

## Neotropical Ascomycetes 9. *Jobellisia* species from Puerto Rico and elsewhere

Sabine M. Huhndorf<sup>1</sup>, Fernando A. Fernández<sup>1</sup> & D. Jean Lodge<sup>2</sup>

<sup>1</sup> Field Museum of Natural History, Botany Department, Chicago, Illinois 60605-2496, U.S.A.

<sup>2</sup> Center for Forest Mycology Research, USDA-Forest Service, Forest Products Laboratory, One Gifford Pinchot Dr., Madison WI, 53705-2398 and P.O. Box 1377, Luquillo, PR 00773-1377, USA

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*Jobellisia barrii* sp. nov. and *J. fraterna* sp. nov. are described and illustrated based on material from Puerto Rico, Costa Rica, French Guiana and Thailand and are compared with *J. rhynchostoma*, *J. luteola* and *J. nicaraguensis*. *Jobellisia* is characterized by superficial or erumpent ascomata and red brown, ellipsoid, one-septate or one-celled ascospores. *Jobellisia barrii* and *J. fraterna* differ from the other species in having dark-colored, non-collapsing, beaked ascomata with a three-layered, variously colored ascomal wall structure.

Keywords: Annulatascaceae, Clypeosphaeriaceae, Neotropics, Sordariales, systematics

*Jobellisia* M. E. Barr currently includes *J. rhynchostoma* (Höhn.) M. E. Barr, *J. luteola* (Ellis & Everh.) M. E. Barr, and *J. nicaraguensis* (Ellis & Everh.) M. E. Barr, distributed in tropic and temperate zones (Barr, 1993; 1994 – this reference includes a key to the genus). All species have relatively large ascomata that are entirely superficial or erumpent and become superficial on the substrate (Barr, 1993, 1994). The ascospores of all the species are brown and ellipsoid and are either aseptate or one-septate. The species are differentiated mainly on ascomal morphology and to a lesser degree on ascospore size and shape. The ascal apical apparatus in *Jobellisia* is distinctive, given by Barr (1993, 1994) as a chitinoid pulvillus above a narrow ring.

Two new species were encountered in Puerto Rico, one of which was subsequently found in French Guiana and Thailand and the other in Costa Rica and French Guiana. Several collections of *J. luteola* were also found in North Carolina and Michigan, further indicating that it is probably restricted to temperate regions. No additional specimens of *J. nicaraguensis* or *J. rhynchostoma* were encountered among our own collections but herbarium specimens

were examined. All the species are illustrated and descriptions and a key are provided. No anamorphs are known for any of the species.

## Materials and methods

Ascomata were mounted first in water, then replaced with lachtophenol containing azure A. All measurements were made in water. Ascomata were sectioned at 5  $\mu$ m for light microscopy using the techniques of Huhndorf (1991) and images were captured using bright field (BF), phase contrast (PH) and differential interference microscopy (DIC). Images were captured and photographic plates were produced following the methods of Huhndorf & Fernández (1998). These methods are discussed further in the electronic image management website at URL:

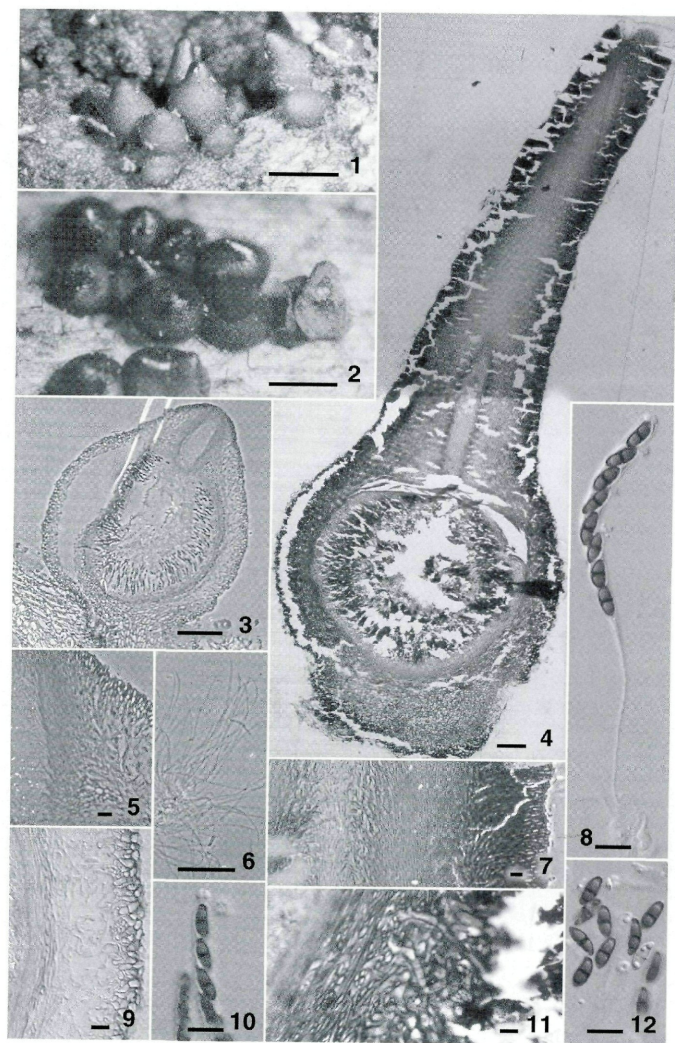
[http://www.fmnh.org/candr/botany/botany\\_sites/imagenage/intropage.htm](http://www.fmnh.org/candr/botany/botany_sites/imagenage/intropage.htm).

