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A new cicada species for Switzerland: *Tettigetta argentata* (Olivier, 1790) (Hemiptera: Cicadoidea)

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In 2007 and 2008, the cicada species *Tettigetta argentata* (Olivier, 1790) was recorded at Monte Caslano in Southern Ticino, Switzerland. Because of its large population size, the occurrence seems to be well established there. *Tettigetta argentata* has previously not been recorded in Switzerland, but in the neighbouring regions of Italy. The occurrence of this Western Mediterranean species might be the result of changing climate in the region, or the species has simply been missed or misidentified previously.

Key words: *Tettigetta argentata*, Tibicinidae, Switzerland

INTRODUCTION

Tettigetta argentata (Olivier, 1790) is a Western Mediterranean cicada species which has been recorded in Spain and Portugal (Schedl 1986; Sueur *et al.* 2004) and in France (Puissant 2006). Records from Northern Italy (Schedl 1973, 2000) and western part of Slovenia (Schedl 1986; Gogala & Gogala 1999) mark the north-eastern extension of the known distribution. Some of the records by Schedl (1973) are only a few kilometres from the Swiss border. However, in Switzerland (Pillet 1993), Germany (Nickel 2003) or Austria (Schedl 2002), the species has never been recorded.

MATERIAL AND METHODS

The calling song of cicadas is an effective way to prove the presence of different cicada species. The equipment used, consisted of an ultrasonic detector (Peterson D 200) with a microphone fitted into a Telinga parabola (see Gogala 2006). However, detecting individuals of *Tettigetta argentata* does not necessarily require ultrasonic equipment because the frequency band range reaches less than 10 kHz. Recordings were made with a Marantz PMD 660 and analysed by Raven1.2. Voucher specimens were not collected in Switzerland but in neighbouring parts of Italy and deposited in the private collection of the author. To clarify species identification, recordings were compared with song patterns published by Boulard (1995), Gogala (2002) and Sueur *et al.* (2004).

RESULTS

Tettigetta argentata was found and recorded by Tomi Trilar and the author at different locations in Northern Italy in June and July 2007, some of them near to

Tab. 1. *Tettigetta argentata* observations in Switzerland and neighbouring parts of Italy.

Location	Coordinates	No. of calling males	Date	Observer	Type of observation
Ticino (Switzerland)					
Monte Caslano	45°58'/8°53'	12 - 15	26.6.2007	Hertach	acoustic (recorded)
Monte Caslano	45°58'/8°53'	18 - 21	21.7.2007	Hertach	acoustic, visual
Monte Caslano	45°58'/8°53'	34	15.7.2008	Hertach	acoustic, visual
Monte Caslano	45°58'/8°53'	1	10.8.2008	Hertach	acoustic
Lombardy (Italy)					
Monte Barro, Lecco	45°50'/9°23'	15	16.6.2007	Hertach/Trilar	acoustic (recorded), visual
Durino-Rovenna, Como	45°51'/9°05'	1	23.7.2007	Hertach	acoustic
Aosta Valley (Italy)					
Doues, Valpelline	45°48'/7°18'	4 - 5	10.6.2007	Hertach/Trilar	acoustic (recorded), visual
Sarre, Rovarey	45°43'/7°15'	5	11.6.2007	Hertach/Trilar	acoustic (recorded), visual
Villeneuve	45°42'/7°11'	15 - 20	11.6.2007	Hertach/Trilar	acoustic, visual (collected)
above Avise	45°42'/7°07'	2	11.6.2007	Hertach/Trilar	acoustic

