

New larval food plant associations for some butterflies and diurnal moths (Lepidoptera) from the Northern Territory and Kimberley, Australia. Part II

Michael F. Braby

Research School of Biology, The Australian National University, Canberra ACT 0200, Australia.

Email: michael.braby@anu.edu.au

ABSTRACT – This paper documents 103 Lepidoptera-plant associations for eight families of butterflies/diurnal moths (Castniidae, Immidae, Hesperidae, Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Noctuidae (Agaristinae)) from the ‘Top End’, central Australia and Kimberley, of which 86 associations are newly recorded for Australia and 17 are newly recorded for the Northern Territory and/or Western Australia. Of particular note are the first recordings of the families Lauraceae for *Graphium eurypylus* (Papilionidae), Phyllanthaceae for *Hypolycaena phorbis* (Lycaenidae), and Anacardiaceae for *Prosotas dubiosa* (Lycaenidae). Sixteen native plant genera are newly recorded for the following genera of Lepidoptera in Australia: *Semecarpus* (Anacardiaceae) for *Prosotas* (Lycaenidae), *Sarcolobus* (Apocynaceae) for *Danaus* (Nymphalidae), *Vitex* (Lamiaceae) for *Charaxes* (Nymphalidae), *Bossiaea* and *Tephrosia* (Fabaceae) for *Jamides* (Lycaenidae), *Amyema* (Loranthaceae) for *Birithana* (Immidae), *Corymbia* (Myrtaceae) for *Anthene* (Lycaenidae), *Aristida* and *Digitaria* (Poaceae) for *Hypocysta* (Nymphalidae), *Chrysopogon* and *Eriachne* (Poaceae) for *Pelopidas* (Hesperidae), *Mnesithea* (Poaceae) for *Pelopidas* and *Telicota* (Hesperidae), *Sacciolepis* (Poaceae) for *Taractrocera* (Hesperidae), *Sorghum* (Poaceae) for *Synemon* (Castniidae) and *Neohesperilla* (Hesperidae), *Whiteochloa* for *Borbo* and *Taractrocera* (Hesperidae), and *Breynia* (Phyllanthaceae) for *Hypolycaena* (Lycaenidae). The significance of the new plant associations is discussed for the following species: *Birithana cleis*, *Graphium eurypylus*, *Danaus affinis*, *Mycalesis sirius*, *Ogyris amaryllis*, *Candalides margarita*, *Famegana alsulus*, *Euchrysops cnejus* and *Freyeria putli*.

KEYWORDS: day-flying moth, insect-plant associations, larval host plant, northern Australia, Top End

INTRODUCTION

The following catalogue of larval food plant associations for butterflies and day-flying moths is based on field observations and rearing of the early stages from the ‘Top End’ of the Northern Territory (NT) and the Kimberley of Western Australia (WA) by the author during the 4.7 year period, January 2011 to September 2015. One observation from the central arid zone of the NT is also included. For three species of diurnal moths, some preliminary observations before this period are also included that were subsequently investigated in more detail during the present study. The Lepidoptera covered here include the Castniidae, Immidae, Hesperidae, Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Noctuidae (Agaristinae). The new records are in addition to those reported in an earlier account (Braby 2011a) for the region, and contribute

to the growing body of knowledge of insect-plant associations for the Australian Lepidoptera as a whole (see Common 1990; Braby 2000 for review).

The catalogue is presented in annotated form for each association: the scientific and common names of the butterfly/moth appear first as a subheading in bold, followed by the larval food plant and voucher number, and then the relevant field observations. The field observations summarise details of locality, date, immature stages and, in some cases, rearing data and other biological notes (e.g. attendant ants for Lycaenidae). The new Lepidoptera-plant associations are arranged into two groups; firstly, those that comprise new records for Australia as a whole, and secondly, those that are new for the NT and/or WA. In many cases, samples of the early stages of Lepidoptera were preserved, photographed and/or reared to adulthood

in captivity to confirm species level identification, and vouchers of these specimens are lodged in the Museum and Art Gallery of the Northern Territory, Darwin (NTM) or the Australian National Insect Collection, Canberra (ANIC). In some cases, however, the early stages were not reared, and identifications of eggs, larvae or pupae were determined on the author's field experience and knowledge of the relevant species.

Nomenclature for butterflies follows Braby (2010, 2011b), while that for moths follows Nielsen et al. (1996). Voucher specimens of the ants have been lodged in the CSIRO Tropical Ecosystem Research Collection, Darwin. Botanical nomenclature follows a recent updated checklist of vascular plants published by the Northern Territory Herbarium (Short et al. 2011). Voucher numbers refer to plant specimens lodged in the Northern Territory Herbarium, Palmerston (DNA). Introduced, naturalised and ornamental plants are designated by an asterisk (*). For each site, geocoordinates are given in decimal degrees, followed by datum (e.g. AGD66, WGS84 or GDA94) and the level of sampling precision or accuracy (i.e., radius of the spatial area sampled).

NEW LEPIDOPTERA LARVAL FOOD PLANT ASSOCIATIONS FOR AUSTRALIA

The following catalogue of species comprises plants that, to the author's knowledge, have not previously been documented as larval food plants for Australian Lepidoptera.

CASTNIIDAE

Synemon wulwulam Angel, 1951

Sun Moth

Sorghum plumosum (R.Br.) P.Beauv. (Poaceae).
(Voucher M.F. Braby 146, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Batten Rd, 16 km N of Borroloola, NT (15.91425°S, 136.33313°E; WGS84, 10 m), 15 May 2013, M.F. Braby. Several females were observed between 1320–1410 h CST ovipositing on the grass *Sorghum plumosum* growing in savannah woodland; when laying, they settled near the ground for about 60 sec and extended their ovipositor into the base of this perennial tussock. A pupal exuvia was also located and collected from within the central base of a large tussock of *S. plumosum*. Females were observed 'inspecting' *Eriachne obtusa* growing amongst *S. plumosum* but it was not certain if eggs were deposited on this grass. Males were common in the area and most active between 1130–1200 h CST.

IMMIDAE

Birithana cleis (R. Felder & Rogenhofer, 1875)

Orange-banded Velvet Day-moth

Amyema sanguinea (F.Muell.) Danser (Loranthaceae).
(Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Alawa, Darwin, NT (12.381°S, 130.865°E; GDA94, 2500 m), 22 April 2011, M.F. Braby. Cohorts of eggs and larvae were recorded on the mistletoe *Amyema sanguinea* parasitising a eucalypt growing in suburban parkland; a larva was collected and reared to adult in captivity, emerging on 17 May 2011. The site was revisited on 26 April 2011 and a large cohort of eggs and three larvae were recorded on the larval food plant. The immature stages of *Candalides margarita* were also recorded on the same mistletoe clump at this site (see below).

Robin Falls, 12 km SSE of Adelaide River, NT (13.34518°S, 131.12926°E; WGS84, 50 m), 30 April 2011, M.F. Braby and J.J. Armstrong. Two larvae were recorded on *A. sanguinea* parasitising *Eucalyptus tetradonta* growing on a ridge. An empty cocoon and an adult at rest were also observed on the foliage of the food plant.

Dendrophthoe glabrescens (Blakely) Barlow (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Fish River Station, 24 km NW of homestead, NT (14.02131°S, 130.73793°E; WGS84, 250 m), 30 April 2012, M.F. Braby. Two cocoons were recorded on the foliage of the mistletoe *Dendrophthoe glabrescens* parasitising *Erythrophleum chlorostachys* growing in riparian open-forest below a sandstone escarpment.

PAPILIONIDAE

Graphium eurypylus nyctimus (Waterhouse & Lyell, 1914)

Pale Triangle

Cryptocarya cunninghamii Meisn. (Lauraceae).
(Voucher M.F. Braby 153, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Namarada Dve, Dundee Beach, NT (12.74953°S, 130.37549°E; WGS84, 250 m), 23 February 2014, M.F. Braby. Two eggs

were recorded on the new leaf growth of the laurel *Cryptocarya cunninghamii*, which grew as a tree in long unburnt eucalypt woodland with rainforest elements in the understorey. A pupal exuvia was also recorded on the underside of a leaf of the larval food plant.

***Papilio fuscus canopus* Westwood, 1842**

Fuscous Swallowtail

Zanthoxylum parviflorum Benth. (Rutaceae). (Voucher M.F. Braby 126, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Marege Dve, Dundee Beach, NT (12.72776°S, 130.35643°E; WGS84, 100 m), 19 May 2012, M.F. Braby and J. Westaway. A mid instar larva was recorded feeding openly on the foliage of a small shrub (<0.5 m high) of *Zanthoxylum parviflorum* growing along the edge of coastal monsoon vine thicket.

HESPERIIDAE

***Neohesperilla xiphiphora* (Lower, 1911)**

Sword-brand Grass-skipper

Sorghum intrans F.Muell. ex Benth. (Poaceae). (Vouchers M.F. Braby 167, 168, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 6 km NW of Robin Falls, NT (13.34119°S, 131.11801°E; WGS84, 50 m), 7 February 2015, M.F. Braby. Several females were observed between 1315–1430 h ovipositing on the annual grass *Sorghum intrans*, which grew as a soft grass (i.e. before the inflorescence had bolted) on sandy loam in eucalypt woodland along the edge of a rocky outcrop. The females had a preference for small clumps that were growing in shade in open areas beneath the canopy of *Eucalyptus miniata* trees. Numerous eggs and first instar larvae were also located singly on the grass blades, and a late instar larva was collected from its shelter on the food plant. The site was revisited on 19 March 2015, by which time most plants were substantially taller and flowering, and three larvae (2 first instar, 1 mid instar) were collected from within their shelters on the larval food plant. The site was visited again on 12 April 2015 but neither eggs nor larvae were detected and most of the plants were seeding and the soft basal leaves had died off. First instar larval shelters were noted to comprise blades that were folded near their apex and joined by

silk, whereas later instar shelters comprised several basal stems joined together with silk.

***Proeidosia polysema* (Lower, 1908)**

Spinifex Sand-skipper

Triodia bitextura Lazarides (Poaceae). (Vouchers M.F. Braby 104, 132, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Saddleback Ridge, El Questro Wilderness Park, WA (15.99434°S, 127.97997°E; WGS84, 250 m), 16 May 2011, M.F. Braby. Three late instar larvae were recorded inside their tubular shelters, each on separate tussocks of the spinifex *Triodia bitextura* growing on the lower slopes of a hill supporting savannah woodland.

Location 1 km N of Zebedee Creek crossing, El Questro Wilderness Park, WA (16.01353°S, 128.01898°E; WGS84, 400 m), 23 May 2011, M.F. Braby. A larva was recorded inside its shelter on *T. bitextura* growing along a dry rocky seasonal gully in savannah open-woodland.

Australia: Northern Territory: Wongalara Wildlife Sanctuary, 11 km NE of homestead, NT (14.05720°S, 134.52600°E; WGS84, 500 m), 4 June 2012, M.F. Braby. Four final instar larvae were collected from inside their shelters on tussocks of *T. bitextura* growing in low open woodland on sandstone pavement above a steep cliff/waterfall. The larvae were transported to Darwin and kept inside their shelters in captivity for eight months during which time they did not feed until they were transferred to a potted tussock of the larval food plant.

***Borbo impar lavinia* (Waterhouse, 1932)**

Yellow Swift

Whiteochloa airoides (R.Br.) Lazarides (Poaceae). (Voucher M.F. Braby 169, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Buffalo Creek, Lee Point, NT (12.33930°S, 130.90683°E; WGS84, 250 m), 13 April 2015, M.F. Braby. Five final instar larvae were recorded in loose shelters on blades of *Whiteochloa airoides*, which grew as a soft grass with broad leaves in beach sand along the edge of coastal monsoon vine thicket. Two larvae were collected and reared in captivity; they pupated and emerged as adult males on 10 May and 2 June 2015. The immature stages of *Taractrocera* sp. were also found on the same grass species at this site (see below).

