

## Revision of *Keissleriella podocarpi* BUTIN

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On a collection of dead needles of *Podocarpus drouyniana* collected by W. GAMS & al. near Pemberton, W. Australia, a unitunicate pyrenomycete with phaeophragmospores was found, which could be identified as a species of *Lepteutypa*. The same needles contained numerous conidiomata of a *Pestalotiopsis* and repeated isolations from single ascospores proved the connection between these states.

*Pestalotiopsis* STEYAERT (= *Pestalotia* ss. GUBA, 1961; VON ARX, 1981, pro parte) is well known as anamorph of several species of *Lepteutypa* PETRAK (= *Pestalosphaeria* BARR, 1975); the present species could not be identified with any of them, but only with *Keissleriella podocarpi* BUTIN (1975), described from *Podocarpus nubigenus* in Chile. In the description of the latter, no attention was given to the structure of the ascus wall, but investigation of the holotype specimen (ZT) confirmed the supposition that the fungus also had a unitunicate ascus with amyloid apical structure, similar to the West Australian collection. BUTIN (l. c.) already hesitated, whether to classify the fungus in *Keissleriella* and the present observations, especially concerning the ascus wall, demonstrate that this species has to be excluded from *Keissleriella*, a genus of the Pleosporaceae (Dothideales), characterized by bitunicate asci without amyloid structures in the ascus tip (VON ARX & MÜLLER, 1975; SIVANESAN, 1984).

For these reasons the fungus is here reclassified and an emended description is provided for the teleomorph, completed with a description of the anamorph, in vivo and in vitro.

***Lepteutypa podocarpi* (BUTIN) VAN DER AA, comb. nov.** – Figs. 1–3.

Basionym: *Keissleriella podocarpi* BUTIN – Sydowia 27: 273. 1973.

Anamorph: *Pestalotiopsis* sp. – Fig. 3.

Perithecia deeply immersed in the host tissue, subglobose or conical, usually with a flattened base, 250–350 µm diam, 200–250 µm high, erumpent through the covering layers of the host

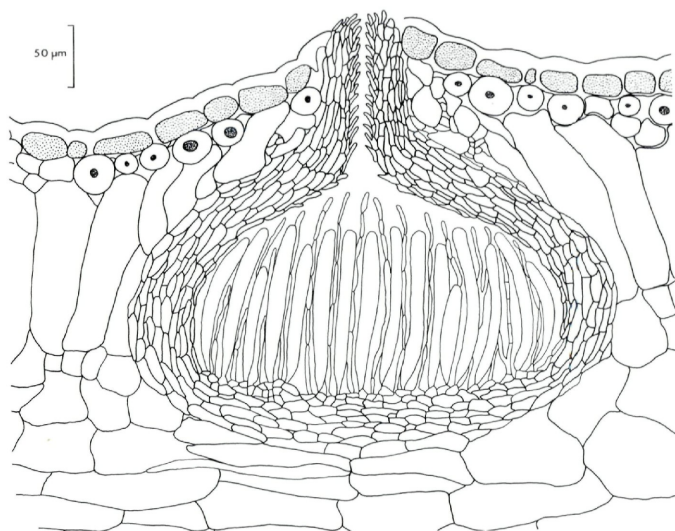


Fig. 1: *Lepteutypa podocarpi*, holotypus (ZT); ascoma.

tissue, with a cylindrical or conical papilla, which is up to 100  $\mu\text{m}$  long, vaulting the epidermis conspicuously and visible as a contrasting white spot, before opening by a central, 10–15(–25)  $\mu\text{m}$  wide pore. – Perithecial wall 15–25(–35)  $\mu\text{m}$  thick, in the apical part of the perithecium of irregular thickness, in the lower parts regularly 15–20  $\mu\text{m}$  thick and composed of 4–8(–10) layers with isodiametrical, locally flattened, pale olivaceous or brownish, thin-walled cells, 5–18  $\mu\text{m}$  in size. In the apical part of the perithecium and inside the papilla the wall is covered with thin-walled, hyaline or subhyaline, 1.5–2.0  $\mu\text{m}$  wide periphyses, with about 10  $\mu\text{m}$  long free ends, growing in the ostiolar cavity. In the basal part the wall merges into a tissue of thin-walled, isodiametrical cells, 4–10  $\mu\text{m}$  diam, in young ascomata forming several layers, in ripe ascomata strongly reduced and partly disappearing. This tissue bears the numerous asci and paraphyses.