Fungi were collected in French Guiana in the vicinity of Saül (03° 42' N, 53° 12' W, elev 200 m) during Aug-Sep 1994 and Nov 1997. The forest type and habitat are described in Huhndorf (1997). In 1995 and 1996 fungi were collected in Puerto Rico as part of a survey of host specificity of wood-inhabiting ascomycetes (Huhndorf & Lodge, 1997). Most of the specimens were collected at the forest grid at the El Verde Field Station (18° 20' N, 65° 49' W; elev 350 m). Abbreviations for collectors are SMH = S.M. Huhndorf, DJL = D. J. Lodge, and FF = F. Fernández.

## Key to species

1. Ascospores one-septate, with darker band of pigment at septum ..... 2
1. Ascospores one-celled or one-septate without darker band of pigment at septum ..... 4
2. Ascomata roughened, luteous, orange to yellow-brown colored, appearing darker when dried, collapsing, ascospores ellipsoid, red brown, 11–14  $\times$  4.5–5.5  $\mu$ m ..... *J. luteola*
2. Ascomata roughened, dark brown or smooth with black to dark blue-green iridescence, not collapsing ..... 3

Figs. 1–12. – *Jobellisia barrii*. – 1, 2. Ascomata on substrate. – 3, 4. Longitudinal section through ascoma. – 5, 7. Longitudinal section through neck wall. – 6. Paraphyses. – 8. Ascus. – 9, 11. Longitudinal section through ascomatal wall. – 10. Ascus apex with refractive ring. – 12. Ascospores. – Figs. 1, 2 = macroscopic view; 3, 5–7 = PH; 4 = BF; 8–12 = DIC. – Scale bars: 1 = 1 mm; 2 = 0.5 mm; 3, 4, 6, 7 = 100  $\mu$ m; 5, 8–12 = 10  $\mu$ m. – Fig. 1 from SMH 1776; 2, 3, 5, 9 from SMH 2838; 4, 7, 11 from holotype SMH 2084; 6, 8, 10, 12 from SMH 1907.



3. Ascomatal outer wall smooth, black to dark blue-green iridescent, easily shed exposing bright orange middle wall, ascospores ellipsoid, red brown,  $9-11.5(-11.8) \times 3-4.5 \mu\text{m}$  . . . *J. barrii*
3. Ascomatal outer wall roughened, dark brown, not easily shed, without bright orange middle wall, ascospores ellipsoid, red brown, larger,  $(9.5-11-14.5(-15) \times 4.25-5 \mu\text{m}$  . . . . . *J. fraterna*
4. Ascomata immersed to erumpent, apex beaked, ascospores one-septate, ellipsoid, navicular inequilateral, one side slightly curved,  $9-15 \times 4.5-7.5 \mu\text{m}$  . . . . . *J. rhynchostoma*
4. Ascomata superficial, ovoid, apex not beaked, ascospores one-celled, oblong ellipsoid,  $10-12 \times 4.5-5.5 \mu\text{m}$  . . . . *J. nicaraguensis*

***Jobellisia barrii*** S. Huhndorf, D. J. Lodge & F. A. Fernández, sp. nov.  
– Figs. 1–12.

Ascomata numerosa, obpyriformia vel lageniformia, 500–1000  $\mu\text{m}$  diametro, 450–1000  $\mu\text{m}$  alta, papillata vel longirostria, pagina ascomatis glabra. Paries ascomatis superficialis textura angulari-globosa, in sectione longitudinali 65–195  $\mu\text{m}$  crassus, tristriatus. Papilla conica vel longi-cylindracea, 150–1500  $\mu\text{m}$  alta, 200–400  $\mu\text{m}$  lata, periphysibus induta. Asci elongati-clavati,  $115-155 \times 5.5-6.5 \mu\text{m}$ , longi-stipitati, pars sporifera 65–80  $\mu\text{m}$ , octospori, uniseriati. Ascosporae ellipsoideae,  $9-11.5(-11.8) \times 3-4.5 \mu\text{m}$ , uniseptatae, rubiginosae, septis fuscatis, terminalis poris germinalibus praeditae, sine vagina vel appendicibus.

