

The early stages and larval food-plants of *Bufoidia larseni* Wiltshire and Legrain, 1997 (Lepidoptera: Lasiocampidae)

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Figure 1. The light coloured and commoner form of the caterpillar or larva of *B. larseni* bred on *Fagonia ovalifolia* in the UAE from moths obtained as larvae in the Sumail Gap, Oman.



Figure 2. The dark form of the larva of *B. larseni* from the same batch of eggs as the light form shown in Fig. 1

The family Lasiocampidae includes the eggar, lackey or lappet moths, a characteristic group of medium-sized, stout-bodied and often sombre-coloured insects that are related to the silk moths (Bombycidae) and moon and atlas moths (Saturniidae). They are not just tropical in their distribution, but are also found in temperate zones, particularly in wooded country and heathland. Altogether over 1200 species of Lasiocampidae have so far been described, less than 20 are known from the Arabian Peninsula (Wiltshire, 1994).

Recently the new genus *Bufoidia* (Wiltshire and Legrain, 1997) was erected to include three previously undescribed Arabian species: *B. pittawayi* from the Asir Mountain region of Saudi Arabia, northern Yemen and southern Oman; *B. larseni* from northern Oman and the United Arab Emirates and *B. gallagheri* from central Oman.

At the same time, three species originally assigned to other genera were transferred to this new genus: *Dendrolimus lederi* Kocak, 1981 from Lebanon, Palestine and Jordan; *D. alferii* Andres & Seitz, 1925 from Egypt

and *Bombycopsis hyatti* Tams, 1931 from Somalia.

All six species were clearly shown to be congeneric and distinct from *Dendrolimus* and *Bombycopsis* not just on the basis of male foreleg structure, wing venation and the morphology of the male and female genitalia, but also in their ecology. Furthermore, Wiltshire and Legrain provided an additional key based on the structure of the male genitalia to differentiate *Bufoidia* from the other genera of Lasiocampidae found in the Arabian Peninsula, including *Chilena*, *Lasiocampa* and *Streblote*, all three of which occur in the UAE.

In dealing with the ecology of these moths, Wiltshire and Legrain (1997) characterised *Dendrolimus* as containing Palaearctic arboreal species and *Bombycopsis* as including Afrotropical forest and savannah wetland species. On the other hand, *Bufoidia* species were portrayed as Eremic steppe or montane moths with polyphagous habits.

However, whilst the distribution of all six *Bufoidia* species is reasonably clear, the larval food plant preferences are not so well known. Indeed, at the time

that the genus was first proposed, the larvae of at least two forms were unknown – *B. larseni* and *B. gallagheri*. The purpose of this present note is to record properly the existence of two colour forms of the final instar of the larva of *B. larseni* and to provide other information on the immature stages of this insect, including its larval food plants. An illustration of these caterpillars was given by Gillett and Howarth (2004), but without further details.

In April 1996 whilst the author was travelling in northern Oman, a series of six grey moth larvae marked with red and black and each about 2.5 - 3 cm in length were found in a dry wadi near to Al Ayn in the Sumail Gap. Five of the caterpillars were feeding on a large bush of *Ochradenus aucheri* (Resedaceae) and the sixth was on a nearby, but altogether different plant, *Fagonia indica* (Zygophyllaceae). Despite further searching, no more larvae were found. Although belonging to an unknown species, the larvae were recognised as belonging to the Lasiocampidae, some members of which had previously been bred successfully by the author, including *Chilena laristana* Daniel, 1949 (Gillett, 1997). It was decided to retain the larvae in the expectation of rearing the adult moths. During the remainder of the trip, they were fed on fresh shoots of *O. aucheri*, but on returning to Al Ain, it proved impossible to obtain this plant on a regular basis. As an alternative, the larvae were transferred to fresh shoots of *Fagonia ovalifolia*, on which they continued to feed, mainly at night. After a single ecdysis (skin change) in late April, all six larvae fed further and then spun up rather open white or grayish silken cocoons amongst the sprigs of the food plant in early May. These cocoons were much more loosely woven than cocoons of related Arabian genera such as *Chilena* and *Streblote* (see below also). Adult moths, three females and three males, hatched some two weeks later and were tentatively identified as a species near to *Dendrolimus bufo* Lederer (= *Dendrolimus ledereri* Kocak) as shown by Wiltshire (1986). Only in 1997, were they eventually confidently identified as *Bufoidea larseni* Wiltshire and Legrain, 1997.

