

IMMATURE STAGES OF *ITHOMIA SALAPIA ARDEA* (LEPIDOPTERA: NYMPHALIDAE, ITHOMIINAE)

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Abstract – The host plant and the immature stages of *Ithomia salapia ardea* are described. The isolated eggs are laid under mature leaves of *Witheringia* sp. (Solanaceae). The larvae pass through five instars, the last with a conspicuous ringed pattern (resembling larvae of *Methona*); the pupae are beige and reflective, very similar to those of other species of *Ithomia*. The color-pattern of the mature larva of this species is very different from those of the other known species of the genus, suggesting that much additional work on Ithomiinae juveniles should be done before patterns can be generalized.

Resumo – A planta hospedeira e os estágios imaturos de *Ithomia salapia ardea* são descritos. Os ovos isolados são colocados em folhas maduras de *Witheringia* sp. (Solanaceae). As larvas passam por cinco estádios, com o último apresentando um padrão de anéis conspícuo (lembrando larvas de *Methona*); as pupas são de cor bege brilhante, muito similares àquelas de outras espécies de *Ithomia*. O padrão de coloração da larva madura desta espécie é muito diferente do das outras espécies conhecidas do gênero, sugerindo que muito trabalho adicional deve ser feito com imaturos de Ithomiinae antes que padrões gerais possam ser generalizados.

keywords – Brazil, *Ithomia*, Ithomiinae, life-cycle, Nymphalidae, Solanaceae

The knowledge of the immature stages of butterflies has grown in importance since the last decade, and characters of early stages have proven to be useful when characters of adults fail to solve some systematic problems (DeVries *et al.* 1985, Kitching 1985, Tyler *et al.* 1994, Brown & Freitas 1994, Freitas *et al.* 1997, Freitas & Brown 2004). In the subfamily Ithomiinae (Nymphalidae), the immature stages are relatively well known for most genera, and good descriptions are available in the literature (D'Almeida 1922, 1938, Young 1973a, b, 1974a, b, 1975, 1977, 1978a, b, DeVries 1987, Brown & Freitas 1994, Freitas 1993, Freitas & Brown 2002, Hill 2006). However, information is scarce or absent for many monotypic or small genera (like *Athesis*, *Eutresis*, *Athyrtis*, *Paititia*, *Patricia*, *Aremfoxia*, *Veladyris*, *Dygoris*), and is still incomplete for larger diversified genera (*Hyalyris*, *Hypothyris*, *Napeogenes*, *Oleria*, *Ithomia*, *Episcada*, *Pteronymia*, *Greta*, *Hypoleria*). Some of the general patterns recognized in these genera could be revised with knowledge of immatures of additional species. This paper describes the immature stages of *Ithomia salapia ardea* Hewitson, 1855, revealing a larval pattern previously unknown in this genus.

STUDY SITES AND METHODS

The immatures were collected near the upper Juruá River, in the “Reserva Extrativista do Alto Juruá”, Marechal Thaumaturgo, Acre, near the “Foz do Rio Tejo” (8°59' S, 72°43' W), in September/October, 1999. Several eggs and larvae were collected in the field on *Witheringia* sp. (Solanaceae). The larvae were kept in plastic boxes, with leaves of the host plant, cleaned daily. Egg size is presented as height and width. The head capsule size of larvae is the distance between the most external ocelli (as in Freitas 1991, 1993). Adults, preserved larvae and pupal skins are in the collection of the author. Larval food plant vouchers, identified by Dr. João Semir, have been deposited in the herbarium of the Universidade Estadual de Campinas.

RESULTS

General Biology

About 50 eggs and larvae were observed in the field on five shrubs of a species of *Witheringia* (Solanaceae) growing on the forest edge, in sunny places. The plants varied from 50 cm to 1.5 m high, and had large soft leaves. No oviposition behavior was observed despite the abundance of adults in the study area. The isolated eggs were found on the underside of mature leaves. After hatching, caterpillars ate part of the egg shell, and after some time began to eat the leaves chewing small holes in the blade. Although solitary, larvae were not cannibalistic; several larvae of different instars could be reared together without losses. The caterpillars rested in a J-shaped position on the underside of the leaves. When disturbed, caterpillars could drop off the leaf and suspend themselves by silk threads.

Egg (Fig. 1): White, rounded, with 16-17 longitudinal ridges and 10-11 transverse ridges; diameter 0.7 mm, height 0.9 mm.