Holotype. – U.S.A. Puerto Rico, Luquillo Mts., El Verde Research Area, 16-ha Grid, 11.02.42, base quad; W of 12.02.12, 18° 19' 26" N, 65° 48' 55" W, 402 m, 26 Jan 1996, on 15 cm log of *Dacryodes excelsa*, Burseraceae, SMH 2084 (F).

Ascomata obpyriform to lageniform, short to long beaked, not or slightly collapsing when dried; 500–1000  $\mu\text{m}$  diameter, 450–1000  $\mu\text{m}$  high; numerous; gregarious; superficial; surface glabrous, shining, appearing black to iridescent dark blue-green. – Ascomatal wall of *textura angularis-globosa* in surface view; in longitudinal section 3-layered, inner layer 15–30  $\mu\text{m}$  thick, composed of 10–20 layers of elongate to flattened, hyaline, pseudoparenchymatic cells, middle layer 40–125  $\mu\text{m}$  thick, composed of loosely woven, pale brown to bright orange colored hyphae, outer layer 10–40  $\mu\text{m}$  thick, composed of 5–10 layers of polygonal to globose, brown, pseudoparenchymatic cells, easily loosening and rupturing, exposing the bright orange middle wall layer. – Ascomatal apex conical to elongate beak-like, 150–1500  $\mu\text{m}$  high, 200–400  $\mu\text{m}$  wide, wall 2-layered, inner layer 20–90  $\mu\text{m}$  thick, composed of 30–40 layers of elongate to flattened, hyaline to pale brown, pseudoparenchymatic cells, toward the ostiole forming parallel hyphal strands which separate and form the periphyses inside the ostiole, outer layer 15–75  $\mu\text{m}$  thick, composed of 20–30 layers of polygonal to globose, brown, pseudoparenchymatic

cells, ostiole circular, 50–75 µm wide, with periphyses. – Paraphyses 3.5–4.5 µm wide, abundant, persistent, with a gelatinous coating. – Asci elongate clavate; 115–155 × 5.5–6.5 µm, long stipitate, spore-bearing part 65–80 µm long; numerous; basal and lateral, lining the peripheral wall of the centrum; unitunicate; apex rounded, with large, refractive, two-layered ring, 2.5–3.0 µm high, 3.5–4.5 µm wide; with 8, uniseriate ascospores. – Ascospores ellipsoid; 9–11.5(–11.8) × 3–4.5 µm; straight to slightly curved; reddish brown with darker pigment at the septum; wall smooth with single terminal germ pores; 1-septate; without sheath or appendages, spores collecting as an iridescent dark blue-green to brown droplet at the beak apex.

**Etymology.** – In honor of Margaret E. Barr.

**Habitat.** – On decorticated wood or decaying bark.

**Known distribution.** – French Guiana, Puerto Rico, Thailand.

**Other material examined.** – FRENCH GUIANA. St-Laurent-du-Maroni Arrondissement, Canton de Maripasoula, Commune de Saul, base of Mount Galbao, 12 Nov 1997, on 25 cm log, SMH 3728; Eaux Claires, 30 Aug 1994, on decorticated wood, SMH 671; 5 Sep 1994, on decorticated branch over water, SMH 810; 8 Sep 1994, on decorticated wood, SMH 894, SMH 899, SMH 913; 13 Sep 1994, on decorticated wood, SMH 1021 (F). – THAILAND: Khao Suk National Park, 20 Nov 1996, on 7 cm branch, SMH 2838, with N. Hywel-Jones (F). PUERTO RICO. Luquillo Mts., El Verde Research Area, 27 Apr 1995, on 50 cm log of *Dacryodes excelsa*, SMH 1183; 28 Apr 1995, on wood, SMH 1208; 4 May 1995, on log, SMH 1329, with DJL; 6 May 1995, on log of *Zanthoxylum martinicense*, SMH 1377; 26 Sep 1995, on 60 cm log of *D. excelsa*, SMH 1588; 27 Sep 1995, on 20 cm branch, SMH 1628; 30 Sep 1995, on 15 cm log, of *Manilkara bidentata*, SMH 1658; 2 Oct 1995, 38 cm log, SMH 1687; 7 Oct 1995, on 50 cm log of *Z. martinicense*, SMH 1776; 10 Oct 1995, on 50 cm log, of *D. excelsa*, SMH 1850; 13 Jan 1996, on 60 cm log of *D. excelsa*, SMH 1869; 15 Jan 1996, on 20 cm log of *D. excelsa*, SMH 1893; 15 Jan 1996, on 20 cm log, SMH 1904; 16 Jan 1996, on 15 cm log of *Croton poecilanthus*, SMH 1907; 16 Jan 1996, on 20 cm log of *Casearia arborea*, SMH 1923; 16 Jan 1996, on 25 cm log, SMH 1928; 19 Jan 1996, on 12 cm log at, of *Matayba domingensis*, SMH 1976; 29 Jan 1996, on 60 cm log, of *Ficus americana*, SMH 2096; 29 Jan 1996, on 38 cm log, SMH 2102; 29 Jan 1996, on 12 cm log, of *C. arborea*, SMH 2103; 29 Jan 1996, on 60 cm log, of *Cyrtilla racemiflora*, SMH 2104; 30 Jan 1996, on 25 cm log, of *C. arborea*, SMH 2119; 30 Jan 1996, on 50 cm log of *Ormosia krugii*, SMH 2123; 30 Jan 1996, on 50 cm log, of *Guarea guidonia*, SMH 2135; 30 Jan 1996, on 18 cm log of *C. arborea*, SMH 2162; 11 Jan 1997, on wood fragment, SMH 2864, with FF; 11 Jan 1997, on log of *Inga laurina*, SMH 2865, with FF; 11 Jan 1997, on log, SMH 2868, with FF; on log, SMH 2884, with FF; 11 Jan 1997, on 20 in log, SMH 2886, with FF; 12 Jan 1997, on 50 cm log, SMH 2902, with FF; 14 Jan 1997, on 50 cm log, SMH 2936, with FF; 14 Jan 1997, on 35 cm log, SMH 2947, with FF; 16 Jan 1997, on 50 cm log, SMH 2993, with FF; 16 Jan 1997, on trunk, SMH 2999, with FF; 16 Jan 1997, on trunk, SMH 3000, with FF; 16 Jan

