Fungi from palms. XXI. The genus *Seynesia*[1]

Kevin D. Hyde

Department of Ecology and Biodiversity, University of Hong Kong, Pokfulam Road, Hong Kong

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Of the six *Seynesia* species recorded from palms, only *S. erumpens* and *S. nobilis* are retained in the genus. The name *S. nobilis* is reinstated. A pycnidial anamorph with conidia produced holoblastically on denticulate, sympodially proliferating conidiogenous cells is reported for *S. erumpens*. The placement in the Xylariales is discussed.

Keywords: Amphisphaeriaceae, *Seynesia*, Xylariaceae, systematics.

Seynesia Saccardo (1883), originally monotypic for *Pemphidium nobile* Welw. & Curr., was described as a brown-spored counterpart of the loculoascomycete genus *Microthyrium* Desm. Theissen & Sydow (1917) included *Seynesia* in the Microthyriaceae. Petrak (1927) was the first to have reexamined the type specimen of *S. nobile* (Welv. & Curr.) Sacc. Because of its thin-walled asci and the presence of 'metaphyses' (paraphyses), Petrak considered *Seynesia* to be a genus in the Sphaeriaceae and not in the Microthyriaceae, and he emended the genus to reflect this affinity. Petrak also found that *P. nobile* and *Steganopycnis oncospermatis* Syd. & P. Syd., the type of that genus, were older taxonomic synonyms of *Micropeltis erumpens* Berk. & Curt. He limited *Seynesia* to one species, *S. erumpens* (Berk. & M. A. Curt.) Petr., and proposed *Arnaudiella* Petr. for *S. caronae* Passerini, the loculoascomycetous, brown-spored counterpart of *Microthyrium*. This was followed by Müller & von Arx (1962) and Pirozynski (1972).

Seynesia has generally been placed in the Amphisphaeriaceae (Eriksson & Hawksworth, 1991a, 1993), but has more recently been included in the Xylariaceae (Barr, 1990; Eriksson & Hawksworth, 1991b), because of the presence of a germ slit in each cell of the ascospores (Pirozynski, 1972). Despite the germ-slit, which suggests that *Seynesia* is a genus in the Xylariaceae, other features are not consistent with the family. Most notably the brown (not black), bicellular ascospores, but also the paraphyses that are embedded in a

[1] XX in Sydowia 47: 180–198.

gelatinous matrix, are indicative of a relationship to *Amphisphaeria* Ces. & De Not. and *Roussoëlla* Sacc. (sensu Müller & Von Arx, 1962), both of the Amphisphaeriaceae (Aptroot, 1995).

Approximately thirty species, occurring on about fifteen families of flowering plants and gymnosperms, are currently included in *Seynesia*. In this work I account for the six species that have been recorded from palms (Arecaceae and Pandanaceae). Of these six, two are acceptable in the genus, viz. *S. erumpens* and *S. nobilis* (Welw. & Currey) Sacc. It is understandable that Petrak (1927) should have synonymized *Pemphidium nobile* under *S. erumpens* because they are remarkably similar in form and habitat. I have studied, however, 16 collections from 6 countries and have found that two taxa can be recognized on the basis of ascospore shape and size. These differences correspond to the two type collections of, respectively, *P. nobile* and *Microthyrium erumpens*. Ascospores in *S. erumpens* are ellipsoid-fusiform with tapered ends, 24–34 x 5.5–7.5 µm with an average length to width ratio of c. 4.4, while those in *S. nobilis* are oblong ellipsoidal with broadly rounded ends, 20–28 x 7.5–10 µm with an average width to length ratio of c. 2.75. Furthermore, *S. erumpens* appears to be found in the American tropics, while *S. nobilis* has a pantropical distribution. Following is an account of the *Seynesia* species reported from palms.

