Short communication

Somatochlora arctica (Odonata: Corduliidae) oviposing at a "lower than usual" altitude for Italy and the Mediterranean Region and first observation for the Varese Province (Northern Italy)

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Abstract - *Somatochlora arctica* is an endangered dragonfly with populations characterized by low density and scattered distribution. The presence of the species in the Varese Province, recorded during the specific monitoring operations for *Nehalennia speciosa*, is reported for the first time. The observation of an oviposing female was carried out in a peat bog placed at 550 m a.s.l., the lowest altitude for the species in Italy and one of the most unusual for the Mediterranean Region. The peculiarities of this record are shown.

Key-words: Altitudinal record, Anisoptera, endangered species, Mediterranean Region.

Riassunto - *Somatochlora arctica* (Odonata: Corduliidae) in ovodeposizione a una quota "più bassa del solito" per l'Italia e la regione mediterranea e prima osservazione per la provincia di Varese (Italia settentrionale).

S. arctica è una libellula (anisottero) minacciata, caratterizzata da popolazioni poco numerose e spesso isolate tra loro. Viene riportata la prima osservazione della specie per la Provincia di Varese, effettuata durante specifici monitoraggi dello zigottero *Nehalennia speciosa*. L'osservazione di una femmina di *S. arctica* in ovideposizione è avvenuta in una torbiera situata alla quota più bassa per la specie in Italia (550 m s.l.m.) e ad una delle più inconsuete per la Regione Mediterranea.

Parole chiave: Anisoptera, record altitudinale, regione mediterranea, specie minacciata.

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INTRODUCTION

Somatochlora arctica (Zetterstedt, 1840) is mainly a Sibero-European dragonfly with populations that reach Central Japan and Central Asia (Boudot & Kalkman, 2015). Its European geographic range extends from the French Massif Central to Belarus and Northern Ukraine and from the Southern Alps to Fennoscandia. It is found also in Scotland and Ireland, the French Pyrenees, Romania and Bulgaria (De Knijf *et al.,* 2011). In Italy, the species is widespread on the Alps, often with small populations, from Valle D'Aosta to Friuli-Venezia Giulia, apparently more scattered in the western Italian range. The short flight season on Italian Alps (from mid-June to the first decade of September) and the potential confusion with the more abundant and sympatric *S. alpestris* (Selys, 1840), lead to think that its actual distribution is underestimated. In Italy, like in other southern European countries, *S. arctica* favours *Sphagnum* peat bogs at high altitudes, from 835 m a.s.l. up to 2205 m a.s.l. (Riservato *et al.,* 2014a), with only one record below 800 meters, in the Autonomous Province of Trento at the Torbiera di Fiavé (650 m a.s.l.; G. Assandri pers. com.). Otherwise, in Central and Northern Europe the species could be found at lower altitudes (Boudot & Jacquemin, 1987; Bouwman & Groenendijk, 2007). Due to the low density of its populations and the scattered distribution, the species is considered Near Threatened by the IUCN Red List of Italian dragonflies (Riservato *et al*., 2014b).

During specific monitoring of the only known population of the damselfly *Nehalennia speciosa* found in Lombardy, the authors observed an egg-laying female of *S. arctica*, the first record for the site. The circumstances and peculiarities of the finding are here reported.

STUDY AREA

The record was collected at 550 m a.s.l. in a peat bog (1.67 ha) in a good conservation status situated in the Cavagnano Special Area of Conservation (IT2010020) of the NATURA 2000 network (Varese Province). The central part of the site is occupied by a typical bog ve-

getation characterized by *Sphagnum* spp. and *Carex* spp. and by a depression with permanent shallow water, while the north-eastern and south-eastern margins host two small water bodies. A small ditch crosses the southern half of the site and ends in the central part of the bog. Many of the observed peat bog habitats are inserted in Annex I of Habitat Directive 92/43/CEE as depressions on peat substrates of the Rhynchosporion, *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*), rooted floating waterlily carpets, *Salix cinerea* scrubs, and large *Carex* beds (Baratelli, 2012; Aguzzi *et al*., 2017).

RESULTS AND DISCUSSION

On 2.VII.2020, during the last survey of the year for the monitoring of *Nehalennia speciosa*, the authors found a female of *S. arctica* (Fig.1). The female was laying eggs in a small portion of *Sphagnum* hummock near the ditch. The female was caught with an insect net, rapidly identified as *S. arctica*, photographed and then released. *S. arctica* was never observed before in the area. The only Corduliidae detected in the previous four years were *Cordulia aenea* and *S. flavomaculata*. In the following field activities, in mid-July and early August, the authors did not find any other adult or exuvia.

This record is interesting for several reasons: it is the first observation for the Varese Province; Mermet and Galli (2000) did not mention *S. arctica* in their paper, not even as a possible presence. The nearest known populations are known for southern Switzerland (Canton Ticino), about 20 km away as the crow flies (Wildermuth *et al*., 2005), while the closest Italian populations are found more distantly (Riservato *et al.,* 2014a) (Fig. 2). Furthermore, this record attests to the reproduction of the species at the lowest altitude for Italy and one of the lowest for the Mediterranean Region, as defined by Boudot *et al.* (2009). Only in Switzerland and France there are records at lower altitudes; in Switzerland altitudes from 400 m to 2500 m a.s.l. are reported (Wildermuth *et al*., 2005), while in France there are observations at similar altitudinal ranges for Bourgogne and Central France (Dommanget, 1984; Ruffoni *et al.,* 2018). In the Pyrenees, Southern French Alps, Bulgaria and Romania all observations are at higher altitudes (Boudot & Jacquemin, 1987; Marinov, 2004; De Knijf *et al.,* 2011), while in Slovenia the species is predominantly found at high altitude, with sporadic observations below (the lowest is at 510 m a.s.l.) without breeding evidence (Bedjanič & Kotarac, 1996; Pirnat *et al*., 1997; Bedjanič, 2014).

