

THE AUSTRALIAN SPECIES OF *ELODINA* C. & R. FELDER (LEPIDOPTERA: PIERIDAE)

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Abstract

The Australian species of *Elodina* C. & R. Felder are revised, with 8 species and 1 subspecies recognised: *E. padusa* (Hewitson), *E. parthia* (Hewitson), *E. walkeri* Butler, stat. rev., *E. angulipennis* (P.H. Lucas), *E. queenslandica* sp. nov., *E. q. kuranda* subsp. nov., *E. tongura* Tindale, stat. nov., *E. claudia* sp. nov. and *E. perdita* Miskin. *E. walkeri* is newly recorded from Queensland and the distributions of *E. perdita* and *E. angulipennis* are redefined. Lectotypes are selected for *E. parthia*, *E. tongura*, *E. perdita*, *E. angulipennis* and its synonym *E. pallene* (Hewitson), and *E. walkeri* and its synonym *E. baudiniana* (Butler). *Elodinesthes* Fruhstorfer is placed as a synonym of *Elodina* (syn. rev.).

Introduction

The genus *Elodina* C. & R. Felder is in need of revision. Up to 39 names are currently available at the species or subspecies level in this and the closely related genus *Elodinesthes* Fruhstorfer (Bridges 1988); of these, 6 plus a further 3 synonyms apply to the Australian fauna. The Australian fauna is considered to be endemic and we maintain this concept here. However, once detailed studies of the non-Australian taxa become available, it is likely that specific relationships will be better understood and that some taxa may prove to occur elsewhere. Such a study is not practicable at the present time, yet we feel confident that the new taxa described here are sufficiently distinct from non-Australian species to warrant naming. Apart from literature comparisons, we have examined several non-Australian species, including *Elodina egnatia* (Godart) from Timor, *E. argypheus* Grose-Smith from Bougainville and Solomon Is, and *E. hypatia* C. & R. Felder, *E. andropia* Butler and several undetermined taxa from Papua New Guinea.

In *Elodina*, as in many pierid genera, good taxonomic characters are difficult to find. The whole genus is similar in wing venation (Fig. 1) and pattern. We do not yet know the full extent of seasonal differences but they appear to be slight. In the male genitalia the valvae and harpes (Fig. 2a) are fairly uniform in shape but there are some differences in the shape of the basal protuberances on the uncus (Figs 3-11) and in *E. claudia* the tip is bifid. In most species the vesica of the aedeagus is strongly setose and in *E. tongura* it is very long (Fig. 2b). Hence reliance on genitalic and pattern characters, particularly the extent of the forewing apical black areas and the presence or absence of dark patches in the apical area on the underside of the forewing, are acceptable criteria for species determination. Wing shape also appears to be of use; in some species the wings are decidedly angled or elongate. We have not examined the female internal genitalia. These tend to be very uniform within pierid genera, with scanning electron microscope studies of the signa necessary for specific separation (Cheong & Lee 1992). Such a study is beyond the scope of the present work.

Elodina species appear to breed exclusively on *Capparis* spp. (Capparidaceae) and this must be considered a limiting factor in their distributions. Whilst some species are widespread, habitat requirements probably account for the restricted distributions of *E. tongura*, *E. claudia* and *E. perdita*. These may prove to be useful indicator species in their respective habitats.

Abbreviations

The following abbreviations have been used for specimen depositories: AMS - Australian Museum, Sydney; ANIC - Australian National Insect Collection, Canberra; BMNH - The Natural History Museum, London; GDC - G. Daniels Collection, Brisbane; JDC - J. Donaldson Collection, Brisbane; KDC - K. Dunn Collection, Melbourne; MDBC - M. De Baar Collection, Brisbane; MNHN - Museum Nationale d'Histoire Naturelle, Paris; QM - Queensland Museum, Brisbane; SAM - South Australian Museum, Adelaide; SJJC - S. J. Johnson Collection, Townsville; TLC - T. Lambkin Collection, Brisbane; UQIC - University of Queensland Insect Collection, Brisbane.

Key to Australian species and subspecies of *Elodina*

- 1 Hindwing distinctly oval in shape; forewing upperside with apical black area extending to tornus, underside with a distinct quadrate subapical brown patch *padusa*
- Hindwing rounded; forewing black area not reaching tornus and underside with subapical brown patch elongate or absent 2
- 2 Upperside of wings cream or pale yellow; hindwing underside usually covered in brown striae or at least with a remnant streak; forewing underside with basal flash distinctly orange *parthia*
- Upperside of wings white; underside not as above, hindwing without brown striae and forewing basal flash not distinctly orange 3
- 3 Forewing underside with a prominent dark brown patch in the apical area; upperside apical dark area with a strong broad projection along vein M3 4
- Forewing underside at most with a pale brown blotch in the apical area; upperside apical dark area at most with a slight projection along vein M3 6
- 4 Underside of forewings with an apricot sheen; hindwing appears angular, being produced at apex so that measurement from wing base to termen at vein M1 is about 1 mm longer than to termen at vein M3 *angulipennis*
- Underside of both wings largely white; hindwing appears rounded, the measurements from wing base to termen at veins M1 and M3 being equal in length *queenslandica* sp. n. . . 5

- 5 Forewing upperside black apical area normally without projections along veins CuA1 and CuA2; underside with subapical dark patch normally not extending beyond vein CuA1 and basal flash distinct
 *q. queenslandica* subsp. n.
- Forewing upperside black apical area normally with projections along veins CuA1 and CuA2; underside with subapical dark patch normally extending beyond vein CuA1 and basal flash indistinct
 *q. kuranda* subsp. n.
- 6 Forewing upperside black apical area often without projections along veins CuA1 and CuA2; underside subapical area usually faintly blotched with brown and edge of termen distinctly brown; hindwing underside white (pale cream in some females), without yellow on costa 7
- Forewing upperside black apical area with distinct projections along veins CuA1 and CuA2; underside subapical area unmarked and edge of termen yellowish; hindwing underside often yellow on costa or completely yellow in females 8
- 7 Forewing underside with indistinct basal flash; vesica about half length of aedeagus; forewing length normally less than 20 mm
 *walkeri*
- Forewing underside with distinct basal flash; vesica about same length as aedeagus; forewing length normally 20 mm or more
 *tongura*
- 8 Uncus bifid; hindwing underside yellow on costa and vein M3 close to vein CuA1 at base (Fig. 1b); forewing underside with termen yellowish *claudia* sp. n.
- Uncus entire; hindwing underside without yellow on costa except in yellow-winged females and vein M3 about equidistant from veins M2 and CuA1 (Fig. 1a); forewing underside with termen greenish-yellow *perdita*

Systematics

Genus *Elodina* C. & R. Felder

Elodina C. & R. Felder, 1865: 215. Type-species *Elodina thersasia* C. & R. Felder.

Parelodina Fruhstorfer, 1910, in Seitz, 1908-27: 123. Type-species *Parelodina anticyra* Fruhstorfer. Preoccupied by *Parelodina* Bethune-Baker, 1904.

Elodinesthes Fruhstorfer, 1914: 33. Replacement name for *Parelodina* Fruhstorfer. Syn. rev.

Metelodina Seitz, 1927, in Seitz, 1908-27: 1108. Unnecessary replacement name for *Parelodina* Fruhstorfer.

