, with a distinct, funnel-shaped collarette. *Conidia* hyaline, smooth-walled, 1-septate, falcate with basal end slightly rounded, 18.5-22.5 × 1.0-1.5 μm at the widest part, produced in a slimy mass.

Habitat: on dead leaf of *Ocotea nemodaphne* Mez.

Known distribution: Cuba.

Material examined: CUBA, Pinar del Río Province, Sierra del Rosario Biosphere Reserve, Loma El Salón, on dead leaf of *Ocotea nemodaphne* Mez., 7 October 1999, G. Delgado (HACM 9805; **holotype here designated**); on unidentified dead leaf (HACM 9806, 9813); on dead leaf of *Calyptrantes caroli* Griseb. (HACM 9816) and on dead leaf of *Beilschmedia pendula* (Sw.) Benth. & Hook (HACM 9817).

Other materials examined: *Cryptophialoidea manifesta* (B. Sutton & Hodges) Kuthub.& Nawawi: BRASIL, Espiritu Santo, Linhares, on dead leaves of *Eucalyptus urophylla* S.T. Blake, 31 May 1973, C. Hodges (IMI 176989c); MALAYSIA, Pahang, Rengit Forest Reserve, on decaying twig of submerged angiosperm, July 1990, A.J. Kuthubutheen (IMI 355823). *Cryptophiale udagawae* Piroz.: CUBA, Santiago de Cuba, Sierra de la Gran Piedra, Reserva Isabelica Norte, on dead litter, 23 May 1985, J. Mena (HACM 7660, 7666, 7671); BRASIL, Espiritu Santo, Serra, on dead leaves of *Eucalyptus grandis* W. Hill ex Maiden, 11 December 1973, C. Hodges (IMI 181536k); BRASIL, Sao Paulo, Itepetininga, on dead leaves of *Eucalyptus saligna* Hort. Berol. ex Maiden, 9 June 1973, C. Hodges (IMI 176992e).

Notes: The genus *Cryptophialoidea* was established by Kuthubutheen and Nawawi (1987) to accommodate *Cryptophiale secunda* Kuthub. & B. Sutton as the type species and *Cryptophialoidea uncinata* Kuthub. & Nawawi,