Methods and materials

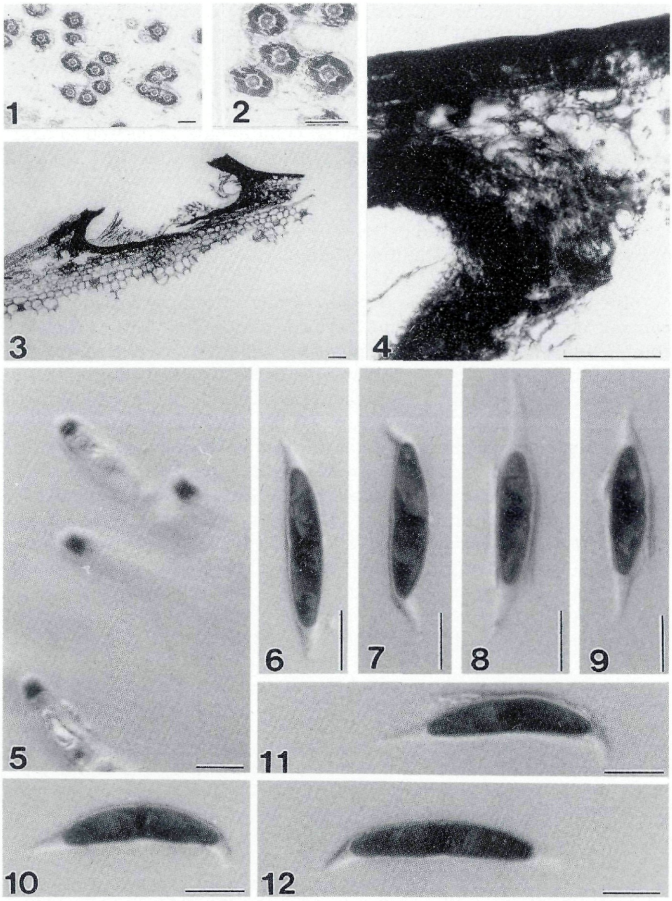
Collections of fungi developing on dead palm petioles were made in Papua New Guinea and *Seynesia nobilis* was identified on *Gulubia costata*. Dried material was borrowed from B, BISH, CUP, FAUY, FH, K, NY and S. All measurements were made in water and the iodine reaction tested with Melzer's reagent.

Taxonomy

Seynesia Sacc., Syll. Fung. 2: 668. 1883 emend Petr., Ann. Mycol. 25: 338. 1927.
= *Steganopycnis* Syd. & P. Syd., Ann. Mycol. 14: 370. 1916 (fide Petrak, 1927).

Type species. – *Seynesia nobilis* (Welw. & Curr.) Sacc.

Ascomata immersed under a shiny blackened raised clypeus with a central erumpent papilla, surrounded or not by teeth-like flanges (remnants of host cuticle); in vertical section conical with a rounded or flattened base. – Peridium comprising a mixture of



Figs. 1–12. *Seynesia erumpens* (from holotype of *Micropeltis erumpens*). – 1, 2. Superficial appearance of ascomata on host surface. – 3, 4. Sections of ascomata. – 5. Apical J+ ring of ascus. – 6–12. Ascospores. Bars: 1, 2 = 1 mm, 3 = 100 µm, 4–12 = 10 µm.

brown globose cells and *textura intricata*. – Paraphyses hypha-like, filamentous, irregular, numerous, septate and embedded in a gelatinous matrix. – Asci 8-spored, cylindrical, unitunicate, pedunculate,

with a subapical, wedge-shaped, J+ ring. – Ascospores uniseriate, ellipsoidal, two-celled, constricted at the septum, opaque brown, surrounded by a thin mucilaginous sheath drawn out to form a distinctive cap-like appendage at each end of each spore, with a germ-slit in each cell.

Anamorph. – Black pycnidial conidiomata immersed in agar. Conidiophores hyaline, denticulate, sympodially proliferating. Conidia lunate, holoblastically produced.

Mode of life. – Saprobic.

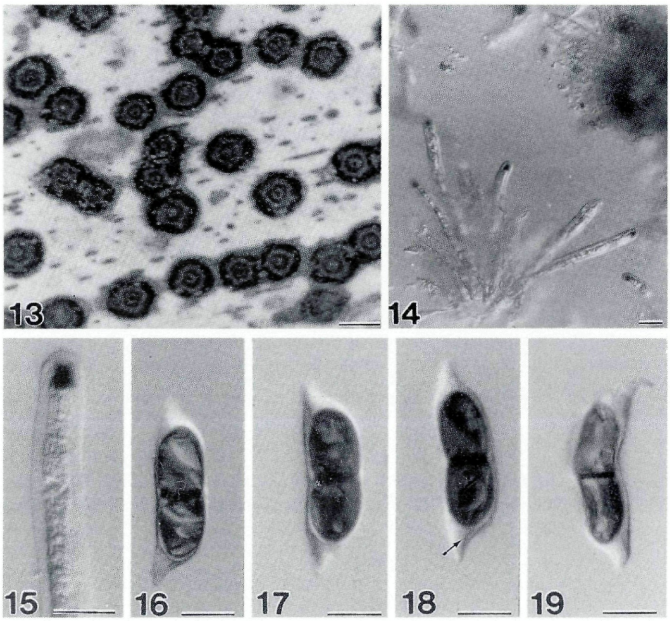
Habitat. – On dead petioles or stems of palms (and dead culms of bamboo according to Dennis, 1970).

