

## Correspondence

An ingrown ground beetle in the middle ear cavity of a North American bullfrog, *Lithobates catesbeianus*MARKUS LAMBERTZ<sup>1</sup> & HEIKO SCHMIED<sup>2</sup><sup>1</sup>Institut für Zoologie, Universität Bonn, Poppelsdorfer Schloß, 53115 Bonn, Germany<sup>2</sup>Institut für Nutzpflanzenwissenschaften und Ressourcenschutz, Universität Bonn, Melbweg 42, 53127 Bonn, Germany

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Manuscript received: 29 June 2010

The North American bullfrog, *Lithobates catesbeianus* (SHAW, 1802) is an invasive alien species in Europe (e.g., KRAUS 2009). Initially introduced into Italy as a source for frog legs, populations have been recorded from Germany since 1934 (LUDWIG et al. 2000, LAUFER 2004). This massive anuran (adult snout–vent length up to 20 cm) is not only a successful competitor to native species but also, being an opportunistic omnivore that feeds on all animals smaller than itself, a novel predator which locally may cause indigenous amphibian population decline (e.g., LUDWIG et al. 2000, BLAB & VOGEL 2002, LAUFER 2004).

Several corpses of bullfrogs, initially collected from a former flood plain north of the town of Karlsruhe (Baden-Wuerttemberg, Germany) for studying their prey spectrum (see LAUFER 2004 for details), were made available by H. LAUFER to the Institute for Zoology, University of Bonn, for anatomical dissection in 2006. Studies revealed that one specimen, after removing the right tympanic membrane, had an ingrown adult ground beetle in the middle ear cavity (Fig. 1). The coleopteran was covered with tissue, pointing towards the interior side of the tympanic membrane with its cranial end. After removal, the beetle was tentatively identified using DÜCKER et al. (1997) as a female of the carabid *Oodes helopioides* (FABRICIUS, 1792). This beetle is difficult to distinguish from a second European ground beetle, *O. gracilis* VILLA, 1833. However, since *O. helopioides* is more common in Germany (FREUDE et al. 1976) we consider it more likely to represent the species ingrown in the bullfrog.

No injury in the frog's tympanic membrane was evident, so it is most likely that the beetle had made its way into the middle ear cavity via the oral cavity. *Oodes* species are not parasitic but have a hygrophilous life style and occur in habitats also occupied by bullfrogs (e.g., WACHMANN et al. 1995). Especially, the Karlsruhe population of *L. catesbeianus* has been reported to feed on carabids by LAUFER (2004). Our only explanation is that the ground beetle may represent a surviving prey item of the frog. The tissue cov-

erage may indicate that the carabid was eating through the frog's head trying to escape from it.

Since the beetle was discovered during a practical laboratory session at the University of Bonn and the dissection was already relatively far advanced at the time, the frog's remnants were disposed of in the organic waste reserved for animal remains. The beetle is deposited in the first author's private collection.

## Acknowledgements

We wish to thank HUBERT LAUFER for making available the specimen, ANDREAS HELLMANN and MARTIN G. LOHMER for arranging the latter, and MICHAEL HOFMANN for giving the first author the opportunity to lecture in the anatomy course where the discovery was made. THOMAS BREUER and STEFAN LÖTTERS are thanked for their helpful suggestions on an earlier version of the manuscript.

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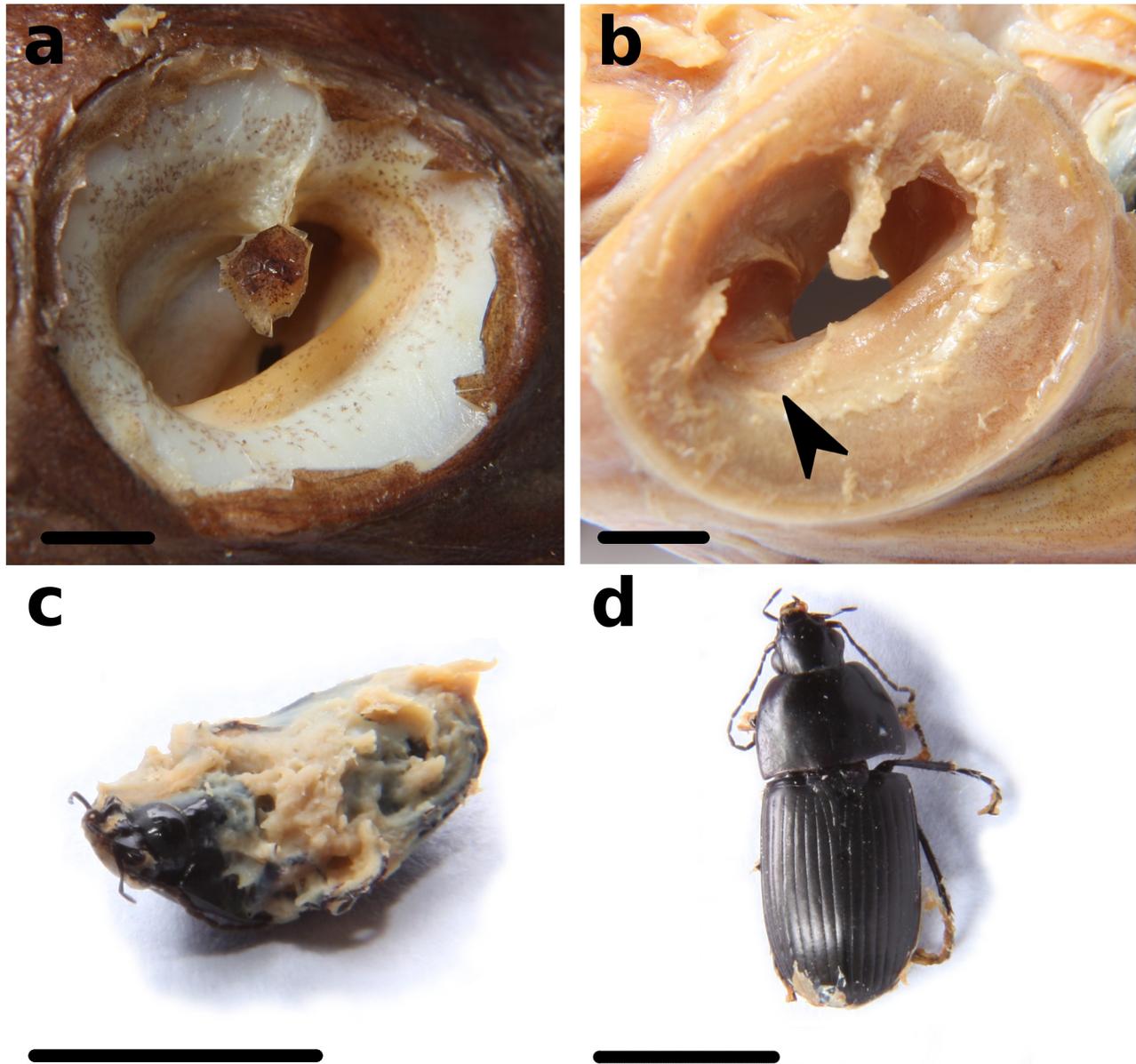


Figure 1. Middle ear of *Lithobates catesbeianus* after the tympanic membrane had been removed (cranial to the right, dorsal is up): (a) of a specimen, unaffected by ingrown ground beetle; (b) of the herein described specimen with the ground beetle removed (arrow indicates the position where it was found); removed ground beetle (c) still covered in tissue and (d) after tissue was removed. All scale bars are 5 mm. Photos by M. LAMBERTZ.

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