# 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, Polyommatiti)

John G. Coutsis

**Abstract**. The male genitalia of *Icaricia lupini* and *I. acmon* are figured and described, and their differences shown, providing a better means for proper identification of these two morphologically similar species. A comparison of their respective male genitalia to those of the other two species in the group, namely *I. neurona* and *I. shasta*, is carried out and the differentiating genitalic characters between all four species are shown.

**Samenvatting**. Verschillen in de mannelijke genitalia van de Noord-Amerikaanse *Icaricia lupini* en *I. acmon*, vergelijking met andere soorten in de groep: *I. neurona* en *I. shasta* (Lepidoptera: Lycaenidae, Polyommatiti)
De mannelijke genitalia van *Icaricia lupini* en *I. acmon* worden afgebeeld en beschreven. De verschillen vormen een betere basis voor de identificatie van deze morfologisch zeer gelijkende soorten. Een vergelijking van de genitalia met die van twee andere soorten in deze groep, nl. *I. neurona* en *I. shasta*, toont aan dat deze organen ook hier voor een correcte determinatie kunnen zorgen.

**Résumé**. Différences entre les genitalia mâle des espèces nord-américaines *Icaricia lupina* et *I. acmon*, et comparaison avec les genitalia mâles de deux autres espèces de ce groupe, *I. neurona* et *I. shasta* (Lepidoptera: Lycaenidae, Polyommatiti)
Les genitalia mâles d'*Icaricia lupini* et *I. acmon* sont figurés et décrits. Les différences trouvées constituent une base pour une meilleure détermination des deux espèces qui sont extrêmement semblables morphologiquement. La comparaison de ces genitalia avec ceux d'*I. neurona* et *I. shasta* montre que ces organes peuvent être utilisés ici aussi pour une détermination correcte.

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

Coutsis, J. G.: 4 Glykonos Street, GR-10675 Athens, Greece (kouts@otenet.gr).

## Introduction

The males of *Icaricia lupini* (Boisduval, 1852) and *Icaricia acmon* (Westwood & Hewitson, 1852), two often syntopic, closely related and quite similar N American butterflies, almost always have been separated from each other and identified on the basis of wing characters alone (Emmel & Emmel 1973, Howe 1975, Tilden & Smith 1986, Opler & Wright 1999). This method is applicable to the majority of specimens, but often there are some that cannot be safely placed, either because they are worn, or because the two taxa sometimes look morphologically strikingly similar. This is reflected by the fact that specimens of these two species, received from entomologists that are familiar with them, were often found to have been misidentified. In Scott (1986), however, there are figures and descriptions of the male and female genitalia of both these species, but the single diagnostic character given for the male genitalia has been found to be inconstant and therefore unreliable. The male genitalic

components that are being figured in Scott's work relate to two examples of *I. acmon* and one of *I. lupini*, all showing in dorsal view what Scott refers to as an uncus with a "cleft", the ensuing branches being normally referred to by others as labides. It is being stated by Scott that in *I. acmon* the uncus cleft is "deep", whereas in *I. lupini* it is shallower ("uncus cleft only a short distance"). The second example of *I. acmon* that is being figured, however, has a cleft that is no deeper than the one figured for *I. lupini*, and all specimens of both these species that the present author has checked shared clefts of about equal depth. In view of all this it appeared desirable to provide new figures and descriptions of the male genitalia of these two species, and to point out the constant differences that may always be useful for the proper identification of these two butterflies.

## The male genitalia in the genus *Icaricia*

The male genitalia of butterflies belonging to this genus [Nabokov 1944: type species *Icaricia icarioides* (Boisduval, 1852)] clearly place them in the sub-tribe Polyommatiti, having slender, oblong, upright-set valvae that end distally in a double process, a strongly excavated tegumen, a v-shaped furca with long and slender branches, a long and slender vinculum and upright-set labides. The aedeagus is long, slender and distally pointed, somewhat reminiscent of that of butterflies in the Palaearctic genus *Aricia*, but the membranous area of the dorsum of its distal part is furnished with minute dorso-lateral spines, this being a feature absent in Aricia. Both *I. lupini* as well as *I. acmon* belong to a group within *Icaricia* that also includes *I. shasta* (W. H. Edwards, 1862) and *I. neurona* (Skinner, 1892), all sharing similar types of male genitalia, all of which are somewhat differentiated from those of *I. icarioides*, the type species of the genus.

