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## Summary

Field and laboratory studies had been carried out in Dakahlia Governorate to study the following

- 1- ) Survey and incidence of different insects, spiders, mites and snails attacked sugar-beet sugar at El-Dakahlia governorate.
- 2- ) Survey of the different mites inhabiting sugar-beet crop soil at El-Dakahlia Governorate
- 3- ) Study the population dynamics of certain insects attacking sugar-beet crop
- 4- ) Study the biological aspects of the predatory mite *Euseius scutalis* when fed on *Bemisia tabaci* and *T. urticae* immature stages.
- 5- ) Study the biological aspects of soil predacious mite, *Laelaspis astonomicus* when fed on free living nematode, acarid mite, *Tyrophagous putrescentiae* and collembola.
- 6- ) Study the effect of some pesticides against the main insects attacking sugar-beet crop.

The results obtained can be summarized as follows:

### I-) Ecological studies

#### I. a.) Survey of the different insect and mite pests attacking sugar-beet crop:

The study indicated that there were 15 species belonging to 11 families in 6 orders. Order Hemiptera included 3 families as follows: Aphididae, Jassidae and Pentatomidae. On the other hand orders Thysanoptera, Diptera and Orthoptera each included one family only as Thripidae, Anthomyiidae and Gryllotalpidae, respectively. From study also, the families Noctuidae and Gelechiidae only the two families of order Lepidoptera.

Regarding order Coleoptera, the survey proved the presence of three families namely Anthicidae, Curculionidae and Nitidulidae.

Concerning the phytophagous harmful mites, two dominant mites were collected belonging to genus *Tetranychus* infesting sugar-beet leaves only. The two species are *T. urticae* and *T. cucurbitacearum*.

**I. b.) Survey of the different insect predators attacking sugar-beet crop:**

The obtained results indicated that there are 10 different predacious insects belonging to 6 families in 5 orders as follows: Order Hemiptera ( Pentatomidae) ; order Coleoptera ( Staphylinidae and Coccinellidae ) ; order Dermaptera ( Labidridae) ; order Diptera ( Syrphidae) and order Neuroptera ( Chrysopidae). All collected predacious insects were collected infested all plant parts .

**I. c.) Survey of the different spider and mite predators attacking sugar-beet crop:**

By carefully examination of sugar-beet plants, different ten predacious spiders and mites were obtained from survey. The different spiders *Philodromus* sp.(Philodromidae), *Lycorma ferox* (Lycoseidae), *Setaphis subtilis* ( Gnaphosidae), *Thomisus spinifer* (Thomesidae) and *Lycosoides coarctata* (Agelenidae) were the five collected spiders in this study . Also, *Euseius scutalis* and *Amblyseius swiriski* ( Phytoseiidae) , *Pronematus ubiquitous* and *P. rykei* (Tydeidae) and *Agistemus exertus* were the collected five mite species.

**I. d.) Survey of the different soil predacious mites associated with sugar-beet crop:**

The collected soil mites inhabiting sugar-beet crop were belonging to two suborders namely Prostigmata and Mesostigmata . The prostigmatid mites in this study were represented by 17 species belonging to 7 families which namely Cunaxidae, Cheyletidae , Tydeidae , Bdellidae , Scutacarida , Ragididae and Pyemotidae

On the other hand the **mesostigmatid mites** in this study were represented by 20 different species belonging to 7 families as follows: Ascidae, Macrochelidae, Parasitidae, Uropodidae, Rhodacaridae, Laelapidae and Ameroseiidae.

The common mites in this study were *Cheyletus eruditus*, *C. malaccensis*, *Tydeus californicus* and *Paralorryia aegyptiaca* (Suborder: Prostigmata) and *Androlaelaps aegyptiacus* and *Laelaspis astronomicus* (Suborder : Mesostigmata)

#### **I. d.) Survey of the different snails attacking sugar-beet crop:**

In this study, different five collected snails were observed and identified. These snails were *Monacha caniana*, *Limax flavus*, *Succinea purris*, *Deroceras reticulatum* and *Succinea oblonga*. The commonest collected snail was *M. caniana*.

#### **I-E.) Population fluctuation of certain economically important pests**

It was observed from the course of study that the cotton leaf worm, *Spodoptera littoralis*, The beet moth *Scrobipalpa ocellatella* and *Aphis* spp. were the most collected insects inhabiting sugar-beet crop at El-Dakahlia governorate. In case of *S. ocellatella*, the population density increased until reached the highest number at the harvest time for all plantations, while the least population density was recorded on plants of the first plantation.

However, *S. littoralis*, October plantation received the highest population density in the three seasons 2001/2002, 2002/2003 and 2003/2004. On the other hand, *Aphis* spp. As harmful insect, the highest population density of the aphid appeared in March during season 2002/2003 for plants of three cultivation

**I.F.) Population fluctuation of *Monacha cartusiana***

The highest population of *M. cartusiana* inhabiting sugar-beet observed during March and April of the three tested seasons in Aga district .On the other hand, and in case of Belkas district, the number of snails slightly increased until March which harbored the most abundant population, and then the population slightly decreased till the end of cultivation.

