Belg. J. Zool. - Volume 126 (1996) - issue 1 - pages 79-81 - Brussels 1996

SHORT NOTE

FIRST BELGIAN RECORD OF *COTESIA VESTALIS* (HALIDAY, 1834) (HYMENOPTERA, BRACONIDAE), PARASITE OF PROCLOSSIANA EUNOMIA (ESPER, 1799) (LEPIDOPTERA, NYMPHALIDAE), NEW HOST SPECIES

MICHEL WAEYENBERGH AND MICHEL BAGUETTE

Unité d'Écologie et de Biogéographie, Université catholique de Louvain,
Place Croix du Sud, 5, B-1348 Louvain-la-Neuve (Belgium)

Key-words : parasitoid, parasitism rate, *Cotesia vestalis*, *Proclossiana eunomia*, *Polygonum bistorta.*

The genus *Cotesia* Cameron, 1891 (Hymenoptera, Braconidae) was redefined by MASON (1), and contains the species of the *glomeratus*-group as defined by NIXON (2, 3), formely a part of the huge genus *Apanteles* Foerster, 1862. *Cotesia vestalis* (HALIDAY, 1834) appears to be the prioritary synonym of *C. cynthiae* (Nixon, 1974) (Van Achterberg, pers comm.). *C. vestalis* is only known from the Alps and Central Europe (Switzerland, Austria, Hungary and Bulgaria) (2, 3). *C. vestalis* , like many braconids, is an endoparasitoid species, larvae developing in caterpillars. Its only known host is the butterfly *Hypodryas cynthia* (Denis & Schiffermüller, 1775) (Lepidoptera, Nymphalidae) (2). In this note we report on the first observation of *C. vestalis* in Belgium, on a previously unknown host species, the bog fritillary, *Proclossiana eunomia* (Esper, 1799) and present some data on the effect of parasite larvae on their host.

We collected 112 last-instar caterpillars of *P. eunomia* from the Pisserotte peat bog (50°13'N, 5°48'E) from 26 May to 2 June 1995. These caterpillars were reared under various conditions. Caterpillars were grown in individual plastic bottles. They were fed every two days with fresh leaves of *Polygonum bistorta*, the only host plant in the study area. Caterpillars were weighed at each food replacement on a Sauter type MDT 160/0001 balance, 0.001 g precision.

During rearing of *P. eunomia* caterpillars, we recorded the presence of *C. vestalis.* Of the 112, 103 caterpillars (92%) were parasitized. The mean number of parasite cocoons per host caterpillar was 35.4 (SD=16.3). Larvae within the same caterpillar left their host synchronously. Caterpillar behaviour was strongly affected by this event: in all our observations, caterpillars stood motionless during the emergence of parasite larvae (Fig. 1, left). Larvae emerged along the whole body of the caterpillar and immediately spun individual bright yellow cocoons, forming a muff around the caterpillar. After larval emergence, caterpillars moved away from this structure (Fig. 1, right). The caterpillars never resumed feeding and in every case died a few days later.

The departure of parasite larvae strongly decreased the weight of the caterpillar by about 50%: the mean weight loss was 119 mg (SD=48 mg, n=63). This loss remained constant what-

ever the developmental conditions of the caterpillar. However, parasite larvae developmental time strongly depended on rearing conditions ($F_{3,76}$=46.9; P=0.0001) and is positively related to temperature in controlled conditions ($F_{1,23}$=23.6; P=0.0001) (Table 1).

