The Herpetological Bulletin 158, 2021: 44-45
NATURAL HISTORY NOTE

https://doi.org/10.33256/hb158.4445

A first case of polymely in the northern pool frog *Pelophylax lessonae* from a translocated population in Norfolk, England

EMILY JORDAN[1*] & TAMMY SHADBOLT[2]

[1]Amphibian and Reptile Conservation Trust, Bournemouth, BH7 6BZ, UK
[2]Insitute of Zoology, Zoological Society of London, NW1 4RY, UK
*Corresponding author e-mail: jordananneemily@gmail.com

The northern clade of the pool frog *Pelophylax lessonae* (Camerano, 1882) is a warmth-loving water frog restricted to England, Estonia, and Scandinavia (Zeisset & Hoogesteger, 2018). Following extirpation from England in 1995, individuals collected from Sweden were translocated to a confidential site in Norfolk in 2005. Head-starting has been used to re-establish the species at a second site, Thompson Common, the last recorded location of the pool frog in England (Foster et al., 2018).

Here we describe the first known record of polymely in the northern clade pool frog observed during a monitoring survey on the 18th August 2021 at Thompson Common, Norfolk, England. A recent metamorph (Gosner [1960] stage 45; tail stub still evident) was observed basking on vegetation in a pond with a supernumerary leg bent parallel to the left hindlimb. We netted, photographed, and measured the metamorph (snout-urostyle length = 28.5 mm; see Fig.1), before releasing it at the place of capture. The supernumerary limb emerged from the base of the left hindlimb, caudal to the acetabulofemoral joint. The muscles of the limb appeared atrophied and although the limb was initially observed bent alongside the left hindlimb, the individual demonstrated no motor control. The individual appeared capable of normal movement with the additional limb causing no obvious hinderance. As it had recently metamorphosed, it is clear that the individual could survive the late larval period with polymely, but the impact on longer term post-metamorphic survival is unknown.

The Institute of Zoology's Disease Risk Analysis and Health Surveillance (DRAHS) project team has monitored the health of free-living northern pool frog populations in Norfolk since 2006. Over 500 metamorph and adult northern pool frogs have received veterinary health examinations. Infrequently, individuals have been identified with absent or abnormal limb extremities however there have been no recorded cases of polymely. The presence of supernumerary limbs has been reported in other free-living anurans and has been attributed to hyper-regeneration subsequent to physical damage, such as traumatic lacerations, musculoskeletal injuries, and cyst formation within tissues caused by trematode parasites (Session & Ruth, 1990; Johnson & Chase, 2004; Svinin et al., 2020). Chemical pollution and radiation have been considered contributing factors where mass occurrences of developmental aberrations have been reported, however

Figure 1. Supernumerary limb present in a *Pelophylax lessonae* metamorph - **A.** Dorsal view, **B.** Hind view with supernumerary limb extended

these causative factors are less likely in an isolated case as described here (Kiesecker, 2002; Taylor et al., 2005; Henle et al., 2017). As the individual would have been descended from a restricted wild-breeding population established through head-starting and translocation, a genetic component is important to consider, yet also seems unlikely where a single case is observed. Further investigation using radiography, parasitology and histopathology techniques may have elicited a diagnosis however this was not possible in the case of this northern pool frog due to licence restrictions and the ethical implications of removing an otherwise fit and functioning, free-living individual from a small population.

ACKNOWLEDGEMENTS

With thanks to Chris Michaels, John Baker and Tony Sainsbury for their comments on the manuscript and Ben King for assistance in the field. Surveying was conducted under licence from Natural England as part of the Pool Frog Recovery Project funded by the Government's Green Recovery Challenge Fund. The fund was developed by Defra and its Arm's-Length Bodies and is delivered by The National Lottery Heritage Fund in partnership with Natural England, the Environment Agency and Forestry Commission. We thank

Norfolk Wildlife Trust for their assistance with pool frog recovery at Thompson Common.

REFERENCES

Foster, J., Buckley, J., Martine, Y., Baker, J. & Griffiths, R. (2018). Reintroduction of the pool frog to the United Kingdom. *Global Reintroduction Perspectives* 2018: 64-68.

Gosner, K. (1960). A simplified table for staging anuran embryos and larvae with notes on identification. *Herpetologica* 16: 183-190.

Henle, K., Dubois, A. & Vershinin, V. (2017). A review of anomalies in natural populations of amphibians and their potential causes. *Mertensiella* 25: 57-164.

Johnson, P.T.J. & Chase, J.M. (2004). Parasites in the food web: linking amphibian malformations and aquatic eutrophication. *Ecology Letters* 7: 521-526.

Kiesecker, J. (2002). Synergism between trematode infection and pesticide exposure: A link to amphibian limb deformities in nature? *PNAS* 99: 9900-9904.

Session, S. & Ruth, S. (1990). Explanation for naturally occurring supernumerary limbs in amphibians. *Developmental and Cellular Biology* 254: 38-47.

Svinin, A.O., Bashinskiy, I.V., Litvinchuk, S.N., Ermakov, O.A., Ivanov, A.U., Neymark, L.A., Vedernikov, A.A., Osipov, V.V., Drobot, G.P. & Dubois, A. (2020). *Strigea robusta* causes polydactyly and severe forms of Rostand's anomaly P in water frogs. *Parasites Vectors* 13(381).

Taylor, B., Skelly, D., Demarchis, L.K., Slade, M.D., Galusha, D. & Rabinowitz, P.M. (2005). Proximity to pollution sources and risk of amphibian limb malformation. *Environmental Health Perspectives* 113: 1497-1501.

Zeisset, I. & Hoogesteger, T. (2018). A reassessment of the biogeographic range of northern clade pool frogs (*Pelophylax lessonae*). *Herpetological Journal* 28: 63-72.

Accepted: 23 September 2021