

Cypselas morphology and a reassessment of the record of *Omalotheca supina* (Asteraceae) from Tasmania

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Abstract

The cypselas of Tasmanian material referred to *Omalotheca supina* (L.) DC, as *Gnaphalium supinum* L. in Curtis (1963), consists of two species, which differ from each other, and also from those of *Omalotheca supina* from the Northern Hemisphere. The Tasmanian material is referred to *Euchiton poliochloris* N.G. Walsh and *E. traversii* (Hook. f) Holub. The cypselas of *Euchiton poliochlorus* lack hairs and conspicuous paired papillae on the cypselas. *Euchiton traversii* has hairs on the cypselas with rounded apices, and conspicuous paired papillae. As the record of *Omalotheca supina* in Tasmania is based upon a misidentification, the species should be deleted from the list of rare species for the State.

Introduction

The genus *Gnaphalium* as treated in the Student's Flora of Tasmania by Curtis (1963) is now recognised as a polyphyletic assemblage of taxa (Nesom 1990; Anderberg 1991), which in Tasmania includes *Euchiton*, *Gnaphalium Vellereophyton*, *Pseudognaphalium* and *Gamochaeta*. Cypselas morphology, and in particular epidermal characters, provide important characters for identifying genera within the *Gnaphalium* complex (Drury 1970; Hilliard & Burt 1981; Anderberg, 1991). A study of the cypselas morphology of the Tasmanian species has recently been undertaken by this author, and these species and genera are also currently being revised by Paul Wilson (PERTH) for the Flora of Australia Series.

This paper describes and illustrates the cypselas of *Omalotheca supina* (L.) DC from Europe and compares it to material that has been considered conspecific from Tasmania. *Omalotheca supina* (cited as *Gnaphalium supinum* L. in Curtis 1963, p. 320) was described as having a localised distribution in Tasmania being restricted "to acid water-logged soil between tussocks of button-grass *Gymnoschoenus sphaerocephalus* Hook. f. in montane heaths". As Curtis (1963) pointed out, its presence in Tasmania is surprising because it was considered a plant of the mountains of central Europe and western Asia and of the arctic regions in Europe, Greenland and Canada. She also commented that the distribution was difficult to understand and suggested that the southern [Tasmanian] plant may prove to be distinct. Its limited distribution and few records, and confusion between species in this genus in Tasmania, has led to its being listed as "Rare" under Schedule 5 of the Tasmanian Threatened Species Act (1995). The Tasmanian material, referred to *O. supina*, has not been re-examined since Curtis (1963). In this paper its status is assessed by comparing cypselas morphology of the material assigned to this taxon from Tasmania with *Omalotheca supina* from the Northern Hemisphere.

Methods and Material

The study was based primarily upon collections in the Tasmanian Herbarium (HO) and material of European *Omalotheca supina* from the National Herbarium of Victoria (MEL). Specimens were selected that had old withered capitula with maturing or mature seeds. Cypselas were taken from the Tasmanian specimens identified as *O. supina* by P. Lewis (KEW), who originally identified this taxon in Tasmania. Cypselas were dissected from the capitulum and three to seven cypselas were placed on aluminium stubs with