Paraphyses numerous, thin-walled, hyaline, repeatedly septate, occasionally branched in the lower half, 1.5–5(–7)  $\mu\text{m}$  wide. – Asci cylindrical, (60–)85–100(–110)  $\times$  8–10  $\mu\text{m}$ , unitunicate, usually

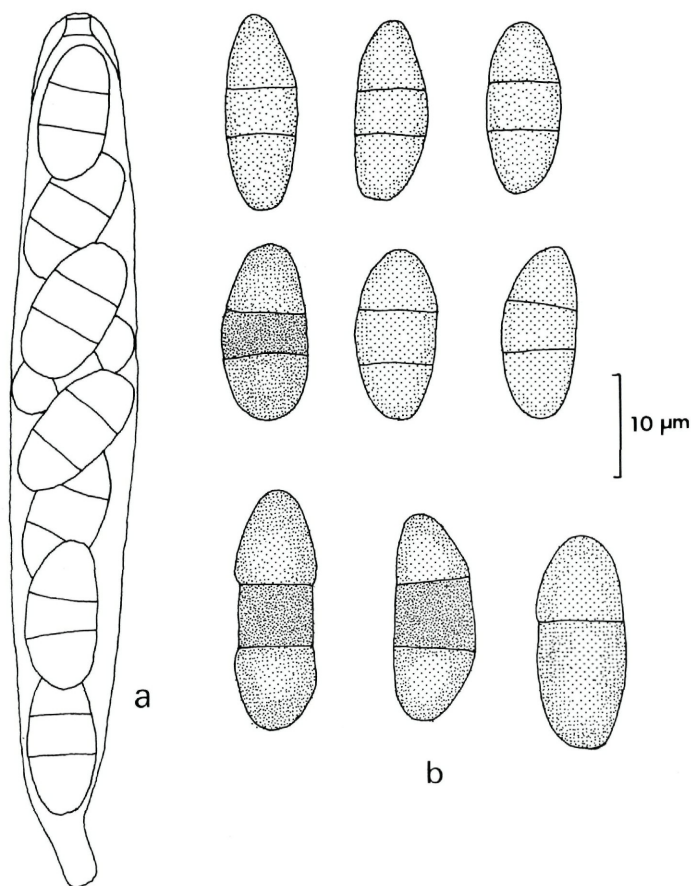


Fig. 2: *Lepteutypa podocarpi*, holotypus (ZT); a. ascus. – b. ascospores.

with a short, thick stalk, apically rounded and with a thickened wall provided with a distinct, 3–3.5 µm wide, amyloid ring, containing 8 ascospores, uni- or indistinctly biseriata. – Ascospores ellipsoid or slightly fusiform, seldom somewhat curved, ends usually rounded, seldom somewhat tapering or even truncate, 2-euseptate, not or only

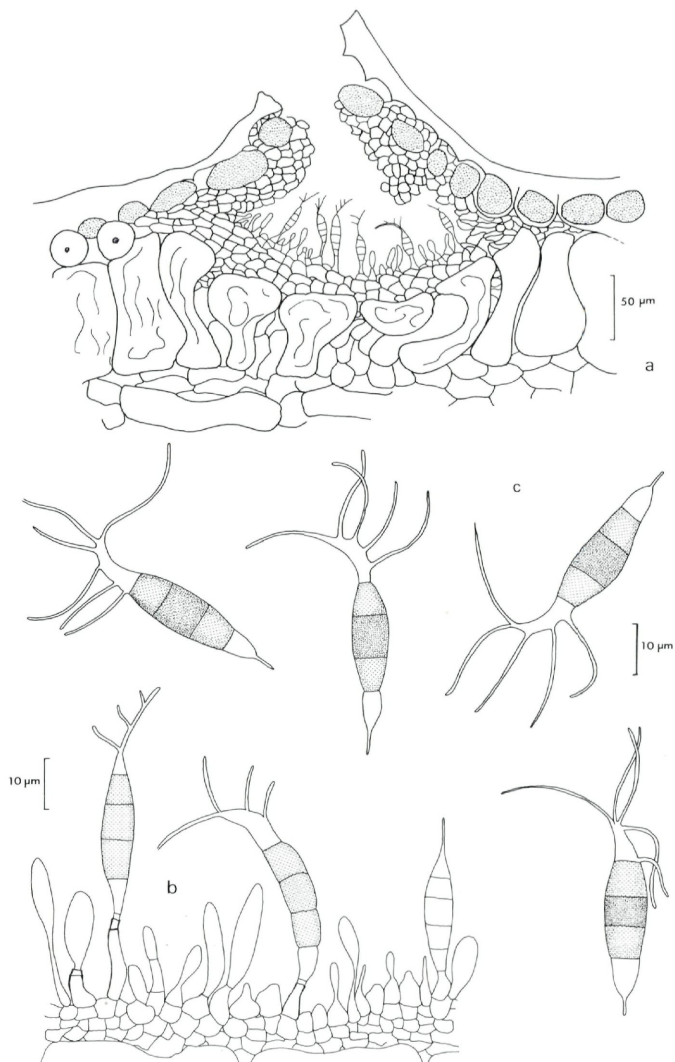


Fig. 3: *Lepteutypa podocarpi*, *Pestalotiopsis* anamorph in vivo (H. A. VAN DER AA 8974, CBS); a. conidioma. – b. developing conidia. – c. conidia.

slightly constricted at the septa, at first pale yellowish brown, later dark brown or with some shade of red-brown, the 3 cells homogeneously coloured or the central cell distinctly darker than the distal ones, the whole spores  $16-18.6(-21) \times 6.5-7.5(-8) \mu\text{m}$ .

