

INCIDENCE OF LAND SNAILS INHABITING DIFFERENT VEGETATION AT SOME GOVERNORATES IN NORTH-EAST OF DELTA EGYPT

Mohammed, Gh. R.

Plant Protection Department, Faculty of Agriculture, Benha University, Egypt.



ABSTRACT

Field trials were carried out at some Governorates in north east of delta, i.e. Qalubia, Sharkia, Gharbia, Munyfia, Dakahlia, Dumyat and Ismaelia to survey terrestrial snails species on different vegetation, vegetable, fruit and ornamental plants, i.e. egyptian clover, wheat, rice, maize; cabbage, lettuce, tomato, potatoes, navel orange, grapes, date palm, mango and swallow during two successive years 2013-2014. Results revealed that ten land snails species belonging to five families, *Helicidae*, [*Eobania vermiculata* (Müller), *Theba pisana* (Müller)]; *Hygrommiidae*, [*Helicella vestalis* (pfeiffer), *Cochlicella acuta* (Müller), *Monacha cartusiana* (Müller), *Monacha obstructa* (ferussac)]; *Succineidae*, [*Succinea putris* (Linnaeus), *succinea oblonga* (Draparnaud)]; *Achatinidae* [*Rumina decollata* (Linnaeus) and *Zonitidae* [*Oxychilus alliarius* (Miller)] were recorded.

INTRODUCTION

The phylum Mollusca is probably the third most important animal group after the arthropods and vertebrates. Several species of land snails (Mollusca, Gastropoda) have extended their geographical distribution and become considerably more abundant as the result of agricultural and horticultural activities in addition to their role as intermediate hosts for many of the parasitic diseases which infected human, animals and birds. (Godan, 1983).

The great damage of land snails to many agricultural and horticultural crops in Egypt has become increasing apparent over the past 30 or 40 years and in recent years terrestrial gastropods have been become one of the most important pests at different Governorates El-Okda, 1984 and Ismail, 1997, So that the present work aims to throw light on the Occurrence and distribution of some land snails species at some Governorates of north east delta region in Egypt on some different plants.

MATERIALS AND METHODS

Snails were collected from Egyptian clover (*Trifolium alexandrinum*), wheat (*Triticum aestivum*), rice (*Oryza sativa*), maize (*zea mays*), cabbage (*Barssica oleracea*), lettuce (*Lactuca stavia*), tomato (*Lycopersicon esculentum*), potatoes (*Solanum tuberosum*), swallow (*Strelizia regiae*), navel orange (*Citrus sinensis*), grapes (*Vitis vinifera*), date palm (*Phoenix dactylifera*) and mango (*Mangifera indica*). At different Governorates in north east of delta namely (Qalubia, Sharkia, Gharbia, Munyfia, Dakahlia, Dumyat, Ismallia) during two successive years 2013-2014. One feddan from each

plant was randomly chosen. Ten samples of 0.25m² were chosen randomly from each locality (Baker, 1989 and Staikou and Lazaridou 1990).

All snails found on plants or soil surface or herbs beside plants were collected during the early morning before sun-rise and transferred in muslin cloth bag to the laboratory for identification to their species according to the keys given by (Bishara, *et al.*, 1968) (Godan, 1983) and (Yildirim and Gumus, 2004) after good washing the samples by the water to appears snails shells characters.

RESULTS AND DISCUSSIONS

An extensive survey was carried out on land snails species infesting different plants at seven north east delta Governorates (Qalubia, Sharkia, Gharbia, Munyfia, Dakahlia, Dumyat & Ismelia) in Egypt.

