Blind species of fish discovered by chance in Kurdistan

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Eidinemacheilus proudlovei is the name given by researchers from IGB and ZMFK to the new species of fish they described together with colleagues from Kurdistan. Credit: Younis Sabir Abdullah

No scales or eyes—together with a team of Iraqi scientists, researchers from the Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB) and the Zoological Research Museum Alexander Koenig (ZFMK) have described a strange new species of fish, Eidinemacheilus proudlovei. The species was first discovered in the Kurdish region of Iraq at the end of March 2016. The blind fish, belonging to the stone loach family, lives in inaccessible subterranean streams.

The heavy rainfall and flooding that hit the northern Zagros mountains in Iraq in March 2016 were anything but a blessing to the local population.

Nor to the blind fish washed up onto the earth's surface from a newly formed source following a rise in the groundwater table: most of the helpless creatures fell victim to birds. However, Korsh Ararat, biologist at the University of Sulaimani in the Kurdish cultural capital of Sulaymaniyah in the autonomous region of Kurdistan, was quick to grasp the enormity of the event. He succeeded in securing a few specimens of the curious fish, which for several days had continued to be flushed out of a hole in the ground and into a nearby brook. In a bid to find out more about the species, the biologist contacted Dr. Jörg Freyhof, ichthyologist at IGB. Whilst Freyhof studied the morphological features of the fish and compared them to the only other known representative of blind loaches in the Middle East, Dr. Matthias Geiger analysed the creatures' DNA at ZFMK in Bonn and had the DNA barcode developed.

When the scientists then brought together their findings on the body structure and considered the extent to which the species differed genetically from all other known species of fish, they realised that it had to be a new species, now seen alive for the first time ever. The fish is most closely related to Eidinemacheilus smithi, another subterranean species of fish from Iran. Until then, E. smithi was the only known species of a genus that was described only recently. The new species was given the name Eidinemacheilus proudlovei. Freyhof and his team chose this name in honour of the scientist Graham S. Proudlove, a globally acclaimed cave fish expert.

"E. proudlovei has no eyes or scales, its skin has no pigments whatsoever. The fish probably graze bacterial films from cave walls, but nothing is known about the biology of this unusual loach," explained Jörg Freyhof. The spontaneously created source soon dried up, and the fish are now once again inaccessible underground. Not only were the extremely unusual circumstances of the find very special, the site where the new species of fish was discovered was also exceptional. "We did not expect anyone to concern themselves with such small fish in Iraq. But

research and nature conservation are still being conducted in this war-torn country," stated Freyhof.

Today, subterranean fish are endangered species, especially on account of dam projects, the implementation of which destroys these specialised creatures' habitats. "The problem also exists in Europe, where subterranean animal species are at great risk from dam projects, particularly in Croatia and Bosnia-Herzegovina," emphasised Jörg Freyhof. Little is known about subterranean ecosystems because they are difficult to access.

More information: JÖRG FREYHOF et al. Eidinemacheilus proudlovei, a new subterranean loach from Iraqi Kurdistan (Teleostei; Nemacheilidae), *Zootaxa* (2016). DOI: 10.11646/zootaxa.4173.3.2

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