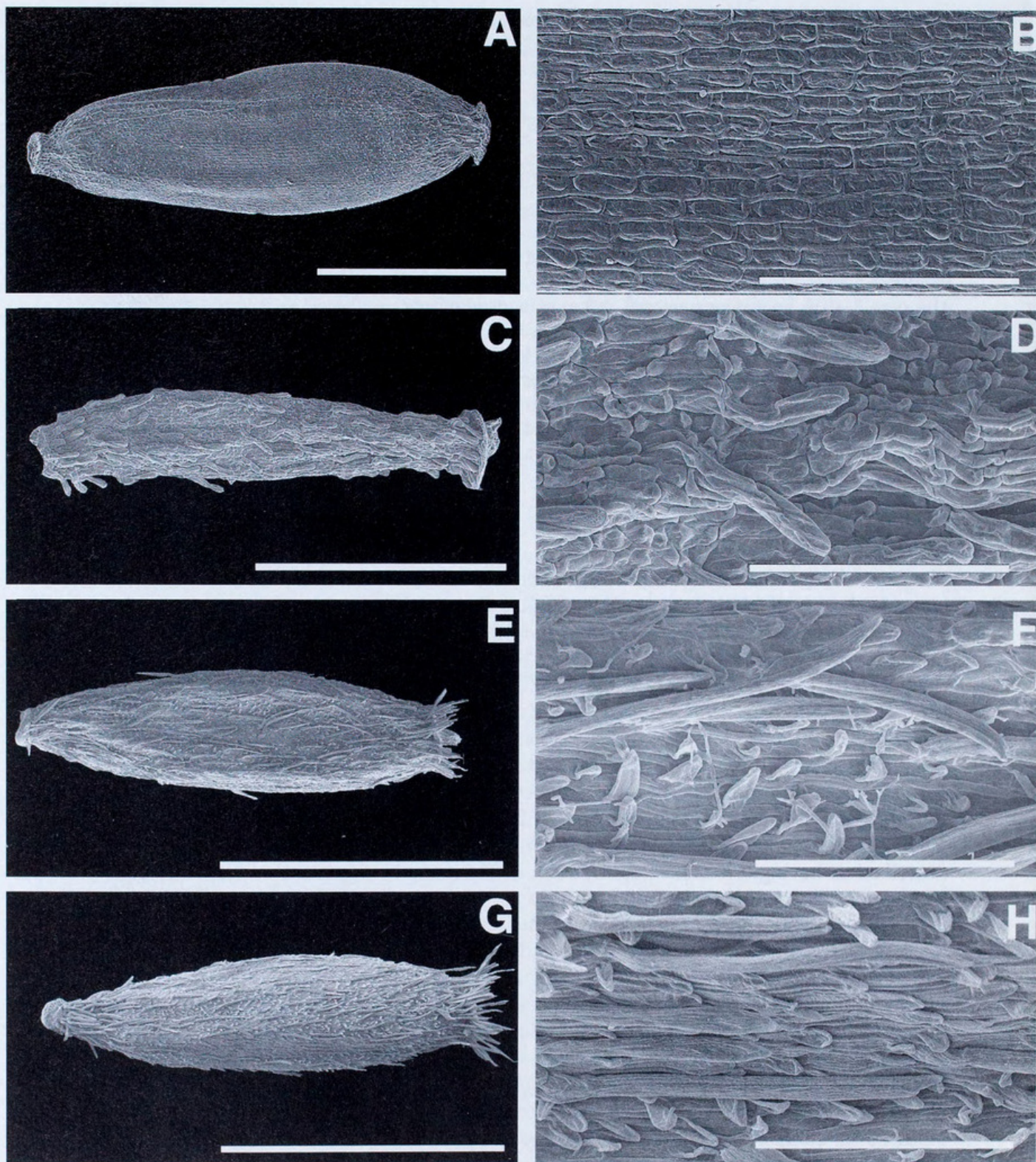


Figure 1. Scanning electron micrographs of cypselas. **A–B** *Euchiton poliochlorus*: **A** Cypselas; **B** Detail of ornamentation of cypselas (W.M.Curtis s.n., HO 52377). **C–D** *Euchiton traversii*: **C** Cypselas; **D** Detail of ornamentation of cypselas (W.M.Curtis s.n., HO 70831). **E–H** *Omalotheca supina*: **E** Cypselas; **F** Detail of ornamentation of cypselas; **G** Cypselas; **H** Detail of ornamentation of cypselas (Dovre, Norvegiae (Norway), ex hb. w. sonder, C.J.Lindberg). Scale bars: **A** 500µm; **B, D, F, H** 100µm; **C** 450µm; **E, G** 1mm.

double-sided tape. The cypselas were oriented in either dorsal, ventral or lateral views. The stubs were sputter coated and examined with a SEM in high vacuum mode at 10–15 kv. The descriptive terminology used by Anderberg (1991) to describe the micro morphological characters will be used.

CYPSELA MORPHOLOGY

European specimens

***Omalothea supina* (L.) DC.** (Figs 1 E–H).

Cypselas elliptical/ovate in shape, c. 1.4 mm long, c. 0.4 mm wide, with a distal fringe of hairs. Epidermal cells, longitudinally arranged, rectangular in shape, have straight to slightly sinuous cell walls. Hairs large conspicuously paired, antrorse, apex acute, prominent furrow, surface finely striated. Single papillae with pointed apex overlaps the distal cell margin of the adjoining epidermal cell.

Material examined: Dovre, Norvegiae (Norway), Ex hb. W Sonder, *C.J.Lindberg* c. 1874 (MEL); Poturages alpins du Lautaret, Daphne, France; identified E. Casson, 10. viii. 1860 (MEL); Near (?Tyndrum), Perthshire, 3000', England, 31. xi. 1883, ex herb. J.T.H. Groves (MEL).