Larvae: first instar: White, turning green after first meal; legs and prolegs light. Head brown; width 0.4 mm. In dorsal view, the sublateral semicircles (present in all instars) can be easily observed as small rounded projections arising on each abdominal segment. Maximum length 3 mm.

Second instar: Dark green; legs and prolegs light. Head dark brown; width 0.5 mm. Maximum length 5 mm.

Third instar: Dark leaden gray, legs and prolegs dark. Head dark brown (capsule lost, not measured). Maximum length 7 mm.

Fourth instar: (Fig. 2A) Body dark gray with white intersegmental rings; legs and prolegs dark. Head black; width 1.1 mm. Maximum length 11 mm.

Fifth instar: (Fig. 2B) Body black with the white intersegmental rings broader than in fourth instar; legs and prolegs dark. Head black; width 1.6 mm. The sublateral semicircles are conspicuous on the abdominal segments. Maximum length 16 mm.

Pupa (Fig. 2C,D,E) Slightly bent, beige with a general golden shine, with many small black stripes and other markings. Ocular caps short and pointed. Length 12 mm.

DISCUSSION

In many aspects, the immature stages of *Ithomia salapia ardea* are typical of the other known *Ithomia*, including egg shape and size, number of longitudinal and transverse ridges, first instar with dark head capsule, sublateral semicircles in the abdominal segments of the larvae, and pupae slightly bent (see Srygley & Penz 2000 and Willmott & Freitas 2006); the reflective pattern of the pupae is present in most species, but varies even in siblings (Brown & Freitas 1994). In most known species of *Ithomia* (such as *I. drymo*, *I. lichyi*, *I. agnosia*, *I. iphianassa*, *I. avella* and *I. terra*), the larval pattern is very constant: a completely brownish larva, with a sublateral light longitudinal stripe (most cream colored, in some species tending to yellow), legs and prolegs light and head capsule with a black stripe in frontal view (see figures of *I. lichyi* and *I. agnosia* in Brown & Freitas 1994), with the only differences concerning color shades. However, the general color pattern of the larva of *I. salapia ardea* is very different from these known species of the genus. The third instar is wholly dark, without any lateral stripes, and the fourth and fifth instars bear a ringed pattern very similar to that observed in *Methona* and *Melinaea* larvae (see Brown & Freitas 1994). The same pattern was observed also in *I. salapia derasa* reared by Keith Willmott from Ecuador (feeding also on a species of *Witheringia*), and an apparently transitional pattern can be observed in larvae of *I. diasia* (Srygley & Penz 2000). It is interesting to note that these two species belong to the same clade (Mallarino *et al.* 2005).

Conspicuous body rings are characteristic of species of Tithoreini, Melinaeini and *Methona*, and this is considered a plesiomorphic trait within the Ithomiinae (Willmott & Freitas 2006). However the ringed pattern is not exclusive of the above cited radiations, being present in a few species of another radiations of Ithomiinae (*Pteronymia lonera* is a good example, see Brown & Freitas 1994).

The importance of this finding is related to the general patterns defined in the diverse Ithomiinae tribes. Some genera, such as *Oleria* and *Ithomia* have been supposed to be constant and monotonous in patterns of immatures, while others, such as *Pteronymia* are considered as variable within and among species. Additionally, many genera are still poorly studied (less than one-third of the species have known immatures: *Napeogenes*, *Hyalyris*, *Hyposcada*, *Oleria*, *Pteronymia*, *Episcada*, *Hypoleria* and *Greta*). The larva of *I. salapia ardea* shows that much additional work in Ithomiinae should be done before color-patterns can be generalized. Any additional descriptions of immatures of species in this group are important.

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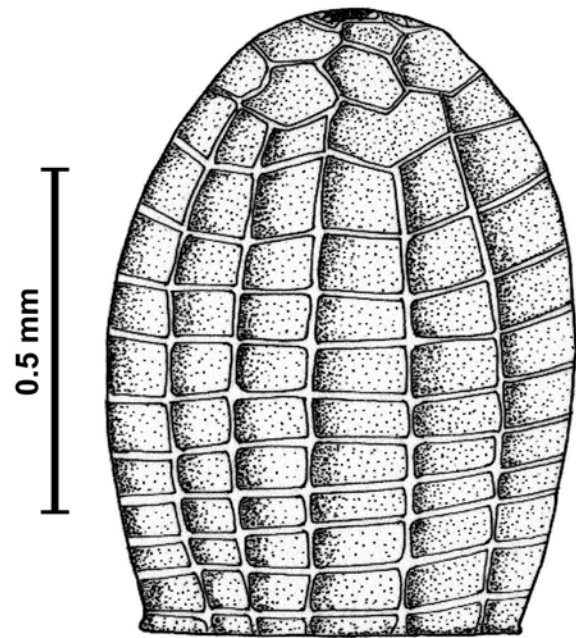


Fig. 1. Egg of *Ithomia salapia ardea*.

