

Short scientific noteSubmitted: August 20th, 2017 - Accepted: October 2nd, 2017 - Published: December 29th, 2017**First record of *Lindenia tetraphylla* (Vander Linden, 1825) and rediscovery of *Orthetrum nitidinerve* (Selys, 1841) in Sicily (Insecta: Odonata)**

Salvatore SURDO

Department of Agriculture, Food and Forest Sciences, University of Palermo - Viale delle Scienze, 90128 Palermo, Italy
salvatore.surdo@unipa.it**Abstract**

The first Sicilian record of *Lindenia tetraphylla* and a new regional record of *Orthetrum nitidinerve*, species not recorded since 1975 in mainland Sicily, are here reported. All individuals of *L. tetraphylla* and *O. nitidinerve* were observed in the same site in the province of Trapani.

Key words: *Lindenia tetraphylla*, *Orthetrum nitidinerve*, Odonata, Sicily, Trapani, Habitats Directive, IUCN Red Lists.

Introduction

The Odonata fauna of Italy is well known, although some areas remain not yet adequately investigated (Riservato et al. 2014a; Boudot & Kalkman 2015). Sicily is one of these areas, for which odonatological surveys have been started, in view of a thorough Sicilian Odonata Atlas. Some outstandingly interesting data are preliminarily reported.

Material and Methods

The habitat of the present records consists mainly of the river Rio Delia, at the bridge of the road, close to the mouth into the artificial lake "Lago della Trinità" (Castelvetrano, Trapani), 37°70'48"N 12°75'52"E (the actual distance from the lake shore greatly varies, depending on the water level), for *L. tetraphylla*, and a small rivulet tributary of the former, 37°43'26"N 12°45'29"E, for *O. nitidinerve*. The riparian vegetation consists mainly of *Phragmites australis* with some *Arundo donax*, *Typha sp.*, *Salix sp.*; surroundings are partly covered with *Eucalyptus sp.* *Lindenia* was also observed along the lake shore, 37°42'37"N 12°45'25"E; here, at the moment of survey, the water level was very low and the shore was almost entirely bare, the few patches of helophytes being more or less far from water edge. During surveys, usually only photographic documentation was obtained; no specimens were collected, unless strictly necessary for a sure identification. The species here reported are unmistakable, so that it was not necessary to kill and preserve specimens. On the other hand, unless permits are obtained, this would be il-

legal for *L. tetraphylla*, a protected species of Community interest, included in the Annexes II and IV of Directive 92/43/EEC (known as Habitats Directive).

***Lindenia tetraphylla* (Vander Linden, 1825)**

Material examined. Italy: Sicily, Castelvetrano (Trapani), Lago della Trinità (Trinità Lake), mouth of Rio Delia, 70 m a.s.l.: 11 Jul 2017, 1 ♂ photographed; 26 Jul 2017, 3 ♂♂ photographed; 3 Jul 2017, a mating pair photographed (Fig. 1); ibidem, eastern shore of the lake, about 1.5 km from the former site: 15 Jul 2017, 5 territorial ♂♂ photographed (S. Surdo, A. Cusmano); 16 Jul 2017, several territorial ♂♂ and a mating pair observed on the shore of the lake (S. Surdo, M. Pavesi, C. Muscarella). No further individuals were noticed on 27 Jul 2017 (M. Pavesi).

Lindenia tetraphylla is predominantly a central and south-west Asian species, reaching to Afghanistan and western Pakistan eastwards, and to the western Mediterranean (eastern Spain) westwards (Boudot & Kalkman, 2015). It was recently also found in Bulgaria (Gastarov & Beshkov 2010). In North Africa *L. tetraphylla* was first recorded in Algeria in the nineteenth century, but later it was considered to be extinct (Boudot et al. 2009). Nevertheless, an exuvia was found downstream of the Djorf Torba reservoir, evidence of the reproduction of the species in western Algeria (Hamzaoui et al. 2015). In addition, a population was discovered in nearby Tunisia (Kunz & Kunz 2001). In Italy, *L. tetraphylla* is known from a very few localities in Tuscany, Tusco-Emilian Apennines and the surrounding area of Lucca (Terzani 2002); Lazio,

one old record; Campania, Tyrrhenian side and two Apennine sites; Molise (Fracasso C. & Corso A., pers. comm.) and Sardinia (Conci & Nielsen 1956; Utzeri & D'Antonio 2005; Utzeri et al. 2006; Hardersen & Leo 2011). Some old records, including the one from Lazio, may however refer to no longer extant populations.

Orthetrum nitidinerve (Selys, 1841)

Material examined. Italy: Sicily, Castelvetro (Trapani province), Lago della Trinità (Trinità Lake), small tributary of Rio Delia, near the mouth: 26 Jun 2017, 1 ♂ photographed; 3 Jul 2017, 1 ♂ photographed (Fig. 2); no longer found during subsequent surveys. Several *O. brunneum* (Fonscolombe, 1837) and *O. coerulescens anceps* (Schneider, 1845) were also present in the same spot where *O. nitidinerve* was observed.

