Zagazig J.Agric. Res., Vol .30 No.(3) 2003 981 - 992

FOOD PREFERENCE AND EFFECT OF CERTAIN ADDITIVES FOR IMPROVING THE EFFICIENCY OF SOME TOXIC BAITS TO HOUSE SPARROW AND PALM DOVE BIRDS .

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Received 26 / 2 / 2003 *Accepted 22 / 4 / 2003*

ABSTRAT: The preferability of some food materials to house sparrow and palm dove birds was investigated under laboratory condition. The obtained results revealed that barnyard seed bait was the most preferable one for birds followed by rice, sorghum, wheat, crushed maize and barely baits, while crushed sunflower bait showed the lowest one. On the other hand, sugar is consider the most promising additive mixed with the poisoned bait for both house sparrow and palm dove birds.

Toxicity results revealed that Lannate insecticide and Nux-vamic ethanolic extract mixed with 0.1% prepulsid as antiromtening was the most effective for both house sparrow and palm dove birds compared with the pervious insecticide and plant extract alone.

The LD_{50},s values for Lannate and Nux-vamic mixed with 0.1% prepulsid were 0.98 & 2.94 and 1.1 & 3.31 mg/kg.b.w., while the paralled values for Lannae and Nux-vamic alone were 1.35 & 3.10 and 1.53 & 4.05 mg/kg.b.w., respectively.

INTRODUCTION

Birds damage several grain crops in Egypt. The most important pest birds to wheat are: roch doves, *columba livia,* crested lark, *galerida cristata,* starling, *Starnus vulgaris* and House sparrow, *Passer domesticus* (Brooks *et al.,* 1982 and El-Deeb., 1991). The principal pests of maize are: rose–ringed parakeets *Psittacula krameri;* and jungle crows. In country like Egypt, with a limited cultivated area, food insufficiency is the major problem that faces the overgrowing human population. The Egyptian Government stated to solve this problem by the reclaimation of desert lands. Also, bird damage to repining stage of wheat, horse bean, barley, sunflower and sorghum reached to 20.68, 2.76, 1.50, 21.03 and 35.60%, respectively and the highest bird damage was occurred at the newly reclaimed areas (El-Deeb, 1991).

The control of birds is one of the most difficult process a pest control specialist is called on to perform. Because many birds are protected by law or ordinance, the specialist must be assure he is not running a foul of the low in his work.

The successful integrated management program to protect the target crop from excessive loss by birds in many particular situations is depending to a large extent on the quality of the available informations on that situation and pesticide formulations to improve performance characteristics with consequent optimum effectiveness and safety to desirable crops.

Additives play an important role on the physico-chemical properties and there by improve the pesticidal efficiency. It is rather cheep to produce locally and considered acute poison with a quick mode of action. In this respect many results were related to use of additives in formulations of the bait system by researchers *i.e* Mangan and Moreno (1995), El-Sis *et al* (1995) and Bobert and Daniel (2001).

The present work aimed to throw light on food preference and effect of some additives in formulations of toxic bait system against house sparrow and palm dove birds.

MATERIALS AND METHODS

1. Avicides used:-

(I) Lannate (methomyl 90% w.p.) S-methyol. N-(methyl carbamoyloxy thioacatimidate).

(II) Prepulsid (Anti-vometing): (cisaprid) Cis-4-amino-5. chloro-N- {1-(3-(4-fluorophenoxy) propyl)-3-methoxy-4- piperidyl}-2-methoxybenzenide.

2. Plant materials :-

Nux-vomica fruits (*Strychno nux-vomica,* family Loganiaceae) were collected from plants growing wildly in Aswan desert. Identification of the tested plant was based mainly on the taxonomic characters detailed by Tackholm (1956).

3. Extraction method:-

150 gram dried powder of the tested plant were successively extracted with ethanol and hexane solvents according to Freedman *and* Nowed Kwolek. (1979) method.

4. Tested birds :-

Two groups of house sparrow, *Passer domesticus niloticus* and palm dove, *Streptopelia senegaliensis* were selected, housed under normal conditions. All birds had access of water, grill, whole-grain sorghum and kept to acclimatize for two weeks before testing according to Kochler *et al.* (1987).

