1973

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Recommended Citation

Benjamin, Richard K. (1973) "Sympodomyces, A New Genus of Laboulbeniales from New Guinea," *Aliso: A Journal of Systematic and Floristic Botany*. Vol. 8: Iss. 1, Article 10.
Available at: <https://scholarship.claremont.edu/aliso/vol8/iss1/10>

SYMPDOMYCES, A NEW GENUS OF LABOULBENIALES
FROM NEW GUINEA¹

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Claremont, California 91711*Sympodomycetes* gen. nov.

Receptaculum ex cellulis tribus superpositis constans; cellula superna receptaculi appendicem primam sterilem subtenens; cellula subbasilaris in lateribus oppositis appendicem singuli secundarium gignens; cellula basilaris appendicem secundariis in latere una vel in lateribus ambabus appendices singulos productens; processus continuus; cellulae basilares appendicium successivarum axes cellulosos elongatos ramis alternis facientes; rami steriles remanentes vel cellula proximalis rami ramulum antheridiiferum gignens; antheridia simplicia ampulliformia; perithecia stipitata in cellulis axium secundariorum genita.

Receptacle consisting of three superposed cells; the upper cell subtending a sterile primary appendage; the subbasal cell giving rise on opposite sides to single secondary appendages; the basal cell of the secondary appendages bearing single appendages on both sides; the process continuous; the basal cells of successive appendages forming elongate cellular axes with alternate branches; the branches remaining sterile or the proximal cell of a branch forming a branchlet bearing simple flask-shaped antheridia; stipitate perithecia produced on cells of the secondary axes.

Etymology.—Gr.: *sym*-, together + *podo*- (from *pus*), foot + *myces*, fungus.

Type species.—*Sympodomycetes pentacellularis* Benjamin.

Sympodomycetes pentacellularis sp. nov.

Fungus luteolus vel subocraceus. Receptaculum parvum prope rectum; pes memnonius vel prope niger infra cum processu brevi rotundato hyalino habens; cellula basilaris supra pedem prope hyalina nonnihil longiora quam latiora; cellula subbasilaris minor prope isodiametra; cellula supera minima appendicem primam singulam liberam simplicem sterilem subtenens. Appendix prima usque ad 70 μ longa ex cellulis quatuor superpositis constans; cellulae

¹ Dedicated to Professor Frederick K. Sparrow, Jr., in the year of his retirement as Professor of Botany at the University of Michigan, and in honor of his distinguished service to the field of mycology.

Figs. 1-3. *Sympodomycetes pentacellaris*.—1. Very young individual showing the 3-celled receptacle [basal cell (I) and foot (f); subbasal cell (II); terminal cell (III)], the 4-celled primary appendage (pa) subtended by cell III of the receptacle, and the first-formed 5-celled secondary appendage (sa-1) that has arisen from the subbasal cell (II) of the receptacle. The next-to-be-formed secondary appendage is beginning to develop from the upper side of the basal cell of the first-formed secondary appendage (arrow). $\times 485$.—2. Detail of a secondary axis. The subbasal cell of the receptacle [lying horizontally below; primary appendage (pa) broken] has given rise to secondary 5-celled appendages on opposite sides; only one appendage is depicted. The basal cell of the first-formed secondary appendage (sa-1) also has given rise to 5-celled appendages on opposite sides, but only one of these is shown (sa-2). Successive formation of a single 5-celled appendage from the basal cell of each preceding appendage (sa-3 to sa-14) has resulted in an axis of superposed, enlarged cells each bearing a divergent

