Introduction: The role and function of an up-to-date faunistics

The biotics, i.e. the scientific exploration of the fauna and flora had been treated as a simple descriptive and therefore out of date branch of biology for decades. The recognition of the biodiversity crisis, however, drew the conservationists' attention to the preservation and maintenance of species diversity, which obviously needs a better knowledge of local and regional faunas and floras. Therefore, a new renaissance of flora and fauna research has started in the last decades, with such outstanding examples in the Pannon Region, as the country-wide floristic survey of Hungary, the botanical and zoological explorations of national parks, the local programs on the natural history of Bakony Mts., the southern part of Transdanubia and the River Tisza valley. A to meet the theoretical, i.e. scientific and practical i.e. conservation requirements, contemporary faunistics should perform much more complex functions than to present a simple list of species names in a locality. The difference between a fauna and an assemblage is two-fold. Firstly, the fauna in the traditional sense is a list of species' names of a locality, whereas a survey of an assemblage contains more information e.g. the density, the frequency, the functional role etc. of the species populations. The other difference is that the fauna list can refer to different types of localities across spatial scales, i.e. a habitat, a landscape, a region or even a continent or the whole biosphere. The assemblage and the related ecological terms (community, coalition, guild etc.) however, always refer to local (habitat level) scale.

The manifold duties and functions of an up-to-date fauna research are as follows:

[1] The species list of a certain area. This has been the main function of the classical faunistics for centuries. The present volume contains mainly such sets of information, but Ch. 2 in this volume, Ch. 2, 3 and 5 in the previous one give more details.

[2] Assessment of the expected number of species. It is an important goal to estimate the sufficiency of the sampling effort and to evaluate the species diversity at a locality.

[3] Comparison of local biotas (e.g. faunas) on a binary basis. The knowledge of similarities or distances of local faunulas is of basic importance for both landscape ecology and a higher scale, macroecology.

[4] Classification and ordination of biotas. This task, similarly to [3], contributes to present and classify faunal types on the basis of the species composition, employing the possibilities of the multivariate analyses.

[5] Biogeographical analysis of faunas. As faunistics serves information on the distribution of species, it is one of the fundamental disciplines for zoogeography. On the other hand, however, the biogeographical characterization of a fauna helps to understand the assembly and the origin of the fauna in question.

[6] Eco-faunistical characterization of faunas. The usage of eco-faunistical categories (e.g. hylophil, eremophil, xero-tolerant etc.) contributes to a better description of the ecological character of the fauna and therefore gives a rough outline on the type of the locality.

[7] Computation of species diversities. In the case of binary fauna lists, the species diversity is given as the number of species. In such lists, which contain more quantitative information, such as frequency of species populations, the other known biodiversity functions can be applied.

[8] Analysis of commonness and rarity. Fauna analyses contribute to the possibilities to compute different commonness and rarity functions, which are of conservation significance. For an example in this series, see Ch. 5 in the previous volume.

[9] Providing data for information systems. Any fauna or flora list with exact and reliable data (locality and tim) can be applied by and involved into information systems.

[10] Assessment of naturalness and degradation, analysis of conservation values. Similarly to [6] a characterization of species in the fauna list on the basis of their natural values and frequency (see [8]) yields information on the condition of the fauna and the habitat.

[11] Quantitative information. The conventional fauna lists provide qualitative data. As it has been outlined in [3], [7] and [8] a new, quantitative type of fauna analysis can be introduced.

[12] Comparison of different scaling levels. Even binary species lists on localities of different scales (habitat, landscape, whole region) serve a basis for computation of such metrics as alpha, beta and gamma diversity and to assess of community types sensu Cornell and Lawton.

The first volume of Vegetation and Fauna of River Tisza Basin published data on the distribution 995 species of 5 animal groups (earthwarms, aquatic Mollusks, aquatic beetles, rove beetles and ants). The present one contains data on 508 species of 4 groups (Orthoptera, aquatic Heteroptera, semiaquatic Heteroptera and ground beetles). Though the fauna volumes of the TISCIA Monograph Series mainly dealing with traditional approaches, we hope that the distribution data of 1503 species and the other results published so far will contribute to implement the other functions of the modern faunistics.

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