Overcoming *Carpobrotus* confusion

By Greg Keighery

Members of Stirling Natural Environment Coastcare (SNEC) raised concerns about the identification of planted materials of *Carpobrotus virescens* in their rehabilitation zones and the difficulty they experienced in differentiating between the native species and the weed (*C. edulis*). On 6 November 2014, I visited beaches in the North Beach area with members of SNEC to view native and naturalised species of *Carpobrotus*.

Project background

Western Australia has a range of native and naturalised species of *Carpobrotus* (pig faces) and the closely related *Sarcozona*. Within the Perth area (Western Australian Herbarium, Florabase) there are four species (*C. virescens*, *C. modestus*, *C. edulis* and *Sarcozona bicarinata*).

Because of their succulent nature and soft flowers, *Carpobrotus* species make very poor herbarium specimens and should be studied alive, if possible, to adequately determine species boundaries. They also readily hybridise when they come into contact and hybrids are recorded between both native and weedy species, and between *Sarcozona* and *Carpobrotus*.

Of the species mentioned above only the weedy *Carpobrotus edulis* and the native *C. virescens* are found along the beaches from Wanneroo to Rockingham. Currently most keys are designed to work on herbarium material or on the colour of flowers, which does not identify the species when sterile, nor the frequent hybrids found nor account for the fact that many native *Carpobrotus* have two sexes.

My intention is to help coastal care groups, collectors and propagators in the Perth area obtain the correct material of the native species, to detect the weed when either a seedling or when plants are not flowering, and to detect hybrids between the weed and the native.

The species

Three taxa are described briefly below: the native *Carpobrotus virescens*, the weed *Carpobrotus edulis* and hybrids between *Carpobrotus virescens X edulis*.

Carpobrotus virescens

This is a low spreading scrambling to prostrate shrub to 2m across with white stems and an increasingly open nature, stems are often flushed red before they turn white. Mature leaves are green and roughly triangular in cross section, usually slightly concave on the upper surface, normally less than 10mm across, with minute white teeth along the bottom ridge below the apex. Plants are normally either male or female (dioecious). Female plants have small flowers that are pale pink, with 'petals' that are 20-25mm long and a white centre with a prominent stigma in the centre. Male plants have larger flowers that are bright pink, with 'petals' that are 32-36mm long, yellow in centre and the stigma never enlarges.

Fruits are purple red and soft; they lack a hard ridge on the side of the fruit and the retained sepals are 13-16mm long.

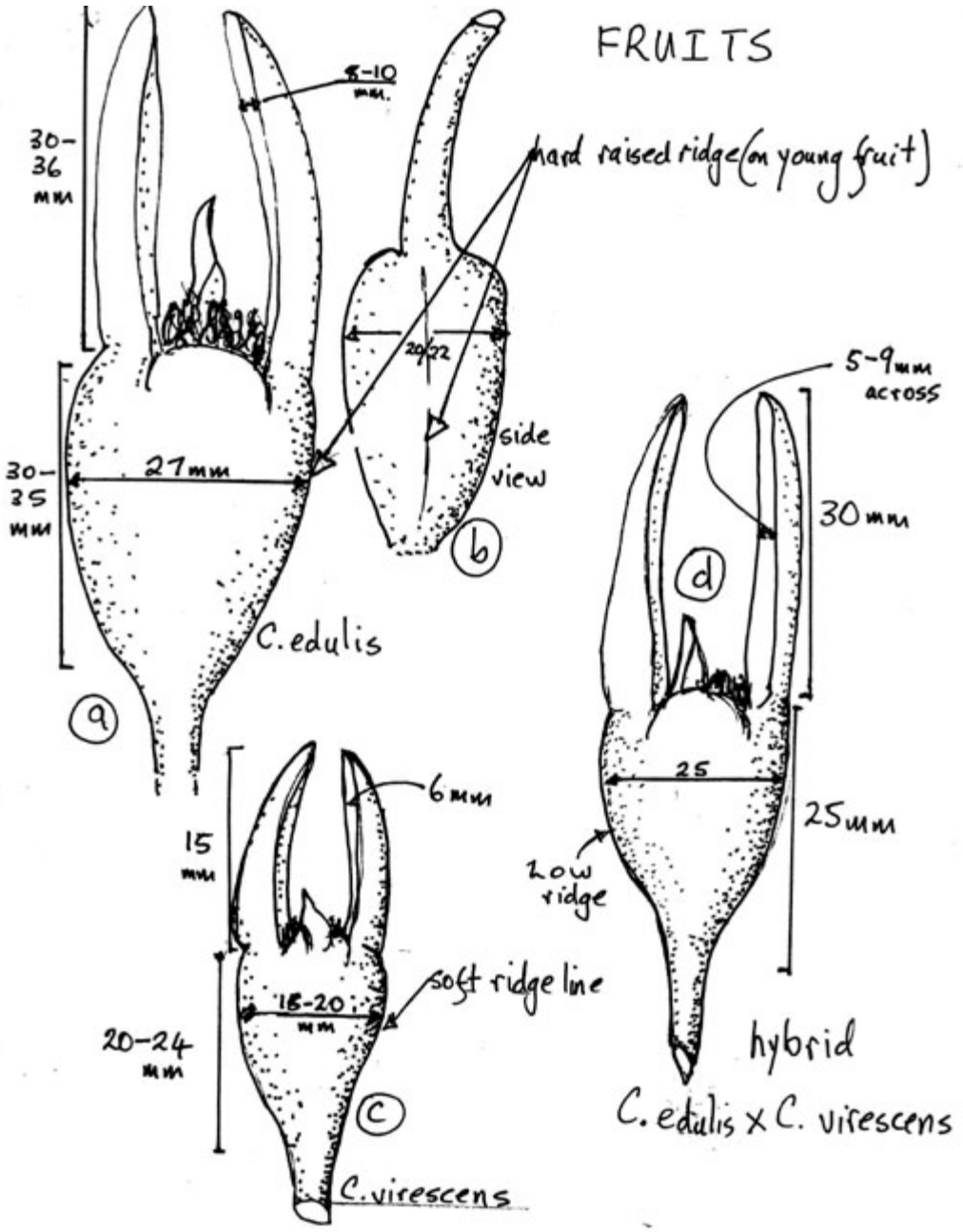
Female (left) and male flowers of C. virscens. *Photo – Greg Kieghery.*

