BOOK REVIEW

Chen, F., Jiang, Y. (ed.): **Algae and Their Biotechnological Potential.** – Kluwer Academic Publishers, Dordrecht – London – Boston 2000. ISBN 1-4020-0162-2. 306 pp., € 119.00, USD 109.50, GBP 73.75.

Photosynthetic microorganisms, algae and cyanobacteria, provide the basis of all life, being the primary producers of the biosphere. One reason for this ability relates to their long evolutionary history, extending back at least 3 500 milion years. However, few biotechnological applications for the unique capabilities of photosynthetic microorganisms have yet been devised.

The book "Algae and their biotechnological potential" is the collection of review articles on the potential exploitation of photosynthetic microorganisms presented at the Fourth Asia Pacific Conference on Algal Biotechnology held in Hong Kong during 3-6 July 2000. This book reflects an increasing awareness of the potential of microalgae and cyanobacteria for biotechnological exploitation. It aims to provide a brief overview to existing and potential applications, with emphasis on high valuable substances including bioactive substances and genetic manipulation of microalgae.

The first section deals logically with articles related to the use of photosynthetic microorganisms as a source of important chemicals. These articles discuss the occurrence and physiological role of these substances and methods of the production as well as the algal growth modelling. State of the art of the most important algal chemicals, namely polyunsaturated fatty acids (eicosapentaenoic and docosahexaenoic acids), carotenoids (astaxanthin, lutein), some vitamines, and extracellular polysaccharides are described in the first ten articles.

Bioremediation of soil and water environment polluted with toxic organic materials or heavy metals already receives substantial social demand. Cadmium, mercury, and lead are the three exclusively toxic heavy metals. There are four articles in the book devoted to this topic. My feeling is that only one article devoted to the discussion of the potential of immobilised algae cells for bioremediation is relatively insufficient because of their importance.

In recent years, as the need for bioactive substances of natural origin has considerably increased, also photosynthetic microorganisms are important in this area. There are four papers dedicated to this topic in the book focused mainly on the antibacterial, antifungal, and immunostimulating activities of some representatives (macroalgae, red algae, and cyanobacteria).

The final five articles are opened by a discussion of the potential on genetic engineering and continue with one paper dealing with the microalgal dynamic and one with biodiversity of cyanobacteria. So far several photosynthetic microorganisms, *e.g. Synechocystis, Synechococcus,* or *Phaeodactylum,* can be genetically manipulated and show good prospects to produce high value chemicals. However, they are only model organisms and their cultivation still can not reach biotechnological scale. There is the clear demand to resign the so called "economic" strains (*Chlorella, Spirulina,* or *Dunaliella*) to gene transformations and regulations resulting in new and more productive microorganisms. Some results in this area are presented in these three articles with emphasis on the *Spirulina platensis*.

Finally I have only one objection concerning to the fact that the individual articles collected in the book are not assorted according to the topic. My overall view of the book is favourable. The book is a valuable addition to libraries, not only for academic and industrial researchers, undergraduate and postgraduate students in biotechnology, food science, and biology in general as well as for all biochemists and technicians.

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