In *Elodina* the length of the stalk of vein R2 with veins R3-5 + M1 is intraspecifically variable; in some specimens vein R2 arises very close to the

cell apex. This invalidates recognition of the genus *Elodinesthes*, based on the position of vein R2 of the forewing relative to the apex of the discal cell. *Elodinesthes* was synonymised by Talbot (1932) but has been treated as distinct in subsequent publications.

Elodina occurs from Java and Sulawesi (Indonesia) to New Caledonia and Australia.

1. *Elodina padusa* (Hewitson) (Figs 3, 12-14)

Pieris padusa Hewitson, 1853: p. 7, pl. IV, figs 10 & 11. Type locality: Australia [New South Wales]. Holotype ♂ in BMNH [examined].

Elodina quadrata Butler, 1873: 175. Type locality: Between Sydney and Moreton Bay [Brisbane]. Holotype ♀ in BMNH [not examined].

Elodina padusa; Waterhouse & Lyell, 1914: 143, fig. 495; Common & Waterhouse, 1981: 278, pl. 20, figs 11 & 11A.

Type specimens. The number of specimens used in the original description of *E. padusa* (Hewitson 1853) from the W.W. Saunders Collection is not stated. There is a single specimen in BMNH, obtained in 1934 ex Grose-Smith and Joicey Collections. It bears 12 labels, including one with the data: 'E. padusa Hew. New South Wales Type ♂' and a red 'Type HT' BMNH label. We regard this as the holotype.

E. quadrata appears to have been described from a single specimen, since Butler (1873) indicated the number when multiple specimens were present. We regard a female in BMNH as the holotype. Butler's (1873) description is sufficient to confirm synonymy of this taxon.

Comments. This species is as understood by Common and Waterhouse (1981). Forewing range: males 18-25 mm, females 20-27 mm. The vesica of the aedeagus has weak setae, not developed into strong bristles as in the other species. Upperside of wings appear black on black and white prints when photographed under ultraviolet-reflection technique.

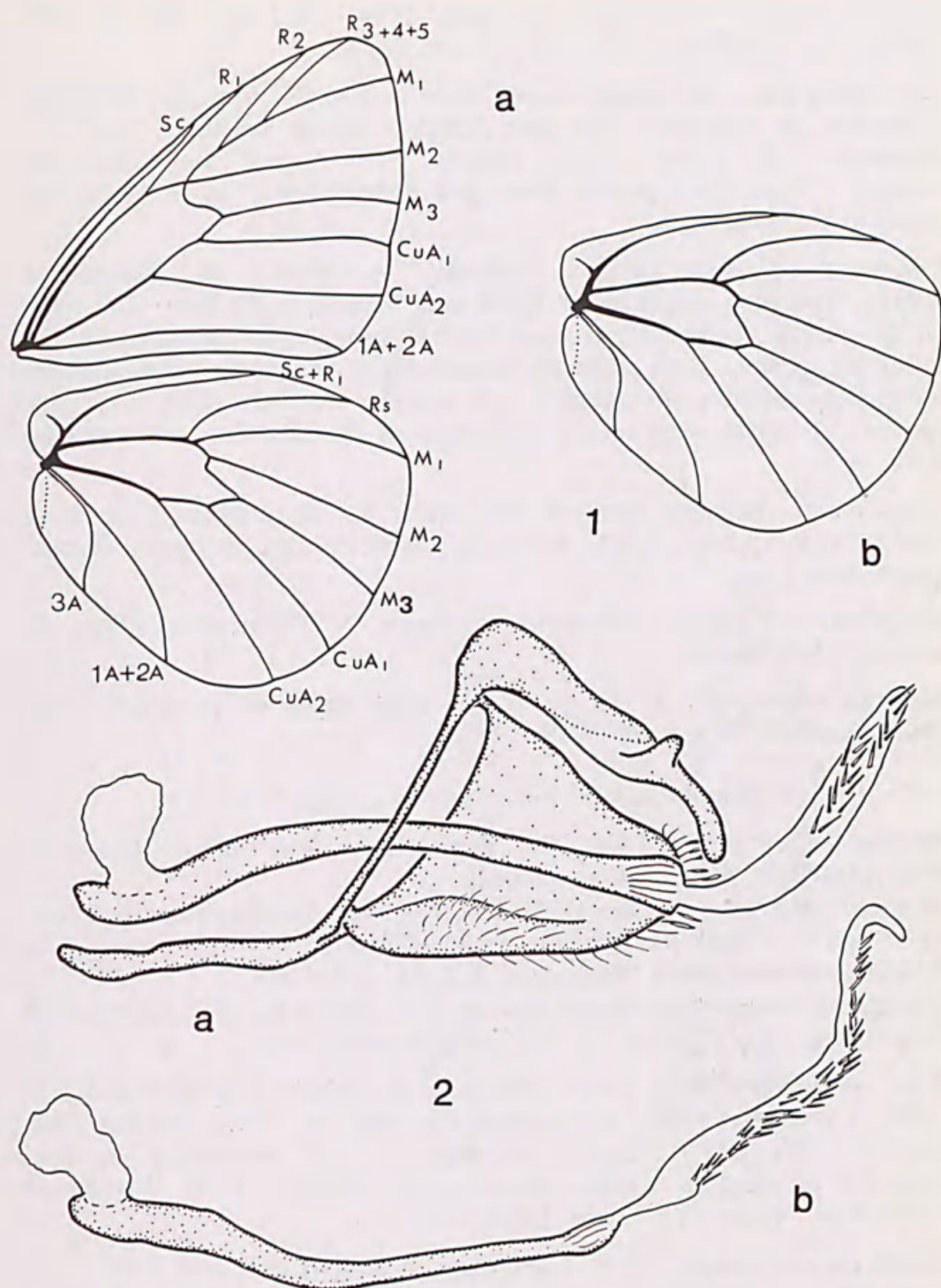
Distribution. Widespread over mainland Australia except northern parts of Northern Territory and Cape York Peninsula and the south-western quarter. An occasional visitor to southern New South Wales, Australian Capital Territory and Victoria.

Hostplants. *Capparis mitchellii* (Common & Waterhouse 1981), *C. canescens* (new record).

Material examined. Holotype of *E. padusa* and a large series of specimens from Western Australia, Queensland and New South Wales.

2. *Elodina parthia* (Hewitson) (Figs 4, 15-17)

Pieris parthia Hewitson, 1853: p. 7, pl. IV, figs 12 & 13. Type locality: Australia. Lectotype ♀ in BMNH [here designated; examined].



Figs 1-2. Wing venation and male genitalia of *Elodina* spp. (1), wing venation: (1a), *E. perdita*; (1b) *E. claudia* sp. nov. (2), male genitalia: (2a), *E. q. queenslandica* sp. nov., lateral view with left valve removed; (2b) *E. tongura*, aedeagus.

Elodina parthia; Waterhouse & Lyell, 1914: 142, figs 498 & 499; Common & Waterhouse, 1981: 277, pl. 20, fig. 8.

Type specimens. We regard 4 specimens in BMNH, from the Hewitson Collection, as syntypes. We here select a female labelled: 'Australia. Hewitson Coll. 79-69. *Elodina parthia*. 3.'/ 'Austral Str. [glued on reverse]'/ 'Type *Pieris parthia* Hew. [red BMNH label]' as lectotype, the others as paralectotypes.

