Part 2

Identification of blackberry (*Rubus*) species in Australia

Summary

- There are 26 known introduced *Rubus* species in Australia. Sixteen of these are from the *R. fruticosus* agg. (European blackberry). The other 10 are classed as other introduced weedy *Rubus* species and originate from either North America or Asia.
- There are also 10 native *Rubus* species present in Australia.
- It is difficult to distinguish between the species in the *R. fruticosus* agg. Land managers should send samples to a herbarium for positive identification.
- An interactive computer key on CD-ROM has been developed to help identify the various blackberry species in Australia (see Part 2.2, p. 22).
- Features such as leaf shape and the inflorescence are used to distinguish between species in the *R. fruticosus* agg. and other *Rubus* species (introduced and native) in Australia.
- Identifying the correct species will help to determine and implement the most effective control options.

2.1 The genus *Rubus* in Australia

There are three main groups of blackberry present in Australia:

- *The R. fruticosus* agg. or *European blackberry*. There are currently 16 known species of this aggregate in Australia (see Table 2.1). They are recognised as a Weed of National Significance (WoNS) in Australia and are declared noxious in most Australian States and Territories (see Appendix 1).
- *Other introduced weedy* Rubus *species that have become naturalised in Australia* (see Table 2.2, p.21). This group includes *Rubus* species from North America and Asia. Many of the introduced species, such as raspberry and loganberry, are also commonly cultivated.
- *Native* Rubus *species*. There are 10 known native species of *Rubus* in Australia (see Table 2.3, p.21).

The taxonomy of blackberry in Australia was recently reviewed. With the help of the weed management community, 300 new herbarium samples were collected from the southern States of Australia. The physical characteristics of existing and new samples were studied and the DNA extracted from each to determine their genetic relationships. Selected specimens were then sent to Europe and America for identification by experts in *Rubus* taxonomy.

This work has improved species identification and has provided more information on the distribution of species, enabling the development of an interactive computer key on CD-ROM (Barker and Barker, 2005) to help identify the various blackberry species (see Part 2.2, p.22).

When exotic plants (i.e. plants foreign to an area) have been introduced to a new area and become established and spread, they are considered to have become naturalised in that area.

Table 2.1. European blackberry (*R. fruticosus* agg.) in Australia (2007)

SPECIES	DISTRIBUTION AND ORIGIN
R. anglocandicans	Most commonly recorded species in southern Australia. It occurs in the wetter areas of all the southern States and south-eastern Qld.
R. leucostachys	Widespread distribution. Recorded in NSW, Vic., Tas. and SA.
R. polyanthemus	Widespread in Vic. Recorded in Kosciusko National Park, NSW.
R. laciniatus	Recorded in the wetter areas of NSW and SA. Also recorded on the central-west coast of Tas.
R. ulmifolius* var. *ulmifolius	Recorded in all southern States of Australia.
R. ulmifolius* var. *anoplothyrsus	Recorded in SA and WA. Possibly present in other States. No prickles on primocanes.
R. vestitus	Recorded in NSW, SA and Tas. but not common.
R. leightonii	Recorded only in NSW.
R. erythrops	Recorded in Vic., Tas. and SA.
R. cissburiensis	Recorded only in Vic.
R. echinatus	Mostly recorded in north-eastern Tas. Also recorded in Vic. and Flinders Island.
R. rubritinctus	Recorded in the Mt Lofty Ranges of SA and Geeveston and Pipers Brook in Tas.
R. phaeocarpus	Limited distribution. Recorded in the Mt Lofty Ranges in SA and in the Kowmung River area of NSW.
R. riddelsdellii	Recorded only in the Mt Lofty Ranges of SA.
***R.* sp. Tasmania** (J.R. Hosking 1551)	Confined to Tas., predominantly in the north-western region.
***R.* sp. Scott Creek** D.E. Symon 16054)	Recorded only in the Mt Lofty Ranges of SA.