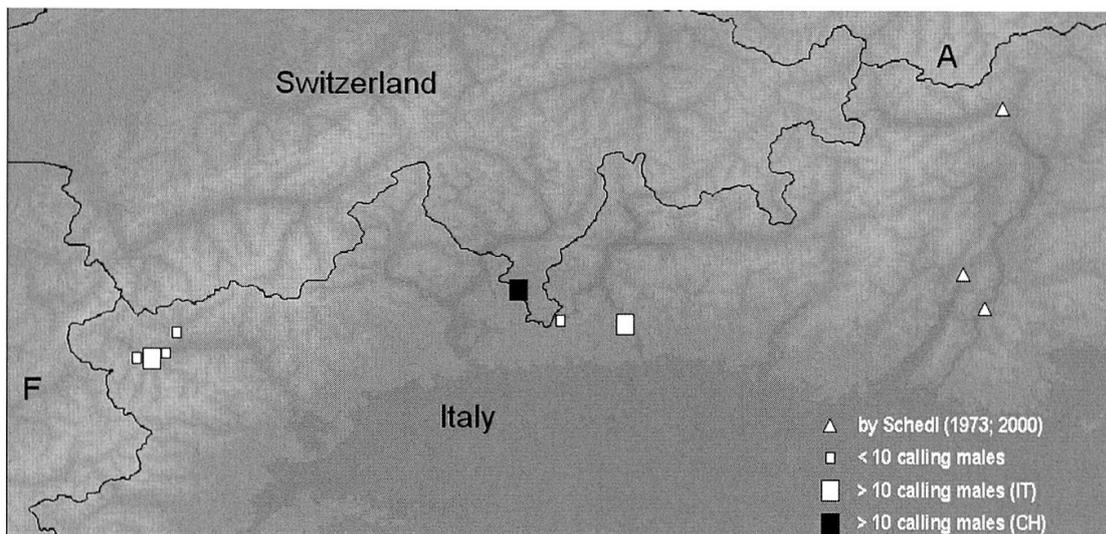


Fig. 1. *Tettigetta argentata* observations in Switzerland and neighbouring parts of Italy.

the border with Switzerland (Tab. 1, Fig. 1, Fig. 2). Similar habitats to those found in Italy were visited in Switzerland. On 26 June 2007, 12 to 15 calling males of *Tettigetta argentata* were registered at Monte Caslano (45°58'/8°53'; 280 to 440 m a.s.l.). Three individuals were also recorded (Fig. 3), totalling eight sequences of 27 minutes duration. On 21 July 2007, 18 to 21 calling individuals were active. One singing male could be observed with field-glasses. In 2008 the population could again be confirmed as being present: High activity with 34 singing males and four visual observations on 15 July and a final calling individual on 10 August. As in 2007, catching a voucher specimen failed. Previously, the Monte Caslano site had been visited by the author three times in 2005 (27 May, 23 July) and 2006 (5 June) without observations of this species. It is obvious that either the field survey time had been too early in the season or the weather conditions insufficient for observing and recording this cicada species.

The habitat at Monte Caslano consists of a *Fraxino orno-Ostryon* with *Quercus pubescens*, *Quercus cerris*, *Quercus ilex* (adventitious) and *Pinus sylvestris* on limestone near Lake of Lugano (Fig. 4). The very steep and rocky slope is exposed to the south. Some areas mainly in the central part are cultivated as dry meadows with bushes and small woods for habitat conservation by regional authorities, the lowest part is wooded more densely. Individuals were singing in the central and lower part of the slope, some of them on treetops directly above the lakefront. The upper part of the slope is occupied by the cicadas *Cicadetta* cf. *cerdaniensis* Puisant & Boulard, 2000 and very occasionally *Cicada orni* Linné, 1758.

DISCUSSION

Because no other European cicada species emits a calling song of similar structure (see Boulard 1995; Gogala 2002; Sueur *et al.* 2004), the distinctive acoustic song of *Tettigetta argentata* can be easily recognized. Neither Holzinger *et al.* (2003), Nast (1972, 1987), Pillet (1993), Schedl (2000) nor Günthart & Mühlethaler (2002) mentioned the species as being recorded for Switzerland. *Tettigetta argentata* is the eighth cicada species currently found in Switzerland (see Hertach 2007). The Monte Caslano population is numerous and presumably a localised reproductively active population. Based on calls, the population size seems even bigger than those of the most numerous populations from Lombardy region (Monte Barro) and the Aosta Valley (Villeneuve) registered in 2007.

It is very difficult to assess whether this species has been present in Switzerland for a long time and has simply been missed, or it has reached the Southern Ticino relatively recently. The second explanation could be a result of possible changing climates in Central Europe (i.e. global climate change). However, Puisant (2006) mentioned *Tettigetta argentata* in the French region of Yonne (observation in 1995) and Schedl (1973) in the Italian South Tyrol near Meran (observations already in the middle of 19th century). Both sites are situated clearly to the north of the Swiss location.