Notes: The cypselas of the European material examined are consistent in morphology. Drury (1970) recorded that the cypselas of *O. supina* (Northern Hemisphere) had hairs and imbricate papillae. This study has shown that the cypselas have antrorse hairs have an acute apex and are conspicuously furrowed. A single pointed papilla occurs on each epidermal cell, and this arrangement of papillae gives the imbricate appearance alluded to by Drury (1970). Drury (1970) identified group of species with "imbricate papillae," that have since been referred to *Omalothea*; eg. *O. supina*, *O. sylvatica* (L.) Schulz-Bip. & F.W. Schulz and *O. norvegica* (Gunn.) Schulz-Bip. & F.W. Schulz.

Tasmanian specimens

The Tasmanian material differs from the Northern Hemisphere specimens in lacking the distal fringe of hairs on the cypselas, and also the pointed conspicuously paired hairs with a prominent longitudinal furrow. Two species, *Euchiton poliochlorus* and *E. traversii*, are represented in the material identified as *G. supinum* in the Tasmanian Herbarium.

***Euchiton poliochlorus* N.G.Walsh** (Figs 1 A–B)

Cypselas elliptical/ovate in shape, c. 1.2 mm long, c. 0.4 mm wide, lacking a distal fringe of hairs. Epidermal cells longitudinally arranged with straight walls. Hairs absent. Papillae a slight rounded single bulge towards the distal end of the epidermal cell.

Material examined: Tasmania: Cradle Mountain Reserve, 41°41'S 145°57'E, between tussocks of button grass, altitude c. 1050m, W.M. Curtis s.n., 8. iii. 1949 (HO 52377); Waldheim, Cradle Mountain 41°38'S 145°56'E, in button grass, W.M. Curtis s.n., 8. iii. 1949 (HO 11324).

Notes: The cypselas of this Tasmanian species lack hairs on the epidermal cells or conspicuous papillae and this taxon is clearly distinct from *O. supina*. These specimens have been recently described as *Euchiton poliochlorus* (Walsh 1999).

***Euchiton traversii* (Hook. f.) Holub** (Figs 1 C–D)

Cypselas probably elliptical in shape, c. 1.0 mm long, c. 0.1 mm wide, lacking a distal fringe of hairs. Epidermal cells longitudinally arranged, straight cell walls. Hairs antrorse, with rounded apices, surface smooth. Papillae rounded, occurring in pairs, near the distal and proximal cell walls of the epidermal cells.

Material examined: Tasmania: Wombat Moor, Mt Field National Park, 42°41'S 146°37'E, W.M. Curtis s.n., 4. i. 1948 (HO 70831); Wombat Moor, Mt Field National Park, 42°41'S 146°37'E,

W.M. Curtis s.n., 4. i. 1947 (HO 70786).

Notes: The correct name for these specimens has been unclear, although they are currently being referred to *E. traversii* (Paul Wilson, pers. comm.). The cypselas are not mature in the collection studied (HO 70831), and they have partially collapsed and are distorted and interpreting their original shape is difficult. They differ from those of *Omalotheca supina* (Northern Hemisphere) in having paired papillae on each epidermal cell, which was considered a synapomorphy for *Euchiton* (Anderberg, 1991). The hairs on the cypselas of *E. traversii* also have a rounded apex, lack a prominent longitudinal furrow and also fine striations, and they are shorter than those of *Omalotheca supina*. The cypselas of *E. traversii* also lack a distal fringe of hairs.

Discussion

This study demonstrates morphological differences between cypselas of *Omalotheca supina* from the Northern Hemisphere and the Tasmanian material referred to this taxon. *Omalotheca supina* (as *Gnaphalium supinum*) was listed as rare in Schedule 5 of the Tasmanian Threatened Species Protection Act (1995). This study demonstrates that the specimens previously referred to *O. supina* from Tasmania were misidentified, and the species should be delisted from the Act.

The study of cypselas also shows that the Tasmanian material previously assigned to *Omalotheca supina* consists of two taxa, *Euchiton poliochlorus* and *E. traversii*. The cypselas morphology of these two species is illustrated and demonstrates that the cypselas can be used to identify species. Assuming that the cypselas are mature, the study would suggest that not all species of *Euchiton* have paired imbricate papillae which was considered by Anderberg (1991) to be a synapomorphy for the genus.

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