

***Occultithea costaricensis* gen. et sp. nov. and *Apiocamarops pulvinata* sp. nov. from Costa Rica**

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Occultithea costaricensis is described as a new genus and species in the family Xylariaceae, order Xylariales. Distinguishing characteristics include clustered ascocarps that are seated in decayed wood beneath bark and ascospores with a hyaline cellular appendage and a short germination slit. *Apiocamarops pulvinata*, family Boliniaceae, order Boliniales differs from other described species in its relatively massive stroma. Cultures were not obtained from either of these taxa.

Keywords: *Apiocamarops*, Boliniaceae, *Occultithea*, Pyrenomycetes, Xylariaceae, systematics

Two taxa hitherto unknown to science are described herein. Both were collected in Costa Rica during a workshop and collecting expedition on ascomycetes held at A. M. Brenes Biological Reserve during December 2002.

Materials and methods

Asci and ascospores were examined by differential interference contrast microscopy (DIC) in mounts of water or Melzer's iodine reagent. Culturing was attempted, but ascospores did not germinate. Ascospore dimensions are based on twenty spores and are given as (minimum) mean \pm standard deviation (maximum). In the case of *Apiocamarops pulvinata* the standard deviation was so small that it is not in the realm of ordinary measurement and, hence, is not given.

Taxonomic part

***Occultithea* J. D. Rogers & Y.-M. Ju, gen nov.**

Perithecia intra corticem, non nisi exposita incisione cortice. Asci octospori, brevistipitati, annulo apicali in liquore iodato Melzeri cyanescenti, buccinato. Ascosporae brunneae, in uno extremo cellula hyalina ornata, leves, rima germinativa praeditae. Anamorphosis ignotus.

Perithecia embedded in bark, only exposed by cutting bark. – Asci octosporous, short-stipitate, with apical ring bluing in Melzer's iodine reagent, trumpet-shaped. – Ascospores brown, with a hyaline cellular appendage at one end, smooth, with a germ slit. – Anamorph unknown.

Etymology. – *occulta* = hidden + *theca* = fruiting body.

Type species. – *Occultithea costaricensis*.

***Occultithea costaricensis* J. D. Rogers & Y.-M. Ju, sp. nov.** – Figs. 1–4.

Perithecia intra corticem, ca. 2–12 aggregata, non nisi exposita incisione cortice. Perithecia 0.4–0.6 mm diam. Ostiola inconspicua, unumquidque cortex penetrans. Asci octospori, brevistipitati, 185–190 μm longitudine tota \times 10–10.5 μm crassi, partibus sporiferis 150–180 μm longitudine, annulo apicali in liquore Melzeri cyanescenti, buccinato, 6 μm alto, 3 μm lato. Ascosporae brunneae, ellipsoideo-inequilaterales, in uno extremo cellula hyalina ornata, leves $(14.5\text{--}19.5 \pm 2\text{--}23.5) \times (7\text{--}8.5 \pm 1\text{--}10.5)$ μm , cellula hyalina $1.5\text{--}4.5 \times 1.5\text{--}4.5$ μm , rima germinativa recta brevissima praeditae. Paraphyses abundantes. Anamorphosis ignotus.

Perithecia embedded in bark, ca. 2–12 in each group, exposed only by cutting into bark. Perithecia 0.4–0.6 mm diam. – Ostioles inconspicuous, each one penetrating the bark. – Asci 8-spored, short-stipitate, 185–190 μm total length \times 10–10.5 μm wide, the spore-bearing part 150–180 μm long, with the apical ring bluing in Melzer's reagent, trumpet-shaped, 6 μm high, 3 μm broad. – Ascospores brown, ellipsoid-inequilateral, with small hyaline cell on one end, smooth, $(14.5\text{--}19.5 \pm 2\text{--}23.5) \times (7\text{--}8.5 \pm 1\text{--}10.5)$ μm , the hyaline cell $1.5\text{--}4.5 \times 1.5\text{--}4.5$ μm , with a straight germ slit, very short. – Paraphyses abundant. – Anamorph unknown.

Etymology. – for Costa Rica.

Specimen examined. – Costa Rica, Alajuela Prov., Cordillera central Conservation Area, Alberto Manuel Brenes Biological Reserve, vic. San Ramon, on decayed wood, 2–6 Dec 2002, J. D. Rogers, INB holotype.

Occultithea resembles *Ascovirgaria* J. D. Rogers & Y.-M. Ju (Rogers & Ju, 2002) except that perithecia are seated in decayed bark rather than wood. The latter genus, moreover, has a rudimentary blackened stroma overlying perithecia, one-celled mature ascospores, and a *Virgaria* anamorph (Rogers & Ju, 2002). Unfortunately, any attempt to obtain cultures of *Occultithea* failed. Another feature of *Occultithea* is the large distance between the uppermost ascospore and the ascus apex, a feature most frequently seen in family Diatrypaceae. The ascospores of *Occultithea* can be oriented with the hyaline cell toward the base or, less frequently, the apex of the ascus.