During the hatching process, one pair was found engaged in copulation before they could be removed from the breeding cage. The female involved was later moved to a small cardboard box and left for two days to see if eggs could be procured. Some 25 to 30 eggs were found to have been deposited individually or in small clutches on the bottom and sides of the box. These were greyish-green in colour and about 2mm high and 2mm in diameter without any obvious sculptural features. After about 10 days, the eggs darkened and some 20 small dark grey caterpillars emerged and were transferred to fresh shoots of *F. ovalifolia*. Four larvae died during the early stages, but as the remainder grew it became obvious, after the second moult, that there were two colour forms.

After the final larval moult, these differences were very conspicuous (*Figures 1 and 2*). The commoner form was similar to, but lighter than, the original wild-found caterpillars and overall light grey with a conspicuous white side stripe overlaid with red and black markings on each abdominal segment and a very faint parallel yellow stripe below. Just three of the surviving larvae were a much darker grey, almost black, with a thin yellow side stripe below the broader white stripe and

with much more prominent red and black markings. Both forms displayed red bristly transverse bands on the second and third thoracic segments, but these were more pronounced and highlighted with black in the darker caterpillars. Unfortunately by the time that the caterpillars had reached the fifth instar and were almost ready to pupate (about four weeks), the author was due to go on leave and the caterpillars had to be released into the wild. They were taken to the Mubazzarah area of Jebel Hafit, near Al Ain, where the adult moth had already been recorded, and left on plants of *Fagonia*. Their subsequent fate is unknown.

Both forms of the larvae of *B. larseni* shown here differ in the disposition of their stripes and in colour from the caterpillar of *B. pittawayi* as shown by Wiltshire (1986) and also of from those of *B. ledereri* and *B. alferii* described in the same publication. Nevertheless, they are easily recognisable as belonging to the same genus because of the two brick-red transverse bristly patches on the second and third thoracic segments, although somewhat similar patches are found in other genera such as *Streblote*.

Short note on rearing *Bufoidea larseni* in Europe

A single female *Bufoidea larseni* was taken during mercury vapour light trapping in Wadi Shik (Oman) in late April 2005. The moth was placed overnight in a stoppered tube to see if any eggs could be obtained. By the next morning, about 20 eggs had been laid in small batches on the walls of the tube. The moth was retained for inclusion in the Al Ain Emirates Natural History Group Collection, whilst the eggs were put aside for rearing. However, the tube with eggs was inadvertently taken back to the United Kingdom at the end of my stay in the UAE and, because I was due to leave straight away for an extended trip to Brazil, the eggs were turned over to two of my children for rearing. Neither Conrad nor Caroline had had any experience of looking after caterpillars. However, in the absence of either *Fagonia* or *Ochradenus* for use as food-plants, I suggested that if any caterpillars hatched, they should try feeding them with hawthorn leaves (*Crataegus*).

All the eggs hatched out at the beginning of May and the tiny larvae were successfully transferred to sprigs of hawthorn on which they hesitatingly began to feed. Development was slow, but by late June, most had survived to the third instar. At this stage, the caterpillars seemed to be intermediate in colouration between the two forms described above, but perhaps more closer to the dark form and similar to the caterpillars collected in the wild in Oman in 1996. Unfortunately at this stage, they began to reject the hawthorn leaves and although a few fed for a time on lettuce leaves, by the time that I arrived back in UK in early July, all but one had died of unknown causes. I immediately tried to get the remaining caterpillar to accept other available possible food-plants, including Elm (*Ulmus*), Holly (*Ilex*), Nightshade (*Solanum*), Blackberry (*Rubus*) and Elder (*Sambucus*) amongst others. Surprisingly, the sprigs of Elder were accepted and the caterpillar resumed feeding at night, although I am aware that very few European



Figure 3. Caterpillar of *B. larseni* on leaves of Blackberry in England. It did not eat these, but fed on leaves of Elder seen in the background.

Figure 4. Cocoon of *B. larseni* attached to dead Elder leaves and to the sides of the glass rearing tank. The pupa inside hatched out into a male moth; this being the sole survivor of about 20 eggs accidentally taken to England.



Figure 5. The original wild-caught female *B. larseni* (top) with the cocoon, last larval skin and emerged male *B. larseni* (bottom).

species of Lepidoptera ever utilise the leaves of this plant as larval food. The caterpillar (*Figure 3*) eventually pupated on 28 July 2005, spinning up a rather flimsy white silken cocoon amongst leaves but which was also fastened to the glass walls of the breeding tank (*Figure 4*). Larval development, therefore, took about 13 weeks in the United Kingdom, which is about three times as long as in the UAE, but this is probably attributable to both the non-ideal food-plants and to lower temperatures particularly at night when feeding takes place. In due course, a perfect male moth emerged on 23 August 2005 and actually escaped to fly around lights in the house until recaptured two days later. It will also be incorporated into the Al Ain ENHG Collection, together with mother moth, the cocoon and last larval skin (*Figure 5*).

References

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