

Zeitschrift: Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech. Hochschule, Stiftung Rübel, in Zürich
Herausgeber: Geobotanisches Institut, Stiftung Rübel (Zürich)
Band: 70 (1980)

Artikel: Cytological variation within the family of "Lemnaceae"
Autor: Urbanska-Worytkiewicz, Krystyna
Kapitel: 2: Material and methods
DOI: <https://doi.org/10.5169/seals-308615>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 26.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

offers a challenging problem as changes in chromosome numbers, their possible transmission to next cell generations as well as bearing upon the population structure and the whole differentiation pattern call for a special attention.

The present paper deals with 30 taxa out of the 35 that form the duckweed family, all the four genera viz. *Spirodela* Schleiden, *Lemna* L., *Wolffiella* Hegelm. and *Wolffia* Horkel being represented. On the whole, material from 1500 localities was studied; this number is obviously not related to the actually examined units and/or fronds. The study was carried out during fifteen years (1966-1980).

Acknowledgements

Sincere thanks of the author are due to Ms. M. Siegl, Ms. A. Hegi and Ms. E. Wohlmann-Bräm who kept the *Lemnaceae* cultures through all the long time in an exemplary care, helped with fixations and the unpleasant task of the staining. Ms. E. Wohlmann-Bräm made also the drawings of the distribution maps. Ms. A. Honegger typed the manuscript.

Generous help of very numerous contributors who collected samples for our collection was acknowledged in the foreword of this volume; the author wishes to express here her cordial thanks to Ms. Ruth Mason, Canterbury, New Zealand, who arranged a most interesting field trip during our visit to New Zealand in 1979.

Last, but not least, very special thanks are addressed to our colleague and friend Prof. Dr. E. Landolt, who stimulated us to undertake this study, precisely determined the whole studied material, translated the Summary into German, provided a cheerful assistance in numerous field trips and, on many occasions, offered not only useful information but also constructive criticism.

2. Material and methods

The material from the present study was taken for the most part from sterile clonal cultures kept at the Geobotanical Institute, Swiss Federal Institute of Technology (SFIT), in Zürich. Some of those clones were repeatedly examined at a certain time interval; in addition, cultures independently obtained from various laboratories in the world but representing various parts of the same original clone, were sometimes studied. Only about 20% of the material comprised population samples from Europe, North America and New Zealand; 10-15 units were then taken at random in various parts of a given population.

The material was fixed in acetic alcohol (1:3) with a small addition of ferric acetate and stored at about -20°C . As the staining solution, lacto-propionic orcein diluted 1:1 with distilled water from the original stock prepared according to DYER (1963) was used. Whenever possible, young parts of the fronds were separated from old tissues for the squashes. Only mitotic chromosomes were studied. Drawings were made with a Leitz camera lucida using a supplementary magnifying tubus. The magnification of the drawings is about 4000X. The material proved unsuitable for microphotography, too many chromosomes staying out of the focus at a given time.

3. Results

The presentation of the results follows the sequence of taxa corresponding to the structure of the family of *Lemnaceae*, the current nomenclature proposals of LANDOLT (1980, 1980a, see the preceeding papers in this volume) being applied.

Prior to describing our results in detail, we should like to precise the meaning of the terms used in the present paper when cytological variation is being commented upon.

a) the term "intra-individual variation" refers obviously to variation observed within a single frond or clone. It should be noted that cultures issued from the same original clone and kept in various laboratories were sometimes independently obtained from several sources or studied repeatedly at some time interval; be as it may, the term is applied to cases when the genetic value of the material as an individual was definite.

b) the term "intra-population variation" was used in cases when numerous units sampled in the wild within a given population represented differences as to their respective chromosome numbers, but most frequently were cytologically uniform. The term is arbitrarily chosen and may not correspond to actual differences between individuals in the genetic sense, distinction between genets and ramets being practically impossible in the duckweeds.

c) the term "cytological differentiation" or "racial variation" used as well in the author's previous paper on the *Lemna* L. (URBANSKA-WORYTKIEWICZ 1975)