

PALPARES LIBELLULOIDES (LINNAEUS, 1764) IN THE NORTHWESTERN PART OF THE BALKAN PENINSULA (NEUROPTERA: MYRMELEONTIDAE)

Dušan DEVETAK

Ph.D., Department of Biology, University of Maribor, SI-2000 Maribor, Koroška 160
dr. biol. znanosti, Oddelek za biologijo, Univerza v Mariboru, SI-2000 Maribor, Koroška 160

ABSTRACT

Results of observation of the European Palparini species, *Palpares libelluloides* (Linnaeus), are presented. Distribution of the ant-lion in the northwestern part of the Balkan Peninsula and some information concerning habitat characteristics and feeding habits are described and figured.

Key words: *Palpares*, Neuroptera, distribution, Balkan, feeding
Ključne besede: *Palpares*, Neuroptera, razširjenost, Balkan, prehranjevanje

INTRODUCTION

Ant-lions (Myrmeleontidae) comprise about 2,000 species (Aspöck *et al.*, 1980; Gepp and Hölzel, 1989). The tribe Palparini includes the largest and most striking ant-lions. The tribe is confined to the Afrotropical, Oriental and southern Palaearctic Regions. There are about 100 valid species in the tribe, but only one species occurs in Europe (Mansell, 1990).

The only European Palparini species, *Palpares libelluloides* (Linnaeus, 1764) (Fig. 1), is widely distributed in the Mediterranean reaching Iran and Caucasus (Aspöck *et al.*, 1980).

Predatory behaviour of the pit-building ant-lion larvae have been described from different aspects (for a review see Gepp & Hölzel, 1989) but information concerning adults is scarce. Knowledge about feeding habits of adults of 4 central European myrmeleontids has recently been reviewed by Stelzel and Gepp (1990).

The larvae live in sand without constructing pits (Gepp & Hölzel, 1989).

MATERIAL AND METHODS

The knowledge on the distribution is based on mate-

rial in the Natural History Museum, Belgrade (coll. Museum BG), Natural History Museum, Zagreb (coll. Museum ZG), Natural History Museum, Ljubljana (coll. Museum LJ), Insect Collection of the Slovene Academy of Sciences and Arts (coll. SAZU LJ) and D. Devetak's collection (Maribor). Insects are pinned or preserved in alcohol.

Activity of the insects was recorded in the field with a Sony video camera recorder CCD-TR750E. Adults (1 male and 4 females), preserved in 70% alcohol, were dissected and the digestive tract was carefully isolated. The masticated food remains suspended in alcohol were mounted on glass slides and examined microscopically.

RESULTS AND DISCUSSION

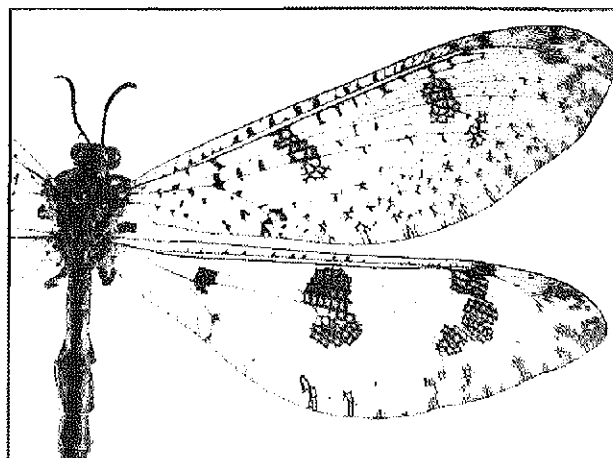
Distribution in the northwestern part of the Balkan Peninsula

Literature records (for a review see also Devetak, 1992):

Stein (1863): Split; Novak (1891): Hvar; Mocsáry (1899): Crikvenica; Galvagni (1902): Komiža; Klapálek (1899 and 1900): Hercegovina; Klapálek (1906): Senj;



Fig. 1: *Palpares libelluloides* (Linnaeus, 1764) (A) A male in resting position. (B) Right wings of a male. Fore wing length 59 mm.



Sl. 1: *Palpares libelluloides* (Linnaeus, 1764). (A) Samec med mirovanjem. (B) Desni krili samca. Dolžina sprednjega krila 59 mm.

