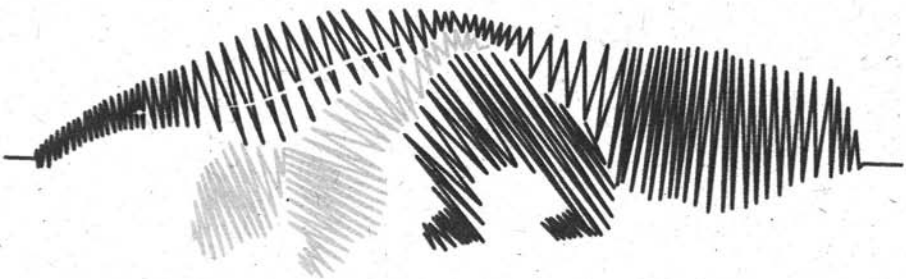
IBAC Brazil 2013



XXIV

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The anatomy of low frequency vocalization in mammals

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Abstract. Several mammalian species independently evolved low frequency vocalizations, either as rutting calls in males only or as contact or territory defence calls in both sexes. Low frequency male rutting calls appear to have evolved by sexual selection. Anatomical structures involved in producing these rutting calls include a large air sac in European reindeer, an enlarged, mobile larynx and vocal pads in Mongolian gazelle and goitred gazelle, an enlarged, mobile larynx and long vocal folds in fallow deer and a normal-sized but highly mobile larynx in red deer. Low frequency vocalizations in both sexes of other species, such as takins, elephants and large felids, probably evolved by natural selection. Both sexes of takins produce low frequency calls via an enlarged larynx with a capacious thyroid bulla and greatly enlarged vocal folds. The calls might facilitate long-distance communication between herd members in a mountainous, densely vegetated habitat. Both sexes of elephants generate low frequency rumbles by means of their large vocal folds and use them for long-distance communication, either in a dense forest or in an open savannah habitat. Low frequency roars in both sexes of large felids involve vocal pads and a descended larynx and are used in territory defence. Evolution towards low frequency vocalization regularly comprises: larynx size increase, mass increase of the vocal folds, larynx descent, vocal tract elongation and resonance devices. Financial Support: IZW, RFBR 12-04-00260.

Peacock train displays: an infrasonic tale.

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Abstract. The train of the peacock (*Pavo cristatus*) provides one of the best-known examples of sexual selection, wherein an exaggerated trait imposes a survival cost but is maintained via enhanced reproductive success. Visual aspects of the train display have been well studied, though conflicting findings regarding the specific visual attributes affecting male mating success abound, suggesting that certain cues produced in the context of train displays have been overlooked. Based on observations of displaying peacocks, we hypothesized that train displays also conveyed acoustic signals, and recorded acoustic and visual components of peacock displays over a two-year period. Our recordings revealed both audible (> 20 Hz) and infrasonic (< 20 Hz) acoustic components associated with male train displays, with increased use of infrasound-containing display elements at greater distances to prospective female mates. Playback of infrasonic display components using a rotary subwoofer resulted in changes in alertness, walking and running among both male and female peafowl, along with increased calling among males. Taken together, our findings reveal that peacock train displays constitute multimodal signals, with infrasound serving as a long-range signal in both intra- and inter-sexual communication. Financial Support: The Natural Sciences and Engineering Research Council of Canada (NSERC).

Information convey by a low frequency signal produced during the courtship of houbara bustard males

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Abstract. In species with lek mating systems, to provide information on identity and/or quality to potential mates or congeners of the same sex might be essential for individuals to optimize their reproductive success. In the north-african houbara bustard (*Chlamydotis undulata*), during the breeding season males perform conspicuous courtship on particular displays sites separated from each other by at least 500m within so-called exploded leks. Courtship includes highly visual and acoustic components. These latter, called booms, were studied in the field and in captivity. We showed that booms are harmonically related sounds of very low frequency with a fundamental frequency of 46 Hz and the majority of the energy below 100 Hz. Such characteristics should allow booms to propagate at long distance and thus appear to be adapted to the transmission of information within the exploded network of lekking houbara males. We then demonstrated that males can be individually discriminated on the basis of acoustic criteria. We also showed correlations between acoustic parameters and other males characteristics susceptible to reflect their "quality". Indeed, individuals who produced the lowest frequency booms were also those who had the greatest weights, performed the highest intensity of visual displays, and produced the most important volume of ejaculate. Therefore the booms may be used by conspecific individuals as an honest signal. Females could use such signals to choose their mates while males could use them to