Pelopidas lyelli lyelli* (Rothschild, 1915)*Lyell's Swift**

Chrysopogon elongatus (R.Br.) Benth. (Poaceae).
(Voucher M.F. Braby 130, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Wilton River, Wongalara homestead, Wongalara Wildlife Sanctuary, NT (14.14035°S, 134.47461°E; WGS84, 250 m), 2 June 2012, M.F. Braby and S. Hirst. An early instar larva was collected from the grass *Chrysopogon elongatus* growing along a riverbank supporting mixed riparian woodland-evergreen monsoon vine forest.

Eriachne triodioides Domin (Poaceae). (Voucher M.F. Braby 176, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Carson River crossing, Kalumburu Rd, c. 18 km SSE of Kalumburu, WA (14.45277°S, 126.66373°E; WGS84, 50 m), 19 May 2015, M.F. Braby and G.J. Paras. A final instar larva was collected from a tussock of *Eriachne triodioides* growing as the dominant grass in an open rocky area along bank of stream in riparian monsoon vine forest. The larva pupated several days later on 23 May and emerged as a female on 2 June 2015.

Mnesithea rottboellioides (R.Br.) de Koning and Sosef (Poaceae). (Voucher M.F. Braby 97, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Zebedee Springs, El Questro Wilderness Park, WA (16.01379°S, 128.02489°E; WGS84, 400 m), 19, 29 May 2011, M.F. Braby and B. Hanekom. Larvae were recorded feeding on *Mnesithea rottboellioides*, which grew as a tall grass along the edge of riparian monsoon forest dominated by *Livistona*. The immature stages of *Telicota colon* were also found on the same grass species at this site (see below).

Pentacost River crossing, near El Questro Station, El Questro Wilderness Park, WA (16.01212°S, 127.97939°E; WGS84, 400 m), 21, 31 May 2011, M.F. Braby. Larvae were recorded in rolled leaf shelters of *M. rottboellioides* growing along the edge of riparian paperbark open-forest with monsoon forest elements in the understorey. The immature stages of *Telicota colon* were also found on the same grass species at this site (see below).

Emma Gorge Resort, El Questro Wilderness Park, WA (15.90753°S, 128.12909°E; WGS84, 100 m),

26 May 2011, M.F. Braby. Larvae were recorded in shelters on *M. rottboellioides* growing along Emma Creek woodland.

Taractrocera ina* Waterhouse, 1932*No-brand Grass-dart**

**Cenchrus pedicellatus* (Trin.) Morrone (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Alawa, Darwin, NT (12.381°S, 130.865°E; GDA94, 2500 m), 13 April 2012, M.F. Braby. Two final instar larvae inside their leaf shelters were collected from introduced Mission Grass *Cenchrus pedicellatus* growing in suburban parkland. The larvae entered diapause in captivity and did not feed for many months during the dry season.

Taractrocera* sp.*Grass-dart**

Sacciolepis indica (L.) Chase (Poaceae). (Voucher M.F. Braby 163, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Edith Falls, upper plunge pool, Nitmiluk National Park, NT (14.18095°S, 132.19424°E; WGS84, 250 m), 17 April 2014, M.F. Braby and L.J. Aitchison. One final instar larva was collected inside its leaf shelter on the grass *Sacciolepis indica* growing along the edge of a sandstone rock pool. In captivity, the larva remained in diapause during the dry season but eventually died.

Whiteochloa airoides (R.Br.) Lazarides (Poaceae). (Voucher M.F. Braby 169, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Buffalo Creek, Lee Point, NT (12.33930°S, 130.90683°E; WGS84, 250 m), 8 November 2014, M.F. Braby. A final instar larva (most likely *T. ina*) was recorded in a rolled cylindrical shelter of *Whiteochloa airoides*, which grew as a soft grass with broad leaves in beach sand along the edge of coastal monsoon vine thicket. The site was revisited on 13 April 2015 and numerous larvae were recorded on the larval food plant. Several larvae were collected and reared to pupation but they subsequently died from viral disease.

Ocybadistes walkeri olivia* Waterhouse, 1933*Green Grass-dart**

**Axonopus compressus* (Sw.) P.Beauv. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 18 March 2014, M.F. Braby. A female was observed at 1205 h CST to deposit two eggs on the upperside of separate blades of introduced Broad-leaved Carpet Grass *Axonopus compressus* growing in a disturbed suburban area. The immature stages of *Hypocysta adiante* and *Ypthima arctous* were also recorded on this grass species at this site (see below).

**Melinis repens* (Willd.) Zizka (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 27 August 2013, M.F. Braby. A female was observed at midday to deposit several eggs on the blades of the introduced grass *Melinis repens* growing in open disturbed suburban area.

Suniana lascivia larrakia* L.E. Couchman, 1951*Dark Grass-dart**

Ischaemum australe R.Br. (Poaceae). (Voucher M.F. Braby 120, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Hidden Valley, Kununurra, WA (15.76672°S, 128.75642°E; WGS84, 50 m), 10 February 2012, M.F. Braby and B. Hanekom. A localised breeding colony was located on the grass *Ischaemum australe*, which grew in abundance in riparian woodland with some rainforest elements along a sandstone gully with flowing water. Two final instar larvae were collected from inside their shelters on blades of the grass and reared in captivity, with adults emerging 1–2 weeks later on 20 and 26 February 2012. Numerous other larvae and parasitised pupae were noted at the site.

Telicota colon argea* (Fabricius, 1775)*Pale-orange Darter**

Imperata cylindrica (L.) Reusch. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Bamboo Creek, Marrakai Rd, 2.5 km E of Stuart Hwy, NT (12.90468°S, 131.16080°E; WGS84, 250 m), 6 April 2013, M.F. Braby. A late instar larva was collected from within its shelter on the grass *Imperata cylindrica* growing in the ecotone of riparian monsoon forest; the larva subsequently proved to be parasitised.

Mnesithea rottboellioides (R.Br.) de Koning and Sosef (Poaceae). (Voucher M.F. Braby 97, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Zebedee Springs, El Questro Wilderness Park, WA (16.01379°S, 128.02489°E; WGS84, 400 m), 19, 29 May 2011, M.F. Braby and B. Hanekom. Two larvae were recorded on *Mnesithea rottboellioides*, which grew as a tall grass along the edge of riparian monsoon forest dominated by *Livistona*; one late instar larva was collected and reared to adult in captivity, emerging on 27 June 2011. The immature stages of *Pelopidas lyelli* were also found on the same grass species at this site (see above).

Pentacost River crossing, near El Questro Station, El Questro Wilderness Park, WA (16.01212°S, 127.97939°E; WGS84, 400 m), 21, 31 May 2011, M.F. Braby. Four larvae were recorded on *M. rottboellioides* growing along the edge of riparian paperbark open-forest with monsoon forest elements in the understorey; two larvae were collected and reared in captivity, with adults emerging on 8 and 19 July 2011. The immature stages of *Pelopidas lyelli* were also found on the same grass species at this site (see above).

Emma Gorge plunge pool, El Questro Wilderness Park, WA (15.89524°S, 128.13351°E; WGS84, 400 m), 2 June 2011, M.F. Braby and T. Schwinghammer. Three larvae were recorded in their shelters on *M. rottboellioides* growing in riparian woodland with patches of monsoon forest.

**Andropogon gayanus* Kunth (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Mt Burrell, Tipperary Station, NT (13.49623°S, 131.03572°E; WGS84, 100 m), 22 March 2014, M.F. Braby. A final instar larva

was collected from its shelter on new regenerating leaf growth of introduced Gamba Grass *Andropogon gayanus* growing at the base of a hill; the larva was reared to adult in captivity, emerging on 12 April 2014.

***Cephenes trichopepla* (Lower, 1908)**

Yellow Palm-dart

Livistona lorophylla Becc. (Arecaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: Pentacost River crossing, near station, El Questro Wilderness Park, WA (16.01212°S, 127.97939°E; WGS84, 400 m), 21, 31 May 2011, M.F. Braby. Three larvae were recorded inside their shelters on the fronds of the palm *Livistona lorophylla* growing in the ecotone of riparian paperbark open-forest with monsoon forest elements in the understorey.

Annie Creek campground, Mornington Wildlife Sanctuary, WA (17.50735°S, 126.11252°E; WGS84, 500 m), 8 August 2011, M.F. Braby and L.J. Aitchison. An early instar larva and numerous unoccupied shelters were recorded on *L. lorophylla* growing in riparian woodland.

Livistona Gully, 13 km SSW of campground, Mornington Wildlife Sanctuary, WA (17.60608°S, 126.04013°E; WGS84, 50 m), 9 August 2011, M.F. Braby and L.J. Aitchison. An egg and three larvae were recorded on *L. lorophylla* growing in a gully with monsoon forest.

PIERIDAE

***Eurema herla* (W.S. Macleay, 1826)**

Macleay's Grass-yellow

Chamaecrista nigricans (Vahl) Greene (Fabaceae). (Voucher M.F. Braby 170, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 6 km NW of Robin Falls, NT (13.34119°S, 131.11801°E; WGS84, 50 m), 19 March 2015, M.F. Braby. A female was observed between 1620–1630 h to deposit two eggs on separate plants of the annual legume *Chamaecrista nigricans* growing in eucalypt woodland on sandy loam at the base of a rocky escarpment. Other eggs were also present on the new foliage of the larval food plant.

***Cepora perimale* (Donovan, 1805)**

Caper Gull

Capparis jacobsii Hewson (Capparaceae). (Voucher M.F. Braby 100, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Location 1.2 km NW of Amalia Creek crossing, El Questro Wilderness Park, WA (15.97100°S, 128.01828°E; WGS84, 400 m), 20 May 2011, M.F. Braby and B. Hanekom. A female was observed ovipositing on shrubs of *Capparis jacobsii* and *C. umbonata* growing along a dry rocky sandstone gully with some monsoon forest elements. The immature stages of *Belenois java* were also found on the same plant at this site (see below).

***Belenois java teutonia* (Fabricius, 1775)**

Caper White

Capparis jacobsii (Capparaceae). (Voucher M.F. Braby 100, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Location 1.2 km NW of Amalia Creek crossing, El Questro Wilderness Park, WA (15.97100°S, 128.01828°E; WGS84, 400 m), 20 May 2011, M.F. Braby and B. Hanekom. A single pupal exuvia was found on a shrub of *Capparis jacobsii* growing along a dry rocky sandstone gully with some monsoon forest elements. The immature stages of *Cepora perimale* were also found on the same plant at this site (see above).

NYMPHALIDAE

***Tirumala hamata* (W.S. Macleay, 1826)**

Blue Tiger

Marsdenia glandulifera C.T.White (Apocynaceae). (Voucher M.F. Braby 134, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Fogg Dam Conservation Reserve, NT (12.56730°S, 131.30809°E; WGS84, 500 m), 20, 27 October 2012, M.F. Braby. A female was observed at 1632 h and again at 1710 h CST ovipositing on *Marsdenia glandulifera*, which grew as a vine in evergreen monsoon vine forest. An additional four eggs and 10 early instar larvae were recorded on

large new soft leaves of the food plant; all larvae were solitary and were located on the leaf underside. Several larvae were collected and reared to adult in captivity; the larvae were noted to inflict a characteristic feeding pattern by first chewing the perimeter of a circle and then eating the interior to create a hole in the leaf about 10 mm in diameter. The adults emerged on 2 and 9 November 2012, with a pupal duration of 7–8 days.

***Danaus affinis affinis* (Fabricius, 1775)**

Swamp Tiger

Marsdenia viridiflora R.Br. (Apocynaceae). (Voucher M.F. Braby 143, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Nanguluwur Art site, Nourlangie Rock, Kakadu National Park, NT (12.84262°S, 132.81895°E; WGS84, 250 m), 15 February 2013, M.F. Braby. A female was observed at 1530 h CST ovipositing on the underside of a leaf of the vine *Marsdenia viridiflora* growing in eucalypt open-forest near the base of a sandstone wall.

Sarcolobus hullsii (F.Muell. ex Benth.) P.I.Forst. (Apocynaceae). (Voucher M.F. Braby 152, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Nanguluwur Art site, Nourlangie Rock, Kakadu National Park, NT (12.84262°S, 132.81895°E; WGS84, 250 m), 5 February 2011, M.F. Braby. A female was observed at 1106–1109 h CST ovipositing on seedlings of the vine *Sarcolobus hullsii* growing in eucalypt open-forest at the base of a sandstone escarpment; three eggs were laid singly on the underside of separate leaves. The site was revisited on 7 December 2013 and two final instar larvae were recorded on *S. hullsii*.