Barker and Barker, 2005

Table 2.2. Other introduced *Rubus* species in Australia (2007)

SPECIES	DISTRIBUTION AND ORIGIN
R. laudatus **(Bundy/Plains blackberry)**	Commonly recorded as a weed in south-west WA, south-eastern Qld and throughout the Sydney area of NSW. Originating from North America.
R. philadelphicus **(lawtonberry)**	Recorded as a weed in Pipers Creek area of northern Tas. and in Cooma in south-eastern NSW. Originating from North America.
R. loganobaccus **(loganberry)**	Recorded as a weed in south-western WA across the mid-north region of SA, on Kangaroo Island, in the Canberra region, in the Ballarat area of Vic. and in southern-eastern Tas. A hybrid between North American *R. ursinus* and Eurasian *R. idaeus*. Can be distinguished by its pinnate leaves and its oblong fruit, which is dark red to dull black.
R. ellipticus **(yellow Himalayan raspberry)**	Recorded as a noxious weed in south-eastern Qld. Also found in the north-eastern and Blue Mountains regions of NSW. Originating from Asia. Easily distinguished by its yellow to orange fruit.
R. idaeus **(raspberry)**	Cultivated in the cooler region of the southern States. Originating from Eurasia; sometimes also considered to be native to North America. Naturalised populations recorded in NSW, Vic. and SA. Not considered to be aggressively weedy. Has red fruit.
R. rugosus **(keriberry)**	Grown in NSW and Qld for its fruit. Originating from Asia. Naturalised populations recorded in the Comboyne area of NSW and the Belgrave South area of Vic. At this time it is not aggressively weedy. Also recorded in small numbers in WA and Tas.
R. roribaccus **(dewberry, youngberry and boysenberry)**	Naturalised populations recorded in the Central Coast and Sydney regions of NSW. Also recorded in the Portland region of western Vic. Originating from Northern America. At this stage it is not aggressively weedy.
R. alceifolius	Recorded in the Cape Tribulation region of Qld. Originating from Asia and a weed in many parts of the world.
R. odoratus	Often cultivated for its large, scented, pink-purple rose-like flowers. Not recorded with any confidence as naturalised in Australia, despite the possible record from Hobart in Tas.
R. niveus	Only recently (2008) recorded as naturalised in Australia; found in Qld and the on the North Coast of NSW. Originating from Asia, and considered a weed in other parts of the world. Also grown for its sweet fruit. Flowers are pink to rose purple.

Barker and Barker, 2005; Evans et al., 2007

Table 2.3. Native *Rubus* species in Australia (2007).

SPECIES	DISTRIBUTION AND ORIGIN
R. parvifolius **(native raspberry)**	The most widely distributed native species of *Rubus* in Australia. Extends from central Qld, along the east coast to Vic. and Tas. along the coastline to the Mt Lofty Ranges in SA. Often occurs with the *R. fruticosus* agg.
R. gunnianus **Hook. (alpine Tasmania)**	A Tasmanian endemic species that occurs in alpine vegetation. It is very small and easily distinguishable from introduced *Rubus* species.
R. moorei **(silky bramble)**	Generally confined in distribution from Lismore in NSW to the Conondale Ranges in Qld.
R. rosifolius	Found along the eastern coast of Australia, from south-eastern Qld through to Vic.
R. queenslandicus	An endemic north Qld species from the Atherton Tableland region.
R. probus	A species confined to coastal areas of Qld between Daintree and Brisbane.
R. x novus	An apparently sterile hybrid between *R. moluccanus* var. *trilobus* and *R. parvifolius*. This hybrid occurs naturally and is found along the east coast of Australia where both species occur.

