

Observation of high degree stylopization of European paper wasp – *Polistes dominula* (Christ, 1791) in Hungary

LÁSZLÓ MÓCZÁR & GYÖRGY SZIRÁKI

Hungarian Natural History Museum Budapest Baross u. 13., Hungary,
e-mail: sziraki@zoo.zoo.nhmus.hu

MÓCZÁR, L. & SZIRÁKI, GY.: *Observation of high degree stylopization of European paper wasp – Polistes dominula (Christ, 1791) in Hungary.*

Abstract: Although the paper wasp *Polistes dominula* is a well known host of *Xenos vesparum* in many European countries, in Hungary it was observed in 1993 at first occasion. The documentation of this observation – with illustration by photographs – is performed in present paper. 5 of the 30 examined wasps were stylopized, and these 5 exemplars were parasitized by 18 strepsipteran specimens. Some details of behaviour of the parasite and host insect are discussed also.

Keywords: *Polistes dominula*, Hymenoptera, *Xenos vesparum*, Strepsiptera, stylopization, Hungary, behaviour.

Occurrence of about 50 strepsipteran species is probable in Hungary, however, hitherto presence of only 32 described species belonging to 12 genera is confirmed, which were found in 4 Homoptera and cca. 60 Hymenoptera host insects (KINZELBACH & KASZAB 1977).

As the capture of the minute, short-living, winged male imagines is possible only exceptionally, data about the occurrence and geographical distribution of this insect group mostly are obtained in connection of the collecting and identification of the host insects, after the picking of the stylopized specimens. (The stylopized insects usually are recognizable due to the puparia visible between the body segments of the host insect.) Subsequently, the determination of strepsipterans usually is carried out on the basis of the females (actually neotenic larvae) remaining in the host, or examination of male puparia.

Since the strepsipteran hosts mostly belong to wasps, material of the Strepsiptera collections largely is accumulated due to activity of hymenopterologists; in the case of the Hungarian Natural History Museum (HNHM) owing to Miklós Móczár, Erzsébet Bajári and Gábor Sthol, and the first author of present paper had also possibility to contribute to creation of this collection.

In Hungary the intensive research of Strepsiptera actually owing to Vilmos Székessy who worked on this insect order from 1954 until 1969 (e. g.: SZÉKESSY 1954, 1959a, 1959b, 1965, 1969). Setting up of the strepsipteran collection of HNHM was carried out



Fig. 1: Flying male of *Xenos vesparum*



Fig. 2: Male of *Xenos vesparum* on hypsophyl of field eryngo



Fig. 3: Male of *Xenos vesparum* arrives to the flower of a field eryngo



Fig. 4: *Polistes dominula* male with puparia of seven Strepsiptera specimens



Fig. 5: A male puparium of *Xenos vesparum* in third abdominal segment of a *Polistes dominula* female just before the emergence, and remainings of two others after the emergence



Fig. 6: Puparia of *Xenos vesparum* in second and third abdominal segment of a female *Polistes dominula*

also in these years. Later, in course of the surveying of the fauna of Hungarian national parks, this insect group – because the absence of specialists – have got only small attention, and only a single paper referring to this field (SZÉL 1987) was published.

On 18th August 1993 thirty living specimens of European paper wasp – *Polistes dominula* (Christ, 1791) were collected by the first author from field eryngo – *Eryngium campestre* Linnaeus, 1753 – on the inhabited territory of Zamárdi (a settlement at the southern shore of the lake Balaton) in a vacant lot. Five specimens (17%) of the captured wasps were parasitized by *Xenos vesparum* Rossi, 1793, which percentage is unusually high.

In course of the working up of the Strepsiptera material of HHNM it was found that in 80% of the 504 stylopized insect specimens only a single parasite developed, while the maximal number was 7 (in one occasion only) (SZÉKESSY 1959b). On the contrary, 18 (3.6 in average) strepsipteran puparia were observed in the 5 stylopized wasps collected at Zamárdi, and in the case of the most infected wasp 7 puparia was detected also, which is equal to the maximal strepsipteran number observed in Hungary. All but one of the observed parasites were situated on the dorsal side of the abdomen of the wasps, most frequently in the third, rarely in second, fourth, fifth, or sixth segments, as below. Male, segment 3: 4, segment 4: 1, segment 5: 1, segment 6: 1, (Fig. 4); female, segment 3: 2, segment 4: 1; female, segment 3: 3 (Fig. 5); female: segment 2: 1, segment 3: 2 (Fig. 6); female: segment 4: 1, segment 5: 1.

The vacant lot, where the collecting was done, has been placed at the southern side of the road directing to the town Siófok, at the eastern part of the settlement, with many flowering ornamental and natural plants, where small family houses with (uninhabited) loft are the typical buildings. These circumstances are optimal ones for growing up stable populations of the paper wasps and their strepsipteran parasites as well.

It is worth to mention that although *Polistes dominula* is a well known host of the steripteran *Xenos vesparum* in many European countries, hitherto it (together the supporting data of the collecting site) was not reported in a scientific publication from Hungary.

The captured wasps were taken in separate vials, and after their investigation the five stylopized specimens into a glass isolator, together with a field eryngo plant. The observation of flight activity of host and of male strepsipterans were possible in this manner. The insects – including the flying male parasites – were photographed by conventional camera (NIKON + Medical-Nikkor Auto 1:5.6, f = 200 + Macro Speedlight SB-21). A few of these photographs were presented in popular form on CD ROOM (MÓCZÁR 2003a) and in printed version (MÓCZÁR 2003b). (However, the latter with a technical fault, and with insufficient denomination of the author.)

Regarding the behaviour of the stylopized host, it is known that its movement activity is lessening considerably. This decrease of flight ability was observed in a clear cut form in the case of the most seriously parasitized wasp specimen.

As the flying behaviour of the newly emerged males regards, these insects flew to the field eryngo plant placed in the isolator after a short foraging (Figs 1-3). This behavioral pattern may be triggered by the pheromone released by the females which were in the wasp(s) visited the given plant previously, and/or by visual stimulus of the (flowering) plant.

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