

The life history of the skipper butterfly *Ocybadistes ardea* Bethune Baker, 1906 (Lepidoptera: HesperIIDae) from southern Queensland
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Abstract

The biology of *Ocybadistes ardea* Bethune-Baker, 1906 (the Orange Grass-dart) is described from the subtropical rainforests of the Sunshine Coast. The skipper is apparently restricted to small breeding areas, and the winter brood duration is unknown, but probably involves several months of delayed development (diapause) of juveniles, with adults flying from January to April in southern Eastern Australia.

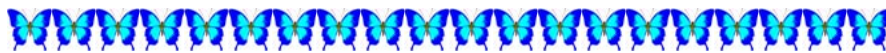
Introduction

Averaging a wingspan (wing-tip to wing-tip) of barely 2cm, the male Orange Grass-dart (*Ocybadistes ardea* Bethune-Baker, 1906), is one of the smallest skipper butterflies in the world, and perhaps the brightest in the Australasian tribe, Taractrocerini.

In recent molecular (DNA) studies the family tree of monocot-feeding skipper butterflies ranks the subfamilies Heteropterinae (mostly South American and some Palearctic genera), and Trapezitinae (Australian) at the base, followed by the Hesperinae (throughout the world). This latter subfamily contains nine tribes. The tribe Taractrocerini ('Grass-darts') is derived from the Baorini (the 'Rice-swifts').

Taractrocerines, which include the genus *Ocybadistes*, are found mostly in the Austro-SE Asian countries (with slight [derived] penetration into the Afro-Indian region). They are dominated by diverse genera in Austro-New Guinea. All the species studied (mostly Australian) have larvae that feed on the monocot groups (grasses, sedges, palms, cane-grasses or cordylines [Poaceae]). The adults are typically coloured in shades of orange and brown, with a few patterned on the underside with white or silver markings. The patterns on both sides of the wing of each species, and each sex, are very similar and some species are hard to distinguish without genitalia examination (particularly females). Males can often be separated by the structure of the sexbrand (when present), a set of raised scales on the forewing of the male.

Ocybadistes is characterised by small size, simple hooked antennae (not 'spoon-shaped' as in *Taractrocera*), and usually with an oblique set of dark brands on the forewing of the males. Apart from its size, *Ocybadistes ardea* (Orange Grass-dart) can be distinguished from other species of *Ocybadistes*, by its bright orange colour, and two small parallel dark, sub-oval patches of black scales on the upper side of the male forewing (very hard to see) and by different genitalia (microscope a must!).



