ARTHRORHAPHIDACEAE

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Arthrorhaphidaceae Poelt & Hafellner, *Phyton* (*Horn*) 17: 220 (1976).

Type: *Arthrorhaphis* Th.Fr.

Thallus lichenised or lichenicolous, crustose (leprose to areolate) or squamulose or absent, whitish to greenish grey or greenish (brownish) yellow to bright yellow. Areolae plane to convex, often becoming partly or completely sorediate; squamules soon becoming strongly bullate, later folded in ridges, sometimes cracked. Thallus ±ecorticate with one or a few hyphae lying parallel to the surface or with a thin cortex of agglutinated hyphae. Photobiont chlorococcoid. Medulla solid or hollow, sometimes containing calcium oxalate crystals (not in Australian specimens). Ascomata apothecial, lecideine, urceolate to plane or strongly convex, solitary or clustered, located between or separated from the squamules, or sessile on the lamina of the host thallus; margin persistent and prominent, or becoming excluded; epithecium greenish to blackish brown throughout or greenish brown in the upper part and bright (blue-)green below (colour intensifying with HNO_3). Hymenium colourless, with oil droplets (at least in the epithecium). Paraphyses thin, weakly branched above; apices not swollen. Asci clavate, non-amyloid, slightly thickened at the apex, with a small ocular chamber. Ascospores 8 per ascus (sometimes fewer), cylindrical to acicular, 3–16-septate, hyaline; perispore not apparent. Conidiomata not known.

Chemistry: Rhizocarpic acid, epanorin, ±atranorin, and an unknown yellow pigment; lichen substances lacking when remaining constantly parasitic.

A monogeneric family of c. 11 closely related and rather polymorphic taxa which is widely distributed in montane to alpine regions of the world; two species and an additional variety are known in Australia. Free-living species mostly occur on or among decaying bryophytes and higher plants (or even decaying lichens) or on sandy soil (rarely on rocks). Parasitic or commensalistic species on several crustose (*Baeomyces*, *Dibaeis*), foliose (*Melanelia*) or fruticose (*Cladonia*) lichen genera.

D.J.Galloway & J.K.Bartlett, *Arthrorhaphis* Th.Fr. (lichenised Ascomycotina) in New Zealand, *New Zealand J. Bot.* 24: 393–402 (1986); W.Obermayer, Die Flechtengattung *Arthrorhaphis* (Arthrorhaphidaceae, Ascomycotina) in Europa und Grönland, *Nova Hedwigia* 58: 275–333 (1994); W.Obermayer, The genus *Arthrorhaphis* in the Himalayas, the Karakorum and the subalpine and alpine regions of south-eastern Tibet, *J. Hattori Bot. Lab.* 80: 331–342 (1996); E.S.Hansen & W.Obermayer, Notes on *Arthrorhaphis* and its lichenicolous fungi in Greenland, *Bryologist* 102: 104–107 (1999).

ARTHRORHAPHIS

Arthrorhaphis Th.Fr., *Lich. Arct.* 203 (1860), *nom. cons.*; from the Greek *arthron* (a limb or articulation) and *rhaphis* (a needle), in reference to the long-acicular transversely septate ascospores of the type species.

Type: *A. flavovirescens* (A.Massal.) Th.Fr. [= *A. citrinella* (Ach.) Poelt]

Characters as for the family.

Thallus greenish yellow or bright yellow; rhizocarpic acid present; free-living or initially parasitic on *Baeomyces* sp. but soon becomming free-living; ascomata marginal on squamules or separated from them..... ..... **1. A. citrinella**

[Thallus areolate; surface coarse or granular, often dissolving into soredia, or completely sorediate .... **1a.** var. **citrinella**
Thallus squamulose; squamules smooth, either strongly bullate, becoming hollow and folded in ridges, or stalked umbrella-like areoles on black hyphal strands .....**1b.** var. **catolechioides**]

Thallus whitish grey to pale greenish; rhizocarpic acid absent; parasitic on the lichen *Baeomyces heteromorphus*; ascomata breaking through the surface of the host thallus ..... **2. A. grisea**