With regard to microclimate and vegetation structure, the habitat at Monte Caslano is unique in Switzerland. It is speculated that there is a low probability of this species occurring in other sites in Switzerland. This is because intense field work has been conducted in the Southern Ticino and Valais over the last five summers. It will be interesting to examine whether *Tettigetta argentata* expands its current range over the following years and if this corresponds to any climate changes in the region.

The habitat distribution pattern of *Tettigetta argentata* at Monte Caslano is unexpected. *T. argentata* males do not clearly prefer the sparse wooded meadows but reach high densities in the lowest parts within rather dense forest. *T. argentata* has never been observed above 440 m a.s.l. and *Cicadetta* cf. *cerdaniensis* never below this altitude. However, it is not expected that this is a result of competition between the two species.

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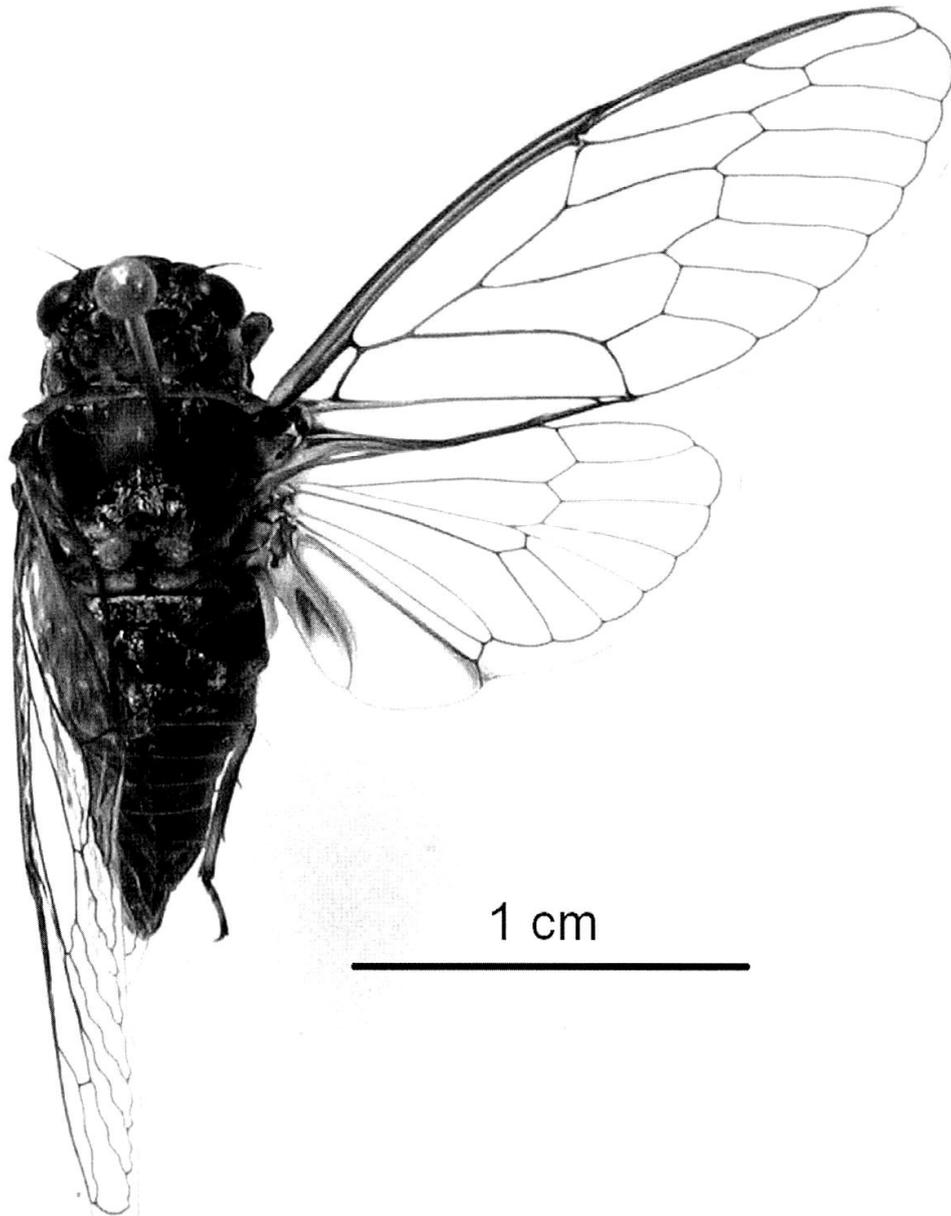


Fig. 2. *Tettigetta argentata* collected at Villeneuve (Aosta Valley, Italy) on 11 June 2007.