Orthetrum nitidinerve is a western Mediterranean endemic, mainly confined to the Maghreb, where it is generally common. Compared to other widespread Palaearctic congeners e.g. *O. coerulescens* or *O. brunneum*, *O. nitidinerve* has a quite restricted range. In southwestern Europe it occurs more or less rarely in Portugal, Spain, Sardinia, Sicily (Boudot et al. 2009) and was also recorded for Lampedusa island (Corso et al. 2012), no doubt upon a vagrant individual. Old records for Campania (southern Italian mainland) are in need of confirmation (Riservato et al. 2014a; Surdo et al. in prep.). Finally, it has been reported for the first time in 2008 in the Maltese archipelago (Sciberras et al. 2010) upon several individuals, yet

no longer found in subsequent years, therefore presumably vagrant.

Discussion

The discovery of *L. tetraphylla* in Sicily extends the known distribution map of this species. The findings here reported are in accordance with other reports of an expansion of this species in Europe and North Africa, presumably as a consequence of the increasing number of available man-made habitats (e.g. Brochard & van der Ploeg 2013; Boudot 2014), and also resulting from increased field investigations (e.g. Skvortsov & Kuvaev 2010).

Considered as a mainly central Asian element, *L. tetraphylla* has a distribution pattern similar to another Euroasiatic species, *Selysiothemis nigra* (Vander Linden, 1825), also found in arid and semi-arid regions (Schneider 1981; Schorr et al. 1998). Both species have scattered populations in the western Mediterranean and both seem to be extending their range in North Africa (Boudot et al. 2009); the latter in recent years is extending its range also in Italian mainland, up to the north (Riservato et al. 2014). It is interesting to highlight that in the man-made Lago della Trinità an abundant population of *S. nigra* occurs; this species is scattered and generally rare in the rest of Trapani province. As explained by Boudot et al. (2013), *L. tetraphylla* adults can migrate long distances from their reproductive area. Some records of *L. tetraphylla* may therefore refer to vagrant imagoes. On the other hand, this attitude makes *L. tetraphylla* able to colonize also recently



Fig. 1 – *Lindenia tetraphylla*, mating. Lago della Trinità (Trinità Lake), Castelvetro (Trapani province), Italy, July 3rd, 2017. Photo by Salvatore Surdo.



Fig. 2 – *Orthetrum nitidinerve*, male. Lago della Trinità (Trinità Lake), Castelvetrano (Trapani province), Italy, July 3rd, 2017. Photo by Salvatore Surdo.

formed, man-made habitats, as soon as they become suitable for the species. The Lago della Trinità, together with the mouth of its main tributary, with deep, quiet waters and locally dense reed-belts, is no doubt potentially suitable as breeding habitat. Although no exuviae nor freshly emerged individuals were hitherto found at the Lago della Trinità, repeated observations of territorial males and mating pairs argue for the very likely existence of a viable population.

Although *L. tetraphylla* is included in Annexes II and IV of the Habitats Directive, and listed as NT (nearly threatened) in the Italian Red List (Riservato et al. 2014b), there are currently no studies in progress, aimed at monitoring the species, even in view of its rarity in Italy (Trizzino et al. 2013).

Concerning *O. nitidinerve*, the new record is the westernmost one in Sicily (Table 1), the hitherto known range reaching westwards the province of Palermo (Bucciarelli 1971, 1977; Carfi et al. 1980; Capra 1934). The habitat where *O. nitidinerve* was found looks not dissimilar to other Sicilian sites (e.g. rio Gornalunga, see Table 1) where the species was found to breed (M. Pavesi pers. comm.). It is therefore very likely that *O. nitidinerve* may breed there as well. This species is listed in the Italian Red List (Riservato et al. 2014b) as DD (Data Deficient), which makes of special concern the present records.

It would be interesting to ascertain whether the supposed rarity of *O. nitidinerve* may be partly explained by its behaviour, which makes sightings and collecting more occasional than in other dragonflies. The species actually is to be seen mainly in the early morning and again more or

less late in the afternoon, while it disappears, or almost so, in the warmer hours of the day. It is uncertain whether indeed returns to the water only late in the afternoon, as supposed by Bucciarelli et al. (1983), or simply remains hidden and motionless within the dense vegetation, or maybe the tree branches. The flight period is possibly shorter than in other species; at the same site, during repeated surveys in the second half of July, no individual was observed, and the scarcity of individuals at the end of June-beginning of July leads to suppose that the flight period may have already been at its end. Finally, especially when occurring in low numbers, or by an unexperienced observer, *O. nitidinerve* may be hardly detected among a lot of the ubiquitous, often exceedingly abundant *O. brunneum*.

