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FIRST DISCOVERY OF *LIBELLOIDES MACARONIUS* (SCOPOLI, 1763) (NEUROPTERA ASCALAPHIDAE) IN THE TARVISIO AREA (SOUTH-EASTERN ALPS)

PRIMO RINVENIMENTO DI *LIBELLOIDES MACARONIUS* (SCOPOLI, 1763) (NEUROPTERA ASCALAPHIDAE) NEL TARVISIANO (ALPI SUD-ORIENTALI)

Abstract - The finding of specimens of the owlfly *Libelloides macaronius* (Scopoli, 1763) (Neuroptera, Ascalaphidae) from the Tarvisio area (Friuli Venezia Giulia region, north-eastern Italy) is reported here for the first time. The species, which is widespread in the Balkan area, was previously only known in Italy from the Karst area. The discovery site consists of a xeric montane meadow, small in size and sunny, located at about 700 m a.s.l. The particular biogeographical distribution of *L. macaronius* in Italy resembles that of the Central European tree frog *Hyla arborea* (Linnaeus, 1758) (Anura, Hylidae). The other species of high biogeographical value that also occur exclusively or almost exclusively in the Tarvisio area are the following: the alderfly *Sialis morio* Klingstedt, 1932 (Megaloptera, Sialidae), the crayfish *Austropotamobius torrentium* (Schrank, 1803) (Decapoda, Astacidae), the smooth newt *Lissotriton vulgaris vulgaris* (Linnaeus, 1758) (Caudata, Salamandridae) and the sand lizard *Lacerta agilis* Linnaeus, 1758 (Squamata, Lacertidae).

Key words: Owlflies, Distribution range, Friuli Venezia Giulia region, Italy, Conservation, Biodiversity.

Riassunto breve - Viene segnalato il primo rinvenimento nel Tarvisiano (Friuli Venezia Giulia, Italia nord-orientale) di esemplari dell'ascalafide *Libelloides macaronius* (Scopoli, 1763) (Neuroptera, Ascalaphidae). La specie, ampiamente diffusa in area balcanica, in precedenza era nota per l'Italia solo per l'area carsica. Il sito di rinvenimento è costituito da un piccolo prato montano xerico, soleggiato, a una quota di circa 700 m. La particolare distribuzione biogeografica di *L. macaronius* in Italia è nota anche per la raganella europea *Hyla arborea* (Linnaeus, 1758) (Anura, Hylidae). Fra le specie di elevato valore biogeografico, presenti in Italia esclusivamente o quasi nel Tarvisiano, si annoverano il sialide *Sialis morio* Klingstedt, 1932 (Megaloptera, Sialidae), il gambero *Austropotamobius torrentium* (Schrank, 1803) (Decapoda, Astacidae), il tritone punteggiato centro-europeo *Lissotriton vulgaris vulgaris* (Linnaeus, 1758) (Caudata, Salamandridae) e la lucertola agile *Lacerta agilis* Linnaeus, 1758 (Squamata, Lacertidae).

Parole chiave: Ascalafidi, Area di distribuzione, Friuli Venezia Giulia, Conservazione, Biodiversità.

Introduction

The owlfly species of the genus *Libelloides* SCHÄFFER, 1763 (Neuroptera, Ascalaphidae) are characterized by long clubbed antennae and wings rich in veins with evident black, white and yellow areas in different patterns. The adults are excellent fliers, while the larvae move on the surface of the soil, but do not dig pits (BADANO & PANTALEONI 2014). Owlflies are diurnal polyphagous predators that live mainly in sunny and xeric meadows. The adults prey in flight mostly on small winged insects, while the larvae are ambush predators that target small arthropods.

In Italy, the genus *Libelloides* includes seven species ([BERNARDI] IORI et al. 1995; BADANO & PANTALEONI 2014). In the Friuli Venezia Giulia region only *L. longi-*

cornis (Linnaeus, 1764) and *L. macaronius* (Scopoli, 1763) have been reported (LETARDI et al. 2010).

In this note we present the distribution of *L. macaronius* in Friuli Venezia Giulia following the first discovery of a small population in the Tarvisio area (south-eastern Alps).

Materials and methods

Field observations

The observations were carried out periodically, from June to July 2018, in the Coccau locality (about 700 m a.s.l.) in the hinterland surrounding Tarvisio, a mountain city in the district of Udine in the Friuli Venezia



Fig. 1 - Localizzazione del sito di rinvenimento (asterisco).
- Map showing the discovery site (asterisk).

Giulia region (north-eastern Italy, south-eastern Alps; Fig. 1). The site studied is a xeric montane meadow, with a surface area of 200-250 m², positioned on a gentle sunny slope, surrounded by a mixed coniferous-broadleaved forest (Fig. 2). Along the perimeter of the meadow, in the ecotonal zone, some bushes (mostly willows) have grown. Near the meadow there is Highway A23 and the Slizza-Gailitz Torrent, which drains the Tarvisio area and joins the Drau River in Austria (Danube basin). Many adult owlflies were photographed using a digital camera.

Identification of the species

For species identification the keys of DEVETAK (2007) and LETARDI (2016) were used. Furthermore, some adults of the genus *Libelliodes* present in the entomological collections of the Department of Agricultural, Food, Environmental and Animal Sciences (University of Udine), identified by the expert Dr. Agostino Letardi (Rome), were used as comparison.

