

**STUDIES ON SOME MORPHOLOGICAL ASPECTS OF
Monacha cartusiana SNAIL UNDR LABORATORY
CONDITIONS AT SHARKIA GOVERNORATE**

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ABSTRACT

Characteristic of size (shell diameter and shell high) of *Monacha cartusiana* snail were studied during the growing season in the period from October 2009 up to may 2010 under laboratory conditions the results obtained can be summarized as the following:

a) Shell diameter

The highest number was 68 individuals with the shell diameter of 12- 12.18 mm during November 2009. While, the lowest number was 9 individuals. During activity season 2009/2010 the total numbers of shell diameter with measurement of 11- 11.18mm were 247 individuals followed by 246 and 218 individuals measurement of 12-12.18 and 9-9.18mm, respectively.

b) shell high

The highest total of number for shell high with measurement of 6.14- 6.18 mm. were 546 individuals followed by 318 individual of measurement 6.1-6.12mm. On the other hand, the lowest total of number for shell high with measurement of 2.20- 3.00 mm. were 22 individuals. The highest number was 130 individuals with the shell high of 6.14-6.18mm during November 2009. While, the lowest number was only one individual with the shell high of 4.12-4.18mm. Also, the results revealed that the individuals with shell diameter of measurement 9-9.18, 10-10.18, 12-12.18 and 13-13.18mm were highly during April 2010, December and November 2009, respectively. Regarding shell high in all studied months the individuals were appeared with different levels in the numbers.

INTRODUCTION

Terrestrial molluscs have been increased in last few years causing severe damage all crops. In Egypt, the glassy clover snail, *Monacha cartusiana* is considered one of the most serious economic importance pests on field crops, vegetables, orchards as well as ornamental plants. (Kassab & Daoud 1964, El-Okda 1980, Ghamry *et al.*, 1993, Ismail 1997, El-Massry 1998, Hegab *et al.* 1999 and Abd El-Karim, N. (2000). It caused severe damage for these crops, including the leaves, roots, trunks and orchard trees as well as apple, citrus, peach, (Dekie, 1969).

The glassy clover snail is caused severely damage to the Egyptian clover. Numerous mucus trails produced by the snails appeared on the foliage crops causing an unacceptable outdoor to cattle (Kassab and Daoud 1964).

Therefore, the following point was studied: characteristic of size (shell diameter and shell high) of *Monacha cartusiana* snail during two growing season 2009/2010.

MATERIALS AND METHODS

1- Tested snails:

Snail of *Monacha cartusiana* were collected from some heavy infested fields cultivated with Egyptian clover (*Trifolium alexandrinum*) in Kafr Al Ashraf village, Zagaizg city, Sharkia Governorate. The study area is one feddan and five replicates of quadrat sample size 50 × 50 cm, were randomly examined at weekly intervals during the growing season (Staikou *et al.*, 1988). The samples were undertaken during early morning. Fifty snail of different stages (adult and juveniles) were found on plants or on soil surface and weeds were collected from the examined replicates (Lokma, 2007).

The snails were transferred in plastic bags to the laboratory and maintained into plastic boxes (50 × 30 × 30 cm) supplied daily with fresh leaves of lettuce (*Lactuca sativa*) for two weeks to acclimatization under 20 ± 2c° and RH 80 ± 3% (El- Okda, 1981) and closed with muslin cloth to prevent snails from escaping. Collected snail from adult and juveniles were measured a shell diameter and high by using (caliper accurate to 0.02 mm., and classified to different measurements then were counted and recorded. This work beginning from half of October 2009 upto May 2010 and inspected weekly to the end of experiment.

