

## A new *Broomella* with a *Truncatella* anamorph on *Clematis*

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A new pyrenomycete, *Broomella verrucosa*, is described on *Clematis alpina* (L.) MILLER from the Grison canton of Switzerland. The anamorph found on the host plant and developed from single ascospore isolates is a species of *Truncatella*.

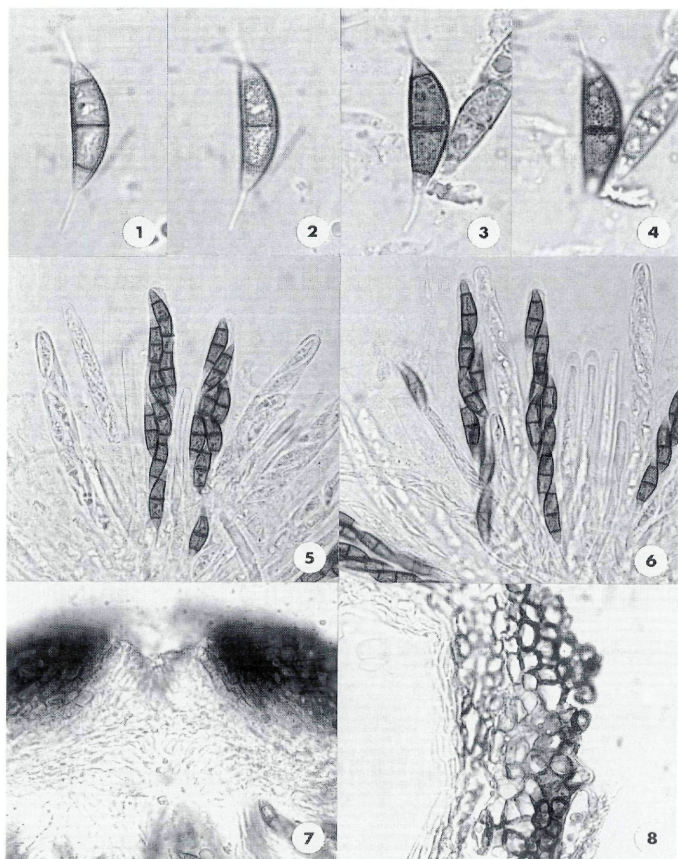
Some species of *Broomella* and their anamorphs were treated earlier (SHOEMAKER & MÜLLER, 1963). A sample of an additional species of *Broomella* on *Clematis alpina* (L.) MILLER, collected in 1970, was examined only recently; cultural studies failed because the sample was too old. A more recent collection was found in viable condition. The species is described as new with notes on the anamorph as it occurs in nature and in pure culture.

***Broomella verrucosa* SHOEMAKER, BABCOCK & MÜLLER sp. nov. –**  
Figs. 1–12.

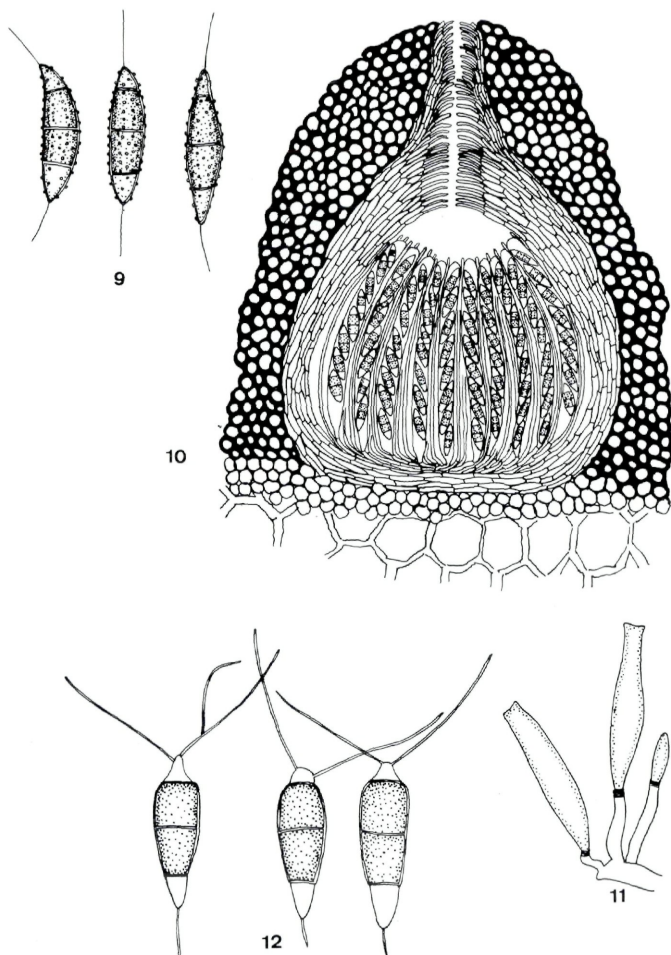
Perithecia dispersa vel aggregata, immersa deinde superficialia, glabra, globosa, (250)300–450 µm lat., (170)350–500 µm alt. Rostrum inclusum vel erumpens, teres, papilliforme, 70–90 µm lat., cellulis brunneis, polygoniis, 5–8 × 5–8 µm magnis compositum; ostiolum 20–60 µm diam.; periphyses 20–25 × 1.5–3 µm. Parietis perithecii 40–80 µm lat., cellulis brunneis polygoniis 10–15 × 10–15 µm; cellulis hyalinis, polygoniis 8–12 × 8–12 µm; cellulis hyalinis, oblongis 12–20 × 4–6 µm compositum. Paraphyses septatae, attenuatae, eguttulatae, sine strato mucoso. Asci copiosi, unitunicati, cylindrici, 90–120 × 9–12 µm, 8-sporei. Ascosporae bi-vel uniseriatae, fusiformes, curvae, 18–22(24) × 5.5–7 µm, 3-septatae, non constrictae; cellulis centralis castaneis longis; cellulis ceteris luteis brevis; eguttulatae, verrucosae, setosae, sine strato mucoso.

