POSTSCRIPT - ACKNOWLEDGEMENTS

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LIVING PLANT COLLECTIONS

Available clones of Lemnaceae

Both authors keep a collection of living clones at their university address. There are c. 1100 clones available in Zürich (Geobotanisches Institut ETH, Stiftung Rübel, Zürichbergstrasse 38, CH 8044 Zürich), and c. 120 clones in Vienna (Universität für Bodenkultur, Botanisches Institut, Gregor Mendel-Strasse 33, A-1180, Vienna). The clones are sent free of charge to all scientists. The collection in Zürich is to be liquidated after 1990.

CONCLUSIONS AND OUTLOOK

The aim of the present monographical treatment of the family of Lemnaceae was to bring together all the information known up to now on this family and to present a family of flowering plants from as many aspects as possible. We hope that we make available at least the main bulk of knowledge which is scattered around in many journals and in different scientific fields. We are aware of the fact that it is not possible for two persons to give a complete view of all the items. Much interesting information has been lost during the touching up and the transcriptions

of the present work. However, some of the facts and indications, though very often presented independently in different chapters, show up at places not expected by the user. In any case the reader is recommended to consult the original literature if he is interested in more details.

The family of Lemnaceae which consists only of four genera and 34 species represents one of the most thoroughly investigated families of flowering plants which is demonstrated by c. 3200 scientific papers dealing with Lemnaceae. The interest in this family is still unbroken: since 1947 the titles on Lemnaceae have been doubling about every twelve years.

Some of the advantages of Lemnaceae as a scientific test object are repeated herewith:

- smallness (length of 0.5 to several mm)
- easy handling in aseptic culture (controlled conditions)
- fast vegetative propagation (cloning)
- possible economic importance.

The Lemnaceae are an excellent example to show how important it is to integrate different scientific fields to solve biological problems. The investigations concern taxonomy, morphology, ecology, ontogeny, physiology, phytochemistry, molecular biology, application etc. After all the investigations we have a fairly consistent picture of the biology of Lemnaceae. We certainly can anticipate how complex the interplay of all factors and all processes is and how big the gaps of our knowledge to a full understanding still are. Some of the results can be summarized as follows:

Lemnaceae are a group of flowering plants which are extremely adapted to free floating life in the water. They are able to take advantage of their habitat by the following characteristics completely or partly realized within the family:

- rigid stomata
- absence of xylem and mechanical elements
- nutrient absorption with the whole surface immersed in the water
- independent individual floating of vegetatively propagating unities for fast spreading.

The following adaptations meet with the precariousness of floating life:

- excretion of phosphatases and RNases to improve availability of the minimum factor phosphorus
- storage of the phosphate in form of polyphosphates and phytin

- greater ability to accumulate micronutrients
- protection against microorganisms by the formation of hardly decomposing cell walls (with apians) and by the excretion of phenols and flavonoids
- formation of turions to survive shortage of nutrients and cold periods
- formation of seeds to survive temporary drying.

We hope that this work will give a stimulus to still more intense exploration of this fascinating family. The tiny little fronds of Lemnaceae which form the smallest of the flowering plants and are also contemptuously called weed are a marvellous example of well functioning and extremely adapated organisms. May the approach to this miraculous and many-sided plant fill all interested persons with enthusiasm.

We close the work with the last sentence of H. BURGEFF in his studies on Marchantia (Genetische Studien an Marchantia, Fischer, Jena, 1954): "Wohl dem, der in der heutigen Periode des wissenschaftlichen Massenangriffs auf die Natur noch Gelegenheit hat, sich in Ruhe zu versenken, am Wachstum seines 'Materials' zu erfreuen und Beobachtungen zu machen, die, Fragen stellend, sie zugleich beantworten und den Frager zur Erleuchtung führen". ("Happy he who in the present period of scientific mass attack on nature still has the opportunity to peacefully enjoy the growth of his 'material' and make observations, asking questions and at the same time answering them, so leading the questioner to enlightment").