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State Herbarium of South Australia
PO Box 2732
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**TAXONOMIC STUDIES IN
EUPHRASIA L. (SCROPHULARIACEAE).
V. NEW AND REDISCOVERED TAXA, TYPIFICATIONS,
AND OTHER NOTES ON THE GENUS
IN AUSTRALIA**

W.R. Barker

State Herbarium, Botanic Gardens,
North Terrace, Adelaide, South Australia 5000

Abstract

A new species *E. amphisysepala* W.R. Barker is distinguished within Sect. *Phragmostomae*; it occurs within a few kilometres of its closest ally *E. phragmostoma* W.R. Barker. The circumscription of the extinct *E. arguta* R. Br. is expanded on the basis of additional collections seen from the last century. The discovery of several taxa believed extinct or rare in all or part of their range, two probable hybrids, and unusual collections indicating taxonomic problems requiring investigation are documented. Further types of 16 names have been located since the publication of a revision of the genus in Australia in 1982, leading to the recognition of two holotypes and three lectotypifications. Additional synonymies and misapplications of names are provided.

Introduction

The publication of a revision of *Euphrasia* in Australia (Barker 1982) has prompted interest from a number of ecologists, conservationists and naturalists in resolving some of the problems raised. This paper presents the results of some of their efforts to date.

In addition, a number of typifications dealt with in Barker (1982) have had to be reassessed. A visit to Europe in 1985 provided the opportunity to examine the holdings of Australian *Euphrasia* in many herbaria. All too often important material had been omitted from loans requested for the original revision. Fortunately, no lectotypification has had to be rescinded. In some cases a preferable syntype has been found, e.g. in the case of *E. multicaulis* Benth. in Bentham's herbarium at K. However, in such cases the existing lectotype has been maintained as, in accordance with Article 8 (ICBN), it is not in serious conflict with the protologue. Nevertheless, some new lectotypifications have had to be made where no types or only a single type had been seen before. The additional material seen has also enabled an assessment to be made of the affinities of two old names proposed by Bentham (1846) for which no type material had been previously seen, while it is now possible to reassess the circumscription of *E. arguta* R. Br., an apparently extinct species poorly collected in the past.

This is the fifth in a series of papers on the taxonomy of *Euphrasia*, the others being Barker (1982, 1984, 1985), Barker & Christensen (1984) and Barker, Kiehn & Vitek (in preparation). Important corrigenda for Barker (1982) are given in *J. Adelaide Bot. Gard.* 7 (2) (1985) 216.

The chapters and sections of text within them are cross-referenced to the 1982 revision of the genus and arranged roughly in the order that the taxa they relate to appear there.

**A review of Sect. *Phragmostomae* of south-eastern Tasmania
(Barker 1982, p. 102)**

A suite of collections by Mr P. Collier from the top of the cliffs lining Fortescue Bay on the Tasman Peninsula, south-eastern Tasmania, has confirmed the existence of a second species of Sect. *Phragmostomae* at Cape Hauy. This location is only a few kilometres from each of the two nearest known populations of its closest ally *E. phragmostoma* W.R. Barker. One of these

populations is on the northern perimeter of Fortescue Bay, the other is further south at Cape Pillar. Despite the proximity and similar cliff habitats of the two taxa, the morphological differences are so many as to place no doubt on their distinction as species. In addition to the description of the new species, amendments to the description of *E. phragmostoma* are given which exclude the specimen of the new species encompassed in the protologue (Barker 1982) and which cover material collected since then.

The branching pattern of the additional specimens of the two species confirms the development of branches at spaced groups of nodes in Sect. *Phragmostomae*. Whole first-year plants now available (*E. phragmostoma*: Collier 1693, 1694; *E. amphisysepala*: Collier 1688) have an erect stem which develop branches in small groups of nodes as in subsequent seasons (Fig. 1A). Subsequent growth is as described in Barker (1982) with the existing main axes usually becoming procumbent and branching continuing on the main laterals. However Collier

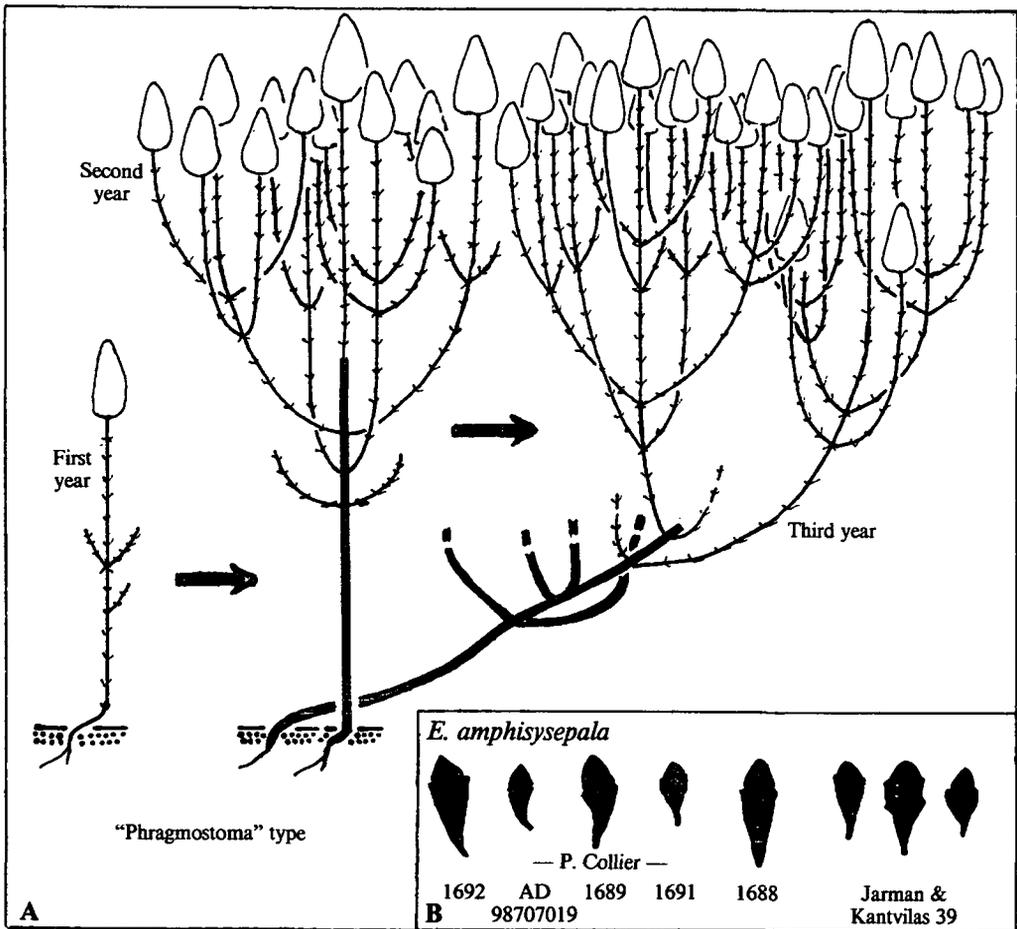


Fig. 1. A. The "Phragmostoma" habit type. (Inflorescences are represented by an oval outline; branches of current year by fine lines, those of prior years by thick lines; nodes are shown as fine transverse lines on current year's branches). It is uncertain if the procumbent axes shown for later years occur in *E. amphisysepala*. B. Uppermost leaves of main inflorescence-bearing branches, actual size, dried, of *E. amphisysepala*.

1694 shows an excellent example, additional to that noted in Barker (1982), of the stem remaining erect and continuing to develop beyond the fruiting nodes of the first year, finally producing a fully-formed inflorescence. The sequence of branching seems generally not to be strictly basipetal.

Key to the species of Sect. *Phragmostomae*

- 1a. Lobes on either side of calyx distinct at apex, the cleft between 0.5-2.0 mm deep. Glandular hairs present on calyces, bracts, rachises, leaves and branch axes, 0.1-0.5 mm long. Uppermost leaves 5-8 (10) mm wide. Corolla 14-24 mm long along upper side, with striations lacking or 3 short striations behind lateral lobes of lower lip, lacking elsewhere. Anthers 2.3-3.0 mm long, with rearmost awns (1.5) 2.5-3.2 mm long, erose or flattened and twisted at tip 1. *E. phragmostoma*
- b. Lobes on either side of calyx completely fused or slightly separated at very apex, the cleft between 0-0.3 (0.6) mm deep. Glandular hairs lacking from calyces, bracts, rachises, leaves and branch axes, except around median clefts of calyx where 0.03-0.1 mm long. Uppermost leaves 3.4-5.5 mm wide. Corolla 11-16 mm long along upper side, with conspicuous striations extending well out onto each lobe of lower lip and to a lesser extent onto upper lobes. Anthers 1.8-2.5 mm long, with rearmost awns 1.0-2.2 mm long, sharp, straight 2. *E. amphisysepala*

1. *E. phragmostoma* W.R. Barker, J. Adelaide Bot. Gard. 5(1982)103, p. maj. part. (excl. Jarman & Kantvilas 39)

The following amendments are made to the previous description. Characters not mentioned are unchanged.

