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The water mites (Acari: Hydrachnidia) of the Balkan peninsula, a revised survey with new records and descriptions of five new taxa

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Abstract

Based on published records and original data from recent research, a list is presented of the water mite (Acari: Hydrachnidia) fauna of the Balkan countries, i.e. Croatia, Bosnia and Hercegovina, Montenegro, Albania, Serbia, Macedonia, Bulgaria and Greece. It includes 382 species and subspecies in 77 genera and 34 families. Numerous new records for national faunas are reported, and five taxa, *Sperchon pelopeius* (Greece), *Atractides stankovici* (Croatia), *Axonopsis graeca* (Greece), *Woolastookia minuta* (Bosnia and Hercegovina, Greece) and *Arrenurus ornatus graecus* (Greece) are described as new to science. *Atractides moniezi* (Motaş, 1927) is synonymized with *A. lacustris* (Lundblad, 1925). The assumption of K. O. Viets (1987) that *Pionopsis subruber* Đorđević, 1903 is a synonym of *P. lutescens* (Hermann, 1804) is confirmed. The characteristics of the water mite fauna in the treated area are briefly outlined. Additional field work is highly desirable for a more appropriate evaluation of the extant water mite biodiversity in the Balkans.

Key words: water mites, species diversity, Croatia, Bosnia and Hercegovina, Montenegro, Albania, Serbia, Macedonia, Bulgaria, Greece

Introduction

Among the lineages of the Acari which have secondarily invaded freshwater habitats, water mites (Hydrachnidia), which have colonized all kinds of freshwater, are the most successful group (Di Sabatino *et al.* 2008). They are useful indicators of ecosystem disturbance, directly because of their sensitivity to reflect natural changes and human induced environmental stresses in freshwater habitats, and indirectly, as important constituents in natural communities (Di Sabatino *et al.* 2000). Research of water mite biodiversity on the Balkans has a relatively long tradition since the first records were published by the eminent Serbian zoologist Živojin Đorđević 1903 and 1906 from Serbia and Macedonia, respectively (both papers have been published in two languages, but in our reference list only the Serbian version is reported). However, despite a growing number of data published during the past 100 years, freshwater mite records from the Balkan countries remain dispersed. Phylogeographic studies show that the Balkan Peninsula (along with two other peninsulas of Southern Europe—Iberian and Apennine) was a refuge of genetic diversity during the Pleistocene (Hewitt 1999). To what extent is the Balkan area unique and important for water mite biodiversity? This paper attempts to answer the question by compiling data on water mites and their current geographic distribution in Croatia, Bosnia and Hercegovina, Montenegro, Albania, Serbia, Macedonia, Bulgaria and Greece.

The study area

The Balkan Peninsula in southeastern Europe is bordered in the east by the Black, Marmara and Aegean seas, in the south by the Mediterranean Sea and in the west by the Adriatic and Ionian seas. The northern boundary may be defined with a line arbitrarily drawn from the Adriatic near Rijeka (Croatia) to the upper Sava River, and then along the Sava River to its confluence with the Danube river, at Belgrade (Serbia), and along the Danube until it reaches the Black Sea. Most of the Balkan Peninsula is mountainous. The mountain ranges include Outer and Inner Dinaric Alps extending parallel to the Adriatic coast, the old Rhodope chain between Macedonia and Maritsa valley, the Šara-Pindus range in northern Greece, eastern Albania and western Macedonia, the Balkan Mountains distributed mostly in Bulgaria, part of the Carpathian Mountain range in eastern Serbia and isolated summits, including Mounts Olympos, Pelion and Óssa in Greece. Rivers are grouped into three major catchments, draining into the Black, Adriatic and Aegean seas.

The richness of physiogeographic features together with its specific topographic position in Europe influences the biogeographic diversity of the Balkan Peninsula (Crnobrnja-Isailović 2007). According to Matvejev & Puncer (1989; treating the area of former Yugoslavia), most of the Balkans comprises seven landscape types (biomes): 1) evergreen Mediterranean maritime woodlands and maquis; 2) sub-Mediterranean Adriatic,