THREE NEW ENDEMIC SUBSPECIES OF SNOW GUM FOR VICTORIA AND NOTES ON THE TAXONOMY OF THE INFORMAL SUPERSPECIES *PAUCIFLORA* L.D.PRYOR AND L.A.S.JOHNSON

K. RULE*

ABSTRACT

Rule, K. Three new endemic subspecies of Snow gum for Victoria and notes on the taxonomy of the informal superspecies *pauciflora* L.D.Pryor and L.A.S.Johnson. **Muelleria 8(2): 223–233 (1994).** — Three new subspecies within *Eucalyptus pauciflora* Sieb. *ex* Spreng. of restricted distribution in Victoria are described. These are *E. pauciflora* ssp. *acerina* Rule, a small-fruited, non-waxy form of the Baw Baw Plateau and nearby Mt Useful, *E. pauciflora* ssp. *hedraia* Rule, a large-fruited, markedly waxy form of the Falls Creek area and *E. pauciflora* ssp. *parvifructa* Rule, another small-fruited yet waxy form of the Grampians' Mt William Range. These taxa are compared with other snow gums and their conservation statuses discussed. In addition comments concerning taxonomic perspectives and problems of snow gums are given.

INTRODUCTION

Historically, the taxonomy of alpine snow gums has focussed on populations in New South Wales and the Australian Capital Territory and have been preoccupied with issues regarding the specific integrities of *E. niphophila* Maiden & Blakely and *E. debeuzevillei* Maiden to the extent that divergent forms within the Victorian alpine regions have been overlooked.

Only a recent study by Williams and Ladiges (1985) has provided a Victorian perspective. Although largely concerned with other taxonomic issues, these researchers found considerable diversity within the Victorian alpine populations selected for study. They suggested that these alpine forms had evolved differently in response to localised, severe environmental pressures.

Preliminary investigations using seedling trials and field observations confirmed the presence of a number of divergent alpine snow guns in Victoria and gave rise to the present study. One such form analysed by Williams and Ladiges is of the Mt William Range in the Grampians. The other two alpine snow gums are located on the Baw Baw Plateau and Mt Useful of West Gippsland and at Falls Creek and adjacent localities in north-east Victoria. In this paper, all three forms are regarded as altitudinal variants or 'end-points' of *E. pauciflora* and are recognised as subspecies.

This study also has focussed on problems associated with the level of formal recognition that these snow gums should be given. Appreciable differences in morphology between the typical form of the species and alpine forms and between the alpine forms themselves were identified, but it is the preference of this paper that these forms not be accorded specific statuses. Such a position is consistent with a well-established convention regarding clinal variation. Obviously, the issue of the taxonomy of the snow gums requires urgent attention, particularly in view of recent taxonomic decisions by Hill and Johnson (1991), and is discussed in a later segment.

TAXONOMY

Eucalyptus pauciflora Sieb. *ex* Spreng. ssp. **acerina** Rule *ssp. nov.*

A subspecie typica foliis juvenilibus adultisque, alabastris fructibusque parvioribus differt;

* 6 Regal Court, Vermont South, Victoria, Australia 3133

a subspecie *niphophila* alabastris fructibusque parvioribus et glaucedinem deficienti differt; a *E. gregsoniana* foliis juvenilibus latioribus et fructibus majoribus differt.

HOLOTYPUS: The summit of Mt Erica, Jan. 1905, *C.S.Sutton* (MEL).

