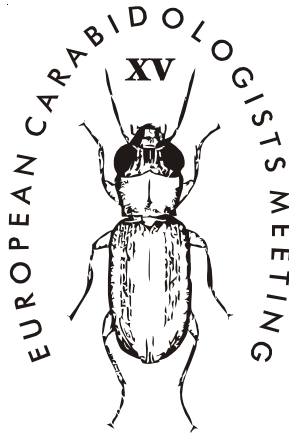


**Institute of Systematic Biology
Daugavpils University**



**DAUGAVPILS, LATVIA
23. - 27.08.2011.**

**15th European Carabidologists Meeting
Daugavpils, Latvia, 23.-27.08.2011.**

BOOK OF ABSTRACTS

**Daugavpils University Academic Press "Saule"
Daugavpils 2011**



To memory of Italian carabidologist Tullia Zetto Brandmayr...

Published by: Daugavpils University Academic Press "Saule", Daugavpils, Saules iela 1/3, Latvia
Printed by: SIA Madonas Poligrāfists, Saieta laukums 2, Madona, Latvia

WEB support: Daugavpils University - www.du.lv
Institute of Systematic Biology, Daugavpils University - www.biology.lv
Baltic Journal of Coleopterology - www.bjc.sggw.waw.pl
15th European Carabidologists Meeting - <http://15thmeeting.biology.lv/>

ISBN

A QUANTITATIVE ANALYSIS OF DOMINANCE STRUCTURE OF GROUND BEETLE COMMUNITIES

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The dominance structure is the most common characteristic of soil arthropods communities. Quantitative characteristics are often used as well (Renkonen, 1938; Mossakowski, 1970), resulting in dividing communities into mono-, oligo- or polydominant ones (Kuznetsova, 2005). Yet these are rather rarely used to describe of carabid communities (Khobrakova, 2006).

Any ground-beetle population can be subdivided into two, stable and labile, components, the former corresponding to resident species while the latter comprising migrant and sporadic ones combined. While being abundant in a particular habitat, the labile component can contribute a little to the structure of the entire community. From this evidence a hypothesis has been put forth that real structure and composition of the community is predominantly defined by the stable component. A study of the demographic structure proves this in general (Makarov, Matalin, 2009; Trushitsina, 2010; Matalin, Makarov, 2011).

In 2006-2008, dynamics of demographic structure of local carabid populations were studied in natural and lightly disturbed habitats within two, semi-desert and forest, belts. The stable component was identified for both the composition of dominant species and the dominance structure of entire community (full list) to be compared with those of residents (limited list). Prominent to strong differences were observed in nine out of 28 pairs compared. They concerned the structure of both the dominant and entire community. In spite of the fact that no general pattern was found, some trends were nevertheless revealed. These are as follows:

- 1) The dominance structure differs considerably between full and limited lists in transit habitats. As represented by flood-plains in the semi-desert belt these habitats aid mesophiles to migrate. In the forest belt, the highest elevations of the Oka flood-land are used by many carabids to escape from and survive during inundations.
- 2). Annual differences between full and limited lists usually coincide in the dominance structure.
- 3) Monodominant communities, as well as the phenomenon of superdominance, *ie*, when one species constitutes 70-85% of the total abundance, are rather exceptions to the rule. These were found in six cases only, their one-third being artifacts resulting from a technique peculiarity.
- 4) In floodplain terraces, the oligodominant communities are characteristic which include two species each reaching 30-40% of the total abundance.
- 5) Flood-plain carabid communities of high species diversity are characterized by a polydominant structure, with three or four dominant species being most frequent, each reaching 10-25% of the total abundance.

Thus, (a) when traditional methods are used to identify dominants, an error may occur; (b) the contribution of the labile component to the dominance structure depends on habitat peculiarity; (c) the labile component prevails in different biotopes depending on a particular belt.