

**ZOOGEOGRAPHIC ANALYSIS OF WEEVIL FAUNA  
(COLEOPTERA, CURCULIONOIDEA: RHYNCHITIDAE, APIONIDAE,  
NANOPHYIDAE, CURCULIONIDAE, RHYNCHOPHORIDAE)  
IN KRAGUJEVAC BASIN (SERBIA)**

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ABSTRACT. Zoogeographic analysis of 355 weevil species registered in Kragujevac basin from 1987 to 1995 was carried out.

The examined fauna mostly is European-Asian-Mediterranean mixture that fully corresponds to the floristic situation. According to the data available so far, the overall zoogeographic picture of the weevil fauna in Kragujevac basin differs significantly from the Central European fauna - the Slovak fauna, for example - where Holarctic and Palaearctic forms predominate, or from Italian fauna, where every fourth species is an endemic. It most closely resembles the Bulgarian fauna, in which European species are numerically dominant, followed by Mediterranean and Eurosiberian species.

The only one cosmopolitan species was registered *Sitophilus granarius* (Linnaeus, 1758), well known pest in grain storehouses.

For the interesting blind species *Ubychia holdhausi* Ganglabauer, 1903 the new data of distribution are given.

## INTRODUCTION

*Curculionoidea* superfamily includes the largest animal's family *Curculionidae* represented by 500.000 species in the world (only 50.000 have been described) (LYAL and KING, 1996). The number of the described weevils species is greater when we include other related families (*Rhynchitidae*, *Apionidae*, *Nanophyidae* etc.). For the people especially interesting are the forest and agricultural weevil pests.

This phitophagous insects have been incompletely and only periodically investigated in Yugoslavia. The first larger study of Serbian insects (included weevils) was conducted on the Majdanpek (East Serbia) forest reserve (ŽIVOJINOVIĆ, 1950).

The Kragujevac basin occupies a central territory in Serbia (Fig. 1), opened for influences almost from all directions. The spurs of the Rudnik, Gledičke Planine, and Kragujevački Crni Vrh mountains



Fig. 1. Position of the investigated zone

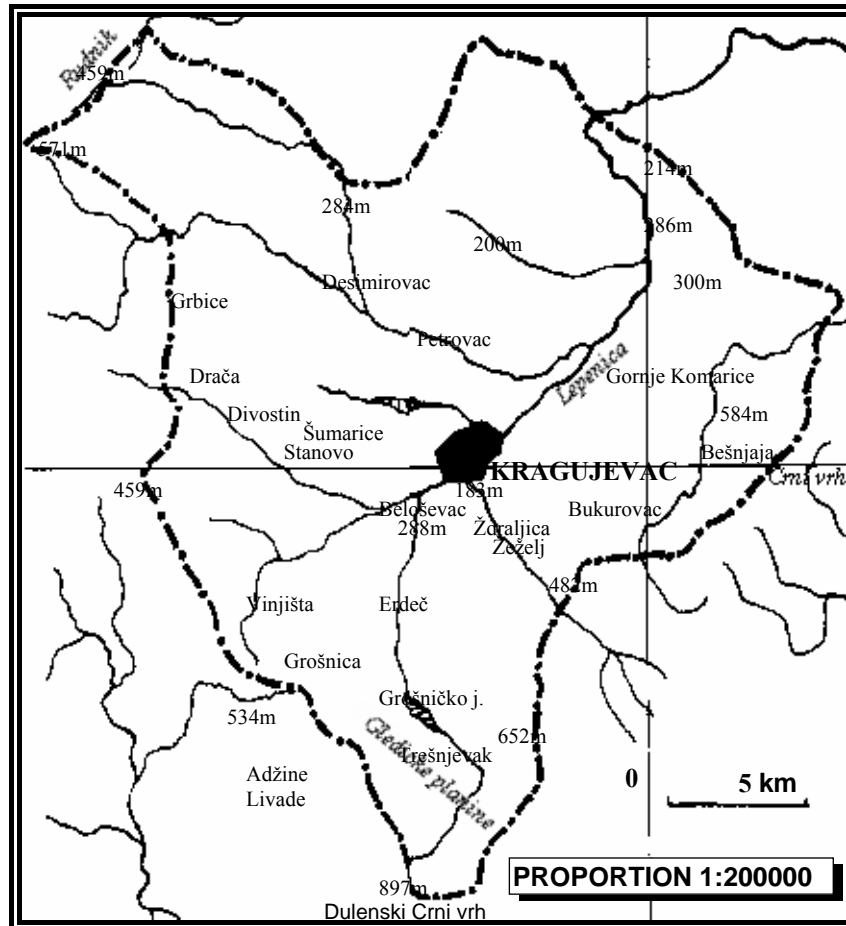


Fig. 2: Kragujevac basin with localities and some elevation data

(Fig. 2) are around. This part of Europe has an interesting geological history, which together with strong anthropogenic influences in the last century reflected on flora (VELJOVIĆ, 1967) and fauna. The Kragujevac basin belongs to the Sub-Mediterranean-Balkan woods zonobiome (LOPATIN and MATVEJEV, 1995) with *Quercetum frainetto cerris*, *Fagetum montanum* s.lat., and *Salici-Populetum* s.lat. plant-associations. Elements of steppes and woodland steppes on higher terrains are included. The natural woods are mostly under human influence, interchanged with agricultural places.