HOLOTYPE: in caulibus *Clematis alpinae* – „Bellaluna“, Filisur, Grison, Switzerland, E. MÜLLER, 11 July 1988, DAOM 198733a. ISOTYPUS in ZT.

Perithecia scattered to aggregated, subepidermal to superficial, glabrous, globose, (250)300–450 µm wide, (170)350–500 µm high. Beak central, terete, flush to erumpent, papillate, 70–90 µm long, 70–90 µm wide, composed of 10–14 layers of brown polygonal 5–8 × 5–8



Figs. 1-8. *Broomella verrucosa*. – Figs. 1-4. Ascospores, showing contour and surface features,  $\times 1000$ . – Figs. 5-6. Asci,  $\times 430$ . – Fig. 7. Ascocarp beak opening,  $\times 430$ . – Fig. 8. Ascocarp wall structure,  $\times 1000$  (all DAOM 198171).



Figs. 9-10. *Broomella verrucosa*. - Fig. 9. Ascospores,  $\times 1000$ . - Fig. 10. Section through ascocarp,  $\times 250$  (all DAOM 198733a). - *Truncatella* sp. - Fig. 11. Conidiophores,  $\times 1000$ . - Fig. 12. Conidia,  $\times 1000$  (all DAOM 198733b).

$\mu\text{m}$  cells around a 20–60  $\mu\text{m}$  diameter ostiole lined with hyaline 20–25  $\times$  1.5–3  $\mu\text{m}$  periphyses. – Perithecium wall surface a *textura angularis*. Wall in longitudinal section laterally 40–80  $\mu\text{m}$  thick of two or three zones: outer zone of 3 or 4 layers of polygonal 10–15  $\times$  10–15  $\mu\text{m}$  dark brown pseudoparenchyma cells; middle zone of 4 or 5 layers of nearly hyaline polygonal 8–12  $\times$  8–12  $\mu\text{m}$  pseudoparenchyma, or indistinguishable from outer zone; inner zone of 4–6 layers of hyaline rectangular 12–20  $\times$  4–6  $\mu\text{m}$  cells. – Paraphyses apically free, numerous, 3–5  $\mu\text{m}$  wide near base, narrowed to apex, 2–3  $\mu\text{m}$  wide above, with thin septa at 20–30  $\mu\text{m}$  intervals, without guttules, without slime coating. – Asci numerous, in a broad hymenium, unilocular, with a pulvillus, without a detectable annulus, cylindrical, 90–120  $\times$  9–12  $\mu\text{m}$ , short-stalked, with 8 overlapping biseriolate to uniseriate ascospores. – Ascospores narrowly fusiform, L/W 3.6, slightly curved, 18–22(24)  $\times$  5.5–7  $\mu\text{m}$ , transversely 3-septate, first septum median, not constricted at septa, without dots at ends of septa, septa thick, central cells long and mid-reddish brown, end cells short and yellow, without guttules, verrucose, with one setose 5–8(12)  $\times$  1  $\mu\text{m}$  appendage at each end, without a sheath.

Anamorph. – *Truncatella* sp.

Conidiophores anellidic, hyaline, 4–13  $\times$  2–3  $\mu\text{m}$ . – Conidia clavate, 3-septate, 20–26  $\times$  6–7(8)  $\mu\text{m}$ , unstricted, verrucose, central cells grayish brown, 14–17  $\mu\text{m}$  long, thick-walled; end cells hyaline, thin-walled; apical cell cap-like; basal seta 5–8  $\times$  1  $\mu\text{m}$ ; two or rarely three apical setae uniformly slender, 20–25  $\times$  1  $\mu\text{m}$ .

