The genus *Xylaria sensu lato* (*Xylariaceae*) in Guadeloupe and Martinique (French West Indies) III. Taxa with slender upright stromata

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Abstract: Thirty-five taxa of *Xylaria* collected in Guadeloupe and Martinique, featuring upright slender stromata less than 5 mm wide, are documented and commented in this paper which comes in the continuation of two previous papers on penzigioid taxa (part I) and upright robust taxa (part II). Based on the evaluation and comparison of their morphological characters, twenty-two previously known taxa were identified, including *X. adscendens, X. arbuscula, X. arbuscula* var. *plenofissura, X. aristata, X. badia, X. bambusicola, X. coccophora, X. curta, X. feejeensis, X. fimbriata, X. fissilis, X. ianthinovelutina, X. microceras, X. multiplex, X. multiplex* var. *microsperma, X. muscandae, X. muscula, X. phyllocharis, X. rickii, X. schwackei, X. scruposa* and *X. vivantii*. The following five taxa are described as new, viz.: *X. friabilis, X. martinicensis, X. martinicensis* var. *microspora, X. pallidocylindracea* and *X. vinosa*. In addition, we present five further collections that could not be identified and likely correspond to potentially new taxa (*X.* sp. CLL 5110, *X.* sp. CLL 5241-2, *X.* sp. CLL 5534, *X.* sp. CLLGUAD 029 and *X.* sp. MJF 14123) but are represented by insufficient material to be formally described; two other collections are provisionally referred to *X. gracillima* and *X. oligotoma*, two species having been variously interpreted in the past and whose ill-defined taxonomic concepts preclude a reliable identification; finally, a group of seven collections appearing closely related but showing a disturbing morphological and phylogenetical heterogeneousness are tentatively referred to *X. longiana*. A dichotomous identification key and synoptic figure plates of stromatal surface are presented. In conclusion, a table summarizing the cumulated number of collections of each taxon dealt with in the three parts is provided.
Keywords: Ascomycota, pyrenomycetes, saproxylic fungi, taxonomy, tropical mycology, *Xylariales*.

Résumé : trente-cinq taxons de *Xylaria* récoltés en Guadeloupe et Martinique, présentant des stromas érigés, graciles, d'un diamètre inférieur à 5 mm, sont documentés et commentés dans le présent article qui vient à la suite de deux articles précédents traitant des taxons penzigioïdes (partie I) et des taxons érigés d'un diamètre supérieur à 5 mm (partie II). En se fondant sur l'évaluation et la comparaison de leur caractères morphologiques, vingt-deux taxons connus précédemment ont été identifiés, à savoir *X. adscendens, X. arbuscula, X. arbuscula* var. *plenofissura, X. aristata, X. badia, X. bambusicola, X. coccophora, X. curta, X. feejeensis, X. fimbriata, X. fissilis, X. ianthinovelutina, X. microceras, X. multiplex, X. multiplex* var. *microsperma, X. muscandae, X. muscula, X. phyllocharis, X. rickii, X. schwackei, X. scruposa* et *X. vivantii*. Les cinq taxons suivants sont décrits comme nouveaux, à savoir : *X. friabilis, X. martinicensis, X. martinicensis* var. *microspora, X. pallidocylindracea* et *X. vinosa*. En outre, nous présentons cinq récoltes qui n'ont pu être identifiées et vraisemblablement correspondent à des taxons potentiellement nouveaux (*X.* sp. CLL 5110, *X.* sp. CLL 5241-2, *X.* sp. CLL 5534, *X.* sp. CLLGUAD 029 et *X.* sp. MJF 14123) mais sont représentées par un matériel insuffisant pour être formellement décrites comme nouvelles ; deux autres récoltes sont provisoirement référées à *X. gracillima* et *X. oligotoma*, deux espèces qui ont été diversement interprétées par le passé et dont les concepts taxinomiques ne sont pas assez bien délimités pour permettre une identification fiable ; enfin, un groupe de sept récoltes paraîssant très proches mais présentant une troublante hétérogénéité morphologique et phylogénétique sont provisoirement rattachées à *X. longiana*. Une clé d'identification dichotomique et deux planches synoptiques des surfaces des stromas sont présentées. En conclusion, un tableau résumant le nombre cumulé de récoltes pour chacun des taxons traités dans les trois parties est présenté.
Mots-clés : Ascomycota, champignons saproxyliques, mycologie tropicale, pyrénomycètes, taxinomie, *Xylariales*.

Introduction

This paper is the last in a series of three dedicated to the survey of *Xylaria* spp. collected in Guadeloupe and Martinique during an inventorial program initiated in 2003 in these Caribbean islands (Courtecuisse, 2006). It comes after similar surveys of penzigioid taxa (Fournier *et al.*, 2018b) and robust upright stromata (Fournier *et al.*, 2019) and deals with taxa with slender upright stromata usually less than 5 mm diam. As noted in part I, this segregation based on width of stromata is artificial but it is followed because it can be successfully applied to segregate taxa in most cases. Out of the thirty-five taxa included in part III, twenty-two could be equated to known taxa, viz.: *X. adscendens* (Fr.) Fr., *X. arbuscula* Sacc., *X. arbuscula* var. *plenofissura* Y.-M. Ju & S.-S. Tzean, *X. aristata* Mont., *X. badia* Pat., *X. bambusicola* Y.-M. Ju & J.D. Rogers, *X. coccophora* Mont., *X. curta* Fr., *X. feejeensis* (Berk.) Fr., *X. fimbriata* C.G. Lloyd, *X. fissilis* Ces., *X. ianthinovelutina* (Mont.) Mont., *X. microceras* (Mont.) Fr., *X. multiplex* (Kunze ex Fr.) Fr., *X. multiplex* var. *microsperma* (Speg.) Dennis, *X. muscandae* C.G. Lloyd, *X. muscula* C.G. Lloyd, *X. phyllocharis* Mont., *X. rickii* Theiss., *X. schwackei* Henn., *X. scruposa* (Fr.) Fr. et *X. vivantii* Y.-M. Ju, J.D. Rogers, J. Fourn. & H.-M. Hsieh. Five new taxa are proposed to accommodate collections that could not be equated to known taxa, viz.: *X. friabilis* J. Fourn. & Lechat, *X. martinicensis* J. Fourn. & Lechat, *X. martinicensis* var. *microspora* J. Fourn. & Lechat, *X. pallidocylindracea* J. Fourn. & Lechat and *X. vinosa* J. Fourn., Y.-M. Ju, & Lechat.

In addition, we present five further collections that could not be identified and likely correspond to potentially new taxa (*X.* sp. CLL 5110, *X.* sp. CLL 5241-2, *X.* sp. CLL 5534, *X.* sp. CLLGUAD 029 and *X.* sp. MJF 14123) but are represented by insufficient material to be formally described; two other collections are provisionally referred to *X. gracillima* (Fr.) Fr. and *X. oligotoma* Sacc. & Paol., two species having been variously interpreted in the past and whose ill-defined taxonomic concepts preclude a reliable identification. Finally, a group of seven collections appearing closely related but showing a disturbing morphological and phylogenetical heterogeneousness are tentatively referred to *X. longiana* Rehm. These thirty-five taxa are documented and comments upon their taxonomic delimitation are given when necessary. The taxonomic part is preceded by a dichotomous key to the taxa dealt with in this survey. As the morphology of stromatal surface is most often taxonomically more informative than the stromatal shape itself, the images at the same scale of stromatal surfaces of the thirty-five taxa are arranged in two plates immediately following the key.

The reader is referred to the introduction to part I (Fournier *et al.*, 2018b) for background information on *Xylaria* and comments upon former records of this genus in Guadeloupe and Martinique.

Materials and methods

Refer to Fournier *et al.* (2018a; 2018b).

Taxonomy

Dichotomous key to the slender upright *Xylaria* taxa known from French West Indies

(*X. cuneata* and *X. hyperythra* are included in the key because they occasionally feature slender stromata; these taxa have been documented in part II)

1 Stromata occurring on woody substrates, including bamboo, dicot wood and woody fruits **2**
1 Stromata occurring on leaves or termite nests **37**

2 Stromata occurring on dead corticated or decorticated wood **3**
2 Stromata occurring on bamboo or woody fruits **32**

3 Stromata hard-textured, featuring a carbonaceous crust over 80 µm thick **4**
3 Stromata not carbonaceous, featuring a leathery, rarely slightly carbonaceous crust usually less than 80 µm thick **11**

4 Interior of stroma whitish or light-coloured, occasionally with a narrow dark inner core **5**
4 Interior of stroma partly to entirely dark grey to blackish **9**

5 Stromata with a persistent, grey to tan, striped outer layer **6**
5 Stromata lacking such a striped outer layer **7**

6 Ascospores 10.9–15.4 × 4.3–5.8 µm (12.6 × 5 µm on average), with a germ slit usually less than spore-length ..... ***X. arbuscula***
6 Ascospores 14.3–15.9 × 5.7–7.1 µm (15.1 × 6.3 µm on average), with germ slit almost spore-length ..... ***X. arbuscula* var. *plenofissura***

7 Stromatal surface coarsely cracked; ostioles on a raised discoid base; ascospores 8–10.7 × 3.5–4.4 µm ..... ***X. curta***
7 Stromatal surface not or minutely cracked; ostioles without a raised discoid base **8**

8 Stromatal surface grey to blackish, encrusted with minute black granules; ascospores 8.2–9.6 × 3.8–4.3 µm ..... ***X. pallidocylindracea*** sp. nov.
8 Stromatal surface in shades of purple, lacking obvious black granules; ascospores 9.3–11.1 × 3.8–4.8 µm ..... ***X. vinosa*** sp. nov.

9 Stromatal interior blackish at centre; ascospores fusoid, 12.2–14.7 × 4–5.3 µm, with a germ slit much less than spore-length ..... ***X. fissilis***
9 Stromatal interior whitish or sooty brown at centre; ascospores ellipsoid, smaller, 10.5 × 4.5 µm on average, with a germ slit almost spore-length **10**

10 Stromatal interior blackish around perithecia, whitish at centre; ostioles sharply conical, surrounded by a basal disc 120–170 µm diam. ..... ***X. adscendens***
10 Stromatal interior whitish around perithecia, sooty brown to blackish at centre; ostioles faintly papillate, often inconspicuous, surrounded by a faint basal disc 100 µm diam. ..... ***X. multiplex***

11 Stromata brittle, with light brown to grey powdery interior **12**
11 Stromata coriaceous, with whitish fibrous to pithy interior **14**

12 Stromata 7–18 mm high × 1–2 mm diam., with a pure white, pruinose outer layer **13**
12 Stromata to 32 mm high × 3 mm diam., with a whitish to cream-coloured fibrous outer layer; ascospores 8.8–11 × 3.3–4.3 µm, 9.8 × 3.8 µm on average ..... ***X. friabilis*** sp. nov.

13 Ascospores 6.6–7.9 × 2.6–3.2 µm, 7.2 × 3 µm on average ..... ***X. muscula***
13 Ascospores 9.9–11.3 × 3.4–3.9 µm, 10.6 × 3.7 µm on average ..... ***X. microceras***

14 Stromata with an outer layer cracking into polygonal scales **15**
14 Stromata with an outer layer splitting into elongated stripes or large plaques, or lacking an outer layer **23**

15 Stromatal surface cinnamon to orange brown, finely cracked, with minutely papillate ostioles **16**
15 Stromatal surface differently coloured, more coarsely cracked, with conspicuous ostioles, usually on a raised-discoid base **18**

16 Outer layer bipartite with a white basal layer, cracked into small elongated scales; ascospores 15–18 × 5.3–6.8 µm ..... ***X. hyperythra***
16 Outer layer homogeneous, reticulately cracked into small polygonal scales surrounding the ostioles **17**

17 Ascospores 13.1–17.3 × 4.6–5.5 µm ..... ***X. cuneata***
17 Ascospores 5.9–7.0 × 2.9–3.4 µm ..... ***X.* sp. MJF 14123**

18 Stromatal outer layer fibrous and/or tomentose **19**
18 Stromatal outer layer not fibrous nor tomentose **20**

19 Stromatal outer layer differentiated into small, brown, polygonal to elongated scales; ascospores 15.7–24.1 × 5.4–8.1 µm ..... ***X. scruposa***
19 Stromatal outer layer differentiated into reddish brown, elongated velvety stripes; ascospores 9.2–10.3 × 3.3–4 µm ..... ***X.* sp. CLL 5241-2**

20 Stromatal cylindrical, terete to flattened up to 55 mm high **21**
20 Stromata turbinate, kretzschmarioid, less than 16 mm high **22**

21 Ascospores dark brown, equilateral, 8.2–10.6 × 4.4–5.1 µm ..... ***X. feejeensis***
21 Ascospores medium brown, inequilateral, 8–10.7 × 3.5–4.4 µm ..... ***X. curta***

22 Ascospores 12.9–15.3 × 5.9–7 µm ..... ***X. martinicensis*** sp. nov.
22 Ascospores 9–10.4 × 4.6–5.2 µm ..... ***X. martinicensis* var. *microspora*** var. nov.

23 Stromata with perithecial contours strongly exposed to almost free **24**
23 Stromata even to nodulose but with perithecial contours not to weakly exposed **26**

24 Stromatal surface overlain by a thick bipartite tan and yellow outer layer splitting into large plaques and stripes; ascospores 9.1–10.8 × 3.6–4.1 µm ..... ***X. coccophora***
24 Stromatal surface lacking a peeling outer layer **25**

25 Stromata up to 13 mm high, simple; surface black; ascospores 10.3–12 × 3.6–4.5 µm; on dead blackened wood ..... ***X.* cf. *gracillima***
25 Stromata up to 42 mm high, frequently branched; surface tan to blackish grey; ascospores 6.7–8 × 3.1–3.4 µm; on heavily rotten wood or termite nests ..... ***X. fimbriata***

26 Ascospores 18.9–22.8 × 5.8–6.9 µm, with a dorsal germ pore ..... ***X. rickii***
26 Ascospores smaller, with an usually ventral germ slit **27**

27 Stromatal surface strongly nodulose with circumferential wrinkles, not granulate **28**
27 Stromatal surface lacking deep wrinkles as above but encrusted with clusters of minute black granules **30**

28 Stromatal surface overlain by persistent, horny, elongated grey to brownish grey stripes; ascospores 11–12.2 × 4–4.6 µm ..... ***X.* sp. CLL 5110**
28 Stromatal surface lacking such horny stripes; ascospores smaller **29**

29 Ascospores medium brown, 8.9–10.8 × 3.5–4.5 µm, with short to long germ slit either on dorsal or ventral side ..... ***X. multiplex* var. *microsperma***
29 Ascospores dark brown, 8.4–9.7 × 3.9–4.5 µm, with ventral germ slit ..... ***X.* sp. CLL 5534**

30 Ascospores 6.5–7.5 × 2.8–3.4 µm, with a short germ slit ..... ***X.* cf. *oligotoma***
30 Ascospores larger, with a germ slit spore-length **31**

31 Stromatal surface with a white splitting outer layer; ascospores 9.5–11.6 × 4.4–5.4 µm, blackish brown, with bipolar secondary appendages ..... ***X.* cf. *longiana***
31 Stromatal surface with a bipartite grey and white splitting outer layer; ascospores 10–11.5 × 3.6–4.4 µm, medium brown, lacking secondary appendages ..... ***X. muscandae***

32 Stromata occurring on bamboo **33**
32 Stromata occurring on woody fruits or pods **34**

33 Stromata short-cylindrical, up to 15 mm high, carbonaceous; ascospores 8.9–9.9 × 3.6–4.2 µm, equilateral, light brown, with a short germ slit ..... ***X. badia***
33 Stromata narrowly cylindrical, up to 80 mm high, leathery; ascospores 9.3–11.2 × 3.8–4.9 µm, inequilateral, dark brown, with a short germ slit almost spore-length ..... ***X. bambusicola***

34 Stromatal surface glabrous **35**
34 Stromatal surface densely tomentose **36**

35 Stromata carbonaceous, cylindrical with unexposed perithecial contours; ascospores 10.9–15.4 × 4.3–5.8 µm with germ slit less than spore length and lacking appendages ..... ***X. arbuscula***
35 Stromata filiform, nodulose, leathery; ascospores 11.6–14.6 × 4.1–5.3 µm with germ slit spore-length and bipolar secondary appendages ..... ***X. schwackei***

36 Ascospores 9–11.3 × 3.7–4.7 µm ..... ***X. ianthinovelutina***
36 Ascospores 14.6–17.9 × 4.6–6.5 µm ..... ***X. vivantii***

37 Stromata on termite nests; ascospores 6.7–8 × 3.1–3.4 µm ..... ***X. fimbriata***
37 Stromata on leaves or petioles **38**

38 Stromata broadly ellipsoid; ascospores 10.3–11.7 × 4.9–5.7 µm with a polar secondary appendage ..... ***X. aristata***
38 Stromata cylindrical to narrowly ellipsoid **39**

39 Stromata roughened by prominent ostioles, usually not nodulose, shortly mucronate; ascospores 9.4–15.3 × 4.6–8.8 µm, highly variable, occasionally with bipolar secondary appendages ..... ***X. phyllocharis***
39 Stromata nodulose on a filiform rachis, with long apical extensions; ascospores 10–11.5 × 5.2–6.1 µm, with a cellular appendage ..... ***X.* sp. CLLGUAD 029**

Plate 1 – Comparison at the same scale of stromatal surface of slender *Xylaria* taxa known from Guadeloupe and Martinique
A: *X. adscendens* CLL 5347; B: *X. arbuscula* CLL 5223; C: *X. arbuscula* var. *plenofissura* CLL 5216; D: *X. aristata* CLL 5130; E: *X. badia* CLL 8319; F: *X. bambusicola* CLLMAR 11081; G: *X. coccophora* CLL 7233-2; H: *X. curta* MJF 07222; I: *X. feejeensis* MJF 10123; J: *X. fimbriata* CLL 5010; K: *X. fissilis* MJF13236; L: *X. friabilis* CLL 5238; M: *X.* cf. *gracillima* CLL 0913; N: *X. ianthinovelutina* CLL 2142; O: *X.* cf. *longiana* CLL 5241; P: *X. martinicensis* CLL 5020 (Holotype); Q: *X. martinicensis* var. *microspora* MJF 13061 (Holotype); R: *X. microceras* CLL 2265; S: *X. multiplex* MJF 16114; T: *X. multiplex* var. *microsperma* CLL 2202. Scale bar (C) = 1 mm.

Plate 2 – Comparison at the same scale of stromatal surface of slender *Xylaria* taxa known from Guadeloupe and Martinique A: *X. muscandae* MJF 13111; B: *X. muscula* CLL5223; C: *X.* cf. *oligotoma* CLL 5517B; D: *X. pallidocylindracea* MJF 13363 (Holotype); E: *X. phyllocharis* CLL 0996; F: *X. rickii* MJF 13140; G: *X. schwackei* MJF 13308; H: *X. scruposa* CLL 5217; I: X. sp. CLL 5110; J: *X.* sp. CLL 5241-2; K: *X.* sp. CLL 5534; L: *X.* sp. CLLGUAD 029; M: *X.* sp. MJF 14123; N: *X. vinosa* MJF 16036 (Paratype); O: *X. vivantii* CLL 5539 (Isotype). Scale bar (C) = 1 mm.

Xylaria adscendens (Fr.) Fr., *Nova Acta Regiae Societatis Scientiarum Upsaliensis (ser. 3)*, 1: 128 (1851). Plate 3, Table 1.

Stromata scattered to gregarious in small groups, separate to connated at base by two, cylindrical to slightly fusiform, simple to rarely branching, terete or flattened and apically ramified, straight to slightly curved, with acute to mucronate sterile apices up to 5 mm long, subsessile to shortly-stipitate, 10–53 mm in total height, the fertile head 5–45 mm high × 1.8–4(–8) mm diam., the stipe 3–15 mm high × 0.8–2 mm diam.; surface dull black, glabrous, lacking perithecial contours, with a brownish grey, tan or brown outer layer splitting into large elongated scales, persistent at maturity, gradually vanishing to reveal a black subsurface; subsurface a carbonaceous crust ca. 80–100 µm thick; the stipes ill- to sharply-defined, simple, black, terete to flattened, puckered, glabrous, originating from a pannose, enlarged base; interior solid, woolly-fibrous, dark brown to blackish around perithecia, centrally white to greyish, eventually disintegrating. **Perithecia** subglobose, 0.4–0.5 mm diam., laterally flattened when crowded. **Ostioles** sharply conic-papillate, shiny black, arising from cracks between the brown superficial scales, on a slightly raised, black discoid base 120–170 µm diam., either lined at periphery by a thin ring of white substance or overlain by a white pruinose disc up to 250 µm diam.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 67–78 × 4.5–5.5 µm, the stipes 60–78 µm long, with apical apparatus 1.7–2.2 × 1.4–1.7 µm (Me = 2 × 1.6 µm, N = 25), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 4–5 µm wide at base, tapering to 1–2 µm wide above asci, embedded in mucilaginous material. **Ascospores** (9.1–)9.8–11.5(–12.4) × (3.4–)3.6–4.4(–4.8) µm, Q = (2.2–)2.4–2.8(–3.2), N = 180 (Me = 10.5 × 4.5 µm, Qe = 2.6), ellipsoid-inequilateral with narrowly to broadly rounded ends, medium brown, unicellular, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side; lacking appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics on OMA, including the production of a distinctive yellow pigment, were described by Callan & Rogers (1990), based on material from French Guiana.

Known distribution: Pantropical (Hladki & Romero, 2007; Rogers, 1984; Van der Gucht, 1995).

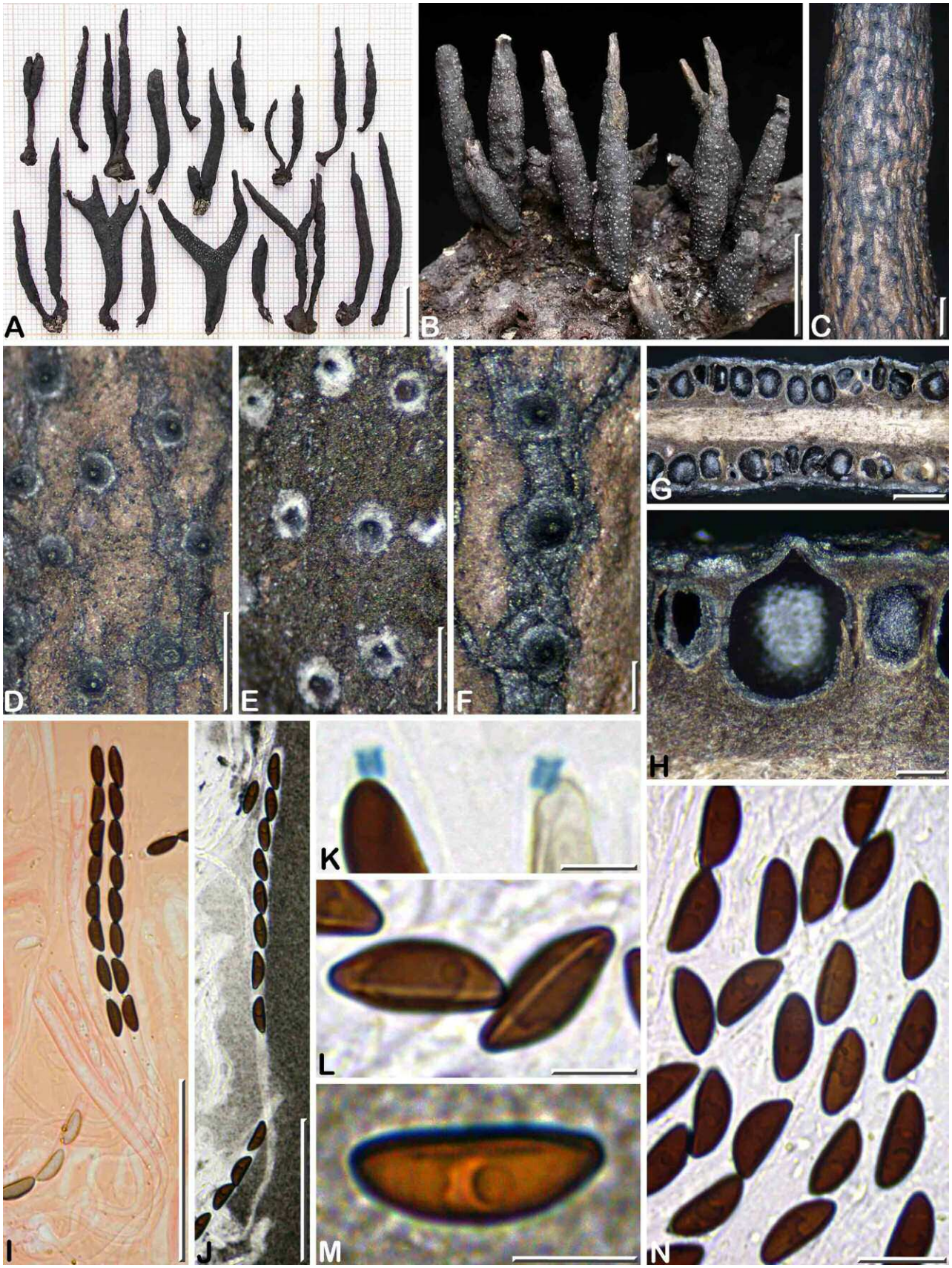

Plate 3 – *Xylaria adscendens*

A, C-H, K-N: CLL 5347; B, I, J: CLL 8254. A: Variously shaped stromata from the same collection; B: Habit of stromata on natural substrate; C: Stromatal surface; D, F: Close-up on stromatal surface showing a cracked brown outer layer and conic-papillate ostiole on a discoid base; E: Close-up on a stroma showing a black subsurface after having lost its brown superficial layer and conspicuous white discs surrounding the ostioles; G: Stroma in longitudinal section showing perithecia fully immersed under the surface and embedded in a blackish layer surrounding a whitish inner region; H: Vertical section of a perithecium immersed beneath a black carbonaceous crust and embedded in a blackish brown tissue; I, J: Asci in Congo red with 3% KOH and in India ink respectively; K: Ascal apical apparati from mature and immature asci, in Melzer's reagent; L: Two ascospores in ventral view showing a germ slit, in 1% SDS; M: Ascospore in India ink showing absence of mucilaginous sheath or appendage; N: Ascospores in 1% SDS. Scale bars: A, B = 10 mm; C, D, G = 1 mm; E = 0.5 mm; F, H = 0.2 mm; I, J = 50 µm; K-M = 5 µm; N = 10 µm.

Table 1 – Ascospore dimensions in three collections of *X. adscendens* from Guadeloupe, showing the range of intraspecific variations, compared with those previously reported worldwide in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5338	(10–1)10.4–11.5(–12.4) × (3.8–)3.9–4.4(–4.5) µm	Q = (2.3–)2.4–2.8(–3), N = 60	Me = 10.9 × 4.2 µm, Qe = 2.6
CLL 5347	(9.4–)9.8–10.9(–11.3) × (3.8–)3.9–4.3(–4.8) µm	Q = (2.3–)2.4–2.7(–2.8), N = 60	Me = 10.3 × 4.1 µm, Qe = 2.5
CLL 8254	(9.1–)9.8–10.8(–11.4) × (3.4–)3.6–4.1(–4.5) µm	Q = (2.2–)2.5–2.8(–3.2), N = 60	Me = 10.2 × 3.9 µm, Qe = 2.6
Cumulated values	(9.1–)9.8–11.5(–12.4) × (3.4–)3.6–4.4(–4.8) µm	Q = (2.2–)2.4–2.8(–3.2), N = 180	Me = 10.5 × 4.1 µm, Qe = 2.6
Dennis (1958) Africa	(10–)11–12.5 × 3.5–4.5(–5) µm	–	Me = 11.8 × 4 µm, Qe = 2.9
Rogers (1984) Tropics	10.5–13 × (3.5–)4.5–5(–6) µm	–	Me = 11.8 × 4.3 µm, Qe = 2.7
San Martín *et al.* (1989) México	(9.5–)10.5–13(–14) × 4–5(–5.5) µm	–	Me = 11.8 × 4.5 µm, Qe = 2.6
Callan & Rogers (1990) French Guiana	10–10.5(–11) × 4–4.5 µm	–	Me = 10.3 × 4.3 µm, Qe = 2.4
Van der Gucht (1995) Papua New Guinea	9–14 × 4–5 µm	–	Me = 9.7 × 4.1 µm, Qe = 2.4
Hladki & Romero (2007) Argentina	10–13 × 4–5 µm	–	Me = 11.5 × 4.5 µm, Qe = 2.6

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Saint-Claude, Matouba, Victor Hughes track, hygrophilic rainforest, on dead wood, 4 Sept. 2005, *leg.* C. Lechat, CLL 5338 (LIP; HAST 145105); Basse-Terre, Vieux-Fort, Ravine Blondeau, hygrophilic rainforest, on dead wood, 4 Sept. 2005, *leg.* C. Lechat, CLL 5347 (LIP; HAST 145106); *ibid.*, on dead wood, 22 Nov. 2006, *leg.* C. Lechat, CLL 6021 (LIP); *ibid.*, on dead wood, 22 Nov. 2006, *leg.* C. Lécuru, CLL 6022 (LIP); *ibid.*, on dead wood, 18 Aug. 2008, *leg.* C. Lechat, CLL 8254 (LIP).

Comments: The numerous reports of *X. adscendens* in the literature suggest it is a widespread tropical taxon featuring some morphological variations, including those of ascospore dimensions, as compiled in Table 1. It is usually regarded as a tropical counterpart of *X. hypoxylon* (L.) Grev., with which it shares stromata varying from cylindrical to flattened and ramified, with sterile acute apices, raised-discoid ostioles and ascospores in a similar size range. This is supported by the strong phylogenetic affinities between the two species demonstrated by Hsieh *et al.* (2010). *Xylaria adscendens* is distinguished from *X. hypoxylon* by carbonaceous stromata with unexposed perithecial contours, overlain by a tan to brown splitting outer layer. Moreover, perithecia are embedded in a blackish layer contrasting with the white to grey inner tissue; this appears to be a good discriminating character but it is not reported in the descriptions found in literature, even in Callan & Rogers (1990) who studied material from French Guiana and whose description is otherwise conforming well to our collections from Guadeloupe. A further discriminating character is the yellow pigment produced in culture, reported by Callan & Rogers (1990).

Most of stromata collected in Guadeloupe are cylindrical and less than 5 mm diam. and thus dealt with along with slender species, but some flattened stromata may occasionally reach 12 mm wide (San Martín *et al.*, 1989). As they usually occur mixed with cylindrical ones, *X. adscendens* is kept with species with slender stromata.

It is noteworthy and intriguing that most of our collections of *X. adscendens* originate from Guadeloupe from the same location, and that it was not found in the neighbouring island of Martinique where much more extensive sampling had been carried out. This suggests that specific ecological requirements are met only in restricted areas. Van der Gucht (1995) mentions a strong preference of *X. adscendens* for very wet sites in dense rainforest, which matches well the sites where we collected it in Guadeloupe.

Xylaria arbuscula Sacc., *Michelia*, 1(2): 249 (1878). Plates 4–5, Tables 2–3.

Stromata solitary to occasionally gregarious in small or large groups, separate, rarely connated at base in small bundles, cylindrical, slightly fusiform or narrowly conical, typically simple and terete, rarely slightly flattened or with isolated deep circumferential wrinkles, occasionally apically furcate, straight, with apiculate to spathulate sterile apices, subsessile to long-stipitate, 3–65 mm in total height, the fertile head 3–24 mm high × 1.5–2(–3) mm diam., the stipe up to 48 mm high × 1–2(–4) mm diam.; surface brownish grey to blackish grey due to a thick, horny, persistent silvery grey to tan outer layer splitting into longitudinally oriented stripes; glabrous, occasionally with scattered, black stiff hairs; perithecial contours usually unexposed; subsurface blackish, a rigid carbonaceous crust 80–120 µm thick; the stipes ill- to sharply-defined, simple to furcate or highly ramified, then giving an arbuscular branching pattern, black, terete to flattened, with dense black stiff hairs, tomentose at base; interior solid, spongy, white to yellowish, with a narrow pale brown inner core, becoming loosely fibrous and greyish with age. **Perithecia** subglobose 0.35–0.5(–0.6) mm diam., laterally flattened when crowded. **Ostioles** obtusely papillate, 80–100 µm diam. at base, barely prominent and often inconspicuous.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 72–84 × 6–7 µm, the stipes 46–74 µm long, with apical apparatus 2.9–3.3 × 1.8–2 µm (Me = 3.1 × 1.9 µm, N = 240), tubular to slightly urn-shaped with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 6–8 µm wide at base, tapering to 2 µm wide above asci, embedded in mucilaginous material. **Ascospores** (10.3–)10.9–15.4(–17) × (4–)4.3–5.8(–6.4) µm, Q = (2–)2.1–3(–3.3), N = 1020 (Me = 12.6 × 5 µm, Qe = 2.5), ellipsoid-inequilateral with narrowly to less frequently broadly rounded ends, at times slightly ventrally concave, medium to dark brown, unicellular, with a conspicuous longitudinally oriented, occasionally slightly obliquely oriented germ slit less to slightly less than spore-length on the ventral side, 6–9(–12) µm long; no mucilaginous sheath; a minute basal secondary appendage occasionally present, only detected in India ink at higher magnification; epispore smooth.

Asexual morph on the natural substrate occasionally observed on immature stromata with strongly ramified to flabellate white powdery apices. Cultural characteristics on OMA were described by Callan & Rogers (1990) based on material from Brazil.

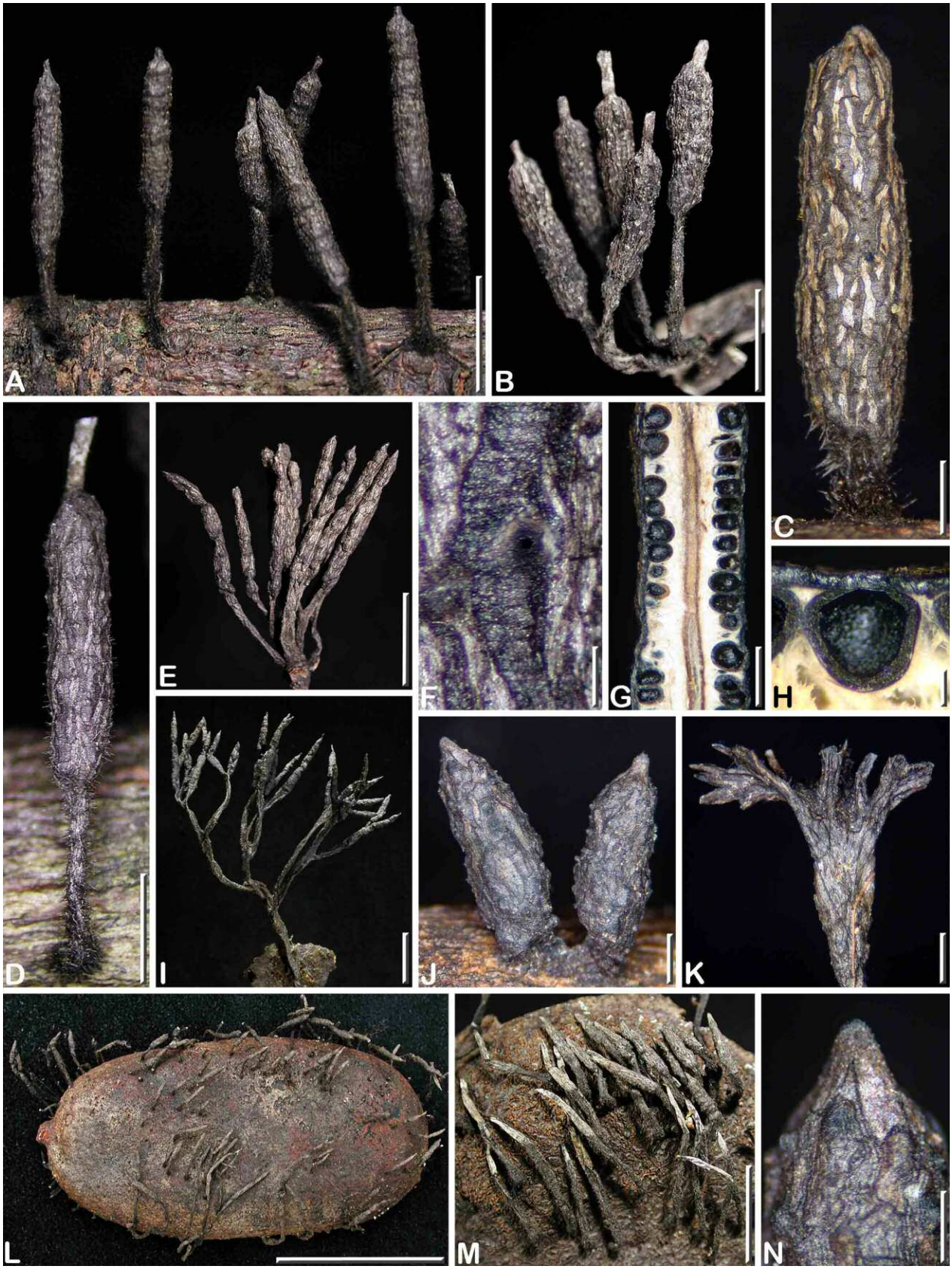

Plate 4 – *Xylaria arbuscula*

A, D, F, H: CLL 8295; B: CLL 5162; C, G: MJF 13124; E: CLL 6156; I: MJF 16030; J, N: MJF 07164; K: CLL 5138; L, M: MJF 13296. A: Habit of upright separate cylindrical stromata with hairy stipe and mucronate apex; B: Bundle of connated stromata with spathulate apex; C: Mucronate subcylindrical stroma on a short hairy stipe; D: Cylindrical stroma with spathulate apex, with scattered stiff hairs on stipe and on fertile head; E: Bundle of cylindrical stromata connated at base; F: Stromatal surface in close-up showing an ostiole piercing the black carbonaceous crust showing through silvery grey stripes of the outer layer; G: Stroma in vertical section showing perithecia fully immersed in a white fibrous internal tissue, with a brownish inner core; H: Perithecium in vertical section lying beneath a thick carbonaceous crust, embedded in a yellowish, loosely fibrous internal tissue; I: Highly ramified stroma; J: Two subsessile, slightly fusiform stromata; K: Flabellate apex of an immature stroma; L: Habit of stromata colonizing a woody pod of *Hymenaea courbaril*; M: Prostrate immature stromata on a woody pod of *Hymenaea courbaril*, some with a conidial white apex; N: Mucronate apex of a stroma showing a split greyish horny outer layer. Scale bars: A, B, D = 5 mm; C, G, J, K, M = 1 mm; F, H = 0.2 mm; I, E = 10 mm; L = 50 mm; N = 0.5 mm.

Known distribution: Pantropical and in hot houses in Europe (Dennis, 1961; Van der Gucht, 1995; Fournier *et al.*, 2010; Fournier, 2014).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Petit-Bourg, forest track of Jules, hygrophilic rainforest, on a dead corticated twig, 1 Sept. 2004, *leg.* C. Lechat, CLL 2267 (LIP); Basse-Terre, Sainte-Rose, Sofaïa, path to Saut des Trois Cornes, meso- to hygrophilic rainforest, on a dead corticated branchlet, 12 Sept. 2003, *leg.* C. Lechat, CLL 1038 (LIP); *ibid.*, on a dead corticated branchlet, 12 Sept. 2003, *leg.* C. Lechat, CLL 1040 (LIP); *ibid.*, on a dead corticated branch, 12 Sept. 2003, *leg.* C. Lechat, CLL 1048 (LIP); *ibid.*, on a dead corticated branch, associated with *Stilbohypoxylon quisquiliarum*, Nov. 2005, *leg.* C. Lechat, CLL 5426 (LIP; HAST 145107); Grande-Terre, Saint-François, Baie Olive, coastal xero-mesophilic forest, on dead wood, 25 Nov. 2006, *leg.* C. Lechat, CLL 605 (LIP). Mar-

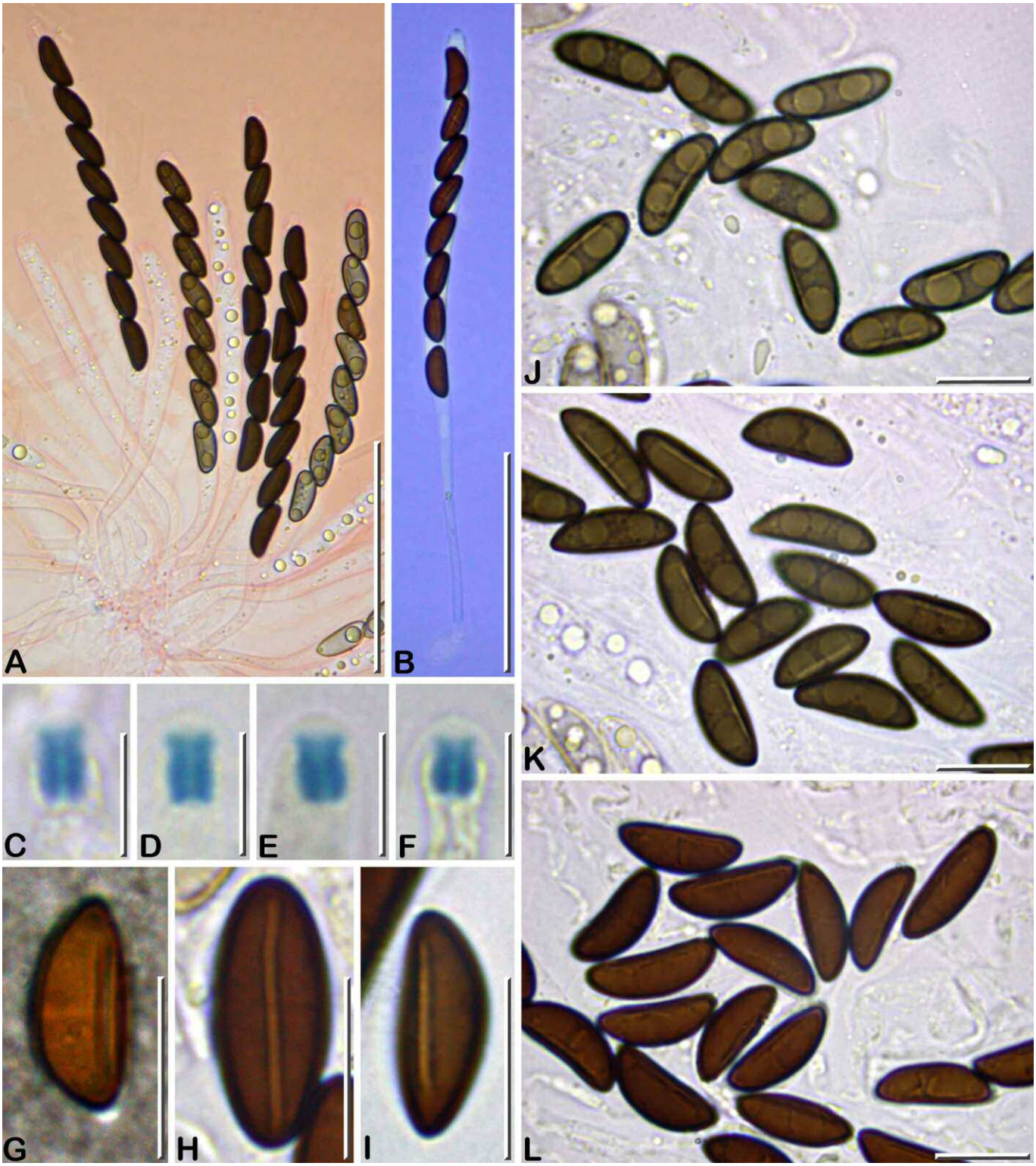

Plate 5 – *Xylaria arbuscula*

A, B, D: MJF 16030; C, J: MJF 16048; E, H, I, L: MJF 10279; F: MJF 13214; G: MJF 14162; K: MJF 10279. A: Bundle of immature and mature asci in Congo red with 3% KOH; B: Ascus with basally broken stipe, in blue Pelikan® ink diluted in 1% SDS; C-F: Tubular to slightly urn-shaped apical apparati, in Melzer's reagent; G: Ascospore in side view showing a basal secondary appendage, in India ink; H, I: Ascospores in ventral view showing germ slits of various lengths, in 1% SDS; J-L: Ascospores in 1% SDS, some in ventral view showing a germ slit. Scale bars: A, B = 50 µm; C-F = 5 µm; G-L = 10 µm.

TINIQUE: Case Pilote, Fond Boucher, coastal mesophilic rainforest, on dead wood, 24 Aug. 2005, *leg.* C. Lechat, CLL 5154 (LIP); *ibid.*, dead corticated branchlet, 25 Aug. 2010, *leg.* J. Fournier, MJF 10106 (LIP); *ibid.*, on dead corticated wood, 17 Aug. 2013, *leg.* J. Fournier, MJF 13292 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 17 Aug. 2013, *leg.* J. Fournier, MJF 13296 (LIP); *ibid.*, on dead corticated wood, 31 Jul. 2016, *leg.* J. Fournier, MJF 16048 (LIP); Case-Pilote, Fond Bourlet, Prise d'Eau, hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla*, *Meliaceae*), associated with *X. ianthino-velutina*, 21 Aug. 2005, *leg.* R. Courtecuisse, CLL 5094–2 (LIP; HAST 145108); *ibid.*, on dead corticated wood, 9 Dec. 2005, *leg.* C. Lechat, CLL 5637 (LIP; HAST 145109); Case-Pilote, Morne Rose, mesophilic rainforest, on a dead corticated branch, 8 Aug. 2013, *leg.* J. Fournier, MJF 13083 (LIP); Fonds-Saint-Denis, Morne Gaubert, mesophilic rainforest, on dead wood, 16 Aug. 2011, *leg.* C. Lechat, CLLMAR 11014B (LIP); Fonds-Saint-Denis, road of Rivière Blanche, hygrophilic rainforest, on dead wood, 4 Sept. 2003, *leg.* C. Lechat, CLL 0861 (LIP); Fort-de-France, Absalon, track to Plateau Michel, 350 m, hygrophilic rainforest, on a dead corticated branch, 5 Jun. 2014, *leg.* J. Fournier, MJF 14047 (LIP); *ibid.*, on a dead corticated branchlet of mahogany (*Swietenia macrophylla*, *Meliaceae*), 15 Jun. 2015, *leg.* J. Fournier, MJF 15093 (LIP); *ibid.*, on a dead corticated trunk, 7 Aug. 2016, *leg.* P.-A. Moreau, MJF 16164 (LIP); Fort-de-France, forest track of Fond Baron, hygrophilic rainforest, on dead corticated branch of Mahogany (*Swietenia macrophylla, Meliaceae*), 10 Aug. 2016, *leg.* J. Fournier, MJF 16200 (LIP); Fort-de-France, edge of the parking lot of Maison forestière de la Donis, hygrophilic rainforest, on a dead corticated branch, 15 Jun. 2014, *leg.* J. Fournier, MJF 14169 (LIP); La Trinité, (Caravelle peninsula), Balata, xerophilic coastal forest, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 23 Aug. 2005, *leg.* C. Lechat, CLL 5138 (LIP); *ibid.*, on a dead corticated branch, 23 Aug. 2005, *leg.* C. Lechat, CLL 5139 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 29 Nov. 2006, *leg.* C. Lechat, CLL 6106 (LIP); *ibid.*, on a dead woody fruit

Table 2 – Comparison of ascospore, apical apparatus and germ slit dimensions of *X. arbuscula* in Guadeloupe and Martinique recorded from specimens on wood, on courbaril pods and woody fruits of mahogany. Extreme values in parentheses.

Collections numbers and substrate	**Ascospore measurements**	**Mean values N = number of measurements**	**Apical apparatus (h × w), N = 20**	**Germ slit length, N = 10**
CLL 5174 wood	(10.3–)10.9–12.2(–12.6) × (4.1–)4.3–4.9(–5.3) µm	Me = 11.6 × 4.6 µm, Qe = 2.5, N = 60		6–9 µm
CLL 8289 wood	(10.4–)11.6–13.1(–13.5) × (4.1–)4.5–5.1(–5.2) µm	Me = 12.3 × 4.8 µm, Qe = 2.6, N = 60	3 × 1.8 µm	6–7.5 µm
CLL 8295 wood	(10.6–)10.9–12.3(–12.7) × (4–)4.5–5.3(–5.7) µm	Me = 11.6 × 5 µm, Qe = 2.4, N = 60		6–7 µm
MJF 10266 wood	(10.7–)11.5–12.6(–13.4) × (4.2–)4.5–5.3(–6.1) µm	Me = 12.1 × 4.9 µm, Qe = 2.5, N = 60		6–8 µm
MJF 15093 wood	(10.8–)11.4–12.8(–13.3) × (4.4–)4.8–5.6(–5.9) µm	Me = 12.2 × 5.2 µm, Qe = 2.3, N = 60	2.7 × 2 µm	6–8.5 µm
MJF 16048 wood	(10.7–)11.3–12.8(–13.7) × (4.3–)4.5–5.1(–5.2) µm	Me = 12 × 4.9 µm, Qe = 2.4, N = 60	3 × 1.9 µm	6–8.5 µm
Cumulated values on wood	(10.3–)10.9–13.1(–13.7) × (4–)4.3–5.6(–6.1) µm	Me = 12 × 4.9 µm, Qe = 2.4, N = 360	2.7–3 × 1.8–2 µm	6–9 µm
CLL 5138 courbaril pod	(11.6–)12.1–14.4(–14.9) × (4.6–)4.8–5.7(–5.9) µm	Me = 13.3 × 5.2 µm, Qe = 2.6, N = 60		7–8.5 µm
CLL 6156 courbaril pod	(11.1–)11.5–13.5(–15) × (4.3–)4.6–5.2(–5.5) µm	Me = 12.6 × 4.9 µm, Qe = 2.6, N = 60	2.8 × 1.8 µm	6–8 µm
CLL 6167 courbaril pod	(11.6–)11.9–14.1(–15.8) × (4.7–)5–5.8(–6.4) µ	Me = 12.9 × 5.4 µm, Qe = 2.4, N = 60	2.9 × 1.9 µm	7–9.5 µm
MJF 10279 courbaril pod	(12–)13.2–15.4(–17) × (4.5–)4.7–5.5(–5.7) µm	Me = 14.2 × 5.1 µm, Qe = 2.8, N = 60	2.8 × 1.8 µm	8–12 µm
MJF 10293 courbaril pod	(11.5–)12.1–13.7(–14.1) × (4.5–)4.8–5.5(–5.7) µm	Me = 12.7 × 5.1 µm, Qe = 2.5, N = 60	2.8 × 1.9 µm	6.5–8 µm
MJF 13124 courbaril pod	(11.6–)12.5–14.5(–15) × (4.5–)4.6–5.5(–5.8) µm	Me = 13.5 × 5.1 µm, Qe = 2.7, N = 60	2.7 × 1.9 µm	8–11 µm
Cumulated values on courbaril pods	(11.1–)11.5–15.4(–17) × (4.3–)4.6–5.8(–6.4) µm	Me = 13.2 × 5.1 µm, Qe = 2.6, N = 360	2.7–2.9 × 1.8–1.9 µm	6–12 µm
CLL 5582 mahogany fruit	(10.6–)11.1–12.3(–12.6) × (4.4–)4.6–5.1(–5.2) µm	Me = 11.7 × 4.8 µm, Qe = 2.4, N = 60	2.9 × 1.8 µm	6–8.5 µm
CLL 7239 mahogany fruit	(12–)12.6–13.9(–14.6) × (4.9–)5.2–5.8(–6) µm	Me = 13.3 × 5.5 µm, Qe = 2.4, N = 60	3.3 × 2.1 µm	6–7.5 µm
MJF 14083 mahogany fruit	(11.4–)11.6–13(–13.8) × (4.4–)4.7–5.4(–5.8) µm	Me = 12.2 × 5.1 µm, Qe = 2.4, N = 60	3.2 × 2 µm	6–7.5 µm
MJF 16030 mahogany fruit	(11.5–)12.3–13.6(–14.7) × (4.5–)4.8–5.5(–5.8) µm	Me = 13 × 5.2 µm, Qe = 2.5, N = 60	3.3 × 2 µm	6–7.5 µm
MJF 16092 mahogany fruit	(11.1–)11.4–12.8(–13.9) × (4.6–)4.9–5.4(–5.7) µm	Me = 12.1 × 5.1 µm, Qe = 2.4, N = 60		5.5–7.5 µm
Cumulated values on mahogany fruits	(10.6–)11.1–13.9(–14.7) × (4.4–)4.6–5.8(–6) µm	Me = 12.5 × 5.1 µm, Qe = 2.4, N = 300	2.9–3.3 × 1.8–2 µm	6–8.5 µm

Table 3 – Ascospore, apical apparatus and germ slit dimensions of *X. arbuscula* in Guadeloupe and Martinique compared with those recorded on material from French Guiana, Germany, Hainan, Mayotte, Taiwan and Thailand, and compared with those reported in literature. Extreme values in parentheses.

Collections numbers and substrate	Ascospore measurements	Mean values N = number of measurements	Apical apparatus (h × w)	Germ slit length
X. arbuscula on wood	(10.3–)10.9–13.1(–13.7) × (4–)4.3–5.6(–6.1) µm	Me = 12 × 4.9 µm, Qe = 2.4, N = 360	2.7–3 × 1.8–2 µm	6–9 µm
X. arbuscula on courbaril pods	(11.1–)11.5–15.4(–17) × (4.3–)4.6–5.8(–6.4) µm	Me = 13.2 × 5.1 µm, Qe = 2.6, N = 360	2.7–2.9 × 1.8–1.9 µm	6–12 µm
X. arbuscula on mahogany fruits	(10.6–)11.1–13.9(–14.7) × (4.4–)4.6–5.8(–6) µm	Me = 12.5 × 5.1 µm, Qe = 2.4, N = 300	2.9–3.3 × 1.8–2 µm	6–8.5 µm
Cumulated values	(10.3–)10.9–15.4(–17) × (4–)4.3–5.8(–6.4) µm	Me = 12.6 × 5 µm, Qe = 2.5, N = 1020	2.7–3.3 × 1.8–2 µm, Me = 3 × 1.9 µm, N = 240	6–9(–12) µm
GYJF 12195 French Guiana	(11.9–)12.4–13.8(–14.8) × (4.6–)4.8–5.6(–5.9) µm	Me = 13 × 5.2 µm, Qe = 2.5	2.9 × 1.9 µm	6–8 µm
GYJF 12240 French Guiana	(10.9–)11.4–12.7(–13) × (4.4–)4.6–5.2(–5.4) µm	Me = 11.9 × 4.9 µm, Qe = 2.5	3.2 × 2 µm	6–8 µm
JU 93082813 Taiwan	(10.2–)11.2–13.1(–15.1) × (4.2–)4.4–5.3(–5.6) µm	Me = 12.2 × 4.8 µm, Qe = 2.5	3.1 × 1.9 µm	5.5–7 µm
MP 2014-092 Mayotte	(11.3–)11.8–13.2(–14.3) × (4.2–)4.6–5.3(–5.5) µm	Me = 12.5 × 4.9 µm, Qe = 2.5	3.5 × 2 µm	5–7 µm
TH 14-03 Thailand	(12.9–)13.5–15.4(–16.7) × (4.7–)5–5.8(–6) µm	Me = 14.3 × 5.4 µm, Qe = 2.6	3 × 2 µm	5–7 µm
VK 2000 Germany	(11.4–)12.1–13.5(–14.2) × (4.1–)4.6–5.8(–6) µm	Me = 12.9 × 5.2 µm, Qe = 2.5	3.2 × 1.9 µm	6–8 µm
YZ 07032 Hainan	(11.3–)11.9–13.1(–13.8) × (4.1–)4.5–5.2(–5.5) µm	Me = 12.6 × 4.9 µm, Qe = 2.6	2.9 × 1.8 µm	5.5–6.5 µm
Dennis (1956)	11–15 × 4.5–6 µm	Me = 13 × 5.3 µm, Qe = 2.4		
Dennis (1961), Congo	11–16 × 4.5–6 µm	Me = 13.5 × 5.3 µm, Qe = 2.5		
Hladki & Romero (2010) Argentina as *X. mellisii*	12–14.5 × 5–6.5 µm	Me = 13.5 × 5.8 µm, Qe = 2.3		spore-length
Ju & Rogers (1999), Taiwan	(12–)12.5–15.5 × 4.5–5.5(–6) µm	Me = 14 × 5 µm, Qe = 2.8		
Rogers *et al*. (1987), Indonesia	11.7–14.7 × 4.4–5 µm	Me = 13.2 × 4.7 µm, Qe = 2.8	2.9–4.4 × 1.5–2.2 µm	
Rogers *et al.* (1988), Venezuela	14.5–17.5 × 6–6.5 µm	Me = 16 × 6.3 µm, Qe = 2.5	3 × 2 µm	
San Martín & Rogers (1989), México	(12–)13–18(–19) × (4–)4.5–6 µm	Me = 15.5 × 5.3 µm, Qe = 2.9	3.5–5.5 × 2.5–3 µm	
San Martín & Rogers (1989), México as *X.* cf. *arbuscula*	(10–)11–13(–14) × 4–5(–6) µm	Me = 12 × 4.5 µm, Qe = 2.7	2.3 × 2–3 µm	undulate to spiralling
Van der Gucht (1995), PNG as *X. mellisii*	13–14(–14.5) × 5–6 µm	Me = 13.5 × 5.4 µm, Qe = 2.5	3–3.5 × 2–2.5 µm	short to almost spore-length, slightly spiralling

of *Hymenaea courbaril* (*Fabaceae*), 29 Nov. 2006, *leg.* C. Lechat, CLL 6110 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 11 Aug. 2013, *leg.* J. Fournier, MJF 13124 (LIP); La Trinité (Caravelle peninsula), Tartane, Pointe Bateau, coastal meso- to xerophilic forest, on a dead corticated branch, 3 Dec. 2006, *leg.* C. Lechat, CLL 6152 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 3 Dec. 2006, *leg.* C. Lechat, CLL 6156 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 3 Dec. 2006, *leg.* C. Lechat, CLL 6158 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 3 Dec. 2006, *leg.* C. Lechat, CLL 6167 (LIP); *ibid.*, on a dead corticated branch, 26 Aug. 2010, *leg.* C. Lechat, MJF 10136 (LIP); La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 27 Aug. 2005, *leg.* C. Lechat, CLL 5200 (LIP); *ibid.*, on a dead corticated branch, 27 Aug. 2005, *leg.* C. Lechat, CLL 5214 (LIP; HAST 145110); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 27 Aug. 2005, *leg.* C. Lechat, CLL 5230 (LIP) (immature); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 27 Aug. 2005, *leg.* C. Lechat, CLL 5231 (LIP) (immature); *ibid.*, on a dead corticated branch, 27 Aug. 2005, *leg.* C. Lechat, CLL 5234 (LIP) (immature); *ibid.*, on a dead corticated branch, 2 Sept. 2008, *leg.* C. Lechat, CLL 8411 (LIP); *ibid.*, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 22 Aug. 2010, *leg.* J. Fournier, MJF 10036 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 29 Aug. 2010, *leg.* J. Fournier, MJF 10220 (LIP); Le Marigot, Habitation Denel, Perou State Forest, hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 7 Jun. 2014, *leg.* J. Fournier, MJF 14083 (LIP); Le Marin, source Berry, xero- mesophilic forest, on dead wood, 25 Aug. 2005, *leg.* C. Lechat, CLL 5171 (LIP); *ibid.*, on dead wood, 25 Aug. 2005, *leg.* C. Lechat, CLL 5174 (LIP); Le Marin, Morne Aca, coastal mesophilic forest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 14 Aug. 2007, *leg.* C. Lechat, CLL 7239 (LIP); Le Morne-Rouge, La Propreté forest trail, hygrophilic rainforest, on bark, 24 Aug. 2007, *leg.* J. Fournier, MJF 07072 (LIP); *ibid.*, on a dead corticated branch, 6 Jun. 2014, *leg.* J. Fournier, MJF 14073 (LIP); Le Morne-Vert, Trace de Caplet, hy-

grophilic rainforest, dead corticated branch, 25 Aug. 2011, *leg.* C. Lechat, CLLMAR 11104 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead corticated branch, 27 Aug. 2007, *leg.* J. Fournier, MJF 07151 (LIP); Le Saint-Esprit, Morne David, mesophilic rainforest, on a dead corticated branch, 23 Aug. 2004, *leg.* C. Lechat, CLL 2007 (LIP); *ibid.*, on a dead corticated branchlet, 23 Aug. 2004, *leg.* C. Lechat, CLL 2037 (LIP); *ibid.*, on a dead corticated branch, 23 Aug. 2004, *leg.* C. Lechat, CLL 2041 (LIP); Le Saint-Esprit, Bois La Charles, mesophilic rainforest, on a dead corticated branch, 8 Dec. 2005, *leg.* C. Lechat, CLL 5621 (LIP; HAST 145111); *ibid.*, on a dead corticated branchlet, 30 Aug. 2010, *leg.* J. Fournier, MJF 10262 (LIP); *ibid.*, on a dead corticated branchlet, 30 Aug. 2010, *leg.* C. Lechat, MJF 10266 (LIP); *ibid.*, on a dead corticated branchlet, 30 Aug. 2010, *leg.* J. Fournier, MJF 10268 (LIP); Rivière-Pilote, Lépinay forest, mesophilic rainforest, on dead corticated wood, 10 Aug. 2013, leg J. Fournier, MJF 13112 (LIP); Saint-Joseph, Coeur-Bouliki forest, hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 26 Aug. 2007, *leg.* J. Fournier, MJF 07111 (LIP); Sainte-Luce, Montravail forest, relict hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 7 Dec. 2005, *leg.* C. Lechat, CLL 5582 (LIP; HAST 145112); *ibid.*, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 7 Dec. 2005, *leg.* C. Lechat, CLL 5595 (LIP); *ibid.*, on dead wood, 7 Dec. 2005, *leg.* C. Lechat, CLL 5597 (LIP); *ibid.*, on a dead corticated branchlet, 23 Aug. 2008, *leg.* C. Lechat, CLL 8289 (LIP); *ibid.*, on a dead corticated branchlet, 23 Aug. 2008, *leg.* C. Lechat, CLL 8295 (LIP); *ibid.*, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 30 Jul. 2016, *leg.* P.-A. Moreau, MJF 16030 (LIP); Sainte-Luce, Trois Rivières, ravine Saint-Pierre, on a dead corticated branchlet, 28 Nov. 2006, *leg.* C. Lechat, CLL 6091 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 28 Nov. 2006, *leg.* C. Lechat, CLL 6098 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 28 Nov. 2006, *leg.* C. Lechat, CLL 6101 (LIP); Sainte-Marie, La Philippe, coastal mesophilic rainforest, on dead corticated branchlets, 31 Aug. 2010, *leg.* J. Fournier, MJF 10271 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 31 Aug. 2010, *leg.* J. Fournier, MJF 10279 (LIP); *ibid.*, on a dead corticated branchlet, 31 Aug. 2010, *leg.* J. Fournier, MJF 10292 (LIP); *ibid.*, on a dead woody fruit of *Hymenaea courbaril* (*Fabaceae*), 31 Aug. 2010, *leg.* J. Fournier, MJF 10293 (LIP) (barely mature); *ibid.*, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 31 Aug. 2010, *leg.* J. Fournier, MJF 10294 (LIP); *ibid.*, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 2 Aug. 2016, *leg.* C. Lechat, MJF 16092 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead wood, 5 Aug. 2013, *leg.* J. Fournier, MJF 13002 (LIP); Schoelcher, Plateau Boucher, hygrophilic rainforest, on a dead corticated branchlets of mahogany (*Swietenia macrophylla, Meliaceae*), 15 Jun. 2014, *leg.* J. Fournier, MJF 14162 (LIP); Schoelcher, Rivière Duclos, Fontaine Didier, meso- to hygrophilic rainforest, on dead corticated twigs, 28 Aug. 2007, *leg.* J. Fournier, MJF 07164 (LIP).