Comments. This species is as understood by Common and Waterhouse (1981). Forewing range: males 13-24 mm, females 16-24 mm. The setae on the vesica of the aedeagus are not as strongly developed as in the following species. Both upper and undersides of wings appear black under ultraviolet-reflection photography. *E. padusa*, the only other very dark species, has white areas on the undersides of the hindwing and forewing apex.

Distribution. Between Wenlock and Pascoe Rivers (northern Cape York Peninsula) to Sydney. Inland to the Carnarvon Ra. and Springsure district, Queensland.

Hostplants. *Capparis canescens* (Common & Waterhouse 1981), *C. arborea* (new record).

Material examined. Lectotype and a large series of specimens from Queensland and New South Wales.

3. *Elodina walkeri* Butler, stat. rev. (Figs 5, 18-21)

Elodina walkeri Butler, 1898: 294. Type locality: Port Darwin. Lectotype ♂ in AMS [here designated; examined].

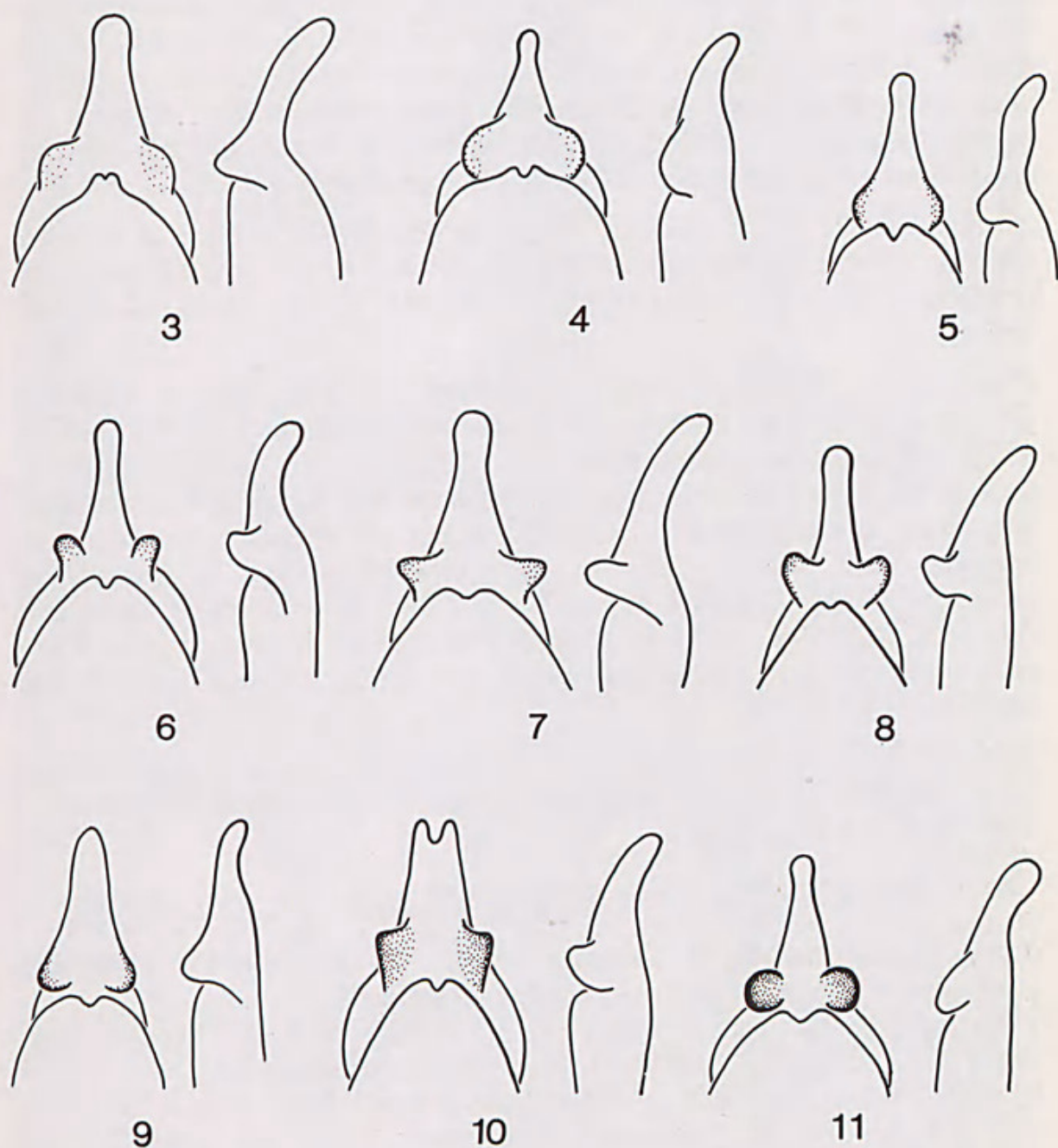
Elodina baudiniana Butler, 1898: 294-5. Type locality: Baudin Island. Lectotype ♀ in AMS [here designated; examined].

Elodina perdita walkeri; Waterhouse & Lyell, 1914: 143.

Elodina perdita perdita; Waterhouse & Lyell, 1914: fig. 497; Common & Waterhouse, 1981: 240, pl. 20, fig. 9. Misidentifications.

Type specimens. There are 4 syntypes of *E. walkeri* in BMNH and 1 in AMS. We here select as lectotype the male in AMS, labelled 'Port Darwin, 6/90, JJW'/ 'Sent in exchange to G.A. Waterhouse by Brit. Museum as *Elodina walkeri* Butler'/ 'KL 14995'/ 'G.A. Waterhouse Collection'/ 'From TYPE series [blue label]'.

There are 12 syntypes of *E. baudiniana* in BMNH and 2 in AMS. We here select as lectotype the female in AMS, labelled 'Baudin I., 6/90, JJW'/ 'Sent in exchange to G. A. Waterhouse by Brit. Museum as *Elodina baudiniana* Butler'/ 'KL 14996'/ 'G. A. Waterhouse Collection'/ 'From TYPE series [blue label]'. The head is glued separately to a piece of card. The paralectotype male in AMS is labelled similarly except dated 5/90.



Figs 3-11. *Elodina* spp., dorsal and lateral (viewed from left hand side) views of uncus. (3), *E. padusa*. (4), *E. parthia*. (5), *E. walkeri*. (6), *E. angulipennis*. (7), *E. q. queenslandica* sp. nov. (8), *E. q. kuranda* subsp. nov. (9), *E. tongura*. (10), *E. claudia* sp. nov. (11), *E. perdita*.

Comments. The distribution of this species is extended to Queensland, where it has been confused with *E. perdita*. Forewing range (70 specimens: both sexes) 15-20 mm. A male from Corneille Is., Admiralty Gulf, WA, 8.iv.1991 (S.J. Johnson) has a reduced apical patch on the upperside of the forewing and a pure white underside without dark markings. The male genitalia are typical of *E. walkeri* and it is assigned to this species. Collected in all months from October-July. *E. walkeri* differs from *E. tongura* in pattern details, less pronounced protuberances on the uncus (Fig. 5) and the shorter vesica of the aedeagus (c.f. Fig. 2). It occurs sympatrically with *E. claudia* sp. nov. at Iron Ra., Qld. Wings appear grey under ultraviolet-reflection photography.