Hybrid C. edulis x C. virscens *flower. Photo – Rae Kolb.*

Young fruits of Carpobrotus *species: (L-R)* C. edulis, hybrid, C. virescens. *Photo – Greg Kieghery.*

Carpobrotus edulis

This is a low spreading, scrambling to prostrate shrub to 2m across with pale yellow stems and a dense habit (which overtops and smothers other plants). Mature leaves are blue-green and are depressed triangular in cross section, usually slightly flat on the upper surface, normally more than 13mm across with rough brown teeth along the bottom ridge below the apex. Plants always have hermaphrodite yellow flowers that age pale pink. 'Petals' are 25-30mm long and flowers are large, 45-55mm wide. Fruits are yellow; when still green have a prominent ridge along the side, and attached sepals are 30-36mm long and 27mm wide.



Fruits of Carpobrotus *of Perth Beaches: a-b:* Carpobrotus edulis*: a-front view, b- side view; c-* Carpobrotus virescens*: c-front view, d: hybrid (*Carpobrotus edulis x virescens*), front view. Images courtesy Greg Keighery.*

New *Carpobrotus* research project

Given the extremely challenging task of identifying native, non-native and hybrid *Carpobrotus* and *Sarcozona* in Australia, researchers at CSIRO are about to begin a collaboration with South African colleagues to provide a clearer understanding of the morphological and molecular differences between the species. The work will ultimately provide insight for the conservation and management of native *Carpobrotus* and *Sarcozona*, as well as the control of introduced *Carpobrotus* in both countries. The researchers are interested in hearing from people who know of populations that may be useful for including in their study.

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Carpobrotus edulis x modestus

Hybrids have hermaphrodite flowers that are pale pink, larger than *C. virescens*. They are fertile and fruits are also intermediate in size, with sepals 30-33mm long.

Collecting cultivation material

Most natural populations of *Carpobrotus virescens* have more male plants than female plants, often up to 2:1 proportions (e.g. at Seabird 28 males, 15 females and six non-flowering plants were recorded). So when collecting cuttings it is very desirable to collect when they are in flower or from a range of plants widely spaced to ensure both sexes are collected. If collections are made where both the native and weed occurs, to avoid mistakenly collecting hybrids between the two, check the leaf width and colouration of the aging stems.

Fruits (deep red-purple, not yellow or light pink) should ideally be collected from plants that are not near any *Carpobrotus edulis* to minimise the risk of hybrids. Checking leaf width of seedlings and cuttings (leaves wider than 10mm) after six months will tell if they are weeds or hybrids.

Acknowledgements: *Thanks to members of SNEC (especially Rae and Walter Kolb) for their interest in conserving our native flora and their careful observations on plants in the field.*

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A copy of Greg's full report including diagrams and photos is available at the Perth Region NRM coastal knowledge hub.