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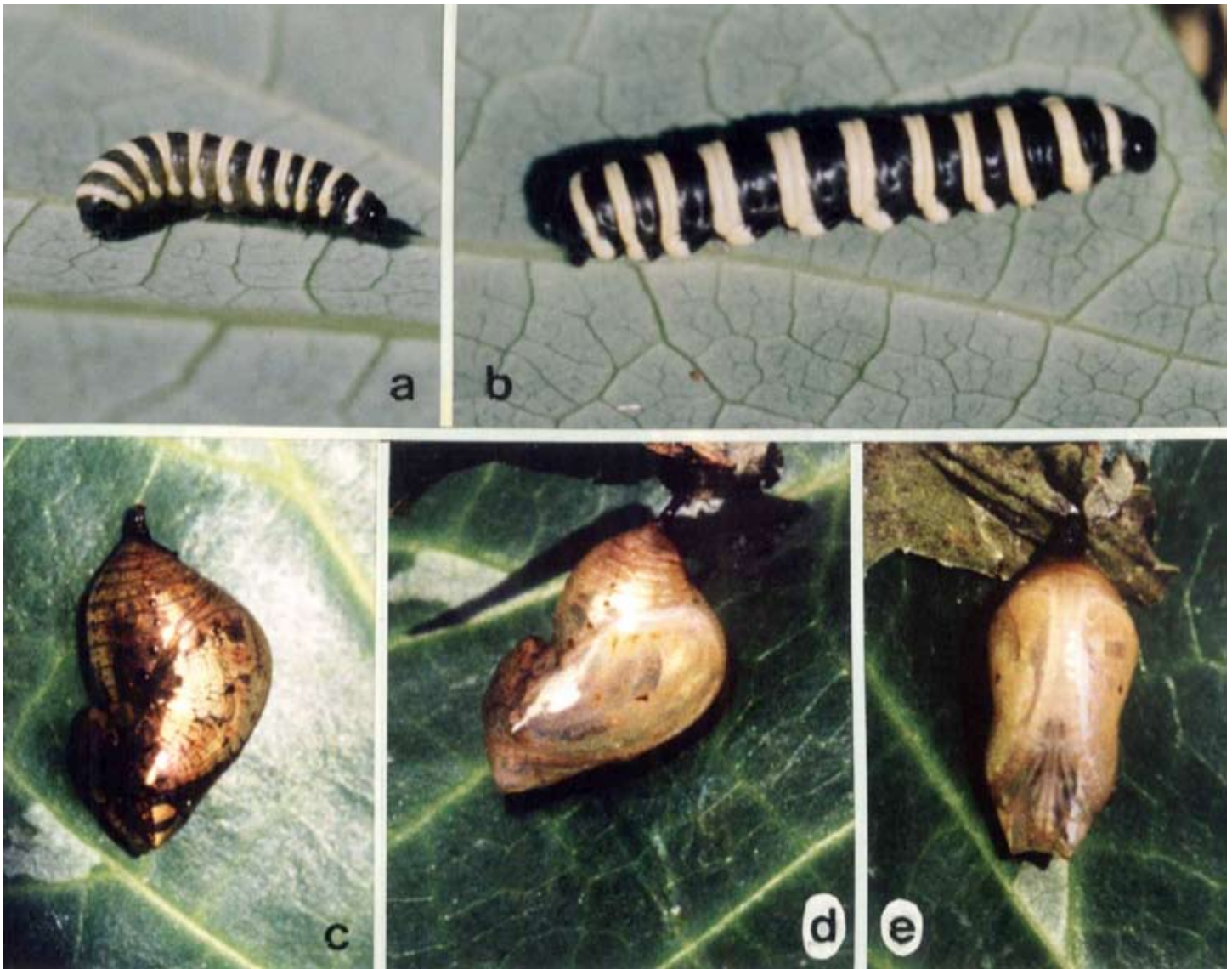


Fig. 2. Immature stages of *Ithomia salapia ardea*; A-B, larvae: A, fourth instar; B, fifth instar; C-E, pupae; C lateral view; D, dorsal view; E frontal view.

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