

First record of two species from land snails, *Monachaobstracta* and *Eobaniavermiculata* in Sohag Governorate, Egypt

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Research Paper

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The present work was aimed to identify of terrestrial gastropods species in Sohag Governorate during 2014/2015 season. The Results showed that found first record of two species of land snails, *Monachaobstracta* (Montagu), and *Eobaniavermiculata* (Muller) in the study areas. These results to be used in the development of a future plan in effective strategy

for implementation of land snails management programs in cultivated and newly reclaimed agro ecosystems in Egypt.

Keywords: First record, terrestrial gastropods, land snails, *Monachaobstracta*, *Eobaniavermiculata*.

INTRODUCTION

Mollusca are the second largest phylum of the animal kingdom, forming a major part of the world fauna. The gastropoda is the only class of mollusca which have successfully invaded land. They are one of the most diverse groups of animals, both in shape and habit. Among gastropods, land snails (subclass: Pulmonata) are one of the most numerous with almost 35,000 described species of the world. The Phylum mollusca are probably the third most important animal group after the arthropods and vertebrates (South, 1992). Snails and slugs belong to the class gastropoda. Snails and slugs are mollusca, a group of invertebrate animals with soft unsegmented bodies. Slugs are often described as snails without a shell, while snail bodies are enclosed in calcareous shells (Barker, 2001; Ramzy, 2009). The terrestrial mollusca including snails and slugs are destructive agricultural pests causing economic damage to a wide variety of plants including horticulture, field

crops, and forestry. Damage caused by snails depends not only on their activity and population density, but also on their feeding habits, which differ from one species to another. Damage involving considerable financial loss is inflicted on cereal, maize, Egyptian clover, vegetables, potatoes, lettuce, carrots, cabbage as well as other agricultural and horticultural crops. The land snails feed on leaves, roots, tubers and ornamental plants (Bishara et al., 1968; El-Okda, 1981). Land snails cause also a heavy damage to seed of oil plants and leaves of ornamental plants, as well as, citrus, peach, palm and vegetable, that is, cabbage, carrot and bean. (El-Deeb et al., 1999; El-Okda, 1979, 1981; Ismail et al., 2003; Lokma, 2007; Shahawy et al., 2008). In addition, during movement snails cause an undesirable smell which prevents men and even animals from feeding on these contaminated plants (El-Okda, 1984; Kassab and Daoud, 1964; Sallam et al., 2009). Crops contaminated by snail

slime lose their marketability and hence their export potential in many countries (Baker and Hawke, 1990; Ittah and Zisman, 1992).

Terrestrial snails are mainly nocturnal, but following a rain may come out of hiding during the day. Temperature and moisture, rather than light, are the main factors to account for their nocturnal habits. Native snails may be found everywhere but prefer habitats offering shelter, adequate moisture, an abundant food supply and an available source of lime. Forested river valleys generally provide such habitats, and those with outcrops of limestone usually show the most abundant and varied mollusk faunas. Snails are very adaptable to times of drought and adverse climatic conditions. During these periods, the snails close the shell aperture with a mucus flap (epiphragm) which hardens and prevents desiccation. Snails can remain in this dormant state (aestivation) for years, breaking dormancy when climatic conditions are favorable again. The snail movement is rather slow and sluggish for a short distance depending upon temperature, food and natural of soil. They were active during optimum temperature, Humidity and moistened soil. They aestivate during the hot summer and hibernate during the cold winter (Kassab and Daoud, 1964). In Egypt, the land snails dispersing in northern Governorate, i.e. Alexandria, Kafr El-Shikh, Behera, and Dumietta (El-Okda, 1980; Hashem et al., 1993; Kassab and Daoud, 1964). At the present time these snails distribute in Ismaellia, Sharkia, Monofia, Gharbia, Minia, and Assiut governorates, Egypt (El-Deeb et al., 2004; El-Massry, 1997; Metwally et al., 2002; Shoieb, 2008; Ramzy, 2009). Some ecological observation such as: Survey, population dynamic and movement, daily activity and dispersal of land snails, have been studied by many researchers (Bishara et al., 1968; Daoud, 2004; El-Deeb et al., 1996, 2004; El-Okda 1984; Metwally et al., 2002; Ramzy, 2009). This study was conducted to identify terrestrial snail species in Sohag governorate.

MATERIALS AND METHODS

The present study was carried out for survey and identification for random land snail in 11 districts, that is (Tema, Tahta, Gehyena, El-Maragha, Saqultah, Sohag, Akhmim, El-Monshah, Gerga, El-Balyana, and Dar El-Salam) at Sohag Governorate, Egypt (Figure 1). Samples were collected from 5 different locations in each district during 2014/2015 season. Monthly samples were taken from winter and summer crops (areas were cultivated with the field crops such as wheat, Egyptian clover, and vegetables crops. The other, was cultivated with fruit and ornamental trees).