Szilády (1912): Senj; Werner (1920): Split, o. Brač; Bol and Supetar-Nerežišća; Pongrácz (1923): Tropolja; Esben-Petersen (1925): Gruž; Dimitrova (1924) and Dimitrova (1925): Belasica, Gorničet (Gevgelija), Bogdanci; Capra (1945): Kopliku, Scutari (=Shkodër); Zelený (1964): Saranda.

Material examined (m, males; f, females):

Croatia:

Dubrovnik VI.1950 1 f, VIII.1950 1f coll. Museum ZG; Istra: Rt Kamenjak 1m 18.VII. 1986 1m leg. D. Devetak; 12.-20.VII.1996 4m 1f leg. M. & D. Devetak; o. Brač: Bol 12.VII.1987 2m 3f leg. D. Devetak; o. Brač; Murvica 12.VII.1990 1f leg. D. Devetak; o. Cres: Cres 16.VII.1982 1f leg. M. Jež; o. Cres: Miholjašćica 15.VII.1985 1m 6f leg. B. Odlak; o. Krk VIII.1949 2f coll. Museum ZG, 21.VI.1973 1m leg. I. Sivec; o. Krk: Punat 13.IV.1961 leg. V. & B. Bartol, coll. SAZU LJ; o. Lošinj: Čunski VII.1974 1m 2f leg. V. Furlan, 10.VII.1976 1m 1f leg. P. Tonkli, VII.1986 1f leg. V. Furlan; o. Molat 10.VI.1985 2m leg. V. Lesjak; o. Pag: Caska 6.VII.1960 1f coll. Museum ZG; o. Pag: Pag 15.VI.1979 1f leg. V. Lesjak; o. Rab 1972 1m leg. S. Vršić; o. Silba 1934 1f leg. J. Staudacher, coll. Museum LJ; o. Unije 29.VI.1963 1m 1f coll. Museum ZG; Pula 6.VI.1983 1f leg. B. Kmecl; Šibenik 14.VI.1983 1f leg. M. Pozar, 12.VII.1987 1f leg. V. Lesjak; Umag 4.VII.1985 1m leg. M. Sukić; Zadar 1.VII.1931 1f, 3.VII.1931 2f 2m leg. J. Staudacher, coll. SAZU LJ.

Yugoslavia:

Montenegro:

Budva VII.1972 1m leg. S. Vršić; Možura near Ulcinj (no other information on the label) coll. Museum BG; Podgorica (=Titograd) 27.VIII.1985 1f leg. A. Šentjirc; Skadarsko jezero: Virpazar 22.VII.1986 1m 2f; Ulcinj 20.VII.-10.VIII.1966 1f leg. J. Camelutti.

Vojvodina:

Deliblatska peščara 1982 1m coll. Museum BG.

Macedonia:

Baba planina: Magarevo 700-900m 22.VII.1988 2f leg. P. Jakšić; Dojransko jezero: Djopčeli 20.-23.VII.1975 2m 4f; Kavadarci: reka Raec 16.VII.1980 2m leg. P. Jakšić; Katlanovo 16.VII.1983 1m 1f leg. P. Jakšić; Ograzden: Novo Selo 24.VII.1983 4f leg. P. Jakšić; Veles: Topolka 19.VII.1983 2m 1f leg. P. Jakšić.

The collection sites in NW Balkan are shown in Fig. 2.

Feeding habits

The intestinal content indicates that the adult *P. libelluloides* are predators feeding on various insects. Legs with strong tibial spurs and strong mandibles enable them to feed on small arthropods, and they are able to consume even strongly sclerotized insects such as Coleoptera.