As noted above, the position of forewing vein R2 in relation to the cell apex is variable. This species may be related to *E. pura* Grose-Smith (previously placed in *Elodinesthes*), from the Lesser Sunda Islands of Indonesia.

Distribution. Northern Australia, from north of Derby, Western Australia to Cairns, Queensland, northwards to Darwin district and the Weipa-Iron Range area of Cape York Peninsula. Localities in Northern Territory include West Alligator Riv. mouth in the north and Roper Riv. in the east, suggesting at least parapatry with *E. tongura*. In Western Australia also recorded from Baudin, Osborne and Corneille Is. and in Queensland records of *E. perdita* from Rocky Is. and Two Isles, north of Cooktown (Duckworth & McLean 1986), probably refer to *E. walkeri*. It appears to be a species of dry tropical scrubs and open forest, occasionally venturing into coastal rainforest.

Material examined. Lectotype of *E. walkeri*, lectotype and 1 paralectotype of *E. baudiniana* and 67 specimens from Western Australia, Northern Territory and Queensland.

4. *Elodina angulipennis* (P. H. Lucas) (Figs 6, 22-23)

Terias angulipennis P. H. Lucas, 1852: 431-2. Type locality: Australie. Lectotype ♂ in MNHN [here designated; examined].

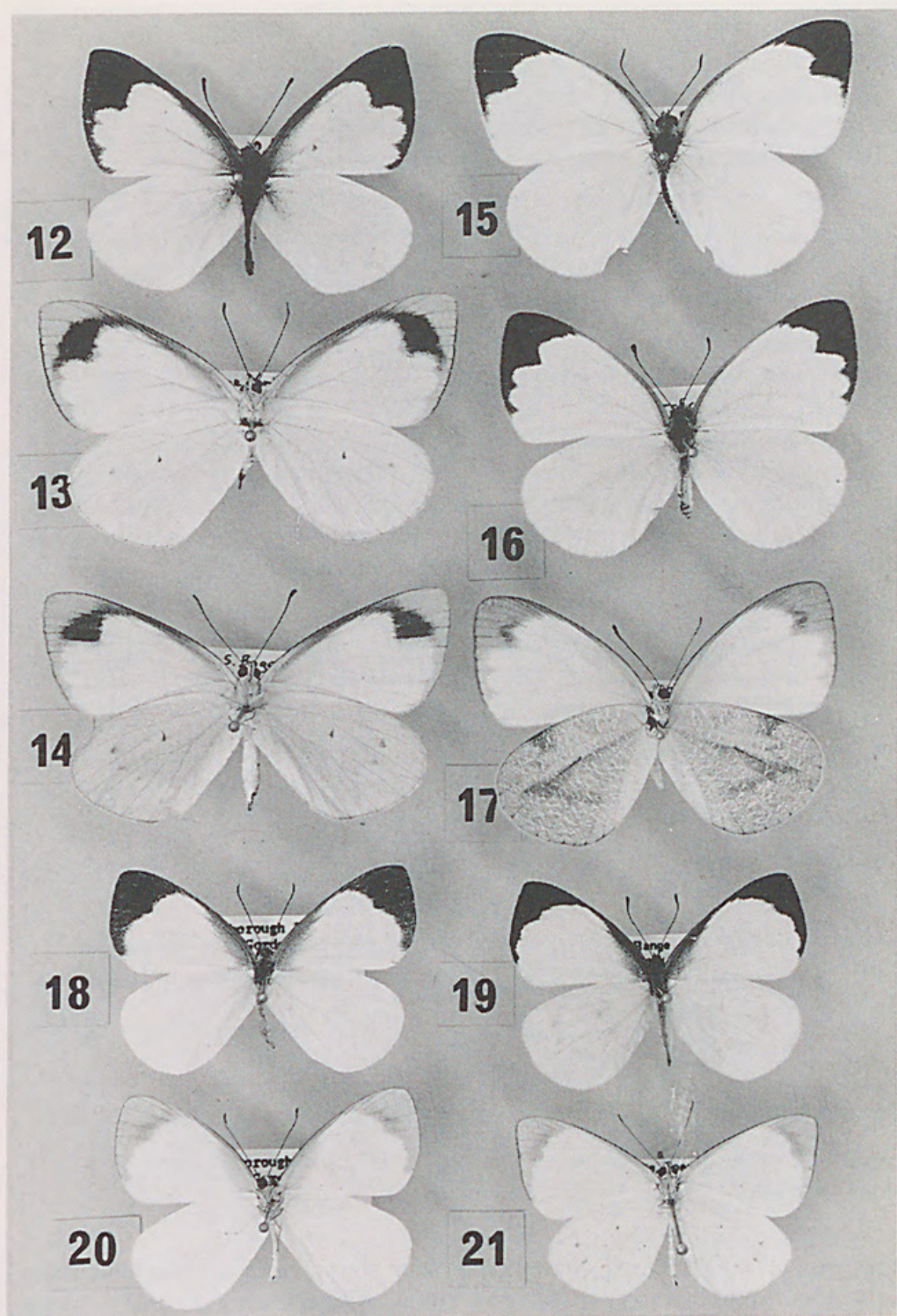
Pieris pallene Hewitson, 1853: p. 7, pl. IV, figs 8 & 9. Type locality: Australia. Lectotype ♂ in BMNH [here designated; examined].

Elodina egnatia angulipennis; Waterhouse & Lyell, 1914: 142.

Elodina angulipennis; Common & Waterhouse, 1972: 202; 1981: 277, pl. 20, fig. 10.

Type specimens. There are 2 syntypes of *E. angulipennis* in MNHN. The male labelled 'Australie 1847, J. Verreaux' is selected here as lectotype, the specimen (? female: abdomen missing) labelled 'Tasmanie 1846, J. Verreaux' as paralectotype.

We regard 3 specimens of *E. pallene* in BMNH, from the Hewitson



Figs 12-21. *Elodina* spp. (12-14), *E. padusa*: (12), ♂ dorsal, Gunnedah NSW; (13), ♀ ventral, nr Coen Qld; (14), ♀ ventral, S. of Boggabilla NSW. (15-17), *E. parthia*: (15), ♂ dorsal, nr Wenlock R., Cape York Pen. Qld; (16), ♀ dorsal, Bahrs Scrub, nr Brisbane Qld; (17), ♀ ventral, same locality. (18-21), *E. walkeri*: (18), ♂ dorsal, nr Gordonvale Qld; (19), ♀ dorsal, Iron Range Qld; (20), ♂ ventral, nr Gordonvale Qld; (21), ♂ ventral, Mt White, Coen Qld.

Collection, as syntypes. The specimen labelled 'Australia. Hewitson Coll. 79-69. *Elodina angulipennis*. 2.'/ 'Austral Str. [glued on reverse]'/ 'Type *Pieris pallene* Hew. [red BMNH label]' is selected here as Lectotype (? male: abdomen missing; recorded as a male by G. A. Waterhouse in 1936 [unpublished notes]), the others as paralectotypes.

Comments. In Queensland this species has been confused with *E. queenslandica* sp. nov. Records from Rockhampton northwards appear to belong to the latter species. Forewing range: males 18-25 mm, females 20-24 mm.

