HOST RANGE AND INCIDENCE OF *HABROLEPIS DIASPIDI* (HYMENOPTERA : ENCYRTIDEA) AS A PARASITOID OF ARMORED SCALE INSECTS (HEMIPTERA: DIASPIDIDIAE)

SHAABAN ABD-RABOU and HODA BADARY

Plant Protection Research Institute, ARC, Dokki, Giza

(Manuscript received 12 February 2012)

Abstract

The encyrtid parasitoid, *Habrolepis diaspidi* (Risbec) (Hymenoptera : Encyrtidea) is one of the most effective parasitoid associated with armored scale insects (Hemiptera: Diaspididiae). This work dealt with the host insect range and the occurance of the parasitoid, *H. diaspidi* in different localities during 2010 and 2011 in Egypt. The results indicated that the parasitoid, *H. diaspidi* was reared from 10 species of armored scale insects. The host armored scale insects were *Aonidiella aurantii* (Maskell), *Aonidiella citrina* (Coquillett), *Aspidiotus nerii* Bouche , *Chrysomphalus aonidum* (L.) , *Chrysomphalus dictyospermi* (Morgan), *Hemiberlesia lataniae* (Signoret), *Lepidosaphes beckii* (Newman), *Lepidosaphes pallida* (Maskell), *Mycetaspis personata* (Comstock), *Parlatoria ziziphi* (Lucas) (Hemiptera: Diaspididiae). Population abundance studies of *H. diaspidi* were carried out on aforementioned armored scale insects at eight locations in Egypt, being Behira , Beni Seuf, Cairo, Giza, Ismailia , North Sinai, Qalyubiya and Sharqiya .The highest rate of parasitism attained with *H. lataniae* showed 56.8 and 77.8 % during the first and second years, respectively . While lowest parasitism rates was 14.9 and 17.5 % during the two years under consideration, respectively. As a general trend *H. diaspidi* was the effective parasitoid attacking armored scale insects in Egypt.

KEY WORDS: Encyrtidea, *Habrolepis diaspidi,* Diaspididiae, armored scale insect and Host range.

INTRODUCTION

The parasitoid, *Habrolepis diaspidi* (Risbec) (Hymenoptera : Encyrtidea) is one of the most dominant parasitoid of armored scale insects (Hemiptera: Diaspididae) . Its role in controlling armored scale insects was studied by (Compere and Annecke , 1961, Trjapitzin, 1989 and Noyes and Hayat,1994). Bénassy and Euverte (1968) reported the seasonal abundance of this parasitoids. In Egypt many authors have been attracted with the parasitoid, *H. diaspidi* (Hassanein and Hamed , 1986, Abd-Rabou, 1997, Coll and Abd-Rabou, 1998, Tawfik and Mohammad, 2001 and Mohammad *et al*., 2001). *Aonidiella aurantii* (Maskell) , *Aonidiella orientalis* (Newstead) *Chrysomphalus aonidum* (Linnaeus), *Chrysomphalus dictyospermi* (Morgan), *Hemiberlesia lataniae* (Signoret), *Parlatoria ziziphi* (Lucas) were recorded as a host insects of this parasitoid by Trjapitzin (1989) , Mohammad *et al*. (2001), Cilliers

(1970, Bénassy and Euverte (1968), Tawfik and Mohammad (2001) and Abd-Rabou (1997), respectively.

The aim of this work is to study host insect range and the occurrence of the parasitoid, *H. diaspidi* in different localities in Egypt.

MATERIALS AND METHODS

Samples of armored scale insects were collected from different host plants in Egypt throughout the period of study 2010 and 2011. As this parasitoid was found to exist in ten locations a incidence was conducted on different stages of *A. aurantii* on citrus (*Citrus* sp.) in Beni Seuf*, Aonidiella citrina* (Coquillett) on citrus (*Citrus* sp.) in Behira , *Aspidiotus nerii* Bouche on oleander in Giza*, C. aonidum* on citrus (*Citrus* sp.) in Qalyubiya , *C. dictyospermi* on *Ficus nitida* in Qalyubiya, *H. lataniae* on mango (*Mangifera indica*) in Ismailia *, Lepidosaphes beckii* (Newman) on mango (*Mangifera indica*) in Sharqiya , *Lepidosaphes pallida* (Maskell) on mango (*Mangifera indica*) in Qalyubiya *Mycetaspis personata* (Comstock) on date palm in North Sinai, *P.ziziphi* on citrus (*Citrus* sp.) in Cairo. Thirty leaves inches of citrus, *Ficus nitida* , mango*,* oleander (*Oleander* sp.) and thirty leaflet of date palm (*Phonix dactyllifera*) from different locations were stored in well-ventilated glass tubes for one week for emergence the adult parasitoid and for identification and counted. Rate of parasitism was determined by dividing the number of emerging parasitoid from each by the number of hosts existing.