In *Seynesia*, ascomata develop under a shiny, raised, black, conical clypeus. The clypeus, formed under the host cuticle is comprised of hyphae and host epidermal cells. The ascomatal papilla breaks through the clypeus and cuticle. In the process, circular tissue tears radially, leaving a light-coloured rim of teeth-like flanges around the papilla (Figs 1, 2, 13, 30, 31, 44, 45). Paraphyses are filamentous, unbranched, irregular, septate, numerous and embedded in a gelatinous matrix (amphisphaeriaceous, *sensu* Hyde, 1994), while asci are cylindrical with a relatively large wedge-shaped, J+, subapical ring. This ring (Figs. 5, 20–22, 34–37) is larger than found in *Roussoëlla* Sacc. *sensu* Müller & von Arx (1962) or *Amphisphaeria* Ces. & De Not. Ascospores are ellipsoidal, two-celled, opaque brown and surrounded by a thin mucilaginous sheath. A single conical appendage at each end of the ascospore appears to emerge from within the outer sheath (Figs. 6–12, 24–28, 38–43).

Seynesia erumpens (Berk. & M. A. Curt.) Petr., Ann. Mycol. 25: 339. 1927. – Figs. 1–12.

≡ *Micropeltis erumpens* Berk. & M. A. Curt., J. Linn. Soc. Bot. 10: 375. 1869.
≡ *Pemphidium erumpens* (Berk. & M. A. Curt.) Sacc., Syll. Fung. 2: 670. 1883.
≡ *Astrosphaeriella erumpens* (Berk. & M. A. Curt.) Theiss., Ann. Mycol. 14: 436. 1916.
≡ *Microthelia erumpens* (Berk. & M. A. Curt.) Speg., Boln. Acad. Nac. Ci. 26: 384. 1923.

Ascomata immersed under a shiny blackened raised clypeus, c. 1–1.5 mm diam, with a central erumpent papilla, surrounded or not by teeth-like flanges (Figs. 1,2); in vertical section 840–1400 µm diam, 120–200 µm high, conical with a flattened or rounded base (Fig. 3). – Clypeus comprising host cells filled with brown intracellular hyphae (Fig. 4). – Peridium to 30 µm wide at the top and base, 60 µm at the sides, sides and top comprising several layers of brown ovoid cells, interspersed with *textura intricata* only at the sides, base of small brown rounded cells (Fig. 4). – Paraphyses to 4 µm wide, filamentous, unbranched, irregular, septate, uniform in width,



Figs. 13–19. *Seymesia nobilis* (from holotype of *Pemphidium nobile*). – 13. Superficial ascomata. – 14. Squash illustrating asci. – 15. Apical ring (J+). – 16–19. Ascospores. Note the inner appendages (arrowed in 18). – Bars: 13 = 1 mm; 14–19 = 10 µm.

numerous and embedded in a gelatinous matrix. – Asci 200–300 x 6–10 µm, 8-spored, cylindrical, unitunicate, pedunculate, apically rounded, with a J+, wedge-shaped, subapical ring, 3.5–4 µm diam, 3.5–4 µm high (Fig. 5). – Ascospores 24–34 x 5.5–7.5 µm, uniseriate or overlapping uniseriate, elliptic-fusiform, with somewhat tapered ends, straight or slightly curved, opaque brown at maturity, two-celled, slightly constricted at the septum, smooth-walled, a full length germ slit in each cell, a thin mucilaginous sheath surrounding the ascospores, with a drawn out (10–13 µm long) conical appendage at each end, which appear to emerge from within the surrounding sheath (Figs. 6–12).

Colonies on oatmeal agar (Difco), slow growing, 7 cm in 2 wk at 20 C. – Conidiogenous cells holoblastic, sympodially proliferating. – Conidia 11.7–16.8 x 2.1–3 µm, falcate to lunate,

unicellular, hyaline, with a non-truncate base (Fig. 46), forming on scattered, immersed, globose conidiomata.