Specimens examined from outside FWI: French Guiana: Sinnamary, Paracou, CIRAD field centre, hygrophilic rainforest, on a corticated branchlet, 25 Jun. 2012, *leg.* J. Fournier, GYJF 12195 (JF); *ibid.*, on a corticated branch, 26 Jun. 2012, *leg.* J. Fournier, GYJF 12240 (JF). Germany: Brandenburg, Potsdam, Botanical Garden, Victoria-Haus, on a plant container with bamboos in a greenhouse, 31 Jan. 2000, *leg.* V. Kummer, VK 2000 (JF). Mayotte: Bandabroua, Dzoumonié, lowland rainforest, on a dead corticated branch, 23 Feb. 2014, *leg.* M. Pélissier, MP 2014-092 (JF). P.R. China: Hainan, Diaoluo mountain, ca. 1000 m, hygrophilic rainforest, on dead wood, July 2007, *leg.* Y. Zhang, YZ 07032 (JF). Taiwan: Ping-tung Co., Heng-chun, Ken-ting, on bark, 28 Aug. 2004, Y.-M. Ju & H.M. Hsieh, 93082813 (HAST; JF). Thailand: Chiang Mai Province, Mae Teang District, Bahn Pha Deng, Mushroom Research Centre, alt. 900 m, on corticated branch, 14 Jun. 2005, *leg.* J. Fournier, JF TH 14-03 (JF).

Comments: As repeatedly acknowledged by mycologists having studied ample material referable to *X. arbuscula* and its numerous putative synonyms including *X. mellisii* (Berk.) Cooke, this taxon appears ill-defined owing to a wide array of morphological variations; it is therefore suspected to encompass several cryptic species and is often referred to as a group or a complex of species (Dennis, 1961; Callan & Rogers, 1990; Rogers *et al.*, 1988; San Martín & Rogers, 1989; Van der Gucht, 1995; Ju & Rogers, 1999; Rogers & Ju, 2012; Ju *et al.*, 2016).

Species included in the *X. arbuscula* complex have in common small, slender cylindrical stromata with a mucronate sterile apex and unexposed perithecial contours, superficially coated with a persistent, grey to tan layer splitting into longitudinal stripes; their stipes vary from simple to highly branched and are typically hairy; their texture is hard, due to a relatively thick carbonaceous crust. Variations in stroma size and shape and branching pattern of the stipes are usually regarded as uninformative as they can be encountered within the same collection. This set of characters allows a good definition of the X. arbuscula complex, within which species delimitation is usually based on ascospore dimensions and shape and germ slit morphology. The ascospore size range usually accepted by most authors for X. arbuscula is roughly 11–15 × 4.5–6 µm (Table 3). Species with ascospores more than 20 µm long are referred to *X. apiculata* Cooke and *X. zealandica* Cooke, both suspected to be synonyms (Rogers & Samuels, 1986). Species with ascospores ranging between 15 and 20 µm long form a poorly resolved group including the two penzigioid (possibly synonyms) species *X. schreuderiana* Van der Bijl and *X. xylarioides* Speg. discussed by Rogers & Samuels (1986), Ju & Rogers (1999), Hladki & Romero (2010) and Fournier *et al.* (2016). Stunted penzigioid stromata of *X. arbuscula* are occasionally encountered on small branchlets but they usually are associated with more typical slender stromata and their ascospore dimensions and shape distinguish them from *X. xylarioides*. *Xylaria arbuscula* var. *plenofissura* was proposed for collections from Taiwan externally like *X. arbuscula* but with larger ascospores 16–19 × 5.5–7 µm (Ju & Tzean, 1985; this paper). Ju & Rogers (1999) acknowleged that *X. juniperus* Starb. var. *asperula* Starb. is "undoubtedly an earlier synonym" of *Xylaria arbuscula* var. *plenofissura*, being redescribed from México by San Martín *et al.* (2001). However, as pointed out by Ju & Rogers (1999), *X. venosula* Speg. is likewise a potentially earlier synonym, which precludes a nomenclatural decision until a reassessment of this group is undertaken. With ascospores 14–20.9 × 4.9–7.8 µm, *X. pseudoapiculata* Hamme & Guerrero, described from Brazil, is likewise related to the large-spored species of the *X. arbuscula* complex; it was segregated from *X. apiculata* by the spiralling germ slit of ascospores (Hamme & Guerrero, 1997) and thereafter reported from northern Argentina by Hladki & Romero (2010).

Species of the *X. arbuscula* complex with small ascospores were discussed in detail by Ju & Rogers (1999). They assigned collections featuring ascospores 11–13.5 × 4.5–5.5 µm with a long germ slit to *X. brachiata* Sacc. which, after examination of the type material, turned out to be a synonym of *X. arbuscula* (Ju, pers. comm., 2005). Ju *et al.* (2016) recently resurrected *X. partita* C.G. Lloyd that differs from *X. arbuscula* by ascospores 10–12 × 4.5–5.5 µm with a long germ slit and might accommodate species previously referred to *X. brachiata*.

Ju & Rogers (1999) also reported two other small-spored species from Taiwan without making a formal decision regarding their taxonomic status as their characteristics in culture do not markedly differ from those of *X. arbuscula*. One, suspected to be pathogenic on sugarcane, differs from *X. arbuscula* by more slender stromata 1–1.5 mm diam. with more conspicuous perithecial contours and ascospores (9–)10–11.5(–12.5) × 4–5 µm with more obtuse ends. The other species has ascospores 9.5–11 × 4–5 µm but with narrowly rounded ends and a long germ slit, thus resembling *X. bacillaris* Rehm, the type of which could not be located for comparison.

As shown on Table 2, ascospore dimensions of our collections from Guadeloupe and Martinique fall within the size range of most

collections from other regions that we examined and the size ranges of most records available in literature. As we collected *X. arbuscula* on wood but also on woody fruits, an attempt was made to find a possible correlation between the substrate and microscopical characters like ascospore dimensions, germ slit length and ascus apical apparatus dimensions (Table 2). The latter character appears fairly stable, thus uninformative. While the collections from wood and from mahogany pods do not apparently differ as to ascospore and germ slit dimensions, ascospores from those on courbaril pods are slightly longer and darker brown and often exhibit a germ slit almost spore-length. This suggests a possible distinct taxonomic status for the collections on courbaril pods but the wide overlap with dimensions encountered in collections on other substrates precludes the segregation of a distinct taxon based on morphological characters only.

Xylaria partita, known from Puerto Rico (Ju *et al.*, 2016) was considered to accommodate our smaller-spored collections because of a similar Caribbean origin. However, in our smaller-spored collections, ascospore germ slits are consistently much less than spore length while in *X. partita* the germ slit is almost spore-length. This absence of a clear correlation between the morphological and ecological characters we surveyed and the lack of differential characters observed in culture between small-spored and large-spored collections (Ju, pers. comm., 2005) leads us to assign all our collections from Guadeloupe and Martinique to *X. arbuscula* in the wide sense currently accepted of a widespread protean species.

Xylaria arbuscula* var. *plenofissura Y.-M. Ju & S.-S. Tzean, *Transactions of the Mycological Society of the Republic of China*, 1: 107 (1985). Plate 6, Table 4.

Stromata scattered, separate, cylindrical, slightly fusiform or ovoid, terete to slightly flattened or somewhat constricted in places, occasionally apically furcate, straight, with apiculate, cylindrical, conical or spathulate sterile apices up to 5.2 mm long, subsessile to stipitate, 6.2–29 mm in total height, the fertile head 3.6–22 mm high (including apical sterile extension) × 2–3.6 mm diam., the stipe 1.5–5.7 mm high × 0.6–1(–2) mm diam.; surface blackish, glabrous, cracked into thick longitudinally oriented carbonaceous scales overlain by a persistent, horny, tan outer layer, forming a striped pattern; perithecial contours unexposed; subsurface blackish, a rigid carbonaceous crust 120–170 µm thick; the stipes ill- to sharply-defined, simple, black, terete to flattened, glabrous or with sparse black stiff hairs, enlarged and tomentose at base; interior solid, whitish, spongy to loosely fibrous. **Perithecia** subglobose 0.4–0.6 mm diam., laterally flattened when crowded. **Ostioles** obtusely papillate, 40–70 µm diam., black, barely prominent and often inconspicuous.

Asci subclavate when immature, cylindrical at maturity, with (4–6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 94–108 × 7–9 µm, the stipes 44–65 µm long, with apical apparatus 3.3–3.8 × 1.9–2.3 µm (Me = 3.5 × 2.1 µm, N = 20), tubular to slightly urn-shaped with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 5–8 µm wide at base, tapering to 2 µm wide above asci, discretely embedded in mucilaginous material. **Ascospores** (13.7–)14.3–15.9(–17.7) × (4.8–)5.7–7.1(–7.4) µm, Q = (2.1–)2.2–2.7(–3.1), N = 60 (Me = 15.1 × 6.3 µm, Qe = 2.4), ellipsoid-inequilateral with narrowly to broadly rounded ends, at times slightly ventrally concave, medium brown to dark brown, with a fugacious cellular appendage only detected on hyaline immature ascospores, with a conspicuous longitudinally oriented, occasionally slightly obliquely oriented or slightly sigmoid germ slit almost spore-length on the ventral side, less frequently on the dorsal side; no mucilaginous sheath or appendage visible in India ink; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics on OMA and asexual morph were described by Ju & Rogers (1999) based on material from Taiwan.

Known distribution: France, Spain (Canary Islands) (Fournier *et al.* 2011); Martinique (this paper); Taiwan (Ju & Tzean, 1985; Ju & Rogers, 1999).

Specimens examined: French West Indies: Martinique: La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on a dead corticated branch, 27 Aug. 2005, *leg.* C. Lechat, CLL 5216 (LIP; HAST 145113). Taiwan, Ping-tung Co., Heng-chun, Ken-ting, on bark, 16 July 2001, *leg.* Y.-M. Ju & H. M. Hsieh 90071618 (HAST).

Comments: The fungus illustrated above was equated with *X. arbuscula* var. *plenofissura* by Dr. Ju, based on morphological traits and cultural characteristics. It shares indeed with *X. arbuscula* similar cylindrical, apiculate, hard-textured stromata with unexposed perithecial contours, minute ostioles and a horny outer layer splitting into elongated stripes; its ascospores that are larger on average than those of typical *X. arbuscula* and are provided with an almost spore-length germ slit are the key features on which the segregation of the variety was based (Ju & Tzean, 1985). However, upon examination of a specimen of *X. arbuscula* var. *plenofissura* from Taiwan kindly sent by Dr. Ju, some minor differences were noticed. The stromata of the collection from Martinique feature a thicker carbonaceous crust (120–170 µm vs. 60–80 µm), their surface is more strongly roughened by thick scales and the striped outer layer is tan vs. mouse grey. Ascospores are likewise smaller on average but extreme values widely overlap, as shown in Table 4. Compared with the numerous similarities with the Taiwanese specimen, these differ-

Table 4 – Ascospore and apical apparatus dimensions of *X. arbuscula* var. *plenofissura* from Martinique and Taiwan, compared with those reported in literature for material from Taiwan and with those of *X. juniperus* var. *asperula*. Extreme values in parentheses.

Collections numbers	**Ascospore measurements**	**Q = quotient l/w N = number of measurements**	**Mean values**	**Apical apparatus (h × w)**
CLL 5216, Martinique	(13.7–)14.3–15.9(–17.7) × (4.8–)5.7–7.1(–7.4) µm	Q = (2.1–)2.2–2.7(–3.1), N = 60	Me = 15.1 × 6.3 µm Qe = 2.4	3.3–3.8 × 1.9–2.3 µm Me = 3.5 × 2.1 µm, N = 20
90071618 (HAST), Taiwan	(14.4–)15.3–17.8(–19) × (5.3–)5.5–7(–7.7) µm	Q = (2.2–)2.5–3(–3.4), N = 60	Me = 16.7 × 6.2 µm Qe = 2.7	3–4.4 × 2.1–2.7 µm Me = 3.7 × 2.3, N = 20
Ju & Rogers (1999), Taiwan	(15.5–)16–19 × 5.5–7 µm		Me = 17.5 × 6.6 µm Qe = 2.5	
Ju & Tzean (1985), Taiwan	16.5–19 × 6.5–7.5 µm		Me = 17.8 × 7 µm Qe = 2.5	
X. juniperus var. *asperula* Starbäck (1901), Brazil	15–18 × 6–7 µm		Me = 16.5 × 6.5 µm Qe = 2.5	
X. juniperus var. *asperula* San Martín *et al.* (2001), México	15–17 × 5–5.5 µm		Me = 16 × 5.3 µm Qe = 3	4 × 2–3 µm

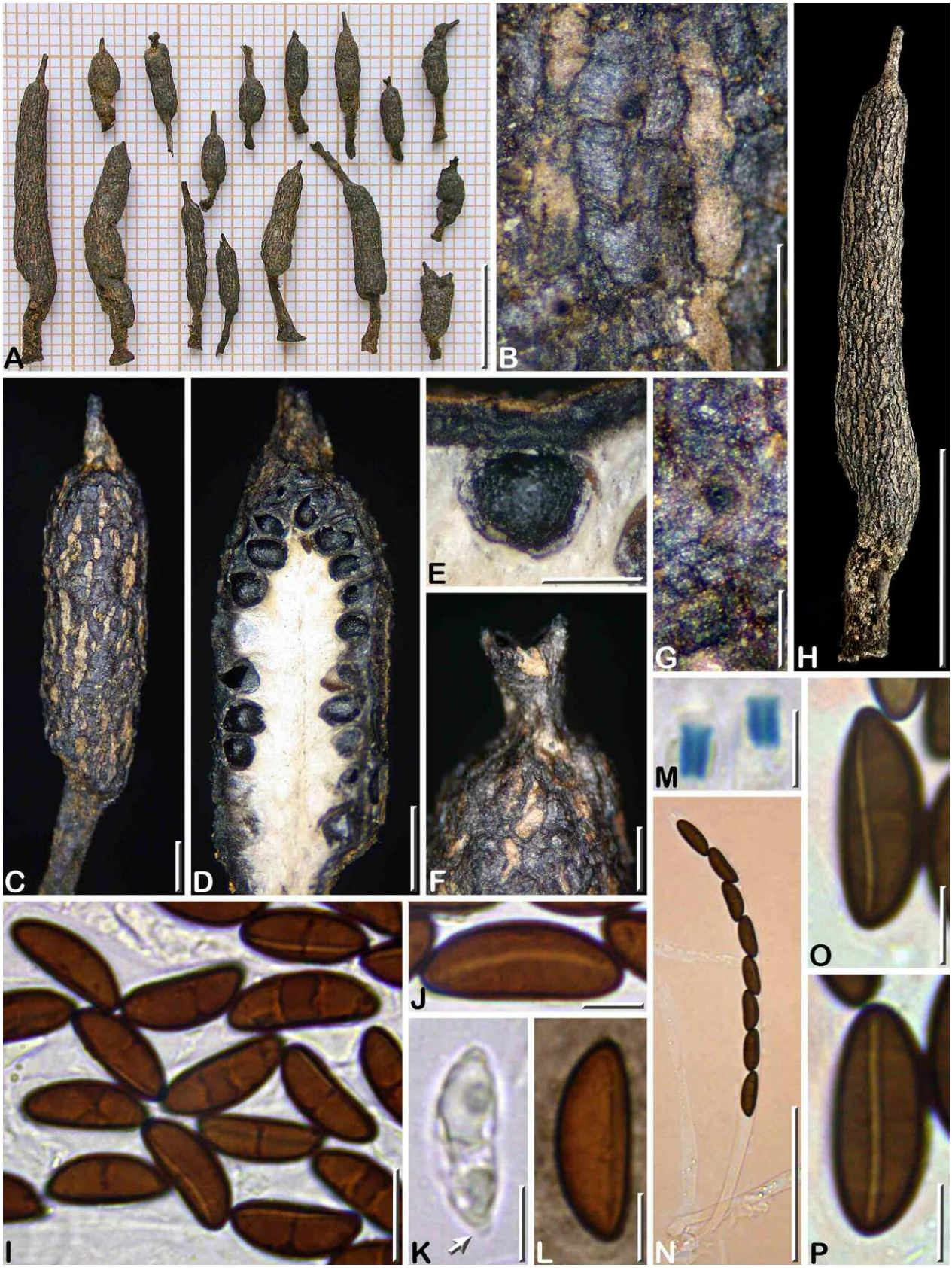

Plate 6 – *Xylaria arbuscula* var. *plenofissura*

A-P: CLL 5216. A: Variously stipitate and apically mucronate stromata; B: Stromatal surface in close-up showing three black ostioles piercing the carbonaceous crust and thick carbonaceous scales with tan superficial coating; C, H: Stromata showing tan superficial stripes; D: Stroma in vertical section showing perithecia fully immersed under a black crust and embedded in a whitish fibrous tissue; E: Perithecium in vertical section lying beneath a thick carbonaceous crust, embedded in a whitish, fibrous internal tissue; F: Apex of a stroma showing a branched process; G: Stromatal surface in close-up showing a black, faintly papillate ostiole; I: Variously shaped ascospores, some showing a germ slit, in 1% SDS; J: Ascospore showing a dorsal germ slit, in 1% SDS; K: Immature hyaline ascospore showing a basal cellular appendage (arrow), in 1% SDS; L: Mature ascospore in India ink showing absence of cellular appendage or mucilaginous sheath; M: Ascal apical apparati, in Melzer's reagent; N: Ascus and a paraphyse, in Congo red in 3% KOH; O, P: Ascospores in ventral view showing respectively a slightly sigmoid and a straight germ slit, in Congo red in 3% KOH. Scale bars: A, H = 10 mm; B, E, F = 0.5 mm; C, D = 1 mm; G = 0.2 mm; I = 10 µm; J-M, O, P = 5 µm; N = 50 µm.

ences that we recorded on a single, perhaps aberrant collection, do not warrant the segregation of a further new taxon.

Ju & Rogers (1999) suggested that *X. juniperus* var. *asperula* (Starbäck, 1901) was likely an earlier synonym of *X. arbuscula* var. *plenofissura* but refrained from making any taxonomic or nomenclatural decision until this group of large-spored taxa related to *X. arbuscula* is better understood. Based on the original description of material from Brazil by Starbäck (1901) and that of a collection from México by San Martín *et al.* (2001), similarities with *X. arbuscula* var. *plenofissura* are prevailing compared with minor differences. The picture appears even more complicated when collections from Europe with similar morphology and cultural characteristics (Ju, pers. comm.) are included under this name (Fournier *et al.*, 2011; Fournier, 2014), suggesting it is a widespread but still poorly known taxon with morphological variations related to geographic origin.

A collection of *X. arbuscula* var. *plenofissura* from Taiwan was included by Hsieh *et al.* (2010) in their phylogenetic assessment of *Xylaria sensu lato*, showing its close affinity with *X. arbuscula* but supporting its distinctiveness. In the same study, *X. venosula*, that was suspected to be likewise a synonym of *X. arbuscula* var. *plenofissura* by Ju & Rogers (1999), was shown to be closer to typical *X. arbuscula* than to its variety.

Xylaria aristata Mont., *Annales des Sciences Naturelles, Botanique*, 3: 106 (1855). Plate 7.

Stromata discreet, scattered on a dead leaf, prostrate to upright, 9–12 mm in total height; fertile part broadly ellipsoid, 2–3 mm high × 1.8–2 mm wide, apex obtusely rounded, occasionally with a small conical blackish mucro; surface smooth, tan to dark grey, glabrous, without exposed perithecial contours; subsurface a black leathery crust 40–45 µm thick; interior solid, soft, slightly fibrous, white; stipes well-defined, simple to branched, straight to geniculate, terete, black, clothed with dense reddish brown hairs. **Perithecia** subglobose, 0.5–0.6 mm diam. **Ostioles** barely prominent, black, obtusely papillate, inconspicuous.

Asci cylindrical, with (4–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 72–82 × 6.5–7.5 µm, the stipes 68–85 µm long, with apical apparatus 2.1–2.8 × 1.8–2.2 µm (Me = 2.5 × 2 µm, N = 20), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, 6–8 µm wide at base, tapering to 1–2 µm wide above asci, embedded in mucilaginous material. **Ascospores** (9.3–)10.3–11.7(–13.2) × (4.5–)4.9–5.7(–5.9) µm, Q = (1.8–)1.9 –2.3(–2.5), N = 60 (Me = 11 × 5.3 µm, Qe = 2.1), ellipsoid-inequilateral, with narrowly to broadly rounded ends, dark brown to blackish brown, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side, with a hemispherical to subglobose secondary appendage ca. 2 µm wide on one end and a flattened mucilaginous cap on opposite end, best viewed when stained by aqueous nigrosin, without mucilaginous sheath on sides; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Likely neotropical.

Specimen examined: French West Indies: Martinique: Case-Pilote, Morne Bois-Laroche, mesophilic rainforest, on a dead leave in the leaf litter, 22 Aug. 2005, *leg.* C. Lechat, CLL 5130 (LIP).

Comments: The taxonomic concept of *X. aristata* is based on the detailed protologue by Montagne (1855) and the short illustrated descriptions given by Dennis (1956; 1958). This foliicolous species is characterized by a smooth, tan to dark grey, subglobose, mucronate fertile part with inconspicuous ostioles, on a slender, well-defined hairy stipe and blackish inequilateral ascospores 9–10 × 4.5–5 µm.

Our collection fits well this concept but deviates in two respects– the development of the apical mucro and the appendaged ascospores.

In his description based on type material, Dennis does not mention nor illustrate a mucronate apex (Dennis, 1956), while Montagne reports a long mucro to a thread-like apical extension up to 6 mm long (Montagne, 1855). An answer to this discrepancy may be found in Montagne's illustration of *X. aristata* which shows an obviously different fungus with a broadly conical fertile part with nodulose surface, prominently papillate ostioles and a mucronate to filiform apex. Interestingly, our collection contains other leaves collected at the same time that feature such stromata with filiform apical extensions, unfortunately immature. Based on a few ascospores that could be measured, the name *X. delicatula* Starb. was considered but could not be supported by the lack of well-developed material. It cannot be ruled out that both species commonly co-occur, leading to possible confusions.

These confusing boundaries between *X. aristata* and *X. delicatula* were likewise discussed by San Martín & Rogers (1989) in their comments on *Xylaria* sp. SM 337, thereafter synonymized with *X. delicatula* by San Martín (1992).

Appendages on ascospores may be easily overlooked when observed in water and it is interesting to note that the presence of two types of appendages is only revealed in aqueous nigrosin, while observation in India ink shows only the rounded appendage and misses the flattened ones on the opposite side.

Xylaria aristata was likewise reported from México on woody fruits of *Guazuma ulmifolia*, featuring conical fertile heads with acute apex and surface roughened by exposed perithecial contours and papillate ostioles (San Martín & Rogers, 1989).

Our identification of the collection from Martinique cannot be more than tentative, until more investigations on taxa resembling *X. aristata* and tiny foliicolous *Xylaria* spp. in general enable to assess clearer taxonomic concepts.

Xylaria badia Pat., *Journal de Botanique*, 5 (19): 319 (1891). Plate 8.

Stromata scattered or in small groups, separate, ranging from cylindrical to fusiform, obovoid or conical, simple to rarely furcate, terete, straight to curved, with broadly rounded fertile apices, subsessile to shortly stipitate, (2.5–)5–15(–28) mm in total height, the fertile head (2–)5–13(–22) mm high × 1.8–4.8 mm diam., the stipe up to 6 mm high × 1–1.8 mm diam.; surface greyish brown to silvery grey at maturity, smooth to finely cracked around the ostioles, overlain with an orange and finely tomentose outer layer before maturity that gradually wears off, with perithecial contours not to faintly exposed in places; the stipes ill-defined, dark brown to black, smooth, enlarged at base, surrounded by a dark brown to black sleeve of thick tomentum; crust slightly carbonaceous, black, 100–130 µm thick; interperithecial tissue black, soft-textured, interior solid, spongy, white to tan. **Perithecia** subglobose to laterally flattened when crowded, 0.3–0.35 × 0.2–0.3 mm. **Ostioles** obtusely papillate, black, 40–90 µm wide, faintly prominent.

Asci cylindrical, shortly stipitate, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 54–63 × 5–6 µm, the stipes 30–40 µm long, with apical apparatus 0.5–0.7 × 1.3–1.6 µm (Me = 0.6 × 1.4 µm, N = 20), discoid to slightly wedge-shaped, bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, 8–10 µ wide at base, tapering to 2 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8.5–)8.9–9.9 (–10.6) × (3.5–)3.6–4.2(–4.4) µm, Q = (2.1–)2.2–2.6(–2.9), N = 60 (Me = 9.4 × 3.9 µm, Qe = 2.4), ellipsoid slightly inequilateral to equilateral with narrowly to broadly rounded ends, light brown, unicellular, with a longitudinally oriented, occasionally slightly obliquely oriented germ slit 4.5–6 µm long on the ventral side when inequilat-

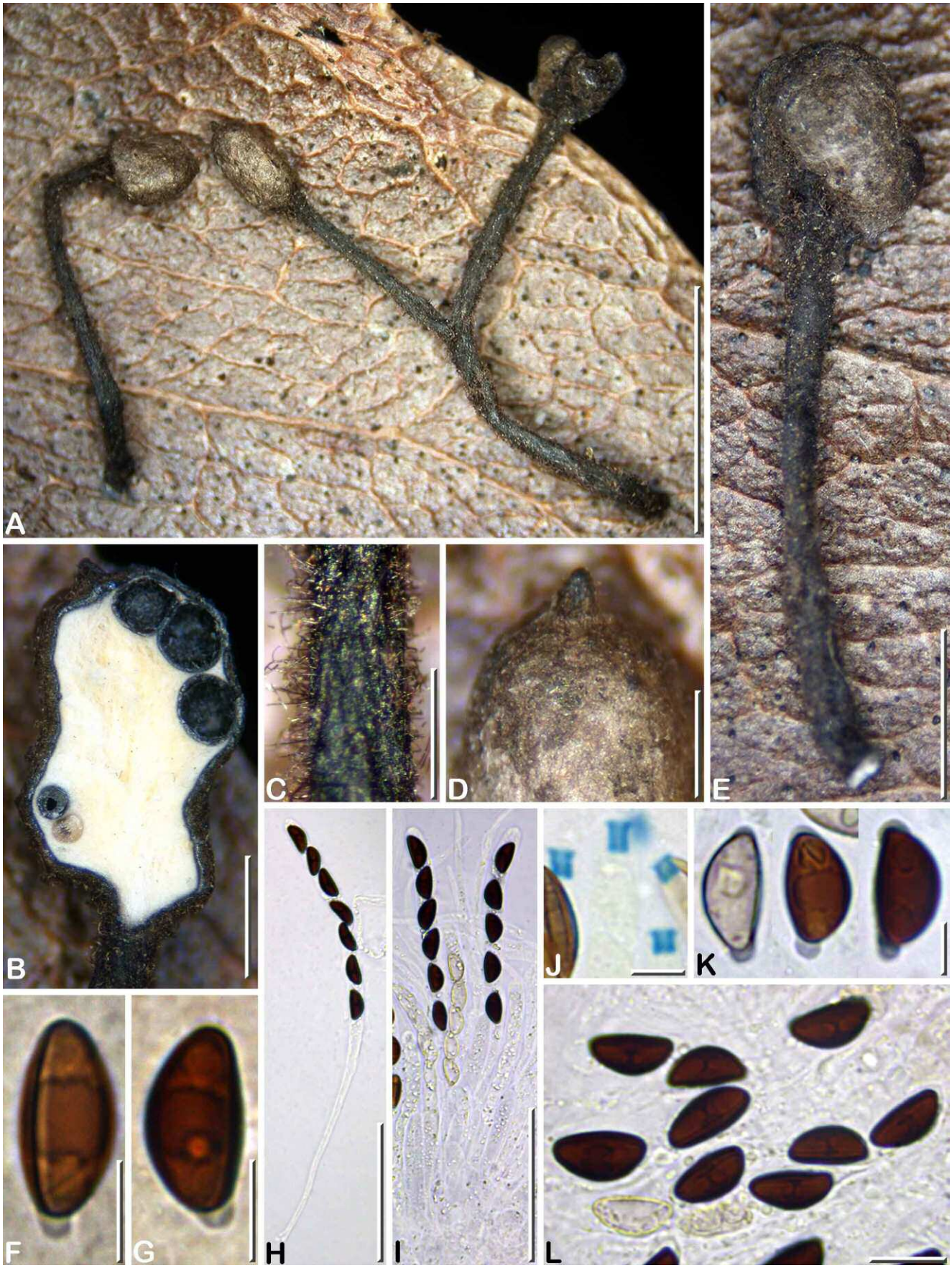

Plate 7– *Xylaria aristata*

A-L: CLL 5130. A, E: Habit of prostrate stromata on a dead leaf; B: Fertile part of a stroma in longitudinal section showing perithecia immersed beneath a thin black crust and a solid white interior; C: Hairy stipe in close-up; D: Close-up on stromatal apex showing a smooth surface and a short conical mucro; F: Ascospore in latero-ventral view showing a long germ slit and a polar secondary appendage, in India ink; G: Ascospore in side view showing a polar secondary appendage, in India ink; H: Seven-spored mature ascus, in 1% SDS; I: Five- and six-spored mature asci, in aqueous nigrosin; J: Ascal apical apparati, in Melzer's reagent; K: Immature and mature ascospores showing bipolar secondary appendages, in aqueous nigrosin; L: Mature ascospores in 1% SDS. Scale bars: A = 5 mm; B = 1 mm; C, D = 0.5 mm; E = 2 mm; F, G, J, K = 5 µm; H, I = 50 µm; L = 10 µm.

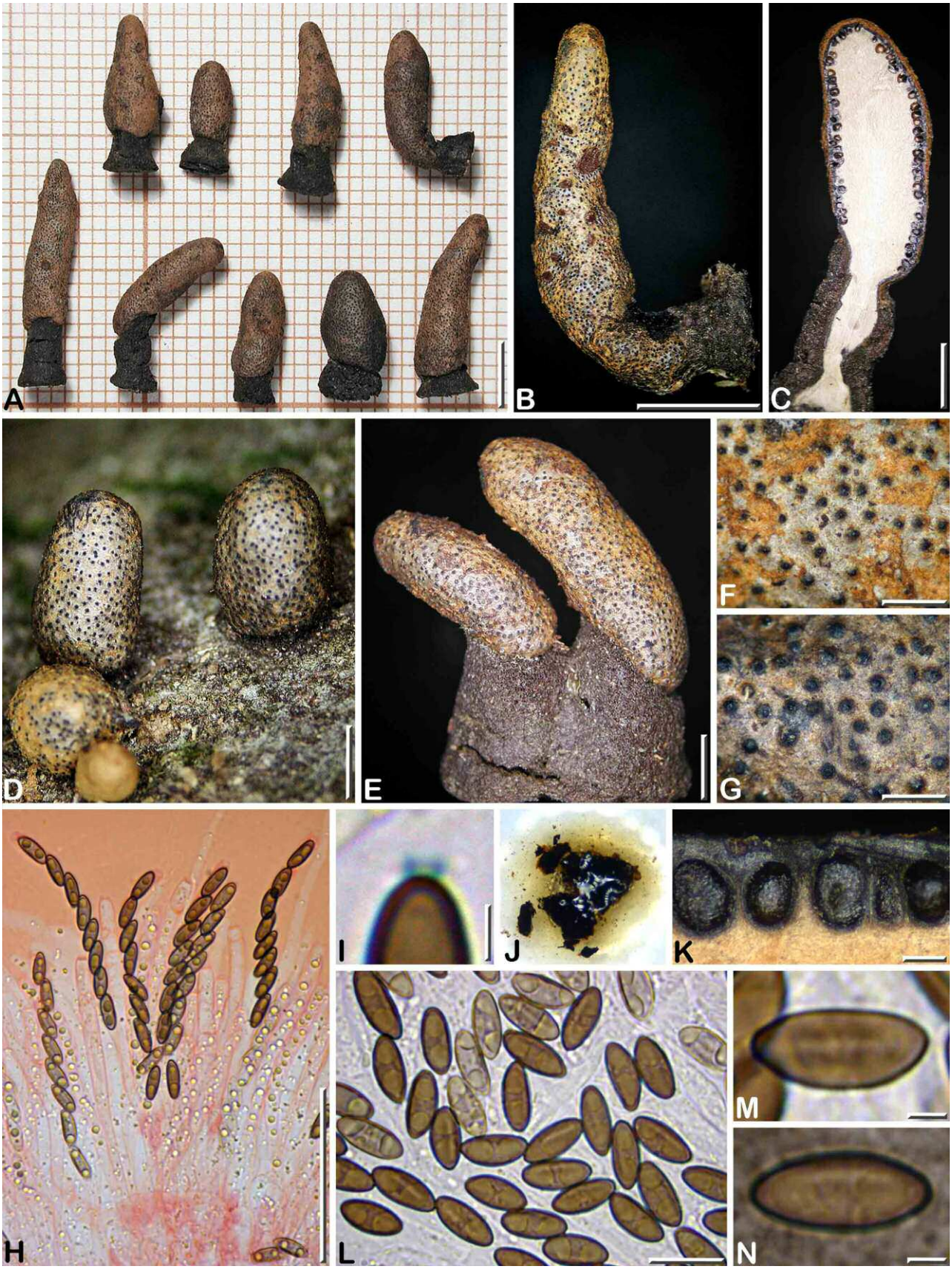

Plate 8 – *Xylaria badia*

A, C, E-N: CLL 8319; B, D: MJF 07132. A: Habit of variously shaped and coloured stromata with a pannose base; B, E: Stipitate stromata showing a pannose base; C: Young stroma in vertical section showing a solid whitish interior extending into the stipe; D: Subsessile stromata on host surface; F: Surface of a young stroma with a grey layer showing through the orange, vanishing, woolly outermost layer; G: Surface of a mature stroma roughened by black hemispherical ostioles; H: Mature and immature shortly stipitate asci, in Congo red and 3% KOH; I: Discoid ascal apical apparatus, in Melzer's reagent; J: Honey-coloured pigments released by a fragment of stromatal crust in 10% KOH; K: Close-up on a stroma in longitudinal section showing perithecia lying beneath a thick black crust and surrounded by black soft tissue, with underlying orange brown solid internal tissue; L: Ascospores in 1% SDS, some showing a germ slit; M: Ascospore showing a germ slit, in Melzer's reagent; N: Ascospore in India ink showing absence of appendage or mucilaginous sheath and a short germ slit. Scale bars: A, B = 5 mm; C-E = 2 µm; F, G = 0.5 mm; H = 50 µm; I, M, N = 2 µm; K = 0.2 mm; L = 10 µm.

eral; no appendage or mucilaginous sheath detected in India ink; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics and asexual morph on OMA were described by Van der Gucht (1996) from material from Papua New Guinea.

Known distribution: Essentially southeastern Asia: China (Ma, 2011), Papua New Guinea (Van der Gucht, 1995), Taiwan, possibly India and the Philippines (Ju & Rogers, 1999), Thailand (Okane *et al.*, 2008; Daranagama *et al.*, 2015; JF, unpublished data), Vietnam (Patouillard, 1891); reported here from the Neotropics (Martinique) for the first time.

Specimens examined: French West Indies: Martinique: Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on dead culms of bamboo, 27 Aug. 2007, *leg.* J. Fournier & C. Lechat, MJF 07132 (LIP); *ibid.*, on dead culms of bamboo, 25 Aug. 2008, *leg.* C. Lechat, CLL 8319 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead culms of bamboo, 28 Aug. 2010, *leg.* J. Fournier, MJF 10180 (LIP).

Comments: *Xylaria badia* is a distinctive species easily recognizable based on its bambusicolous habitat and its small-sized, orange to grey brown cylindrical stromata with broadly rounded apices, a thick black crust and a tan solid interior; it is further characterized by almost equilateral light brown ascospores 8.9–9.9 × 3.6–4.2 µm with a short germ slit, discoid apical apparatus and honey-coloured KOH-extractable pigments. This reaction is different from that observed in *X. telfairii* (Berk.) Sacc. and allies because it is not associated with the presence of xylaral (Stadler *et al.*, 2008) and is not accompanied by a vinaceous reaction in NH_3.

Though easily recognizable by its ecology and its morphology, it has been erroneously described as a new species of *Rhopalostroma* D. Hawksw. by Daranagama *et al.* (2015), based on sequences obtained from another lignicolous sample.

Phylogenetic studies carried out by Hsieh *et al.* (2010) showed that *X. badia* in included in the *X. polymorpha* aggregate but on a separate, fairly isolated branch, in agreement with its unusual morphological traits.

All records of *X. badia*, including the type collection (Patouillard, 1891) are from southeastern Asia. Bamboo is not native to the West Indies and is likely to have been imported from southeastern Asia, which suggests that *X. badia* followed its host as endophyte, in a way that probably also occurred with *X. bambusicola*, the other bamboo-inhabiting *Xylaria*.

Xylaria bambusicola Y.-M. Ju & J.D. Rogers., *Mycotaxon*, 73: 400 (1999). Plate 9, Table 5.

Stromata upright, separate, arising from either the inner side or the outer side of the bamboo culm, simple to frequently branching, 23–80(–135) mm in total height, the fertile head 6–53 mm high × 1–2.5(–4 mm) wide, long-stipitate, cylindrical, terete to occasionally flattened, straight to curved, apically attenuated into a mucronate sterile apex, with perithecial contours not to partially exposed; the stipes usually sharply-defined, 12–100 mm high × 0.7–2.5 mm diam., terete to flattened in places, blackish, straight to curved, occasionally branched, hairy, swollen at base; surface first dark grey, eventually blackish, nodulose to cerebriform with wrinkles isolating groups of perithecia, with a long-persistent grey to brownish grey outermost layer splitting into elongated stripes; subsurface a thin black leathery crust 35–70 µm thick; interior whitish to cream-coloured, with a pale brown inner core, solid, spongy to fibrous. **Perithecia** immersed, subglobose to laterally compressed, 0.4–0.65 mm diam. **Ostioles** papillate, obtusely conical, porate, 70–85 µm diam. at base, black, occasionally surrounded by a white to yellowish ring 180–250 µm diam.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 67–81 × 6–6.5 µm, the stipes 66–90 µm long, with apical apparatus short-cylindrical to slightly tubular, apically with a faint lateral rim, 1.7–2.7 × 1.5–1.7 µm (Me = 2.3 × 1.7 µm, N = 60), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 5–6 µm wide at base, tapering to 1.5–2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (8.8–)9.3–11.2(–12.2) × (3.5–)3.8–4.9(–5.1) µm, Q = (1.9–)2.1–2.7(–3), N = 240 (Me = 10.3 × 4.4 µm, Qe = 2.4), ellipsoid inequilateral with narrowly to broadly rounded ends, dark brown, unicellular, with a conspicuous, straight, longitudinally oriented germ slit almost spore-length on the ventral side; without appendage or well-defined sheath but frequently surrounded by a thin halo of mucilaginous material after release from the ascus; epispore smooth.

Asexual morph on the natural substrate not observed, not present on immature stromata with white to yellowish apices. Cultural characteristics on OMA were described by Ju & Rogers (1999) based on material from Taiwan. A distinctive feature reported by these authors is the unusual yellowish colour of conidia appearing vivid yellow in mass.

Known distribution: China (MA, 2011), Martinique (this paper), Taiwan (Ju & Rogers, 1999) and Thailand (?Dai *et al.*, 2017; Okane *et al.*, 2008).

Specimens examined: French West Indies: Martinique: Fort-de-France, Absalon, track to Plateau Michel, 400–500 m, hygrophilic rainforest, on a rotten bamboo culm in the litter, 7 Aug. 2013, *leg.* J. Fournier, MJF 13047 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a rotten bamboo culm in the litter, 3 Sept. 2003, *leg.* C. Lechat, CLL 755 (LIP); *ibid.*, on a rotten bamboo culm in the litter, 28 Aug. 2004, *leg.* C. Lechat, CLL 2191 (LIP; HAST 145114); *ibid.*, on a rotten bamboo culm in the litter, 28 Aug. 2004, *leg.* C. Lechat, CLL 2192 (LIP); *ibid.*, on a rotten blackened bamboo culm in the litter, 21 Aug. 2010, *leg.* J. Fournier, MJF 10027 (LIP); *ibid.*, on a rotten blackened bamboo culm in the litter, 23 Aug. 2010, *leg.* J. Fournier, MJF 10065 (LIP) (immature); *ibid.*, on a rotten blackened bamboo culm in the litter, 6 Aug. 2013, *leg.* J. Fournier, MJF 13034 (LIP); *ibid.*, on a rotten bamboo culm in the litter, 16 Aug. 2013, *leg.*

Table 5 – Ascospore dimensions in four randomly selected collections of *X. bambusicola* from Martinique, showing a narrow range of intraspecific variations, compared with those previously reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 755	(8.8–)9.6–10.9(–11.5) × (3.9–)4.3–4.8(–5.1) µm	Q = (1.9–)2.1–2.5(–2.7), N = 60	Me = 10.3 × 4.5 µm, Qe = 2.3
CLL 2191	(8.8–)9.3–10.5(–11.2) × (3.5–)3.8–4.4(–5) µm	Q = (2.1–)2.2–2.7(–2.9), N = 60	Me = 9.9 × 4.1 µm, Qe = 2.4
CLLMAR 11081	(8.9–)9.4–10.8(–11.2) × (3.6–)3.8–4.7(–5) µm	Q = (2–)2.1–2.7(–3), N = 60	Me = 10.1 × 4.3 µm, Qe = 2.4
MJF 16010	(9.5–)9.9–11.2(–12.2) × (4.1–)4.2–4.9(–5.1) µm	Q = (2.1–)2.2–2.6(–2.7), N = 60	Me = 10.8 × 4.6 µm, Qe = 2.4
Cumulated values	(8.8–)9.3–11.2(–12.2) × (3.5–)3.8–4.9(–5.1) µm	Q = (1.9–)2.1–2.7(–3), N = 240	Me = 10.3 × 4.4 µm, Qe = 2.4
Ju & Rogers (1989)	9.5–11(–12.5) × 4–5 µm		Me = 10 × 4.5 µm, Qe = 2.2

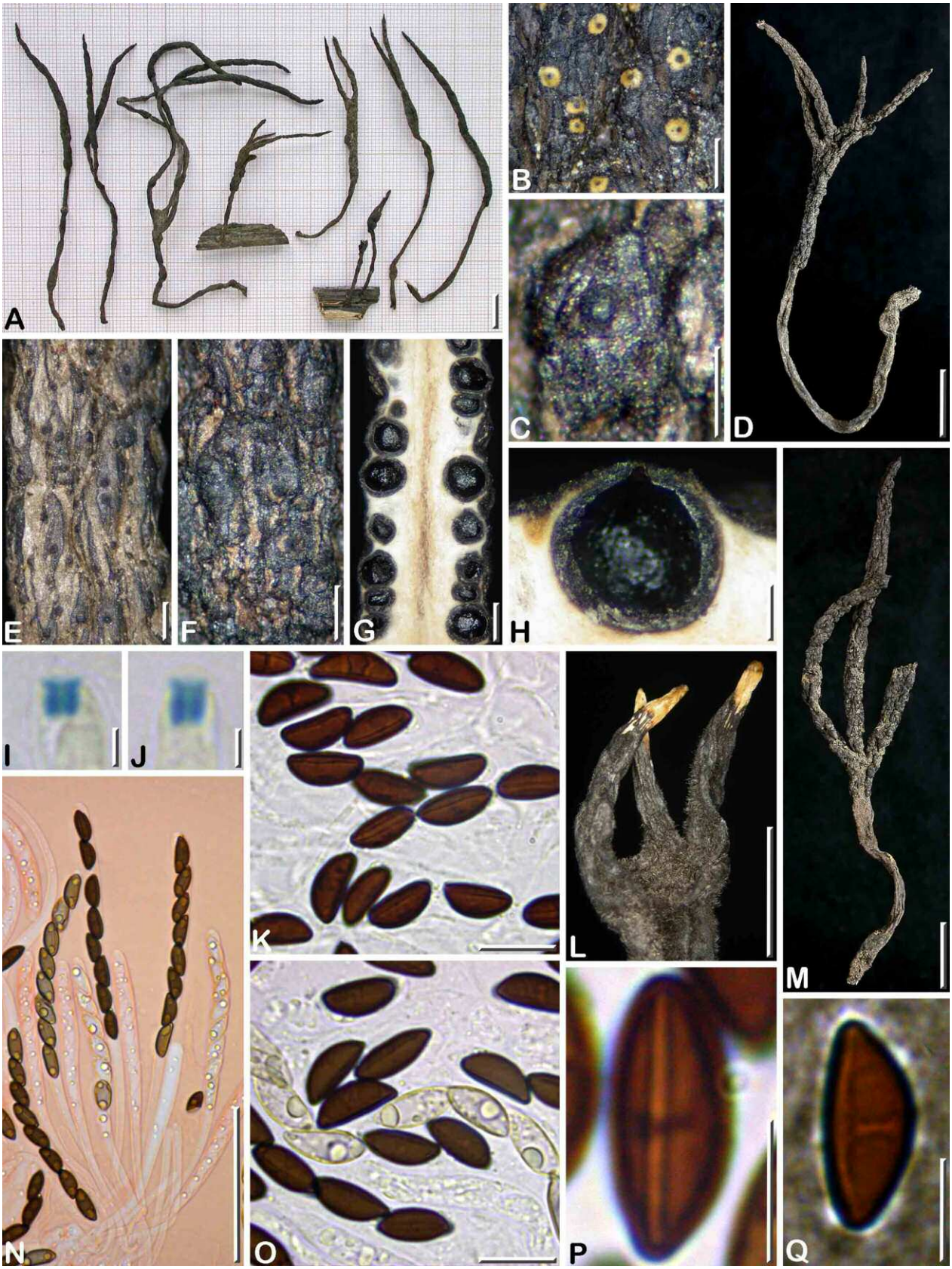

Plate 9 – *Xylaria bambusicola*

A, N, O: MJF 16010; B, D-F, M, Q: CLLMAR 11081; C, G, H, J, P: CLL 2191; I, K : CLL 755; L: MJF 13034. A: Variously shaped stromata showing variations within the same collection; B: Cerebriform surface and ostioles surrounded by a yellowish ring; C: Stromatal surface in close-up showing a prominent perithecial contour and an obtusely papillate ostiole; D, M: Two large and branched stromata; E: Surface of a young stroma showing a grey striped outer layer and black ostioles; F: Nodulose surface of a mature stroma bearing remnants of outer layer; G: Stroma in longitudinal section showing slightly exposed perithecial contours and whitish interior with a pale brown inner core; H: Perithecium in vertical section immersed beneath a thin black crust; I, J: Ascal apical apparati, in Melzer's reagent; K, O: Ascospores with variously rounded ends, some showing a germ slit in K, in 1% SDS; L: Immature branched stroma with yellowish sterile tips; N: Immature and mature asci, in Congo red in 1% SDS; P: Ascospore in ventral view showing a germ slit, in 1% SDS; Q: Ascospore showing a thin and uneven mucilaginous coating, in India ink. Scale bars: A, D, M = 10 mm; B, E-G = 0.5 mm; C, H = 0.2 mm; I, J= 2 µm; K, O =10 µm; L = 5 mm; N = 50 µm; P, Q = 5 µm.

C. Lechat, MJF 13260 (LIP); *ibid.*, on a rotten blackened bamboo culm in the litter, 28 Jul. 2016, *leg.* C. Lechat, MJF 16010 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on a rotten bamboo culm in the litter, 28 Aug. 2010, *leg.* J. Fournier, MJF 10190 (LIP); *ibid.*, on a rotten bamboo culm in the litter, 23 Aug. 2011, *leg.* C. Lechat, CLLMAR 11081 (LIP).

Comments: *Xylaria bambusicola* is first characterized by its habitat on rotten bamboo culms buried in the leaf litter, an unusual substrate for *Xylaria* spp., on which only *X. badia* and *X. scabriclavula* San Martín & J.D. Rogers are also known to occur. *Xylaria badia* is morphologically clearly distinct from *X. bambusicola* and thus easily distinguished (Ju & Rogers, 1999; this paper). *Xylaria scabriclavula*, known from México, is distinguished from *X. bambusicola* by short clavate stromata 1 cm high with strongly cracked surface and paler, often allantoid ascospores with a shorter germ slit (San Martín & Rogers, 1989).

Xylaria bambusicola recalls *X. arbuscula* by its slender, cylindrical, mucronate, frequently branched stromata coated with a persistent grey striped outer layer and faintly papillate ostioles. Its phylogenetic affinities with the *X. arbuscula* aggregate were demonstrated by Hsieh *et al.* (2010), based on material from Taiwan and Thailand. Aside from its bambusicolous habitat, *X. bambusicola* differs from *X. arbuscula* by a more nodulose stromatal surface and a thinner leathery black crust; its ascospores are likewise smaller, 10.3 × 4.4 µm vs. 12.6 × 5 µm on average, but with some overlap in extreme dimensions and they have a long, almost spore-length germ slit.

The collection CLL 2191 was sent to Dr Ju who confirmed our identification based on morphological features but the characteristics in culture turned out to be different from those obtained from Taiwan material, suggesting a possible cryptic species.

Dai *et al.* (2017) reported two collections of *X. bambusicola* from Thailand, phylogenetically close to the original material from Taiwan but differing by smaller ascospores 6–8 × 3–3.5 µm and ascal apical apparati wider than high 1–1.5 × 2–3 µm. This strong discrepancy in ascospore dimensions and apical apparatus shape makes this identification highly dubious. It can be speculated that either their measurements are erroneous, due to wrong calibration of the measuring software, or, worse, that the material they sequenced was not the one they submitted to morphological characterization. Such a mistake was already made by Daranagama *et al.* (2015) who sequenced a *Rhopalostroma* and described a *Xylaria* (see comments on *X. badia*, this paper).

Xylaria coccophora Mont., *Annales des Sciences Naturelles, Botanique*, 3: 109 (1855). Plate 10, Table 6.

Stromata scattered to gregarious, prostrate to upright, separate, rarely connated at base by two, slender, terete to slightly flattened or somewhat constricted in places, straight to curved, strongly nodulose, with mucronate sterile apices, subsessile to stipitate, 2.5–37 mm in total height, the fertile head 2–30 mm high (including apical sterile extension) × 0.9–1.5 mm diam., the stipe 0.5–12 mm high × 0.5–1 mm diam.; surface dull black, consisting of a leathery crust 30–40 µm thick, glabrous, finely roughened by minute black granules, overlain by a long persistent usually bipartite splitting outer layer, superficially grey to tan, with a more or less well-developed yellowish to sulphur-yellow basal layer showing through in places, releasing orange yellow pigments in 10% KOH when the yellow basal layer is present; perithecial contours strongly to fully exposed, with perithecia single or fused by 2–4; the stipes ill-defined, simple, black, flattened, glabrous, bearing greyish scales in upper part, slightly enlarged at base; interior solid, whitish, spongy, with a conspicuous reddish brown to blackish inner core. **Perithecia** subglobose to depressed-spherical, 0.5–0.65 mm diam. **Ostioles** obtusely papillate, black, barely prominent and often inconspicuous.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 74–86 × 5–5.5 µm, the stipes 55–80 µm long, with apical apparatus 1.7–2.2 × 1.3–1.7 µm (Me = 1.9 × 1.5 µm, N = 40), short-cylindrical to slightly urn-shaped with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 4–5 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8.8–)9.1–10.8(–11.3) × (3.5–)3.6–4.1(–4.3) µm, Q = (2.1–)2.4–2.9(–3.2), N = 120 (Me = 10 × 3.8 µm, Qe = 2.6), ellipsoid-inequilateral with broadly rounded ends, at times slightly ventrally concave, medium brown, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side; without appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics on OMA and asexual morph were described by Rogers *et al.* (1988) based on material from Venezuela.

Known distribution: Neotropical: Argentina (Hladki & Romero, 2007), French Guiana, Paraguay, Trinidad, Venezuela (Dennis, 1956; Rogers *et al.*, 1988); Martinique (this paper); México (San Martín & Rogers, 1989).

Specimens examined: French Guiana: Sinnamary, Paracou, CIRAD research Centre, hygrophilic rainforest, on a dead corticated branchlet 1 cm diam., 26 Feb. 2007, *leg.* C. Lechat, CLL 7056. French West Indies: Martinique: Le Marin, source Berry forest, xero- mesophilic forest, on a dead decorticated branchlet 1.5–2 cm diam., 25 Aug. 2005, *leg.* C. Lechat, CLL 5178 (LIP; HAST 145115); Le Marin, Morne Aca, coastal

Table 6 – Ascospore dimensions in two collections of *X. coccophora* from Martinique and one from French Guiana, showing a narrow range of intraspecific variations, compared with those reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5178	(8.8–)9.1–10.5(–11) × (3.5–)3.6–4.1(–4.3) µm	Q = (2.1–)2.4–2.7(–2.8), N = 60	Me = 9.7 × 3.8 µm, Qe = 2.5
CLL 7233-2	(9.1–)9.7–10.8(–11.3) × (3.5–)3.6–4.1(–4.2) µm	Q = (2.3–)2.4–2.9(–3.2), N = 60	Me = 10.2 × 3.8 µm, Qe = 2.7
Cumulated values	(8.8–)9.1–10.8(–11.3) × (3.5–)3.6–4.1(–4.3) µm	Q = (2.1–)2.4–2.9(–3.2), N = 120	Me = 10 × 3.8 µm, Qe = 2.6
CLL 7056 French Guiana	(9.4–)10–11.1(–12.2) × (3.3–)3.6–4.3(–4.7) µm	Q = (2.3–)2.4–2.9(–3.4), N = 60	Me = 10.6 × 4 µm, Qe = 2.7
Dennis (1956), Neotropics	8–10 × 3.5–5 µm		Me = 9 × 4.3 µm, Qe = 2.1
Rogers *et al*. (1988), Venezuela	9.5–10.5(–12) × 3.5–4.5 µm		Me = 10 × 4 µm, Qe = 2.5
San Martín & Rogers (1989), México	10–11(–13) × (3.5–)4–4.5 µm		Me = 10.5 × 4.2 µm, Qe = 2.5
Hladki & Romero (2007)	9–13 × 4.5–5 µm		Me = 11 × 4.8 µm, Qe = 2.3
Joly (1968) Leprieur 1398 (holotype)	(7–)9.47–9.58(–12) × (3–)4.22–4.3(–6) µm		Me = 9.5 × 4.3 µm, Qe = 2.2

Plate 10 – *Xylaria coccophora*

A-D, F, J: CLL 7233-2; E, G, H, I, K-N: CLL 5178. A: Habit of prostrate stromata on host surface; B: Variously shaped and stipitate stromata; C: Fully exposed perithecium in close-up showing a roughened dull black surface and a bluntly papillate ostiole; D: Stroma in longitudinal median section showing a solid white interior with a central brown inner core, perithecia immersed beneath a thin black crust and a bipartite outer layer with a yellowish basal region (arrow); E: Stroma showing a bipartite tan and sulphur-yellow outer layer split around the perithecia; F: Stromatal apex showing an apiculate sterile tip and brownish remnants of outer layer; G: Stunted stroma with obtusely rounded sterile apex; H: Immature and mature asci, in Congo red in 3% KOH; I, J: Ascal apical apparati, in Melzer's reagent, slightly urn-shaped in I; K: Mature ascus, in diluted India ink; L: Ascospore in latero-ventral view showing a germ slit on the ventral side, in 1% SDS; M: Ascospores in lateral and ventral view showing a germ slit and absence of a cellular appendage or a mucilaginous sheath, in diluted India ink; N: Ascospores, some showing a faint germ slit, in 1% SDS. Scale bars: A, B = 10 mm; C, D = 0.5 mm; E-G = 1 mm; H, K = 50 µm; I, J = 2 µm; L, M = 5 µm; N = 10 µm.

mesophilic forest, on a dead corticated branch 2–3 cm diam., 14 Aug. 2007, *leg.* C. Lechat, CLL 7233-2 (LIP).

Comments: *Xylaria coccophora* is characterized by small, filiform, soft-textured lignicolous stromata with strongly exposed perithecial contours and mucronate sterile apices, and ascospores 9.5–10.5 × 3.5–4.5 µm with obtuse ends and a long germ slit; its most distinctive and diagnostic character is the presence of a bipartite splitting outer layer comprising a superficial grey to tan layer on a yellowish to sulphur-yellow basal layer. This feature was reported by Dennis (1956) but not mentioned in subsequent reports by other authors, possibly because the yellow layer is not always conspicuous, especially in old stromata. Joly (1968), in his revision of *Xylaria* spp. related to *X. pumila* (Fr.) Mont., regarded *X. coccophora* as closely related to his wide concept of *X. compressa* Pat. including *X. gracillima* (Fr.) Fr. and *X. pumila*, based on slightly smaller ascospores. As shown in Table 6, ascospore dimensions from collections of various origins exhibit some variations overlapping with those of aforementioned species; the partly yellow superficial stromatal layer of *X. coccophora* is a better specific marker that was unfortunately not mentioned by Joly (1968).

San Martín *et al.* (2001) described *X. subcoccophora* San Martín & Lavin from Mexican oak forests. Besides its different ecology, this fungus is distinguished from *X. coccophora* by less exposed perithecial contours, a white peeling outer layer and dark brown ascospores with more narrowly rounded ends.

Xylaria curta Fr., *Nova Acta Regiae Societatis Scientiarum Upsaliensis*, 1: 126 (1851). Plate 11, Table 7.

Stromata gregarious in small or large groups, separate, rarely connated at base, variable in shape, ranging from cylindrical to clavate or fusiform, simple to furcate, terete to slightly flattened, straight to curved, with most often broadly rounded fertile apices, subsessile to long-stipitate, 2.5–65 mm in total height, the fertile head 2–55 mm high × 1.5–5(–7) mm diam., the stipe 0.5–38 mm high × 1–2.5 mm diam.; surface yellowish white to cream-coloured before maturity, gradually turning yellowish grey, eventually dull black at maturity, coarsely cracked into thick polygonal scales, more or less nodulose due to irregularly arranged deep wrinkles and furrows, with perithecial contours unexposed to slightly exposed; the stipes ill-defined, dark brown to black, smooth, puckered, terete to flattened, glabrous, the base often swollen and tomentose; crust including the persistent scales slightly carbonaceous, 80–100 µm thick; interior solid, spongy, white to cream. **Perithecia** subglobose 0.5–0.75 mm diam., laterally flattened when crowded. **Ostioles** finely papillate on a raised-discoid, convex base 150–220 µm diam., black, occasionally encircled with a ring of white substance.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 58–70 × 4.5–5.5 µm, the stipes 52–90 µm long, with apical apparatus 1.5–2.5 × 1.3–1.7 µm (Me = 2 × 1.5 µm, N = 80), short-cylindrical to slightly tubular with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** copious, hyphal, filiform, thin-walled, 0.8–2 µm wide, embedded in mucilaginous material. **Ascospores** (7.2–)8–10.7(–11.1) × (3.1–)3.5–4.4 (–4.9) µm, Q = (1.8–)2.1–2.8(–3.1), N = 720 (Me = 9.2 × 3.9 µm, Qe = 2.3), ellipsoid-inequilateral with broadly to narrowly rounded ends, yellowish brown to medium brown, unicellular, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side; a thin mucilaginous coating, sometimes thicker at poles, often present but does not constituting a well-defined mucilaginous sheath or appendages; epispore smooth.

Asexual morph on the natural substrate not observed. Colonies on OMA based on a collection from French Guiana yielding sterile cylindrical stromata were described by Callan & Rogers (1990); similar results were reported by Van der Gucht (1996) from material from Papua New Guinea.

Known distribution: Pantropical (Van der Gucht, 1995).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Sainte-Rose, Sofaïa, mesophilic rainforest, on dead wood, 1 Sept. 2005, *leg.* C. Lechat, CLL 5303 (LIP); *ibid.*, on dead wood, 1 Sept. 2005, *leg.* C. Lécuru, CLL 5304 (LIP); *ibid.*, on dead wood, 1 Sept. 2005, *leg.* C. Lécuru, CLL 5306 (LIP). Martinique: Case-Pilote, Savane Saint-Cyr, trail to Plateau Concorde, hygrophilic rainforest, 600–650 m, on dead wood, 27 Aug. 2010, *leg.* J. Fournier, MJF 10169 (LIP); Le Morne-Rouge, La Propreté *Hibiscus* plantation, hygrophilic rainforest, on a small dead branch, 29 Aug. 2007, *leg.* J. Fournier, MJF 07208 (LIP); *ibid.*, on a small dead branch, 29 Aug. 2007, *leg.* J. Fournier, MJF 07214 (LIP); *ibid.*, on dead wood, 29 Aug. 2007, *leg.* J. Fournier, MJF 07215 (LIP); *ibid.*, on dead wood, 29 Aug. 2007, *leg.* J. Fournier, MJF 07217 (LIP); Le Prêcheur, Anse Couleuvre, coastal

Table 7 – Ascospore dimensions in twelve collections of *X. curta* from Guadeloupe and Martinique, including those with robust stromata dealt with in part II, showing the range of intraspecific variations, compared with those reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 1073	(7.7–)8.3–9.6(–10.8) × (3.1–)3.7–4.2(–4.3) µm	Q = (2–)2.1–2.5(–2.8), N = 60	Me = 9 × 3.9 µm, Qe = 2.3
CLL 5044	(8.4–)8.7–9.9(–10.3) × (3.5–)3.7–4.1(–4.2) µm	Q = (2.1–)2.2–2.6(–2.8), N = 60	Me = 9.3 × 3.9 µm, Qe = 2.4
CLL 5095	(8.1–)8.9–10.2(–11.1) × (3.4–)3.5–4.2(–4.3) µm	Q = (2–)2.2–2.7(–3), N = 60	Me = 9.5 × 3.9 µm, Qe = 2.5
CLL 5260	(7.6–)8.1–9.2(–10.1) × (3.4–)3.6–4(–4.3) µm	Q = (1.8–)2.1–2.5(–2.6), N = 60	Me = 8.6 × 3.8 µm, Qe = 2.3
MJF 07222	(8.3–)8.9–10.2(–11) × (3.2–)3.6–4.2(–4.5) µm	Q = (2.1–)2.2–2.7(–3), N = 60	Me = 9.4 × 3.9 µm, Qe = 2.4
MJF 07240	(8.1–)8.6–9.9(–10.4) × (3.5–)3.7–4.2(–4.3) µm	Q = (1.9–)2.2–2.5(–2.8), N = 60	Me = 9.2 × 4 µm, Qe = 2.3
MJF 10169	(7.2–)8–9.2(–9.8) × (3.3–)3.6–4.1(–4.2) µm	Q = (1.9–)2.1–2.5(–2.7), N = 60	Me = 8.6 × 3.8 µm, Qe = 2.2
MJF 10275	(8–)8.4–9.5(–10.1) × (3.4–)3.6–4.3(–4.4) µm	Q = (1.9–)2.1–2.5(–2.8), N = 60	Me = 9 × 3.9 µm, Qe = 2.3
MJF 13201	(8.2–)8.6–9.6(–10.2) × (3.1–)3.5–4.2(–4.3) µm	Q = (2.1–)2.2–2.6(–3.0), N = 60	Me = 9.2 × 3.8 µm, Qe = 2.4
MJF 13207	(8.6–)9.2–10.7(–11.1) × (3.7–)3.9–4.4(–4.9) µm	Q = (2.1–)2.15–2.6(–2.7), N = 60	Me = 9.9 × 4.2 µm, Qe = 2.4
MJF 16015	(8.2–)8.7–10.1(–10.6) × (3.4–)3.6–4.2(–4.4) µm	Q = (2.1–)2.2–2.6(–2.9), N = 60	Me = 9.4 × 3.9 µm, Qe = 2.4
MJF 16081	(8.3–) 8.7–10.4 (–11.1) × (3.2–) 3.5–4.2 (–4.4) µm	Q = (2–) 2.2–2.8 (3.1), N = 60	Me = 9.6 × 3.8 µm, Qe = 2.5
Cumulated values	(7.2–)8–10.7(–11.1) × (3.1–)3.5–4.4(–4.9) µm	Q = (1.8–)2.1–2.8(–3.1), N = 720	Me = 9.2 × 3.9 µm, Qe = 2.3
Callan & Rogers (1990)	8.5–9.5 × 4–4.5 µm		Me = 9 × 4.3 µm, Qe = 2.1
Van der Gucht (1995)	8–9.5 × 3–4.5 µm		Me = 8.4 × 4 µm, Qe = 2.1

Plate 11 – *Xylaria curta*

A: MJF 13160; B-L: MJF 07222. A: Habit of crowded stromata *in situ*; B: Variously shaped immature and mature stromata from the same collection; C: Immature stroma showing white superficial scales; D: Mature stroma showing a deeply wrinkled surface; E: Stroma in longitudinal section showing a fertile apex and a white solid interior; F: Surface of an immature stroma in close-up showing white to yellowish scales and minute ostiolar papillae; G: Surface of a mature stroma in close-up showing cracks and raised-discoid ostioles; H: Mature and immature long-stipitate asci, in Congo red and 3% KOH; I: Ascal apical apparati, in Melzer's reagent; J: Ascospore in side view showing a thin mucilaginous coating thicker at one end, in India ink; K: Variously shaped ascospores in 1% SDS, some showing a ventral germ slit; L: Vertical section of a perithecium immersed under a slightly carbonaceous crust. Scale bars: A, B = 10 mm; C-E = 5 µm; F, G, L = 0.5 mm; H = 50 µm; I, J = 5 µm; K = 10 µm.

mesophilic rainforest, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5044 (LIP; HAST 145116); *ibid.*, on dead wood, 13 Aug. 2007, *leg.* C. Lechat, CLL 7223 (immature) (LIP); *ibid.*, on a dead corticated branch, 1 Sept. 2007, *leg.* J. Fournier, MJF 07240 (LIP); *ibid.*, on dead blackened wood, 2 Sept. 2007, *leg.* J. Fournier, MJF 07257 (LIP); *ibid.*, on dead wood, 2 Sept. 2007, *leg.* J. Fournier, MJF 07280 (LIP); *ibid.*, on dead wood, 4 Sept. 2007, *leg.* C. Lechat, MJF 07297 (LIP); *ibid.*, on dead wood, 21 Aug. 2010, *leg.* J. Fournier, MJF 10030 (LIP); *ibid.*, on dead blackened wood, 23 Aug. 2010, *leg.* J. Fournier, MJF 10054 (LIP); *ibid.*, on dead blackened wood, 23 Aug. 2010, *leg.* C. Lechat, MJF 10057 (LIP); *ibid.*, on dead wood, 23 Aug. 2010, *leg.* C. Van Wonterghem, MJF 10062 (LIP); *ibid.*, on dead blackened wood, 28 Jul. 2016, *leg.* J. Fournier, MJF 16015 (LIP); Le Prêcheur, Anse des Galets, coastal mesophilic rainforest, on a dead decorticated blackened branch, 30 Aug. 2007, *leg.* J. Fournier, MJF 07222 (LIP); Le Saint-Esprit, Bois La Charles, mesophilic rainforest, on dead wood, 24 Aug. 2004, *leg.* C. Lechat, CLL 2051 (LIP); *ibid.*, on dead wood, 24 Aug. 2004, *leg.* C. Lechat, CLL 2060 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on dead wood, 10 Dec. 2005, *leg.* C. Lechat, CLL 5658 (immature) (LIP); Sainte-Luce, Montravail forest, relict hygrophilic rainforest, on a dead corticated branch, 30 Jul. 2016, *leg.* J. Fournier, MJF 16043 (LIP); Sainte-Marie, La Philippe, coastal mesophilic rainforest, on dead wood, 31 Aug. 2010, *leg.* R. Courtecuisse, MJF 10272 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10276 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10284 (LIP); *ibid.*, on dead wood, 14 Aug. 2013, *leg.* J. Fournier, MJF 13207 (LIP); *ibid.*, on dead wood, 21 Aug. 2013, *leg.* J. Fournier, MJF 13352 (LIP); *ibid.*, on dead wood, 2 Aug. 2016, *leg.* J. Fournier, MJF 16081 (LIP); Saint-Joseph, Plateau Perdrix, hygrophilic rainforest, on dead root of *Philodendron* sp. (*Araceae*), Sept. 2003, *leg.* C. Lechat, CLL 0901 (LIP; HAST 145117); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead wood, 5 Aug. 2013, *leg.* J. Fournier, MJF 13004 (LIP); *ibid.*, on dead blackened wood, 5 Aug. 2013, *leg.* J. Fournier, MJF 13011 (LIP); Schoelcher, Fond Lahaye, banks of Fond Lahaye River, mesophilic rainforest, on dead blackened wood, 12 Aug. 2013, *leg.* J. Fournier, MJF 13160 (LIP); *ibid.*, on dead wood, 12 Aug. 2013, *leg.* J. Fournier, MJF 13165 (LIP); Schoelcher, Rivière Duclos, Fontaine Didier, meso- to hygrophilic rainforest, on dead blackened wood, 4 Dec. 2005, *leg.* C. Lechat, CLL 5532 (LIP); *ibid.*, on dead wood, 28 Aug. 2007, *leg.* C. Lécuru, MJF 07165 (LIP); *ibid.*, on dead wood, 28 Aug. 2007, *leg.* C. Lécuru, MJF 07176 (LIP).