Mallee with robust, erect trunks, from 5 to 12 m; branchlets semi-erect. *Bark* smooth throughout, lustrous, grey-green; old bark shed in light brown ribbons. *Juvenile leaves* broadly lanceolate, ovate-lanceolate or elliptical, petiolate, alternate, semi-erect, dull, blue-green or grey-green, concolorous, moderately glandular, apiculate or acuminate, slightly uncinate, to 10 × 4 cm; petioles rarely waxy, to 1.2 cm long; venation sub-parallel; nodes moderately crowded. *Coppice leaves* similar to the juvenile leaves only slightly larger. *Adult leaves* lanceolate, broadly lanceolate or ovate-lanceolate, semi-pendulous, lustrous, green, concolorous, conspicuously glandular, coriaceous, acuminate or acute, uncinate, to 10 × 3 cm; petioles non-waxy, to 2 cm; venation sub-parallel; canopy crowded. *Inflorescences* 7 or 9-flowered; peduncles terete, 3–6 mm long. *Buds* clavate or slightly pyriform, pedicellate, warty, non-waxy, to 8 × 4 mm; opercula burnished, hemispherical. *Fruits* hemispherical or slightly obconical, subsessile or sessile, 4–5(6) × 5–7(8) mm; disc level with rim or slightly ascending; locules 3(4). *Seeds* black, cuboidal or pyramidal, somewhat smooth on the dorsal surface (as in other subspecies), to 2 mm long. (Fig. 1)

SPECIMENS EXAMINED

Victoria — Mt St Gwinear Car Park, 17 Jan. 1980, *M.I.H.Brooker 6834* (MEL 648630); Along walking track 2 km west of Mt St Gwinear, 25 Jan. 1986, *S.J.Forbes 2995* (MEL 557318); Summit of Mt Erica, 20 Mar. 1990, *K.Rule 9001* (MEL); Mt Baw Baw Ski Village, 23 Apr. 1991, *K.Rule 9148* (MEL); Summit of Mt Useful, 23 Feb. 1992, *K.Rule 9224* (MEL).

FLOWERING PERIOD

Spring or early summer.

DISTRIBUTION

Eucalyptus pauciflora ssp. *acerina* is known only from the Baw Baw Plateau and the nearby Mt Useful, both of which are located in Victoria's West Gippsland region. The plateau, which is dominated by several mountains including Baw Baw, Erica and St Gwinear, rises above 1500 m. Mt Useful is of a similar altitude. These sites are geographically segregated from other mountains in the vicinity, for example, Mt Matlock and Lake Mountain, which are a part of the Great Dividing Range and which contain populations of conspicuously waxy snow gums with fruits larger than *E. pauciflora* ssp. *acerina*. Such populations mark the western extremity of *E. pauciflora* ssp. *niphophila*. (Fig 2.)

CONSERVATION STATUS

The Baw Baw Plateau is elongated with a somewhat east-west orientation and is relatively extensive, being approximately 12 km long. The populations of *E. pauciflora* ssp. *acerina* are abundant and secure within the Baw Baw National Park. In contrast, however, the Mt Useful population, although secure in a protected flora reserve, is relatively small.

ASSOCIATED SPECIES

On the Baw Baw Plateau *E. pauciflora* ssp. *acerina* grows in pure stands. At its lower limits it abuts *E. glaucescens* Maiden and Blakely, *E. delegatensia* R.T.Baker and *E.nitens* (Deane and Maiden) Maiden. On Mt Useful *E. kybeanensia* Maiden and Cambage is an associated species.

ETYMOLOGY

The subspecific epithet is derived from Latin and refers to the absence of observeable surface wax in the adult stage, a feature which contrasts well with other alpine snow gums.

Fig. 1. *Eucalyptus pauciflora* ssp. *acerina*. a — fruiting branchlet ×1. b — buds ×2. c — seedling leaves ×0.6.

