



The palaeoclimatic significance of Eurasian Giant Salamanders (Cryptobranchidae: *Zaissanurus*, *Andrias*) – indications for elevated humidity in Central Asia during global warm periods (Eocene, late Oligocene warming, Miocene Climatic Optimum)

Davit Vasilyan (1), Madelaine Böhme (1), and Michael Winklhofer (2)

(1) University Tuebingen, Institute for Geoscience, Tuebingen, Germany (davit.vasilyan@ifg.uni-tuebingen.de), (2) University Munich (LMU), Department of Earth- and Environmental Science, Munich, Germany

Cryptobranchids represent a group of large sized (up to 1.8 m) tailed amphibians known since the Middle Jurassic (Gao & Shubin 2003). Two species are living today in eastern Eurasia: *Andrias davidianus* (China) and *A. japonicus* (Japan). Cenozoic Eurasian fossil giant salamanders are known with two genera and two or three species from over 30 localities, ranging from the Late Eocene to the Early Pliocene (Böhme & Ilg 2003). The Late Eocene species *Zaissanurus beliajevae* is restricted to the Central Asian Zaissan Basin (SE-Kazakhstan, 50°N, 85°E), whereas the Late Oligocene to Early Pliocene species *Andrias scheuchzeri* is distributed from Central Europe to the Zaissan Basin. In the latter basin the species occur during two periods; the latest Oligocene and the late Early to early Middle Miocene (Chkhikvadze 1982). *Andrias scheuchzeri* is osteological indistinguishable from both recent species, indicating a similar ecology (Westfahl 1958).

To investigate the palaeoclimatic significance of giant salamanders we analyzed the climate within the present-day distribution area and at selected fossil localities with independent palaeoclimate record. Our results indicate that fossil and recent *Andrias* species occur in humid areas where the mean annual precipitation reach over 900 mm (900 – 1.300 mm).

As a working hypothesis (assuming a similar ecology of *Andrias* and *Zaissanurus*) we interpret occurrences of both fossil Eurasian giant salamanders as indicative for humid palaeoclimatic conditions.

Based on this assumption the Late Eocene, the latest Oligocene (late Oligocene warming) and the late Early to early Middle Miocene (Miocene Climatic Optimum) of Central Asia (Zaissan Basin) are periods of elevated humidity, suggesting a direct (positive) relationship between global climate and Central Asian humidity evolution.

Böhme M., Ilg A. 2003: fosFARbase, www.wahre-staerke.com/

Chkhikvadze V.M. 1982. On the finding of fossil Cryptobranchidae in the USSR and Mongolia. *Vertebrata Hungarica*, 21: 63-67.

Gao K.-Q., Shubin N.H. 2003. Earliest known crown-group Salamanders. *Nature*, 422: 424-428.

Westphal F. 1958. Die Tertiären und rezenten Eurasiatischen Riesensalamander. *Palaentographica Abt. A*, 110: 20-92.