

THE EFFECTS OF HERBICIDE GLYPHOSATE ON THE NUTRITIONAL ECOLOGY OF CARABID BEETLES

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Carabid beetles (Coleoptera: Carabidae) are important generalist predators in agroecosystems. They are known to effectively control various pests and weeds, but knowledge in principles and factors of their food preferences are limited. According to nutritional geometry concept, animals often are selective for foods of differing macronutritional composition to meet their specific nutritional requirements in order to achieve maximum fitness. However, such macronutrient selection can potentially be disturbed by various xenobiotics used in agriculture, e.g. pesticides. Glyphosate, the most widely used herbicide in the world, is known to affect insect behavior and gut microbiota which can likely change insect's macronutrient selection and lead to its reduced fitness.

The main aim of the current study was to investigate how carabid beetles balance macronutrients (proteins, lipids and non-structural carbohydrates) when treated with glyphosate. We hypothesized that glyphosate will cause higher carbohydrate consumption due to increased metabolic stress and that this consumption will increase with higher glyphosate concentration. As well, we expected glyphosate-treated beetles to lose weight and deplete their body lipids. Three different concentrations of pure glyphosate and a field relevant amount of commercial glyphosate-based product Roundup® Express were used mixed with mealworm powder and fed to *Pterostichus aethiops* beetles. After the pesticide treatment, beetles were served with three different uncontaminated food options: high in carbohydrates, lipids and protein for 24 hours. Carabids were offered the same three food options for 24 hours after a week. Served pesticide-treated and uncontaminated foods were weighted before and after to determine consumed amount. Beetles were weighted and their lipid and protein body content was measured after the experiment. Data analyses are currently being performed and the results will be presented.
