

Scorpions of Austria

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Summary

Three species of the family Euscorpidae occur in Austria. *Euscorpium germanus* (C. L. Koch, 1837) is widely distributed in southwestern Carinthia and East Tyrol, with a few records from North Tyrol. *E. gamma* Caporiacco, 1950 occurs in a limited area in south-eastern Carinthia (Karawanken and Steiner Alps). *E. carpathicus* (L., 1767) shows a disjunct distribution with three localities in Carinthia and one in Lower Austria. All three species reach their northern distribution limits in Austria. *E. italicus* (Herbst, 1800) is sometimes introduced from the Mediterranean.

History of study

The first records of scorpions in Austria were made from Carinthia by Kohlmayer (1859), from Tyrol by Ausserer (1867) and from Lower Austria (Krems) by Ferrari (1872). Since then, many discoveries have been published by several zoologists, although the identification of the species often seemed imprecise. The *Catalogus Faunae Austriae* (Strouhal, 1952, 1956) summarized our knowledge of the Austrian scorpion fauna by the middle of the twentieth century. Historical surveys of earlier investigations were given by Kofler (1977), Thaler (1979, 1994), Scherabon (1987) and Komposch & Komposch (2000).

Morphological investigation of 400 specimens during the 1980s by the second author suggested that "*Euscorpium germanus*" occurred as two geographically separated forms in southern Austria, which were designated as the typical form ("T-Form") and the Karawankenform ("K-Form") (Scherabon, 1984, 1987). Significant differences in the number and position of trichobothria on the pedipalps, the number of pectine teeth in the female, and the structure, shade of colour and the shape of various parts of scorpion body, indicated the presence of two taxa. Recent genetic analyses using allozymes and mitochondrial DNA proved that the K-Form is in

fact a separate species, *Euscorpium gamma* Caporiacco, 1950 which belongs to the "*Euscorpium mingrelicus* (Kessler, 1874) complex" (Scherabon *et al.*, 2000).

Fauna and distribution

Three species of the family Euscorpidae occur in Austria: *Euscorpium germanus* (C. L. Koch, 1837), *E. gamma* Caporiacco, 1950, and *E. carpathicus* (L., 1767).

Euscorpium germanus is widely distributed in the western part of Carinthia (Komposch & Komposch, 2000) and the valleys of East Tyrol (Kofler, 1977) between 510 and 2170 m a.s.l. Only a few localities between 700 and 900 m a.s.l. are known from the North Tyrol (Thaler, 1979, 1994), which include the northernmost natural scorpion records in Europe (Walchsee: 47°39'N, 12°19'E). A recent record in the upper Inn Valley is most likely due to natural dispersion. A former population near Innsbruck became extinct (Walde, 1932; Thaler, 1979, 1994). In Styria, there are several historical records of scorpions in and around the city of Graz and north of the city (Frohnleiten and Peggau; e.g. Reisinger, 1972; see Scherabon, 1985), although recent records are lacking. A single record of two females collected near Leutschach in 1981 was reported by

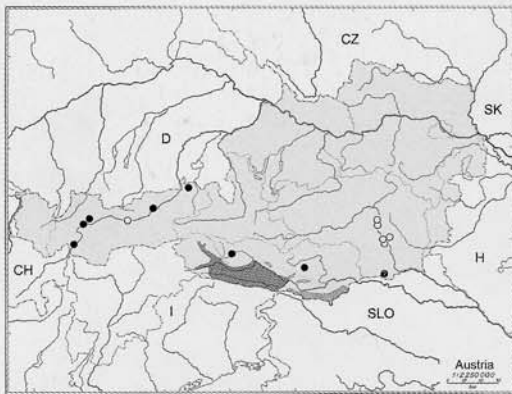


Fig. 1: Distribution of *Euscorpius germanus* (hatched area and black circles, recent records; white circles, historical records) and *E. gamma* (stippled area) in Austria (after Kofler, 1977; Scherabon, 1987; Thaler, 1994; Komposch & Komposch, 2000).

