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First record of the adventive weevil *Gymnetron rotundicolle* Gyllenhal, 1838 from Switzerland (Coleoptera, Curculionidae)

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The adventive weevil *Gymnetron rotundicolle* Gyllenhal, 1838 is recorded for the first time from canton Ticino, Switzerland. The find of 5 individuals in a vineyard at the peri-urban area of Lugano represents the westernmost record of the species currently known in Europe.

Keywords: Curculionoidea, distribution, adventive species, new record, vineyards, Southern Switzerland, canton Ticino.

INTRODUCTION

The genus *Gymnetron* Schönherr, 1825 is represented in Switzerland with six species (Caldara 2008a; Germann 2010). All of them live on *Veronica* spp. (Plantaginaceae). The first author examined six specimens of a weevil species not yet known for the Swiss fauna. Arthropod specimens were sampled in the frame of the large research-project code-named BioDiVine (Biological Diversity in Vineyard) which addresses the invertebrate biodiversity of vineyard ecosystems in the canton of Ticino.

MATERIAL & METHODS

Study area and design

The study area comprises the whole wine-growing area of the canton of Ticino (southern Switzerland) which extends from the most northern site in Giornico (8°51'52" E, 46°24'30" N) to the most southern in Stabio (8°55'50" E, 45°51'23" N). Based on a pilot study by Trivellone *et al.* (2012), 48 vineyards were selected using a random stratified balanced design based on three main variables: the aspect (50 % of the vineyards exposed toward NW-NE; 50 % exposed SW-SE), the slope (50 % of the vineyards on the plain: < 5° slope; 50 % on the slope: > 10°) and the dominant environment types (> 50 % vegetation cover) surrounding the vineyards within a radius of 500 m ($\frac{1}{3}$ forest, $\frac{1}{3}$ urbanized settlement, $\frac{1}{3}$ open field). In this way, the selected vineyards can be considered representative of the vineyard ecosystem and vineyard landscape of southern Switzerland.

Data sampling

In each vineyard we placed two trap sites, one along the vine row and the other on the vegetated slope; if the slope was absent, the second trap site was placed along another vine row. The two trap sites were at least 10 m apart and 20 m away from the vineyard margin to avoid edge effects. Each pitfall trap site consisted of four 200 ml cups (7 cm in diameter) placed in a row spaced approx. 1 m from one another. Each cup was half-filled with saline solution and covered by a transparent plastic roof. The traps were opened during 7 days per month from March 28 to October 11, 2011, for a total of eight sampling periods. All the specimens were labeled and conserved in 70 % alcohol and sent to the first author for identification.

The samples are conserved at three different museums in Switzerland: the Museo cantonale di storia naturale, Lugano (MCSN), the Naturhistorisches Museum der Burgergemeinde Bern (NMBE), and the Natur-Museum Luzern (NMLU).

RESULTS & DISCUSSION

Altogether 1063 individuals belonging to 93 weevil species were collected by pitfall trapping. Five specimens of a *Gymnetron* species were only recorded from a southeast-facing terraced vineyard in the community of Porza with the following indications: TI, Porza, 8°57'20" E, 46°01'35" N (Swiss coordinates: 717548 / 098300), 442 m a.s.l. slope, 29. 3.-5. 4. 2011, BioDiVine Project, leg. Trivellone & Pollini. 2 Ex., same data but collected from 28. 4.-5. 5. 2011. One additional specimen was collected by the first author on 14.3.2013 in Chiasso, Pedrinete, Swiss coordinates: 721.818 / 076.590, 480 m a.s.l. from *Veronica persica* with a sweep net (collections NMBE, NMLU, MCSN).

The specimens collected in the pitfall traps have been sampled from sparsely grass covered slopes placed between vine rows, and from inter-row spaces. The vineyard is located on a hill above the plane of the Cassarate river at the periphery of the city of Lugano. During the sampling season, the permanent grass cover treatment included three times mowing and twice chemical weed control under the row. Fungicides were applied up to 10 times per growing season on the vine canopy and two treatments with an insect growth regulator insecticide were applied.

Based on the key by Caldara (2008a) the specimens have been assigned to *Gymnetron rotundicolle* Gyllenhal, 1838 (Fig. 1), a species originally distributed from Central Asia and Russia to the Near East (Reitter 1906) and Bulgaria (Caldara 2008b). Recently Strejcek (2007) recorded *G. rotundicolle* for the Czech Republic based on eight specimens collected in the years 2000-2006 at six localities. Krátký & Trnka (2012) added finds of five specimens from Moravia collected in the same year. Caldara (2008b) recorded *G. rotundicolle* in 35 specimens from Veneto collected in 2007 for the first time for Italy.

Within the determination of samples for the ALARM-Project (Assessing Large scale Risks for biodiversity with tested Methods, see also <http://www.alarm-project.net/alarm/>) a further locality for Italy can be added: Italy, Venice province, Meolo, disturbed site, 166 m a.s.l., 46°03 N / 12°47 E, grass surrounded by trees, 16.6.2006, FSN-Project. The single male specimen was collected using pitfall traps. It was first erroneously determined as *Gymnetron melanarium* (Germar, 1821). Furthermore, the following new records from Italy are provided: 2 males, 3 females,



Fig. 1. Habitus (dorsal, lateral) of the adventive *Gymnetron rotundicolle* Gyllenhal, 1838, canton Ticino, Porza. The photos were taken using the VHX-2000 photograph system version 2.2.3.2. (Keyence Corporation) at the NMBE. (Photos: C. Germann).