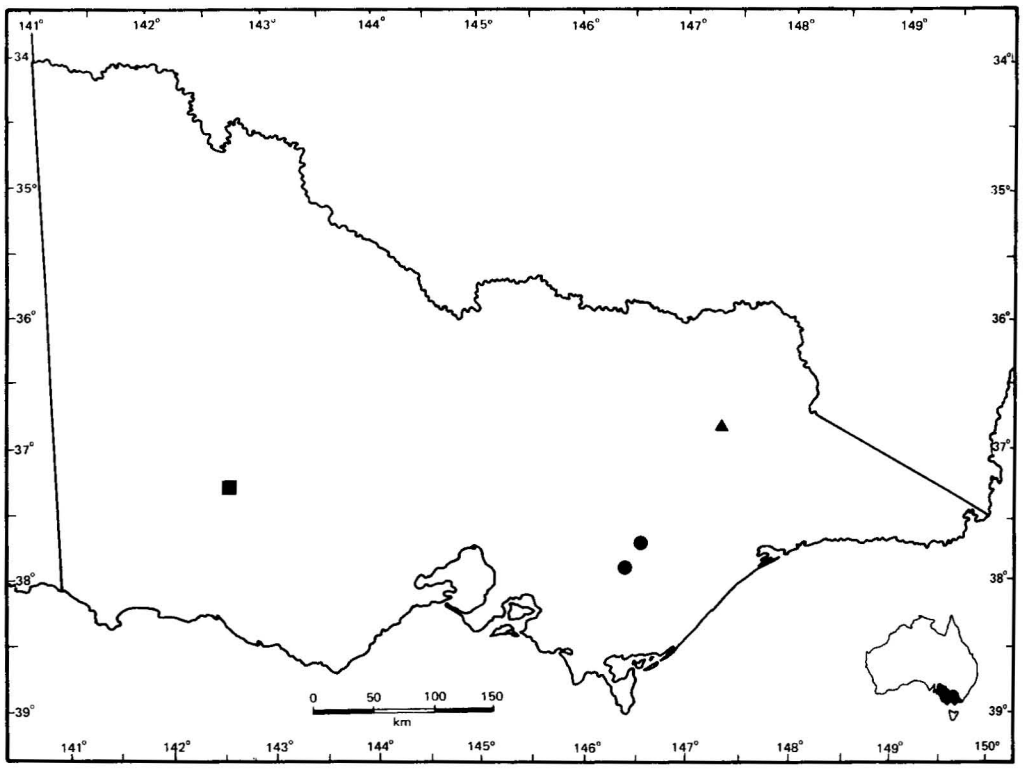

Fig. 2. Distribuion of *Eucalyptus pauciflora* ssp. *acerina* (●), *Eucalyptus pauciflora* ssp. *hedraia* (▲), and *Eucalyptus pauciflora* ssp. *parvifructa* (■).

Discussion

Collections of *E. pauciflora* ssp. *acerina* in herbaria are few. It is surprising that it has been ignored until recently, particularly as it occurs on the popular Mt Baw Baw snowfield which is relatively close to Melbourne. A few local observers have given it attention by incorrectly referring to it as 'var. *nana*', a name originally applied to *E. gregsoniana* Johnson & Blaxall. Such confusion appears to be dervied from inaccurate comparisons of fruit sizes as those of ssp. *acerina* are generally smaller. Other differences include ssp. *acerina* having broader yet shorter juvenile leaves and having inflorescences borne on shorter peduncles.

E. pauciflora ssp. *acerina* has been mistaken for *E. pauciflora* ssp. *niphophila* because of its alpine, mallee habit, small coriaceous adult leaves and crowded canopy. Yet it is readily separable from that form in being completely non-waxy in adult characters and rarely do its seedlings display a hint of wax around the nodes (observed only in the Mt Useful population). Most conspicuous is its glossy-green canopy which contrasts markedly from the bluish one of *E. pauciflora* ssp, *niphophila* (resulting from the copious amounts of wax on buds, fruits and branchlets). The *E. pauciflora* ssp. *acerina* also is different in having shorter peduncles, smaller buds with hemispherical opercula and smaller fruits. The shortness of the peduncles sometimes causes the fruits to become stem-clasping as they mature. A further difference is in seedling morphology with the stems of *E. pauciflora* ssp. *niphophila* becoming markedly waxy as the seedlings mature.

Eucalyptus pauciflora ssp. *acerina* has been mistaken for *Eucalyptus pauciflora* ssp. *pauciflora*, most likely because it is non-waxy. However, it differs from that form in being a mallee with erect trunks and a dense canopy (the effect of

crowded nodes) rather than a spreading tree with a somewhat pendulous, open canopy. It is also different in having shorter peduncles, smaller buds with regularly hemispherical opercula, smaller fruits and shorter, coarser, more glandular adult leaves. Further, as alluded to above, the seedling leaves of *Eucalyptus pauciflora* ssp. *acerina* are more crowded along the axis and its juvenile leaves are usually smaller and do not become pendulous as the seedlings mature, as occurs in the typical form.