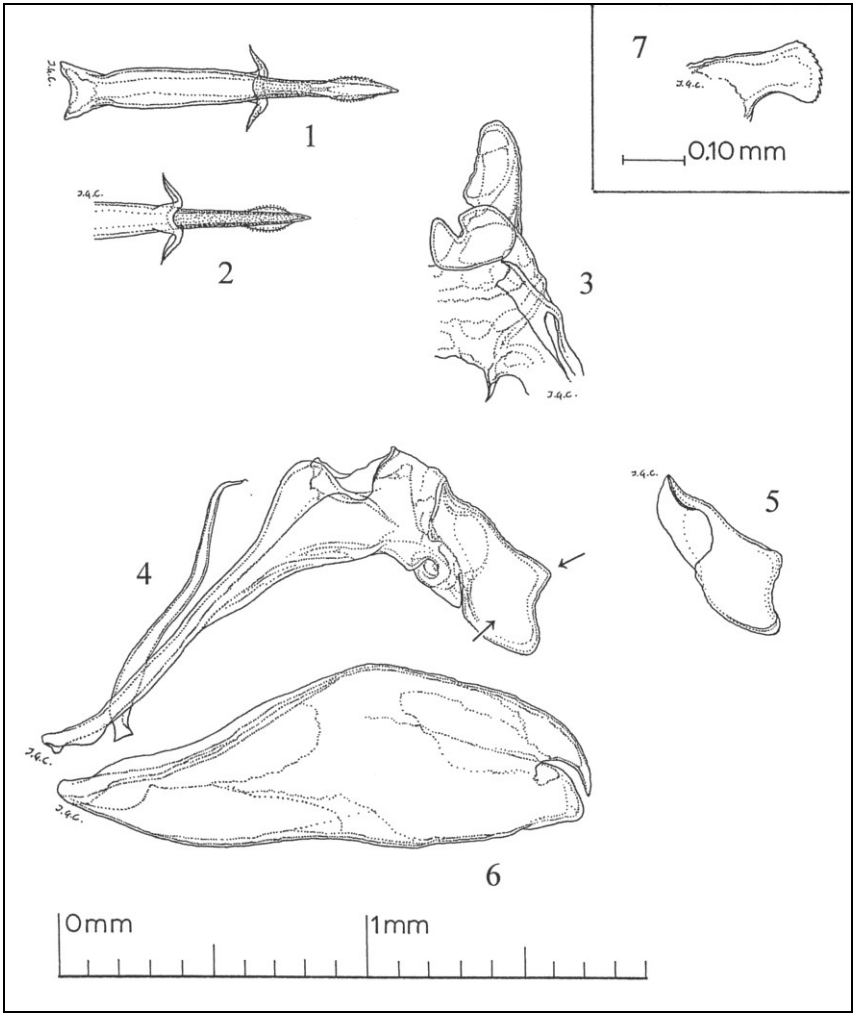
Material examined: 23♂ specimens, USA California, comprising:

a) 10 specimens, *Icaricia lupini*, of which: 2 specimens, Alpine County, Woods Lake, 9.vii.1991; 2 specimens, same locality data, but 2 miles S of Highway 88, 10.vii.1990; 1 specimen, same locality data, but 5 miles S of Highway 88, 10.vii.1991; 1 specimen, Lassen County, Bogard Station, Highway 44, 19.vi.2003; 1 specimen, Toulumne County, Sonora Pass, Highway 108, 14.vii.1991; 1 specimen, Sierra County, Dog Valley Area, 6-7 miles SW of Border Town, 13.vi.1991; 1 specimen, Glenn County, Snow Basin FH7, 33 miles from start, 9.vii.1996; 1 specimen, same County, but Sage Ridge, 6700 ft, 19.vi.2002.