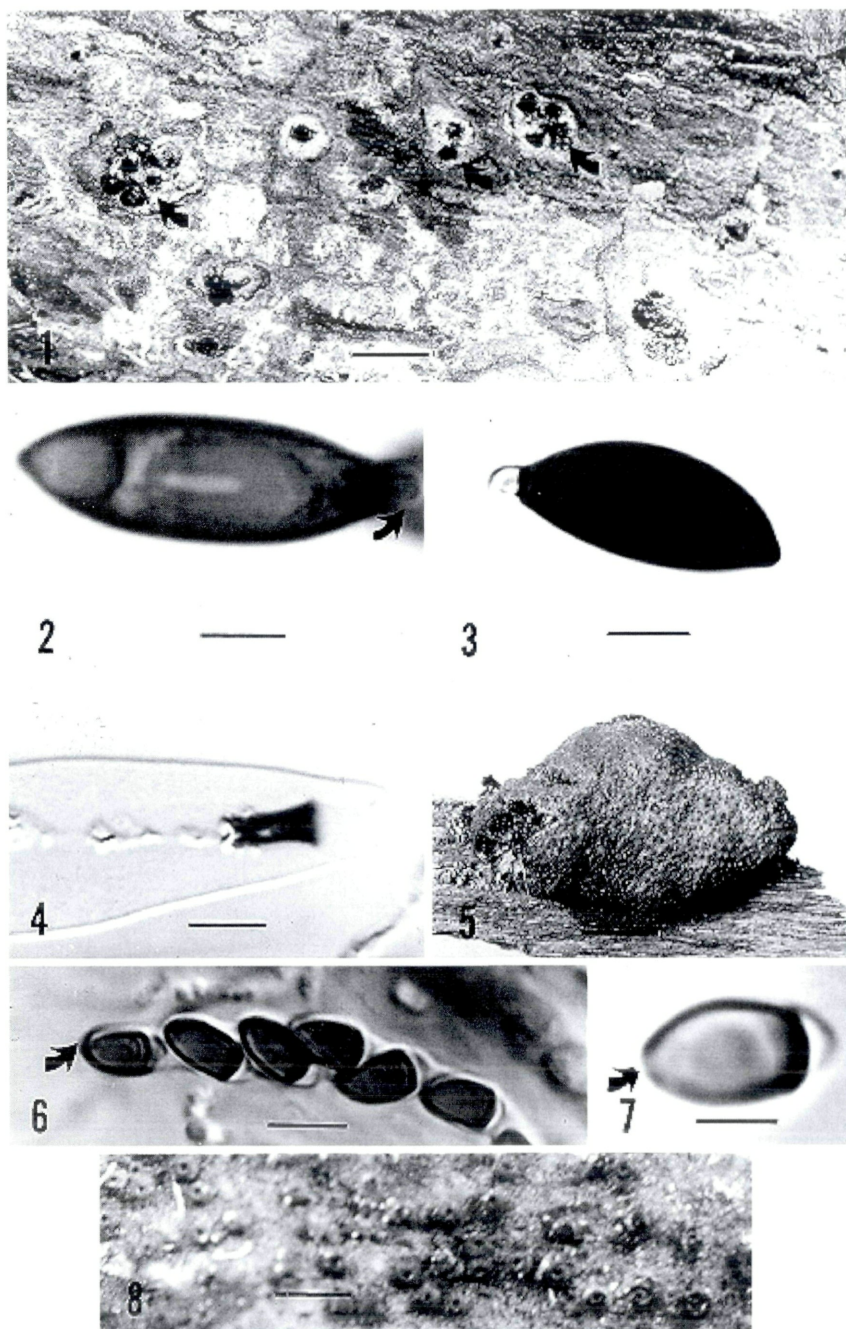
Key to xylariaceous fungi with immersed perithecial stromata

1. Perithecial stromata solitary, immersed in dung . . . *Hypocopra*
- 1*. Perithecial stromata solitary or aggregated, immersed in wood or leaf tissue 2
2. Perithecial stromata solitary, immersed in wood. Ascus apical ring always iodine- negative. Anamorph, where known, *Liber-tella*-like *Barrmaelia*
- 2*. Perithecial stromata solitary or aggregated. Ascus apical rings most often iodine-positive. Anamorphs, where known, various 3
3. Perithecial stromata aggregated, immersed in decayed wood beneath blackened surface. Ascus apical ring iodine-positive. Anamorph *Virgaria* *Ascovirgaria*
- 3*. Perithecial stromata solitary or aggregated. Anamorph, if present, not a *Virgaria* 4
4. Perithecial stromata valsooid or diatrypoid, partly or completely immersed in substrate. Anamorphs, where known, *Libertella*-like *Lopadostoma*
- 4*. Perithecial stromata not as above. Anamorphs, where known, *Geniculosporium* 5
5. Perithecial stromata poorly developed, aggregated, immersed in bark. Ascospores with hyaline cellular appendage and short germ slit. Anamorph unknown *Occultitheca*
- 5*. Perithecial stromata poorly developed, usually solitary. Anamorphs, where known, *Geniculosporium* 6
6. Perithecial stromata immersed, beneath blackened clypeus. Ascospores unicellular or with a hyaline cellular appendage and germ slit *Anthostomella*
- 6*. Perithecial stromata mostly immersed in highly decayed wood. Ascospores with median germination pore *Euepixylon*