SPECIES	DISTRIBUTION AND ORIGIN
R. moluccanus* var. *moluccanus	Found along the east coast of Australia from the McIlwraith Range to the Moreton Bay district.
R. moluccanus* var. *trilobus	Found along the east coast of Australia from the Atherton Tableland to north-eastern Vic. More commonly encountered than *R. moluccanus* var. *moluccanus*.
R. nebulosus	An east coast species extending from the NSW–Qld border to Batemans Bay on the South Coast of NSW. Flowers from August to January and is found in rainforests or tall eucalyptus forests next to rainforests.

Barker and Barker, 2005

2.2 Identifying species

Distinguishing among species in the *R. fruticosus* agg.

The best way to ensure correct identification of blackberry species is to send samples to a herbarium for positive identification. The best time to collect samples is when the plant is flowering. Segments of both the floricane and primocane are needed to identify *Rubus* specimens to species level.

If possible, collect three separate specimens from the one plant. Keep one for personal reference and send two to the herbarium. The herbarium receiving your specimen can then forward one to the main *Rubus* collection, located at the State Herbarium of South Australia, in Adelaide for verification. Appendix 2 provides detailed guidelines on collecting samples for identification. Appendix 3 lists contact details for State herbaria.

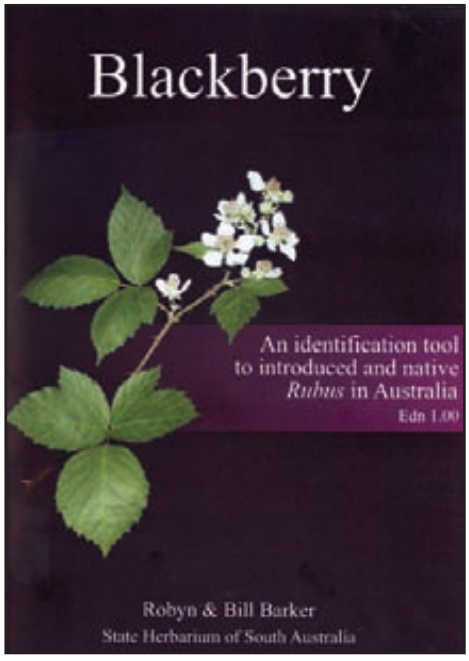
Alternatively, the interactive identification key on the CD-ROM, *Blackberry, an identification tool to introduced and native* Rubus *in Australia*, is a useful resource. It is available for purchase from **www.cbit.uq.edu.au/software/blackberry/** See Appendix 4 for the fact sheet on using the CD-ROM Lucid Key.

Even with the development of the key contained in the CD-ROM and other identification resources, it requires specialist skill to distinguish between some of the species. It is therefore important that blackberry managers help to accumulate information about species presence and distribution across Australia by sending samples to a herbarium for positive identification and mapping.

Importance of identifying blackberry species

Different *Rubus* species react differently to various control options such as herbicides or biological control agents. For example, species originating from North America or Asia are not susceptible to the current biological control options available in Australia. As a consequence, where infestations are made up of mixed species, a species that has been controlled with biological control or herbicides can be replaced by a species with a higher tolerance to these control options.

It is also important to know whether the blackberry in question is a native species. Native blackberry species should not be controlled in their native range.



Robyn Barker (Department for Environment and Heritage, SA)

Blackberry identification tool Lucid CD.

Distinguishing between *R. fruticosus* agg. and species of North American and other origin

Three North American *Rubus* species have become naturalised and weedy in Australia. They are *R. laudatus* (Bundy/Plains blackberry), *R. philadelphicus* (lawtonberry) and *R. roribaccus* (dewberry). They can be distinguished from the *R. fruticosus* agg. species by the characteristics given in Table 2.4 (p. 24).

Figure 2.1 (p. 24) shows the differences in the inflorescences (flower clusters) and pedicels (flower stalks). Figure 2.2 (p. 24) shows differences in the sepals and Figure 2.3 (p. 25) shows differences in the leaf characteristics.