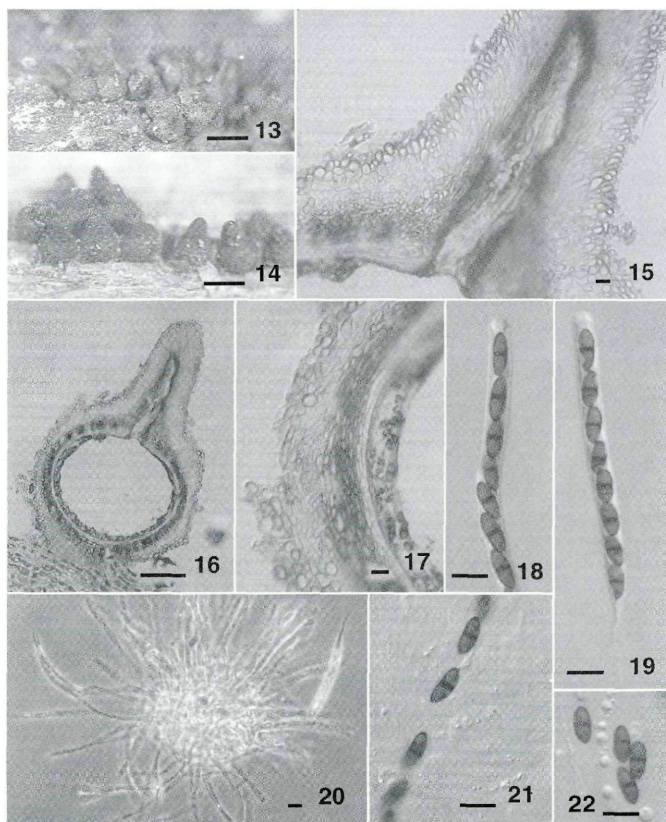
1997, on 20 cm log, SMH 3002, with FF; 18 Jan 1997, on 50 cm log, SMH 3026, with FF; 20 Jan 1997, on 25 cm log, SMH 3076, with FF (F).

***Jobellisia fraterna*** S. Huhndorf, D. J. Lodge & F. A. Fernández, sp. nov. – Figs. 13–22.

Similis *J. barrii* sed ascomata lageniformia longirostria, 350–450 µm diametro, 350–550 µm alta, pagina ascomatis aspera. Paries ascomatis superficialis textura angulari-globosa, in sectione longitudinali 50–105 µm crassus, tristriatus. Papilla longi-cylindracea, 200–300 µm alta, 200–225 µm lata, periphysibus induta. Asci elongati-clavati, 110–155 x 6.5–8 µm, longi-stipitati, pars sporifera 80–95 µm, octospori, uniseriati. Ascospores ellipsoideae, (9.5–)11–14.5(–15) x 4.25–5 µm, uniseptatae, rubiginosae, septis fuscatis, terminalis poris germinalibus praeditae, sine vagina vel appendicibus.

Holotype. – U.S.A. Puerto Rico, Luquillo Mts., El Verde Research Area, 16-ha Grid, 10.20.44, base quad, 18° 19' 39" N, 65° 48' 56" W, 377 m, 1 Feb 1996, on 60 cm log, of *Byrsonima spicata*, Malpighiaceae, SMH 2172 (F).

