

## Eastern Alpine endemic arachnids (Arachnida: Araneae, Opiliones)

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### Summary

A comprehensive overview of plant, fungus and animal species of Austria has been published. Altogether 748 endemic and subendemic species have been identified, including 10 pseudoscorpion-, 11 harvestman- and 46 spider-species. Hot-spots of endemisms in the Eastern Alps are the north-eastern and southern Calcareous Alps and the central Alps. The conservation status of these highly endangered taxa is poor.

### Keywords

endemic, subendemic, Alps, Austria, spiders, harvestmen, conservation

### Area of study and aims of the project

The so-called Eastern Alps belong to the 30-35 million year old European Alp system, and are largely contained within the national borders of Austria. Despite to the intensive research efforts of several Austrian zoologists in the past, like Karl Holdhaus, Herbert Franz and Heinz Janetschek as well as more recently renowned „Alpine-arachnologists“ like Konrad Thaler and Jürgen Gruber a comprehensive faunal catalogue of the region is lacking. The present study, coordinated by the Austrian Environmental Agency (Umweltbundesamt) aims at filling this deficit. The geographical localisation, digitalisation and management of all available data facilitates the drawing of distribution maps and – for the first time – the clear identification of centres and hot-spots of faunal and floral endemism of the Eastern Alps. Included in this effort are taxa that are truly endemic to the Austrian Republic as well as those whose distribution area lies primarily within national borders (i.e. subendemic).

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### Results and discussion

Altogether 748 (sub)endemic animal and plant species have been identified within the political borders of Austria (RABITSCH & ESSL 2009). Within the 548 animal species 10 pseudoscorpion-, 11 harvestman- and 46 spider-species can be found. The orders scorpions and palpigrades include no real (sub)endemic species of Austria, whereas 10 oribatid mites are classified as endemic and subendemic, many more oribatids as pseudoendemics.

The number of (sub)endemic arachnid species differs widely in the nine Austrian federal provinces. Rich in endemic spiders and harvestmen are the mountainous countries Styria, Carinthia, Tyrol and Salzburg. The recent climate history with large-scale expansion of the last ice-shields is of importance to understand today's distribution ranges.

Highest arachnid species numbers are reached in the central Alps (e.g. Hohe Tauern NP), the north-eastern Calcareous Alps (Ennstaler Alps) and in particular in the southern Alps (Karawanken) with their massifs de refuge, marking the margin of the Würm-ice-shields. Regions outside the Alps are poor in endemics. For animals, a maximum of 46 endemic taxa was found in a grid cell in the Gesäuse NP, and the Hochobir in the Karawanken came second with 41 endemic taxa.

As expected, most of the endemic arachnid species occur from the nival down to the montane zone. The most important habitats are rocky areas, caves and woodlands. High absolute numbers and percentages of endemics can be found within the soil-inhabiting harvestman-families Cladonychiidae, Ischyropsalididae and Nemastomatidae and the spider-family Linyphiidae (*Lepthyphantes* spp. s. l. and *Troglohyphantes* spp.).

The threat status of endemic spider- and harvestman-species in Austria is in general high. Despite to the big threats caused by forestry, hydraulic engineering, agriculture, tourism and climate change up to now no endemic arachnids and insects are protected by law. The coverage of the distribution of endemics by nature reserves is rather poor. Conservation efforts must focus on these unique tesserae of our Alpine fauna.

Resumé

The presented results should provide a valuable basis for both zoogeographical inferences involving glacial refugia and postglacial recolonization of the fauna and flora of the Alps as well as conservation planning in Austria.

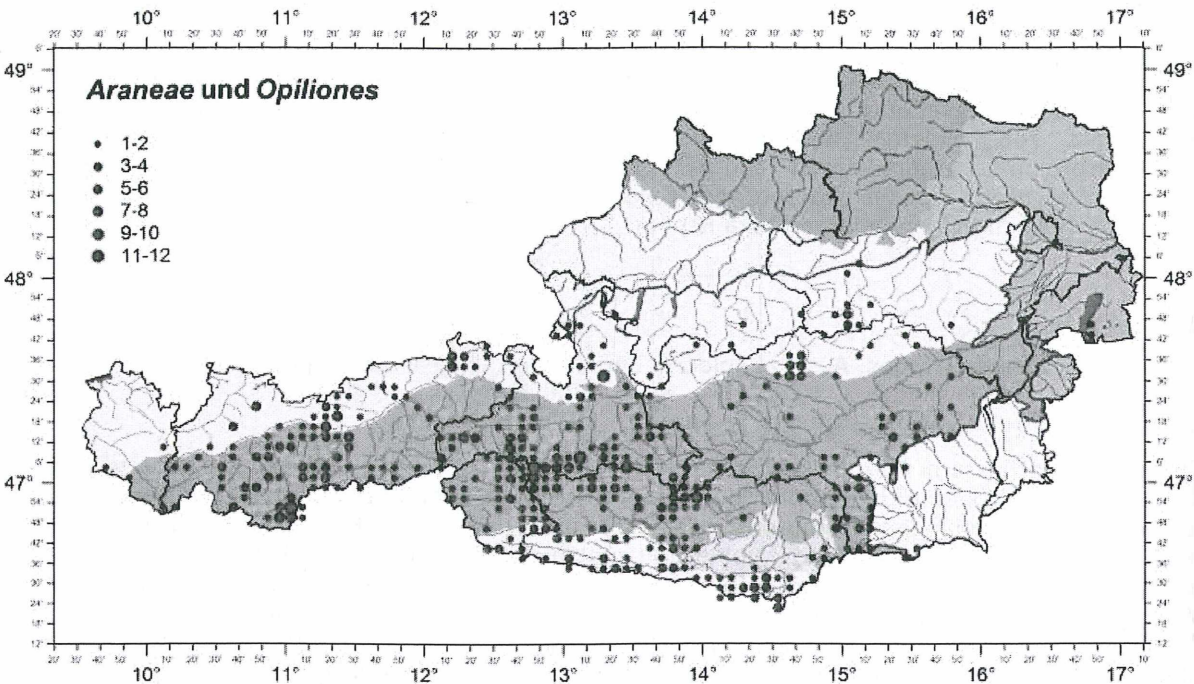


Figure 1: Cumulative distribution map showing all (sub)endemic spiders and harvestmen in Austria.

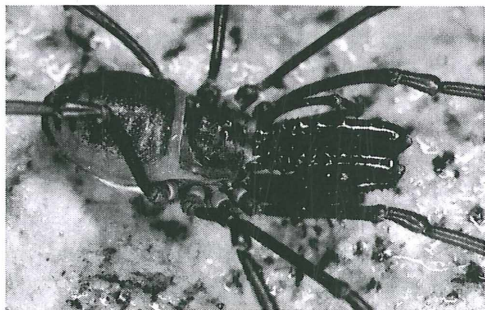


Figure 2: *Ischyropsalis kollari*, an endemic harvestman species to the Eastern Alps.

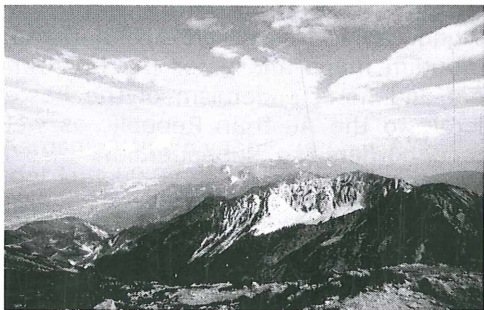


Figure 3: The Karawanken mountains in Carinthia, Southern Austria, are a hot-spot of endemic species.

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Literature

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