***Danaus petilia* (Stoll, 1790)**

Lesser Wanderer

Cynanchum liebianum (F.Muell.) P.I.Forst. (Apocynaceae). (Voucher B. Stuckey 891, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Howard River sandsheet, N of Girraween Road, NT (12.51903°S, 131.11686°E; GDA94, 50 m), 11 December 2011, B. Stuckey. A single larva was photographed eating the

flowers of *Cynanchum liebianum*, which grew as a perennial herb about 1 m high in deep sand dominated by the grass *Eriachne burkittii* with scattered *Pandanus spiralis*.

***Euploea corinna* (W.S. Macleay, 1826)**

Common Crow

Sarcostemma viminale (L.) R.Br. (Apocynaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Spirit Hills, 42 km NE of Keep River National Park ranger station, NT (15.70199°S, 129.31718°E; WGS84, 50 m), 7 February 2012, M.F. Braby and P. Runyu. A mid instar larva was recorded feeding on *Sarcostemma viminale* growing on open sandstone pavement, and a pupa was recorded nearby suspended from a dead branch.

Australia: Western Australia: Champaign Springs, El Questro Wilderness Park, WA (16.03052°S, 127.96643°E; WGS84, 50 m), 8 April 2012, M.F. Braby and L.J. Aitchison. A mid instar larva was recorded on *S. viminale* growing on open sandstone pavement.

***Junonia orithya albicincta* Butler, 1875**

Blue Argus

Buchnera asperata R.Br. (Orobanchaceae). (Voucher M.F. Braby 99, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Saddleback Ridge, El Questro Wilderness Park, WA (15.99668°S, 127.98529°E; WGS84, 200 m), 18 May 2011, M.F. Braby. A late instar larva and a pupa were recorded on the herb *Buchnera asperata* growing in savannah open-woodland along a dry seasonal gully at the base of a hill.

Thunbergia arnhemica F.Muell. (Acanthaceae). (Voucher M.F. Braby 119, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Dundee Beach, Fog Bay, NT (12.77415°S, 130.35603°E; WGS84, 500 m), 6 November 2011, M.F. Braby. A final instar larva was recorded feeding on the underside of a leaf of *Thunbergia arnhemica*, which grew as a vine along the edge of coastal monsoon vine thicket.

***Charaxes sempronius sempronius*
(Fabricius, 1793)**

Tailed Emperor

Celtis australiensis Sattarian (Cannabaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Charles Darwin University, Katherine campus, NT (14.39513°S, 132.14429°E; WGS84, 50 m), 16 April 2014, M.F. Braby and L.J. Aitchison. A pupa was collected suspended beneath a leaf of a large tree of *Celtis australiensis* growing in monsoon vine thicket on limestone karst; the pupa was subsequently found to be parasitised and several wasps emerged the next day.

Vitex acuminata R.Br. (Lamiaceae). (Voucher M.F. Braby 112, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Windjana Gorge National Park, WA (17.40754°S, 124.94625°E; WGS84, 250 m), 16 August 2011, M.F. Braby and L.J. Aitchison. A female was observed at 1215 h WST ovipositing on a sapling of *Vitex acuminata* growing on river sand in monsoon forest at the base of a limestone cliff; five eggs were laid singly on the leaves over a three-minute period.

***Mycalesis sirius sirius* (Fabricius, 1775)**

Cedar Bush-brown

Imperata cylindrica (L.) Reusch. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Robin Falls, creek upstream of falls, NT (13.34877°S, 131.12622°E; WGS84, 250 m), 30 April 2011, M.F. Braby and J.J. Armstrong. Three early instar larvae were collected (and reared to adult in captivity) from the grass *Imperata cylindrica* growing along the edge of riparian evergreen monsoon forest.

***Hypocysta adiante antirius* Butler, 1868**

Orange Ringlet

Aristida macroclada Henrard (Poaceae). (Voucher M.F. Braby 151, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Marege Dve, Dundee Beach, NT (12.72776°S, 130.35643°E; WGS84, 100 m), 31 March 2012, M.F. Braby and G. Brown. A female was observed at 1445–1450 h CST ovipositing on the grass *Aristida macroclada* growing in an open shaded area along the edge of coastal monsoon vine thicket; three eggs were laid singly on the underside of the blades.

Digitaria gibbosa (R.Br.) P.Beauv. (Poaceae). (Voucher M.F. Braby 91, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Nanguluwur Art site, Nourlangie Rock, Kakadu National Park, NT (12.84262°S, 132.81895°E; WGS84, 250 m), 5 February 2011, M.F. Braby. A female was observed at 1130 h CST to deposit a single egg on the underside of a blade of the grass *Digitaria gibbosa* growing in eucalypt open-forest.

Ischaemum tropicum B.K.Simon (Poaceae). (Voucher M.F. Braby 123, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Fish River Station, waterfall 24 km NW of homestead, NT (14.00750°S, 130.75212°E; WGS84, 250 m), 24 April 2012, M.F. Braby. A female was observed at 1310 h CST depositing several eggs on the grass *Ischaemum tropicum* growing at the edge of a creek in riparian woodland along a sandstone gorge; an early instar larva was also recorded on a blade of the larval food plant.

**Axonopus compressus* (Sw.) P.Beauv. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 25 June 2012, M.F. Braby. A female was observed at 1255 h CST to deposit a single egg on the underside of a blade of introduced Broad-leaved Carpet Grass *Axonopus compressus* growing in a disturbed suburban area. The immature stages of *Ocybadistes walkeri* (see above) and *Ypthima arctous* (see below) were also recorded on this grass species at this site.

**Cynodon dactylon* (L.) Pers. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: Annie Creek campground, Mornington Wildlife Sanctuary, WA

(17.50735°S, 126.11252°E; WGS84, 500 m), 10 August 2011, M.F. Braby and L.J. Aitchison. A late instar larva was recorded on a blade of non-indigenous Green Couch Grass *Cynodon dactylon* growing in riparian woodland; the larva was in the process of moulting and was located approximately within the centre of a large patch of the larval food plant. The immature stages of *Ocybadistes flavovittatus* were also found on the same grass at this site (see below)

***Ypthima arctous* (Fabricius, 1775)**

Dusky Knight

**Axonopus compressus* (Sw.) P.Beauv. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 3 February 2014, M.F. Braby. A female was observed at 1250 h CST to deposit a single egg on a blade of introduced Broad-leaved Carpet Grass *Axonopus compressus* growing in an open disturbed suburban area. The egg was collected and the resulting larva was reared in captivity, emerging as an adult approximately six weeks later on 20 March 2014. The immature stages of *Ocybadistes walkeri* and *Hypocysta adiante* were also recorded on this grass species at this site (see above).

LYCAENIDAE

***Hypochrysops ignitus erythrina*
(Waterhouse & Lyell, 1909)**

Fiery Jewel

Acacia leptocarpa A.Cunn. ex Benth (Fabaceae). (Voucher M.F. Braby 164, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Bathurst Island, NT (11.48889°S, 130.33287°E; WGS84, 500 m), 27 May 2014, M.F. Braby. A female was observed at 1250 h CST to deposit two eggs at the base of a stem of a sapling of *Acacia leptocarpa* growing in tall woodland. Numerous *Papyrius* ants were present on the plant and in the general vicinity.

***Arhopala eupolis asopus*
Waterhouse & Lyell, 1914**

Purple Oak-blue

Terminalia carpentariae C.T.White (Combretaceae). (Voucher M.F. Braby 156, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Jim Jim Ranger Station, Kakadu National Park, NT (12.93061°S, 132.57068°E; WGS84, 100 m), 10 November 2013, M.F. Braby and C. Webb. Numerous eggs and four early instar larvae were recorded on *Terminalia carpentariae*, which comprised a sapling regenerating after fire in savannah woodland. A final instar larva and a pupa were also collected inside the curled margin of a new leaf of a small tree of the food plant that was regenerating its foliage (*T. carpentariae* is seasonally deciduous during the dry season); an adult emerged from the pupa 10 days later on 20 November 2013. In both cases, *Oecophylla smaragdina* ants attended the immature stages.

Corymbia disjuncta K.D.Hill and L.A.S.Johnson (Myrtaceae). (Voucher M.F. Braby 148, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: South Alligator Ranger Station, Kakadu National Park, NT (12.68306°S, 132.47223°E; WGS84, 100 m), 24 April 2013, M.F. Braby. Eggs and two mid instar larvae were recorded feeding on new foliage of a sapling of *Corymbia disjuncta* growing in long unburnt eucalypt woodland with a monsoon vine thicket understorey. The site was revisited on 13 November 2013 and a final instar larva was recorded on the food plant. In each case, numerous *Oecophylla smaragdina* ants attended the larvae. The immature stages of *Anthene seltuttus* were also found on the same sapling at this site (see below)

Popham Bay, Cobourg Peninsula, NT (11.27261°S, 131.85768°E; WGS84, 100 m), 12 August 2014, M.F. Braby. Six final instar larvae were recorded feeding on new foliage of saplings of *C. disjuncta* that were regenerating in response to a recent dry season fire in eucalypt woodland adjacent to monsoon forest. Numerous *Oecophylla smaragdina* ants attended the larvae. The immature stages of *Anthene seltuttus* and *Theclinesstes miskini* were also found on the same plant species at this site (see below).

Eucalyptus miniata A.Cunn. ex Schauer (Myrtaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Jim Jim Ranger Station, Kakadu National Park, NT (12.93061°S, 132.57068°E; WGS84, 100 m), 21 April 2013, M.F. Braby. A female was observed at 1510 h CST to deposit an egg low down on the main stem of a sapling of *Eucalyptus miniata* growing in savannah woodland; the sampling supported a nest of *Oecophylla smaragdina* ants.

***Ogyris amaryllis meridionalis*
(Bethune-Baker, 1905)**

Satin Azure

Amyema benthamii (Blakely) Danser (Loranthaceae).
(Voucher M.F. Braby 111, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Bluebush, Mornington Wildlife Sanctuary, WA (17.55675°S, 126.17020°E; WGS84, 50 m), 8 August 2011, M.F. Braby and L.J. Aitchison. Numerous eggs were observed on the leaves and stem junctions of the mistletoe *Amyema benthamii* parasitising *Bauhinia cunninghamii* growing in savannah open-woodland. Numerous larval feeding scars were also evident on the leaves, and a female was noted settled on a mistletoe clump. A number of males were observed flying around and settling on the host tree during the morning, indicating the presence of a localised breeding colony. No other mistletoe species grew in the immediate area.

***Ogyris iphis doddi* (Waterhouse & Lyell, 1914)**

Dodd's Azure

Amyema sanguinea (F.Muell.) Danser (Loranthaceae).
(Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Danger Pt Rd, Garig Gunak Barlu National Park, NT (11.25417°S, 132.31907°E; WGS84, 50 m), 8 August 2014, M.F. Braby. A pupa and two mid instar larvae were collected from a clump of the mistletoe *Amyema sanguinea* parasitising *Eucalyptus tetradonta* growing in savannah woodland on a laterite outcrop/breakaway with a gentle west-facing slope. The pupa, which was attached to an outer branch of the mistletoe, was partially concealed by foliage and dead flowers that were joined together with silk. The larvae were hiding in hollows constructed by wood boring insects inside branches of the haustorium/basal branches of the mistletoe clump. Numerous *Froggattella kirbii* ants attended all immature stages. The immature stages were reared in captivity, with adults emerging after a pupal duration of 12 days on 22 August 2014 and 15 and 23 September 2014.