Snails collected from each sample were drowned

overnight in water to facilitate extension of the foot from the shell in any snails collected live. Snails were considered to have been alive at collection when the foot extended from the shell during drowning. Snails from each host plant in each surveyed areas were transferred in muslin cloth bags to the laboratory and identified according to the keys given by Smith and Kershaw (1979) and Godan (1983). After 24 h, the water was decanted and replaced with 70% ethanol for preservation. The snails with complete soft parts were identified. To study the morphology of the collected shell of the snail species, each shell was carefully cleaned and the visceral mass was removed according to the method of Frandsen, (1983). After that, the shell of each species was photographed (Photo 1). The following references, beside others mentioned in the text, were used in the identification of the collected snails: (Pilsbry, 1948); Horst, 1958; Cameron and Radfern 1976; Kerney and Cameron, 1979; Godan, 1983, Dindal, 1990; Neubert, 1998; Ibrahim et al., 1999; Barker, 2001; Genena, 2003; Yildirim, 2004; Ramzy, 2009).

RESULTS AND DISCUSSION

Mollusca are the second largest phylum of the animal kingdom, forming a major part of the world fauna. The gastropoda is the only class of mollusks which have successfully invaded land. They are one of the most diverse groups of animals, both in shape and habit. Among gastropods, land snails (subclass: Pulmonata) are one of the most numerous with almost 35,000 described species of the world.

Table 1 shows the results of two land snail species in Sohag governorate. They are as follows *Monachaobstracta*, *Eobaniavermiculata*.

The Terrestrial snail species were identified in three different sites at Sohag Governorate, during the study period 2014/2015 season. The first site (Tahta district, Shatora village) was recorded, *Monachaobstracta* and *Eobaniavermiculata*. While the second site (Sohag district, Experimental farm of the Faculty of Agriculture, Sohag University) was *Eobaniavermiculata*. The third site (Dar El-Salam, Arab Sabha village) was *Monachaobstracta*.

In the past years were land snails distributed in North Delta, where suitable climatic conditions (temperature-humidity-plant cover) and with climate change began to distribute in the governorates of southern Egypt recorded in (Giza, Beni Suef, Minia, Assiut) and in this study recorded in Sohag and may be that this pest moved to these governorates with transportation, passengers from places spread these new places and happened to her adaptation.

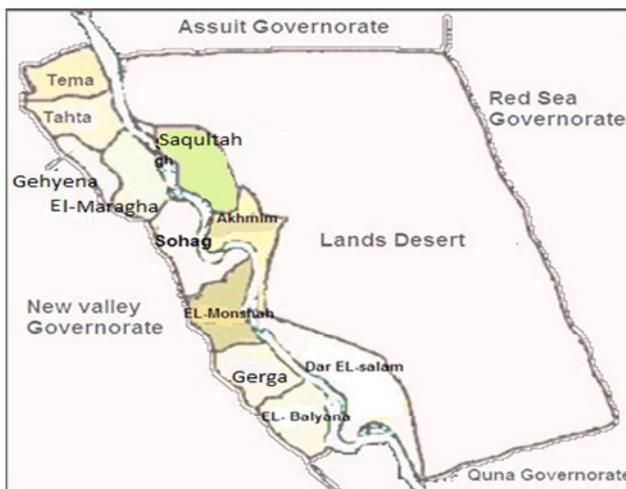


Figure 1. Map showing the locations of sampling Sohag Governorate districts.



Photo1. *Eobaniavermiculata* on Orchard trees Photo(2) *Monachaobstructa* on Egyptian clover (*Trifolium alexandrinum*).

Table 1. First record of distribution of land snails collected from different localities in Sohag Governorate, Egypt, during 2014/2015 season.

Crops	Sites (districts)	<i>Monachaobstructa</i> (Montagu, 1803)	<i>Eobaniavermiculata</i> (Muller, 1774)
Egyptian clover, Wheat, Orchards and ornamental trees.	Tema	-	-
	Tahta	+	+
	Gehyena	-	-
	Saqultah	-	-
	El-Maragha	-	-
Ornamental trees	Akhmim	-	-
	Sohag	-	+
Egyptian clover, Wheat, Orchards&ornamental trees	El-Monshah	-	-
	Gerga	-	-
	El-Balyana	-	-
Egyptian clover, Wheat	DarEl-Salam	+	-

+ = Found, - = Unfound

Table 2. History of land snails distribution in governorates, Egypt.

