

The birdwing butterfly vine, *Pararistolochia praevenosa*, is the primary food plant for larvae of the Richmond Birdwing Butterfly (*Ornithoptera richmondia*), a rare butterfly classified as a Vulnerable species in Queensland.

P. praevenosa is an endemic vine, found in patches of lowland subtropical rainforest from Kin Kin, Queensland, to Wardell, New South Wales (NSW), and with one small patch on the Atherton Tablelands in northern Queensland. A related vine, the mountain butterfly vine *Pararistolochia laheyana*, occurs on mountains (>600 m) of the Qld/NSW Border Ranges where it is an occasional food plant for the birdwing larvae during favourable climatic conditions.

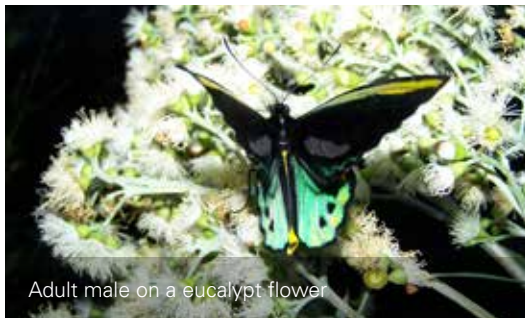
The vine has become rare in the wild due to clearing, burning and other disturbance of its rainforest habitats.

CULTIVATION OF THE BIRDWING BUTTERFLY VINE

PARARISTOLOCHIA PRAEVENOSA (Aristolochiaceae)



Birdwing vine



Adult male on a eucalypt flower



P. praevenosa open flower



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WHY GROW THE BIRDWING BUTTERFLY VINE?



Ideal growth of a birdwing vine

Flowers of *Pararistolochia praevenosa* are mostly produced from September to November but also at other times of the year depending on rainfall. The flowers are pollinated by tiny flies, and if pollinated, the green seed capsules expand, becoming swollen and turn yellow-orange when they ripen in February, March or April. Each seed capsule contains light brown seeds (20-60) and when ripe, capsules become soft and fall (adhescent) to the ground, where the seeds are dispersed and buried by brush turkeys as they feed on the pulp. Seed capsules are infrequently seen on wild vines but in cultivation, capsules commonly develop on vines after flowering. Flowering and seeds develop more often on stems of vines exposed to bright light, if the vines are at least 3 years old and kept well mulched.

Pararistolochia praevenosa is planted in gardens and bush regeneration sites to attract the Richmond birdwing butterfly, and to encourage them to breed in places where there are very few wild food plants, or places that are no longer suitable as butterfly habitats. In the longer term planting the vine reduces the likelihood of extinction of the Richmond birdwing butterfly and it helps

to recolonise areas where the birdwing butterfly is rare or has become extinct. Each larva can eat about 2 square metres of vine, leaves and the softer stem. Vines need to be about 4 m or more in height, with more than 30 leaves attached before a vine can support a larva to maturity. *Pararistolochia praevenosa* can be easily grown from seeds or cuttings but seedlings will grow more rapidly than cutting-struck

plants. Gloves must be worn when seeds are being prepared, and when planting the vines.

Pararistolochia praevenosa is a protected plant in Queensland where the vine is listed as *Least threatened*. Plants are readily available from approved nurseries, and the seeds or cuttings should not be collected from the wild, without a *Permit to Propagate* or a *Permit to Collect*.

PROPAGATING *P. PRAEVENOSA* FROM CUTTINGS

- Prepare cutting beds using a suitable container: e.g. plastic foam tray with drainage holes, or a large (>12 cm) shallow pot.
- Before filling the container with cutting mix, add a moistened layer of peat moss (about 1 cm deep) at the bottom of tray or pot.
- One 4 litre batch of medium for striking cuttings is best made from: (i) 4 parts washed river sand, (ii) 2 parts perlite granules, (iii) 2 parts peat moss, and (iv) 4 spoons of micro-Osmocote® or Nutricote®.
- Prepare cuttings (13 – 20 cm in length) from the older brown stems (2-3 mm thick, not soft and green), when the stems are at least one year old. Retain 3 nodes on each cutting and remove side shoots. (Best time to take cuttings: March to September).
- Retain one upper leaf per cutting and cut off and discard the outer half; cut off any remaining leaves and any soft terminal growth using secateurs.
- Roughen the bark on one side at the base for 1 cm, using a blade; dip the base of the cutting in hormone root powder before planting.
- Make a hole with a pencil, place cutting in the striking medium and gently press the mix to fill the hole around the base of the cutting. (Recommended rooting powder, "Stem Root No. 2," containing 0.4% Indol-3-butyric acid).
- Sprinkle the container holding cuttings with water and ensure the cutting mix is always kept moist, preferably by misting for 15 minutes per day.
- After 8 months test cuttings for the formation of roots: by soaking the container to loosen mix and gently lift cuttings to test for root formation. Take care: young roots are very fragile and easily broken!
- Cuttings take 2 months to callous, 6 months for shoots to emerge and 8 months for sufficient root growth before rooted cuttings are potting up. Using a heat bed will enhance and speed up root formation.