Ascomata lageniform, long beaked, not collapsing when dried; 350–450 µm diameter, 350–550 µm high; numerous; gregarious, superficial; surface roughened, dark brown. – Ascomal wall of *textura angularis-globosa* in surface view; in longitudinal section 3-layered, inner layer 6–20 µm thick, composed of 3–4 layers of elongate to flattened, hyaline, pseudoparenchymatic cells, middle layer 20–35 µm thick, composed of 5–7 layers of polygonal to elongate, brown cells (this layer becoming tightly woven, brown *textura intricata* at the apical part of the ascomata), outer layer 25–50 µm thick, composed of 8–10 layers of polygonal to globose, pale brown, pseudoparenchymatic cells, surface 1–2 cell layers becoming darker brown. – Ascomatal apex elongate beak-like, 200–300 µm high, 200–225 µm wide, wall 1-layered, 40–45 µm thick, composed of polygonal to globose, pale brown, pseudoparenchymatic cells, surface 1–2 cell layers becoming darker brown, ostiole circular, 40–45 µm wide, with periphyses. – Paraphyses 3.5–4 µm wide, abundant, persistent, with gelatinous coating. – Asci elongate clavate; 110–155 x 6.5–8 µm, long stipitate, spore-bearing part 80–95 µm long; numerous; basal and lateral, lining the peripheral wall of the centrum; unitunicate; apex rounded, with large, refractive, two-layered ring, 3.0 µm high, 5 µm wide; with 8, uniseriate ascospores. – Ascospores ellipsoid; (9.5–)11–14.5(–15) x 4.25–5 µm; straight to slightly curved; reddish brown with darker pigment at the septum; wall smooth with single terminal germ pores; 1-septate; without sheath or appendages; spores collecting as an iridescent dark blue-green to brown droplet at the beak apex.



Figs. 13–22. *Jobellisia fraterna*. – 13, 14. Ascomata on substrate. – 15. Longitudinal section through neck wall. – 16. Longitudinal section through ascoma. – 17. Longitudinal section through ascomatal wall. – 18. Ascus apex with refractive ring. – 19. Ascus. – 20. Paraphyses. – 21, 22. Ascospores. Figs. 13, 14 = macroscopic view; 15, 16 = BF; 17–19, 21, 22 = DIC; 20 = PH. – Scale bars: 13, 14 = 0.5 mm; 15, 17–22 = 10  $\mu$ m; 16 = 100  $\mu$ m. – Figs. 13, 15–17, 19 from holotype SMH 2172; 14, 18, 20–22 from SMH 2863.

Etymology. – ‘Closely allied’, refers to its similarity to the other species, *J. barrii*.

Habitat. – On decaying wood.

Known distribution. – Costa Rica, Puerto Rico.

Other material examined. – COSTA RICA. San Jose, Bosque los Ninos, 8 May 1996, on 50 cm log, SMH 2510, with FF. Puerto Rico. Luquillo Mts., El Verde Research Area, 11 Jan 1997, on 30 cm log, SMH 2863, with FF (F).

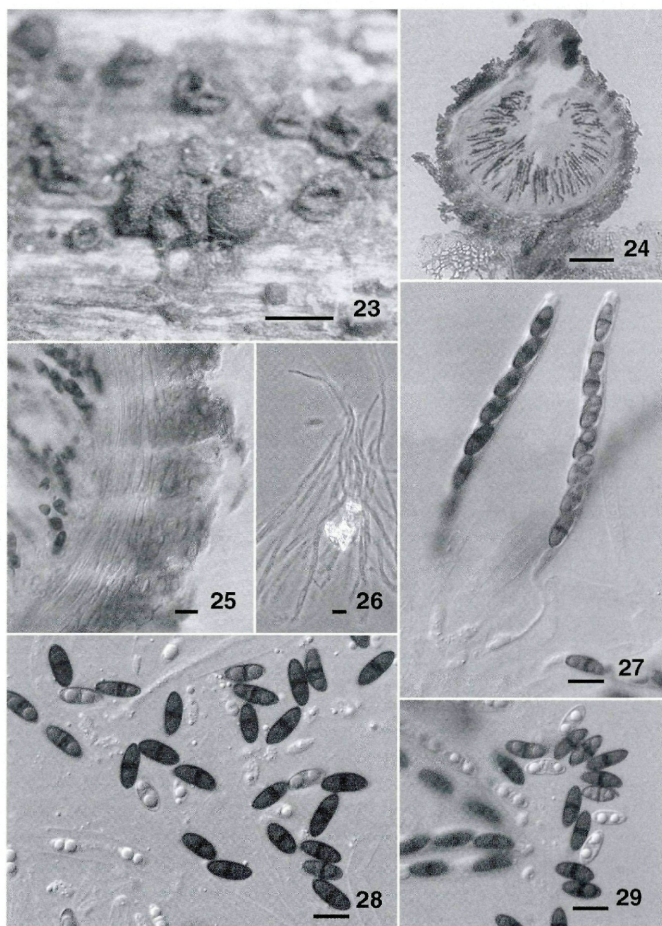
***Jobbellisia luteola*** (Ellis & Everh.) M. E. Barr. – Figs. 23–29.

