Anavirga dendromorpha, anamorph of *Apostemidium torrenticola*

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Abstract. – Cultures derived from ascospores of *Apostemidium torrenticola* have produced the anamorphic states *Anavirga dendromorpha* and its associated *Phialocephala*.

We have made several collections of *Apostemidium torrenticola* Graddon, all on submerged wood of oak *(Quercus)*, in rapidly-flowing streams and rivers. Cultures derived from ascospores of all these collections have produced the macroconidial anamorph *Anavirga dendromorpha* Descals & Sutton and its *Phialocephala* synanamorph. We have been fortunate to have some of our teleomorph collections authenticated by Mr. W. D. Graddon, and the identification of the anamorph confirmed by our former colleague, Dr. E. Descals.

Graddon (1965) gave a Latin description and an excellent drawing of a median microtome section of *Apostemidium torrenticola* (see Fig. 1 A, and compare with Fig. 1 E in Graddon's paper). The greenish-yellow apothecia are somewhat convex when ripe and often cover large patches of wood. We have collected material in Devon from early February to late July. The specimens have been deposited in Herb. IMI, together with dried cultures derived from them. Our material matches the original description and figure in most respects, so further detailed description is superfluous. In some of our material, the apothecia attain 3.3 mm diam (2.5 mm in the original description). The lengths of spore bundles found in our collections are listed in Table 1 and range from 150–260 µm, exceeding the range given by Graddon (175–195 µm). A distinctive feature not emphasised in the original description is the tendency of the ascospores to break up into 0–5 septate segments measuring 25–53 × 1 µm (Fig. 1 D, E).

Ascospores shot off from apothecia were collected on 0.1% malt extract agar. They germinated overnight at room temperature, producing narrow germ-tubes from any cell of the part-spore. It was noticeable that the germ-tubes tended to grow out from one side of the spore (Fig. 1 F), and it is possible that the direction of growth is controlled by light. Cultures were prepared by transferring single or several germinating part-spores to 2% malt extract agar in 9 cm

Table 1. *Collections of* Apostemidium torrenticola *and lengths of asci and ascospore bundles*

Herbarium Number HME	Host	Locality	Date	Ascus length (µm)	Length of spore bundles (µm)
4265	*Quercus*	Stream near Fingle Bridge, Devon	30. 4. 86	280 – 310	180 – 220
4274	*Quercus*	Stream near Fingle Bridge, Devon	4. 6. 86	240 – 280	150 – 165
4278	*Quercus*	Farley Water, Hillsford Bridge, Lynton, Devon	13. 6. 86	260 – 280	140 – 160
4289	*Quercus*	East Lyn River, Rockford, Brendon, Devon	13. 6. 86	260 – 290	140 – 170
4290a	*Quercus*	River Teign, Fingle Bridge, Devon	24. 7. 86	220 – 230	130 – 170
4291	*Quercus*	Stream near Fingle Bridge, Devon	24. 7. 86	240 – 270	150 – 180
4293	*Quercus*	Stream near Fingle Bridge, Devon	24. 7. 86	280 – 310	145 – 170
4339	*Quercus*	Stream near Fingle Bridge, Devon	3. 2. 87	320 – 350	150 – 260

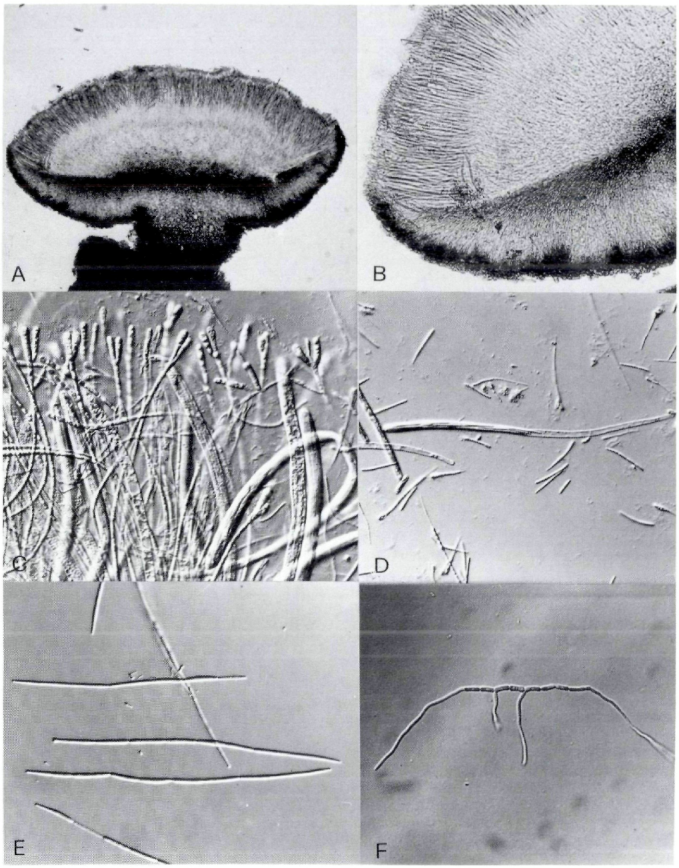

Fig. 1. *Apostemidium torrenticola* (Herb. M. E. 4290 a): A: V. S. apothecium. – B: V. S. apothecial margin. – C: Portion of hymenium showing ascus tips and branched paraphyses. – D: Ascus containing a spore bundle, and surrounded by part-spores. – E: Discharged ascospores showing constrictions into part-spores. – F: Germinating part-spore: note the direction of germ-tube growth. – Scale bar: A = 1 mm; B = 200 µm; C, E = 50 µm; D, F = 100 µm.