5. Tested bait material additives :-

Five birds for each group species, while seven different types of substance and five additives were tested. The tested bait materials included three groups, the first group comprised sorghum, barley and wheat. While the second one included sorghum, sunflower and rice. The third group included sorghum, barnyard seeds and maize.

Sorghum grains were used as standard material. Attraction of the bait materials was measured by comparing consumption between the standard and the other six tested bait materials. Suger, fish meal, vanillia, salt and maize oil were used as attractants. Barnyard seeds plus one of the attractant materials (5% of each) were used. Sugar on barnyard seeds was used as standard and the comparison was done between the standard and the other additives on barnyard seeds.

Five grams from each bait material and additives of each group was offered to individually caged bird for three successive days with water. The amount

consumed from each bait material and barnyard seeds that used as a carrier for the additives were recorded daily by estimating the eaten amount. The placement of each container which has the materials were changed daily to prevent preference for a certain location . Five replicates of house sparrow and palm dove birds for each test group were weighed and caged individually. On the other hand, two types of formulated toxic baits, carried on the preferred bait (barnyard seeds), were prepared. The first was methomyl and nux-vomica ethanolic extract surface-coated on barnyard seeds and the other was methomyl and ,ux-vomica plant extract with ethanol added to 0.1% anti-vomting (Prepulsid) surface-coated on barnyard seeds also. Five individually caged birds of house sparrow and palm dove birds were used for each dose of the two types of formulated toxic baits. Birds were individually caged, provided with food and water and observed for sings of toxicosis and mortality during the first 48 hours post-treatment. Depending upon the mortality at initial dose, LD_{50} values were calculated by the method of Finney (1971).

The consumption percentage were calculated in all cases according to Stafford and Summers (1963) and the least significant difference (L.S.D.) between treatment.

RESULTS AND DISCUSSION

1. Preference and consumption of baiting materials by house sparrow and palm dove birds.

The relative acceptance of the tested groups of food materials for both house sparrow, *Passer domesticus niloticus* and palm dove, *Streptopelia senegalensis* birds are shown in Table (1). Results obtained revealed that among the seven food materials; barnyard seed bait proved to be the most preferable one for both house sparrow and palm dove birds. The order of preferability of the tested seven food material for both birds based on the overage daily consumption was as follows: barnyard seed bait (2.51 & 4.60/g) > rice (2.10 & 2.20/g) > sorghum (1.63 & 1.80/g) > wheat (1.03 &1.20/g)> crushed maize (0.68 & 0.62/g) and barley (0.51 & 0.39/g), while crushed sunflower bait ranked the least one.

Table (1): Bait preference and bait consumption by house sparrow, *Passer domesticus niloticus* and palm dove . *Streptopelia senegalensis* birds .

Baits	House sparrow bird		Palm dove bird	
	Average daily consumption bird /g	Ratio relative to sun flower	Average daily consumption bird /g	Ratio relative to sun flower
Barnyard seed	2.51	13.21 (a)	4.60	20.0 (a)
Rice	2.10	11.05 (b)	2.20	9.57 (b)
Sorghum	1.63	8.58 (c)	1.80	7.83 (c)
Wheat	1.03	5.42 (d)	1.20	5.22 (d)
Mize*	0.68	3.58 (e)	0.62	2.70 (e)
Barley	0.51	2.68 (f)	0.39	1.70 (f)
Sunflower*	0.19	1.00	0.23	1.00

F between treatment = 40.098 = 24.174

L.S.D for treatment at 0.05 = 0.085 = 0.042

*** Crushed material**

Table (2) : Attractiveness of different additives on barnyard seed to the house sparrow, *Passer domesticus niloticus* and palm dove. *Streptopelia senegalensis* birds .

