



▲ *Vipera berus bosniensis*,
photo by Adnan Zimic



▼ *Cephalaria pastricensis*,
photo by Snezana Vuksanovic



▲ *Gymnospermium scipetarum*,
photo by Snezana Vuksanovic



▲ *Dioscorea balcanica*,
photo by Snezana Vuksanovic

▶ *Proteus anguinus*,
photo by Gergely Balázs



▶ *Edraianthus pilosulus*,
photo by Snezana Vuksanovic

▶ (further right)
Pedicularis ferdinandi,
photo by Vlado Matevski



▼ *Rana graeca*,
photo by Ambroise Jouaux



◀ *Cymbalaria ebelii*,
photo by Snezana Vuksanovic

▶ *Calosoma relictum*,
photo by Slavco Hristovski



◀ *Lynx lynx balcanicus*,
photo by MES (camera trapping)

▼ *Lilium bosniacum*,
photo by Snezana Vuksanovic



▲ *Vipera ursini macrops*,
photo by Adnan Zimic

▶ *Centaurea kosanini*,
photo by Gordana Tomovic



▲ *Salamandra atra prenzensis*,
photo by Emina Sunje &
Ambroise Jouaux



◀ *Euphorbia subhastata*,
photo by Gordana Tomovic



МАКЕДОНСКО
ЕКОЛОШКО
ДРУШТВО

The Macedonian Ecological Society (MES) (<http://mes.org.mk/en/>) administered the entire process together with the Regional Expert Team (13 selected taxonomists and 1 GIS analyst) from the SEE region. A number of taxonomists, experts for Balkan flora and fauna, was also consulted. MES is an organization currently registered as a data publisher on GBIF (<https://www.gbif.org/publisher/856529fb-02f1-4539-80c1-174f7231ef0f>), which will allow publication of data on endemic taxa of the SEE region.



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ENDEMISM IN SOUTH-EAST EUROPE



▲ *Daphne malyana*,
photo by Snezana Vuksanovic

▶ *Genista fukarekiana*,
photo by Vlado Matevski

▼ *Dinarolacerta mosorensis*,
photo by Aleksandar Simovic

▼ (further right)
Cruciata balcanica,
photo by Snezana Vuksanovic





▲ Volujak, photo by Vladimir Stupar

Preliminary studies of endemic life forms in the Balkans show a pronounced domination of oral (high-altitude) forms, whose distribution is restricted to a cluster or a single mountain in the Dinaric range. Arboreal taxa (e.g. woodland, moist meadow, riverside, littoral and other humid habitats) are also numerous, while a low percentage of endemic taxa prefer eremial types of habitats (e.g. steppe-like, xeric scrub, sand and other arid habitats) (Stevanović V. 1996. Analysis of the Central European and Mediterranean orophytic element on the mountains of the W. and Central Balkan Peninsula, with special reference to endemics).

A significant share of regional endemic animal taxa are hypogean (=troglotic). They are frequently characterized by strong morphological specialization as a result of the environment they inhabit, i.e. different karst formations such as caves and cavities or deep layers of soil.

Most of the hypogean species are now deprived of migratory capabilities and not able to extend their present range.

Perhaps the most famous example of paleoendemism in the Balkans is the endemic Serbian spruce (*Picea omorika*), widespread in western Serbia and eastern Bosnia and Herzegovina. Its closest relatives are present in North America. Paleo-botanical studies have established that the area of this species was far greater in the Tertiary, occupying much of Central Europe. During the glacial periods it disappeared throughout Europe and survived only in the recent habitats.



▲ *Leptostagus babunae*, photo by Slavco Hristovski



▲ *Picea omorika*, photo by Marjan Niketic

Endemism in the living world is the ecological state of a species which is unique to a defined, mostly small geographic area. The distribution of endemic species can be restricted to an island, country or some other defined zone, habitat type, or some combination of these. Abundance of species and endemism are highly relevant for global prioritization of conservation efforts. Although the Balkans (especially their western parts) are frequently highlighted as one of the world's biodiversity hotspots, this fact is poorly documented and remains relatively neglected. Worldwide loss of biodiversity requires clear conservation priorities in order to channel limited conservation resources to those regions with the highest conservation value and need for action. Because of their limited distributions, endemic species are highly vulnerable to disturbance and in danger of possible extinction.

The Balkan Peninsula is not physically separated from the European mainland by mountain barriers but the biogeographical uniqueness of this region is indisputable. Peculiar geography and geomorphology shaped the contemporary flora and fauna in the western parts of the Balkans and make it clearly distinguishable from other parts of the Balkan Peninsula. During the Ice Age, this area was a vast refugial zone for a number of paleoendemic forms. Additionally, recent studies have shown that dramatic habitat shifts in more than 200 mountains in the Western Balkans, which occurred in the same period, triggered a rapid diversification in a number of groups - neoendemics. (Kryštufek B, Reed JM. 2004. Patterns and process in Balkan biodiversity: an overview; Hewitt, G.M. 2011. Mediterranean Peninsulas: The Evolution of Hotspots).

List of Selected Endemic Terrestrial Plant and Animal Taxa of South-East Europe

The main goal in the development of the list was to record all taxa (species and subspecies) described on the territory of SEE economies (or in their immediate vicinity) whose present distributions are restricted to the Western Balkans region. Data was compiled by means of direct review of a large number of published monographs and articles containing scientific descriptions of particular taxons. From the compiled literature, the original (verbatim) scientific name (under which it was

described) and localities where it was first found (classic locality) were extracted. Actual taxonomic status of every taxon was agreed among members of thematic expert teams (plants, beetles, reptiles, amphibians and mammals) and scientific names were aligned with the accepted scientific nomenclature format according to the International Code of Zoological Nomenclature or the International Code of Nomenclature for Algae, Fungi and Plants. Furthermore, classic localities were spatially determined and georeferenced with the highest possible precision, and their names were adjusted to the current political situation and topographic naming.

Compiled data were inserted into Excel templates (one for taxa and one for occurrences), with columns compatible with Darwin Core. In this way the data were structured according to international standards and were shared with different stakeholders at the national, regional and international level.

As a result, there are **nearly 2.200 endemic taxa** (from selected groups) described in the SEE region; **1.598 species and 576 subspecies**.

Almost **2.500 classic localities** were spatially determined, of which **2.430 were georeferenced** (i.e. have exact coordinates) with accuracy ranging from 50 to 10.000 m. According to compiled results, the most diverse endemic fauna were

registered in the central and litoral belt of the Dinaric mountains, however the region of Sharr Mountain and the mountainous region in the central and southern Macedonia are also especially rich in endemic forms.

The completed inventory of living forms of the SEE region is far from sufficiently explored. Discovery of new species of beetles and plants is very likely. It is also expected that further field work will enable better insight into the distribution of

taxa from the current list. Adding newly discovered species, completing distributions of taxa and any necessary data corrections are some of the activities foreseen as part of **database maintenance**. All these activities will be performed by IT experts from MES, according to the instructions and with consent of the Regional Expert Team that compiled the data. The data will be corrected in the local database (within MES) using web services automatically synchronized with the Global Biodiversity Information Facility (GBIF) database.

	Plants	Beetles	Vertebrate	TOTAL
<i>Classis</i>	4	1	3	8
<i>Family</i>	47	40	9	96
<i>Genus</i>	145	354	15	514
<i>Species</i>	289	1.299	10	1.598
<i>Subspecies</i>	201	363	12	576
Total taxa	490	1.662	22	2.174
<i>Classic localities</i>	623	1.826	25	2.474
<i>Georeferenced</i>	605	1.805	20	2.430

