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## ECOLOGICAL STATE ASSESSMENT IN MÁRTÉLY LANDSCAPE-PROTECTION AREA

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**Abstract.** The paper summarises the results of the studies on natural conditions in Mártély Landscape-protection area. We presented general information about the survey of natural conditions. A large-scale vegetation map was given with the botanical-floristical characterisation of habitat types. The studied reference groups of arthropods were: *Gastropoda*, *Isopoda*, *Collembola*, *Homoptera*, *Auchenorrhyncha*, *Cicadinea*, *Coleoptera*, *Caraboidea*, *Hymenoptera*, *Formicoidea*. We described the vegetation of the studied areas and emphasised importance of some Arthropod species. The last part of the paper contains proposals for nature conservation.

*Key words: state assessment, arthropods, vegetation*

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This paper summarises the main results of the technical report on a state assessment compiled by Kovács (1996).

The 42 paged report is divided into six chapters. In the first section it gives a short review on scientific researches performed in the landscape-protection area, with special regard to the activity of Tisza-research Working Committee. It emphasises the scientific and nature protection importance of this region from two point of view: this area is part of the ecological corridor formed by Tisza-valley and it can be regarded as the natural laboratory of community disturbances owing to the natural disturbance of regular floods.

The following three chapters give general information about the survey of natural conditions: the list of sampling areas, sampling data and the description of sampling methods are published in

them. The botanical research carried out during the survey of natural conditions has two important way:

(1) We prepared the vegetation map of the Mártély Landscape-protection Area. This large-scale map can serve as the basis of every further survey, mainly for detecting changes in vegetation.

(2) We characterised in detail the vegetation in sampling areas of invertebrate fauna. We chose the sampling areas of invertebrate fauna in such a way that these areas represented both the typical natural habitats of Mártély Landscape-protection Area and the frequently occurring more disturbed habitats as well. We based the selection of sampling areas on plant associations because according to our previous studies the sensitivity of vegetation to habitat heterogeneity is more finer than those of the majority of animal communities, so habitats discriminated by vegetation generally represent sufficiently fine division also for animal communities. The chosen sampling areas of invertebrate fauna: Babos forest,

Körtvélyesi-Petres forest, Hunyadi hillock and Téré-riverside oak-forest. For the survey of natural conditions we studied reference species and reference groups because the study of complete biocenoses technically can not be performed. Besides vascular plants the chosen reference groups were: *Gastropoda*; *Isopoda*; *Collembola*; *Hemiptera*: *Auchenorrhyncha*, *Cicadinea*; *Coleoptera*: *Caraboidea*; *Hymenoptera*: *Formicoidea* and vertebrate fauna.

The fifth chapter gives the results of the survey of natural conditions. Botanical results include the botanical characterisation of sampling areas, lists of plant species and any further information collected during the field-work. Readers can find detailed description about the main sections of the landscape-protection area: Ányás island, Kutyafenék, Körtvélyes island and Barci-meadow. Planted forests, mostly hybrid poplar woods cover large areas; they are disturbed to a great degree since they are under intensive treatment of forestry. Main species of native forests are: white willow (*Salix alba*), white poplar (*Populus alba*), black poplar (*Populus nigra*), *Fraxinus angustifolia*, but also occurs *F. pennsylvanica* and pedunculate oak (*Quercus robur*). Forests of nature species are found on the eastern part of Ányás island and the southern part of Körtvélyes island (otherwise they remained only in patches in other sections of the landscape - protection area); an old soft-wooded gallery forest also survived in the latter territory. In the undergrowth *Alopecurus pratensis* and *Typhoides arundenacea* grass species are dominant, plants of one-time hard-wooded gallery forest also occur in it, e. g. lily of the valley (*Convallaria majalis*). Unfortunately the common weed ragweed (*Ambrosia elatior*) lives in vast number in some places. There are many disturbance-indicator and adventive plants in the shrub level, first of all dewberry (*Rubus caesius*) and bramble species (*Rubus spp.*); *Fraxinus pennsylvanica* and *Amorpha fruticosa* are also widely spread. The territory bordered by Körtvélyes-backwater is perhaps the most valuable section of the landscape-protection area, particularly wet grasslands spiced with old willow trees and poplar groups are remarkable: grasses of *Alopecurus pratensis*, *Typhoides arundenacea*, *Bolboschoenus maritimus*, *Glyceria maxima* and *Schoenoplectus lacustris*. Ploughlands can be found in Kutyafenék and on Barci-meadow, of course these are the less natural habitats; holiday camp also reaches the northern part of the former section.

Zoological results partly include species lists of reference groups and the quantitative characterisation

of reference species, partly include the characterisation of sampling areas emphasising important data in the respect of indication, degradation and biogeography of species.

Notable *Gastropoda* species found in the landscape-protection area are: *Vallonia pulchella*, *V. ennensis* and *Vertigo antivertigo*; their occurrences refer to undisturbed habitats.

From *Isopoda* group the records of *Hyloniscus riparius* refer to wetter and less disturbed conditions.

Remarkable *Collembola* records are: *Orchesella* and *Entomobrya* species, they indicate intensive leaf-litter decomposition. *Entomobrya atrocincta* is found only in non-degraded habitats.

Species from *Cicadinea* group are: *Euscelidius variegatus* which is rare in Hungary and has southern range. *Criomorphus williams* is also noteworthy species, it were known up till now only from England and Kazakhstan.

Besides *Carabidae* species living typically on flood plains there are also three protected species of this taxon living in the landscape-protection area: *Carabus cancellatus tibiscinus* (endemism characteristic of the Great Hungarian Plain), *Carabus granulatus granulatus* and *Carabus clathratus auraniensis*. The quite rare *Calosoma inquisitor* also occurred, it lives in oak-forests. *Dyschirius globosus* prefers wet habitats, while *Calathus fuscipes*, *Pseudoophorus rufipes* indicates degradation. A scarce *Brachinus psophia* were also recorded.

*Formicoidea* species form a species assemblage typical of flood plain forests. *Myrmica rugulosa*, *Myrmica specioidea* are remarkable species generally living on loess-soils in the southern regions of the Great Hungarian Plain.

We made multivariate ordination analysis (PCoA) on assemblages of 17 insect groups from which we obtained valuable scientific results about similarities and differences between distribution patterns of these taxa. Results of the survey of natural conditions in Mártély Landscape-protection Area provided new data confirming our knowledge - originated from studies of larger scale - about the role of habitats connecting with Tisza-river (habitats of Tisza-valley and dam system): these territories serve as important species pool and species propagating areas. Our wide-ranging researches on the southern part of the Great Hungarian Plain also showed the existence of some animal and plant species living exclusively along Tisza-river or in nearby habitats (e. g. *Messor structor* ant species indicating warm and dry habitats).

In order to illustrate the foregoing we represented the species distributions of some invertebrate taxa on UTM-maps; the maps concerning the Mártély Landscape-protection Area are also included in the report.

The last chapter contains proposals for nature conservation. these suggestions touch upon among others the replacement of planted forests by native tree species at least after final cutting; the importance of continuous change of water in oxbow lakes; the rehabilitation of ploughlands into nearly natural habitats; the restoration of traditional methods of cultivation; the prevention of further expansion of holiday resort and the necessity of its canalization.

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