E. angulipennis differs from *E. queenslandica* in having more elongate protuberances on the uncus (Fig. 6), more angular hindwings and differences in wing pattern. The underside of the wings tend to have a distinct apricot-coloured sheen, which often blends into the basal flash on the forewing. Under ultraviolet-reflection photography the wings appear pale, with the male hindwing showing a distinct dark marginal band, which is lacking in both subspecies of *E. queenslandica*. The head capsule of the mature larva has smaller tubercles than in *E. queenslandica*.

In some specimens from River Heads, near Maryborough, the hindwings are more rounded but other characters are typical of *E. angulipennis*. Pending further evidence, *E. angulipennis* and *E. queenslandica* are regarded here as separate species.

Distribution. Carnarvon Range and Bulburin (25 km SW of Miriam Vale), and from Maryborough, Queensland to Sydney, New South Wales. The locality "Tasmanie" on the paralectotype is presumably an error.

Hostplants. *Capparis canescens*, *C. arborea* (Common & Waterhouse 1981, confirmed by De Baar [unpublished records]).

Material examined. Lectotype and paralectotype of *E. angulipennis*, lectotype of *E. pallene* and over 100 specimens from Queensland and New South Wales.

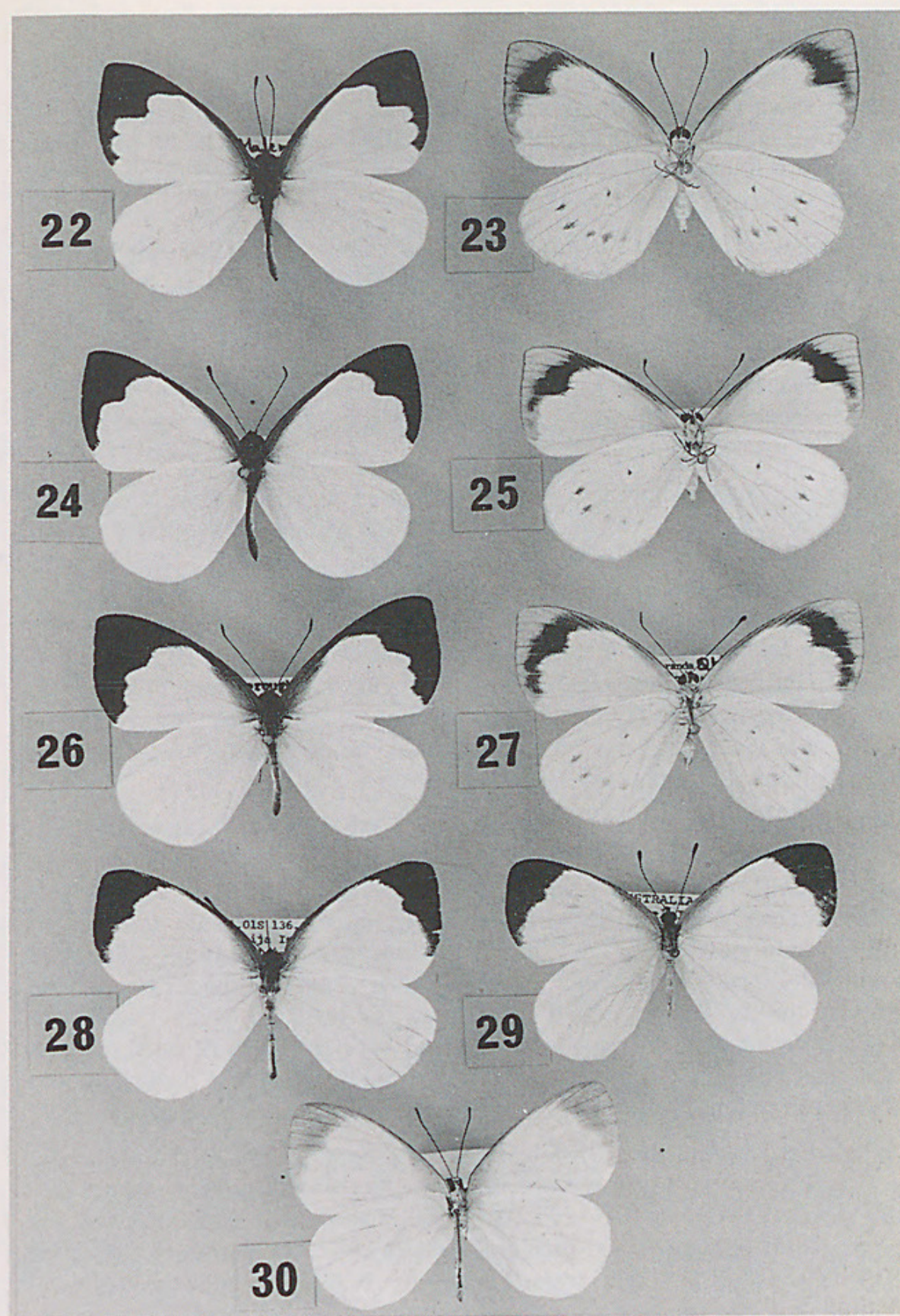
5. *Elodina queenslandica* sp. nov.

5a. *Elodina queenslandica queenslandica* subsp. nov. (Figs 2a, 7, 24-25)

Elodina egnatia angulipennis; Waterhouse & Lyell, 1914: 143 (partim). Misidentification.

Description.

Male (Fig. 24). Antennal shaft black with short white longitudinal lines above and below almost to end of club. Club flattened, with orange terminal patch. Forewing length (82 specimens) 15-24 mm. Upperside of forewing white except apical area; costa black with overlaid pale scales, basal area variably darkened, sometimes weakly so, overlaid with pale scales. Apex and termen to beyond end of vein CuA2 black, abruptly



Figs 22-30. *Elodina* spp. (22, 23), *E. angulipennis*: (22), ♂ dorsal, Maleny Qld; (23), ♀ ventral, Brisbane Qld. (24, 25), *E. q. queenslandica* subsp. nov. from Iron Range Qld: (24), holotype ♂, dorsal; (25), ♀ ventral. (26, 27), *E. q. kuranda* subsp. nov.: (26), holotype ♂, dorsal, nr Gordonvale Qld; (27), ♀ ventral, Kuranda Qld. (28-30), *E. tongura* from Wessel Islands NT: (28), ♂ dorsal; (29), ♀ dorsal; (30), ♂ ventral.

terminated before tornus and with a black projection normally only along vein M3. Hindwing evenly rounded, the upperside white. Underside of forewing silvery-white, with a dark subapical patch that rarely extends to vein CuA2 and a yellowish-orange basal flash. Underside of hindwing silvery-white, occasionally with a postmedian series of 1 or 2 dark spots and with the costa partly orange.

Male genitalia (Fig. 2a) typical of genus. The vesica of the aedeagus is about half length of aedeagus and has well developed bristles along most of its length. The uncus (Fig 7) has the basal protuberances distinct and relatively high.

Female (Fig. 25). Similar to male. Forewing length (41 specimens) 18-24 mm. Underside of hindwing with or without a postmedian series of 5 dark spots.