Comments: The above macromorphological description is adapted from that given for collection with robust stromata dealt with in part II, and is more representative of stromata of *X. curta* as usually encountered. The micromorphological description includes data from both robust and slender stromata and data gathered in Table 7 show that ascospore size, though fairly variable, is not correlated with variations of stromatal morphology.

Whereas robust stromata of *X. curta* can be fairly easily distinguished from externally similar *Xylaria* spp. as shown in part II, more slender stromata may be confused with those of *X. feejeensis* and *X. multiplex* var. *microsperma*. The former resembles *X. curta* in having similar small stromata with a corky-cracked surface and large discoid-conical ostioles, and *X. curta* was even considered by Dennis (1956) as possibly "no more than a state of *X. feejeensis*".

Xylaria fejeensis differs from *X. curta* by its dark brown superficial scales that are never overlain with a thin white pellicle and darker brown equilateral ascospores, with subacute ends and bearing a minute cellular appendage on one end (Van der Gucht, 1995; this paper).

Xylaria multiplex var. *microsperma* is a rarely recorded taxon with strongly nodulose stromata due to deep, sometimes circumferential wrinkles, which resemble those stromata of *X. curta* with nodulose surface; as their ascospore size range is similar and as they share a similar habit and coexist in some coastal forests in Martinique, their distinction may prove challenging. The characters differentiating *X. multiplex* var. *microsperma* from *X. curta* are an evanescent greyish brown outermost peeling layer, more strongly exposed perithecial contours, a thinner leathery crust, smaller ostioles and ascospores with more irregular germ slits, frequently shorter than ascospore length or located on the dorsal side (this paper).

Xylaria feejeensis (Berk.) Fr., *Nova Acta Regiae Societatis Scientiarum Upsaliensis*, 1: 128 (1851). Plate 12, Table 8.

Stromata upright, simple, occasionally forked or connated at base by 2–3, 6–37(–60) mm in total height, the fertile head 3.5–41 mm high × 2–5(–14 mm) wide, subsessile to long-stipitate, typically cylindrical, terete, straight to curved, with attenuated or broadly rounded fertile apices, with perithecial contours barely exposed, occasionally flattened, contorted to flabelliform in some luxuriant collections; the stipes ill- to sharply-defined, 1–26 mm high × 1–3 (–5) mm diam., blackish brown, straight to curved, tomentose,

Table 8 – Ascospore dimensions in six collections of *X. feejeensis* from Guadeloupe and Martinique, showing the range of intraspecific variations, compared with those previously reported in literature. Extreme values in parentheses.

Collections numbers	**Ascospore measurements**	**Q = quotient l/w N = number of measurements**	**Mean values**
CLL 5107	(7.3–)8.2–9.7(–10.4) × (4.3–)4.6–5.1(–5.3) µm	Q = (1.5–)1.7–2(–2.2), N = 60	Me = 8.9 × 4.8 µm, Qe = 1.8
CLL 5653	(8.3–)8.8–10.1(–10.5) × (4.2–)4.4–4.9(–5) µm	Q = (1.7–)1.9–2.2(–2.3), N = 60	Me = 9.4 × 4.7 µm, Qe = 2
CLLGUAD 11003	(7.5–)8.3–9.5(–10.1) × (4.1–)4.5–5.1(–5.3) µm	Q = (1.6–)1.7–2(–2.1), N = 60	Me = 8.9 × 4.8 µm, Qe = 1.9
MJF 07296	(8.5–)9.1–10.6(–11.5) × (4.3–)4.4–5(–5.2) µm	Q = (1.7–)1.9–2.3(–2.5), N = 60	Me = 9.8 × 4.7 µm, Qe = 2.1
MJF 10123	(7.6–)8.2–9.8(–10.4) × (4.1–)4.4–5.1(–5.5) µm	Q = (1.6–)1.8–2.1(–2.3), N = 60	Me = 8.9 × 4.7 µm, Qe = 1.9
MJF 16083	(8.2–)8.8–9.9(–10.2) × (4.3–)4.4–5(–5.2) µm	Q = (1.8–)1.9–2.1(–2.3), N = 60	Me = 9.4 × 4.7 µm, Qe = 2
Cumulated values	(7.3–)8.2–10.6(–11.5) × (4.1–)4.4–5.1(–5.5) µm	Q = (1.5–)1.7–2.3(–2.5), N = 360	Me = 9.2 × 4.7 µm, Qe = 2
Dennis (1958)	8–10(–11) × 4–5.5 µm		Me = 9 × 4.3 µm, Qe = 2.1
Rogers *et al.* (1988), Venezuela	7.5–9 × 4.5 µm		Me = 8.3 × 4.5 µm, Qe = 1.8
San Martín *et al.* (1999), México	(8–)9–10 × 4–4.5(–5) µm		Me = 9.5 × 4.3 µm, Qe = 2.2
San Martín & Rogers (1989), México	(8–)8.5–11(–12) × 4–4.5(–5) µm		Me = 9.8 × 4.3 µm, Qe = 2.3
Van der Gucht (1995), Papua New Guinea	(8.5–)9–11 × 4–5 µm		Me = 9.7 × 4.5 µm, Qe = 2.1

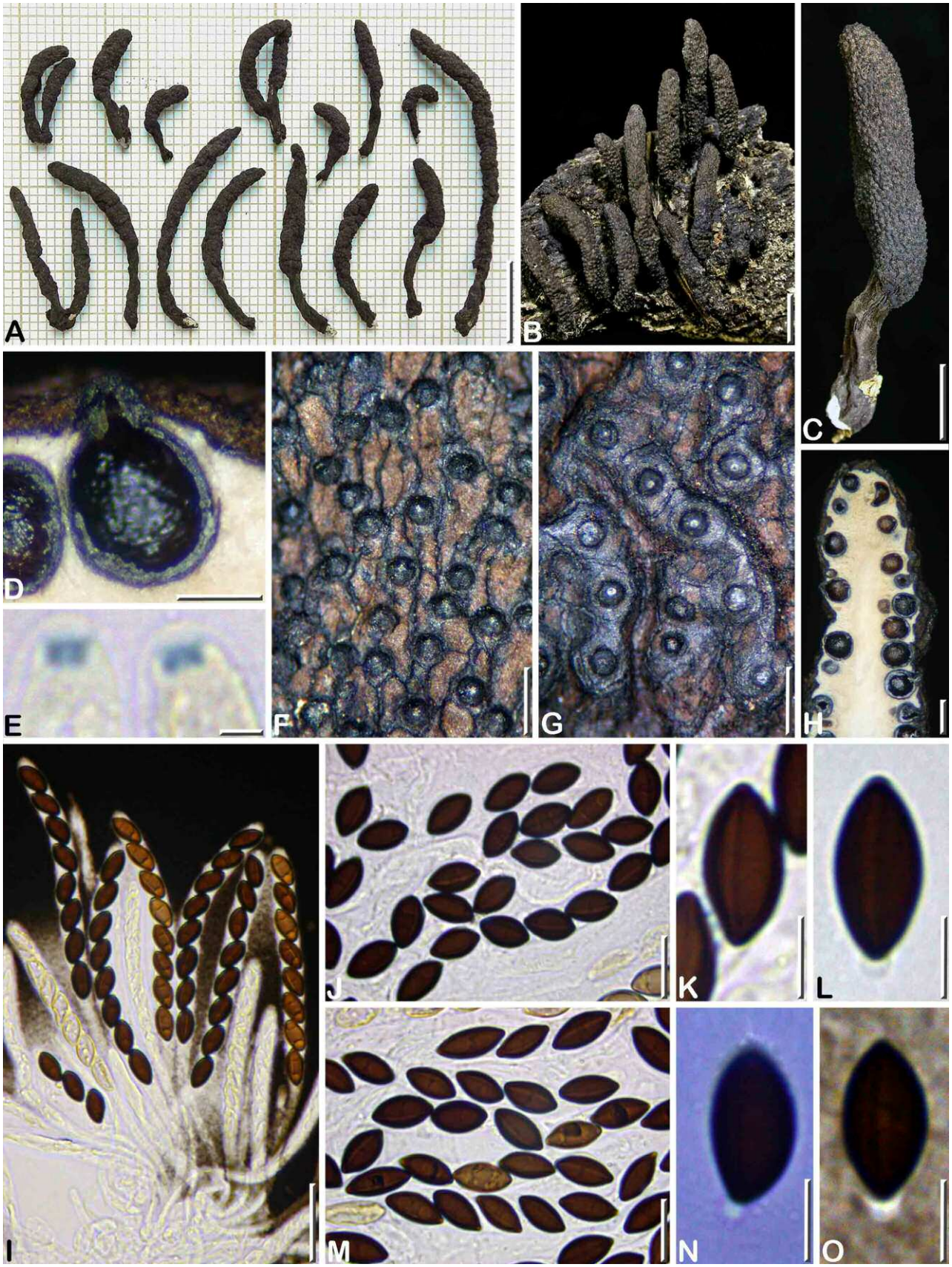

Plate 12 – *Xylaria feejeensis*

A: CLL5277; B, E, K-M: MJF 07296; C: CLL 5018; D, I : CLLGUAD 11003; F, H: MJF 10123; G: CLL 5016-2; J: CLL 5017; N, O: MJF 16083. A: Variously shaped stromata showing variations within the same collection; B: Habit of gregarious stromata on host surface; C: Mature stroma; D: Stroma in longitudinal section in close-up showing a perithecium immersed under a thin black crust overlain by a reddish brown superficial tissue; E: Ascal apical apparati, in Melzer's reagent; F: Stromatal surface showing a reddish brown coating cracked into elongated scales and black bluntly rounded ostioles; G: Cerebriform surface of a stroma older than in F showing partially eroded reddish brown coating; H: Stroma in vertical section showing a fertile apex and a solid interior; I: Immature and mature asci, in India ink; J, M: Slightly differently shaped and coloured ascospores from two different collections, some showing a germ slit, in 1% SDS; K: Ascospore showing a germ slit, in 1% SDS; L, N, O: Ascospores showing a basal cellular appendage, in 1% SDS, diluted blue Pelikan® ink and India ink respectively. Scale bars: A = 10 mm; B, C = 5 mm; D = 0.2 mm; E = 2 µm; F-H = 0.5 mm; I = 20 µm; J, M =10 µm; K, L, N, O = 5 µm.

swollen at base; surface greyish brown to reddish brown, eventually blackish brown, strongly roughened by prominent ostioles, with a persistent outermost layer cracked into small polygonal isodiametric or elongated scales, with stromata appearing slightly cerebriform when the outermost layer is worn off; subsurface a thin black leathery crust 20–40 µm thick; interior whitish to cream-coloured, pithy, solid, not turning hollow upon drying. **Perithecia** immersed, subglobose to laterally compressed, 0.3–0.5(–0.7) mm diam. **Ostioles** hemispherical to obtusely conical, prominent, 120–170(–200) µm diam., black, occasionally surrounded by a white ring.

Asci cylindrical, with (4–6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 60–68 × 5–6.5 µm, the stipes 45–65(–100) µm long, with apical apparatus short-cylindrical, slightly wider than high, apically with a faint lateral rim, 1.1–1.7 × 1.5–2.1 µm (Me = 1.4 × 1.8 µm, N = 40), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, 6–9 µm wide at base, tapering to 1.5–2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (7.3–)8.2–10.6 (–11.5) × (4.1–)4.4–5.1(–5.5) µm, Q = (1.5–)1.7–2.3(–2.5), N = 360 (Me = 9.2 × 4.7 µm, Qe = 2), ellipsoid-equilateral to slightly inequilateral with broadly to most often narrowly rounded, occasionally slightly pinched or truncate ends, frequently subcitriform, dark brown, unicellular, with a straight, longitudinally oriented germ slit almost spore-length; with a fugacious, short, basal, hemispherical to broadly conical cellular appendage 1.2–1.8 µm long, at times masked by mucilaginous remnants; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics were described from a collection from Puerto Rico by Callan & Rogers (1990) and by Van der Gucht (1996) from a collection from Papua New Guinea.

Known distribution: Pantropical (Van der Gucht, 1995).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Vieux-Fort, Ravine Blondeau, hygrophilic rainforest, on dead wood, 4 Sept. 2005, *leg.* C. Lechat, CLL 5350 (LIP; HAST 145118); Basse-Terre, Vieux-Habitants, Marigot, Anse à la Barque, coastal mesophilic rainforest, on dead wood, 3 Aug. 2011, *leg.* C. Lechat, CLLGUAD 11003 (LIP); Martinique: Case Pilote, Fond Boucher, coastal mesophilic rainforest, on dead wood, 24 Aug. 2005, *leg.* C. Lechat, CLL 5164 (LIP; HAST 145119); *ibid.*, on dead corticated wood, 2 Dec. 2006, *leg.* C. Lechat, CLL 6145 (LIP); *ibid.*, on dead wood, 25 Aug. 2010, *leg.* J. Fournier, MJF 10108 (LIP); *ibid.*, on dead wood, 17 Aug. 2013, *leg.* J. Fournier, MJF 13294 (LIP); La Trinité (Caravelle peninsula), Tartane, Pointe Bateau, coastal meso- to xerophilic forest, on dead blackened wood, 26 Aug. 2010, *leg.* J. Fournier, MJF 10123 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* J. Fournier, MJF 10140 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* J. Fournier, MJF 10143 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* C. Lechat, MJF 10144 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* C. Lechat, MJF 10145 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* J. Fournier, MJF 10149 (LIP); *ibid.*, on dead wood, 26 Aug. 2010, *leg.* J. Fournier, MJF 10152 (LIP); La Trinité (Caravelle peninsula), Tartane, Pointe Jean-Claude, coastal meso- to xerophilic forest, on dead blackened wood, 24 Aug. 2010, *leg.* C. Lechat, CLLMAR 11088 (LIP); La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on dead blackened wood, 22 Aug. 2010, *leg.* C. Lechat, MJF 10040 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on dead wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0700 (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5016-2 (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5017 (LIP; HAST 145120); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5018 (LIP); *ibid.*, on dead wood, 4 Sept. 2007, *leg.* J. Fournier, MJF 07296 (LIP); *ibid.*, 24 Aug. 2010, on dead blackened wood, associated with X. multiplex var. microsperma, *leg.* J. Fournier, MJF 10085 (LIP); Le Saint-Esprit, Bois La Charles, mesophilic rainforest, on dead wood, 30 Aug. 2010, *leg.* J. Fournier, MJF 10261 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5272 (LIP); *ibid.*, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5277 (LIP; HAST 145121); *ibid.*, on dead wood, 10 Dec. 2005, *leg.* C. Lechat, CLL 5653 (LIP; HAST 145122); Sainte-Marie, La Philippe, Trou Mulet, coastal mesophilic rainforest, on dead corticated wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10270 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10277 (LIP); *ibid.*, on dead wood, 2 Aug. 2016, leg J. Fournier, MJF 16080 (LIP); *ibid.*, on dead wood, 2 Aug. 2016, *leg.* J. Fournier, MJF 16083 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead wood, 28 Aug. 2010, *leg.* J. Fournier, MJF 10185 (LIP); *ibid.*, on dead wood, 28 Aug. 2010, *leg.* J. Fournier, MJF 10200 (LIP); Schoelcher, Fond Lahaye, banks of Fond Lahaye River, mesophilic rainforest, on dead wood, 12 Aug. 2013, *leg.* J. Fournier, MJF 13163 (LIP).

Comments: The above collections match well the concept of *X. feejeensis* outlined by Van der Gucht (1995) in featuring stromata with a surface roughened by prominent hemispherical ostioles and reticulately cracked dark brown outermost coating, combined with dark brown, equilateral-ellipsoid ascospores 9.2 × 4.7 µm on average, with narrowly rounded ends and a long germ slit. This combination of morphological characters sets *X. feejeensis* apart from related tropical *Xylaria* spp., especially *X. curta* with which it has frequently been confused. The stromatal surface of *X. feejeensis* may occasionally be confused with that of *X. scruposa*; the latter is easily distinguished by its significantly larger and differently shaped ascospores with a short, obliquely oriented and slightly sigmoid germ slit (this paper).

Like Van der Gucht (1995) we noticed the unusual shape of the ascal apical apparatus being wider than high, which is unlike most *Xylaria* spp. where the ascal apical apparatus is higher than wide. We also encountered some atypical collections with unusually robust and flattened stromata. We noticed the presence of a minute, inconspicuous cellular appendage on ascospores, which had also been reported by San Martín (1992).

According to Van der Gucht (1995), "*X. feejeensis* is probably a complex of taxa", which is difficult to assess based on morphology only. Phylogenetic results published by Hsieh *et al.* (2010) and U'Ren *et al.* (2016), by showing a slight difference between material from Martinique and two Asian collections, suggest that the broad concept of *X. feejeensis* followed here might be revised in future.

Xylaria fimbriata C.G. Lloyd., *Mycological Writings*, 5 (51): 726 (1917). Plate 13.

Stromata scattered, simple to most often branched into straight to curved, claw-like fertile heads, 15–42 mm in total height, short-stipitate, arising from a common ill-defined swollen base to which woody debris or termite nest debris are usually strongly attached; fertile heads 10–25 mm high × 1.5–3.5 mm diam., cylindrical to fusiform, terete to most ofteny flattened, apically acuminate with pointed sterile apex; tan before maturity due to a thin peeling outer layer wearing off with age, surface dark grey to blackish at maturity, nodulose with strongly exposed to almost free perithecial contours; subsurface a thin leathery crust 15–25 µm thick; interior solid, spongy, white to greyish at fresh state, light yellowish brown on dry material. **Perithecia** subglobose 0.25–0.3 mm diam., laterally flattened when crowded. **Ostioles** raised-discoid, 100–150 µm diam. at base, with a whitish halo surrounding the black central papilla and vanishing with age.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 54–63 × 4.5–5 µm, the stipes 20–35 µm long, with apical apparatus 1.4–1.7 × 1.3–1.5 µm (Me = 1.5 × 1.4 µm, N = 25), quadrate, with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** copious, hyphal, filiform, thin-walled, 1–2 µm wide, embedded in mucilaginous material. **Ascospores** (6.5–)6.7–8(–8.7) × (2.9–)3.1–3.6(–3.9) µm, Q = (1.8–)1.9–2.4(–2.7), N = 120 (Me = 7.4 × 3.4 µm, Qe = 2.2), ellipsoid-inequilat-

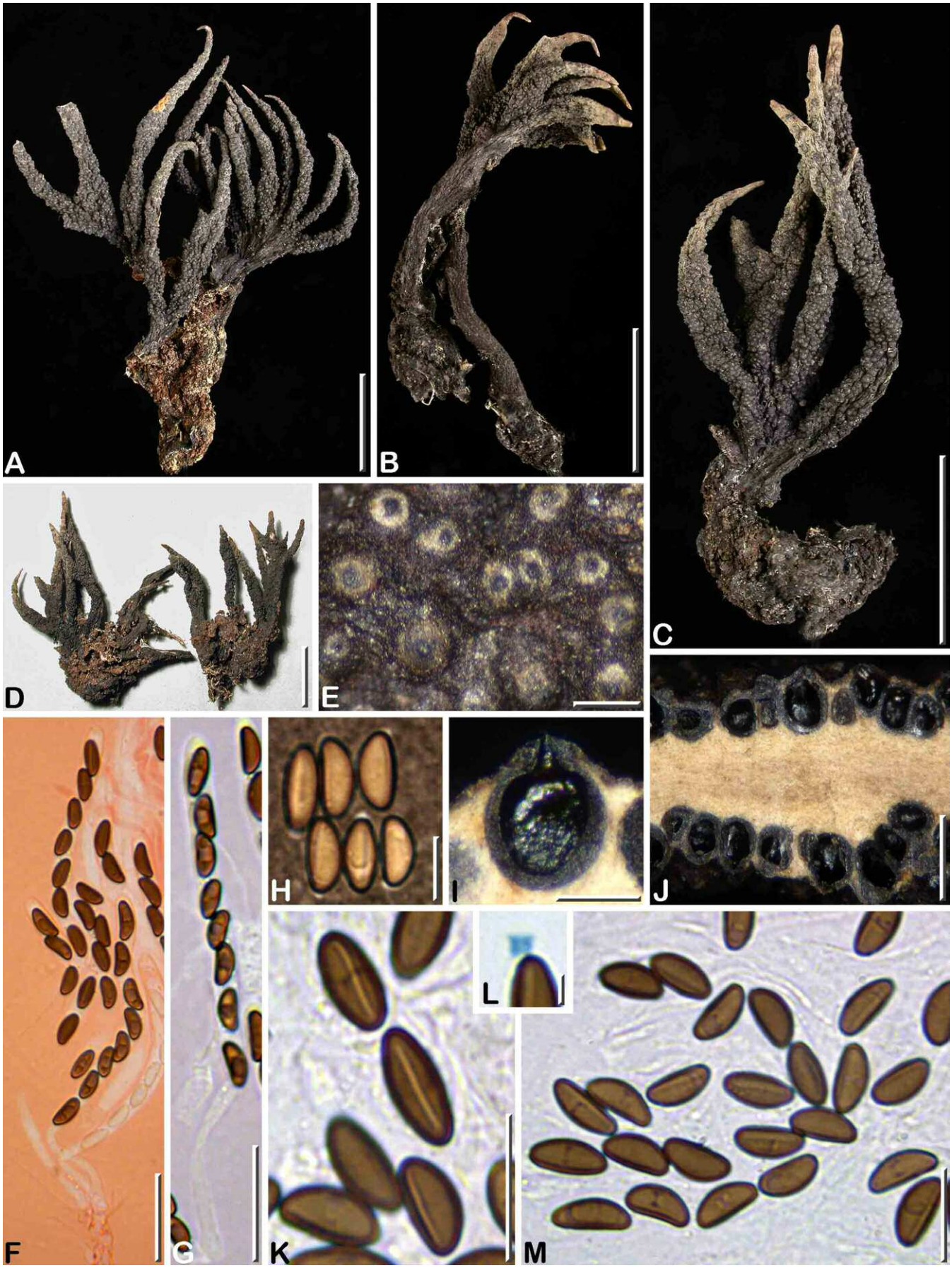

Plate 13 – *Xylaria fimbriata*

A, C, F, G: MJF 10139; B, D, E, H-M: CLL 5010. A, C, D: Mature stromata; B: Two imbricated immature stromata; E: Nodulose surface of a mature stroma, showing ostioles surrounded by a pallid halo; F, G: Short-stipitate asci, in Congo red in 1% SDS and black Pelikan ink respectively; H: Ascospores showing a minute secondary appendage, in India ink; I: Perithecium in vertical section immersed beneath a very thin crust; J: Stroma in longitudinal section showing crowded perithecia and a light brown solid interior; K: Ascospores in ventral view showing a conspicuous germ slit, in 1% SDS; L: Ascal apical apparatus, in Melzer's reagent; M: Ascospores in 1% SDS, some showing a germ slit. Scale bars: A-D = 10 mm; E, I = 0.2 mm; F, G = 20 µm; H = 5 µm; J = 0.5 mm; K, M = 10 µm; L = 2 µm.

eral with broadly rounded ends, occasionally slightly ventrally concave, light olivaceous brown at fresh state, medium brown in herbarium material, unicellular, with a conspicuous longitudinally oriented germ slit slightly less than spore-length on the ventral side; a minute mucilaginous polar secondary appendage can be detected in India ink; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: West Indies: Martinique (this paper), Puerto Rico (Ju *et al.*, 2016).

Specimens examined: French West Indies: Martinique: Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on old termite nest, 18 Aug. 2005, *leg.* C. Lechat, CLL 5010 (LIP; HAST 145123); La Trinité (Caravelle peninsula), Tartane, Pointe Bateau, coastal meso- to xerophilic forest, on a heavily rotten trunk, 26 Aug. 2010, *leg.* C. Lechat & J. Fournier, MJF 10139 (LIP; HAST 145124).

Comments: *Xylaria fimbriata* is recognized based on its ramified, acuminate and strongly nodulose stromata, small ascospores and occurrence on termite nests (Ju & Hsieh, 2007; Ju *et al.*, 2016). A multigene phylogenetic study showed that all known *Xylaria* species associated with termite nests are distantly related to the rest of *Xylaria* and form a separate clade that could be accommodated in the subgenus *Pseudoxylaria* Boedijn (Hsieh *et al.*, 2010). Within this clade, *X. fimbriata* does not cluster with the numerous Asian species included in this survey but appears on a separate branch. The specimen CLL 5010 illustrated above was included in this survey as representative of *X. fimbriata*. Morphologically, the other specimen MJF 10139 conforms well to the concept of this species but was collected on a heavily rotten trunk, without obvious association with a termite nest; however, several stromata show at their base what might be remnants of a termite nest.

Although we had extensively searched for on old termite nests in the station where the first collection was made, this distinctive and apparently uncommon species was not collected again.

Xylaria fissilis Ces., *Atti dell´Accademia di Scienze Fisiche e Matematiche Napoli*, 8(3): 16 (1879). Plate 14, Table 9.

Stromata scattered to gregarious in small groups, separate to connated at base by two or in small bundles, cylindrical to clavate or slightly fusiform, simple to furcate, terete to flattened, straight to slightly curved, brittle, longitudinally splitting with age, with obtuse fertile apices, subsessile to stipitate, 10–51 mm in total height, the fertile head 6–36 mm high × 2–5(–13) mm diam., the stipe (1–)4–18 mm high × 1.5–3 mm diam.; surface dull black, with a thin, vanishing greyish brown to blackish brown outer layer splitting into small scales or stripes; glabrous, strongly nodulose with circumferential wrinkles and more or less exposed perithecial contours; subsurface a carbonaceous crust ca. 80–100 µm thick; the stipes most often ill-defined, simple, black, terete to flattened, glabrous, fragile; interior solid to fibrous, disintegrating with age, white to dark grey or brown around perithecia, centrally blackish. **Perithecia** subglobose to depressed spherical when isolated, 0.3–0.6 mm diam., laterally flattened when crowded. **Ostioles** obtusely papillate, black, often inconspicuous, 40–70 µm diam., occasionally surrounded by a flat, blackish, discoid base 100–130 µm diam.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 83–96 × 6.5–7.5 µm, the stipes 75–110 µm long, with apical apparatus 1.9–2.4 × 1.4–1.8 µm (Me = 2.1 × 1.6 µm, N = 40), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 3–4.5 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (11.5–)12.2–14.7(–15.8) × (3.7–)4–5.3(–6) µm, Q = (2.1–)2.5–3.3(–3.7), N = 300 (Me = 13.4 × 4.5 µm, Qe = 3), fusoid-inequilateral with most often narrowly rounded ends, at times slightly ventrally concave, medium brown, unicellular, with an inconspicuous, longitudinally oriented, short germ slit 6.5–8.5 µm long on the ventral side; no appendage but mucilaginous remnants can be detected in India ink just after release from the ascus; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics on OMA were described by Hladki & Romero (2007), based on material from Argentina.

Known distribution: Argentina (Hladki & Romero, 2007), Ecuador (Thomas *et al.*, 2016), Guadeloupe and Martinique (this paper), Indonesia (Rogers *et al.*, 1987), Panamá (Carmona *et al.*, 2009) and Taiwan (Ju & Rogers, 1999).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Capesterre-Belle-Eau, third Carbet waterfall, hygrophilic rainforest, on a dead corticated branch, 2 Sept. 2004, *leg.* C. Lechat, CLL 2283 (LIP); Basse-Terre, Capesterre-Belle-Eau, Grand-Étang, hygrophilic rainforest, on a dead corticated branch, 6 Sept. 2005, *leg.* C. Lechat, CLL 5390 (LIP, HAST 145125). Martinique: Case-Pilote, Savane Saint-Cyr, trail to Plateau Concorde, 600–650 m, hygrophilic rainforest, on dead wood, 27 Aug. 2010, *leg.* J. Fournier, MJF 10160 (LIP)(parasitized by *Hypocreopsis xylariicola* Samuels); *ibid.*, on dead wood, 27 Aug. 2010, *leg.* J. Fournier, MJF 10172 (LIP); Fonds-Saint-Denis, Trace des Jésuites, hygrophilic rainforest, on dead wood, 29 Aug. 2008, *leg.* C. Lechat, CLL 8376 (LIP); Fort-de-France, Absalon, track to Plateau Michel, 400–500 m, hygrophilic rainforest, on dead wood, 7 Aug. 2013, *leg.* J. Fournier, MJF 13043 (LIP); *ibid.*, on dead wood, 7 Aug. 2013, *leg.* J. Fournier, MJF 13050 (LIP); *ibid.*, on dead wood, 15 Aug. 2013, *leg.* J. Fournier, MJF 13236 (LIP); *ibid.*, on dead wood, 5 Jun. 2014, *leg.* R. Courtecuisse, MJF 14036 (LIP); *ibid.*, on a dead trunk, 7 Aug. 2016, *leg.* J. Fournier, MJF 16151 (LIP); *ibid.*, on dead wood, 7 Aug. 2016, *leg.* J. Fournier, MJF 16155 (LIP); Fort-de-France, Colson forest, hygrophilic rainforest, on dead wood, 6 Sept. 2003, *leg.* C. Lechat, CLL 0928 (LIP); Fort-de-France, Fontaine Didier, hygrophilic rainforest, on dead wood, 19 Aug. 2013, *leg.* J. Fournier, MJF 13318 (LIP); Fort-de-France, forest track of Fond Baron, hygrophilic rainforest, on a dead rotten stump, 10 Aug. 2016, *leg.* J. Fournier, MJF 16191 (LIP); *ibid.*, on dead wood, 10 Aug. 2016, *leg.* J. Fournier, MJF 16198 (LIP); *ibid.*, on dead wood, 12 Jun. 2015, *leg.* G. Gruhn, MJF 15045 (LIP); Le Lorrain, Rivière Pirogue, Crassous forest, mesophilic rainforest, on dead wood, 26 Aug. 2004, *leg.* C. Lechat, CLL 2155 (LIP); Le Morne-Rouge, Domaine d'Emeraude, hygrophilic rainforest, on a dead corticated trunk, 9 Aug. 2013, *leg.* J. Fournier, MJF 13099 (LIP); Le Morne-Rouge, La Propreté forest trail, hygrophilic rainforest, on dead wood, 24 Aug. 2007, *leg.* J. Fournier, MJF 07071 (LIP); *ibid.*, on dead wood, 29 Aug. 2007, *leg.* J. Fournier, MJF 07184 (LIP); *ibid.*, on dead wood, 6 Jun. 2014, *leg.* J. Fournier, MJF 14066 (LIP) (immature); *ibid.*, on a dead trunk, 9 Aug. 2016, *leg.* J. Fournier, MJF 16177 (LIP); Le Morne-Rouge, *Hibiscus* plantation, hygrophilic rainforest, on dead wood, 29 Aug. 2007, *leg.* J. Fournier, MJF 07207 (LIP); Le Saint-Esprit, Bois La Charles, mesophilic rainforest, on dead wood, 25 Aug. 2004, *leg.* C. Lécuru, CLL 2097 (LIP); Macouba, Trou Navet, hygrophilic rainforest, on a dead trunk, 13 Aug. 2013, *leg.* J. Fournier, MJF 13195 (LIP); Schoelcher, trail from Absalon to Ravine Clark, hygrophilic rainforest, on dead wood, 7 Aug. 2013, *leg.* R. Courtecuisse, MJF 13057 (LIP); Schoelcher, Plateau Boucher, hygrophilic rainforest, forest trail of Rivière Blanche, hygrophilic rainforest, on dead wood, 15 Jun. 2014, *leg.* R. Courtecuisse, MJF 14161 (LIP).

Comments: *Xylaria fissilis* is characterized by nodulose and carbonaceous stromata with obtuse fertile apices overlain by a discreet grey to dark brown outer layer splitting into small scales or stripes, and inconspicuous ostioles; the interior is blackish at center and the stipes are glabrous and usually short; its ascospores are fusoid-inequilateral, 12.2–14.7 × 4–5.3 µm, with a short germ slit. This set of characters makes *X. fissilis* a distinct species but variations in as-

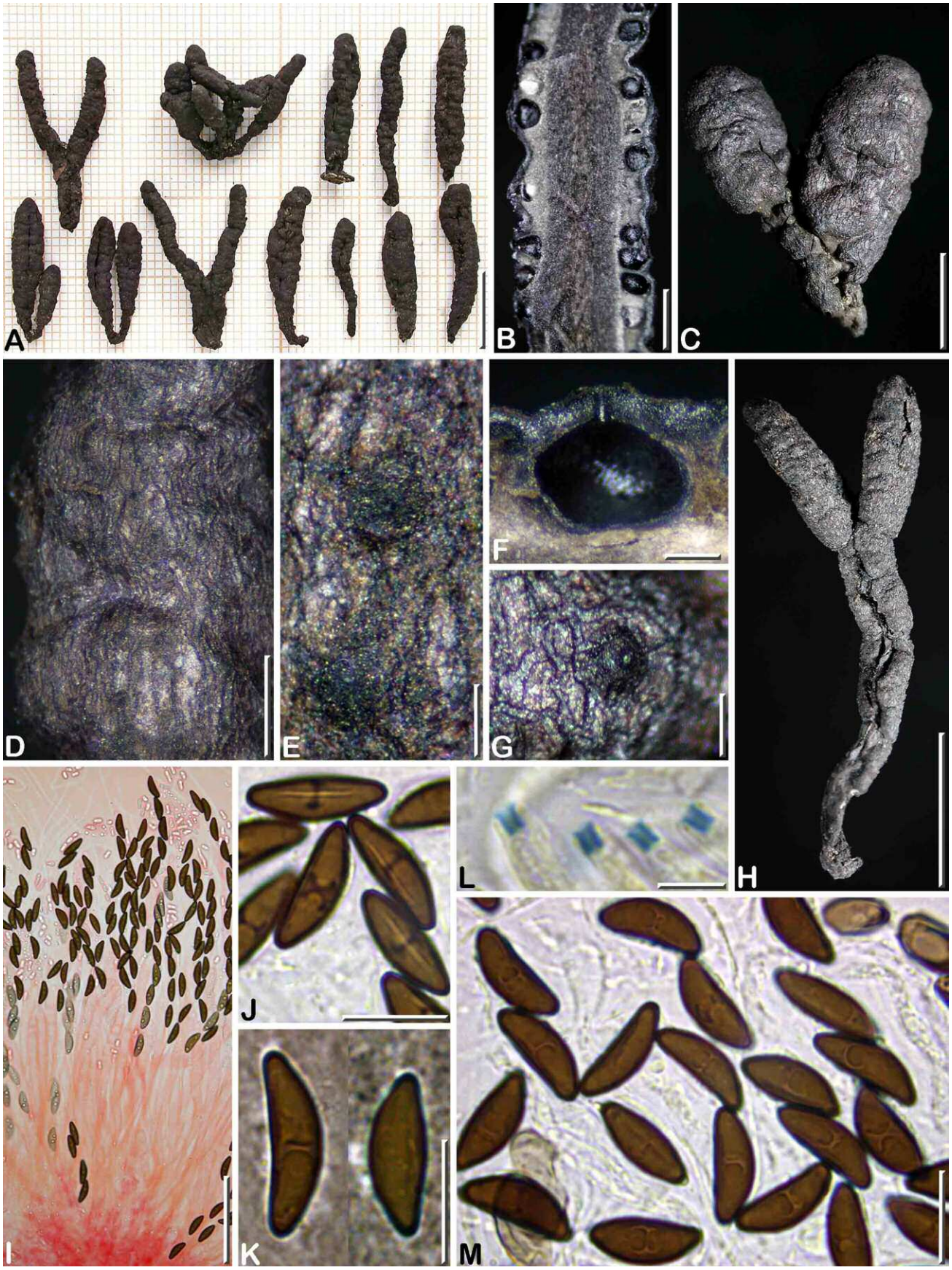

Plate 14 – *Xylaria fissilis*

A, D-G, J, M: MJF 13236; B, H: CLL 8376; C, L: CLL 0928; I, K: MJF 16177. A: Variously shaped stromata from the same collection; B: Stroma in longitudinal section showing slightly exposed perithecial contours and a blackish interior; C: Two subclavate stromata connated at base; D: Stromatal surface showing depressions, greyish splitting outer layer and minute black ostioles; E, G: Black ostioles in close-up, surrounded by small greyish scales; F: Vertical section of a perithecium immersed beneath a black carbonaceous crust, embedded in brownish tissue and seated on whitish tissue; H: Furcate and longitudinally split stroma; I: Asci in Congo red with 3% KOH; J: Ascospores in 1% SDS, three of them in ventral view showing a short straight germ slit; K: Ascospores in India ink showing remnants of mucilaginous material after release from the ascus; L: Ascal apical apparati from immature asci, in Melzer's reagent; M: Ascospores in 1% SDS. Scale bars: A, H = 10 mm; B, D = 1 mm; C= 5 mm; E, F, G = 0.2 mm; I = 50 µm; J, K, M = 10 µm; L = 5 µm.

Table 9 – Ascospore dimensions in five collections of *X. fissilis* from Guadeloupe and Martinique, showing the range of intraspecific variations, compared with those previously reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 0928	(12.5–)12.8–14.2(–15) × (4–)4.1–4.8(–5.1) µm	Q = (2.6–)2.8–3.2(–3.3), N = 60	Me = 13.5 × 4.5 µm, Qe = 3
CLL 5390	(12.4–)13.1–14.7(–15.8) × (3.7–)4.4–5.3(–6) µm	Q = (2.1–)2.5–3.2(–3.5), N = 60	Me = 13.9 × 4.8 µm, Qe = 2.9
MJF 07184	(11.5–)12.4–14(–15.2) × (4.1–)4.3–5.1(–5.5) µm	Q = (2.4–)2.5–3(–3.7), N = 60	Me = 13.2 × 4.7 µm, Qe = 2.8
MJF 13099	(11.8–)12.2–13.8(–14.3) × (3.8–)4–4.7(–5.1) µm	Q = (2.7–)2.8–3.3(–3.5), N = 60	Me = 13 × 4.4 µm, Qe = 3
MJF 13236	(12.3–)12.7–14.5(–15) × (4.1–)4.3–5(–5.2) µm	Q = (2.5–)2.7–3.2(–3.5), N = 60	Me = 13.5 × 4.6 µm, Qe = 2.9
Cumulated values	(11.5–)12.2–14.7(–15.8) × (3.7–)4–5.3(–6) µm	Q = (2.1–)2.5–3.3(–3.7), N = 300	Me = 13.4 × 4.5 µm, Qe = 3
Rogers *et al.* (1987), Indonesia	13.3–14.7 × 4.4–5 µm		Me = 14 × 4.7 µm, Qe = 3
Ju & Rogers (1999), Taiwan	14–16.5 × 4.5–5.5(–6.5) µm		Me = 15.3 × 5 µm, Qe = 3.1
Hladki & Romero (2007), Argentina	14.5–17.5 × 4–7 µm		Me = 16 × 5.5 µm, Qe = 2.9

cospore dimensions can be noticed between our collections and those reported from Asia or Argentina (Table 9). These variations do not justify the segregation of a new taxon since dimensions slightly overlap but suggest a possible cryptic speciation related to geographic origin.

Based on external morphology only, the nodulose stromata of *X. fissilis* may be confused with those of *X. curta*, *X. feejeensis*, *X. globosa*, *X. multiplex* var. *microsperma* and *X. schweinitzii*, all species readily distinguished from *X. fissilis* by their white interior and ascospore morphology (this paper).

In our experience in Guadeloupe and Martinique, *X. fissilis* occurs exclusively in montane hygrophilic forests where it is not uncommon, usually on dead stumps or dead blackened wood, but its small dull black stromata make it easily overlooked.

A specimen of *X. fissilis* from Martinique was included in the phylogenetic survey carried out by Hsieh *et al.* (2010), showing its affinities with the HY clade and the *X. hypoxylon* aggregate but on a basal, isolated branch, supporting the distinctiveness of this species inferred from morphological traits.

Xylaria friabilis J. Fourn. & Lechat, *sp. nov.* – MycoBank MB835275. Plate 15, Table 10.

Diagnosis: Differs from *X. microceras*, the most resembling taxon, by wider and more robust, often fusiform stromata with pale orange to white fibrous outer layer gradually wearing off, leaving a black, much less nodulose surface, and ascospores with a consistently ventral germ slit.

Typification: French West Indies: Martinique: Case-Pilote, Fond Boucher, dry coastal mesophilic forest, on rotten decorticated wood, 28 Aug. 2005, *leg.* C. Lechat, CLL 5238 (Holotype LIP; isotype HAST 145126).

Etymology: From Latin *friabilis* = friable, crumbly, for the brittle and easily crumbled stromata.

Stromata upright to often prostrate, scattered or in small groups, most often simple but occasionally branching, fragile and frequently fragmentary, (4–)12–32 mm high × 1–3 mm wide, subsessile to long-stipitate, narrowly cylindrical to fusiform, terete to flattened, straight to curved, with obtusely rounded fertile or pointed sterile apices, with perithecial contours unexposed; the stipes mostly ill-defined, 2–15 mm high, black, glabrous, with a slightly swollen discoid base; surface of immature stromata overlain with a pale orange to cream or white fibrous outer layer splitting longitudinally and gradually worn off, revealing a black, slightly uneven subsurface with shallow wrinkles; black crust leathery, 30–40 µm thick; interior pale brownish grey, solid, persistent, slightly fibrous to powdery and brittle. **Perithecia** fully immersed, subglobose, 0.3–0.4 mm diam. **Ostioles** obtusely papillate, minute, ca. 40 µm diam., shiny black.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 65–72 × 4.5–5 µm, the stipes 27–45 µm long, with apical apparatus short-cylindrical to slightly tubular, apically with a faint lateral rim, 1.9–2.3 × 1.3–1.6 µm (Me = 2.1 × 1.5 µm, N = 40), bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, 6–7 µm wide at base, simple, tapering to 1.5–2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (8.2–)8.8–11(–12.4) × (3.2–)3.3–4.3(–4.7) µm, Q = (2.1–)2.3–3.1(–3.3), N = 180 (Me = 9.8 × 3.8 µm, Qe = 2.6), ellipsoid slightly inequilateral with broadly rounded ends, occasionally suballantoid, light brown, unicellular, with a fairly conspicuous, straight, longitudinally oriented germ slit less than spore length (3–7 µm long) on the ventral side; without appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Only known from Martinique.

Additional specimens examined (paratypes): French West Indies: Martinique: Case-Pilote, Fond Boucher, dry coastal mesophilic forest, on rotten decorticated wood, 26 Aug. 2005, *leg.* C. Lechat, CLL 5191 (LIP; HAST 145127) (immature); *ibid.*, on rotten decorticated wood, 26 Aug. 2005, *leg.* C. Lechat, CLL 5192 (LIP) (immature); *ibid.*, on rotten decorticated wood, 2 Dec. 2006, *leg.* C. Lechat, CLL 6134 (LIP); *ibid.*, on rotten decorticated wood, 2 Dec. 2006, *leg.* C. Lechat, CLL 6140 (LIP).

Comments: The stromata of *X. friabilis* are highly variable in shape, ranging from narrowly cylindrical to fusiform-flattened, with obtuse to acute apices, but they have in common a thin leathery crust overlain by an evanescent, fibrous, whitish outer layer, minute ostioles, a crumbly brownish grey interior and pale brown suballantoid ascospores with a straight germ slit less than spore length consistently on the ventral side. This set of characters is distinctive and recalls *X. microceras* and *X. muscula*, two species likewise present in Guadeloupe or Martinique (this paper). Both differ by featuring smaller cylindrical stromata not exceeding 2 mm wide and their pure white outer layer is long-persistent and waxy-pruinose. The stromata of *X. microceras* have a nodulose surface and its ascospores, though in the same size range (Table 22), differ in having germ slits either on the dorsal or the ventral side. *Xylaria muscula* is primarily distinguished by significantly smaller ascospores 6.5–7.9 × 2.6–3.2 µm.

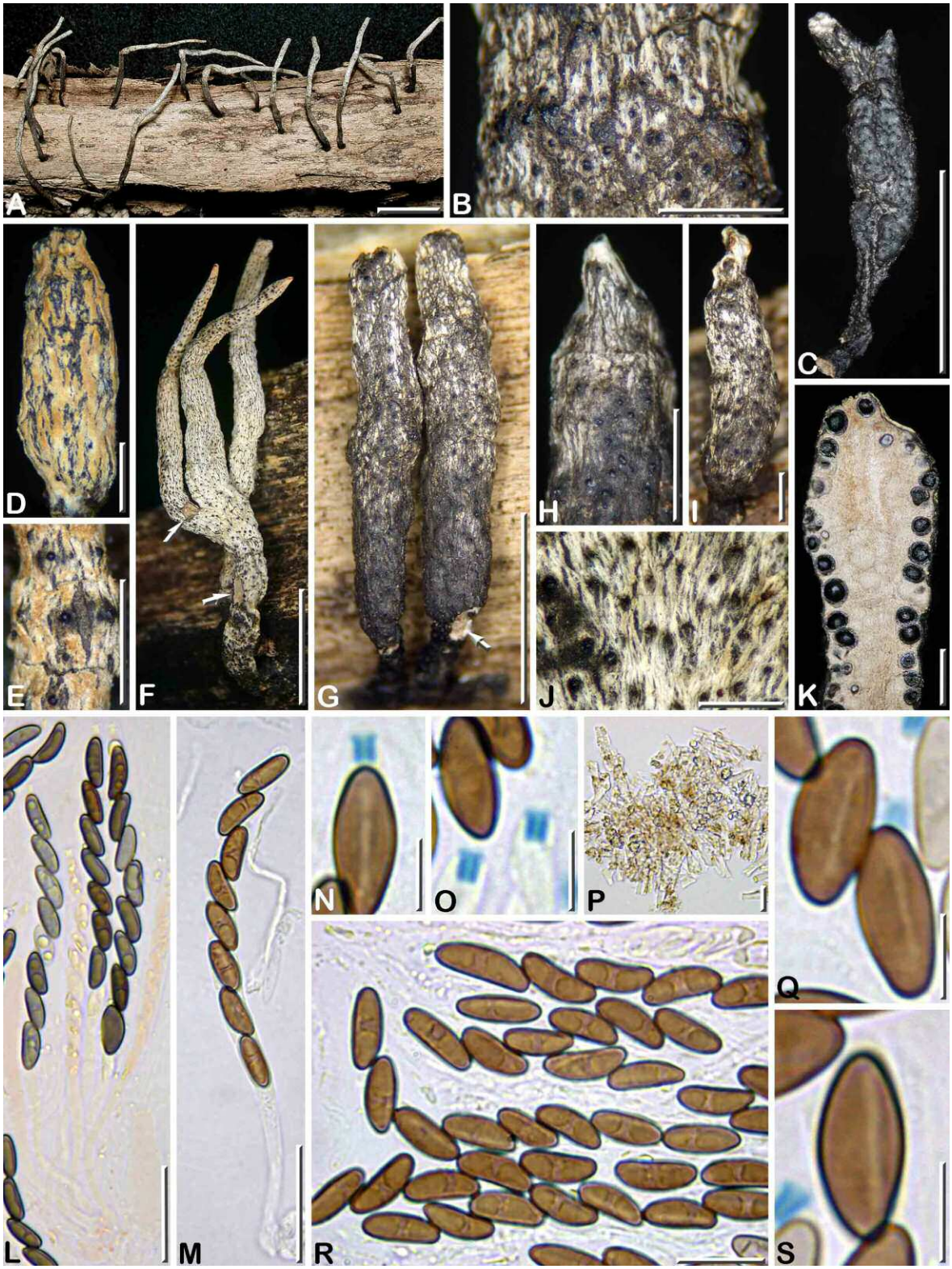

Plate 15 – *Xylaria friabilis*

A: CLL 5191; D-F, J: CLL 5192; B, C, G-I, K, L, N-S: CLL 5238 (Holotype); M: CLL 6134. A: Habit of narrowly cylindrical immature stromata on host surface; B: Surface of a mature stroma in close-up showing a white fibrous outer layer splitting longitudinally; C: Mature black stroma with furcate apex (note the broken tip); D: Sessile immature stroma with pale orange and white splitting outer layer; E: Immature filiform stroma in close-up showing a pale orange and white splitting outer layer and black ostioles; F: Furcate immature stroma with pointed apices (left) and a simple cylindrical stroma with obtuse apex (right); note the bruised parts of the stroma showing the interior (arrows); G: Two adjacent mature stromata with obtuse apices; note the basal bruised part of the stroma showing the interior (arrow); H: Apical region of a mature stroma showing a pointed apex overlain with remnants of a white outer layer and shiny black ostioles; I: Stunted mature stroma; J: Surface of an immature stroma in close-up showing a dense white fibrous outer layer splitting longitudinally; K: Stroma in longitudinal median section showing a fertile rounded apex, fully immersed perithecia and a solid brownish grey interior; L: Immature and mature asci, in Congo red with 3% KOH; M: Short-stipitate ascus, in 1% SDS; N: Ascus apex showing an apical apparatus and an ascospore in ventral view showing a straight germ slit, in Melzer's reagent; O: Two ascal apical apparati, in Melzer's reagent; P: Crush mount of internal tissue showing hyphae interspersed with pale brown granules, in 1% SDS; Q: Two ascospores in ventral view showing short germ slits, in Melzer's reagent; R: Mature ascospores, some in latero-ventral view showing a germ slit, in 1% SDS; S: Ascospore in ventral view showing a long germ slit, in Melzer's reagent. Scale bars: A = 10 mm; B, D, E, H, I, K = 1 mm; C, F, G = 5 mm; J = 0.5 mm; L, M = 20 µm; N, O, Q, S = 5 µm; P, R = 10 µm.

Table 10 – Ascospore dimensions in three collections of *X. friabilis* showing the range of intraspecific variations, compared with those of *X. microceras*. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5238 (holotype)	(8.2–)8.8–10.4(–11.5) × (3.2–)3.3–3.7(–3.8) µm	Q = (2.3–)2.4–3.1(–3.3), N = 60	Me = 9.5 × 3.5 µm, Qe = 2.7
CLL 6134	(8.6–)9.2–10.4(–11) × (3.4–)3.7–4.2(–4.4) µm	Q = (2.2–)2.3–2.7(–2.9), N = 60	Me = 9.7 × 4 µm, Qe = 2.5
CLL 6140	(8.8–)9.4–11(–12.4) × (3.4–)3.8–4.3(–4.7) µm	Q = (2.1–)2.3–2.8(–3.1), N = 60	Me = 10.2 × 4 µm, Qe = 2.5
Cumulated values	(8.2–)8.8–11(–12.4) × (3.2–)3.3–4.3(–4.7) µm	Q = (2.1–)2.3–3.1(–3.3), N = 180	Me = 9.8 × 3.8 µm, Qe = 2.6
X. microceras	(9.1–)9.9–11.3(–12.8) × (3.1–)3.4–3.9(–4.1) µm	Q = (2.4–)2.6–3.1(–3.8), N = 60	Me = 10.6 × 3.7 µm, Qe = 2.9

The stromata of *X. microceras* var. *yungae* Hladki & A.I. Romero resemble those of *X. friabilis* in shape, dimensions and vestiture but the characteristics of the crust and the the interior were unfortunately not documented (Hladki & Romero, 2010). Ascospores of *X. microceras* var. *yungae* were reported as 6.5–8 × 4 µm, which clearly sets this taxon apart from *X. friabilis*.

The brittle texture of the stromata of *X. friabilis*, due to their very thin crust and their powdery internal tissue, is a distinctive character, only encountered in the aforementioned taxa and suggestive of close affinities between them. Unpublished results kindly communicated by Dr. Yu-Ming Ju (2020) show the close phylogenetic affinities of *X. friabilis* with *X. microceras* but also show that their ITS, RPB2, TUB and ACT sequences have 92–96% similarity with those of the new species, which supports the recognition of *X. friabilis* as a distinct species.

We repeatedly collected *X. friabilis* in the very same station, a dry coastal mesophilic forest but nowhere else in Martinique, which suggests specific ecological requirements, which concurs to the distinctiveness of this new species.

Xylaria* cf. *gracillima (Fr.) Fr., *Nova Acta Regiae Societatis Scientiarum Upsaliensis*, 1: 128 (1851). Plates 16–17, Table 11.

Stromata upright to prostrate, scattered to gregarious, simple, 6.5–13 mm in total height, the fertile heads 3–9 mm high × 0.8–1.8 mm diam., cylindrical to narrowly fusiform, straight to slightly curved, strongly nodulose with perithecial contours partly to fully exposed, apically ending into mucronate sterile apices; the stipes ill- to well-defined, 2–6 mm high × 0.3–0.8 mm diam., straight to slightly curved, terete to flattened, blackish, finely longitudinally furrowed, coated with a blackish tomentum or dense, stiff, fasciculate reddish brown hairs; surface black, glabrous, devoid of peeling outer layer at maturity, finely roughened by minute cracks or warts; subsurface a black leathery crust 30–80 µm thick; interior whitish to yellowish between and just beneath the perithecia, loosely fibrous, with a wide, black, conspicuous, solid inner core extending into the stipe. **Perithecia** subglobose, superficial to half-exposed, 0.25–0.45 mm diam. **Ostioles** obtusely papillate, black, 80–130 µm diam. at base.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 67–81 × 4.5–5.5 µm, the stipes 34–56 µm long, with apical apparatus short-cylindrical, apically flattened with a faint lateral rim, 1.7–2 × 1.3–1.6 µm (Me = 1.8 × 1.5 µm, N = 40), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 3–4 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (9.6–)10.3–12(–13.1) × (3.1–)3.6–4.5(–4.9) µm, Q = (2.2–)2.4–3.2(–3.6), N = 120 (Me = 11.1 × 4 µm, Qe = 2. 8), ellipsoid-inequilateral, with narrowly to broadly rounded ends, often ventrally concave to subcrescentic, medium brown, unicellular, with a conspicuous, straight, longitudinally oriented short germ slit 6–6.5 µm long on the ventral side, at times slightly sinuous; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique.

Specimens examined: French West Indies: Martinique: Le Morne-Rouge, road to La Propreté, *Hibiscus* plantation (*Hibiscus elatus*, *Malvaceae*), hygrophilic rainforest, on a dead blackened branch in the leaf litter, 12 Jun. 2014, *leg.* J. Fournier, MJF 14138 (LIP; HAST 145128); Saint-Joseph, Plateau Perdrix, hygrophilic rainforest, on dead blackened wood, associated with dead ascomata of a *Xenolophium* sp., 5 Sept. 2003, *leg.* C. Lechat, CLL 0913 (LIP).

Comments: The stromata of both collections slightly differ and were first assumed to represent two different species. In CLL 0913, the stromata feature narrowly cylindrical fertile heads with small superficial, discreet, rarely coalescent perithecia on a central rachis and the stipes are longer and clothed with conspicuous reddish brown hairs. In MJF 14138, the stromata are relatively wider, with shorter, slightly tomentose stipes and less exposed perithecial contours; the perithecia are larger and the leathery crust thicker. However, as they

Table 11 – Ascospore dimensions in the two collections from Martinique compared with those referred to *X. gracillima* reported in literature from various origins. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 0913 Martinique	(9.8–)10.4–12(–13.1) × (3.8–)3.9–4.5(–4.9) µm	Q = (2.2–)2.4–3.1(–3.3), N = 60	Me = 11.1 × 4.2 µm, Qe = 2. 7
MJF 14038 Martinique	(9.6–)10.3–11.7 (–12.0) × (3.1–)3.6–4.1(–4.5) µm	Q = (2.5–)2.7–3.2(–3.6), N = 60	Me = 11.0 × 3.8 µm, Qe = 2.9
Cumulated values	(9.6–)10.3–12(–13.1) × (3.1–)3.6–4.5(–4.9) µm	Q = (2.2–)2.4–3.2(–3.6), N = 120	Me = 11.1 × 4 µm, Qe = 2. 8
Dennis (1961), Congo	9–10.5 × 3–4 µm		Me = 9.8 × 3.5 µm, Qe = 2.8
Dennis (1961) ?holotype, French Guiana	11–11.5 × 4–4.5 µm		Me = 11.3 × 4.3 µm, Qe = 2.6
San Martín & Rogers (1989), México	10–12(–13) × 4–5 µm		Me = 11 × 4.5 µm, Qe = 2.4
Van der Gucht (1995), Papua New Guinea	11–12.5 × 4.5 µm		Me = 11.7 × 4.6 µm, Qe = 2.5

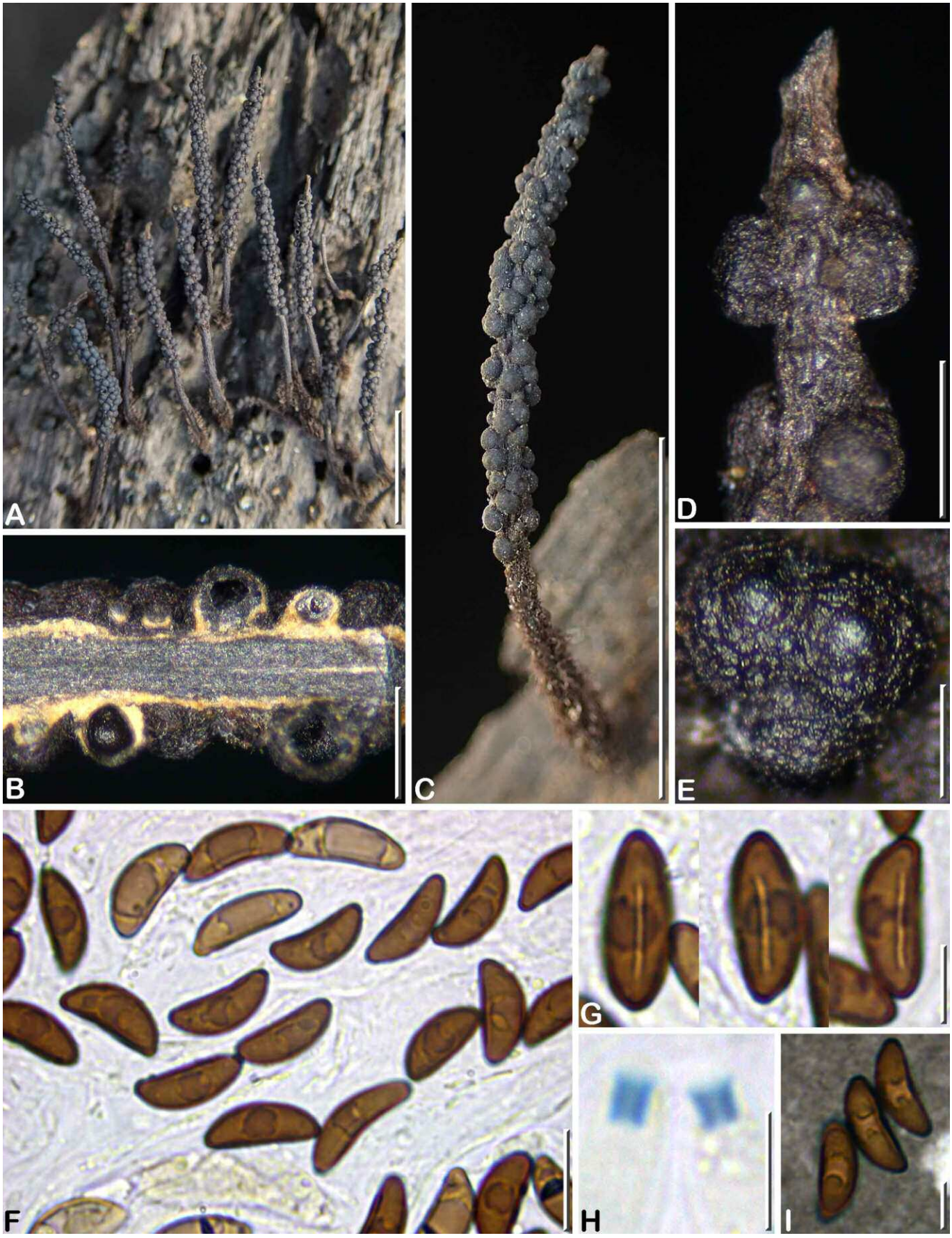

Plate 16 – *Xylaria* cf. *gracillima*

A-I: CLL 0913. A: Gregarious stromata on host surface; B: Stroma in longitudinal section showing superficial perithecia and a black solid internal tissue; C: Stroma showing a strongly nodulose surface and a hairy stipe; D: Apex of a mucronate stroma showing perithecia isolated on a central rachis; E: Three coalescent perithecia showing an obtusely papillate ostiole and a minutely warted surface; F: Ascospores in 1% SDS; G: Ascospores in ventral view showing a germ slit; H: Ascal apical apparati in Melzer's reagent; I: Ascospores showing absence of appendages or mucilaginous sheath, in diluted India ink. Scale bars: A, C = 5 mm; B, D = 0.5 mm; E = 0.2 mm; F = 10 µm; G-I = 5 µm.

share similar small-sized nodulose stromata with mucronate sterile apices, a similar and unusual black internal tissue and ascospores with a short germ slit, similar in shape, colour and dimensions, we postulate that both collections could represent the same taxon and that the differences observed reflect intraspecific variations related to environmental conditions.

