

PANKOW, H.: *Algenflora der Ostsee. II. Plankton.* — Gustav Fischer Verlag, Stuttgart—New York, 493 pp., 1976. (In German.)

The Baltic Sea belongs to the prominent localities that arouse particular interest of phylogoists. The changes in salinity, considerable inflow of freshwater phytoplankton and the increase in eutrophication in the last decades are the main factors that lead to the development of a specific microflora, differing both from the typical marine and the freshwater algal vegetation. It consists of a mixture of freshwater phytoplankters with typical representatives of marine algae, the former being represented mainly by chlorococcal and blue-green algae often forming striking water blooms and the latter by diatoms and *Pyrrophyceae*. This mixture forms unusual communities yielding convenient material to solve important ecophysiological problems, e.g., adaptation of freshwater species to saline environments, comparison of physiological and biochemical differences between the convergent freshwater and Baltic species, etc. Several species were found to be endemic in the Baltic Sea; such narrow limitation of geographical occurrence is not common with microscopic algae.

Pankow's book (which complements the first volume dealing with benthic algal flora and issued in 1971) represents a valuable manual, particularly since it contains the descriptions of all algal species recorded from the Baltic Sea, provided with notes on their ecology, localities and taxonomy, and accompanied with the keys for their determination. A great part of the species are documented by drawings or microphotos. The introductory chapter „Bemerkungen zur Pflanzengeographie der Ostsee“ is mainly oriented on the discussion of the salinity as a most important factor responsible for the specificity of Baltic microflora. Included is a brief but instructive review of salt concentrations in various parts of the Baltic Sea and a description of the influence of salinity on the species from different algal groups.

The most important drawback of the book is inadequate emphasizing the specificity of Baltic algal flora. Thus it contains relatively few drawings of the original Baltic specimens and the descriptions deal, as a rule, with the whole variability of the species discussed, including the material from outside the Baltic area. This is doubtless a consequence of the fact that many of the descriptions are selected from those found in basic determination keys and taxonomical monographs. Nevertheless a book dealing with the microflora of a specific area should present first of all original descriptions of the species and should also clearly distinguish statements concerning the species as a whole and its representation in the given area. Good examples of regional treatments are the works of G. M. Smith, Skuja, etc.

This principle seems to be important particularly in the case of the Baltic Sea where convergent types with freshwater algal species, whose morphological and physiological identity is as yet questionable, occur more frequently than anywhere else. Examples are given by the author himself: several of his original drawings or microphotos evidently represent algae which differ from those known under the same name from freshwater biotopes. I can comment on several examples of blue-green and chlorococcal algae, in which I am particularly interested. The photographs of *Gomphosphaeria pusilla* (Table 2 : 2) and *Merismopedia punctata* (Table 2 : 4) and the drawing of *Monoraphidium contortum* (Fig. 831) are morphologically different from their freshwater parallels. The presentation of original material would make it possible to solve the taxonomy of such specimens.

Several taxonomical conclusions also appear insufficiently proved. For example *Microcystis incerta* from freshwater biotopes cannot be accepted to be identical with *M. reinboldii*, (as proposed by Pankow) as I can warrant on the basis of material I collected at several localities in Greifswalder Bodden. The alga in Fig. 821 designated as „*Crucigenia quadrata*“ (orig., p. 372) does not belong to this species. The author creates a new combination *Monoraphidium mirabile* (W. et G. S. West) Pankow (p. 374), but this species is known very insufficiently and for such a transfer the presentation of original drawings and of all reasons would be desirable. The classification of the alga drawn in Fig. 784 (orig., p. 362) and that represented by the microphotograph on Table 25 : 2 in two different species of *Pediastrum* is not clear.

In conclusion, Pankow's book is a good basis for everybody who intends to work with Baltic algae or in hydrobiology of the Baltic Sea.

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ESSER, K.: *Kryptogamen. Blaualgen, Algen, Pilze, Flechten. Praktikum und Lehrbuch.* — Springer-Verlag, Berlin—Heidelberg—New York, 572 pp., 1976. (In German.)