Known distribution. – Brazil, Cuba, French Guiana.

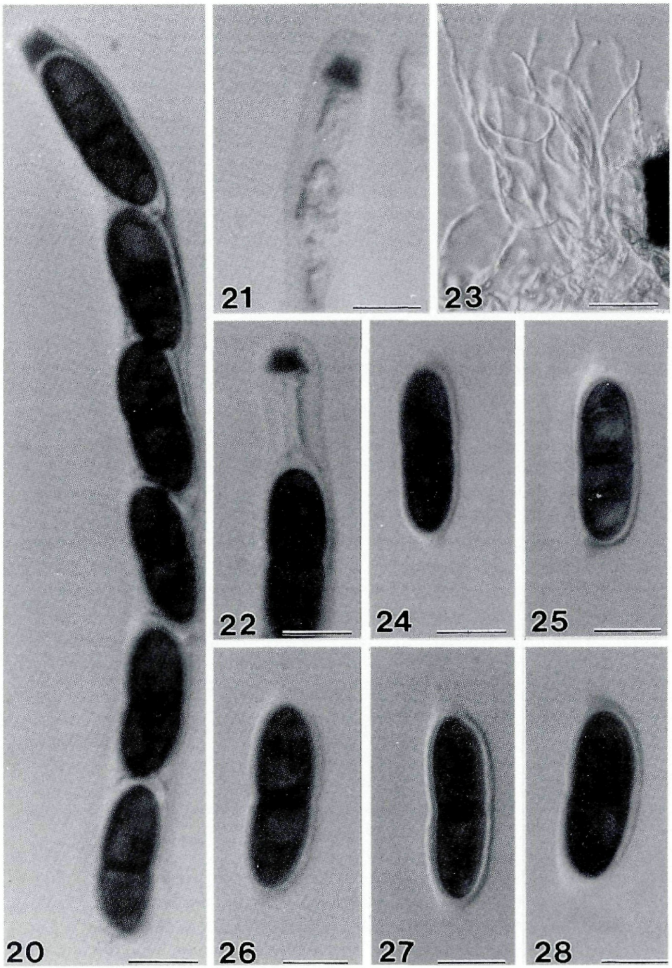
Known hosts. – Saprobic on petioles and stems of various palms and bamboo.

Material examined. – BRAZIL. PARA: Belém, EMPARA, elev. 0 m, on *Euterpe oleracea*, 12 Jan 1989, G. J. Samuels & K. F. Rodrigues 6201 (NY, GJS culture 89–2). – CUBA. on palm petioles, C. Wright 745, 474, 556, K (holotype and syntypes of *Microthelia erumpens* respectively, also syntypes in FH). – FRENCH GUIANA: Upper Marouini River, Roche Koutou, 02° 55′ N, 54°04′ W, 400 m, on palm petiole, 17 Aug 1987, G. J. Samuels, J.-J. deGranville, L. Allorge, W. Hahn & M. Hoff 5820 (NY). – 5 km WSW of Monpé Soula near three inselbergs, 02° 37′ N, 54°03′ W, 250–300 m, on dead petiole of *Euterpe* sp., Aug/Sep 1987, G. J. Samuels, J.-J. deGranville, L. Allorge, W. Hahn & M. Hoff 6158 (NY). – 2 km N of Oumanfou-Lange Soula, 02° 52′ N, 54°00′ W, 150 m, on dead palm petiole, 12–14 Aug 1987, G. J. Samuels, J.-J. deGranville, L. Allorge, W. Hahn & M. Hoff 5758 (NY).

Seynesia nobilis (Welw. & Curr.) Sacc., Syll. Fung. 2: 668. 1883. – Figs. 13–45.

≡ *Pemphidium nobile* Welw. & Curr., Trans. Linn. Soc. London 26: 283. 1870.
= *Amphisphaeria arengae* Rehm, Leaft. Philipp. Bot. 8: 2947. 1916.
= ?*Steganopycnis oncospermatis* Syd. & P. Syd., Ann. Mycol. 14: 370. 1916.
= *Didymosphaeria palmicola* I. Hino & Katumoto, J. Jap. Bot. 38: 26. 1963.
= *Amphisphaeria palmicola* (I. Hino & Katumoto) I. Hino & Katumoto, J. Jap. Bot. 41: 331. 1966.
= *Didymosphaeria cocconiae* Arx var. *maior* Bat. & Peres, Publ. Univ. Recife Inst. Micol. 440: 6. 1964.

