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RESEARCH ARTICLE

FOOD PREFERENCE BY NILE RAT ARVICANTHISNILOTICUS OF DIFFERENT CEREAL SEEDS IN MULTI CHOICE TEST UNDER LABORATORY CONDITIONS

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ABSTRACT

The total consumptions from cereals whole and grinded in the 1st day of the trial were 3.1, 1.1, 1.5, 1.6, and 1.9 g / 100 g body wt. of wheat, maize, sorghum ,rice and barely, respectively. The total intake from whole and grinded cereals in the 2nd day exceled the intake in the 1st day recording 3.4, 1.4, 1.7 and 2.0 g/ 100 g body wt., consecutively.The total accounted consumptions from these cereals (whole and grinded) in the 3rd day recorded the highestamounts of 5.4, 1.6, 2.4, 2.8 and 1.6 g/ 100g body wt., respectively**.** The counted total consumptions of these foods (wheat, maize, sorghum, rice and barely) in the 4th day were reduced than the 3rd day recording 3.9, 1.8, 2.1, 2.5 and 0.9 g /100 g of body wt., respectively. At the 5th day (the trial finale) the total consumed of both whole and grinded cereals reduced to be 3.2, 1.3, 1.8, 2.4 and 0.8 with wheat, maize, sorghum, rice and barely, respectively.

INTRODUCTION

Rodents are a dominant group of mammals. Most of living rodent species the Muridae, and most of rodents exist in Egypt also belong to this family.Rodents occupy a wide natural habitat; they can be found in forests, grasslands, agricultural landscapes, villages and townships. Rodents play an important role in the food web, both as consumers of plants and as food resources for many of larger predators, they also help aerating the soil through their digging and burrowing activities such as the Nile rat *Arvicanthusniloticus*.

The success of rodent control depends on the preference of the bait materials used. The ideal bait is the one that shows attractiveness and acceptance to many rodent species and it is easy to be prepared and to be applied (Thompson *et al,* 1972; Brooks and Bowerman, 1973; Abdel-Gawad and Maher Ali, 1982; Asran *et al*.; El-Deeb *et al*, 1985; Sherief et al, 1985;l-Bahrawy, 1989; Abd El- Rahman *et al*, 1991; Shafi *et al*, 1992; Abdel-Galil, 1997; Khan *et al*, 2000; Witmer *et al,* 2008 and Desoky, 2011).

This study aims to shad light uponthe preference and consumption of different cereal seed food items by the Nile rat ,*A. niloticus*.

MATERIALS AND METHODS

In multi-choice feeding trials, ten food items of cereals *i.e*.whole wheat, grinded wheat, whole maize, grinded maize, whole rice, grinded maize, whole sorghum, grinded sorghum, whole barely and grinded barely were presented simultaneously to rat. Each container attached with the multi choice unit was offered 20 g of each food in separate bait containers for five consecutive days. The position of the food containers was changed clockwise daily to avoid place preference by the rat. Five replicates were used.

The units of multi-choice trial for comparison ten food items of the cereal seeds were four circular plastic dishes attached by ten tubes and ten containers (five for the food as whole seeds and other five were for the grinded seeds of the these foods) for testing the type of food whoever preferred. Each unit served as a replicate from five replicates.

RESULTS AND DISCUSSION

Data in Table (1) show the consumed in the 1st day of the experiment from the whole and grinded cereals by Nile rat Arvicanthes niloticus under laboratory condition. The consumption from whole cereals surpassed other from grinded cereals of wheat, sorghum, rice and barely, while the opposite result was recorded with maize whereas the grinded cereals was

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consumed more than the wholecereals Ford (1977) found that increasing hardness of diet reduced food wastage by mice and rats . The recorded intake in the 1st day of the experiment were 2.34, 0.4, 1.2, 1.4 and 0.6 g / 100g of body wt. from whole cereals of wheat, maize, sorghum, rice and barely, while the intake from the grinded seeds of these cereals were 0.7, 0.7, 0.3, 0.2 and 0.3 g/ 100g body wt., respectively. The total consumption from cereals whole and grinded were 3.1, 1.1, 1.5, 1.6, and 1.9 g / 100 g body wt. of wheat, maize, sorghum ,rice and barely, respectively. These results indicate the excellence of wheat as preferred food for the Nile rat than other cereals. This result agreed with other reported by El-Deeb *et al*., (1985) who studied the preference and consumption of selected bait materials offered to the Nile rat, *A. niloticus* under field conditions in the governorate of Benni-Suef, Egypt and mentioned that wheat was the preferred one.

