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STUDIES ON *RHINOESTRUS SP* (DIPTERA: OESTRIDAE) LARVAE INFESTING DONKEYS (*EQUUS ASINUS*) IN EGYPT

1) Incidence and seasonal variations

BY

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INTRODUCTION

The larval stages of the Dipteran flies of the genus *Rhinoestrus* are obligatory specific myiasis producing parasites of naso-pharyngeal cavity of wild and domestic animals belonging to genus *Equus*.

Rhinoestrus species larvae were reported to induce irritation of the mucous membrane of the nasopharyngeal cavity, injuries of the olfactory nerves and cerebral membrane, encephalomyelitis and death of the horses (Akchurin, 1945 and Karpenko, 1947).

Unfortunately, few contributions appeared in the literature dealing with the incidence and seasonal variations of *Rhinoestrus* spp. larvae infesting horses. Informations on those flies infesting donkeys were completely lacking except that of Rastegaev on donkeys (*Equus asinus)* and Asiatic wild asses *(E. hemiounus)*. He mentioned that these donkeys were infested with *R. purpureus* and *R.* *R. usbekistanicus* while studying the fauna of

nose-flies and stomach flies in the Turkman, USSR. On the other hand, Rastegaev (1979, 1983,]984a and 1984b) dealt with the incidence and seasonal variations of *Rhinoestrus* spp. larvae among horses in different Republics of USSR without referring to its larval stages.

In Egypt, previous studies on this fly in donkeys or horses were non existent. Therefore, this study was initiated in order to investigate the incidence and monthly prevalence of Rhinoestus spp. larvae. The sequence of the larval instars during the different months of the year and the number of generations per year were determined.

MATERIAL AND METHODS

144 donkeys of both sexes over three years of age were examined during this study. The donkeys were purchased from the different provinces of Egypt. They were slaughtered at the slaughter house of the National circus, at Giza governorate and examined through a weekly visit during the period from September 1989 up to the end of August 1990. Each head of slaughtered donkey was separated from the rest of the body and the skull was incised longitudinally. The larvae if present were collected from the nasopharyngeal cavity, kept in a separate labelled nylon bag, transferred to the laboratory, and differentiated into 1st, 2nd, and 3rd instar larvae according to Zumpt (1965).

RESULTS

The present study reported that the donkeys in Egypt were infested with one species of *Rhinoestrus*, probably identified as *R. purpureus* (Zumpt 1965).

Table 1: Monthly distribution of *Rhinoestrus purpureus* larvae infesting donkey in Egypt, in the period from September, 1989 up to the end of August, 1990.

Month	No. Exam.	No. Inf.	M.L.NO	% of Inf.
September, 1989	12	11	19.00	91.67
October	12	01	10.00	08.33
November	12	00	00.00	00.00
December	12	00	00.00	00.00
January, 1990	12	03	03.00	25.00
February	12	08	08.50	66.67
March	12	12	38.92	100
April	12	11	11.73	91.67
May	12	11	04.18	91.67
June	12	07	57.86	58.33
July	12	12	50.25	100
August	12	12	29.67	100
Total	144	88	23.31 S.E19.81	61.11

No Exam. Number examined.
No Inf. „ infested
M.L. No Mean larval number.

Table II: Monthly prevalence of 1st, 2nd and 3rd instar larvae of Rhinoestrus purpureus infesting donkeys in Egypt in the period from September, 1989 up to the end of August, 1990.