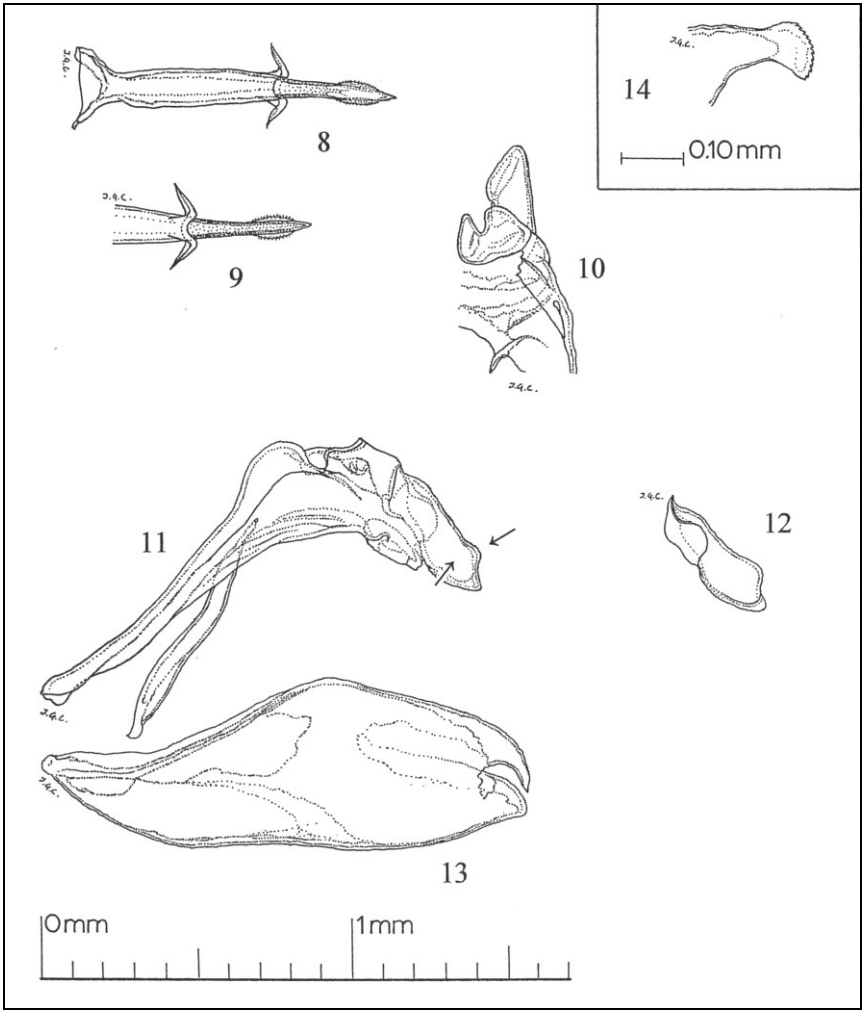
b) 4 specimens, *Icaricia acmon*, of which: 1 specimen, Yolo County, Willow Slough Bypass, 2 miles N of Davis, Road 102, 27.x.1994; 1 specimen, Napa County, Quail Ridge Reserve, 14 miles SW of Winters, 24.v.1995; 1 specimen, Plumas County, Queen Lily Campground, 2500ft, 20.v.2003; 1 specimen, Colusa County, Goat Mountain Road, 1300ft, 27.v.2003.

c) 1 specimen, *Icaricia neurona*, Ventura County, Pine Springs Campground, SW of Lockwood, 9800ft, 15.vi.1993.

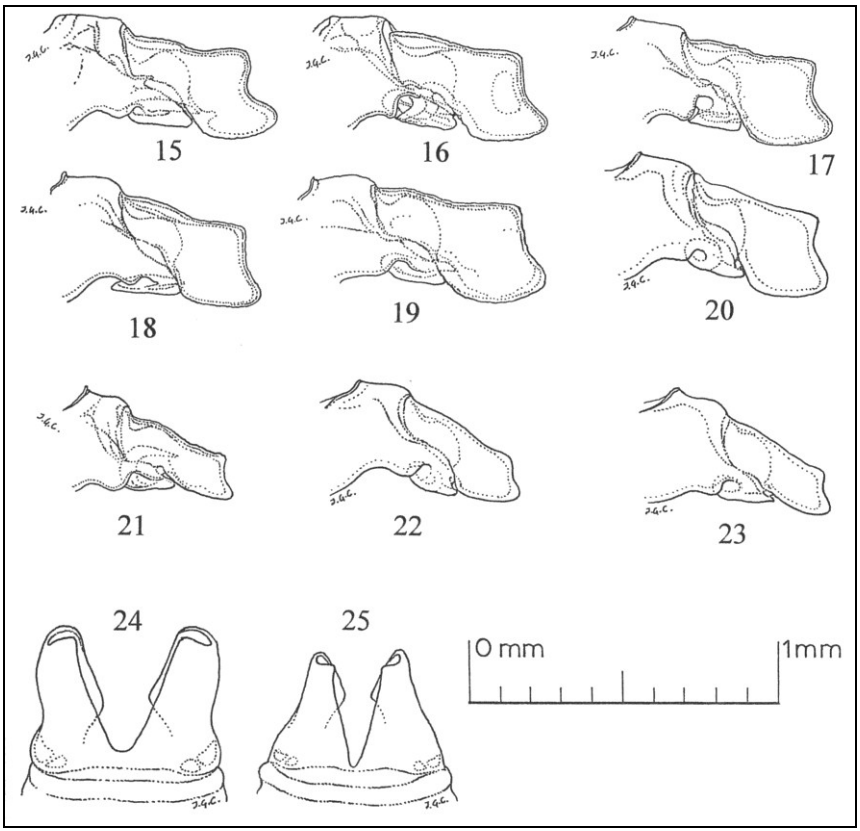
d) 7 specimens, *Icaricia shasta*, Alpine County, 3 specimens of which, Winnemucca Lake, 9000ft, 24.vii.2002 and 4 specimens, Woods Lake, 1 mile S of Highway 88, 9.viii.1991.