***Ogyris zosine zosine* (Hewitson, [1853])**

Northern Purple Azure

Amyema villiflora ssp. *villiflora* (Domin) Barlow (Loranthaceae). (Voucher M.F. Braby 109, 114, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 23 April 2011, M.F. Braby and J.J. Armstrong. A colony of 10 larvae and four pupae were collected from the base of several host trees of *Acacia multistipulosa* supporting clumps of the mistletoe *Amyema villiflora* growing in open-woodland on rocky sandstone breakaway. The immature stages were attended by a pale species of sugar ant *Camponotus* sp. (*novaehollandiae* species group). The site was revisited on 29 July 2012 and all but one clump of *Amyema villiflora* had been burnt and killed by fire (dry season control burn in May 2011); a cohort of 14 pupae and several late instar larvae were located in the ground at the base of *Acacia multistipulosa* supporting this single clump of mistletoe, indicating that the colony had survived the fire. However, this tree (and mistletoe) was subsequently destroyed by another fire in November 2012, and the neither the butterfly nor attendant ants could be found. The immature stages of *Candalides margarita* and *Comocrus behri* were also found on the same mistletoe species at this site (see below).

Diplatia grandibractea (F.Muell. and Tate) Tiegh.
(Loranthaceae) (Voucher M.F. Braby 177, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Favenc Range, Carpentaria Hwy, NT (16.70357°S, 135.36717°E; WGS84, 50 m), 17 May 2013, M.F. Braby. Several eggs, mostly hatched, were collected from under loose bark or on epicortical runners of the mistletoe *Diplatia grandibractea* parasitising *Eucalyptus leucophloia* growing in low open woodland on rocky hill slope/breakaway; one fresh egg subsequently proved to be parasitised by small parasitic wasps. The site was revisited on 24 August 2015 and a female was observed at 1405 h perched on the larval food plant; she was possibly about to lay eggs but was disturbed and flew off. The immature stages of *Comocrus behri* were also found on the same mistletoe species at this site (see below).

***Hypolycaena phorbas phorbas* (Fabricius, 1793)**

Black-spotted Flash

Breynia cernua (Poir.) Muell.Arg (Phyllanthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Bowali Information Centre, Kakadu National Park, NT (12.67377°S,

132.81757°E; WGS84, 50 m), 4 February 2011, M.F. Braby. Two larvae comprising one early instar and one final instar were recorded feeding on new leaves of a small shrub of *Breynia cernua* that was growing in close proximity to several taller shrubs of *Clerodendrum floribundum* on which a large colony of the butterfly was established. *Oecophylla smaragdina* ants were attending the larvae.

Anthene seltuttus affinis
(Waterhouse & R.E. Turner, 1905)

Dark Ciliate-blue

Corymbia disjuncta K.D.Hill and L.A.S.Johnson
(Myrtaceae). (Voucher M.F. Braby 148, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: South Alligator Ranger Station, Kakadu National Park, NT (12.68306°S, 132.47223°E; WGS84, 100 m), 24 April 2013, M.F. Braby. A female was observed at 1500 h CST ovipositing on a sapling of *Corymbia disjuncta* growing in long unburnt eucalypt woodland with a monsoon vine thicket understorey; cohorts of eggs and larvae were also recorded on the new soft leaves. Numerous *Oecophylla smaragdina* ants were attending the larvae. The immature stages of *Arhopala eupolis* were also found on the same sapling at this site (see above).

Popham Bay, Cobourg Peninsula, NT (11.27261°S, 131.85768°E; WGS84, 100 m), 12 August 2014, M.F. Braby. Thirty pupae were recorded clustered in two groups on the stem of a sapling of *Corymbia disjuncta* growing in woodland adjacent to monsoon forest. The pupae were green or brown in colour and oriented head downwards, and attended by numerous *Oecophylla smaragdina* ants. The immature stages of *Arhopala eupolis* (see above) and *Theclinesthes miskini* (see below) were also found on the same plant species at this site.

***Candalides margarita gilberti* Waterhouse, 1903**

Northern Pencil-blue

Amyema sanguinea (F.Muell.) Danser (Loranthaceae).
(Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Rapid Creek, Rapid Creek, Darwin, NT (12.38083°S, 130.86462°E; WGS84, 50 m), 26 April 2011, M.F. Braby and J.J. Armstrong. Two eggs were recorded on the mistletoe

Amyema sanguinea parasitising a eucalypt in a suburban parkland. The immature stages of *Birthisia cleis* were also found on the same mistletoe clump at this site (see above).

Australia: Western Australia: King River crossing, Gibb River Road, El Questro Wilderness Park, WA (15.91133°S, 128.18486°E; WGS84, 10 m), 3 August 2011, M.F. Braby and L.J. Aitchison. Two eggs were recorded on new leaf shoots of a clump of *A. sanguinea* in the canopy parasitising *Eucalyptus camaldulensis* growing in riparian woodland along the bank of a river. The immature stages of *Delias argenthona* and *Ogyris amaryllis* were also found on the same mistletoe clump at this site (see below).

Australia: Northern Territory: Danger Pt Rd, Garig Gunak Barlu National Park, NT (11.25417°S, 132.31907°E; WGS84, 50 m), 8 August 2014, M.F. Braby. Two females were observed at 1200–1215 h CST settled on or flying around the foliage of a clump of *A. sanguinea* parasitising *Eucalyptus tetradonta* growing in savannah woodland; one female eventually deposited an egg on a new soft leaf. Closer inspection of the mistletoe clump revealed a hatched egg and a second instar larva on the foliage.

Amyema villiflora ssp. *villiflora* (Domin) Barlow
(Loranthaceae). (Voucher M.F. Braby 114, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 18 December 2011, M.F. Braby. An egg and a first instar larva were collected from the flowers of the mistletoe *Amyema villiflora* parasitising *Acacia multistipulosa* growing in open-woodland on rocky sandstone breakaway. The larva was reared in captivity and an adult emerged a month later on 18 January 2012, with a pupal duration of 10 days. The immature stages of *Ogyris zosine* (see above) and *Comocrus behri* (see below) were also found on the same mistletoe species at this site.

Dendrophthoe glabrescens (Blakely) Barlow
(Loranthaceae). (Voucher M.F. Braby 108, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Emma Gorge Resort, El Questro Wilderness Park, WA (15.90753°S, 128.12909°E; WGS84, 100 m), 2 June 2011, M.F. Braby and T. Schwinghammer. Two empty egg-shells were collected from the leaf petiole of the mistletoe *Dendrophthoe glabrescens* parasitising *Erythrophleum chlorostachys* growing in riparian woodland. The immature stages of *Delias argenthona* were also found on the same mistletoe clump at this site (see below).

Dendrophthoe odontocalyx (F.Muell. ex Benth.) Tiegh.
(Loranthaceae). (Voucher M.F. Braby 154, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Barrk Track, 0.6 km E of Nanguluwur Art Site, Kakadu National Park, NT (12.84650°S, 132.82295°E; WGS84, 200 m), 15 February 2014, M.F. Braby and J. Westaway. A female was observed at 1410 h CST ovipositing on a leaf bud of the mistletoe *Dendrophthoe odontocalyx* parasitising *Xanthostemon paradoxus* growing in riparian woodland along a seasonal sandstone gully.

***Nesolycaena urumelia* (Tindale, 1922)**

Spotted Opal

Boronia wilsonii (F.Muell. ex Benth.) Duretto
(Rutaceae). (Voucher D. Lewis 1713, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Spirit Hills, 105 km NE of Keep River National Park ranger station, NT (15.22063°S, 129.64844°E; GDA94, 50 m), 13 May 2011, D. Lewis. Two adults were observed flying in close proximity of a large patch of *Boronia wilsonii* growing in open woodland on a steep sandstone rocky slope just below an escarpment in the East Kimberley. Subsequent microscopic examination of herbarium voucher material revealed two hatched eggs on the underside of the leaves. The author visited the site on 8 February 2012 and collected two male butterflies: subsequent morphological examination of this material and dissection of the genitalia confirmed the species level identity as *Nesolycaena urumelia* and not the closely related *N. caesia*, which is known to feed on *B. wilsonii* and which is endemic to the Kimberley and allopatric with *N. urumelia*.

***Nacaduba biocellata biocellata* (C. & R. Felder, 1865)**

Two-spotted Line-blue

Acacia plectocarpa ssp. *plectocarpa* A.Cunn. ex Benth.
(Fabaceae). (Voucher M.F. Braby 98, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Saddleback Ridge, El Questro Wilderness Park, WA (15.99668°S, 127.98529°E; WGS84, 200 m), 16 May 2011, M.F. Braby. Large numbers of males were noted during the mid morning flying low over the ground in very localised areas around and near the base of the trunk of several trees of *Acacia plectocarpa* growing in savannah woodland

along a dry seasonal gully at the base of a hill, and presumably were searching for freshly emerged females that had, as larvae, descended from the flowers of the food plant to pupate amongst the leaf litter; by early afternoon the behaviour had ceased. A search of the flowers of *A. plectocarpa* confirmed that this species was indeed the larval food plant: two larvae were collected by beating the flowering branches; the larvae were subsequently reared in captivity, with adults emerging 1–2 weeks later on 25 and 29 May 2011.

Acacia torulosa Benth. (Fabaceae). (Voucher M.F. Braby 107, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Gubara Track, Kakadu National Park, NT (12.83696°S, 132.85626°E; WGS84, 250 m), 25, 26 June 2011, M.F. Braby. Males were observed to exhibit the same mate-location behaviour observed a month earlier at El Questro Wilderness Park noted above. Large numbers of males were observed at 0930 h CST flying in a very localised area, patrolling close to the ground over leaf litter around the base of a tall tree of *Acacia torulosa* growing in sandy soil adjacent to creek, and no doubt was the larval food plant. The site was burnt out and the tree killed by fire (in November 2012) preventing follow up of this observation to confirm that *A. torulosa* was indeed the larval food plant of *N. biocellata*.

Acacia tumida var. *tumida* F.Muell. ex Benth.
(Fabaceae). (Voucher M.F. Braby 110, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Hidden Valley, Kununurra, WA (15.76449°S, 128.74844°E; WGS84, 100 m), 1 August 2011, M.F. Braby and L.J. Aitchison. Similar to the observations made earlier at El Questro Wilderness Park and Kakadu National Park noted above, large numbers of males were observed at 0830 h WST, again flying very locally over the ground beneath the canopy of several trees of *Acacia tumida* growing between the camp ground and nature park.

***Prosotas dubiosa dubiosa* (Semper, [1879])**

Purple Line-blue

Acacia scopulorum Pedley (Fabaceae). (Voucher M.F. Braby 155, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Nourlangie Rock, 300 m S of Nanguluwur Art Site, Kakadu National Park, NT

(12.84591°S, 132.81886°E; WGS84, 50 m), 7 December 2013, M.F. Braby. A female was observed at 1010 h CST ovipositing on flower buds of *Acacia scopulorum* growing on sandstone.

Cupaniopsis anacardioides (A.Rich.) Radlk.
(Sapindaceae). (Voucher M.F. Braby 150, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Mary River crossing, Arnhem Hwy, Mary River Park, NT (12.90784°S, 131.65155°E; WGS84, 250 m), 20 July 2013, M.F. Braby and J. Westaway. Numerous females were observed during the afternoon ovipositing on flower buds of the tree *Cupaniopsis anacardioides* growing in riparian wet monsoon forest (evergreen vine forest).

Semecarpus australiensis Engl. (Anacardiaceae).
(Voucher K. Brennan 10323, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Popham Bay, Cobourg Peninsula, NT (11.27261°S, 131.85768°E; WGS84, 100 m), 12 August 2014, M.F. Braby. A female was observed at 1125 h CST ovipositing on flower buds of the tree *Semecarpus australiensis* growing along the edge of coastal monsoon forest.

***Theclinesthes miskini miskini* (T.P. Lucas, 1889)**

Wattle Blue

Corymbia disjuncta K.D.Hill and L.A.S.Johnson
(Myrtaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Popham Bay, Cobourg Peninsula, NT (11.27261°S, 131.85768°E; WGS84, 100 m), 12 August 2014, M.F. Braby. Three larvae were recorded feeding on new soft foliage of saplings of *Corymbia disjuncta* growing in eucalypt woodland adjacent to monsoon forest. All larvae were solitary and not attended by ants; one larva was collected and reared to adult, emerging on 24 August 2014. The immature stages of *Arhopala eupolis* and *Anthene seltuttus* were also found on the same plant species at this site (see above).

