

RICHMOND BIRDWING BUTTERFLY

Ornithoptera richmondia (Gray) (Lepidoptera, Papilionidae)



Egg deposited beneath leaf of the lowland food plant, *Paristolochia praevenosa*



Newly hatched larva (1st instar) on young leaf of *Paristolochia praevenosa*



Pupa attached to underside of leaf by silk at the tip of abdomen and a central harness

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RICHMOND BIRDWING BUTTERFLY

Common name

Richmond birdwing butterfly

Scientific name

Ornithoptera richmondia (Gray) (Order Lepidoptera, Family Papilionidae)

Type locality: Richmond River, New South Wales (NSW).
Syntype male in Museum of Natural History, London.

Distribution

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

Current range: South-eastern Qld – coastally, Kin Kin to Currumbin; subcoastally, Conondale, Blackall and northern D’Aguilar Ranges, Upper Ormeau, Tamborine Mountain, Canungra and McPherson Range; rarely in or near Brisbane. NSW – coastally, Tweed River to Broken Head and Blackwall Range; subcoastally, Border Ranges to Mallanganee. The distribution of breeding colonies is fragmented throughout the natural range. In some years abundant on ranges both sides of the Qld/NSW border on the McPherson, Border, Nightcap and Richmond Ranges and Mount Warning but usually absent above 600 m.

Conservations status

Vulnerable (Qld); not listed (federally and NSW).

Habitats

Lowland subtropical rainforest and, occasionally, mountain rainforest on the Qld/NSW McPherson and Border Ranges. Occasionally adults seek nectar in gardens and breed on cultivated food plants.

Similar species

Two other species of birdwing butterflies, *Ornithoptera euphorion* and *O. priamus*, occur in north-eastern Qld. About 30 other birdwing species occur in South-east Asia, New Guinea (Indonesian Papua and Papua New Guinea) and its islands, as well as the Solomon Islands.



Food plants

Lowlands (<600 m): Birdwing butterfly vine (*Pararistolochia praevenosa*) (F. Muell.) M.J. Parsons (Family Aristolochiaceae).

Uplands (>400 m): Mountain butterfly vine (*P. laheyana*) (Bail.) M.J. Parsons (Family Aristolochiaceae). Occurs only on mountains of Qld/NSW McPherson and Border Ranges, and Mt Warning and Mt Nardi (Nightcap Range), NSW. Occasional food source only.

Right, Fig 1. Pre-pupal larva beneath leaf of *Pararistolochia praevenosa*, attached by silk at the tip of abdomen and via a mid-body harness

Right, Fig 2. Female Richmond birdwing resting, showing underside of wings

Right, Fig 3. Male Richmond birdwing resting, showing underside of wings



Fig 1.



Fig 2.



Fig 3.

Although *P. praevenosa* and *P. laheyana* are the natural food plants for the Richmond birdwing, females will lay eggs on the introduced Dutchman's pipe vine (*Aristolochia elegans*) but young larvae are poisoned when they feed on leaves of this South American plant.

Description

The Richmond birdwing butterfly is the largest butterfly in subtropical eastern Australia (average male wingspan ca 125 mm, female ca 140 mm).

Adult males: The fore wings above are black, with metallic green edging; the hind wings are metallic green, with black edging and sometimes black and gold spots. Beneath, the fore wings are black, with variable green patches, and the hind wings are variably green, blue and gold with black spots.

Adult females: The fore wings above are brownish-black, with greyish-white patches; the hind wings are brownish-black on the inner half of the wing and cream and yellowish-grey, enclosing black spots, on the outer half, except for a wavy black margin. Beneath, the colour is similar but the cream areas become yellow near the outer part of the hind wing.

Both sexes have a large red spot on the thorax at the base of the wings, visible from beneath.

The Richmond birdwing is similar to, but smaller than, the Cairns birdwing (*O. euphorion*) and Cape York birdwing (*O. priamus*). The three species do not overlap in distribution in Australia.

Life history

The Richmond birdwing inhabits lowland subtropical rainforests where the birdwing butterfly vine is sufficiently abundant to support numbers of immature stages (larvae or 'caterpillars') of the butterfly. Although the Richmond birdwing occasionally occurs in rainforest >600 m near the Qld/NSW border where it can breed on the mountain butterfly vine, it rarely survives to produce adults at these altitudes, except after unusually mild winters. Adults live for up to one month, feeding on nectar from flowers of eucalypts, native frangipani (*Hymenosporum flavum*), lilly pillies (*Syzygium* spp.), broad-leaved paperbark (*Melaleuca quinquenervia*), lantana (*Lantana camara*) and many other native and introduced plants (e.g. hibiscus, buddleia).



