REPTILES & AMPHIBIANS

Limb Malformation in a Lesser Spiny Frog, *Quasipaa exilispinosa* (Liu and Hu 1975) (Anura: Dicroglossidae)

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The Lesser Spiny Frog (*Quasipaa exilispinosa*) is a medium-sized Dicroglossid endemic to southern China (Frost 2022) where it has a patchy distribution. The species inhabits hill streams in montane forest and shrublands, and the population is currently threatened by habitat degradation and overharvesting for human consumption (Fei et al. 2012). We herein report an adult male *Q. exilispinosa* with a malformed right forelimb.

At 2130 h on 17 July 2021, during a survey at Tei Tong Tsai, Lantau Island, Hong Kong S.A.R. (22.252556 N, 113.938361 E; elev. 259 m asl), we encountered a male *Q. exilispinosa* on the bank of a small cascade (ca. 0.5–0.9 m wide, 0.3–0.7 m deep). A closer examination revealed multiple right forelimb malformations (Meteyer 2000): a shortened right humerus and radioulnar with poorly developed muscle (hemimelia) and absence of right carpus and entire digits (ectrodactyly) (Fig. 1). Pertinent measurements were SVL = 84.5 mm, length of the left forelimb = 53.9 mm, and length of the deformed right forelimb = 31.5 mm; both hindlimbs were normal. Black nuptial spines were present on the chest and left arm fingers. On the malformed right forelimb, the spines were present on the lower arm instead.

In this malformed individual, it is noteworthy that the breeding spines were present on the lower arm instead of fingers of the malformed limb. We believe that this serves as an adaptive mechanism of ectrodactyly. Although call and amplexus behavior of the individual were not observed, the presence of breeding nuptial spines shows the malformed individual was nevertheless capable of breeding.

A previous report has presented a similar case of morphological malformation in an adult *Odorrana graminea* (Boulenger 1900) in Lantau South Country Park, the same protected area in this study (Yeung and Yang 2022). Although the habitat is not subjected to substantial anthropogenic pollution, multiple reports of malformed anurans suggest that additional monitoring and survey efforts in the area are required. We suggest that evaluating the physiochemical and environmental parameters of the stream and sampling different life stages, such as tadpoles and metamorphs are crucial to understanding whether the instances of malformations

Fig. 1. An adult male Lesser Spiny Frog (*Quasipaa exilispinosa*) with a shortened right humerus and radioulnar with poorly developed muscle (hemimelia), absence of right carpus and entire digits (ectrodactyly). Note the presence of breeding spines on the lower arm (right). Photographs by H.Y. Yeung.

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are caused by pollution, larval predation, or natural mutation (Ballengée and Sessions 2009).

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Literature Cited

Ballengée, B. and S.K. Sessions. 2009. Explanation for missing limbs in deformed amphibians. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution* 312: 770–779. https://doi.org/10.1002/jez.b.21296.

Fei, L., C.Y. Ye, and J.P. Jiang. 2012. *Colored Atlas of Chinese Amphibians and their Distributions*. Sichuan Publishing House of Science and Technology, Chengdu, China.

Frost, D.R. 2022. *Amphibian Species of the World: An Online Reference*. Version 6.1. American Museum of Natural History, New York, New York, USA. https://doi.org/10.5531/db.vz.0001. <https://amphibiansofheworld.amnh.org/index.php>.

Meteyer, C.U. 2000. Field Guide to Malformations of Frogs and Toads with Radiographic Interpretations. Biological Science Report USGS/BRD/BSR-2000-005. U.S. Geological Survey National Wildlife Health Center, Madison, Wisconsin, USA.

Yeung, H.Y. and J.H. Yang. 2022. Limb malformation and ocular abnormalities in a Large Odorous Frog, *Odorrana graminea* (Boulenger 1899) (Anura: Ranidae). *Reptiles & Amphibians* 29: 101–102.https://doi.org/10.17161/randa.v28i3.16274.