

Selection and evaluation of eastern Australian *Conospermum* species as cut flowers: The western Victorian species *C. mitchellii* and *C. patens*.

Final report to the Australian Flora Foundation

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Summary

Conospermum mitchellii and *C. patens* are two particularly attractive species that are found in western Victoria and South Australia. These species produce terminal inflorescences with a long vase-life and would make attractive cut-flowers, particularly forms with blue buds a rare colour in cut-flowers. As a further advantage these species produce a subtle sweet aroma which would enhance their marketability. The size of the inflorescence of these two species would enable them to be used as a focal filler flower in mixed arrangements.

Field surveys were conducted on both species to locate selections that had suitable characteristics for use as cut flowers. The character assessment was based on a range of physical characters; including, stem length (longer than 40 cm), inflorescence demography (width, evenness of floral display, evenness of floral maturity, colour and visual attraction), and fragrance.

Material from 18 plants was collected for further assessment. The material that was placed in the post-harvest vase life trials exhibited consistently good vase life. Unfortunately the material that was placed into propagation trials failed.

These two species of *Conospermum*, especially *C. mitchellii*, could be used as cut flowers if further work is done to improve their propagation rates and cultivation.

Introduction

The genus *Conospermum* contains many attractive species, several of which are currently used in ornamental horticulture. A number of species in Western Australia are bush-picked for use as both fresh and dried cut flowers, and are exported to Asia and the USA. The bush-picking industry was not developed to the same degree in the eastern states of Australia, and consequently the species from the eastern states have not yet been utilised as cut flowers.

Conospermum mitchellii and *C. patens* are two particularly attractive species which are found in western Victoria and extend into South Australia. These species produce large terminal inflorescences with a long vase-life and would make attractive cut-flowers, particularly forms with blue buds, a rare colour in cut-flowers. As a further advantage these species produce a subtle sweet aroma which would enhance their marketability. The size of the inflorescence of these two species would enable them to be used as a focal filler flower in mixed arrangements.

Objectives

The objectives of this project were to:

- conduct a field survey to assess individual plants of *C. mitchellii* and *C. patens* on physical characteristics; including stem length, inflorescence shape and size, the colour of the flowers and floral bracts, and the presence and strength of the floral aroma.
- determine the vase life of the superior forms under controlled conditions.
- establish these superior forms in cultivation, by obtaining propagation material, and conducting propagation trials.

Field survey of material suitable for development as cut flowers

Plants from *Conospermum mitchellii* and *C. patens* were surveyed in natural populations in western Victoria for their suitability as cut flowers. Character assessment in the field was based on a range of physical characters; including, stem length (longer than 40 cm), inflorescence demography (width, evenness of floral display, evenness of floral maturity, colour and visual attraction), and fragrance.

Descriptions of the species observed in the field populations

Conospermum mitchellii is an erect multi-stemmed shrub that reached a height of 2m. The branches rarely branch and are covered by long dark green leaves. The flowering season was from late October to mid December. The floral display was a compound inflorescence up to 15cm in diameter. The flowers are surrounded by a bract, which varies in colour from pale cream to dark blue.

Conospermum patens is a small erect shrub up to 80 cm. The branches rarely branch and are covered with short linear leaves. The flowering season was from late October to mid December. The floral display is a small compound inflorescence up to 5 cm in diameter. The flowers are surrounded by a bract that varies in colour from pale to dark blue.

Selection of plant and floral material

In total 18 selections of the two species were collected (Table 1), 2 selections of *C. patens* and 16 of *C. mitchellii*. The 16 selections of *C. mitchellii* were collected based on variations in the size and shape of the inflorescence, and the colour of the bracts around the young flowers.

Table 1. Collection details for selections of *C. mitchellii* and *C. patens*.

