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Observations on the Biology of Skipper Butterflies in Trinidad, Trinidad and Tobago: *Phocides*, *Chioides*, *Typhedanus*, and *Polythrix* (Hesperiidae: Eudaminae)

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ABSTRACT

Observations are provided on the early stages and food plants of *Phocides polybius polybius* (Fabricius), *P. pigmalion pigmalion* (Cramer), *Chioides catillus catillus* (Cramer), *Typhedanus undulatus* (Hewitson), *Polythrix auginus* (Hewitson), *P. caunus* (Herrich-Schäffer), *P. metallescens* (Mabille), *P. octomaculata* (Sepp), *Polythrix roma* Evans from Trinidad, supplemented with observations on *Phocides polybius lilea* (Reakirt) and *Polythrix octomaculata* in Mexico.

Key words (not in title): egg, caterpillar, larva, pupa, leaf shelter, parasitoid, Mexico, guava.

INTRODUCTION

In 1981, I started to publish a series of papers in *Living World* to document the butterfly family Hesperiidae in Trinidad (Cock 1981), which at that time was only documented with lists of recorded species (Kaye 1921, 1940; Barcant 1970). In 2013, the final, twentieth part was published in *Living World* (Cock 2013), “an integral part of the building of a knowledge base on the biodiversity of the country,” (Kenny 2007).

However, the classification used in the early parts, including the checklist (Cock 1982), is now out of date. Some names have changed and much new information and new records are available on biology and distribution. In a separate publication I have prepared a new checklist, including new records, which brings the total known species from Trinidad to 307 (Cock 2014).

An earlier paper (Cock 2008) described two life histories in the Pyrrhopygini (Pyrginae). Here, I document partial life histories of some Trinidad species of several genera in the subfamily Eudaminae (Warren *et al.* 2009), which were either unknown, or could not be illustrated in the earlier parts (Cock 1984, 1986).

Further papers will follow. I hope they will encourage *Field Naturalists* to seek out and document the early stages of other species, as yet unknown from the island. I recently published a full description of the methods that I used to rear and document skipper life-histories, which may provide useful advice as to how to go about this (Cock 2010).

Phocides polybius polybius (Fabricius)

Figs. 1-6.

This species in Trinidad was treated in Cock (1984). Mielke (2004) follows Evans (1952) in recognising three subspecies: nominate *polybius* from Panama to the Guianas, ssp. *lilea* (Reakirt) from Central America, and ssp.

phanias (Burmeister) from southern Brazil to Argentina. The biology of ssp. *phanias* on guava (*Psidium guajava*; Myrtaceae) was documented more than 100 years ago (Jones 1882-3, as *Pyrrhopyga palemon* (Cramer), a synonym), and more recently by Moss (1949). Other reported food plants for *P. polybius phanias* include *Eucalyptus*, *Eugenia*, and *Myrciaria* spp. (all Myrtaceae) in Argentina and Brazil (Beccaloni *et al.* 2008).

The early stages of ssp. *polybius* on guava have been described from Trinidad (Cock 1984). It is not a difficult species to find as a caterpillar, although seldom seen as an adult. To supplement the earlier account which lacked illustrations, these are now provided for the shelters (Fig. 1), n-2 instar (Fig. 2), newly moulted final instar (Fig. 3), before it acquires the white body colouring (Fig. 4), pupa (Fig. 5) and living adult (Fig. 6). It has also been reared from *Myrcia tomentosa* (Myrtaceae) in Trinidad (S. Alston-Smith in Beccaloni *et al.* 2008).



Fig. 1. Leaf shelters of *Phocides polybius polybius* on guava tree of 1m, St. Benedict's, 2 May, 1995; 95/8.



Fig. 2. Instar n-2 caterpillar of *Phocides polybius polybius* collected on guava, St. Benedict's, 12 October, 1993; 95/8.



Fig. 3. Newly moulted final instar caterpillar of *Phocides polybius polybius* collected on guava, St. Benedict's, 12 October, 1993; moulted and photographed 21 October, 1993; 95/8.

