



**Terrestrial or extra-terrestrial?**  
This recently discovered dragonfly nymph is unusual in both its terrestrial life style and its strange countenance.

## Nymphs in the rainforest

Rainforest communities are renowned for their diversity of plant and animal species, but sometimes this diversity is carried to quite unusual extremes.

Take two recently discovered dragonfly species. Their adult stage is ordinary enough, but the younger stages of these rainforest dragonflies have raised a few eyebrows in entomological circles.

Immature dragonflies, the nymphs, are usually aquatic, occasionally semi-aquatic; they live in rapid streams, lazy rivers, lakes, or temporary ponds, or sometimes burrow in stream banks or bogs. After a year or more, they crawl clumsily from the water before casting off the larval wet-suit, inflating then hardening their wings, and taking to the air. If the nymphs are removed from water before this last moult, they dry out and eventually die. At least, that's been the conventional wisdom.

But the textbooks will soon need amendment because, lately, some terrestrial dragonfly nymphs have turned up in leaf litter samples from Queensland rainforests.

The first of these 'terrestrials' was found under a log some 50 m from the bank of Cedar Creek in Joalah National Park, near Tambourine Mountain in southern Queensland. Dr John Lawrence and Mr Tom Weir, of the CSIRO Division of Entomology, collected it in 1978 and it was later described by Dr Tony Watson of the same Division and Mr Günther Theischinger, both experts on dragonfly taxonomy.

However, the entomologists were not sure whether the nymphs of this species (*Antipodophlebia asthenes*) were really terrestrial. Possibly the one last-stage nymph found away from water had simply been particularly athletic in its dryland travels, in readiness for the last moult to adulthood; or perhaps the nymphs are truly terrestrial for the last immature stage but aquatic during earlier stages.

This question had not been pondered for long when another dragonfly nymph of a different type was extracted from rainforest leaf litter, and three further specimens turned up in quick succession. In this case

there was no doubt about the terrestrial life style of the nymphs. All were found well away from free surface water and at high altitude in northern Queensland rainforest. Three were very small, but one specimen collected by Dr Geoff Monteith of the Queensland Museum was a respectable size, indicating that the nymphs are terrestrial for much of their lives.

Dr Watson kept the largest one alive for 6 months in a Petri dish containing leaf litter and lined with damp filter paper. It had a strange appearance, with a hairy, flattened body and protruding eyes. Still, looks aren't everything, and this little beast can lay claim to being the first unequivocally terrestrial dragonfly nymph.

The nymph was nocturnal, spending daylight hours in a rigid state, but in dim light it often prowled about with a spider-like gait, hunting down small prey such as woodlice, termites, earwigs, and the larvae of beetles and flies.

This extraordinary dragonfly nymph (tentatively identified as a *Pseudocordulia* sp.) respire by means of a

rectal gill, in common with other species, but here the gill chamber seems to function as a lung.

Scientists believe that the evolution of dragonfly nymphs involved a progressive change from air-breathing in a damp habitat to an aquatic way of life and respiration with rectal gills. Our newly discovered ones have, for some unknown reason, reverted to a terrestrial life style.

In November 1982, after the first account had appeared, Dr Monteith collected another *A. asthenes* nymph in a dry environment within a northern New South Wales rainforest. He discovered it more than 200 m from the nearest creek and kept it alive out of water for more than 6 weeks. This species and the *Pseudocordulia* should perhaps share the honour of being the first dragonflies in the world known to have authentically terrestrial nymphs.

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A truly terrestrial dragonfly larva from Australia (Odonata: Corduliidae). J.A.L. Watson. *Journal of the Australian Entomological Society*, 1983, 21, 309-11.