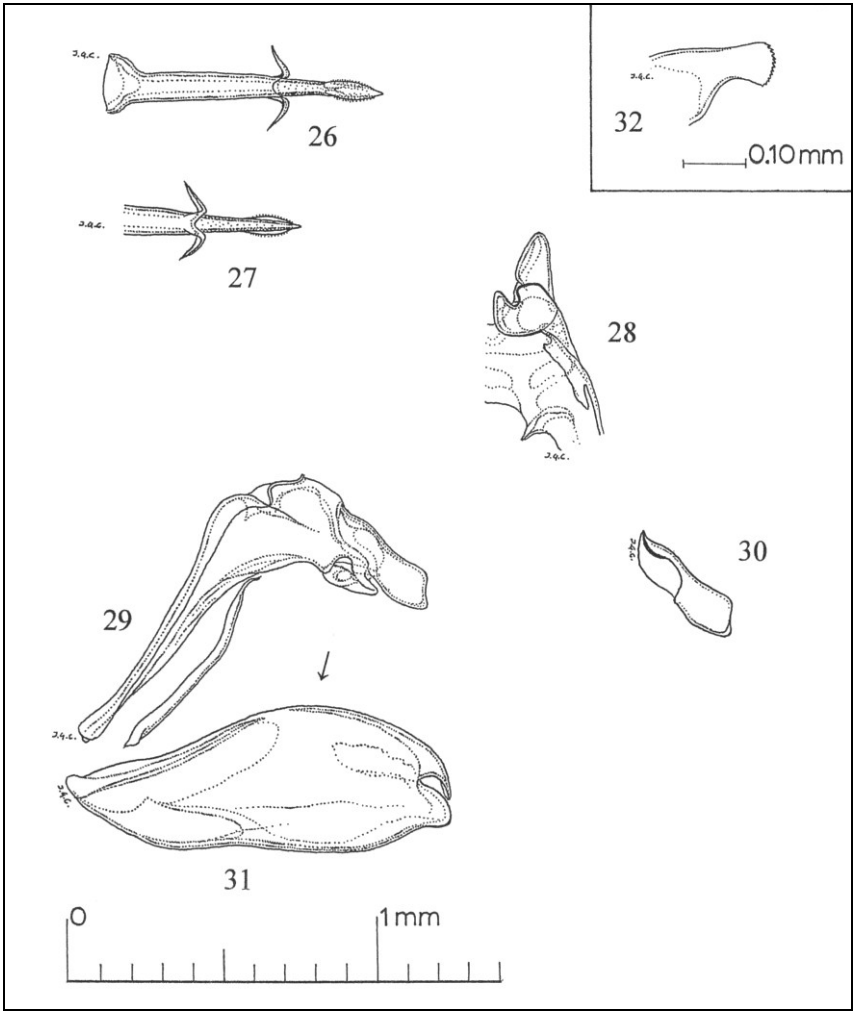

**Figs. 1–7**. Male genitalia components of *Icaricia lupini*, USA, California, Alpine County, Carson Pass, Highway Dam, 10.vii.1990. **1, 2**. Aedeagus. **1**.– Dorsal aspect. **2**.– Ventral aspect of distal half. **3**.– Ventral aspect of right half of tegumen together with right labis and falx. **4**.– Left side aspect of armature with valvae and aedeagus removed. **5**.– Side aspect of inner face of right labis. **6, 7**. Left valva. **6**.– Side aspect of outer face. **7**.– Flat aspect of dorso-distal element.



