

BIRDWING BUTTERFLY VINE

Pararistolochia praevenosa (F. Muell.) M.J. Parsons (Aristolochiaceae)



Flowers



Ripe seed capsule (fruit)

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BIRDWING BUTTERFLY VINE

Common name

Birdwing butterfly vine

Scientific name

Pararistolochia praevenosa (F. Muell.) M.J. Parsons
(Family Aristolochiaceae)

Type locality: Clarence River, New South Wales (NSW). Type specimen in National Herbarium of Victoria.

Distribution

Historical range: Queensland (Qld) – Atherton Tablelands and Maryborough to Currumbin. NSW – Tweed River to Grafton and Clarence River.

Current range: North-eastern Qld – Lake Eacham; south-eastern Qld – coastally, Kin Kin to Currumbin; subcoastally, Conondale, Blackall and northern D’Aguilar Ranges, Upper Ormeau, Tamborine, Canungra and McPherson Range. NSW – coastally, Tweed River and Cudgen to Broken Head and Blackwall Range; subcoastally, Border Ranges and Tweed Valley to Mallanganees. The distribution of the vine is fragmented and disjunct throughout the natural range.

Conservation status

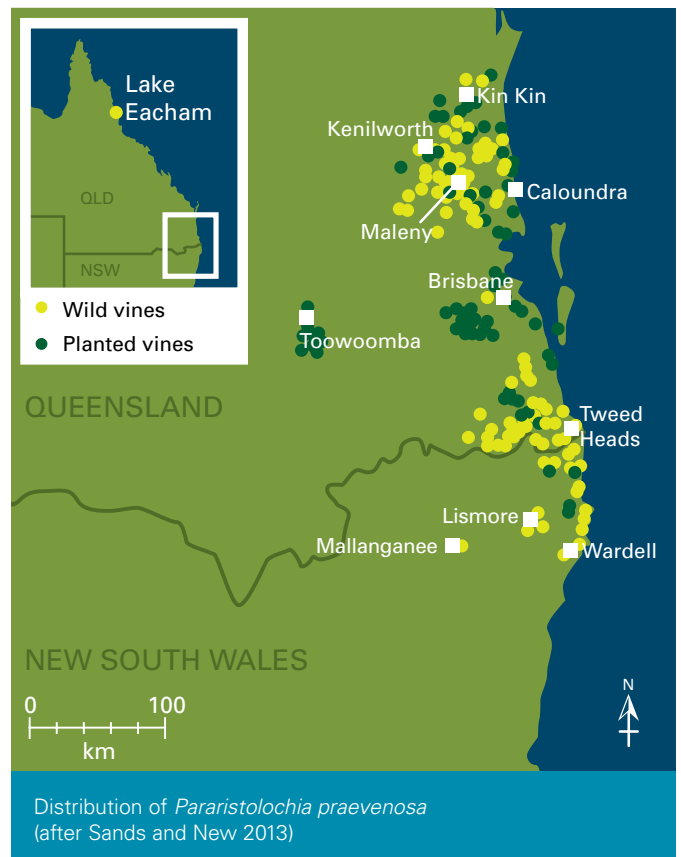
Near Threatened (Qld); not listed (federally and NSW).

Pararistolochia praevenosa is an uncommon lowland vine, and is the main natural food plant for larvae of the Richmond birdwing (*Ornithoptera richmondia* [Gray]), a butterfly classified as Vulnerable in Qld. The vine’s habitat, lowland subtropical rainforest, is listed federally as Critically Endangered.

Habitats

Subtropical rainforests on the eastern coast and lower ranges (<600 m), with plant communities on nutrient-rich volcanic, alluvial or, uncommonly, sandy soils.

The related mountain butterfly vine (*P. laheyana*), listed as Least Concern in Qld, occurs at ca >600 m on the Qld/NSW McPherson and Border Ranges surrounding Mt Warning, near the summit of Mt Warning and on Mt Nardi in the Nightcap



Range, NSW. Occasionally *P. laheyana* is a food plant of the Richmond birdwing. Several *Aristolochia* species and five other *Pararistolochia* species are food plants for two other Australian species of birdwing butterflies in north-eastern Qld.