Conidiomata in vivo at first pycnidial, subconical or irregular in shape, with a flattened base and a subconical apex which is closely connected with the covering host tissue, often very irregular in outline and intermixed with surrounding host cells, without pre-formed ostiolar structures, soon opening by fissure of the upper part and becoming acervular, up to  $550 \mu\text{m}$  diam and  $180 \mu\text{m}$  high. – Wall of variable thickness due to the close connection with the surrounding irregular host tissue, often about 3–5 cells ( $10-15 \mu\text{m}$ ) thick and composed of thin-walled, pale olivaceous or hyaline cells,  $5-12(-18) \mu\text{m}$  in size. – Conidiophores lining the basal and lateral parts of the conidiomata, the basal cells usually not differentiated from the inner wall cells. Conidiogenous cells short conical or cylindrical, even thread-like,  $4-22 \times 2-5 \mu\text{m}$ , integrated or discrete, holoblastic, annellidic. – Conidia fusiform, smooth, 4-euseptate,  $(30-)32-38(-40) \times 6.8-8.5 \mu\text{m}$ , basal cell almost hyaline but strongly cyanophilic, after liberation developing an endogenous, cellular, simple,  $2.5-5(-8.5) \mu\text{m}$  long appendage; the central 3 cells with somewhat thicker walls, second cell from below pale yellowish brown to olivaceous brown, the central cell the darkest, hazel to umber brown, the sub-apical cell olivaceous brown and the apical cell hyaline, not cyanophilic, tapering into an up to  $20 \mu\text{m}$  long, hyaline, cellular, usually bent appendage, bearing at the convex side (3–)4–7(–9) branches which are hyaline,  $10-18 \mu\text{m}$  long and non-spathulate.

Cultural characters. – Isolates from single ascospores and from single conidia similar. – Colonies on cornmeal agar spreading rapidly, attaining a diameter of 7–8 cm in 8 days at  $240 \text{ C}$  under near UV. Aerial mycelium white, becoming slightly greyish, typically zonate: Well developed and floccose in concentric rings, alternating with zones with scarce aerial mycelium and abundant conidiomata. Reverse of the colony at first slightly yellowish or faintly greenish, soon turning greyish red or brownish orange.

Conidiomata abundant, formed in concentric rings, with blackish exudate of conidia from about the 6th day onward. Conidiomata at first completely closed, subspherical, lens-shaped or in irregular flat crusts, up to  $1200 \mu\text{m}$  diam, covered by an upper wall, 1–5, laterally up to 12 cells thick, pseudoparenchymatous or prosenchymatous and composed of thinwalled, pale olivaceous cells,  $5-12 \mu\text{m}$  diam. No ostiole formed, but sometimes opening by fissure



at maturity in the thinner central part, sometimes with two distinct valves but usually more irregularly. Morphology of the conidia as on the host plant.

Material examined. — *Keissleriella podocarpi* BUTIN, on needles of *Podocarpus nubigenus*, Chile, Tres Chiflones, La Unión, 600 m alt., coll. BUTIN, 29 August 1968; holotypus containing teleomorph only, (ZT). — On needles of *Podocarpus drouyniana*, Beedlup National Park near Pemberton, W. Australia; coll. GAMS, DIXON & MCCREDIE, 4 August 1983 (= VAN DER AA 8974, CBS, anamorph and teleomorph, and single-ascospore isolate CBS 113.84).

Discussion. — The teleomorph is a typical species of *Lepteutypa* PETRAK, according to the somewhat extended concept given by VON ARX (1981), who also listed further synonyms. Recent descriptions were given by SWART (1973) and BARR (1975, sub *Pestalotphaeria*) and NAG RAJ (1985 b, sub *Pestalotphaeria*). Most of the ten species described in this genus differ from *L. podocarpi* in perithecial morphology and the number of septa of the ascospores. *L. concentrica* (BARR) VON ARX has 3-celled ascospores but with striated exosporium, whereas the conidial state, *Pestalotiopsis guepini* (DESM.) STEYAERT var. *macrotricha* (KLEBAHN) SUTTON, is quite different from the anamorph of *L. podocarpi*. *L. elaeidis* (BOOTH & ROBERTSON) VON ARX has also some similarity in the teleomorph, but the *Pestalotiopsis* anamorph has only 2–3 apical appendages, which are distinctly spatulate. According to the description the type species *Lepteutypa fuckelii* (NITSCHKE) PETRAK has three septate ascospores (PETRAK, 1923; SHOEMAKER & MÜLLER, 1965). Other species also resemble the teleomorph but have quite different anamorphs belonging to the genera *Seiridium* NEES: FR. or *Labridella* BRENCLE (sub *Labridiella* in VON ARX, 1981).

Amongst hundreds of *Pestalotiopsis* species, merely described as *Pestalotia* (STEYAERT, 1948 a and b, 1949, 1961; GUBA, 1961; SUTTON, 1961; NAG RAJ, 1985 a and b) there is no species with this combination of measurements and typical apical cell with lateral branches. *Pestalotia heterocornis* GUBA, *P. multisetata* (SPEG.) GUBA and *P. thujae* SAWADA have some similarity but can be differentiated on the base of the number of appendages, their length and branching pattern.

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