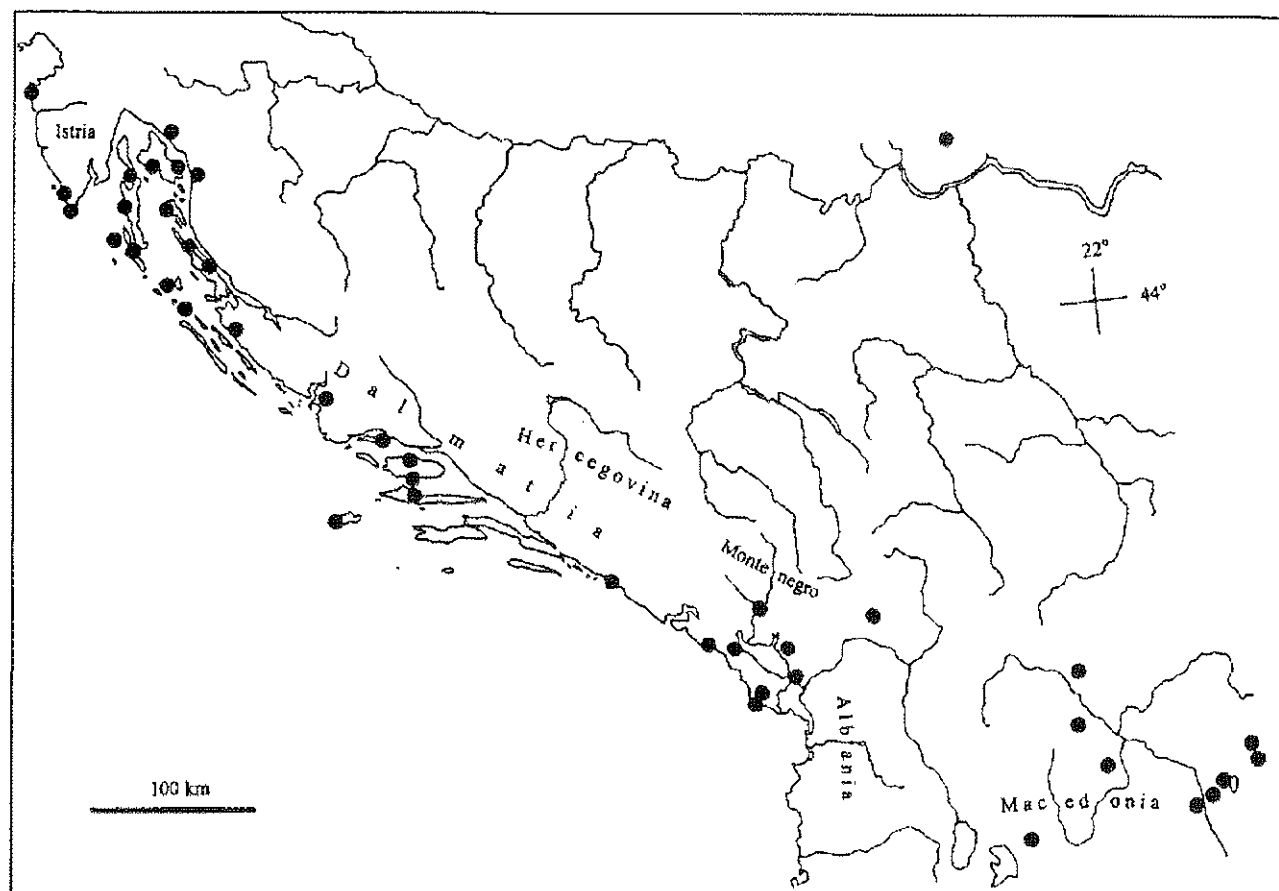


Fig. 2: Collecting sites of *P. libelluloides* in the northwestern part of the Balkan Peninsula
 Sl. 2: Razširjenost volkca *P. libelluloides* v severozahodnem delu Balkanskega polotoka.

In the intestinal content, well chewed and partially digested insect fragments were found (Figs. 3-10). The following structures were identified: mandibles, compound eyes, antennae, legs, wings, chitinous plates, etc. From the size of the fragments it can be concluded that *Palpares* is able to consume also larger prey. In most cases it was impossible to determine the origin of these fragments. The tarsus with pectinate claw (Fig. 7) and the segment with trichobothria (Fig. 6) belonged to a spider (Araneae).

Two of five individuals examined contained plant material (Fig. 10). The fragments of plant tissue very probably originated from intestinal content of herbivorous insects.