They could fit *X. gracillima* as documented by Dennis (1961) and further authors (Table 11) but the distinctive and likely diagnostic black colour of the internal tissue was not documented by Fries (1830) and Dennis (1961), nor reported by San Martín & Rogers (1989) and Van der Gucht (1995).

Becerril-Navarrete *et al.* (2018) recently reported from México a collection they assigned to *X.* aff. *gracillima* based on its small slender stromata with a sterile apex and strongly exposed perithecial contours, but deviating by larger ascospores 12–15 × 5–6 µm. It further deviates from our collections by remnants of a white superficial outermost layer, larger perithecia 0.5–0.9 mm diam., a white interior and darker brown ascospores with a long germ slit.

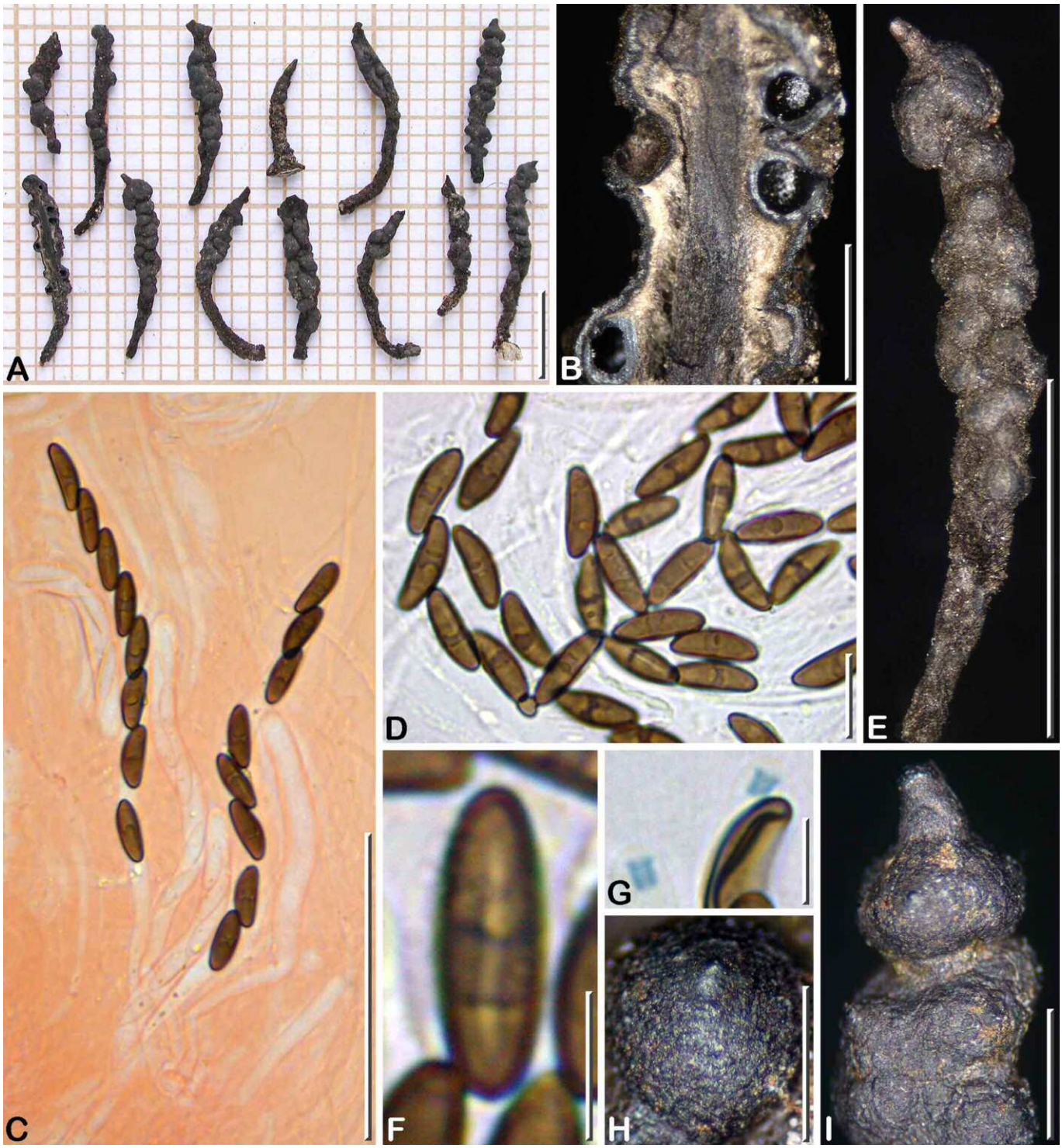

Plate 17 – *Xylaria* cf. *gracillima*

A-I: MJF 14138. A: Stromata from the same collection; B: Stroma in longitudinal section showing exposed perithecia and a black solid internal tissue; C: Asci and paraphyses, in Congo red in 1 % SDS; D: Ascospores in 1% SDS; E: Stroma showing a nodulose surface and a mucronate apex: F: Ascospore in ventral view showing a slightly sinuous germ slit; G: Ascal apical apparati in Melzer's reagent; H: Exposed perithecial contour showing a papillate ostiole and a minutely warted surface; I: Apex of a mucronate stroma. Scale bars: A, E = 5 mm; B, I = 1 mm; C = 50 µm; D = 10 µm; F, G = 5 µm; H = 0.5 mm.

As the type of *X. gracillima* is apparently lost (Dennis, 1961) and has been variously interpreted, we are reluctant to assign our collections to *X. gracillima* until the concept of this taxon is revised and better delineated.

Xylaria ianthinovelutina (Mont.) Mont., *Sylloge generum specierumque plantarum cryptogamarum*: 204 (1856). Plate 18, Table 12.

Stromata usually densely gregarious in large groups, upright to prostrate, separate to connated at base by 2–3, cylindrical to filiform, simple to branched, terete to flattened, straight to curved, with apiculate to filiform sterile apices, stipitate; 20–120 mm in total height, the fertile head 5–26 mm high × 0.6–1.8(–4) mm diam., the stipe to 100 mm high; surface brownish black, nodulose with perithecial contours strongly exposed emerging from dense tufts of reddish brown tomentum, overlain by a thin fibrous greyish brown to reddish brown, eventually black outer layer splitting longitudinally into wide stripes; the stipes ill-defined, black, flattened, longitudinally puckered, entirely densely tomentose, the base slightly swollen; subsurface crust leathery, 25–40 µm thick; interior solid, whitish. **Perithecia** subglobose to depressed-spherical, 0.4–0.55 mm diam. **Ostioles** finely papillate, dull to shiny black, 40–60(–100) µm diam. at base.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 68–83 × 5–6 µm, the stipes 48–70 µm long, with apical apparatus 2.1–2.4 × 1.3–1.8 µm (Me = 2.2 × 1.5 µm, N = 40), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, filiform, thin-walled, 0.8–2 µm wide, embedded in mucilaginous material. **Ascospores** (7.5–)9–11.3(–12.6) × (3.4–)3.7–4.7(–5.1) µm, Q = (1.9–)2.1–2.8(–3.2), N = 480 (Me = 10.1 × 4.2 µm Qe = 2.4), ellipsoid strongly inequilateral with narrowly rounded to subacute ends, brown, unicellular, with a conspicuous longitudinally oriented germ slit slightly less than spore-length on the ventral side, with a thin mucilaginous coating visible in India ink and bipolar subglobose secondary appendages visible in water and stained by diluted blue Pelikan ink or aqueous nigrosin; epispore smooth.

Asexual morph on the natural substrate not observed. Cultural characteristics on OMA were described by Ju & Rogers (1999) based on material from Taiwan.

Known distribution: Pantropical.

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Saint-Claude, Matouba, Victor Hughes track, hygrophilic rainforest, on a dead woody fruit of *Sterculia caribaea* (*Malvaceae*), 26 Nov. 2006, *leg.* R. Courtecuisse, CLL 6082 (LIP); Basse-Terre, Petit-Bourg, Rivière Tambour, hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla*, *Meliaceae*), 3 Sept. 2005, *leg.* C. Lécuru, CLL 5321 (LIP); Basse-Terre, Sainte-Rose, Sofaïa, path to Saut des Trois Cornes, meso- to hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 12 Sept. 2003, *leg.* C. Lechat, CLL 5416 (LIP; HAST 145129); Martinique: Case-Pilote, Fond Bourlet, Prise d'Eau, hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), associated with *X. arbuscula*, 21 Aug. 2005, *leg.* R. Courtecuisse, CLL 5094 (LIP; HAST 145130); Le Lorrain, Rivière Pirogue, Crassous forest, mesophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 26 Aug. 2004, *leg.* C. Lechat, CLL 2142 (LIP); *ibid.*, same host and date, *leg.* C. Lechat, CLL 2145 (LIP); Macouba, Trou Navet, hygrophilic rainforest, on a dead woody fruit of *Sterculia caribaea* (*Malvaceae*), 13 Aug. 2013, *leg.* J. Fournier, MJF 13192 (LIP); Sainte-Luce, Montravail forest, relict hygrophilic rainforest, on a dead woody fruit of mahogany (*Swietenia macrophylla, Meliaceae*), 7 Dec. 2005, *leg.* C. Lechat, CLL 5584 (LIP); *ibid.*, same host and date, *leg.* C. Lechat, CLL 5585 (LIP); *ibid.*, same host and date, *leg.* C. Lechat, CLL 5599 (LIP; HAST 145131); *ibid.*, same host, 22 Jun. 2015, *leg.* J. Fournier, MJF 15186 (LIP).

Comments: *Xylaria ianthinovelutina* is a widespread tropical species occurring on dead woody fruits, characterized by gregarious cylindrical to filiform stromata with nodulose and tomentose surface and with densely tomentose stipes appearing often wider than the fertile head, with inconspicuous ostioles; its ascospores are (7.5–)9–11.3(–12.6) × (3.4–)3.7–4.7(–5.1) µm, brown, with narrowly rounded ends bearing subglobose secondary appendages. *Xylaria culleniae* Berk. & Broome is similar in many respects but is distinguished from *X. ianthinovelutina* by slightly smaller ascospores (7.5–)8–9(–9.5) × (3.5–)4–4.5(–5) µm and more conspicuous ostioles 200 µm wide at base (Ju *et al.*, 2018). Both *X. culleniae* and *X. ianthinovelutina* were included in a large-scale phylogenetic survey, confirming their close affinities (Hsieh *et al.*, 2010). *Xylaria apeibae* Mont.

Table 12 – Ascospore dimensions in eight collections of *X. ianthinovelutina* from Guadeloupe and Martinique, showing the range of intraspecific variations, compared with those previously reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 2142	(8.5–)9.2–10.5(–10.9) × (3.4–)3.7–4.3(–4.8) µm	Q = (2.2–)2.3–2.7(–2.9), N = 60	Me = 9.9 × 4 µm, Qe = 2.5
CLL 5094	(9.5–)10–11.3(–11.8) × (3.6–)3.9–4.4(–5.1) µm	Q = (2.2–)2.3–2.7(–3.2), N = 60	Me = 10.6 × 4.2 µm, Qe = 2.5
CLL 5099	(7.5–)9.2–10.5(–12) × (3.5–)4–4.6(–4.8) µm	Q = (2–)2.1–2.5(–2.7), N = 60	Me = 9.8 × 4.3 µm, Qe = 2.3
CLL 5416	(8.9–)9.4–11(–11.7) × (3.4–)3.8–4.4(–4.6) µm	Q = (2.1–) 2.3–2.8(–2.9), N = 60	Me = 10.3 × 4.1 µm, Qe = 2.5
CLL 5585	(8.3–)9.8–11.3(–12.5) × (4–)4.1–4.7(–5) µm	Q = (1.9–)2.1–2.6(–3.1), N = 60	Me = 10.6 × 4.4 µm, Qe = 2.4
CLL 6082	(9.1–)9.3–10.8(–12.6) × (3.9–)4.1–4.8(–5.1) µm	Q = (1.9–)2.1–2.5(–2.7), N = 60	Me = 10.1 × 4.4 µm, Qe = 2.3
MJF 13192	(8.7–)9–10.4(–10.6) × (3.5–)3.9–4.4(–4.8) µm	Q = (2–)2.2–2.5(–2.8), N = 60	Me = 9.7 × 4.2 µm, Qe = 2.3
MJF 15186	(8.5–)9.4–10.5(–10.9) × (3.6–)3.9–4.5(–4.7) µm	Q = (2.1–)2.2–2.6(–2.8), N = 60	Me = 9.9 × 4.2 µm, Qe = 2.4
Cumulated values	(7.5–)9–11.3(–12.6) × (3.4–)3.7–4.7(–5.1) µm	Q = (1.9–)2.1–2.8(–3.2), N = 480	Me = 10.1 × 4.2 µm, Qe = 2.4
Dennis (1956), Tropical America	10–13 × 4–6 µm		Me = 11.5 × 5 µm, Qe = 2.3
Dennis (1958), Tropical Africa	8–13 × (3–)4–6 µm		Me = 10.5 × 4.5 µm, Qe = 2.6
Ju *et al.* (2018)	(9–)9.5–11(–12) × (3.5–)4–4.5(–5) µm	N = 60	Me = 10.3 × 4 µm, Qe = 2.6
San Martín & Rogers (1989), México	10–12(–13) × 4–5 µm		Me = 11.5 × 4.5 µm, Qe = 2.6

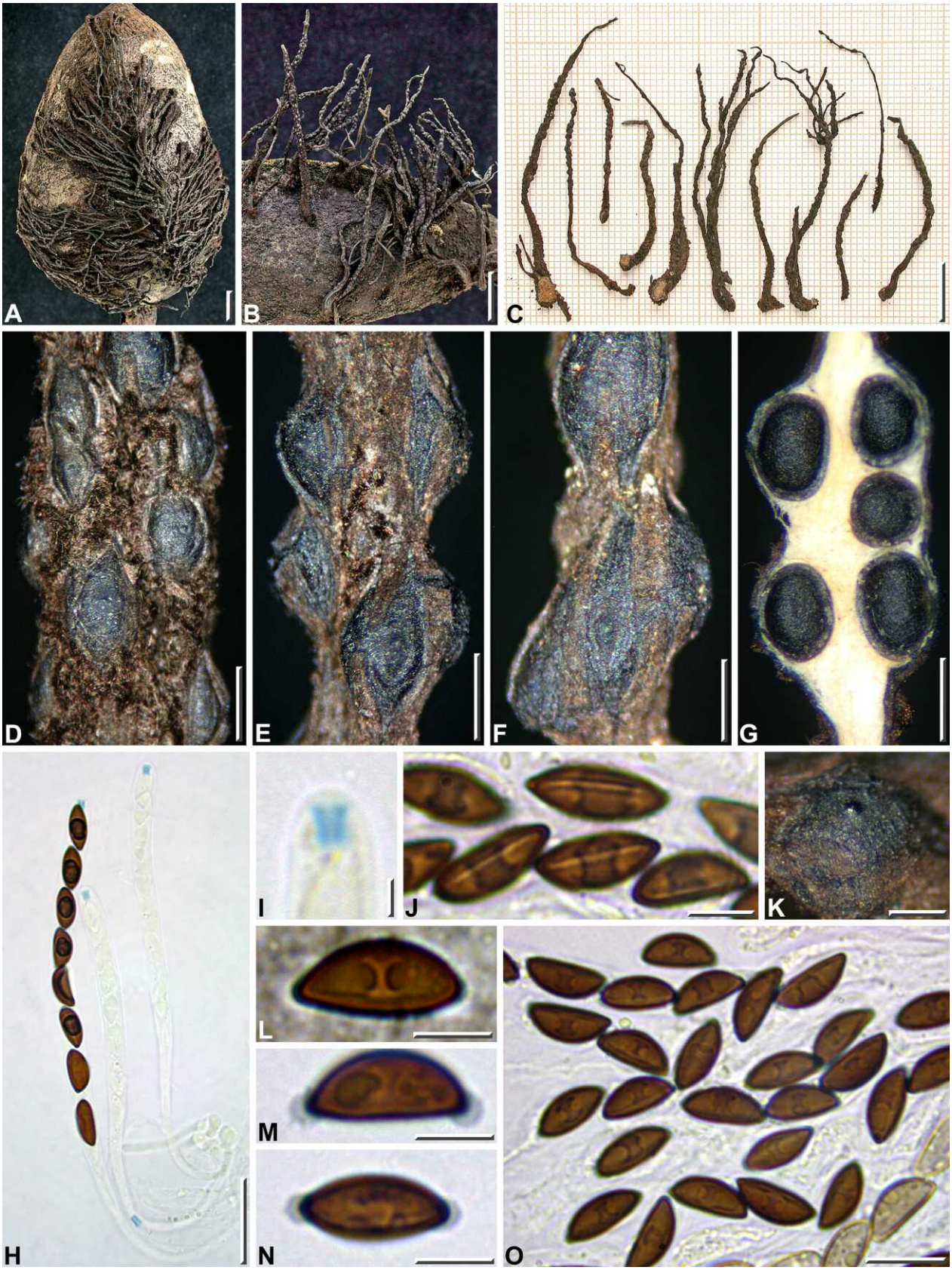

Plate 18 – *Xylaria ianthinovelutina*

A, C-G, K: CLL 2142; B: CLL 2416; H, J: CLL 5099; I, L-O: MJF 13192. A: Habit of crowded prostrate stromata on a mahogany fruit; B: Habit of upright stromata on a mahogany fruit; C: Variously shaped mature stromata from the same collection; D: Stromatal surface showing black exposed perithecia emerging from a dense reddish brown tomentum; E: Stromatal surface showing tomentum reduced to scattered tufts and perithecial contours overlain by a reddish brown outer layer splitting into wide stripes; F: Glabrous stromatal surface showing a reddish brown splitting outer layer; G: Stroma in longitudinal section showing perithecia immersed beneath a thin crust and a whitish solid interior; H: Mature and immature asci, in Melzer's reagent; I: Ascal apical apparatus, in Melzer's reagent; J: Ascospores in ventral view showing germ slits, in 1% SDS; K: Close-up on a perithecial contour showing a minute shiny black ostiole and remnants of a superficial reddish brown layer; L: Ascospore in diluted India ink showing a thin mucilaginous coating; M, N: Ascospores showing bipolar appendages stained by aqueous nigrosin, in side and dorsal view respectively; O: Ascospores in 1% SDS. Scale bars: A-C = 10 mm; D-G = 0.5 mm; H = 20 µm; I = 2 µm; J, L-N = 5 µm; K = 0.2 mm; O = 10 µm.

and *X. luzonensis* Henn., two morphologically similar species with ascospores roughly in the same size range primarily differ from *X. ianthinovelutina* by light brown ascospores lacking secondary appendages (Ju *et al.*, 2018).

The presence of a superficial splitting layer over the stroma of *X. ianthinovelutina* was not mentioned by Ju *et al.* (2018) but was observed in at least some stromata of all the collections we studied. This layer is usually concealed beneath the dense tomentum and can be made out only in aged stromata where the tomentum is worn off, making it a differential character sometimes difficult to evaluate.

Xylaria* cf. *longiana Rehm, *Annales Mycologici,* 2 (2): 175 (1904). Plates 19–20, Table 13.

Stromata upright, scattered or in small clusters, 20–100 mm in total height, highly variable in shape and branching pattern, with unexposed to slightly exposed perithecial contours, short- to long-stipitate; the fertile parts either narrowly cylindrical to acicular with a mucronate to long-apiculate sterile apex, straight to curved, simple or branched at base, terete to rarely flattened or nodulose, 8–30 mm high × 1.2–2 mm wide, or repeatedly branched, sometimes at right angle, cylindrical with obtusely rounded apex, nodulose, most often contorted, 20–40 mm high × 2–4 mm wide; the stipes mostly ill-defined, 6–80 mm high × 0.8–4 mm wide, black, terete to strap-like, simple to branched, slightly curved to contorted, roughened by longitudinal wrinkles and tomentose in places, occasionally with a slightly swollen discoid base; surface of immature stromata overlain with a continuous white to cream fibrous outer layer splitting longitudinally and gradually worn off, revealing a black leathery subsurface crust 40–80 µm thick, densely encrusted with minute persistent black granules; interior whitish, solid, persistent, fibrous, with a narrow brown to dark brown inner core. **Perithecia** subglobose, 0.45–0.5 mm diam. to laterally compressed when crowded, up to 0.6 mm high × 0.2–3 mm diam. **Ostioles** obtusely papillate, rarely conical, black to shiny black, conspicuous, 80–100 µm diam. at base.

Asci cylindrical, with (4–6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 68–82 × 5.5–6.5 µm, the stipes 45–56 µm long, with apical apparatus short-cylindrical to slightly tubular, apically with a faint lateral rim, 2–2.5 × 1.5–1.9 µm (Me = 2.2 × 1.6 µm, N = 60), bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, simple, 4–5.5 µm wide at base, tapering to 1–2 µm wide above asci, sparsely guttulate, embedded in mucilaginous material. **Ascospores** (8.1–)9.5–11.6(–12.4) × (4–)4.4–5.4 (–5.9) µm, Q = (1.8–)1.9–2.6(–2.7), N = 300 (Me = 10.6 × 4.7 µm, Qe = 2.2), ellipsoid-inequilateral, mostly with broadly rounded ends, occasionally slightly ventrally concave, blackish brown, unicellular, with a straight, longitudinally to slightly obliquely oriented and sinuous germ slit almost spore-length on the ventral side, with a minute rounded secondary appendage on one end, occasionally a flattened one on the opposite end, both inconspicuous and only detected in India ink; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique.

Specimens examined: French West Indies: Martinique: Case-Pilote. Fond Boucher, meso- to xerophilic forest, on a dead decorticated branch, 24 Aug. 2005, *leg.* C. Lechat, CLL 5153 (mostly immature)(LIP; HAST 145166); *ibid.*, 28 Aug. 2005, *leg.* C. Lechat, CLL 5241 (LIP; HAST 145167); *ibid.*, on a dead decorticated branch of *Haematoxylon campechianum* (*Fabaceae*), 17 Aug. 2013, *leg.* J. Fournier, MJF 13300 (LIP). La Trinité, (Caravelle peninsula), Balata, xerophilic coastal forest, on a dead corticated branch, 23 Aug. 2005, *leg.* C. Lechat, CLL 5144 (LIP; HAST 145168) (mostly immature); *ibid.*, on dead wood of *Haematoxylon campechianum* (*Fabaceae*), 29 Nov. 2006, *leg.* C. Lechat, CLL 6105 (LIP; HAST 145169); *ibid.*, on dead wood of *Haematoxylon campechianum* (*Fabaceae*), 29 Nov. 2006, *leg.* C. Lechat, CLL 6107 (LIP); *ibid.*, on dead wood, 18 Aug. 2011, *leg.* C. Lechat, CLLMAR 11027 (LIP) (barely mature).

Additional specimen examined: *Xylaria hypoxylon* complex, close to *X. longiana* Rehm: USA: Illinois, Johnson Co., Forman Cypress swamp, on wood, 21 Oct. 1983, *leg.* J.H. Crane, *det*. J.D. Rogers (JDR).

Comments: The seven collections that we examined share stromata with a white to cream fibrous outer layer splitting into elongated stripes, lying over a thin leathery crust densely encrusted with minute black granules, black ill-defined tomentose stipes, conspicuous obtusely papillate ostioles and inequilateral, slightly ventrally concave, blackish brown ascospores 9.5–11.6 × 4.4–5.4 µm with broadly rounded ends and bearing most often a mucilaginous polar appendage. On the other hand, the stromata display a confusing variability in shape and dimensions, ranging from 20 to 100 mm high, short- to long-stipitate, acicular, 1.2–2 mm wide with a long sterile apex to branched, contorted, 2–4 mm wide with an obtuse fertile apex; ascospores are fairly consistent as to dimensions (Table 13), shape and colour but vary in germ slit morphology (straight to slightly spiralling) and presence and number of secondary mucilaginous appendages.

While slender stromata occurring on dead wood lying on the ground seem typical for the species, those of collections CLL 6205 and CLL 6207 differ in being more robust, more branched and more nodulose, lacking mucronate to acute apices. They are, however, regarded as closely related to those with narrowly cylindrical and acuminate stromata based on their similar surface characters including a white striped outer layer and dense black granulations, ostioles and micromorphological features, including similar secondary appendages on ascospores. In both deviating collections, the long rooting stipes are encrusted with sand particles, strongly suggesting they originate from buried wood, which likely accounts for a luxuriant growth involving a different gross morphology. Such variations in external morphology in relation with growth conditions are not uncommon in *Xylaria*, but they reach here an amplitude rarely encountered, which would be misleading without a close examination of the stromatal surface and comparison of ascospore morphology.

Table 13 – Ascospore dimensions in five collections of *X.* cf. *longiana* showing the range of intraspecific variations, compared with those of collection of *X. longiana* from USA. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5241	(9.1–)9.5–11.3(–12.4) × (4.3–)4.5–5.4(–5.9) µm	Q = (1.8–)1.9–2.3(–2.5), N = 60	Me = 10.4 × 5 µm, Qe = 2.1
CLL 6105	(9.6–)9.8–11.5(–12.4) × (4–)4.5–5.1(–5.6) µm	Q = 2–2.5(–2.6), N = 60	Me = 10.7 × 4.8 µm, Qe = 2.2
CLL 6107	(8.1–)9.7–11.4(–12.1) × (4.2–)4.4–5.1(–5.4) µm	Q = (1.8–)2–2.5(–2.7), N = 60	Me = 10.4 × 4.7 µm, Qe = 2.2
CLLMAR 11027	(9.3–)9.8–11.2(–11.6) × (4–)4.4–4.9(–5.3) µm	Q = (1.9–)2.1–2.5(–2.6), N = 60	Me = 10.6 × 4.6 µm, Qe = 2.3
MJF 13300	(9.6–)10.4–11.6(–12.3) × (4.2–)4.4–4.9(–5.6) µm	Q = (1.9–)2.2–2.6(–2.7), N = 60	Me = 11 × 4.6 µm, Qe = 2.4
Cumulated values	(8.1–)9.5–11.6(–12.4) × (4–)4.4–5.4(–5.9) µm	Q = (1.8–)1.9–2.6(–2.7), N = 300	Me = 10.6 × 4.7 µm, Qe = 2.2
X. longiana JDR	(9.3–)9.7–11.6(–13.3) × (4.3–)4.7–5.1(–5.3) µm	Q = 1.9–2.4(–2.8), N = 60	Me = 10.5 × 4.9 µm, Qe = 2.1

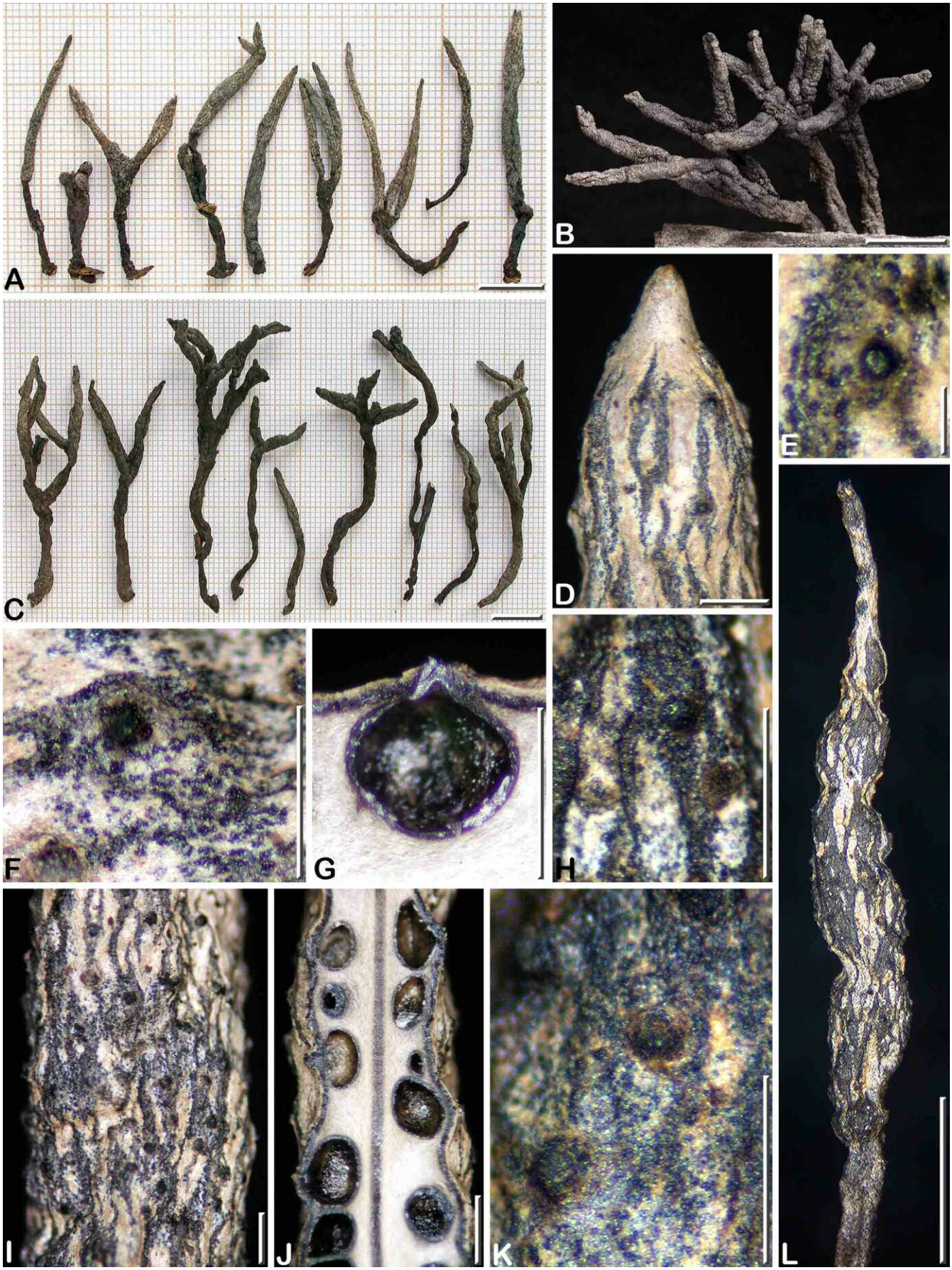

Plate 19 – *Xylaria* cf. *longiana*

A, D-G, I, J: CLL 5241; B, C, K: CLL 6105; H, L: MJF 13300. A, C: Variously shaped stromata from two different collections; B: Bunch of stout branching stromata; D: Mucronate apex of a narrowly cylindrical stroma; E, F, H, K: Stromatal surface in close-up showing ostioles and a variously worn off white outer layer revealing minute black granulations; G: Vertical section of a perithecium showing a thin black subsurface leathery layer pierced by a papillate ostiole; I: Stromatal surface showing a whitish striped outer layer, a granular blackish subsurface and black ostioles; J: Stroma in longitudinal section showing perithecia immersed in a white solid internal tissue with a narrow dark brown inner core; L: Unusually small, nodulose and apiculate stroma. Scale bars: A-C = 10 mm; D, F-K = 0.5 mm; E = 0.2 mm; L = 2 mm.

Unpublished molecular data kindly provided by Dr. Ju (pers. comm., 2020) strongly suggest that three different taxa may be involved within these seven collections. The two collections CLL 5241 and CLL 6105 that feature so different stromata (Plate 19) are shown to be genetically identical based on ITS, TUB and ACT sequences, while gene sequences of CLL 5144 differ from them by 4–6 % and those of CLL 5153 even more. As both latter collections are largely immature their microscopical characters could not be thoroughly studied, thus they are provisionally discarded from the discussion.

Xylaria oligotoma, known from Malaysia (Malacca), was considered to accommodate our collections for having narrowly cylindrical, frequently branched stromata with acute apices and a similar superficial coating including black granules. Beside a different geographical origin, our collections differ from *X. oligotoma* as described and illustrated in the protologue (Saccardo & Paoletti, 1888) by larger stromata up to 10 cm high and significantly wider, non-allantoid ascospores 9.5–11.6 × 4.4–5.4 µm vs. 9–12 × 3–4 µm.

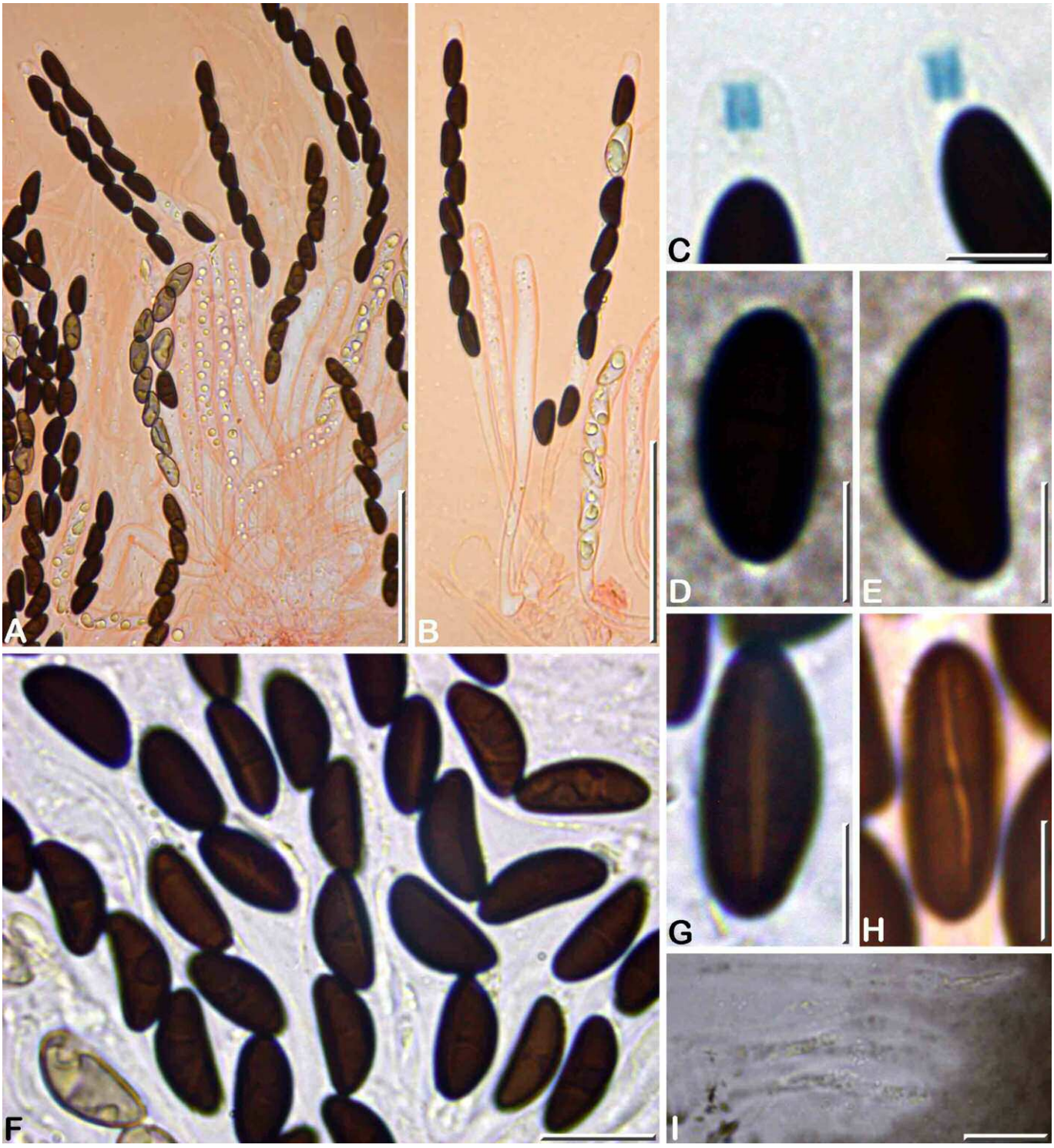

Plate 20 – *Xylaria* cf. *longiana*

A-D, F, H, I: CLL 5241; E: CLL6205; G: MJF 13300. A: Few-spored and eight-spored immature and mature asci, in Congo red in 1% SDS; B: Immature and mature asci, in Congo red in 1% SDS; C: Two ascal apical apparati, in Melzer's reagent; D, E: Ascospores showing bipolar secondary appendages, in diluted India ink; F: Ascospores in 1% SDS, some in ventral view showing a germ slit; G: Ascospore in ventral view showing a straight germ slit, in 1% SDS; H: Ascospore in ventral view showing an obliquely oriented, slightly sinuous germ slit, in Congo red in 1% SDS; I: Paraphyses tips embedded in mucilage, in diluted India ink. Scale bars: A, B = 50 µm; C = 1 mm; C-E, G, H = 5 µm; F, I = 10 µm.

Another collection from Guadeloupe is referred in this paper to *X. oligotoma* (as *X.* cf. *oligotoma*) based on its similar stromata with similar coating, which differs from both our collections and typical *X. oligotoma* by much smaller ascospores 6.5–7.5 × 2.8–3.4 µm. The differences between the species related to *X. oligotoma* are discussed in the comments on this species.

Xylaria muscandae (Ju *et al.*, 2016; this paper) likewise features narrowly cylindrical to acicular stromata with a granulate crust overlain by a whitish and fibrous outer layer splitting into narrow stripes; it differs in having lighter brown and narrower ascospores lacking secondary appendages (this paper).

As suggested by Dr. Yu-Ming Ju (pers. comm., 2020), the most resembling taxon appears to be *X. longiana*, known from North America and México (Rogers, 1986; San Martín & Rogers, 1989; San Martín *et al.*, 2001) where it is regarded as having a strong preference for *Quercus* wood. *Xylaria longiana*, as usually conceived, indeed possesses cylindrical stromata with a whitish outer layer splitting into elongated stripes and ascospores 9–11 × 4.5–5 µm, which led to refer it to a small-spored form of *X. hypoxylon* (Rogers, 1986). We examined a specimen from Prof. Rogers' personal herbarium (JDR) matching this concept, on which we observed the so far unreported presence of numerous black granules on stromatal crust and prominent obtusely rounded ostioles, like in our collections, and dark brown ascospores 9.7–11.6 × 4.7–5.1 µm (Table 13) with a straight germ slit spore-length and a polar mucilaginous appendage, similar to those of the Caribbean material. However, *X. longiana* itself, originally described from Texas with ascospores 8–9 × 4 µm (Rehm, 1904), is fairly ill-delimited and frequently referred to as *X.* cf. *longiana* based on deviating ascospore morphology or deviating characteristics in culture (San Martín & Rogers, 1989; San Martín, 1992).

Our seven Caribbean collections appear ecologically restricted to dry coastal stations with xeric vegetation characterized in West Indies by *Haematoxylon campechianum* L. (*Fabaceae*), an unusual host for *Xylaria* to which several collections could be reliably assigned. This peculiar ecology might be an additional discriminating feature from *X. longiana* as currently conceived, which, however remains the closest taxon to which our collections can be tentatively referred.

Xylaria martinicensis J. Fourn. & Lechat, *sp. nov.* – MycoBank MB835276. Plates 21–22, Tables 14–15.

Diagnosis: Differs from *X. luteostromata* var. *macrospora*, the most resembling taxon, by a kretzschmarioid habit, coarsely corky-cracked stipes, conspicuous raised-discoid ostioles and subequilateral, slightly larger ascospores.

Typification: French West Indies: Martinique: Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead corticated trunk, 18 Aug. 2005, *leg.* C. Lechat, CLL 5020 (holotype, LIP; isotype, HAST 145132).

Etymology: Epithet derived from Martinique, the Caribbean island where this species was repeatedly collected.

Stromata kretzschmarioid, densely gregarious to tightly aggregated, often in large orbicular or effused groups, usually simple, separate to frequently connated at base or fused with adjacent stromata, turbinate, subsessile to long stipitate, 4–9.5 mm in total height, the fertile head convex, hemispherical to slightly conical, occasionally short cylindrical or flattened, frequently laterally compressed and deformed by mutual pressure, 1–3.6(–5.2) mm high × 1.6–4(–6) mm diam., the stipe 1.5–6.8 mm high × 1–3.2 mm diam. in its widest part; surface blackish brown to dull black, glabrous, coarsely cracked into prominent polygonal warts, more or less nodulose, with perithecial contours not to slightly exposed; the stipes dark brown, glabrous, coarsely cracked into polygonal scales from the very base, with evanescent reddish brown tomentum at base of young stromata; subsurface black, leathery, ca. 40 µm thick; interior solid, whitish, soft-textured, typically with a faint to conspicuous layer of citrine-yellow tissue embedding the perithecia, due to minute yellowish granules accumulated within the entostromatic hyphae, not changing colour nor dissolving in 3% KOH. **Perithecia** subglobose, 0.4–0.55 mm diam. **Ostioles** papillate, on a conspicuous raised-discoid base 200–250(–300) µm diam., black, occasionally overlain with white substance.

Asci cylindrical to slightly fusoid, with (6–)8 overlapping uniseriately arranged ascospores, the spore-bearing parts 81–92 × 8.5–9.5 µm, the stipes 60–90 µm long, with apical apparatus trapezoid with straight to slightly concave sides, wider than high, 1.2–1.7 × 2.5–2.9 µm (Me = 1.4 × 2.7 µm, N = 40), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, 6–9 µm wide at base, tapering to 2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (12.2–)12.9–15.3 (–16.5) × (5.5–)5.9–7(–7.4) µm, Q = (1.8–)2–2.4(–2.6), N = 300 (Me = 14.1 × 6.4 µm, Qe = 2.2), ellipsoid-subequilateral, with mostly narrowly rounded ends, medium brown, unicellular, with a narrow but conspicuous, straight, longitudinally oriented germ slit spore-length on the less convex side when inequilateral; focusing immediately beneath the germ slit reveals a wide, blurred pale band; appendage or mucilaginous sheath not present; epispore smooth.

Asexual morph on the natural substrate occurring on the convex heads of small primordial stromata associated with immature stromata, appearing as an olivaceous grey powdery layer. Conidiogenous cells cylindrical to slightly geniculate, olivaceous in 3% KOH, tightly palisadic, 30–45 µm long × 3.5–4.5 µm wide, with terminal and lateral denticulate conidial secession scars; conidia produced holoblastically in sympodial sequence, ellipsoid to subglobose, pale olivaceous, smooth, 5.5–7.5 × 4–5 µm.

Table 14 – Ascospore dimensions in five collections of *X. martinicensis* from Martinique, showing a narrow range of intraspecific variations, compared with those of *X. luteostromata* var. *macrospora* and *X. martinicensis* var. *microspora*. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5020 (holotype)	(12.7–)13.8–15.3(–16.3) × (6–)6.2–6.9(–7.1) µm	Q = (1.9–)2.1–2.4(–2.6), N = 60	Me = 14.6 × 6.5 µm, Qe = 2.2
CLL 5270	(12.5–)12.9–14.6(–15.3) × (5.5–)5.9–6.7(–7.4) µm	Q = (1.8–)2–2.3(–2.6), N = 60	Me = 13.8 × 6.3 µm, Qe = 2.2
CLL 5649	(12.5–)13.1–14.5(–15.1) × (5.9–)6.2–7(–7.2) µm	Q = (1.9–)2–2.3(–2.4), N = 60	Me = 13.9 × 6.6 µm, Qe = 2.1
MJF 07082	(12.2–)13.7–15.2(–16.5) × (6.1–)6.3–6.9(–7.2) µm	Q = (1.9–)2–2.4(–2.5), N = 60	Me = 14.4 × 6.6 µm, Qe = 2.2
MJF 16004	(12.3–)13.3–14.6(–15.3) × (5.7–)5.9–6.5(–6.9) µm	Q = (1.9–)2.1–2.4(–2.6), N = 60	Me = 13.9 × 6.2 µm, Qe = 2.2
Cumulated values	(12.2–)12.9–15.3(–16.5) × (5.5–)5.9–7(–7.4) µm	Q = (1.8–)2–2.4(–2.6), N = 300	Me = 14.1 × 6.4 µm, Qe = 2.2
X. luteostromata var. *macrospora* New Zealand	(10–)11.5–14(–16.5) × (4–)5–6.5(–8.5) µm		Me = 13 × 5.8 µm, Qe = 2.2
X. martinicensis var. *microspora* MJF 13061	(8.2–)9–10.4(–10.8) × (3.9–)4.6–5.2(–5.5) µm	Q = (1.5–)1.8–2.2(–2.7), N = 60	Me = 9.6 × 4.9 µm, Qe = 2

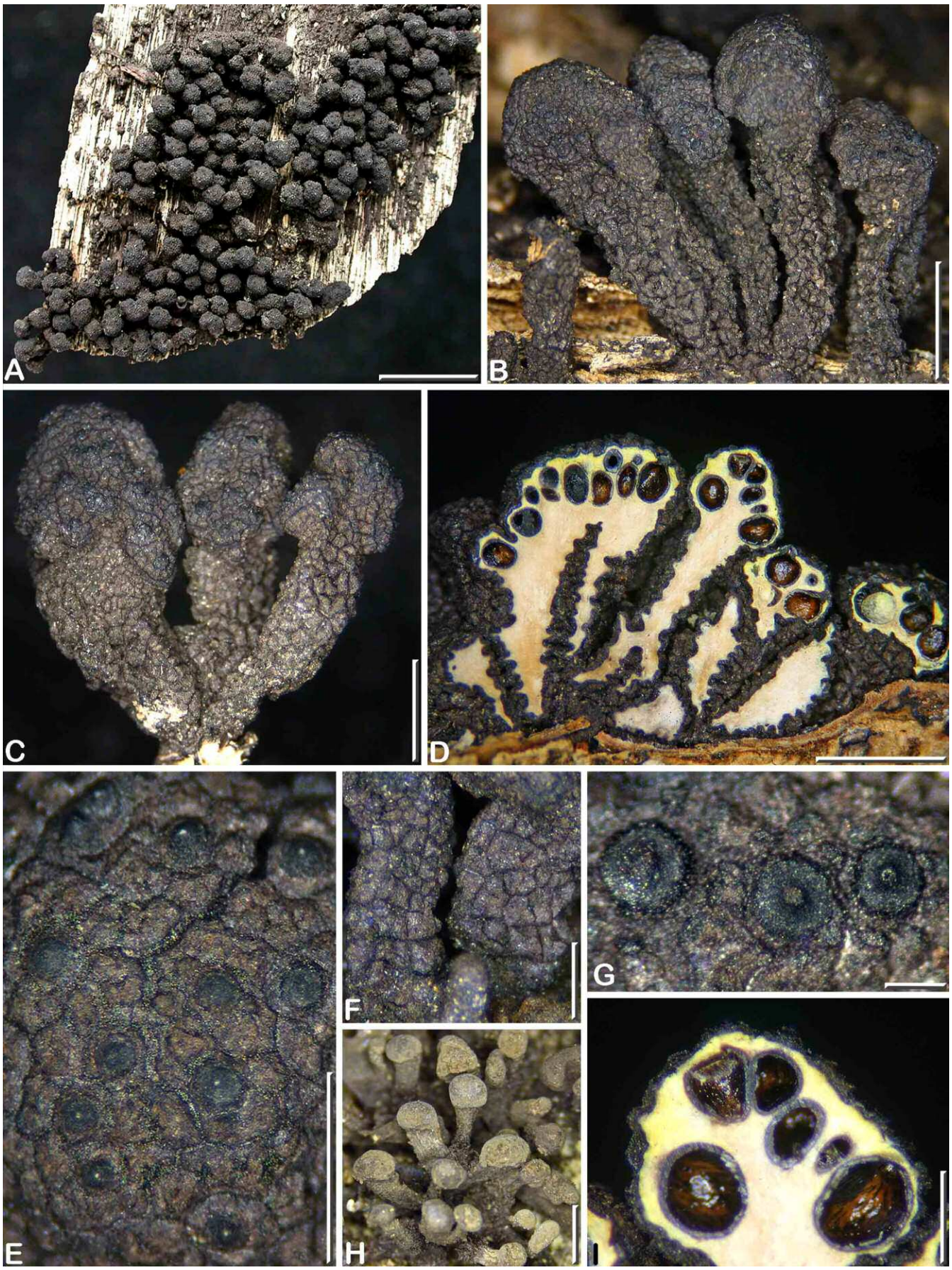

Plate 21 – *Xylaria martinicensis*

A-C, E, F: CLL 5020 (Holotype); D, G, I: MJF 07282; H: CLL 0741. A: Habit of kretzschmarioid stromata in top view on host surface; B, C: Tightly aggregated (B) or connated at base (C) stromata in side view (note the coarsely cracked stipes); D: Tightly aggregated stromata in vertical section showing a solid whitish interior with a yellow tinge around and above perithecia; E: Stromatal surface roughened by dark brown polygonal scales and black raised-discoid ostioles; F: Close-up on stipes showing deeply cracked surface; G: Three adjacent ostioles in close-up; H: Conidial stromata; I: Fertile head of a stroma in vertical section showing a thin superficial crust and light yellow tissue above perithecia. Scale bars: A = 10 mm; B-D, H = 2 mm; E, F = 1 mm; G = 0.2 mm; I = 0.5 mm.

Known distribution: Martinique, apparently restricted to coastal mesophilic forests.

Other specimens examined (paratypes): French West Indies: Martinique: Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead corticated trunk, 3 Sept. 2003, *leg.* C. Lécuru, CLL 0741 (LIP) (immature); *ibid.*, on a dead corticated trunk, 5 Dec. 2005, *leg.* C. Lechat, CLL 5554 (LIP); *ibid.*, on a dead corticated trunk, 1 Sept. 2007, *leg.* J. Fournier, MJF 07241 (LIP); *ibid.*, on a dead corticated trunk, 2 Sept. 2007, *leg.* J. Fournier, MJF 07265 (LIP); *ibid.*, on a dead corticated trunk, 2 Sept. 2007, *leg.* C. Lécuru, MJF 07289 (LIP); *ibid.*, on a dead corticated trunk, 2 Sept. 2007, *leg.* J. Fournier, MJF 07282 (LIP); *ibid.*, on a dead corticated trunk of *Lonchocarpus roseus* (*Fabaceae*), 23 Aug. 2010, *leg.* J. Fournier, MJF 10053 (LIP); *ibid.*, on a dead corticated trunk, 23 Aug. 2010, *leg.* J. Fournier, MJF 10089 (LIP); *ibid.*, on a dead corticated trunk, 16 Aug. 2013, *leg.* J. Fournier, MJF 13269 (LIP); *ibid.*, on a dead corticated trunk, 28 Jul. 2016, *leg.* J. Fournier, MJF 16004 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on a dead corticated trunk, 30 Aug. 2005, *leg.* C. Lechat, CLL 5270 (LIP; HAST 145133); *ibid.*, on a dead corticated trunk, 30 Aug. 2005, *leg.* C. Lechat, CLL 5276 (LIP; HAST 145134);); *ibid.*, on a dead corticated trunk, 30 Aug. 2005, *leg.* C. Lechat, CLL 5280 (LIP; HAST 145135);); *ibid.*, on a dead corticated trunk, 30 Aug. 2005, *leg.* C. Lechat, CLL 5281 (LIP); *ibid.*, on a dead corticated trunk,

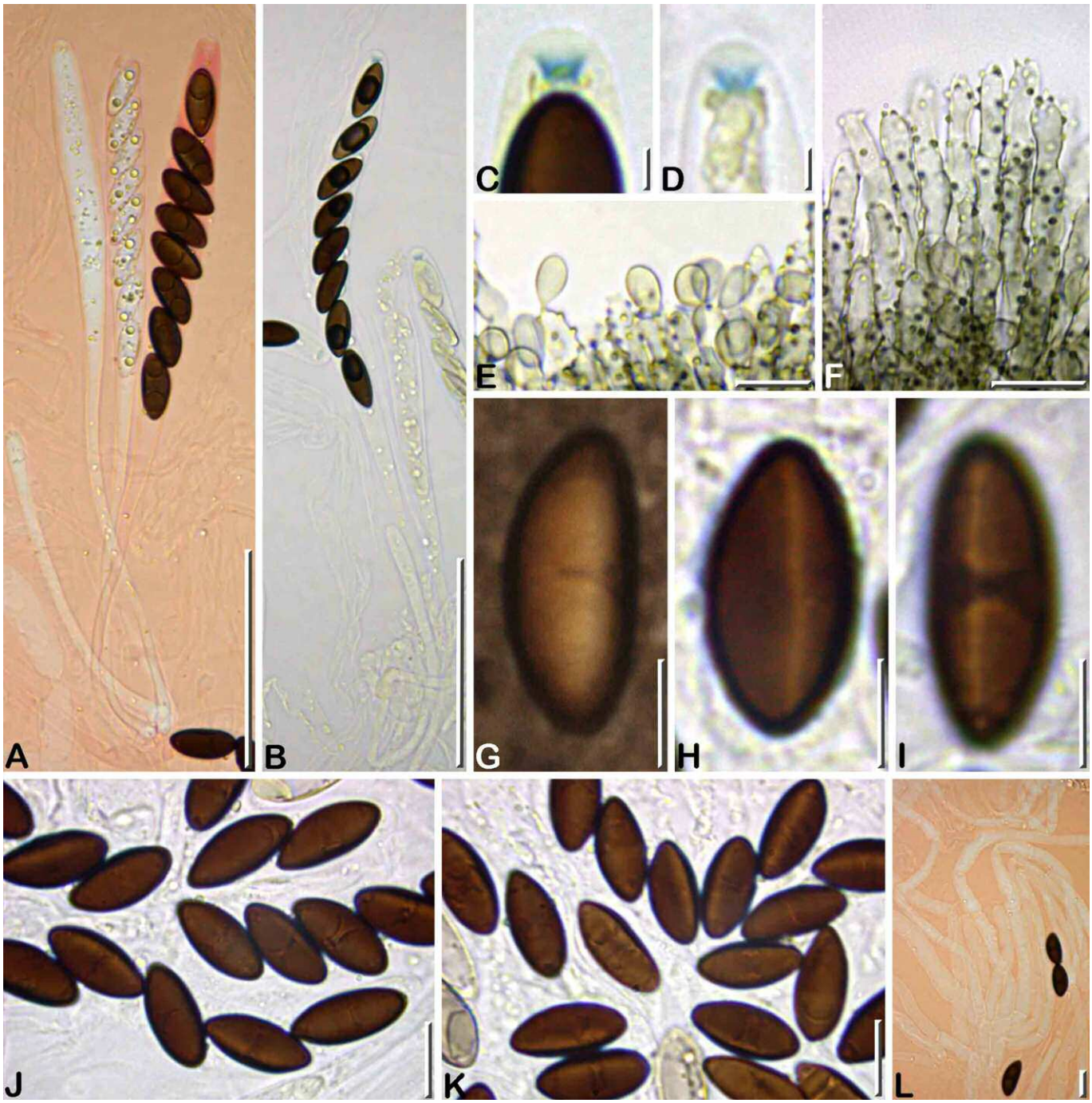

Plate 22 – *Xylaria martinicensis*

A, B, G, L: MJF 16004; C, D, J: CLL 5020 (Holotype); E, F: CLL 0741; H: CLL 5270; I, K: MJF 07282. A, B: Immature and mature asci, in Congo red with 3% KOH and Melzer's reagent respectively; C, D: Ascal apical apparati, in Melzer's reagent; E, F: Conidiogenous cells and conidia of the asexual morph, in 3% KOH; G: Slightly inequilateral ascospore in side view, showing lack of appendage and mucilaginous sheath, in diluted India ink; H, I: Ascospores in ventral view with focus on the epispore, showing a narrow and long germ slit, in 1% SDS; J, K: Ascospores in 1% SDS with focus on the contours, some in ventral view showing a central, blurred pale band located immediately beneath the germ slit; L: Bundle of paraphyses at their base, in Congo red with 3% KOH. Scale bars: A, B = 50 µm; C, D = 2 µm; E, F, J-L = 10 µm; G-I = 5 µm.

Table 15 – Synoptic table summarizing the diagnostic morphological differences between *X. martinicensis* and other *Xylaria* taxa featuring a kretzschmarioid habit and/or an orange to yellow interior.

	Stroma height	Stroma shape	Texture	Stipe surface	Coloured granules	Ostioles	Ascospore dimensions	Germ slit *	Apical apparatus (h × w)
X. martinicensis Martinique (1)	4–9.5 mm	turbinate kretzschmarioid	leathery	corky-cracked	pale yellow	raised-discoid	12.9–15.3 × 5.9–7 µm equilateral	=	trapezoid 1.2–1.7 × 2.5–2.9 µm
X. apoda Southeast Asia (4)	1.6–2 mm	turbinate kretzschmarioid	carbonaceous	smooth to corky-cracked	absent	slightly papillate discoid	9–11 × 3.5–4.5 µm pale brown inequilateral	<	1.5 × 2 µm
X. heliscus Pantropical (3)	2–3 mm	turbinate kretzschmarioid	leathery	corky-cracked and hairy	absent	papillate discoid	9–11 × 5–6 µm dark brown inequilateral	=	2.2 × 1.5 µm
X. intracolorata Southeast Asia (3)	2–4 mm	turbinate kretzschmarioid	leathery	corky-cracked	yellow to orange	papillate discoid	10–12 × 4.5–5 µm inequilateral	=	2.2 × 1.5–2.2 µm
X. luteostromata Indonesia, Philippines (2, 3, 5)	to 50 mm	cylindrical to clavate	hard (carbonaceous?)		bright orange	dome-shaped prominent	8.8–10.3 × 4.4 –5 µm inequilateral	=	wedge-shaped minute
X. luteostromata var. *macrospora* New Zealand (2)	15–30 (–60) mm	cylindrical to lanceolate	leathery?	wrinkled glabrous	very pale orange	minutely papillate	11.5–14 × 5–6.5 µm inequilateral	=	wedge-shaped 2–3 × 2–2.5 µm
X. plebeja Southeast Asia (6)	10–42 mm	cylindrical to fusoid	leathery	smooth to cracked	yellow	coarsely conic-papillate	8.5–9.5 × 4.5–4.8 µm inequilateral	=	short-tubular 1.7–2 × 1.7 µm
X. martinicensis var. *microspora* Martinique (1)	4–16 mm	subglobose kretzschmarioid	leathery	corky-cracked	pale yellow	raised-discoid	9 –10.4 × 4.6–5.2 µm ± inequilateral	=	quadrate 2.1 × 1.9 µm

(1) this paper; (2) Rogers & Samuels (1986); (3) Rogers *et al.* (1987); (4) Rogers & Ju (1998); (5) Ju *et al*. (2016); (6) Fournier, unpublished results based on material communicated by Dr. Ju.; * = means spore-length; < means less than spore-length.

10 Dec. 2005, *leg.* C. Lechat, CLL 5649 (LIP); *ibid.*, on a dead corticated trunk, 10 Dec. 2005, *leg.* C. Lechat, CLL 5651 (LIP); *ibid.*, on a dead corticated trunk, 10 Dec. 2005, *leg.* C. Lechat, CLL 5659 (LIP; HAST 145136).

Comments: The first collections of this fungus could not be equated with a known taxon and were submitted to Dr. Ju who noticed the faint yellow colour present under the stromatal surface and suggested is was likely an undescribed taxon that could be provisionally referred to *X. luteostromata* Lloyd var. *macrospora* J.D. Rogers & Samuels (JU, pers. comm., 2005).

The collection CLL 5020 was included under this name by Hsieh *et al.* (2010) in their phylogenetic survey of *Xylaria sensu lato*. It appeared to have closest affinities with *X. plebeja* Ces. and *X. intracolorata* (J.D. Rogers *et al.*) J.D. Rogers & Y.-M. Ju, two species with yellow to orange internal tissue, in the *X. heliscus* aggregate within the PO clade. *Xylaria heliscus* (Mont.) J.D. Rogers & Y.-M. Ju is a kretzschmarioid fungus featuring small, soft-textured, densely aggregated turbinate stromata with a flattened head and discoid ostioles, being moved from *Kretzschmaria* to *Xylaria*, along with the similar *X. apoda* (Berk.& Broome) J.D. Rogers & Y.-M. Ju and *X. intracolorata* (Rogers & Ju, 1998). *Xylaria heliscus* and *X. apoda* primarily differ from *X. martinicensis* by an entirely white interior and smaller and differently shaped ascospores. The morphological differential characters between the above species are summarized in Table 15. Based on numerous collections with consistent features, it appears that *X. martinicensis* is a distinct species resembling *X. luteostromata* var. *macrospora* by the presence of coloured tissue around the perithecia and similar ascospore dimensions but primarily differing by a kretzschmarioid habit, turbinate stromata with coarsely corky-cracked stipes and conspicuous raised-discoid ostioles, and nearly equilateral ascospores.

Closely aggregated stromata of *X. martinicensis* consistently occur on dead, corticated or decorticated trunks lying on the ground, in coastal mesophilic forests, with the overall habit of the common *Kretzschmaria clavus* (Fr.) Sacc. with which it can be easily confused at first glance. *Xylaria martinicensis* can be readily distinguished from *K. clavus* which is strongly carbonaceous and has much larger ascospores (Rogers & Ju, 1998).

The unique collection closely resembling *X. martinicensis* made outside a coastal forest turned out to be a small-spored variety (this paper).

Xylaria martinicensis* var. *microspora J. Fourn. & Lechat, *var. nov.* – MycoBank MB835278. Plate 23.

Diagnosis: Differs primarily from *X. martinicensis* by significantly smaller ascospores 9.6 × 4.9 vs. 14.1 × 6.4 µm on average.

Typification: French West Indies: Martinique: Case-Pilote, Morne Rose, mesophilic rainforest, on a dead corticated moss-covered trunk, 8 Aug. 2013, *leg.* S. Welti & J. Fournier, MJF 13061 (holotype, LIP).

Etymology: Epithet referring to the smaller ascospores as compared with the typical variety.