Much-branched perennial *herb* or undershrub . . . with many ascending branches arising from erect or procumbent stem or main branches of previous years. *Stem* in first year erect or ascending, often subsequently procumbent; *main inflorescence-bearing* branches . . . simple for 0-35 nodes below inflorescence . . . ; *axes* covered by a dense mixture of moderately long to very long glandular hairs and short to moderately long eglandular hairs *Leaves: uppermost* . . . [with] *teeth* (1) 2 along each margin . . . ; *apical tooth* . . . 1-3 x 3-6 mm. *Bracts*: lowermost bracts similar in shape, size and indumentum to uppermost leaves, distal ones progressively smaller, otherwise similar. *Calyx* . . . externally covered by sparse to dense, short eglandular hairs mixed with sparse to dense, short to long glandular hairs . . . ; *lateral clefts* 0.5-2.0 mm deep . . . *Corolla* cream-white, lacking prominent yellow patches or, usually, purple striations (W.M. Curtis pers. comm. 1976; also from colour slides sent by her), rarely (observation of dried material in *Collier 1693*) possibly with short striations behind each of the lateral lower lobes . . . ; *tube* . . . abaxially and somewhat laterally expanded below point of insertion of anterior filaments c. 4.5-8 mm from base of corolla . . . *Stamens* with . . . *anthers* 2.3-3.0 x 1.2-1.9 mm.

Distribution and ecology

E. phragmostoma is now known from two localities on Tasman Peninsula, one at Dolomieu Point, Bivouac Bay just north of Fortescue Bay, the other further south at The Chasm on Cape Pillar. The old Marion Bay locality has yet to be rediscovered.

The new collections have indicated that the species is not confined to the exposed upper edges and faces of the coastal cliffs (Barker 1982), but also near their base. *Collier 1694* is recorded at sea level "emergent from rock crevice at edge of land vegetation and rocky shore", while *Collier 1693*, a plant which, from the remnants of the prior season's fruits, is in its second flowering season, comes from 20 m above sea level in "a locally abundant stand in dense shrub and herb regeneration after recent fire".

Additional specimens examined

TASMANIA. EAST COAST: *Collier 1693, 1694, 4.x.1986*, Dolomieu Point, Fortescue Bay (Storm Bay sheet 793 248) 43°08'S, 147°58'E, HO(2 collections).

2. *Euphrasia amphisysepala* W.R. Barker, sp. nov.

E. phragmostoma auct. non W.R. Barker: W.R. Barker, J. Adelaide Bot. Gard. 5 (1982) 103, p.p. (as to *Jarman & Kantvilas 39*).

Species nova in Sectione *Phragmostomis* foliis subpetiolaribus, habitu ramis principalibus inflorescentigeris ramulos in gregibus dispersis nodorum productentibus, et aristis postremis antherae longissimis posita; ab *E. phragmostoma* pilis glandulosis carentibus, foliis angustioribus dente apicali angustiore, paribus lateralibus sepalorum connatis vel fere ita, et corollis manifeste striatis differt.

Holotypus: S.J. Jarman & G. Kantvilas 39, 17.xi.1979, Tasmania, East Coast region, Cape Hauy, Tasman Peninsula, Lat. 43°09' Long. 148°00', AD 98047536. *Isotypi*: HO (2 sheets).

Much-branched erect to sprawling perennial *herb* or undershrub, to c. 20 or 25 cm tall, with many ascending to erect branches arising from stem and main branches of previous year(s). *Stem* in first year erect, subsequently possibly procumbent; *main inflorescence-bearing branches* 3.5-17 cm long, simple for 0-19 nodes below inflorescence, developing branches in axils of widely spaced groups of 1-4 (5) consecutive nodes, within groups the distal node(s) developing inflorescences; *internodes* shorter than leaves throughout except at base where

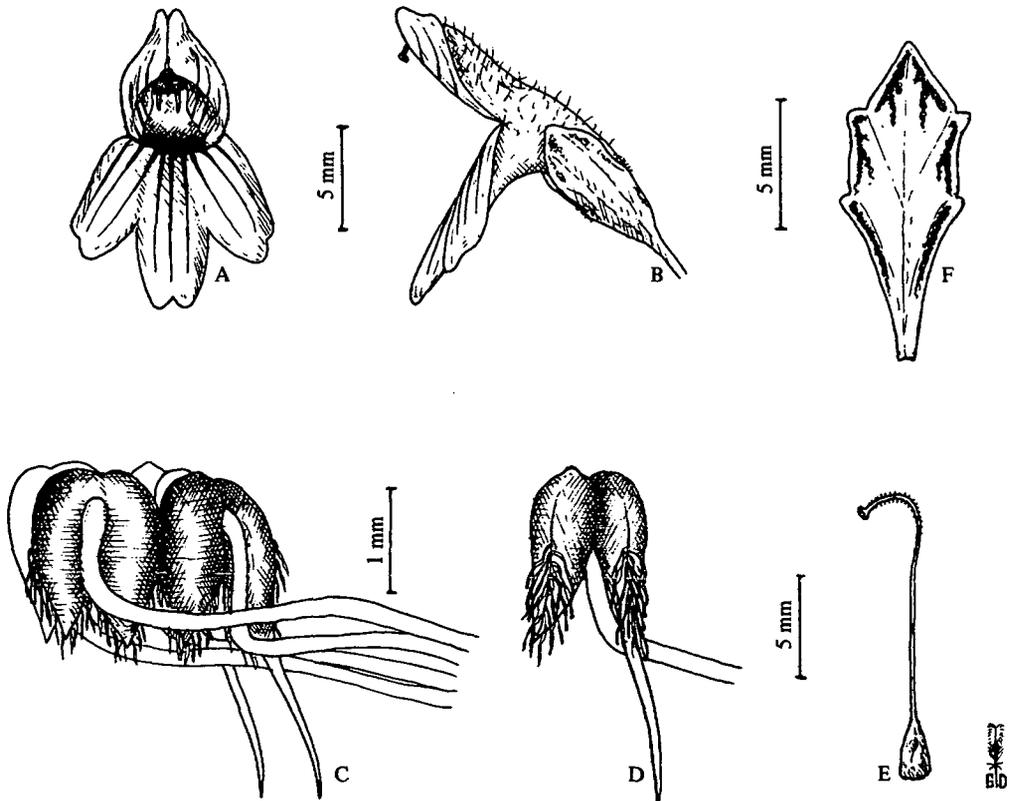


Fig. 2. *Euphrasia amphisysepala* W.R. Barker. A, flower, front view; B, flower, side view; C, external view of anthers from one side of flower, with anterior anther on left; D, internal view of posterior anther; E, lateral view of pistil; F, abaxial view of uppermost leaf of main inflorescence-bearing axis. (A, *Collier 1392*; B-F, *Jarman & Kantvilas 39*).