Data presented in Table (1) indicated that ten species of terrestrial snails belonging to five families, i.e. *Helicidae*, *Hygromiidae*, *Succineidae*, *Achatinidae* and *Zonitidae* were recorded, these species were *Eobania vermiculata* (Müller), *Theba pisana* (Müller); *Helicella vestalis* (Pfeiffer), *Cochlicella acuta* (Müller), *Monacha cartusiana* (Müller), *Monacha obstructa* (ferussac); *Succinea putris* (Linnaeus), *Succinea oblonga* (Draparnoud); *Rumina decollata* (Linnaeus); *Oxychilus alliarius* (Miller) respectively. On the other hand, data illustrated that *E. vermiculata* and *M. cartusiana* were the most dominant, they were appeared at all seven studied Governorates, but *S. oblonga* and *O. alliarius* were appeared in Munyfia only. While *H. vestalis* was recorded at most of Governorates except Gharbia; and *T. pisana*, *C. acuta* and *S. putris* were a recorded at five Governorates, in addition each *M. obstructa* and *R. decollata* were collected at two Governorates (Qalubia, Gharbia) and (Dakahlia, Ismaelia) respectively.

These results is in agreement with Abd-Elhak. A. I. Arafa (2006) who recorded that *E. vermiculata* and *M. cartusiana* were found at some tested Governorates; Qalubia, Gharbia and Dakahlia.

From the previous results it is cleared that Qalubia and Munyfia Governorates were the most infesting with land snails, where different seven species of land snails were appeared in each Governorate, same five species were appeared at two Governorates *E. vermiculata*, *H. vestalis*, *C. acuta*, *M. cartusiana* and *S. putris*; while, *T. pisana* and *M. obstructa* were appeared in Qalubia, but *S. oblonga*, and *O. alliarius* were appeared in Munyfia.

Shoieb (2008) showed also that six species of land snails were found at Ismaelia Governorate, while one specie only was appeared at Port Said, and two species at North of Sinai.

The present results in table (1) showed that, the glassy clover snail *M. cartusiana* was the most dominant on many tested plants at different locations, i.e. navel orange, egyptian clover, cabbage, wheat, lettuce tomato, potatoes and maize. these results is in a agreement with Mortada, (2002) and , Mohammed , (2013) While each *S. oblonga* and *O. alliaria* were appeared on one plant specie only, these plants were rice and navel orange respectively. Also data showed that navel orange was the most infesting plant

with land snails, where sex species were appeared on this plant in some different tested governorates, these species were *E. vermiculata*, *T. pisana*, *H. vestalis*, *M. Cartusiana*, *M. obstructa* and *O. allarius*; where each of potatoes and maize was infested with *M. cartusiana* only. On the other hand each of cabbag, lettuce, tomato, rice, swallow and date palm was infested with different two species of land snails and each of graps and mango was infested with three species of land snails.

Key to Egyptian species of terrestrial snails collected from different Governorates in North – East of Delta