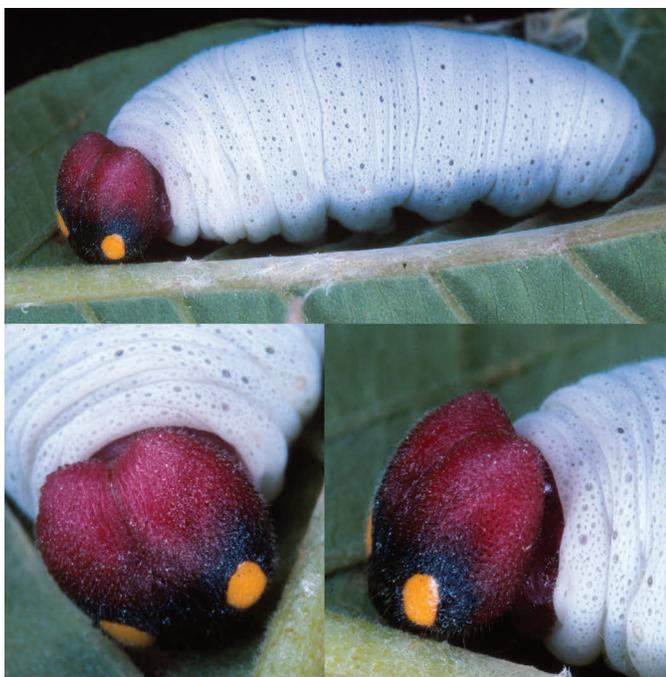


Fig. 4. Final instar caterpillar of *Phocides polybius polybius* collected on guava, St. Benedict's, 2 May, 1995; 95/8.



Fig. 5. Pupa of *Phocides polybius polybius* collected as caterpillar on guava, St. Benedict's, 12 October, 1993; pupated 14 November; photographed 16 November; emerged 7 December; 93/13.



Fig. 6. Adult *Phocides polybius polybius* collected as caterpillar on guava, St. Benedict's, 12 October, 1993; emerged 7 December; 93/13.

The early stages are very similar to those of the Central American ssp. *lilea* (which is sometimes referred to as *P. lilea*). Adults of the two subspecies are similar but ssp. *lilea* lacks the orange cilia at tornus hindwing of ssp. *polybius* (Fig. 6). Subspecies *lilea* has also been reported from guava (Comstock and Vázquez 1961; Kendall and McGuire 1975), and Janzen and Hallwachs (2013) have

reared it from at least eight species of *Eugenia*, *Psidium* and *Syzygium* (Myrtaceae) in Costa Rica, although the great majority were found on *P. guajava*. The author found caterpillars on *Terminalia catappa* (Combretaceae) in Mexico (Tapachula, Chiapas, 98/102) (Beccaloni *et al.* 2008). The early stages apart from the egg are comprehensively documented by Janzen and Hallwachs (2013) as *Phocides lilea*.

***Phocides pigmalion pigmalion* (Cramer)**

Mielke (2004) accepts six subspecies of *P. pigmalion*, including nominate *pigmalion* found from Guatemala to Ecuador and Trinidad, and ssp. *okeechobee* (Worthington) in Florida.

Stoll (1787-91) purportedly illustrates the caterpillar and pupa of this species, but his figures and description are of a Hesperinae, Calpodini, e.g. *Calpodes ethlius* (Stoll).

Red mangrove (*Rhizophora mangle*; Rhizophoraceae) is widely reported as the food plant, but most records refer to ssp. *okeechobee* in Florida (Dyar 1890; Minno *et al.* 2005; Wagner 2005); the caterpillars are similar to those of *P. polybius* (Figs. 2-4). Farnsworth and Ellison (1991) list *P. pigmalion pigmalion* as a common herbivore of red mangrove in Belize, and Ellison and Farnsworth (1996) report an outbreak there which reached densities of more than 7 per sapling in May-June 1993, leading to many saplings losing >50% of their leaf area, compared typically to about 10% due to all defoliators. Hernández *et al.* (1998) state that ssp. *batabano* (Lucas) in Cuba also feeds on red mangrove.

