

Role reversal as humans suck life out of leeches

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Global warming may be to blame for the gradual extinction of cold-loving species, and the European land leech in particular, according to Ulrich Kutschera and colleagues from the University of Kassel in Germany and the Karl-Franzens-University of Graz in Austria. Their findings show that human-induced temperature increases over a 40-year period in the Graz region of Austria may have led to the near extinction of the local land leech *Xerobdella lecomtei*. The study will be published in the December issue of Springer's journal *Naturwissenschaften*.

Back in 1868 a new leech was discovered in Austria, in the moist soil of a mountain far away from any freshwater pond or stream. This unusual annelid was the European land leech *X. lecomtei*. Between 2001 and 2005, Kutschera and team were only able to find one living juvenile *Xerobdella* individual in the birch forests around Graz in Austria, suggesting that this leech had become virtually extinct.

Kutschera's team studied the single leech and described in detail both its morphology and feeding behavior, as there had previously only been one published report on the biology of *Xerobdella*. Once the leech died, the researchers extracted mitochondrial DNA to sequence it. Their analysis showed that *X. lecomtei* is not a member of the tropical land leeches (family Haemadipsidae), as previously thought, but may be a relative of the amphibious-terrestrial Haemopidae/Hirudinidae, which prefer cooler climates.

The researchers also looked at data documenting the human-induced

climate change in Austria over the last four decades, which showed that between 1961 and 2004, the average summer temperatures in the area rose by over 3 OC. The observed decline in the local leech population around Graz mirrors this temperature rise. This increase in air temperature led to a drastic reduction in the moisture content of the soil where the land leech *X. lecomtei* lives. In the authors' opinion, this recent human-induced warming may have led to the almost complete extinction of the local population of this rare annelid.

These findings are a reminder that the impact of humans on the environment can be more rapid and subtle than previously thought. The authors conclude that “human-induced warming without apparent habitat destruction may lead to subtle changes in biodiversity, notably the decline and extinction of populations that consist of cold-adapted species.”

Citation: Kutschera U et al. (2007). The European land leech: biology and DNA-based taxonomy of a rare species that is threatened by climate warming. *Naturwissenschaften* (DOI 10.1007/s00114-007-0278-3)

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