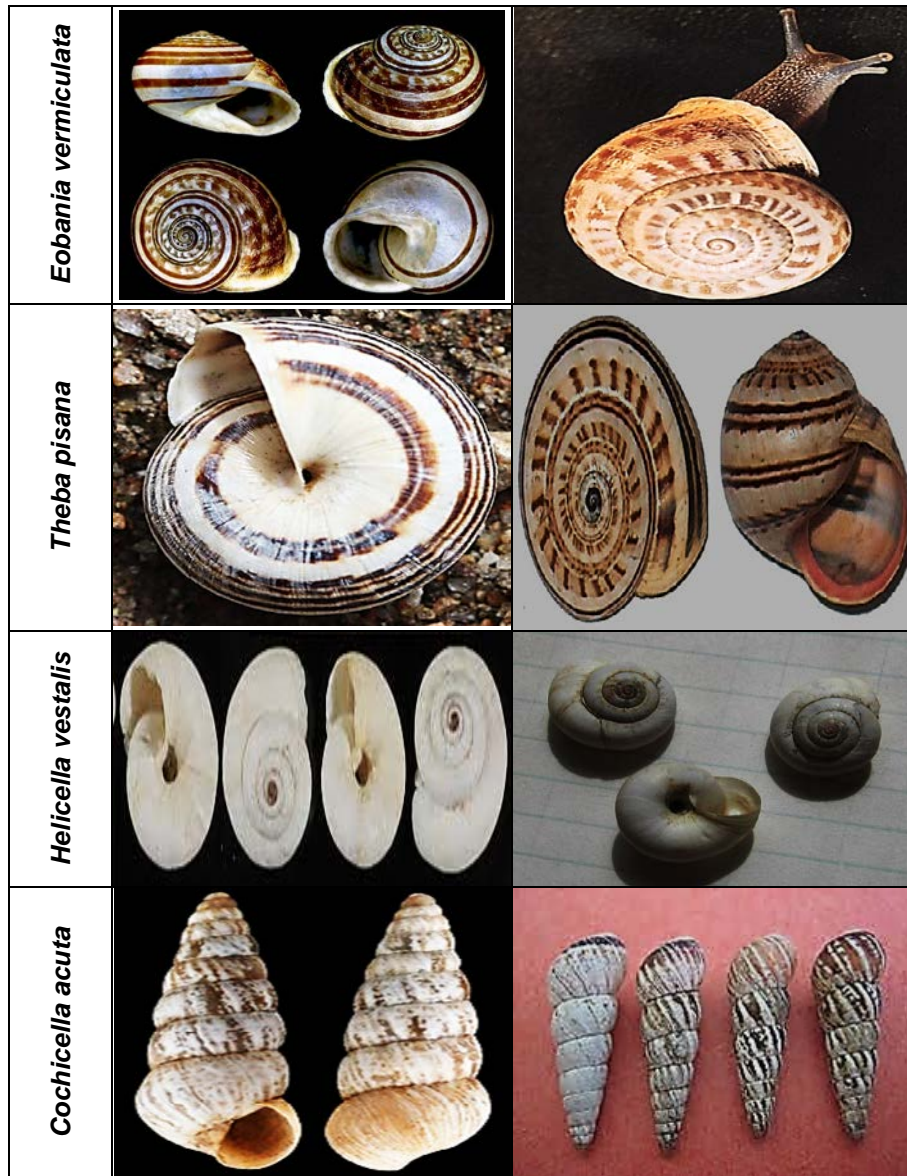
- 1- Shell heliciform, flattend, elevated or depressed, slowly or rapidly increasing ; whorls convex , hard or thin; sutures shallow, nearly deep; no ribs, striae; growth lines plain or not ; shell with or without umbilicus; aperture rounded crescentic without keel , oblique or not with dextral turning ; peristome sharp or thickened 2
- 1 – shell conical – turreted or cylindrix, slowly increasing ; whorls convex, hard, not translucent; stutures shallow, not deep; no ribs, striae, hairs; growth lines clear; shell without umbilicus; aperture oval , small, without keel, bending or not, with right turning; peristome thickened.....7
- 1- shell conical – ovate, very rapidly enlarging; whorls very convex, swollen, thin, finely, glassy, shin, translucent; stutures plain, deep or not; no ribs, striae , hairs , bands; growth lines very fine and not prominent ; shell is imperforate; body whorl very larg, swollen; aperature larg , oval , broad , not oblique, without keel, with dextral direction; peristome sharp; sanils are amphibian..... 8
- 2- Spire elevated ; shell wall strong, not transparent; growth lines clear; shell with or without bands; umbilicus found or clothed 3
- 2* - Spire depressed; shell wall thin , glassy, transparent; growth lines very fine; shell without bands; umbilicus found , partly obscured by reflected columellar lip; peristome sharp, not oblique 5
- 3- Shell larg with 5 -5.5 whorls, 25- 28 mm width, 17-19 mm height , rapidly increasing , pale brown coloured; some broad brown to black , completed or cutting bands a round spire ; without umbilicus; peristome thickened, oblique.....
- Eobania vermiculata* (Müller, 1774)
- 3* - Shell middle with slowly increasing ; apex brown to dark coloured; umbilicus found , deep, obscured by reflected columellar lip; peristome sharp, not oblique.....4
- 4- Shell with 5-5.5 whorls, 10-12 mm width, 6-8 mm height, minute umbilicus; shell colour very variable (white or creamy white or pale brown or yellowish) ; some faint brown to black , completed or cutting instrument dotted bands a rund spire.....
- Theba pisana* (Müller, 1774)