RESULTS AND DISCUSSION

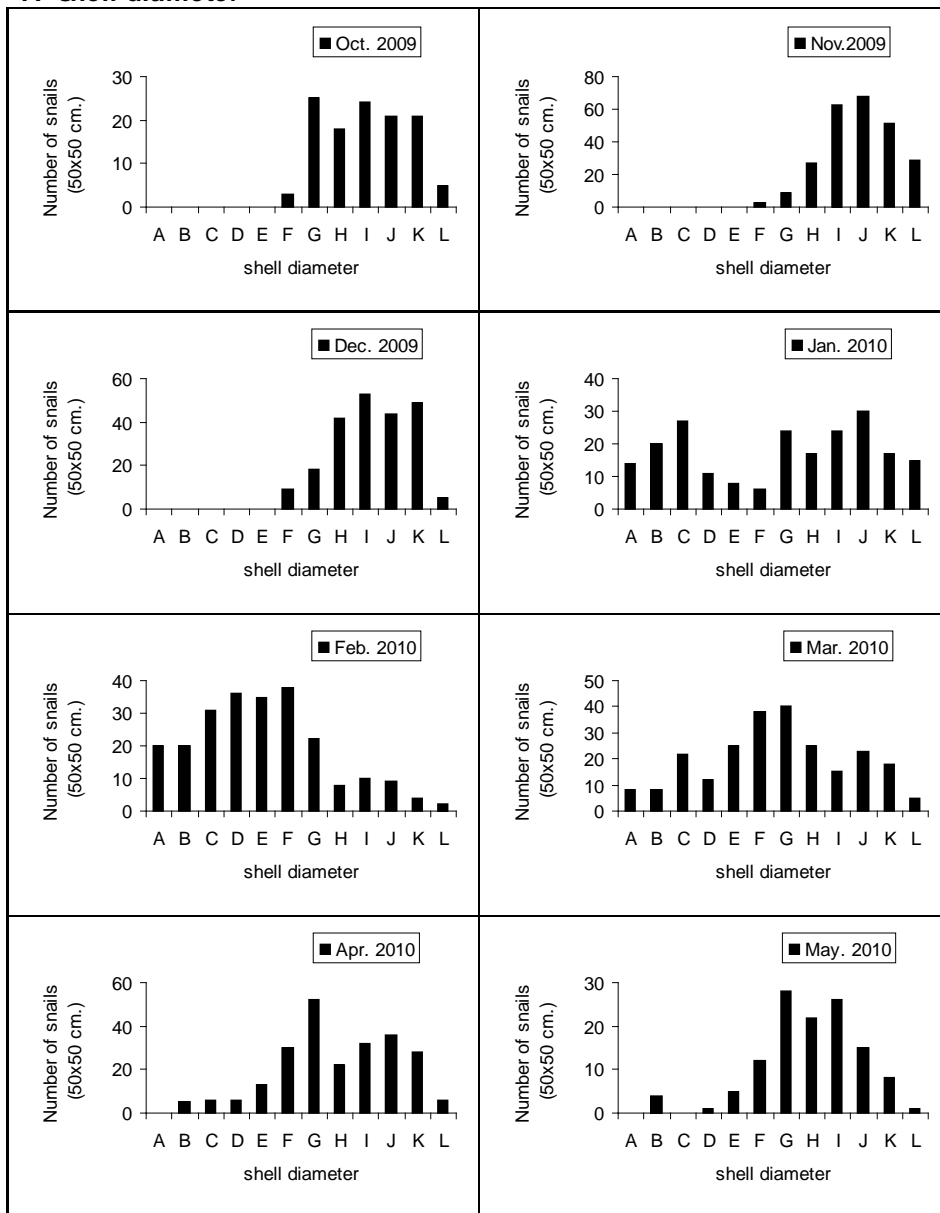
1-Size frequency distribution of *Monacha cartusiana* snail under field conditions.

Snails of *M. cartusiana* were randomly examined at monthly intervals during the growing season on Egyptian clover (*Trifolium alexandrina*) during the period from October 2009 up to May 2010.

Data were used to construct monthly size frequency histogram of the sampled population using (shell diameter and shell high).

Data in (Fig1 & Table 1) show that the highest number was 68 individuals with a shell diameter of 12- 12.18mm. during November 2009 followed by the individuals with a shell diameter of 13- 13.18 mm. was 53 individuals during December 2009. In January 2010 the highest number was 30 individuals with a shell diameter of 12- 12.18 mm., while the lowest number was 6 individuals with a shell diameter 8-8.18mm, also the results revealed that no any individuals for all shell diameter with of 3- 3.18 & 4- 4.18 & 5- 5.18 & 6- 6.18 and 7- 7.18mm during October, November and December 2009The highest number was 38 individuals with shell diameter of 8- 8.18mm. followed by 36 individuals with shell diameter of 6.-6.18mm while the lowest numbers was 2 individuals with shell diameter of 14- 14.18mm. during February 2010. During March 2010 the highest number was 40 individuals with shell diameter of 9- 9.18mm followed by 38 individuals with a shell diameter of 8- 8.18mm, respectively. While the lowest number was 5 individuals with shell diameter of 14- 14.18mm in the same month.