Ascomata obpyriform, short beaked, collapsing when dried; 450–575  $\mu\text{m}$  diameter, 350–450  $\mu\text{m}$  high; numerous; gregarious; superficial; surface roughened; orange-yellow-brown with slightly darker beak, appearing dark brown when dried. – Ascomal wall of *textura angularis-globosa* in surface view; in longitudinal section 2-layered, inner layer 20–25  $\mu\text{m}$  thick, composed of 10–12 layers of elongate to flattened, hyaline, pseudoparenchymatic cells, outer layer 30–35  $\mu\text{m}$  thick, composed of 10–12 layers of polygonal to globose, brown, pseudoparenchymatic cells, breaking and rupturing on the ascomal surface. – Ascomatal apex conical, short beaked, 125–215  $\mu\text{m}$  high, 115–150  $\mu\text{m}$  wide, wall 2-layered, ostiole circular, 40–50  $\mu\text{m}$  wide, with periphyses. – Paraphyses 4–4.5  $\mu\text{m}$  wide, abundant, persistent, with gelatinous coating. – Asci elongate clavate; 100–135  $\times$  7.5–8, long stipitate, spore-bearing part 75–90  $\mu\text{m}$  long; numerous; basal and lateral, lining the peripheral wall of the centrum; unitunicate; apex rounded, with large, refractive, two-layered ring, 3–3.5  $\mu\text{m}$  high, 4.5–5.5  $\mu\text{m}$  wide; with 8, uniseriate ascospores. – Ascospores ellipsoid; 11–14  $\times$  4.5–5.5  $\mu\text{m}$ ; straight to slightly curved; reddish brown with darker pigment at the septum; wall smooth with single terminal germ pores; 1-septate; without sheath or appendages.

Habitat. – On decaying wood.

Known distribution. – Canada, U.S.A. (Iowa, Michigan, New York, North Carolina, Ohio) (Barr 1993).

Material examined. – U.S.A. North Carolina, Macon Co., Highlands, Whiteside Mountain, 35° 01' 09" N, 83° 16' 25" W, 1000 m, 7 Oct 1996, on 15 cm log, SMH 2753 with Q. X. Wu, J. C. Wei, G. M. Mueller, B. Strack, & FF. Michigan, Marquette Co., Huron Mountain Club, Mountain Lake, lakeside, end of road, 46° N, 87° W, 17 Aug 1997, on 25 cm log over the water, SMH 3349, with M. Huhndorf (F).



Figs. 23-29. – *Jobellisia luteola*. – 23. Ascomata on substrate. – 24. Longitudinal section through ascoma. – 25. Longitudinal section through ascomatal wall. – 26. Paraphyses. – 27. Ascus. – 28, 29. Ascospores. – Fig. 23 = macroscopic view; 24 = BF; 25, 27-29 = DIC; 26 = PH. – Scale bars: 23 = 0.5 mm; 24 = 100  $\mu$ m; 25-29 = 10  $\mu$ m. – Figs. 23-25, 28 from SMH 2753; 26, 27, 29 from SMH 3349.

***Jobellisia nicaraguensis*** (Ellis & Everh.) M. E. Barr – Figs. 30–34.

Ascomata ovoid, not collapsing when dried; 400–475  $\mu\text{m}$  diameter, 425–525  $\mu\text{m}$  high; numerous; gregarious; superficial; short papillate; surface roughened; dark brown to black. – Asci cylindric; p. sp. 50–80  $\times$  6–7  $\mu\text{m}$ ; stipe 20  $\mu\text{m}$  long; ring narrow, pulvillus refractive (Barr, 1993). – Ascospores oblong ellipsoid; 10–12  $\times$  4.5–5.5  $\mu\text{m}$ ; pale brown; one celled; wall smooth; without sheath or appendages.

Habitat. – On decaying wood.

Known distribution. – Nicaragua.

Material examined. – NICARAGUA. Ometepe, Lake Nicaragua, winter (Jan–Feb) 1893, B. Shimek, Nicaragua Fungi 77 (holotype); Central Amer. Fungi, C. L. Smith 8 (isotype) (NY).