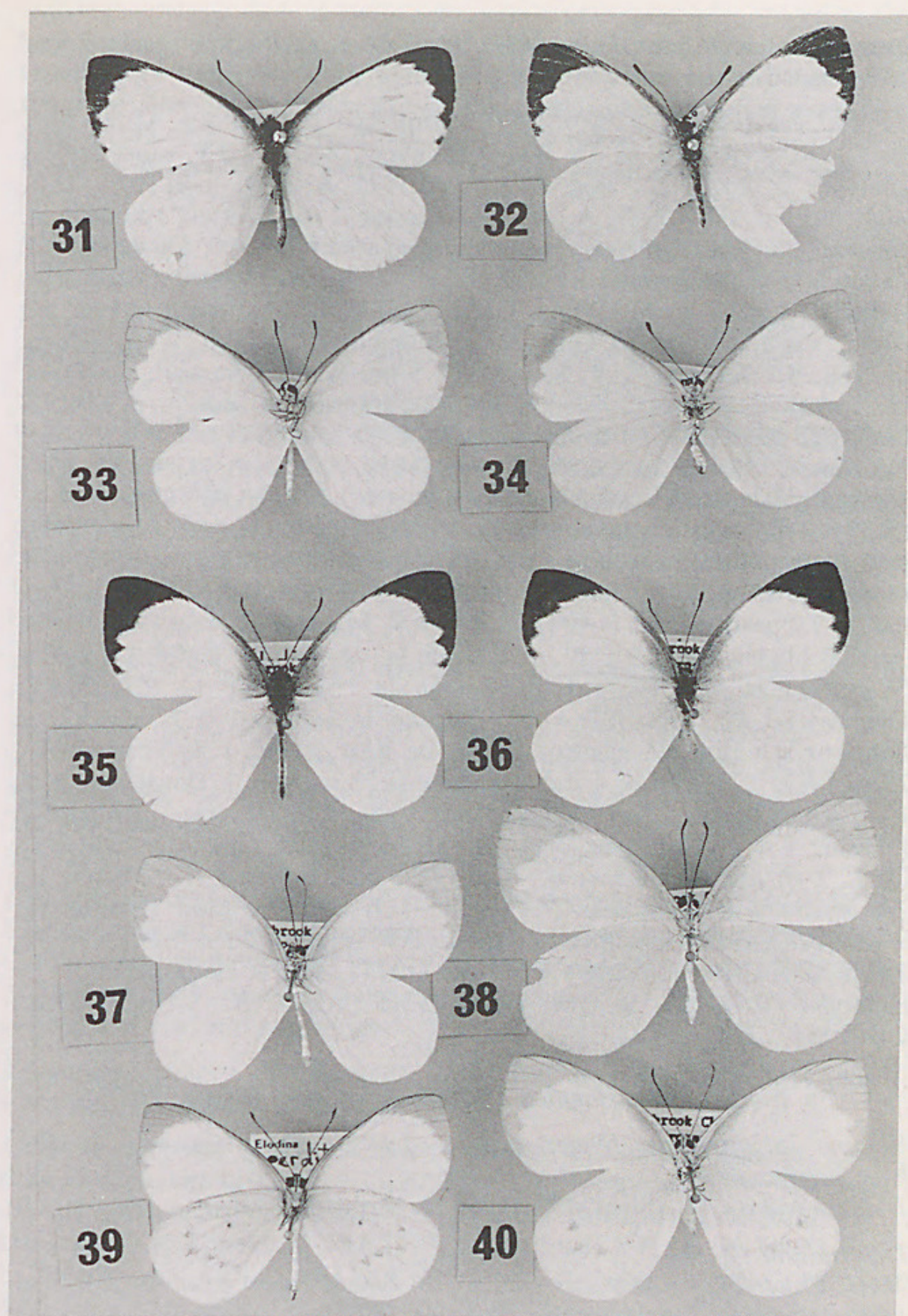
Comments. This species appears to be related to two undetermined taxa from northern Papua New Guinea but differs in having the subapical brown band on the underside of the forewing less well developed. The wings of all 3 species appear similar under ultraviolet-reflection photography, the upperside appearing pale except for the black apical area on the forewing. They may be related to *E. effeminata* (Fruhstorfer), previously placed in *Elodinesthes* and similarly from northern Papua New Guinea. Neither *E. queenslandica* nor *E. angulipennis* is related to *E. hypatia*, the wings of which appear black on the upperside under ultraviolet-reflection photography.

Within Australia, *E. queenslandica* and its subspecies *E. q. kuranda* subsp. nov. appear most closely related to *E. angulipennis* and previously have been confused with that species. *E. queenslandica* differs in the rounder hindwings, lack of an apricot-coloured sheen on the underside and lack of a dark marginal band on the hindwing under ultraviolet-reflection photography, the whole wing appearing pale. On the underside of the forewing the termen is edged from apex to between veins CuA2 and 1A+2A pale brown in *E. queenslandica* and dark brown in *E. angulipennis*. In the male the projections of the uncus are broader and less prominent and the mature larva has much larger head tubercles than in *E. angulipennis*.

E. q. queenslandica differs from both *E. angulipennis* and *E. q. kuranda* in the absence (normally) of projections from the black forewing apical area along veins CuA1 and CuA2. The basal flash on the underside of the forewing is better developed than in *E. q. kuranda*. Waterhouse and Lyell (1914) discussed a series from Prince of Wales I. (under *E. egnatia angulipennis*) that belongs here.

Distribution. Islands of Torres Strait and Cape York to Musgrave, Cape York Peninsula, Queensland.

Hostplant. *Capparis sepiaria* (De Baar 1988).



Figs 31-40. *Elodina* spp. (31-34), *E. claudia* sp. nov. from Iron Range Qld: (31), ♂ dorsal; (32), ♀ dorsal; (33), ♂ ventral; (34), ♀ ventral. (35-40), *E. perditia* from nr Proserpine Qld: (35), ♂ dorsal; (36), ♀ dorsal; (37, 39), ♂ ventral; (38, 40), ♀ ventral.

Etymology. Named after Queensland, from where all known specimens of both subspecies have been collected.