Janzen *et al.* (2011) and Janzen and Hallwachs (2013) indicate that at least two cryptic species occur under this name in Costa Rica, one feeding primarily on *Terminalia catappa* (Combretaceae) and Sapindaceae (*Melicoccus* and *Nephelium*) and the other primarily on *Trichospermum* spp. (Malvaceae).

When caterpillars resembling *P. polybius* were found on *T. catappa* in Trinidad (Maracas Bay, 22 March, 2003; 03/216), I expected them to be *P. polybius polybius*, having found *P. polybius lilea* on this species in Mexico (above), but S. Alston-Smith reared one out and it was *P. pigmalion pigmalion*. This is the only food plant record from Trinidad, but given that *T. catappa* is introduced, it seems likely that one or more related indigenous plants are also food plants. The penultimate and earlier instars of *P. pigmalion* are superficially similar in colour and markings to those of *Pyrrhopyge amyclas amyclas* (Cramer), which also feeds on *T. catappa* in Trinidad (Cock 2008), but the latter are conspicuously hairy, whereas those of *P. pigmalion* are smooth. The possibility of a second species breeding on red mangrove in Trinidad

merits investigation.

***Chioides catillus catillus* (Cramer)**

Figs. 7-11.

Although Evans (1952) recognised eight subspecies for *C. catillus*, several of these are now considered valid species, and Mielke (2004) lists only three subspecies: nominate *catillus* found throughout most of South America, *albivus* Evans from Panama and Costa Rica, and *jethira* (Butler) from north Peru and Ecuador.

In Suriname, the early stages of *C. catillus* were first documented by Sepp (1843-7, pl. 90) as *Papilio longicauda*, a synonym (Mielke 2004), on what they refer to as a *Mimosa* sp., but their plate shows a species of Faboideae. Subsequently, Hayward (1927) described the caterpillar and pupa on *Rhynchosia senna* (Faboideae) in Argentina.

Cock (1986) briefly described the early stages on *Pueraria phaseoloides*, and it has since been recorded in Trinidad from *P. montana* (= *P. lobata*) (S. Alston-Smith in Beccaloni *et al.* 2008), *Galactia striata* and *Dioclea guianensis* (all Faboideae) (M.J.W. Cock in Beccaloni *et al.* 2008). Most food plant records are from Faboideae (*Calopogonium*, *Glycine*, *Phaseolus*, *Rhynchosia*, *Tephrosia*), but there are also records from Caesalpinoideae (*Senna*), Lamiaceae (*Hyptis*, *Monarda*, *Origanum*) and Asteraceae (*Lindheimeria*) (Beccaloni *et al.* 2008).

Janzen and Hallwachs (2013) list nearly 600 rearings in Costa Rica, all from Fabaceae, including *Calopogonium*, *Centrosema*, *Dioclea*, *Eriosema*, *Galactia*, *Phaseolus*, *Rhynchosia* and *Teramnus*, of which *Rhynchosia* spp. and *Teramnus uncinatus* dominated. Since this massive rearing programme yielded no observations from Lamiaceae or Asteraceae, these records are likely to represent errors, misidentifications or cryptic species.

To supplement the information already provided in Cock (1986), figures are provided here of caterpillar instars 3, 4 and 5 (Figs. 7-9), the pupa (Fig. 10) and living adult (Fig. 11).



Fig. 7. Instar 3 caterpillar of *Chioides catillus*, collected on *Galactia striata*, Manzanilla Beach, 14 November, 1995; 13mm; 95/72.



Fig. 8. Instar 4 caterpillar of *Chioides catillus*, collected on *Galactia striata*, Manzanilla Beach, 14 November, 1995; 29mm; 95/71B.



Fig. 9. Instar 5 caterpillar of *Chioides catillus*, anterodorsolateral view of anterior portion; collected on *Galactia striata*, Manzanilla Beach, 14 November, 1995; moulted to final instar 14 November; photographed 19 November; pupated 30 November; 33mm; 95/71A.