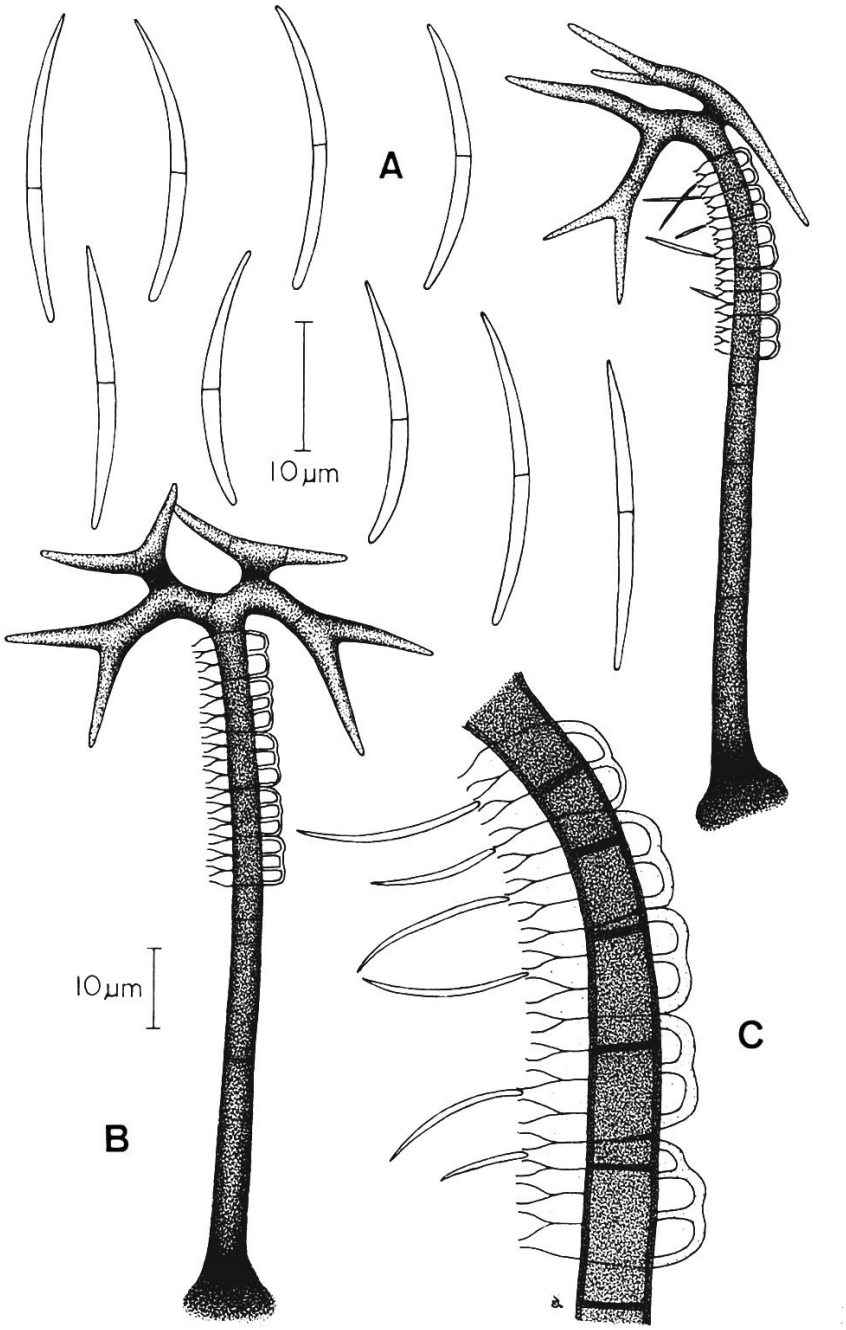

Fig. 1. *Cryptophialoidea ramosa* (HACM 9805). **A.** Conidia. **B.** Setose conidiophores. **C.** Bundles of conidiogenous cells.

based on the presence of a single row of closely arranged phialides on one side of setiform conidiophores and the absence of a well developed shield of sterile cells surrounding them as in *Cryptophiale* Piroz. (Pirozynski, 1968; McKenzie and Kuthubutheen, 1993; Goh and Hyde, 1996). Later, Kuthubutheen and Nawawi (1994) described *Cryptophialoidea fasciculata* Kuthub.& Nawawi on a decaying twig of an unidentified angiosperm submerged in a freshwater stream from Malaysia and transferred *Cryptophiale manifesta* B. Sutton & Hodges (Sutton and Hodges, 1976) to *Cryptophialoidea* based on the diagnostic features mentioned above. Although the presence of the shield of sterile cells surrounding the phialides seems to be an outstanding character to separate both genera, some *Cryptophialoidea* species like *C. fasciculata* and *C. manifesta* have a rudimentary shield on the base of phialide bundles (Sutton and Hodges, 1976; Kuthubutheen and Nawawi, 1994).

Cryptophialoidea ramosa is morphologically close to *C. fasciculata* and *C. manifesta* in the nature of the conidiogenous zone, but the latter two species differ in producing unbranched, and longer setiform conidiophores (up to 270 μm and 250 μm long, respectively). In addition, *C. fasciculata* has broader conidiogenous cells (4-6 μm wide) and longer conidia (22-29 μm) with a wider and distinctly rounded base and *C. manifesta* has a longer conidiogenous zone (31.5-70 μm long) and larger conidia (22-27 × 1.5-2 μm). Some species of *Cryptophiale* such as *C. udagawae* Piroz. (Pirozynski, 1968), *C. guadalcanalensis* Matsush. (Matsushima, 1971) and *C. cucullata* Kuthub. (Kuthubutheen and Sutton, 1985) resemble *Cryptophialoidea ramosa* in having dichotomously branched setiform conidiophores. However, they are clearly different having two rows of phialides without collarettes, on each side of the conidiophores, and these are obscured by a shield of sterile cells.

The relevant features to differentiate the five known species of *Cryptophialoidea* are included in the following key.

