Z.M. RENTERÍA-SOLÍS, Berlin; B. A. KÖHNEMANN, Tharandt/Eberswalde; F.-U. MICHLER, Tharandt; M. ROTH, Tharandt; S. RIEGER, Eberswalde; G. WIBBELT, Berlin

Free-ranging raccoons (*Procyon lotor* L., 1758) in northern Germany: parasitology, pathology and feeding ecology investigation

Key words: raccoon, *Procyon lotor*, parasitology, pathology, feeding ecology, conversion factor

Introduction

Invasive animal species like the North American raccoon (*Procyon lotor* L., 1758) play a significant role in the ecologic balance of their newly encountered biotope, particularly as their habits might overlap and compete with that of native animals. Being introduced in Germany for more than 70 years ago, two main raccoon populations in central and northeast Germany are differentiated these days. Against the background of a vast increase of raccoon numbers in Germany within the last years, a controversial discussion arose regarding the influence of the new inhabitant on indigenous resp. protected species and the potential transmission of diseases and parasites.

In the United States and Canada numerous studies on biology and veterinary aspects of raccoons have been published whereas comparable investigations are lacking for Europe. Aiming to elucidate the wildlife biology of this invasive species, a large perennial project has been initiated in 2006 in the northeastern area of distribution (Müritz National Park, Mecklenburg-Western Pomerania; www.projekt-waschbaer.de). Consisting of several sub studies, this research project on raccoon population biology also involves A) the analysis of feeding ecology as well as B) pathological and parasitological investigations in deceased animals. Investigations have started a few months ago and will last until 2013.

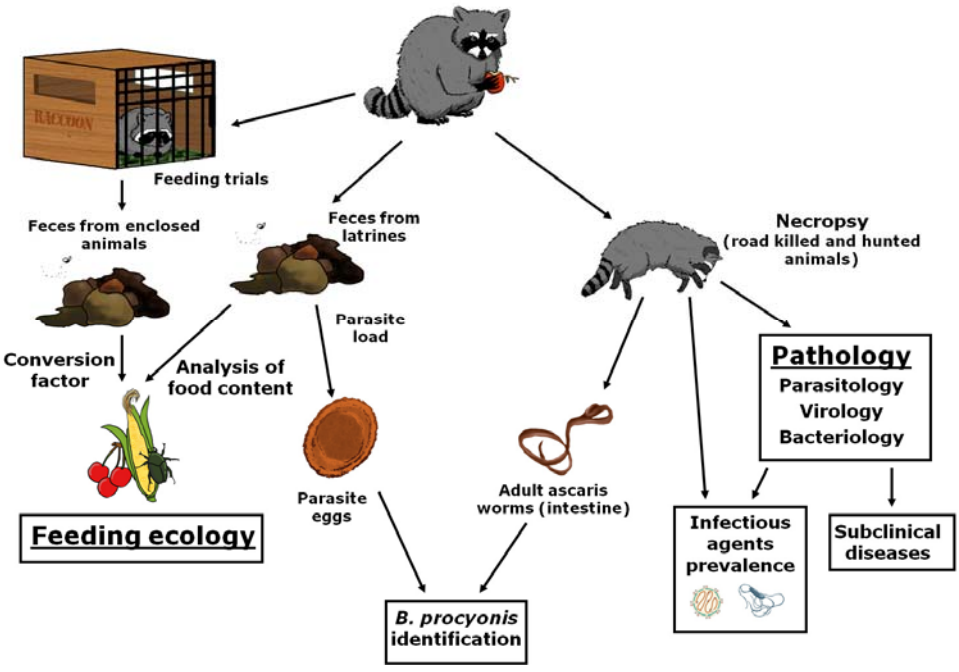

Image 1: scheme of the single topics of investigation on raccoons in Müritz National Park, Germany.

A) Feeding ecology investigation

Extensive knowledge about the effects of raccoon settlement, primarily in natural landscapes, and the possible occupation of an ecological niche in the autochthonous fauna is lacking entirely so far. As raccoons are highly adaptable, especially in terms of different food sources, it is difficult to evaluate the nourishment composition against the bag drop of a potential threat to indigenous species - yet scat analysis is currently the most informative approach. In order to elementarily evaluate and interpret quantitative statements regarding the nourishment categories of raccoons it is furthermore essential to establish a special conversion factor.
The objectives of this sub study are therefore:

- Scat analysis regarding the quantitative and qualitative composition of nourishment categories
- Determination of a raccoon specific conversion factor on the basis of feeding trials with encountered animals.

Image 2: raccoon faeces on a characteristic latrine in Müritz National Park (Frank Michler, 2010).