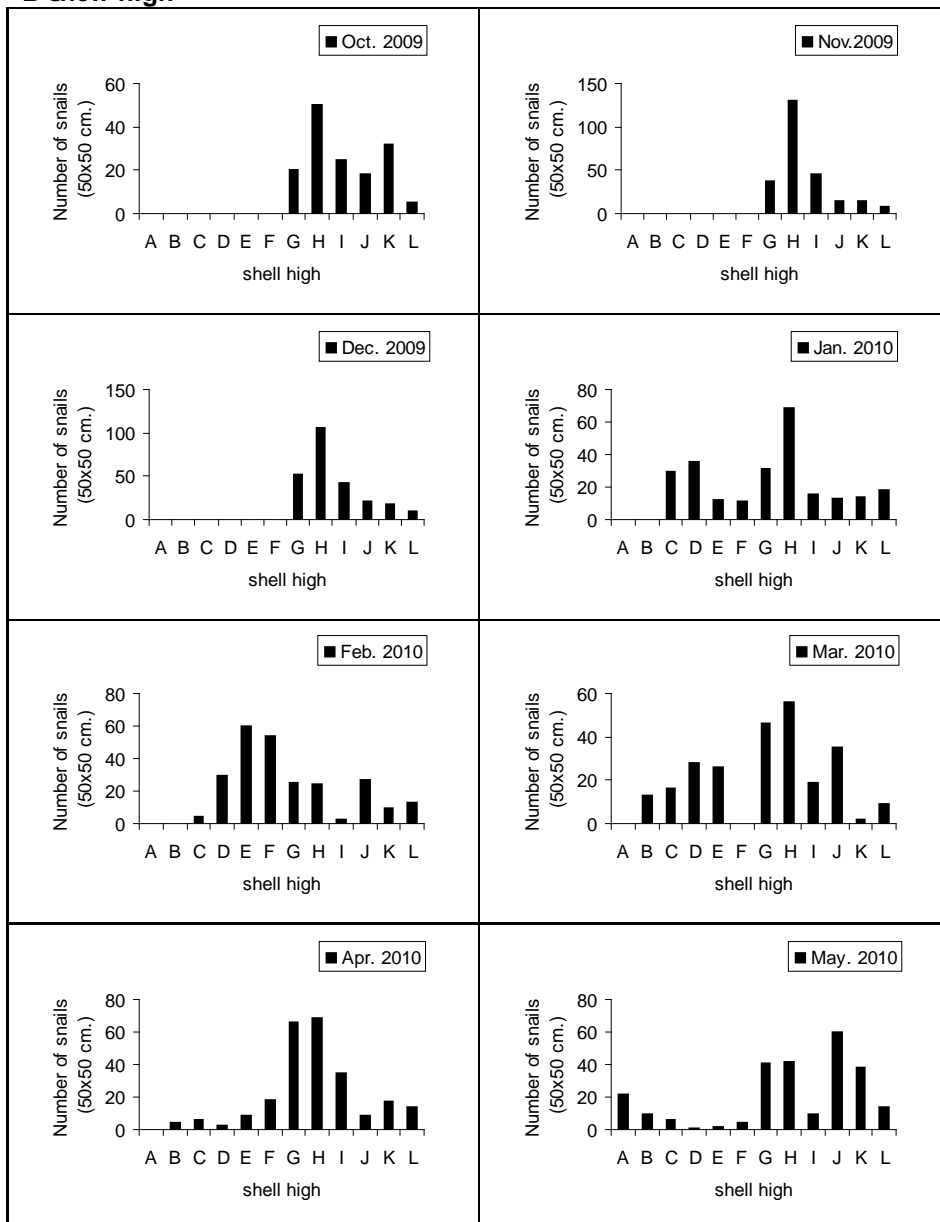
A- shell diameter



A= 3- 3.18 B=4- 4.18 C=5- 5.18 D=6- 6.18 E=7- 7.18 F=8- 8.18 G=9- 9.18
H=10-10.18 I=11-11.18 J=12-12.18 K=13-13.18 L=14-14.18 mm.

Fig (1): Size frequency histogram of *M. cartusiana* snail (shell diameter) during the period from October 2009 to May 2010 at Kafr Al ashrafe village, Sharkia Governorate.