usually longer; *axes* with 2 rows of dense short eglandular hairs. *Cotyledons* not seen. *Leaves*: *uppermost* leaves of main inflorescence-bearing branches 8.5-15.5 x 3.4-5.5 mm, spatulate, crenulate-serrulate, with sessile gland patches confined to distal c. 0.6-0.75 of undersurface, otherwise glabrous; *base* narrowly long-attenuate, subpetiolate; *teeth* 1-2 along each margin, confined to distal c. 0.24-0.55, bluntly obtuse to acute, the longest tooth 0.2-0.8 mm long; *apical tooth* usually bluntly, sometimes sharply, broad-acute to obtuse or acuminate, 2.2-4.8 x 2.9-4.3 mm; leaves *lower down* more or less similar, towards very base often smaller. *Inflorescences* racemes, moderately dense to dense in flower, the young inflorescences seen with 8-14 flowers, the lowest nodes sometimes with only one flower; *pedicels* at lowest node 1.5-3.3 (4.0) mm long, shorter higher up; *rachis* with indumentum similar to upper part of axis; *apical bud cluster* moderately dense, initially elongated, extended c. 0.3-3 cm above first flower or pair of flowers, becoming hidden by the uppermost flower pair after flowers at first c. 2-4 nodes have reached anthesis. *Bracts*: lowermost bracts similar in size, shape and indumentum to uppermost leaves, distal ones progressively smaller. *Calyx* 6.8-10.2 mm long, externally glabrous but sometimes for a small patch of tiny glandular hairs around the median clefts, internally glabrous, at least sometimes (*Collier AD 9870719*) apart from a few scattered tiny glandular hairs on the lobes; *teeth* bluntly acute if present, the adaxial pair longer than the abaxial, often each lateral pair fused to form a single bluntly acute to bluntly acuminate lateral segment; *lateral clefts* absent to very shallowly broad-emarginate and oblique, 0-0.3 (0.6) mm deep; *median clefts* 3.5-6.3 mm deep. *Corolla* 11-16 mm long along upper side, (from colour of dried material) white, sometimes flushed pink to pale purple around mouth (*Collier 1392*) and possibly sometimes at ends of lower lobes, with 3 conspicuous fine red-purple lines extending well out onto each lower lobe and to a lesser extent onto upper lobes, with yellow patches apparently occurring behind middle lobe (*Collier 1689, 1691, AD 98707019*) and at least sometimes also in tube (*Collier AD 98707019*); *tube* 6-8.6 mm long, narrow cylindrical in basal half, beyond point of insertion of anterior filaments 3.8-6 mm from the base abaxially and somewhat laterally expanded, externally glabrous at very base, distally covered by dense, downturned, short to long eglandular hairs, usually lacking from the upper side, sometimes also lacking from lower side, internally from above ovary to the base of the anterior filaments covered all around by dense, short to long eglandular hairs; *hood* 5-8 mm long, including lobes c. 4-6 mm wide, externally covered by dense, short to long, downturned eglandular hairs, usually absent from sides, sometimes all over, with sparse, very short glandular hairs extending from part of way along sides from base, internally glabrous apart from dense, moderately long to long eglandular hairs mixed with sparse, very short glandular hairs behind sinus; *upper lobes* shallowly emarginate to very shallowly broad-emarginate, glabrous on both surfaces, with the cleft between 0.4-1.2 mm deep; *lower lip* 6.5-9 x 10-15 mm, externally glabrous but for sparse to dense, short to long eglandular hairs behind lateral lobes, usually also with a few, very short glandular hairs on lobes, internally glabrous; *lower lobes* emarginate or shallowly so, the middle lobe sometimes truncate, with clefts between 3-4.8 mm deep. *Stamens* with *filaments* glabrous but for moderately to dense, short to long eglandular hairs at base of anterior pair, the anterior pair 5.9-7.3 mm long, the posterior pair 2.7-5 mm long; *anthers* 1.8-2.5 x 1.0-2.0 mm, with area surrounding *connectives* glabrous, with *slits* lined densely by moderately long to long eglandular hairs, with *awns* smooth and sharp, the anterior three pairs 0.1-0.2 mm long, the rearmost pair 1.0-2.2 mm long. *Ovary* in lateral view elliptic to narrow-ovate, laterally compressed, in median view narrowly elliptic-acuminate to narrowly ovate-caudate, glabrous or with very few short setae towards apex on one or both lines of dehiscence, sometimes also with dense very short setae in upper $\frac{1}{3}$ only on lateral surfaces; *apex* in lateral view broadly acute to obtuse; *ovules* c. 46-70. *Capsules* (from decayed ones of prior year on most specimens) c. 7.0-9.5 x 2.2-3.0 mm, in lateral view obovate to narrowly oblong-elliptic, with indumentum not known; *apex* truncate-obtuse to truncate, possibly sometimes shallowly emarginate; *seeds* unknown. *Chromosome number*: unknown. Figs 1, 2, 3.

Distribution and ecology

E. amphisysepala is known only from a single location at Cape Hauy on the south side of Fortescue Bay on the Tasman Peninsula, southeastern Tasmania.

It is recorded from the edge of the cliffs at 75-100 m altitude overlooking a large "hole" (?chasm) in small soil pockets and on rock faces, sometimes beneath a shrub layer.

From the few specimens seen, flowering occurs at least between late September and December, with another record in May. It is possible that the growing and flowering seasons are not one each year as the inflorescences in each of these months are young, none having developed flowers at more than 3-4 nodes.

Conservation status: 2 ?E. The vicinity of the only known population and similar habitats elsewhere in southeastern Tasmania need to be searched further to determine if further populations of this species (and its ally *E. phragmostoma*) exist.

Specimens examined

TASMANIA. EAST COAST: *Collier 1392*, 25.v.1986, Cape Hauy (Storm Bay sheet 814 226) 43°09'S 148°00'E, HO. — *Collier 1688*, 4.x.1986, Cape Hauy (Storm Bay sheet 814 227), HO. — *Collier 1689*, 4.x.1986, Cape Hauy (Storm Bay sheet 813 225), HO. — *Collier 1691*, 4.x.1986, Cape Hauy (Storm Bay sheet 814 227), HO. — *Collier 1692*, as for 1691, AD, HO. — *Collier s.n.*, 4.x.1986, Cape Hauy [without grid reference], AD 98707019. — *Jarman & Kantvilas 39*, 17.xi.1979, Cape Hauy, Tasman Peninsula, 43°09'S, 149°00'E, AD (holotype); HO (2 sheets).

**The rediscovery of *E. gibbsiae* Du Rietz ssp. *psilantherea* (FvM.) W.R. Barker
(Barker 1982, p. 119)**

A single plant of *E. gibbsiae* ssp. *psilantherea* was collected by P. Collier in October 1985 in the Southport region, south of Hobart, Tasmania. The only dated collection made previously was the type, gathered in 1855 (Barker 1982). Although the importance of the find was not realised until identified subsequently, Mr P. Collier (pers. comm., April 1986) comments that he saw no other plant of the taxon. A further search in early November 1986 was unsuccessful (Mr P. Collier pers. comm., April 1987). The plant was found amongst low sedges in open wet heathland. The location has extensive heath and wetter areas with a few copses of *Eucalyptus* on higher ground. It is designated State Forest and "Southport Lagoon Wildlife Sanctuary" and is entered in the National Estate Register. Mr Collier sees the biggest threat to the habitat being from four-wheel drive recreation vehicles which alone have access. Other areas with similar habitats are likely to occur further south, particularly at a location known as Blowhole Valley. It is imperative that the extent of this subspecies be determined to ensure it survives.

Flower colour of the subspecies is described as white with "black/dark purple striations extending out into the lobes".

Several further old collections of this subspecies were seen in the European herbaria, but none bore additional localities.

Specimen examined

TASMANIA. EAST COAST: *P. Collier 729*, 12.x.1985, NE of Blackswan Lagoon, Southport, (D'Entrecasteux sheet 947 805) 43°32'S, 146°56'E, HO.

**The status of a variant allied in the past to *E. collina* R. Br. s. str.
(Barker 1982, p. 176, 181)**

Du Rietz (1948b) noted two variants under his discussion of the *E. collina* R. Br. of his conception, equivalent to *E. collina* ssp. *collina*. One of these represented by Gunn ⁸⁶³/₁₈₃₇

belonged to *E. collina* ssp. *tetragona* (R. Br.) W.R. Barker (Barker 1982). The two collections in Du Rietz's second variant, *Gunn 1993* and *Gunn 1995*, have now come to light. Both belong to *E. collina* ssp. *diemenica* (Sprengel) W.R. Barker of Tasmania.

In the informal varietal framework proposed in Barker (1982) for this subspecies, *Gunn 1995* from the Central Plateau region resembles *var. G* with large flowers and lacking glandular hairs on the calyx and vegetative parts, which is known from the same region.

Gunn 1993 from St Patricks River is non-glandular and with white, relatively small corollas. It is possibly allied to *var. I* which is a hypothetical taxon represented only by one specimen from Ben Lomond in the same general region. With its subglabrous capsules it would qualify well as the missing parental taxon in the proposed intraspecific hybrid swarm (Barker 1982) on the edge of Ben Lomond massif.

Du Rietz (1948b) noted that *Gunn 1993* had some resemblance to *E. striata* in habit, leaves and anthers. While one specimen has glabrous anther backs, those in one of the other two specimens are densely hairy while in the remaining they are intermediate, possessing just a few hairs. It is unlikely that this is associated with Sect. *Striatae* which has yet to be recorded from north-eastern Tasmania. All other attributes conform well with *E. collina* ssp. *diemenica*.

Specimens examined

TASMANIA. CENTRAL PLATEAU: *Gunn 1995*, 17.i.1845, Arthurs Lakes From the summit of the Western Mts and may perhaps prove similar to some others Nos. — Flowers purple, K (Herb. Hook.). BEN LOMOND: *Gunn 1993*, 16.xi.1844, St. Patricks Riv[er], alt. 1500 ft. Flowers white. I am keeping the species (or vars.) of *Euphrasia* as separate as possible as I believe there are a greater no. of actual species than I formerly thought. The present plant is common in the cold wet country N.E. of Launceston — very abundant at an elevation of about 1500 feet, K (Herb. Hook.).

A specimen allied to *E. collina* R. Br. ssp. *diemenica* (Sprengel) W.R. Barker from eastern Tasmania (Barker 1982, p. 181)

A collection allied to *E. collina* ssp. *diemenica* from St Marys, Tasmania represents a significant eastward extension of range of this group. It is to be linked with this subspecies by its relatively broad leaves with the lateral extensions of the marginal rows of sessile glands usually short, emarginate corolla lobes and apparently decumbent main branches produced only from the base of the plant. The flower is described as "blue". The specimens diverge from ssp. *diemenica* by the long apical bud cluster, thus tending towards ssp. *collina*, which is also not known from this vicinity.

Further collections are needed from the region before the taxonomic significance of the collection can be assessed.

Specimen examined

TASMANIA. EAST COAST: *E. Rees s.n.*, xi.1929, St Marys, K (ex HO).

The glandular subspecies of *E. collina* R. Br. in eastern Tasmania (Barker 1982, pp. 198-204)

Additional collections seen from K and HO indicate that the circumscriptions or diagnostic characters of ssp. *gunnii* (Du Rietz) W.R. Barker, ssp. *deflexifolia* (Gand.) W.R. Barker and a further provisional subspecies based on *E. tasmanica* Gand. among the glandular forms of *E. collina* in eastern lowland to low montane Tasmania may need reassessment.

