Abstract*

Red wood ants – oak herbivore interactions: preliminary results of short-time observation (Hymenoptera: Formicidae; Insecta varia)

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The leaf damage caused by chewing insects and an abundance of leaf sap-sucking aphids in an oak forest habitat were studied in five localities affected by red wood ants (*Formica rufa* LINNAEUS, 1761 group) in the České Středohoří Mountains (Litoměřice, North Bohemia). Preliminary results from July 2006 are presented. The effects of the ants were studied by (1) comparing one locality with red wood ants (Strážiště Hill) and four control localities without or with only a low red wood ant abundance, and (2) using an experimental design where half of the studied oak trees in each locality were isolated from ant access through the use of petroleum jelly barriers.

The aphid density was significantly higher (ANOVA, $p < 0.05$) in the locality affected by ants than in the control localities. This result was to be expected and is readily explained by the mutualistic ant-aphid relationship, as documented in the literature (reviewed, for example by ADLUNG 1966). On the other hand, MAHDI & WHITTAKER (1994) and others have suggested a more complicated situation. All the aphid populations in their study were increased by the presence of *Formica rufa* on birch trees (*Betula pendula* ROTH) only in summer and autumn, whereas a decrease in aphid number was observed at the beginning of the season. Moreover, an increase in number was recorded only for aphids tended by ants; aphid populations not tended by ants decreased.

Although some studies have well documented the effect of ants in decreasing the leaf damage caused by chewing insects (e.g., MAHDI & WHITTAKER 1994), we did not verify this effect. The percentage leaf areas removed by chewing insects in the studied localities were not significantly different. The same result was obtained in the tree isolation experiment within the locality influenced by wood ants. We postulate that the probable reason why the experimental removal of ants from the trees through use of a petroleum jelly barrier had no observable effect on the aphids or the leaf damage was the short time of the tree isolation. The fact that there were no significant differences between the localities with different ant densities suggests only a slight effect of these ants on chewing insects.

Our preliminary short-time observations on the interactions of wood ants and insect herbivores on oak trees indicated that the effect of wood ants on leaf damage consisted in particular in the increase of the abundance of aphids. Aphid species determination and a longer period of observation will be needed for more reliable results.

References

ADLUNG, K.G. 1966: A critical evaluation of the European research on the use of red wood-ants (*Formica rufa* group) for the protection of forests against harmful insects. – Zeitschrift für Angewandte Entomologie 57: 167-189.

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