Lombardia: Monguzzo (Como), 31.3.2012, leg. & coll. L. Diotti; 3 males, 2 females, Lago di Alserio (Como), 2.6.2012, leg. & coll. L. Diotti; 2 males, 3 females, Emilia Romagna, Varano (Parma), 12.11.2010, leg. & coll. L. Diotti; 1 male, Umbria: Monte Martano, Giano dell'Umbria (Perugia), 700–900 m a.s.l., 25.5.2012, leg. & coll. A. Paladini.

There are two possible hypotheses on the sudden appearance of *G. rotundicolle*: (i) either it is an accidental introduction (e.g. along with cultivated *Veronica* spp.) with subsequent establishment of populations and spreading (Strejcek 2007;

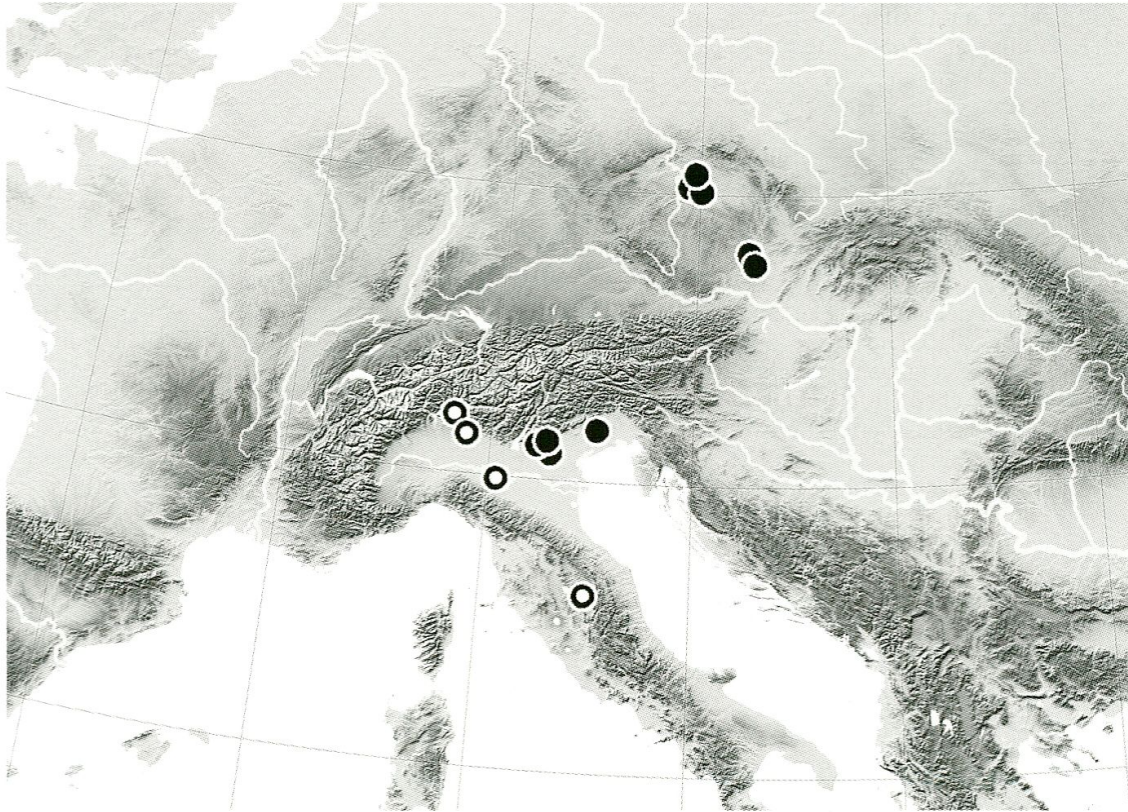


Fig. 2. Distribution of *Gymnetron rotundicolle* Gyllenhal, 1838 as presently known, with new records of the species in Europe (white spotted black circle).

Caldara 2008a, b) or (ii) an actual active enlargement of the distributional area of the species (Caldara 2008a, b).

Promoting the second hypothesis Caldara (2008a) collected specimens of *G. rotundicolle* from *Veronica persica* in Italy. This probable host plant is a common weed growing at ruderal places, in gardens, vineyards and fields. Originally *V. persica* is a native plant of the region between the Pontus (northeastern Turkey) and the Himalayan Mountains (Hegi 1975). The first records of *V. persica* from Europe date back to 1800 and within one century the whole of Europe was invaded (Hegi 1975). However, *Gymnetron rotundicolle* may also develop on other *Veronica* spp., as Krátký & Trnka (2012) collected specimens from *Veronica chamaedrys*.

It is noteworthy that despite of intensive collecting by L. Diotti in the Italian province Lombardia during the last ten years, there are no older records of *G. rotundicolle* (written comm. R. Caldara). All the facts combined provide fair evidence for a recent, contemporary spreading from the East to the West. In this context, the records from Ticino represent currently the westernmost records in Europe (Fig. 2). A similar dispersal was observed for *Rhopalapion longirostre* (Olivier, 1807) (Apioidae) starting presumably in the 70s and 80s (overview in Sprick *et al.* 2002).

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