Fig. 10. Pupa of *Chioides catillus*, lateral view; collected as instar 4 on *Galactia striata*, Manzanilla Beach, 14 November, 1995; pupated 30 November; photographed 3 December; adult 23 December; 21mm; 95/71A.

As can be seen at Janzen and Hallwachs (2013), and the author will document in a future contribution, some *Urbanus* spp. caterpillars are superficially similar to the earlier instars, but the final instar of *C. catillus* seems distinct in Trinidad.

The pupa is covered with a dense particulate layer of white waxy powder which, in Fig. 10, has been abraded on the wings by rubbing against the Y-shaped silk girdle.

This is one of the more frequently photographed skipper-poppers in Trinidad, due to the striking tails and fondness for flowers (Fig. 11).



Fig. 11. Adult *Chioides catillus* feeding at flowers of *Austro-eupatorium inulifolium*, Rio Claro-Guayaguayare Road, 11 October, 1993.

Typhedanus undulatus (Hewitson)

Fig. 12.

Cock (1986) provided a brief description of the caterpillar of this species which he found on *Senna obtusifolia* (as *Cassia obtusifolia*). A figure of this caterpillar is now provided (Fig. 12). It seems to be a specialist on *Senna* spp. (Beccaloni *et al.* 2008).



Fig. 12. Final instar caterpillar of *Typhedanus undulatus*, anterior view of head and lateral view of body; collected on *Senna obtusifolia*, Piarco, 19 November, 1981; photographed 19 November; 20mm; 81/21C.

Polythrix auginus (Hewitson)

Figs. 13-14.

Cock (1986) considered the life history of this species to be unknown. However, this overlooked that Moss

(1949) reported that he reared it from *Tanaecium pyramidatum* (as *Tabebuia pyramidatum*) (Bignoniaceae), although in a footnote W.H. Evans notes that Moss's series of *P. auginus* included some *P. caunus* (Herrich-Schäffer), which also feeds on Bignoniaceae (below). Since then, S. Alston-Smith (in Beccaloni *et al.* 2008) also reared this species from *T. pyramidatum* (as *Paragonia pyramidatum*) in Trinidad. Janzen and Hallwachs 2013 reared it from four genera of Bignoniaceae (*Anemopaegma*, *Fridericia* as *Arrabidaea*, *Lundia*, *Macfadyena*) in Costa Rica.

I reared this species from a field collected pupa, with associated signs of earlier stages of two individuals on *Fridericia patellifera* (MJWC273), Moruga East, 24 March, 2003 (03/221). The egg associated with the pupa was laid on the edge of the upper surface of a leaf used in the pupal shelter; it had 13 strong ribs. On an adjacent leaf, a hatched egg was partially eaten and had 12 strong ribs. Leaf shelter 1 associated with the second egg was almost quadrate in shape, cut from the leaf margin, 8 x 6mm. Shelter 2 was adjacent, also folded from the edge of the leaf, but the distal margin of the 20 x 10mm shelter had been irregularly eaten. This may have been due to caterpillar feeding before the shelter was made, but could have been done during shelter construction. The pupa was formed in a shelter made from two leaves, one on top of the other; it was attached upside down to the upper leaf by the cremaster and held with a Y-shaped silk girdle.

Unfortunately, the final instar cast skin and head capsule was dropped and lost as the pupa was collected, but the head was observed to be similar to that of *P. caunus* (Fig. 15), but plain brown. The pupa (Fig. 13) measured 23mm; frontal spike blunt, laterally flattened and slightly upturned; scattered similar, but less pronounced protuberances on head and thorax: one above the frontal spike, one each side of this but lower, two small ones at front of eye and two at the back; subdorsal on T1; two small ones at the base of the forewing, one on dorsum forewing, laterally on T2-3 above last, and one subdorsally on T3 at the highest point; abdomen wider at posterior margin of each segment than anterior margin of the following segment; ground colour grey-green white on head, thorax and appendages, bone white on abdomen; extensive brown markings including: heavier spot anterior to eye, two above each eye, spiracle T1, dorsal to spiracle T1, several spots on abdomen just above forewing dorsum, laterally on A5; basal part of antennae pale brown; scattered pale brown dots notably on head, anterior margin T1, dorsum T2-3, wings, posterior margin abdominal segments etc.; cremaster elongate, lateral margin ridged dorsally, apex black.