Ascomata immersed under a shiny blackened raised clypeus, 900–1200 µm diam, with a central erumpent papilla, surrounded or not by teeth-like flanges (Fig. 13); in vertical section 520–780 µm diam, 260–400 µm high, conical to subglobose, with a somewhat flattened or rounded base. – Clypeus comprising host cells filled with brown intracellular hyphae. – Peridium to 25 µm wide at the top and base, 50 µm at the sides, sides and top comprising several layers of brown ovoid cells, interspersed with *textura intricata* only at the sides, base of small brown rounded cells. – Paraphyses to 6 µm wide at the base, filamentous, unbranched, irregular, septate, uniform in width, numerous and embedded in a gelatinous matrix. – Asci 120–140 x 10–12 µm, 8-spored, cylindrical, unitunicate, pedunculate, apically rounded, with a J+, wedge-shaped, subapical ring, 4.5–5.5 µm diam, 4–4.5 µm high (Figs 14, 15). – Ascospores 20–28 x 7.5–10 µm, uniseriate or overlapping uniseriate, oblong-ellipsoidal, ends broadly rounded, brown at maturity, two-celled, constricted at the septum, smooth-walled, with a full length germ slit in each cell, with



Figs. 20–28. *Seynesia nobilis* (from holotype of *Didymosphaeria palmicola*). – 20–22. Asci with J+ ring. – 23. Paraphyses. – 24–28. Ascospores. – Bars = 10 μm.

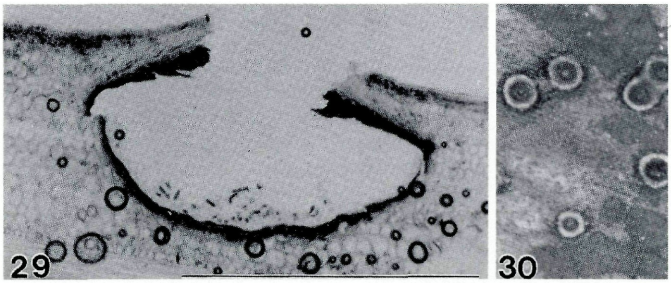
a thin mucilaginous sheath surrounding the ascospores, with a single drawn out (6–8 μm long) conical appendages at each end of the spore, which appear to emerge from within the surrounding sheath (Figs. 16–19).

K n o w n d i s t r i b u t i o n . – Angola, Brazil?, French Guiana, Guyana, Japan, Papua New Guinea, Philippines, Tanzania.

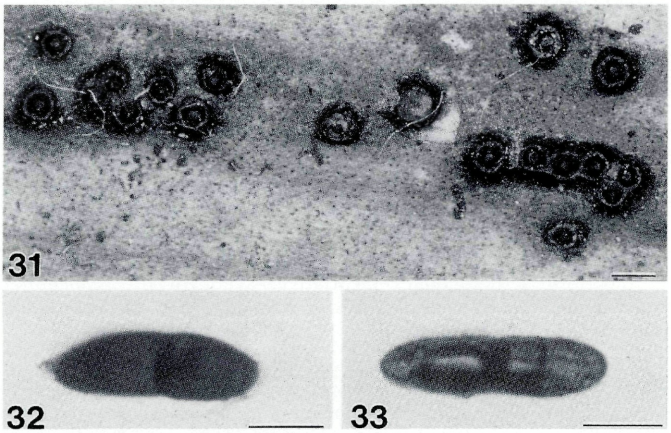
K n o w n h o s t s . – Saprobic on petioles and stems of various palms.