Simple correlation and regression values were calculated to obtain information about the relationships between the three tested weather factors and percent parasitism by studied parasitoid.

RESULTS AND DISCUSSION

Ten collected armored scale insect species were associated with the parasitoid, *H. diaspidi.* These are:

1. *Aonidiella aurantii* (Maskell)
2. *Aonidiella citrina* (Coquillett)
3. *Aspidiotus nerii* Bouche
4. *Chrysomphalus aonidum* (Linnaeus)
5. *Chrysomphalus dictyospermi* (Morgan)
6. *Hemiberlesia lataniae* (Signoret)
7. *Lepidosaphes beckii* (Newman)
8. *Lepidosaphes pallida* (Maskell)
9. *Mycetaspis personata* (Comstock)
10. *Parlatoria ziziphi* (Lucas)

1. On Aonidiella aurantii (Maskell)

The population of *A. aurantii* reached its peak in October with 7510 and 7954 individuals / sample during the first and second years, respectively (Fig.1). The parasitoid *H. diaspidi* recorded here was associated with *A. aurantii* infested citrus in Beni Seuf. The results indicated that the maximum parasitism rate reached 20.5 and 21.5 % during November in the first and second years, respectively . While the lowest parasitism rates was 1.2 and 2.6 % during February in the first and second years, respectively (Fig.2).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *A. aurantii* were non-significant (r = 0.21, 0.23 and 0.18), while significant was recorded between maximum temperature and the population of *A. aurantii* (r = 0.91). Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and % relative humidity and the mean number of *A. aurantii* were non-significant (b = 0.19, 0.31 and 0.23), while significant was proved between maximum temperature and the population of *A. aurantii* (b = 0.95) . In the second year 2011**,** statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and % of relative humidity and the mean number of *A. aurantii* were non-significant (r = 0.13, 0.25 and 0.30), while significant between maximum temperature and the population of *A. aurantii* (r = 0.90). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *A. aurantii* were non-significant (b = 0.25, 0.28, and 0.30), while significant between maximum temperature and the population of *A. aurantii* (b = 0.87) .

2. On *Aonidiella citrina* (Coquillett)

The population of *A. citrina* reached its peak in October with 457 and 154 individuals / sample during the first and second years, respectively (Fig.3). The parasitoid *H. diaspidi* recorded here associated with *A. citrina* infested citrus in Behira. The results indicated that the maximum parasitism rate reached 55.6 and 55.7 % during November in the first and second years, respectively. While the lowest parasitism rates was 11.2 and 12.6 % during January in the first and second years, respectively (Fig.4).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *A. citrina* were non-significant (r = 0.22, 0.21 and 0.24), while showed significant between maximum temperature and the population of

A. citrina (r = 0.70. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *A. citrina* were non-significant (b = 0.24, 0.38 and 0.40), while proved significant between maximum temperature and the population of *A. citrina* (b = 0.88) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and % of relative humidity and the mean number of *A. citrina* were non-significant (r = 0.34, 0.39 and 0.40), while significant between maximum temperature and the population of *A. citrina* (r = 0.79). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *A. citrina* were non-significant (b = 0.44, 0.58, and 0.36), while significant between maximum temperature and the population of *A. citrina* (b = 0.91) .

