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Schmidt & Sachser

Abstracts

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Leptusa simoni Eppelsheim, 1878 (Coleoptera, Staphylinidae) – zoogeographical analysis of an indicator organism of air-conditioned scree slopes

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Leptusa simoni was hitherto known as an endemic species in the Black Forest region in Central Europe (Lohse GA 1974 in: Freude *et al* 1974 Käfer Mitteleuropas Bd. 5: 32). New investigations on ecology and zoogeography of *Leptusa simoni* show a high degree of adaptation to the boulder scree slopes, which is a particular terrestrial island ecosystem. In extra-alpine Central European areas they represent a relict of former climatic periods. Some of them form so-called wind-tube systems which establish a specific microclimatic environment: at the bottom part of the scree slopes cold air streams out forming an extrazonal permafrost soil with temperatures constantly near freezing. However, the top parts do not freeze. These ecosystems have not been documented in detail until recently (Möseler BM & Molenda R 1999 (eds.) Decheniana Beih. 37 Bonn). It is shown here, that specific environmental conditions cause a island-like distribution pattern in *Leptusa simoni*. Results of our investigation on air conditioned rock scree ecosystems show first that these species can be used as an indicator organism of these habitats (Molenda R 1996 Verh naturw Ver Hamburg, 35: 72). The specific biocoenotical and landscape conditions characterize these biotopes as „archives" of faunistic elements of former climate periods. Using an analysis of landscape history, distribution of the species and dispersal power, a reconstruction of distribution process of this species is proposed. The relict status of *Leptusa simoni* is discussed.

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Living together – feeding apart: how to measure individual food consumption in a social species

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In ethological as well as in physiological research it is of interest to measure the amount of food consumed by an individual. While this is an easy task in animals kept solitarily it often is problematic in species kept in groups. Here, individual food consumption typically can only be measured with some interference from the experimenter and thus disturbance of the animals. To investigate the behaviour and the maternal investment of communally nursing house mice we developed an automatic device that allows to individually control and measure the food intake of female mice kept in groups.
For this purpose we use an automatic identification system that triggers an individual's access to a feeding station. For identification we use subcutaneously implanted microchips (transponder) with a diameter of 2.1 mm and a length of 11 mm. An electromagnetic field at the entrance of the feeding station, tuned to the transponders' frequency, allows to discriminate between individuals according to their microchip.
The feeding device consists of a movable hollow metalarm filled with commercial food pellets. In case of correct identification, the metalarm will be moved by a little servomotor in close contact to the lid of the cage, so that the animal can feed on the pellets as long as it remains in the feeding station. We not only use this device to quantify food consumption but also to individually limit the daily amount of food available. This fairly simple method of identifying animals with passive transponders can also be used to control individual access to other resources like nesting sites or mating partners. With the help of several such reading devices it is also possible to register the movements of individuals in a seminatural enclosure.

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**Radiotelemetric investigations o
free-ranging mousebirds *Urocol***

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Blue-naped mousebirds *Urocolius macrourus* (Coliidae) are typical inhabitants of the semi-arid savanna regions of sub-Saharan Africa. They live almost entirely on fruits and leaves throughout the year, but very few data are available about their food choice under natural conditions. We investigated the behaviour of a group of 6-8 individuals in the steppe of Olorgesaillie in the Rift Valley region of Kenya, about 70 km south of Nairobi. Telemetry transmitters (1.8 g, 4 % of body mass) were glued on the upper tail feathers and did not hamper the bird in its movements. A temperature sensor allowed continuous recording of the microclimate temperature at the bird. This was of special interest when the birds formed clusters for roosting at night. We observed that the formation of clusters was independent of air temperature and there is evidence that this behaviour is of major importance for the social bounds of the group as well as for thermoregulation (Brown CR & Foster GG 1992 J Comp Physiol B 162: 658). Berries that were preferred for food *(Salvadora persica, Cordia sinensis* and *Cocculus hirsutus)* were collected in the field and investigated for their water, fat and protein content in laboratory investigations. The fruits contained 60 – 83 % of water. Of the dry matter, 6 % were crude protein and 16 % fat. The energy content was determined by bomb calorimetry. The dried fruit pulp contained 13 – 23 kJ/g. The food supply in the territory enabled the birds to remain inactive during a considerable part of the day. Moreover, the mousebirds only needed to drink at temperatures > +30 °C. At lower temperatures, the group never visited the waterhole probably in order to minimize the risk of predation.

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**Trouble in the morning affects the whole day!
Behavioural consequences of food dispersal in the white rhino**

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A previous study showed that in white rhinoceroses the behaviour of the animals during feeding can be changed distinctly by the way food is provided (Schmidt C Sachser N 1995 KTBL-Schrift 376: 188). In this study we investigated whether these differences are detectable through the whole day and whether or not changes in behaviour caused by the mode of feeding in the morning can be compensated by a second feeding in the afternoon.
Five southern white rhinoceroses (*Ceratotherium simum simum*), kept at the Allwetterzoo Münster, were studied. During the day one male and four females lived together in a 1200m^2 outdoor enclosure. During the night each animal had its own box. In these boxes the main feeding took place (at least 10kg hay/animal).
From April to July 1997 two additional feedings (each about 10±0,5kg hay) were offered in the outdoor enclosure. In the morning (8:30) the amount of hay was prepared either in a clumped (one heap) or in a dispersed mode (one heap per animal). These two feeding conditions alternated weekly. In the afternoon (13:30) a second feeding always took place in the dispersed mode. For 250h behavioural data were recorded quantitatively (focal sampling, continuous recording) using a handheld computer (hardware: Psion - Workabout; software: Noldus - The Observer).
The most importing findings were: (1a) In the morning the frequency of agonistic interactions was increased during and after feeding in the clumped situation. (1b) In the afternoon the frequency of agonistic encounters was increased during and after feeding only, if the feeding in the morning had taken place in the clumped mode. (2) Providing the hay in a clumped mode evoked a decrease in resting behaviour both, after feeding in the morning and after feeding in the afternoon. (For results 1a, 1b and 2: Wilcoxon matched-pairs test; N=5, T=0, $p < 0,05$.)
Thus, behavioural changes caused by a clumped feeding in the morning were detectable through the whole day and could not be compensated by a dispersed feeding in the afternoon.

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