Corymbia sp. (Myrtaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Mt Burrell, Tipperary Station, NT (13.49623°S, 131.03572°E; WGS84, 100 m), 8 December 2012, M.F. Braby. About 20 larvae were

recorded feeding on young soft regenerating foliage of a sapling (<300 mm high) of *Corymbia* sp. (*C. disjuncta* or *C. confertiflora*) growing in savannah woodland near the base of a hill. Numerous small black ants attended the larvae.

Dundee Beach, Fog Bay, NT (12.76420°S, 130.35324°E; WGS84, 50 m), 15 December 2012, M.F. Braby and A. Lilleyman. About 50 larvae were recorded feeding on the new soft regrowth of a plant (<300 mm high) of *Corymbia* sp. (*C. disjuncta* or *C. confertiflora*) growing in an open slashed area on a laterite cliff. The larvae were attended by meat ants *Iridomyrmex sanguineus*.

***Jamides phaseli* (Mathew, 1889)**

Purple Cerulean

Bossiaea bossiaeoides (A.Cunn. ex Benth.) Court
(Fabaceae). (Voucher M.F. Braby 102, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Emma Creek, Cockburn Ranges, El Questro Wilderness Park, WA (15.89300°S, 128.13385°E; WGS84, 500 m), 24 May 2011, M.F. Braby. A female was observed at 1400 h WST ovipositing on new leaves of the shrub *Bossiaea bossiaeoides* growing in woodland along a sandstone gully with a spinifex understorey; several other eggs were located on dried leaf tissue. Adults were extremely abundant in the area and, although the food plant was in flower with numerous flower buds present, females did not oviposit on the flowers buds.

Cajanus aromaticus Maesen (Fabaceae). (Voucher M.F. Braby 159, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Koongarra Saddle, Kakadu National Park, NT (12.848°S, 132.860°E; WGS84, 200 m), 16 February 2014, M.F. Braby and J. Westaway. A female was observed at 1325 h CST ovipositing on flower buds of the shrub *Cajanus aromaticus* growing in an open area at the edge of monsoon forest on sandstone breakaway. The butterfly was very abundant in the area, flying rapidly around the food plant. The immature stages of *Catochrysops panormus* were also found on the same plant species at this site (see below).

Tephrosia spechtii Pedley (Fabaceae). (Voucher M.F. Braby 092, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National

Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 6 February 2011, M.F. Braby. A final instar larva was collected from the flowers of the shrub *Tephrosia spechtii* growing in open-woodland on sandstone breakaway; two hatched eggs were also noted on the stems of the larval food plant. Adults were extremely abundant in the area and were flying around the food plant. The larva was reared in captivity and an adult emerged on 14 February 2011.

***Catochrysops panormus platissa*
(Herrich-Schäffer, 1869)**

Pale Pea-blue

Cajanus aromaticus Maesen (Fabaceae). (Voucher M.F. Braby 159, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Koongarra Saddle, Kakadu National Park, NT (12.848°S, 132.860°E; WGS84, 200 m), 16 February 2014, M.F. Braby and J. Westaway. Several females were observed at 1210–1215 h CST ovipositing on flower buds of the shrub *Cajanus aromaticus* growing in an open area at the edge of monsoon forest on sandstone breakaway. The immature stages of *Jamides phaseli* were also found on the same plant species at this site (see above).

Cajanus pubescens (Ewart and Morrison) Maesen (Fabaceae). (Voucher M.F. Braby 106, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Livistona Gully, 13 km SSW of campground, Mornington Wildlife Sanctuary, WA (17.60608°S, 126.04013°E; WGS84, 50 m), 9 August 2011, M.F. Braby and L.J. Aitchison. A female was observed at 1515 h WST attempting to oviposit on new leaves of the shrub *Cajanus pubescens*, which grew abundantly as small shrubs in an open rocky gully adjacent to riparian monsoon forest; eggs were subsequently located on flower buds and new leaves of the larval food plant.

***Lampides boeticus* (Linnaeus, 1767)**

Long-tailed Pea-blue

Swainsona canescens (Benth.) F.Muell. (Fabaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Mulga Park Rd, 12.5 km SE of Curtin Springs, NT (25.39962°S, 131.83987°E;

WGS84, 250 m), 26 September 2013, M.F. Braby. A female was observed ovipositing on the legume *Swainsona canescens* growing in shrubland dominated by spinifex on the ridge of a sand dune; numerous eggs were also located on the bracts of the buds. Several males were hilltopping at the site.

***Zizina otis labradus* (Godart, [1824])**

Common Grass-blue

**Desmodium triflorum* (L.) DC. (Fabaceae). (Voucher M.F. Braby 137, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Wanguri, Darwin, NT (12.37308°S, 130.88657°E; WGS84, 500 m), 12 January 2013, M.F. Braby. A female was observed at 1230 h CST ovipositing on the prostrate scrambler *Desmodium triflorum* growing in a residential garden; the eggs were laid singly on the underside of the leaflets. Further searches revealed additional eggs on the larval food plant.

***Famegana alsulus alsulus*
(Herrich-Schäffer, 1869)**

Black-spotted Grass-blue

Vigna lanceolata var. *filiformis* Benth. (Fabaceae). (Voucher M.F. Braby 101, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Saddleback Ridge, El Questro Wilderness Park, WA (15.99668°S, 127.98529°E; WGS84, 200 m), 18 May 2011, M.F. Braby. A female was observed at 1000 h CST to deposit several eggs on the trailing legume *Vigna lanceolata* growing in savannah woodland along a dry seasonal gully at the base of a hill.

Vigna radiata (L.) R.Wilczek (Fabaceae). (Voucher M.F. Braby 161, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Charles Darwin University, Katherine campus, NT (14.39513°S, 132.14429°E; WGS84, 50 m), 16 April 2014, M.F. Braby and L.J. Aitchison. A female was observed at 1310 h CST ovipositing on *Vigna radiata*, which grew as a trailing vine in woodland adjacent to vine thicket on limestone karst.

Euchrysops cnejus cnidus
Waterhouse & Lyell, 1914

Spotted Pea-blue

Vigna lanceolata var. *filiformis* Benth. (Fabaceae).
 (Voucher M.F. Braby 117, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Finn Rd, ca. 3 km N of Berry Springs, NT (12.67554°S, 131.00994°E; WGS84, 100 m), 21 January 2012, M.F. Braby. A female was observed at 1220 h CST fluttering slowly around and alighting on *Vigna lanceolata*, which grew as a trailing legume in the grassy understorey of savannah woodland; closer inspection of the larval food plant revealed two freshly laid green eggs on the sepals of a flower bud.

Vigna radiata (L.) R.Wilczek (Fabaceae). (Voucher M.F. Braby 122, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Mt Muriel, 7 km SSW of Douglas Daly Research Farm, Fish River Station, NT (13.89433°S, 131.15822°E; WGS84, 500 m), 23 April 2012, M.F. Braby. A female was observed during the early afternoon ovipositing on a vine of *Vigna radiata* growing in savannah woodland on a laterite plateau; several eggs were laid on the stems of the larval food plant, as well as on those of adjacent plants over which the vine grew.

***Freyeria putli putli* (Kollar, [1844])**

Jewelled Grass-blue

Indigofera linifolia (L.f.) Retz. (Fabaceae). (Voucher M.F. Braby 144, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Timber Creek, NT (15.65278°S, 130.47972°E; WGS84, 50 m), 30 March 2013, M.F. Braby and L.J. Aitchison. A final instar larva was collected from the leaves of the annual herb *Indigofera linifolia* growing in an open disturbed area. The larva, which was attended by two small black ants *Iridomyrmex* sp. (1 *anceps* group), was reared in captivity and an adult emerged on 6 April 2013. Adults were common at the site and were closely associated with the food plant, on which they also observed to feed from the small red flowers.

NOCTUIDAE: AGARISTINAE

***Comocrus behri* (Angas, 1847)**

Mistletoe Day-moth

Figure 1

Amyema bifurcata (Benth.) Tiegh. (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Borroloola, NT (16.05725°S, 136.30681°E; WGS84, 500 m), 15 May 2013, M.F. Braby. Two pupae were collected from within their cocoons at the base of a eucalypt festooned with numerous clumps of the mistletoe *Amyema bifurcata* growing near suburban parkland. The adults emerged a week later on 23 May 2013.

Amyema villiflora ssp. *villiflora* (Domin) Barlow (Loranthaceae). (Voucher M.F. Braby 109, 114, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 19 November 2011, M.F. Braby. Four final instar larvae were collected from two clumps of the mistletoe *Amyema villiflora* parasitising *Acacia multistipulosa* growing in open-woodland on rocky sandstone breakaway; a dead parasitised larva also present on the larval food plant. All larvae died in captivity from viral disease. The immature stages of *Ogyris zosine* and *Candalides margarita* were also found on the same mistletoe species at this site (see above).

Diplatia grandibractea (Loranthaceae) (Voucher M.F. Braby 177, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Favenc Range, Carpentaria Hwy, NT (16.70357°S, 135.36717°E; WGS84, 50 m), 24 August 2015, M.F. Braby. A final instar larva was collected feeding on the foliage of the mistletoe *Diplatia grandibractea* which grew abundantly in the area parasitising *Eucalyptus leucophloia* in low open woodland on a rocky hill slope/breakaway. The larva pupated the following day and a female emerged on 22 September 2015. The immature stages of *Ogyris zosine* were also found on the same mistletoe species at this site (see above).

Cruria donowani* (Boisduval, 1832)*No common name**

Figure 2

Cayratia trifolia (L.) Domin (Vitaceae). (Voucher M.F. Braby 138, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Mt Burrell, Tipperary Station, NT (13.49623°S, 131.03572°E; WGS84, 100 m), 8 December 2012, M.F. Braby. A female was observed for 10 mins at 1315–1325 h CST ovipositing on small regenerating vines of *Cayratia trifolia* growing in open grassy areas or near the base of tree trunks in savannah woodland at the base of a hill; about five bright yellow-green eggs were laid singly on upperside of the leaves and stems. The female was captured and found to have deposited many eggs on the food plant when held inside a plastic container in captivity. The resulting larvae were reared in captivity and they pupated a few weeks later in late December 2012, with adults emerging in January or October 2013. Previous observations at this site indicated that adults were common seasonally, especially around large trees of Ironwood *Erythrophleum chlorostachys* that were in flower during the pre-monsoon storm period.

Idalima metasticta* Hampson, 1910*No common name**

Figure 3

Hibbertia dilatata (Benth.) J.W.Horn (Dilleniaceae). (Voucher M.F. Braby 118, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Intersection of Finn Rd and Middle Arm Rd, ca. 6.5 km N of Berry Springs, NT (12.64514°S, 131.00986°E; WGS84, 10 m), 21 January 2012, M.F. Braby. A female was observed at 1400 h CST exhibiting pre-oviposition flight behaviour (slow flutter close to the ground) around *Hibbertia dilatata* growing as a low shrub in an open disturbed area comprising remnant woodland that had been graded and slashed; she appeared to be depositing eggs on the leaf litter under grass stems around base of the larval food plant. The female was collected and held in a glass jar with fresh cuttings of the *H. dilatata* in captivity for 48 h, during which time she laid approximately 20 bright yellow eggs on the walls of the jar. The eggs hatched four days later and the larvae were noted to feed on the soft new cladodes (as well as the flowers), eating along

the margin of the flattened stem; at rest they often raised the anterior end into the air resembling a piece of dried leaf material. An adult emerged on 26 February 2012. The site was revisited on 28 January 2012 and a second instar larva was collected from *H. dilatata*.

Finn Rd, ca. 3 km N of Berry Springs, NT (12.67554°S, 131.00994°E; WGS84, 100 m), 2 November 2012, M.F. Braby. A single final instar larva was collected from *H. dilatata* growing in savannah woodland and reared to adult in captivity, emerging on 20 December 2012.