**II-) Biological studies****II-A. ) Biological studies of the predatory mite, *Euseius scutalis***

*Euseius scutalis* in this study reared on immature stages of *Bemisia tabaci* and *Tetranychus urticae* at 20 and 30 °C and 70 % R.H. in incubator.

Incubation period of this mite was 1.92 and 1.56 days at 20 and 30 °C, respectively for female when fed on *B. tabaci* changed to 1.00 and 0.60 days for male at same conditions. On the other hand, these periods were 1.72 and 1.35 & 0.90 and 0.59 days for the same conditions when *E. scutalis* fed on *T. urticae* immature, respectively.

Regarding the life cycle, this period lasted 8.80 & 6.81 days at 20 and 30 C when the mites female fed *B. tabaci* and 8.17 & 6.44 days on *T. urticae* at the same conditions of temperature. **On the other** hand the male lasted 5.54 & 4.30 and 5.02 & 3.93 days at the same conditions when the predatory mite fed on the two preys, respectively.

However, the predacious mite *E. scutalis* female and male took 17.12 & 15.63 and 13.52 & 13.00 days when the individuals fed on immature stages of *B. tabaci* at 20 and 30 °C , respectively during their adult life. On the other and in ease of feeding on *T. urticae* immature stages, the female life lasted 16.20 and 14.84 at 20 and 30 °C , respectively , but this period in case of male was 14.21 & 13.20 days at 20 and 30 °C , respectively.



**Food consumption of *Euseius scutalis* when fed on immature stages of *Bemisia tabaci* and *Tetranychus urticae***

The predatory mite, *E. scutalis* consumed during their life span an averaged 330.62 & 350 and 80.24 & 100.55 individuals of prey at 20 and 30 °C for female and male individuals, respectively in case of *B. tabaci*. On the other hand during the predatory mite life span, the number of *T. urticae* consumed was 355.00, 89.25 & 400.26 and 121.18 mites for female and male at 20 and 30 °C, respectively.

**II-B. ) Biological studies of the predatory mite, *Laelaspis astronomicus***

*Laelaspis astronomicus* in this study reared on free living nematode, *T. urticae* and collembola at 20 and 30 °C and 70 % R.H. in incubator.

Incubation period of this mite for male and female 1.4, 1.6 & 1.6 and 1.80 days at 20 and 30 C, respectively when the mite fed on free living nematode, These period lasted 1.32, 1.51 & 1.35 and 1.45 days when the mites fed on acarid mite, respectively on the same previously mentioned conditions. On the other hand and in case of feeding on collembola, this period took 1.600, 1.70 & 1.80 and 2.20 days, respectively.

Regarding the life cycle, this period lasted 7.70, 8.50 & 8.91 and 9.81 days when the individuals reared on free living nematode at 20 and 30°C, respectively for male and female, these periods changed to took 7.27, 8.44 & 7.44 and 7.88 days in case of feeding on *T. putrescentiae* and 8.93, 9.34 & 9.34 and 10.50 days in case of feeding on collembola respectively, when the mites fed on the previously mentioned conditions.

However, the predacious mite *Laelaspis astronomicus* male longevity was 19.20 and 20.21 days when fed on the free living nematode at 20 and 30 °C , respectively This period lasted 23.22 and 22.38 days for female at the same conditions, respectively. On the other hand, the longevity of the predator took 17.02 , 21.64 & 19.09 and 22.00 days for male and female when mites reared on acarid mite at 20 and 30 °C , respectively. In case of collembola as feeding diet , the longevity of male predators lasted 19.20 and 20.21 days at 20 and 30°C , changed to 23.22 and 22.38 days when female fed on the same diet at the same conditions.

The number of deposited eggs by the predatory female was 46.21 and 48.25 when the mites fed on free living nematode at 20 and 30 °C, respectively, This number changed to 40.21 and 50.28 in case of feeding on the acarid mite, but in case of rearing of the predator on collembola, the number of eggs was 35.20 and 40.28 eggs at the same conditions mentioned before.

#### II.C.) Biological studies of the parasitoid *Megaslia scalaris*

The incubation period of *Megaslia scalaris* eggs when fed on *M. caniana* as food was 1.1 days while the larval and pupal periods lasted 4.44 and 6.62 days, respectively. The first, second and third instar larval duration lasted 0.81, 1.11 and 2.52 days, respectively. Pre-oviposition , oiposition and post-oviposition periods were 1.3, 4.4 and 2.70 days , respectively.

#### III ) Effect of certain insecticides against sugar-beet fly *Pegomia mixta*

In this study, Dizonox gave the highest kill 98.00 % followed by Diazole 94.60 . On the other hand, Admiral and Biofly gave 30.29 and 32.58 % killing , respectively when used by the rate of recommended application.