Results and discussion

The first specimen of *L. macaronius*, an adult male (Fig. 3), was accidentally observed on 17 June 2018 in flight just above the montane meadow studied, during monitoring of the Odonata community of the Tarvisio area. The next day, at least five flying adults were detected over the same meadow. On this occasion, a male and a female were observed to join at the abdomen level for a few seconds in an attempt to mate. Subsequently, several owlflies have been detected flying over the meadow, with a maximum of 10 specimens on



Fig. 2 - Overview of the montane meadow near Coccau in the Tarvisio area (UD) where a population of *Libelliodes macaronius* was observed in June and July 2018 (photo by R. Pontarini).

- *Panoramica del prato montano presso Coccau nel Tarvisiano ove è stata rinvenuta una popolazione di Libelliodes macaronius in giugno e luglio 2018 (foto R. Pontarini).*

19 June 2018 (Figs 4 and 5). The last two flying adults were observed on 16 July 2018.

These phenological data are in substantial agreement with other studies conducted over several years in the neighbouring Slovenia and Croatia, with adults mostly observed in June and July and only a few in August (DEVETAK et al. 2002; DEVETAK 2007).

During the surveys in the same meadow, adults of *Cylindera germanica* (Linnaeus, 1758) (Coleoptera, Carabidae, Cicindelinae) and *Oedipoda coerulescens* (Linnaeus, 1758) (Orthoptera, Acrididae) were detected, both species being indicative of xeric habitats with poor vegetation cover. Moreover, adults of the dragonfly *Orthetrum coerulescens* (Fabricius, 1798) (Odonata, Libellulidae) were found, whose occurrence is associated with the nearby Slizza-Gailitz Torrent.

Until now, the presence of *L. macaronius* in Italy was known only from the Friuli Venezia Giulia region, in particular the Karst area near Trieste ([BERNARDI] IORI et al. 1995; DEVETAK et al. 2002; POPOV 2004; LETARDI et al. 2010). Considering the current discovery, the Italian range of the species must now be extended to the mountain area of Tarvisio (south-eastern Alps). However, the species must be considered as expected, as it is widespread in both Slovenia (DEVETAK 2007) and Austria (ASPÖK et al. 1980), not too far from the Tarvisio area. The distribution of *L. macaronius* ranges from central to south-eastern Europe and continues into western Asia. In the remaining part of the Friuli Venezia Giulia territory the species is replaced by *L. longicornis*.

The peculiar distribution of *L. macaronius* in Friuli Venezia Giulia in only the Tarvisio and Karst areas is interestingly similar to that of the Central European tree frog, *Hyla arborea* (Linnaeus, 1758) (Anura, Hylidae), whose vast distribution ranges from central-eastern



Fig. 3 - Male of *Libelloides macaronius*, 17.VI.2018, Coccau (Tarvisio, UD; photo by R. Pontarini).
- *Maschio di Libelloides macaronius*, 17.VI.2018, Coccau (Tarvisio, UD; foto R. Pontarini).



Fig. 4 - Female of *Libelloides macaronius*, 19.VI.2018, Coccau (Tarvisio, UD; photo by R. Pontarini).
- *Femmina di Libelloides macaronius*, 19.VI.2018, Coccau (Tarvisio, UD; foto R. Pontarini).

Europe to south-western Asia (NASCETTI et al. 1995; LAPINI 2005; BOTTO et al. 2016; FIORENZA 2019). In the remaining part of Friuli Venezia Giulia, the allopatric vicariant Po's tree frog it is present, recently described as *H. perrini* Dufresnes et al., 2018 (LAPINI 2005; DUFRESNES et al. 2018).

Likewise, other species of significant biogeographical value are present in Italy exclusively or almost exclusively in the Tarvisio area. Among them we can mention i) the alderfly *Sialis morio* Klingstedt, 1932 (Megaloptera, Sialidae), observed in the Fusine Lakes' basin ([BERNARDI] IORI et al. 1995; LETARDI & NICOLI ALDINI 2007), ii) the crayfish *Austropotamobius torrentium* (Schrank, 1803) (Decapoda, Astacidae), present in some tributaries of the Slizza-Gailitz Torrent (LAPINI et al. 2014; MACHINO et al. 2016), iii) the smooth newt *Lissotriton vulgaris vulgaris* (Linnaeus, 1758) (Caudata, Salamandridae), found in some ponds and small lakes (LAPINI et al. 1992, 1999), and iv) the sand lizard *Lacerta agilis* Linnaeus, 1758 (Squamata, Lacertidae) present in wet meadows and shrublands



Fig. 5 - Two adults of *Libelloides macaronius*, while resting on the stems of some herbaceous plants, 19.VI.2018, Coccau (Tarvisio, UD; photo by R. Pontarini).
- *Due adulti di Libelloides macaronius mentre sostano sui fusti di alcune piante erbacee*, 19.VI.2018, Coccau (Tarvisio, UD; foto R. Pontarini).

near Fusine in Valromana (LAPINI et al. 1989, 1999; FIORENZA 2016, 2018). Moreover, the natural recolonization of the Eurasian otter *Lutra lutra* Linnaeus, 1758 (Carnivora, Mustelidae) is currently observed in the Tarvisio area. The species, which probably originated from the Austrian population, recently settled along the Slizza-Gailitz Torrent (PAVANELLO et al. 2015). Finally, in November 2018 a specimen of the Eurasian beaver *Castor fiber* Linnaeus, 1758 (Rodentia, Castoridae), also of probable Austrian origin, was observed along the Slizza-Gailitz Torrent (PONTARINI et al. 2019). This is the first sighting in the region (and in Italy) of a species that had been absent for about 450 years.

L. macaronius could be included among the species of 'regional conservation interest' according to the Regional Law of Friuli Venezia Giulia 23 April 2007 n. 9, which already includes *L. longicornis*. It should be noted that in Slovenia *L. macaronius* is considered an endangered species (DEVETAK et al. 2002).

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