3. On Aspidiotus nerii Bouche

The population of *A. nerii* reached its peak in October and September with 4781 and 1451 individuals / sample during the first and second years, respectively (Fig.5). The parasitoid *H. diaspidi* recorded here associated with *A. nerii* infested oleander in Giza. The results indicated that the maximum parasitism rate reached 41.8 and 60.4 % during November and October in the first and second years, respectively . While the lowest parasitism rates was 15.9 and 18.9 % during January in the first and second years, respectively (Fig.6).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *A. nerii* were non-significant (r = 0.17, 0.19 and 0.15), while showed significant between maximum temperature and the population of *A. nerii* (r = 0.68. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *A. nerii* were non-significant (b = 0.14, 0.22 and 0.18), while significant between maximum temperature and the population of *A. nerii* (b = 0.66) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *A. nerii* were non-significant (r = 0.15, 0.19 and 0.26), while proved significant between maximum temperature and the population of *A. nerii* (r = 0.64). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *A. nerii* were non-significant (b = 0.14, 0.16, and 0.24),

while significant between maximum temperature and the population of *A. nerii* (b = 0.61) .

4. On *Chrysomphalus aonidum* (Linnaeus)

The population of *C. aonidum* reached its peak in October with 7421 and 7210 individuals / sample during the first and second years, respectively (Fig.7). The parasitoid *H. diaspidi* recorded here associated with *C. aonidum* infested citrus in Qalyubiya. The results indicated that the maximum parasitism rate reached 31.4 and 33.9 % during October in the first and second years, respectively . While the lowest parasitism rates was 7.7 and 10.2 % during February in the first and second years, respectively (Fig.8).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *C. aonidum* were non-significant (r = 0.40, 0.35 and 0.43), while proved significant between maximum temperature and the population of *C. aonidum* (r = 0.85. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *C. aonidum* were non-significant (b = 0.34, 0.41 and 0.29), while significant between maximum temperature and the population of *C. aonidum* (b = 0.81) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *C. aonidum* were non-significant (r = 0.39, 0.46 and 0.45), while showed significant between maximum temperature and the population of *C. aonidum* (r = 0.87). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and % relative humidity and the mean number of *C. aonidum* were non-significant (b = 0.36, 0.39, and 0.44), while significant between maximum temperature and the population of *C. aonidum* (b = 0.93) .

5. On *Chrysomphalus dictyospermi* (Morgan)

The population of *C. dictyospermi* reached its peak in October with 6210 and 4550 individuals / sample during the first and second years, respectively (Fig.9). The parasitoid, *H. diaspidi* recorded here associated with *C. dictyospermi* infested *Ficus nitida* in Qalyubiya. The results indicated that the maximum parasitism rate reached 36.8 and 52.6 % during November and October in the first and second years, respectively. While the lowest parasitism rates was 14.5 and 14.8 % during January in the first and second years, respectively (Fig.10).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *C. dictyospermi* were non-significant (r = 0.22, 0.24 and 0.26), while showed significant between maximum temperature and the population of *C. dictyospermi* (r = 0.85. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *C. dictyospermi* were non-significant (b = 0.25, 0.35 and 0.33), while significant between maximum temperature and the population of *C. dictyospermi* (b = 0.79) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *C. dictyospermi* were non-significant (r = 0.25, 0.36 and 0.39), while showed significant between maximum temperature and the population of *C. dictyospermi* (r = 0.88). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *C. dictyospermi* were non-significant (b = 0.23, 0.29 and 0.35), while significant between maximum temperature and the population of *C. dictyospermi* (b = 0.90) .

6. On *Hemiberlesia lataniae* (Signoret)

The population of *H. lataniae* reached its peak in October with 2115 and 1250 individuals / sample during the first and second years, respectively (Fig.11). The parasitoid *H. diaspidi* recorded here associated with *H. lataniae* infested mango in Ismailia. The results indicated that the maximum parasitism rate reached 56.8 and 77.8 % during October and November in the first and second years, respectively . While the lowest parasitism rates was 14.9 and 17.5 % during January in the first and second years, respectively (Fig.12).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *H. lataniae* were non-significant (r = 0.18, 0.21 and 0.25), while showed significant between maximum temperature and the population of *H. lataniae* (r = 0.83. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *H. lataniae* were non-significant (b = 0.32, 0.35 and 0.35), while significant between maximum temperature and the population of *H. lataniae* (b = 0.89) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *H. lataniae* were non-significant (r = 0.24, 0.23 and 0.31), while significant between maximum temperature and the population

of *H. lataniae* (r = 0.82). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *H. lataniae* were non-significant (b = 0.38, 0.40, and 0.43), while significant between maximum temperature and the population of *H. lataniae* (b = 0.82) .