Key to *Cryptophialoidea* species

1. Setiform conidiophores 1-3 times dichotomously branched ..... *C. ramosa*
1. Setiform conidiophores unbranched..... 2

2. Conidiogenous cells polyphialidic ..... *C. manifesta*
2. Conidiogenous cells monophialidic 3

3. Conidia falcate 4
3. Conidia uncinate..... *C. uncispora*

4. Phialides arranged in discrete bundles ..... *C. fasciculata*
4. Phialides not arranged in bundles..... *C. secunda*

Hughesinia verrucosa Delgado, J. Mena & Gené **sp. nov.** (Fig. 2)

Coloniae in substrato naturali effusae, atrobrunneae, pilosae. *Mycelium* plerumque superficiale ex hyphis laevibus, pallide brunneis vel brunneis, 3-8 μm crassis compositum. *Stromata* prosenchymatica, non erumpentia, parva, atrobrunnea vel nigrescentia. *Hyphopodia* carentia. *Conidiophora* macronematosa, mononematosa, simplicia, solitaria vel fasciculata, erecta, recta vel leviter flexuosa, cylindrica, septata, parietibus crassis, brunnea vel atrobrunnea, verrucosa, usque ad 416 μm longa, 10-16 μm lata ad basim, 6-8 μm ad apicem. *Cellulae conidiogenae* monotreticae, in conidiophoris incorporatae, terminales, proliferationes usque ad 3, percurrentes, verrucosae, pallide brunneae vel brunneae, 12-32 × 8-12 μm. *Conidia* solitaria, acrogena, rostrata, obclavata vel obpyriformia, aureobrunnea usque ad atrobrunnea, saepe cellula basali verrucosa, 40-64 × 16-24 μm; ex 4-8 cellulis 3-4 obclavatis serietibus appendiculatis ad apicem composita, appendicibus pallide brunneis, 16-44 μm longa, 6-8 μm lata ad basim. *Cellulae basales* protrudentiae, brunneae, cylindricae vel obconicae, truncatae, 4-8 × 3-6 μm.

Colonies on the natural substrate effuse, dark brown, hairy. *Mycelium* mostly superficial composed of pale brown to brown, smooth-walled, 3-8 μm thick hyphae. *Stroma* prosenchymatous, flattened, small, dark brown to blackish brown. *Hyphopodia* absent. *Conidiophores* macronematous, mononematous, simple, solitary or caespitose on the stroma, erect, straight or slightly flexuous, cylindrical, septate, thick walled, brown to dark brown, sometimes darker toward the apex, verrucose, up to 416 μm long, 10-16 μm thick at the base and 6-8 μm at the apex. *Conidiogenous cells* monotretic, integrated, terminal, with up to three verrucose, pale brown to brown, 12-32 × 8-12 μm percurrent proliferations. *Conidia* solitary, acrogenous, appendiculate, rostrate, obclavate or obpyriform, golden brown to dark brown, mainly verrucose in the basal cells, 40-64 × 16-24 μm; consisting of 3-4 obclavate rows of 4-8 cells laterally fused except at the apex, 16-44 μm long, 6-8 μm wide at the base, 2-4 μm at the apex; appendages septate, pale brown. *Basal cells* protuberant, brown, cylindrical to obconical, truncate, 4-8 × 3-6 μm.

Habitat: On dead stem of *Arthrostylidium* sp.

Known distribution: Cuba.

Material examined: CUBA, Sancti Spiritus Province, Alturas de Trinidad, Topes de Collantes National Park, on the way to Finca Codina, on dead stem of *Arthrostylidium* sp., 18 May 1999, G. Delgado (HACM 9604; **holotype here designated**).

Notes: Lindquist and Gamundí (1970) proposed the genus *Hughesinia* to accomodate *H. chusqueae* J.C. Lindq. & Gamundí, found on leaves of *Chusquea* sp. from Chile. To date the genus was monotypic and the fungus had been recorded only from the type locality. The genus is characterized by solitary or caespitose conidiophores on a stroma with a few hyphopodia, monotretic, integrated and percurrent conidiogenous cells, and appendiculate, smooth conidia with 2 - 4 independently developed cell rows, without a hilum.

Hughesinia verrucosa differs from the type species in its verrucose conidia and conidiophores with conspicuous, light brown and frequently