Species	Code	Collection location	Field comments
<i>C. mitchellii</i>	CMMZ1	Mt Zero Rd	Blue buds, late flowering
<i>C. mitchellii</i>	CMMZ2	Mt Zero Rd	Large heads
<i>C. mitchellii</i>	CMMZ3	Mt Zero Rd	Paler blue bracts
<i>C. patens</i>	CPMZ1	Mt Zero Rd	Dark blue form
<i>C. mitchellii</i>	CMMZ4	Mt Zero Rd	
<i>C. patens</i>	CPMZ6	Mt Zero Rd	Pale blue form
<i>C. mitchellii</i>	CMMA1	Near Mt Abrupt	Early flowering, large heads 12 cm, dark blue bracts
<i>C. mitchellii</i>	CMMA2	Near Mt Abrupt	Blue centres, heads variable
<i>C. mitchellii</i>	CMMA3	Near Mt Abrupt	Very dark blue bracts, late flowering,
<i>C. mitchellii</i>	CMMA4	North of Mt Abrupt	Blue bracts, 12 cm heads, flat, compact
<i>C. mitchellii</i>	CMMA5	North of Mt Abrupt	Cream-white flowers, little blue, large heads 12 cm,
<i>C. mitchellii</i>	CMMW1	Mt William	Large 15 cm heads, domed, blue bracts
<i>C. mitchellii</i>	CMMW2	Mt William	Pale blue bracts, robust plant
<i>C. mitchellii</i>	CMMW3	Mt William	Open large heads, blue bracts, robust plant
<i>C. mitchellii</i>	CMMW4	Mt William	Smaller heads, light blue bracts
<i>C. mitchellii</i>	CMMW5	Mt William	Good heads, robust
<i>C. mitchellii</i>	CMMW6	Mt William	Globular heads, dark blue bracts
<i>C. mitchellii</i>	CMMW7	Mt William	Open inflorescence, little colour blue and yellow

Vase life assessment

Plants selected in the field were assessed for their post-harvest vase life. Stems for assessment were collected from each plant, placed in a plastic bag with moistened paper then placed on ice for transport back to the laboratory. Transport and treatment of the flowering material occurred within 48h of harvest. The stems were placed in distilled water and maintained under controlled environmental conditions (20°C, 65% RH, 10 $\mu\text{mol m}^{-2}\text{s}^{-1}$), until they were no longer considered suitable.

The optimum length of vase life for both species could not be determined as the field collected material was of unknown maturity, and was kept dry for up to 48 hours after harvest. The stems of *C. mitchellii* remained acceptable for a period of up to 23 days (Table 2), despite the harsh treatment surrounding harvest.

The end of vase life of most of the *C. mitchellii* and *C. patens* stems was due to wilting and flower drop. Further work will be required to determine if this would occur on cultivated stems, and if rehydrating solutions could extend the vase life further, although the *C. mitchellii* generally exhibited an acceptable vase life (Table 2). Further work would be required to determine the optimum vase life of stems in cultivation.

Table 2. Vase life details for the selected clones.

Species	Code	Stems	Vase life (days)	Comments
<i>C. mitchellii</i>	CMMZ1	2	16	Flowers dropping
<i>C. mitchellii</i>	CMMZ2	2	14	Flowers brown
<i>C. mitchellii</i>	CMMZ3	3	9	Flowers wilt and drop
<i>C. patens</i>	CPMZ1	2	9	Dropping dead flowers
<i>C. mitchellii</i>	CMMZ4	2	17	Flowers dropping
<i>C. patens</i>	CPMZ6	3	5	Wilting
<i>C. mitchellii</i>	CMMA1	2	13	Flowers brown
<i>C. mitchellii</i>	CMMA2	1	23	Flowers dropping
<i>C. mitchellii</i>	CMMA3			Not tested
<i>C. mitchellii</i>	CMMA4	2	17	Flowers dropping
<i>C. mitchellii</i>	CMMA5	2	23	Flowers drop
<i>C. mitchellii</i>	CMMW1	1	23	Flowers wilt
<i>C. mitchellii</i>	CMMW2	2	18	Flowers dropping
<i>C. mitchellii</i>	CMMW3	2	17	Flowers wilt and drop
<i>C. mitchellii</i>	CMMW4	2	10	Flowers wilt
<i>C. mitchellii</i>	CMMW5			Not tested
<i>C. mitchellii</i>	CMMW6	3	23	Flower drop
<i>C. mitchellii</i>	CMMW7	2	17	Flowers brown and wilt

Propagation and Cultivation

The plants were propagated using semi-hardened tip cuttings, dipped in Clonex[®], purple gel (3g/l indole-3-butyric Acid) and placed into a mist bed. The majority of selections had a very low strike rate, if any cuttings produced roots at all. The roots that were produced were weak and these cuttings did not last once they were potted up. A second propagation trial was conducted on material of *C. mitchellii* in the autumn when the cutting material was more suitable for propagation, but again resulted in low strike rates. These cuttings did establish and continue to grow, but eventually all plants died.

Further work is needed on developing a suitable propagation and cultivation technique for these two species.

Conclusion

This work investigated two species of smokebush that exhibit attractive floral displays and have a vase life that would enable them to be used as cut flowers. A severe limitation to their use is their difficulty in being propagated and cultivated.

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