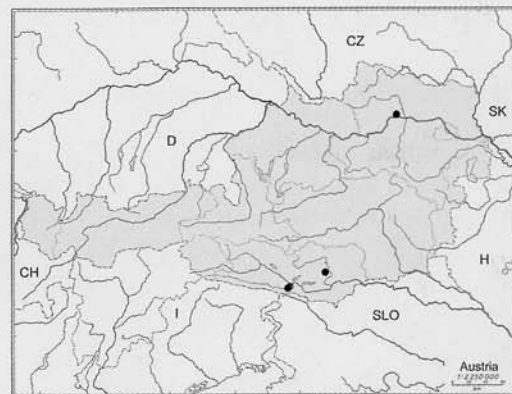


Fig. 2: Distribution of *Euscorpius carpathicus* in Austria (after Scherabon, 1987). The southern localities Unterfederaun and Warmbad Villach are close together (2.2 km).

Scherabon (1985); unfortunately a reliable identification (*Euscorpius germanus* or *E. gamma*) is not possible.

Euscorpius gamma is quite common in the Karawanken and Steiner Alps in south-eastern Carinthia between 470 and at least 1840 m a.s.l. (Komposch & Scherabon, 1999); for this area, it is clearly above the timber line. This species does not cross the Drau River, which represents the northern border of its distribution (Kanzianiberg, S of Finkenstein: 46°33'N, 13°52'E; Hemmaberg, W of Globasnitz: 46°33'N, 14°40'E).

Euscorpius germanus and *E. gamma* appear to be vicariant species in Carinthia (Fig. 1) but are found sympatrically in some localities in Slovenia (Fet *et al.*, 2001). In Austria, both species inhabit similar habitats with a similar geological subsoil and climate in the same altitudinal zones. An explanation of their distribution needs more details concerning the occurrence in Styria, Slovenia and northern Italy, as well as further investigations.

It is quite difficult to give density data on Austrian scorpions, especially if they inhabit rock debris. The activity densities of *Euscorpius germanus* in the Schütt/Dobratsch rockslip area were 1–3 specimens per pitfall trap and month (Komposch, 1997); the highest densities of *E. gamma* were 11 specimens (1♂, 7♀♀, 3 juv.) m⁻² in the Trögerner Klamm (Karawanken).

An interpretation of the disjunct distribution of *Euscorpius carpathicus* in Austria (Fig. 2) with records from Unterfederaun, Warmbad Villach and Burg Hochosterwitz (Carinthia), also from Krems (Lower Austria), is quite difficult. It can be assumed that the occurrence of *E. carpathicus* in Austria is anthropogenic. Recent DNA analysis from three Austrian sites (Unterfederaun, Burg Hochosterwitz, and Krems) show that these populations are genetically identical and very close to a Slovenian population (Huber *et al.*, 2001). The most likely explanation of the occurrence of *E. carpathicus* in Austria is the intensive trade in scorpions in the Middle Ages for use in folk medicine (Herbst, 1800; Walde, 1932; Komposch & Komposch, 2000).

Until the eighteenth century, scorpions had been sold widely in Austria because they were of great use in pharmacy. One of the most important remedies was the so-called “scorpion oil” (*oleum scorpionum*) or the “big scorpion oil”, made of 300 living scorpions, oil and 15 medicinal herbs; it was supposedly a good remedy for the bites of wild animals and even a cure for the plague. Because of their alleged medical powers, live scorpions were traded through the whole of Central Europe, especially from Brixen to Tyrol and from the south up to Berlin (Herbst, 1800). In Carinthia, *Euscorpius germanus* was used as a medicine against different diseases of cattle up until World War II.



Fig. 5: *Euscorpium carpathicus*, Warmbad Villach. (Photo: Ch. Komposch)

thermophilic pine forests, stony subalpine meadows, stone walls, and castle hills with ruins.