P. praevenosa seed capsule



P. praevenosa flower



A struck cutting



Nursery grown vines ready to plant

POTTING UP STRUCK CUTTINGS OF *P. PRAEVENOSA*

- Rooted cuttings can be potted up when 8 - 12 months old and when roots are about 5 cm long.
- After potting up the rooted cuttings, hold the plants for at least one year in large pots until they climb the stakes. Coax the shoots to climb clockwise (facing upwards) up the stakes (dead bamboo stakes, ideal, ca 750 cm long x 1 cm diameter) inserted in pots. Tips can be pruned when growth is too vigorous to plant out.

PROPAGATING *P. PRAEVENOSA* FROM SEEDS

Before removal from a vine, the fruity capsules need to be ripe, yellow-orange and not green. If not already soft and ready to prepare for planting, capsules may need to be held in a bag for several days. Seeds will remain viable only if kept moist. In propagation houses, always minimise air drafts rising from beneath the benches that often results in drying of roots, die-back or yellowing of foliage. Excessive aeration of roots of vines often becomes a problem when the pots vines are held on wire benches, or widely-spaced timber slats. The problem can easily be overcome by placing seed trays and pots on benches covered first by a plastic sheet. The following steps will ensure the seeds are prepared in the best way to optimise seed germination, pot up seedlings, strike cuttings and maintain potted plants until they are ready for planting in the ground.

- Prepare a seed bed using a suitable container, e.g. plastic foam tray with drainage holes, or a large shallow pot.
- Place a moistened layer of peat moss (about 1 cm deep) at the bottom of the tray or pot before filling it with potting mix.
- Fill the container to 2/3rd depth with a quality potting mix (e.g. Searle's Potting Mix®). Moisten the mix and press it down firmly.
- Break up the soft capsules in a container of water (1-2 capsules per bowl) and make a slurry of the pulp and seeds (best time for planting seeds March -June).
- Pour the slurry evenly over the surface of the seed bed. Cover the slurry with potting mix (about 1 cm), sprinkle with water and press the mix down gently (with base of an empty pot) to make the surface firm.



- Place the container on a well-shaded, sheltered bench and cover with loose transparent plastic sheet until seed leaves appear.
- Broken light is desirable; direct sunlight or total shade is unsuitable.
- Keep the soil moistened using a fine spray; always replacing the loose plastic covers afterwards*.
- Depending on season and temperatures, seeds take from 6 - 12 weeks to several months (or up to 3 years) to germinate after sowing.
- When seed leaves appear, remove the plastic sheet but make sure the seed bed is kept moist, preferably by using a misting nozzle.
- Remove the plastic cover as soon as the first pair of true leaves appears (up to 8 - 16 weeks).

* NB Containers with soil, seeds or seedlings must be kept moist until the seedlings are potted up.



Birdwing eggs under leaf of food plant



First stage of newly-hatched larva



Close up of *praevenosa* stem

POTTING UP *P. PRAEVENOSA* SEEDLINGS AND GROWING UP STAKES

Seedlings can be transferred from the seed bed into plastic tubes (4 cm) or small pots (8 cm) initially, and then into larger pots (>10 cm), but the preferred method is to transfer them directly from a seed tray into larger pots to minimise disturbance of the fragile roots. Planting tube stock directly into the ground is not recommended as the root development will not be sufficient to ensure survival.

- A quality potting mix (e.g. Searles Potting Mix®) is recommended for potting up seedlings.
- Seedlings should be potted up after the second pair of leaves has emerged.
- Seedlings are easily 'pricked out' using the handle of a teaspoon to loosen the soil before lifting out the seedling and potting up.
- Plastic tubes (5 x 5 x 20 cm) or small plastic pots (10 x 10 cm diameter) are used for primary 'growing on' of seedlings (ca 6-12 months).
- Transfer seedlings into large pots (minimum 14 x 13 cm diameter) for second stage growth and production of climbing shoot.
- Coax shoots to climb up (clockwise facing upwards) dead bamboo stakes (ca 750 cm long x 1 cm diameter) inserted in the pots. Tips can be pruned when growth is too vigorous to plant out.
- Hold plants in pots for 2 years before planting out into final growing position.