7. **On *Lepidosaphes beckii* (Newman)**

The population of *L. beckii* reached its peak in October with 6500 and 6510 individuals / sample during the first and second years, respectively (Fig.13). The parasitoid *H. diaspidi* recorded here associated with *L. beckii* infested mango in Sharqiya. The results indicated that the maximum parasitism rate reached 30.8 and 31.9 % during November and October in the first and second years, respectively. While the lowest parasitism rates was 5.4 and 10.6 % during February and January in the first and second years, respectively (Fig.14).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *L. beckii* were non-significant (r = 0.45, 0.44 and 0.35), while significant between maximum temperature and the population of *L. beckii* (r = 0.85. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *L. beckii* were non-significant (b = 0.36, 0.39 and 0.31), while significant showed between maximum temperature and the population of *L. beckii* (b = 0.95) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *L. beckii* were non-significant (r = 0.45, 0.42 and 0.30), while significant between maximum temperature and the population of *L. beckii* (r = 0.92). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *L. beckii* were non-significant (b = 0.47, 0.45, and 0.49), while significant between maximum temperature and the population of *L. beckii* (b = 0.80) .

8. On *Lepidosaphes pallida* (Maskell)

The population of *L. pallida* reached its peak in October with 8210 and 7200 individuals / sample during the first and second years, respectively (Fig.15). The parasitoid *H. diaspidi* recorded here associated with *L. pallida* infested mango in Qalyubiya. The results indicated that the maximum parasitism rate reached 25.4 and 25.7 % during November in the first and second years, respectively . While the

lowest parasitism rates was 3.6 and 4.2 % during February and March in the first and second years, respectively (Fig.16).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *L. pallida* were non-significant (r = 0.14, 0.12 and 0.18), while significant between maximum temperature and the population of *L. pallida* (r = 0.58. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *L. pallida* were non-significant (b = 0.12, 0.15 and 0.18), while significant between maximum temperature and the population of *L. pallida* (b = 0.65) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *L. pallida* were non-significant (r = 0.23, 0.28
and 0.31), while proved significant between maximum temperature and the population of *L. pallida* (r = 0.71). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *L. pallida* were non-significant (b = 0.11, 0.15, and 0.18), while significant between maximum temperature and the population of *L. pallida* (b = 0.85) .

9. On *Mycetaspis personata* (Comstock)

The population of *M. personata* reached its peak in October with 7415 and 6231 individuals / sample during the first and second years, respectively (Fig.17). The parasitoid *H. diaspidi* recorded here associated with *M. personata* infested date palm in North Sinai. The results indicated that the maximum parasitism rate reached 41.4 and 44.7 % during November and October in the first and second years, respectively . While the lowest parasitism rates was 12.7 and 13.8 % during March and January in the first and second years, respectively (Fig.18).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *M. personata* were non-significant (r = 0.44, 0.48 and 0.47), while significant between maximum temperature and the population of *M. personata* (r = 0.85). Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *M. personata* were non-significant (b = 0.42, 0.44 and 0.35), while significant between maximum temperature and the population of *M. personata* (b = 0.91) . In the second year 2011, statistical analysis showed that the

simple correlation between the population of parasitoid, minimum temperature and % of relative humidity and the mean number of *M. personata* were non-significant (r = 0.39, 0.43 and 0.46), while showed significant between maximum temperature and the population of *M. personata* (r = 0.97). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *M. personata* were non-significant (b = 0.49, 0.46, and 0.42), while significant between maximum temperature and the population of *M. personata* (b = 0.95) .

10. On *Parlatoria ziziphi* (Lucas)

The population of *P. ziziphi* reached its peak in October with 7351 and 6541 individuals / sample during the first and second years, respectively (Fig.19). The parasitoid *H. diaspidi* recorded here associated with *P. ziziphi* infested citrus in Cairo. The results indicated that the maximum parasitism rate reached 24.9 and 27.6 % during October in the first and second years, respectively. While the lowest parasitism rates was 4.5 and 5.6 % during February in the first and second years, respectively (Fig.20).