Fig. 13. Pupa of *Polythrix auginus*, collected on *Fridericia patellifera*, Moruga East, 24 March, 2003; 23mm; 03/221.



Fig. 14. Adult male *Polythrix auginus*, collected as pupa on *Fridericia patellifera*, Moruga East, 24 March, 2003; adult 3 April; 03/221.

Polythrix caunus (Herrich-Schäffer)

Fig. 15.

Cock (1986) stated that the life history of this species was unknown. Since then, S. Alston-Smith (in Beccaloni *et al.* 2008) has reared this species from *Fridericia patellifera* (as *Arrabidaea patellifera*; Bignoniaceae) in Trinidad. Janzen and Hallwachs (2013) have reared it from several genera of Bignoniaceae of which the most frequent were *Fridericia* (as *Arrabidaea*) and *Cerato-phytum*.

Now that the early stages are known, we can see that *P. caunus* is the species that Moss (1949, Pl. IV, f. 5) illustrated as *P. asine*. However, his text makes it clear that the caterpillar of *asine* resembles that of *P. metallescens* and *P. octomaculata* (both treated below), so this is an error of association in Moss's material.



Fig. 15. Final instar caterpillar of *Polythrix caunus*, collected on *Tanaecium tetragonolobum* (MJWC217) on Mt. Tamana, 14 October, 1995; photographed 14 October; subsequently died; MJWC 95/55.

I found and documented a caterpillar on *Tanaecium tetragonolobum* (= *Ceratophytum tobagense*) (MJWC217) on Mt. Tamana, 14 October, 1995 (95/55), but was not able to rear it through. My identification of this individual as *P. caunus* is by comparison with Janzen and Hallwachs (2013). The final instar caterpillar (Fig. 15) measured 19mm and was found in a shelter formed between two partially overlapping leaves. Head chordate, broadly indent at vertex; shiny, slightly rugose, no obvious setae; light chestnut; small diffuse spot in middle of anterior-facing epicranium; small dark spot over stemmata. T1 light chestnut. Body smooth, no obvious setae; dorsally and laterally dull maroon, patterned with narrow yellow-white lines; dorsolateral line well marked. Dorsal to the dorsolateral line there are narrow transverse lines as follows: T2 and T3 on anterior margin and mid segment, with a mid-dorsal spot between the two lines; A1 anterior margin and near posterior margin; A2 anterior margin, near posterior margin and a partial narrow line on posterior margin, interrupted dorsally; A3-A7 behind anterior margin, near posterior margin, and a narrower

line on posterior margin; A8 anterior margin and posterior margin, the area adjacent to the margins slightly paler maroon. Below the dorsolateral line: A2-A7 a small triangle and three vertical lines posterior to this, the pattern breaking up T1-A1 and A8. Ground colour from just dorsal to ventrolateral flange to below it reddish brown, the flange paler. Legs T1 light chestnut; legs T2-T3 reddish brown; prolegs concolorous; gonads faintly visible.

Polythrix metallescens (Mabille)

Figs. 16-17.

Moss (1949) found the caterpillars and pupae of this species similar in all respects to those of *P. asine* and found on the same food plants: *Pterocarpus santalinoides* (= *P. amazonicus*), *P. officinalis* (= *P. draco*) and *Lonchocarpus monilis* (= *Muellera moniliformis*), as well as on *Lonchocarpus* sp. and *Machaerium floribundum* (all Fabaceae, Faboideae).

S. Alston-Smith (in Beccaloni *et al.* 2008) reared this species from *Lonchocarpus heptaphyllus* (= *L. pentaphyllus*) and *Platymiscium trinitatis* (Fabaceae, Faboideae) in Trinidad.