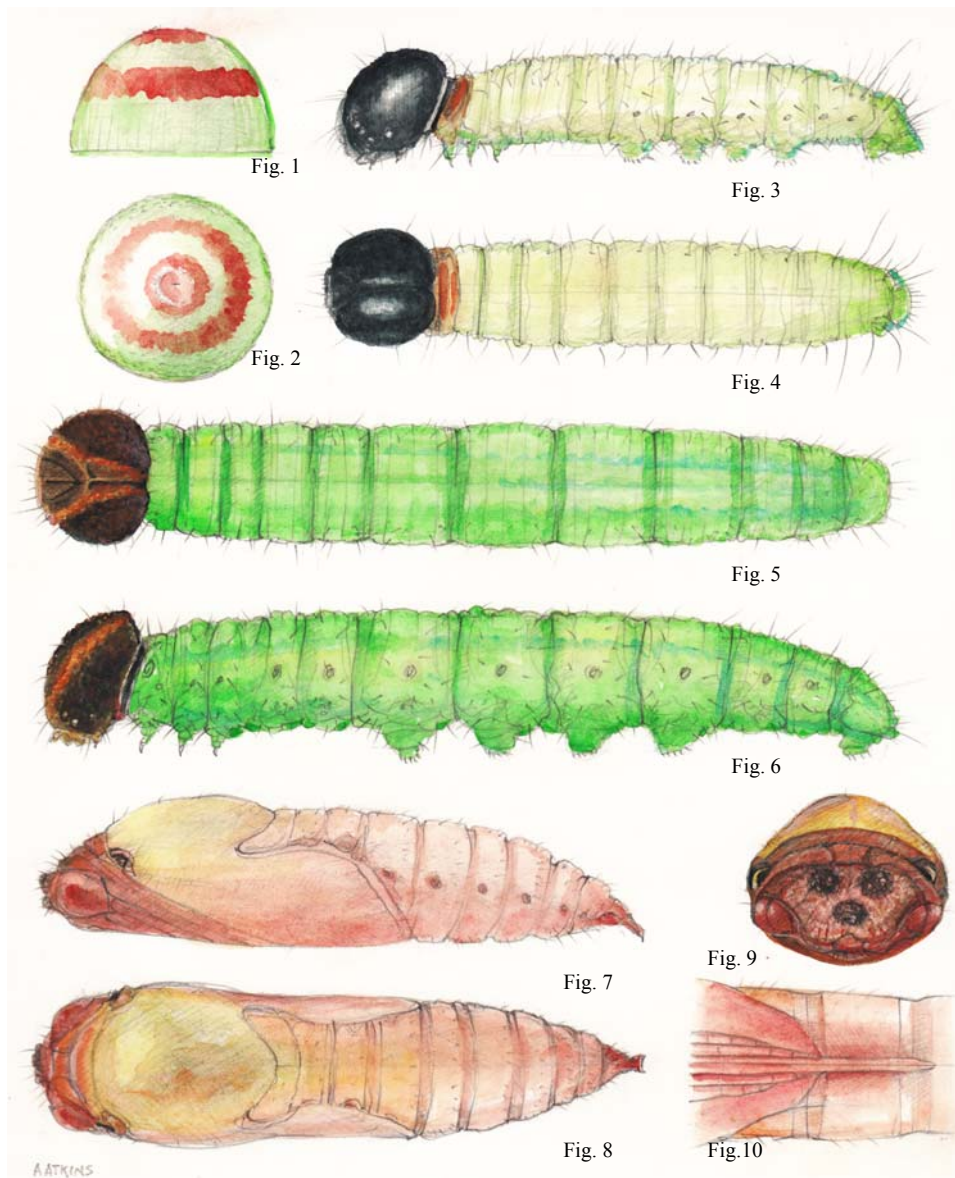


Plate 1 – Juveniles of *Ocybadistes ardea*: egg (lateral and dorsal); 1st instar larva and 4th instar larva (lateral and dorsal); pupa (lateral and dorsal); pupa (frons); section of pupal case (ventral)



The skipper is found in Queensland from the NSW border to Cape York and in New Guinea and adjacent islands, where it frequents sub-tropical to tropical woodlands (Braby, 2000). In the Sunshine Coast the skipper is very local to river and creek systems bordering rainforest, sometimes sharing damp habitats with the taractrocines *Suniana sunias* (C. Felder, 1860) and *Ocybadistes walkeri* Heron, 1894. The adult skipper appears to be confined to at least two broods from January to April, although it has been recorded in all months (Braby, 2000). The latter flight records may apply to northern specimens.

The life history of *O. ardea* has not previously been described.

Description

Food plant: *Oplismenus aemulus* (broad-leafed form), but probably also a narrow leafed form, and probably *O. undulatifolius*, but possibly also *Ottochloa nodosa*. These grasses are often referred to as 'Basket Grasses' or, especially *Oplismenus* 'Bearded Grass' (see illustrations on the front cover).

Egg (front cover and plate 1, figs 1, 2): diam. 0.75mm, dome shaped and smooth, whitish-green at first, then bright red micropyle and central band appear after 36 hours.

First instar (front cover and plate 1, figs 3, 4): length 1.5mm; head shiny black with fine setae, body pale yellowish-green covered with fine setae (longer at posterior).

Fourth instar (plate 1, figs 5, 6) and final instar: length 15-20mm; head roughened with variable mottled brown and pale orange banding.

Pupa (plate 1, figs 7, 8, 9): length 9-12mm; pale yellow, thorax pale brown with thoracic spiracle pinkish-brown, frons dark pinkish-brown with three darker roughened round protuberances; cremaster brown, rhomboid with roughened edges and two posterior projecting spikes; ventral surface near end of wing-cases (Plate 1, fig. 10) with proboscis case elongated to beyond abdominal segment 5.

Observations and Comments

Between 2004 and 2010 several colonies of *Ocybadistes ardea* (Orange Grass-dart) were found close to waterways in summer and early autumn, especially on the Mooloolah and Maroochy river catchment systems.

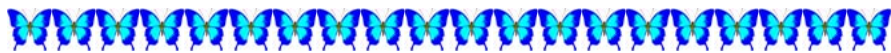
In these areas the colonies were usually found close to or within rainforest, where individuals usually settled on tussocks, shrubs (plate 2) or on mid-canopy treetops. Females were more commonly found at ground level, perching near prostrate species of Beard or Basket Grass (*Oplismenus*), or on larger grasses and low shrubs, mostly in isolated sunny glades within the forest. Both sexes were capable of extremely rapid flight, quickly reaching the canopy cover when disturbed. Males 'patrolled' the





Plate 2 – *Ocybadistes ardea* in rainforest habitat, Sunshine Coast (female above, 2 males below).

