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**NESTING OF THE SPHECID WASP *CHILOSPHEX ARGYRIUS*
(BRULLÉ) IN SLOVENIA
(HYMENOPTERA: SPHECIDAE)**

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Abstract - The nest and larval development of the Mediterranean sphecid wasp *Chilosphex argyrius* (Brullé) are described. Observations in the Karst in Slovenia are compared to the nesting behaviour of the same species in France. The Slovenian specimen observed used a different building material for the nest, dry pine needles instead of dried herbaeous plant stalks, and laid an egg on each prey specimen in the nest.

Izvleček - GNEZDENJE OSE GREBAČE VRSTE *CHILOSPHEX ARGYRIUS* (BRULLÉ) V SLOVENIJI (HYMENOPTERA: SPHECIDAE)

Opisana sta gnezdo in larvalni razvoj mediteranske ose grebače vrste *Chilosphex argyrius* (Brullé). Opazovanja na Krasu v Sloveniji so primerjana z gnezditvenim vedenjem iste vrste v Franciji. Opazovani slovenski primerek je uporabljal drugačen gradbeni material za gnezdo, namesto suhih rastlinskih stebel suhe borove iglice, in legel jajčeca na vsak primerek plena v gnezdu.

Introduction

Chilosphex argyrius (Brullé, 1832) is a northern Mediterranean species, ranging from Spain to Israel (Pagliano, 1985). Its nesting behaviour is known only from the observations

made by L. Berland in France (Berland, 1958). He reported that females of this sphecid wasp nest in crevices between stones in a stone wall. The nest is made of dried herbaceous plant stalks collected by the female from the surroundings. The nest contains just a single cell to which the female brings three to four paralyzed bush-crickets (Tettigoniidae) of the genera *Pholidoptera* or *Metrioptera*. The egg is laid on one of them on the side of the abdomen, just above the hind coxae. In a few days the larva hatches. Its growth is complete in about 8 days, when it spins a cocoon in which it overwinters. The final development to the adult stage proceeds in the following summer.

Chilosphex argyrius is quite a common species in the Kras (Karst), the karstic region in the sub-Mediterranean part of Slovenia, along the Italian border. As the stones from the rocky pastures are collected by farmers into the numerous stone walls and piles, the nesting opportunities for the species are very good here. In the summer of 1996, I had the opportunity to observe the nesting habits and the larval development of this species. I was interested to see if there were any differences in the nesting habits of this species in Slovenia compared to the observations made in France.

Observations

Already on July 9th and 16th, 1989 a *Chilosphex argyrius* female had been observed and photographed with its prey near the village Brje near Komen in the Karst (UTM: VL07). It dragged its prey, a *Pholidoptera* or *Metrioptera* bush-cricket, to its nest, which was not found. The prey was held by the shortened antennae with mandibles and pulled over ground. It was not possible for the wasp to fly with its heavy prey.

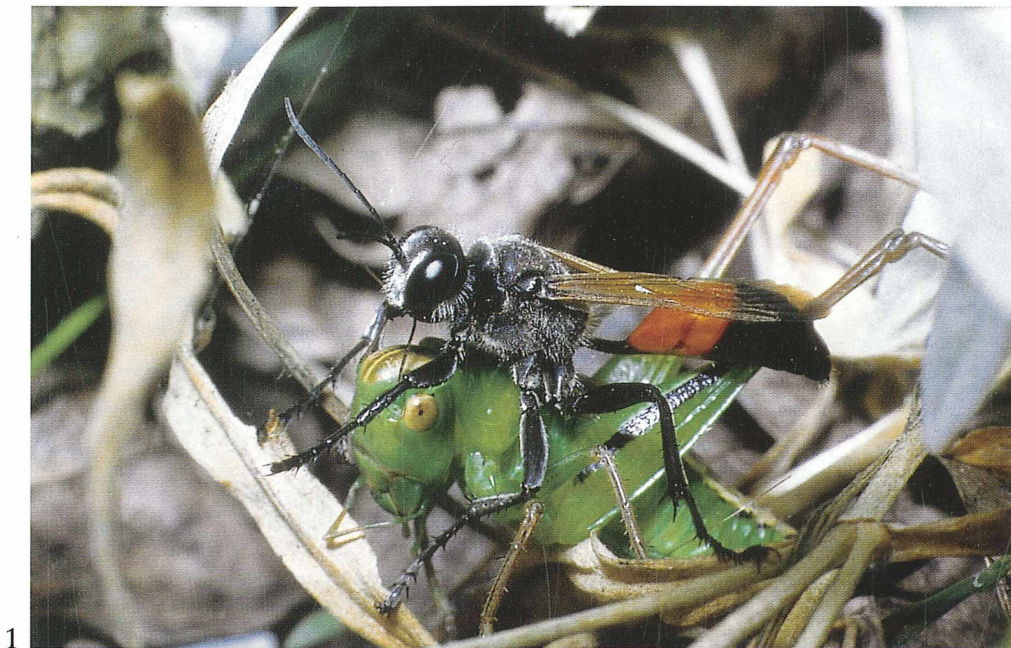
On June 29th, 1996, I noticed a female wasp *Chilosphex argyrius* under a stone in a pasture, with a dry pine needle in its mandibles. After it flew away, I noticed many pine needles in a crevice under this stone, positioned on a bigger stone in the rocky ground. Although I suspected this pile of needles to be the nest of the wasp, I didn't open it. I saw the wasp later, feeding on an inflorescence of an *Allium* species.