ZUSAMMENFASSUNG

Im Juni 2007 wurde eine sehr individuenreiche Population der westmediterran verbreiteten Silbernen Zikade (*Tettigetta argentata*) am Monte Caslano akustisch entdeckt und auch im Jahre 2008 bestätigt. Die Art kann als achte aktuell vorkommende Singzikadenart (Cicadoidea) erstmals für die Schweiz belegt werden.

Das Habitat am Monte Caslano besteht aus einem steilen und felsigen südexponierten Abhang zum Luganersee. Er enthält ein Mosaik aus lockeren bis dichteren Mannaeschen-Hopfenbuchenwäldern (*Fraxino orno-Ostryon*) und aus gepflegten Trockenwiesen. Es wird wohl kaum enträtselt werden können, ob *T. argentata* diesen Lebensraum schon lange nutzt und überhört wurde oder erst kürzlich - vielleicht als Folge der Klimaerwärmung - eingewandert ist. Die Population scheint sich jedenfalls fortzupflanzen. Aufgrund der intensiven Feldforschungen in den letzten Jahren ist es derzeit eher unwahrscheinlich, dass weitere Standorte von *T. argentata* in der Schweiz erwartet werden können.

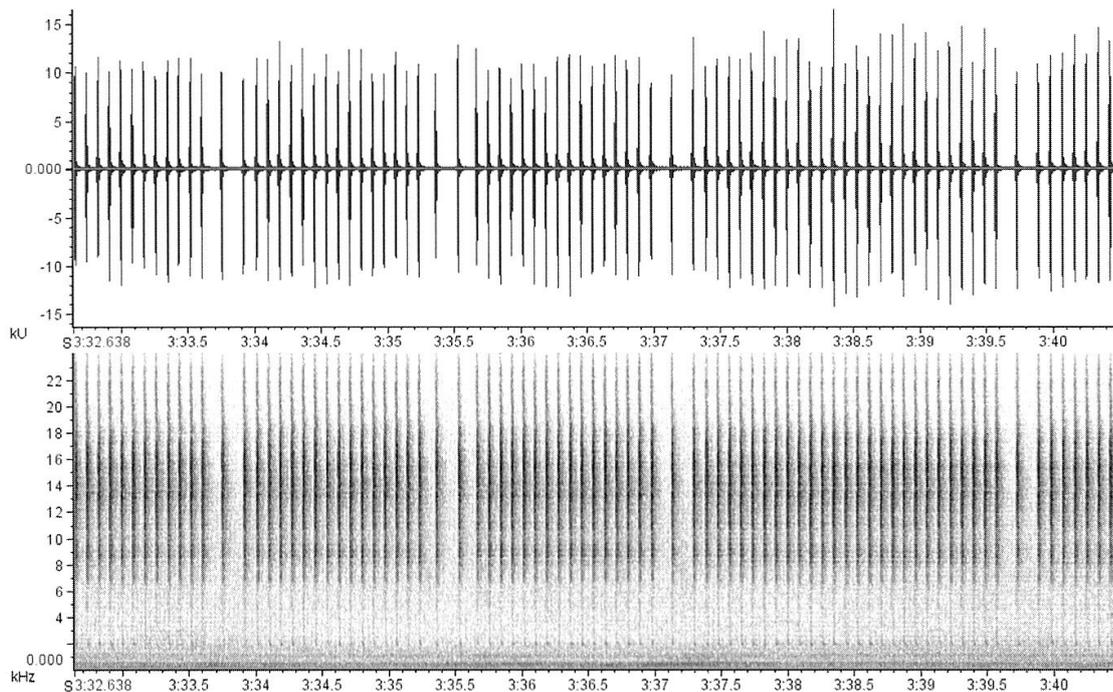


Fig. 3. Oscillogram and spectrogram of the calling song of *Tettigetta argentata* (sequence of 8 seconds): typical recording from Monte Caslano (26 June 2007).