This is a really modern textbook of cryptogamic botany with regard both to its original conception and to the high technical standard. The book, which is designated for the undergraduate university students, lays stress on biology and cytology of cryptogams and the treatment presents a complete and well balanced survey of the microphytic vegetation. In addition

many useful practical lessons and instruction for laboratory demonstrations and simple experiments are included in each chapter. The text is written clearly and its illustration by micrographs and drawings (e.g., schemes of generation cycles) is of exceptionally high quality.

In view of the high general standard of the book, it is to be regretted that the author did not avoid minor errors and terminological confusions. I shall comment only on the part concerning algae, which may, perhaps, contain a relatively more errors, since algae do not represent the main research interest of the author.

There are many inaccuracies of minor importance in the text. From the otherwise very nice schematic drawing of the cyanophycean cell (Fig. 13, p. 63) the reader gets an inadequate idea on the structure of the gas vacuoles. The main taxonomical character for differentiating between the genera *Chroococcus* and *Gloeocapsa* consists in the mode of cell division (comp. GOLUBIĆ 1967) and not in the thickness of the mucilaginous envelopes (p. 64). Blue-green algae with heteropolar trichomes are quoted as important constituents of water blooms (p. 69), while there is no such indication with the genera *Anabaena*, *Aphanizomenon*, *Microcystis* and *Oscillatoria* although they rank with the main water bloom components. It is not clear, why *Oscillatoria amoena* and *Calothrix desertica* are recommended for practical lessons as they are of rare occurrence.

Better known and more easily available types can be obtained even from culture collections and would serve the same purpose. As an alternative to the term „Dauerzellen“ (p. 74) the author uses the term „Cysten“, which is not usual with blue-green algae but common with the eucaryotic chrysomonads and other flagellates. The often used equivalents „Sporen“, „Akineten“ and „Artrsporen“ are completely omitted. *Pyrrhophyceae* are not exclusively marine organisms just as *Chlorophyceae* are not obligatory freshwater algae, as implied by Table 3 (p. 77). The resting stages of euglenas can be mistaken for several types of unicellular algae having spherical cells, but in no case for *Chlorella* cells whose protoplast structure and size are sufficiently different to exclude confusion. The characteristics given for the class *Pyrrhophyceae* are identical with those applying only to the *Dinophyceae*, whereas characteristics of the other pyrrhophycean group *Cryptophyceae* are omitted. The numbers of species in individual genera can be at present only approximately estimated and the quoting of precise numbers (e.g., p. 136) is of dubious value. Daughter coenobia are formed from zoospores aggregating outside the mother cell only in some zoosporine members of *Hydrodictyaceae*; this does not occur in *Scenedesmus* and *Coelastrum*, as implied on p. 141; etc.

Several errors are more important. Thus, the genus *Phacus* does not belong to *Euglenophyceae* with flexible periplast; on the other hand, *Trachelomonas* has metabolic cells (i.e. not with rigid periplast), which are surrounded by a rigid lorica (p. 79—80). *Chloromonadales* do not belong in the *Chlorophyceae* (p. 120) and they cannot be synonymous with *Volvocales* (what the author had in mind were, probably, *Chlamydomonadales*). According to present views, the genus *Protococcus* belongs to the filamentous (trichal) green algae; the use of the name „*Protococcales*“ as a synonym for *Chlorococcales* is therefore incorrect, although it was earlier used in this sense (p. 120). In the genus *Chlorococcum* the sexual reproduction is well known (comp., e.g., STARR 1955), while ESSER states with emphasis just the contrary (p. 137). In a few cases the names of algae seen on the photographs are not correct (e.g., *Coelastrum proboscideum* in Fig. 61b, etc.).