Month	No exam	1st instars			2nd instars			3rd instars		
		No inf.	M.L.No	Rel.+	No. inf.	M.L.No.	Rel++	No. inf.	M.L.No	Rel.+++
September, 1989	12	50	02.80	06.7	04	02.00	03.8	11	17.00	89.5
October	12	00	00.00	00.0	00	00.00	00.0	01	10.00	100
November	12	00	00.00	00.0	00	00.00	00.0	00	00.00	00.0
December	12	00	00.00	00.0	00	00.00	00.0	00	00.00	00.0
January, 1990	12	03	03.00	100	00	00.00	00.0	00	00.00	00.0
February	12	04	07.75	45.6	06	02.33	20.6	04	05.75	33.8
March	12	08	10.38	17.8	11	08.90	21.0	11	26.00	61.2
April	12	02	02.00	03.1	04	04.00	12.4	11	09.90	84.5
May	12	00	00.00	00.0	00	00.00	00.0	11	04.18	100
June	12	07	51.42	88.9	03	15.00	11.1	00	00.00	00.0
July	12	12	32.08	63.8	11	14.00	25.6	10	06.40	10.6
August	12	10	10.2	28.7	10	05.70	16.0	10	19.70	55.3
Total	144	51	14.95		49	07.42		69	12.37	
		35.42 %	S.E. 17.63		34.03 %	S.E. 5.37		47.92 %	S.E. 7.74	

Rel+ : Percentage of 1st to 2nd and 3rd instars.

Rel++ : " of 2nd to 1st and 3rd instars.

Rel+++ : " of 3rd to 1st and 2nd instars.

M.L.No : Mean larval number = $\frac{\text{total larval number}}{\text{No of infested donkeys}}$

Table 1, displayed that out of 144 donkey examined, 88 (61.11%) were infested with *R. purpureus* larvae. The annual mean larval number was 23.31 ± 19.18. The monthly distribution showed that the larvae were absent during November and December and present during the other months of the year reaching its lowest mean number in January (3.0) and May (4.18). However, its occurrence showed two peak of infestations (Plate I); during March (38.92) and June (57.86). The monthly percentage of infestation **(Table 1)**, indicated that the infestation rate were 100% during March, July and August, 91.67% during September, April an May, varied from 8.33 to 66.67% during the other months.

A total of 2302 larvae of *R. purpureus* were collected in this study and differentiated to three instars. It was found that 988 larvae were first instars (42.92%) 392 second instars (17.03%) and 922 third instars (40.05%).

The 1st instar larvae infested 35.42% of examined donkeys **(Table, II)** with mean larval number 14.45± 17.63. The 1st instars were found in two seasons (Plate II); from January to April with a peak of infestation during March (10.38), and from June to September with a peak of infestation during June (51.42). The 2nd instar larvae infested 34.03% of donkeys **(Table II)** with annual mean larval number 7.42 ± 5.37 per donkey. It was in two seasons (Plate II); from February to April with a maximum mean larval number during March (8.90), and from June to September with a maximum mean during June (15.0). The 3rd instar larvae infested 47.92% of donkeys **(Table II)** with average number 12.37 ± 7.74 per donkey. It occurred also in two seasons (Plate II); from February to May with a peak of infestation during March (26.0), and from July to October with a peak during August (19.70).

Table III: Ranked size of infestation with *R. purpureus* in Nasopharyngeal cavity of donkeys.

Size of infestation	No of donkeys	% of donkeys
0	56	38.89
1 - 50	73	50.69
51 - 100	13	09.03
101 - 150	02	01.39