The finding of an egg-laying female in a site where the species was never observed, despite the frequent inspections in recent years, poses some questions. It could be possible that a small population went unnoticed during the past field seasons, when looking for *Nehalennia speciosa*. It is known that the species moves away from the breeding site to complete individual maturation and often forages among trees, often at the treetop. However, it should be highlighted that males usually show patrol flights at the mating places and defend the site against intruders (Wildermuth & Spinner, 1991). Another hypothesis is that the female has come from one of the neighbouring breeding sites in Switzerland. Despite the noticeable distance, it cannot be excluded that the specimen arrived in flight, perhaps carried by the wind. "Flyer type" Anisoptera are easily able to cover long distances and, in the specific case of Corduliidae, *S. alpestris* is known to cross wide valleys (Knaus & Wildermuth, 2002). It is possible that *S. arctica* could do the same. A possible expansion of its range at lower altitudes is improbable, since Odonata, as well as other animal taxa, are at present generally showing upward altitudinal shifts in response to the ongoing global warming (Hickling *et al*., 2006).

Fig. 1 - Lateral and frontal view of the female observed. / Visione laterale e frontale della femmina osservata.

Further research effort is necessary, in consideration of the rarity of the species, to verify the presence of a stable or temporary breeding population. This is demonstrated by the recent finding of a female with eggs and a patrolling male (Fig. 3) in July 2021. The observations confirm the good preservation and high ecological value of this site of the Varese Province and its importance for Odonata communities.

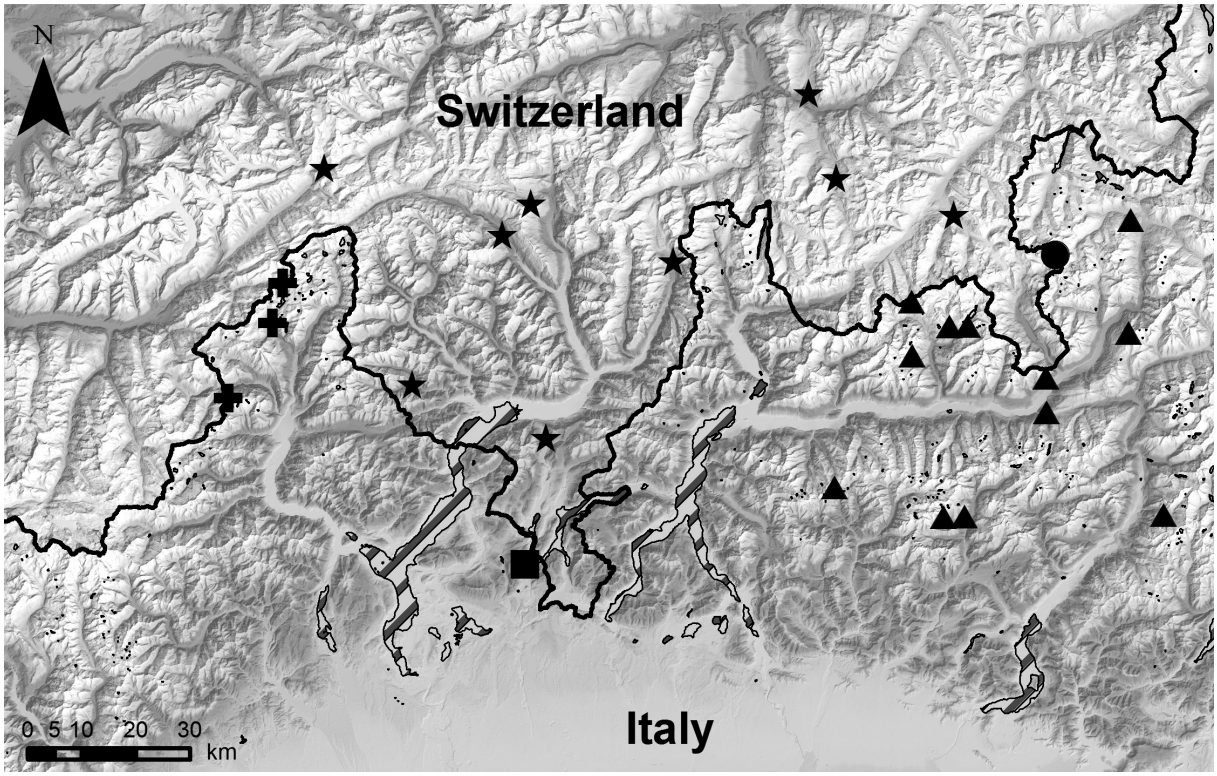

Fig. 2 - Location of the closer known populations of *S. arctica* to the study area (square). Data come from Wildermuth (2013) (stars), Pompilio *et al*. (2012) (crosses), Riservato *et al*. (2014a) (triangles) and personal communications (circle). Background: elevation (dark: low, white: high). Striped polygons: lakes. / Localizzazione delle popolazioni note di *S. arctica* più vicine all'area di studio (quadrato). I dati sono tratti da Wildermuth (2013) (stelle), Pompilio *et al*. (2012) (croci), Riservato *et al*. (2014a) (triangoli) e comunicazioni personali (cerchio). Sfondo: altitudine (scura: bassa, bianca:elevata). Poligoni barrati: laghi.

Fig. 3 - Lateral view of the male captured and released in July 2021. / Visione laterale del maschio catturato e rilasciato nel luglio 2021.

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