- 4* - Shell with 5-6 whorls, 14-16 mm bread , 8-10 mm height, broad umbilicus, limy surface; shell colour creamy or yellowish, no bands.....
Helicella vestalis (Pfeiffer, 1842)
- 5- shell slightly translucent, shin, with narrow umbilicus; one broad creamy-white band around aperture6
- 5* - shell very translucent , very shin, smooth, with 4.5-5 whorls, 6-7 mm width, 3-4 mm height ; shell colour is silver or yellowish; umbilicus broad , pit – like, deep
Oxychilus alliarius (Miller, 1822).
- 6- shell with 5.5- 6.5 whorls, 10-12 mm width , 6.5- 8.5 mm height, pale grey or yellowish – white or creamy coloured ; young animals slightly hairy
Monacha cartusiana (Müller, 1774)
- 6* - shell with 3.5-5 whorls, 7-8 mm bread , 5-5.5 height , milky- with coloured
Monacha obstructa (Ferussac, 1842).
- 7- Shell conical – turreted with 7-9 limy whorls, 3-5 mm bread , 9-12 mm neight , not ablunt apex; colour of shell pale brown or grey or creamy with or without brown to black broad bands , peristome not bending.....
Cochicella acuta (Müller, 1774)
- 7* - shell conical – cylindrix with 5-8 soft whorls , 0.8- 1.4 mm bread, 3-5 mm height; apex flat , may separating from rest spire ; shell colour chalk-white or pale brown or pale yellow without bands; peristome nearly oblique.....
Rumina decollata (Linnaeus, 1758)
- 8- Spire rduced ; shell width 3-4 whorls, 8-11 mm with ,16-22 mm height , small a pex , pale yellow or grey to a mber coloured ; stutures not deep.....
Succinea putris (Linnaens, 1758)
- 8* - Spire raised ; shell with 3- 3.5 whorls , 4-5 mm width, 6-8 mm height , grey to pale amber coloured; stutures deep
Succinea oblonga (Draparnoud, 1801)

Table (1): Survey and distribution of land snails on different plant crops at some North East of delta governorates in Egypt.

Species	Host plant	Localities	
		Governorate	District
1- Family: <i>Helicidae</i> <i>Eobania vermiculata</i>	navel orange, egyptian clover, swallow, wheat	Qalubia, Sharkia, Gharbia, Munyfia, Dakahlis, Dumyat, Ismaelia	Toukh, Zgazig, El-Santa, Berkat El-Sabaa, Meit Ghamr, Kafr-Saad, Abou Soltan
<i>Theba pisana</i>	navel orange, wheat, grapes, mango	Qalubia, Sharkia, Gharbia, Dumyat, Ismaelia,	Toukh, Zagazig, El-Santa, Kafr-Saad, Abou-Soltan
2- family: <i>Hygromiidae</i> <i>Helicella vestalis</i>	navel orange, wheat, grapes	Qalubia, Sharkia, Munyfia, Dakahlia, Dumyat, Ismaelia	Toukh, Zagazig, Berkat El-Sabaa, Meit Ghamr, Kafr-Saad, Abou-Soltan
<i>Cochicella acuta</i>	grapes, mango, date palm	Qalubia, Gharbia, Munyfia, Dumyat, Ismaelia	Toukh, El-Santa, Berkat El-Sabaa, Kafr-Saad, Abou-Soltan
<i>Monacha cartusiana</i>	navel orange, egyptian clover, wheat, maize, potatoes, tomato, lettuce, cabbage.	Qalubia, Sharkia, Gharbia, Munyfia, Dakahlia, Dumyat, Ismaelia	Toukh, Zagazig, El-Santa, Berkat El-Sabaa, Meit Ghamr, Kafr-Saad, Abou-Soltan
<i>Monacha obstructa</i>	navel orange, egyptian clover, tomato, cabbage, swalloa	Qalubia, Gharbia	Toukh, El-Santa
3- Family: <i>Succineidae</i> <i>Succinea putris</i>	egyptian clover, rice, lettuce	Qalubia, Sharkia, Munyfia, Dakahlia, Dumyat	Toukh, Zagazig, Berkat El-Sabaa, Meit Ghamr, Kafr Saad
<i>Succinea oblonga</i>	rice	Munyfia	Berkat El-Sabaa
4- Family : <i>Achatinidae</i> <i>Rumina decollata</i>	mango, date palm	Dakahlia, Ismaelia	Meit Ghamr, Abou Soltan
5 – Family: <i>Zonitidae</i> <i>Oxychillus alliaria</i>	navel orange	Munyfia	Berkat El-Sabaa

