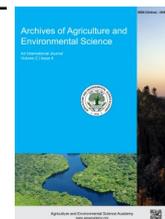




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ORIGINAL RESEARCH ARTICLE



## Identification of terrestrial gastropods species in Sohag Governorate, Egypt

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### ABSTRACT

The study aims to identify of terrestrial gastropods species in Sohag Governorate during the year 2016 and 2017. The present study was carried out for survey and identification for random land snail in 11 districts, i.e. (Tema, Tahta, Gehyena, El-Maragha, Saqultah, Sohag, Akhmim, El-Monshah, Gerga, El-Balyana, and Dar El-Salam) at Sohag Governorate, Egypt. Samples were collected from 5 different locations in each district during 2016-2017 seasons. The 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 results showed that found two species of land snails, *Monacha obstructa* (Montagu) and *Eobania vermiculata* (Muller). It was also observed that the occurrence of the spread of land snails was increased from the previous periods. The results further indicated that land snails were recorded in Sohag for a second time more widespread and may be that this pest moved to these governorates with transportation, passengers from places spread these new places and happened to her adaptation and after 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. Therefore, this study gives an interesting indication of the development of a plan in effective strategy for land snail's management program in agro ecosystems in Upper Egypt.

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### INTRODUCTION

In Egypt, terrestrial snails and slugs represent important economic pests and they are prevalent in many Governorates infesting and causing severe damage to many economic crops i.e. vegetable crops, ornamental plants, orchard trees and field crops (El-Okda, 1980; Azzam, 1998; Desoky *et al.*, 2015). Land snails cause heavy damage was manifested in chewing soft vegetative growing, the flowers and fruits, also eating seeds, roots and tubers after the sowing or during repining. (El-Okda, 1980; Imevore and Ajayi, 1993; Ismail *et al.*, 2003; Ramzy, 2009). In addition, the movement of snails causes an unwanted smell which avoids men and even animals from feeding on these polluted plants (Sallam *et al.*, 2009). Furthermore, some gastropods work as intermediate hosts for many parasitic worms infesting man and his domestic animals (Barker, 2001).

In Egypt, the land snails dispersing in northern Governorate,

Alexandria, El-Beheira, Kafr El-Shikh, and Domietta (Kassab and Daoud, 1964; El-Okda, 1980; Hashem *et al.*, 1993; and Eshra, 2103 ) At the present time these snails distribute in Ismaellia, Sharkia, Monofia, Gharbia, Minia, and Assiut Governorates (El-Deeb *et al.*, 2004; and Shoieb, 2008). Nine terrestrial snail species in Upper Egypt region has been identified by Assiut Governorate. All the species recorded belong to order: Pulmonata from eight families (Ramzy, 2009). Keeping in view the significance of gastropods in agricultural fields, the present study was undertaken for the identification of terrestrial snail species in Sohag Governorate, Egypt.

### MATERIALS AND METHODS

The present study was carried out for survey and identification for random land snail in 11 districts, i.e. (Tema, Tahta, Gehyena, El-Maragha, Saqultah, Sohag, Akhmim, El-Monshah, Gerga,

El-Balyana, and Dar El-Salam) at Sohag Governorate, Egypt. Samples were collected from 5 different locations in each district during 2016/2017 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 hours, the water was decanted and replaced with 70% ethanol for preservation. The snails with complete soft parts were identified. To morphology study of the collected shell of the snail species respectively, shell was prudently washed and the visceral mass was removed according to the method of Frandsen (1983). After that, the shell of each species was photo graphed. The following references, beside others cited in the text, were used in the documentation of the collected snails: Pilsbry (1948); Horst (1958); Cameron and Radfern (1976); 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. Amongst the gastropods, land snails (sub class: Pulmonata) are one of the maximum frequent with almost 35.000 described species of the world.

Data in Table (1), the terrestrial snail species were identified in many different sites at Sohag Governorate, during the study period 2016-2017 seasons. Through the table, the results showed the identification of two lands and their distribution was as follows *Monacha obstructa* was recorded in the following areas (Tema, Tahta, Gerga, El-Balyana and DarEl-Salam districts). While the *Eobania vermiculata* was recorded in the following areas (Tema, Tahta, Saqultah, El-Maragha, Akhmim (Sohag,

districts).

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 an in (Giza, BeniSuef, Minia, Assiut). In this study, land snails were recorded in Sohag for a second time more widespread and may be that this pest moved to these governorates with transportation, passengers from places spread these new places and happened to her adaptation and after 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 individuals of *E. vermiculata* at Shatby 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 *Deroceas reticulatum* 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) measured altered earthly snails on the field crops, vegetables, ornamental plants and the orchards at different Governorates of Egypt. Results showed that *M. cartusiana*, *E. vermiculata*, *C. acuta*, *Cepaea nemoralis*, *Oxychilus aliavus* 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-Sheik 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*, *Vallonia pulechella*, *T. pisana*, *Vitrea pygmaea*, *Helicodiscus singleyanus inermis*, *Pupoides coenopictus* 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. The three land snail

**Table 1.** Survey of land snails collected from different districts in Sohag Governorate, Egypt, during 2016-2017.

S.N.	Crops	Sites (districts)	<i>Monacha obstructa</i>	<i>Eobania vermiculata</i>
1		Tema	+	+
2		Tahta	+	+
3		Gehyena	-	-
4	Egyptian clover	Saqultah	-	+
5	Wheat	El-Maragha	-	+
6	Orchards	Akhmim	-	+
7	Ornamental trees	Sohag	-	+
8	Vegetables	El-Monshah	-	-
9	etc...,	Gerga	+	-
10		El-Balyana	+	-
11		DarEl-Salam	+	-

+ Found; - Unfound

species are *Monacha obstructa* (Montagu); *Eobania vermiculata* (Muller) and *Oxyloma elegans* (Risso) while a slug is *Limax flavus* (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 snail's management programs at varying environmental regulations in Egypt. Desoky *et al.* (2015) the results showed that found first record and identified of two land snail species in Sohag Governorate. They are as follows *Monacha obstructa* and *Eobania vermiculata*.

### Conclusion

The present study concluded the occurrence of two species of land snails, *Monacha obstructa* (Montagu) and *Eobania vermiculata* (Muller) in the Sohag Governorate, Egypt. It was also noted that the spread of land snails was increased from previous periods. The results also indicated that land snails were recorded in Sohag for a second time more widespread and may be that this pest moved to these governorates with transportation, passengers from places spread these new places and happened to her adaptation and after 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. Therefore, the present investigation provides an interesting development plan for the effective strategy for land snail's management program in agro ecosystems in the Upper region of Egypt.

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