The introduced South American Dutchman’s pipe vine (*Aristolochia elegans*) has spread from gardens into bushland, where the Richmond birdwing will lay eggs on its leaves. However, the young birdwing larvae are poisoned when they feed on Dutchman’s pipe vine.

Description

The birdwing butterfly vine is a climbing liane, with stems to 5 cm diameter, slightly flattened basally; older stems branch



Unripe seed capsule



Mature stems, showing reticulated bark pattern



Leaf and twisted petiole attached to young stem

and ascend to 20 m. Stems from older vines often arise from rhizomes near the base. Corky bark forming raised, reticulated and elongate patterns develops on older stems. Leaves are alternate on stems; blades oval or oblong, 7–20 cm (rarely 35 cm) long, acuminate, with curved margins and rounded bases. Older leaves are firm, blades glossy green above, darkening with age, dull and paler below. Beneath, leaf veins are raised, with the sub-basal vein long, reaching the margin of blade about midway between base and apex. Texture of young foliage and the growing tip is soft and brittle, with fine hairs; leaves become leathery and hairless with age. Petioles 1–3 cm long, thickened and often twisted. Flower buds arise near terminal or lateral foliage; flowers occur singly, on stalks or short racemes. The calyx is tubular, ca 2 cm long, slightly curved, the exterior with red-purplish veins and brown hairs; the opening has three inwardly yellow, petal-like expanded segments, with fine hairs crossing the throat. Seed capsules are initially green, turning yellow or orange after expansion, and becoming fruit-like and soft when ripe. The mature globular fruit has six prominent ribs and contains 30–70 brown, flattened, sub-triangular seeds measuring 6 x 5 mm.

Biology and ecology

Natural habitats for *P. praevenosa* are lowland subtropical rainforests (<600 m) with annual rainfall >900 mm. The vines usually occur in gullies or on moist lower slopes of mountain ranges, and in gallery or riparian rainforest on flats fringing rivers and streams; less commonly, in littoral rainforest behind coastal sand dunes and on headlands, or in mixed forests with eucalypt emergents. Vines prefer nutrient-rich soils, such as volcanic alluvial soils (derived from basalt or andesite, sometimes with volcanic floaters; preferred pH ca 6.5–6.8), basaltic slopes or caps but can also be found on soils derived from sediments, metasediments, metavolcanics and, rarely, moist, old sand dune loams overlying volcanic soils with high water tables. The key factors influencing occurrence are permanent soil moisture and nutrient enrichment from accumulation of humus and outwash of nutrients or minerals from adjoining or underlying decomposing rocks. *Pararistolochia praevenosa* does not survive being burnt but root stocks are occasionally protected from fire between rocks or in rock falls.

Flowering occurs mainly from September–November and, dependent on rainfall, unseasonally at other times. Flowers appear most frequently on apical stems and parts of younger stems receiving sunlight, and are pollinated by small flies (Diptera, possibly Phoridae) that breed in decomposing leaf litter. Seed capsules begin to expand in spring, ripening in late summer and autumn; when mature they fall to the ground where Australian brush-turkeys (*Alectura lathamii*) feed on the pulp, inadvertently burying seeds by scratching. Seeds germinate if soils are not strongly acidic (pH 6.5–6.8) and exposure to light is adequate. Depending on permanent soil moisture and temperature regimes, germination takes from six weeks to two years but seeds can remain dormant for years. *Pararistolochia praevenosa* produces new growth at all times of the year but mostly following rainfall during spring and summer.



Typical understory growth of *Pararistolochia praevenosa*

The larvae of some other Lepidoptera feed on the leaves of *P. praevenosa*, including the moth *Tiracola plagiata* (Walker) (Erebidae) and a small, unidentified leaf-rolling moth (Tortricidae).

Associated plant species

Pararistolochia praevenosa grows in association with rainforest plants requiring similar soils, moisture, shade, mulch, slopes, nutrients and other environmental conditions. These include Bangalow palm (*Archontophoenix cunninghamiana*), black bean (*Castanospermum australe*), lilly pillies (*Syzygium* spp.), hairy walnut (*Endiandra pubens*), bolwarra (*Eupomatia laurina*), blue quandong (*Elaeocarpus grandis*), figs (*Ficus* spp.), weeping lilly pillie (*Waterhousea floribunda*) and coogeras (*Arytera* spp.). Associated vines include bull cane (*Flagellaria indica*), burny vine (*Trophus scandens*), lawyer vine (*Calamus muelleri*), carronia (*Carronia multisepealea*) and zigzag vine (*Melodorum leichhardtii*). Vines sometimes mistaken for *P. praevenosa* include *Parsonsia* spp., hypserpa (*Hypserpa decumbens*) and kangaroo vine (*Cissus antarctica*). *Pararistolochia praevenosa* has been cultivated and planted to assist recovery of the Richmond birdwing butterfly (Sands and Grimshaw 2013).