M a t e r i a l e x a m i n e d . – ANGOLA: Golungo alto, River de Capopa, on petiole of *Elaeis guineensis*, Jun 1856, Welwitsch 60, K (holotype of *Pemphidium nobile*). – FRENCH GUIANA: Saül, ca. 15 km SW of Saül towards Mt Galbao, near 03° 60′ N, 53°20′ W, 600–650 m, on palm petiole, Jan 1986, G. J. Samuels, & J. R. Boise 3026 (NY). – Mt Boeuf Mort., 03° 60′ N, 53°20′ W, 300–350 m, on fallen wood (palm?), 8 Feb 1986, G. J. Samuels 3610 (NY). – On base of palm leaf sheath, 18 Jan 1986, G. J. Samuels & J. R. Boise 3027 (FH). – On palm rachis, 18 Jan 1986, G. J. Samuels & J. R. Boise 3018 (FH). – On palm rachis, 14 Jan 1986, G. J. Samuels & J. R. Boise 2869 (FH). – On palm rachis, 14 Jan 1986, G. J. Samuels & J. R. Boise 2885 (FH). – Paul Isnard Area, ca. 150 km S of St. Laurent du Moroni, Citron, Mt. Decou Decou, 04° 70′ N, 53°90′ W, 250–300 m, on rachis of dead *Euterpe* sp., 11, 12 Mar 1986, G. J. Samuels & P. Searwar 4229 (NY). – Upper Marouini River, between Roche Koutou and unnamed granitic, 250 m high inselberg, 02° 55′ N, 54°04′ W – 02° 55′ N, 54°07′ W , 200–300 m, on dead palm rachis, 19, 20 Aug 1987, G. J. Samuels, J.- J. deGranville, L. Allorge, W. Hahn & M. Hoff 5913 (NY). – 2 km N of Oumanfou–Lange Soula, 02° 52′ N, 54°00′ W, 150 m, on dead petiole of *Oenocarpus bacada*, 12–14 Aug 1987, G. J. Samuels, J.- J. deGranville, L. Allorge, W. Hahn & M. Hoff 5677 (NY). – JAPAN. Hyuga Province, Miyazaki, Aosima, on dead rachides of *Livistona subglobosa* Mart., 2 Mar 1955, K. Katumoto, (FAUY, holotype of *Didymosphaeria palmicola*). – PAPUA NEW GUINEA: Kiunga, on petiole of *Gulubia costata*, May 1992, K. D. Hyde 1391 (BRIP 22940). – PHILIPPINES. Los Baños, on dead petiole of *Arenga*, May 1914, S. A. Reyes, C. F. Baker No. 3436, (S, holotype of *Amphisphaeria arengae*).

Seynesia erumpens has only been collected from Cuba and South America, while *S. nobilis* is pantropical in its distribution and has been collected in Africa, Asia, Australasia and South America. *S. erumpens* has narrower ascospores (5.5–7.5 μm) with an average length to width ratio of c. 4.4, as compared to *S. nobilis* with ascospores 7.5–10 μm wide and length to width ratio of c. 2.75. Moreover, the ascospores of *S. erumpens* are elliptic-fusiform, usually tapered at the ends, while those of *S. nobilis* are oblong ellipsoidal, having broadly rounded ends. The ascal ring of *S. nobilis* is also larger than that in *S. erumpens* (4.5–5.5 μm diam, 4–4.5 μm high, vs 3.5–4 μm diam, 3.5–4 μm high). Dennis (1970) listed *S. erumpens* from palm petioles and bamboo culms in Guyana and the length to width ratio (c. 4.6) conform to this species. I could not locate this specimen at K. *Didymosphaeria cocconiae* Arx var. *maior* (length to width ratio,



Figs. 29, 30. *Seynesia nobilis* (from holotype of *Didymosphaeria palmicola*). – 29. Vertical section of ascoma. – 30. Superficial necks of ascomata. – Bars = 1 mm.



Figs. 31–33. *Seynesia nobilis* (from holotype of *Amphisphaeria arengae*). – 31. Superficial appearance on host surface. – 32, 33. Ascospores. Bars: 31 = 1 mm, 32, 33 = 10 µm.

c. 2.8), *Amphisphaeria arengae* (Figs. 31–33), *Amphisphaeria palmicola* (Figs. 20–30) and K. D. Hyde 1391 (Figs. 34–45) have length to width ratios similar to *S. nobilis*. The specimen reported by Pirozynski 1972 collected on *Elaeis* in Tanzania with ascospores 20–30 x 8.5–10 µm also conforms to *S. nobilis*. I have not seen material of *Didymosphaeria cocconiae* var. *maior*, but from the description and

illustration provided by Batista, Peres, Garnier & Cavalcanti (1964) it is similar to *S. nobilis*.

Although I have not seen material of *Steganopycnis oncospermatis*, this species was considered to be identical to *Seynesia erumpens* by Petrak (1927). Sydow & Sydow (1916) described ascospores of *Steganopycnis oncospermatis* as 18–24 x 9–10 µm, indicating that this species is a synonym of *S. nobilis*. This is further supported by the fact that the specimen was collected in the Asia (The Philippines).