Hibbertia juncea (Benth.) J.W.Horn (Dilleniaceae). (Voucher M.F. Braby 133, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Wongalara Wildlife Sanctuary, 17 km WSW of homestead, NT (14.18256°S, 134.32269°E; WGS84, 10 m), 1 June 2012, M.F. Braby and T. Bauer. Two final instar larvae were collected from *Hibbertia juncea* growing as a low shrub in heath-woodland on sand; the larvae were reared in captivity, but died during pupation.

Nitmiluk National Park (Katherine Gorge), walking trail, NT (14.32541°S, 132.44066°E; WGS84, 5 m), 15 April 2014, M.F. Braby and L.J. Aitchison. Four larvae comprising various instars were recorded on *H. juncea* growing in woodland on flat sandy terrain between rocky sandstone outcrops.

Idalima* sp. 'Arnhem Land'*Rock-art Day-moth**

Figure 4

Hibbertia candicans Benth. (Dilleniaceae). (Voucher M.F. Braby 67, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m). A series of observations were made at this site by the author on 25 January 2010, 19–20 February 2010, 27 March 2010 and 17 December 2011. Females were observed between 1625–1730 h CST on the three separate occasions depositing eggs on the rock face of boulders close to or directly beneath shrubs of *Hibbertia candicans* growing in eucalypt woodland with a shrubby heath understorey on broken sandstone hill-slope. The eggs were collected and they hatched five days later. A number of larvae comprising various instars ($n = 15$) were also recorded on the larval food plant; the larvae were solitary and were usually found on the underside

of leaves; sometimes more than one larva was present on a particular plant. Several larvae were collected (between December 2009–March 2010), of which two were reared to adult: the larvae pupated a few weeks later and emerged as adults on 10 February and 24 April 2010, respectively, with the pupal duration varying from 18–20 days.

***Periopta diversa* (Walker, [1865])**

No common name

**Oldenlandia corymbosa* L. (Rubiaceae). (Voucher M.F. Braby 140, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Vanderlin Dve, Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 31 January 2013, M.F. Braby. Three mid to late instar larvae were recorded feeding on the introduced annual herb *Oldenlandia corymbosa* growing in a highly disturbed open area along a roadside verge.

**Spermacoce articularis* L.f. (Rubiaceae). (Voucher M.F. Braby 139, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Vanderlin Dve, Berrimah, Darwin (CSIRO complex), NT (12.41333°S, 130.92194°E; WGS84, 500 m), 8, 14, 31 January 2013, M.F. Braby. Four larvae comprising various instars were recorded feeding on the introduced annual herb *Spermacoce articularis* growing in a highly disturbed open area along a roadside verge. One larva was collected and reared in captivity; an adult emerged on 30 January 2013.

***Radinocera vagata* (Walker, 1865)**

No common name

Figure 5

Cayratia trifolia (L.) Domin (Vitaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Daly Waters Hotel, NT (16.25331°S, 133.36894°E; WGS84, 100 m), 28 January 2013, M.F. Braby and L.J. Aitchison. Two larvae were recorded on *Cayratia trifolia* growing as a vine on the trunk of a eucalypt in woodland that had

recently been burnt by an extensive dry season fire. One larva was collected and reared in captivity, emerging as an adult on 3 March 2013. This larval food plant for *R. vagata* was previously documented (Braby 2011a) based on the collection and rearing of larvae from Mt Bunday, NT; however, the larvae at Daly Waters comprised an unusual ‘pale white’ colour morph that has not previously been recorded; usually the larvae (at least in the higher rainfall areas of the Top End) comprise a ‘dark’ colour morph in which the transverse stripes are brown, grey and white.

***Radinocera* sp. ‘Arnhem Land’**

Boulder Day-moth

Figure 6

Ampelocissus acetosa (F.Muell.) Planch. (Vitaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Nanguluwur Art site, Nourlangie Rock, Kakadu National Park, NT (12.84262°S, 132.81895°E; WGS84, 250 m). A series of observations were made at this site by the author on 7, 19, 20 December 2009, 27 November 2010, 11 December 2010 and 18 November 2011. Females were observed at 1800–1840 h flying close to the ground around or ovipositing on the vine *Ampelocissus acetosa* growing amongst foot-slope boulders at the base of a sandstone escarpment. A number of larvae (n = 19) comprising various instars were collected and reared to adult in captivity.

***Hecatesia* sp. ‘Arnhem Land’**

Kakadu Whistling Moth

Figure 7

Cassytha filiformis L. (Lauraceae). (Voucher M.F. Braby 113, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 16, 17 December 2011, M.F. Braby. Three late instar larvae (instars IV, V) were collected from separate vines of *Cassytha filiformis* growing over understorey shrubs in eucalypt woodland on broken sandstone hill-slope. The larvae were reared in captivity, with two adults emerging on 2 and 3 January 2012 after a pupal duration of approximately 15 days. A catastrophic



FIGURES 1–8

Larvae of Agaristinae (Noctuidae) from the Northern Territory discussed in this paper: 1, *Comocrus behri* on *Amyema villiflora*, Nourlangie Rock, Kakadu National Park; 2, *Cruria donowani* on *Cayratia trifolia*, Mt Burrell, Tipperary Station; 3, *Idalima metasticta* on *Hibbertia dilatata*, Berry Springs; 4, *Idalima* sp. 'Arnhem Land' on *Hibbertia candicans*, Nourlangie Rock, Kakadu National Park; 5, *Radinocera vagata* on *Cayratia trifolia*, Daly Waters; 6, *Radinocera* sp. 'Arnhem Land' on *Ampelocissus acetosa*, Nourlangie Rock, Kakadu National Park; 7, *Hecatesia* sp. 'Arnhem Land' on *Cassytha filiformis*, Nourlangie Rock, Kakadu National Park; 8, *Hecatesia* sp. 'Kimberley' on *Cassytha capillaris*, Keep River National Park. (Photos by M.F. Braby.)

fire temporarily eliminated the breeding colony in November 2012: subsequent searches in 2013 and 2014 failed to detect the moth, and the larval food plant had not recovered to its former density.

Barrk Track, 0.6 km E of Nanguluwur Art Site, Kakadu National Park, NT (12.84650°S, 132.82295°E; WGS84, 200 m), 7 December 2013, M.F. Braby. A fourth instar larva was collected from *C. filiformis* growing over shrubs in eucalypt woodland on steep broken sandstone hill-slope below the Nourlangie Rock plateau. The larva pupated five days later on 12 December 2013 and emerged as an adult on 26 December 2013. The site was revisited on 26 January 2014 and four larvae (2 instar III, 2 instar V) were collected from *C. filiformis*; all larvae were on separate vines. The site was revisited again on 15 February 2014 and two more larvae (instars III, V) were collected from the larval food plant; a gravid female was also captured and transferred to a glass jar supplied with fresh cuttings of the food plant and held in captivity for 36 h during which time she laid about 100 eggs. The eggs hatched four days later and the resulting larvae were reared in captivity, emerging as adults during March and April 2014, with no evidence of pupal diapause.

***Hecatesia* sp. 'Kimberley'**

Kimberley Whistling Moth

Figure 8

Cassytha capillaris Meisn. (Lauraceae). (Voucher M.F. Braby 34, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Jininum Gorge, Keep River National Park, NT (15.83376°S, 129.11018°E; WGS84, 50 m), 1–2, 4 February 2008, M.F. Braby. A number of mid to late instar larvae (n = 24) were collected from vines of *Cassytha capillaris* parasitising various grasses, including *Triodia*, growing in savannah open-woodland on flat sandy loam that was long unburnt. All larvae were feeding solitarily and, during the heat of the day (typically 42°C during mid afternoon), they were noted to rest vertically head downwards, fully stretched on the more shaded side of stems of flower spikes or blades of the host grass just above the food plant; often the head and thorax was raised in the air. The site was revisited on 20 March 2008 and three larvae were collected from *C. capillaris*. The site was revisited again on 9 February 2012 and five mid instar larvae were collected from the larval food plant. All larvae reared in captivity during the wet season developed directly, with no evidence of pupal diapause.

Nganalam Art Site, Keep River National Park, NT (15.80501°S, 129.10548°E; WGS84, 10 m), 3 February 2008, M.F. Braby. Eleven larvae were recorded on *C.*

capillaris growing in similar habitat to the Jininum Gorge site noted above.

NEW LEPIDOPTERA LARVAL FOOD PLANT ASSOCIATIONS FOR THE NORTHERN TERRITORY AND/OR NORTHERN WESTERN AUSTRALIA

The following catalogue of species comprises plants that have previously been recorded as larval food plants from eastern Australia (e.g. Common 1990; Braby 2000) but, to the author's knowledge, have not been previously documented for the NT and/or the Kimberley region of western Northern Territory and north-western Western Australia.

HESPERIIDAE

***Ocybadistes flavovittatus vesta*
(Waterhouse, 1932)**

Narrow-brand Grass-dart

**Cynodon dactylon* (L.) Pers. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: Annie Creek campground, Mornington Wildlife Sanctuary, WA (17.50735°S, 126.11252°E; WGS84, 500 m), 10 August 2011, M.F. Braby and L.J. Aitchison. A localised breeding colony was located on non-indigenous Green Couch Grass *Cynodon dactylon*, which grew as an extensive hummock in an open damp area with some shade afforded by overstorey trees in riparian woodland. A female was observed at 1040 h WST to oviposit on the larval food plant, and two late instar larvae were collected from their shelters, which were constructed amongst the basal stems and blades of the food plant; both larvae subsequently proved to be parasitised. Males were noted to repeatedly perch on blades of the food plant and other objects close to ground to bask or establish territories for mate location during late morning; conspecific rival males were not tolerated and chased away if they entered the territory of a resident male. The immature stages of *Hypocysta adiante* were also found on the same grass at this site (see above).

***Suniana lascivia larrakia* L.E. Couchman, 1951**

Dark Grass-dart

Imperata cylindrica (L.) Reusch. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Wanguri, Darwin, NT (12.37308°S, 130.88657°E; WGS84, 500 m), 1 September 2013, M.F. Braby. Two larvae were collected from the grass *Imperata cylindrica* and reared in captivity, with adults emerging on 7 and 15 October 2013.

PIERIDAE

Eurema hecabe* (Linnaeus, 1758)*Large Grass-yellow**

Phyllanthus sp. (Phyllanthaceae). (Voucher M.F. Braby 103, DNA).

MATERIAL EXAMINED

Australia: Western Australia: El Questro Gorge, El Questro Wilderness Park, WA (16.02005°S, 128.02899°E; WGS84, 400 m), 17 May 2011, M.F. Braby. A female was observed during the late morning ovipositing on *Phyllanthus* sp., possibly *P. maderaspatensis*, which grew as a herb in an open rocky area along a narrow gully adjacent to monsoon forest.

Belenois java teutonia* (Fabricius, 1775)*Caper White**

Capparis lasiantha R.Br. ex DC. (Capparaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: Location 9 km S of campground, Mornington Wildlife Sanctuary, WA (17.58320°S, 126.08272°E; WGS84, 10 m), 9 August 2011, M.F. Braby and L.J. Aitchison. Numerous pupae, pupal exuviae and adults were recorded on *Capparis lasiantha*, which grew as a large vine around *Bauhinia cunninghamii* in savannah woodland.

Delias argenthona fragalactea* (Butler, 1869)*Scarlet Jezebel**

Amyema miquelii (Lam. ex Miq.) Tiegh. (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu

National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 6 February 2011, M.F. Braby. A cohort of five final instar larvae were recorded on a clump of the mistletoe *Amyema miquelii* in the canopy parasitising *Eucalyptus miniata* growing in eucalypt woodland with a heath understorey on broken sandstone hill-slope. The immature stages of *Candalides margarita* were also found on the same mistletoe species at this site (see below).

Amyema sanguinea (F.Muell.) Danser (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: King River crossing, Gibb River Road, El Questro Wilderness Park, WA (15.91133°S, 128.18486°E; WGS84, 10 m), 3 August 2011, M.F. Braby and L.J. Aitchison. A cohort of five late instar larvae was recorded on a clump of the mistletoe *Amyema sanguinea* in the canopy parasitising *Eucalyptus camaldulensis* growing in riparian woodland along the bank of a river. The immature stages of *Ogyris amaryllis* (see below) and *Candalides margarita* (see above) were also recorded on the same mistletoe clump.