Introduced species

Euscorpium italicus (Herbst, 1800) is periodically introduced to Austria from the Mediterranean (Thaler & Knoflach, 1995; Komposch & Komposch, 2000): records are known from Kufstein, Innsbruck, Feistritz a.d. Drau, Tigring near Moosburg, Klagenfurt, Graz, and Vienna. *Euscorpium carpathicus* is also sometimes introduced from the Mediterranean (beside the four resident populations in Carinthia and Lower Austria). In the years following World War II, Sochurek (1984) discovered *Euscorpium flavicaudis* (De Geer, 1778), *Buthus occitanus* (Amoreux, 1789) and *Scorpio maurus* L., 1758 in a cork factory near Mödling.

Endangered species

In Styria and Tyrol *Euscorpium germanus* is protected by law, but the "Naturschutzgesetz"

legislation of Carinthia and Lower Austria does not consider scorpions. Red lists of endangered scorpions have been published for the whole of Austria (Scherabon, 1994) and, recently, also for Carinthia (Komposch & Scherabon, 1999). In Carinthia, *Euscorpium carpathicus* is considered a rare species (Category R), while in Austria as a whole it is critically endangered (Category 1), while *Euscorpium germanus* is vulnerable (Category 3). The occurrence of resident populations of *E. carpathicus* was confirmed in all four known localities in Austria within the last few years by means of hand-collecting, application of UV-light and pitfall traps. Scorpions are probably now extinct in Styria, but further investigations in the regions with historical records and/or potential habitats are planned. Current efforts are concerned with drawing up a red list for scorpions in Styria and updating the Austrian list.

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Fig. 3: *Euscorpius germanus*, Schütt/Dobrach. (Photo: Ch. Komposch)



Fig. 4: *Euscorpius gamma*, Koschutabach/Karawanken. (Photo: Ch. Komposch)

In Austria, scorpions can be found under stones, in rock debris, under the bark of dead trees or stumps, and in leaf litter. Although they occur regularly in thermophilic habitats, a certain

humidity seems to be required. Typical habitats of scorpions in Austria are montane and subalpine rock debris, with or without vegetation, rich structured Illyric mixed forests, beech forests,