Table 1 Food preference by *Arvicanthisniloticus* in multi choice of different cereal seeds in the 1st day of the test under laboratory conditions

Food	Food type	Mean [1]	Food type	Mean [1]	Total consumed
Wheat	Whole wheat	2.4a	Grinded wheat	0.7 a	3.1 a
Maize	Whole maize	0.4 c	Grinded maize	0.7 a	1.1 bc
Sorghum	Whole sorghum	1.2 b	Grinded sorghum	0.3 b	1.5 b
Rice	Whole rice	1.4 b	Grinded rice	0.2 b	1.6 b
Barely	Whole barely	0.6 c	Grinded barely	0.3 b	0.9 c

[1,] Mean of consumed food g / 100 g of body weight
Values followed by the same litters in each column are not significantly different (P<0.05)

In the 2nd day the intake amounts clearly increased, whereas the recorded intake amounts from the whole cereals of wheat, maize, sorghum, rice and barely were 2.5, 0.6, 1.4, 1.7 and 0.6 g/ 100 g body wt., respectively. While the intake from the grinded of these cereals were 0.9, 0.8, 0.3, 0.3, 0.3 g / 100g body wt. Total intake from whole and grinded cereals in the 2nd day exceled the intake in the 1st day recording 3.4, 1.4, 1.7 and 2.0 g/ 100 g body wt., consecutively (Table 2).

Table 2 Food preference by *Arvicanthisniloticus* in multi choice of different cereal seeds in the 2nd day of the test under the laboratory conditions

Food	Food type	Mean [1]	Food type	Mean [1]	Total consumed
Wheat	Whole wheat	2.5a	Grinded wheat	0.9 a	3.4 a
Maize	Whole maize	0.6 c	Grinded maize	0.8 a	1.4 bc
Sorghum	Whole sorghum	1.4 b	Grinded sorghum	0.3 b	1.7 b
Rice	Whole rice	1.7 b	Grinded rice	0.3 b	2.0 b
Barely	Whole barely	0.6 c	Grinded barely	0.3 b	0.9 c

[1,] Mean of consumed food g / 100 g of body weight Values followed by the same litters in each column are not significantly different (P<0.05)

Continues increase in the consumption of the whole and grinded cereals so the total consumption was observed in the 3rd day from the trial (Table 3).

Table 3 Food preference by *Arvicanthisniloticus* in multi choice of different cereal seeds in the third day of the test under laboratory conditions

Food	Food type	Mean [1]	Food type	Mean [1]	Total consumed
Wheat	Whole wheat	4.0 a	Grinded wheat	1.4 a	5.4 a
Maize	Whole maize	0.2 c	Cracked maize	1.4 a	1.6 c
Sorghum	Whole sorghum	2.2 b	Cracked sorghum	0.2 b	2.4 b
Rice	Whole rice	2.6 b	Cracked rice	0.2 b	2.8 b
Barely	Whole barely	0.6 c	Cracked barely	1.0 a	1.6 c

[1,] Mean of consumed food g / 100 g of body weight
Values followed by the same litters in each column are not significantly different (P<0.05)

Consumption of 4.0, 0.2, 2.2, 2.6 and 0.6 g/ 100 g body from the whole cereals of wheat, maize, sorghum, rice and barely were recorded in the 3rd day, consecutively. As for the consumption of grinded wheat, maize, sorghum, rice and barely cereals by Nile rat at the 3rd day were 1.4, 1.4, 0.2, 0.2 and 1.0 g / 100 g body wt., respectively. So the total accounted consumptions from these cereals (whole and grinded) were 5.4, 1.6, 2.4, 2.8 and 1.6 g/ 100g body wt., respectively. These results emphasize the superiority of wheat as preferred food for Nile rat. These results in agreement with the results obtained by Abdel-Karim (1991), who reported that the wheat grain was the most preferred food to the Nile rat, *A. niloticus*.