Food additives	House sparrow bird		Palm dove bird	
	Average daily consumption bird /g	Ratio relative to barnyard seed	Average daily consumption bird /g	Ratio relative to barnyard seed
Barnyard seed+suger	2.10	4.76 (a)	4.28	3.82 (a)
Barnyard seed+fish meal	1.23	2.73 (b)	3.22	2.88 (b)
Barnyard seed+vanellia	1.14	2.53 (b)	2.02	1.80 (c)
Barnyard seed+salt	0.62	1.38 (c)	1.91	1.71 (d)
Barnyard seed+maze oil	0.45	1.00	1.12	1.00

F between treatment = 59.713 = 24.122

L.S.D. for treatment at 0.05 = 0.179 = 0.022

2. Role of additives on enhancing bait consumptions.

Results in Table (2) showed that both house sparrow and palm dove birds consumed the highest amount of barnyard seed bait when mixed with 5% suger followed by barnyard seed mixed with first meal, vanellia, salt and maize oil with the same levels. The average amount of food mixture eaten for house sparrow and palm dove birds were (2.10 & 4.28); (1.23 & 3.22); (1.14 & 2.02); (0.62 & 1.91) and (0.45 & 1.12)g/ bird, respectively. Obviously the sugar when added to barnyard seed enhanced the consumption markedly, while adding salt and maize oil had the lowest attractive effect for both birds.

These results agree with data obtained by Suliman *et al* (1984) who found that the addition of 5% suger enhanced the rat consumption from sorghum bait. Whole sorghum to which 2% by weight groundnut oil and 5% suger had been add was preferred over all other food. Also, Gaber (1991). who found that crushed wheat grains were most attractive food for rats and mice.

3. Toxic effect of formulated avicides.

The toxicity profile of Lannate compound and Nux-vomica ethanol extract alone or mixed with prepulsid as anti-vomiting for both house sparrow and palm dove birds is shown in Tables (3 and 4).

Data in Table (3) revealed that 10, 30, 50, 70 and 90% ; 10, 20, 40, 60 and 90% bird mortality were obtained when treated with 0.94, 1.12, 1.35, 1.62 and 1.94; 1.94, 2.33, 2.80, 3.36 and 4.83 mg/kg b.w. of Lannate alone, resulting in LD_{50}'s of 1.35 and 3.10 mg/kg b.w. for both house sparrow and palm dove, respectively.On the other hand, the toxic effect of Lannate was markedly enhanced when mixed with 0.1% prepulsid as anti-vomiting where 10, 20, 30, 60 and 80, 10, 30, 60, 70 and 80 % bird mortality was obtained when prepulsid was add to same tested Lannate dose (0.94, 1.12, 1.35, 1.62 and 1.94; 1.94, 2.33, 2.80, 3.36 and 4.83 mg/kg b.w. with LD_{50} ' ^{s} of 0.98 and 2.94 mg/kg b.w. for both sparrow and dove birds, respectively.

Data shown in Table (4) revealed that 0.0, 20.0, 40.0 and 80; 20.0, 40.0, 60.0 and 100.0%

Table(3):Toxic effect of Lannate alone and combind with 0.1%prepulsis as anti-vomiting against the house sparrow and palm dove birds .

House sparrow bird					Palm dove bird				
	Lannate alone		Lannate with anti-vomiting (prepulsid)			Lannate alone		Lannate with anti-vomiting (prepulsid)	
Dose Mg/kg b.w.	Mortality %	LD 50 mg/kg b.w.	Mortality %	LD 50 mg/kg b.w.	Dose Mg/kg b.w.	Mortality %	LD 50 mg/kg b.w.	Mortality %	LD 50 mg/kg b.w.
0.94	10	1.35	10	0.98	1.94	10	3.10	10	2.94
1.12	30		20		2.33	20		30	
1.35	50		30		2.80	40		60	
1.62	70		60		3.36	60		70	
1.94	90		80		4.83	90		80	

Table (4) : Toxic effect of Nux-vomica ethanol extract alone and nux-vomica ethanol extract mixed with 0.1% prepulsid as aanti-vomting against the house sparrow and palm dove birds .