Collections allied to ssp. *deflexifolia* outside the Freycinet Peninsula, from where the bulk of collections seen for Barker (1982) came, show a tendency to diverge. *Hemsley 6321A* from west of Swanport has the large white corollas and long glandular indumentum of ssp. *deflexifolia*, but has the rather narrow leaves with 1(2) teeth and long anther awns of ssp. *gunnii*.

Further afield to the northwest of Swanport *Moscal 492* tallies well with ssp. *deflexifolia* in the length and density of its glandular indumentum, its apparently white corollas, its short rear anther awns and its densely setose capsules. Its inflorescences are rather fewer flowered than usual for the subspecies, but the branches are clearly depauperate lateral branches. The one major area of divergence is in the narrow 1 (2)-toothed leaves; those occurring on similar lateral branches in similar instances in the Freycinet Peninsula material are broad. With narrow leaves occurring in some plants of *Barker 977* on the coastal flats west of the granitic mountains of the Freycinet Peninsula, it is possible that such leaf forms are associated with the non-granitic soils. *Moscal 492* is noted as growing in the doleritic soils which (Banks 1965) predominate in the region. It had been noted (Barker 1982) that previous collections seen may have been associated with granite which (Banks l.c.) forms a marginal belt along the east Tasmanian coast.

Additional or cited specimens examined

E. collina ssp. *deflexifolia*

TASMANIA. EAST COAST: *W.M. Curtis s.n.*, ix.1948, 42°07'S 148°20'E, Coles Bay, AD (ex HO). — *W.R. Barker 977* (see Barker 1982). — *A. Himson s.n.*, 22.xi.1968, Coles Bay, light *Eucalyptus* forest, K. — *A. Moscal 769*, 10.v.1981, 41°32'S, 148°10'E, North Sister (6 km N of St Marys), rock plates at summit, alt. 700 m, corolla lilac, AD (ex HO).

E. collina aff. ssp. *deflexifolia*

TASMANIA. EAST COAST: *Hemsley 6321A*, 1.xi.1967, 14 miles W of Swansea, open sandy places in open *Eucalyptus* forest, rocky places, flowers white, K. — *A. Moscal 492*, 27.xii.1980, 41°54'S 147°59'E, West Swan River, open forest, open heathy understorey, stony dolerite soils, AD (ex HO).

The rediscovery of *E. collina* R. Br. ssp. *muelleri* (Wettst.) W.R. Barker in Victoria
(Barker 1982, p. 209)

The efforts of the group at La Trobe University studying endangered plants have resulted in the rediscovery of *E. collina* ssp. *muelleri*. This subspecies was known previously mainly from collections from the last century when it was widely distributed in south-east mainland Australia (Barker 1982). As circumscribed by Barker (l.c.) it comprises only those plants of *E. collina* with a short to long eglandular-scabrous to -scaberulous indumentum covering the calyx surface; they also have a characteristic pattern of shooting from the base of the plant. The collections *Scarlett 83-156* and *Scarlett 84/697-699* from Wren's Flat belong to this taxon. *Scarlett 86/473-474* and the majority of specimens in *Scarlett 85/122-125* from near Dromana also belong here, but one of the four plants in the latter has a glabrous calyx.

Variants allied to ssp. *muelleri* but divergent in indumentum were noted in Barker (1982). A representative of the groups with sparse to dense glandular hairs amongst the scabrous or scaberulous indumentum of the typical variant has been located south of Arthurs Seat on the east side of Port Philip Bay (*Eichler AD 98709096*). It also shows the branching pattern characteristic of ssp. *muelleri*.

Among other collections made in the course of the La Trobe University work* are a number of small samples of populations of *E. collina* from various parts of montane and lowland Victoria. A high proportion of these show a tendency for break-down of the diagnostic limits recognised in Barker (1982) for ssp. *collina*, ssp. *paludosa* (R. Br.) W.R. Barker, ssp. *trichocalycina* (Gand.) W.R. Barker and ssp. *muelleri*. For the 1982 revision modern collections from Victoria were limited and field work in the State was restricted to the Grampians and the summer-flowering,

*The principal duplicate of all *Euphrasia* collections made under this project presently at La Trobe University will ultimately be transferred to MEL (Mr N.H. Scarlett pers. comm., April 1987).

higher montane populations of the eastern highlands. A number of problems of delimitation of these subspecies were indicated and it is now more apparent that field studies are needed to ascertain whether the existing infraspecific framework is a natural one and whether factors of introgression are involved.

Specimens cited

E. collina ssp. *muelleri*

VICTORIA. EASTERN HIGHLANDS: *Scarlett 82-156*, 16.xi.1982, *84/697-699*, 12.xii.1984, Lower slopes of the spur east of the Mitchell's Flat track, immediately south of the Jamieson River, at Wren's Flat, 37°20'45"S 146°22'20"E, 740 m a.s.l., AD (ex LTB). EASTERN COASTAL PLAINS: *Scarlett 85/122-125*, 29.ix.1985, Junction Rd., approx. 9 km east of Dromana: 0.4 km south by road of the Myer's Road/Junction Road intersection, 145°03'E 38°21'S, approx. 200 m a.s.l., AD (ex LTB). — *Scarlett 86-473, 86-474*, 15.xii.1986, as for *Scarlett 85/122-125*, AD (all material).

E. collina aff. ssp. *muelleri*

VICTORIA. EASTERN COASTAL PLAINS: *Eichler s.n.*, 7.x.1985, Mornington Peninsula, Seamists Drive, approx. 4 km south of Arthurs Seat: 44 m north of the road at a point 0.3 km west of the Seamists Drive/Purves Road junction, 144°58'E 38°22'S, 260 m a.s.l., AD (ex LTB).

New South Australian records of *E. collina* R. Br. ssp. *osbornii* W.R. Barker (Barker 1982, p. 218)

Three new populations of this rare South Australian subspecies have been located in recent years. One occurs at the foot of Fleurieu Peninsula in Deep Creek Conservation Park (*Meyers AD 98346073*). Another represents its most southerly mainland record (*Carpenter AD 98709001*); the land on which it was found is privately owned, has had a clearance application refused, and is currently subject to negotiation for conservation under Heritage Agreement. Both these collections were made casually, their importance being realised only subsequently. As a result the extent of the populations and their habitat is unknown.

The third new population (*Lang D8902*) was from near Clare, about 1 km from the Clare Cemetery from which the collection *Bates 803* was made in 1980. This new location on a council reserve contained over 200 individuals growing in low *Eucalyptus leucoxylon* woodland with an open understorey of grasses, herbs and low shrubs on the upper slopes of a hill. The area had been burnt in recent times.

Further collections made or seen since the last documentation of the subspecies (Barker 1982) have verified the continued existence of populations, more accurately defined their location or added also to the list of former localities of the subspecies.

Specimens examined

SOUTH AUSTRALIA. NORTHERN LOFTY: *Hinterocker s.n.*, s. dat., Sylv[aticae] Sevenh[ills], W7932. — *Lang D8902*, 23.x.1984, Section 461, Hundred of Clare, ca. 2 km WSW Clare, AD. YORKE PENINSULA: *W.R. Barker 5418*, *R.M. Barker, J. Short*, 7.ix.1986, Remnant patch of Stansbury Scrub, 10 km direct ESE of Minlaton, c. 0.4 km S of main Minlaton-Stansbury road, 34°49'S 137°41½'E, AD. SOUTHERN LOFTY: *Bates 3605*, 1.x.1977, sphagnum bog near Myponga, AD. — *Brown s.n.*, ix.1948, Cape Jervis, AD. — *Meyers s.n.*, 1.x.1983, Deep Creek Conservation Park, on track ca. 100 m from Black Bullock Road towards Deep Creek, AD 98346073. — *Riedel s.n.*, 6.x.1945, Mt Compass, AD 98023153. SOUTH-EASTERN: *Carpenter per Lang s.n.*, 12.xii.1986, Section 33, Hundred of Strawbridge, 12 km SE of Coonalpyn, private property of K.M. & D.B. Lutze, AD 98709001.

The rediscovery of *E. scabra* R. Br. in montane southeastern Australia
(Barker 1982, p. 270)

As a result of investigations of endangered species being undertaken at La Trobe University, Mr N.H. Scarlett and his colleagues have located in the Victorian Alps populations of *E. scabra* and also of the allied form discussed by Barker (1982) which approaches *E. caudata* (J.H. Willis) W.R. Barker. Both are reported to occur as distinct populations in the region, with no evidence in Mr Scarlett's view or from his collections of intergrading specimens. Field study seems desirable for as many populations as can be located before a taxonomic solution is proposed for the allied form. Mr N.H. Scarlett (pers. comm., April 1987) reports further collections of typical lowland *E. scabra* from the other side of the Dividing Range (*M.J. Bartley* 57, 58 & *Scarlett*, 11.ii.1987, Victoria, Eastern Highlands, beside the western approach track to King Spur, 3 km W of Mt Koonika, approx. 50 km E of Mirimbah, MEL). There was not time for me to examine these before going to press. These populations are the first records of these taxa from mainland southeastern Australia in many years, and it is imperative that they be conserved while there are so few known.