Material examined. QUEENSLAND: Holotype ♂, Iron Ra., Cape York Pen., 24.vi.-8.vii.1978, M. De Baar. Paratypes: 8 ♂♂, 7 ♀♀, same data as holotype; 7 ♂♂, 1 ♀, Iron Ra., 1-9.vi.1971 & 30.vi.-4.vii.1977, G.B. Monteith; 1 ♂, 30.vi.1981, A.J. & I.R. Johnson; 2 ♂♂, Gordon's Mine area, Iron Ra., 12-18.ii.1976, G.B. Monteith, open forest; 17 ♂♂, 3 ♀♀, Leo Ck Rd, ca 300 m, McIlwraith Ra., 29.vi.-4.vii. 1976, M. De Baar, G.B. & S. Monteith; 1 ♂, 1 ♀, Mt White, Coen, 23.vi.1978, M. De Baar; 1 ♂, Mt White, Coen, 6.vii.1976, G.B. & S. Monteith; 1 ♀, Mt White, Coen, 8.i.1988, S.J. Johnson; 1 ♀, Stewart R., 5 km W. Port Stewart, via Coen, 25-27.vi.1976, G.B. & S. Monteith; 1 ♂, 13 km W of Musgrave, 14°48'S 143°23'E, 26.iv.1989, G. & A. Daniels; 1 ♀, 11.5 km SW of Fox Ck x-ing, 'Wolverton', 13°13'S, 142°54'E, 14.iv.1989, G. & A. Daniels; 1 ♂, Bamaga, 7.vii.1985, I.R. Johnson; 1 ♀, Lockerbie, Cape York, 13-27.iv.1973, G.B. Monteith; 1 ♂, 5 km NE Lockerbie, Cape York, 8-10.iv.1991, I.R. Johnson; 4 ♂♂, 1 ♀, Cape York, 4.x. & 11.xi.1927, 12, 14 & 17.iv.1928, W.B. Barnard. TORRES STRAIT ISLANDS: Paratypes: 1 ♂, 2 ♀♀, Arden Is., 6.iv.1987; 3 ♂♂, 1 ♀, Marsden Is., 4.iv.1987; 2 ♂♂, Gettulai Is., 9.iv.1987; 2 ♂♂, 2 ♀♀, Tudu Is., 31.iii.1987; 4 ♂♂, 3 ♀♀, Sue (Warraber) Is., 8.iv.1987; 1 ♀, Bourke Is., 5.iv.1987; 12 ♂♂, 5 ♀♀, Thursday Is., 27-29.iii.1987; 4 ♂♂, Thursday Is., emerged 21-22.iv.1987, on *Capparis sepiaria*; all collected by M. De Baar; 2 ♂♂, 1 ♀, Thursday Is., 25.vii.1983, T. Lambkin; 4 ♂♂, Thursday Is., 8.ix.1983, J. Donaldson; 1 ♂, 1 ♀, Thursday Is., 28.v.1983 & 16.iii.1989, S.J. Johnson, I.R. & A.J. Johnson; 1 ♀, Yam (Turtle Back) Is., 18-26.vii.1977, G.B. Monteith & D. Cook; 1 ♂, Sue (Warraber) Is., 4.xii.1977, E.D. Edwards; 1 ♀, Banks Is., 23.v.1928, W.B. Barnard; 2 ♀♀, Bet Hill vicinity, Moa (Banks) Is., 9-13.v.1977, G.B. Monteith & D. Cook; 1 ♀, Airstrip, Badu (Mulgrave) Is., 18.vii.1977, G.B. Monteith; 1 ♂, Yorke I, 24.iv.1990, J. Donaldson. Holotype (T. 12703) in QM; paratypes in QM, ANIC, UQIC, MDBC, GDC, SJJC, JDC and TLC.

5b. *Elodina queenslandica kuranda* subsp. nov. (Figs 8, 26-27)

Elodina angulipennis; Waterhouse & Lyell, 1914: figs 493 & 494. Misidentification.

Elodina padusa; D'Abrera, 1971: pl. 125. Misidentification.

Description.

Male (Fig. 26). Antenna similar to typical subspecies except club orange-tipped and pale orange along lower edge. Forewing length (19 specimens) 17-22 mm. Upperside of forewing white except apical area; costa and basal areas both blackened, overlaid with pale scales. Apex and termen black to beyond vein CuA2, abruptly terminated before tornus and

with black projections along veins M3, CuA1 and CuA2. Hindwing evenly rounded, the upperside white with a few dark scales at base. Underside of forewing silvery-white with a dark subapical patch that often extends to vein CuA2 and a subdued, orange-yellow basal flash. Underside of hindwing silvery-white, rarely with 1 or 2 postmedian dark spots and with the costa partly orange.

Male genitalia similar to those of *E. q. queenslandica* (c.f. Figs 7-8) but with slightly shorter valvae.

Female (Fig. 27). Similar to male. Forewing length (12 specimens) 20-26 mm. Underside of hindwing with up to 5 postmedian dark spots.

Comments. This subspecies differs from typical *E. q. queenslandica* in the well developed projections along veins CuA1 and CuA2 from the apical black area on the upperside of the forewing and the indistinct basal flash on the underside of the forewing. The subapical dark patch on the underside of the forewing normally persists to vein CuA2, whilst in *E. q. queenslandica* and *E. angulipennis* this patch seldom extends beyond vein CuA1. From *E. angulipennis* it further differs in characters mentioned under *E. q. queenslandica*.

Waterhouse and Lyell (1914) illustrate 2 specimens from Mackay that fit this subspecies. A male from Palm Bay, Long Is. (nr Proserpine), 30.viii.1980 (K.L. Dunn), has no projections along forewing veins CuA1 and CuA2 from the black apical area. We provisionally include this specimen as a variant of this subspecies but exclude it from the type series. The distribution of *E. q. kuranda* may overlap that of *E. angulipennis* in the Miriam Vale-Maryborough region of southern Queensland.

Distribution. Palmer River and Atherton Tableland to Eurimbula (30 km ENE of Miriam Vale), Queensland. Records of *E. angulipennis* from Cooktown (Waterhouse & Lyell 1914), Percy and Garden Is. (Duckworth & McLean 1986) probably belong to *E. q. kuranda*. This taxon has been collected in vine and rain forests.

Etymology. Named after Kuranda, the locality from which the first known specimen (F.P. Dodd's) was collected.

Material examined. QUEENSLAND: Holotype ♂, Goldsborough Rd, 12 km from Gordonvale, 12-14.xii.1983, M. De Baar. Paratypes: 2 ♂♂, 1 ♀, same data as holotype; 1 ♂, Kuranda, F.P. Dodd; 1 ♂, Kuranda, 6.viii.1974, G. Daniels; 2 ♀♀, Kuranda, 2-3.xii.1977, M. De Baar; 1 ♂, Davies Ck St. For., E. of Mareeba, 27.viii.1990, R.I. Storey; 1 ♂, Lake Euramoo, Atherton Tableland, 17.v.1973, D.L. Hancock; 1 ♂, Yungaburra, Curtain Fig tree, 18.iii.1990, K.L. Dunn, in rainforest; 2 ♀♀, 40-mile scrub, SW of Mt Garnet, 24.i.1982, G. & A. Daniels; 1 ♂, 1 ♀, vine forest, 12 km N of Palmer R., 16°01'S, 144°48'E, 16.v.1989, G. & A. Daniels; 1 ♂, 8 miles S of Port Douglas, 4.viii.1975, A. Bedford Russell; 4 ♂, 1 ♀, Mt Lewis, nr

Mossman, 23.i.1982, G. & A. Daniels; 1 ♂, 22 miles N of Cairns, iv.1959, J.F.R. Kerr; 1 ♂, Ellis Beach, 29.iv.1974, J.A. Baker; 1 ♂, nr Cairns, 1970's, M. De Baar; 1 ♀, 6 miles W of Paluma, 2700', 15.iv.1969, I.F.B. Common & M.S. Upton; 1 ♀, Mt Elliot Nat. Pk, 10.ii.1991, K.L. Dunn & T. Woodger; 1 ♀, Bluewater Ra., N of Townsville, 17.iv.1988, M. De Baar; 1 ♂, 1 ♀, Mt Etna, nr Rockhampton, 14.iv.1968, D.L. Hancock; 1 ♀, Fairy Bower, Rockhampton, 2.i.1962, I. Common; 1 ♂, 1 ♀, Eurimbula Nat. Pk, Ganoonga Noonga Lookout, 10-15.ix.1989, G.B. Monteith. Holotype (T. 12704) in QM; paratypes in QM, ANIC, UQIC, MDBC, GDC, TLC and KDC.