***Jobellisia rhynchostoma*** (Höhn.) M. E. Barr – Figs. 35–39.

Ascomata globose, long beaked; 350–660  $\mu\text{m}$  diameter, beaks 375–850  $\mu\text{m}$  high, 160–300  $\mu\text{m}$  wide; immersed to erumpent; surface roughened. – Asci cylindric; 65–90  $\times$  6–11(–14.5)  $\mu\text{m}$ ; 8-spored or less; ring narrow, pulvillus refractive (Barr, 1994). – Ascospores ellipsoid, navicular; 9–15  $\times$  4.5–7.5  $\mu\text{m}$ ; inaequilateral, one side slightly curved; dark brown; wall smooth with single terminal germ pores; 1-septate or 1-celled; without sheath or appendages.

Habitat. – On decaying wood and in pericarps.

Known distribution. – Austria, U.S.A. (Massachusetts, North Carolina) (Barr, 1994).

Material examined. – U.S.A. Massachusetts, Franklin Co., Conway, Roaring Brook Road, 11 Nov 1961, *Carya* pericarp, M. E. Barr 3176 (NY).

## Discussion

All species of *Jobellisia* have ascomata that are relatively large and mostly superficial on the substrate. They can occur on wood or bark and are often found on large logs. *Jobellisia luteola* was described for a temperate fungus with bright pigmentation and soft texture (Barr, 1993). Additional specimens illustrated here are also temperate in distribution, soft-textured and were brightly colored when freshly collected, but appear dark brownish on the substrate upon drying. Also upon drying, the papillate globose or obpyriform ascomata completely collapse laterally and vertically (Fig. 23). The

centrum remains intact and adheres to the walls but the ascomata are totally distorted.

*Jobellisia barrii* differs from the other species by ascomata that have a bright orange-brown middle wall layer of loosely woven hyphae that appears pulverescent in dried collections (Fig. 2). This middle wall layer is readily apparent because the outer wall layer is easily broken and sloughs off. The ascomata are large, superficial and occur in extensive or discrete clusters mostly on the wood of large rather well-decorticated logs. The ascomata can be strongly beaked (Fig. 1) or the apex can be just a short, conical papilla as in the Thailand collection (Fig. 2), but upon drying they do not collapse as in *J. luteola*. *Jobellisia barrii* occurs commonly in Puerto Rico and was encountered a few times in French Guiana and once in Thailand. It appears to have a tropical distribution only.

*Jobellisia fraterna* resembles *J. barrii* in its extensive clusters of beaked ascomata but differs in lacking the orange middle wall layer. The wall is three-layered but the outer layer remains attached to the dark-colored middle layer which is composed of polygonal to elongate cells. This middle layer becomes tightly woven, brown *textura intricata* at the apical part of the ascomata. The ascomata also do not collapse upon drying.

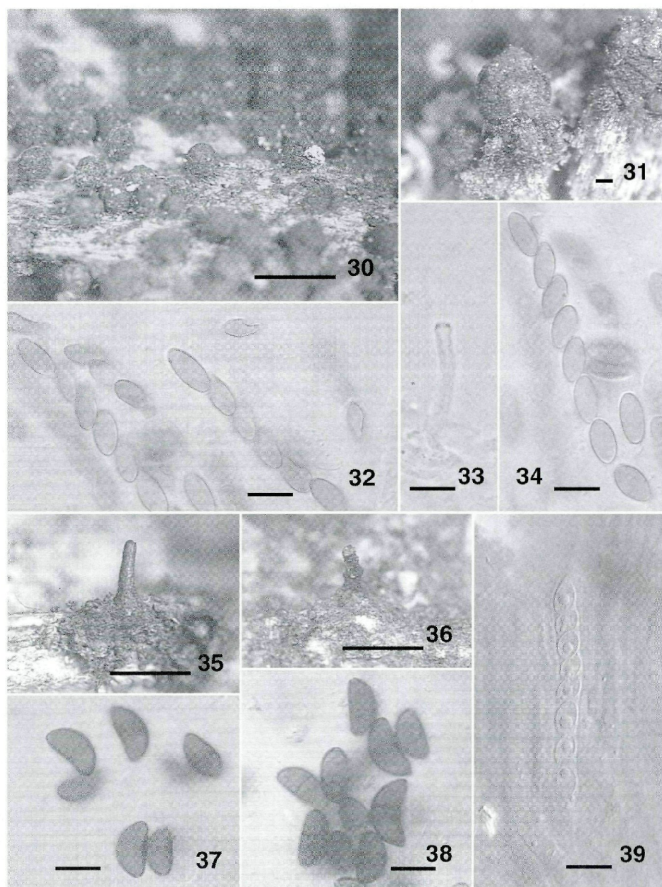
*Jobellisia barrii*, *J. fraterna* and *J. luteola* resemble each other more closely than do the other two species, *J. nicaraguensis* and *J. rhynchostoma*. The main resemblance is in the ascospore and the ascus morphology. The three species share the characteristics of ellipsoid, red-brown ascospores that have a darker band of color at the single septum and two terminal germ pores. The ascospore sizes differ slightly but the differences are not statistically significant (*J. luteola*  $11-14 \times 4.5-5.5 \mu\text{m}$ ; *J. barrii*  $11.5(-11.8) \times 3-4.5 \mu\text{m}$ ; *J. fraterna*  $(9.5-11-14.5(-15) \times 4.25-5 \mu\text{m}$ ). They also share the long-stipitate ascus structure with a prominent two-layered apical ring. This structure is given as a pulvillus by Barr (1993) but the additional narrow ascular ring described for *J. luteola* was not seen in any of the species. The pulvillus or two-layered ring is very reminiscent of the apical ring described for the genus *Annulatascus* K. D. Hyde, originally placed in the Lasiosphaeriaceae (Hyde, 1992). In these three species the unbranched paraphyses are distinctively long and tapering above the asci. They are relatively numerous and wide rather than narrow as given by Barr (1994) for *J. rhynchostoma* and *J. luteola*.