In the first year 2010, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and percent of relative humidity and the mean number of *P. ziziphi* were non-significant (r = 0.14, 0.20 and 0.19), while significant between maximum temperature and the population of *P. ziziphi* (r = 0.70. Also, Statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *P. ziziphi* were non-significant (b = 0.20, 0.32 and 0.19), while significant between maximum temperature and the population of *P. ziziphi* (b = 0.72) . In the second year 2011, statistical analysis showed that the simple correlation between the population of parasitoid, minimum temperature and %of relative humidity and the mean number of *P. ziziphi* were non-significant (r = 0.15, 0.14 and 0.22), while significant between maximum temperature and the population of *P. ziziphi* (r = 0.74). Also, statistical analysis showed that the simple regression for changing the population of parasitoid, minimum temperature and %relative humidity and the mean number of *P. ziziphi* were non-significant (b = 0.34, 0.38, and 0.42), while significant between maximum temperature and the population of *P. ziziphi* (b = 0.86) .

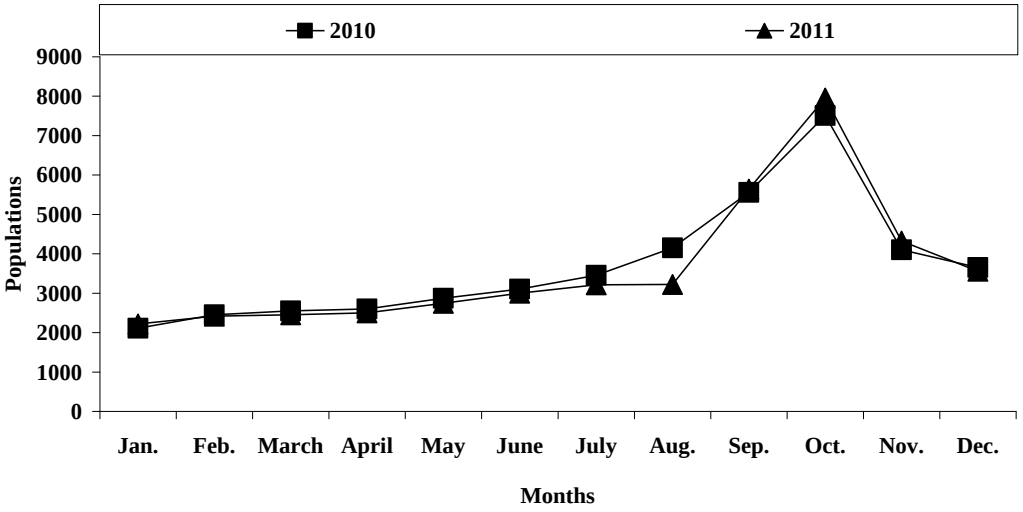

Fig.1: Population dynamics of *Aonidiella aurantii* on citrus in Beni-Suef

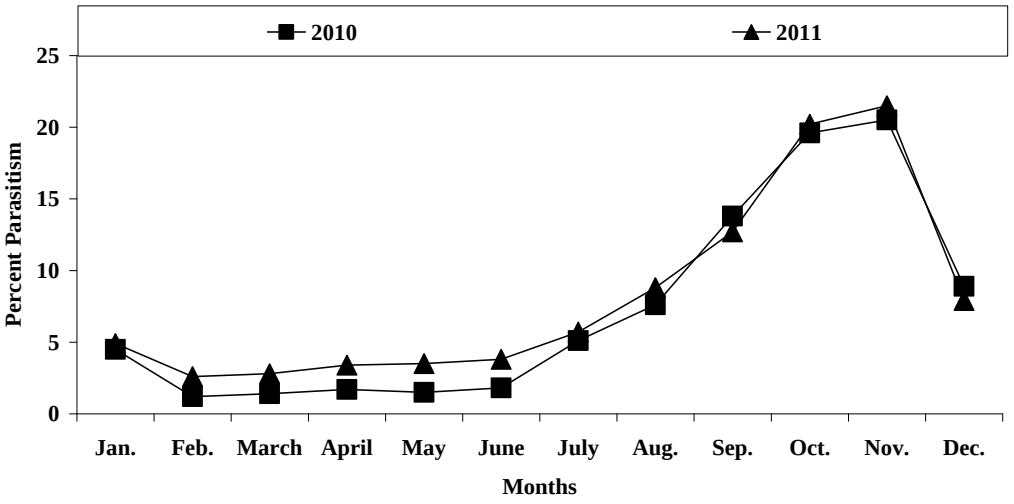

Fig.2: Perecent Parasitism by *Habrolepis diaspidi* associated with *Aonidiella aurantii* on citrus in Beni-Suef

