J. of Plant Protection and Pathology, Vol. 1 (4): 189 - 193, 2010

FOOD PREFERENCE AND FOOD CONSUMPTION OF SOME LAND SNAILS UNDER LABORATORY CONDITIONS.

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ABSTRACT

Egyptian clover leaves were most consumed for *Monacha obstracta* (27g./ 10 individuals/ 5 days) followed by peganums, hibiscus and date palm11,11 and 10g./ 10 individuals/ 5 days respectively, while did not approach the sansevieria leaves. Peganums leaves were most consumed for both *Eopania vermiculata* and *Thepa pisana* 63 and 54 g./ 10 individuals/ 5 days respectively. Sansevieria and date palm leaves were less than the two previous ornamental plants.

M. obstracta preferred Egyptian clover leaves followed by plant leaves, while *T. pisana* and *E. vermiculata* preferred the peganums and hisbicus . wheat bran and crushed bread were most attractive for all species wheat bran snails than other foods.
Keywords: land snails – food preference- food consumption

INTRODUCTION

Recently, the land snails becoming one of the serious molluscs pests in Egypt infesting numerous agronomic, horticultural and ornamental plants. These animals cause serious reduction in yield production of attacked crops, and fruits, as well as destroying plant seedling El-Okda (1980). The injury inflicted by land snail species varied greatly due to the habitats and locations, the nature and extent of food supply and weather conditions, Asran (1999), Abd-Al- Aal (2001) and El-Deeb *et al*., (1996). More over, in heavy infestation, snails fed on leaves, new branches and small fruit. Food preferences of some snails was studied by Mohamed-Ghada (2004), Abdl Al-Maabaad (2008) and Khalifa- Rasha (2008).

The present work aimd to study the preference of plant leaves, baits and daily consumption of the three land snails *M. obstracta, T. pisana* and *E. vermiculata*, in order to use the valuable bait for control .

MATERIALS AND METHODS

Snails under this study were collected from untreated nursery plants and farms in EL-Gharbia and Alexandria Governorates and transported into white light bags to laboratory, Awad (1994) and Badawey (2002). Species of land snails were identified on the basis of external features of shells according to the key given by El-Okda (1979) and (1980). Snails individuals caged in plastic boxes (24× 20× 12 cm) and supplied with lettuce leaves for 15 days before testing. Every treatments consists of ten healthy individuals which started 24 hours before starting the experiments Eshra, (2004) and Shetaia (2005).

Two groups of tested food included ten materials as follows:-

The first group consisted of leaves from the following plants: peganums (*Aptenia cordifolia*), hibiscus (*Hibiscus mutablis*), sansevieria (*Sansevieria bahmii*), date palm (off- shoots) *phoenix dactylifera* L. and leaves of Egyptian clover (*Trifolium alexandrinum*).

The second group included bran and crushed of bread, date, rice and sorghum. Two grams from either leaves or dry food material of the two groups were offered in small glass dish to ten caged individuals of *M. obstracta, T. pisana* and *E. vermiculata* for five successive days. Ten replicates were carried out for each treatment. The consumed amount of each food material for snail were recorded daily, and dishes were replenished. The placement of each dish was daily observed to avoid preference for certain location.

RESULTS AND DISCUSSION

Results in Tables (1) indicated average daily consumption of two ornamental plants (Peganums and Hibiscus), sansevieria, date palm and Egyptian clover for *M. obstracta*, *T. pisana* and *E. vermiculata* under laboratory conditions.

Table (1): Susceptibility of three land snails to ornamental plants (Peganums and Hibiscus), sansevieria, date palm and Egyptian clover under laboratory conditions (22±2ċ and R.H.75±5).

Snail species	Plant material	Daily consumptions/g./10 individuals					Total	Mean ± S.E.
		1st day	2nd day	3rd day	4th day	5th day		
M. obstracta	Peganums	0	0	9	11	11	31	6.2±2.56
	Hibiscus	0	0	8	9	11	28	5.6±2.33
	Sansevieria	0	0	0	0	0	0	0
	Date palm	4	5	5	8	10	32	6.4±1.12
	Clover	20	21	21	24	27	113	22.6±1.29
Theba pisana.	Peganums	29	33	43	44	45	194	38.8±3.26
	Hibiscus	26	37	35	29	31	158	31.6±1.98
	Sansevieria	14	16	20	22	26	98	19.6±2.13
	Date palm	12	12	14	14	15	67	13.4±0.6
	Clover	9	5	8	8	10	40	8±0.84
Eobania vermiculata	Peganums	38	47	55	57	63	260	52±4.33
	Hibiscus	33	33	25	40	41	172	34.4±2.89
	Sansevieria	19	22	21	24	25	111	22.2±1.06
	Date palm	11	11	15	16	20	73	14.6±1.69
	Clover	6	4	6	10	11	37	7.4±1.32

Egyptian clover leaves were most consumed for *M. obstracta* (27g./ 10 individuals/ 5days) followed by peganums, hibiscus and date palm 11, 11 and 10g./ 10 individuals/ 5days respectively, while did not approach the sansevieria leaves. Peganums leaves were most consumed for both *E.*

vermiculata and *T. pisana* 63 and 45g. / 10 individuals/ 5days respectively. Sansevieria and date palm leaves were less than the two previous ornamental plants, while Egyptian clover leaves were the lowest preferable one for the last two land snails.

