

Summary of the project for the general public

“Development, larval aggregations and attractants of carrion beetle *Necrodes littoralis* (Linnaeus, 1758) (Coleoptera: Silphidae)”

The aim of the project is to know the biology of carrion beetle *N. littoralis*, in particular its adaptations to carrion. Adaptations of larvae and adult insects will be studied. In the case of larval stage we will study spatial and temporal patterns for larval aggregation on carrion, as well as mechanisms for this phenomenon. In this respect we will test the hypothesis, that larvae of *N. littoralis* do not aggregate actively in response to some aggregation stimulus, instead masses are created passively through searching for places with temperature optimal for development. Moreover, we will study temperature patterns for the premature development of *N. littoralis*. In the case of adult stage, we will identify volatile organic compounds attracting them to carrion. Because it is assumed that adult *N. littoralis* select carcasses not infested or only slightly infested with larvae of blow flies, we predict that it is attracted by compounds emitted from the putrefying carrion tissues and not larval blow flies. Moreover, interactions of *N. littoralis* with necrophagous flies of Calliphoridae will be studied. In this respect we predict that in competition with blow flies it uses the strategy of active reduction of blow fly larvae population on carrion through selective and voracious feeding on them.

Biology of *N. littoralis* is poorly studied, with no single systematic laboratory study devoted to this topic. Results of the project will have a profound impact on several research fields, in particular development and larval aggregations of carrion insects, attractants and interspecies interactions of carrion insects, as well as carrion ecology. We assume that *N. littoralis* adaptations to carrion are very different compared to adaptations of well-studied carrion insects. From this point of view, the project will result in description and partial explanation of the new way of carrion use by insects.

The significance of this research for forensic entomology was another reason for choosing the topic. We anticipate that results of the current project will help to integrate the development-based and the succession-based methods for estimation of post-mortem interval from insect evidence. *N. littoralis* is a species in case of which such a universal method for post-mortem interval estimation is within our reach. The only thing which is necessary is to better understand its biology.