B) Pathology and parasitology investigation

To investigate the prevalence of subclinical diseases and infectious agents of raccoons in Müritz National Park particular focus is placed on the following questions:

- What kind of pathological lesions and infectious agents occur in raccoons in Müritz National Park?
- What is the prevalence for such agents?
- Does the zoonotic parasite *Baylisascaris procyonis* occur in this raccoon population?

For this purpose about 100 carcasses of road killed and hunted raccoons were collected from the research area. A full necropsy is performed and various biometrical measurements are registered. Tissue samples of selected organs are fixed in 4% formalin, processed routinely and stained with haematoxylin-eosin for histology analysis. Further samples are stored for virology and bacteriology investigations. Additionally, the gastrointestinal tracts are examined for the presence of adult helminths. Moreover, as previous investigations indicated the

presence of a parasite within the raccoons' tongues tissue samples are stored frozen for subsequent species identification of this parasite.

Image 3: necropsy of a female raccoon with a closer view to the gastro-intestinal system (Irina Muschik, 2010).

Summary

Free-ranging raccoons (*Procyon lotor* L., 1758) in northern Germany: parasitology, pathology and feeding ecology investigation

The North American raccoon was introduced into Germany more than 70 years ago. In order to elucidate the population biology of raccoons in this country, a large project was initiated in 2006 investigating the northern raccoon population in Müritz National Park (www.projekt-waschbaer.de). Two of the several studies that comprehended this broad research are currently carried out with the following focus: A) feeding ecology, aimed to study the nutrient composition in the free-ranging population in addition to feeding trails in captive animals; B) pathology and parasitology, to investigate the prevalence of subclinical diseases and infectious agents within the MNP population.

Zusammenfassung

Untersuchungen zur Parasitologie, Pathologie und Nahrungsökologie wild lebender Waschbären (*Procyon lotor* L., 1758) in Norddeutschland

Um umfassende Daten zur Populationsbiologie des Neubürgers Waschbär in seinem nordostdeutschen Verbreitungsgebiet zu erheben, wurde ein mehrjähriges, integriertes Forschungsprojekt im Müritz-Nationalpark (Mecklenburg-Vorpommern) initiiert, welches sich aus mehreren Themenschwerpunkten zusammensetzt (www.projekt-waschbaer.de). Die beiden hier vorgestellten Teilprojekte beschäftigen sich zum einen mit nahrungsökologischen Analysen frei lebender Waschbären mittels Exkrementanalysen, auf deren Grundlage über die Quantifizierung genutzter Biomasseanteile einzelner Nahrungskategorien Aussagen zu ökologischen Auswirkungen des Waschbären im naturnahen Raum erwartet werden. Zum anderen werden histo-pathologische und parasitologische Untersuchungen durchgeführt, um Erkenntnisse bezüglich der Verbreitung subklinischer Erkrankungen und infektiöser Erreger innerhalb der untersuchten Waschbärenpopulation zu erlangen. Diese Ergebnisse werden Hinweise auf ein Übertragungspotential von Krankheitserregern zwischen Waschbären und Haustieren bzw. Menschen liefern.

Acknowledgements
We give thanks to the German Academic Exchange Service (DAAD) and the Consejo Nacional de Ciencia y Tecnologia (CoNaCyT, Mexico) and the Studienstiftung des deutschen Volkes for granting fellowships

Author addresses

MVZ ZAIDA MELINA RENTERÍA-SOLÍS
Institute for Zoo and Wildlife Research Berlin
Alfred-Kowalke-Str. 17
D-10315 Berlin
E-Mail: renteria@izw-berlin.de

DIPL.-BIOL. BERIT KÖHNEMANN
Technische Universität Dresden
Institut für Forstzoologie
Arbeitsgruppe Wildtierforschung
Pienner Straße 7
D-01737 Tharandt
E-Mail: koehnemann@projekt-waschbaer.de

DIPL.-BIOL. FRANK-UWE MICHLER
Technische Universität Dresden
Institut für Forstzoologie,
Arbeitsgruppe Wildtierforschung
Pienner Straße 7
D-01737 Tharandt

PROF. DR. MECHTHILD ROTH
Technische Universität Dresden
Institut für Forstzoologie,
Arbeitsgruppe Wildtierforschung
Pienner Straße 7
D-01737 Tharandt

PROF. DR. SIEGFRIED RIEGER
Hochschule für nachhaltige Entwicklung Eberswalde (FH)
Fachgebiet Wildbiologie, Wildtiermanagement und Jagdbetriebskunde
Alfred-Möller-Straße 1
16225 Eberswalde

DR. GUDRUN WIBBELT
Institute for Zoo and Wildlife Research Berlin
Alfred-Kowalke-Str. 17
D-10315 Berlin