Rubus loganobaccus (loganberry) is a stabilised hybrid of *R. idaeus* (European) and *R. ursinus* (North America). It can be distinguished from *R. fruticosus* agg. species by its pinnate leaves.

Species in the *R. fruticosus* agg. have palmate leaves. Figure 2.3 (p. 25) shows the various leaf shapes and leaflet arrangements.

Rubus idaeus (raspberry) is widely cultivated and is considered weedy. Apart from being distinguished by its hollow red or yellow fruit, it also has pinnate leaves. *R. fruticosus* agg. species have black fruit and palmate leaves.

Rubus ellipticus (yellow Himalayan raspberry) has been declared noxious in Queensland. It has soft bristles on the stems, rounded leaflets and yellow-orange fruit.

Rubus alceifolius and *R. rugosus* are of Asian origin and have simple lobed leaves (see Figure 2.3, p. 25) and red fruit at maturity.

Rubus niveus (Ceylon raspberry) has only recently been recorded in northern NSW and has also been found in Queensland. It has pinnate leaves that appear dark green on top and whitish below. The fruit is purple–black at maturity.

Paul Yeoh (CSIRO Entomology)

R. laudatus (Bundy/Plains blackberry) in Western Australia.

John Hosking (NSW DPI)

R. leucostachys in Kosciusko National Park.

R. J. Hore (Victoria)

R. rugosus (keriberry).

Craig Stehn (Coffs Harbour Regional Landcare)

R. niveus (Ceylon raspberry).

Table 2.4. Summary of features distinguishing between *R. fruticosus* agg. (European origin) and North American *Rubus* species.

	EUROPEAN ORIGIN *R. fruticosus* agg.	NORTH AMERICAN *Rubus* SPECIES
Inflorescence (collection of flowers at the apex of the floricane)	In panicles (branched flower head) – Figure 2.1(A)	Not in panicles – Figure 2.1(B)
Pedicel (flower stalk) length	Mostly less than 1.5 cm – Figure 2.1(C)	Mostly more than 1.5 cm – Figure 2.1(D)
Sessile (non-stalked) glands on primocane	No sessile glands	With sessile glands
Sepals (in fruit)	Reflexed, bent backwards from the fruit – Fig 2.2	Not reflexed, surrounding the base of the fruit – Fig 2.2

