

Re-examination of the female genitalia of N American *Icaricia lupini* and *I. acmon* and description of those of the closely allied *I. neurona* and *I. shasta* (Lepidoptera: Lycaenidae, Polyommata)

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Abstract. The female genitalia of *Icaricia lupini* and *I. acmon* are re-figured and re-described, in order to give a more detailed account of their differences than that provided by Scott (1986). The female genitalia of the other two members of the group, i.e. *I. neurona* and *I. shasta*, are, to the best of my knowledge, being figured for the first time, and are shown here in order to provide a better understanding of the genitalic interrelationship between all four species of the group.

Samenvatting. Heronderzoek van de vrouwelijke genitalia van de Noord-Amerikaanse *Icaricia lupini* en *I. acmon* en beschrijving van die organen van de nauw verwante *I. neurona* en *I. shasta* (Lepidoptera: Lycaenidae, Polyommata) De vrouwelijke organen van *Icaricia lupini* en *I. acmon* worden opnieuw afgebeeld en beschreven, zodat een meer gedetailleerd wordt gegeven van de verschillen gepubliceerd door Scott (1986). De vrouwelijke genitalia van twee andere soorten uit deze groep, nl. *I. neurona* en *I. shasta*, worden, voor zover ik weet, voor het eerst hier afgebeeld, zodat een beter overzicht ontstaat betreffende de genitale verwantschappen tussen de vier soorten uit deze groep.

Résumé. Ré-examination des genitalia femelles des espèces nord-américaines *Icaricia lupini* et *I. acmon*, et description de ces organes des espèces apparentées *I. neurona* et *I. shasta* (Lepidoptera: Lycaenidae, Polyommata) Les genitalia femelles de *Icaricia lupini* et *I. acmon* sont figurées et décrites avec plus de détails que dans la publication de Scott (1986). Les genitalia femelles de deux autres membres de ce groupe, c.à.d. *I. neurona* et *I. shasta*, sont décrites et figurées ici pour la première fois, autant que je sais, afin que des relations interspécifiques entre les quatre membres de ce groupe soient mieux connues.

Key words: Lycaenidae – Polyommata – *Icaricia* – *I. lupini* – *I. acmon* – *I. neurona* – *I. shasta* – Female genitalia – Nearctic – N America – California.

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Introduction

As with the males of *Icaricia lupini* (Boisduval, 1852) and *Icaricia acmon* (Westwood & Hewitson, 1852), two superficially quite similar butterflies that are often difficult to tell apart other than by genitalia (Coutsis 2010), so is also the case with their respective, often deceptively similar, females. To make sure, the female genitalia of these two species have already been figured and described by Scott (1986), and the differentiating characters given by him were found to be valid, and are in no way contradicted by the finds of the present author. The reason then for re-figuring the female genitalia stems from the desire to provide somewhat more detailed drawings and descriptions. The inclusion of the female genitalia of *Icaricia neurona* (Skinner, 1892) and *Icaricia shasta* (W. H. Edwards, 1862) was deemed desirable both in order to figure them for what I believe to be the first time ever, as well as to provide a general overview of the female genitalia of the group as a whole.