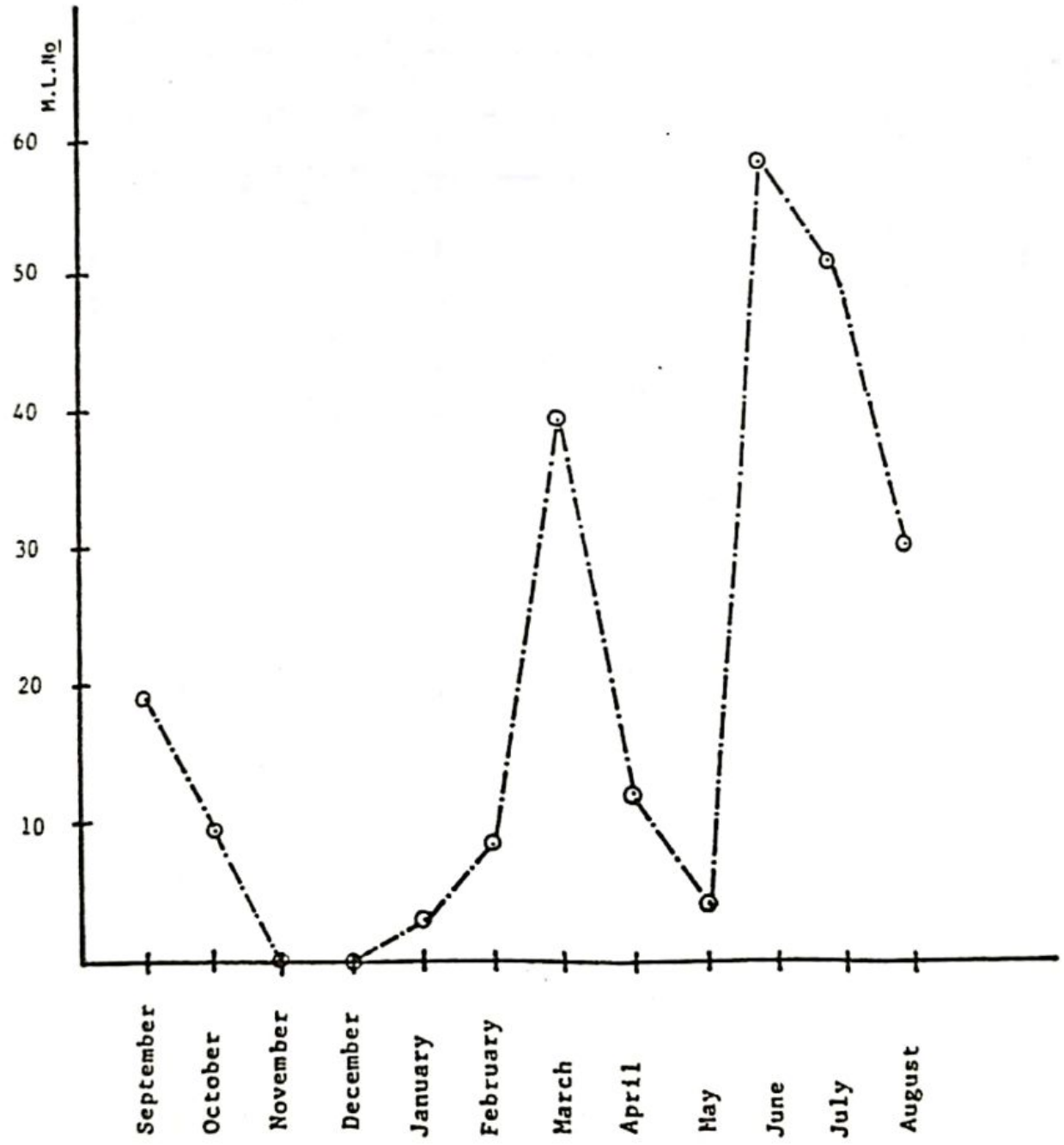

Plate I: Monthly distribution of R. purpureus larvae infesting donkeys in Egypt.