I found a penultimate caterpillar on an unidentified sapling at Inness Field, 2 October, 1994 (94/52), which subsequently fed on *Lonchocarpus* sp. in captivity, but died in the final instar. This caterpillar closely resembles that of *P. kanshul* Shuey from Central America (Janzen and Hallwachs 2013). *P. kanshul* is most closely related to *P. metallescens*, so this caterpillar is likely to be that species. Janzen and Hallwachs (2013) have reared *P. kanshul* from several similar genera: *Dioclea*, *Erythrina*, *Lonchocarpus*, *Machaerium* and *Pterocarpus* (all Fabaceae, Faboideae).

The egg base remains associated with this caterpillar were found on the leaf upper surface, adjacent to the midrib. The shelter of the penultimate instar caterpillar was an irregular two-cut oval folded over upwards adjacent to the midrib of a mature leaf. The caterpillar measured 15mm two days before moulting to the final instar (Fig. 16); head rounded, chordate, semiprognathous; ground colour brown; posterior margin black, extending in a broad lateral stripe to mouthparts; anterior to this a narrow orange line, wider dorsally; just below vertex, an oval black spot on each epicranium, the basal 80% joined at the epicranial suture. T1 concolorous with body. Body dull, dark green, covered with a network of short, fine, white longitudinal lines; dorsal line narrowly clear; narrow, white dorsolateral line; spiracles pale, inconspicuous; all legs concolorous.



Fig. 16. Dorsolateral view of penultimate instar caterpillar of *Polythrix metallescens* collected and photographed on unidentified Faboideae, Inniss Field, 2 October, 1994; 94/52.

The final instar caterpillar was similar (Fig. 17), but no detailed description was prepared. The lateral stripe on the head is yellow-brown rather than orange, and the two spots dorsally on the face are separated at the epicranial suture, rather than joined.



Fig. 17. Dorsolateral view of final instar caterpillar of *Polythrix metallescens* collected on unidentified Faboideae, Inniss Field, 2 October, 1994; photographed 8 October; died in final instar; 94/52.

Polythrix octomaculata (Sepp)

Figs. 18-22.

This species was treated as *P. octomaculata octomaculata* in Evans (1952) and Cock (1982, 1986), but this species is now considered monotypic and the former subspecies treated as synonyms (Mielke 2004).

Sepp (1843-7, pl 58) described this species from Suriname and illustrated the early stages which were found on *Pterocarpus indicus*. Moss (1949) illustrates a similar caterpillar which he also found on species of Faboideae near Belem, Brazil: *P. santalinoides* (= *P. amazonicus*), *P. officinalis* (= *P. draco*) and *Lonchocarpus monilis* (= *Muellera moniliformis*).

In Trinidad, S. Alston-Smith (in Beccaloni *et al.* 2008) reared this species from *Dalbergia ecastaphyllum* (Faboideae). Most of Janzen and Hallwachs' (2013) material was reared in Costa Rica from *Andira inermis* and *Acosmium panamense*, but they also reared it from seven other genera of Faboideae as well as *Ceiba pentandra* (Malvaceae) and *Karwinskia calderonii* (Rhamnaceae). Beccaloni *et al.* (2008) include further records from

Faboaceae (Faboideae, Caesalpinioideae), Bignoniaceae and Sapindaceae.

I have reared this species from Trinidad from a pupa collected on *Lonchocarpus benthamianus* (MJWC264) at Point Gourde, 22 March, 2003 (Fig. 18). The food plant was a young roadside tree that had been cut back and was regrowing. The remains of the egg and first larval shelter were associated. The egg was laid on the leaf upper surface and had 11 strong ribs, similar to that of *P. roma* (Fig. 23). The stage 1 shelter was a two-cut triangle from the edge of a leaf and hinged on a vein. The stage two shelter was not found. The stage 3 shelter was formed from two leaves, one on top of the other. The pupa (Fig. 18) was attached by its cremaster to a bar of silk across one leaf and supported by a Y-shaped silk girdle. It measured 20mm; the frontal spike was 1mm, blunt, widened at the base; tubercles on the anterior and dorsal aspects of the head and the eyes; abdomen segments wider at anterior and posterior margins; cremaster elongate. Ground colour white with small brown markings: a pair of spots each side just above and just below frontal spike, spiracle T1, a spot just dorsal to spiracle T1, a subdorsal spot on posterior margin of T1, spot on base of forewing, irregular markings on basal part of wing, on T3, A1 and A2 just posterior to dorsum of forewing, a conspicuous spot laterally on A5; tip of cremaster black.



