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RATE OF PASSAGE OF FOODSTUFFS THROUGH THE ALIMENTARY TRACT OF *NEOMYS FODIENS* (PENNANT, 1771) UNDER LABORATORY CONDITIONS

SZYBKOŚĆ PRZECHODZENIA TREŚCI PRZEZ PRZEWÓD POKARMOWY *NEOMYS FODIENS* (PENNANT, 1771) W WARUNKACH LABORATORYJNYCH

A considerable amount of data can be found in literature on the rate of passage of foodstuffs through the alimentary tract of carnivorous animals. Honigmann (1936) investigated this process in animals including the wild cat and wolf, Mangold (1950) in the dog, Neseni, et al. (1955) and Sławiński, et al. (1962) in foxes, and Neseni & Piątkowski (1958), Sibbald, et al. (1962) and Sławiński, et al. (1962) in mink.

It is interesting to learn something of the rate of passage of foodstuffs through the alimentary canal of *Insectivora*, which also feed on a chiefly meat diet. Only the investigations made by Hamilton (1944) in *Cryptotis parva* and Spiridonova (1949), who traced this process in *Talpa europaea* by the use of *X*-ray examination, are known to us from the literature available on this subject.

Our experiment was aimed at investigating the rate of passage of foodstuffs through the alimentary tract of the carnivorous (Buchalczyk & Pucek,

Table 1.

Description of the course taken by excretion of larvae *Tenebrio molitor* in 10 ♂♂ and 10 ♀♀ of *Neomys fodiens* (Pennant, 1771).

		Excretion time of stained food (hours and minutes)			*R* values
		50%	90%	100%	
MALES	1	1.22	2.00	5.00	1.26
	2	1.29	2.30	4.00	1.30
	3	0.38	1.36	3.00	0.44
	4	0.50	2.07	4.00	1.00
	5	1.23	1.54	4.00	1.18
	6	1.13	2.36	4.00	1.18
	7	0.51	1.54	4.00	1.00
	8	1.18	2.49	5.00	1.25
	9	0.42	1.48	5.00	0.49
	10	0.43	1.45	3.00	0.49
$\bar{X}$ ♂♂		1.03 ± 0.14	2.06 ± 0.16	4.06 ± 0.32	1.08 ± 0.12
FEMALES	11	1.42	3.25	6.00	1.38
	12	1.23	1.58	4.00	1.22
	13	2.11	2.58	5.00	2.03
	14	1.10	2.55	5.00	1.22
	15	0.57	1.49	3.00	1.00
	16	1.37	2.38	4.00	1.40
	17	0.54	1.48	4.00	0.57
	18	1.11	1.55	5.00	1.12
	19	1.28	2.16	4.00	1.28
	20	1.16	1.52	4.00	1.10
$\bar{X}$ ♀♀		1.23 ± 0.16	2.22 ± 0.24	4.24 ± 0.36	1.23 ± 0.15
$\bar{X}$ ♂♂+♀♀		1.13 ± 0.11	2.14 ± 0.18	4.15 ± 0.22	1.15 ± 0.10

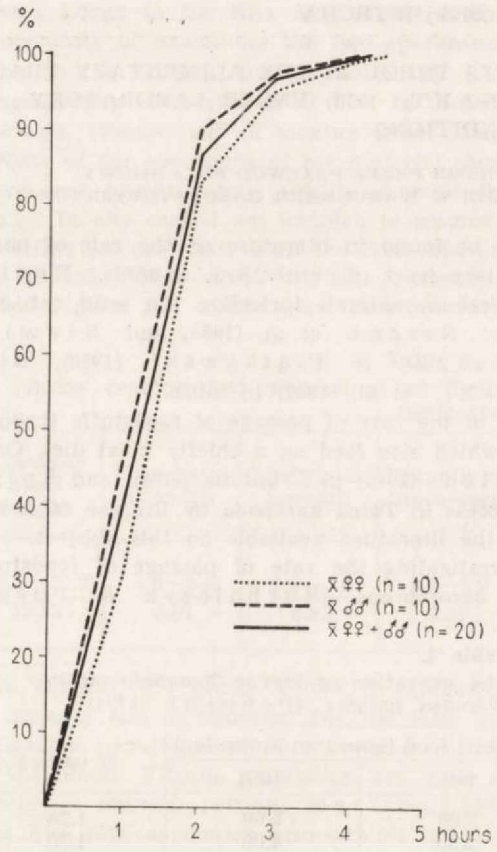

Fig. 1. Average course taken by excretion of red stained larvae *Tenebrio molitor* in *Neomys fodiens* (Pennant, 1771).

1963) *Neomys fodiens*. The experiments were made on 20 individuals of this species (10 ♂♂ and 10 ♀♀) caught in the Białowieża National Park and kept in captivity for 6—10 months. During this time the animals were fed on minced beef or pork offal, with the addition of yeast and vitamins. A two-day period of preparation preceded the experiment. Both during this period and during the experiment *N. fodiens* were given the larvae of *Tenebrio molitor*, which appears to be the most natural food for them. The stained food method worked out by Castle (1956), as modified by Gill (1957) was used in our investigations, the larvae of *Tenebrio molitor* being stained with basic fuchsin. These larvae were pushed into the middle of decapitated unstained larvae, in which form there were readily eaten by the experimental animals. Stained food was given only during the first five minutes of each experiment. Further methods used were the same as those described in our earlier investigations (Kostelecka-Myrcha & Myrcha, 1964a; 1964b).

The results obtained (Table 1, Fig. 1) make it possible to establish that process of digestion in *N. fodiens* takes place very rapidly. Excretion of the indicator began in all the test animals during the first hour of the experiment, and ended after 3—4 hours. The main mass of stained remains (80%) was excreted very evenly within the first two hours of the experiment, and the last 20% about 4 times more slowly.

No differences connected with sex were found in the rate of passage of foodstuffs in any of the test animals. When comparison was made (*t*-Student test) of the times of excretion of 90% and 100% of the indicator and of the *R* value no statistically significant results were obtained. It was only when comparing the times of excretion of 50% of the test food that a result on the borderline of significance was obtained.

It is not possible to make either an exact comparison of the results obtained by different authors for different animals living on a meat diet, or comparison of our own data with those results, on account of the different research methods used. Despite this fact it would seem that these results give ground for assuming that the rate of passage of foodstuffs is higher in smaller mammals than in larger ones. *N. fodiens* is the smallest of all the carnivorous mammals so far investigated from this aspect. The rate of passage of foodstuffs proved to be most rapid in this animal. As is well-known, this species is characterised by a relatively high metabolic rate (Hawkins & Jewell, 1962; Hawkins, et al. 1960; Gębczyńska & Gębczyński, in litt.). It would seem that the fact of more rapid digestion in the smaller species of mammals could be connected with the higher metabolic rate of these animals.

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