Mature larva (5th instar) feeding on leaf of *Pararistolochia praevenosa*

Mostly from September–March, female butterflies deposit eggs on the underside of leaves of food plants. After hatching, tiny (2 mm long) black larvae bearing fleshy spines (including a yellow middle pair) eat the eggshell before searching for soft leaves for their first meal. Larval development progresses through five stages (instars). Larger larvae vary in colour from pale brown to black, with rows of fleshy, dark tubercles, banded with orange. The mid-body pair of these tubercles is yellow or mostly yellow. Larvae feed for 25–50 days, initially on soft and later on firm leaves, before (usually) leaving the food plant to pupate. During this process, a larva spins a silken mat on the underside of a leaf to which it attaches itself with silk, first by the tip of the abdomen and then with a mid-body harness for support. Finally, it casts off its skin to form a pupa. The pupae of Richmond birdwings are green, unlike the brown pupae of other Australian birdwings. The pupal stage lasts 22–40 days in summer or around 120–300 days when over-wintering. Adults emerge from pupae in spring, summer and autumn, depending on seasons and temperatures. Two or three generations of birdwings can occur per year in coastal areas and one or two at higher altitudes.

Natural enemies and mortality

Ants and mites prey on eggs; ants and spiders are predators of larvae; spiders and birds prey on pupae and adults. Diseases also kill pupae. Internal parasitoids of larvae or pupae have not been recorded. Leaf toughness during drought causes starvation of young larvae and can produce natural mortality.



Fig 4.



Fig 5.

Left, Fig 4. Male Richmond birdwing from above

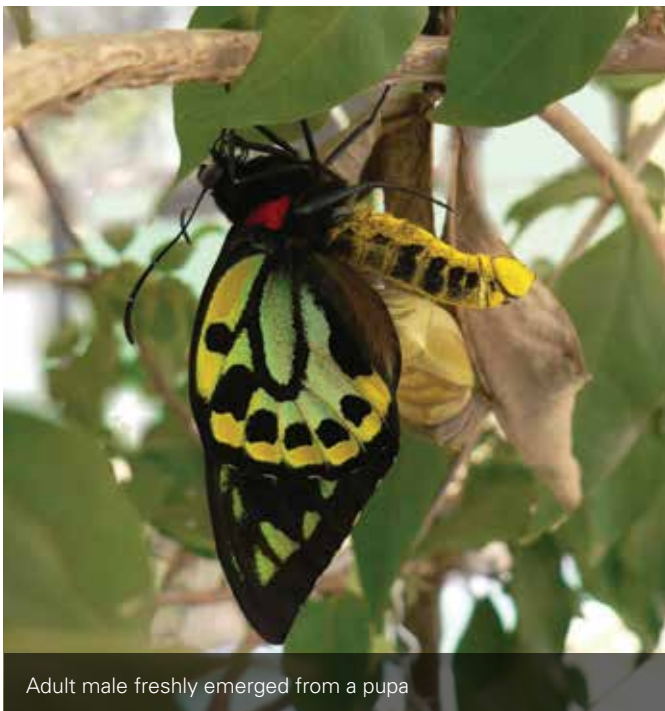
Left, Fig 5. Female Richmond birdwing from above

Threats

- Inadequate protection (due to tenure and/or inappropriate management) of key habitats supporting the food plant *P. praevenosa*, with risks 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 are habitats on creeks and rivers in south-eastern Qld.
- Fragmentation of lowland subtropical rainforest and destruction of habitat corridors, leading to isolation of breeding colonies and inbreeding depression in the butterfly.
- Poisoning of birdwing larvae by Dutchman's pipe vine, a formerly cultivated exotic species from South America that has invaded forests.
- Displacement of food plants 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 apical growth, leaf toughness and palatability (to larvae) of leaves of the food plant *P. praevenosa*, as well as making birdwing habitats in the north of the range unsuitable for the butterfly and its host vine. Warmer temperature regimes will also disrupt the winter pupal diapause.
- Unregulated collecting and commercial trade of specimens.

What can be done to recover this species?

- Assemble a recovery team, update the recovery plan (1996) and integrate recovery actions with those for the principal food plant, the vine *P. praevenosa*.
- Maintain listing of *O. richmondia* as Vulnerable in Qld until threat abatement strategies improve the conservation status.
- Coordinate efforts by community and Landcare groups to establish more food plants (*P. praevenosa*, *P. laheyana*) in suitable areas.
- Maintain recovery actions including corridor rehabilitation as a landscape tool for the birdwing and other native wildlife.
- 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.
- Improve and implement methods to eradicate Dutchman's pipe vine throughout the range of *O. richmondia* and ban this vine's sale by NSW nurseries.
- Implement appropriate actions to reduce the negative effects of inbreeding depression on butterfly populations.
- Promote research on the pollinators of the larval food plants and include relevant actions in the revised recovery plan.



Adult male freshly emerged from a pupa

Further reading

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