superae duae elongatae; cellulae inferiores duae prope isodiametrae vel nonnihil longiores quam latiores. Cellula subbasilaris receptaculi in lateribus oppositis appendices singulas secundarias cellularum quinque productens; cellulas basillares appendicum secundariorum in lateribus oppositis appendices similis genitae; processus continuus; cellula basilaris appendicum successivarum appendicem singulos in lateribus alternis gignens. Axes e cellulis basilaribus appendicum successivarum compositi; cellulae axis $15-30 \times 9-13 \mu$ ramos singulos 4-cellularis divergentis $60-115(-130) \mu$ longos habentes; longitudo axis longissimi observata $280-290 \mu$. Rami axis ex cellulis duabus elongatibus distalibus et cellulis duabus relative brevibus proximalibus constantes; cellula terminalis $30-50(-60) \mu \times 4-5 \mu$; cellula subterminalis $20-30(-35) \times 6-7.4 \mu$; cellula subbasilaris $(5-6-9(-10)) \mu \times 5-6.4 \mu$; cellula basilaris $9-12(-15) \times 6-8 \mu$; ramus sterilis vel cellula basilaris rami ramulum brevem unicellularem antheridiiferum gignens. Ramulus antheridiiferus $6-10 \times 4-4.6 \mu$ antheridia duo terminalia ampulliformia leniter arcuata $15-18 \mu$ longa $3-4 \mu$ lata productentia. Cellula basilaris appendicis secundariae proximalis perithecium singulum stipitatum gignens; stipes perithecii $15-18 \times 7-10 \mu$; cellulae basillares perithecii parvae inconspicuae; corpus perithecii $55-65 \times 18-26 \mu$ prope symmetricum gradatim decrescens; collum cum processibus parvis rotundatis $1-2 \mu$ diametris habens; apex late truncatus; cellulae labiatae papillas inconspicuas divergentis faciens.

Fungus pale yellow tinged with brown. Receptacle small, nearly straight; the foot brown-black to nearly black with a short, rounded, hyaline projection below; basal cell above the foot nearly hyaline, slightly longer than broad; subbasal cell smaller than the basal, nearly isodiametric; upper cell smallest of the three, subtending a single, free, sterile, primary appendage. Primary appendage up to 70μ long, consisting of four superposed cells; the upper two cells several times longer than broad; the two lower cells only slightly longer than broad. Subbasal cell of the receptacle giving rise on opposite sides to single 5-celled secondary appendages; the distal two cells of the appendage several times longer than broad; the median and subbasal cells small, subequal, the subbasal slightly broader than the median; the basal cell at first about equal in dimensions to the subbasal cell, soon giving rise to similar 5-celled appendages on opposite sides; a succession of like appendages formed, each appendage arising alternately from the basal cell of the preceding appendage; the successive basal cells forming an axis of relatively large cells, $15-30 \times 9-13 \mu$; the longest axis observed, $280-290 \mu$;

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4-celled branch. The basal cell of four of these branches (sa-4, -5, -6, -13) has given rise to a small single-celled branchlet bearing paired flask-shaped antheridia (an); the other branches have remained sterile. The last-formed secondary appendage (sa-14) arising from the basal cell of sa-13 still is immature. $\times 400$.—3. Essentially mature individual (holotype) showing secondary axes in varying stages of development and their relationship to the subbasal cell of the receptacle and the basal cells of the first-formed secondary appendages (sa-1). A nearly mature perithecium (per) that has arisen from the basal cell of a proximal secondary appendage of one axis is shown. The distal cell of the primary appendage (pa) is missing. $\times 290$.

each cell of an axis having a 4-celled, divergent branch, 60–115(–130) μ long, consisting of two elongate cells distally and two relatively short cells proximally; the terminal cell 30–50(–60) $\times$ 4–6 μ ; the subterminal cell 20–30(–35) $\times$ 6–7.4 μ ; the subbasal cell (5–)6–9(–10) $\times$ 4–6 μ ; the basal cell 9–12(–15) $\times$ 6–8 μ ; branches remaining sterile or the basal cell giving rise to a single, short, 1-celled branchlet, 6–10 $\times$ 4–4.6 μ , producing two flask-shaped antheridia terminally; antheridia 15–18 μ long, the neck slightly curved, the venter 3–4 μ wide. Perithecia arising singly from the basal cell of one of the first-formed appendages of a secondary axis; stalk cell about two times longer than broad, 15–18 $\times$ 7–10 μ ; body above the small, inconspicuous basal cells nearly symmetrical, 55–65 $\times$ 18–26 μ ; neck coarsely roughened by small rounded prominences 1–2 μ in diam, gradually tapered to the broadly truncate apex; lip cells forming slightly divergent, inconspicuous papillae.