Specimens examined

E. scabra R. Br.

VICTORIA. EASTERN HIGHLANDS: *Beardsell s.n.*, 6.iv.1985, Little Bog Creek, approx. 20 km east of Bendoc (direct) between 0.5 & 1.5 km south of the track crossing near the N.S.W. border, 149°06'E 37°10'S, 830 m a.s.l., AD (ex LTB). — *Parsons* 600, 18.ii.1986, Mundy Plain, 17 km NW of Gelantipy, AD (ex LTB). — *Scarlett* 84-136, 17.ii.1984, East branch of the Delegate River, above 'the forks', approx. 10.5 km south of Bendoc (direct), 37°14'30"S 148°55'E, 880 m a.s.l., AD (ex LTB). — *Scarlett* 84-160, s. dat., as for 84-136, AD (ex LTB). — *Scarlett* 85-48, 85-50, 85-51, 19.ii.1985, Little Bog Creek, 19 km ESE of Bendoc (direct), 37°10'S 149°06'E, 830 m a.s.l., AD (ex LTB). — *Scarlett* 86-79, 86-81, 11.iii.1986, Bentley's Plain, Nunning Plateau, 18 km NNE of Ensay, 147°55'E 37°14'S, 1600 m a.s.l., AD (ex LTB).

E. scabra R. Br. ssp. '*large-flowered*'

VICTORIA. EASTERN HIGHLANDS: *Scarlett* 84-110, 84-111, 5.ii.1984, West side of unnamed creek running off Bucketty Plain, 36°58'20"S 147°21'10"E, AD (ex LTB). — *Scarlett* 84-118, 5.ii.1984, West side of Clearwater Creek, below Bucketty Plain, 37°57'S 147°21'15"E, AD (ex LTB). — *Scarlett* 84-214, 19.iii.1984, as for 84-111, AD (ex LTB).

***E. arguta* R. Br.: two species or one?**
(Barker 1982, p. 282)

In the revision of the genus in Australia (Barker 1982) it was thought possible that two species may have been confused under the name *E. arguta* R. Br. Both Bentham's (1846, 1868) and Wettstein's (1896) descriptions were discordant with the specimens available to me.

In 1985 a number of additional collections of *E. arguta* were located. Amongst these were material seen by Bentham and the Hügel collection in W used principally by Wettstein (1896) in drawing up his description.

After an analysis of the length, distribution and density of glandular and eglandular hairs on the plant, the capsule apex and indumentum, the length of the calyx, bract and leaf teeth, and the length of the rearmost anther awns, it is concluded that all the material belongs to one species, variable in these attributes.

The following is an amended description.

Erect brittle annual *herb*, (17) 20-35 (45) cm high. *Stem* to base of inflorescence (12) 13-28 (33) cm tall, bearing (13) 15-28 (30) pairs of leaves, with axillary branches developing from (1) 2-11 (12) nodes above cotyledons to 1-2 (5) nodes below inflorescence, rarely

(Crawford 577, one of four plants; Brown BM, lecto) with an extra shoot along underside of branch in axils of upper leaf pair; *branches* flowering later than stem, developing in basipetal sequence, lower branches bearing 3-c. 13 leaf pairs, uppermost pair bearing 0-4 (5) leaf pairs, with usually all, otherwise most, leaf pairs subtending shoots sometimes developing into inflorescence-bearing branches; *axes* in upper parts covered equally all around by moderately to very dense, short to moderately long downturned eglandular hairs, often dense on young shoots, sometimes mixed with moderately long to long glandular hairs, the indumentum somewhat sparse to very sparse lower down stem. *Cotyledons* caducous. *Leaves*: uppermost stem leaves in outline ovate to elliptic, often broadly so, pinnatifid-serrate to deeply pinnatifid, (6.8) 7.5-12.5 (14.5) x (3.5) 4.0-12.0 (13.0) mm, very sparsely to densely eglandular-scaberulous, sometimes sparser rarely glabrous on lower side, sometimes with scattered to moderately dense, tiny to long glandular hairs, rarely densely scabrous on upper surface and margins, with blade lanceolate to elliptic or narrowly so, with margins recurved; *base* rounded-cuneate to narrowly cuneate; *teeth* 2-3 (4) along each margin, sharply acuminate to long acuminate with longest (1.2) 1.5-4.8 (5.5) mm long; *apical tooth* (2.7) 3.1-6.0 (7.5) mm long, sharply acute to long acuminate; *lower leaves* similar to upper leaves, sometimes with somewhat longer scabridity or broader blades with shorter teeth; leaves in similar positions on *branches* similar but somewhat smaller. *Inflorescences* dense racemes, with that of stem producing (30) 50-90 or more flowers, those of branches somewhat fewer; *rachis* of same pilosity as upper stem; *internodes* sometimes elongating after anthesis, the capsules extending well past or just reaching node above; *pedicels* (0.2) 0.3-0.5 (1.1) mm long, remaining the same length after anthesis; *apical bud cluster* rounded to broadly bluntly conical, up to 1.5 cm long, emergent above flowers even after many flowers are produced. *Bracts* similar in dimensions to upper leaves, with blade usually broader with shorter teeth, rarely narrower with longer teeth (Hügel W), usually moderately to densely scaberulous, often also bearing tiny to moderately long, scattered to moderately dense glandular hairs, rarely densely scabrous. *Calyx* (5.0) 5.5-7.0 (8.2) mm long, externally usually densely scaberulous, usually also bearing scattered to moderately dense glandular hairs 0.03-0.2 mm long, rarely densely scabrous, internally bearing sparse to dense, very short to moderately long, appressed upturned eglandular hairs mixed with sparse to dense, very short glandular hairs, the indumentum on the teeth shorter or sometimes lacking; *teeth* sharp-tipped, usually very narrowly acuminate, sometimes narrowly acute; *lateral clefts* 2.0-3.7 (4.0) mm deep, shorter than the *median clefts* which are (2.6) 3.0-5.2 (6.3) mm deep. *Corolla* 10.0-13.5 (14.0) mm long along upper side, with lower side \pm broadly grooved, white or lilac and (Brown unpubl.) with yellow area on lower side of mouth; *tube* 6.7-8.3 (8.5) mm long, laterally and somewhat medianly narrowly broadened from below bases of anterior filaments, which are (3.0) 4.0-5.8 (6.0) mm from base of corolla, externally glabrous at base, distally covered by dense, moderately long to long eglandular hairs, usually with dense patch of short glandular hairs behind lateral cleft extended towards base of anterior filaments, internally glabrous to summit of ovary, distally covered by dense, short to long, downturned eglandular hairs up to bases of posterior filaments; *hood* 3.0-5.0 (5.5) mm long, covered externally by dense, moderately long to long eglandular hairs, sometimes mixed with dense, very short glandular hairs on sides, internally with moderately long to long flexuose eglandular hairs, dense at sinus, sparser above anthers, and usually lacking proximally, often mixed with very few to moderately dense, very short glandular hairs, with *upper lobes* usually obtuse, sometimes acute or shortly apiculate, with front glabrous or covered by moderately dense to dense, very short to short eglandular hairs, with rear usually covered by sparse to dense, short to long eglandular hairs, rarely glabrous, with margins lined by moderately to dense, short to moderately long eglandular hairs, with cleft between (1.0) 1.2-2.3 (2.5) mm deep; *lower lip* (4.5) 5.0-7.0 (9.0) x (8.2) 8.6-12.5 (13.0) mm, \pm flat cross-wise, apparently distally bent downwards, always longer than upper lip, externally covered by dense, moderately long to long eglandular hairs, internally covered behind lobes by sparse to dense, short to moderately long eglandular hairs, on lobes usually sparser and shorter,

sometimes lacking, with margins lined by moderately dense to dense, short to moderately long eglandular hairs, with *lower lobes* broadly obtuse, sometimes praemorse or slightly apiculate, with clefts between (2.0) 2.2-3.5 (5.0) mm deep. *Stamens* with *filaments* glabrous but for sparse to dense, short to very long eglandular hairs on anterior pair in lower half to at base only, anterior pair (4.0) 4.5-6.3 (6.5) mm long, posterior pair (1.7) 2.0-3.6 mm long; *anthers* (0.9) 1.3-1.6 (1.7) x (0.6) 0.8-1.2 mm, with *connectives* of anterior pair surrounded by sparse to dense, long flexuose eglandular hairs, less or equally as hairy as those of posterior pair which bear dense long eglandular hairs, with rearmost pair of *awns* (0.2) 0.3-0.4 (0.5) mm long, longer than the three anterior pairs. *Ovary* laterally compressed, in lateral view narrowly ovate to elliptic or oblong-elliptic, glabrous but for dense antrorse setae in apical $\frac{1}{8}$ - $\frac{1}{3}$, long at very apex, very short to short below; *apex* in lateral view usually acute or somewhat shortly acuminate, rarely obliquely obtuse; *ovules* c. 35-80. *Capsule* laterally compressed, in lateral view usually obovate-elliptic to oblong-elliptic or obliquely so, sometimes ovate-elliptic, 4-7 (7.5) x (1.5) 1.8-2.5 (3.2) mm, usually with setae, moderately to dense over upper $\frac{1}{4}$ - $\frac{1}{2}$ and dense along upper $\frac{1}{3}$ - $\frac{2}{3}$ of lines of dehiscence, short to long at apex, shorter lower down, sometimes glabrous but for a few setae at very apex; *apex* in lateral view usually acute to obtuse, sometimes acuminate or obliquely so; *seeds* (8) 23 (50), usually \pm oblong-ellipsoid, sometimes broadly so, (0.4) 0.6-0.8 (1.0) x (0.3) 0.4-0.6 (0.9) mm. *Chromosome number*: unknown. Figs. 5, 7.

