



Northern Apennines as centre of speciation: a new *Verdanus* species group (Hemiptera, Cicadomorpha, Cicadellidae) from Italy and its phylogenetic relationships with *V. bensoni* and the *V. limbatellus* group

ADALGISA GUGLIELMINO¹ & CHRISTOPH BÜCKLE²

¹Department of Plant Protection, University of Tuscia, Via S. Camillo de Lellis, 01100 Viterbo, Italy

²Neckarhalde 48, 72070 Tübingen, Germany

Abstract

A small sector of Northern Apennines - the Tuscan-Emilian Apennines - constitutes an interesting diversity centre of a new *Verdanus* species group closely related to *V. bensoni* and the *V. limbatellus* group. It consists of three species: *V. tyrannus* sp. nov., *V. saurosus* sp. nov. and *V. rosaurus* sp. nov., the latter with two subspecies, *V. rosaurus rosaurus* ssp. nov. and *V. rosaurus rex* ssp. nov., which doubtless form a monophyletic group (*V. rosaurus* group). Data on their distribution, ecology and life cycle are added to their original descriptions. The new taxa live allopatrically in a very restricted area and thus occupy a distribution gap of another species group of *Verdanus*, the *V. abdominalis* group, present in Italy in the mountain regions of the Alps and Central and Southern Apennines. A hypothesis of the origin of the new taxa is presented based on the ecological conditions in the Tuscan-Emilian Apennines during the last Postglacial period and on the limited dispersal ability of these normally brachypterous insects. Possible synapomorphic characters and phylogenetic relationships of the new taxa with each other and with *V. bensoni* (China) and the *V. limbatellus* group (*V. limbatellus* (Zetterstedt), *V. kyrilli* (Emeljanov), *V. sichotanus* (Anufriev), *V. kaszabi* (Dlabola)) are discussed and a cladistic analysis is conducted. Comparing *V. bensoni* and the *V. limbatellus* group on the one hand and the *V. rosaurus* group on the other, some morphological characters appear to change often in parallel on the same paths, independently from the phylogenetic hypothesis. Remarkably, within the same morphological characters the range of variation among species inhabiting the comparatively minute area of the Tuscan-Emilian Apennines is similar to that found among other taxa distributed across vast areas of northern and central Eurasia.

Key words: Auchenorrhyncha, biogeography, Deltocephalinae, ecology, evolution, Paralimnini, phylogeny, taxonomy

Introduction

The genus *Verdanus* was established by Oman (1949) for *Deltocephalus evansi* Ashmead, 1904 (the type species). He distinguished the new taxon from the genus *Diplocolenus* on the base of aedeagal differences. Several authors (i.e. Ribaut, 1952; Nast, 1972, 1987; Knight, 1974; della Giustina, 1989) considered it a subgenus of *Diplocolenus*.

Verdanus is a Holarctic genus with prevalence of species occurring only in the Palaearctic Region (Knight, 1974). Presently, in Europe, this genus consists of two subgenera, *Verdanus* and *Erdianus*, including ten and nine species respectively (Hoch, 2004). In Italy are recorded: *Verdanus* (*Verdanus*) *abdominalis* (Fabricius), *V.* (*Verdanus*) *laetitia* (Servadei), *V.* (*Verdanus*) *monticola* (Linnavuori), *V.* (*Erdianus*) *nigricans* (Kirschbaum) and *V.* (*Erdianus*) *penthopitta* (Walker) (D'Urso, 1995); the record of the last species is doubtful as it is based on only one very old notice (Vismara, 1878: Piemonte, as *Acocephalus sudeticus* Kolenati, see Servadei, 1967).

The species of the subgenus *Verdanus* s. str. living in Italy all belong to the *V. abdominalis* group: *Verdanus monticola* is widely distributed and quite common throughout the Central Apennines on meadows and