



IBAC

2019 BRIGHTON

31ST AUGUST -
5TH SEPTEMBER 2019

50TH ANNIVERSARY OF
THE INTERNATIONAL
BIOACOUSTICS COUNCIL

IBAC IS 50!

IBAC 2019
ABSTRACT BOOKLET
ORAL & POSTER PRESENTATIONS

International Bioacoustics Congress
Brighton, UK
31 August – 5 Sept 2019

Refer to conference programme for schedule

Postnatal ontogeny of ultrasonic calls and body size in yellow steppe lemming (*Eolagurus luteus*)

Daria D. Yurlova

Lomonosov Moscow State University, Russia

Co-authors

Ilya A. Volodin; Julia D. Kozhevnikova; Olga G. Ilchenko; Elena V. Volodina

Arvicolinae species vocalise in ultrasonic (USV) range, but pathway of vocal ontogeny in this taxonomic group remains unknown. We recorded USV calls of 120 yellow steppe lemmings in Moscow Zoo (Russia) during February -June 2018. Subjects were recorded at one of 12 post-natal-day (PND) age-classes: PND 1 - 4, 5 - 8, 9 - 12, 13 - 16, 17 - 20, 21 - 24, 28 - 32, 33 - 36, 37 - 40 (pups), PND 41 - 60 (adolescents); PND 60 and older (breeding adults). We recorded 10 individuals per age-class, 120 in total, each isolated for 2 min at 22°C on an unfamiliar territory using Pettersson D1000X (384 kHz, 16 bit). Then, we measured body mass, body length and head length. In total 1176 USV calls (up to 10 per individual) were analysed spectrographically. USV duration decreased from 70 ± 21 ms at PND 1 - 4 to 37 ± 7 ms at PND 9 - 12 ($r = -0.53$, $p < 0.001$), and then remained unchanged (29 ± 3 ms) to adulthood. The maximum f_0 decreased from 49.1 - 52.9 kHz at PND 1 - 12 to 39.4 ± 4.0 in adults ($r = -0.47$, $p < 0.001$). The beginning and minimum f_0 did not change with age. The end f_0 and peak frequency reached maxima at PND 9 - 12 (42.9 ± 5.5 kHz and 41.2 ± 4.7 kHz respectively) coinciding with eye opening. We detected USV contours ascending (61.3%), flat (21.3%), chevron (11.4%), descending (2.1%) and wave (3.8%). Nonlinear phenomena were presented in 33.1% USV calls at any age; 3.3% USV calls contained two nonlinear phenomena. We detected frequency jumps (31.6%), biphonation (3.7%) and subharmonics (1.1%). This USV ontogenetic pathway (decreasing f_0 and call shortening) is similar with those of domestic mice. This research was supported by RSF (grant 19-14-00037).