Additional specimens examined

NEW SOUTH WALES. NORTH COAST: *R. Brown* s.n., 1802-1805, Hunter's River, BM (lectotype). — *R. Brown* s.n., s. dat., Paterson's River, K p.p. (syntype, probable isolectotype). NORTH-WESTERN SLOPES: *Boorman* s.n., vi.1904, Nundle, E. CENTRAL COAST: *Anon. s.n.*, s. dat., Port Jackson, Blue Mountains, BM. — *Hügel* s.n., s. dat. [prior 1824], prope Port Jackson, M 2923. CENTRAL TABLELANDS: *Anon. s.n.*, s. lat., Blue Mountains, K (Herb. Hook.) p.p. — [*A. Cunningham* 229, 1817, Bathurst Plains, BM. — [*A. Cunningham*] s.n., s. dat., Bath[ur]s], K (Herb. Hook.) p.p. — *A. Cunningham* $\frac{229}{1817}$ p.p., iv.1817, in the open forest country around Bathurst (the western

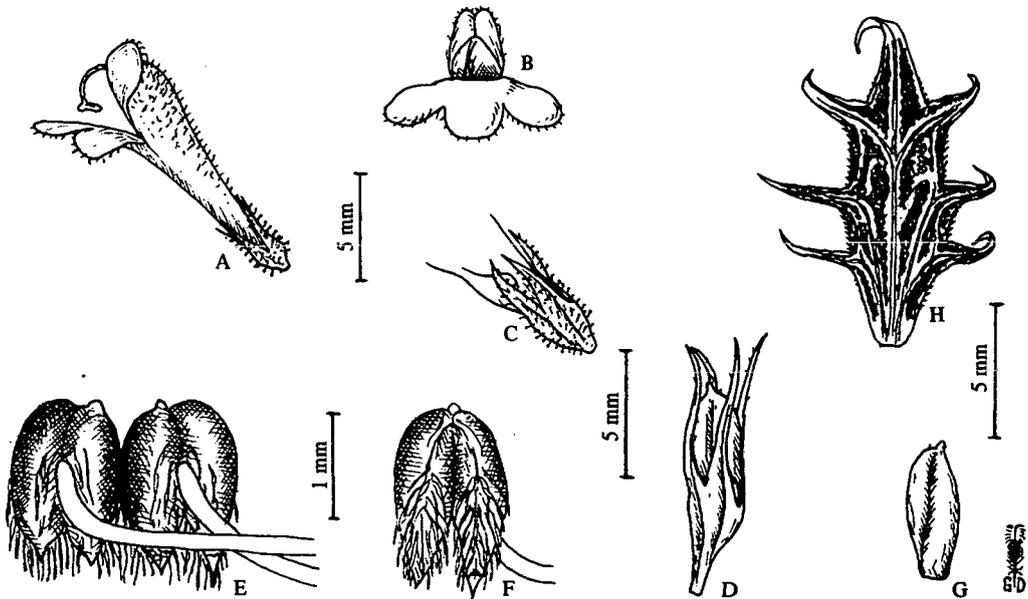


Fig. 5. *Euphrasia arguta* R. Br. A, side view of flower; B, front view of flower; C, oblique side view of base of flower of variant with calyx bearing glandular hairs; D, similar view of fruit with subglabrous calyx; E, external view of anthers; F, internal view of anterior anther; G, capsule in lateral view; H, abaxial view of uppermost leaf of main inflorescence-bearing axis. (A-C, E-H, Sieber 490W; D, Boorman s.n. E).

settlement) in subhumid places, flores albi, K p.p. — *A. Cunningham s.n.* (p.p.), s. dat., Bathurst plains, K (Herb. Hook.) p.p. — *Fraser s.n.*, s. dat., [Fo]und on the grassy country near Bathurst & Flowers in March, [Petals] white, BM. — *Urville* 7, s. dat., Bathurst, P. CENTRAL WESTERN SLOPES: *Woolfs s.n.*, s. dat. (prior 1868), Mudgee, K p.p.

AUSTRALIA. WITHOUT SPECIFIC LOCALITY: *R. Cunningham s.n.*, s.dat., N. Holld., CGE (Herb. Lindley) p.p. — *Hügel s.n.*, s. dat., Australasia orient., W. — *Sieber 490 p.p.*, *Sieber 490 p.p.* *Euphrasia n.* [5]76, s. dat., F[lor]a Novae Holl[andiae], W s.n., W 300499 p.p., W (reg. Berol.), K p.p., K (Herb. Benth.), E p.p., M 2906.

**A further example of hybridism between *E. striata* R. Br.
and *E. collina* R. Br. ssp. *diemenica* (Sprengel) W.R. Barker
(Barker 1982, p. 287)**

A single specimen in K from Tasmania has the habit and leaves of *E. collina* ssp. *diemenica* and the glabrous anther backs of Sect. *Striatae*. The pollen from two flowers was examined, one showing little but mostly functional pollen (voucher slide PS 407 in AD), the other showing a large proportion of small malformed and often empty grains (PS 408). It is likely that the specimen is of hybrid origin. Because it lacks glandular hairs it is likely that *E. striata* is the other parent.

Specimen examined

TASMANIA. WITHOUT LOCALITY: *Anon. s.n.*, s. dat., V.D.L., K (Herb. Hook.) p.p.

**A probable hybrid between *E. orthocheila* W.R. Barker ssp. *orthocheila*
and *E. ciliolata* W.R. Barker
(Barker 1982, p. 287)**

A collection of a single annual plant dating from prior to 1868 (it was seen by Bentham for his 'Flora Australiensis' treatment) from near Tenterfield, New South Wales has characteristics of both *E. orthocheila* ssp. *orthocheila* and *E. ciliolata*, taxa which are also known from this region. It has the very short glandular hairs, dense and 0.02 mm long on the calyx, small calyces, narrow-linear leaves with 1 pair of teeth and small, densely setose capsules of the former species. From the dark brown colour of the dried corolla and anthers the corolla was not yellow (see Barker 1982) and was probably lilac rather than white, a characteristic of the latter. Both species have the densely scaberulous indumentum and basipetal branching pattern with many axillary shoots seen in the specimen. An examination of the pollen shows it to be almost completely sterile (PS405, 406).

Specimen examined

NEW SOUTH WALES. NORTHERN TABLELANDS: *C. Stuart s.n.*, s. dat., Nr. Tenterfield, K.

Typification, affinities and status of two names

E. alpina R. Br. γ . *angustifolia* Benth. in DC., Prod. 10 (1846) 553 (= *E. collina* ssp. *collina*: Barker 1982, p. 176).

Lectotypus hic designatus: *R. Gunn 1219*, s. dat., Tasmania, Hobart, K (Herb. Benth.). — *Isolectotypus et syntypus probabilis*: *Gunn* ¹²¹⁹/₁₈₄₂, s. dat., V.D.L., Hobart. There seem to be many more species of this genus than I at first supposed. The present is from the hills about Hobart Town. K (Herb. Hook). — *Isolectotypi sed non syntypi probabiliter*: *Gunn* ¹²¹⁹/₁₈₄₂, 23.x.1839, Hobart, CGE (Herb. Lemann). — *Gunn 1219*, s. dat. Hobart Town, CGE (Herb. Lindley) p.p.

In 1985 several syntypes and isosyntypes were located. They apparently all belong to the one collection under Gunn's species number 1219. The dates 1842 on most specimens and 1844 on labels in the Bentham herbarium refer not to date of collection but to the year of shipment in the former case (Burns & Skemp 1961) and presumably the year of acquisition in the latter. No syntypes occur in the De Candolle herbarium in G.

The syntypes and isosyntypes belong to *E. collina* ssp. *collina*. With *E. collina* s. str. misapplied by Bentham (1846, 1868) and subsequent authors (cf. Du Rietz 1948b, Barker 1982), *E. alpina* γ . *angustifolia* was the name Bentham (1846) applied to typical *E. collina*. Later (Bentham 1868), he reduced it to synonymy under an expanded *E. collina*.