(Illustrations using combined watercolour and gouache techniques)
Andrew Atkins, Eudlo, Feb. 2011



glades and lower canopy for freshly emerged females (they are not known to hill-top). They also aggressively chased much larger butterflies and other insects.

During the late summer of 2009 and 2010, several females of *O. ardea* were also seen in the forests surrounding Buderim. They were carefully investigating prostrate grasses, selecting and eventually laying eggs on the host plants (particularly *Oplismenus aemulus* and *O. undulatifolius*) growing in the shade where they laid an egg on the upper side or under side of a leaf of the food plant (front cover). Females were also seen at Forest Glen searching large areas of *Ottochloa nodosa*, but oviposition was not observed on this grass, and it is possible *Oplismenus* may have been growing beneath it. Several other butterflies on the Sunshine Coast, including *Suniana sunias*, *Toxidia parvula*, *Toxidia rietmanni* (Hesperiidae), *Hypocysta metirius* and *Heteronympha mirifica* (Nymphalidae), oviposit on these grasses.

Eggs of *O. ardea* are positioned either on the upperside or underside of a mature leaf of the food plant, close to the stem and midrib (see ovipositing female on the front cover). They matured between 9 to 14 days, the ring and central spot of reddish orange appearing after 36 hours on the surface of the pale green egg (plate 1). The emerging larvae ate the egg chorion and moved nearby to make a tubular shelter from the grass-blade, which was stitched together with silk (illustration, front cover). The larvae ate (mostly near the shelter) in the morning or evening, or occasionally at night. As the larvae grew they moved to a more substantial shelter, usually made from both older and dead leaves of the food plant, and placed low on this plant, close to the ground. The final shelters were enlarged to pupariums made from loosely spun leaves of the food plant and litter. They were generally roundish to rhomboid in shape (similar to the puparium of *O. knightorum* [see Atkins, 1996]). The puparium were small and difficult to locate and the pupae were pale and attached by the cremaster with silk at the base. One pupa was only 9mm long (as opposed to those of 15mm for *O. flavovittata* and *O. walkeri* [Jenkinson, 2009]). It hatched from the pupa as a perfect (but small) adult female in about eight or nine days.

Juvenile stages of *O. ardea* are similar to that of *O. knightorum* (Atkins, 1996) though in this species the roughened area on the pupal frons is restricted to a central point (the pupal cap structure and cremaster morphology is generally diagnostic for grass-darts). There are also close similarities to the eggs, larvae and pupae of *O. flavovittata* and *O. walkeri* (see Jenkinson, 2009) and also *Suniana sunias* (see Jenkinson, 2010), but the mature larva of *O. ardea* are smaller and comparatively shorter. The total length of larval stage from eggs laid in mid-March was about 40 days, but the winter brood must last much longer. There may be up to three broods attained in summer to autumn but I have not been able to find larval eating-bites on *Oplismenus* leaves in winter, although some first instar larval shelters were found in spring. No adults have been found in spring or early summer. This suggests that the skipper overwinters (or even early summer) as a young larva, but possibly there is a



brief spring emergence of adults, although this was not observed. More intensive research is needed to investigate the possibility of a prolonged winter to early summer diapause of larva or pupa, and a multi-brood emergence from late January/ early February to April.

The local occurrence of *O. ardea* is also similar to that of *O. knightorum*, but it is more sparsely distributed and across wider areas. The adults of both species generally keep to secluded scattered glades close to their host plants where they bask in sunshine and visit the flowers of nearby Lantana and herbaceous plants.

Some authors (e.g. Braby, 2000) have stated that *O. ardea* is locally common at times, however, on the Sunshine Coast, it is unusual to see more than five or six specimens together at any locality, despite the relative (though scattered) abundance of colonies of Basket Grass. Undoubtedly the skipper once occurred in larger areas throughout the Sunshine Coast before land clearing, sub-division and road building. Several populations appear threatened, however population links (corridors) and possibly a broader choice of food plants in the Mooloolah River and Painter/ Eudlo Creek systems may be sufficient to maintain genetic diversity in the Sunshine Coast region.

References

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OBITUARY

Murdoch De Baar (1945-2011)

It was with much sadness that we heard in early January of the passing of Murdoch. Murdoch's great passion was entomology and he was renowned as an authority on forest insects and Australian butterflies. Murdoch commenced his career in the mid 1960s as a forest technician for, what was then the Queensland Department of Forestry, which later was merged into Department of Primary Industries (now



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