Nota lepid. 12 (3) : 175-178 : 30.XI.1989 ISSN 0342-7536

SEM morphological observations of *Papilio hospiton* GN. 1839 and *P. machaon* L. 1758 eggs (Lepidoptera : Papilionidae)

Mario MARINI and Massimo TRENTINI

Department of Biology, University of Bologna, Bologna, Italy.
Correspondence : Dr. Mario Marini, University of Bologna, Department of Biology, via S. Giacomo 9, I-40126 Bologna, Italy.

Riassunto

In questa nota viene esaminata la morfologia delle uova di popolazioni sarde di *Papilio hospiton* e *Papilio machaon*. Oltre alle differenze di dimensioni esistono significative differenze nelle sculture dell'area micropilare. In particolare *P. hospiton* presenta un numero più elevato di poligoni, un minor diametro della fossetta micropilare ed un numero inferiore di micropili.

Summary

The chorionic morphology of the eggs of *P. hospiton* and *P. machaon* from Sardinia is described ; the micropyle area morphology presents significant differences between the two species.

Introduction

There has always been a certain systematic and zoogeographic interest in *P. hospiton*, a species indigenous to Sardinia and Corsica, as well as in the related holarctic *P. machaon* (ZANGHERI, 1975). In addition, *P. hospiton* also resembles in striking ways *P. machaon saharae* OBTH., a subspecies of Saharan-Arabian distribution, sharing with it both several ecological characteristics, e.g. arid mountain habitat and *Ferula communis* L. as foodplant, and an appearance even closer in likeness than that to *P. machaon*'s Sardinian populations (MEERMAN & BOOMSMA, 1986 ; CLARKE & LARSEN, 1986).

A number of publications (VERITY, 1940-1953 ; FIORI, 1964 ; MARINI, 1983) have dealt mainly with the ecological aspects of *P. hospiton*'s biological cycle and larva and adult morphology, especially in comparison to the sympatric *P. machaon* with which it sometimes cross-breeds in the wild (STROBINO, 1970). Recently, on the basis of karyological observations of mature larvae

and newly formed pupae, *P. hospiton*'s chromosome number has been determined (Trentini & Marini, 1988). To our knowledge there is to date nothing specific in the literature on egg morphology.

Eggs of the Sardinian *P. hospiton* and *P. machaon* were studied by scanning electron microscope (SEM) and their descriptive characteristics are reported in the present note.

Materials and methods

About 200 eggs from 20 females were studied : 12 *P. hospiton* and 8 *P. machaon* donors. Part of the eggs were collected in the field from foodplants (*Ferula communis* L. for *P. hospiton* and *Foeniculum vulgare* Hill. for *P. machaon*) during May, the only period in which *P. hospiton* lays its eggs. The collection sites for *P. hospiton* were in northern (M. Limbara), central (Gennargentu Massif) and southern (Sarrabus-Bosco dei Sette Fratelli) Sardinia, and along the eastern (Olbia and Arbatax-Tortoli) and western (Oristano) coasts (only seldom in Gennargentu) for *P. machaon*, were they were relatively easy to find and plentiful.

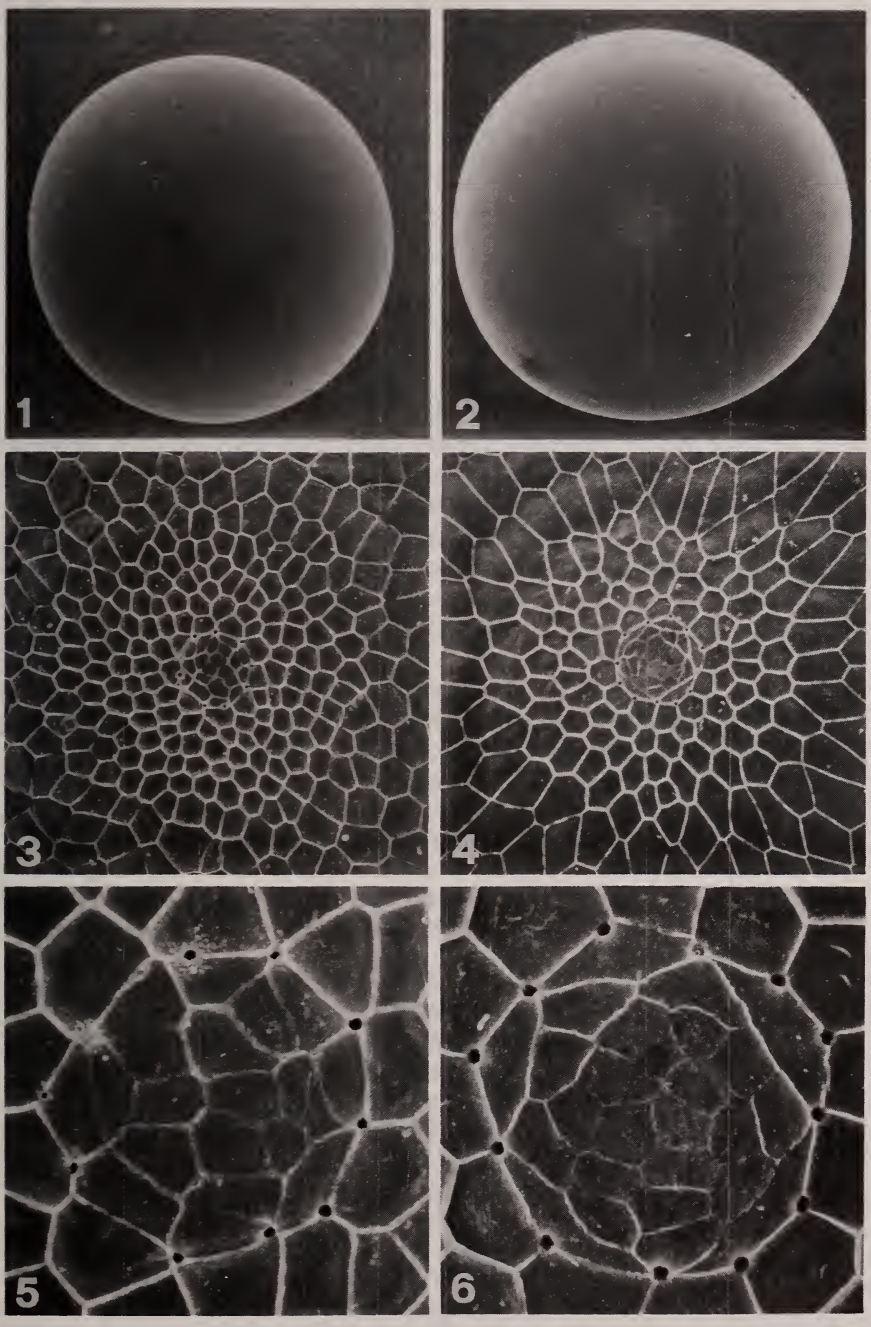
Other eggs were laid in the laboratory by females caught in the field. This technique was far more viable with *P. machaon* than with *P. hospiton* females, which proved less prolific because of dependence on determining factors of light, temperature, exposure, and vegetative conditions of the foodplant. The remaining eggs were extracted from abdomens of females either recently or previously captured (Marini & Trentini, 1988).

