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## Poster Session 1 – Population Dynamics

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### 53 Regulation of reproduction in Brandt's voles

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Seasonal breeding is a universal strategy in many animals living in non-tropical regions. Brandt's vole (*Lasiopodomys brandtii*) is a small, non-hibernating, herbivorous, and social rodent that is mainly distributed in the grasslands and steppes of China, the Republic of Mongolia, and the Baikal Lake region of Russia. Brandt's voles show striking seasonal breeding and only breed from spring to autumn, which caused dramatically annual fluctuation of their population. By a four-year investigation, we demonstrated the annually photoperiod-synchronized reproductive activity of wild Brandt's vole population. Male adult voles displayed a strict seasonal rhythm of gonadal mass with the precise annual peak around summer solstice. Cooperatively, hypothalamus genes, Dio2, Rfrp-3, Kiss-1 and GnRH, predictively initiation of reproductive inhibition occurred in the best stage of breeding season by response to ambient condition, possibly including photoperiodic signal and variation of temperature and food supply. After long term domestication, inhibition of gonadal development of juveniles gradually disappeared in non-breeding season while the photoperiod response was still retained. These results indicate that the photoperiod response is only a predictive indecisive mechanism. Limited by short life span, an age-dependent reproductive strategy divergence occurred in the main breeding season: overwintered voles could keep reproductive activity across the season, while most of newborn males inhibited the development of gonadal gland except few born in early breeding season. In the wild population, male biased dispersal is a key mechanism of inbreeding-avoidance while it facilitated the reproduction of early born voles, which was testified by completely inhibiting of reproductive activity of newborn voles when overwintered voles were coexisted in the semi-natural enclosure.

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# Julius-Kühn-Archiv

Jens Jacob, Jana Eccard (Editors)

6<sup>th</sup> International Conference of Rodent  
Biology and Management  
and  
16<sup>th</sup> Rodens et Spatium

Potsdam, Germany, 3-7 September 2018

Book of Abstracts



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