The anamorph formed in cultures derived from ascospores of *B. verrucosa*. The acervuli developed on autoclaved leaves of alfalfa, *Medicago sativa* L., on the surface of Sach's agar medium (SHOEMAKER, 1955).

Host. – *Clematis alpina* (L.) MILLER (Ranunculaceae).

Collections examined. – SWITZERLAND: Grison, Filisur, Bellaluna, MÜLLER, 11 July 1988, DAOM 198733a ex ZT, type; same site, MÜLLER, 25.5.1988, ZT; Grison, Val S-charl, MÜLLER, 1 September 1970, DAOM 198171, ex ZT.

This species seems closest to *Broomella montaniensis* (ELLIS & EVERHART) E. MÜLLER & AHMAD (1955) among those treated earlier (SHOEMAKER & MÜLLER, 1963). The ascospores of the new species are distinct in being warted, not finely echinulate, and are more nearly fusiform. The anamorph of the new species has usually two apical setae on the conidia whereas *B. montaniensis* conidia have four apical setae.

The recent review by SAMUELS & al. (1987) dealt with the classification of *Broomella* in the Amphisphaeriaceae. The present findings for yet another species are not inconsistent with their general view. They emphasized the point that the ascus apex in *Broomella*

does not have an iodine positive annulus. In the new species, all tests with iodine were negative. In fact, it was not possible to detect an annulus.

The use of the generic name *Truncatella* reflects what we take to be the current usage for some species formerly treated in *Pestalotia* Sect. *Quadriloculatae* by GUBA (1961). SUTTON (1980) summarized the reasons for his acceptance of *Truncatella* and we follow this idea. Consequently, some anamorphs treated earlier (SHOEMAKER & MÜLLER, 1963) are revised with the following new combinations.

*Truncatella vitalbae* SHOEMAKER, BABCOCK & MÜLLER comb. nov.

BAS.: *Pestalotia vitalbae* SHOEMAKER & MÜLLER (1963). – Can. J. Bot. 41: 1237.

*Truncatella pestalozzioides* (DEARNESS & FAIRMAN in FAIRMAN)

SHOEMAKER, BABCOCK & MÜLLER comb.

nov.

BAS.: *Arthrobotryum pestalozzioides* DEARNESS & FAIRMAN in FAIRMAN (1918). – Mycologia 10: 263.

*Truncatella excelsa* (PETRAK) SHOEMAKER, BABCOCK & MÜLLER comb. nov.

BAS.: *Ahmadinula excelsa* PETRAK (1953). – Sydowia 7: 375.

### Key to *Broomella* Teleomorphs

1. Ascospores up to 5 µm wide, biseriate, fusiform, smooth, 22-30 × 4-5 µm; setae 8-12 µm long.  
Anamorph *Truncatella vitalbae* ..... *B. vitalbae*
- 1\*. Ascospores wider ..... 2
  2. Ascospore ends hemispheric ..... 3
  - 2\*. Ascospore ends acute ..... 4
3. Ascospore wall smooth, uniseriate, broadly fusiform, 16-23 × 7-9 µm; setae 12-15 µm long.  
Anamorph *Truncatella excelsa* ..... *B. excelsa*
- 3\*. Ascospore wall echinulate, ascospores broadly ellipsoidal, 18-22 × 5-7 µm; setae 6-9 µm long. Anamorph *Truncatella pestalozzioides* ..... *B. montaniensis*
  4. Ascospore wall smooth, ascospores uniseriate, fusiform, 16-24 6-7 µm; setae 6-9 µm long.  
Anamorph *Truncatella* ..... *B. acuta*
  - 4\*. Ascospore wall verrucose, ascospores uni- or biseriate, fusiform, 18-22 × 5.5-7 µm; setae 6-8 µm long. Anamorph *Truncatella* ..... *B. verrucosa*

### Key to *Broomella* Anamorphs (*Truncatella*)

1. Conidia with one simple seta at each end . . . . . 2
- 1\*. Conidia with branched or multiple setae at the apical end and with or without a simple seta at the basal end . . . . . 3
  2. Conidia  $30-45 \times 5-7 \mu\text{m}$ , central cells yellow . . . . *T. vitalbae*
  - 2\*. Conidia  $16-24 \times 6-9 \mu\text{m}$ , central cells brown . . . . *T. excelsa*
3. Conidia with one branched apical seta,  $20-25 \times 5-7 \mu\text{m}$ , conidium wall smooth . . . . . *Truncatella* anamorph of *B. acuta*
- 3\*. Conidia with two or more apical setae and warted . . . . . 4
  4. Conidia with 3-5 apical setae,  $25-30 \times 8-10 \mu\text{m}$ , central cells warted . . . . . *T. pestalozzioides*
  - 4.\* Conidia with 2 or 3 apical setae,  $20-26 \times 6-7 \mu\text{m}$ , central cells grayish brown, verrucose . . . . . *Truncatella* anamorph of *B. verrucosa*

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