Stromata kretzschmarioid, densely gregarious to tightly aggregated, often in large groups, usually simple, separate to frequently connated at base or fused with adjacent stromata, subsessile to stipitate, 4–16 mm in total height, the fertile head convex, hemispherical to subglobose, frequently asymmetrical or laterally flattened, the margin frequently bulging out, 2–6(–13) mm high × 1.5–6(–11) mm diam., the stipe 0.5–8 mm high × 1–3(–7) mm diam. in its widest part; surface blackish brown to dull black, glabrous, coarsely cracked into prominent polygonal warts, slightly nodulose, with perithecial

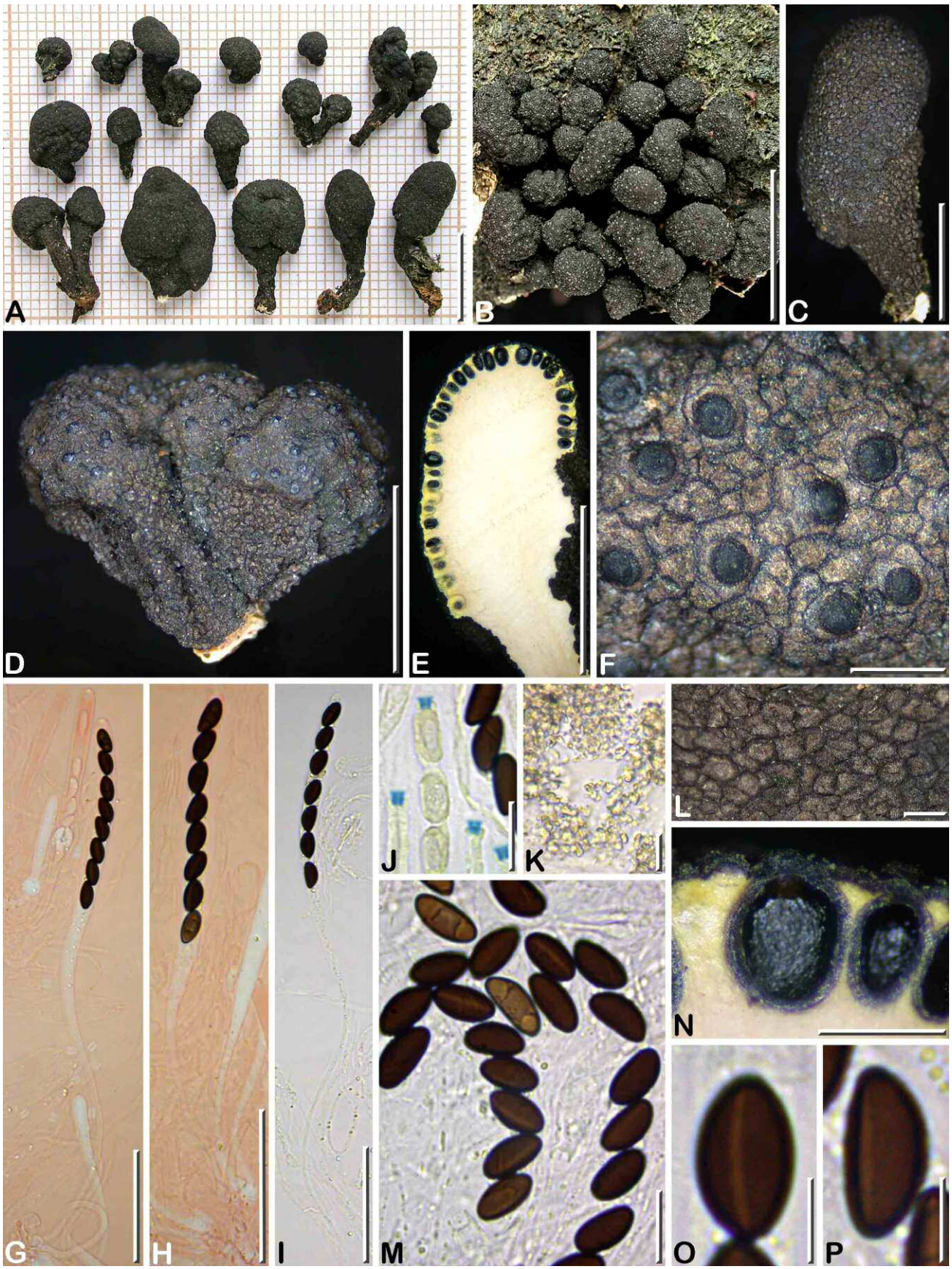

Plate 23 – *Xylaria martinicensis* var. *microspora*

MJF 13061 (Holotype). A: Variously shaped subsessile to stipitate stromata; B: Habit of densely aggregated stromata on host surface; C: Single stroma in side view; D: Stromata with fused corky-cracked stipes; E: Stroma in vertical section showing a solid whitish interior and perithecia embedded in a yellow tissue; F: Stromatal surface roughened by dark brown polygonal scales and black raised-discoid ostioles; G-I: Long-stipitate asci, in Congo red with 3% KOH (G, H) and in 1% SDS (I); J: Ascal apical apparati, in Melzer's reagent; K; Yellowish granules from the interperithecial tissue, in 3% KOH; L: Corky-cracked surface of a stipe in close-up; M: Ascospores in 1% SDS, some showing a germ slit; N: Vertical section though the stromatal surface showing perithecia immersed under a thin black crust and an underlying yellow tissue; O, P: Ascospores showing a germ slit either on convex or on flattened side, in 1% SDS. Scale bars: A, B = 10 mm; C-E = 5 mm; F, L, N = 0.5 mm; G-I = 50 µm; J, K, M = 10 µm; O, P = 5 µm.

contours usually not exposed; the stipes usually sharply delimited from the fertile head, dark brown, glabrous, coarsely cracked into polygonal scales from the base, with evanescent reddish brown tomentum at base of young stromata; subsurface black, leathery, ca. 40 µm thick; interior solid, whitish, soft-textured, typically with a faint to conspicuous layer of citrine-yellow tissue embedding the perithecia, due to minute yellowish granules accumulated within the entostromatic hyphae, not changing colour nor dissolving in 3% KOH. **Perithecia** subglobose to laterally flattened, 0.35–0.55 mm diam. **Ostioles** papillate, on a conspicuous, flat to convex, raised-discoid base 170–200(–230) µm diam., black, occasionally overlain with white substance.

Asci cylindrical, long-stipitate, with (6–)8 overlapping uniseriately arranged ascospores, the spore-bearing parts 72–80 × 5.5–6.5 µm, the stipes 90–110 µm long, with apical apparatus short-cylindrical to quadrate with a faint upper rim, 1.9–2.4 × 1.8–2.1 µm (Me = 2.1 × 1.9 µm, N = 25), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, 6–9 µm wide at base, tapering to 2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (8.2–)9–10.4(–10.8) × (3.9–)4.6–5.2(–5.5) µm, Q = (1.5–)1.8–2.2(–2.7) N = 60 (Me = 9.6 × 4.9 µm, Qe = 2), ellipsoid slightly inequilateral, with mostly broadly rounded ends, medium brown to dark brown, unicellular, with a conspicuous, straight, longitudinally oriented germ slit spore-length on the less convex side when inequilateral; appendage or mucilaginous sheath not present; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique, known only from the type collection.

Comments: This fungus is strikingly similar to *X. martinicensis*, with which it shares kretzschmarioid stromata with a coarsely cracked surface on the fertile part and the stipe, wide raised- discoid ostioles, a thin leathery crust and perithecia embedded in a pale citrine yellow layer containing minute yellowish granules. It differs by significantly smaller ascospores 9–10.4 × 4.6–5.2 vs. 12.9–15.3 × 5.9–7 µm and thus is introduced as the new variety *X. martinicensis* var. *microspora* (Tables 14 and 15). Further differences from the typical variety are its occurrence in a slightly different ecological niche, more globose fertile heads on a more sharply-defined stipe, a quadrate vs. trapezoid apical apparatus and more inequilateral ascospores with more obtuse ends. These subtle differences support the distinctiveness of *X. martinicensis* var. *microspora* but should be appraised on the basis of the examination of more collections.

In the field, *X. martinicensis* var. *microspora* can be confused with *X. globosa* and *X. schweinitzii*, both easily set apart by their lack of yellow tissue around the perithecia and much larger ascospores with a short obliquely oriented germ slit.

The variable morphology of *X. martinicensis* var. *microspora* makes it difficult to comply with our delimitation in three different morphological groups based on stromatal shape and width. Its subsessile subglobose stromata could have justified its treatment in part I with penzigioid taxa. Conversely, its often rather robust stromata more than 5 mm wide would have better taken place in part II. We prefered to keep it in part III for its obvious affinities with *X. martinicensis*, but it is also included in the keys to taxa with penzigioid and robust stromata.

Xylaria microceras (Mont.) Fr., *Nova Acta Regiae Societatis scientiarum upsaliensis*: 128 (1851). Plate 24.

Stromata upright, scattered, simple, 10–18 mm high × 1–1.5 mm wide, cylindrical with obtusely rounded fertile apices, short-stipitate, terete to occasionally flattened, straight to curved, nodulose with perithecial contours exposed and shallow circumferential constrictions; the stipes 3–5 mm high, ill-defined, flattened, overlain with a white pellicle extending downwards almost to the black and discoid base; surface pure white, with a long-persistent, thick, waxy to powdery layer finely cracked in places; subsurface a thin black brittle crust ca. 25 µm thick, showing through around the ostioles; interior pale brown, solid, persistent, slightly fibrous to powdery and brittle. **Perithecia** subglobose, 0.35–0.4 mm diam. **Ostioles** minutely papillate, shiny black, at the centre of a black discoid area 120–200 µm diam.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 67–80 × 5–5.5 µm, the stipes 40–60 µm long, with apical apparatus short-cylindrical to slightly tubular, apically with a faint lateral rim, 1.3–1.7 × 1–1.2 µm (Me = 1.5 × 1.1 µm, N = 25), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 8–9 µm wide at base, simple, tapering to 1–1.5 µm wide above asci, sparsely guttulate, embedded in mucilaginous material. **Ascospores** (9.1–)9.9–11.3(–12.8) × (3.1–)3.4–3.9(–4.1) µm, Q = (2.4–)2.6–3.1(–3.8), N = 60 (Me = 10.6 × 3.7 µm, Qe = 2.9), ellipsoid-inequilateral with most often broadly rounded ends, frequently suballantoid, light brown, unicellular, with an inconspicuous, straight to slightly sinuous, longitudinally to obliquely oriented germ slit ca. ½ spore-length (4–5.5 µm long) frequently on the dorsal side; without appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Neotropical: Cuba, French Guiana (Dennis, 1956); Guadeloupe (this paper).

Specimen examined: French West Indies: Guadeloupe: Basse-Terre: Petit Bourg, forest track of Jules, hygrophilic rainforest, on a dead corticated branchlet 1–1.5 cm diam., associated with effete stromata of *Nemania diffusa*, 1 Sept. 2004, *leg.* C. Lechat, CLL 2265 (LIP; HAST 145139).

Comments: With its minute, slender, white cylindrical stromata with a nodulose surface and a powdery brittle interior, this collection conforms well to the protologue of *X. microceras* (Montagne, 1840) and to the descriptions and illustrations provided by Dennis (1956) and Joly (1968). It can be confused in the field with *X. muscula*, from which it differs by its nodulose surface, the presence of short stipes, slightly larger perithecia and larger ascospores 9.9–11.3 × 3.4–3.9 µm vs. 6.5–7.9 × 2.6–3.2 µm (this paper). Both species are otherwise morphologically similar in many respects and their close phylogenetic affinities were demonstrated by Hsieh *et al.* (2010), based on the material collected in Guadeloupe.

Xylaria microceras is a poorly documented and rarely reported, apparently neotropical species. Medel *et al.* (2010) reported from México a whitish *Xylaria* with fairly robust stromata emerging from a common base, with ascospores 14–17(–20) × (4.5–)5–5.5 µm; they referred it to *X. microceras*. Aside from the whitish superficial colour, all morphological characters exclude any affinity of their collection with *X. microceras*. San Martín & Rogers (1989) reported from México a collection they referred to *X.* cf. *microceras* that turned out to be *X. coccophora* upon subsequent revision (San Martín, 1992).

Rogers *et al.* (1988) reported *X. microceras* from Venezuela based on a collection featuring more robust cylindrical to clavate stromata to 6 mm wide, with a fairly hard texture and ascospores provided with a germ slit almost spore-length. It cannot be clearly assessed from these slightly deviating characters if they just reflect intraspecific variations within *X. microceras* or if they are taxonomically relevant.

Hladki & Romero (2010) described *X. microceras* var. *yungae* Hladki & A. I. Romero for a collection from tropical Argentina with slightly more robust stromata overlain by a vanishing yellowish brown outer layer and smaller ascospores 6.5–8 × 4 µm, a size range closer to that of *X. muscula*.

Another probably closely related species is *X. friabilis* (newly described in this paper) that likewise features initially whitish stromata

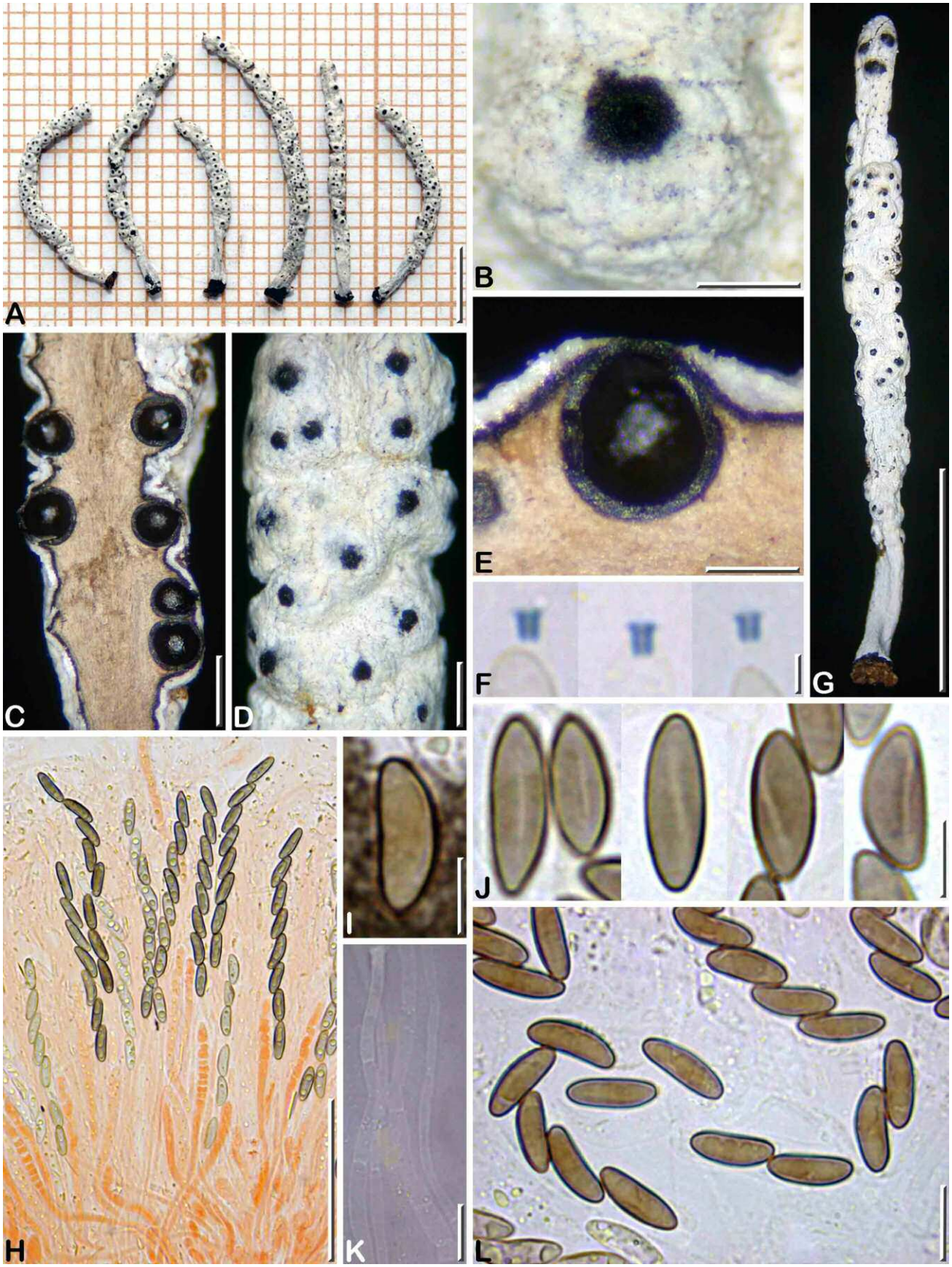

Plate 24 – *Xylaria microceras*

CLL 2265. A: Straight to curved stromata with short white stipes and black discoid bases; B: Stromatal surface in close-up showing a black discoid ostiolar area contrasting against the white outer layer; C: Stroma in longitudinal median section showing globose perithecia and a solid pale brown interior; D: Nodulose stromatal surface; E: Vertical section of a perithecium raising the stromatal surface, immersed beneath a thin black crust overlain by a white layer and embedded in a pale brown tissue; F: Ascal apical apparati, in Melzer's reagent; G: Stroma with obtuse fertile apex and nodulose surface; H: Immature and mature asci, in Congo red with 3% KOH; I: Ascospore in side view showing a lack of appendage or mucilaginous sheath, in India ink; J: Ascospores showing straight to oblique germ slits, on dorsal or ventral side, in Melzer's reagent; K: Paraphyses, in black Pelikan ink; L: Ascospores in 1% SDS. Scale bars: A, G = 5 mm; B, E = 0.2 mm; C, D = 0.5 mm; F = 2 µm; H = 50 µm; I, J = 5 µm; K, L = 10 µm.

with a brittle pale brownish grey interior and pale brown ascospores. Unlike *X. microceras*, the surface of its often fusiform stromata is not nodulose, it features a cream to pale orange fibrous outer layer before maturity and ascospores have a germ slit consistently on the ventral side.

Xylaria multiplex (Kunze ex Fr.) Fr., *Nova Acta Regiae Societatis Scientiarum Upsaliensis*, 1: 127 (1851). Plate 25, Table 16.

Stromata typically densely gregarious in large groups, separate to frequently connated at base in small bundles, rarely scattered, narrowly cylindrical, slightly fusiform when short, simple to furcate, terete to flattened, with scattered constrictions, straight to curved, with apiculate to spathulate sterile apices, short- to long-stipitate, (6–)15–82 mm in total height, the fertile head (3–)10–60 mm high × 1–2(–3) mm diam., the stipe (3–)15–32 mm high × 0.4–2 mm diam.; surface dull black, with a thick, persistent tan to blackish brown outer layer roughened by minute black granulations, longitudinally split into wide stripes; glabrous, nodulose to strongly nodulose, with deep wrinkles and more or less exposed perithecial contours; subsurface a carbonaceous crust ca. 80 µm thick exposed by splitting of the outer layer, shiny black, transversely striate in places; the stipes ill- to sharply-defined, simple to furcate, black, terete to most often flattened, glabrous in upper part, with a reddish brown pannose base; interior loosely fibrous, white immediately around perithecia, brownish grey to sooty brown inside, darkening with age, with a solid dark brown inner core. **Perithecia** subglobose 0.3–0.55 mm diam., laterally flattened when crowded. **Ostioles** finely papillate, black, 30–40 µm diam., often inconspicuous, surrounded by a flat, discoid black to occasionally whitish base 100–150 µm diam.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 67–76 × 5.5–6.5 µm, the stipes 52–108 µm long, with apical apparatus 1.5–2.2 × 1.4–1.7 µm (Me = 1.8 × 1.5 µm, N = 40), short-cylindrical with a faint upper rim, occasionally wider than high, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 6–7 µm wide at base, tapering to 0.8–1 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8.9–)9.6–11.5(–12.1) × (3.7–)4–4.8(–5.8) µm, Q = (1.9–)2.1–2.7(–3.1), N = 360 (Me = 10.5 × 4.4 µm Qe = 2 .4), ellipsoid-inequilateral with narrowly to broadly rounded ends, at times slightly ventrally concave, medium brown to dark brown, unicellular, with an inconspicuous longitudinally oriented, germ slit almost spore-length on the ventral side; no appendage or mucilaginous sheath detected in India ink; epispore smooth.

Asexual morph on the natural substrate occasionally observed on immature stromata with filiform white powdery apices. Cultural characteristics on OMA were described by Van der Gucht (1996) based on material from Papua New Guinea and by Ju & Rogers (1999) based on material from Taiwan.

Known distribution: Pantropical, summarized by Van der Gucht (1995).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Goyave, trail to Moreau waterfall, hygrophilic rainforest, on dead wood, 10 Sept. 2003, *leg.* C. Lechat, CLL 0977 (LIP); *ibid.*, on dead wood, 10 Sept. 2003, *leg.* C. Lechat, CLL 1005 (LIP); Basse-Terre, Petit Bourg, Rivière Moustique, Trianon, hygrophilic rainforest, on a dead corticated branch, 5 Sept. 2005, *leg.* C. Lechat, CLL 5364 (LIP); Basse-Terre, Petit Bourg, Maison de la Forêt, hygrophilic rainforest, on dead decorticated wood, 24 Nov. 2006, *leg.* C. Lechat, CLL 6045 (LIP); Basse-Terre, Saint-Claude, Beausoleil, track to Plateau Dimba, hygrophilic rainforest, on dead decorticated wood, 9 Sept. 2003, *leg.* C. Lechat, CLL 0978 (LIP); Basse-Terre, Sainte-Rose, Sofaïa, path to Saut des Trois Cornes, meso- to hygrophilic rainforest, 3 Sept. 2004, on dead corticated wood, *leg.* C. Lechat, CLL 2306 (LIP); *ibid.*, on dead wood, Nov. 2005, *leg.* C. Lechat, CLL 5409 (LIP); Martinique: Case-Pilote, Crête Jean-Louis, hygrophilic rainforest, on dead wood., 27 Aug. 2004, *leg.* C. Lechat, CLL 2172 (LIP); Case-Pilote, Fond-Bourlet, Prise d'Eau, hygrophilic rainforest, on dead decorticated wood, 21 Aug. 2005, *leg.* C. Lechat, CLL 5120 (LIP); Case-Pilote, Savane Saint-Cyr, trail to Plateau Concorde, hygrophilic rainforest, on rotten wood, 27 Aug. 2010, *leg.* J. Fournier, MJF 10177 (LIP); Fonds-Saint-Denis, Morne Gaubert, mesophilic rainforest, on dead wood, 16 Aug. 2011, *leg.* C. Lechat, CLLMAR 11012 (LIP); Fort-de-France, Alma recreation area, banks of Rivière Blanche, hygrophilic rainforest, on a dead partly buried trunk, 3 Aug. 2016, *leg.* J. Fournier, MJF 16099 (LIP); Fort-de-France, forest track of Fond Baron, hygrophilic rainforest, on a dead rotten stump, 10 Aug. 2016, *leg.* J. Fournier, MJF 16195 (LIP); Fort-de-France, edge of the parking lot of Maison forestière de la Donis, hygrophilic rainforest, on dead blackened wood, 15 Jun. 2014, *leg.* J. Fournier, MJF 14168 (LIP); Fort-de-France, Fontaine Didier, hygrophilic rainforest, on dead wood, 4 Dec. 2005, *leg.* C. Lechat, CLL 5514 (LIP); *ibid.*, on dead wood, 4 Dec. 2005, *leg.* C. Lechat, CLL 5529 (LIP; HAST 145140); *ibid.*, on dead wood, 28 Aug. 2007, *leg.* J. Fournier, MJF 07171 (LIP); La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on dead wood, 27 Aug. 2005, *leg.* C. Lechat, CLL 5207 (LIP); *ibid.*, on dead wood, 27 Aug. 2005, *leg.* C. Lechat, CLL 5212 (LIP); *ibid.*, on rotten wood, 31 Aug. 2007, *leg.* J. Fournier, MJF 07229 (LIP) ; *ibid.*, on rotten wood, 29 Aug. 2010, *leg.* J. Fournier, MJF 10208 (LIP); *ibid.*, on rotten wood, 29 Aug. 2010, *leg.* J. Fournier, MJF 10228 (LIP); Le Morne-Rouge, Hibiscus plantation, hygrophilic rainforest, on bark, 29 Aug. 2007, *leg.* J. Fournier, MJF 07204 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on dead wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0710 (LIP); *ibid.*, on dead wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0728 (LIP); *ibid.*, on dead wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0776 (LIP) (immature); *ibid.*, on dead wood, 28 Aug. 2004, *leg.* C. Lechat, CLL 2188 (LIP); *ibid.*, on dead wood, 28 Aug. 2004, *leg.* C. Lechat, CLL 2194 (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5011 (LIP); *ibid.*, on dead wood, 19 Aug. 2005, *leg.* C. Lechat, CLL 5051 (LIP); *ibid.*, on dead wood, 5 Dec. 2005, *leg.* C. Lechat, CLL 5544 (LIP; HAST 145141); *ibid.*, on dead wood, 5 Dec. 2005, *leg.* C. Lechat, CLL 5550 (LIP); *ibid.*, on dead wood, 5 Dec. 2005, *leg.* C. Lechat, CLL 5552 (LIP); *ibid.*, on rotten wood, 23 Aug. 2007, *leg.* J. Fournier, MJF 07047 (LIP); *ibid.*, on dead corticated wood, 23 Aug. 2010, *leg.* J. Fournier, MJF 10058 (LIP); *ibid.*, on rotten wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10095 (LIP); *ibid.*, on dead wood, 19 Aug. 2011, *leg.* C. Lechat, CLLMAR 11036 (LIP); *ibid.*, on dead wood, 19 Aug. 2011, *leg.* C. Lechat, CLLMAR 11039-B (LIP); *ibid.*, on dead wood, 19 Aug. 2011, *leg.* C. Lechat, CLLMAR 11044 (LIP); *ibid.*, on a rotten blackened stump, 4 Aug. 2016, *leg.* J. Fournier, MJF 16114 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5287 (LIP; HAST 145142); *ibid.*, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5291 (LIP); Sainte-Luce, Montravail forest, relict hygrophilic rainforest, on dead wood, 20 Aug. 2005, *leg.* C. Lechat, CLL 5074 (LIP; HAST 145143); *ibid.*, on rotten wood, 30 Jul. 2016, *leg.* J. Fournier, MJF 16040 (LIP) (immature).

Comments: *Xylaria multiplex* is characterized by narrowly cylindrical, densely gregarious to caespitose stromata with apiculate sterile apices and a blackish carbonaceous nodulose surface, arising from rotten, often blackened wood and inequilateral ascospores 9.6–11.5 × 4–4.8 µm with a long straight germ slit. Its often cuboid ascal apical apparatus is likewise noticeable. However, this common and widespread species may exhibit atypical, stunted stromata, likely in relation with less favourable environmental conditions. The thick, persistent, tan to blackish splitting outer layer encrusted with minute black granulations and the transversely striate subsurface provide further reliable diagnostic characters allowing to distinguish atypical stromata from similar species. The dark grey to sooty brown fibrous interior consistently observed in our numerous collections appears likewise distinctive but may be variable since it was not reported by San Martín & Rogers (1989) nor by Van der Gucht (1995).

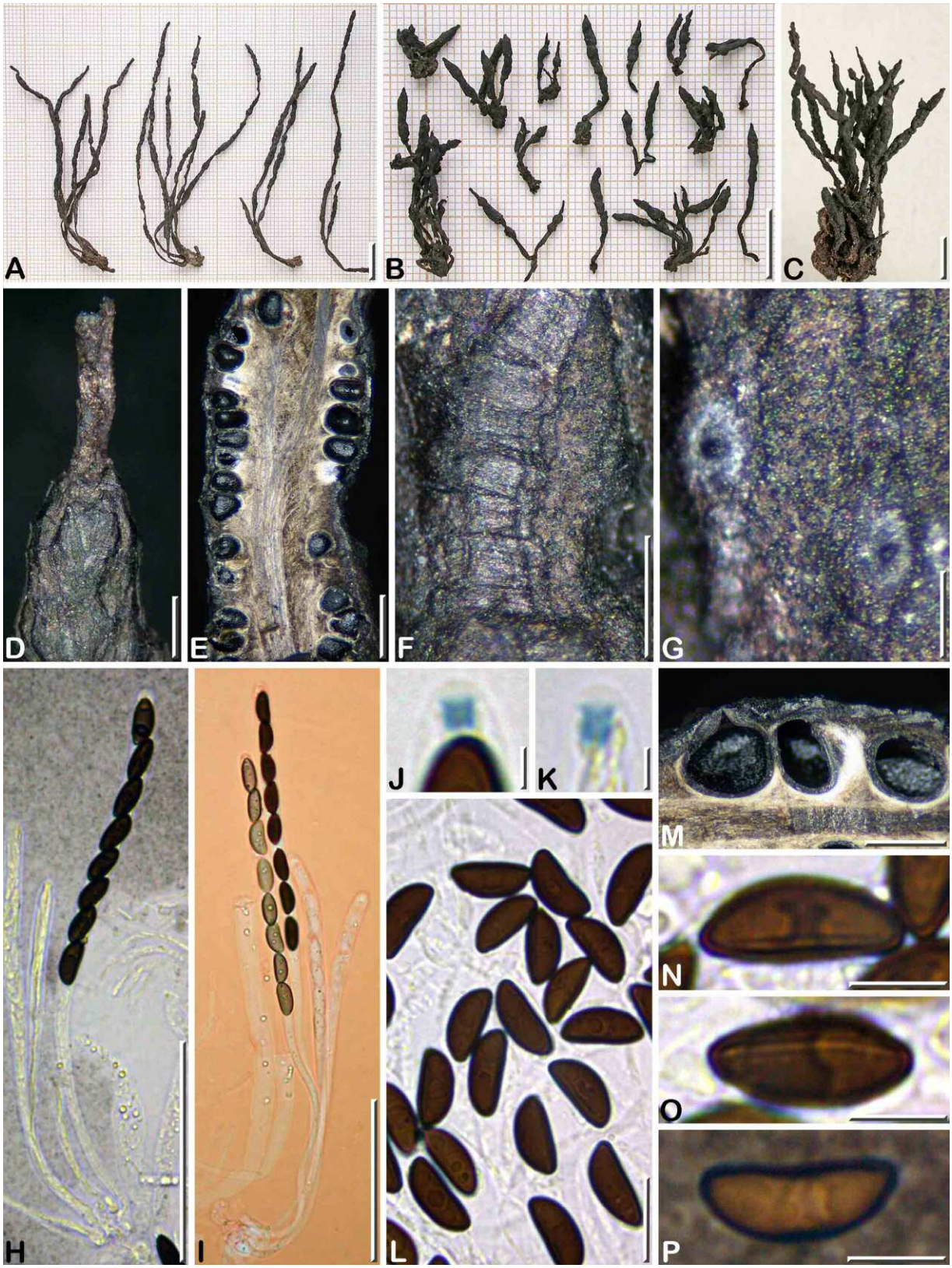

Plate 25 – *Xylaria multiplex*

A: MJF 16099; B, K, N, O: MJF 16195; C-J, L, M, P: MJF 16114. A: Habit of long filiform stromata; B: Habit of short stromata; C: Habit of fasciculate and relatively robust stromata; D: Apex of a stroma with nodulose surface and a long sterile extension; E: Stroma in longitudinal section showing a greyish brown fibrous interior with a darker inner core; F: Stromatal surface showing transverse striae on the black crust (left) and a dark brown stripe of the outer layer, roughened by minute black granules (right); G: Stromatal surface in close-up showing two ostioles surrounded by a white discoid halo and minute black granules roughening the dark brown outer layer; H, I: Immature and mature asci with fragmentary paraphyses, in India ink and Congo red with 3% KOH respectively; J, K: Ascal apical apparati, in Melzer's reagent; L: Ascospores in side view, in 1% SDS; M: Stroma in longitudinal section showing perithecia immersed beneath a thin carbonaceous crust and embedded in a thin layer of white tissue, with underlying greyish brown to blackish internal tissue; N: Ascospore in latero-ventral view showing a germ slit less than spore length, in 1% SDS; O: Ascospore in ventral view showing a ventral germ slit almost spore length, in 1% SDS; P: Ventrally concave ascospore in side view in India ink, showing absence of appendage or mucilaginous sheath. Scale bars: A-C = 10 mm; D, E = 1 mm; F, M = 0.5 mm; G = 0.2 mm; H, I = 50 µm; J, K = 2 µm; L = 10 µm; N-P = 5 µm.

Table 16 – Ascospore dimensions in six collections of *X. multiplex* from Martinique, showing the range of intraspecific variations, compared with those previously reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5287	(9.5–)10.1–11.3(–12.1) × (3.7–)4–4.7(–5.1) µm	Q = (2.2–)2.3–2.7(–3.1), N = 60	Me = 10.7 × 4.3 µm, Qe = 2.5
CLL 5544	(9–)9.7–11.3(–11.9) × (3.8–)4.1–4.7(–4.9) µm	Q = (2–)2.2–2.6(–2.7), N = 60	Me = 10.5 × 4.4 µm, Qe = 2.4
MJF 10095	(8.9–)9.6–10.6(–11.1) × (3.8–)4–4.8(–5.2) µm	Q = (1.9–)2.1–2.6(-2.7), N = 60	Me = 10.1 × 4.4 µm, Qe = 2.3
MJF 10228	(10–)10.2–11.5(–11.8) × (3.9–)4.1–4.6(–4.9) µm	Q = (2.2–)2.3–2.7(–2.9), N = 60	Me = 10.8 × 4.3 µm, Qe = 2.5
MJF16114	(9.2–)9.7–10.9(–11.3) × (3.9–)4.2–4.7(–4.9) µm	Q = (1.9–)2.2–2.5(–2.7), N = 60	Me = 10.3 × 4.4 µm, Qe = 2.3
MJF 16195	(9.9–)10.2–11.3(–11.9) × (3.7–)4–4.6(–5.8) µm	Q = (1.9–)2.3–2.7(–2.9), N = 60	Me = 10.7 × 4.3 µm, Qe = 2.5
Cumulated values	(8.9–)9.6–11.5(–12.1) × (3.7–)4–4.8(–5.8) µm	Q = (1.9–)2.1–2.7(–3.1), N = 360	Me = 10.5 × 4.4 µm, Qe = 2 .4
Dennis (1958), South America	9–12(–11) × 4–4.5 µm		Me = 10.5 × 4.3 µm, Qe = 2.4
Dennis (1961), Congo	9–10(–11) × 3.5–4.5 µm		Me = 9.5 × 4 µm, Qe = 2.4
Rogers *et al.* (1988), Venezuela	9–10.5 × 3.5–4.5 µm		Me = 9.8 × 4 µm, Qe = 2.4
San Martín *et al.* (1989), México	9–11(–12) × (3.5–)4–4.5(–5) µm		Me = 10 × 4.3 µm, Qe = 2.3
Van der Gucht (1995), Papua New Guinea	9–10.5(–11) × 3.5–4 µm		Me = 9.7 × 3.9 µm, Qe = 2.5

Ju & Rogers (1999) reported *X. consociata* Starb. as similar to *X. multiplex* with the difference of flattened vs. conical sterile apices. Our observations on Caribbean material showed that this character may be variable within the same collection and does not allow for a clear-cut distinction between the two taxa. Due to its widespread distribution and its variable morphology leading to various interpretations, *X. multiplex* has many synonyms, listed by Van der Gucht (1995). Based on its description by Dennis (1956), *X. inaequalis* Berk. & M.A. Curtis might be a further later synonym of *X. multiplex* but the poor condition of the type material precludes a formal decision.

In their phylogenetic assessment of *Xylaria*, Hsieh *et al.* (2010) showed that a strain of *X. multiplex* from Hawaii and one Martinique cluster together within the *X. hypoxylon* aggregate, supporting the status of *X. multiplex* as a morphologically well-defined species widely distributed in tropics.

Xylaria multiplex* var. *microsperma (Speg.) Dennis, *Kew Bulletin*, 11 (3): 418 (1956). Plate 26, Table 17.

Stromata gregarious in small or large groups, separate, occasionally connated at base by 2–3, variable in shape, ranging from cylindrical to clavate, rarely fusiform, simple to rarely furcate, terete to slightly flattened, straight to strongly curved, with broadly rounded fertile apices or apiculate sterile apices, subsessile to long-stipitate, 4–60 mm in total height, the fertile head 3–37 mm high × 1.8–3.5 (–5) mm diam., the stipe to 30 mm high × 0.6–1.4 mm diam.; surface brownish grey before maturity due to a thin evanescent superficial pellicle, eventually black at maturity, finely cracked, usually strongly nodulose with irregularly arranged, at times circumferential deep wrinkles and furrows, with perithecial contours barely to strongly exposed; the stipes ill- to sharply-defined, black, smooth, puckered, terete to flattened, glabrous, the base slightly swollen and occasionally tomentose; subsurface crust leathery, 35–50 µm thick; interior solid, spongy, brittle at dry state, white to yellowish, sometimes greyish at base. **Perithecia** subglobose 0.5–0.65 mm diam., laterally flattened when crowded. **Ostioles** finely papillate on a flattened discoid base 120–150(–250) µm diam., shiny black at maturity, rarely surrounded by a white ring.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 70–78 × 4.5–5.5 µm, the stipes 52–80 µm long, with apical apparatus 1.7–2.2 × 1.4–1.8 µm (Me = 2 × 1.6 µm, N = 60), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, filiform, thin-walled, 0.8–2 µm wide, embedded in mucilaginous material. **Ascospores** (8.1–)8.9–10.8(–11.8) × (3.3–)3.5–4.5(–4.8) µm, Q = (1.9–)2.2–2.9(–3), N = 480 (Me = 9.7 × 3.9 µm Qe = 2.4), ellipsoid-inequilateral with narrowly, less frequently broadly rounded ends, yellowish brown to medium brown, unicellular, with a conspicuous longitudinally oriented germ slit slightly less than spore-length on the ventral side, occasionally on the dorsal side or shorter or misplaced; a thin mucilaginous coating is often present just after release from the ascus but does not constitute a well-defined mucilaginous sheath or appendages; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Neotropical: Argentina (Spegazzini, 1884), British Guiana, Jamaica, Paraguay (Dennis, 1956), French Guiana (JF, unpublished results) and Martinique (this paper).

Specimens examined: French West Indies: Martinique: La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on a rotten trunk, 22 Aug. 2010, *leg.* J. Fournier, MJF 10041 (LIP); Le Marin, Morne Aca, coastal mesophilic forest, on dead wood, 25 Aug. 2005, *leg.* C. Lechat, CLL 5184 (LIP; HAST 145144); Le Morne-Rouge, La Propreté, Hibiscus plantation, hygrophilic rainforest, on dead wood, 29 Aug. 2007, *leg.* J. Fournier, MJF 07209 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on dead blackened wood of *Piper* sp. (*Piperaceae*), 3 Sept. 2003, *leg.* C. Lechat, CLL 0721 (LIP; HAST 145145); *ibid.*, on dead blackened wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0724 (LIP); *ibid.*, on dead blackened wood, 3 Sept. 2003, *leg.* C. Lechat, CLL 0764 (LIP; HAST 145146); *ibid.*, on dead blackened wood of *Ocotea cernua* (*Lauraceae*), 3 Sept. 2003, *leg.* C. Lechat, CLL 0787 (LIP; HAST 145147); *ibid.*, on dead wood, 28 Aug. 2004, *leg.* C. Lechat, CLL 2202 (LIP); *ibid.*, on dead blackened wood, 5 Dec. 2005, *leg.* C. Lechat, CLL 5546 (LIP); ibid, on dead blackened wood, 2 Dec. 2006, *leg.* C. Lechat, CLL 6137 (LIP); ibid, on dead blackened wood, 27 Aug. 2007, *leg.* J. Fournier, MJF 07136 (LIP); *ibid.*, on dead blackened wood, 27 Aug. 2007, *leg.* J. Fournier, MJF 07140 (LIP); *ibid.*, on dead blackened wood, 27 Aug. 2007, *leg.* J. Fournier, MJF 07150 (LIP); *ibid.*, on dead blackened wood, 1 Sept. 2007, *leg.* J. Fournier, MJF 07249 (LIP); *ibid.*, on dead blackened wood, 1 Sept. 2007, *leg.* J. Fournier, MJF 07251 (LIP); *ibid.*, on dead blackened wood, 2 Sept. 2007, *leg.* J. Fournier, MJF 07279 (LIP); *ibid.*, on dead blackened wood, 4 Sept. 2007, *leg.* J. Fournier, MJF 07300 (LIP); *ibid.*, on

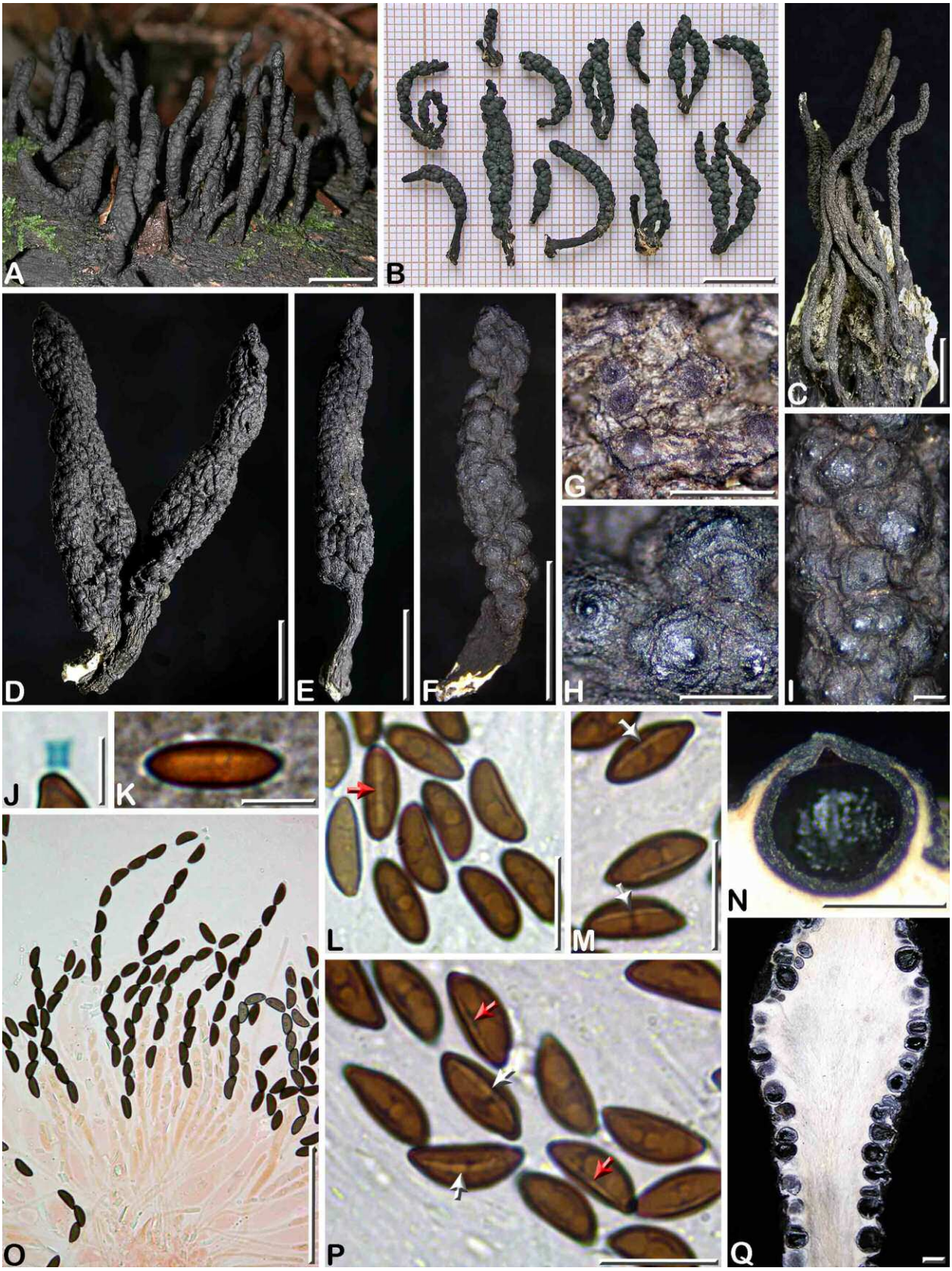

Plate 26 – *Xylaria multiplex* var. *microsperma*

A: MJF 07249; B, F, H, I, M, N, P: CLL 2202; C, G: MJF 07025; D, E, L: MJF 13265; J, Q: CLL 6137; K, O: MJF 16002. A: Habit of gregarious stromata *in situ*; B: Variously shaped mature stromata from the same collection, at dry state; C: Immature cylindrical stromata; D, E: Mature stromata with slightly nodulose surface and apiculate sterile apices; F: Mature stroma with strongly nodulose surface and rounded fertile apex; G: Surface of an immature stroma in close-up showing a cracked brownish grey outer layer and black ostioles; H: Surface of a mature stroma in close-up showing cracks and shiny black papillate ostioles; I: Nodulose surface of a mature stroma; J: Ascal apical apparatus, in Melzer's reagent; K: Ascospore in ventral view showing a germ slit and mucilaginous remnants, in India ink; L: Ascospores with broadly rounded ends, one showing a ventral germ slit (red arrow), in 1% SDS; M, P: Ascospores with narrowly rounded ends and dorsal (white arrows) or ventral (red arrows) germ slit, in 1% SDS; N: Vertical section of a perithecium immersed under a thin leathery crust; O: Mature and immature asci, in Congo red and 3% KOH; Q: Stroma in longitudinal section showing a white to greyish solid interior. Scale bars: A-C = 10 mm; D-F = 5 mm; G-I, N, Q = 0.5 mm; J, K = 5 µm; L, M, P = 10 µm; O = 50 µm.

Table 17 – Ascospore dimensions in eight collections of *X. multiplex* var. *microsperma* from Martinique, showing the range of intraspecific variations, compared with those reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 0721	(8.7–)9–10.5(–11) × (3.7–)3.8–4.3(–4.5) µm	Q = (1.9–)2.2–2.6(–2.7), N = 60	Me = 9.8 × 4.1 µm, Qe = 2.4
CLL 0787	(8.6–)9.2–10.3(–11.2) × (3.6–)3.9–4.5(–4.6) µm	Q = (2–)2.2–2.6(–2.7), N = 60	Me = 9.8 × 4.2 µm, Qe = 2.3
CLL 2202	(8.2–)8.9–9.9(–10.4) × (3.5–)3.7–4.1(–4.4) µm	Q = (2.1–)2.2–2.6(–2.9), N = 60	Me = 9.3 × 3.9 µm, Qe = 2.4
CLL 5285	(8.3–)8.9–10.3(–10.8) × (3.3–)3.5–4.1(–4.5) µm	Q = (2–)2.3–2.9(–3), N = 60	Me = 9.6 × 3.8 µm, Qe = 2.6
MJF 10091	(8.1–)9–10.2(–10.7) × (3.4–)3.6–4.3(–4.5) µm	Q = (2–)2.2–2.7(–2.9), N = 60	Me = 9.5 × 3.9 µm, Qe = 2.4
MJF 13204	(8.8–)9.2–10.6(–11.8) × (3.4–)3.7–4.2(–4.5) µm	Q = (2–)2.3–2.8(–3), N = 60	Me = 9.9 × 3.9 µm, Qe = 2.5
MJF 13265	(8.6–)9.2–10.5(–11.3) × (3.5–)3.7–4.3(–4.5) µm	Q = (2.1–)2.2–2.7(–2.8), N = 60	Me = 9.8 × 4 µm, Qe = 2.4
MJF 16002	(8.3–)8.9–10.8(–11.8) × (3.4–)3.5–4.2(–4.8) µm	Q = (2.2–)2.4–2.8(–3), N = 60	Me = 9.9 × 3.9 µm, Qe = 2.6
Cumulated values	(8.1–)8.9–10.8(–11.8) × (3.3–)3.5–4.5(–4.8) µm	Q = (1.9–)2.2–2.9(–3), N = 480	Me = 9.7 × 3.9 µm, Qe = 2.4
Spegazzini (1884)	8–9 × 3–3.5 µm		Me = 8.5 × 3.3 µm
Dennis (1956)	6–9 × 3–4 µm		Me = 7.5 × 3.5 µm

dead blackened wood, 21 Aug. 2010, *leg.* J. Fournier, MJF 10010 (LIP); *ibid.*, on dead blackened wood, 21 Aug. 2010, *leg.* J. Fournier, MJF 10015 (LIP); *ibid.*, on dead blackened wood, 23 Aug. 2010, *leg.* J. Fournier, MJF 10055 (LIP); *ibid.*, on dead blackened wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10076 (LIP); *ibid.*, on dead blackened wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10077 (LIP); *ibid.*, on dead blackened wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10078 (LIP); *ibid.*, on dead blackened wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10091 (LIP); *ibid.*, on dead wood, 24 Aug. 2010, *leg.* J. Fournier, MJF 10094 (LIP); *ibid.*, on blackened bark, 24 Aug. 2010, *leg.* J. Fournier, MJF 10102 (LIP); *ibid.*, on dead wood, 19 Aug. 2011, *leg.* C. Lechat, CLLMAR 11039C (LIP); *ibid.*, on dead blackened wood, 6 Aug. 2013, *leg.* J. Fournier, MJF 13029 (LIP); *ibid.*, on dead blackened wood, 6 Aug. 2013, *leg.* J. Fournier, MJF 13037 (LIP); *ibid.*, on dead blackened wood, 16 Aug. 2013, *leg.* J. Fournier, MJF 13264 (LIP); *ibid.*, on dead blackened wood, 16 Aug. 2013, *leg.* J. Fournier, MJF 13265 (LIP); *ibid.*, on dead blackened wood, 23 Aug. 2013, *leg.* J. Fournier, MJF 13376 (LIP); *ibid.*, on dead blackened wood, 9 Jun. 2014, *leg.* J. Fournier, MJF 14111 (LIP) (immature); *ibid.*, on a dead corticated trunk, 28 Jul. 2016, *leg.* J. Fournier, MJF 16002 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5285 (LIP); *ibid.*, on a dead blackened stump, 22 Aug. 2007, *leg.* J. Fournier, MJF 07024 (LIP) (immature); *ibid.*, on a dead blackened stump, 22 Aug. 2007, *leg.* J. Fournier, MJF 07025 (LIP) (mostly immature); Sainte-Marie, La Philippe, coastal mesophilic rainforest, on dead wood, 19 Aug. 2007, *leg.* C. Lechat, CLL 7257 (LIP); *ibid.*, on dead wood, 19 Aug. 2007, *leg.* C. Lechat, CLL 7258 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10278 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10280 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10282 (LIP); *ibid.*, on dead wood, 31 Aug. 2010, *leg.* J. Fournier, MJF 10283 (LIP); *ibid.*, on a dead blackened stump, 14 Aug. 2013, *leg.* J. Fournier, MJF 13202 (LIP); *ibid.*, on dead wood, 14 Aug. 2013, *leg.* J. Fournier, MJF 13204 (LIP); *ibid.*, on dead blackened wood, 14 Aug. 2013, *leg.* J. Fournier, MJF 13210 (LIP); *ibid.*, on dead wood, 2 Aug. 2016, *leg.* J. Fournier, MJF 16097 (LIP); *ibid.*, on dead wood, 2 Aug. 2016, *leg.* J. Fournier, MJF 16098 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead wood, 28 Aug. 2010, *leg.* J. Fournier, MJF 10203 (LIP); *ibid.*, on dead blackened wood, 5 Aug. 2013, MJF 13014 (LIP).

Comments: This *Xylaria*, characterized by small gregarious stromata with a strongly nodulose surface and small medium brown ascospores, is common in some coastal forests of Martinique but is sometimes difficult to distinguish from *X. curta* that likewise occurs in the same stations. Differential characters between *X. multiplex* var. *microsperma* and *X. curta* are discussed in comments on *X. curta* (this paper). As we failed to find a match in the literature available to us, we asked help from Dr. Ju who suggested the name of *X. multiplex* var. *microsperma* (pers. comm., 2005). This species is poorly documented aside from the protologue by Spegazzini (1884), as *X. biceps* var. *microsperma* Speg., and the description by Dennis (1956) who combined it as a variety of *X. multiplex*. *Xylaria biceps* was synonymised with *X. arbuscula* (Dennis, 1956; Hladki & Romero, 2010), a taxon whose concept is fairly unsettled (Fournier *et al.*, 2011). The fungus illustrated above does not show obvious morphological affinities with *X. arbuscula* (this paper), and neither does with *X. multiplex* (this paper).

The taxonomic status of the taxon we document here should perhaps be revised in future but we prefer to temporarily keep this name for this survey.

Xylaria muscandae C.G. Lloyd, *Mycological Writings*, 6: 894, Fig. 1560. (1919). Plate 27, Table 18.

Stromata gregarious, upright, separate or connated at base by two, subcylindrical to narrowly fusiform, terete to slightly flattened in places, straight to curved, with gradually acuminate sterile apices, short- to long-stipitate, 14–62 mm in total height, the fertile head simple to occasionally furcate 8–36 mm high × 1.2–3 mm diam.; surface blackish, strongly wrinkled, overlain by a long-persistent white bipartite fibrous outer layer with a tan to grey superficial pellicle, splitting into elongate stripes or polygonal scales, vanishing with age; perithecial contours slightly exposed; subsurface blackish, a thin leathery crust 40–50 µm thick, densely encrusted with superficial clusters of minute black granules; the stipes ill-defined, 4–40 mm high × 0.8–1.8 mm diam., blackish, flattened, puckered, glabrous, enlarged and tomentose at base; interior solid, whitish, spongy, occasionally with a light brown inner core. **Perithecia** subglobose to depressed-spherical 0.4–0.65 mm diam. **Ostioles** obtusely papillate, 100–130 µm diam. at base, black.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 68–80 × 4.5–5.5 µm, the stipes 45–70 µm long, with apical apparatus short-cylindrical to slightly tubular, apically slightly flared, 1.9–2.2 × 1.3–1.6 µm (Me = 2 × 1.5 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 3.5–4.5 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (9–)10–11.5(–13) × (3.5–)3.6–4.4(–4.7) µm, Q = (2–)2.3–2.9(–3.2), N = 120 (Me = 10.8 × 4.2 µm, Qe = 2.6) , ellipsoid-inequilateral, with narrowly to broadly rounded ends, medium brown, unicellular, with a thin, straight, longitudinally oriented germ slit almost spore-length to slightly less than spore-length, on the ventral side; lacking appendages or mucilaginous sheath; epispore smooth.

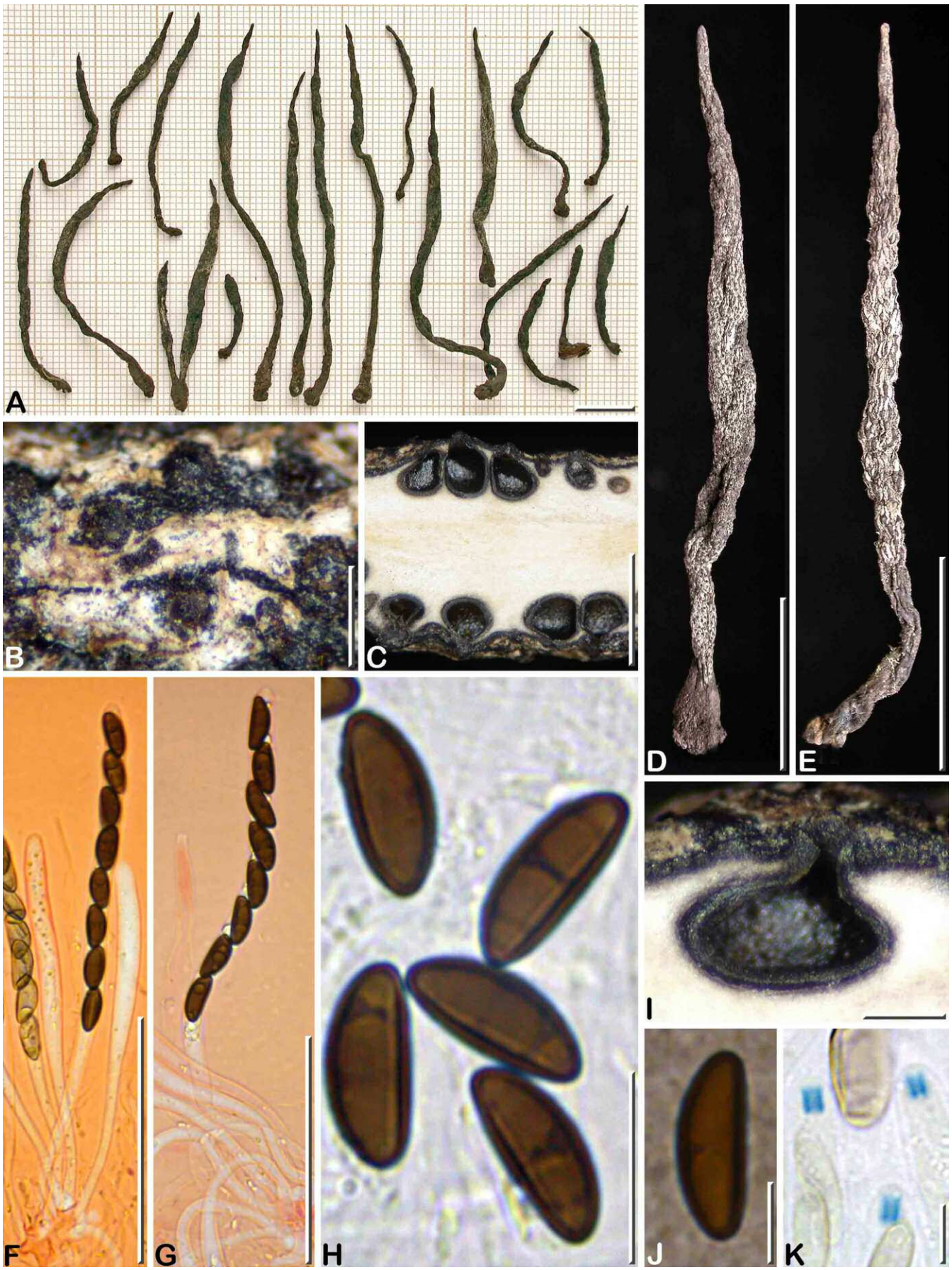

Plate 27 – *Xylaria muscandae*

A-D, F-K: MJF 13111; E: MP 3909. A: Various stromata from the same collection; B: Stromatal surface in close-up showing a whitish, superficially tan splitting outer layer and black obtusely rounded ostioles; C: Stroma in longitudinal section showing perithecia immersed beneath a thin crust and a white solid internal tissue; D, E: Stromata from two different collections; F, G: Immature and mature asci, in Congo red and 1% SDS; H: Ascospores in ventral view, all showing a germ slit, in 1% SDS; I: Perithecium in vertical section immersed beneath a thin black subsurface crust; J: Mature ascospore showing absence of appendages or mucilaginous sheath, in diluted India ink; K: Ascal apical apparati in Melzer's reagent. Scale bars: A, D, E = 10 mm; B, I = 0.2 mm; C = 1 mm; F, G = 50 µm; H = 10 µm; J, K = 5 µm.

Table 18 – Ascospore dimensions in the two known neotropical collections of *X. muscandae*, compared with those of the holotype. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
MJF 13111 Martinique	(9.4–)10.3–11.5(–13) × (3.5–)3.8–4.5(–4.7) µm	Q = (2.2–)2.4–2.9(–3.1), N = 60	Me = 10.9 × 4.2 µm, Qe = 2.6
MP 3909 Panamá	(9–)10–11.5(–11.9) × (3.5–)3.6–4.4(–4.7) µm	Q = (2–)2.3–2.9(–3.2), N = 60	Me = 10.7 × 4.1 µm, Qe = 2.6
Cumulated values	(9–)10–11.5(–13) × (3.5–)3.6–4.4(–4.7) µm	Q = (2–)2.3–2.9(–3.2), N = 120	Me = 10.8 × 4.2 µm, Qe = 2.6
Holotype Sri Lanka (Ju *et al.*, 2016)	10–11 × 4.5–5 µm		Me = 10.5 × 4.8 µm, Qe = 2.2

Asexual morph on the natural substrate not observed.

Known distribution: Martinique, Panamá, Sri Lanka.

Specimens examined: French West Indies: Martinique: Rivière-Pilote, Lépinay forest, mesophilic rainforest, on a dead trunk on the ground, 10 Aug. 2013, *leg.* J. Fournier, MJF 13111 (LIP; HAST 145137). Panamá: Chiriqui Prov., Dolega district, Los Algarrobos, trail to Rio Majagua, disturbed seasonally dry forest, ca. 140 m, on dead wood, 11 Aug. 2007, *leg.* M. Piepenbring and students, MP 3909 (M 0141367; JF; HAST 145138).

Comments: We first considered creating a new taxon to accommodate these two collections characterized by tall, slender and acuminate stromata with a thin granulate leathery crust, a thick, bipartite, whitish, fibrous splitting outer layer, obtusely rounded papillate ostioles and narrowly ellipsoid ascospores 10–11.5 × 3.6–4.4 µm with a long straight germ slit. This was until Dr. Yu-Ming Ju drew our attention to *X. muscandae* (pers. comm., 2020) a species described from Sri Lanka whose holotype was recently retrieved (Ju *et al.*, 2016) and likely conspecific with our specimens. They just differ by a different geographic origin and less broadly ellipsoid ascospores in the neotropical material (Table 18), which does not warrant to recognize a new taxon.

The stromata of *X. muscandae* are similar to those of *X.* cf. *longiana* (this paper) and *X.* cf. *oligotoma* (this paper) in shape and presence of a thin leathery granulate crust. The stromata of both species differ from those of *X. muscandae* by more conspicuous clusters of black superficial granules. Moreover, ascospores of *X.* cf. *longiana* differ from those of *X. muscandae* in being blackish brown with a polar appendage, whereas those of *X. oligotoma* are smaller with a short germ slit.

In *X. muscandae*, the white fibrous outer layer is thick and bipartite, with a tan-coloured to grey outermost layer; the clusters of minute black granules adherent to the subsurface crust are long concealed beneath this fibrous layer and only become visible on aged stromata on which it is worn off.

Based on morphology, *X. muscandae* appears closely related to the temperate *X. hypoxylon* (Ju *et al.*, 2016), and possible previous collections of this species may have been recorded as tropical forms of *X. hypoxylon*. Distinguishing *X. muscandae* from long cylindrical forms of *X. hypoxylon* and species akin to it requires a thorough examination of the stromatal surface, along with a study of ascospore morphology.

Xylaria muscula C.G. Lloyd, *Mycological Writings*, 6(64): 994 (1920). Plate 28, Table 19.

Stromata upright to most often prostrate, scattered to fused at base in small bundles, most often simple but occasionally branching, (4–)7–14 mm high × 1.3–2 mm wide, sessile on a slightly swollen discoid base, cylindrical or slightly fusiform, terete to occasionally flattened, straight to curved, with obtusely rounded to rarely pointed fertile apex, with perithecial contours unexposed; surface pure white, even to very slightly nodulose, first densely pruinose, pruina gradually sloughing off with maturation and leaving a persistent white slightly fibrous layer splitting longitudinally in places, eventually worn off to reveal a black subsurface; subsurface a thin black crust 30–40 µm thick, slightly carbonaceous, showing through the cracks of the outer layer and around the ostioles, before becoming exposed; interior pale brownish grey, solid, persistent, slightly fibrous to powdery, brittle. **Perithecia** fully immersed, subglobose, 0.2–0.25 mm diam. **Ostioles** papillate, obtusely conical to apically truncate, 35–60 µm diam., appearing as black dots against the white background.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 48–54 × 4–5 µm, the stipes 35–48 µm long, with apical apparatus short-cylindrical to slightly tubular, apically with a faint lateral rim, 1.1–1.3 × 0.9–1.1 µm (Me = 1.2 × 1 µm, N = 40), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 7–8 µm wide at base, simple to branched, tapering to 1.5–2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material; hamathecium interspersed with sparse, straight, narrowly clavate hyphal elements 100–120 µm long, 6–12 µm wide, apically broadly rounded, septate, slightly constricted at septa, with refractive content, disarticulating into oblong cells 11–18 µm wide. **Ascospores** (6.2–)6.5–7.9(–8.4) × (2.4–)2.6–3.2(–3.4) µm, Q = (2–)2.1–2.8(–3.3), N = 180 (Me = 7.1 × 3 µm, Qe = 2.4), ellipsoid-inequilateral with broadly rounded ends, frequently suballantoid to reniform, pale brown, unicellular, with a blurred, straight to slightly sinuous, longitudinally to obliquely oriented germ slit ca. ½ spore-length (2.8–4 µm long) mostly on the ventral side but fairly frequently on the dorsal side; without appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Neotropical: Brazil, Florida, Puerto Rico (Ju *et al.*, 2016); French Guiana, Guadeloupe (this paper); México (San Martín & Rogers, 1989).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre: Petit Bourg, Rivière Tambour, hygrophilic rainforest, on a dead corticated branchlet 1.5–2 cm diam., 3 Sept. 2005, *leg.* F. Lurel, CLL 5323 (LIP; HAST 145148); Basse-Terre, Petit Bourg, Natural Park of Guadeloupe, Maison de la Forêt, hygrophilic rainforest, on a dead corticated branchlet 1 cm diam., 8 Sept. 2003, *leg.* C. Lechat, CLL 0954 (LIP); Basse-Terre: Sainte-Rose, Sofaïa trail, hygrophilic rainforest, on a dead corticated branchlet 2 cm diam., 1 Sept. 2005, *leg.* C. Lechat, CLL 5299 (LIP; HAST 145149).

Additional specimen examined: French Guiana: Sinnamary, Saint-Elie trail, hygrophilic rainforest, on dead wood, associated with *X. schweinitzii*, 25 Feb. 2007, *leg.* C. Lechat, CLL 7032–2.