6. *Elodina tongura* Tindale, stat. nov. (Figs 2b, 9, 28-30)

Elodina perdita tongura Tindale, 1923: 350-1; Common & Waterhouse, 1981: 279. Type locality: Groote Eylandt, NT. Lectotype ♂ in SAM [here designated; examined].

Type specimens. There are 16 syntypes in SAM, labelled Type male, Type female or Cotype. The specimen labelled 'Groote Eylandt, N. Territory, N.B. Tindale' / '*Elodina perdita tongura* N.B. Tindale, Type female [actually a male], I. 13778' / 'S.A. Museum specimen [red label]' is selected here as lectotype, the "Type male" (I. 13777) and "Cotypes" as paralectotypes.

Comments. This species shows some resemblance to *E. walkeri* but the yellow basal flash on the underside of the forewing is more distinct and the aedeagus (Fig. 2b) has a much longer vesica, being about as long as the aedeagus itself. In size and pattern it resembles *E. perdita* and *E. claudia*, from which it differs in details of the male genitalia. Specimens from McCluer Is. (3 ♂♂, 22.vi.1989, T. Fenner) have faint brown subapical markings on the underside of the forewing and are slightly smaller than average (Forewing length 18-20 mm) but have the distinct yellow basal flash and long vesica characteristic of this species. *E. tongura* may occur sympatrically with *E. walkeri* in Arnhem Land. Forewing range (30 specimens: both sexes) 18-22 mm, normally over 20 mm. Collected from January-April and in June. Wings appear grey under ultraviolet-reflection photography.

Distribution. Northern coast and islands of Northern Territory, from Cobourg Peninsula to Groote Eylandt. Recorded from Groote Eylandt, Woodah Is., Winchilsea Is., Rimbija Is. and Marchinbar Is. (Wessel Is), McCluer Is. and 7 km ESE of Smith Point, Cobourg Peninsula.

Material examined. Lectotype, 3 ♂♂ and 1 ♀ paralectotypes and 25 specimens from various localities in the Northern Territory.

7. *Elodina claudia* sp. nov. (Figs 1b, 10, 31-34)*Description.*

Male (Figs 31, 33). Antennal shaft black with short white longitudinal lines above and below to club. Club flattened, blackish-brown, slightly paler brown on tip. Forewing length (11 specimens) 19-22 mm. Veins M3 and CuA1 on both wings arise closer together than in other Australian species of *Elodina* (Fig. 1b). Upperside of forewing white except apical area; costa dark brown, with some overlaid dark and pale scales at base. Apex and termen narrowly black, terminating with a black projection along vein CuA2 and with a similar projection along vein CuA1. Upperside of hindwing white with a few dark scales at base. Underside of forewing white with a lemon-yellow basal flash. Termen brown-edged and yellowish-mustard coloured on the apical and terminal margins. Underside of hindwing whitish, base of costa orange, a lemon-yellow suffusion at wing base extends as a smear along costal, discal and anal areas. The termen is edged whitish-yellow.

Male genitalia generally typical of genus (c.f. Fig. 2a), with vesica of aedeagus about half length of aedeagus and with well developed bristles along most of its length. Uncus bifid (Fig. 10), with broad, relatively high basal protuberances.

Female (Figs 32, 34). Similar to male except for hindwing colour below. Forewing length (8 specimens) 20-22 mm. Underside of forewing with discal area whitish-yellow and upperside black areas silhouetted beneath, otherwise as for male. Underside of hindwing yellowish-orange in all specimens examined.

Comments. This species resembles *E. perdita* and *E. tongura* and, to a lesser extent, *E. walkeri* but the bifid uncus and shape of the protuberances show it to be distinct. The female closely resembles yellow-winged females of *E. perdita* but both sexes may be distinguished by the venation, veins M3 and CuA1 of both wings being closer together in *E. claudia* than in *E. perdita* and other species (Fig. 1). Males of *E. claudia* have a basal flash on the underside of the hindwing which is not present in *E. perdita*, *E. tongura* or *E. walkeri*. Both *E. claudia* and *E. perdita* lack any trace of subapical brown scales on the underside of the forewing; these are occasionally absent in *E. tongura* and *E. walkeri* but normally at least microscopic traces of these scales remain. Wings appear grey under ultraviolet-reflection photography.

Distribution. Iron Range, Cape York Peninsula. This appears to be a rainforest species.

Etymology. Named after the Claudie River at Iron Range.

Material examined. QUEENSLAND: Holotype ♂, Iron Ra., Cape York Pen., 24.vi.-8.vii.1978, M. De Baar. Paratypes: 5 ♂♂, 2 ♀♀, same data as holotype; 2 ♀♀, Iron Ra., 1-9.vi.1971 & 30.vi.-4.vii.1977, G.B. Monteith; 1

♀, Gordon's Mine area, Iron Ra., 12-18.ii.1976, G.B. Monteith; 1 ♂, 1 ♀, Iron Ra., 9.iv.1971 & 29.ix.1975, A. Atkins; 4 ♂♂, 2 ♀♀, Iron Ra., 11, 15 & 19.vii.1968, J. & M. Le Souef.

Holotype (T. 12705) in QM, paratypes in QM, ANIC, UQIC and MDBC.

8. *Elodina perdit* Miskin (Figs 1a, 11, 35-40)

Elodina perdit Miskin, 1889: 263; Waterhouse & Lyell, 1914: 143, fig. 496. Type locality: Bowen. Lectotype ♂ in QM [here designated; examined].

Type specimens. There are 2 syntypes in QM from the Miskin Collection. The male (T. 12346) is labelled 'A.S., B. Bowen/' '44' and is selected here as lectotype, the female (T. 12347) as paralectotype. This female has the underside of the hindwings yellow. A second female in QM, also from the Miskin Collection, is labelled 'Bowen/' '184'. It has the underside of the hindwings white. Species number 184 was listed as *E. egnatia* in Miskin's unpublished notebook (in QM) and this specimen therefore is not regarded as a syntype.

Comments. In northern Queensland *E. perdit* has been confused with *E. walkeri*. Records from Cape York to Cairns refer to the latter species. These 2 species differ in wing pattern characters (see Key) and in the shape of the uncus (Figs 9, 11). Forewing range (32 specimens: both sexes) 20-24 mm. Females may be white or yellow on the underside of the hindwings, the latter resembling females of *E. claudia*, which differs in the position of vein M3 (Fig. 1). The uncus (Fig. 11) has well sclerotized, globose basal protuberances. Collected in February, April, May, July, August and December. Wings appear grey under ultraviolet-reflection photography.

Distribution. Ingham to Mackay. Also Holbourne, Olden, Hayman and Shaw Is. (Duckworth & McLean 1986) and Carlisle Is., NNE of Mackay. A species of coastal lowland *Melaleuca* swamps and rivers.

Early stages. The mature larva is green with a thick white dorsal longitudinal line from behind the head almost to the posterior end. The last abdominal segment is a diffuse orange colour and is forked posteriorly. Mulberry red spots surrounding small tubercles occur on each side of the white dorsal line on thoracic segment 2 and abdominal segments 2, 4 and 8.

Hostplant. *Capparis sepiaria* (new record).

Material examined. Lectotype, paralectotype and 30 specimens from various localities in Queensland.

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