Dendrophthoe glabrescens (Blakely) Barlow (Loranthaceae). (Voucher M.F. Braby 108, DNA).

MATERIAL EXAMINED

Australia: Western Australia: Emma Gorge Resort, El Questro Wilderness Park, WA (15.90753°S, 128.12909°E; WGS84, 100 m), 2 June 2011, M.F. Braby and T. Schwinghammer. A cohort of 10 first instar larvae were collected and three prepupae were recorded on a large clump of the mistletoe *Dendrophthoe glabrescens* in the canopy parasitising *Erythrophleum chlorostachys* growing in woodland along the gorge; a live pupa and a dead pupa were also found on a grass blade about 1 m above the ground beneath the mistletoe food plant. The larvae were reared in captivity and pupated on 2 July 2011, emerging as adults 10 days later on 12 July 2011. The site was revisited on 4 August 2011 and a cohort of 14 final instar larvae was recorded on the same larval food plant. The immature stages of *Candalides margarita* were also found on the same mistletoe clump (see above).

Intersection of Lake Argyle Rd and Victoria Hwy, ca. 35 km E of Kununurra, WA (15.96229°S, 128.96069°E; WGS84, 100 m), 1 August 2011, M.F. Braby and L.J. Aitchison. A cohort of 14 final instar larvae was recorded feeding on *D. glabrescens* parasitising *Erythrophleum chlorostachys* growing in savannah open-woodland on sandplain.

Australia: Northern Territory: Wilton River, Wongalara homestead, Wongalara Wildlife Sanctuary, NT (14.14035°S, 134.47461°E; WGS84, 250 m), 29 May

2012, M.F. Braby. A female was observed at 1400 h CST ovipositing on *D. glabrescens* in the canopy (approx. 7–8 m above the ground) parasitising *Erythrophleum chlorostachys* growing in riparian woodland; a small cohort of eggs was laid on a new leaf.

NYMPHALIDAE

Euploea corinna (W.S. Macleay, 1826)

Common Crow

Ichnocarpus frutescens R.Br. (Apocynaceae). (Voucher M.F. Braby 121, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Bamboo Creek, Marrakai Rd, 2.5 km E of Stuart Hwy, NT (12.90468°S, 131.16080°E; WGS84, 250 m), 15 October 2011, M.F. Braby. Two females were observed at 1055 h and 1104 h CST ovipositing on a vine of *Ichnocarpus frutescens* growing along the edge of wet riparian monsoon forest; each female laid a single egg on the underside or edge of a leaf. A first instar larva was also recorded on the new leaf growth.

**Adenium obesum* (Forssk.) Roem. and Schult. (Apocynaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Adelaide River, 5.5 km NE of Adelaide River, NT (13.21222°S, 131.1475°E; AGD66 100 m), 26 August 2013, V. Kessner. Numerous larvae and pupae were recorded on several ornamental *Adenium obesum* plants growing in pot-plants in a rural garden.

Melanitis leda bankia (Fabricius, 1775)

Evening Brown

Imperata cylindrica (L.) Reusch. (Poaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Bamboo Creek, Marrakai Rd, 2.5 km E of Stuart Hwy, NT (12.90468°S, 131.16080°E; WGS84, 250 m), 16 March 2013, M.F. Braby. A final instar larva was recorded feeding on the grass *Imperata cylindrica* growing in the ecotone of riparian monsoon forest. The site was revisited on 6 April 2013 and another larva was recorded feeding on the blade of the larval food plant.

LYCAENIDAE

Arhopala eupolis asopus Waterhouse & Lyell, 1914

Purple Oak-blue

Cupaniopsis anacardioides (A.Rich.) Radlk. (Sapindaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Bullocky Point, Darwin, NT (12.43777°S, 130.83377°E; WGS84, 500 m), 28 February 2011, M.F. Braby. Ten larvae comprising various instars were collected from new soft leaves of the tree *Cupaniopsis anacardioides* growing in suburban parkland. The larvae were attended by *Oecophylla smaragdina* ants and reared in captivity, with adults emerging between 17–20 March 2011.

Ogyris amaryllis meridionalis (Bethune-Baker, 1905)

Satin Azure

Amyema sanguinea (F.Muell.) Danser (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Western Australia: King River crossing, Gibb River Road, El Questro Wilderness Park, WA (15.91133°S, 128.18486°E; WGS84, 10 m), 3 August 2011, M.F. Braby and L.J. Aitchison. Numerous eggs were recorded on the stems of a clump of the mistletoe *Amyema sanguinea* in the canopy parasitising *Eucalyptus camaldulensis* growing in riparian woodland along the bank of a river; an early instar larva and a pupa were also collected from under loose bark of the larval food plant. The larva and pupa were reared in captivity to adult; the pupa emerged on 10 August 2011, and the larva on 1 September after a pupal duration of 10 days. Several males were observed at the site and were noted to fly high in the canopy of the host tree, frequently settling on dead branches. The immature stages of *Delias argenthona* and *Candalides margarita* were also recorded on the same mistletoe clump (see above).

Diplatia grandibractea (Loranthaceae) (Voucher M.F. Braby 78, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Near Lake Mary Ann, 5 km NNW of Tennent Creek, NT (19.60678°S, 134.20479°E; WGS84), 12 September 2015, M.F. Braby. A female was observed at 1310 h to deposit a single egg on a branch of the mistletoe *Diplatia grandibractea*

parasitising *Eucalyptus leucophloia* growing in low open woodland with a ground layer of *Triodia* sp.; three final instar larvae were also collected from the haustoria of another clump, the larvae were sheltering either in borer holes or amongst the basal branches beneath debris of an abandoned birds nest. The larvae were reared in captivity to pupation, with the adults emerging on 10, 15 October 2015. The record confirms this mistletoe as a larval food plant of *O. amaryllis* that was previously based only on the presence of eggs and larval feeding scars (Braby 2011a).

***Hypolycaena phorbas phorbas* (Fabricius, 1793)**

Black-spotted Flash

Planchonia careya Blume (Lecithydaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Manton River crossing, Stuart Hwy, NT (12.83833°S, 131.13361°E; GDA94, DMS, 250 m), 10 January 2015, M.F. Braby. Two larvae were collected from a large shrub of *Planchonia careya* growing in savannah woodland and reared to adult, with a pair emerging on 22–23 January 2015. The larvae were feeding on the new soft foliage and were attended by numerous *Oecophylla smaragdina* ants.

***Anthene seltuttus affinis*
(Waterhouse & R.E. Turner, 1905)**

Dark Ciliate-blue

Cupaniopsis anacardioides (A.Rich.) Radlk. (Sapindaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Fish River, 6 km SE of homestead, Fish River Station, NT (14.23081°S, 130.91939°E; WGS84, 500 m), 29 April 2012, M.F. Braby. Three pupae were recorded on the tree *Cupaniopsis anacardioides* growing in riparian paperbark woodland with monsoon elements in the understorey.

South Alligator Ranger Station, Kakadu National Park, NT (12.68306°S, 132.47223°E; WGS84, 100 m), 25 April 2013, M.F. Braby and C. Webb. A female was observed at 1140 h CST ovipositing on *C. anacardioides* growing in long unburnt eucalypt woodland with monsoon vine thicket in the understorey.

Gunn Point, 1.5 km N of car park, NT (12.22762°S, 131.03122°E; WGS84, 250 m), 30 November 2013, M.F. Braby and D. Bisa. A large cohort of eggs and several early instar larvae were recorded on *C. anacardioides*

growing in coastal monsoon vine thicket. The eggs had been deposited on a stem, and numerous *Oecophylla smaragdina* ants were present.

***Candalides margarita gilberti*
Waterhouse, 1903**

Northern Pencil-blue

Amyema miquelii (Lam. ex Miq.) Tiegh. (Loranthaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Location 0.6 km W of Gubara Track, Nourlangie Rock, Kakadu National Park, NT (12.83721°S, 132.84970°E; WGS84, 250 m), 19 November 2011, M.F. Braby. A female was observed for 7 mins between 1555–1602 h CST ovipositing on the flower buds on clumps of the mistletoe *Amyema miquelii* in the canopy parasitising *Eucalyptus miniata* growing in eucalypt woodland with a heath understorey on broken sandstone hill-slope. The immature stages of *Delias argenthona* were also recorded on the same mistletoe species at this site (see above).

***Theclinesthes miskini miskini*
(T.P. Lucas, 1889)**

Wattle Blue

Atalaya hemiglauca (F.Muell.) F.Muell. ex Benth. (Sapindaceae). (Not vouchered).

MATERIAL EXAMINED

Australia: Northern Territory: Mataranka Homestead, Thermal Pool campground, NT (14.92277°S, 133.13400°E; WGS84, 10 m), 4 April 2015, M.F. Braby. A female was observed during mid afternoon ovipositing on the new soft foliage of a sapling of *Atalaya hemiglauca* growing in the campground.

***Euchrysops cnejus cnidus*
Waterhouse & Lyell, 1914**

Spotted Pea-blue

**Macroptilium lathyroides* (L.) Urb. (Fabaceae). (Voucher M.F. Braby 147, DNA).

MATERIAL EXAMINED

Australia: Northern Territory: Location 48 km N of Borroloola, NT (15.63012°S, 136.38232°E; WGS84, 500 m), 16 May 2013, M.F. Braby. A female observed was ovipositing on the introduced vine *Macroptilium lathyroides* growing in abundance in a paperbark swamp; numerous other eggs were also present.

DISCUSSION

In total, 103 Lepidoptera-plant associations are documented, of which 86 are new for Australia and 17 are new for the NT and/or WA. Of particular note are the first recordings of the following three plant families for three butterfly species: the Lauraceae for *Graphium eurypylus*, the Phyllanthaceae for *Hypolycaena phorbis*, and the Anacardiaceae for *Prosotas dubiosa*. Moreover, 16 native plant genera are newly recorded for the following genera of Lepidoptera in Australia: *Semecarpus* (Anacardiaceae) for *Prosotas* (Lycaenidae), *Sarcolobus* (Apocynaceae) for *Danaus* (Nymphalidae), *Vitex* (Lamiaceae) for *Charaxes* (Nymphalidae), *Bossiaea* and *Tephrosia* (Fabaceae) for *Jamides* (Lycaenidae), *Amyema* (Loranthaceae) for *Birhana* (Immididae), *Corymbia* (Myrtaceae) for *Anthene* (Lycaenidae), *Aristida* and *Digitaria* (Poaceae) for *Hypocysta* (Nymphalidae), *Chrysopogon* and *Eriachne* (Poaceae) for *Pelopidas* (Hesperiidae), *Mnesithea* (Poaceae) for *Pelopidas* and *Telicota* (Hesperiidae), *Sacciolepis* (Poaceae) for *Taractrocera* (Hesperiidae), *Sorghum* (Poaceae) for *Synemon* (Castniidae) and *Neohesperilla* (Hesperiidae), *Whiteochloa* for *Borbo* and *Taractrocera* (Hesperiidae), and *Breynia* (Phyllanthaceae) for *Hypolycaena* (Lycaenidae). In addition, new larval food plant associations are reported for five day-flying moths in the subfamily Agaristinae (*Idalima metasticta*, *Idalima* sp. 'Arnhem Land', *Radinocera* sp. 'Arnhem Land', *Hecatesia* sp. 'Arnhem Land', *Hecatesia* sp. 'Kimberley') for which the life histories have not previously been documented. The final instar larvae of these five species are illustrated for the first time in figures 3, 4, 6–8.