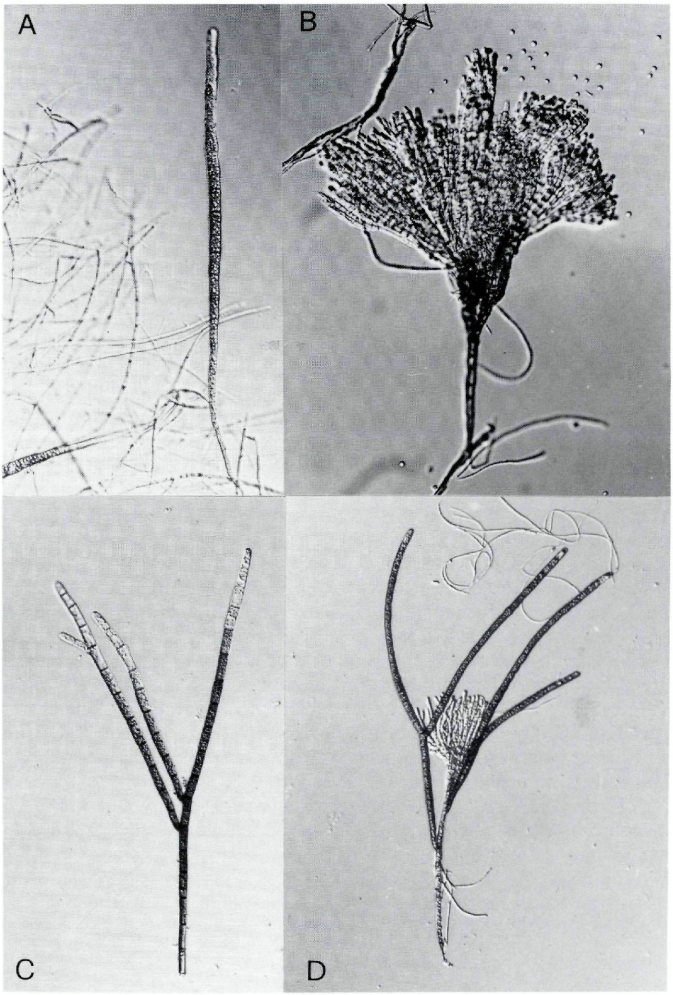

Fig. 2 *Apostemidium torrenticola:* A: Developing *Anavirga* macroconidium in a culture derived from ascospores (Herb. M. E. 4265). – B: *Phialocephala* state in culture (Herb. M. E. 4265). – C: *Anavirga* state associated with apothecia (Herb. M. E. 4290 b). – D: *Phialocephala* state developing from *Anavirga* macroconidium in culture derived from ascospores (Herb. M. E. 4290 a).

plastic Petri-dishes. The cultures were incubated in a glass-fronted cool incubator (12–14° C) exposed to diffuse natural daylight, supplemented by N. U. V. light from a Phillips "black light" tube. Growth was slow, with a sparse aerial mycelium in the centre and flat appressed mycelium at the margins. The culture medium was coloured a dark reddish-brown to black. In two-month-old dry cultures, dark aerial macroconidia of *Anavirga dendromorpha* were discovered. The conidia were at first unbranched (Fig. 2 A), but in older cultures, branched conidia developed. DESCALS & SUTTON (1976) stated that in their cultures derived from conidia, sporulation was absent on or in agar, but abundant when culture pieces were forcibly aerated in distilled water, and in this respect our cultures differ from theirs. Cut pieces of our cultures placed in Petri-dishes containing a shallow layer of water also formed macroconidia.

The characteristic *Phialocephala* phialidic state occurred in our cultures, either as part of a branch system attached to a macroconidium (Fig. 2 D) or arising directly from the mycelium of the culture (Fig. 2 B). Attempts to induce the phialoconidia in our cultures to germinate have failed, and we think that the phialoconidia probably have a spermatial function.

In several of our cultures, the *Anavirga* state has been found growing near to, or around the bases of the apothecia. In one collection, Herb. M. E. 4290 b, cultures were made by teasing out the *Anavirga* conidia in sterile water, and transferring them to 0.1% M. E. A. with added antibiotic. These conidia germinated readily, and transfers to 2% M. E. A. produced cultures identical to those derived from ascospores. We have another collection of *Anavirga dendromorpha* on an unidentified woody branch collected in the R. Teign (Herb. M. E. 4217), indicating that the anamorph state is not restricted to *Quercus*. DESCALS & SUTTON (1976) report the *Anavirga* state from submerged decaying angiosperm twigs, a submerged oak leaf and from stream foam.

KORF (1974) has listed *A. torrenticola* as a synonym of *Vibrissea flavovirens* (PERS.: FR.) KORF & DIXON, which would thus provide an earlier name for our fungus.

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References

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