

A new classification of endemic species of Austria for nature conservation issues

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Abstract

Endemic species are the biological treasure of every country. They show a restricted distribution and thus are often endangered. Responsibility for the protection of these species is high. Despite these facts they are widely neglected in nature conservation work. The new categorization presented here comprises 14 categories and combines a biogeographic basis with nature conservation demands.

Zusammenfassung

Endemiten sind der biologische Schatz des jeweiligen Landes und der exklusive Beitrag zur weltweiten Biodiversität. Sie besitzen eine kleinräumige Verbreitung und sind daher oftmals gefährdet. Die Verantwortlichkeit zum Erhalt dieser Arten ist hoch. Dennoch erfahren diese hochrangigen Schutzgüter in der fachlichen Naturschutzarbeit kaum Berücksichtigung. Die neue Kategorisierung der Endemiten umfasst 14 Kategorien. Sie basiert auf einer biogeographischen Grundlage und wird naturschutzfachliche Anforderungen gerecht.

Keywords

endemics, biodiversity, areas, protection, nature conservation, Austria, Alps

Introduction

“Nothing in biology makes sense except in the light of evolution.” (DOBZHANSKY 1973)

Endemic species represent the exclusive contribution of a given region to the overall worldwide biodiversity. They are the most interesting topic of faunistics and biogeography and the biological treasure of every country. Endemics show a restricted distribution, reaching up to local endemics occurring in, for example, a cave system or a mountain massif. They are highly adapted to special climate conditions, habitats and structures. Furthermore they are sensitive to environmental changes and impacts. Therefore it is obvious that endemics have a high risk of becoming extinct. It might be expected that endemic species are protected by law and enjoy a high awareness in nature conservation matters. This paper deals with the large gap between this expectation and reality.

The currently used categories “endemic and subendemic to Austria” (RABITSCH & ESSL 2009) are appropriate to reduce the large number of endemic species to a workable size, which could be published in one book weighing less than 5 kilograms. In terms of nature-conservation issues this approach leads to a negligence of numerous rare and endangered taxa from Alpine-endemic ones up to local endemics. A new suggestion for categorization aims to reflect the phenomenon of endemism on a wider basis, facilitating the consideration and protection of all valuable endemic species in nature conservation work.

A new classification for endemic species

Endemism can be described as a phenomenon of time. We make a distinction between older (palaeoendemic) and younger (neoendemic) taxa. An accepted threshold value for this differentiation is about 1.9 million years. In other words, all neoendemics have developed during the last ice age.

Considering endemics, we first of all have to define the geographic area of the taxon. The borders can be natural (e.g. the Alps, Northern Calcareous Alps) or political (e.g. the national territory of Austria or the federal country of Carinthia). So long as these geographic units are clearly defined, the endemics are as well. If parts of the autochthonous population(s) and habitats are outside of these units, we must talk about subendemism – and require a definition for these distribution patterns.

To their credit, Wolfgang Rabitsch and Franz Essl have coordinated the Catalogue of Austrian endemic and subendemic species (RABITSCH & ESSL 2009). These authors chose a definition of subendemic if 75% of a given species' area is situated inside the national borders of Austria. This 75% borderline is merely an arbitrary value. The advantage of this astonishingly high percentage is a reduction of the assemblage of endemics to a smaller, manageable amount. The big disadvantage of this value is that several endemic species from the Eastern Alps fall

through the sieve – probably half of the relevant species! To be absent in the Catalogue (“Endemitenkatalog”) means to be absent in several scientific and nature conservation evaluations. In such cases these endangered species, their areas and habitats are often the forgotten losers among protected species.

The new categorization (Table 1) recognises 14 categories and is an attempt to combine biogeographic basics with nature conservation demands. It is also an extended approach, which compensates this deficit to a wide degree.

