Differentiation of courtship songs in parapatric sibling species of dwarf stonebashers from southern Africa (Mormyridae, Teleostei)

Michael Lamml & Bernd Kramer
(Zoologisches Institut der Universität Regensburg, Universitätsstraße 31, D-93040 Regensburg, Germany)

(Accepted: 24 April 2006)

Summary
We describe the nocturnal courtship songs of male dwarf stonebashers, Pollimyrus castelnaui, from the Okavango River and its inland delta. We examined the question of whether the songs are sufficiently differentiated from those of its parapatric sibling species, the only recently discovered P. marianne from the Upper Zambezi River, to form a potential cue for mate choice. Both species vocalised two sound types in courtship, the moan and the grunt, which they combined into long songs in similar fashion. However, one sound type was clearly differentiated: while P. castelnaui moans were of a husky quality and composed of three or four broadband formants, P. marianne moans were more tonal, with a single spectral line dominating the first and any higher formants (and a smaller bandwidth BW−10 dB for the dominant frequency of the first formant). Moan and Grunt Duration and the moan Pulse Group Period (mPGP) were longer, and the latter more variable, in P. castelnaui compared to P. marianne (range of mPGP: 10-30 ms in P. castelnaui, 7-16.7 ms in P. marianne). P. castelnaui grunts were of longer duration and composed of more pulses than those of P. marianne. A single male from the contact zone between the Okavango and the Zambezi, the lower Kwando River, resembled P. castelnaui in moan BW−10 dB but P. marianne in Moan Duration and mPGP. Both southern African species thus vocalise in a species-specific fashion. Since in both species several characteristics of both moans and grunts show high between- and low within-male variability, mate choice may be selective for individual high-quality males characterised by acoustic features.

1) Corresponding author’s e-mail address: bernd.kramer@biologie.uni-regensburg.de

© Koninklijke Brill NV, Leiden, 2006

Behaviour 143, 783-810
Also available online - www.brill.nl
Introduction

The dwarf stonebasher *Pollimyrus castelnau* (Boulenger, 1911) inhabits the Okavango River and Delta, whereas its recently discovered sister species, *Pollimyrus marianne*, inhabits the Upper Zambezi River (Kramer et al., 2003). Both mega systems are sporadically linked by a tenuous water connection via the intermediate Kwando/Linyanti System, a tributary of the Zambezi River (for details, see Kramer et al., 2003). Although they cannot be distinguished by the naked eye, both species are well differentiated in morphology, genetics, and the waveform of their electric organ discharges (EODs; Kramer et al., 2003; Markowski et al., subm.), and are regarded as vicariant sibling species.

In addition to their electrical signalling by EODs, the males of *Pollimyrus marianne* vocalise mating calls during courtship and spawning (Lamml & Kramer, 2005), as also known for two *Pollimyrus* species from West Africa (review, Crawford, 1997). While the song elements are basically similar among all *Pollimyrus* species studied so far, their complexity and sequence in a song may differ. *Pollimyrus marianne* males produce single tonal moans, or, when a female approaches the nest site, a long-lasting moan that is superimposed by several pulsatile grunts (Lamml & Kramer, 2005). *Pollimyrus adspersus* from the West African Niger River generates long courtship songs in which moans alternate with pulsatile grunts, which are often terminated by a long growl, whereas its sibling species *Pollimyrus isidori* vocalises a single grunt followed by several short tonal moans (Crawford et al., 1986; Bratton & Kramer, 1989; Crawford et al., 1997a, 1997b).

We here describe the mating songs of *P. castelnau* for the first time. In contrast to the two West African *Pollimyrus* species, EOD waveform is well