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On the morphology and classification of larval water mites (Hydrachnidia, Acari) from springs in Luxembourg

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Abstract

Morphological data on the larvae of 37 species of freshwater mites (Hydrachnidia) known from springs in Luxembourg are reported. Larvae of *Sperchon insignis* (Walter, 1906), *S. longissimus* K.Viets, 1920, *Lebertia holsatica* K. Viets, 1920, *Atractides fonticolus* (K.Viets, 1920) and, with a question mark, *A. pennatus* (K.Viets, 1920) are described for the first time; re-descriptions are presented for *Sperchon squamosus* Kramer, 1879 and *S. setiger* Thor, 1898. Previous larval descriptions are listed and commented on for all species. Two species are recorded as new for the Luxembourgian fauna: *Panisellus thienemanni* (K.Viets, 1920) and *Pseudofeltria scourfieldi* Soar, 1904. A further taxon previously not recorded from springs in Luxembourg is described, probably *Tiphys* Koch, 1836 sp. An illustrated key is presented suitable for the determination of most parasitic water mite larvae attached to insect hosts from Luxembourgian springs.

Key words: Acari, water mite larvae, taxonomy, springs, identification key

Introduction

Water mites (Hydrachnidia, Acari) are a widespread and species-rich group whose members live in freshwater and whose larvae are parasites of insect hosts (Di Sabatino *et al.* 2002). The study of larval morphology is of great interest for taxonomical questions because of the extensive heteromorphy between the larval stage on the one hand and the deutonymphal and adult stage on the other (Prasad & Cook 1972). Knowledge of larval morphology may also be helpful in separating sister species. In addition, questions regarding host ranges (Smith & Oliver 1986) and parasitology (Smith 1988) can be treated in a species-specific way only on the basis of larval morphology.

Few studies of the larval morphology of water mites in Central Europe have been published since the review of Sparing (1959). Whereas Wainstein (1980) undertook a study on the water mite larvae of the former Soviet Union and a key for the genera present in North America was compiled by Smith *et al.* (2001), parasitic larvae of water mites in the Western Palaearctic have mostly been investigated in species-specific studies only (e.g. Gerecke & Tuzovskij 2001; Moreno *et al.* 2004).

The present study concentrates on seven spring sites in Luxembourg, for which the species composition has been previously investigated with respect to deutonymphs and adults from benthos samples (Gerecke *et al.* 2005 and own data). Of these 24 species, larval morphology was known for about two thirds. The larvae of five species have been reared from eggs and are described here for the first time, whereas further species have been distinguished by the diagnostic characters at the genus level. In the course of this study, three water mite species have been found for the first time in Luxembourg, two as larvae and one at the adult stage only. The state of our knowledge concerning larval morphology is thus presented for a total of 37 species that are now known to be spring-dwellers. As a result, most species living in Luxembourgian springs can now also be recognized at the larval stage.