Comments: *Xylaria muscula* is a distinctive, poorly documented species recently resurrected by Ju *et al.* (2016) after re-examination of the type material from Brazil that proved immature; an epitype from Puerto Rico was designated, to which our collections can be readily equated, as suggested by Dr. Ju (pers. comm., 2005). *Xylaria muscula* is diagnosed by small cylindrical sessile stromata overlain with a pure white, pruinose, long persistent outer layer, a brittle pale brownish grey interior and pale brown ascospores 6.5–8.5 × 3–4 µm

Table 19 – Ascospore dimensions in three collections of *X. muscula* from Guadeloupe and one from French Guiana, showing a narrow range of intraspecific variations, compared with those reported from the epitype from Puerto Rico. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 0954	(6.2–)6.6–7.4(–7.8) × (2.4–)2.6–3.2(–3.4) µm	Q = (2–)2.2–2.8(–3), N = 60	Me = 7 × 2.9 µm, Qe = 2.4
CLL 5299	(6.2–)6.5–7.3(–7.8) × (2.7–)2.8–3.1(–3.3) µm	Q = (2–)2.1–2.5(–2.7), N = 60	Me = 6.9 × 3 µm, Qe = 2.3
CLL 5323	(6.6–)6.9–7.9(–8.4) × (2.5–)2.8–3.1(–3.4) µm	Q = (2.1–)2.2–2.8(–3.3), N = 60	Me = 7.4 × 3 µm, Qe = 2.5
Cumulated values	(6.2–)6.5–7.9(–8.4) × (2.4–)2.6–3.2(–3.4) µm	Q = (2–)2.1–2.8(–3.3), N = 180	Me = 7.1 × 3 µm, Qe = 2.4
CLL 7032-2 French Guiana	(5.9–)6.3–7.3(–8.3) × (2.6–)2.8–3.3(–3.4) µm	Q = (1.9–)2.1–2.5(–2.8), N = 60	Me = 6.9 × 3 µm, Qe = 2.3
epitype, Ju *et al.* (2016)	6.5–8.5 × 3–4 µm		Me = 7.5 × 3.5 µm, Qe = 2.1

with a short germ slit. The most resembling species is *X. microceras*, with a similar habit but differing in having a more nodulose surface and significantly larger, more narrowly ellipsoid ascospores 9.9–11.3 × 3.4–3.9 µm (Dennis, 1956; this paper). Both species were shown by Hsieh *et al.* (2010) to have close phylogenetic affinities with each other, and they cluster on a separate branch in the HY clade distantly related to "*Penzigia*" *cantareirensis*.

Xylaria microceras var. *yungae* Hladki & A.I. Romero was described from Argentina for a collection recalling *X. muscula* by its ascospore dimensions of 6.5–8 × 4 µm, but differing by slightly more robust, often flattened stromata with a vanishing yellowish brown striped outer layer and ascospores with a ratio l/w of 1.8 (vs. 2.4 for *X. muscula*), with a germ slit slightly less than spore-length on the ventral side (Hladki & Romero, 2010).

Another probably closely related species is *X. friabilis* (elsewhere in this paper) that likewise features initially whitish stromata with a brittle pale brownish grey interior and pale brown ascospores. It can be distinguished from *X. muscula* by slightly more robust, often fusiform stromata, a cream to pale orange outer layer before maturity and larger ascospores 8.8–11 × 3.3–4.3 µm with a germ slit consistently on the ventral side.

Ascospore germ slit of *X. muscula* is barely visible in water and was described as located on the ventral side by Ju *et al.* (2016). The observation of ascospores of our collections in mounting media like heated chloral-lactophenol and PVA-lactophenol, making it more conspicuous, showed that the germ slit may be obliquely oriented and frequently occurs on the dorsal side, in a similar way to what was observed in *X. microceras*.

A striking feature encountered in all collections studied, including that from French Guiana, is the presence of septate hyphal elements much longer than asci and paraphyses, emerging from the base of the hymenium and disarticulating into oblong cells with refractive content. They might reflect the presence of a parasitic hyphomycete but possibly also an unusual type of hamathecial structure.

Xylaria* cf. *oligotoma Sacc. & Paol., *Atti dell´Istituto Veneto Scienze*, 6: 404 (1888). Plate 29, Table 20.

Stroma upright to prostrate, scattered, simple, 8.5–28 mm in total height, short-stipitate; the fertile heads 6–22 mm high × 1–2.4 mm diam., cylindric to narrowly fusiform, even to slightly constricted in places, straight to slightly curved, apically tapering to acute sterile apices, with perithecial contours unexposed; the stipes ill-defined, glabrous, overlain by a thin white tissue wearing off to expose a black to blackish brown surface densely encrusted with minute black granules, straight to contorted, flattened, the base swollen and occasionally with an orange brown tone; surface grey, overlain by a white outer layer splitting into linear stripes, encrusted with scattered clusters of minute black granules; subsurface a thin black leathery crust 30–40 µm thick; interior whitish, pithy, solid, with a narrow light orange brown inner core. Perithecia immersed, depressed-spherical, 0.4–0.6 mm diam. Ostioles obtusely rounded-papillate, black to slightly shiny black, ca. 80 µm diam. at base.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 44–54 × 4.5–5 µm, the stipes 40–67 µm long, with apical apparatus short-cylindrical, apically flattened with a faint lateral rim, 1.4–1.8 × 1.1–1.4 µm (Me = 1.7 × 1.2 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 4–6 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (6.2–)6.5–7.5(–8) × (2.6–)2.8–3.4(–3.5) µm, Q = (2–)2.1–2.5(–2.7), N = 60 (Me = 7.1 × 3.1 µm, Qe = 2.3), ellipsoid-inequilateral, with narrowly to broadly rounded ends, occasionally slightly ventrally concave, medium brown, unicellular, with a conspicuous, straight, longitudinally to obliquely oriented germ slit less than spore-length on the ventral side; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Guadeloupe.

Specimens examined: French Guiana: Sinnamary, Piste St. Elie, on dead wood, 25 Feb. 2007, *leg.* C. Lechat, CLL7031 (LIP). French West Indies: Guadeloupe: Basse-Terre, Petit-Bourg, Carrère, private garden of Félix Lurel, on a dead corticated branchlet 1.5 cm diam., associated with dead stromata of a penzigioid *Xylaria* sp., 4 Dec. 2005, *leg.* C. Lechat, CLL 5517B (LIP; HAST 145150).

Comments: *Xylaria oligotoma*, originally described from Malaysia, is characterized by slender, simple to branched apiculate stromata with a granulate surface and glabrous stipes, and suballantoid ascospores 9–12 × 3–4 µm (Saccardo & Paoletti, 1888). It was synonymized with *X. hypoxyloides* C.G. Lloyd by Dennis (1974) and Ju *et al.* (2016). Further reports from the Australasia by Dennis (1974) and Van der Gucht (1995) confirmed the presence of black granulations on stromatal surface but also mentioned the presence of a buff to white veil on mature stromata; these authors recorded smaller ascospores (Table 20).

San Martín (1992) reported several collections from México as *X.* cf. *oligotoma*, based on slender apiculate stromata with a white outer layer and granulate surface, and suballantoid ascospores 10–12 × 3–4 µm. Ascospore size and shape fit well those of the type material but the tomentose stipes and the outer layer split into polygonal scales do not match the observations made on Australasian material. A collection from French Guiana (CLL 7031) was identified as *X. oligotoma* by Dr. Ju and included under this name by Hsieh *et al.* (2010) in their phylogenetic study of *Xylaria s.l.*. This collection features branched to unbranched nodulose stromata up to 30 mm high, terete to most often flattened, apically mucronate, with a granulate leathery surface and a tan to whitish peeling outer layer; its ascospores are 9 × 3.6 µm on average, medium brown, slightly ventrally concave and possess a long germ slit almost spore-length (JF, unpublished data). This set of various interpretations of *X. oligotoma* is suggestive of either a fairly variable taxon or a complex of closely related taxa having in common a granulate leathery surface and a pale brown to whitish peeling outer layer.

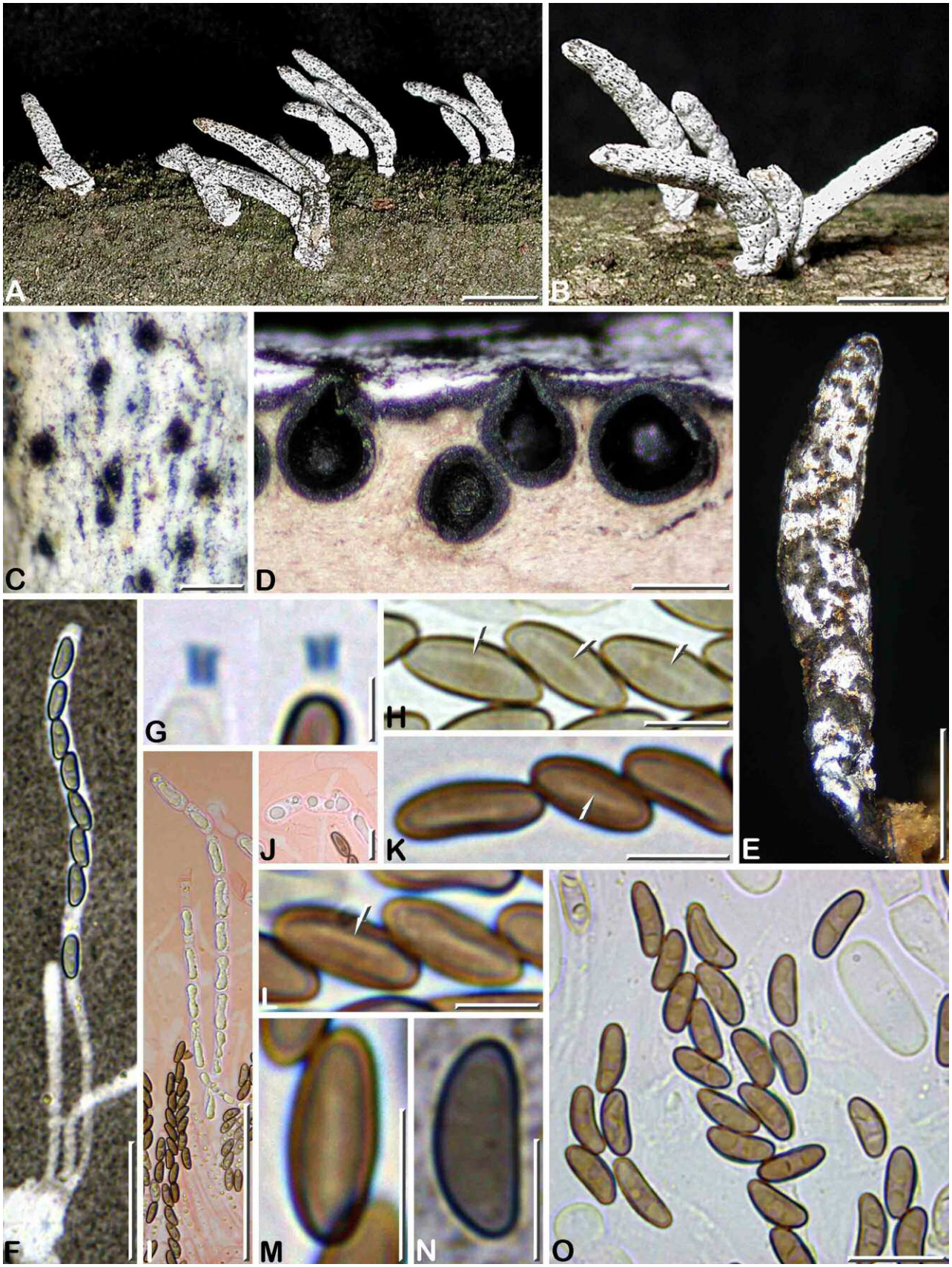

Plate 28 – *Xylaria muscula*

A-D, F-J, N, O: CLL 5323; E: CLL 5299; K-M: CLL 0954. A, B: Habit of stromata on host surface; C: Stromatal surface in close-up showing a white powdery outer layer splitting longitudinally; D: Perithecia in vertical section showing papillate ostioles piercing a thin black crust overlain by a white pruinose layer and a brownish grey interior; E: Senescent stroma showing a black surface mottled white by remnants of the outer layer; F: Short-stipitate ascus, in India ink; G: Ascal apical apparati, in Melzer's reagent; H: Three adjacent ascospores showing a germ slit on the dorsal side (arrows), in PVA-lactophenol; I: Refractive hamathecial elements extending above the asci, in Congo red with 3% KOH; J: Paraphyses and disarticulating cells from the hamathecial elements, in Congo red with 3% KOH; K-M: Ascospores with germ slit located either on the ventral or on the dorsal (arrows) side, in heated chloral-lactophenol; N: Ascospore showing a lack of appendage or mucilaginous sheath, in India ink; O: Ascospores in 1% SDS (note the presence of a free oblong cell in upper right). Scale bars: A, B = 5 mm; C, D = 0.2 mm; E = 2 mm; F = 20 µm; G = 2 µm; H, K-N =5 µm; I = 50 µm; J, O = 10 µm.

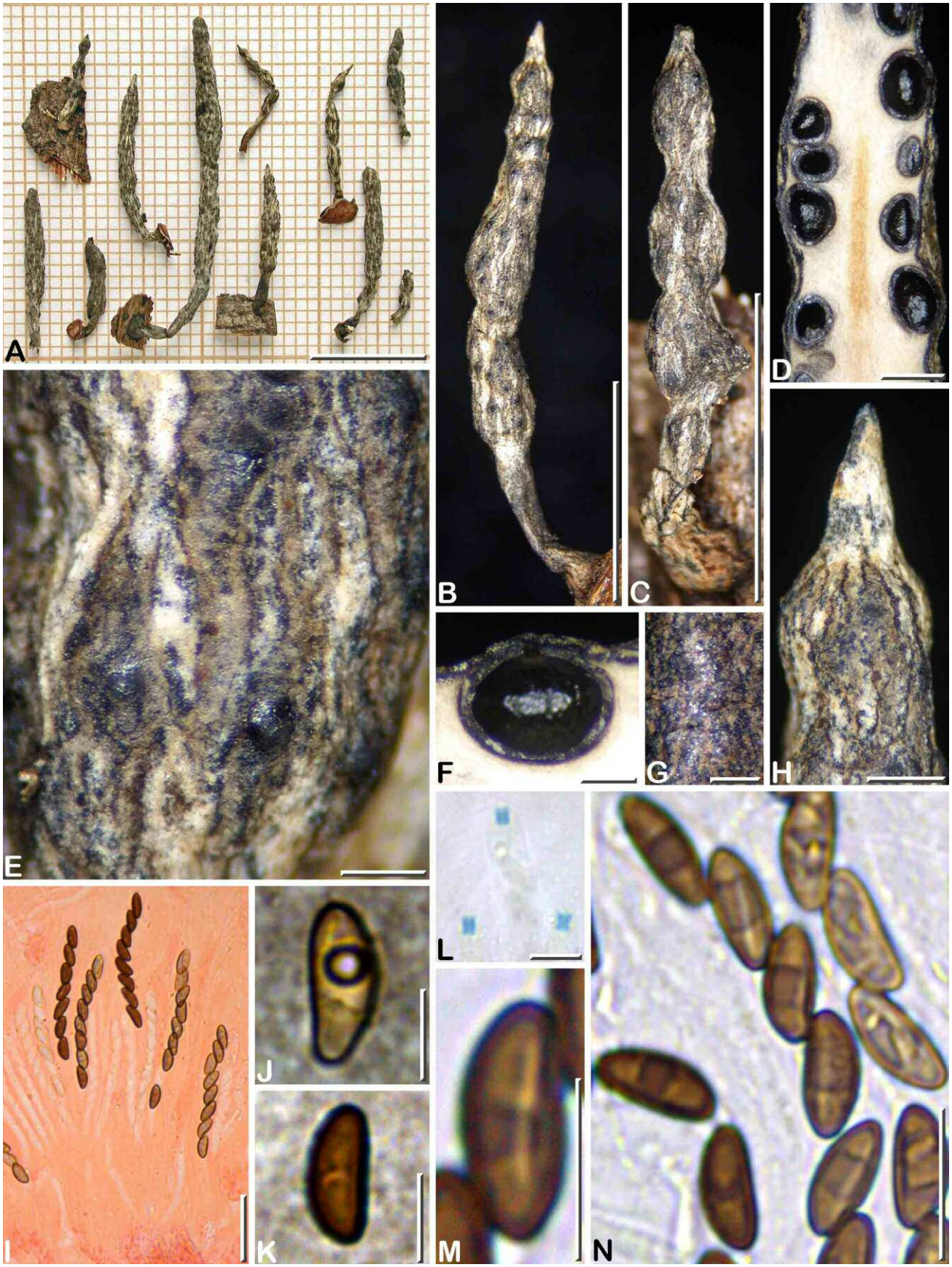

Plate 29 – *Xylaria* cf. *oligotoma*

A-N: CLL 5517B. A: Various stromata from the same collection; B, C: Two stromata showing a conical sterile apex, a smooth stipe and a more or less nodulose surface; D: Stroma in longitudinal section showing perithecia immersed beneath a thin crust and a white solid internal tissue with a light brown inner core; E: Stromatal surface in close-up showing a grey basal layer overlain by a white splitting outer layer, both encrusted with minute black granules, and black obtusely rounded ostioles; F: Perithecium in vertical section slightly raising a thin black subsurface crust; G: Close-up on the stipe surface encrusted with black granules; H: Stromatal apex in close-up; I: Immature and mature asci, in Congo red in 1% SDS; J, K: Immature and mature ascospores showing absence of appendages or mucilaginous sheath, in diluted India ink; L: Ascal apical apparati in Melzer's reagent; M: Ascospore in ventral view showing a short germ slit; N: Ascospores in 1% SDS, some showing a germ slit. Scale bars: A = 10 mm; B, C = 5 mm; D, H = 0.5 mm; E-G = 0.2 mm; I = 20 µm; J-M = 5 µm; N =10 µm.

Table 20 – Ascospore dimensions in collections from various origins referred to *X. oligotoma*, suggesting possibly different interpretations. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 5517B Guadeloupe	(6.2–)6.5–7.5(–8) × (2.6–)2.8–3.4(–3.5) µm	Q = (2–)2.1–2.5(–2.7), N = 60	Me = 7.1 × 3.1 µm, Qe = 2.3
CLL 7031 French Guiana (Hsieh *et al*., 2010)	(8–)8.4–9.6(–10.4) × (3.2–)3.3–3.9(–4) µm	Q = (2.2–)2.3–2.8(–3), N = 60	Me = 9 × 3.6 µm, Qe = 2.5
Dennis (1974), Papua New Guinea	7.5–9 × 2.5–4 µm		Me = 8.3 × 3.3 µm, Qe = 2.5
Saccardo & Paoletti (1888), Malaysia	9–12 × 3–4 µm		Me = 10.5 × 3.5 µm, Qe = 3
San Martín (1992), México	(9–)10–12(–13) × 3–4(–4.5) µm		Me = 11 × 3.5 µm, Qe = 3.1
Van der Gucht (1995), Papua New Guinea	7.5–9.5 × 3–4 µm		Me = 8.5 × 3.5 µm, Qe = 2.4

As the taxonomic concept of *X. oligotoma* appears ambiguous and as ascospores of our collection are clearly smaller than those of all collections referred to this taxon (Table 20), we provisionally refrain to assign our collection to *X. oligotoma*, to which it is, however, likely closely related.

The most similar species encountered in Martinique is *X.* cf. *longiana* (elsewhere in this paper) which likewise features slender apiculate stromata with a white striped outer layer and a granulate surface. However, its stromata are usually much higher and more branched, and its ascospores differ from those of *X.* cf. *oligotoma* in being larger 9.5–11.6 × 4.4–5.4 µm, blackish brown, with a long germ slit and minute bipolar secondary appendages.

Xylaria muscandae (this paper) is another species featuring slender apiculate stromata with a white striped outer layer that should be compared to the present fungus. *Xylaria* cf. *oligotoma* is primarily distinguished from *X. muscandae* by more conspicuous black granules showing through the white outer layer and smaller ascospores with a short germ slit (see comments on *X. muscandae*).

Xylaria pallidocylindracea J. Fourn. & Lechat, *sp. nov*. – MycoBank MB835279. Plate 30, Table 21.

Diagnosis: Differs from the most similar species *Xylaria pallida* by smaller ascospores 8.2–9.6 × 3.8–4.3 µm vs. 10.5–12 × 4.5–5 µm.

Typification: French West Indies: Martinique: Saint-Joseph, Fond Fougères, hygrophilic rainforest, on dead blackened wood, 22 Aug. 2013, *leg.* J. Fournier & C. Lechat, MJF 13363 (LIP, holotype; isotype HAST 145151).

Etymology: The epithet refers to the almost cylindrical shape of stromata with a fugacious white outer layer.

Stromata scattered or in small groups, upright, separate, simple, cylindrical, straight to slightly curved, terete to slightly flattened in places, blackish, with obtuse fertile apex, occasionally slightly mucronate, short-stipitate, 8–20 mm in total height, the fertile head 6–17 mm high × 1.8–2.8 mm diam.; surface even to slightly constricted in places, grey to dark grey, densely encrusted with superficial clusters of minute black granules, overlain by a thick white fibrous outer layer splitting into sparse elongated stripes, vanishing with age; perithecial contours unexposed; subsurface black, hard-textured, a carbonaceous crust 80–100 µm thick; the stipes ill- defined, 2–5 mm high × 1–1.5 mm diam., black, flattened, glabrous, enlarged at base; interior whitish, fibrous, solid, slightly disintegrating with age, occasionally with a light brown inner region. **Perithecia** subglobose 0.4–0.6 mm diam., laterally flattened to 0.25–0.3 mm diam. when crowded. **Ostioles** finely conic-papillate, often inconspicuous, black, ca. 80 µm diam. at base.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 60–68 × 4.5–5.5 µm, the stipes 60–80 µm long, with apical apparatus short-cylindrical with a faint upper rim, 1.7–2.1 × 1.2–1.5 µm (Me = 1.9 × 1.3 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, remotely septate, thin-walled, 4–5 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8–)8.2–9.6(–10) × (3.6–)3.8–4.3(–4.8) µm, Q = (1.9–)2–2.4(–2.5), N = 60 (Me = 8.9 × 4.1 µm, Qe = 2.2), ellipsoid-inequilateral, with narrowly to broadly rounded ends, brown to dark brown, unicellular, with a thin, straight, longitudinally oriented germ slit almost spore-length on the ventral side; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Table 21 – Ascospore dimensions in *X. pallidocylindracea*, compared with those reported for *X. pallida* and *X.* cf. *pallida* in the literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
MJF 13363 Martinique (Holotype)	(8–)8.2–9.6(–10) × (3.6–)3.8–4.3(–4.8) µm	Q = (1.9–)2–2.4(–2.5), N = 60	Me = 8.9 × 4.1 µm, Qe = 2.2
Berkeley & Cooke (1876), Brazil (Holotype)	15 × 5 µm		Me = 15 × 5 µm, Qe = 3
Dennis (1956), Brazil (Holotype)	10.5–12 × 4.5–5 µm		Me = 11.3 × 4.8 µm, Qe = 2.3
Rogers *et al.* (1988), Venezuela (as *X.* cf. *pallida*)	9–10.5 × 3.5–4.5 µm		Me = 9.8 × 4 µm, Qe = 2.3
San Martín & Rogers (1989), México	(8.5–)9–10(–11) × 3.5–4.5 µm		Me = 9.5 × 4 µm, Qe = 2.4

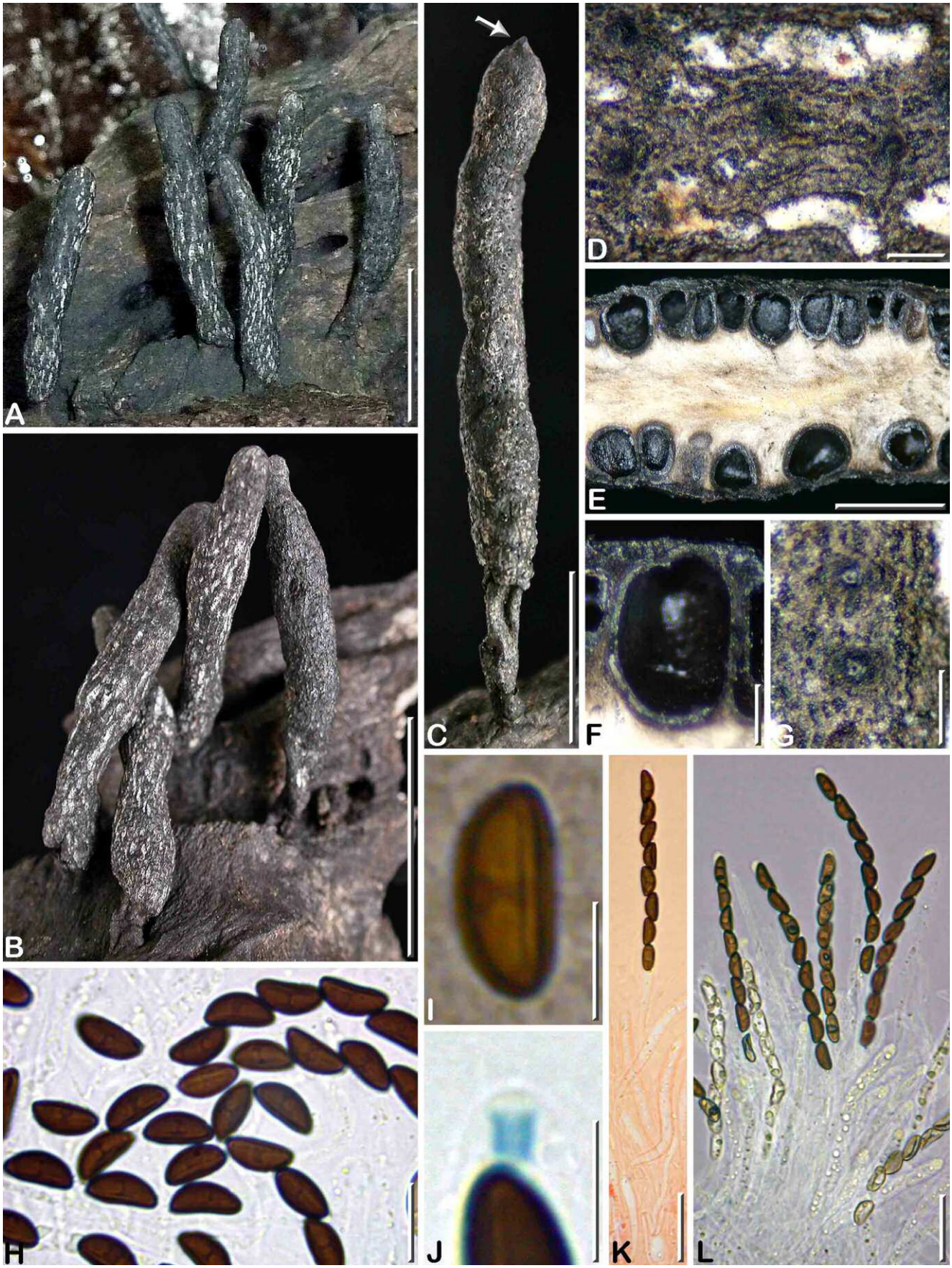

Plate 30 – *Xylaria pallidocylindracea*

A-L: MJF 13363 (Holotype). A: Habit of stromata *in situ*; B: Stromata at dry state; C: Single stroma featuring a mucronate apex (arrow); D: Stromatal surface in close-up showing white stripes and clusters of black granules; E: Stroma in longitudinal section showing perithecia immersed beneath a relatively thin carbonaceous crust and whitish fibrous internal tissue; F: Perithecium in vertical section immersed beneath a black carbonaceous crust; G: Two adjacent ostioles in close-up, surrounded by clusters of superficial black granules; H: Ascospores in 1% SDS; I: Ascospore in latero-ventral view showing a long straight germ slit and absence of appendages or mucilaginous sheath, in diluted India ink; J: Ascal apical apparatus in Melzer's reagent; K: Long-stipitate ascus, in Congo red in 1% SDS; L: Bundle of asci, in black Pelikan ink. Scale bars: A, B = 10 mm; C = 5 mm; D, F, G = 0.2 mm; E = 1 mm; H = 10 µm; I, J = 5 µm; K, L = 20 µm.

Known distribution: Martinique.

Comments: *Xylaria pallidocylindracea* is characterized by short, cylindrical, hard-textured, short-stipitate stromata with a broadly rounded, occasionally mucronate apex. The surface is densely encrusted with minute black granules and overlain by a fibrous white outer layer splitting into sparse elongated stripes. Its ascospores are dark brown, inequilateral, 8.9 × 4.1 µm on average, with a straight germ slit.

Its overall morphology, especially the rounded to minutely mucronate apex, it is reminiscent of *X. pallida* as documented by Dennis (1956), from which it differs by smaller ascospores 8.2–9.6 × 3.8–4.3 µm vs. 10.5–12 × 4.5–5 µm. The ascospore size given in the protologue was even larger (Berkeley & Cooke, 1876) (Table 21). However, the comparison of our collection with *X. pallida* would have been more conclusive if data had been provided on crust texture, thickness, presence of superficial granules and ascospore germ slit morphology.

Rogers *et al.* (1988) reported *X.* cf. *pallida* from Venezuela based on a collection differing from *X. pallida* by smaller ascospores 9–10.5 × 3.5–4.5 µm compatible with our specimen and thus possibly an earlier collection of *X. pallidocylindracea*. However, the presence of a granular surface, though fairly obvious under a stereomicroscope, was not reported by these authors, which suggests that *X. pallidocylindracea* is different from their fungus.

San Martín & Rogers (1989) reported *X. pallida* from México based on a collection featuring clavate, conical or subglobose hard-textured stromata on long narrow stipes, slightly raised-discoid ostioles and ascospores (8.5–)9–10(–11) × 3.5–4.5 µm. This size range would approximately fit that of our collection but other characters markedly differ.

Xylaria phyllocharis Mont., *Annales des Sciences Naturelles, Botanique*, 3: 108 (1855). Plates 31–33, Table 22.

Stromata scattered on either side of dead rotten leaves in the litter, prostrate, separate, cylindrical to filiform, simple, terete, straight, with usually mucronate sterile apices, stipitate; 3–17(–25) mm in total height, the fertile head 2–8 mm high × 0.4–1.2(–1.4) mm diam.; surface dark brown to blackish brown, a thin soft crust 25–30 µm thick occasionally split on stipe or on immature stromata and revealing an underlying white internal tissue, lacking a splitting outer layer, with perithecial contours not to half exposed, glabrous, smooth to finely cracked; the stipes well-defined, black, terete to slightly flattened, longitudinally puckered, glabrous, rarely hairy, the base not to slightly swollen; interior soft, solid, white. **Perithecia** subglobose, 0.25–0.3 mm diam. **Ostioles** conic-papillate to obtusely rounded, prominent, black, 80–120 µm diam. at base.

Asci cylindrical, with (4–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts (45–)60–110 × 7–8(–9) µm, the stipes 28–45 µm long, with apical apparatus 2.4–4.8 × 1.7–4.2 µm (Me = 3.5 × 3 µm, N = 180), short-cylindrical with a faint upper rim to slightly urn-shaped or acorn-shaped with a sharp lateral subapical rim, bluing to strongly bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, sparse, 5–9 µm wide at base and slightly moniliform, tapering to 1.5–2 µm wide above asci, discretely embedded in mucilaginous material. **Ascospores** (9.1–)9.4–15.3(–15.7) × (4.4–)4.6–8.8(–9.3) µm, Q = (1.5–)1.6–2.8(–3.1), N = 540 (Me = 12.1 × 5.8 µm, Qe = 2.1), ellipsoid, slightly to strongly inequilateral, at times ventrally concave, with narrowly to broadly rounded ends, dark brown to blackish brown, unicellular, with a conspicuous longitudinally oriented germ slit slightly less than spore-length to almost spore-length on the ventral side, with a thin mucilaginous sheath on the ventral side swollen into bipolar secondary ap-

Table 22 – Ascospore dimensions in nine collections of *X. phyllocharis* from Guadeloupe and Martinique, showing the range of intraspecific variations, compared with those from a collection from French Guiana and those previously reported in literature. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values	Ascal apical apparatus
CLL 0823	(12.6–)13.3–15.3(–15.7) × (4.8–)5.2–5.9(–6.3) µm	Q = (2.2–)2.3–2.7(–3), N = 60	Me = 14.2 × 5.6 µm, Qe = 2.5	4–4.6 × 3.6–3.9 µm, Me = 4.2 × 3.7 µm, N = 20
CLL 0974	(12.6–)12.9–14.4(–14.9) × (7.2–)7.5–8.8(–9.3) µm	Q = (1.5–)1.6–1.8(–2), N = 60	Me = 13.7 × 8.1 µm, Qe = 1.7	3.7–4.1 × 3.3–3.7 µm, Me = 3.9 × 3.5 µm, N = 20
CLL 0996	(11.9–)12.7–14.8(–15.6) × (4.8–)5.1–5.8(–6) µm	Q = (2.1–)2.3–2.8(–3.1), N = 60	Me = 13.7 × 5.5 µm, Qe = 2.5	3.8–4.8 × 3.5–4.2 µm, Me = 4.4 × 3.9 µm, N = 20
CLL 2135	(9.4–)9.7–11(–12) × (4.4–)4.6–5.3(–5.8) µm	Q = (1.8–)1.9–2.3(–2.4), N = 60	Me = 10.3 × 5 µm, Qe = 2.1	2.5–2.9 × 1.9–2.3 µm, Me = 2.7 × 2.1 µm, N = 20
CLL 2284	(9.9–)10.3–12(–12.6) × (5.6–)5.9–6.9(–7.4) µm	Q = (1.5–)1.6–1.9(–2.2), N = 60	Me = 11 × 6.4 µm, Qe = 1.7	2.7–3.2 × 2.4–2.8 µm, Me = 3 × 2.6 µm, N = 20
CLL 5302	(11.5–)11.8–13.4(–14.6) × (5.4–)5.7–6.5(–6.8) µm	Q = (1.7–)1.9–2.3(–2.4), N = 60	Me = 12.7 × 6.1 µm, Qe = 2.1	3.8–4.2 × 3.4–3.9 µm, Me = 4 × 3.6 µm, N = 20
CLL 5324	(9.4–)9.7–10.9(–11.3) × (4.4–)5–5.7(–6) µm	Q = (1.7–)1.8–2.1(–2.2), N = 60	Me = 10.2 × 5.3 µm, Qe = 1.9	2.4–2.9 × 1.9–2.4 µm, Me = 2.7 × 2.1 µm, N = 20
MJF 13256	(11.1–)12.4–14.4(–15) × (4.7–)4.9–5.6(–6) µm	Q = (2.1–)2.3–2.8(–3), N = 60	Me = 13.6 × 5.3 µm, Qe = 2.6	3.6–4.2 × 3.3–3.8 µm, Me = 3.8 × 3.5 µm, N = 20
MJF 14080	(9.1–)9.4–10.4(–11) × (4.6–)5–5.8(–6) µm	Q = (1.6–)1.7–2(–2.1), N = 60	Me = 9.9 × 5.3 µm, Qe = 1.9	2.4–2.8 × 1.7–2.1 µm, Me = 2.6 × 2 µm, N = 20
Cumulated values	(9.1–)9.4–15.3(–15.7) × (4.4–)4.6–8.8(–9.3) µm	Q = (1.5–)1.6–2.8(–3.1), N = 540	Me = 12.1 × 5.8 µm, Qe = 2.1	2.4–4.8 × 1.7–4.2 µm, Me = 3.5 × 3 µm, N = 180
GYJF 12073 French Guiana	(9.8–)10.6–12.4(–13.5) × (5.3–)5.7–6.8(–7) µm	Q = (1.6–)1.7–2.1(–2.2), N = 60	Me = 11.6 × 6.3 µm, Qe = 1.9	2.8–3.2 × 2.3–2.7 µm, Me = 3 × 2.5 µm, N = 20
Dennis (1956), holotype French Guiana	12–13 × 6–7.5 µm		Me = 12.5 × 6.8 µm, Qe = 1.8	
San Martín *et al.* (1989), México	11–14 × 5–6(–7) µm		Me = 12.5 × 5.5 µm, Qe = 2.3	2–4 × 2–3 µm

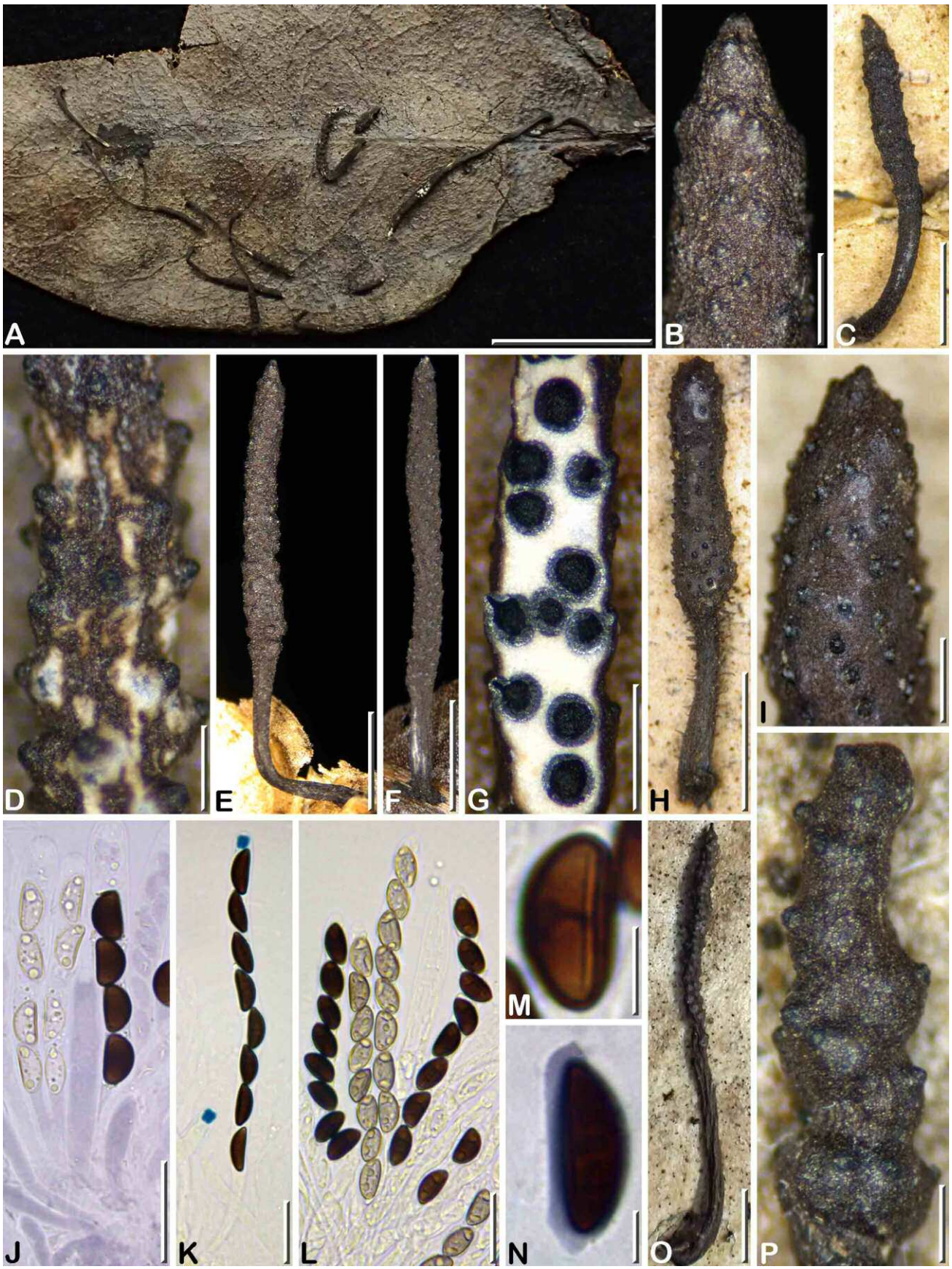

Plate 31– *Xylaria phyllocharis*

A: CLL 5302; B, C, E, K: CLL 0996; D, G, P: CLL 5324; F, J: MJF 14080; H, I: CLL 0974; M: CLL 2135; N: CLL 0823; O, L: CLL 2284. A: Habit of prostrate stromata on a dead leaf; B, I: Stromatal apices with slightly mucronate apex; C, E, F, O: Mature stromata on their substrate; D: Immature stroma in close-up showing internal white tissue exposed through splits of the brown superficial crust; G: Stroma in longitudinal section showing a very thin superficial crust and fully immersed perithecia; H: Mature stroma with obtuse apex and hairy stipe; J: Immature and mature four-spored asci, in aqueous nigrosin; K: Mature ascus in Melzer's reagent showing a short stipe and two apical apparati with amyloid reaction; L: Immature and mature asci, in 1% SDS; M: Barely mature ascospore in latero-ventral view showing a conspicuous germ slit, in aqueous nigrosin; N: Ascospore in lateral view showing a ventral sheath swollen into polar appendages stained by aqueous nigrosin; P: Unusually nodulose stroma in close-up. Scale bars: A = 10 mm; B, G, I = 0.5 mm; C, E, F, H, O = 2.5 mm; D, P = 0.25 mm; J-L = 20 µm; M, N = 5 µm.

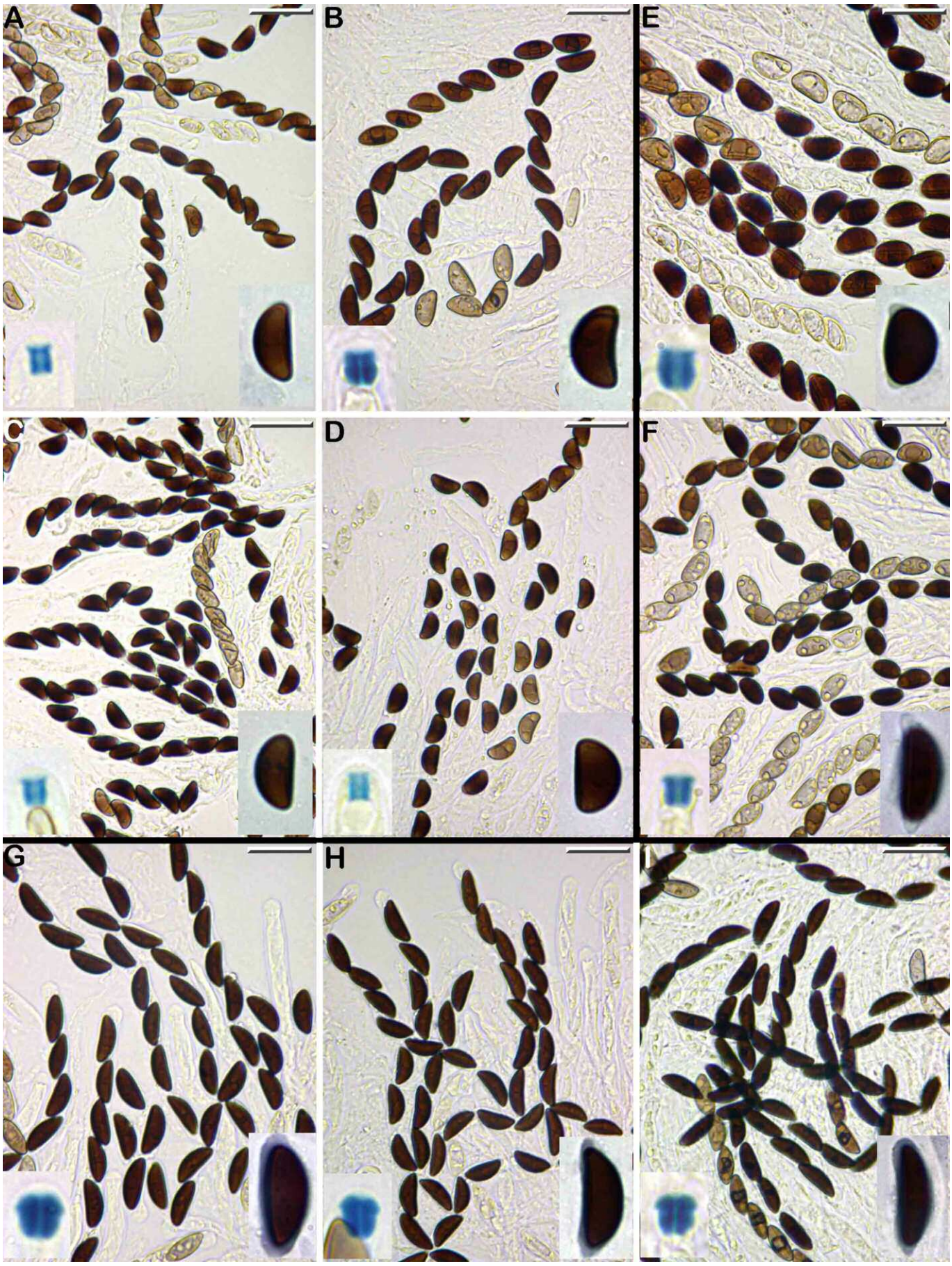

Plate 32 – *Xylaria phyllocharis*

A: CLL 2135; B: CLL 5302; C: CLL 5324; D: MJF 14080; E: CLL 0974; F: CLL 2284; G: CLL 0823; H: CLL 0996; I: MJF 13256. Ascospores in 1% SDS and, inserted, ascal apical apparati in Melzer's reagent (bottom left) and ascospores in aqueous nigrosin (bottom right). Scale bars = 20 µm. Apical apparati and ascospores in aqueous nigrosin are respectively at same scale.

pendages visible in water and stained by aqueous nigrosin, or without sheath or appendages; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Neotropical.

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Capesterre-Belle-Eau, third Carbet waterfall, hygrophilic rainforest, on dead leaves of *Pouteria pallida* (*Sapotaceae*), 2 Sept. 2004, *leg.* C. Lechat, CLL 2284 (LIP); *ibid.*, on dead leaves, 13 Aug. 2008, *leg.* C. Lechat, CLL 8215 (LIP) (immature); Basse-Terre, Petit Bourg, Desbordes Forest, secteur Déjeuner, hygrophilic rainforest, on dead leaves, 3 Sept. 2005, *leg.* C. Lechat, CLL 5324; Basse-Terre, Saint-Claude, Beausoleil, track to Plateau Dimba, hygrophilic rainforest, on dead leaves, 9 Sept. 2003, *leg.* C. Lechat, CLL 0974 (LIP); *ibid.*, on dead leaves, 9 Sept. 2003, *leg.* C. Lechat, CLL 0975 (LIP) (immature); *ibid.*, on dead leaves, 9 Sept. 2003, *leg.* C. Lechat, CLL 0996 (LIP); Basse-Terre, Sainte-Rose, Sofaïa, path to Saut des Trois Cornes, mesophilic rainforest, on dead leaves, 1 Sept. 2005, *leg.* C. Lécuru, CLL 5302 (LIP). Martinique: Case-Pilote, Fond Bourlet, Prise d'Eau, hygrophilic rainforest, on dead leaves of *Magnolia dodecapetala* (*Magnoliaceae*), Sept. 2003, *leg.* C. Lechat, CLL 0823 (LIP); Fort-de-France, Absalon, track to Plateau Michel, 400–500 m, hygrophilic rainforest, on dead leaves, 15 Aug. 2013, *leg.* C. Lechat, MJF 13256 (LIP); Le Lorrain, Rivière Pirogue, Crassous forest, mesophilic rainforest, on dead leaves of *Lauraceae*, 26 Aug. 2004, *leg.* F. Hairie, CLL 2135 (LIP); Le Morne-Rouge, La Propreté forest trail, hygrophilic rainforest, on dead leaves, 6 Jun. 2014, *leg.* J. Fournier, MJF 14080 (LIP; HAST 145152). French Guiana: Régina, Nouragues natural reserve, Inselberg camp, trail 11, primary rainforest, on a dead leaf, 19 Jun. 2012, *leg.* J. Fournier, GYJF 12073 (JF).

Comments: The taxonomic concept of *X. phyllocharis* is based on the protologue by Montagne (1855) and the short illustrated description given by Dennis (1956).

Xylaria phyllocharis is characterized by its foliicolous habitat, narrowly cylindrical blackish brown stromata with a fertile head with a mucronate sterile apex, unexposed perithecial contours and prominent black ostioles, and well-defined glabrous stipes; ascospores are 12–13 × 6–7.5 µm, blackish and convex on both sides with obtuse ends (Dennis, 1956). The stromata of our twelve collections from Guadeloupe and Martinique match well with this set of morphological characters (Plate 31) but, unexpectedly, feature a wide range of variations in shape and dimensions of ascospores, ascospore mucilaginous coating and shape and dimensions of the ascal apical apparatus (Plate 32, Table 22).

The four collections illustrated in A-D (Plate 32) have in common ascospores at the lower end of the size range that are strongly inequilateral with broadly rounded ends and often ventrally concave; they likewise lack appendages or sheath and ascal apical apparati are small and tubular. The collection B deviates in having larger ascospores and slightly urn-shaped ascal apical apparati but is kept here for the lack of appendages on ascospores.

The collection CLL 0974 (Plate 32E) is distinct in featuring larger and bulging ascospores bearing small bipolar secondary appendages; a further deviating character is the presence of stiff hairs on the stipes of stromata. This set of characters is suggestive of *X. phyllocharis* var. *hirtella* Theiss., a foliicolous taxon described from Brazil for which ascospores are said to be enclosed in a delicate hyaline sheath and to lack appendages, but unfortunately their dimensions were not documented (Theissen, 1908). The status of this taxon and its affinities with the collection from Guadeloupe should be evaluated based on a revision of the type collection.

Ascospores of the collection CLL 2284 (Plate 32F) are on the lower range like those in Plates A, C and D but they differ in being convex on both sides and in bearing conspicuous bipolar appendages. The collection GYJF 12073 from French Guiana we studied is similar in ascospore dimensions and presence of bipolar secondary appendages.

Those in Plate 32G, H and I feature larger navicular ascospores with narrowly rounded ends, with a ventral sheath swollen at both ends into secondary appendages, in correlation with more massive acorn-shaped ascal apical apparati with a sharp subapical rim. This combination of deviating characters suggests a distinct taxon that could be segregated from *X. phyllocharis* as defined by Dennis (1956).

San Martín & Rogers (1989) equated a collection from México to *X. phyllocharis* and suggested that a previous unnamed collection from Venezuela, R1741 (Rogers *et al.*, 1988) could likewise be in-

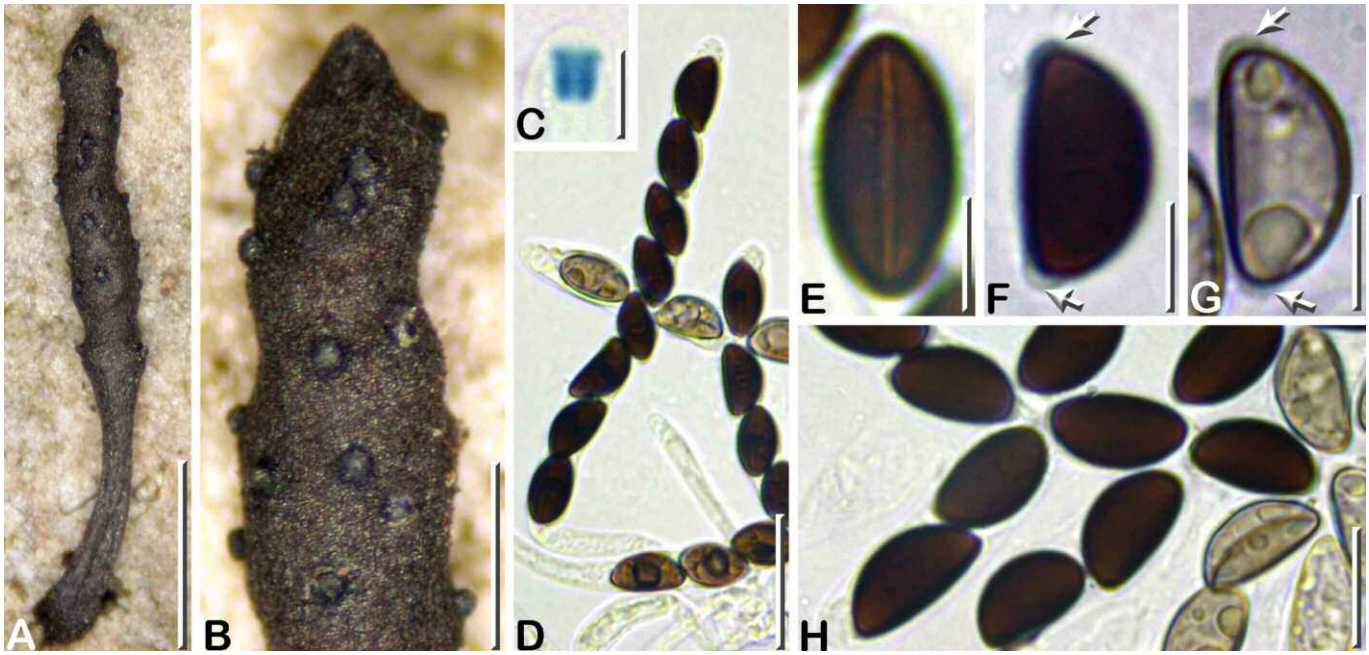

Plate 33 – *Xylaria phyllocharis* (specimen from French Guiana)

A-H: GYJF 12073. A: Mature stroma on a dead leaf; B: Stroma in close-up showing a mucronate apex and obtusely papillate prominent ostioles; C: Ascal apical apparatus, in Melzer's reagent; D: Mature ascus, in 1% SDS; E: Ascospore in ventral view showing a germ slit, in 1% SDS; F, G: Mature and immature ascospores in side view showing small bipolar secondary appendages (arrows), stained in aqueous nigrosin; H: Mature and immature ascospores, in 1% SDS. Scale bars: A = 2 mm; B = 0.5 mm; C, E-G = 5 µm; D = 20 µm; H = 10 µm.

cluded in *X. phyllocharis*. This collection was peculiar in featuring smaller perithecia 0.1–0.2 mm diam. and unusually large and slightly urn-shaped apical apparati 7 × 6 µm.

Unlike most of *Xylaria* spp. that exhibit highly variable stromatal morphology beside more consistent microscopical characters, *X. phyllocharis* shows little variations in stromatal morphology but a wide range of variations in ascospore and apical apparatus morphology. This is strongly suggestive of a complex of cryptic species that cannot be resolved without culturing and phylogenetic comparative studies, and we therefore provisionally keep our collections under this name.

As stated by Rogers *et al.* (1987) who experienced difficulties delineating new taxa in this ecological group, foliicolous *Xylaria* spp. represent a taxonomically poorly known group. Their stromata are most often inconspicuous and form small colonies that are easily overlooked in the leaf litter. Moreover, they are frequently collected before maturity and thus cannot be properly characterized.

Xylaria rickii Theiss., *Annales Mycologici*, 6 (4): 342 (1908). Plate 34, Table 23.

Stromata upright, narrowly cylindrical, terete to slightly flattened in places, acuminate, slightly sinuous, 42–63 mm in total height, the fertile part 1.5 mm diam. at base gradually tapering to 0.8 mm at apex. Stipes ill-defined 5–8 × 1–1.3 mm, brown to blackish, puckered, glabrous, slightly enlarged at base. Surface copper-coloured to blackish brown, faintly cerebriform with low wrinkles isolating small groups of perithecia, more rarely individual perithecia, with a loose, evanescent, dark orange hyphal superficial coating present on immature stroma and remaining at the bottom of wrinkles during maturation; subsurface crust leathery, 10–15 µm thick, superficially blackish brown and finely longitudinally striate; interior white between the perithecia, fibrous to powdery, with a wide brown to blackish brown inner core. **Perithecia** fairly deeply immersed, subglobose to laterally compressed, 0.25–0.35 mm diam. **Ostioles** obtusely papillate, black, conspicuous, 80–90 µm diam. at base.

Asci cylindrical, short-stipitate, mostly immature and fragmentary, not measured, often few-spored, with apical apparatus cylindrical to faintly trapezoid or urn-shaped, with a marked upper rim, 3.4–4.1 × 2.4–3 µm (Me = 3.7 × 2.7 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, (8–)4–6 µm wide at base, tapering to 2–3 µm wide above asci, embedded in mucilaginous material. **Ascospores** (17.9–)18.9–22.8(–25.9) × (5.3–)5.8–6.9 (–7.4) µm, Q = (2.5–)2.9–3.8(–4.1), N = 60 (Me = 21 × 6.4 µm, Qe = 3.3), narrowly ellipsoid to fusiform, inequilateral with narrowly rounded ends, light to medium brown, unicellular, with a conspicuous oblong to ellipsoid germ pore 3.5–5 µm long on the dorsal side, usually central to occasionally closer to one end, dark-bordered, the dark rim thicker at ends; without appendage or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Likely neotropical: Brazil (Theissen, 1908), Colombia (Dennis, 1970), Cuba (Herrera, 1989), French Guiana (JF, unpublished data) and Martinique (this paper).

Specimens examined: French Guiana: Maripasoula, Saül, edge of the forest next to Carbets du bord lodge, 3.623598° N, 53.210338° W, mesophilic rainforest, on a dead blackened branch in the litter, 19 Aug. 2018, *leg.* J. Fournier, GYJF 18004 (JF; HAST 145153). French West Indies: Martinique: Schoelcher, Fond Lahaye, banks of Fond Lahaye River, mesophilic rainforest, on a dead decorticated branch, 12 Aug. 2013, *leg.* J. Fournier, MJF 13140 (LIP).

Comments: *Xylaria rickii* is a distinctive but rarely recorded species and our collection conforms well to the protologue and the description and illustration provided by Dennis (1956). It is characterized by upright, discreet, narrowly cylindrical acuminate stromata with slightly cerebriform surface and large light brown ascospores with a conspicuous germ pore on the dorsal side. The latter feature is unique within *Xylaria* spp. and, combined with other morphological features of the stromata, makes the identification of *X. rickii* unambiguous.

Table 23 shows differences in ascospore dimensions between the known collections of *X. rickii*. We assume that the measurements taken from our collection from French Guiana are more representative than those from this collection from Martinique which is barely mature and features few-spored asci and greater variations in ascospore size and morphology. Ascal apical apparati are likewise slightly different, larger and with more convex sides in the collection from French Guiana. Compared with the consistency of other characters, these minor differences in ascospore and apical apparatus morphology are regarded as reflecting intraspecific variations, likely linked to the degree of maturity.

Xylaria schwackei Henn., *Hedwigia*, 34: 108 (1895). Plates 35–36, Table 24.

Stromata densely gregarious, prostrate to upright, separate, filiform, terete or somewhat flattened or constricted in places, rarely forked at base or in upper part, straight to curved, occasionally interspersed with black upright sterile rhizomorphs; strongly nodulose, with mucronate to apiculate sterile apices, short- to long-stipitate, 20–120 mm in total height, the fertile head 11–41 mm high (including apical sterile extension) × 1–2(–2.5) mm diam., the stipe 5–80 mm high × 0.5–1.5 mm diam.; surface dull black, glabrous, consisting of a leathery crust 30–40 µm thick, superficially finely roughened, overlain by a long persistent olivaceous grey to tan-coloured outer layer releasing vinaceous to cinnamon pigments in 10% KOH, splitting into large scales remaining adherent in depressions at the base of perithecial mounds; perithecial contours strongly to fully exposed, with perithecia single or fused in small groups; the stipes ill-defined, simple, black, flattened, glabrous, slightly enlarged at base; interior solid, white, spongy, with a conspicuous blackish inner core. **Perithecia** subglobose to laterally flat-

Table 23 – Ascospore dimensions in two collections of *X. rickii* from French Guiana and Martinique, compared with those previously reported in literature for this species. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
MJF 13140	(17.9–)18.9–22.8(–25.9) × (5.3–)5.8–6.9(–7.4) µm	Q = (2.5–)2.9–3.8(–4.1), N = 60	Me = 21 × 6.4 µm, Qe = 3.3
GYJF 18004	(16.1–)17.4–20.5(–21.7) × (4.6–)5.1–6(–6.3) µm	Q = (2.7–)3.1–3.9 (–4.2), N = 60	Me = 19 × 5.5 µm, Qe = 3.5
Theissen (1908), Brazil holotype	20–28 × 6–7 µm		Me = 24 × 6.5 µm, Qe = 3.7
Dennis (1956) holotype	18–25 × 5–7 µm		Me = 22 × 6 µm, Qe = 3.7
Herrera (1989), Cuba	16–24 × 4–6 µm		Me = 20 × 5 µm, Qe = 4

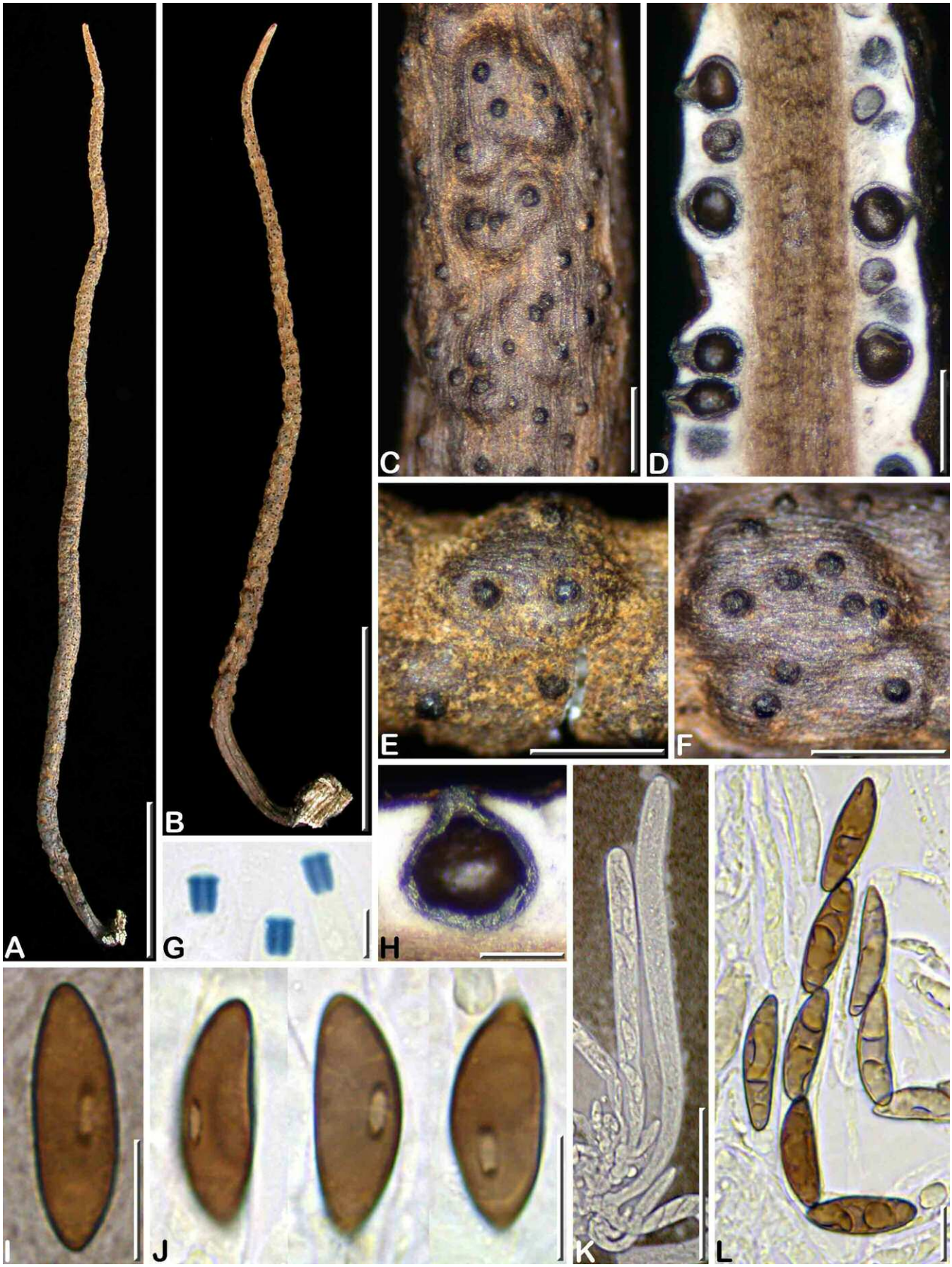

Plate 34 – *Xylaria rickii*

A-L: MJF 13140. A: Mature stroma; B: Immature stroma; C, F: Surface of mature stroma; D: Stroma in longitudinal section showing perithecia embedded in a white tissue and a wide brown inner core; E: Surface of immature stroma in close-up showing a loose superficial dark orange hyphal tissue remaining in depressions; G: Ascal apical apparati, in Melzer's reagent; H: Perithecium in vertical section, immersed beneath a thin superficial crust; I: Ascospore in dorsal view, showing an oblong germ pore and absence of mucilaginous sheath or appendages, in diluted India ink; J: Ascospores in latero-dorsal or dorsal view showing variously located germ pores, in 1% SDS; K: Immature asci, in diluted India ink; L: Immature and mature ascospores, in 1% SDS. Scale bars: A, B = 10 mm; C-F= 0.5 mm; G = 5 µm; H = 0.2 mm; I, J, L= 10 µm; K = 50 µm.

tened by mutual pressure, 0.5–0.65 mm diam. **Ostioles** obtusely papillate, black, not sharply delimited, often inconspicuous.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 90–112 × 7–8 µm, the stipes 52–90 µm long, with apical apparatus 2.6–3.5 × 1.6–2.3 µm (Me = 3.1 × 2.1 µm, N = 60), tubular to slightly urn-shaped, with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 3–4 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (10.8–)11.6–14.6(–16.2) × (3.6–)4.1–5.3(–5.8) µm, Q = (2.2–)2.4–3(–3.6), N = 240 (Me = 13.1 × 4.8 µm, Qe = 2.7), ellipsoid-inequilateral with most often broadly rounded ends, at times with one end beaked, unicellular, dark brown, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side; with a thin appressed mucilaginous sheath swollen at both ends into secondary appendages visible in India ink and stained by aqueous nigrosin; epispore smooth.