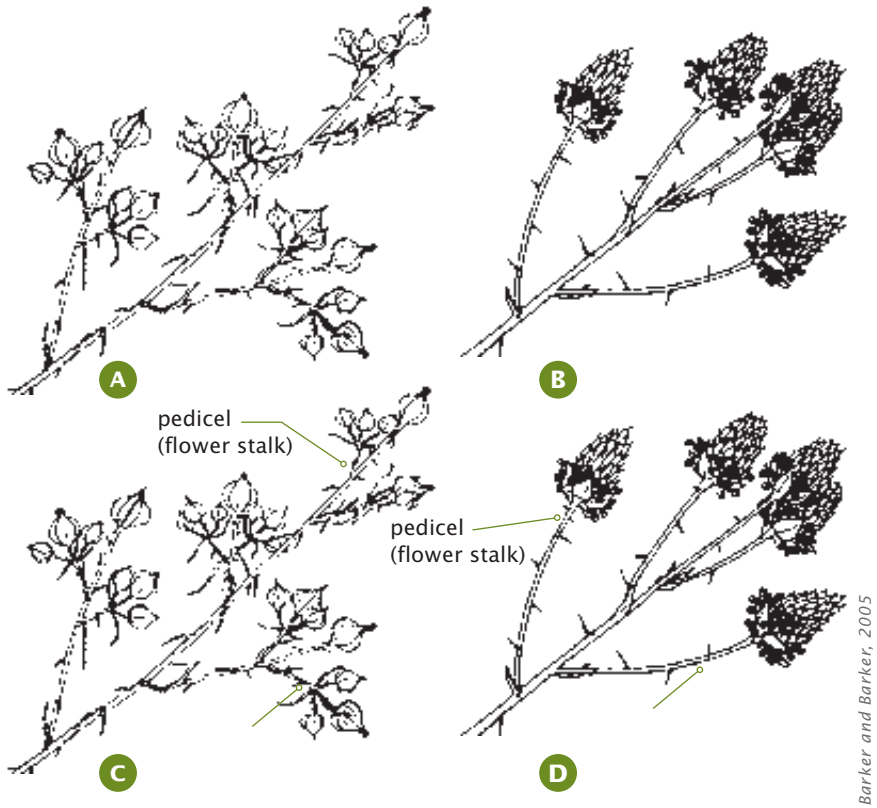


Figure 2.1 Inflorescence and pedicel length (see Table 2.4 for key).

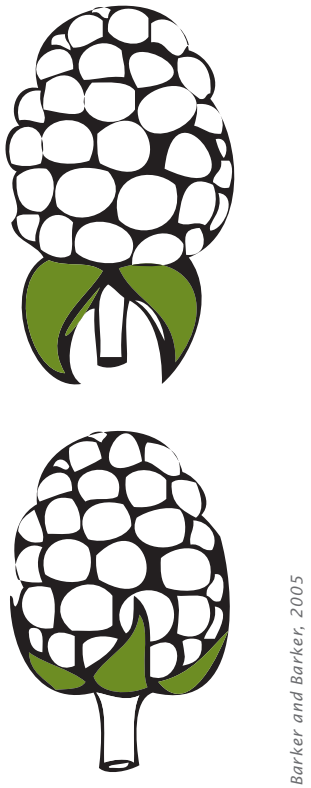


Figure 2.2 Sepals reflexed (above) or non-reflexed (below).