The most serious of the terminological confusions is the strange use of the terms „coenobia“ and „colonies“. The author uses the term „Coenobien“ for colonies (and even for trichomes — p. 63) of blue-green algae, *Chrysophyceae*, diatoms and heterokonts, the term „Kolonien“ for colonies of green algae and the term „Aggregationsverbände“ for what has been hitherto called coenobia. The sense of this change is not clear and not explained. The author also generally uses the term „Planosporen“ instead of the usual term „Zoosporen“, and „Aplanosporen“ instead of „Autosporen“. Since, however, it is necessary to assume that the graduate student of botany will meet the above terms, at least their simultaneous quotation in a textbook is desirable. Every author has, of course, the right of criticizing the terminology and of proposing new and more convenient terms but such propositions should be confined to scientific papers. Handbooks and textbooks have to present modern knowledge, but its presentation cannot substantially differ from the hitherto customary practices.

The author is evidently more familiar with problems of biology and physiology than with those of cytomorphology and taxonomy. It will certainly not be difficult to amend the imperfections mentioned above in the next edition. In any case, the book is very useful and valuable both for biology students and for specialists in cryptogamology.

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LIETH, H., WHITTAKER, R. H. (ed.): **Primary Productivity of the Biosphere**. Ecological Studies 14. — Springer-Verlag, Berlin—Heidelberg—New York 1975. 339 pp., DM 69,40.

The purpose of twelve authors contributing to this book was "to synthesize current knowledge of world primary productivity in terms of methods of measurements, environmental determinants, the quantities for different communities and for the biosphere as a whole, the relationship to other biosphere characteristics, and the implication for man". It is a pleasure to state that the authors accomplished this task with an evident success. They collected and synthesized an ample material dispersed throughout the world literature so that the net primary productivity and related variables (e.g. the energy and carbon fixation, chlorophyll amount, leaf area index, amounts of inorganic substances incorporated into the organic compounds, etc.) of marine ecosystems (by J. S. Bunt), inland aquatic (by G. E. Likens) and terrestrial ones (with particular respect to the tropical ecosystems by P. G. Murphy and global productivity patterns by H. Lieth) could be specified and compared. Problems of the stratal and species productivity and chemical differences within and between the ecosystems did not remain beyond the scope of the book either (by H. Lieth). The data submitted are compiled into numerous well-arranged tables and figures which characterize ecosystems by the annual production values and their ranges and daily production rate.

A considerable part of the book is devoted to the strategy employed for obtaining the experimental results: the surveys of methods, techniques and procedures (e.g. harvest technique, gas exchange determinations, ^{14}C uptake, dimension analysis, vegetation-type correlations, environmental parameter correlations, combustion values, etc.) elaborated and used for estimating the net primary productivity with respect to the specificity of different ecosystems and limitations to various approaches are given in appurtenant chapters (by A. S. Hall and R. Moll, R. H. Whittaker and P. L. Marks, H. Lieth, D. D. Sharp, D. Whigham, D. M. Sharpe, respectively).

Many efforts were exerted on utilizing the primary productivity data for computing the global production of earth: As the outcome of these efforts, the predictive models of the relationship between the world primary production pattern, annual precipitation and average temperature (Miami Model), evapotranspiration (Montreal Models) and the length of the vegetation period are described and represented by corresponding computer maps (by H. Lieth). Simultaneously, the quantitative evaluation of the global productivity models generated by computers is given (by E. Box).

Finally, R. H. Whittaker and G. E. Likens consider man's relationship to the biosphere: they discuss the adequacy of the net primary productivity to the needs of mankind as dependent on the resource limits of the earth and the pattern of growth of human population.

Generally, the book brings the up-to-date and many-sided view of the most quantitative aspects of the accumulation of the organic matter by photosynthesizing plants, and in this way, the carrying capacity of the biosphere: To a great extent, it registers the attainable actual values of the net primary production and their geographic distribution and estimates the potential productivity limits which can be used as a clue for maximization and optimization of principles for the national and regional ecosystems. It stimulates contemplations upon the ways and manners how to increase the net productivity by man's conscious intervention likewise as assesses the negative effects of destruction of vegetation formations on the production future of the ecosystems. This is why the book will be attractive for specialists working not only in plant physiology, forestry, agronomy, bioclimatology but also in geography, economy, sociology, etc. The efficacy of the book is also warranted by the high editorial standard that characterizes the whole series of the Ecological Studies.

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