Fig. 18. Pupa of *Polythrix octomaculata* collected on *Lonchocarpus benthamianus*, Point Gourde, 22 March, 2003, 20mm; 03/205.



Fig. 19. Adult male of *Polythrix octomaculata* collected as pupa on *Lonchocarpus benthamianus*, Point Gourde, 22 March, 2003; adult 26 March, 2003; 03/205.

I have not seen the caterpillar from Trinidad, but have found caterpillars near Tapachula, Mexico on an unidentified Faboideae (3 April, 1998; 98/106). The Central American population of *P. octomaculatus* was treated as subsp. *alciphron* (Godman and Salvin) (Evans 1952) but as noted above, the species is now considered monotypic. The Mexican caterpillar matched those illustrated by Sepp (1843-7) and Moss (1949), and therefore provides a good indication of what the caterpillar in Trinidad should look like. Instar n-3 measured 7mm about mid-way through the instar; head brown with a dark posterior margin, and an indistinct black patch on face below vertex. Instar n-2 measured 14mm a day before moulting; head flattened dorsally, only slightly indent at vertex; shiny, rugose; brown with a weakly differentiated, diffuse black rectangle on face below vertex; T1 as body; body dull translucent pale green; dorsally and laterally a series of longitudinal, irregular, pale lines on anterior part of A2-A7; small irregular dots on T1 and A1, and posterior half of A2-A9; legs concolorous; spiracles pale, inconspicuous. Penultimate instar photographed (Fig. 20), but not described.

The final instar (Fig. 21) was similar to the penultimate instar, although the head markings are paler. Head flattened dorsally; slightly, but broadly indent at vertex; colour dark yellow with pink-brown markings: an arc across face (concave side up), the ends reaching to just below apices, and the central area across clypeus (which is yellow centrally), an oval area above this arc below vertex, and the posterior margin of the head; black spot around the stemmata. Body white; T1-T3 and A8-A9 uniform, unmarked; anterior half of A1-A7 with a band of about 20 longitudinal slightly darker lines, some of which bifurcate anteriorly or posteriorly; posterior half of A1-A7 with shallow transverse ridges. Spiracles



Fig. 20. Penultimate instar caterpillar of *Polythrix octomaculata* collected on unidentified Faboideae, Tapachula, Mexico, 3 April, 1998; photographed 6 April; moulted 8 April; 25mm; 98/106A.



Fig. 21. Final instar caterpillar of *Polythrix octomaculata* collected on unidentified Faboideae, Tapachula, Mexico, 3 April, 1998; moulted 8 April; photographed 9 April; pupated 28 April; 26mm; 98/106A.

paler, inconspicuous; legs, prolegs and venter with a green tinge; anal plate slightly pointed posteriorly with a brighter white margin.

The female pupa from Mexico (Fig. 22) was similar to the male pupa from Trinidad (Fig. 18) but noticeably more heavily and extensively marked in darker brown. More material would be needed to assess the significance of the colour differences.

Polythrix roma Evans

Figs. 23-27.

Moss (1949) treated this species as *P. asine* (Hewitson), which is a very similar Central American species. Near Belem, he reared it from the same food plants as *P. octomaculata*: i.e. the Fabaceae, Faboideae, *Pterocarpus santalinoides*, *P. officinalis* and *Lonchocarpus monilis*. In Trinidad, this species has also been reared from three other Faboideae: *Coursetia ferruginea* (M.J.W. Cock in Beccaloni *et al.* 2008), *Dalbergia ecastaphyllum* and *L. punctatus* (S. Alston-Smith in Beccaloni *et al.* 2008).



