

Untersuchung des Nahrungsspektrums zweier Fledermausarten (*Rhinolophus hipposideros* & *R. ferrumequinum*) auf Asinara, Sardinien

Von VANESSA WESKE¹, REBECCA WINTER¹, ARMIN BLÖCHL², SABINE SCHMIDT³ und JASMIN MANTILLA-CONTRERAS¹

¹ Institut für Biologie und Chemie, Universität Hildesheim, Universitätsplatz 1, D-31141 Hildesheim, E-Mail: VanessaWeske@web.de

² Tierärztliche Hochschule Hannover, Arbeitsgruppe Zellbiologie, Bischofsholer Damm 15, Gebäude 102, D-30173 Hannover

³ Institut für Zoologie, Tierärztliche Hochschule Hannover, Bünteweg 17, D-30559 Hannover

Diet of two bat species (*Rhinolophus hipposideros* & *R. ferrumequinum*) on Asinara Island, Sardinia

Abstract

At the former prison island Asinara the bat species *Rhinolophus ferrumequinum* and *R. hipposideros* use the abandoned buildings as roosts. To understand the quality of a foraging habitat, data about the potential prey and the species' dietary requirements are necessary. Therefore, we studied prey availability as well as insects consumed by *R. hipposideros* and *R. ferrumequinum* in the Asinara Island National Park. Insects were assessed to order using light trap capture data from 2013 and 2014. Droppings were collected once a week from May to July 2015 at a day roost and a night roost of each species. We determined presence-absence data of insect orders and the main prey component per dropping. Lepidoptera, Hymenoptera and Coleoptera were predominant in light trap captures. In droppings, we identified fragments of seven insect orders, i. e. Lepidoptera, Hy-

menoptera, Diptera, Coleoptera, Neuroptera, Orthoptera and Hemiptera, as well as spiders. In droppings of *R. hipposideros*, we determined fragments of six insect orders as well as of spiders. In droppings of *R. ferrumequinum*, seven insect orders were identified. Lepidoptera was the most present order in droppings of both species (98,8%). Significant differences in the diet of the two species were ascertained for Hymenoptera, Neuroptera and Diptera. Composition of droppings in day roosts and night roosts showed no significant differences, but droppings from day roost of *R. hipposideros* showed Lepidoptera as significant main prey.

Keywords

faeces, prey insects, bat conservation, national park

Literatur

- AHMIM, M. & MOALI, A. (2013): The diet of four species of horseshoe bat (Chiroptera: Rhinolophidae) in a mountainous region of Algeria: evidence for glean-ing. Abderrahmane Mira University.
- BECK, A., GLOOR, S., ZAHNER, M., BONTADINA, F., HOTZ, T. & MÜHLETHALER, E. (1997): Zur Ernährungsbiologie der Großen Hufeisennase *Rhinolophus ferrumequi-num* in einem Alpental der Schweiz. In: Arbeitskreis Fledermäuse Sachsen-Anhalt e.V.[Hrsg.]: Tagungs-band „Zur Situation der Hufeisennasen in Europa.“ Nebra.
- BECK, A., STUTZ, H.-P. B. & ZISWEILER, V. (1989): Das Beute-spektrum der Kleinen Hufeisennase *Rhinolophus hip-posideros* (Bechstein, 1800) (Mammalia, Chiroptera). Revue Suisse. Zool. **96**, 643-650.
- BONTADINA, F., HOTZ, T., GLOOR, S., BECK, A., LUTZ, M. & MÜHLETHALER, E. (1997): Schutz von Jagdgebieten von *Rhinolophus ferrumequinum*. Umsetzung der Ergebnisse einer Telemetry-Studie in einem Alpental der Schweiz. Encarden: Arbeitsgruppe zum Schutz der Hufeisennasen Graubündens ASHG. 76.
- BONTADINA, F., SCHONFIELD, H. & NAEF-DAENZER, B. (2002): Radio-tracking reveals that lesser horseshoe bats (*Rhinolophus hipposideros*) forage in woodland. The Zoological Society of London.
- BUNDESAMT FÜR NATURSCHUTZ (BFN) (o.J.): Arten-Anhang IV FFH-Richtlinie.<<https://ffh-anhang4.bfn.de/arten->

