

Institute of Environmental Sciences

Topic: Echolocation and vocal communication of lesser horseshoe bat (*Rhinolophus hipposideros*).

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The main question to be addressed in the project:

The project focuses on determining the factors influencing the variability of the lesser horseshoe bats' vocalizations (echolocation and social calls), within and between colonies. Research considers the possible effects of biometric parameters, sex, environmental conditions and distance between colonies on bats' calls parameters, particularly frequency-related.

Information on the methods/description of work:

The fieldwork will consist of the ultrasonic recordings of:

(a) echolocation calls emitted by individuals' mist-netted from maternity colonies (females and offspring), and from swarming sites in mating seasons (where both sexes congregate) – the mist-netted specimens will undergo biometric measurements, sex and age recognition;

(b) echolocation and social calls emitted in maternity colonies throughout southern Poland (ca. 20 colonies): stationary ultrasound detector recording bats' calls, several nights of recordings in each colony.

All recordings will be later analyzed using computer software dedicated to sound analysis.

Additional information:

Recommended: previous experience in research on bats and using bioacoustic methods. Appropriate permissions to work with vertebrate animals.

Place/name of potential foreign collaborator:

Kate McAney – Vincent Wildlife Trust, Donaghpatrick, Headford, Co. Galway, Ireland

References:

Finger NM, Bastian A, Jacobs DS (2017) To seek or speak? Dual function of an acoustic signal limits its versatility in communication. *Anim Behav* 127:135–152. doi: 10.1016/j.anbehav.2017.03.005

Ma J, Kobayasi K, Zhang S, Metzner W (2006) Vocal communication in adult greater horseshoe bats, *Rhinolophus ferrumequinum*. *J Comp Physiol A Neuroethol Sensory, Neural, Behav Physiol* 192:535–550. doi: 10.1007/s00359-006-0094-9

Xie L, Sun K, Jin L, Feng J (2017) The effects of cultural drift on geographic variation in echolocation calls of the Chinese rufous horseshoe bat (*Rhinolophus sinicus*). *Ethology* 123:532–541. doi: 10.1111/eth.12627