Table (4) indicate that the consumption of cereal food items in the 4th day of trial started in reduction, whereas the amounts of the whole cereals of wheat, maize, sorghum, rice and barely were 3.0, 0.8, 1.8, 2.0 and 0.6 as well as 0.9, 1.0, 0.3, 0.5 and 0.3 g/ 100g body wt.from these cereals in grinded shape,respectively. So the counted total consumptions of these foods were 3.9, 1.8, 2.1, 2.5 and 0.9 g /100 g of body wt., respectively. The consumptions of the whole cereals of wheat, maize, sorghum, rice and barely at the 5th day (the trial finale) reduced to be 2.2, 0.4, 1.5, 2.0, and 0.6 g/100 g body wt., respectively while the consumed from the grinded of these cereals were 1.0, 0.9, 0.3, 0.4 and 0.2 g/ 100g of body wt., consecutively.

Table 4 Food preference by *Arvicanthisniloticus* in multi choice of different cereal seeds in the 4th day of the test under laboratory conditions

Food	Food type	Mean [1]	Food type	Mean [1]	Total consumed
Wheat	Whole wheat	3.0 a	Grinded wheat	0.9 a	3.9 a
Maize	Whole maize	0.8 c	Grinded maize	1.0 a	1.8 c
Sorghum	Whole sorghum	1.8 b	Grinded sorghum	0.3 b	2.1 b
Rice	Whole rice	2.0 b	Grinded rice	0.5 ab	2.5 b
Barely	Whole barely	0.6 c	Grinded barely	0.3 b	0.9 d

[1,] Mean of consumed food g / 100 g of body weight
Values followed by the same litters in each column are not significantly different (P<0.05)

Table 5 Food preference by *Arvicanthisniloticus* in multi choice of different cereal seeds in the 5th day of the test under the laboratory conditions

Food	Food type	Mean [1]	Food type	Mean [1]	Total consumed
Wheat	Whole wheat	2.2 a	Grinded wheat	1.0 a	3.2 a
Maize	Whole maize	0.4 c	Grinded maize	0.9 a	1.3 cd
Sorghum	Whole sorghum	1.5 b	Grinded sorghum	0.3 b	1.8 c
Rice	Whole rice	2.0 a	Grinded rice	0.4 b	2.4 b
Barely	Whole barely	0.6 c	Grinded barely	0.2 b	0.8 d

1, Mean of consumed food g / 100 g of body weight
Values followed by the same litters in each column are not significantly different (P<0.05)

Total consumed of both whole and grinded cereals in the 5th day were 3.2, 1.3, 1.8, 2.4 and 0.8 with wheat, maize, sorghum, rice and barely, respectively. Fig. (1) illustrate thedaily consumed of different cereal seed types /100 g of body weight of *A.niloticus* under the laboratory conditions. It was obvious that the high consumption of the cereal foods was attained in the 3rd day in opposite to the low consumption that recorded in the 1 st day. The curve of the cereal food consumption clearly declinedat the 5th day of trial.

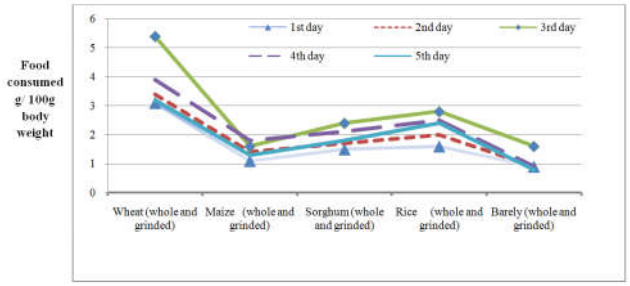

Fig 1 Daily consumed of different cereal seed types g /100 g of body weightof *Arvicanthusniloticus* under the laboratory conditions

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