A week later, on July 6th, I visited the same place again. The pile of pine needles under the stone was much larger and I took off the stone to inspect the contents of the nest. Between the needles, two big, adult bush-crickets had been laid. Both were *Decticus verrucivorus* (Linnaeus, 1758) males. On top of each, on the side above the hind coxae, an egg had been laid which was still present on one. On the other, a young larva had already hatched. I carefully put the stone back over the nest. In the vicinity, I had seen a *Chilosphex argyrius* male, patrolling over a stone pile, resting on it for short periods.

I returned on July 13th. I found two big wasp larvae of approximately the same size with their heads hidden inside the prey. After disturbance, they moved their abdomens. In the vicinity, the male was still patrolling the stone pile and I caught it to prove its identity.

On July 21st, both larvae had already spun their cocoons. Of the prey, only the wings, legs and strongly chitinized pronotum plates were left.

Later, the accessibility of the nest, which had enabled me to inspect it, proved to be fatal to its occupants. When cows grazed the pasture, they overturned the stone covering the nest. The larvae in the exposed cocoons were consumed by some hole-boring animals.



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Fig. 1: *Chilosphex argyrius* female with its prey, a *Metrioptera* bush-cricket. Brje near Komen, 9.7.1989.

Fig. 2: Intact finished nest of *Chilosphex argyrius* under a stone. Brje near Komen, 6.7.1996.

Fig. 3: Opened nest with two *Decticus verrucivorus* males among pine needles.



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Fig. 4: An egg attached to the prey above the hind coxa.

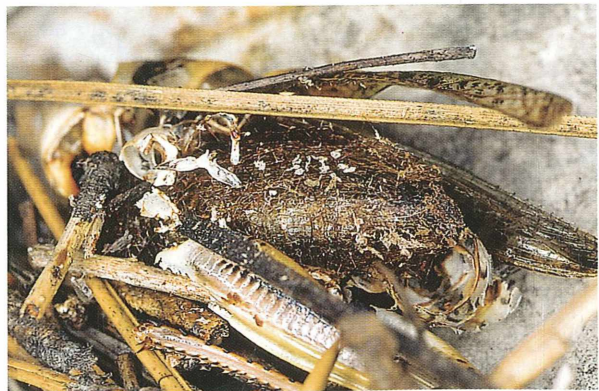
Fig. 5: A recently hatched larva on the other prey specimen.

Fig. 6: A week old larva eating its prey, 13.7.1996.

Fig. 7: Finished cocoon among the remains of the prey, 21.7.1996.



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Discussion

In comparison to the observations by L. Berland in France, some differences are evident in the behaviour of the *Chilosphex argyrius* female observed in Slovenia. It uses a different building material for the nest: dried pine needles instead of dried herbaceous plant stalks. But this is probably just a matter of availability of the kind of dried plant material in the vicinity of the nest. Both building materials are similar from the wasp's point of view, as both are found on the ground, have an oblong shape, and can be transported to the nest in the same manner.

In the nest observed, the prey is also slightly different. It is always a tettigoniid bush-cricket, but in this case a different species, *Decticus verrucivorus*. This is probably also a matter of availability, as the same wasp species observed in 1989 just a few hundred meters away, hunted *Pholidoptera* and *Metrioptera* species, just as in France.

More important is the fact that each prey specimen in the nest had its own wasp egg attached. Berland observed only one egg in a nest in which three or four bush-crickets were deposited. The cause for this behavioural difference could be the size of the prey as *Decticus* specimens are larger than *Pholidoptera* and *Metrioptera* specimens. It is possible that they suffice for the whole development of the larva, while the *Pholidoptera* or *Metrioptera* specimens do not. The other possibility is that Berland did not notice eggs and larvae on other prey specimens in the nest.

The nest observed was about half of its size when seen for the first time in comparison to its final extent. When I opened it a week later, one larva had already hatched, while the other bush-cricket still had only an attached egg. We can conclude that only one prey specimen had been deposited first, an egg laid on it, and the nest closed with pine needles. Then all was repeated with the second prey. The number of prey specimens in the nest probably depends on the largeness of the crevice where it is built.

More observations are needed to conclude if the behavioural differences between the French and Slovenian specimens are only due to plasticity of behaviour in different habitats, or whether some genetically determined differences do exist.

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