CHOOSING THE BEST PLACE TO PLANT *P. PRAEVENOSA*



Pararistolochia praevenosa vines can only be successfully grown if the soils are well drained and kept permanently moist. The roots of the vines are very sensitive to prolonged drought and will die if the surrounding soils dry out. In the wild, mature vines have been known to die and they will not re-sprout from root stocks after the leaves and stems have become brown. Female Richmond birdwing butterflies are attracted to shaded or semi-shaded vines with soft leaves and will avoid depositing eggs on vines growing in full sunlight.

Lightly pruning the tops of vines to produce plenty of low, soft green leaves, can encourage the new growth to emerge from stems, foliage preferred by the female birdwing as a place to lay her eggs. Do not remove all growth with leaves attached and heavily pruned vines will die if the leaves are removed from old stems. The vines prefer moist, semi-shaded positions with nutrient-rich soils, not too acidic (pH 6.5 – 6.8) and with good drainage (10-30° slope). Acidic soils can be improved by mixing the surface soils with dolomite. Always plant the vines more than 1 m from the base of a tree, to avoid competition for moisture. The vines will tolerate less-suitable conditions, such as sandy soils and shales, as long as soils do not dry out and have good drainage (slope of 10% or more, or a built-up bed).

Dead bamboo stakes provide the best supports for vines and are easily seen. A hollow log segment (< 30 cm) will promote establishment when slightly sunk into the ground and back-filled with a soil rich in nutrients, and moisture retaining materials (used sparingly) mixed with 10% dolomite. Mulch is essential for keeping the surface roots from drying out.

The *Pararistolochia praevenosa* vines can be grown on fences or trellises with several other species of native 'companion' vines, for example Wonga vines (*Pandorea* spp.) but competitive and vigorous species (e.g. *Parsonsia* spp.) should be avoided.

If wanted for growing at a small site, *Pararistolochia praevenosa* will do well in large tubs, trained up long stakes or frames and they can then be easily moved. Relocation of mature vines should be avoided as damage to mature roots invariably results in losses. The following guidelines will provide the best opportunities to grow healthy vines needed to attract the Richmond birdwing butterfly:

- Make sure the potted vines are at least 2 years old and climbing a stake before planting.
- Select the final place where the vine is to climb: e.g. an evergreen tree (not deciduous), trellis, fence or another vine (companion vines).
- Semi-shade is preferred. Avoid choosing a site for planting exposed to direct sunlight or in complete shade. The edge of a forest is ideal.
- If the vine is to grow up a tree, dig the hole at least 1.5-2 m from its base (to avoid competition for moisture). Vines can be easily grown up a string into a canopy.
- A hole should be dug at least twice the width (ca 20 cm) and twice the depth of the pot.
- Mix the soil removed from hole with 10% dolomite (by volume), or make up some potting mix with 10% dolomite to be used for back-filling around the roots.
- Wet the soil around roots as soon as possible after planting. Insert base of stake (2-3 m, dead bamboo) into the ground near base of vine and tie the upper end of stake to tree or final support for the vine.
- Provide a 'collar' (diameter ca 1 m, depth 20 cm) of good quality mulch (e.g sugarcane) around the base of the vine and thoroughly soak the mulch and soil around the vine.
- After planting, to coax new apical growth, carefully remove with secateurs the lower and older leaves, leaving only the top two or three. Take care not to break off or remove the growing shoot – they are fragile.
- Apply sugar cane or other aged mulch and surround the base of the vine to a depth of at least 20 cm.
- Water vines once per week for two months after planting unless rainfall is adequate (at least once per week). Watering frequency will then depend on maintaining adequate soil moisture but watering should be applied at intervals until vines are at least 2 years old after planting.

HOW TO ENCOURAGE HEALTHY GROWTH

The vines prefer to climb up into living trees but will also grow well on a semi-shaded trellis. *P. praevenosa* does not like growing up trunks of eucalypts or smooth-barked trees and the climbing apex of a vine needs narrow stems (<10 cm) to climb and grow up into a canopy. Vines can be encouraged into a canopy by coaxing the shoot to grow up a stake or along a cord tied into a branch. Once in a canopy 3 m or more above the ground the vines will branch and climb among stems of a supporting tree. Deciduous trees, other than some native figs, are unsuitable as supports for vines and butterfly pupae attached beneath their leaves are likely to be shed. Lillypillies (*Syzygium* spp.) and Bolly Gum (*Noelitsea dealbata*) are the best of well known low-growing and well-shaded trees that will support a growing vine.

Birdwing vines are not aggressive and do not normally smother plants supporting them. Vines need to be kept permanently moist in the dry season otherwise they will die. During periods of drought watering may be needed every 3 days until the vines are at least 3 years old. The vines like fertiliser to become established and will grow much more rapidly if Osmocote® or something similar is provided frequently for the first 2-3 years. Unlike many other native plants, *P. praevenosa* likes fertilisers containing some phosphate.