House sparrow bird					Palm dove bird				
	Nux-vomica alone		Nux-vomica anti-vomiting (prepulsid)			Nux-vomica alone		Nux-vomica anti-vomiting (prepulsid)	
Dose Mg/kg b.w.	Mortaliy %	LD 50 mg/kg b.w.	Mortality %	LD 50 mg/kg b.w.	Dose Mg/kg b.w.	Mortaliy %	LD 50 mg/kg b.w.	Mortaliy %	LD 50 mg/kg b.w.
0.83	-	1.58	20	1.1	2.71	-	4.05	20	3.31
1.00	20		40		3.25	20		40	
1.40	40		60		3.90	40		60	
1.70	80		100		4.70	80		100	

bird mortality for both house sparrow and palm dove birds were recorded with 0.83, 1.00, 1.40 and 1.70 mg/kg b.w. doses to the house sparrow, while for the palm dove reached 2.71, 3.25, 3.90 and 4.70 mg/kg b.w., respectively.

From the obtained data, it could be concluded that the house sparrow bird was more sensitive than palm dove, whereas LD_{50} value for house sparrow and palm dove were (1.58 & 1.10) and (4.05 & 8.31) mg/kg b.w. for both Nux-vomica ethanol extract alone and mixed with 0.1% prepulsid as anti-vomiting, respectively.

Finally, it could be concluded that the effect of additives of prepulsid as anti-vomiting markedly potentiated the toxicity of methomyl compound and Nux-vomica plant extract to house sparrow and palm dove bird.

These results are in agreement with the finding, of Salam and Ahmed (1997) who showed that methanol extract of chinaberry, *Melia azedarach I* caused very high effect when added to the diet. Also, agree with Mangan and Moreno (2001)who reported that adjuvents appear to be active inside the pest rather than increasing the solubility of the day in the bait medium. Also, they proposed that the addition of 1% valavol of the best adjuvant. Tween 60 to the proicinaceous bait with 0.5% phloxine B will enhance toxicity as well as improve mixing and other characteristics of the bait.

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دراسة الغذاء المفضل وتأثير بعض الإضافات على زيادة فعالية بعض الطعوم السامة ضد عصفور النيل الدوري واليمام

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أجريت هذه الدراسة بهدف تحسين خواص بعض الطعوم وزيادة فاعليتها ضد عصفرالنيل ألدورى واليمام كطعوم سامة بإستخدام بعض الإضافات . حيث أظهرت النتائج أن بذور الدنيبة كانت أفضل غذاء لكل من عصفور النيل الدورى واليمام يليه الأرز والذرة الرفيعة والقمح وجريش الذرة ثم الشعير بينما كان طعم جريش عباد الشمس أقلها أفضلية . وبالنسبة للمواد الجاذبة المضافة فلقد كان لإضافة السكر دور كبير فى زيادة إستهلاك عصفور النيل الدوري واليمام للطعم السام بالمقارنة بالمواد الجاذبة الأخرى مثل مسحوق السمك والفانيليا والملح وزيت الذرة .

وعند تقديم هذه الطعوم المخلوطة بالمواد الجاذبة مضافا إليها المبيد الحشرى اللانيت والمستخلص الأثيانولى لنبات الجوز المقيء منفردا ثم المبيد والمستخلص مضافا إليهم مادة مانعة للتقيء للتغلب على ظاهرة التقيء لدى الطيور المصاحبة لها عند تناولها الطعوم السامة وحيث أظهرت النتائج أن إضافة المادة المانعة للتقيء أعطت كفاءة عالية بالمقارنة بالمبيد والمستخلص منفرداً حيث كانت الجرعة السامة التطبيقية للمبيد والمستخلص مخلوطاً مع المادة المانعة للتقيء هى ٠,٩٨ ، ٢,٩٤ ، ١,١٠ ، ٣,٣١ ملليجرام/كجم من وزن الجسم على التوالى لكل من عصفور النيل الدورى واليمام بينما كانت الجرعة السامة التطبيقية للمبيد والمستخلص منفرداً ١,٣٥ ، ٣,١٠ ، ١,٥٣ ، ٤,٠٥ ملليجرام/كجم من وزن الجسم على التوالي.