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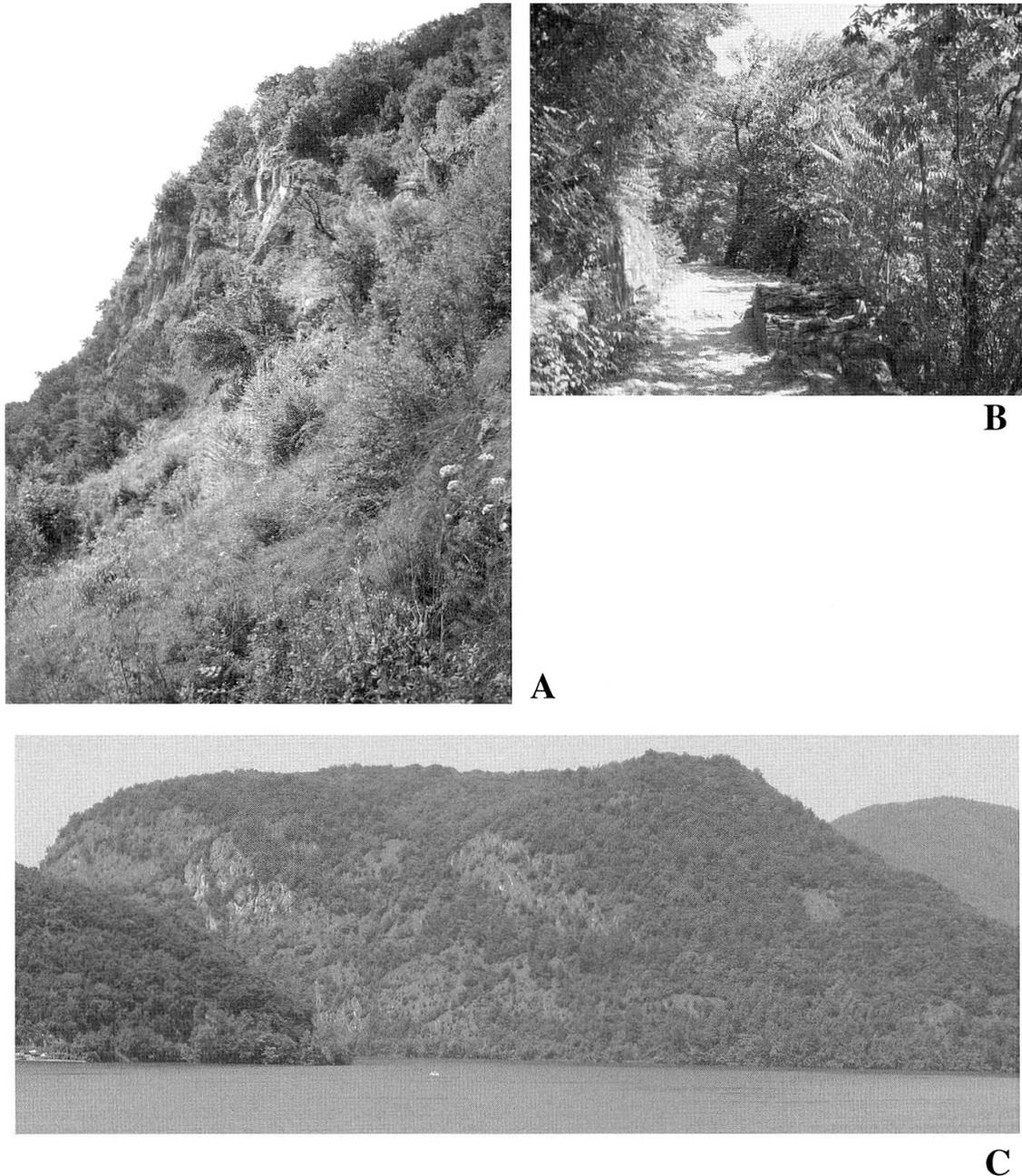


Fig. 4. Habitat of *Tettigetta argentata* at Monte Caslano: (A) dry meadow with bushes and small woods, (B) wooded part at lakefront, (C) overview from Barbengo.

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