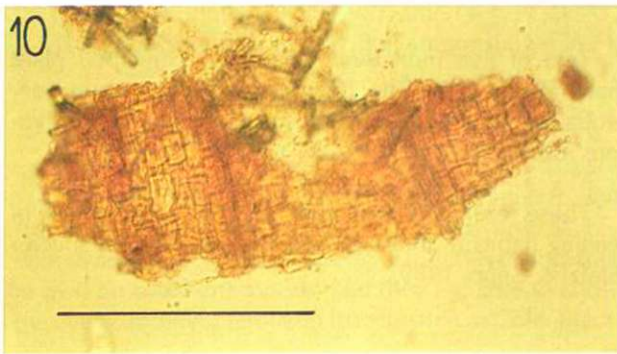
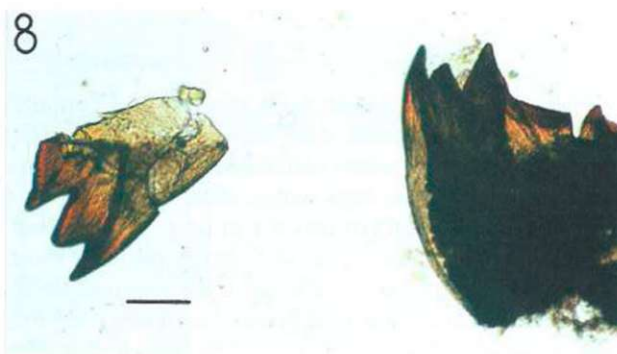
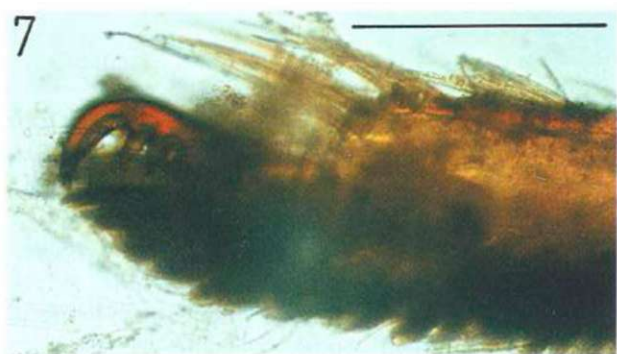
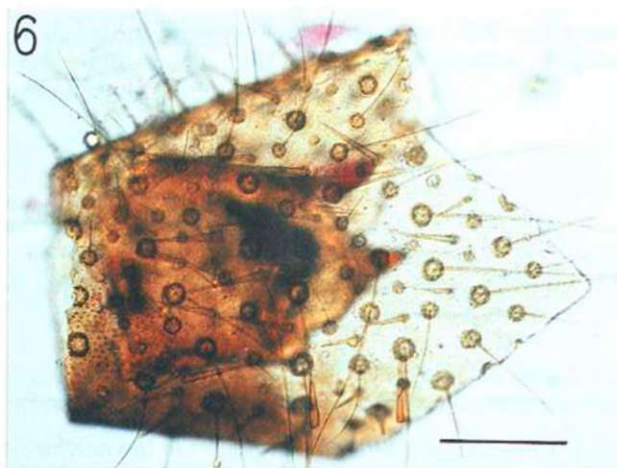
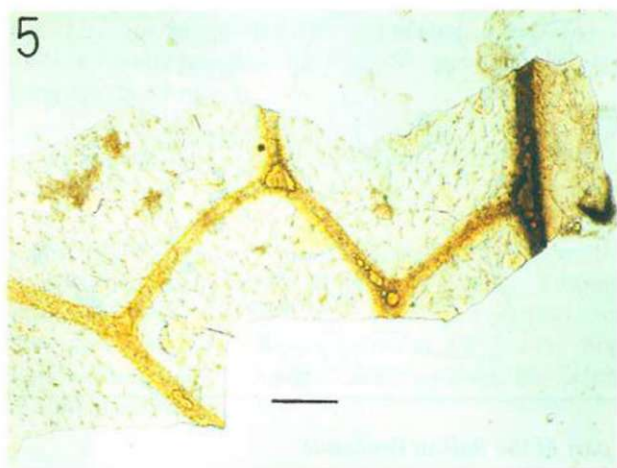
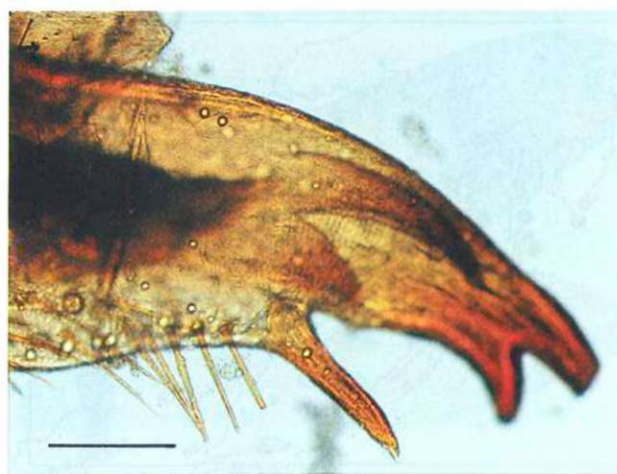
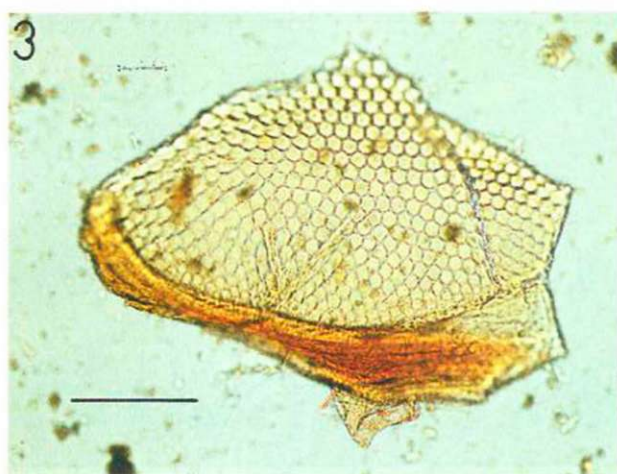
These results are very similar to the investigation of feeding habits in four central European ant-lion species (Stelzl & Gepp, 1989).

