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# Egg-breaking behavior in a yellow-throated marten, *Martes flavigula* (Mustelidae; Carnivora)

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*Receipt of Ms. 8. 4. 1975*

Behavioral specializations for opening and eating hard shelled foods are not widespread among animals. The majority of omnivores and carnivores open eggs, molluscs, and hard shelled arthropods by puncturing with the canine teeth, but among the mongooses and mustelids such food is opened by smashing against the substrate or an upright hard object. In both of these families, the food is propelled by the limbs, but several variations exist (Dücker 1965; Ewer 1973). Among the Herpestinae *(Mungos, Helogale, Herpestes* and *Atilax)* the object is either "hiked" between the hindlegs or dashed upon the ground from a bipedal stance. The Galidiinae *(Mungotictis* and *Galidia)* clutch the object with all four feet and throw it posteriorly while reclining on the side (Ewer 1973; Albignac 1969). The spotted and striped skunk *(Spilogale* and *Mephitis)* seem to use a technique similar to the mongooses except that a hindleg may assist in throwing the food in *Spilogale* (Ewer 1973; H. Egoscue pers. comm.). This paper describes a curious method of breaking eggs observed in a female yellow-throated marten at the Brookfield Zoo.

The animal's ability to break eggs was first observed by G. J. in July, 1974. Raw egg had been a part of the animal's diet, but had previously been given without the shell. When a whole egg was presented to the animal, she sniffed at the egg and manipulated it with her forepaws: rolling or pulling with a single forepaw and dragging with both forepaws in a hunching motion. An attempt to bite the egg was

Z. Säugetierkunde 41 (1976) 58—60

ISSN 0044—3468/ASTM-Coden ZSAEA 7

made, but the shell was not pierced. Finally, she grasped the egg between the pads of both forefeet and dropped it from a height of about 10 cm as she rose briefly to her hindlegs.

Further eggs were presented to this animal and a male of the same species over the next six weeks to verify the observation. In cases where the egg was fractured in being removed from the food pan, both animals were able to open the egg by pawing, dragging, and biting. In all instances involving intact eggs, the male was able to pierce the egg by biting; while the female always broke the eggs by dropping them from the elevated forepaws. In many instances, the grasping and dropping of the egg occurred as the female pivoted on the hindfeet towards the nest box at the rear of the cage. Thus, the breaking of the egg appeared to be a by-product of her effort to move the egg to the rear of the cage rather than a deliberate action. Nevertheless, once the egg was broken in this manner, efforts to move the egg were abandoned and feeding began immediately.

Both animals fed on the egg in a similar manner. Once the shell was cracked, no attempt was made to split the egg open. Rather, the canines were used to make a hole in the shell large enough for the tongue to pass through. The contents were then lapped from the egg, often leaving a rather complete shell. The muzzle was pressed firmly against the egg, presumably steadying it and allowing the tongue to extend farther into the egg.

In summary, both male and female manipulated eggs by pawing, dragging and biting. In the case of fractured eggs this behavior sufficed to break the shell. Intact eggs were always broken by biting in the case of the male, while the female always broke intact eggs by dropping them from the elevated forepaws at a height of 2—10 centimeters. Both animals lapped the contents from the broken eggs.

It is not possible to say whether the female's behavior was an idiosyncrasy or was specifically evoked by a food which she was unable to open using conventional methods. According to Novikov (1962) the yellow-throated marten feeds chiefly on musk deer, but also takes the eggs and young of hazel grouse and pheasants during the summer. The similarity of the egg dropping pattern to the food smashing behavior of the water mongoose is particularly curious and worthy of comment. Ewer (1973) suggested that the upright smashing method of the water mongoose may have evolved as a frustration reaction of rearing up as the unyielding food was held in the paws. The case of the marten is significant because it is an example of how a behavioral innovation may arise from a non-specific behavior (such a food transport in the forepaws). Similarly, Eisenberg and Leyhausen (1972) describe another variation of the upright smashing pattern in a *Mungos mungos*. The snail was held in the mouth and forepaw as the animal stood bipedally; then as the jaws relaxed their grip the forepaws slammed the snail to the ground. Two elements of their description differ from the conventional method described — normally the mouth does not assist and the food is hurled between the hindlegs (Kinloch 1965; Eisner and Davis 1966; Simpson 1966; Davis 1966). But in fact, there ist considerable variation in the methods by which the mongoose opens hard shelled foods. The extent to which these variations are determined by learning and features of the food or motivational state remains to be studied in the species exhibiting this unusual behavior.

## Summary

The opening of hen's eggs by dropping on the ground from elevated forepaws is described in a female yellow-throated marten. More perfected versions of this behavior have been

described in several species of mongoose, but up to now this particular pattern has not been described in the Mustelidae.


## Zusammenfassung

*Verhalten eines Gelbhalsmarders (Martes flavigula) beim Öffnen von Eiern*

Für einen weiblichen Gelbhalsmarder wird eine ungewöhnliche Verhaltensweise beschrieben. Dieses Tier öffnete Hühnereier, indem es sie mit emporgehobenen Vorderfüßen auf den Boden warf. Perfektere Versionen dieses Verhaltens sind bereits von verschiedenen Mangustenarten bekannt, jedoch noch nie von Musteliden beschrieben worden.


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# BEKANNTMACHUNG

## Einladung

Die 50. Hauptversammlung der Deutschen Gesellschaft für Säugetierkunde e. V. findet auf Einladung von Herrn Prof. Dr. Dr. h. c. Wolf Herre und Mitarbeitern in der Zeit vom 5. 9. 1976 bis zum 9. 9. 1976 in Kiel statt.

Am Dienstag, 6. 9. 1976, nachmittags, soll eine Fahrt nach Schleswig zur Besichtigung der Außenstelle für prähistorische Zoologie des Institutes für Haustierkunde (Leitung: Wiss. Dir. Dr. Hans Reichstein) stattfinden. Am 9. 9. 1976 ist eine Exkursion mit folgender Route geplant: entlang Selenter See, durch das Kossautal nach Rantzau zum Trakehner-Gestüt, durch die Plöner Seenplatte zum Segeberger Forst (verschiedene Haustierrassen), nach Trappenkamp (Wildgehege) und zurück nach Kiel. Weitere Einzelheiten werden später bekanntgegeben.

Alle Säugetierkundler sind zu dieser Tagung herzlich eingeladen. Falls besondere persönliche Einladungen gewünscht werden, wird gebeten, sich mit dem 1. Vorsitzenden, Herrn Prof. Dr. Hans Frick, Anatomisches Institut der Universität, Pettenkoferstraße 11, D-8000 München 2, in Verbindung zu setzen.