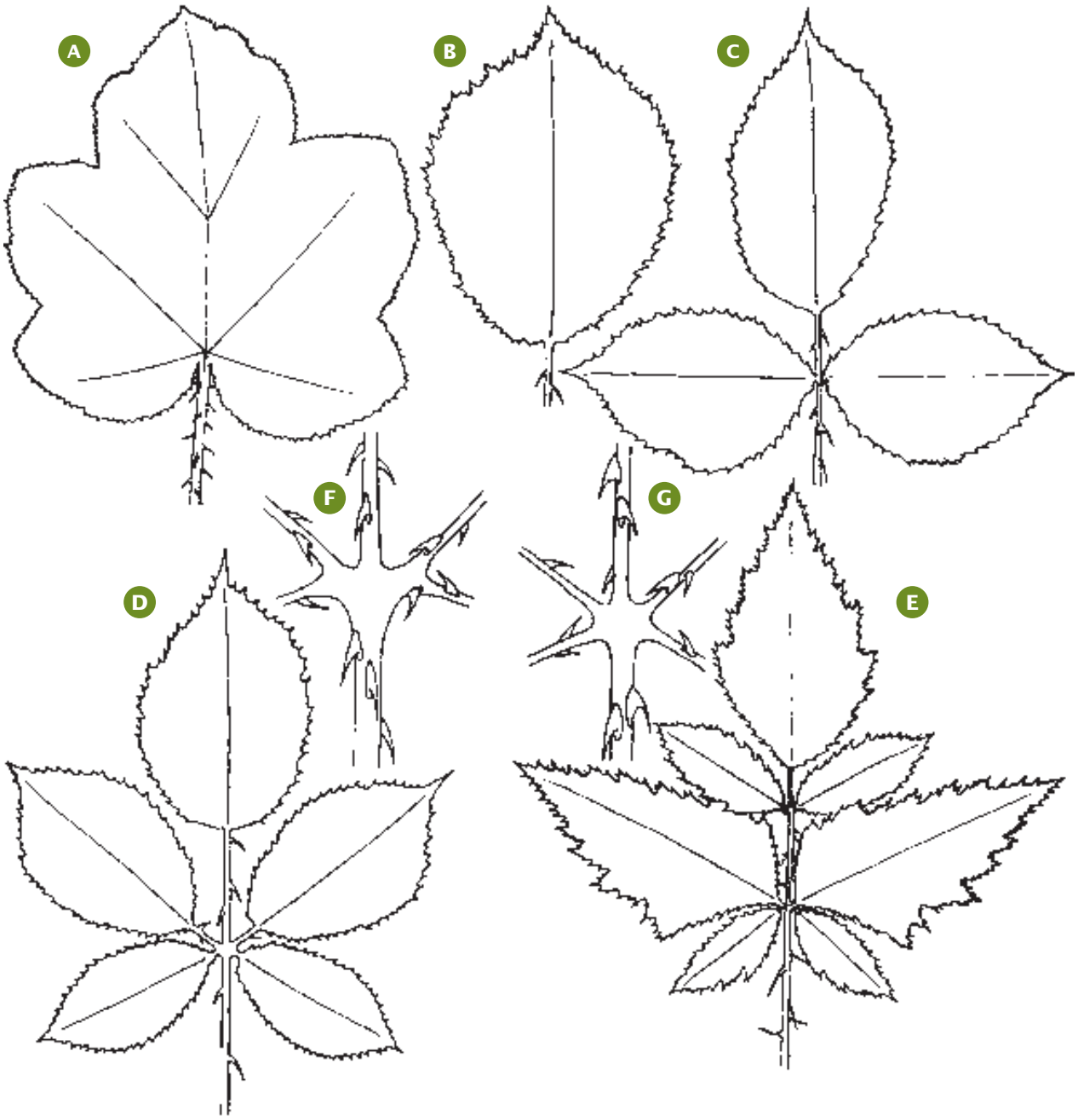


Figure 2.3 Leaf characteristics of *R. fruticosus* agg. and North American *Rubus* species in Australia. *Drawing by Beth Chandler from Evans et al., 2007*

A–entire lobed leaf as found in *R. rugosus*.

B–simple (reduced trifoliate) leaf found in the upper parts of the floricane in many taxa of the *R. fruticosus* agg.

C–typical leaf found subtending base of most inflorescences in the *R. fruticosus* agg.

D–typical leaf found in taxa of the *R. fruticosus* agg.

E–pinnate leaf as found in *R. loganobaccus*, *R. idaeus* or *R. parvifolius*.

F–pedate arrangement of petiolules where the lowest pair of petiolules arises from the middle pair of petiolules as found in *R. leucostachys* or *R. riddelsdelli*.

G–digitate arrangement of petiolules where the petiolules of all leaflets arise from the same point on the petiole, for example, *R. anglocandicans*.

Distinguishing native *Rubus* species

The native *R. parvifolius* is the most commonly encountered and widely distributed native *Rubus* in Australia. It is often found growing with other *Rubus* species in infestations and is easily distinguished by its pinnate leaves and distinctive pink to red flowers.

Table 2.3 (p. 21) lists the *Rubus* species native to Australia.

Birgitte Verbeek (NSW DPI)

Birgitte Verbeek (NSW DPI)

*R. parvifolius (*Native raspberry).

Case study

Importance of blackberry identification

At Tumut Shire Council in southern NSW the Noxious Weeds Inspector was informed by Forests NSW that they had a problem with the control of certain blackberries near a creek line. The inspector noted that this blackberry had a slightly different appearance to others he had been controlling in the region.

When he had the species identified at a herbarium, it was found to be *R. philadelphicus*, a blackberry species from North America that grows readily in any type of soil as long as there is consistent moisture. Unlike other blackberry species in this area, it could not be controlled with Brush Off® (metasulfuron) but seemed to die back well when treated with Grazon Extra® (containing a mixture of the active ingredients triclopyr, picloram and aminopyralid).