endemism-category I	endemism-category II	Deutsche Bezeichnung	definition
a Austrian-endemic	a.1 locally endemic	Österreich-Endemit: Lokalendemit	100 % in Austria AND less than 10 localities (populations) OR total area less than 1.000 km ²
	a.2 regionally endemic	Österreich-Endemit: Regionalendemit	100 % in Austria AND total area less than 10.000 km ²
	a.3 nationally endemic	Österreich-Endemit: Nationalendemit	100 % in Austria AND total area more than 10.000 km ²
b Austrian-subendemic s. str.	b.1 locally subendemic	Österreich-Subendemit im engeren Sinn: Lokaler Subendemit	> 75 % in Austria AND less than 10 localities OR total area less than 1.000 km ²
	b.2 regionally subendemic	Österreich-Subendemit im engeren Sinn: Regionaler Subendemit	> 75 % in Austria AND total area less than 10.000 km ²
	b.3 nationally subendemic	Österreich-Subendemit im engeren Sinn: Nationalendemit	> 75 % in Austria AND total area more than 10.000 km ²
c Austrian-subendemic s. l.	c.1 locally subendemic	Österreich-Subendemit im weiteren Sinn: Lokaler Subendemit	25-75 % in Austria AND less than 10 localities OR total area less than 1.000 km ²
	c.2 regionally subendemic	Österreich-Subendemit im weiteren Sinn: Regionaler Subendemit	25-75 % in Austria AND total area less than 10.000 km ²
	c.3 supranationally subendemic	Österreich-Subendemit im weiteren Sinn: Überregionaler Subendemit	25-75 % in Austria AND total area more than 10.000 km ²
d. Eastern-Alps-endemic		Ostalpen-Endemit	endemic to the Eastern Alps and in general total area less than 25 % in Austria
e. Alps-endemic		Alpen-Endemit	endemic to the Alps and in general less than 25 % of its area in Austria
f. Alps-subendemic		Alpen-Subendemit	Main-distribution in the Alps with further populations in adjacent/related mountains (Dinardis, Apennin, Carpathians, Central-European Mittelgebirge) and in general less than 25 % of its area in Austria
g. Boreo-alpine species		Boreo-alpine Art	Disjunct distribution in the Alps and the boreal deciduous forests
h. Arcto-alpine species		Arkto-alpine Art	Disjunctive distributed in the Alps, Central-and Southern European mountains and the arctic tundra (e.g. THALER 1976)

Table 1: Categories and definitions of endemic species with the reference area of Austria. The total area is defined as the smallest possible polygons including all localities. (sensu IUCN).

The pragmatic solution used by conservationists has been to define range-restriction, sometimes called “local endemic” species, using an arbitrary threshold of < 50,000 km². Range restriction is also an integral part of the criteria used by the IUCN to identify and classify species in danger of global extinction – known as the IUCN Red List (www.redlist.org) (LADLE & WHITTAKER 2011).

The Endemics-Catalogue of Austria lists in total 548 species for the fauna and 200 for the flora; the hot-spot of endemic species is the Gesäuse National Park with the sum of 70 endemic taxa within one grid-square (RABITSCH & ESSL 2009). “Die deutliche Häufung von Endemiten in den nordöstlichen und südöstliche Alpen wurde schon früh erkannt.“ (NIKLFIELD et al. 2008). The South-Eastern Calcareous Alps (Karawanken, Steiner Alps, Karnische Alps) has dozens of endemic species, shared between the countries Austria, Slovenia and Italy, which reach a value of “only” 30 or 50 % of their area in Austria. This problem has been pointed out already in the endemics-catalogue by KOMPOSCH (2009: 491 ff.): “Die Südalpen oder Südöstlichen Kalkalpen sind ... der „Verlierer“ der 75 % Areal-Rahmenbedingung dieser Studie. Die Südalpen mit ihren zahlreichen Massifs de Refuge am Rand der wärmezeitlichen Vergletscherung sind nicht nur aus arachnologischer Sicht das mit Abstand bedeutendste und diverseste Endemitenzentrum Mitteleuropas.“

The new categorization of endemism proposed here (Table 1) allows a more detailed consideration and more precise analysis options. Regarding the spider fauna, 46 species are listed in the catalogue. At least 37 species with distribution patterns making them Austrian subendemics s.l. according to the definitions in Tab. 1 had to be excluded. A similar picture can be seen for the harvestmen: 11 species benefit from the definition of RABITSCH & ESSL (2009), but at least 8 additional subendemic species s.l. were omitted. The total for endemic and subendemic species for Austria is herewith more than 1,000 species; the definitive number is not known at present. A recent calculation for two endemism-hot-spots show total numbers of 165 for the Koralpe (Steirisches Randgebirge; Carinthia and Styria) and 180 for the Gesäuse National Park (Ennstaler Alps; Styria) (ÖKOTEAM 2016; KREINER & KOMPOSCH 2018). A survey of the endemics of the Karawanken would lead to a total value far beyond 200 species.

Acknowledgements

Endemic species undoubtedly need greater attention and protection by law. The first step is a comprehensive and more detailed approach towards the new categorization as presented here in this paper. The lists of protected species in Austria (Artenschutzverordnungen and habitats/birds directive) still contain at the present many more mammals, amphibians, reptiles, diurnal butterflies, etc., even if they are not endangered and show a European or Palaearctic distribution. Endemics deserve our care although they are mostly not big, colourful or “sweet looking”. The new categories address much better the responsibility for protection of endemic species for a federal country, a nation or the European Community.

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MIT UNTERSTÜTZUNG DES LANDES STEIERMARK UND DER EUROPÄISCHEN UNION