Etymology.—Gr.: *penta*-, five + NL: *-cellularis*, celled.

Holotype.—NEW GUINEA. Dobodura. Mar.–June, 1944, P. J. Darlington coll.; on upper surface of an unidentified beetle [Order: Coleoptera; Superfamily (?)Tenebrionoidea]; *RKB 1173*; slide in RSA.

Other specimens examined.—Data as for the holotype; *RKB 1173* (isotypes), *RKB 1348* (paratypes); slides in RSA.

The hosts of *Sympodomycetes pentacellularis* were among miscellaneous beetles collected by P. J. Darlington when he was stationed for a time in New Guinea during World War II. Dr. Darlington kindly permitted me² to examine many of these insects for Laboulbeniales, but he retained the hosts pending further study. The species of beetle bearing *S. pentacellularis* appeared definitely to belong to the Tenebrionoidea, but its precise identity could not be ascertained at the time the fungi were removed and mounted on slides.

Eight individuals of *S. pentacellularis* were found on the two specimens of the host that were examined. Three examples were in a very early stage of development like that shown in Fig. 1; one (Fig. 4) was immature and without perithecial initials; one (Fig. 2; only the receptacle and one

² During tenure as a National Research Fellow in Botany, Harvard University, 1951–1952.

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Figs. 4–8. *Sympodomycetes pentacellularis*.—4. Immature individual showing developing secondary axes with sterile and antheridia-bearing 4-celled branches. $\times 240$.—5. Three successive 5-celled secondary appendages comprising part of a young secondary axis. The basal cell of the upper appendage (ap) bears an immature perithecium (per) on one side and an immature secondary appendage (isa) on the other. $\times 610$.—6. Essentially mature individual (paratype) showing one elongate secondary axis bearing sterile and antheridia-bearing 4-celled branches and a mature perithecium near its base. The other secondary axes are less well developed. $\times 265$.—7. Fertile 4-celled branch showing paired flask-shaped antheridia (an) subtended by a single-celled branchlet that has arisen from the basal cell. $\times 640$.—8. Nearly mature perithecium (per) and 5-celled secondary appendage (sa) that have arisen from the basal cell of a previously formed appendage which is partly obscured. Note apical proliferation of previously broken branch of lowermost appendage shown. $\times 610$.

secondary axis shown) was at a later stage of development and bore an immature perithecium (Fig. 5); and three were essentially mature, each bearing a single perithecium (Figs. 3, 6, 8). Thus, the specimens available for study provided ample material for interpretation of thallus development in the fungus and observation of the nature and origin of the antheridia (Fig. 7) whose simple, flask-shaped structure places the genus in the Laboulbeniaceae. Perithecial development could not be traced in detail, but the number of tiers of outer wall cells formed at maturity appear definitely to be five—a number common to many genera of Laboulbeniales. My desire not to destroy any of the specimens precluded crushing a perithecium to determine ascospore dimensions. The accompanying descriptions and illustrations, based on the appearance of specimens mounted in glycerine containing either cotton blue or acid fuchsin dyes, should provide for ready identification of the type species of *Sympodomycetes* should it again be collected in the region of the type locality—northeastern Papua in the costal lowlands below the Owen Stanley Range—or elsewhere.

Sympodomycetes cannot be allied with any other genus of Laboulbeniales known at present (Benjamin, 1970; and see key, pp. 77–94, in Benjamin, 1971).

LITERATURE CITED

- Benjamin, R. K. 1970. Laboulbeniales on semiaquatic Hemiptera. II. *Autophagomyces*, *Dioicomyces*, and *Prolixandromyces* gen. nov. *Aliso* 7: 165–182.
- . 1971. Introduction and supplement to Roland Thaxter's Contribution towards a monograph of the Laboulbeniaceae. *Biblioth. Mycol.* Vol. 30, in part. J. Cramer, Lehre. 155 p.