***E. paludosa* R. Br. β . *pedicularoides* Benth. in DC., Prod. 10 (1846) 554 (= *E. collina* ssp. *paludosa*: Barker 1982, p. 204)**

Holotype: *A. Cunningham* 1836, vi.1827, on the hills in the vicinity of Logan Vale, at the western base of the Main, [a] dividing chain of mountains, in Lat. 28°S, Long. 152°E, K (Herb. Benth.) p.p.

The single specimen seen was given the species name "pedicularioides" on Cunningham's field label. It is a particularly robust plant of *E. collina* R. Br. ssp. *paludosa* (R. Br.) W.R. Barker with large, many-toothed leaves.

Further Typifications

Names are placed in the order of their appearance in the revision (Barker 1982).

Except where a lectotypification is proposed here, only additional types seen are cited.

***E. brownii* FvM. var. *psilantherea* FvM.**
(Barker 1982, p. 119)

Possible isoelectotype, not syntype: *C. Stuf[a]rt* s.n., s. dat., Without locality, K (Herb. Hooker) p.p.

The label is annotated "C. Sturt" not Stuart, the collector of the type of this name. Although I am unaware whether the South Australian explorer Charles Sturt visited Tasmania, it would be extremely improbable that he would have collected so rare a taxon. I know of no other *Euphrasia* collected by him.

As there is no evidence that Charles Stuart made more than the one collection of this taxon, it is likely that this specimen is an isoelectotype.

***E. striata* R. Br.**
(Barker 1982, p. 134)

Syntype and isoelectotype: *R. Brown* s.n., s. dat. Table Mountain, BM.

This specimen clearly comes from the lectotype collection.

***E. alpina* R. Br. β . *humilis* Benth.**
(Barker 1982, p. 134)

Syntype, possible isolectotype: Gunn ¹²²¹/₁₈₄₂, 31.i.1840, Mt Wellington, K p.p. *Syntypes or isosyntypes, possible isolectotypes*: R. Gunn ¹²²¹/₁₈₄₂, 7.i.1841, Mt Wellington, BM. — Gunn ¹²²¹/₁₈₄₂, 7.i.1841, Mt Wellington, V. Diemen's Land, CGE (Herb. Lemann). — Gunn ¹²²¹/₁₈₄₂, s. dat., Near summit of Mt Wellington, CGE (Herb. Lindley).

Gunn made two collections under his species number 1221, one on 31.i.1840 cited previously by Barker (1982) and by Du Rietz (1948a), the other on 7.i.1841, a fact only discovered from the above collections in 1985. If all syntypes and isosyntypes were assembled together it may be possible to determine from which collection the lectotype comes.

E. cuspidata Hook. f. (≡ *E. hookeri* Wettst.)
(Barker 1982, p. 142)

Isolectotypes: J. Milligan 767, 15.i.1847, Mt Sorrel [...] Peaty ground, BM p.p. — [J. Milligan] 767, s. dat., Mt Sorrel, McQr. Hr., Tasmania, BM p.p. *Isolectotypes, not syntypes*: J. Milligan s.n., s. dat., Summit Mt Sorrel. Peaty ground. Macqie Harbour. K (presented by Linn. Soc. in 1915). — Milligan 767, 15.i.1847, Summit Mt Sorrel. Peaty ground, K.

E. collina R. Br.
(Barker 1982, p. 159)

Syntype, not isolectotype: R. Brown s.n., s. dat. Derwent, K (Herb. Hook.) p.p. *Syntypes*: [R. Brown] s.n., s. dat. V. Diemen's Island, BM (2 sheets).

The additional K syntype bears the manuscript name "Euphrasia collina" in Brown's hand, came from the locality "Derwent", has upper leaves with two pairs of teeth, and is in bud and flower. All these factors conform with its coming from the collection of plants intermediate between ssp. *collina* and ssp. *diemenica*, not from the lectotype collection (see discussion in Barker 1982). The two BM specimens are syntypes but I am uncertain to which of the two known collections they belong.

E. alpina R. Br. non Lamk. (≡ *E. diemenica* Sprengel)
(Barker 1982, p. 181)

Isolectotype & syntype: R. Brown s.n., s. dat., Table Mountain, K p.p.

Brown supplied a third manuscript name "E. tabularis" to this taxon on the accompanying label to add to "E. speciosa" and "E. grandiflora" on other syntypes (Barker 1982).

E. tetragona R. Br.
(Barker 1982, p. 189)

Lectotypus hic designatus: R. Brown s.n., xii.1801-i.1802, Bald Head, King George's Sound, BM (Fig. 4). *Syntypi et isolectotypi possibiles*: R. Brown s.n., xii.1801-i.1802, Bald Head, King George's Sound, BM. — R. Brown 2720, s. dat. [Dec. 1802?]. In collibus [prope] Bald Head, King Georges Sound, BM p.p. (seen for Barker 1982). — R. Brown s.n., s. dat., Bald Head, K p.p.

Of the four collections seen which apparently comprise all the extant syntypes, the one

chosen as lectotype is in the best condition and the only one with a substantial inflorescence. It is also apparently the specimen seen by Du Rietz (1948b) and described by him as the holotype. Brown's (unpubl.) manuscript contains probably two descriptions, the one from "in collibus arenosis prope Bald Head" relating to plants in both flower and fruit, while the one from "King George III^d Sound" describes only the fruits.

Brown was at King George's Sound in early summer when flowering of the plant would have been near completion (as indicated in the material). It is uncertain, particularly with the loss of specimens with the wreck of the 'Porpoise' (Stearn 1960; Mabberley 1985), whether the new syntypes on which the locality 'Bald Head' has been typed in recent times, actually belong to the same collection as that seen for Barker (1982).

The K collection consists of a mixture of the syntype material with specimens collected later by Brown from Memory Cove, South Australia, as indicated by two labels in his hand. This latter material is a duplicate of the collection discussed in Barker (1982). It is not clear whether the mixing indicates that Brown considered the two collections to be conspecific.

E. multicaulis Benth.

(Barker 1982, p. 189)

Syntype, possible isolectotype: Gunn 863, s. dat., Van Diemen's Land, K (Herb. Benth.). Probable syntypes or isosyntypes, possible isolectotypes: R. Gunn $\frac{863}{1842}$, 30.x.1837, Circular Head, BM. — Gunn 863, s. dat., Circular Head, CGE (Herb. Lindley) p.p. — Gunn $\frac{863}{1842}$, s. dat., Circular Head, V. Dieman's Land, CGE. Possible syntype or isosyntype: R. Gunn 1220 p.p., s. dat., Tasmania, BM p.p. (as to the discordant specimen; this locality and species number presumably apply only to the other specimens).

The only definite syntype found additional to those cited in Barker (1982) was in the Bentham Herbarium at K. The existing previously chosen lectotype (Barker 1982) in the Hooker Herbarium at K is maintained. Both syntypes are annotated "E. multicaulis" by Bentham, both have uncertain locality details, one coming from two possible collections, the other lacking any specific locality, and both are in equivalent condition and of similar quantity of material.

Specimens with Gunn's species numbers 200, 836? or 1220?, and 1220, although annotated as *E. multicaulis* by Bentham, are considered to have no type status. It is assumed that they were seen by Bentham after preparation of the protologue (Bentham 1846) as he otherwise would have cited them there.

E. gunnii Du Rietz

(Barker 1982, p. 199)

Lectotypus hic designatus: Gunn $\frac{1220}{1842}$, 24.xii.1842, 10 miles N of Launceston, K (Fig. 6). Isolectotypi non syntypi: R. Gunn $\frac{1220}{1842}$, 24.xii.1842, 10 miles N of Launceston, BM p.p., CGE p.p. — R. Gunn $\frac{1220}{1842}$, 24.xii.1842, 10 miles N of Launceston road to Pipers, NSW 10830, CGE. Isolectotypi possibiles: R. Gunn 1220, s. dat., Tasmania, BM p.p., M (ex Herb. Hook.). Syntypi alteri, possibiles isolectotypi pro parte: Gunn $\frac{1220}{1842}$, 20.ix.1841 & 1842, Launceston. This is the commonest species about Launceston . . . , K p.p. ("holotype": Barker 1982). — R. Gunn $\frac{1220}{1842}$, 18.ix.1841, 1842 & 1843, Launceston, BM p.p. Isosyntypus, non isolectotypus: R. Gunn $\frac{1220}{1842}$, 20.ix.1841, Launceston, BM p.p.

Fig. 6. Lectotype of *Euphrasia gunnii* Du Roi (scale 5 cm long).

