

Zeitschrift: Berichte des Geobotanischen Institutes der Eidg. Techn. Hochschule, Stiftung Rübel

Herausgeber: Geobotanisches Institut der Eidg. Techn. Hochschule, Stiftung Rübel

Band: 55 (1989)

Artikel: Studies on competition between closely related species of *Scabiosa columbaria* L.s.l. Part 2. Differentiation of hybrid populations under different temperature, water and nutrient conditions = Konkurrenzuntersuchungen zwischen nah verwandten Arten von *Scabiosa columbaria* L.s.l. : Teil II. Differenzierung von Bastardpopulationen unter verschiedenen Temperatur-, Feuchtigkeits- und ...

Autor: Landolt, Elias / Binz, Hans-Rudolf

Inhaltsverzeichnis

DOI: <https://doi.org/10.5169/seals-377754>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften. 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. [Siehe Rechtliche Hinweise.](#)

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. [Voir Informations légales.](#)

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. [See Legal notice.](#)

Download PDF: 04.05.2025

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

Ber.Geobot.Inst.ETH, Stiftung Rübel, Zürich 55 (1989), 177-236

**Studies on competition between closely related
species of *Scabiosa columbaria* L.s.l.
II. Differentiation of hybrid populations under different
temperature, water and nutrient conditions**

**Konkurrenzuntersuchungen zwischen nah verwandten
Arten von *Scabiosa columbaria* L.s.l.
II. Differenzierung von Bastardpopulationen unter
verschiedenen Temperatur-, Feuchtigkeits- und
Nährstoffbedingungen**

by

Elias LANDOLT and Hans-Rudolf BINZ

CONTENT

1.	Introduction - Acknowledgements	178
2.	Material and methods	179
2.1.	The species investigated	179
2.2.	Experimental conditions	182
2.3.	The characteristics investigated	185
2.4.	Evaluation methods	186
3.	Summary of the results of part I	188
3.1.	General results	188
3.2.	Influence of fertilization	188
3.3.	Influence of ground water table and irrigation conditions	189
3.4.	Influence of temperature	189
3.5.	Competition experiments	190

4.	Results of part II	191
4.1.	Variability of the characteristics under identical and differing conditions	191
4.2.	Morphological differentiation under different conditions	212
4.3.	The influence of different conditions	218
4.4.	A synthetical approach to the experimental differentiation by discrimination analysis	221
5.	Discussion	225
5.1.	Stability of characteristics of the final populations	225
5.2.	Ecological meaning of the characteristics investigated	226
5.3.	Effect of selection formation	227
5.4.	The formation of new ecological races	228
	Summary - Zusammenfassung	233
	References	234

1. INTRODUCTION

In the winter of 1966/1967, a study was started at the Geobotanical Institute ETHZ (SFIT) in Zürich on the evolution of closely related species of *Scabiosa columbaria* s.l. under different temperature, fertilization and water conditions. The intention was to follow up the morphological differentiation of populations grown under different conditions as a result of free crossing between the different species. The question was, if for each condition tested a population with specific properties would develop.

After four years the first part of the investigations dealing with the response of the pure species to different conditions was completed and the results published (LANDOLT et al. 1975). The study of the greenhouse containers was discontinued in 1985, and that of the plots of differing water table levels in 1983. Thus the experiments lasted for 18 and 20 years, respectively.

Acknowledgements

In the first years the investigations were assisted by F. Grossmann and M. Meyer. Later M. Porret, Th. Egloff, R. Dickenmann and M. Gasser supervised the experiments. E. Wohlmann-Bräm, the late E. Brouillet, A. Hegi and many other collaborators measured the different characteristics of the plants and took care of the cultures, C. Fornallaz made the first statistical analysis. This very valuable assistance is greatly appreciated.

We are very grateful to our colleagues K.M Urbanska and A. Gigon for constructive criticism.