The obtained results indicated that *M. obstracta* preferred Egyptian clover leaves followed by plant leaves, while, *T. pisana* and *E. vermiculata* preferred the peganums and hisbicus plants.

These data agree with some previous studies, Beshara *et al*., (1968) display the *E. vermiculata* and *T. pisana* show a decided preference for certain hosts, Eshra(1997) recorded that *M. obstracta* preferred Egyptian clover, and Khalifa- Rasha (2008) revealed that the grape leave were most preferable food for both the snails *E. vermiculata* and *Limex maximus* slugs.
Data in Tables (2) showed that, the wheat bran was the most preferable dry food material for *E. vermiculata*, *T. pisana* and *M. obstracta* 100, 85 and 33g./ 10 individuals/ 5days respectively followed by crushed bread 66, 33 and 19g./ 10 individuals/ 5days respectively). This agree with the of Mahmoud-Maha (1994) who proved that wheat bran was the most preferable for *E. vermiculata* and *L. maximus* .

Table (2): Susceptibility of three land snails to wheat bran and crushed (bread, date, rice and sorghum) under laboratory conditions (22±2ċ and R.H.75±5).

Snail species	Bait material	Daily consumptions/g. /10individules					Total	Mean ± S.E.
		1st day	2nd day	3rd day	4th day	5th day		
M. obstracta	Wheat bran	18	20	23	30	33	124	24.8±2.88
	Crushed bread	12	12	14	18	19	75	15±1.4
	Crushed date	3	4	3	4	6	20	4±0.54
	Crushed rice	2	2	2	3	4	13	2.6±0.4
	Crushed sorghum	0	0	0	0	2	2	0.4±0.04
T. pisana	Wheat bran	60	66	75	81	85	367	73.4±4.63
	Crushed bread	23	27	31	32	33	146	29.2±1.85
	Crushed date	6	6	7	6	8	33	6.6±0.4
	Crushed rice	4	3	5	4	5	21	4.2±0.37
	Crushed sorghum	0	0	0	2	2	4	0.8±0.48
E. vermiculata	Wheat bran	52	71	90	95	100	406	81.6±8.63
	Crushed bread	33	44	52	63	66	258	51.6±6.08
	Crushed date	11	13	12	12	14	62	12.4±0.51
	Crushed rice	2	4	5	3	4	18	3.6±0.51
	Crushed sorghum	0	0	3	0	2	3	0.6±0.6

Data in Table (2) showed that, the wheat bran was the most preferable, for *M. obstracta* followed by crushed bread, crushed date, crushed rice and crushed sorghum respectively (Average daily consumption were 24.8±2.88, 15±1.4, 4±0.54, 2.6±0.4 and 0.4±0.4g./ 10 individuals/ 5days respectively). and crushed bread were the most attractive materials for snails than there other foods.

Therefore from the previous results it could formulate an acceptable bait, and more bile table bait, leading to high control success of the land snails.

Acknowledgment

Special thanks are extended to Dr., Ahmed Aatef Reyadh Al-Gendy Assessment professor of Agric. Zoology , Agric., zoology and Nematology Dept., Faculty of Agric., Al-Azhr University, for his help and solve all laboratory problem of this work.

REFERENCES

Abd Al-Maabaad,F.A.(2008): Studies on plant parasitic snails in some desert regions in Northern coastal zone. M.sc. Thesis in Agric. Zoology and Nematology, Al-Azhr University. 155pp.

Abd-El-Aal, E.M.(2001):Studies on certain land snails at Sharkia Governorate. M.Sc.Thesis, fac. Agric. Zagazig University 160 pp.

Asran, F.D. (1999): Studies on harmful terrestrial snails and there management on Egyptian agricultural lands. M.sc. Thesis. Instit. Enveron. Stad,Res. , Ain Shams University., Cairo. 172 pp.

Awad, M.H. (1994): Studies on agricultural mollusks at Demmitta Governorate. M.Sc. Theses, Fac. Of Agric., Mansoura University. 153.pp.

Badawey, M. A. (2002): Studies on glassy clover snail and possibility of its Calcium and protein components to be used for poultry nutrition. M.sc. Thesis in Agric. Zoology and Nematology, Al-Azhr University. 157 pp.