Type of land snail	Governorate	References
<i>Euparypha pisana</i> , <i>Thebasp.</i> , <i>Eobania vermiculata</i> , <i>Rumina decolata</i> , <i>Helicella</i> sp., and <i>Cochlicellaacuta</i>	Northern Delta Nile in Egypt	Bishara et al., (1968)
<i>Moncachasp.</i> and <i>Oxychilus</i> sp	Ismailia	El-Okda, (1984)
<i>Moncachacartusiana</i> and <i>Succiniaputris</i>	Sharkia	Abd El-All, (2001)
<i>M. cartusiana</i> , <i>E. vermiculata</i> and <i>Cochlicellaacuta</i>	Monofia and Gharbia	Metwally et al. (2002)
<i>E. vermiculata</i> , <i>Succinea putris</i> and <i>Cepaeanemoralis</i>	Kafr El- Sheikh	El-Deeb et al., (2003)
<i>M. cartusiana</i> , <i>E. vermiculata</i> , <i>C. nemoralis</i> , <i>C. acuta</i> , <i>Oxychilus aliavus</i> and <i>Helicellasp.</i>	Demietta	
<i>M. cartusiana</i> , <i>S. putris</i> , <i>E.vermiculata</i> , <i>C. acuta</i> and <i>C. nemoralis</i>	Dakahlia	
<i>Monchacartusiana</i> and <i>Succineaaputris</i>	Sharkia	Shetaia et al., (2009)
<i>Pupoidescoenopictus</i> , <i>Valloniapulchella</i> , <i>O. elegans</i> , <i>Vitreapygmaea</i> , <i>E. vermiculata</i> , <i>T.pisana</i> , <i>M. obstructa</i> , <i>Helicodiscussingleyanusinermis</i> , and <i>Cecilioides acicula</i> .	Assiut	Ramzy (2009)
<i>Monacha obstructa</i> , <i>Eobania vermiculata</i> and <i>Oxyloma elegans</i>	Assiut	Abo El-Naser, (2013)
<i>E. vermiculata</i> , <i>T. pisana</i> , <i>H.vestalis</i> , <i>M. obstructa</i> and <i>Oxychilusalliarus</i>	EL-Beheira	Eshra, (2013)
<i>E.vermiculata</i> and <i>T. pisana</i>	Alexandria	
<i>Monacha cartusiana</i> , <i>Cochlicellaacuta</i> , <i>Succinea putris</i> , <i>Deroceras leave</i> and <i>Derocerasreticulatum</i>	Ismailia and Sharkia	Radyet al., (2014)
<i>Monacha obstructa</i> , and <i>Eobania vermiculata</i>	Sohag	

This may be due to The Terrestrial snails species have transferred from infestation regions so, have adapted under weather factors of new region also, several factors e.g., the presence of more preferable food, shelter, intra-specific competition, fecundity increasing, several hosts or habitat in the new ecosystems. This finding is in agreement with El-Okda (1979) recorded in individuals of *E. vermiculata* at Shat by and SediBechr districts, Alexandria. While, *M. obstructa* was recorded in Behera (El-Deeb et al., 1999). Metwally et al. (2002) recorded six terrestrial snails include *M. cartusiana*, *E. vermiculata*, *C. acuta*, *O. alliarus*; the slugs, *L. flavus* and *Derocerasreticulatum* on different crops at 23 localities representing 10 districts at Monofia and Gharbia governorates. *E. vermiculata* and *M. obstructa* were recorded in the coastal area of the Nile Delta by El-Deeb et al. (1996) and (2003) surveyed different terrestrial snails on the field crops, vegetables, ornamental plants and orchards at different governorates of Egypt. Results showed that *M. cartusiana*, *E. vermiculata*, *C. acuta*, *Cepaeanemoralis*, *Oxychilusaliavus* and *Helicella* sp. were recorded on different host plants in Demietta Governorate while *M. cartusiana*, *E. vermiculata*, *C. acuta*, *C. nemoralis* and *S. putris* were found in Dakahlia Governorate. However, *E. vermiculata*, *C. nemoralis* and *S. putris* were common species in Kafr El-Sheikh Governorate. While, *M. obstructa* was recorded in Kafr El-Sheikh (Gabr et al., 2006) and in Ismailia Governorate (Shoieb, 2008). Ramzy, (2009) surveyed nine land snail

species in Assiut Governorate namely, *E. vermiculata*, *M. obstructa*, *O. elegans*, *Valloniapulechella*, *T. pisana*, *Vitreapygmaea*, *Helicodiscussingleyanusinermis*, *Pupoidescoenopictus* and *Cecilioides acicula*. The first three species are accessory species while the accidental species include the other six snail species. In addition, *O. elegans*, *V. pygmaea*, *P. coenopictus* and *C. acicula* were recorded for the first time in Egypt. Abo-El-Naser, (2013) found that four terrestrial snails include three land snails and slugs were found in the main investigated sites in Assiut Governorate (Table 2). The three land snail species are *Monachaobstructa* (Montagu); *Eobaniavermiculata* (Muller) and *Oxylomaelegans* (Risso) while a slug is *Limaxflavus* (Muller). All terrestrial snails, *M. obstructa*, *E. vermiculata*, *O. elegans* and *L. flavus* were recorded in the Exp. Farm, Fac. Agric., Assiut Univ., while *M. obstructa* was recorded only in El-Wasta in Assiut Governorate, during the investigation period. *L. flavus* was recorded for the first time in Assiut governorate. These results can be used for future studies as follows: future work plan in an effective strategy for the implementation of snails management programs at varying environmental regulations in Egypt.

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