References to the literature dealing with genera in the keys include: *Barrmaelia* Rappaz and *Lopadostoma* (Nitschke) Traverso (Rappaz, 1995); *Euepixylon* Füsting (Laessøe & Spooner, 1994); *Hypocopra* (Fr.) J. Kickx f. (Krug & Cain, 1974); and *Anthostomella* Sacc. (Lu & Hyde, 2000). The latter publication also summarizes information on genera with immersed ascomata such as *Brunnei-apiospora* K. D. Hyde et al. and *Leptomassaria* Petr. that are possibly xylariaceous.

***Apiocamarops pulvinata* J. D. Rogers & Y.-M. Ju, sp. nov.** – Figs. 5–8.

Stroma pulvinatum, 1.5 cm longum × 1 cm crassum × 3 mm altum. Superficie stromatis levi praeter ostiolis; extus armeniacum, ligneum; intus griseum, molle et



laxum. Perithecia plus minusve globosa, 0.2–0.3 mm diam., monosticha. Ostiola umbilicata annulo elevato cincta. Asci octospori, longistipitati, ca. 90 μ m longitudine tota \times 3–4 μ m crassi, partibus sporiferis 25–40 μ m longitudine, annulo apicali minuto in liquore iodato Melzeri haud caerulescenti. Ascosporae inequaliter bicellulares, ellipsoideae, leves, cellula longiore brunnea poro apicali praedita, 4.5(–5) \times 2.5(–3) μ m, cellula altera hyalina sine poro apicali, ca. 1.5 μ m longitudine. Paraphyses abundantes. Anamorphosis ignotus.

Stroma pulvinate, 1.5 cm long \times 1 cm broad \times 3 mm high, with surface smooth except for ostioles. Exterior dull orange, woody; interior grey, loose and soft. – Perithecia more or less globose, 0.2–0.3 mm diam., monostichous. – Ostioles umbilicate, surrounded by raised rings. – Asci 8-spored, long-stipitate, ca. 90 μ m total length \times 3–4 μ m broad, the spore-bearing part 25–40 μ m long, with minute apical ring not staining in Melzer's iodine reagent. – Ascospores unequally bicellular, ellipsoid, smooth, the longer cell brown with apical pore, 4.5(–5) \times 2.5(–3) μ m, the other cell hyaline without apical pore, ca. 1.5 μ m in length. – Paraphyses abundant. – Anamorph unknown.

Etymology. – from the pulvinate shape of stroma.

Specimen examined. – Costa Rica, Alajuela Prov., Cordillera central Conservation, Alberto Manuel Brenes Biological Reserve, vic. San Ramon, on decayed wood, 2–6 Dec 2002, J. D. Rogers, INB holotype.

Apiocamarops pulvinata differs from the other two species (Rogers & Samuels, 1988; Samuels & Rogers, 1987) in its orange pulvinate stroma with raised doughnut-shaped rings around the ostioles. The stroma resembles those of *Camarops* more than those of the other species, reinforcing the conviction that these genera are closely related. Unlike the ascospores of most *Camarops* species, those of *A. pulvinata* are not noticeably flattened and the perithecia of *A. pulvinata* are monostichous rather than polystichous. *Apiocamarops* is separated from *Camarops* primarily on the base of the appendaged ascospores of the former genus. This distinction might ultimately prove untenable.

Figs. 1–8. *Occultitheca costaricensis* and *Apiocamarops pulvinata*. – 1–4. *Occultitheca costaricensis*. – 1. Perithecia on branch exposed by removing overlying bark (arrows). – 2. Ascospore showing short germination slit. Appendage overlapping another ascospore (arrow). – 3. Mature ascospore. – 4. Apical portion of ascus with iodine-positive apical ring. Ascospores (not shown) are distantly separated from apical region of ascus. – 5–8. *Apiocamarops pulvinata*. – 5. Stroma. – 6. Ascus with 6 (of 8) ascospores. Ascus apex (arrow). – 7. Ascospore with germ pore (arrow). – 8. Surface of stroma showing raised ostiolar rings. – Figs. 1, 5 & 8 by photomicrography. Other figs. by DIC microscopy. Scale bars: 1 = 1.5 mm; 2 = 4 μ m; 3 = 5.6 μ m; 4 = 6 μ m; 5 = 4 mm; 6 = 4 μ m; 7 = 2.25 μ m; 8 = 1 mm.

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