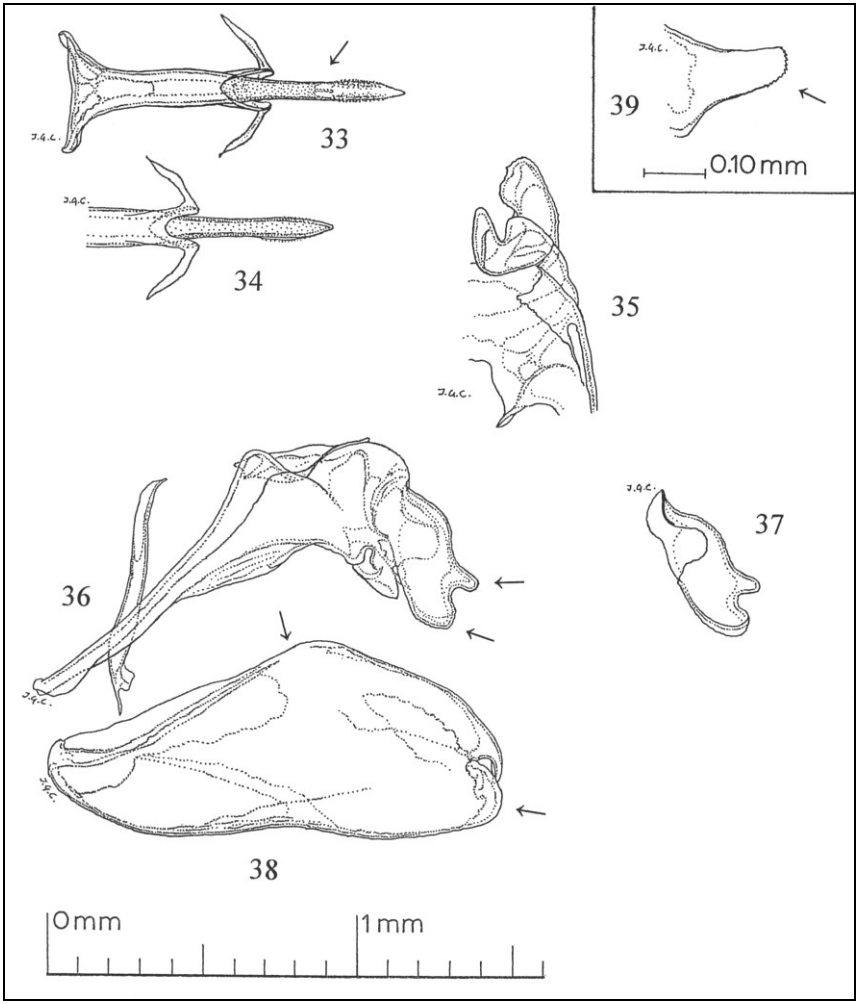

**Figs. 8–14**. Male genitalia components of *Icaricia acmon*, USA, California, Napa County, Quail Ridge Reserve, 14 miles SW of Winters, 5800ft, 24.v.1995. **8, 9**. Aedeagus. **8**.– Dorsal aspect. **9**.– Ventral aspect of distal half. **10**.– Ventral aspect of right half of tegumen together with right labis and falx. **11**.– Left side aspect of armature with valvae and aedeagus removed. **12**.– Side aspect of inner face of right labis. **13, 14**. Left valva. **13**.– Side aspect of outer face. **14**.– Flat aspect of dorso-distal element.




**Figs. 15–25**. Labides of *Icaricia* from USA, California. **15–23**. Side aspect of outer face of left labis. **24, 25**. Dorsal aspect of both labides (showing clefts of equal depth for both *I. lupini* and *I. acmon*). **15–20, 24**. *I. lupini*. **15**.– Glenn County, Snow Basin, FH 7, 33 miles from start, 9.vii.1996 (originally misidentified as I. acmon). **16, 17**. Alpine County, Woods Lake. **16**.– 2 miles S of Highway 88, 10.vii.1990. **17**.– 1 mile S of Highway 88, 9.viii.1991. **18**.– Toulumne County, Sonora Pass, Highway 108, 14.vii.1991. **19**.– Sierra County, Dog Valley Area, 6-7 miles SW of Border Town, 13.vi.1991. **20, 24**. (Same specimen, originally misidentified as *I. acmon*). Glenn County, Sage Ridge, 6700ft, 19.vi.2002. **21–23, 25**. *I. acmon*. **21**.– Yolo County, Willow Slough Bypass, 25 miles N of Davies, Road 102, 27.x.1994. **22, 25**. (Same specimen). Plumas County, Queen Lily Campground, 2500ft, 20.v.2003. **23**.– Colusa County, Goat Mountain road, 1300ft, 27.v.2003.