Of the new food plant records, 34 are based on oviposition behaviour of females and/or presence of eggs only, and further observations may be required to determine their suitability. In my experience, however, females rarely make mistakes when ovipositing, and subsequent rearing of the larvae from eggs laid on their respective food plants has demonstrated that in most cases the larvae are indeed able to feed and develop to adulthood on these plants in captivity. In the present work, this assumption of host suitability, based on oviposition records only, was confirmed in at least three cases: *Axonopus compressus* for *Ypthima arctous*, *Amyema villiflora* for *Candalides margarita*, and *Cayratia trifolia* for *Cruria donowani*. In other cases, females were initially observed ovipositing on a plant and then subsequent searching revealed larvae, some of which were reared. For example, in a previous report I observed a female of the hesperiid *Suniana lascivia* deposit a single egg on the grass *Ischaemum australe* in the eastern Kimberley at El Questro Wilderness Park, WA, in July 2009 (Braby 2011a), but did not rear the egg nor search for additional immature stages on the plant. However, subsequent observations

made during this study confirmed that butterfly does exploit *I. australe* – numerous larvae, pupae and shelters were detected on this grass species, and two larvae were collected and reared in captivity to adult, from a localised breeding colony at Kununurra, WA, in February 2012.

Another, but slightly different, example concerns the mate-location behaviour exhibited by the lycaenid *Nacaduba biocellata*. During mate-location, large numbers of males of this species patrol a relatively small area beneath the canopy of the larval food plant, which consists of trees of *Acacia* that have just finished or almost finished flowering, during the mid morning. The males fly very close to the ground near the trunk of the tree in search for freshly emerged females, which pupate amongst the leaf litter, under stones, pieces of bark or in holes in the ground at or near the base of the trunk (Braby 2000). The presence of such male behaviour can thus be used as a clue as to the likely food plant. This assumption was tested and confirmed in the present study at El Questro Wilderness Park in May 2011 by the detection of larvae on the flowers of a tree of the putative larval food plant (in this case *A. plectocarpa*).

It can therefore be assumed that the majority, if not all, of the plants listed are exploited and comprise an important ecological resource for these insects. The suitability of these plants in terms of offspring fitness components (e.g. survival rate, larval growth rate, adult body size attained, and reproductive output of adult females), however, was beyond the scope of this study and was not investigated. It is well known that not all plants are equal in terms of offspring fitness for butterfly species that have broad larval diets (i.e. oligophagous or polyphagous) (e.g. Singer 1984), and further experimentation is required to determine patterns of host preference and/or host suitability in relation to diet breadth for those species which feed on more than one particular plant species.

Comments are provided for several species in terms of the new plant associations reported herein.

Larvae of the aposematic diurnal moth *Birhana cleis* specialise on the mistletoe family Loranthaceae, and previously they have been reported from the genera *Decaisnina* and *Dendrophthoe* (Braby 2011a). In that publication I predicted that the host range of this immid within the Loranthaceae may be considerably wider than available data indicates. The new association with *Amyema* in part confirms this prediction, and is therefore not entirely unexpected.

Larvae of the swallowtail butterfly *Graphium eurypylus* in Australia feed predominantly on Annonaceae and very occasionally Magnoliaceae (Larsen et al. 2008). It is therefore of considerable interest that the species is now known to also exploit Lauraceae, which have not previously been reported for

this species in Australia. This family has been recorded for two other species of *Graphium* in Australia (*G. macleayanum*, *G. sarpedon*) (Braby 2000), but not for *G. eurypylus*.

Larvae of the danaine butterfly *Danaus affinis* in Australia were previously known to feed only on *Cynanchum carnosum* (Apocynaceae), particularly growing at the edge of swamplands in coastal areas (Braby 2000), although recently Moss (2010) added *C. ovalifolium* as a food plant from south-east Queensland. The utilisation of *Marsdenia* and *Sarcolobus* in a different habitat (eucalypt open-forest at the base of sandstone escarpments in inland areas) is somewhat surprising, although both genera belong in the Apocynaceae. These two new plant records indicate a broader host range for *D. affinis*, and it may explain the occurrence of this butterfly in non-coastal areas of the Top End where it is widely distributed. *Sarcolobus* has not previously been recorded for the genus *Danaus* in Australia.

Larvae of the satyrine butterfly *Mycalesis sirius* are known to feed on a limited set of grasses (Poaceae), mainly growing in paperbark swampland or eucalypt woodland adjacent to paperbark swampland (Braby 1995a, b). Manski (1960) listed *Imperata* sp. as a larval food plant for *M. sirius* in northern Queensland; however, Valentine (1988) cast considerable doubt over the reliability of this association and, on the basis of this evidence, the record was not formally included in the review by Braby (2000). Thus, the discovery of larvae feeding on *I. cylindrica* along the edge of riparian evergreen monsoon forest at Robin Falls, NT, confirms the earlier observation by Manski (1960).

Larvae of the lycaenid butterfly *Ogyris amaryllis* specialise on the genus *Amyema* and the closely related genus *Diplatia* within the Loranthaceae (Braby 2000, 2011a). The recording of *A. benthamii* in the Kimberley in 2011 brings the total number of *Amyema* food plant species to about 17. This mistletoe species was subsequently confirmed by Paton (2013), who documented *A. benthamii* as a larval food plant for *O. amaryllis*, based also in the Kimberley, on collections and rearing of pupae at Broome, WA, in July 2013.

Larvae of the lycaenid *Candalides margarita gilberti* were previously known to associate only with the mistletoe genus *Decaisnina* in the Loranthaceae (Samson and Wilson 1995; Braby 2008). Braby (2011a) predicted that the host range of this subspecies was likely to be wider given its broad geographical distribution in the Kimberley, Top End and western Gulf Country. Hence, the five new plant records from the genera *Amyema* (3 species) and *Dendrophthoe* (2 species) confirm this prediction and are not entirely unexpected.

Larvae of the lycaenid *Famegana alsulus* have been previously recorded associated with shrubby legumes

in northern Australia (Braby 2000). However, in a recent report I recorded an association with the twining creeper *Vigna vexillata* in the Top End (Braby 2011a), and in this study females were observed ovipositing on two further species of *Vigna*. The record of *V. lanceolata* from the eastern Kimberley, in particular, supports an earlier observation (Braby 1997) in which I reported a female of *F. alsulus* ovipositing on this species at Townsville, Qld – the association, however, was not formally included in the review by Braby (2000).

Larvae of the lycaenid *Euchrysops cnejus* feed on various legumes, including at least three species of *Vigna* (Braby 2000). The two additional species of *Vigna* reported here bring the tally for this plant genus to five species. The record of *V. radiata* from Fish River Station in the Top End, in particular, supports the earlier observation of Meyer (1996), who reported a female of *E. cnejus* ovipositing on this species in the Northern Territory [precise details of location and date not provided] – the association, however, was not formally included in the review by Braby (2000).

The usual larval food plants of *Freyeria putli* in Queensland are species of *Indigofera* (Braby 2000), but Meyer (1996) listed *Flemingia lineata* as the only food plant in the Northern Territory. However, at Timber Creek, NT, adults (and larvae) were associated with *Indigofera linifolia*. Subsequent observations made at widely dispersed locations in the Top End, including Gregory National Park (Limestone Gorge), near Borroloola (Bing Bong) and near Katherine (Katherine Gorge), indicated that adults were very numerous around, and frequently settled upon, localised patches of this plant, suggesting that *I. linifolia* may be the preferred or most frequently used food plant. This plant, like the two species of *Indigofera* used in Queensland, is a seasonal annual and highly ephemeral, being only available to larvae during and shortly after the wet season.

ACKNOWLEDGEMENTS

I am indebted to I.D. Cowie, K. Brennan, J. Westaway, N. Cuff, B. Stuckey, D. Lewis and J. Low Choy for their botanical advice and competent determinations of many of the larval food plants listed in this paper, and to A. Andersen for identification of the attendant ants. J. Westaway kindly read a draft of the manuscript and greatly assisted with plant nomenclature and higher classification. I thank L.J. Aitchison, J. Westaway, J.J. Armstrong, B. Hanekom, G.J. Paras, D. Bisa, S. Hirst, A. Lilleyman and V. Kessner, and volunteers T. Bauer, P. Runyu, T. Schwinghammer and C. Webb for their assistance in the field. I am also grateful to the Northern Territory Parks and Conservation Commission for their co-operation and access to lands under their management and control. Field work in Kakadu

National Park, Northern Territory, was undertaken under Scientific Research Permit numbers RK 704 and RK 729 under the auspices of Commonwealth *EPBC Act*. The Australian Geographic Society provided financial and logistical support during the field expedition to El Questro Wilderness Park in 2011, and the ABRS Bush Blitz program provided funds for field expeditions to Fish River Station and Wongalara Wildlife Sanctuary in 2012.

REFERENCES

- Braby, M.F. (1995a). Larval and adult food plants for some tropical satyrine butterflies in northern Queensland. *The Australian Entomologist* **22**: 5–13.
- Braby, M.F. (1995b). Reproductive seasonality in tropical satyrine butterflies: strategies for the dry season. *Ecological Entomology* **20**: 5–17.
- Braby, M.F. (1997). New larval food plants for some butterflies (Lepidoptera) from northern and central Queensland, Australia. *The Australian Entomologist* **24**: 97–108.
- Braby, M.F. (2000). *Butterflies of Australia. Their Identification, Biology and Distribution*. CSIRO Publishing: Collingwood, Melbourne.
- Braby, M.F. (2008). Taxonomic review of *Candalides absimilis* (C. Felder, 1862) and *C. margarita* (Semper, 1879) (Lepidoptera: Lycaenidae), with descriptions of two new subspecies. *The Beagle, Records of the Museums and Art Galleries of the Northern Territory* **24**: 33–54.
- Braby, M.F. (2010). The merging of taxonomy and conservation biology: a synthesis of Australian butterfly systematics (Lepidoptera: Hesperioidea and Papilionoidea) for the 21st century. *Zootaxa* (**2707**): 1–76.
- Braby, M.F. (2011a). New larval food plant associations for some butterflies and diurnal moths (Lepidoptera) from the Northern Territory and eastern Kimberley, Australia. *The Beagle, Records of the Museums and Art Galleries of the Northern Territory* **27**: 85–105.
- Braby, M.F. (2011b). Revised checklist of Australian butterflies (Lepidoptera: Hesperioidea and Papilionoidea): Addendum and Errata. *Zootaxa* (**3128**): 67–68.
- Common, I.F.B. (1990). *Moths of Australia*. Melbourne University Press: Melbourne.
- Larsen, M.L., Scriber, J.M. and Zalucki, M.P. (2008). Significance of a new field oviposition record for *Graphium eurypylus* (L.) (Lepidoptera: Papilionidae) on *Michelia champaca* (Magnoliaceae). *Australian Journal of Entomology* **47**: 58–63.
- Manski, M.J. (1960). Food plants of some Queensland Lepidoptera. *Queensland Naturalist* **16**: 68–73.
- Meyer, C.E. (1996). Butterfly larval food plant list for the Northern Territory and the Kununurra District in Western Australia. *Victorian Entomologist* **26**: 66–72.
- Moss, J.T. (2010). *Butterfly Host Plants of south-eastern Queensland and northern New South Wales*. Butterfly and Other Invertebrates Club Inc.: Runcorn, Brisbane.
- Nielsen, E.S., Edwards, E.D. and Rangsi, T.V. (1996). *Checklist of the Lepidoptera of Australia. Monographs on Australian Lepidoptera, Volume 4*. CSIRO Publishing: Collingwood, Melbourne.
- Paton, G. (2013). A new host plant for the Satin Azure (*Ogyris amaryllis meridionalis*). *Metamorphosis Australia. Magazine of the Butterfly and Other Invertebrates Club* (**70**): 37–38.
- Samson, P.R. and Wilson, D.N. (1995). The life history of *Candalides gilberti* Waterhouse (Lepidoptera: Lycaenidae). *The Australian Entomologist* **22**: 71–73.
- Short, P.S., Albrecht, D.E., Cowie, I.D., Lewis, D.L. and Stuckey, B.M. (2011). *Checklist of the Vascular Plants of the Northern Territory*. Northern Territory Herbarium, Department of Natural Resources, Environment, The Arts and Sport: Palmerston.
- Singer, M.C. (1984). Butterfly-hostplant relationships: host quality, adult choice and larval success. In *The Biology of Butterflies. Symposium of the Royal Entomological Society of London, Number 11*. (Eds R.I. Vane-Wright and P.R. Ackery) pp. 81–88. Academic Press: London.
- Valentine, P.S. (1988). *Australian Tropical Butterflies*. Tropical Australilan Graphics: Paluma via Townsville.