Diversity of deadwood and saproxylic beetles (Insecta, Coleoptera) in dry broadleaved forests in the Slītere National park, Latvia

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Introduction

Deadwood plays a significant role for the biodiversity conservation in forests - at least 20-25% of species living in forests are saproxylic organisms. Saproxylic beetles are especially rich in species, therefore they are widely used as forest biodiversity indicators in Europe. The aim of current study is to evaluate diversity of both deadwood and saproxylic beetles in dry broadleaved forests in the Slitere National park. At first, we will try to find out which of deadwood substrates are the most important for the beetle diversity. Then we will characterize availability of various deadwood substrates in studied broadleaved forests. Finally, we will evaluate whether saproxylic beetles depending on widely available deadwood substrates are actually more common than beetles related with less abundant substrates.



Methods

Field study was carried out in dry broadleaved deciduous forests on the hillside of Zilie kalni (Blue Hills) in the Slitere National park located in the NW Latvia. This is one of the most important and still intact deciduous woodland territory remained in Latvia. Sampling was carried out in three woodland key habitats with ash as dominant tree species. Amount, type and decay class of various deadwood substrates were assessed using standard methods in 20x50m sampling plots replicated three times in each forest stand. Saproxylic beetles were sampled during June and July of 2010 with simple window traps attached directly on the deadwood substrates. Beetles were identified only to the family level, although all biodiversity signal species (red-listed species) were also listed.

Results: the most important deadwood substrates for the saproxylic beetle diversity

Type and decay class of deadwood significantly (p<0.05) influences saproxylic beetles. The highest richness of beetle families was found on the snags in early decomposition stages, however the largest abundance of beetles was found on the logs in late decomposition stages. Composition of beetle families was different on snags and logs, as well as on deadwood in various decomposition stage.

Parameters of	Influence (p<0.05) on saproxylic beetles		
deadwood substrates	Abundance	Richness	Composition
Tree species	-	-	-
Туре	+ (logs)	+ (snags)	+
Decomposition	+ (intermediate -late stages)	+ (early- intermediate stages)	+

Photo: Voldemars Spungis Results: diversity of saproxylic beetles

In total, 41 families of saproxylic beetles and 14 biodiversity signal species have been found. The most abundant families are Leiodidae (38%), Cholevidae (12%), Staphylinidae (11%), Sphindidae (8%), Throscidae (5%), Elateridae (5%) and Anobiidae (3%), the most frequent signal species are *Ampedus erytrhogonus* (n=63), *Tillus elongatus* (n=19) and *Ceruchus chrysomelinus* (n=19).

Results: the most abundant deadwood substrates in broadleaved forests in the study area

All kinds of deadwood occur in the studied forest stands (average volume $48.5 \text{ m}^3\text{ha}^{-1}$), however logs clearly dominate (average volume $35.4\text{m}^3\text{ha}^{-1}$). Deadwood of ash, elm and spruce dominate in study area. Although four decay classes were found, the greatest proportion of

Although four decay classes were found, the greatest proportion of deadwood is formed by the 3rd class**Conclusions** of decomposition (average volume 17.9m³ha⁻¹).





2 Conclusions 1. Snags in early and intermediate decomposition stage play the most important role for the conservation of

play the most important role for the conservation of saproxylic beetle diversity in broadleaved forests. However, there are specific taxa related to logs as well as snags in late decomposition stage.

35.4 m3

2. Abundance of saproxylic beetles was the highest on the most available deadwood substrates. However, richness of beetle families was the highest on standing deadwood much less distributed in broadleaved forests This confirm yet more that saproxylic beetles clearly prefer snags and this should be considered in the management of broadleaved forests. Photo: Volumers Spurgis



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