Cave Scorpions

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Do you think that scorpions inhabit only hot deserts, steppes or tropical rain forests? If you do, the following story of a search for the rarest European scorpion will sound unusual.

The trip commenced in early May and we first stopped by the seashore near the French town of Perpignan. The local climate apparently suits scorpions, because within two hours of collecting on a single rocky hill we found 160 specimens of *Euscorpius flavicaudis*. Afterwards we picked some tasty cherries and drove for two hours to an elevation of about 1300 m in the Pyrenees, where cherry trees were only begining to bloom.

The scorpion whose habitat we came to explore is named *Belisarius xambeui*. The French arachnologist Eugéne Simon described the genus and species in 1879, but it was not until 1959 that another French arachnologist, Michéle Auber, published information on the occurrence of this species. It is known from about two dozen localities at altitudes of 650 and 1500 m along the French-Spanish border. *Belisarius xambeui* is a blind species which, however, does not appear to inhabit open underground passages but rather cave entrances and near-surface portions of karst dissolution features such as collapsed chimneys filled with rock debris and clay. On the forested slopes these chimneys appear as roughly circular or elliptical depressions covered by a thick blanket of beech leaves, and in the rocks beneath layers of decaying leaves is the cool and dark microhabitat required by this scorpion. This habitat is exceedingly difficult to explore and the population most likely is thinly spread through it. Consequently, it is not surprising that after two days of examining numerous collapse sinks in the area we have not seen a single specimen of *Belisarius*. We have found a variety of other cavernicolous invertebrates however, as well as some characteristic of associated or similar environments such as rock taluses or dark, cool cellars. Eventually we resorted to exploring abandoned man-made structures ranging from wine cellars to castle ruins, which are not at all rare in the area. Finally, in a small cellar of an abandoned house at the altitude of 1350 m, under a boulder surrounded by dry beech leaves, we found what we were looking for – a perfect adult of *Belisarius xambeui* about 35 mm long, shiny, with a smooth, eyeless carapace, and with a translucent metasoma revealing the pulsaring alimentary tract.

The taxonomic position of *Belisarius xambeui* has yet to be satisfactorily resolved. It was at first placed in the family Ischnuridae and currently it is in the family Superstitionidae as the only species of the subfamily Belisariinae. However, I feel the family Superstitionidae has to some extent been used as a basket category for species whose relationships are not understood. This family is comprised of 10 species in five genera inhabiting Mexico, of which only *Superstitiona donensis* occurs also in the USA, and European *Belisarius xambeui* which has little in common with *Superstitiona* and the

rest. Rather it resembles the Mexican genus *Typhlochactas*, which includes six blind species of coloration similar to *Belisarius* and inhabiting similar niches, namely caves and associated collapse sinks. It is interesting that the type locality of *Typhlochactas redelli* is at an elevation of 1400 m and that of *Typhlochactas cavicola* even much higher, at 2600 m. *Typhlochactas sylvestris* was found at an elevation of 1200 m, but this species inhabits leaf litter in a cloud forest.

However, although *Belisarius* resembles *Typhlochactas* more than it does any of the superstitionids, the two genera do not appear to be close it terms of a real phyletic relationship. The species of these two genera happen to be blind, but this is an adaptation rather than an indication of a true relationship. For instance, the genus *Chaerilus* (Chaerilidae) includes *Chaerilus sabinae* known only from an entirely blind specimen, *Chaerilus chapmani* (caves of Malaysia and the Philippnes) known from specimens with varying numbers of lateral eyes, and other species in which all eyes are present and functional. Disregarding the adaptation for subterranean existence, I therefore believe *Belisarius* to be related either to the Turkish *Calchas nordmanni* (Iuridae) or to the European genus *Euscorpius* (Euscorpiidae).

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