

### **3 ABSTRACT**

#### **Reconstruction of modern woodland history revealed from anthracological studies of charcoal kiln sites in Brdy Mountains, Central Bohemia**

Reconstruction of former woodland vegetation in the area of the Brdy Mountains (Central Bohemia) was carried out on the basis of an anthracological analysis. In this work, we used method of charcoal accumulations on the site of former kilns which was an undervalued source of information until now. Charcoal production activities were strongly dependent on the wood supply from the vicinity of the kiln sites. Taxonomic composition of layers rich in charcoal thus reflect the former surrounding forest vegetation (Ludeman 2003, Nelle 2003). Charcoal spectra were obtained from 46 kiln sites that were located mainly in the Jinecko region. Conventional radiocarbon dating of 26 samples revealed the kilns' construction time frame: with one exception (see dating report), the whole group dates back to the 18th and the beginning of the 19th century. We established a correlation between the distribution of similar charcoal spectra and the ecological conditions of the examined localities. Sites conditions were deduced from the classification system used for the forestry management (Pliva 1991). Species composition and diversity reflect ecological parameters of the sites as well as anthropogenic impact. Similar charcoal spectra were found in identical site conditions which confirms the assumption that all the available taxa of wood in the vicinity of the kilns were used. The main reason was that the character of the wood charcoal production in areas with highly developed metallurgical manufacturing was intensified to the highest possible extent and therefore all available fuel wood was utilized.

An extensive part of the study is focused on spatial distinction of the charcoal data. Size of the woodland area required for a single charcoal burning process was estimated in a locality with high kiln sites concentration. The comparison of the kiln sites distribution and wood supplies in the surrounding forest suggests that the burning process was repeated 1-2x at the same place. An experiment with the real charcoal kiln indicated the non-homogeneity of the layer rich in charcoal. It is therefore necessary to optimize sampling strategy and take samples from various patches of the kiln site.

Forest composition outside the highest central area of Brdy Mountains was strongly affected by human activities. The beginning of a systematic forest management dates back to the second half of the 18th century and seedling cultivation was dominant over the natural regeneration in the middle of the 19th century. Data obtained from the anthracological analysis show strong admixture of coniferous species such as *Abies alba* and *Picea abies* on the zonal type of the habitat. Potential natural vegetation of this sites are mainly acidophilous beech woodlands (*Luzulo-Fagetum*) (Neuhauslová 1998). The long antropogenic influence caused a shift in competitive relationships and coniferous species where allowed to establish stronger populations. The distribution of *Carpinus betulus* indicates a certain dependency on human settlement activities. It has become a dominant species in village surroundings. Samples from an area of a deserted village Komorsko (abandoned in 15th century) demonstrate increased occurrence of *Carpinus betulus*. Charcoal spectra also reflect the specific distribution of *Quercus petraea*, which occupied sites at the lowest altitudes and at extreme rocky stands around summits at 600 m a.s.l. Anthracological analysis confirmed former hypothesis about distribution of *Quercus petraea* based on the historical forest managements documents (Samek 1961, Málek 1979) and recent observations (Karlik 2001, Sofron 1998).