Asexual morph on the natural substrate occurs at tip of white conidial stromata. Conidiogenous cells occur in bundles proliferating laterally at right angle from conidiophores creeping on the surface of conidial stromata; smooth-walled, hyaline, to 20 µm high × 2.5–4 µm wide, 1–3-septate, with obtuse tips bearing scattered apiculate extensions; conidiogenesis not observed; conidia 6–7.5 × 2–2.5 µm, narrowly fusiform with acute ends, smooth-walled, hyaline. Cultural characteristics unknown.

Known distribution: Brazil (type collection), Guadeloupe, Martinique (this paper), India (Ju, pers comm.), Spain (Ju & JF, unpublished data).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Gourbeyre, Rivière Sens, coastal mesophilic rainforest, on a dead pod of *Hymenaea courbaril* (*Fabaceae*), 22 Oct 1998, *leg.* J. Vivant, communicated by F. Candoussau, JF 00225 (LIP). Martinique: Case Pilote, Fond Boucher, coastal mesophilic rainforest, on a dead pod of *Hymenaea courbaril* (*Fabaceae*) buried in bamboo leaf litter, 25 Aug. 2010, *leg.* C. Lechat & J. Fournier, MJF 10105 (LIP; HAST 145154); *ibid.*, on a dead pod of *Hymenaea courbaril* (*Fabaceae*) buried in bamboo leaf litter, 17 Aug. 2013, *leg.* J. Fournier, MJF 13284 (LIP); Le Diamant, Morne Blanc, trail from Ancinel to Morne du Riz through Morne Fournerey, meso- to xerophilic forest, on a dead pod of *Hymenaea courbaril* (*Fabaceae*) buried in bamboo leaf litter, 18 Aug. 2013, *leg.* J. Fournier, MJF 13308 (LIP; HAST 145155); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead pod of *Hymenaea courbaril* (*Fabaceae*), 19 Aug. 2005, *leg.* C. Lechat, CLL 5055 (LIP) (immature); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on a dead pod of *Hymenaea courbaril* (*Fabaceae*), 28 Aug. 2010, *leg.* J. Fournier, MJF 10182 (LIP) (immature).

Comments: This filiform and nodulose *Xylaria* was repeatedly and exclusively found on decaying woody pods of *Hymenaea courbaril*, appearing akin to *X. ianthinovelutina* and its allies but differing by the lack of tomentum on the stromatal surface (Rogers, 1979; Ju *et al.*, 2018).

Unlike all glabrous fructicolous taxa surveyed by Ju *et al.* (2018), the stromata of this *Xylaria* are overlain by an olivaceous grey to tan outer layer splitting into scales remaining adherent in the depressions at the base of perithecial contours. A further highly diagnostic character is the cinnamon, slightly vinaceous pigments released in 10% KOH by a fragment of stroma bearing scales of the outer layer, a reaction most unusual in *Xylaria*. This set of morphological characters suggested an undescribed species, until Dr. Ju discovered that the two collections of *X. schwackei* designated as type by Hennings (1895) were actually different, one of them fitting the protologue and our collections, while the other has less exposed perithecial contours and is likely allied to the *X. hypoxylon* group (Ju, pers. comm., 2018). *Xylaria schwackei* as described by Ju & Rogers (1999) was unfortunately based on the wrong type collection, which hampered the identification of our collections.

Based on this new species concept, our collections clearly represent *X. schwackei*; interestingly, a recent collection from Spain (Galicia), made on dead fern rachis, appeared morphologically and phylogenetically identical with the Caribbean material (Ju, pers. comm., 2018), thus considerably expanding the distribution range of this fungus and the diversity of its hosts.

It is noteworthy that, like in several taxa related to *X. ianthinovelutina*, ascospores of *X. schwackei* feature a narrow mucilaginous sheath swelling at ends to form bipolar non-cellular appendages.

Xylaria scruposa (Fr.) Fr., *Nova Acta Regiae Societatis scientiarum upsaliensis*: 127 (1851). Plate 37, Table 25.

Stromata upright, simple, occasionally forked or connated at base, 13–82 mm in total height, the fertile head 6–55 mm high × 1.5–5(–7) mm wide, highly variable, cylindric-fusiform to lanceolate, frequently flattened, straight to often curved or contorted, apically tapering to broadly rounded fertile or acute sterile, occasionally white apices, with perithecial contours barely exposed; white apices of mature stromata appear to result from the erosion of the superficial layers, not in relation with conidiogenesis; the stipes usually sharply-defined, 4–52 mm high × 2–6 mm diam., blackish brown, straight to strongly curved, densely tomentose, slightly swollen at base; surface greyish brown to blackish brown, roughened, slightly wrinkled, with a fugacious outermost layer comprising a superficial greyish brown fibrous tissue cracked into small scales and tufts of reddish brown tomentum, leaving small polygonal brown scales adherent to the subsurface when worn off; densely tomentose stromata may retain a thick layer of released ascospores and appear black; subsurface a thin black leathery crust 40–50 µm thick; interior whitish to cream-coloured, pithy, solid, not turning hollow upon drying, frequently with a narrow blackish core in lower half. **Perithecia** immersed, subglobose to laterally compressed, 0.5–0.75 mm diam. **Ostioles** papillate on a conspicuous raised-discoid base 170–250 µm diam., black, frequently overlain by white substance or surrounded by a conspicuous white ring.

Table 24 – Ascospore dimensions in four collections of *X. schwackei* from Guadeloupe and Martinique, showing the range of intraspecific variations, compared with those of the type collection. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
JF 00225	(11.6–)12.3–14.3(–15.7) × (4.2–)4.7–5.3(–5.8) µm	Q = (2.3–)2.4–2.9(–3.2), N = 60	Me = 13.3 × 5 µm, Qe = 2.7
MJF 10105	(10.8–)11.7–14.1(–16.2) × (4.1–)4.4–5.2(–5.4) µm	Q = (2.2–)2.4–2.9(–3.2), N = 60	Me = 12.8 × 4.8 µm, Qe = 2.7
MJF13308	(10.9–)12.6–14.6(–15.3) × (4.4–)4.6–5.3(–5.7) µm	Q = (2.2–)2.5–3(–3.1), N = 60	Me = 13.6 × 4.9 µm, Qe = 2.8
MJF13284	(11–)11.6–13.3(–14.6) × (3.6–)4.1–4.9(–5.2) µm	Q = (2.4–)2.5–3(–3.6), N = 60	Me = 12.6 × 4.6 µm, Qe = 2.8
Cumulated values	(10.8–)11.6–14.6(–16.2) × (3.6–)4.1–5.3(–5.8) µm	Q = (2.2–)2.4–3(–3.6), N = 240	Me = 13.1 × 4.8 µm, Qe = 2.7
Hennings (1895), Brazil	12–14 × 4–5 µm		Me = 13 × 4.5 µm, Qe = 2.9

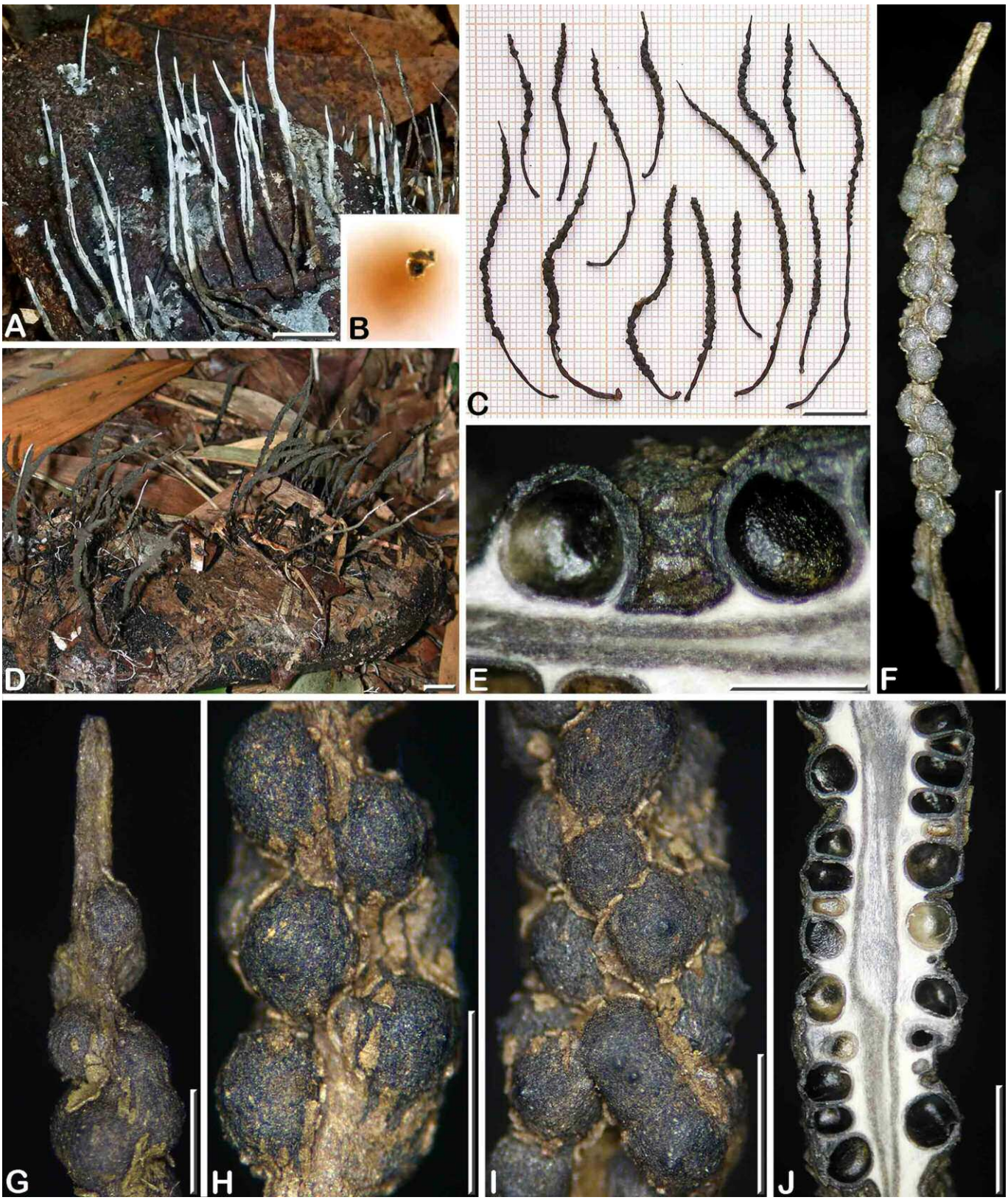

Plate 35 – *Xylaria schwackei*

A: MJF 13284; B, C, G-J: MJF 13308; D-F: MJF 10105. A: Habit of conidial stromata on host surface, *in situ*; B: Pigments released by a fragment of mature stroma in 10% KOH; C: Various stromata from the same collection; D: Habit of mature stromata on host surface, *in situ*; E: Stroma in longitudinal section showing perithecia immersed beneath a thin black crust overlain by olivaceous grey scales and a white solid interior with a blackish inner core; F: Mature stroma showing a sterile apiculate apex and a nodulose surface with olivaceous grey outer layer; G: Stromatal apex showing an apiculate sterile tip and olivaceous grey scales of the outer layer; H, I: Stromatal surface showing variously exposed perithecial contours, papillate ostioles and scaly remnants of a tan outer layer; J: Stroma in longitudinal median section showing a solid white interior with a blackish inner core. Scale bars: A, C, D = 10 mm; E = 0.5 mm; F = 5 mm; G-J = 1 mm.

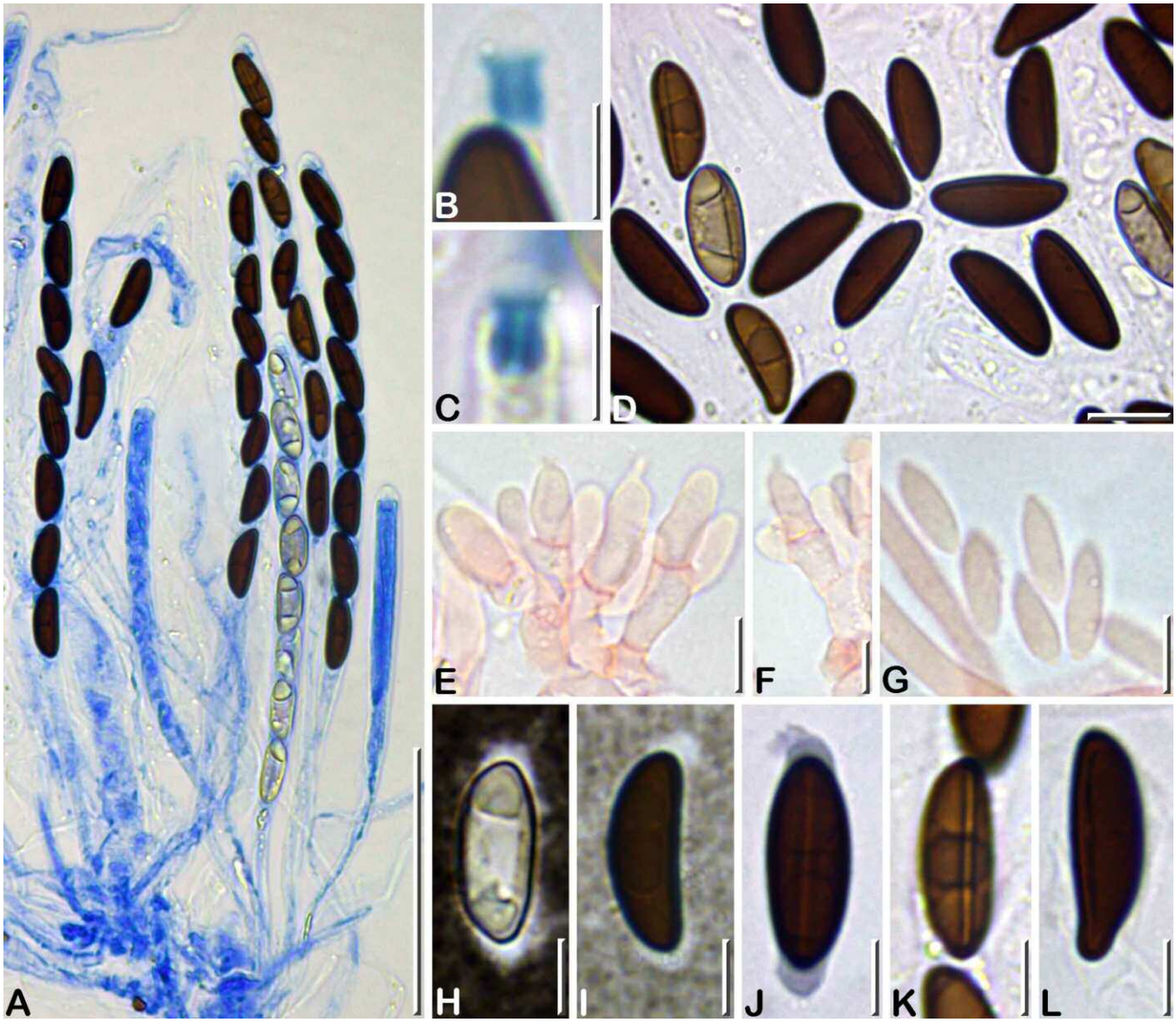

Plate 36 – *Xylaria schwackei*

A-D, J-L: MJF 13308; E-I: MJF 13284. A: Immature and mature asci, in blue Pelikan® ink diluted in 1% SDS; B, C: Ascal apical apparati, in Melzer's reagent, slightly urn-shaped in C; D: Mature and immature ascospores, some showing a faint germ slit, in 1% SDS; E: Bundle of conidiogenous cells; F: Apiculate conidiogenous cell; G: Conidia (E-G in Congo red diluted in 3 % KOH); H, I: Immature and mature ascospores in India ink, showing a narrow mucilaginous sheath and bipolar secondary appendages; J: Ascospore showing secondary appendages stained by aqueous nigrosin; K: Immature ascospore in ventral view showing a conspicuous germ slit; L: Mature ascospore with a beaked end, showing an inconspicuous germ slit. Scale bars: A = 50 µm; B, C, E-L = 5 µm; D = 10 µm.

Asci cylindrical, with (4–6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 120–170 × 8.5–10 µm, the stipes 70–85 µm long, with apical apparatus tubular to slightly urn-shaped, apically flattened with a faint lateral rim, basally attenuated, 4.7–5.9 × 3.7–4.4 µm (Me = 5.4 × 4.1 µm, N = 50), strongly bluing in Melzer's reagent. **Paraphyses** copious, hyphal, thin-walled, 6–7 µm wide at base, tapering to 1.5–2 µm wide above asci, sparsely guttulate, discretely embedded in mucilaginous material. **Ascospores** (14.2–)15.7–24.1(–28.1) × (4.9–)5.4–8.1(–9.1) µm, Q = (2.3–)2.5–3.6(–4.5) N = 720 (Me = 19.4 × 6.5 µm, Qe = 3), ellipsoid-inequilateral to navicular with narrowly rounded to slightly pinched ends, at times slightly ventrally concave, dark brown, unicellular, with a narrow, obliquely oriented, straight to often slightly sigmoid germ slit ca. ½ spore-length on the ventral side; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate occurring on immature stromata overlain with a thick, greenish grey, powdery tissue resulting from conidiogenesis, occasionally associated with more mature stromata. Cultural characteristics were described by Rogers *et al.* (1987; 1988).

Known distribution: Pantropical (Dennis, 1956; 1958; 1961; Rogers & Callan, 1986; Rogers *et al.*, 1987; 1988; San Martín & Rogers, 1989; Van der Gucht, 1995; Ju & Rogers, 1999; Rogers & Ju, 2012).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Petit-Bourg, Natural Park of Guadeloupe, Maison de la Forêt, hygrophilic rainforest, on dead decorticated wood, 24 Nov. 2006, *leg.* C. Lechat, CLL 6055 (LIP). Martinique: Case-Pilote, Fond Boucher, mesophilic rainforest, on a dead corticated branch, 2 Dec. 2006, *leg.* C. Lechat, CLL 6132 (LIP); Case-Pilote, Fond-Bourlet, Prise d'Eau, hygrophilic rainforest, on dead corticated wood, 21 Aug. 2005, *leg.* C. Lechat, CLL 5117 (immature) (LIP); Case-Pilote, Morne Bois-Laroche, mesophilic rainforest, on dead wood, 22 Aug. 2005, *leg.*

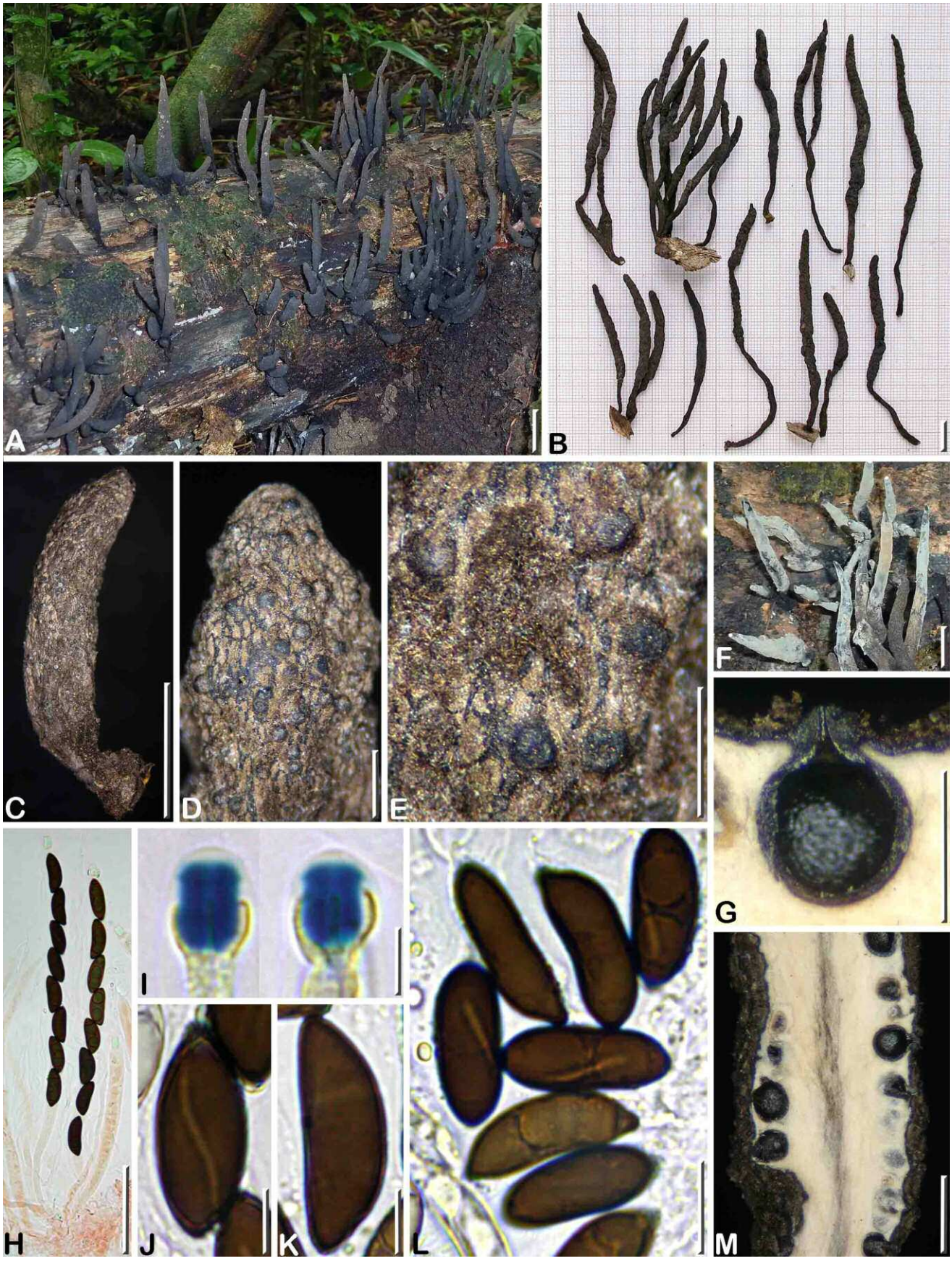

Plate 37 – *Xylaria scruposa*

A, F: CLL 7256; B, D, E, J, K, L: CLL 5217; C, G, M: MJF 13067: H, I : MJF 13116. A: Gregarious stromata *in situ*; B: Variously shaped stromata showing variations within the same collection; C: Small subsessile stroma with tomentose surface; D: Fertile apex in close-up; E: Stromatal surface in close-up showing a cracked outer layer, tomentum in a central depression and raised-discoid ostioles; F: Conidial stromata, *in situ*; G: Perithecium in vertical section showing a thin black crust pierced by a papillate ostiole and overlain by greyish brown fibrous tissue; H: Immature and mature asci, in Congo red in 1% SDS; I: Ascal apical apparati in Melzer's reagent; J: Ascospore in ventral view showing a sigmoid germ slit, in 1% SDS; K: Ascospore in side view, in 1% SDS; L: Variously shaped ascospores in 1% SDS, some in ventral view showing a germ slit; M: Stroma in vertical section showing immersed perithecia and a whitish solid interior with a narrow blackish core. Scale bars: A, B, F = 10 mm; C = 5 mm; D, M = 1 mm; E, G = 0.5 mm; H = 50 µm; I-K =5 µm; L =10 µm.

C. Lécuru, CLL 5129 (immature) (LIP); Case-Pilote, Morne Rose, mesophilic rainforest, on a dead corticated branch, 8 Aug. 2013, *leg.* J. Fournier, MJF 13067 (LIP); Case-Pilote, Savane Saint-Cyr, trail to Plateau Concorde, hygrophilic rainforest, 600–650 m, on a dead corticated branch, 27 Aug. 2010, *leg.* C. Lechat, MJF 10175 (LIP); La Trinité, Pointe-Rouge, coastal meso- to xerophilic forest, on a dead corticated branch, 27 Aug. 2005, *leg.* C. Lechat, CLL 5201 (LIP); *ibid.*, on dead wood, 27 Aug. 2005, *leg.* C. Lechat, CLL 5217 (LIP); *ibid.*, on dead wood, 27 Aug. 2005, *leg.* C. Lechat, CLL 5222 (LIP); *ibid.*, on dead wood, 29 Aug. 2010, *leg.* C. Lechat, MJF 10222 (LIP); La Trinité (Caravelle peninsula), Tartane, Pointe Bateau, coastal meso- to xerophilic forest, on a dead corticated branch, 3 Dec. 2006, *leg.* C. Lechat, CLL 6157 (LIP); *ibid.*, on dead wood, 26 Aug. 2004, *leg.* C. Lechat, CLL 2133 (LIP); *ibid.*, on dead wood, 26 Aug. 2004, *leg.* C. Lechat, CLL 2139 (immature) (LIP); Le Marin, Morne Aca, coastal mesophilic forest, on a dead corticated branch, 25 Aug. 2005, *leg.* C. Lechat, CLL 5185 (LIP); Le Morne-Rouge, Domaine d'Émeraude, hygrophilic rainforest, on a dead rotten trunk, 9 Aug. 2013, *leg.* J. Fournier, MJF 13091 (LIP); *ibid.*, roadside to Morne-Rouge, on dead wood, 24 Aug. 2007, leg J. Fournier, MJF 07080; Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead corticated branch, 3 Sept. 2003, *leg.* C. Lechat, CLL 0709 (LIP, HAST 145156); *ibid.*, on a dead corticated branch, 3 Sept. 2003, *leg.* C. Lechat, CLL 0729 (LIP); *ibid.*, on a dead corticated branch, 3 Sept. 2003, *leg.* C. Lechat, CLL 0743 (immature) (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5007 (immature) (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5013 (LIP); *ibid.*, on dead wood, 18 Aug. 2005, *leg.* C. Lechat, CLL 5015 (immature) (LIP); *ibid.*, on dead wood, 19 Aug. 2005, *leg.* C. Lechat, CLL 5025 (LIP, HAST 145157); *ibid.*, on dead wood, 19 Aug. 2005, *leg.* C. Lechat, CLL 5048 (LIP); *ibid.*, on dead buried wood, 23 Aug. 2007, *leg.* J. Fournier & C. Lécuru, MJF 07036 (LIP); *ibid.*, on dead buried wood, 23 Aug. 2007, *leg.* J. Fournier & C. Lécuru, MJF 07037 (LIP); *ibid.*, on dead buried wood, 23 Aug. 2007, *leg.* J. Fournier & C. Lécuru, MJF 07039 (LIP); *ibid.*, on a dead corticated branch, 23 Aug. 2007, *leg.* J. Fournier, MJF 07046 (LIP); *ibid.*, on a dead corticated branch, 23 Aug. 2007, *leg.* J. Fournier, MJF 07052 (LIP); *ibid.*, on dead corticated wood, 1 Sept. 2007, *leg.* J. Fournier, MJF 07244 (LIP); *ibid.*, on a dead corticated woody liana, 1 Sept. 2007, *leg.* J. Fournier, MJF 07248 (LIP); *ibid.*, on dead corticated wood, 2 Sept. 2007, *leg.* C. Lechat, MJF 07272 (LIP); *ibid.*, on a dead corticated branch, 5 Sept. 2007, *leg.* J. Fournier, MJF 07316 (LIP); *ibid.*, on dead wood, 13 Aug. 2007, *leg.* C. Lechat, CLL 7224 (immature) (LIP); *ibid.*, on dead wood, 25 Aug. 2008, *leg.* C. Lechat, CLL 8311 (LIP); *ibid.*, on a dead corticated branch, 25 Aug. 2008, *leg.* C. Lechat, CLL 8320 (immature) (LIP); *ibid.*, on a dead corticated branch, 25 Aug. 2008, *leg.* C. Lechat, CLL 8321 (LIP); *ibid.*, on dead wood, 23 Aug. 2010, *leg.* J. Fournier, MJF 10059 (LIP); *ibid.*, on dead wood, 23 Aug. 2010, *leg.* C. Van Wonterghem, MJF 10063 (LIP); *ibid.*, on a dead decorticated trunk, 24 Aug. 2010, *leg.* J. Fournier, MJF 10079 (LIP); *ibid.*, on dead wood, 19 Aug. 2011, *leg.* C. Lechat, CLLMAR 11040 (LIP); *ibid.*, on a dead trunk of *Cocos nucifera* (*Arecaeae*), 6 Aug. 2013, *leg.* J. Fournier, MJF 13031 (LIP); Le Prêcheur, Anse Lévrier, coastal mesophilic rainforest, on a dead trunk of *Cocos nucifera* (*Arecaeae*), 24 Aug. 2010, *leg.* R. Courtecuisse, MJF 10086 (LIP); Le Robert, Bois Pothau, coastal xero-mesophilic forest, on a dead corticated branch, 30 Aug. 2008, *leg.* C. Lechat, CLL 8381 (immature) (LIP); *ibid.*, on a dead corticated branch, 30 Aug. 2008, *leg.* C. Lechat, CLL 8382 (LIP); Le Saint-Esprit, Bois La Charles, mesophilic rainforest, on a dead corticated branch, 23 Aug. 2004, *leg.* C. Lechat, CLL 2017 (LIP); *ibid.*, on dead wood, 24 Aug. 2004, *leg.* C. Lechat, CLL 2050 (LIP); *ibid.*, on dead wood, 29 Aug. 2005, *leg.* C. Lechat, CLL 5246 (LIP); *ibid.*, on a dead corticated branch, 29 Aug. 2005, *leg.* C. Lechat, CLL 5248 (parasitized by an unidentified discomycete) (LIP); *ibid.*, on a dead corticated branch, 29 Aug. 2005, *leg.* C. Lechat, CLL 5249 (LIP); *ibid.*, on dead wood, 29 Aug. 2005, *leg.* C. Lechat, CLL 5259 (LIP); *ibid.*, on dead wood, 29 Aug. 2005, *leg.* C. Lechat, CLL 5268 (LIP); *ibid.*, on dead wood, 30 Aug. 2010, *leg.* J. Fournier, MJF 10257 (LIP); Les Anses-d'Arlet, Anse Noire, coastal mesophilic forest, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5278 (LIP); *ibid.*, on dead wood, 30 Aug. 2005, *leg.* C. Lechat, CLL 5283 (LIP); *ibid.*, on dead wood, 22 Aug. 2007, *leg.* J. Fournier, MJF 07023 (LIP); Les Anses-d'Arlet, Morne Réduit, coastal mesophilic forest, on dead wood, 17 Aug. 2011, *leg.* C. Lechat, CLLMAR 11018 (LIP); Rivière-Pilote, Lépinay forest, mesophilic rainforest, on dead corticated wood, 10 Aug. 2013, *leg.* J. Fournier, MJF 13116 (LIP); Sainte-Marie, La Philippe, Trou Mulet, coastal mesophilic rainforest, on dead corticated wood, 19 Aug. 2007, *leg.* C. Lechat, CLL 7254 (immature) (LIP); *ibid.*, on a dead trunk, 19 Aug. 2007, *leg.* C. Lechat, CLL 7256 (LIP); *ibid.*, on dead wood, 27 Aug. 2008, *leg.* C. Lechat, CLL 8333 (immature) (LIP); *ibid.*, on dead wood, 27 Aug. 2008, *leg.* C. Lechat, CLL 8335 (immature) (LIP); *ibid.*, on dead wood, 27 Aug. 2008, *leg.* C. Lechat, CLL 8338 (immature) (LIP); *ibid.*, on a dead trunk, 21 Aug. 2013, *leg.* J. Fournier, MJF 13354 (LIP); *ibid.*, on a dead trunk, 2 Aug. 2016, *leg.* J. Fournier, MJF 16078 (LIP); Schoelcher, Case Navire River, Fond Rousseau, mesophilic rainforest, on dead wood, 23 Aug. 2011, *leg.* C. Lechat, CLLMAR 11080 (LIP); *ibid.*, on dead wood, 23 Aug. 2011, *leg.* C. Lechat, CLLMAR 11083 (LIP); *ibid.*, on dead wood, 23 Aug. 2011, *leg.* C. Lechat, CLLMAR 11084 (LIP); Schoelcher, Fond Lahaye, banks of Fond Lahaye River, mesophilic rainforest, on a dead corticated branch, 12 Aug. 2013, *leg.* J. Fournier, MJF 13169 (LIP).

Comments: The stromata of *X. scruposa* exhibit a wide array of variation in dimensions and morphology, making this widespread species sometimes difficult to recognize. *Xylaria scruposa* can be distinguished from resembling species by the combination of leathery stromata with a thin crust overlain by a fibrous grey-brown to dark brown coating cracking into small scales, often associated with a woolly tomentum, conspicuous raised-discoid ostioles and ellipsoid-inequilateral dark brown ascospores 15.7–24.1× 5.4–8.1 µm with a slightly sigmoid ventral germ slit less than spore-length. More accurate comments on its diagnostic features were given in part II (Fournier *et al.*, 2019).

As shown in part II (Fournier *et al.*, 2019), ascospores of *X. scruposa* feature a wide range of variation. We report here four collections from Martinique with ascospores whose dimensions barely overlap with those of typical *X. scruposa* (Table 25). The collection MJF 14053 features a single mature stroma growing on a woody fruit of Mahogany (*Swietenia macrophylla* King, *Meliaceae*), externally typical for *X. scruposa* but with larger ascospores 25.5 × 9.1 µm on average.

The collections CLL 5088, CLL 5567 and MJF 13362 likewise have stromata fairly typical for *X. scruposa* but their ascospores differ in

Table 25 – Ascospore dimensions in four collections from Martinique referred to *X.* cf. *scruposa*, compared with those of typical *X. scruposa*. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
MJF 14053	(22.2–)23.6–27.4(–31.0) × (7.9–)8.5–9.7(–10.1) µm	Q = (2.4–)2.6–3.1(–3.5), N = 60	Me = 25.5 × 9.1 µm, Qe = 2.8
X. scruposa (this paper, part II)	(14.2–)15.7–24.1(–28.1) × (4.9–)5.4–8.1(–9.1) µm	Q = (2.3–)2.5–3.6(–4.5), N = 720	Me = 19.4 × 6.5 µm, Qe = 3
CLL 5088	(13.7–)14.4–16.2(–17.1) × (5.5–)5.8–6.5(–6.8) µm	Q = (2.2–)2.3–2.7(–2.9), N = 60	Me = 15.4 × 6.1 µm, Qe = 2.5
CLL 5567	(12.7–)13.7–15.8(–17.4) × (5.3–)5.6–6.3(–6.5) µm	Q = (2.2–)2.3–2.8(–2.9), N = 60	Me = 14.7 × 6 µm, Qe = 2.5
MJF 13362	(13.5–)14.1–15.9(–17) × (5–)5.4–6.2(–6.5) µm	Q = (2.3–)2.4–2.9(–3.1), N = 60	Me = 15.1 × 5.7 µm, Qe = 2.6

being markedly shorter with a slightly longer germ slit, with more broadly rounded ends and relatively wider with ratio l/w of 2.5 vs. 3 (Table 25). Such ascospore morphology was reported by Ju & Tzean (1985) and Ju & Rogers (1999) for *Xylaria* collections from Taiwan externally resembling *X. scruposa* they referred to *X. leprosa* Speg. However, after revision of the type material of *X. leprosa*, Dr. Ju reconsidered his previous interpretation of this species and suggested that these deviating collections should be provisionally filed as *X. scruposa* (pers. comm., 2005).

Specimens referred to *X. scruposa* with deviating ascospore dimensions: French West Indies: Martinique: Case-Pilote, Crête Jean-Louis, hygrophilic rainforest, dead corticated branch, 21 Aug. 2005, *leg.* C. Lechat, CLL 5088 (LIP; HAST 145158); Fort-de-France, Absalon, track to Plateau Michel, 400–500 m, hygrophilic rainforest, on a dead woody fruit of Mahogany (*Swietenia macrophylla*, *Meliaceae*), 5 Jun. 2014, *leg.* J. Fournier, MJF 14053 (LIP); Le Lorrain, Rivière Pirogue, Crassous forest, mesophilic rainforest, on dead wood, 6 Dec. 2005, *leg.* C. Lechat, CLL 5567 (LIP); Saint-Joseph, Fond Fougères, hygrophilic rainforest, on a dead moss-covered trunk, 22 Aug. 2013, *leg.* J. Fournier, MJF 13362 (LIP; HAST 145159).

***Xylaria* sp. CLL 5110**. Plate 38.

Stromata arising in a bundle, separate or connated at base by two, subcylindrical, terete, straight to sinuous, with apiculate, conical or spathulate sterile apices 0.8–1.5 mm long, stipitate, 25–36 mm in total height, the fertile head simple to furcate 16–26 mm high (including apical sterile extension) × 1.2–2 mm diam., the stipe 4–6 mm high × 0.5–0.7(–1.2) mm diam.; surface blackish, glabrous, nodulose with deep wrinkles isolating groups of perithecia, overlain by a persistent grey to brownish grey, horny splitting outer layer, forming a striped pattern, vanishing with age; perithecial contours slightly exposed, occasionally strongly exposed; subsurface blackish, a thin leathery crust 40–60 µm thick; the stipes ill- defined, simple to furcate, black, terete to flattened, puckered, glabrous, enlarged and tomentose at base; interior solid, whitish, spongy to loosely fibrous, with a pale orange brown inner core. **Perithecia** subglobose 0.3–0.45 mm diam., laterally flattened when crowded. **Ostioles** obtusely papillate to hemispherical, 80–100(–120) µm diam., black, surrounded by a white, hyphal, discoid area 150–200 µm diam. vanishing with age.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 76–86 × 5.5–6.5 µm, the stipes 64–76 µm long, with apical apparatus 2.4–3.1 × 1.6–2.1 µm (Me = 2.7 × 1.8 µm, N = 20), tubular to slightly urn-shaped with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, remotely septate, 5–6.5 µm wide at base, occasionally apically branched and diverticulate, tapering to 1.5 µm wide, embedded in mucilaginous material. **Ascospores** (10.4–)11–12.2 (–13.1) × (3.8–)4–4.6(–5) µm, Q = (2.4–)2.5–2.9(–3.1), N = 60 (Me = 11.7 × 4.3 µm, Qe = 2.7), ellipsoid-inequilateral with narrowly to broadly rounded ends, frequently slightly ventrally concave to suballantoid, medium brown, with a conspicuous, longitudinally oriented germ slit on the ventral side, less than spore-length to almost spore-length, 6–10 µm long, occasionally slightly obliquely oriented or slightly sigmoid; no appendage or mucilaginous sheath visible in India ink; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique (this paper).

Specimen examined: French West Indies: Martinique: Case-Pilote, Fond-Bourlet, Prise d'Eau, hygrophilic rainforest, on a dead partly decorticated branchlet 1 cm diam., 21 Aug. 2005, *leg.* C. Lechat, CLL 5110 (LIP; HAST 145160).

Comments: This *Xylaria* was first assigned to *X. arbuscula* owing to its slender, apiculate, sometimes furcate stromata featuring a grey striped surface. A closer examination showed it differs from the wide concept of *X. arbuscula* accepted by most authors and resumed in this paper by smaller ascospores 11–12.2 × 4–4.6 µm vs. 11–15 × 4.5–6 µm but also by a more nodulose stromatal surface, a thin leathery crust and larger obtusely papillate ostioles frequently surrounded by a white disc.

We first considered *X. brachiata* that was said to be a small-spored counterpart of *X. arbuscula* (Ju & Rogers, 1999), but examination of the type of *X. brachiata* showed it could not be distinguished from *X. arbuscula* (Ju, pers. comm., 2005). *Xylaria partita*, known from Puerto Rico, is another small-spored counterpart of *X. arbuscula* with ascospores 10–12 × 4.5–5.5 µm and a long germ slit (Ju *et al.*, 2016) to which our collection might be equated. However, ascospores in our collection are narrower, giving a l/w ratio of 2.7 vs. 2.2 in *X. partita* and are frequently ventrally concave or suballantoid, an unusual feature within the *X. arbuscula* complex. For these reasons, and because this unfortunately single collection may be atypical, we refrain to segregate it from known species within the *X. arbuscula* complex until it is better resolved.

***Xylaria* sp. CLL 5241-2**. Plate 39.

Stroma upright, forked at mid height, plus one additional stroma connated at base, 18 mm in total height, short-stipitate; the fertile heads 14 mm high × 4 mm wide at base, ca. 2 mm wide above, cylindric-fusiform to lanceolate, flattened, straight, apically tapering to acute sterile apices, with perithecial contours unexposed; the stipe ill-defined, 4 mm high × 2.5 mm wide, blackish brown, straight, flattened, tomentose; surface dark brown, roughened by prominent discoid ostioles and longitudinal stripes of velvety tufts; subsurface a thin black leathery crust 30–40 µm thick overlain by a bipartite tomentose outer layer, comprising a continuous tan to light brown basal layer and a dark reddish brown, velvety superficial layer splitting into longitudinal stripes between ostioles; interior whitish, pithy, solid, with a narrow pale brown inner core. **Perithecia** immersed, subglobose, 0.35–0.4 mm diam. to laterally compressed in places. **Ostioles** raised-discoid with a minute blackish central papilla, 130–170 µm diam., overlain by light brown tissue gradually worn off, eventually black.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 55–63 × 4–4.5 µm, the stipes 34–58 µm long, with apical apparatus short-cylindrical, apically flattened with a faint lateral rim, 1.4–1.8 × 1.1–1.3 µm (Me = 1.6 × 1.2 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** sparse, hyphal, thin-walled, 7–9 µm wide at base, tapering to 1.5–2 µm wide above asci, sparsely guttulate, embedded in mucilaginous material. **Ascospores** (9–)9.2–10.3(–11.5) × (3.1–)3.3–4(–4.2) µm, Q = (2.3–)2.4–3(–3.2), N = 60 (Me = 9.8 × 3.6 µm, Qe = 2.7, ellipsoid almost equilateral, mostly with narrowly rounded ends, light brown, unicellular, with a conspicuous, straight, longitudinally to slightly obliquely oriented germ slit slightly less than spore-length; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique.

Specimen examined: French West Indies: Martinique: Case-Pilote, Fond Boucher, meso- to xerophilic forest, on a dead corticated branch, associated with *X.* cf. *longiana*, 28 Aug. 2005, *leg.* C. Lechat, CLL 5241-2 (LIP).

Comments: This single stroma was found mixed with the stromata of *X.* cf. *longiana* and has apparently been collected at the same time. Its leathery black crust overlain by a tomentose superficial layer and its raised-discoid ostioles suggest possible affinities

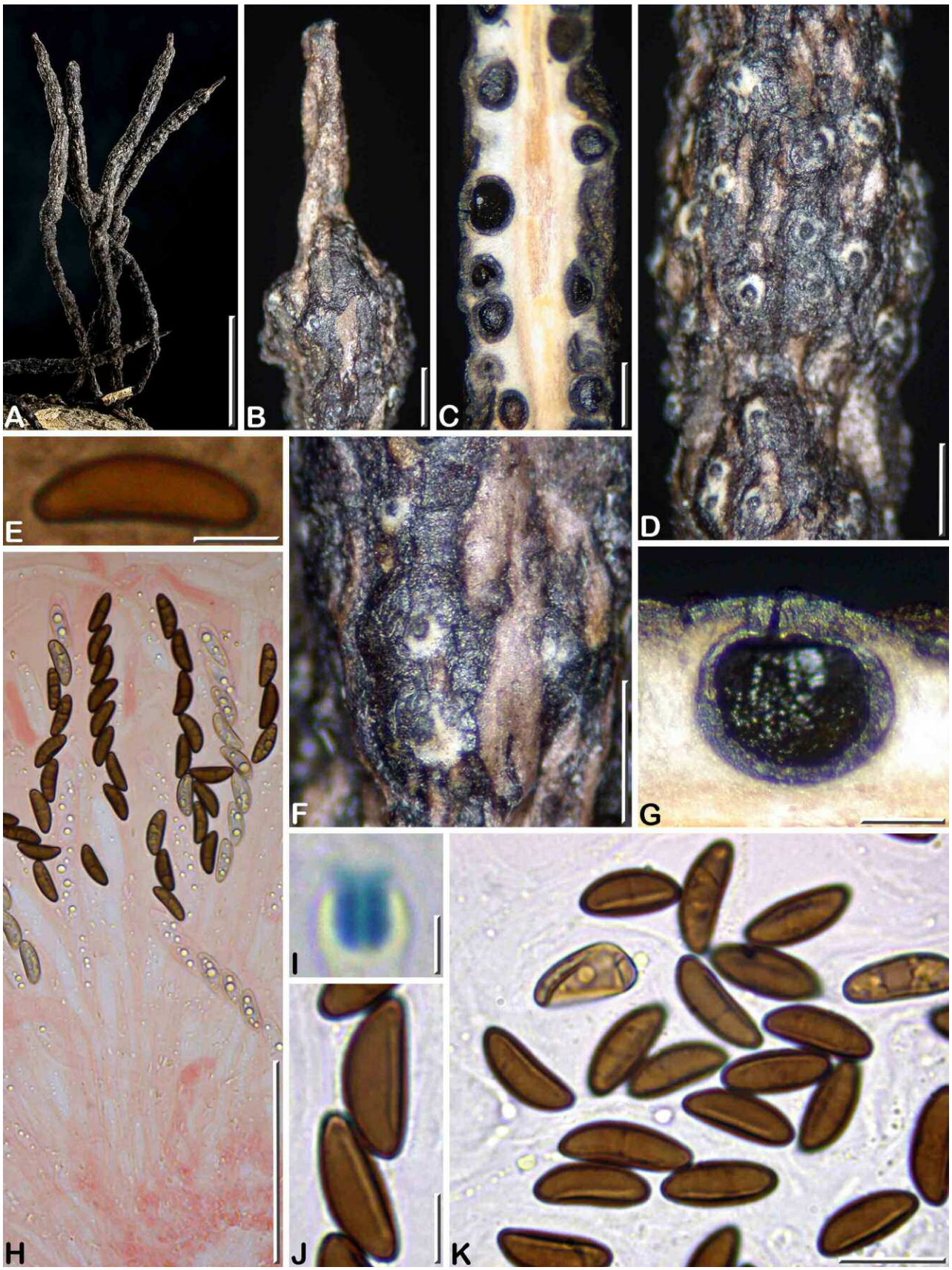

Plate 38 – *Xylaria* sp. CLL 5110

A-K: CLL 5110. A: Habit of a bundle of stromata arising from a branchlet; B: Apex of a stroma in close-up showing a spathulate sterile extension overlain by a brownish grey outer layer; C: Stroma in vertical section showing perithecia immersed under a thin black crust and slightly raising the surface, and whitish interior with a pale orange brown inner core; D: Slightly nodulose stromatal surface showing wrinkles, papillate ostioles surrounded by a white disc and remnants of a striped brownish grey outer layer; E: Allantoid ascospore in side view in India ink, showing absence of appendage and mucilaginous sheath; F: Close-up on stromatal surface showing remnants of a striped brownish grey outer layer and obtusely papillate ostioles; G: Perithecium in vertical section lying beneath a thin leathery crust, embedded in a whitish, fibrous internal tissue; H: Asci in Congo red in 3% KOH; I: Slightly urn-shaped ascal apical apparatus, in Melzer's reagent; J: Two ascospores in latero-ventral view showing germ slits, in 1% SDS; K: Ascospores in 1% SDS, some in ventral view showing germ slits of variable length. Scale bars: A = 10 mm; B, C, D, F = 0.5 mm; E, J = 5 µm; G = 0.2 mm; H = 50 µm; I = 2 µm; K = 10 µm.

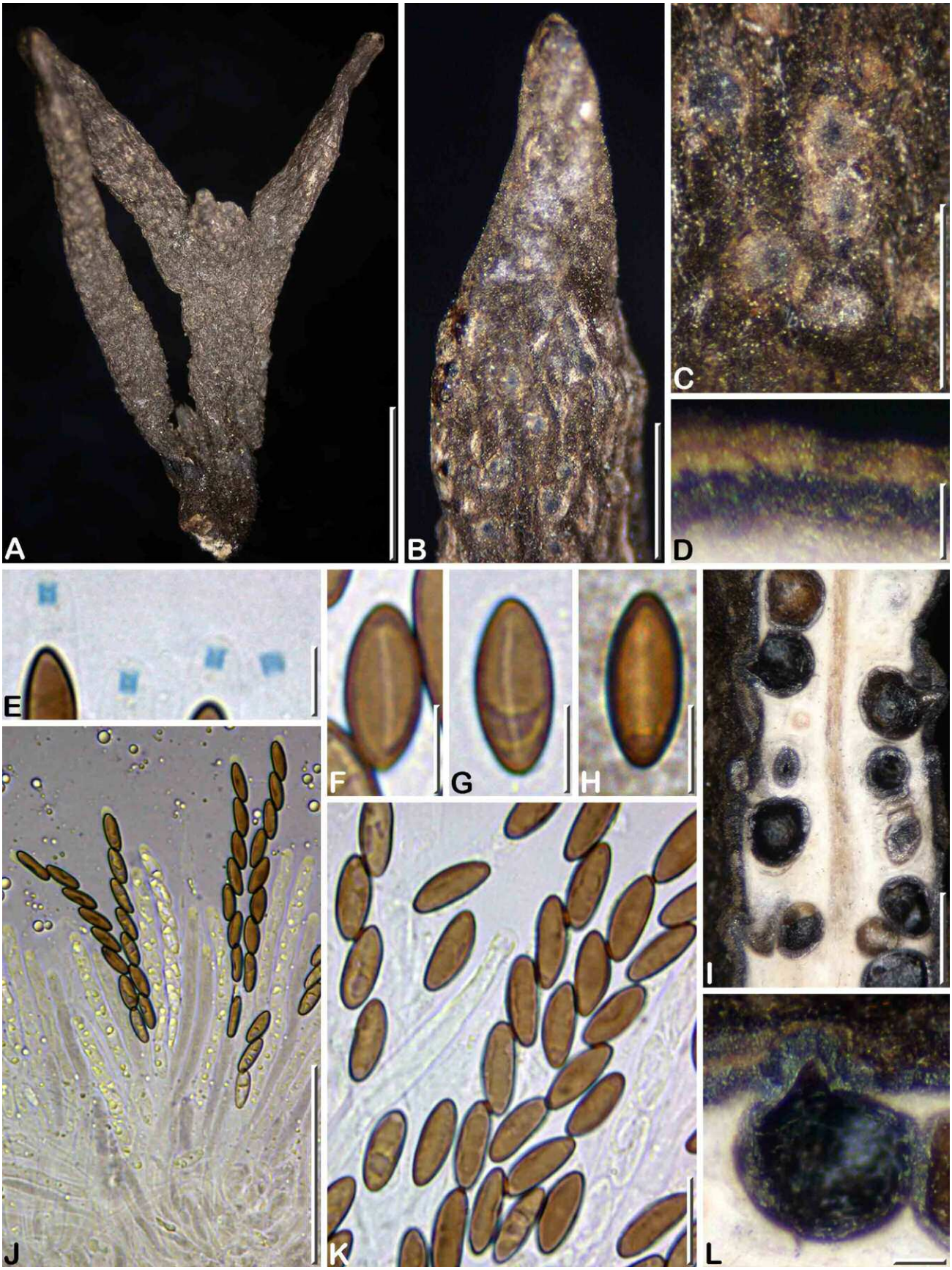

Plate 39 – *Xylaria* sp. CLL 5241-2

A-L: CLL 5241-2. A: Two connated stromata; B: Stromatal apex showing a conical sterile tip and a dark brown velvety superficial layer split around the ostioles; C: Stromatal surface in close-up showing pale brown raised-discoid ostioles emerging from dark brown tufts of tomentum; D: Vertical section of the stromatal surface showing a thin black crust overlain by a bipartite layer of light brown and dark brown tissues; E: Ascal apical apparati in Melzer's reagent; F, G: Ascospores showing slightly oblique to longitudinal germ slits, in 1% SDS; H: Ascospore in diluted India ink, showing absence of sheath or appendages; I: Stroma in longitudinal section showing subglobose perithecia immersed in a whitish solid tissue with a light brown inner core; J: Immature and mature asci, in black Pelikan ink; K: Ascospores in 1% SDS; L: Perithecium in vertical section showing a raised-discoid ostiole piercing the superficial layers. Scale bars: A = 5 mm; B = 1 mm; C, I = 0.5 mm; D, L = 0.1 mm; E-H = 5 µm; J = 50 µm; K =10 µm.

with members of the PO clade like *X. scruposa* (Hsieh *et al.*, 2010) but its subequilateral and light brown ascospores 9.8 × 3.6 µm on average do not fit any known species in this group.

It might represent an undescribed taxon but the paucity of the material precludes the formal description of a new species.

***Xylaria* sp. CLL 5534**. Plate 40.

Stromata scattered, separate, subcylindrical to slightly clavate, simple to connated at base by two, terete to slightly flattened, straight to curved, with broadly rounded fertile apices; fragile at dry state and larger stromata longitudinally split with inrolled margins, 18–60 mm in total height, the fertile head 10–38 mm high × 2–5 mm diam., the stipe 3–22 mm high × 2 mm diam.; surface dull black with traces of a cream-coloured superficial pellicle in places, smooth to finely longitudinally striate, cerebriform with deep circumferential wrinkles isolating small groups of perithecia, with perithecial contours slightly exposed; the stipes ill-defined, blackish, flattened, glabrous, cracked on surface, the base slightly swollen; crust leathery, ca. 40 µm thick; interior solid and spongy in smaller stromata, loosely fibrous in larger stromata, whitish to cream. **Perithecia** subglobose 0.6–0.65 mm diam., laterally flattened when crowded. **Ostioles** finely conic-papillate on a discoid, barely raised base 170–210 µm diam., black.

Asci cylindrical, with 4–6(–8) slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 52–65 × 4.5–5.5 µm, the stipes 70–90 µm long, with apical apparatus 1.9–2.2 × 1.6–1.9 µm (Me = 2 × 1.8 µm, N = 20) , short-cylindrical to slightly tubular with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** copious, hyphal, filiform, thin-walled, 1–2 µm wide, embedded in mucilaginous material. **Ascospores** (7.7–)8.4–9.7(–10.4) × (3.7–)3.9–4.5 (–4.8) µm, Q = (1.9–)2–2.2(–2.3), N = 60 (Me = 9.1 × 4.2 µm, Qe = 2.1), ellipsoid-inequilateral with mostly broadly rounded ends, medium brown to dark brown, unicellular, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side; lacking mucilaginous sheath or appendages; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique.

Specimen examined: French West Indies: Martinique: Schoelcher, Rivière Duclos, Fontaine Didier, meso- to hygrophilic rainforest, on dead blackened wood, 4 Dec. 2005, *leg.* C. Lechat, CLL 5534 (LIP; HAST 145161).

Comments: This collection appears akin to *X. multiplex* var. *microsperma* with which it shares stromata with a similar cerebriform surface with an evanescent light-coloured superficial pellicle and large discoid ostioles, along with ascospores in the same size range (this paper). However, we refrain to include it in our concept of *X. multiplex* var. *microsperma* because of some stromata becoming unusually hollow with inrolled margins, few-spored asci and darker brown ascospores with more broadly rounded ends and a germ slit consistently almost spore-length and located on the ventral side. Additional collections could show if this set of deviating characters justifies the segregation of a distinct taxon or just represents intraspecific variations occasionally encountered in a taxon that is still poorly known.

***Xylaria* sp. CLLGUAD 029**. Plate 41.

Stromata discreet, scattered on a dead leaf, upright, consisting of a black, contorted, unbranched, filiform rachis 45–60 mm high with an intercalary fertile part delimiting a stipe 16–18 mm high × 0.3–0.4 mm wide and an upper sterile extension tapering to 0.15–0.2 mm wide; fertile part narrowly cylindrical, nodulose with perithecial contours slightly to strongly exposed, 4–6 mm high × 0.8–1 mm wide; surface black, a leathery crust 40–50 µm thick, finely longitudinally furrowed, glabrous, overlain by a thin silvery grey splitting outer layer gradually worn off at maturity; the stipes and the sterile upper extensions strap-like, longitudinally puckered, glabrous; interior soft, solid, slightly fibrous, white. **Perithecia** depressed-spherical, 0.3–0.35 mm high × 0.4–45 mm diam. **Ostioles** slightly prominent, black, conic-papillate to obtusely papillate, 100–150 µm diam. at base.

Asci cylindrical, with (4–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 74–84 × 7–8.5 µm, the stipes 36–45 µm long, with apical apparatus 2.3–2.7 × 1.8–2.2 µm (Me = 2.5 × 2 µm, N = 20), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, thin-walled, 9–11 µm wide at base, tapering to 2–3 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8.8–)10–11.5(–12) × (4.9–)5.2–6.1(–6.5) µm, Q = (1.6–)1.7–2.1(–2.2), N = 60 (Me = 10.6 × 5.6 µm, Qe = 1.9), ellipsoid-inequilateral, with narrowly to broadly rounded ends, dark brown to blackish brown, with a conspicuous longitudinally oriented germ slit almost spore-length on the ventral side, with a basal, slightly obliquely oriented cellular appendage and occasionally either a second cellular appendage or a mucilaginous cap on opposite end, without mucilaginous sheath on sides; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Guadeloupe.

Specimen examined: French West Indies: Guadeloupe: Basse-Terre, Petit-Bourg, trail to La Mamelle, hygrophilic rainforest, on a dead leave in the litter, 14 Aug. 2010, *leg.* C. Lechat, CLLGUAD 029 (LIP).

Comments: The most remarkable feature of this *Xylaria* is the cylindrical fertile part topped by a very long filiform extension of the rachis. A search through literature showed that this may occur in species whose fertile part consists of scattered superficial perithecia but not when perithecia are aggregated in a common subglobose or cylindrical stroma. Such stromata are often shortly apically mucronate, or rarely feature an upper extension up to 10 mm long as in *X. axifera* Mont. (Dennis, 1956; Læssøe & Lodge, 1994). *Xylaria axifera* is characterized by subglobose fertile portions and larger ascospores 20.7–28 × 6.1–7.1 µm with a dorsal germ slit and long secondary bipolar appendages, which clearly sets it apart from the present *Xylaria* species.

An unnamed foliicolous collection from Taiwan (Ju 80082005) was considered because it features small filiform stromata with acute sterile apices and ascospores bearing a cellular appendage (Ju & Rogers, 1999). It could not be equated with our species because of its much shorter sterile apices and significantly larger and more slender ascospores 13.5–16.5 × 5–6 µm surrounded by a slimy sheath swollen at both ends.

Xylaria sp. S 1364 is another unnamed foliicolous *Xylaria* known from Venezuela that should be compared with our species because its filiform stromata reach 30 cm long × 1 mm wide (Rogers *et al.*, 1988). It is different from our species in having free perithecia scattered along the rachis and larger ascospores 17.5–20 × 6.5–7.5 µm.

Xylaria foliicola G. Huang & L. Guo, recently described from China (Huang *et al.*, 2014) shares with our species a similar longitudinally cracked stromatal surface overlain by a white striped outer layer and ascospores (8.5–)9–11 × 4–6 µm. However, its cylindrical stromata up to 35 mm high × 1–2 mm wide with a short sterile apex cannot be confused with those of our species. *Xylaria hainanensis* Y.F. Zhu & L. Guo is another foliicolous species with similar ascospores 8–11 × 4–6 µm that differs from *X. foliicola* by smooth stromata and tomentose stipes (Zhu & Guo, 2011; Huang *et al.*, 2014). Regrettably, the presence of appendages or slimy sheath on ascospores is not documented for these two latter species.

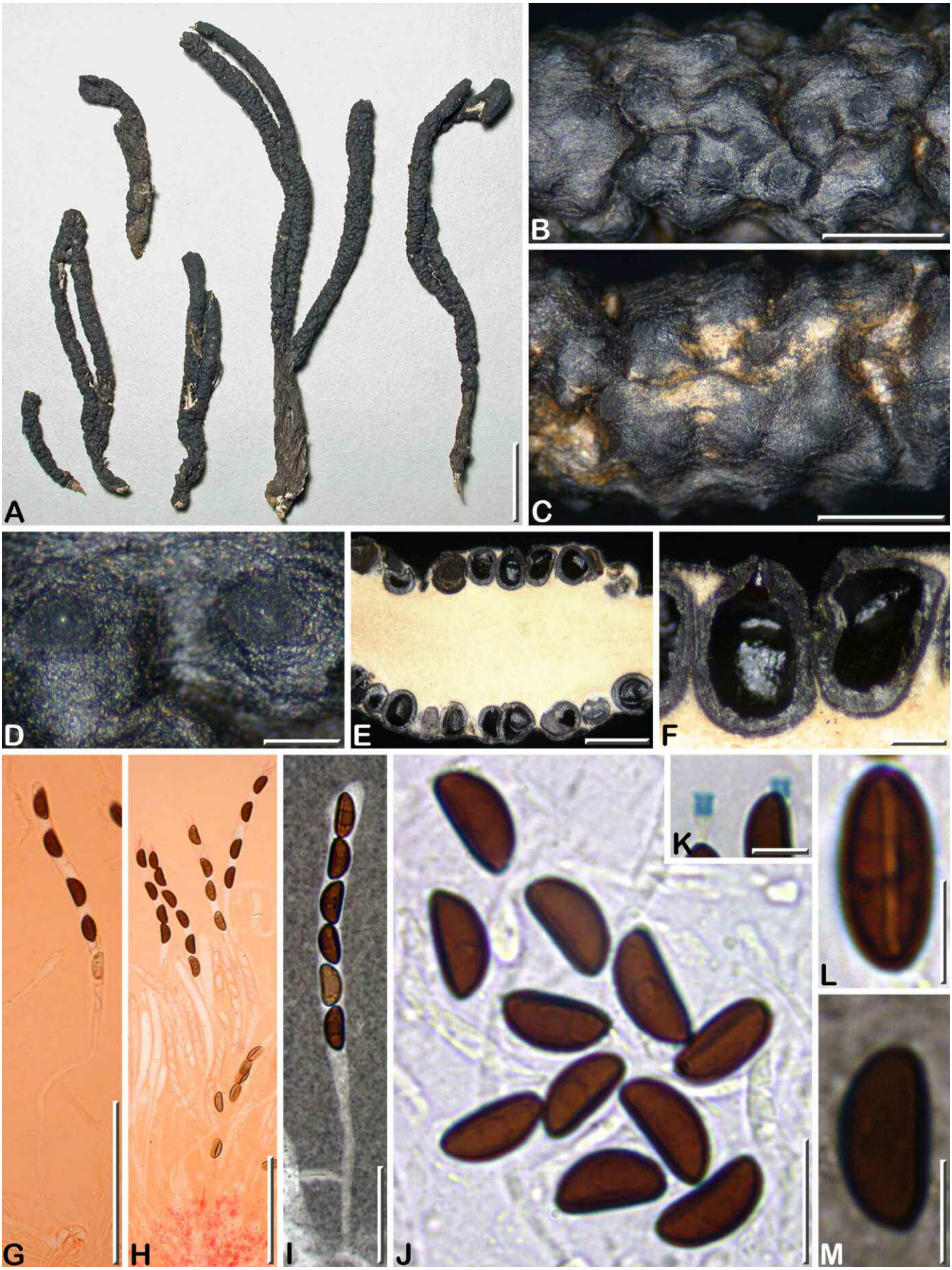

Plate 40 – *Xylaria* sp. CLL 5534

A-M: CLL 5534. A: Habit of stromata at dry state; B: Stromatal surface showing deep wrinkles; C: Stromatal surface showing remnants of a cream-coloured superficial pellicle; D: Close-up on two adjacent discoid ostioles; E: Stroma in longitudinal section showing a yellowish white solid interior; F: Perithecia in vertical section, immersed beneath a thin black crust; G, H: Long-stipitate few-spored asci, in Congo red in 1% SDS; I: Six-spored ascus with ruptured stipe, in diluted India ink; J: Mature ascospores, in 1% SDS; K: Ascal apical apparati, in Melzer's reagent; L: Ascospore in ventral view showing a long germ slit, in 1% SDS; M: Ascospore in side view showing absence of sheath or appendages, in diluted India ink. Scale bars: A = 10 mm; B, C, E = 1 mm; D, F = 0.2 mm; G, H = 50 µm; I = 20 µm; J = 10 µm; K-M = 5 µm.