All the studied eggs were washed and put in alcohol 80, dehydrated, mounted on metal stub with conductive paint, gold-coated and observed by a Philips 515 SEM.

Results and discussion

The eggs of *P. hospiton* and *P. machaon* are subspherical, featuring a flat posterior pole for adhesion to the foodplant. The diameter of the *P. hospiton* egg is about 1.0 mm, that of *P. machaon* is 1.1 mm (Figs. 1, 2). The micropyle area of the two species is clearly distinct from the rest of the chorion owing to the reticulate structure formed by its "cells" (Salkeld, 1973). The latter, shaped like irregular polygons, are small around the central pit of the micropylar area, gradually becoming larger as they move away from it until their outlines fade and then vanish beyond the micropyle area (Figs. 3, 4).

The micropyle pit, i.e. the roughly circular area bounded by the micropyles, is riddled with ridges, more or less evident, that divide the surface into



Figs.1, 3, 5. *P. hospiton* egg. Fig. 2, 4, 6 : *P. machaon* egg. Figs. 1, 2 : eggs (50 ×). Figs. 3, 4 : Micropyle areas (280 ×). Fig. 5, 6 : Micropyle pits (1050 ×).

numerous small irregular polygons. Its dimensions are rather variable but the differences between the two species are significant (Tab. 1). The number of micropyles in *P. hospiton* ranges from 7 to 12 and in *P. machaon* from 8 to 15 (Figs. 5, 6).

Table 1

	Avg. "cells" no.	Avg. diameter of micropyle pits
Papilio hospiton	101.2 + 3.7	u 40.4 + 0.09
Papilio machaon	56.1 + 2.8	u 45.8 + 0.06

These findings show that there are significant differences between the eggs of *P. hospiton* and *P. machaon*, thereby confirming the diagnostic value of micropyle area morphology in taxonomy, as already observed in other species (SALKELD, 1973). It will be particularly interesting to extend this type of study to *P. machaon saharae* and other natural and artificial hybrids among these three taxa.

References

CLARKE C. A. & LARSEN T. B., 1986. Speciation problems in the *Papilio machaon* group of butterflies (Lepidoptera : Papilionidae). *Syst. Ent.* 11 : 175-181.

FIORI G., 1964. *Papilio hospiton. Natura e Montagna.* 4 : 192-194.

MARINI M., 1983. *Papilio hospiton. Natura e Montagna.* 30 (3).

MARINI M., 1986. Osservazioni su *Dendrolimus pini* (L.) e descrizione di una nuova ssp. dell'Italia meridionale (Lepidoptera Lasiocampidae). *Boll. Soc. Ent. Ital.* 118 (1-3) : 20-24.

MARINI M. & TRENTINI M., 1988. *Pachypasa otus* (DRURY) : aspetti di oomorfologia e cariologia (Lepidoptera Lasiocampidae). *Boll. Soc. Ent. Ital.* 120 (3) : 223-226.

MEERMAN J. & BOOMSMA T., 1986. Der wenig bekannte Schwalbenschwanz aus Nord-Jemen, *Papilio saharae rathjensi* WARNECKE 1932. Freilandbeobachtungen und Zucht (Lepidoptera : Papilionidae). *Ent. Z.* 96 (13) : 177-182.

SALKELD E. H., 1973. The chorionic architecture and shell structure of *Amathes c-nigrum* (Lepidoptera : Noctuidae). *Can. Ent.* 105 (1) : 1-10.

STROBINO R., 1970. Observations concernant *Papilio hospiton* GÉNÉ en Corse, et ses hybrides naturels avec *P. machaon* L. *Entomops* 19 : 103-112.

TRENTINI M. & MARINI M., 1988. Osservazioni sui cromosomi di *Papilio hospiton* GN. (Lepidoptera Papilionidae). *Boll. Soc. Ent. Ital.* 120 (1) : 53-55.

VERITY R., 1940-1953. *Le farfalle diurne d'Italia.* Marzocco ed., Firenze.

ZANGHERI S., 1975. La Lepidotterofauna della Sardegna. *Atti X. Congr. Naz. Ital. Ent.* pp. 29-45.