Annex II of Habitats Directive, in which *L. tetraphylla* is included, identifies in particular the species whose conservation requires the establishment of Special Conservation Areas (ZSC). For this purpose the Directive establishes a European ecological network of ZSC, called Natura 2000 Network. It is to be noted that in the Lago della Trinità there is another species that is included in both Annexes of the Habitats Directive, the endemic Sicilian pond turtle *Emys trinacris* (Fritz et al. 2005). The Lago della Trinità, although artificial, is a biotope of greatest importance, being situated along one of the most important birds migratory paths, and forming an important resting site for several species. Moreover, it has a high biodiversity; 23 species of dragonflies, a number very likely underestimated, are hitherto reported for this site, namely: *Sympecma fusca* (Vander Linden, 1820), *Lestes barbarus* (Fabricius, 1798), *Calopteryx haemorrhoidalis* (Vander

Table 1 – The most recent records of *Orthetrum nitidinerve* in Sicily. This species has been last reported in 1975 in Sicily mainland; one observation in 2011 also for Lampedusa, Pelagie islands (see above).

Year	Province	Site	Province	Reference
2010	AG	Lampedusa island (Sicilian Channel)	1	Corso et al. 2012
1975	CT	Randazzo, fiume Simeto near “Ponte Bolo”	4 ♂♂; 1 ♀	Bucciarelli 1977
1975	CT	Rio Gornalunga near “Bivio Jannarello”	13 ♂♂; 3 ♀♀	Bucciarelli 1977
1975	EN	Fiume Dittaino near “Stazione Dittaino”	19 ♂♂; 4 ♀♀	Bucciarelli 1977
1975	ME	Caltagirone, fiume Dirillo near Grammichele	3 ♂♂	Bucciarelli 1977
1975	PA	Fiume Eleuterio near Ponte d’Arcera	many juv.	Bucciarelli 1977
1975	CT	Paternò, fiume Simeto near “Ponte La Barca”	2 ♂♂	Bucciarelli 1977
1973	CT	Paternò, fiume Simeto near “Ponte La Barca”	2 ♀♀	Bucciarelli 1977
1973	CT	Fiume Dittaino near “Masseria abbandonata”	3 ♂♂; 1 ♀	Bucciarelli 1977
1971	RG	Fiume Acate near “Contrada Pavone”	1 ♂; 1 ♀	Carfi et al. 1980
1970	CT	Fiume Simeto mouth	1 ♀	Bucciarelli 1971
1970	SR	Fiume Ippari	1 ♀	Bucciarelli, 1971
1967	RG	Fiume Ippari near Vittoria	1 ♂	Carfi et al. 1980
1933	ME	Torrente Zappulla	1 ♀	Capra 1934

Linden, 1825), *Ischnura genei* (Rambur, 1842), *Coenagrion scitulum* (Rambur, 1842), *C. puella* (Linnaeus, 1758), *Erythromma lindenii* (Selys, 1840), *E. viridulum* (Charpentier, 1840), *Ceriagrion tenellum* (Villers, 1789), *Anax imperator* Leach, 1815, *A. parthenope* (Selys, 1839), *Paragomphus genei* (Selys, 1841), *Lindenia tetrphylla* (Vander Linden, 1825), *Orthetrum trinacria* (Selys, 1841), *O. nitidinerve* (Selys, 1841), *O. coeruleascens anceps* (Schneider, 1845), *O. brunneum* (Fonscolombe, 1837), *O. cancellatum* (Linnaeus, 1758), *Crocothemis erythraea* (Brullé, 1832), *Brachythemis impartita* (Karsch, 1890), *Sympetrum fonscolombii* (Selys, 1840), *Trithemis annulata* (Palisot de Beauvois, 1805), *Selysiothemis nigra* (Vander Linden, 1825).

Despite its ecological importance, the Lago della Trinità is threatened as a consequence of a largely inappropriate territory management, resulting e.g. in water pollution and eutrophication, because of inadequate or non-existing sewage treatment and of uncontrolled waste dumping along the shores (the problem becoming even worse because of the frequent scarcity of water, partly consequence of an unsatisfying water management), and in illegal hunt, even of protected species. Effective conservation measures to protect the whole habitat and its outstanding biodiversity are therefore urgently needed.

Acknowledgements – I am grateful to Federico Landi and Alex Festi for further confirmation of identification of species through the analysis of the photographic material, Angelo Troia for plant identification and Bruno Massa for his corrections and advices. I also wish to thank Carlo Utzeri (Università “La Sapienza”, Roma) and an anonymous referee for the critical reading of the manuscript and useful comments. Finally, a special thank to Maurizio Pavesi (Museo di Storia Naturale, Milano) for the accurate revision

of the manuscript and the communication of unpublished observations.

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