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Important life history traits of *Chaetopteryx villosa* (Fabricius, 1798) (Trichoptera, Limnephilidae)

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Abstract

Long-term studies of the life cycle of *Chaetopteryx villosa* (Fabricius) have been conducted in Wolbórka Spring, in the vicinity of Łódź (Central Poland). The emergence period of adults lasts from the beginning of October until mid December. During this relatively long period, adults are exposed to diverse weather conditions. Low (sometimes below zero) ambient temperatures influence the survival of adults. Although oviposition usually starts at the end of October, freshly laid eggs were found even in January. These temperatures also determine the activity of predators as well as the development and survival of eggs laid on land. Some egg masses have been transferred to the laboratory and bred at different temperatures.

Key words: biology, trade-off, life history, egg and larval development

Introduction

Chaetopteryx villosa (Fabricius) has been recorded from almost all over Europe, except in the Balkans and Appeninian Penninsula (Tomaszewski 1965, Botosaneanu & Malicky 1978, González 1979). Its larvae are characteristic for spring areas and running waters, but also occur in oxbow lakes and mountain ponds or lakes. The larvae are shredders and feed mainly on detritus. Graf *et al*. (2008), however, also classified them as grazers, gatherers, and even predators.

The life cycle of this caddis species is temperature dependent (Wagner 1990, 2002) and mostly univoltine, but in very cold waters, for example in mountain streams of Norway, it may sometimes be semivoltine (Andersen & Tysse 1984). Because of late emergence of adults, *C. villosa* was classified (Crichton 1960) as an autumnal species and even an autumn-early winter species (Solem 1984). In univoltine populations in Norway, adults are present from the middle of September to the middle of October (Andersen & Tysse 1984) and from the middle of September until the middle of December (Andersen 1983). In Germany, they are present from the beginning of September until the end of December (Wagner 1986). In Poland the occurrence of adults lasts from the end of September to the end of December (Majecki 2006). According to Andersen & Tysse (1984) and Solem (1984), females emerge with mature ovaries and very quickly start to copulate with males. Pairing/copulation is one of the longest among insects and lasts as long as 12 days (Solem 1984). The weight of males and females of *C. villosa* measured by Wagner (2002) was lower in the upper part of Breitenbach Stream (Germany) than in the lower part. The weight of adults (males and females) was significantly higher in the beginning of the emergence period (Wagner 1986).

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