Figures of collected species of terrestrial snails in North – East of Delta



<i>Monacha cartusiana</i>		
<i>Monacha obstructa</i>		
<i>Succinea putris</i>		
<i>Succinea oblonga</i>		



REFERENCES

- Abd El-Hak, A. I. Arafa (2006). Studies on terrestrial mollusks in some Delta governorates. Ph.D. Thesis. Fac. Agric., Al-Azhar Uni. 167pp.
- Baker, G. H. (1989). Damage, population dynamics, movement and control of pest helicid snails in Southern Australia. BCPC Mono, No. 41p. 175-185.
- Bishara, S.I.; Hassan, M.S. and Kalling , A.S. (1968). Studies on some land snails injurious to a griculture in U.A.R. Rev. Zool.Bot Afr., LXXVII (3-4) : 329-335.
- El-Okda, M. K. (1984). Land mollusca infestation and chemical control in EL-Ismaelia Governorate. Agric. Res. Rev., 62(1):87-92.
- Godan, D. (1983). Pest slugs and snails-Biology and control (transated by S. Gruber), springer verlag, Berlin, 445pp.
- Ismail, S. A. (1997). Ecology, biology and control of certain terrestrial snails infesting some vegetables and field crops in Sharkia Governorate. Ph.D. Thesis, Fac. Agric. Zagazig Univ., 130pp.
- Mohammed, H. E. E. (2013). Studies on some terrestrial mollusks injurious infested to vegetables and field crops in east Delta locality (Sharkia and Ismaelia). Ph. D. Thesis, Fac. Agric. Moshtohor, Benha Univ., 168pp.
- Mortada, M. M. (2002). Ecological and biological studies on certain terrestrial gastropods in Dakahlia governorate. Ph.D. Thesis, Fac. Agric., Zagazig. Univ., 183pp.

- Shoieb-Maha, A. (2008). Occurrence distribution of terrestrial mollusks in Seuz Canal Governorates and North of Sinai, Egypt. *J. Agric. Res.*, 86(3):989-994.
- Staikou, A. and Lazaridou, D. M. (1990). Aspects of the life cycle, population dynamics growth and secondary production of the snail *Monacha cartusiana* (Müller) (Gastropoda: Pulmonata) in Greece *Malacologia*, 31(2):353-362.
- Yildirim, M.Z. and Gumus, U.K. (2004): Edible snails (Terrestrial) of Turkey. *Turk. J. Zool.*, 28: 239-252.

**حصر لبعض أنواع القواقع الأرضية في بعض محافظات شمال شرق الدلتا – مصر
غادة رفعت يوسف محمد
حيوان زراعي- قسم وقاية النبات- كلية الزراعة – جامعة بنها – مصر**

تمت هذه الدراسة لحصر بعض أنواع القواقع الأرضية والتي تنتشر على بعض أنواع النباتات مثل محاصيل الحقل والخضر والفاكهة بجانب نباتات الزينة ، وقد تم إختيار مجموعة من النباتات مثل البرسيم المصرى ، القمح ، الأرز ، الذرة ، الكرنب ، الخس ، الطماطم ، البطاطس ، البرتقال ، العنب ، نخيل البلح ، الماتجو ، عصفور الجنة وذلك في بعض محافظات شمال شرق الدلتا مثل (القليوبية ، الشرقية ، الغربية ، المنوفية ، الدقهلية ، دمياط ، الإسماعيلية). خلال موسمين متتاليين 2013-2014 . وقد أسفرت النتائج عن إنتشار عشرة أنواع من القواقع الأرضية تنتمي إلي خمس عائلات.

Eobania vermiculata, *Theba pisana* (*Helicidae*); *Helicella vestalis*, *Cochicella acuta*, *Monacha cartusiana*, *Monacha obstructa* (*Hygromiidae*); *Succinea putris*, *Succinea oblonga*, (*Succineidae*); *Rumina Decollata* (*Achatinidae*); *Oxychilus alliarius* (*Zonitidae*).