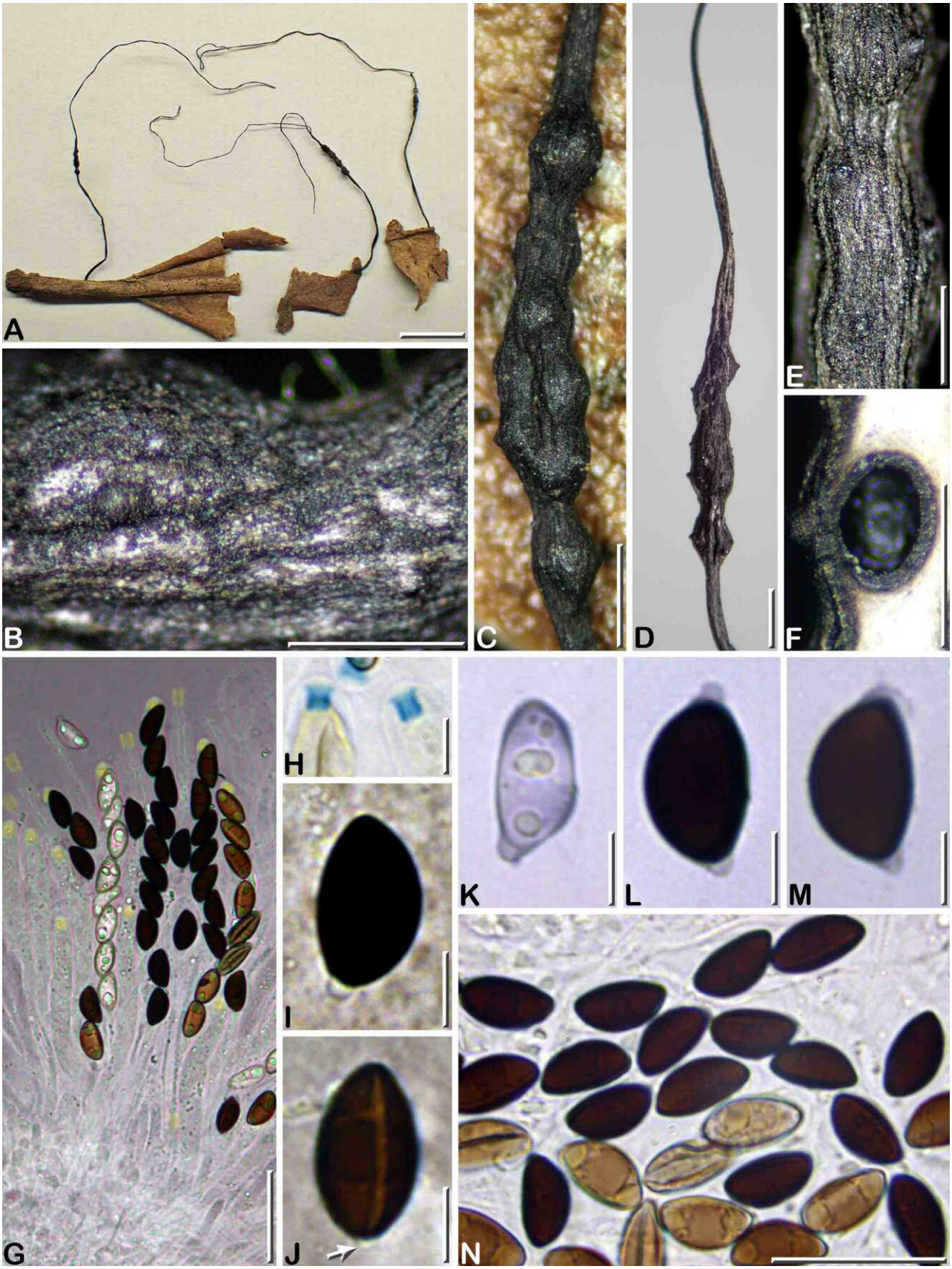

Plate 41 – *Xylaria* sp. CLLGUAD 029

A: Habit of stromata on petiole and dead leaf fragments showing long filiform apical extensions; B, E: Stromatal surface in close-up showing a longitudinally furrowed black crust overlain by scattered remnants of a thin superficial silvery grey layer; C: Fertile part of a stroma with nodulose and furrowed surface; D: Fertile part of a stroma showing conical ostioles and a filiform apical extension; F: Perithecium in vertical section, immersed beneath a thin black crust; G: Immature and mature asci, in black Pelikan ink; H: Ascal apical apparati, in Melzer's reagent; I: Ascospore in side view showing a single basal cellular appendage, in diluted India ink; J: Ascospore in ventral view showing a germ slit and a reduced cellular appendage (arrow), in diluted India ink; K: Immature ascospore in side view showing a single basal cellular appendage, in aqueous nigrosin; L: Ascospore in side view showing bipolar cellular appendages, in aqueous nigrosin; M: Ascospore in side view showing a single basal cellular appendage and a gelatinous cap at upper end, in aqueous nigrosin; N: Immature and mature ascospores in 1% SDS. Scale bars: A = 10 mm; B, E, F = 0.5 mm; C, D = 1 mm; G, N = 20 µm; H-M = 5 µm.

This collection from Guadeloupe might represent an undescribed taxon but its scantiness preludes its description as a new taxon.

***Xylaria* sp. MJF 14123**. Plate 42.

Stromata upright to prostrate, narrowly cylindrical with obtusely rounded fertile apex, terete to slightly flattened, simple, straight to slightly curved, 12–32 mm in total height × 1.5–2 mm wide, with perithecial contours unexposed; the stipes ill-defined, 3–5 mm high × 1–1.5 mm wide, brown, cracked, glabrous, arising from a conspicuous discoid pannose base 3–4 mm diam.; surface orange brown, even in the mature stroma, immature stromata shrivelling upon drying, with a persistent outermost layer cracked into minute polygonal scales whose contours form a network around the ostioles; fairly hard-textured, with black leathery to slightly carbonaceous tissue forming a superficial crust 40–45 µm thick immediately beneath surface; interior spongy, whitish to yellowish, solid, with a conspicuous brown inner core. **Perithecia** immersed, subglobose, 0.25–0.38 mm diam., rarely in contact. **Ostioles** papillate, bluntly conical, black to shiny black, 80 µm diam. at base.

Asci cylindrical, with 8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 42–51 × 4.5–5 µm, the stipes 18–45 µm long, with apical apparatus 1.3–1.5 × 1.1–1.4 µm (Me = 1.4 × 1.2 µm, N = 20), short-cylindrical with a faint upper rim, bluing in Melzer's reagent. **Paraphyses** hyphal, strap-like, thin-walled, 4–6 µm wide at base, tapering to 1–2 µm wide, not extending above asci, embedded in mucilaginous material. **Ascospores** (5.4–)5.9–7.0(–7.3) × (2.7–)2.9–3.4(–3.7) µm, Q = (1.7–)1.8–2.3(–2.5), N = 60 (Me = 6.5 × 3.2 µm, Qe = 2.1) , ellipsoid subequilateral, with narrowly to broadly rounded ends, light brown, with a wide, conspicuous, longitudinally oriented germ slit 3.5–4 µm long on the less convex side when inequilateral, lacking mucilaginous sheath or appendages; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Martinique.

Specimen examined: French West Indies: Martinique: Le Lorrain, Rivière Pirogue, Crassous forest, mesophilic rainforest, ca. 100 m, on a dead corticated branchlet, 11 Jun. 2014, *leg.* J. Fournier, MJF 14123 (LIP; HAST 145162).

Comments: This collection is characterized by narrowly cylindrical stromata with rounded apex, overlain by an orange brown reticulately cracked outer layer and glabrous stipes arising from a wide pannose base; its light brown slightly inequilateral ascospores are distinctive in their small size 6.5 × 3.2 µm on average, and in featuring a conspicuous short germ slit. This set of characters does not match a known species but most of stromata are fully immature, which precludes to describe it as new species for the time being.

Stromatal morphology, especially the reticulately cracked surface, suggests affinities with species in the PO clade as defined by Hsieh *et al.* (2010). The only known species in this group with such small ascospores is *X. aemulans* Starbäck, known from a collection from Brazil (Starbäck, 1901). Based on the protologue and the illustrations, *X. aemulans*, said to be akin to *X. corniformis*, appears to differ from our collection by wider, subsessile, conical to clavate stromata with most often acute apex and slightly wider ascospores 6–7.5 × 4–5 µm with narrowly rounded ends. Ju & Hsieh (2019), who revised the type specimen of *X. aemulans*, recently established that it is a later synonym of *X. feejeensis*, a species morphologically different from the specimen MJF 14123 (see description and illustrations of *X. feejeensis* in this paper). Dennis (1958) referred to *X. aemulans* a collection from Bolivia housed at Kew that features a reticulately cracked surface and ascospores 6–7.5 × 2.5–4 µm and that would be interestingly compared with our material.

The orange brown reticulately cracked surface of our collection is strikingly reminiscent of that of *X. cuneata* as illustrated in Ju *et al.* (2016) and in our previous paper (Fournier *et al.*, 2019). *Xylaria cuneata* can be readily distinguished from the present fungus by larger and dark brown inequilateral ascospores 15 × 5 µm on average.

Xylaria vinosa J. Fourn., Y.-M. Ju & Lechat, *sp. nov*. – MycoBank MB835280. Plates 43–44, Table 26.

Diagnosis: Differs from known *Xylaria* spp. with stromata featuring a thick carbonaceous crust by a rosy to purple superficial colour.

Typification: French West Indies: Martinique: Saint-Joseph, Fond Fougères, hygrophilic rainforest, on dead wood, 22 Aug. 2013, *leg.* J. Fournier & C. Lechat, MJF 13361 (LIP; isotype HAST 145163).

Etymology: From Latin *vinosus* = vinaceous, for the distinctive vinaceous to purple stromatal surface colour.

Stromata scattered or in small groups of 2–3, upright, separate, rarely connated at base by two, simple, rarely apically branched, varying from clavate to fusiform, straight to curved, terete to flattened or constricted in places, occasionally longitudinally furrowed, most often with a distinctly mucronate sterile apex, subsessile to long-stipitate, 16–52 mm in total height, the fertile head 6–35 mm high × 3–5(–6) mm diam.; surface even, typically cream to buff (45) in immature stromata, gradually turning purple (35) from the base in developing stromata and purple to violet (32) at maturity before gradually blackening; subsurface black, hard-textured, a carbonaceous crust 120–170 µm thick, overlain by a bipartite, fibrous, appressed outer layer, basally buff, superficially rosy to purple, cracking into an ill-defined network; black crust superficially minutely granulate, black granules showing through cracks of the outer layer in places; perithecial contours unexposed; the purple tissue not releasing pigments in NH_3 or KOH; the stipes usually well-defined, 2–45 mm high × 1–2.5(–4) mm diam., black, glabrous, occasionally slightly granulate at maturity, terete to flattened, puckered, enlarged at base; interior whitish, solid, disintegrating and turning pale brown with age. **Perithecia** subglobose 0.4–0.6 mm diam., laterally flattened when crowded. **Ostioles** obtusely papillate, barely prominent, black, often inconspicuous, 80–100 µm diam. at base.

Asci cylindrical, long-stipitate, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 68–78 × 5–6 µm, the stipes 100–135 µm long, with apical apparatus tubular with a faint upper rim, 2.2–2.6 × 1.4–1.6 µm (Me = 2.4 × 1.5 µm, N = 20), bluing in Melzer's reagent. **Paraphyses** copious, hyphal, remotely septate, thin-walled, 5–9 µm wide at base, tapering to 1–1.5 µm wide above asci, embedded in mucilaginous material. **Ascospores** (8.2–)9.3–11.1(–11.7) × (3.4–)3.7–4.8(–5.2) µm, Q = (1.9–)2.1–2.8(–3), N = 360 (Me = 10.2 × 4.3 µm, Qe = 2.4), ellipsoid-inequilateral with narrowly to broadly rounded ends, brown to dark brown, unicellular, with a thin, straight, longitudinally oriented germ slit slightly less than spore length on the ventral side; lacking appendages or mucilaginous sheath; epispore smooth.

Asexual morph on the natural substrate not observed.

Known distribution: Likely neotropical: Ecuador (Læssøe, pers. comm.), French Guiana, Guadeloupe, Martinique, Panamá.

Specimens examined (paratypes, except MJF 14022-2): French West Indies: Guadeloupe: Basse-Terre, Petit-Bourg, forest track of Jules, hygrophilic rainforest, on dead wood, 1 Sept. 2004, *leg.* F. Hairie, CLL 2263 (LIP; HAST 145164); Basse-Terre, Sainte-Rose, Sofaïa, Chemin des Contrebandiers, hygrophilic rainforest, on dead wood, 15 Aug. 2008, *leg.* C. Lechat, CLL 8230 (immature) (LIP; HAST 145165). Martinique: Fort-de-France, edge of the parking lot of Maison forestière de la Donis, hygrophilic rainforest, on dead blackened wood, 15 Jun. 2014, *leg.* J. Fournier, MJF 14181 (LIP); Le Lorrain, Rivière Pirogue,

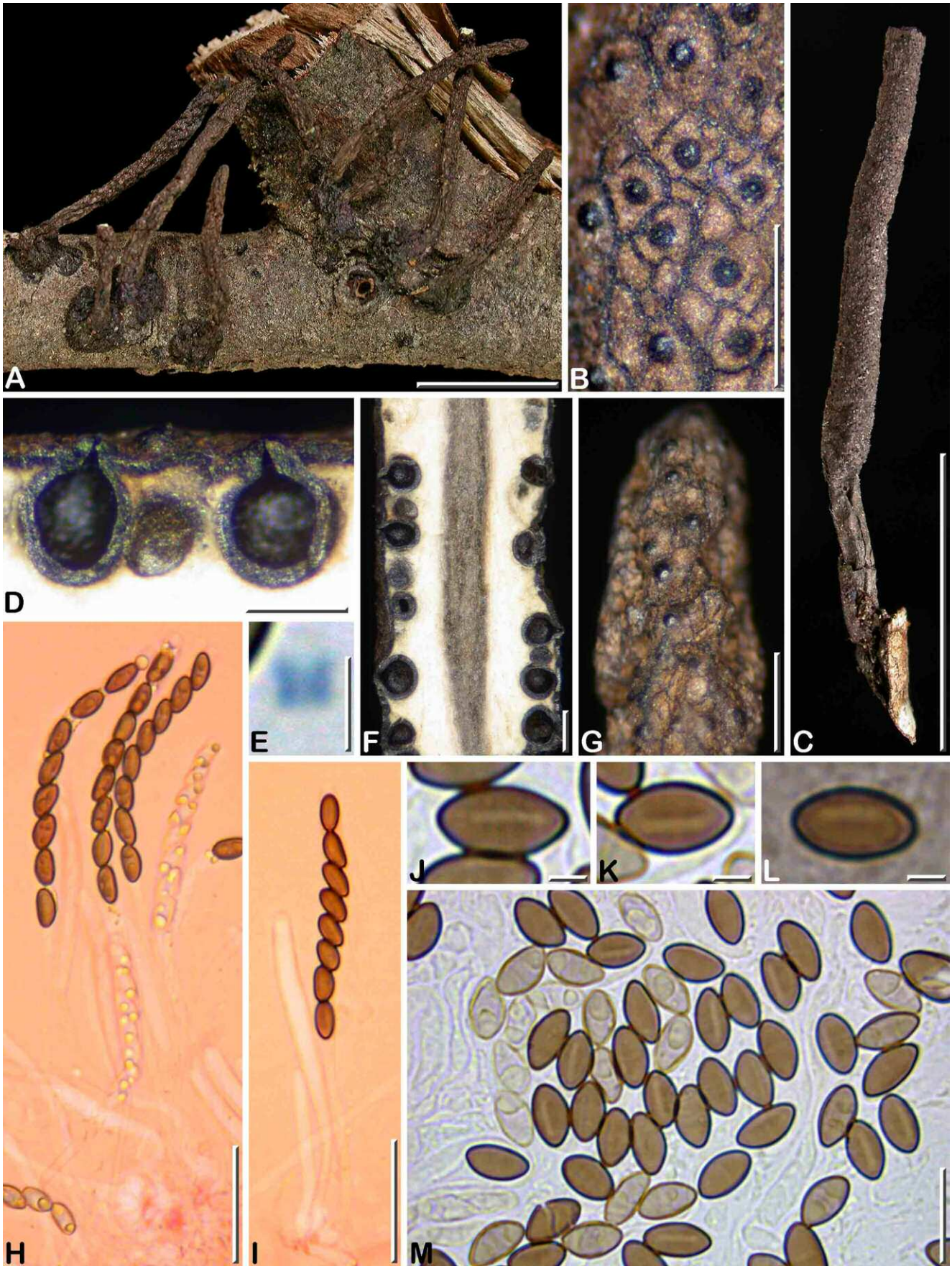

Plate 42 – *Xylaria* sp. MJF 14123

A: Habit of immature stromata on a corticated branchlet (note the wide pannose bases); B: Stromatal surface in close-up showing a reticulately cracked orange brown surface and black ostioles; C: Mature stroma, apically broken; D: Perithecia in vertical section showing ostioles piercing a thin black subsurface crust; E: Ascal apical apparatus, in Melzer's reagent; F: Stroma in longitudinal section showing a white solid interior with a wide dark brown inner core; G: Obtusely rounded apex of a shrivelled immature stroma; H, I: Respectively long-stipitate and short-stipitate asci in Congo red in 1% SDS; J, K: Ascospores showing a germ slit, in 1% SDS; L: Ascospore in diluted India ink, showing absence of mucilaginous sheath or appendages; M: Immature and mature ascospores in 1% SDS, some showing a germ slit. Scale bars: A, C = 10 mm; B, F, G = 0.5 mm; D = 0.2 mm; E, J-L: 2 µm; H, I = 20 µm; M = 10 µm.

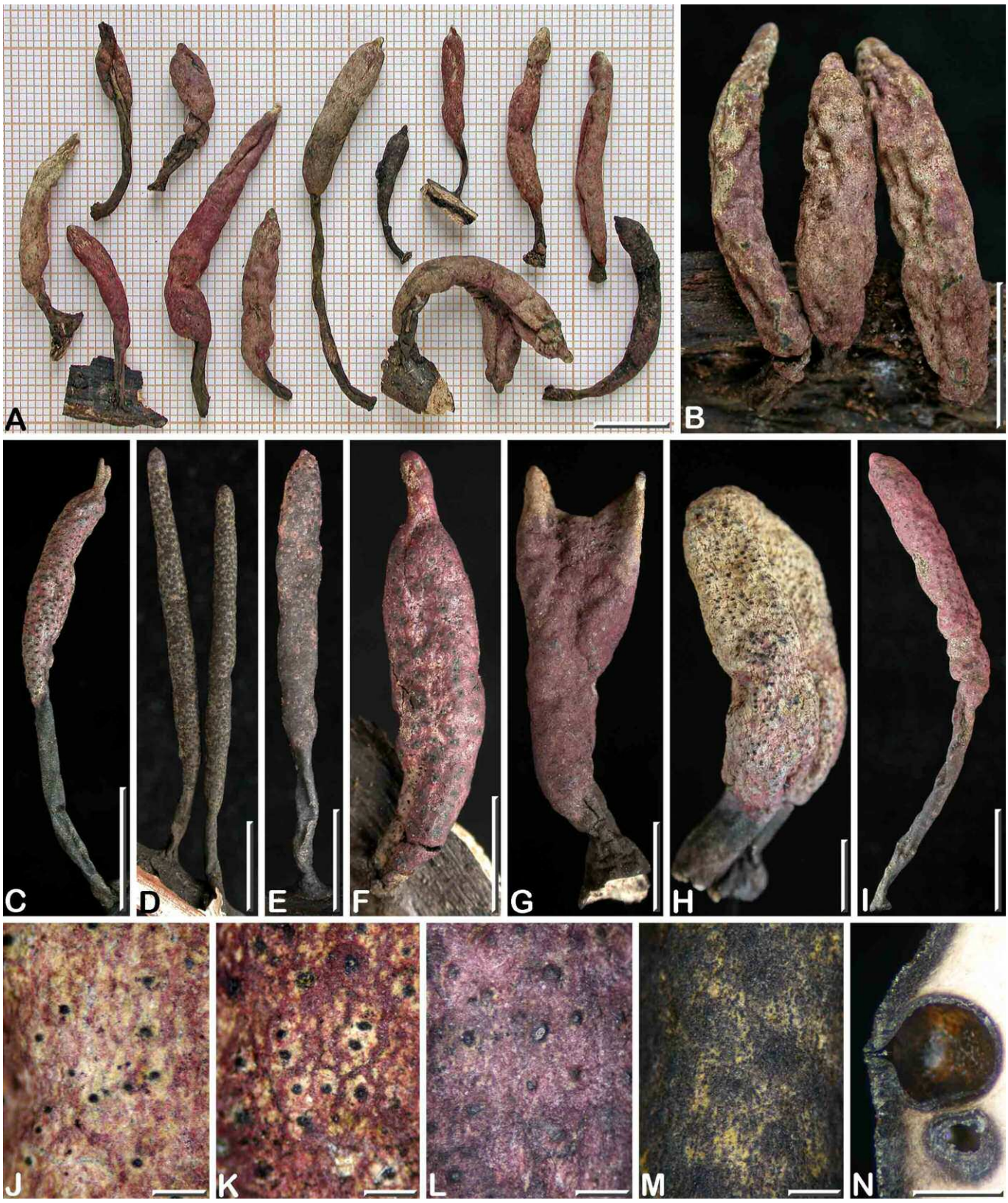

Plate 43 – *Xylaria vinosa* and *X.* sp. MJF 14022-2

Xylaria vinosa: A, B, J: MJF 16036; C, E: MJF 14022; F: MJF 13361; G, L, N: CLL 2263; H, K: CLL 8230; I: MP 3758. *X.* sp. D, M: MJF 14022-2. A: Various stromata from the same collection; B: Three developing stromata arising from dead blackened wood; C, F, G, I: Mature stromata featuring a purple surface; D: Blackish, narrowly cylindrical stromata; E: Mature blackish stroma with purple marks at apex; H: Immature stroma; J-K: Stromatal surfaces showing a network of reddish and white superficial tissues; L: Evenly purple stromatal surface; M: Stromatal surface showing olivaceous yellow marks and scattered black granules; N: Perithecium in vertical section immersed beneath a thick black carbonaceous crust. Scale bars: A-E, I = 10 mm; F-H = 5 mm; J-N = 0.5 mm.

Table 26 – Ascospore dimensions in five collections of *X. vinosa* from Guadeloupe and Martinique and one from Panamá, showing a narrow range of intraspecific variations, compared with those of a morphologically deviating collection. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 2263	(8.2–)9.3–11(–11.7) × (3.8–)4–4.8(–5.2) µm	Q = (2–)2.1–2.6(–2.7), N = 60	Me = 10.2 × 4.4 µm, Qe = 2.3
MJF 13114	(9–)9.4–11.1(–11.3) × (3.7–)3.9–4.7(–4.9) µm	Q = (2–)2.2–2.7(–2.9), N = 60	Me = 10.3 × 4.3 µm, Qe = 2.4
MJF 13361 Holotype	(9.2–)9.5–10.8(–11.3) × (3.7–)3.9–4.5(–4.6) µm	Q = (2–)2.2–2.6(–2.9), N = 60	Me = 10.2 × 4.2 µm, Qe = 2.4
MJF 14022	(9–)9.5–11.1(–11.6) × (3.6–)4–4.5(–4.9) µm	Q = (2.1–)2.2–2.6(–2.8), N = 60	Me = 10.1 × 4.2 µm, Qe = 2.4
MJF 16036	(9.1–)9.8–10.9(–11.3) × (4–)4.3–4.8(–5.1) µm	Q = (1.9–)2.1–2.5(–2.7), N = 60	Me = 10.3 × 4.5 µm, Qe = 2.3
MP3758 Panamá	(9.3–)9.7–10.7(–11.5) × (3.4–)3.7–4.4(–4.9) µm	Q = (2.2–)2.3–2.8(–3), N = 60	Me = 10.2 × 4 µm, Qe = 2.5
Cumulated values	(8.2–)9.3–11.1(–11.7) × (3.4–)3.7–4.8(–5.2) µm	Q = (1.9–)2.1–2.8(–3), N = 360	Me = 10.2 × 4.3 µm Qe = 2.4
MJF 14022-2	(8.8–)9.4–10.7(–11.5) × (3.1–)3.8–4.4(–4.7) µm	Q = (1.9–)2.2–2.6(–3.2), N = 60	Me = 10.1 × 4.2 µm Qe = 2.4

Crassous forest, mesophilic rainforest, on a dead blackened branch, 4 Jun. 2014, *leg.* J. Fournier, MJF 14022 (LIP); *ibid.*, same host and date, MJF 14022-2 (LIP); Rivière-Pilote, Lépinay forest, mesophilic rainforest, on dead blackened wood, 10 Aug. 2013, *leg.* J. Fournier, MJF 13114 (LIP); Sainte-Luce, Montravail forest, relict hygrophilic rainforest, on dead blackened wood, 30 Jul. 2016, *leg. leg.* J. Fournier, MJF 16036 (LIP). PANAMÁ: Prov. Bocas del Toro, Banyic, on dead wood, 5 Apr. 2004, *leg.* M. Piepenbring, MP 3758 (JF).

Comments: *Xylaria vinosa* is characterized by clavate to fusiform, hard-textured stromata with mucronate apex and smooth glabrous stipes; the subsurface is minutely granulate and overlain by a bipartite rosy to purple outer layer, which is its most distinctive feature. The few *Xylaria* spp. known to display such coloured stromata, including the present species before its formal description, were discussed by Fournier *et al.* (2014).

The collection MJF 14022 was puzzling by displaying blackish, carbonaceous, narrowly cylindrical stromata with an obtuse apex (Plate 43, D), closely mixed with some typical fusiform, mucronate and purple stromata. Microscopical features of both blackish and purple stromata proved identical as to long-stipitate asci with a tubular apical apparatus and ascospores of the same shape, germ slit morphology, colour and dimensions (Table 26). However, a close examination of the blackish cylindrical stromata showed a surface more densely granulate and mottled by olivaceous yellow marks (Plate 43, M), lacking purple tones. In absence of cultural and molecular data on this deviating material, we provisionally exclude it from

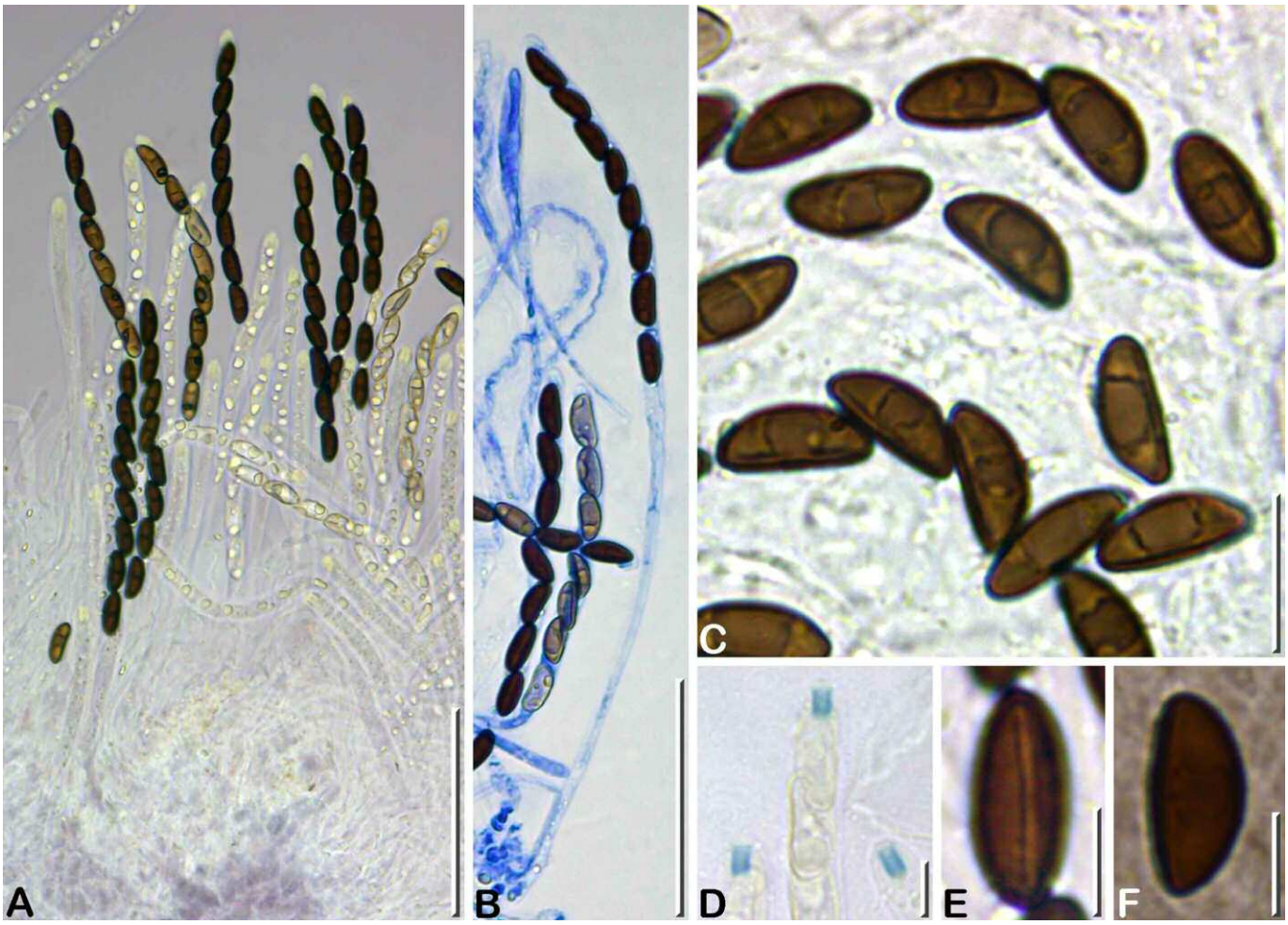

Plate 44 – *Xylaria vinosa*

A, B, D-F: MJF 16036; C: MJF 13361. A, B: Long-stipitate asci, respectively in black Pelikan ink and in blue Pelikan ink diluted in 1% SDS; C: Ascospores in 1% SDS; D: Ascal apical apparati in Melzer's reagent; E: Ascospore in ventral view showing a germ slit; F: Ascospore in side view showing absence of appendages or mucilaginous sheath, in diluted India ink. Scale bars: A, B = 50 µm; C = 10 µm; D-F = 5 µm.

our definition of *X. vinosa*, which is restricted to stromata with a vinaceous to purple surface.

The presence of *X. vinosa* with a typical purple fertile head was already known from Ecuador (Læssøe, pers. comm., 2014) and French Guiana based on five collections made by G.J. Samuels (Ju, pers. comm., 2018); the collection from Panamá reported here expands its known distribution to mainland Central America and strongly suggests a wide neotropical distribution for this distinctive but rarely recorded species.

Xylaria vivantii Y.-M. Ju, J.D. Rogers, J. Fourn. & H.-M. Hsieh, *Mycologia*, 110(4): 744 (2018). Plate 45, Table 27.

Stromata usually scattered or in small groups, upright, separate, cylindrical, terete to most often flattened, straight to slightly curved, with mucronate to flattened sterile apices, stipitate; (25–)50–125 mm in total height, the fertile head (10–)30–55 mm high × 2–4(–5) mm diam., the stipe to 70 mm high; surface black, slightly nodulose with slightly exposed, apically glabrous perithecial contours emerging from a dense mat of persistent brownish black tomentum, lacking a splitting outer layer; the stipes ill-defined, black, flattened, entirely densely tomentose, the base slightly swollen; subsurface crust leathery, 40–50 µm thick; interior solid, whitish. **Perithecia** subglobose to depressed-spherical, 0.5–0.8 mm diam. **Ostioles** obtusely papillate, dull to shiny black, 40–80 µm diam. at base.

Asci cylindrical, with (6–)8 slightly overlapping uniseriately arranged ascospores, the spore-bearing parts 112–124 × 6–7 µm, the stipes 65–80 µm long, with apical apparatus 2.9–3.4 × 1.9–2.5 µm (Me = 3.2 × 2.3 µm, N = 25), short-cylindrical with a faint upper rim, at times slightly attenuated at base, bluing in Melzer's reagent. **Paraphyses** hyphal, filiform, thin-walled, 5–6 µm wide at base, tapering to 1–2 µm wide above asci, containing conspicuous refractive guttules, embedded in mucilaginous material. **Ascospores** (14–)14.6–17.9(–19.2) × (4.4–)4.6–6.5(–6.9) µm, Q = (2.3–)2.4–3.6(–4), N = 300 (Me = 16 × 5.3 µm, Qe = 3), narrowly ellipsoid to fusiform, inequilateral, with broadly rounded to subacute ends, with one end occasionally slightly pinched, ventrally straight to slightly concave, brown to dark brown, unicellular, with a conspicuous obliquely oriented, straight to slightly sinuous germ slit slightly less than spore-length on the ventral side; with bipolar subglobose secondary appendages visible in water and India ink and weakly stained by aqueous nigrosin; epispore smooth.

Asexual morph on the natural substrate not observed. Immature stromata frequently feature white apices that lack any trace of conidiogenesis.

Known distribution: Brazil, Guadeloupe, Martinique (Ju *et al.*, 2018; this paper).

Specimens examined: French West Indies: Guadeloupe: Basse-Terre, Capesterre-Belle-Eau, Grand- Etang, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 6 Sept. 2005, *leg.* C. Lechat, CLL 5382 (LIP). Martinique: Case-Pilote, Savane Saint-Cyr, trail to Plateau Concorde, 600–650 m, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 27 Aug. 2010, *leg.* J. Fournier, MJF 10162 (LIP); Fort-de-France, La Médaille, Rivière Blanche, 420-500 m, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 4 Sept. 2003, *leg.* C. Lechat, CLL 0839 (LIP); Fort-de-France, Absalon, track to Plateau Michel, 400–500 m, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 15 Aug. 2013, *leg.* J. Fournier, MJF 13222 (LIP); Gros-Morne, Rivière Rouge, Pierre Denis, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 29 Aug. 2004, *leg.* C. Lechat, CLL 2205 (LIP); Le Prêcheur, Anse Couleuvre, coastal mesophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 5 Dec. 2005, *leg.* C. Lechat, CLL 5539 (Holotype HAST; Isotype LIP); Saint-Joseph, Rivière Blanche, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 4 Sept. 2003, *leg.* C. Lécuru, CLL 0843 (LIP) (immature); Saint-Joseph, Fond Fougères, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 22 Aug. 2013, *leg.* J. Fournier, MJF 13365 (LIP; HAST); Schoelcher, trail from Absalon to Ravine Clarck, hygrophilic rainforest, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), 7 Aug. 2013, *leg.* O. Roze, MJF 13058 (LIP) (immature). Guadeloupe or Martinique: *sine loco*, on a dead fruit of *Magnolia dodecapetala* (*Magnoliaceae*), Aug.-Sept. 2004, *leg.* C. Lechat, CLL 9282 (LIP).

Comments: *Xylaria vivantii* is primarily well-characterized by its habitat on dead rotten woody fruits of *Magnolia dodecapetala* [formerly known as *Talauma dodecapetala* (Lam.) Urb.], a tree endemic to the Lesser Antilles (http://www.iucnredlist.org/details/193935/0) to which it seems strictly affiliated. The specimen from Brazil reported by Ju *et al.* (2018) originates from a fruit of *Talauma* sp. whose affinities with *M. dodecapetala* are unknown.

Xylaria vivantii is morphologically similar to *X. ianthinovelutina*, another widespread fructicolous species, with which it shares densely tomentose stromata and brown ascospores provided with bipolar secondary appendages. In addition to a different host preference, it differs by significantly larger ascospores with a slightly obliquely oriented germ slit.

As noted by Ju *et al.* (2018), the close phylogenetic affinities of *X. vivantii* (as *Xylaria* sp. 8) with *X. ianthinovelutina* were demonstrated in their phylogenetic survey of *Xylaria sensu lato* (Ju *et al.*, 2010).

Conclusion

Xylaria is a fascinating and highly diverse genus that has always attracted the attention of collectors since the beginning of mycology (Pfister, 2008). Both reasons likely account for the 800 taxa listed in MycoBank but, as mentioned in the introduction (part I, Fournier

Table 27 – Ascospore dimensions in five collections of *X. vivantii* from Guadeloupe and Martinique, showing the range of intraspecific variations. Extreme values in parentheses.

Collections numbers	Ascospore measurements	Q = quotient l/w N = number of measurements	Mean values
CLL 2205	(14.5–)14.9–16.9(–17.6) × (4.9–)5.6–6.5(–6.9) µm	Q = (2.3–)2.4–2.8(–3.1), N = 60	Me = 15.9 × 6.1 µm, Qe = 2.6
CLL 5382	(14.5–)14.7–16.7(–18.1) × (4.4–)4.8–5.7(–6.2) µm	Q = (2.7–)2.8–3.2(–3.6), N = 60	Me = 15.8 × 5.2 µm, Qe = 3.1
CLL 5539 isotype	(14.1–)14.6–16.6(–17.5) × (4.5–)4.9–5.5(–5.8) µm	Q = (2.6–)2.8–3.3(–3.6), N = 60	Me = 15.7 × 5.2 µm, Qe = 3
MJF 13222	(14–)15.9–17.9(–19.2) × (4.5–)4.8–5.5(–5.9) µm	Q = (2.7–)3.1–3.6(–4), N = 60	Me = 16.7 × 5.1 µm, Qe = 3.3
MJF 13365	(14.5–)15.2–16.8(–18.4) × (4.5–)4.6–5.2(–5.5) µm	Q = (2.9–)3–3.5(–3.9), N = 60	Me = 16.1 × 4.9 µm, Qe = 3.3
Cumulated values	(14–)14.6–17.9(–19.2) × (4.4–)4.6–6.5(–6.9) µm	Q = (2.3–)2.4–3.6(–4), N = 300	Me = 16 × 5.3 µm, Qe = 3
Ju *et al.* (2018)	(14.5–)15–16.5(– 17.5) × (4.5–)4.5–5.5(–6) µm	N = 40	Me = 15.7 ± 0.8 × 5.0 ± 0.3 µm, Qe = 3.1

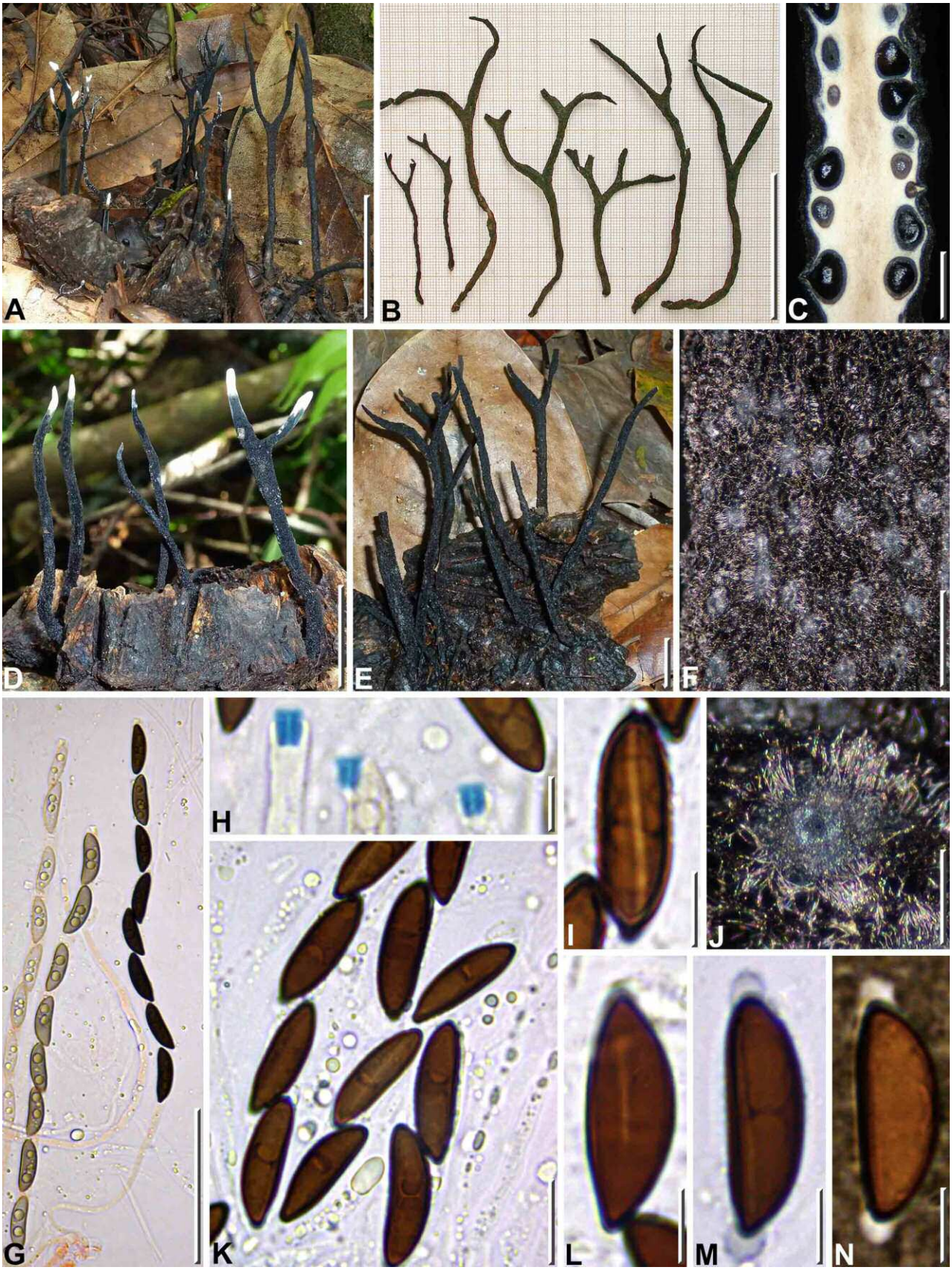

Plate 45 – *Xylaria vivantii*

A, D, E, H, I, K: MJF 13365; B, C, G, N: CLL 5539 (isotype); F, J, M: MJF 13222; L: CLL 2205. A: Habit of immature (left) and mature stromata *in situ*; B: Variously branched stromata from the same collection; C: Stroma in longitudinal section showing perithecia immersed beneath a thin crust and embedded in a whitish solid interior; D: Immature stromata arising from a decayed woody fruit of *Magnolia*; E: Mature stromata arising from a decayed woody fruit of *Magnolia*; F: Stromatal surface with slightly exposed perithecial contours embedded in a dense blackish tomentum; G: Immature and mature asci, in Congo red with 3% KOH; H: Ascal apical apparati, in Melzer's reagent; I: Ascospore in ventral view showing an oblique, slightly sinuous germ slit, in 1% SDS; J: Stromatal surface in close-up showing a glabrous ostiolar area surrounded by tufts of tomentum; K: Ascospores amongst paraphyses containing refractive guttules, in 1% SDS; L: Abnormal broadly fusiform ascospore with a short germ slit; M, N: Ascospores in side view showing bipolar appendages, in aqueous nigrosin and India ink respectively. Scale bars: A, B = 50 mm; C, F = 1 mm; D, E = 20 mm; G = 50 µm; H, I, L-N = 5 µm; J = 0.5 mm; K = 10 µm.

Table 28 – *Xylaria* taxa dealt with in this study listed in alphabetical order, along with the number of collections and the morphological type [P = penzigioid (part I), R = robust (part II), S = slender (part III)]. New taxa are in **bold**.

X. alboareolata	13	P	*X. friabilis*	5	S	***X. papillatoides***	4	P
X. allantoidea	2	R	*X. frustulosa*	7	P	***X. parvula***	1	P
X. arbuscula	73	S	*X. globosa*	51	R	***X. peltiformis***	19	P
X. arbuscula var. *plenofissura*	1	S	*X. cf. gracillima*	2	S	*X. phyllocharis*	11	S
X. aristata	1	S	*X. hyperythra*	10	R	*X. regalis*	10	R
X. badia	3	S	*X. ianthinovelutina*	11	S	***X. rhytidosperma***	7	P
X. bambusicola	11	S	*X. lechatii*	1	P	*X. rickii*	1	S
X. berteroi	9	P	***X. leptosperma***	3	P	*X. schwackei*	6	S
X. boergesenii	3	P	*X. cf. longiana*	7	S	*X. schweinitzii*	66	R
X. cantareirensis	6	P	***X. martinicensis***	19	S	*X. scruposa*	76	S
X. coccophora	2	S	***X. martinicensis* var. *microspora***	1	S	*X.* sp. CLL 5109	1	P
X. conopeicola	10	P	*X. microceras*	1	S	*X.* sp. CLL 5110	1	S
X. cubensis	16	R	*X. moelleroclavus*	13	R	*X.* sp. CLL 5241-2	1	S
X. cuneata	2	R	*X. multiplex*	42	S	*X.* sp. CLL 5534	1	S
X. curta	39	S	*X. multiplex* var. *microsperma*	49	S	*X.* sp. CLLGUAD 029	1	S
X. entomelaina	1	P	*X. muscandae*	1	S	*X.* sp. MJF 13098	1	P
X. feejensis	32	S	*X. muscula*	3	S	*X.* sp. MJF 14123	1	S
X. fimbriata	2	S	***X. obtusispora***	2	P	*X. telfairii*	8	R
X. fissilis	27	S	*X.* cf. *oligotoma*	1	S	*X. tuberoides*	11	R
X. flabelliformis	53	R	*X. olobapha*	3	R	***X. vinosa***	7	S
X. formosana	1	R	***X. pallidocylindracea***	1	S	*X. vivantii*	10	S

et al., 2018), their number should be reduced to roughly 400 because of the many synonyms and doubtful names (Ju, conference at IMC 10, 2014).

In this context, this long term survey carried out in two relatively small Caribbean islands provides interesting quantitative data along with the taxonomic insight.

We studied seven hundred and ninety collections of *Xylaria*, exclusive of immature or depauperate samples lacking informative morphological features. The result is presented in Table 28, showing a total number of sixty-three different taxa, including forty previously known taxa, thirteen new taxa and ten taxa that could not be reliably identified or represented by scanty material, but possibly represent undescribed taxa. Uncovering such a high biodiversity is beyond what could be expected from such a limited geographical area. These figures are to be compared with those obtained by San Martín & Rogers (1988) and Ju & Rogers (1999), following similar long term studies in México and in Taiwan respectively.

San Martín & Rogers (1988) recorded sixty-three *Xylaria* taxa, including eight new taxa and nine unnamed taxa, thus a result amazingly similar to ours. San Martín *et al.* (2001) added fifteen further taxa associated with *Quercus* in México, including six new species.

Ju & Rogers (1999) recorded fifty-three taxa, including five unnamed collections but no new taxa; eight species associated with termite nests, including six new species, were added thereafter (Ju & Hsieh, 2007), raising the total number to sixty-one, again approximately the same number as ours.

Rogers & Samuels (1986) reported nineteen *Xylaria* taxa from New Zealand, including a new species, two new varieties and two unnamed taxa, which they interpreted as an "apparent paucity of species".

Likewise worth mentioning is the survey of xylariaceous fungi in Papua New Guinea carried out by Van der Gucht (1995). She recorded and illustrated twenty-six known *Xylaria* spp., based on her two own field trips and inclusion of earlier reports by other mycologists.

In Table 29, the twenty-three most frequently collected taxa having been collected ten times or more are sorted out by decreasing frequency, showing that, expectedly, those common, conspicuous and widely distributed tropical taxa are top of the list. However, it is interesting to note the relatively high occurrence of the rarely reported *X. multiplex* var. *microsperma* and that of the new taxa *X. conopeicola*, *X. martinicensis* and *X. peltiformis*, to which the recently described *X. vivantii* could be added. On the other hand, the many new and unnamed taxa that are only represented by a single collection suggest that much remains to be investigated before a good assessment of the diversity of *Xylaria* in Guadeloupe and Martinique can be achieved. This somewhat frustrating feeling is far from original as it has apparently been shared by all the mycologists mentioned above who have extensively studied *Xylariaceae* in tropical zones, and especially *Xylaria*.

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Table 29 – Most frequently collected *Xylaria* taxa during this survey, sorted by decreasing number of collections; new taxa are in **bold**.

***Xylaria* spp.**	**Cumulated number of collections**
X. scruposa	76
X. arbuscula	73
X. schweinitzii	66
X. flabelliformis	53
X. globosa	51
X. multiplex var. *microsperma*	49
X. multiplex	42
X. curta	39
X. feejeensis	32
X. fissilis	27
X. martinicensis	19
X. peltiformis	19
X. cubensis	16
X. alboareolata	13
X. moelleroclavus	13
X. bambusicola	11
X. ianthinovelutina	11
X. phyllocharis	11
X. tuberoides	11
X. conopeicola	10
X. hyperythra	10
X. regalis	10
X. vivantii	10

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References

Becerril-Navarrete A.M., Gómez-Reyes V.M., Villa E.N.P & Medel-Ortiz R. 2018. — Nuevos registros de *Xylaria* (*Xylariaceae*) para el estado de Michoacán. *Sciencia Fungorum*, 48: 61–75. doi: 10.33885/sf.2018.48.1199

Berkeley M.J. & Cooke M.C. 1876. — The fungi of Brazil, including those collected by J.W.H. Trail. *Botanical Journal of the Linnean Society*, 15: 363–398.

Callan B.E. & Rogers J.D. 1990. — Teleomorph-anamorph connections and correlations in some *Xylaria* species. *Mycotaxon*, 36 (2): 343–369.

Carmona A., Fournier J., Williams C. & Piepenbring M. 2009. — New records of *Xylariaceae* from Panama. *North American Fungi*, 4 (3): 1–11. doi: 10.2509/naf2009.004.003

Courtecuisse R. 2006. — Liste préliminaire des Fungi recensés dans les Îles françaises des Petites Antilles : Martinique, Guadeloupe et dépendances. 1. Basidiomycètes lamellés et affines (*Agaricomycetideae*). *Documents mycologiques*, 133–134: 81–140.

Dai D.Q., Phookamsak R., Wijayawardene N.N., Li W.J., Bhat D.J., Xu J.C., Taylor J.E., Hyde K.D. & Chukeatirote E. 2017. — Bambusicolous fungi. *Fungal Diversity*, 82: 1–105. doi: 10.1007/s13225-016-0367-8

Daranagama D.A., Liu X., Chamyuang S., Stadler M., Bahkali A.H. & Hyde K.D. 2015. — *Rhopalostroma brevistipitatum* sp. nov. from Thailand with an extended generic description for *Rhopalostroma*. *Phytotaxa*, 227 (3): 229–242. doi: 10.11646/phytotaxa.227.3.2

Dennis R.W.G. 1956. — Some Xylarias of tropical America. *Kew Bulletin*, 1956 (3): 401–444, 46 figs. doi: 10.2307/4109126

Dennis R.W.G. 1958. — Some Xylosphaeras of tropical Africa. *Revista de Biologia (Lisboa)*, 1 (3–4): 175–208.

Dennis R.W.G. 1961. — *Xylarioideae* and *Thamnomycetideae* of Congo. *Bulletin du Jardin Botanique de l'État à Bruxelles*, 31: 109–154.

Dennis R.W.G. 1970. — Fungus Flora of Venezuela and adjacent countries. *Kew Bulletin Additional Series*, 3: 1–531.

Dennis R.W.G. 1974. — *Xylariaceae* from Papua and New Guinea. *Bulletin mensuel de la Société linnéenne de Lyon*, 43, numéro spécial: 127–138.

Fournier J. 2014. — Update on European species of *Xylaria*. http://www.ascofrance.fr/uploads/xylaria/201406.pdf

Fournier J., Delgado M.-A. & Castillo J. 2016. — *Xylaria xylarioides* (*Xylariaceae*), a subtropical species reported for the first time from Europe. *Ascomycete.org*, 8 (5): 221–226. doi: 10.25664/art-0189

Fournier J., Flessa F., Persoh D. & Stadler M. 2011. — Three new *Xylaria* species from Southwestern Europe. *Mycological Progress*, 10 (1): 33–52. doi: 10.1007/s11557-010-0671-8

Fournier J., Lechat C. & Courtecuisse R. 2018a. — The genera *Kretzschmariella* and *Nemania* (*Xylariaceae*) in Guadeloupe and Martinique (French West Indies). *Ascomycete.org*, 10 (1): 1–47. doi: 10.25664/art-0226

Fournier J., Lechat C. & Courtecuisse R. 2018b. — The genus *Xylaria sensu lato* (*Xylariaceae*) in Guadeloupe and Martinique (French West Indies) I. Taxa with penzigioid stromata. *Ascomycete.org*, 10 (4): 131–176. doi: 10.25664/art-0239

Fournier J., Lechat C. & Courtecuisse R. 2019. — The genus *Xylaria sensu lato* (*Xylariaceae*) in Guadeloupe and Martinique (French West Indies) II. Taxa with robust upright stromata. *Ascomycete.org*, 11 (3): 75–113. doi: 10.25664/art-0263

Fournier J., Román A., Balda J. & Rubio E. 2014. — *Xylaria violaceorosea* sp. nov. (*Xylariaceae*), a distinctive species discovered in Spain. *Ascomycete.org*, 6 (2): 35–39. doi: 10.25664/art-0097

Fries E.M. 1830. — Eclogae fungorum praecipue ex herbariis Germanorum descriptorum. *Linnaea*, 5: 497–553.

Hamme M.S. & Guerrero R.T. 1997. — *Xylaria pseudoapiculata* and *Xylaria montagnei*: two new taxa from south Brazil. *Mycotaxon*, 64: 195–202.

Hennings P. 1895. — Fungi goyazenses. *Hedwigia*, 34 (2): 88–112.

Herrera G. 1989. — Contribución al estudio de la familia *Xylariaceae* en Cuba (VI). *Xylaria rickii* Theiss. y *Xylaria tenuispora* (Dennis) Hawksworth: Dos nuevos reportes para Cuba. *Revista del Jardín Botánico Nacional*, 10 (2): 123–127.

Hladki A.I. & Romero A.I. 2007. — New records of the genus *Xylaria* (Ascomycota, *Xylariaceae*) from the República Argentina. *Darwiniana*, 45 (1): 28–44.

Hladki A.I. & Romero A.I. 2010. — A preliminary account of *Xylaria* in the Tucuman Province, Argentina, with a key to the known species from the Northern Provinces. *Fungal Diversity*, 42: 79–96. doi: 10.1007/s13225-009-0008-6

Hsieh H.-M., Lin C.-R., Fang M.-J., Rogers J.D., Fournier J., Lechat C., Ju Y.-M. 2010. — Phylogenetic status of *Xylaria* subgen. *Pseudoxylaria* among taxa of the subfamily *Xylarioideae* (*Xylariaceae*) and phylogeny of the taxa involved in the subfamily. *Molecular Phylogenetics and Evolution*, 54 (3): 957–969. doi: 10.1016/j.ympev.2009.12.015

Huang G., Guo L. & Liu N. 2014. — Two new species of *Xylaria* and *X. diminuta* new to China. *Mycotaxon*, 129 (1): 149–152. doi: 10.5248/129.149

Joly P. 1968. — Éléments de la flore mycologique du Viet-Nam (Troisième contribution: A propos de quelques Xylarias). *Revue de Mycologie*, XXXIII (2–3): 155–206, pl. VII-XVIII.
Ju Y.-M. & Hsieh H.-M. 2007. — *Xylaria* species associated with nests of *Odontotermes formosanus* in Taiwan. *Mycologia*, 99 (6): 936–957. doi: 10.1080/15572536.2007.11832525
Ju Y.-M. & Hsieh H.-M. 2019. — *Xylaria botuliformis*, a small-ascospored species with a reticulately cracked stromatal surface. *Fungal Science*, 34 (1): 1–8.
Ju Y.-M., Hsieh H.-M. & Shannon D. 2016. — The *Xylaria* names proposed by C. G. Lloyd. *North American Fungi*, 11 (1): 1–31. doi: 10.2509/naf2016.011.001
Ju Y.-M. & Rogers J.D. 1999. — The *Xylariaceae* of Taiwan (excluding *Anthostomella*). *Mycotaxon*, 73: 343–440.
Ju Y.-M., Rogers J.D. & Hsieh H.-M. 2018. — *Xylaria* species associated with fallen fruits and seeds. *Mycologia*, 110 (4): 726–749. doi: 10.1080/00275514.2018.1469879
Ju Y.-M. & Tzean S.-S. 1985. — Investigations of *Xylariaceae* in Taiwan. I. The teleomorph of *Xylaria*. *Transactions of the Mycological Society of the Republic of China*, 1: 103–128.
Læssøe T. & Lodge D.J. 1994. — Three host-specific *Xylaria* species. *Mycologia*, 86 (3): 436–446. doi: 10.1080/00275514.1994.12026431
Ma H.X. 2011. — *Taxonomy and molecular phylogeny of several genera of Xylariaceae from China*. Ph.D. Thesis. [not consulted]
Medel R., Guzmán G. & Castillo R. 2010. — Adiciones al conocimiento de *Xylaria* (Ascomycota, *Xylariales*) en México. *Revista Mexicana de Micología*, 31: 9–18.
Montagne J.F.C. 1840. — Seconde centurie de plantes cellulaires exotiques nouvelles, Décades III, IV et V. *Annales des Sciences Naturelles. Botanique, sér. II*, 13: 339–359.
Montagne J.F.C. 1855. — Cryptogamia Guyanensis seu plantarum cellularium in Guyana gallica annis 1835-1849 a cl. Leprieur collectarum enumeration universalis. *Annales des Sciences Naturelles, Botanique, sér. IV*, 3: 91–144.
Okane I., Srikitikulchai P., Toyama K, Læssøe T., Sivichai S., Hywel-Jones N., Nakagiri A., Potacharoen W. & Suzuki K.-I. 2008. — Study of endophytic *Xylariaceae* in Thailand: diversity and taxonomy inferred from rDNA sequence analyses with saprobes forming fruit bodies in the field. *Mycoscience*, 49 (6): 350–372. doi: 10.1007/s10267-008-0440-6
Patouillard N. 1891. — Contributions à la Flore mycologique du Tonkin II. *Journal de Botanique*, 5 (19): 306–321.
Pfister D.H. 2008. — Early illustrations of *Xylaria* species. *North American Fungi*, 3 (7): 161–166. doi: 10.2509/naf2008.003.0079
Rehm H. 1904. — Ascomycetes Americae borealis. *Annales Mycologici*, 2 (2): 175–178.
Rogers J.D. 1979. — *Xylaria magnoliae* sp. nov. and comments on several fruit-inhabiting species. *Canadian Journal of Botany*, 57 (8): 941–945. doi: 10.1139/b79-115
Rogers J.D. 1984. — *Xylaria acuta*, *Xylaria cornu-damae*, and *Xylaria mali* in continental United States. *Mycologia*, 76 (1): 23–33. doi: 10.1080/00275514.1984.12023805
Rogers J.D. 1986. — Provisional keys to *Xylaria* species in continental United States. *Mycotaxon*, 26: 85–97.
Rogers J.D. & Callan B.E. 1986. — *Xylaria polymorpha* and its allies in continental United States. *Mycologia*, 78 (3): 391–400. doi: 10.1080/00275514.1986.12025261
Rogers J.D., Callan B.E., Rossman A.Y. & Samuels G.J. 1988. — *Xylaria* (*Sphaeriales*, *Xylariaceae*) from Cerro de la Neblina, Venezuela. *Mycotaxon*, 31 (1): 103–153.
Rogers J.D., Callan B.E. & Samuels G.J. 1987. — The *Xylariaceae* of the rain forests of North Sulawesi (Indonesia). *Mycotaxon*, 29: 113–172.
Rogers J.D. & Ju Y.-M. 1998. — The genus *Kretzschmaria*. *Mycotaxon*, 68: 345–393.
Rogers J.D. & Ju Y.-M. 2012. — The *Xylariaceae* of the Hawaiian Islands. *North American Fungi*, 7 (9): 1–35. doi: 10.2509/naf2012.007.009
Rogers J.D. & Samuels G.J. 1986. — Ascomycetes of New Zealand 8. Xylaria. *New Zealand Journal of Botany*, 24: 615–650.
Saccardo P.A. & Paoletti G. 1888. — Mycetes malacenses. Funghi della Penisola di Malacca raccolti nei 1885 dall'Ab. Benedetto Scortechini. *Atti del Instituto Veneto di Scienze, Lettere et Arti*, 6: 387–428.
San Martín F. 1992. — *A mycofloristic and cultural study of Xylariaceae of México*. Ph. D. dissertation. Washington State University, Pullman, 560 p.
San Martín F., Lavin P. & Rogers J.D. 2001. — Some species of *Xylaria* (Hymenoascomycetes, *Xylariaceae*) associated with oaks in México. *Mycotaxon*, 79: 337–360.
San Martín F., Lavin P., Esqueda-Valle M. & Perez-Silva E. 1999. — Additions to the known *Xylariaceae* (Hymenoascomycetes, *Xylariales*) of Sonora, México. *Mycotaxon*, 70: 77–82.
San Martín F. & Rogers J.D. 1989. — A preliminary account of *Xylaria* of México. *Mycotaxon*, 34 (2): 283–373.
Spegazzini C.L. 1884. — Fungi Guaranitici. *Anales de la Sociedad Científica Argentina*, 18 (6): 267–279.
Stadler M., Fournier J., Læssøe T., Lechat C., Tichy H.-V. & Piepenbring M. 2008. — Recognition of Hypoxyloid and xylarioid *Entonaema* species and allied *Xylaria* species from a comparison of holomorphic morphology, HPLC profiles and ribosomal DNA sequences. *Mycological Progress*, 7 (1): 53–73. doi: 10.1007/s11557-008-0553-5
Starbäck K. 1901. — Ascomyceten der ersten Regnellschen Expedition. II. *Bihang till Kungliga svenska Vetenskaps-Akademiens Handlingar*, 27 (9): 1–26.
Theissen F. 1908. — Novitates riograndenses. *Annales Mycologici*, 6 (4): 341–352.
Thomas D.C., Vandegrift R., Ludden A., Carroll G.C. & Roy B.A. 2016. — Spatial ecology of the fungal genus *Xylaria* in a tropical cloud forest. *Biotropica*, 48: 381–393. doi: 10.1111/btp.12273
U' Ren J.M., Miadlikowska J., Zimmerman N.B., Lutzoni F., Stajich J.E & Arnold A.E. 2016. — Contributions of North American endophytes to the phylogeny, ecology and taxonomy of *Xylariaceae* (*Sordariomycetes*, Ascomycota). *Molecular Phylogenetics and Evolution*, 98: 210–232. doi: 10.1016/j.ympev.2016.02.010
Van der Gucht K. 1995. — Illustrations and descriptions of xylariaceous fungi collected in Papua New Guinea. *Bulletin du Jardin Botanique National de Belgique*, 64: 219–403.
Van der Gucht K. 1996. — *Xylaria* species from Papua New Guinea: cultural and anamorphic studies. *Mycotaxon*, 60: 327–360.
Zhu Y.-F. & Guo L. 2011. — *Xylaria hainanensis* sp. nov. (*Xylariaceae*) from China. *Mycosystema*, 30 (4): 526–528.


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