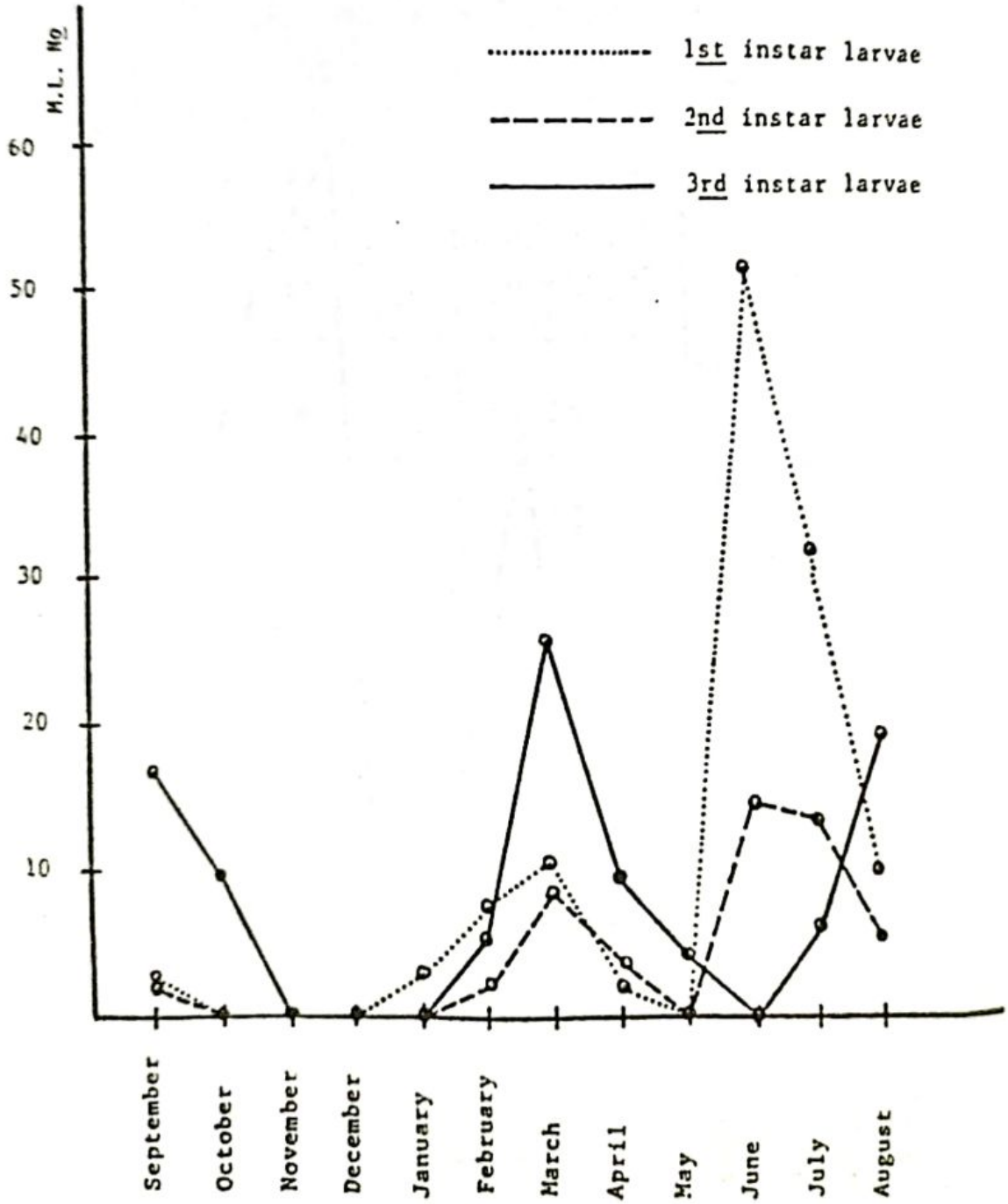

Plate II: Monthly prevalence of 1st, 2nd, and 3rd instar larvae of R. purpureus infesting donkeys in Egypt.