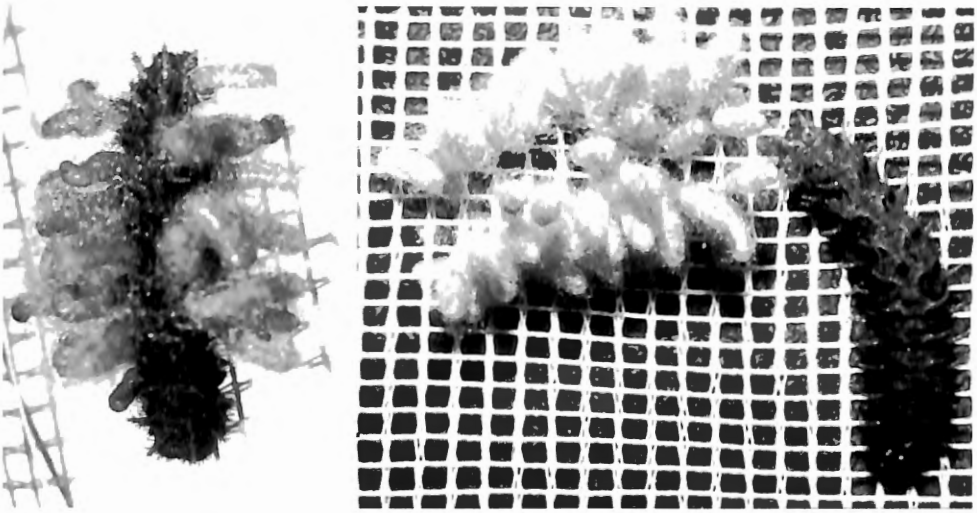

Fig. 1. – Left: emergence of *C. vestalis* larvae from the body of *P. eunomia* caterpillar. (1cm = 0.25 Lm) – Right: *P. eunomia* caterpillar escaping from the muff formed by *C. vestalis* cocoons. (1cm = 0.3 Lm).

TABLE 1

Mean duration of the development of P. eunomia *caterpillars before emergence of the parasite larvae at different temperature conditions (time between the collection in the field and the emergence of parasite larvae) Outside = at the back door of the laboratory, n = number of caterpillars.*

	Temperature conditions (°C ± SD)	*n*	*duration (days ± SD)*
controlled A	23.5 ± 1.8	11	5.9 ± 1.8
controlled B	28.8 ± 1.4	14	3.0 ± 1.2
room	15.7 ± 1.8	5	6.6 ± 4.3
outside	16.1 ± 5.2	50	17.7 ± 5.8

Parasitism affected the developmental time of the host: 4 of the 5 healthy caterpillars pupated before the first emergence of the parasite larvae in the same temperature conditions. The 5 uninfected caterpillars pupated successfully (1 in controlled conditions B and

4 outside). The 4 remaining larvae died without being dissected and were probably parasitized which can raise the parasitism rate up to 95%.

The distribution of *C. vestalis* shows a high disjunction between the Belgian and alpine/medio-European populations. This pattern results probably more from a lack of data than from a true biogeographical process. On the other hand, the host species *Proclossiana eunomia* has a boreo-montane distribution, while *Hypodryas cynthia* is an alpine species, but both host species occur in Bulgaria (4).

Professor Ph. Lebrun showed constant support in this research. We want to thank Dominique Maas, Isabelle Convié and Olivier Raspé for the contribution to the collection of *P. eunomia* larvae and I. Convié, D. Maas and Gabriel Nève for their help during the rearings. We are grateful to Dr P. Dessart of the Institut Royal des Sciences Naturelles de Belgique and to Dr J. Papp of the Hungarian Natural History Museum for the identification of *C. vestalis*.

(*Received 24 January 1996*)

REFERENCES

1. MASON, W.R.M. (1981) - The polyphyletic nature of *Apanteles* Foerster (Hymenoptera: Braconidae): a phylogeny and reclassification of Microgastrinae. *Mem. ent. Soc. Can.*, **115**: 1-147.
2. NIXON, G.E.J. (1974) - A revision of the north-western European species of the *glomeratus*-group of *Apanteles* Förster (Hymenoptera, Braconidae) . *Bull. ent. Res.*, **64**: 453-524.
3. PAPP, J. (1988) - Contributions to the Braconid fauna of Hungary, VIII. Microgastrinae (Hymenoptera: Braconidae). *Fol. ent. hung.*, **59**: 167-184.
4. ABADJIEV, S. (1995) - *Butterflies of Bulgaria. Volume 3. Nymphalidae : Apaturinae & Nymphalinae*. Abadjiev, Sofia: 159 pp.