**Figs. 26–32**. Male genitalia components of *Icaricia neurona*, USA, California, Ventura County, SW of Lockwood Valley, Pine Springs Campgrounds, 5800ft, 15.vi.1993. **26, 27**. Aedeagus. **26**.– Dorsal aspect. **27**.– Ventral aspect of distal half. **28**.– Ventral aspect of right half of tegumen together with right labis and falx. **29**.– Left side aspect of armature with valvae and aedeagus removed. **30**.– Side aspect of inner face of right labis. **31, 32**. Left valva. **31**.– Side aspect of outer face. **32**.– Flat aspect of dorso-distal element.




**Figs. 33–39**. Male genitalia components of *Icaricia shasta*, USA, California, Alpine County, Woods Lake, 1 mile S of Highway 88, 9.viii.1991. **33, 34**. Aedeagus. **33**.– Dorsal aspect. **34**.– Ventral aspect of distal half. **35**.– Ventral aspect of right half of tegumen together with right labis and falx. **36**.– Left side aspect of armature with valvae and aedeagus removed. **37**.– Side aspect of inner face of right labis. **38, 39**. Left valva. **38**.– Side aspect of outer face. **39**.– Flat aspect of dorso-distal element.

## Male genitalia of *I. lupini*

Dorso-distal process of valva fan shaped, distally wide, and bearing minute teeth; ventro-distal process rounded and toothless; inner face of valva without the pronounced longitudinal fold present in most Polyommatiti. **Labides large, with pronounced mid-dorsal triangular prominence**, and tapering distally to a rounded point. Falces wide, short and distally blunted. Post-zonal part of aedeagus shorter than pre-zonal part (Figs. 1–7, 15–20, 24).

## Male genitalia of *I. acmon*

As in *I. lupini*, but **labides considerably smaller, being about half as wide as in *I. lupini*, and having shorter dorsal prominence placed closer to distal end**. (Figs. 8–14, 21–23, 25).

## The male genitalia of the other members of the group

***Icaricia neurona*** (Skinner, 1892)

Genitalia of this morphologically different butterfly very similar to those of *I. acmon*, but **overall smaller, and with shorter, less elongate valva**. It is interesting to note that the morphologically different *I. acmon* and *I. neurona* have closer affinities in their male genitalia than do the morphologically similar *I. lupini* and *I. acmon* (Figs. 26–32).

***Icaricia shasta*** (W. H. Edwards, 1862)

Genitalia differ from those of other members of group as follows: **valva wider, with heavier ventro-distal process; dorso-distal process not fan shaped**, but instead **with parallel dorsal and ventral edges, ending in narrow, rounded distal tip**, furnished with minute teeth. Labides with less tapering distal end and with **pronounced dorsal prominence in form of blunt spine. Post-zonal part of aedeagus about equal in length to pre-zonal part**. This species is structurally the most differentiated in the group (Figs. 33–39).

## Acknowledgments

I wish to express all my thanks and gratitude to Greg Kareofelas for providing the totality of the specimens used in this endeavour, and for giving me invaluable information on certain nomenclatural issues and practices concerning N American butterflies.

## References

Emmel, T. C. & Emmel, J. F. 1973. *The Butterflies of Southern California*. — Anderson, Ritchie and Simon, Los Angeles, 148 pp.

Howe, W. H. 1975. *The Butterflies of North America*. — Doubleday, New York, 633 pp.

Opler, P. & Wright, A. B. 1999. *A Field Guide to Western Butterflies*. — Houghton Miflin, Boston, 540 pp.

Scott, J. A., 1986. *The Butterflies of North America*. – Stanford University Press, Stanford, 583 pp.

Tilden, J. W. & Smith, A. C. 1986. *A Field Guide to Western Butterflies*. — Houghton Miflin, Boston, 370 pp.