B-shell high



A= 2.20-3.00B=3.12-3.14C=3.16-4.00D=4.12-4.18E=5.00-5.18F=5.20-6.00
 G=6.10- 6.12H=6.14- 6.18I=6.20-7.00 J=7.12- 7.18K=7.20- 8.00L=8.12-8.16m.

Fig (2): Size frequency histogram of *M. cartusiana* snail (shell high) during the period from October 2009 to May 2010 at Kafr Al ashrafe village, Sharkia Governorate.

On the other hand, April and May 2010 it noticed that the highest number was 52 and 28 individuals with shell diameter of 9- 9.18mm followed

by 36 and 26 individuals with shell diameter of 12-12.18 and 11-11.18mm respectively, while the lowest number was 5 and 1 individuals with shell diameter of 4- 4.18 and 6- 6.18 mm, respectively. Generally, it could be concluded that the total numbers of shell diameter were 247 individuals with the measurement of 11-11.18mm followed by 246, 218 and 196 individuals with shell diameter of 12- 12.18, 9-9.18 and 13-13.18mm respectively. On the other hand, the total lowest number of shell diameter with measurement of 3- 3.18mm was 42 individuals.

Data in (Table 2& Fig 2) showed that the size frequency histogram of *M. cartusiana* snail (shell high) during the growing season in the period from October 2009 up to May 2010. Results revealed that the highest number of individuals was during October 2009 the highest number was 50 individuals with shell high of 6.14-6.18mm followed by 42 individuals with shell high of 7.20-8.00mm., while the lowest number was 5 individuals with shell high of 8.12-8.16mm. In November 2009 (130 individuals with shell high of 6.14 - 6.18mm) followed by December 2009 106 individuals with the same measurement, while the lowest number of individuals was during May 2010 (only one individual with shell high of 4.12- 4.18mm). During January and February 2010 the highest number was 69 and 60 individuals with shell high of 6.14- 6.18 and 5.00- 5.18mm., respectively, while the lowest numbers was 11 and 3 individuals with shell high of 5.20- 6.0 and 6.20- 7.00mm., respectively. On the other hand in March and April 2010 it noticed that the highest numbers was 56 and 69 individuals with shell high of 6.14- 6.18 mm followed by 46 and 66 individuals with shell high of 6.10- 6.12mm., respectively. The lowest number was 2 and 3 individuals with shell high of 7.20- 8.00 and 4.12- 4.18mm., respectively. During May 2010 the highest number was 60 individuals with shell high of 7.12- 7.18 mm., while the lowest number was only one individual with shell high of 4.12- 4.18 mm., generally it could be concluded that the high number of shell high with the measurement of 6.14- 6.18mm. was 546 individuals followed by 318, 199 and 196 individuals with shell high of 6.10- 6.12, 7.12- 7.18 and 6.20- 7.00mm., respectively. while, the lowest number of shell high with measurement of 2.20- 3.00mm. was 22 individuals.

These results were confirmed with the findings of Staikou *et al.* (1990) reported that the reproductive period of the land snail, *Bradybaena fruticum* started in the beginning of summer season and the newly hatched individuals appeared in mid summer. Increased growth rate occurred during spring season. One year after hatching, the largest shell diameter of the snails reached a size of about 10.5 mm. two years after hatching snails reached a size of about 20.5 mm. where it required 5 years to attain its maximum size in the field (20.4 mm).

Ismail (1997) studied the effect of food types on the growth of *M. cartusiana* snails as indicated by shell diameter. He found that feeding on lettuce and cabbage leaves gave the highest growth in shell diameter after six months of the feeding on lettuce leaves and shell diameter were 8.8 and 8.6 mm for lettuce and cabbage, respectively.

The shell diameter of snails fed on broad bean and clover were 5.2 and 5.3mm for the two tested plants, respectively. The lowest effect was obtained with navel orange with 2.9 mm.

Mohammad (2011) studied the relation between shell diameter and number of eggs of *M. cartusiana* during the breeding season. Result revealed that the clutch size of *M. cartusiana* snail as influenced by shell diameter of the tested snail. Clutch size noticed with high egg numbers during the first month of the breeding season where recorded 30.4, 33.3 and 32 eggs / one pair snail for 12 m x 12 m, 12m x 10m and 10m x 10m a shell diameter of snail, respectively. Regarding general mean it can be arranged the three tested snail shell diameter descending as follow: 12m x 10m (22.9) and 10 m x 10 m (16.9) eggs / one pair snail, respectively.