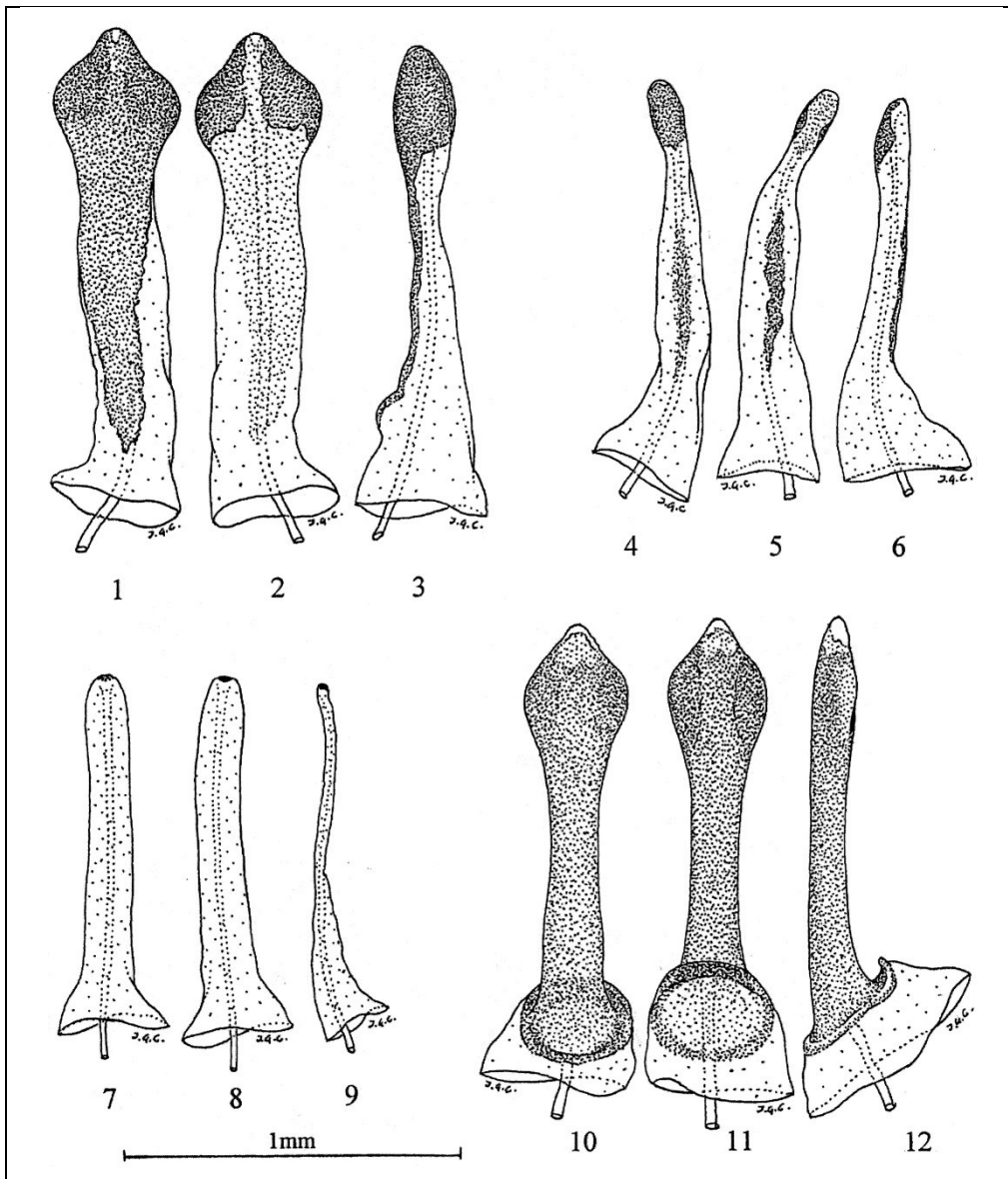
The female genitalia of the Polyommata

A remarkable feature of the female genitalia of the Polyommata, is the henia (Chapman 1916, Tuxen 1970). This is an eversible, almost always membranous and flexible tube, inside which extends the ductus bursae that connects the ostium bursae to the corpus bursae. This component is unique to the Polyommata and may very well be used for defining the sub-tribe.

Material examined: 13♀ specimens, USA California, comprising: **a)** 5 specimens *Icaricia lupini*, of which: 2 specimens, Sierra County, Dog Valley area, 6–7 miles SW of Border Town, 13.vi.1991; 2 specimens, Alpine County, one of which, N of Carson Pass, 1 mile N of Hwy 88, 26.vii.1996, the other, Woods Lake, 9.viii.1991; 1 specimen, Glenn County, along FH 7, 35 miles from start, 9.vii.1996. **b)** 6 specimens *Icaricia acmon*, of which: 3 specimens, Yolo County, willow Slough By-pass, 2 miles N of Davis, Rd 102, two of which, 18.x.1994 and one, 27.x.1994; 1 specimen, Glenn County, Rd to Plaskett Meadow, FH 7, 10 miles from start, 10.vii.1995; 1 specimen, Yolo County, Willow Slough By-pass, 2 miles N of Davis, Rd 102, 27.x.1994; 1 specimen, Plumas County, Queen Lily Campground, 2500 ft, 20.v.2003; 1 specimen, Siskiyou County, Algoma Campground, 1.vii.2003. **c)** 1 specimen *Icaricia neurona*, Ventura County, Pine Springs Campground, SW of Lockwood Valley, 5800ft, 15.vi.1993. **d)** 1 specimen *Icaricia shasta*, Alpine County, Woods Lake, 1 mile S of Hwy 88, 9.viii.1991.

