INVESTIGATIONS ON DETERMINANTS OF SPECIFIC COMPOSITION OF A PLANT COMMUNITY BY MEANS OF STOCHASTIC MODELS

by

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For some time, a new approach to the study of community structure has been proposed. It is stressed that apart from the competition and individualistic hypotheses the question should be also answered whether the co-occurrence of plant species in a given place could not be brought about by chance (null hypothesis) /1/. In each investigation an attempt should be made to estimate, by turns, the biocenotic role of chance as well as abiotic and biotic environmental factors.

In the present studies, the co-occurrence of plant species is assessed on the basis of phytosociological records. Only binary data are applied. All records, in which even one of the species considered is found, are taken into account.

The commmon appearance of the species considered is analysed with the help of stochastic simulation. A suitable simulated model has been worked out. Detailed information on the model including theoretical foundations and the instruction of its practical application has been given in previous papers /2, 3, 4/.

Results.

At the time being, water community assemblages of free floating plants (*Lemnetea* class) and one of the *Luzula* species from Poland have been investigated.

On the basis of results obtained for the pleustonic plants, it seems evident that chance plays a very important role in determining the species composition of the assemblages /2, unpbl. data/.

In the case of the *Luzula* species, the results obtained suggest that some species combinations could arise by chance. On the other hand, however, the species composition of other combinations could be also explained by means of abiotic environmental factors /4/.

It seems therefore that species considered in both studies are indepentent of each other. In this respect the author's results correspond to the data contributed by other scientists.

When the null hypothesis is tested on the basis of phytosociological data, two consequences follow from its acceptance. First, the present phytosociological and, to some degree, ecological explanations of the species composition of a given plant community are called into question. Second, it throws a new light on some problems of the theory of the plant community.

In the author's opinion, the testing of the null hypothesis is in each case worth our while in consideration of this theory improvement. For this reason it is intended to continue investigations on factors determining the species combination of other plant communities.

References

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