Doubtful or excluded taxa from palms or the Pandanaceae

Seynesia atkinsonii F. Stevens & R. W. Ryan, Bernice P. Bishop Mus. Bull. 19: 69. 1925.

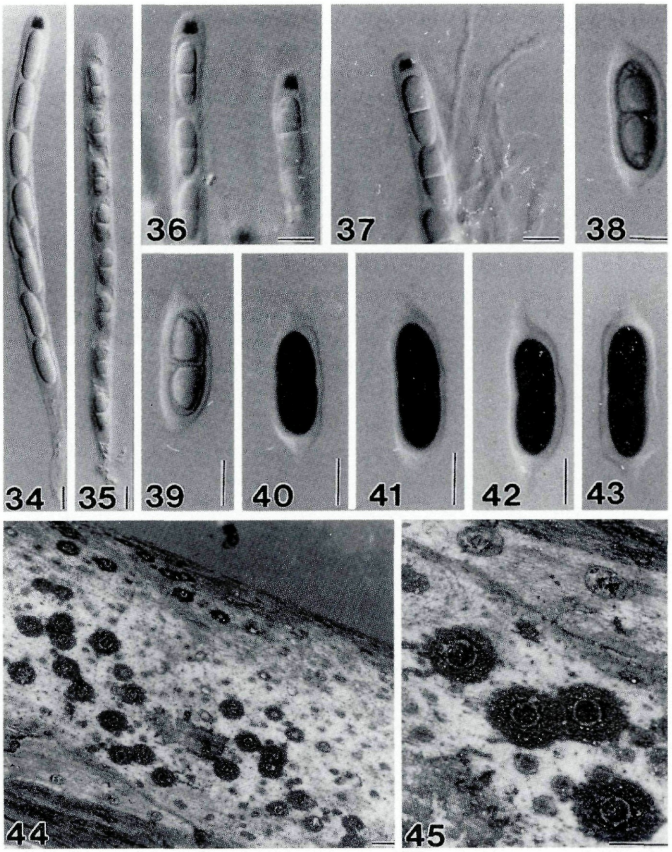
Stevens (1925) described *S. atkinsonii* based on a herbarium specimen which had the unpublished name *Seynesia freycinetiae*. This specimen is not, as indicated by Arnaud (1931), the type of *Myiocopron freycinetiae* (Atk.) Arnaud. Arnaud (1931) made a (editorial?) mistake in citing his new combination as *Myiocopron freycinetiae* (G.F. Atk.) G. Arnaud, because he clearly indicated in the same paper that *Peltella freycinetiae* F. Stevens & Ryan was an earlier name and a synonym of the *Myiocopron*. Thus the *Myiocopron* should read *M. freycinetiae* (F. Stevens & Ryan) Arnaud. *Seynesia atkinsonii* is therefore a taxonomic, facultative, synonym of *Myiocopron freycinetiae* (F. Stevens & Ryan) Arnaud, both species being represented by separate types.

Seynesia atkinsonii occurs on *Freycinetia arnotti* Gaudi in Hawaii and is unrelated to *Seynesia* as it has fissitunicate asci. It seems unlikely to belong in *Myiocopron* since ascospores are two-celled. Placement in the Microthyriaceae should be considered.

Material examined. – U.S.A. HAWAII: Oahu, Palolo Valley, Mt. Olympus, on leaf of *Freycinetia arnotti*, 16 Jun 1921, F.L. Stevens 300, BISH (holotype of *Seynesia atkinsonii*).

Seynesia calamicola Henn. & E. Nyman, Monsunia 1: 160. 1899.

This taxon was made a synonym of *Palawania grandis* (Niessl) Syd. & P. Syd. by Sydow & Sydow (1914) after examining the type material. Material in B has been destroyed.



Figs. 34–45. *Seynesia nobilis* (KDH 1391). – 34–37. Asci with J+ ring. – 38–43. Ascospores with inner appendage. – Figs. 44, 45. Ascomata with erumpent necks. – Bars: 34–43 = 10 μm, 44, 45 = 1 mm.

Seynesia grandis (Niessl.) G. Winter, Hedwigia 24: 107. 1885.