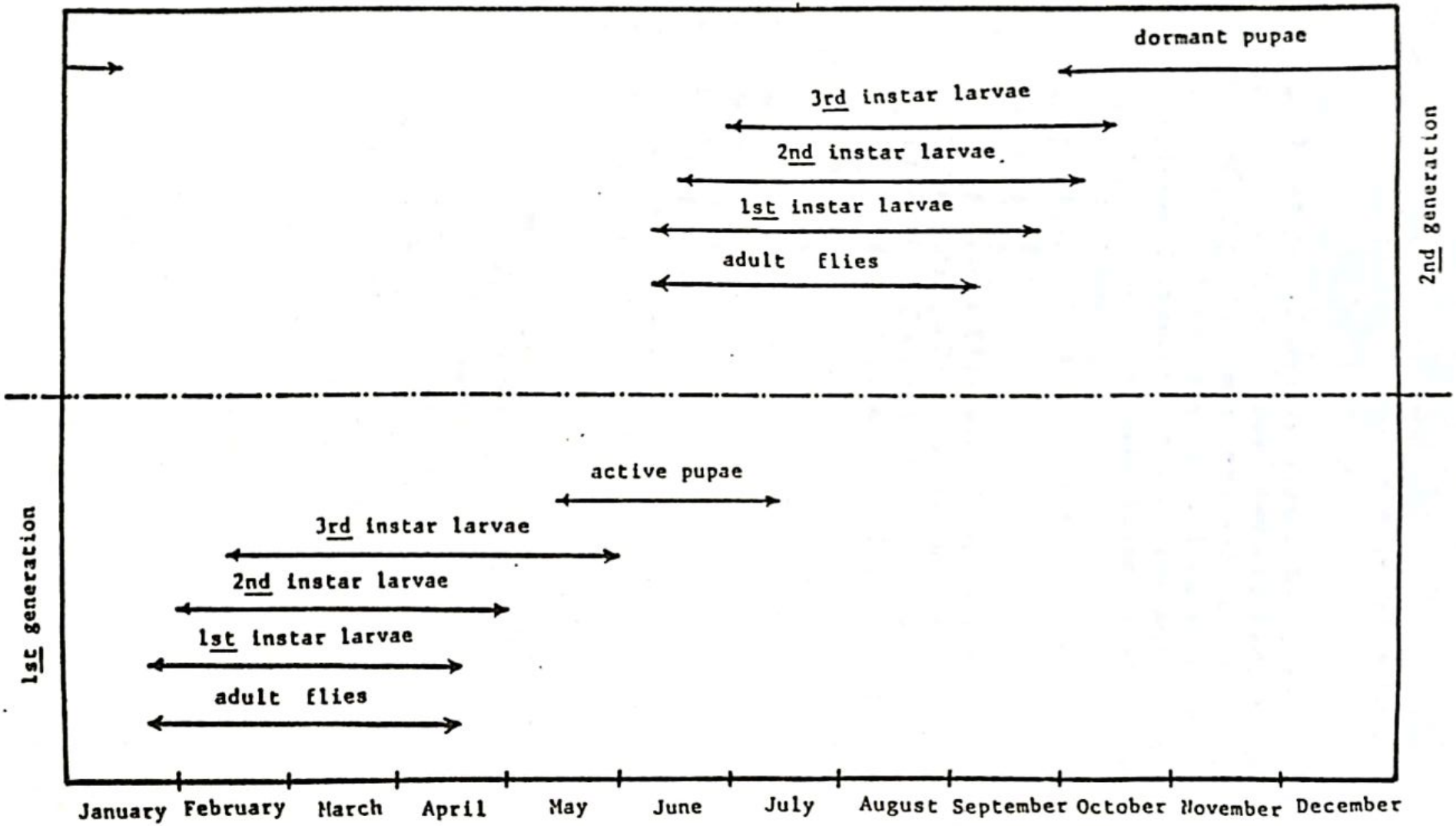

Fig. I: The life cycle of R.purpureus fly infesting donkeys in Egypt.

This study demonstrated that the larval instars of *R. purpureus* (Table II) were absent through a long winter period; the 1st instars from October to December, the 2nd instrars from October to January and the 3rd instars from November to January. However, the absence of these larval instars occurred also during a short summer period; May in case of the 1st and 2nd instars and june for the 3rd instar larvae.

The degree of infestation (Table III) showed that most of the infested donkeys (50.69%) harboured 1-50 larvae. However the percentage of donkeys infested with 51-100 and 101-150 were 9-30 and 1.39%, respectively.