Bishara, S.I.; Hassan M.S. and Kalling, A.S. (1968): Studies on some land snails injurious to agriculture in U.A.R. Rev. zool. Bot. Afy. 77(3-4):239-262.

El-Deeb, H.I., Ghamry, E. M., El-hawashy, N. and Essa, N. (1996): Relative abundance of some land snails in certain Governorates of Egypt. J. Agric. Sci. Mansoura University 21 (8): 2977-2983.

Eshra, H.H.(1997):Ecological and biological studies on land snails associated some important economic crops. M.sc. Thesis in Agric. Zoology and Nematology, Al-Azhr University. 153 pp.

Eshra, H.H.(2004): Studies on terrestrial mollusks at some Governorates of west delta with species references to its integrated management. Ph. D. Thesis in Agric. Zoology and Nematology, Al-Azhr University.232 pp.

El-Okda.M.M.K. (1979): Land snails of economics importance crops at Alexandria region with some notes on the morphological feature, classification, economic damage and population on the ornamental plants. Agric.Res. Rev. 57 (1): 125-131.

El-Okda.M.M.K. (1980): Land snails of economics importance on vegetables crops at Alexandria and nieghbouring. Agric. Res. Rev. 58: 79-85.

Khalifa-Rasha, F. (2008): Studies on some common land snails and slugs on certain horticulturual in Menoufia Governorate. M.sc. Thesis in Eco-Ento- Zool. Menoufia University. 125.pp.

Mohamed-Ghada, R.Y.(2004): Ecological and biological studies on some species of snails. M.Sc. Thesis in Agric. Mosh., Zagazig Unive., 204.pp.

Mahmoud-Maha, F. M. (1994): Ecological, biological and toxicological studies on land snails. M.sc. Thesis in Agric. Zoology, Cairo University. 126 pp.

Shetaia, Z.S.(2005): Integrated control of land snails pests in the fields of Sharkia Governorate Ph.D. Thesis in Agric. Zoology and Nematology, Al-Azhr University. 147pp.

التفضـيل الغـذائي و الإسـتهلاك اليـومي لـبعض القواقـع الأرضـية تحـت الظـروف المعملية

طـــارق محمـــد مصـــطفى الأقـــرع ، محمـــد عبـــد العظـــيم محمـــد الدناصـــورى و محمد عبدالعال محمد محافظ

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الهدف من هذه الدراسة معرفة التفضيل الغذائي و الإستهلاك اليومي لبعض أنواع القواقع الأرضية *M. obstracta, Theba pisana* و *E. vermiculata* تحت الظروف المعملية .

تم جمع انواع القواقع المختبرة من مزارع ومشاتل محافظتى الغربية و الأسكندرية من على أوراق نباتي الزينة (هيبسكس و بيجونيا والسنسفير) بالإضافة إلى نخيل التمور والبرسيم المصري، وتم تغذيتها على نبات الخس لمدة ١٥ يوم لأقلمتها ثم تصويمها لمدة ٢٤ ساعة قبل بدء التجارب.

أوضحت النتائج ان اوراق البرسيم المصرى هي الغذاء المفضل لقوقع *Theba pisana* حيث سجل معدل استهلاك ٢٧ جرام لكل ١٠ أفراد لمدة ٥ أيام متتالية تلاها كلاً من أوراق نبات البيجونيا ، الهبسكس ، نخيل التمور بمعدل استهلاك ١١ ، ١١، ١٠ جرام لكل ١٠ أفراد على التوالي لمدة ٥ أيام متتالية ؛ بينما لم يقترب من أوراق نبات السنسفير.

أوضحت النتائج أن أوراق البيجونيا كانت هي المفضلة لكلٍ من النوعان *Theba pisan* و*E. vermiculata* بمعدل ٦٣ ، ٥٤ جرام لكل ١٠ أفراد على التوالي لمدة ٥ أيام متتالية في حين كانت أوراق السنسفير ونخيل البلح الأقل إستهلاكاً عن مثيلتها من أوراق النباتات الطبية، وكانت أوراق البرسيم المصري هي الأقل إستهلاكاً لكلا القوقعين.

أظهرت النتائج أن قوقع *M. obstracta,* ويُفضل أوراق البرسيم المصري عن باقي أوراق النباتات المُختبرَة؛ بينما كانت أوراق البيجونيا والهبسكس أكثر تفضيلاً لكلٍ من النوعان *Theba pisana* و*E. vermiculata* و كذلك كانت نخالة القمح وجريش الخبز الأكثر تفضيلاً للقواقع الثلاثة تحت الاختبارعن باقي الأغذية الأُخرى المُختبرَة.

قام بتحكيم البحث

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