Threats

- Inadequate protection (due to tenure and/or inappropriate management) of key habitats, with risks to the vine from human disturbance, including burning practices that have an adverse impact on the rainforest understorey.
- Clearing of remnant lowland subtropical rainforest for forestry, agriculture, quarrying and urban development. Particularly affected is vegetation on creeks and rivers in south-eastern Qld.
- Fragmentation of lowland subtropical rainforest and destruction of habitat corridors, leading to isolation of vine communities and colonies of the vine's pollinator.
- Out-competition by the introduced, related Dutchman's pipe vine, which also has leaves poisonous to Richmond birdwing larvae.
- Smothering and competition for light by exotic vines blue morning glory (*Ipomoea indica*), cat's claw creeper (*Dolichandra unguis-cati*), glycine (*Neonotonia wightii*) and madeira vine (*Anredera cordifolia*), and by woody weeds camphor laurel (*Cinnamomum camphora*), Chinese elm (*Celtis sinensis*) and privets (*Ligustrum* spp.). Introduced grasses (e.g. *Megathyrsus maximus*) invade rainforest edges and increase flammability of the understorey.
- Climate change and prolonged drought, affecting survival and reproduction of the vine by reducing apical growth, flowering, seed set and seedling recruitment.

What can be done to recover this species?

- Assemble a recovery team and prepare a recovery plan.
- Maintain listing of the vine as Near Threatened in Qld until threat abatement strategies improve the conservation status.
- Encourage and support efforts by community and Landcare groups to plant *P. praevenosa* in parts of the natural range.
- Promote rehabilitation of rainforest corridors and planting of vines to restore connectivity of fragmented vine populations.
- Protect habitats of *P. praevenosa* by securing tenure (adding key public lands to State-protected areas and other reserves, and establishing nature refuges or other conservation covenants on privately-owned land).
- Improve management of *P. praevenosa* habitats on all protected areas by excluding fire and preventing degradation by human activities and weeds.
- Eradicate or control Dutchman's pipe vine throughout the range of *P. praevenosa* by removal, poisoning or other means, and ban this vine's sale by NSW nurseries.
- Promote research on the pollinators of *Pararistolochia* spp. and include relevant actions in revised recovery plan(s) for the Richmond birdwing and its food plants.
- Select and maintain at least one arboretum to preserve living representatives of *P. praevenosa* from across the geographical range and reservoir of genetic stocks.



Seeds extracted from a ripe seed capsule

Further reading

- Harden, G., McDonald, B. and Williams, J. 2007. *Rainforest Climbing Plants. A field guide to their identification*. Gwen Harden Publishing, Nambucca Heads, NSW. 176 pp.
- Leiper, G., Glazebrook, J., Cox, D. and Rathie, K. 2009. *Mangroves to Mountains*. Revised Edition. Society for Growing Australian Plants, Logan River Branch, Qld. 544 pp.
- McDonald, B. and Hunter, J. 2010. The Vegetation. pp 129–134 in (eds R. Kitching, R. Braithwaite and J. Cavanaugh) *Remnants of Gondwana: A Natural and Social History of the Gondwana Rainforests of Australia*. Surrey Beatty and Sons Pty Ltd, Chipping Norton, NSW.
- Sands, D. 2008. Conserving the Richmond Birdwing Butterfly over two decades: Where to next? *Ecological Management and Restoration* **9**: 4–16.
- Sands, D.P.A. and Grimshaw, P.A. 2013. Cultivation of the birdwing butterfly vine *Pararistolochia praevenosa* (Aristolochiaceae). Information brochure. Wildlife Preservation Society of Queensland, Brisbane. 4 pp.
- Sands, D.P.A. and New, T.R. 2013. *Conservation of the Richmond Birdwing Butterfly in Australia*. Springer Dordrecht, Holland.