

Section 3

Primary Production and Production Processes in Littoral Plant Communities

In the IBP research project, the primary production by higher vegetation and certain production processes occurring in plants were studied most thoroughly in fishpond reed-belts. This section presents the principal results of these studies. The intraspecific variability and its role in determining plant production are acknowledged. However, in a natural vegetation, the validity of any production estimate depends much on the method and sampling technique used. The various ways—both direct and indirect—of assessing the growth, development and production both of above- and belowground plant parts have therefore been evaluated. Examples are shown of the growth analyses and dry-matter economy of reedswamp as well as other fishpond littoral plant communities, and of the assessment of their vertical structure by stratified harvesting. Selected data on biomass and estimates of annual net production are then given for a number of fishpond littoral higher-plant communities. Illustrated also is the storage of energy in their biomass and their efficiency of solar energy conversion into net primary production. Of the production processes, the photosynthetic production by common reed communities was ascertained in two ways: from growth-analytical data and by measurements of gas exchange; finally, a model of the photosynthetic production has been proposed.

Water relations have also been studied mainly in common reed, while the nutrient uptake and its relation to net production have been followed in all ecological dominants of the fishpond reed-belts. The results of cultivation experiments in hydroponics prove the findings made in the field. As duckweeds frequently form an important component of the fishpond littoral ecosystems, a brief survey is presented of the growth, production and mineral nutrient uptake by duckweed communities in ponds.