The only other snow gum to have fruits as consistently small as *Eucalyptus pauciflora* ssp. *acerina* is a waxy, narrow-leaved form growing on the Mt William Range and the Major Mitchell Plateau in Western Victoria's Grampian Ranges, a description of which is given below as *E. pauciflora* ssp. *parvifructa* Rule.

Eucalyptus pauciflora Sieb. *ex* Spreng. ssp. **hedraia** *ssp. nov.* Rule.

A subspecie typica alabastris fructibusque majoribus et sessilis et glaucedine copiosa differt; a subspecie *debeuzevillei* alabastris sessilis, fructibusque sessilis majoribus, et a subspecie *niphophila* alabastris fructibusque majoribus sessilis differt.

HOLOTYPUS: Victoria, Falls Creek Ski Village, 36°51′S, 147°16′E, 14 Jan. 1982, *S. Forbes 821* (MEL 612462).

Mallee, shrubby or robust, upright or spreading, from 5–10 m high; branchlets semi-erect. *Bark* smooth throughout, grey or brown; old bark shed in grey-brown ribbons. *Juvenile leaves* broadly ovate, oblong or elliptical, alternate, petiolate, semi-erect, dull, grey-green, concolorous, moderately glandular, acuminate or apiculate, uncinate, to 12 × 5 cm; venation conspicuous, sub-parallel; petioles waxy, to 1.5 cm long; nodes moderately crowded or crowded. *Coppice leaves* similar to juvenile leaves. *Adult leaves* broadly lanceolate, ovate or elliptical, dull or semi-lustrous, blue-green or grey-green, glandular, coriaceous, acuminate or acute, uncinate, to 13 × 4 cm; petioles waxy, slightly angular, to 2 cm long; venation conspicuous, sub-parallel; canopy moderately crowded or crowded. *Inflorescences* 7–11-flowered; peduncles slightly angled, to 7 mm long. *Buds* ovoid, sessile, markedly waxy, warty, round in cross-section or sometimes angular, to 8 × 7 mm; opercula conical or hemispherical. *Fruits* hemispherical or slightly cupular, sessile, non-angled, waxy, 7–10 × 10–14(15)mm; diam. level with rim; peduncle 2–4mm long; locules 3 (4). *Seed morphology* as in other subspecies, to 3 mm long. (Fig. 3.)

FLOWERING PERIOD

Spring or early summer.

SPECIMENS EXAMINED

Victoria — Mt Bogong, 22 Oct. 1944, *Brig.Chapman* (MEL); Mt Mackay, 3 km west of Falls Creek, *L.G.Adams and G.C.Pierson 2646* (MEL 571904); Falls Creek Village, 17 Dec. 1981, *H.van Rees 285* (MEL 617716); Summit of Mt Arthur, 3 Jan. 1980, *N.T.Rossiter 101* (MEL 6947580); Falls Creek Village, 19 Feb. 1986, *D.E.Albrecht 2478* (MEL 1124700); Above Rocky Valley Dam, along track to Mt Mackay, 13 Apr. 1982, *K.Rule 9233* (MEL).

DISTRIBUTION

The known concentration of populations of *E. pauciflora* ssp. *hedraia* occupies several square kilometres around the site of the Falls Creek Ski Village which is located in the Victorian Alps. The altitude of the village is approximately 1700 m and its aspect is a mountainside facing northwards. Other collections have been made in the vicinity; on Mt Bogong and Mt Arthur. (Fig. 2)

ASSOCIATED SPECIES

Eucalyptus pauciflora ssp. *hedraia* grows in pure stands except along its boundaries where it mixes with *E. pauciflora* ssp. *niphophila*. A small number of individuals intermediate between the two subspecies have been observed. This