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دراسات علي بعض الصفات المورفولوجية لقواقع الموناكا كارتوسيانا تحت الظروف المعملية بمحافظة الشرقية
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مركز البحوث الزراعية – معهد بحوث وقاية النباتات – الدقي – الجيزة – مصر

اجري هذا البحث اثناء موسم النشاط لقواقع الموناكا كارتوسيانا في الفترة من اكتوبر ٢٠٠٩ حتى مايو ٢٠١٠ باحدي قري محافظة الشرقية على محصول البرسيم وذلك لدراسة صفة حجم القواقع (قطر وارتفاع الصدفة) ولخصت النتائج كالآتي:
أ- بالنسبة لقطر الصدفة:

كان اعلي تعداد للافراد ٦٨ فردا / م^٢ ذات قطر صدفة ١٢-١٢.١٨ مم خلال شهر نوفمبر ٢٠٠٩ بينما اقل تعداد كان ٩ افراد لنفس المقاس وكان اكبر تعداد للافراد ذات صدفة قطر ١١.١٨-١١ مم هو ٢٤٧ فردا طول مدة التجربة بليه ٢٤٦ ، ٢١٨ فردا ذات مقاييس ١٢-١٢.١٨ ، ٩-١١.١٨ مم علي التوالي.
ب- بالنسبة لارتفاع الصدفة:

نلاحظ ان اكبر تعداد للافراد ذات صدفة ارتفاع ٦.١٤-٦.١٨ مم هو ٥٤٦ فردا/ م^٢ وبلية ٣١٨ فردا ذات ارتفاع صدفة ٦.١-٦.١٢ مم وعلي الجانب الاخر كان اقل تعداد ذات صدفة ارتفاع ٢.٢٠-٣.٠ مم هو ٢٢ فردا/ م^٢.

Table (1): Numbers of *Monacha cartusiana* snail for juvenile and adults with the different measurements (shell diameter) during activity season 2009 -2010.

Diameter mm Date	Shell diameter (mm)											
	3- 3.18	4- 4.18	5- 5.18	6- 6.18	7- 7.18	8- 8.18	9- 9.18	10-10.18	11-11.18	12-12.18	13-13.18	14-14.18
Oct. 2009	0	0	0	0	0	3	25	18	24	21	21	5
Nov.2009	0	0	0	0	0	3	9	27	63	68	51	29
Dec. 2009	0	0	0	0	0	9	18	42	53	44	49	5
Jan. 2010	14	20	27	11	8	6	24	17	24	30	17	15
Feb. 2010	20	20	31	36	35	38	22	8	10	9	4	2
Mar. 2010	8	8	22	12	25	38	40	25	15	23	18	5
Apr. 2010	0	5	6	6	13	30	52	22	32	36	28	6
May. 2010	0	4	0	1	5	12	28	22	26	15	8	1
Total	42	57	86	66	86	139	218	181	247	246	196	68
Mean	5.25	7.13	10.75	8.25	10.75	17.38	27.25	22.63	30.88	30.75	24.5	8.5

Table (2): Numbers of *Monacha cartusiana* snail for juvenile and adults with the different measurements (shell high) during activity season 2009 -2010.

High mm Date	Shell high (mm)											
	2.20-3.00	3.12-3.14	3.16-4.00	4.12-4.18	5.00-5.18	5.20-6.00	5.12-6.18	6.14- 6.18	6.20-7.00	7.12- 7.18	7.20- 8.00	8.12-8.16
Oct. 2009	0	0	0	0	0	0	20	50	25	18	32	5
Nov.2009	0	0	0	0	0	0	37	130	46	15	14	8
Dec. 2009	0	0	0	0	0	0	52	106	42	22	18	10
Jan. 2010	0	0	30	36	12	11	31	69	16	13	14	18
Feb. 2010	0	0	4	30	60	54	25	24	3	27	10	13
Mar. 2010	0	13	16	28	26	0	46	56	19	35	2	9
Apr. 2010	0	4	6	3	9	18	66	69	35	9	17	14
May. 2010	22	10	6	1	2	4	41	42	10	60	38	14
Total	22	27	62	98	109	87	318	546	196	199	145	91
Mean	2.75	3.38	7.75	12.25	13.63	10.88	39.75	68.25	24.5	24.88	18.13	11.38