## MATERIAL AND METHODS

During investigations in the Kragujevac basin from 1987 to 1995, in the course of 145 outings, the author collected at 25 localities (mostly in the Šumarice memorial park as a representative area) and identified 5495 adult specimens of weevils, encompassing 355 species (PEŠIĆ, 1998). They belong into 113 genera, and 22 subfamilies, from five families (ALONSO-ZARAZAGA and LYAL, 1999).

Zoogeographic analysis was based on the data presented in the keys for identification of species, faunistic checklists and catalogues mentioned in references. In the view of the fact that we are dealing mainly with a collection of partial data of a local nature, in the absence of clearly known overall boundaries of species ranges in most cases, the analysis was performed by counting the citations of geographic units (127 units were distinguished).

## RESULTS AND DISCUSSION

The list of the ten most frequently mentioned geographic units and data on the number with percentage of species, ordered by values, has the following order:

Geographic unit	nr. of species	% of species
Europe	122	34.3
Asia Minor	108	30.4
Central Asia	76	21.4
Central Europe	70	19.7
Siberia	70	19.7
Caucasus	65	18.3
Europe without the northern part	61	17.2
North Africa	57	16.1
Southern Europe	56	15.8
South-eastern Europe	46	12.9

The only one cosmopolite species was registered - *Sitophilus granarius* (Linnaeus, 1758), a pest in grain storehouses.

Of species registered in the Kragujevac basin, 28 (7.9%) have a Palearctic or nearly Palearctic distribution, 5 (1.4%) have a Holarctic distribution, and 11 (3.1%) live in the United States. The 14 species has mentioned Balkan-peninsula in the distribution, but the majority of them are not exclusively linked with it (for example, *Phyllobius (Hoplophyllobius) pilicornis* Desbrochers, 1873, accompanying hazel, reaches south-eastern Central Europe, while *Ph. (Ustavenus) longipilis* Boheman, 1843 lives in Italy).

It can be concluded that the examined fauna is a European-Asian-Mediterranean mixture. It completely corresponds to the flora.

According to the data available so far, the overall zoogeographic picture of the weevil fauna in the Kragujevac basin differs significantly from the Central or South European fauna. For example, the Slovak fauna (HOLECOVA, 1993) has got Holarctic and Palearctic elements as predominate. Italian weevils' fauna, has every fourth species as an endemic (ABBAZZI & OSELLA, 1992; ABBAZZI et al., 1995). Weevils' fauna in Kragujevac basin most closely zoogeographically resembles the Bulgarian fauna, in which European species are numerically dominant, followed by Mediterranean and Eurosiberian elements (ANGELOV, 1976).

Several species are distinguished by a narrow range: *Ceratapion beckeri* (Desbrochers, 1875) (South-eastern Europe, the Caucasus); *Protapion dentipes* (Gerstäcker, 1854) (Southern Europe, Syria, Palestine); *Otiorrhynchus inflatus* Gyllenhal, 1834 (southern Austria, northern Italy, the western Balkans); *O. pulverulentus* Germar, 1824 (eastern Alps, South-eastern Europe); *O. austriacus* (Fabricius, 1801) (South-eastern Europe); *Phyllobius longipilis* (Italy, the Balkans); *Ph. pilicornis* (south-eastern Central Europe, the Balkans); *Sciaphobus caesius* (Hampe, 1870) (south-eastern Central Europe, South-eastern Europe); *Bradybatus tomentosus* Desbrochers, 1893 (southeastern Central Europe, the Balkans, Sicily); *Echinodera capiomonti* (C.Brisout, 1864) (Italy, northern part of the Balkan peninsula); and *Ceutorhynchus fulvitaris* C. Brisout, 1860 (Gaul, Italy, Sicily, Algeria).

Available data (OSELLA, 1977) indicated that the blind geophile *Ubychia holdhausi* Ganglbauer, 1903 lives only on limestone terrains in Bosnia and Herzegovina. The range of this species, meanwhile, was extended to the east by recent findings (PEŠIĆ, 1995), and it has also been discovered in the Kragujevac basin (Petrovac and Lake Grošničko). Those findings indicate that *U. holdhausi* prefers the oak and beech litter on hilly terrains (200-650 m above sea level), in the neighbourhood of surface water (rivers, reservoirs etc.). It is in any event a Balkan endemic.

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