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References

- AUSSERER, A. 1867: Die Arachniden Tirols nach ihrer horizontalen und verticalen Verbreitung. *Verh. zool.-bot. Ges. Wien* **17**: 137–170.
- FERRARI, J. A. 1872: Über das Vorkommen von Skorpionen im Erzherzogthume Österreich. *Verh. zool.-bot. Ges. Wien* **22**: 655–658.
- FET, V., KUNTNER, M. & SKET, B. 2001: Scorpions of Slovenia: a faunistic and biogeographical survey. In V. Fet & P. A. Selden (eds.). *Scorpions 2001. In Memoriam Gary A. Polis*. Burnham Beeches, Bucks.: British Arachnological Society: 255–265.
- HERBST, J. F. W. 1800: *Natursystem der ungeflügelten Insekten. Viertes Heft: Naturgeschichte der Skorpione*. Berlin: Gottlieb August Lange.
- HUBER, D., GANTENBEIN, B., FET, V. & SCHERABON, B. 2001: *Euscorpius carpathicus* (L., 1767) in Austria: phylogenetic position clarified by mitochondrial DNA analysis (Scorpiones: Euscorpiidae). In V. Fet & P. A. Selden (eds.). *Scorpions 2001. In Memoriam Gary A. Polis*. Burnham Beeches, Bucks.: British Arachnological Society: 273–278.
- KOFLER, A. 1977: Zur Verbreitung des Deutschen Skorpions in Osttirol. *Osttiroler Heimatblätter* **45**: 3–4.
- KOHLMAYER, P. 1859: Der Reisskofel und seine östlichen Abhänge in naturhistorischer Beziehung. *Jb. naturh. Landesmus. Kärnten* **4**: 44–64.
- KOMPOSCH, C. 1997: The arachnid fauna of different stages of succession in the Schütt rockslip area, Dobratsch, southern Austria (Arachnida: Scorpiones, Opiliones, Araneae). In M. Żabka (ed.). *Proceedings of the 16th European Colloquium of Arachnology, Siedlce, 1996*. Siedlce, Poland: Wyższa Szkoła Rolniczo-Pedagogiczna: 139–149.
- KOMPOSCH, C. & SCHERABON, B. 1999: Rote Liste der Skorpione Kärntens (Arachnida: Scorpiones). *Naturschutz Kärnten* **15**: 619–624.
- KOMPOSCH, C. & KOMPOSCH, B. 2000: Die Skorpione Kärntens. Vorkommen, Verhalten und volksmedizinische Bedeutung (Arachnida: Scorpiones). *Carinthia II* **190/110**: 247–268.
- REISINGER, E. 1972: Veränderungen in der Tierwelt im Grazer Raum innerhalb der letzten 60 Jahre. *Mitt. Abt. Zool. Landesmus. Joanneum* **1**: 5–27.
- SCHERABON, B. 1984: *Die Skorpione Österreichs in vergleichender Sicht*. Unpublished dissertation, Karl-Franzens-Universität, Graz, Austria.
- SCHERABON, B. 1985: Skorpionvorkommen in der Steiermark. *Mitt. naturw. Ver. Steierm.* **115**: 133–135.
- SCHERABON, B. 1987: Die Skorpione Österreichs in vergleichender Sicht unter besonderer Berücksichtigung Kärntens. *Carinthia II* **45**: 77–154.
- SCHERABON, B. 1994: Zur Gefährdung von Skorpionen in Österreich. In J. Gepp (ed.). *Rote Listen gefährdeter Tiere Österreichs. Grüne Reihe des Bundesministeriums für Umwelt, Jugend und Familie* **2**: 275–278.
- SCHERABON, B., GANTENBEIN, B., FET, V., BARKER, M., KUNTNER, M., KROPF, C. & HUBER, D. 2000: A new species of scorpion from Austria, Italy, Slovenia and Croatia: *Euscorpius gamma* Caporiacco, 1950, stat. nov. (Scorpiones: Euscorpiidae). *Ekologia, Bratislava* **19, Suppl. 3**: 253–262.
- SOCHUREK, E. 1984: Zur Situation der Skorpionarten in Österreich. *Öko L* **6**: 27–29.
- STROUHAL, H. 1952: Scorpionidea, Palpigradi. *Cat. faun. Austriae* **9a**: 1.
- STROUHAL, H. 1956: Scorpionidea, Palpigradi. 1. Nachtrag. *Cat. faun. Austriae* **9a**: 7.
- THALER, K. 1979: Fragmenta Faunistica Tirolensia, IV (Arachnida: Acari: Caeculidae; Pseudoscorpiones; Scorpiones; Opiliones; Aranei Insecta: Dermaptera: Thysanoptera; Diptera Nematocera: Mycetophilidae, Psychodidae, Limoniidae und Tipulidae). *Veröff. Mus. Ferdinandeum* **59**: 49–83.
- THALER, K. 1994: Partielle Inventur der Fauna von Nordtirol: Arachnida, Isopoda: Oniscoidea, Myriapoda, Apterygota (Fragmenta Faunistica Tirolensia - XI). *Ber. naturw.-med. Ver. Innsbruck* **81**: 99–121.
- THALER, K. & KNOFLACH, B. 1995: Adventive Spinnentiere in Österreich - mit Ausblick auf die Nachbarländer (Arachnida ohne Acari). *Stapfia, Kat. OÖ. Landesmus. N.F.* **84** **37**: 55–76.
- WALDE, K. 1932: Über das Vorkommen von Skorpionen in Nordtirol. *Tiroler Heimatblätt.* **10**: 308–309.