Fig. 22. Female pupa of *Polythrix octomaculata* collected as caterpillar on unidentified Faboideae, Tapachula, Mexico, 3 April, 1998; pupated 28 April; photographed 2 May; emerged 11 May; 24mm; 98/106A.

The following observations are based on material the author collected on *C. ferruginea* (93/24, 94/21, 95/4, and 96/1, although only the last of these was successfully reared through).

The eggs (Fig. 23) are laid on the upper surface of a leaflet, near the midrib; as tall as wide, top flattened, with micropyle slightly indent; 12-13 strong narrow ribs, with a connecting bar at the edge of the flattened top; contents reddish through translucent egg, contrasting with the pale ribs.



Fig. 23. Egg of *Polythrix roma* collected on *Coursetia ferruginea*, behind St. Benedict's, 15 October, 1993; photographed 21 October; 93/24E.



Fig. 24. Final instar caterpillar of *Polythrix roma* collected on *Coursetia ferruginea*, behind St. Benedict's, 3 July, 1996; photographed 10 July; pupated 15 July; 26mm; 96/1.



Fig. 25. Final instar caterpillar of *Polythrix roma* dorsolateral view of anterior portion; collected on *Coursetia ferruginea*, behind St. Benedict's, 13 October, 1993; photographed 13 October; died; 25mm; 93/24A.

Leaf shelter 1 was made on a single leaflet, normally the same leaflet on which the egg is laid, by making an oval two-cut flap which is folded over upwards; feeding was noted in an irregular patch from the edge of the leaf margin, basal to the shelter (93/24B). Larger caterpillars make a shelter between two leaves (93/24A).

The earliest instars have a plain brown head. The following description of the final instar caterpillar is based on individual 93/24A which died (Fig. 25), but seemed identical to individual 91/6 from the same food plant and locality which was reared through (Fig. 24). The caterpillar measured 25mm when described but grew to 31mm; head flattened dorsally, the vertex widely and shallowly indent; semiprognathous; ground colour pale green-brown; face with a narrow yellow-orange rim, except at vertex and mouthparts; a thin black line posterior to this, but separated by a gap of comparable width of ground colour. T1 concolorous with body. Body transparent and shiny; dark green internal colouring visible;

cuticle covered with very fine, short white longitudinal lines, less dense along dorsal line and increasing heavy laterally; small orange spot laterally near anterior margin of A1-A8, joined by a slightly heavier white line com-



Fig. 26. Pupa of *Polythrix roma*, dorsolateral view; collected as final instar caterpillar on *Coursetia ferruginea*, behind St. Benedict's, 3 July, 1996; pupated 15 July; photographed 18 July; adult 30 July; 20mm; 96/1.



Fig. 27. Adult male *Polythrix roma* collected as final instar caterpillar on *Coursetia ferruginea*, behind St. Benedict's, 3 July, 1996; adult 30 July; 96/1.

pared to rest of body. All legs concolorous; developing gonads small and pale, near posterior margin A5.

The pupa of 91/6 measured 20mm; short, stout frontal spike; head covered with scattered tubercles except down centre of eye; ground colour blue-green, abdomen white-green; scattered small brown dots with larger speckles laterally on anterior margin T2, and on front of head.

Small caterpillars are probably parasitised by an unidentified species of euplectrine wasp. In March, 2003, two stage 1 leaf shelters were found on *C. ferruginea* at Point Gourde, with caterpillars remains which appeared to be this species, and a single euplectrine pupa (03/208D, E).

***Polythrix* discussion**

The caterpillars of *Polythrix auginus* and *P. caunus* are very different from those of the other *Polythrix* spp. treated here. Similarly, the food plants are Bignoniaceae for *P. auginus* and *P. caunus*, and Fabaceae, Faboideae for the other species. Burns (1996) is surely correct, when he suggests that *P. auginus* and *P. caunus* belong in a separate genus.

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