The henia of *Icaricia lupini*

Membranous and flexible. In dorsal or ventral aspect overall wide and ending distally in prominent bulbous expansion. Ventrum with prominent sclerotization, extending over most of henia's length, gradually diminishing in width from distal end to base, and embracing dorsum of bulbous expansion, the latter constituting the only dorsal sclerotization present (Figs. 1–3).



Figs. 1–12. Hena of female *Icaricia* species, USA, California. 1, 4, 7, 10. Ventral aspect. 2, 5, 8, 11. Dorsal aspect. 3, 6, 9, 12. Right side aspect. 1, 2, 3. *I. lupini*, Sierra County, Dog Valley area, 6–7 miles SW of Border Town, 13.vi.1991. 4, 5, 6. *I. acmon*, Yolo County, Willow Slough Bypass, 2 miles N of Davis, Rd 102, 18.x.1994. 7, 8, 9. *I. neurona*, Ventura County, Pine Springs Campground, SW of Lockwood Valley, 5800ft, 15.vi.1983. 10, 11, 12. *I. shasta*, Alpine County, Woods Lake, 1 mile S of Hwy 88, 9.viii.1991.

The hena of *Icaricia acmon*

Membranous and flexible. In dorsal or ventral aspect overall slender throughout. Ventrum with sclerotized plate restricted to distal end and not extending beyond sides of hena. Dorsum with medial, oblong, slender, sclerotized plate (Figs. 4–6).

Variation

Both species exhibit individual variation in the shape, size and extent of sclerotization of the sclerotized areas, but the basic characters as described above are constant.

The hena of the other members of the group

Icaricia neurona.

Membranous, flexible and devoid of any sclerotizations other than minute, horizontally extending plate at ostium bursae. In dorsal or ventral aspect overall very slender throughout (Figs. 7–9).

Icaricia shasta.

Heavily sclerotized throughout, rigid and ending proximally in sclerotized ring. In dorsal or ventral aspect with distal bulbous expansion (Figs. 10–12).

Conclusions

The often strikingly similar females of *I. lupini* and *I. acmon* can always readily be told apart from each other by shape of hena, as well as by distribution and extension of its sclerotized areas. Hena of morphologically different *I. neurona* bears closer affinities in shape to that of *I. acmon* than it does to those of other two members of group. Hena of *I. shasta*, though somewhat similar in shape to that of *I. lupini*, deviates from all members of group by overall heavy sclerotization and structural rigidity, in fact this appearing to be unique amongst the totality of Holarctic Polyommata. Also appearing as being unique is extent of intra-generic diversity observed in hena of members of this group, while in all other Polyommata studied diversity of similar magnitude was found instead to be

inter-generic. One other point of interest, based on sheer coincidence and having nothing to do with homologies or analogies of the parts, is the remarkable similarity in shape of the heniae of *I. lupini* and *I. shasta* to the aedeagus of the Palearctic Polyommata of the sub-genus *Agrodiaetus*.

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References

- Chapman T. A. 1916. On the pairing of the Plebeiid Blue Butterflies (Lycaenidae, tribe Plebeiidi). — *Transactions of the Entomological Society of London* **1916**(1): 156–180, pls. 18–62.
- Coutsis J. G. 2010. The male genitalia of N American *Icaricia lupini* and *I. acmon*; how they differ from each other and how they compare to those of the other two members of the group, *I. neurona* and *I. shasta* (Lepidoptera: Lycaenidae, Polyommata). — *Phegea* **39**(4): 144–151.
- Scott J. A. 1986. *The Butterflies of North America*. — Stanford University Press, Stanford, 583 pp.
- Tuxen S. L. 1970. *Taxonomist's Glossary of the Genitalia in Insects*. — Munksgaard, Copenhagen, 259 pp.
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