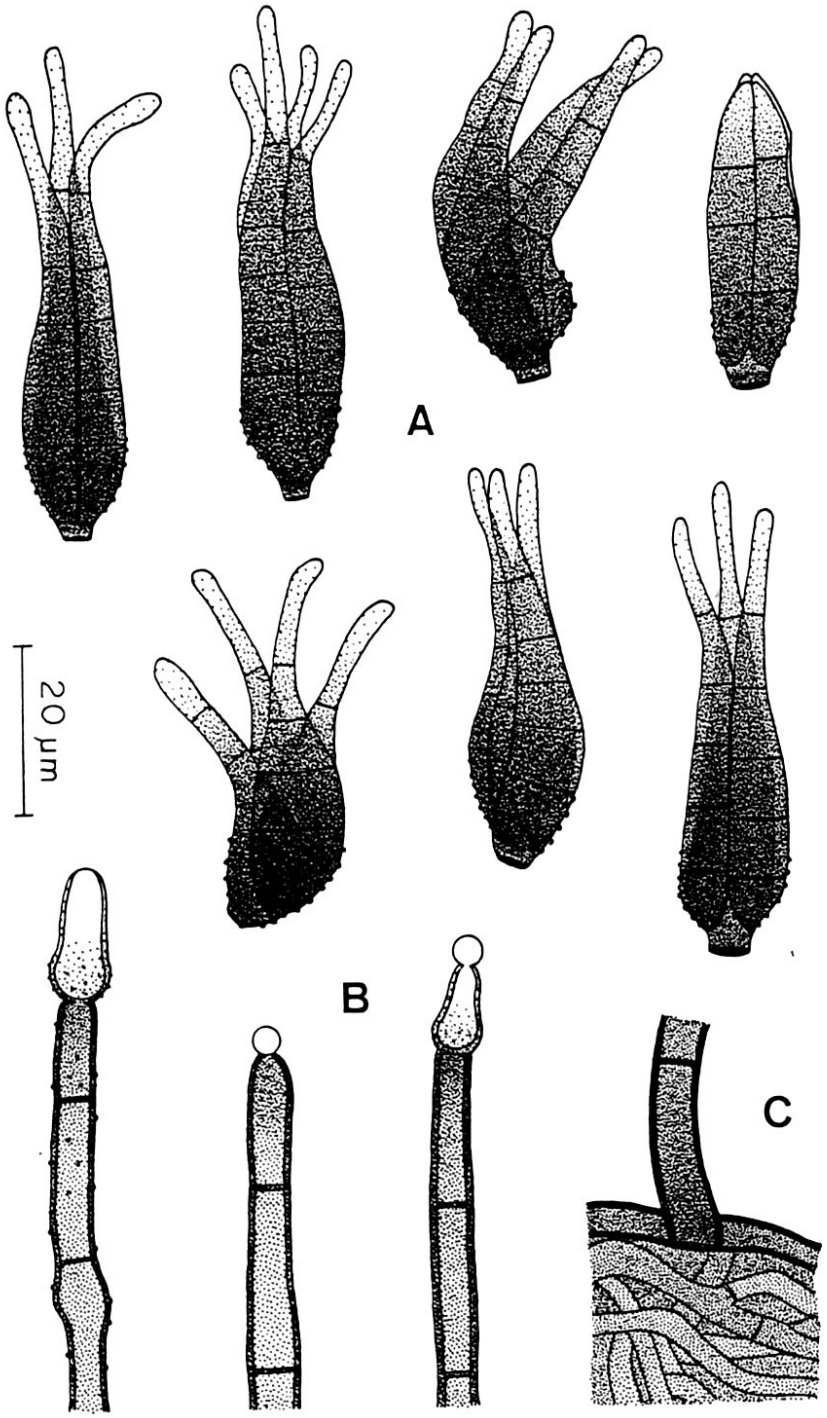

Fig. 2. *Hughesinia verrucosa* (HACM 9604). **A.** Conidia. **B.** Conidiogenous cells with percurrent proliferations. **C.** Detail of the stroma.

verrucose percurrent proliferations. *Hughesinia chusqueae* has smooth, obovoid, pyriform or turbinate, shorter and broader (35-48 × 22-30 μm) conidia, with appendages of a similar length but slightly wider (20-40 × 7-14 μm). The hyphopodia, always present in *H. chusqueae*, were not observed in the new species. The presence of a protuberate, brown basal cell is also a relevant feature to differentiate both species.

Hughesinia verrucosa has some resemblance with *Tretospeira ugandensis* (Hansf.) Piroz. in its monotretic conidiogenesis and conidial morphology, but the latter has short, determinate conidiophores and subspherical conidiogenous cells (Pirozynski, 1972). Another fungus, *Carrismyces proliferatus* R.F. Castañeda & Heredia (Castañeda and Heredia, 2000) can also be compared with the new species as they both share the same conidial ontogeny and conidiophores with smooth or verrucose, brown to dark brown percurrent proliferations. However, the conidia of *C. proliferatus* are muriform (dictyoseptate) with 1-5 corniform to conical appendages, and the conidiophores bear adventitious hyphae arising toward the base.

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