≡ *Palawania grandis* (Niessl) Syd. & P. Syd., Phillip. J. Sci. Sect. C. Bot. 9: 172. 1914.
≡ *Microthyrium grande* Niessl, in Rabenh. Fungi europaei cent. 23: 2467. 1876.

Sydow & Sydow (1914) introduced *Palawania grandis* and included *Microthyrium grande*, *Seynesia grandis* and *Seynesia calamicola* as synonyms. *Palawania* Syd. & P. Syd. has flattened black ascomata, bitunicate asci and bicelled hyaline ascospores and

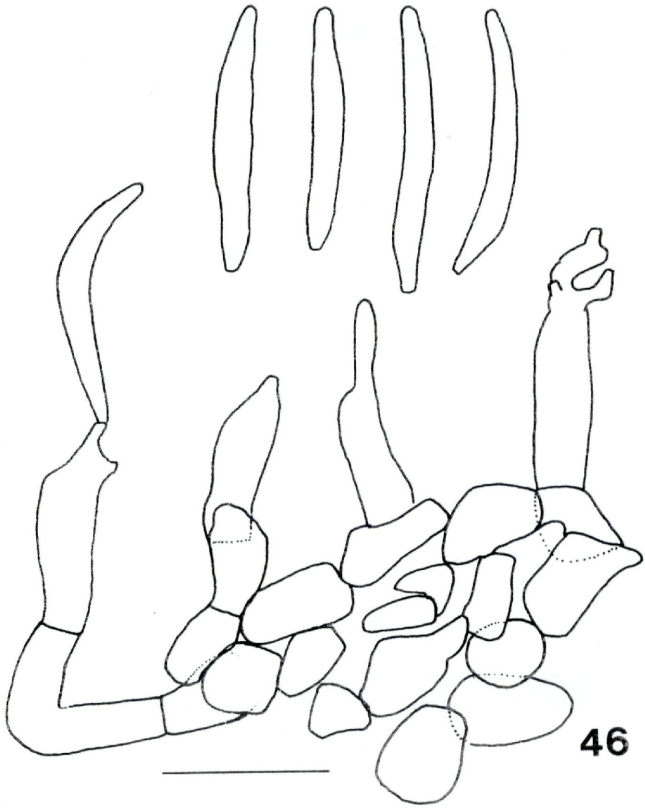


Fig. 46. Diagrammatic representation of anamorph of *Seynesia erumpens* (from GJS culture 89–2) illustrating conidiophores and conidiogenous cells. Bar = 10 μm.

cannot be included in *Seynesia*. The specimen that I have seen conforms to *Palawania* and is not a *Seynesia*.

Material examined. – PHILIPPINES: Luzon, Laguna, Los Baños, Mt. Makiling, on *Daemonorops*, Dec 1915, C. F. Baker (B).

Seynesia palmicola Batista, Cavalcanti & J. Oliveira, Brotéria Ci. Nat. 33: 187. 1964.

I have been unable to locate material of this taxon, which is not held at URM. However, in Fig. 2 provided by Batista, Da Silva & Peres (1964) the ascospores are hyaline apiosporous. The taxon should therefore probably be considered for inclusion in *Apiospora* Sacc., *Apioclypea*, K. D. Hyde or other related genera.

Seynesia serrulata (Ellis & G. Martin) Petr., Sydowia 7: 109. 1953.

≡ *Didymosphaeria serrulata* Ellis & G. Martin, J. Mycol. 1: 99. 1885.

≡ *Didymosphaerella serrulata* (Ellis & G. Martin) Cooke, Grevillea 18:29. 1889.

≡ *Microthelia serrulata* (Ellis & G. Martin) O. Kuntze, Rev. Gen. Pl. 3 (2): 498. 1898.

≡ *Amphisphaeria serrulata* (Ellis & G. Martin) M. Barr, Stud. Mycol. 31: 42. 1989.

≡ *Roussoëlla serrulata* (Ellis & G. Martin) K.D. Hyde in Aptroot, Nova Hedwigia 60: 369. 1995.

Didymosphaeria serrulata has unitunicate asci, with a subapical, J+ ring, and ascospores are striate and surrounded by a mucilaginous sheath. It has therefore been transferred to *Roussoëlla* Sacc., *sensu* Müller & von Arx (1962), in Aptroot (1995).

Material examined. – U.S.A. Florida: on dead rachides of *Sabal serrulata*, 1885, Martin, NY (holotype).

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