- anhang-iv-ffh-richtlinie/saeugetiere-fledermaeuse.html>. [Stand:2014-10-14] [Zugriff: 2019-08-10].
- BUSE, J. (2015): persönliche Mitteilung.
- CARBONI, D., CONGIATU, P. & DE VINCEZI, M. (2015): Asinara Nationalpark. An Example of Growth and Sustainability in Tourism. *Journal of Environmental and Tourism Analyses*. Vol. 3.1, **45**, 46-50.
- DICKMAN, C. R. & HUANG, C. (1988): The reliability of fecal analysis as a method for determining the diet of insectivorous mammals. *University of western Australia*. 108.
- DIETZ, CH. & KIEFER, A. (2014): *Die Fledermäuse Europas. Kennen, bestimmen, schützen*. Stuttgart: Franck Kosmos Verlag.
- ENTE PARCO DELL'ASINARA (2012): Progetti.<<http://www.parcoasinara.org/?modulo=contenuti&id=533>>. [Stand: 2012] [Zugriff: 2016-08-29].
- FENTON, M. B. & SIMMONS, N. B. (2014): *Bats. A world of science and mystery*. Chicago, London: The University of Chicago Press. 14, 105.
- FLANDERS, J. & G. JONES (2009): Roost use, ranging behavior and diet of Greater Horseshoe bats (*Rhinolophus ferrumequinum*) using a transitional roost. *Journal of Mammalogy*. 90.
- GEBHARD, J. (1997): *Fledermäuse*. Springer Basel AG.
- HÖTTINGER, H. & GRAF, W. (2003): Zur Anlockwirkung öffentlicher Beleuchtungseinrichtungen auf nachtaktive Insekten. Hinweise für Freilandversuche im Wiener Stadtgebiet zur Minimierung negativer Auswirkungen. Wien.
- HUTSON, A. M., S. P. MICKLEBURGH & RACEY, P. A. (2001): Microchiropteran bats: global status survey and conservation action plan. IUCN/SSC Chiroptera Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK.
- JÄGER, O., BRUNK, I. & LORENZ, J. (2014): Zur Insekten- und Spinnenfauna der Kleinraschützer Heide bei Großenhain in Sachsen – Allgemeiner Teil und Käfer (Coleoptera). *Sächsische Entomologische Zeitschrift*. 8.
- JONES, G. (1990): Prey selection by the Greater Horseshoe bat (*Rhinolophus ferrumequinum*): optimal foraging by echolocation? Department of Zoology. University of Bristol.
- KLEMEN, K., SCHNITZLER, H.-U. & SIEMERS, B. M. (2011): Horseshoe bats make adaptive prey-selection decisions, informed by echo cues. *Proceedings of the royal society*.
- KUNZ, T. H. & WHITAKER, J. O. (1982): An evaluation of fecal analysis for determining food habits of insectivorous bats. *Canadian Journal of Zoology*. **61** (6). 1317-1321.
- KUNZ, T. H. (1974): Feeding Ecology of a Temperate Insectivorous Bat (*Myotis velifer*). *Ecology*. Vol. **44**. Issue 4. P. 693-711).
- MOLINU, A., SASSU, A. & PANTALEONI, R. A. (2007): Neuroptera of the Asinara Island (NW Sardinia, Italy). Vol. **8**. Pp. 111-115.
- MUCEDDA, M. & PIDINCHEDDA, E. (2010): [Bats of Sardinia. Know and protect the flying mammals Pipistrelli in Sardegna.] *Conoscere e tutelare i mammiferi volanti*. Nuova Stampa Color, Muros. [In Italian].
- RUSSO, D. & JONES, G. (2002): Identification of twenty-two bat species (Mammalia: Chiroptera) from Italy by analysis of time-expanded recordings of echolocation calls. *Journal of Zoology*. Vol. 258. Iss. 1.
- SHIEL, C., MCANEY, C. SULLIVAN, C. & FAIRLEY, J. (1997): Identification of Arthropod Fragments in Bat Droppings. An occasional publication of the mammal society. No. 17.
- ULRICH, W., K. SACHANOWICZ & MICHALAK, M. (2007): Environmental correlates of species richness of European bats (Mammalia: Chiroptera). *Acta Chiropterologica*, **9** (2): 347-360.
- VEITH, M., M. MUCEDDA, A. KIEFER & PIDINCHEDDA, E. (2011): On the presence of pipistrelle bats (*Pipistrellus* and *Hypsugo*; Chiroptera: Vespertilionidae) in Sardinia. *Acta Chiropterologica*, **13** (1): 89-99.
- WHITAKER, J. O., DANNELLY, K. & PRENTICE, D. A. (2004): Chitinase in insectivorous bats. Department of Life Sciences. Indiana State University. *Journal of Mammalogy*. **15**.
- WHITAKER, J. O., MCCracken, G. F. & SIEMERS, B. M. (o.J.): Food Habits Analysis of Insectivorous Bats. In: KUNZ, T. & S. PARSONS (2009): *Ecological and Behavioral Methods for the study of bats*. Baltimore, Maryland: The John Hopkins University Press.
- WILLIAMS, C., SALTER, L. & JONES, G. (2011): The winter diet of the Lesser Horseshoe bat (*Rhinolophus hipposideros*) in Britain and Ireland. *Hystrix* It. J. Mamm. **22**.
- WINTER, R. (2013): Vorkommen und Aktivitätsmuster von Fledermäusen in verschiedenen Habitattypen im Norden der Insel Asinara (Sardinien). Masterarbeit.
- WINTER, R., MANTILLA-CONTRERAS, J. & SCHMIDT, S. (2019): Synanthropic roosting of two endangered *Rhinolophus* species: Implications for a sustainable bat protection in the Mediterranean. *European Journal of Wildlife Research* (in Bearbeitung).
- WINTER, R., MUCEDDA, M., PIDINCHEDDA, E., KIERDORF, U., SCHMIDT, S. & MANTILLA-CONTRERAS, J. (2017): Small in size but rich in bats – species diversity and abandoned man-made structures put Asinara Island (Sardinia) into conservation focus for bats in the Mediterranean region. In: *Acta Chiropterologica*. **19** (1): 119-126.
- WOLZ, I. (1992): Zur Ökologie der Bechsteinfledermaus *Myotis bechsteinii* (KUHLE, 1818) (Mammalia: Chiroptera). Promotion. Universität Erlangen-Nürnberg.
- WOLZ, I. (2010): Untersuchungen zum Beutespektrum der Großen Hufeisennasen (*Rhinolophus ferrumequinum*). Augsburg: Bayerisches Landesamt für Umwelt.
- WOLZ, I. (2015): persönliche Mitteilung.