

Joint Meeting of Ichthyologists and Herpetologists

Program Book

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Providence, Rhode Island

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Hosted by
University of Rhode Island
Brown University
University of Connecticut

0058 Acoustics Symposium II, Ballroom D, Saturday 10 July 2010

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Sound Production in a Mudskipper (*Periophthalmodon septemradiatus*): Implications for the Study of Evolutionary Convergence Related to the Vertebrate Water-Land Transition

Mudskippers are fishes (Teleostei: Gobiidae: Oxudercinae) which exhibit extreme adaptations to an amphibious lifestyle; nonetheless, previous observations failed to demonstrate the presence of acoustic communication. The use of appropriate laboratory conditions and equipment allowed to record agonistic sounds during dyadic male-male aggressive encounters in a mudskipper species (*Periophthalmodon septemradiatus*). Preliminary analyses revealed that sounds were emitted when out of water and mainly transmitted through the wet substrate. Calls were significantly associated with aggressive visual displays. Both sexes were soniferous, showing very similar call structure. Sounds were organised in complex bouts, mostly composed of different combinations of pulsatile units and tonal segments, whose acoustical properties were assessed and analysed. Pulsatile units were broad band, low frequency (below 100 Hz) and highly damped oscillations well below 300 ms in duration; while tonal segments were continuous sine waves, showing a mean fundamental frequency around 160 Hz and mean duration of about 400 ms. The analysis of intraspecific variability revealed that most acoustical properties were highly dynamic, due to the high level of within individual variability, with the exception of the fundamental frequency of tonal segments, that could contain and convey some degree of individual information. These results both showed how exposed wet substrates and physical interfaces facilitated acoustical communication during the mudskippers' transition from water to land; and offered new insights for the study of analogous transitions of the ancestors of all terrestrial vertebrates.