



ORLANDO SCHWERY^{1,2}
FRANK-UWE MICHLER^{1,3}
BERIT A. KÖHNEMANN^{1,3}
WINAND BRINKMANN^{1,2}



04
2011



© Orlando Schwery

Morphometrical characterisation

of a raccoon population from Müritz-Nationalpark (Germany) by means of the *Os baculum*

- 1 Projekt Waschbär, Goldenbaum 38, 17237 Carpin
- 2 Universität Zürich, Paläontologisches Institut
- 3 TU Dresden, Institut für Forstzoologie, Arbeitsgruppe Wildtierforschung

Introduction

Concerning age determination, classically considered traits in raccoons are certain characteristics of the *Os baculum* (penis bone), especially its weight (HEDDERGOTT 2008, LUTZ 1991, SANDERSON 1950). Although only assessable post-mortem (exception see SANDERSON 1950), quantifying these characteristics provides a comparatively easy **method for age estimation**, especially to separate juvenile from adult individuals.

The present study, a cooperation between the University of Zurich (Switzerland) and the "Projekt Waschbär" (Germany), aims primarily at confirming that the previously observed relationships between weight of *Os baculum* and age also holds for the raccoon population from Müritz-Nationalpark.

Methods

The *Os bacula* of 30 male raccoons from Müritz-Nationalpark have been extracted at the Leibniz Institute for Zoo and Wildlife Research (Berlin, Germany). The remaining tissue was removed and the bones were degreased using white spirit, bleached in 3% hydrogen peroxide and dried for a couple of days.

The weight of the bones was determined using precision scales, the length measurements using a sliding calliper. All measured lengths are shown in Fig. 1.

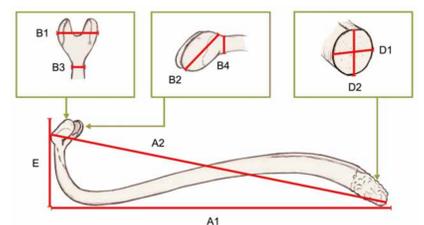


Fig.1: Measurements: Red bars: linear measurements. Green boxes: position of magnified parts.

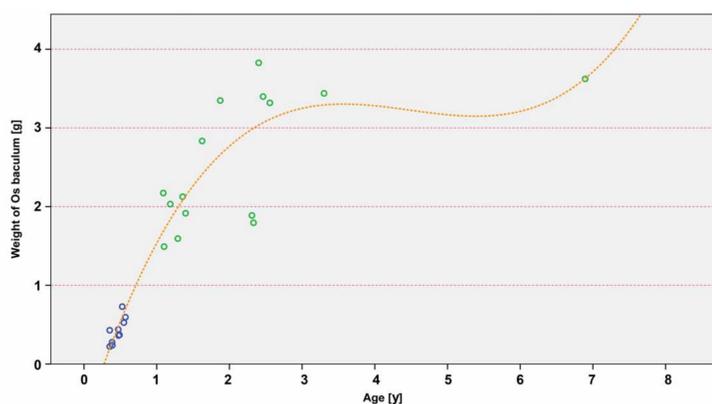


Fig.2: Relationship of bacular weight and age: Blue circles: cartilaginous distal end; green circles: ossified distal end; orange dotted line: cubic fit, $R^2=0.875$; age estimation: days from 1st April to date of death; $n=25$.

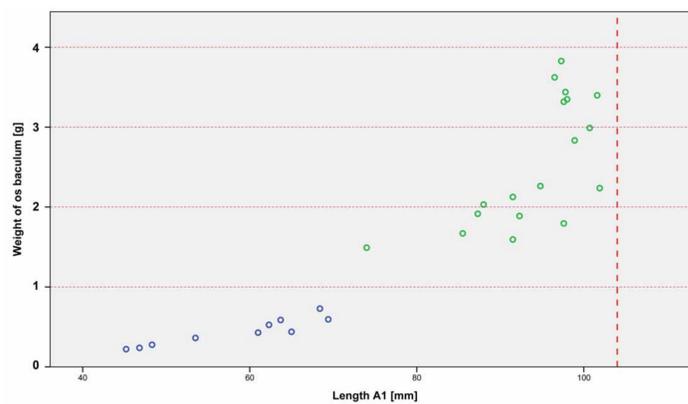


Fig.3: Relationship of bacular weight and length: Blue circles: cartilaginous distal end; green circles: ossified distal end; red dashed line: possible maximal length; $n=28$.



Fig.4: Age variation: Spectrum of bacular size and shape, age increases from top to bottom. Scale = 1cm.

Bacular weight and state of the distal end can be used to assign male raccoons to their age cohort. Bacular weight and length increase correlated but meet their maxima independently.

Results & Discussion

The weight of the *Os bacula* ranged from 0.222 g to 3.827 g (mean: 1.758 g, $n=30$). If plotted against age (Fig.2), age cohorts become evident. The bacular weight of juveniles ranged from 0.222 g to 0.729 g (mean: 0.419 g, $n=10$), that of subadults and adults from 1.492 g to 3.827 g (mean: 2.587 g, $n=15$). The gap between subadults and adults might lie between 2.173 g and 2.834 g, however this separation is diffused by two outliers (see Fig.2).

Previous findings could be confirmed, that the ossification of the distal end marks the transition from juvenile to adult after the first year (SANDERSON 1950).

All correlations between the length measures, age and weight are highly significant (Pearson, two-tailed), indicating strong age (and

therefore size) specific allometric relations.

The plot of bacular weight against length (Fig.3) illustrates how the increase of length ceases around 100 mm, while weight further increases from this point, similar as previously found by SANDERSON (1950).

Outlook

In further steps, allometric relationships, correlations with other traits and the ontogenetic pattern of curvature will be analysed to further reveal functionality and development of this bone. Photo-based digital measurements will be performed and their consistency compared to the classical measurements will be assessed.

Literature

- HEDDERGOTT, M. (2008): Zur Altersschätzung vom Waschbär *Procyon lotor* (L., 1758) nach dem Gewicht des *Os baculum*. - Beiträge zur Jagd- und Wildforschung 33: 383-388.
- LUTZ, W. (1991): Über das Gewicht des *Os baculum* vom Waschbären (*Procyon lotor* L., 1758) in Westdeutschland. - Z. Jagdwiss. 37: 204-207.
- SANDERSON, G.C. (1950): Methods of measuring productivity in raccoons. - Journal of Wildlife Management 14 (4): 389-402.

www.projekt-waschbaer.de