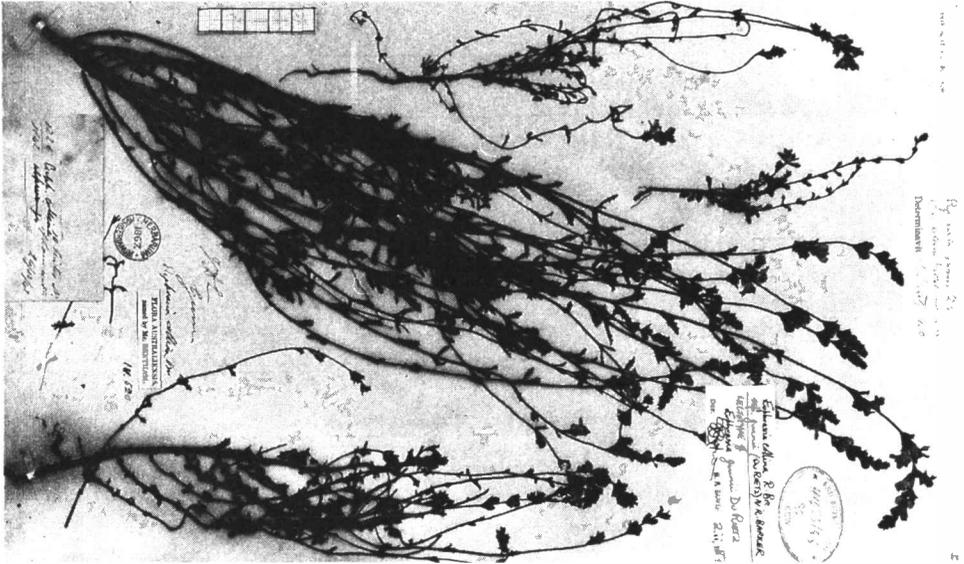
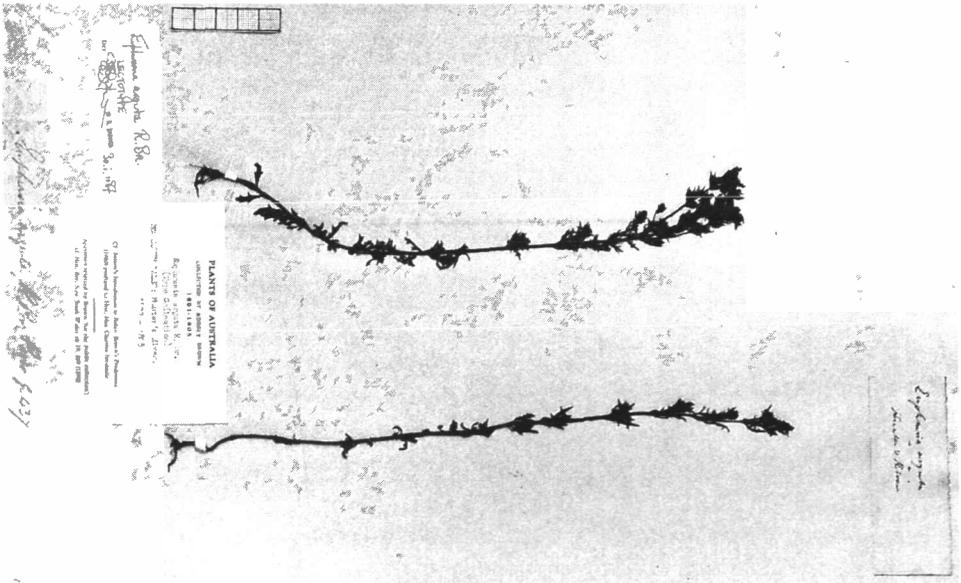


Fig. 7. Lectotype of *Euphrasia arguta* R. Br. (scale 5 cm long).



In 1930 Du Rietz annotated two sheets collected by Gunn and numbered $\frac{1220}{1842}$ in K as *E. gunnii* without noting which he considered was the principal type. The lectotype, not seen by me for my previous study, is chosen because it is of good quality and shows in the four plants a wide variation from depauperate to a large robust habit and, unlike the other candidate assumed previously (Barker 1982) to be the holotype, apparently belongs to the one gathering.

***E. paludosa* R. Br.**
(Barker, 1982, p. 204)

Syntype and possible isolectotype: R. Brown s.n., 1802-1805, Port Jackson, BM.

It is not possible to know whether Brown made more than one collection of this taxon. In his manuscript (Brown unpubl.) there is not the usual lengthy description with locality details cited. Instead reference to this species is appended to one of the descriptions of his *E. speciosa*. The newly seen specimen is of somewhat better quality than the lectotype chosen in Barker (1982). The lectotype, however, has more flowering branches (6 vs. 3) and bears one of Brown's labels, which was probably written on the expedition.

***E. glacialis* Wettst.**
(Barker 1982, p. 233)

Isolectotypes, not syntypes: Dr Mueller s.n., s. dat., Highest mountains of the sources of the Murray, K(2 sheets).

Both specimens conform with other isolectotypes seen in having the same locality wording and bearing Mueller's unpublished annotation "Euphrasia alpina Br. var. nivalis Muell."

***E. alsa* FvM.**
(Barker 1982, p. 256)

Syntypes, possible isolectotypes: Dr Mueller s.n., s. dat., Munyang Mountains 5-6000 ped, K. — *Ferd. Mueller s.n.*, s. dat., Munyang Mountains 5-6000, K (Herb. Hook.) p.p. — *Dr M[ueller] s.n.*, i.1855, In montibus altioribus lapidosis tractus Munyang Mountains 5-6000' elevation (crescit gregarie), K. — *Anon. s.n.*, s. dat., Summit of Munyang Mts. So Australia —6000 ped. s.m., BM p.p. — *Dr Ferd. Mueller s.n.*, s. dat., Munyang Mountains, BM p.p.

***E. scabra* R. Br.**
(Barker 1982, p. 270)

Syntype and isolectotype: R. Brown 2718, 1802-5, Port Dalrymple, Tasmania, *E. Syntype, not isolectotype: [R. Brown] s.n.*, [i.1804], Port Philip, BM.

All the specimens denoted as isolectotypes in Barker (1982) are to be considered syntypes; they were in Brown's possession until his death (Stearn 1960; Mabberley 1985).

***E. arguta* R. Br.**
(Barker 1982, p. 282)

Lectotypus hic designatus: R. Brown s.n., 1802-1805, Hunter's River, BM (Fig. 7). *Syntypi*,

probabiliter isolectotypi: *R. Brown s.n.*, s. dat., Paterson's River, K p.p. — *R. Brown s.n.*, x-xi.1804, In pascuis prope fluv: Patersons & Williams Rivers, BM (seen for Barker 1982, but not for this study).

Two further syntypes of *E. arguta* were found in the collections of BM and K. The single syntype seen previously by me and considered to be a holotype was in very poor condition, lacking inflorescences (Barker 1982). The lectotype chosen is the best of the three specimens, the K specimen being damaged by injudicious gluing.

Despite the four different localities given on the three syntypes and in Brown's (unpubl.) manuscript ("In pratio prope ripas Paterson's River, inter Mt. Anna and Mt. Elizabeth. Oct. 1804./No. 58"), the stage of flowering and general appearance of the material make it possible that they come from the one gathering. The "Hunters River" designation is not in Brown's usual hand and may represent the later provision of a more widely known regional name as often occurred on duplicate material in the 19th century.

Additional synonymies and misapplications of names

E. gibbsiae Du Rietz ssp. ***kingii*** (W.M. Curtis) W.R. Barker
(Barker 1982, p. 124)

E. alpina auct. non R. Br.: Benth., *Fl. Austral.* 4 (1868) 521, p.p. (as to *Milligan 766*, 8.x.1846, between Birchs Inlet and the Gordon river, Macquarie Harbour, K p.p.; *Milligan s.n.*, 1.viii.1846, Kelly's Basin McQuarie Hbr, K p.p.)

E. collina R. Br. ssp. ***collina***
(Barker 1982, p. 176)

E. alpina R. Br. γ . *angustifolia* Benth. in DC., *Prod.* 10 (1846) 553 (see p. 214).

E. paludosa R. Br.: Wettst., *Monogr. Gatt. Euphrasia* (1896) 255, p.p. (as to *Gunn s.n.*, s. dat., without locality, W p.p.)

E. collina R. Br. ssp. ***diemenica*** (Sprengel) W.R. Barker
(Barker 1982, p. 181)

E. collina R. Br.: Du Rietz, *Sv. Bot. Tidskr.* 42(4) (1948) 357, p.p. (as to *Anon s.n.*, s. dat., without locality, W p.p., W (ex Herb. Hook.), W (ex Herb. Hook.).

E. collina R. Br. ssp. ***tetragona*** (R. Br.) W.R. Barker
(Barker 1982, p. 189)

E. alpina R. Br. β . [*humilis*] auct. non Benth.: Hook.f., *Fl. Tasm.* 1 (1857) 296, p.p. (as to *Anon s.n.*, s. dat., without locality, W (ex Herb. Hook.).

E. collina R. Br. ssp. ***paludosa*** (R. Br.) W.R. Barker
(Barker 1982, p. 204)

E. paludosa R. Br. β . *pedicularoides* Benth. in DC., *Prod.* 10 (1846) 554 (see p. 215).

E. collina R. Br. ssp. *osbornii* W.R. Barker
(Barker 1982, p. 218)

E. scabra auct. non R. Br.: Wettst., Monogr. Gatt. *Euphrasia* (1896) 260 p.p. (as to *Anon s.n.*, s. dat. Lofty-ranges, W; *Mueller s.n.*, s. dat., Nov. Holland. meridional, Fiedlers Section, W; *Wilhelmi s.n.*, s. dat., Lofty Ranges, W).

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