DISCUSSION

This study reported for the first time that the donkeys in Egypt were infested with a single species of *Rhinoestrus* identified as *R. purpureus* according to Zumpt 1965.

The result obtained through the period from September 1989 to the end of August 1990 showed that the incidence of *R. purpureus* larvae (61.11%) was relatively lwoer than that reported from horses in nothern Kazakhstan, USSR (49.8 - 98.9%, Rastegaev 1979), in the desert zone of Caspian Lowland and around the Caspian sea, USSR (96.7 - 100%, Rastegaev 1983 and 1984).

Our result reported that the annual mean larval number was 23.31 per donkey. This result was in agreement with that reported from horses in northern kazakhstan, USSR by Rastegaev (1979) who estimated the intensity of infestation to be 16-421 larvae per animal. Comparable higher numbers were reported for the combined spp. (*R. purpureus; R. latiforms*

and *R. uzbekistanicus*) infesting horses; 122-144 larvae per horse in the Turkmenian, USSR (Rastegaev 1984 b) and 45-899 larvae per horse in the desert zone around the Caspian sea (Rastegaev 1983).

The present investigation showed that the larvae of *R. purpureus* were absent during November and December, present during the other months of the year with two peak of infestations; during March (38.92) and june (57.86).

The monthly prevalence of 1st, 2nd and 3rd instar larvae was of primary interst in this study as it gave an idea on the duration of various stages of the life cycle of *R. purpureus*, and the number of generations occurred per year. The 1st instar larvae were absent for a long period (three months from October to December) and during a short period (May) (fig. 1). This indicated that the flies of *R. purpureus* were absent during these periods. The appearance of the 1st instars during two seasons; from January to April, and from June to September indicated that the flies begin to appear at late January and early June (Fig. 1). Since, the adult *Rhinoestrus* spp. ejects the 1st instar larvae directly into the nostrils (Zumpt, 1965). Therefore, it could be concluded that *R. purpureus* flies were active in two seasons through the year; from late January to mid-April, and from early June to late September.

The data obtained for the monthly prevalence of the 3rd instar larvae of *R. purpureus* demonstrated these larvae were absent through; a long winter period (from November to January), and a short summer period (June). This indicated that the 3rd larval instars began to leave the host at early October and mid May. Therefore, it could be concluded that the larvae which were voided during the summer period (May) resulting active pupae during June. However, those voided during winter period (October)

resulting dormant pupae (over wintering phase) during the proceeding months (November mid-January) to become gradually active during late January giving a current flow of the flies during February reaching its maximum during March. From the above mentioned discussion, it could be concluded that there are two generations through the year for *R. purpureus* infesting donkeys in Egypt.

Since, this study demonstrated that *R. purpureus* had two generation per year with maximum larval number during March and June, a twice annual treatment of donkeys is recommended during March and June. This program effectively remove most of the larvae infesting the animal.

SUMMARY

Examination of 144 donkey heads at the postmortem during the period from September 1989 up to the end of August 1990 revealed that 88 (61.11%) donkeys were infested with *Rhinoestrus purpureus*. The larvae were present in the 88 head examined theroughout the year with highest mean larval number during June (57.86%). The larvae were absent during November and December. The monthly prevalence of each 1st, 2nd and 3 rd instar larvae was determined. Each larval instar occurred in two peak of infestations; March and June for the 1st and 2nd larval stages and March and August for the 3rd larval stage. The size of infestation showed that the percentage of donkeys infested with 1-50, 51-100 and 101-150 larvae were 50.69, 9.03 and 1.39% respectively.

It was concluded that, two generations of *R. purpureus* occurred during the year and the adult flies were active during two seasons; from mid-January to mid-April and from early June to late September. Two annual treatment of donkeys during March and June were recommended to eliminate most of the larvae from infested donkeys.

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