Remarks on the habitat

P. libelluloides inhabits grassland areas and scrub communities. In Istria and Dalmatia the insects were collected in steppe or grassland and in garrigue. In garrigue, the dominant plant community where *P. libelluloides* occurs is *Cisto-Ericetum arboreae*, H-č. In Vojvodina (Deliblatska peščara) the insects were found in sand-dune ecosystem. Some collecting places have been strongly influenced by man.

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Figures 3-10.

Slike 3-10.

Figs. 3-10: Food remains found in digestive tract of *P. libelluloides*. Bar 200 μ m.

Fig. 3: Corneal lenses of an insect compound eye. Fig. 4: An arthropod fragment of unknown origin. Fig. 5: A part of the wing. Fig. 6: A part of the spider's segment with the trichobothria. Fig. 7: A spider's tarsus with the pectinate claw. Fig. 8: Mandibles. Fig. 9: Antennal segments. Fig. 10: A fragment of plant tissue.

Slike 3-10: Ostanki hrane iz prebavila *P. libelluloides*. Merilo: 200 μ m.

Slika 3: Kornealne leče žuželčjega fasetnega očesa. Slika 4: Fragment členonožca neznanega izvora. Slika 5: Del krila. Slika 6: Del pajkovega segmenta s trihobotriji. Slika 7: Tarsus pajka z glavničastim krempljem. Slika 8: Mandibule. Slika 9: Antenalni segmenti. Slika 10: Del rastlinskega tkiva.

POVZETEK

Za vrsto volkca *Palpares libelluloides* (Linnaeus, 1764), ki je razširjena po celotnem Sredozemlju, opisujem razširjenost v severozahodnem delu Balkanskega polotoka ter navajam nekaj podatkov o prehranjevanju in habitatih.

V Istri in Dalmaciji poseljuje ta vrsta različne habitate - od stepskih in travnatih površin do grmovnih združb, kot je gariga. V garigi je prevladujoča rastlinska združba Cisto-Ericetum arboreae, H-ic. V Vojvodini so vrsto našli v Deliblatski peščari. V nekatere habitate človek močno posega.

Pri analizi prežvečenih in deloma prebavljenih ostankov hrane iz prebavila sem ugotovil, da imajo insekti večinski delež v prehrani te vrste. *Palpares* se lahko hrani tudi z močno sklerotiziranimi žuželkami. Med ostanki plena so fragmenti mandibul, sestavljenih oči, anten, nog, kril in močno sklerotiziranih hitinskih plošč. Pri dveh od šestih osebkov sem našel tudi rastlinsko tkivo, ki zelo verjetno izvira iz prebavila rastlinojedih insektov, ki jih je *Palpares* uplenil.

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