*Jobellisia nicaraguensis* and *J. rhynchostoma* differ from the other species in ascomatal structure, ascus and ascospore morphology. *Jobellisia nicaraguensis* is known only from the type collection and that is not in very good condition. The ovoid ascomata form in large groups, superficial on the substrate. The genus was described

as having stromatic tissues that form a closely adhering crust around the ascomata or the beaks (Barr, 1993). This feature is probably best seen in this species, showing up as a dark outer wall layer that is roughened and sloughs off. This species also differs in having ellipsoid, one-celled ascospores that apparently have germ pores in variable positions, however these were not observed in this investigation. A very delicate ring-like ascus apical structure was observed under phase microscopy (Fig. 33) but no refractive pulvillus was seen. The overall aspect of *J. nicaraguensis* is reminiscent of *Ceratosomella subdenudata* (Peck) M. E. Barr, a species with similar one-celled pale brown ascospores, but because of the poor condition of the type specimen of *J. nicaraguensis*, additional collections are necessary before the placement of this species can be reassessed. Despite extensive collecting in Costa Rica, no additional material of *J. nicaraguensis* was encountered.

*Jobellisia rhynchostoma* has immersed, long-beaked ascomata that occur individually, separate and few on the substrate. In the collection observed the asci were difficult to distinguish and again no distinctive apical apparatus was seen. The ascospores differ from the other species in their curved, inequilateral shape and in the lack of strong pigmentation at the septum, but as in the first three species, terminal germ pores were present. *Jobellisia nicaraguensis* and *J. rhynchostoma* quite possibly do not belong in *Jobellisia* because of the different ascus apices but additional specimens are necessary before they can be adequately placed in other genera.

*Jobellisia* currently resides in the Clypeosphaeriaceae (Barr, 1994) but if the ascus apical structure is any indication, its relationships should lie with the recently described Annulatascaceae (Wong & al., 1998). All attempts to obtain *J. barrii*, *J. fraterna* and *J. luteola* in culture were unsuccessful, however, DNA extraction from intact ascomata has allowed the genus to be included in molecular studies. Preliminary molecular data from the large subunit nuclear ribosomal DNA gene (25S) (Huhndorf, Fernández, Miller & Lutzoni, unpublished), place *J. luteola* and *J. barrii* in the same clade with *Diaporthe phaseolorum* and *Schizoparme botrytidis* with strong bootstrap support. This suggests that *Jobellisia* could be arranged in the Diaporthales, but the family placement is still unclear. Additionally, genera representing the Annulatascaceae, *Annulatascus* and *Asco-taiwania* Sivan. & H. S. Chang, were also included in the analyses and neither genus came together on the same clade as *Jobellisia*. Nor did these two genera come together on the same clade indicating that the Annulatascaceae as it is currently circumscribed may not be monophyletic. For this group of taxa, ascus apical structure, while tempting to use, may not be informative as an indicator of generic relationships. At this time *Jobellisia* should be removed from the Clypeosphaeriaceae and placed in the Diaporthales.



Figs. 30-39. - 30-34. *Jobellisia nicaraguensis*. - 30, 31. Ascomata on substrate. - 32. Ascospores. 33. - Ascus apex. - 34. Ascus. - 35-39. *Jobellisia rhynchostoma*. - 35, 36. Ascomata on substrate. - 37, 38. Ascospores. - 39. Ascus. - Figs. 30, 31, 35, 36 = macroscopic view; 32, 34, 37-39 = DIC; 33 = PH. - Scale bars: 30, 35, 36 = 1 mm; 31 = 100  $\mu$ m; 32-34, 37-39 = 10  $\mu$ m. - Figs. 30-34 from holotype Shimek, Nicaragua Fungi 77; 35-39 from MEB 3176.

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Autor(en)/Author(s): Huhndorf Sabine M., Fernandez Fernando, Lodge Jean

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