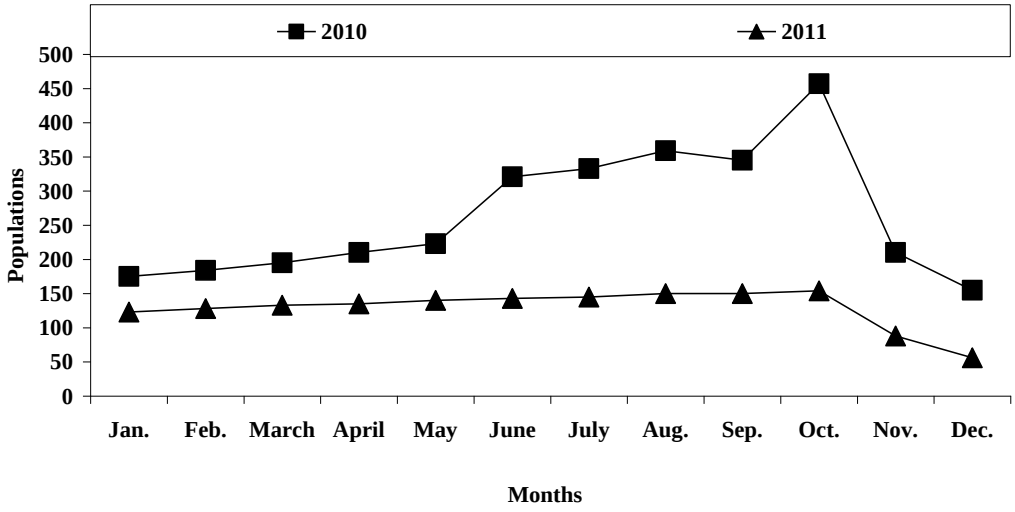

Fig.3: Population dynamics of *Aonidiella citrina* on citrus in Behira

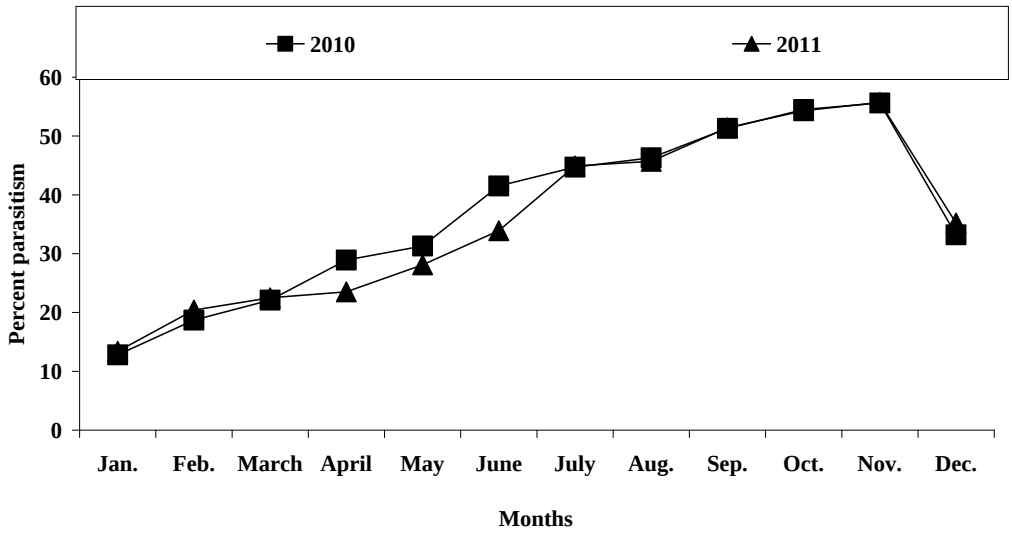

Fig.4: Percent parasitism by *Habrolepis diaspidi* associated with *Aonidiella citrina* on citrus in Behira

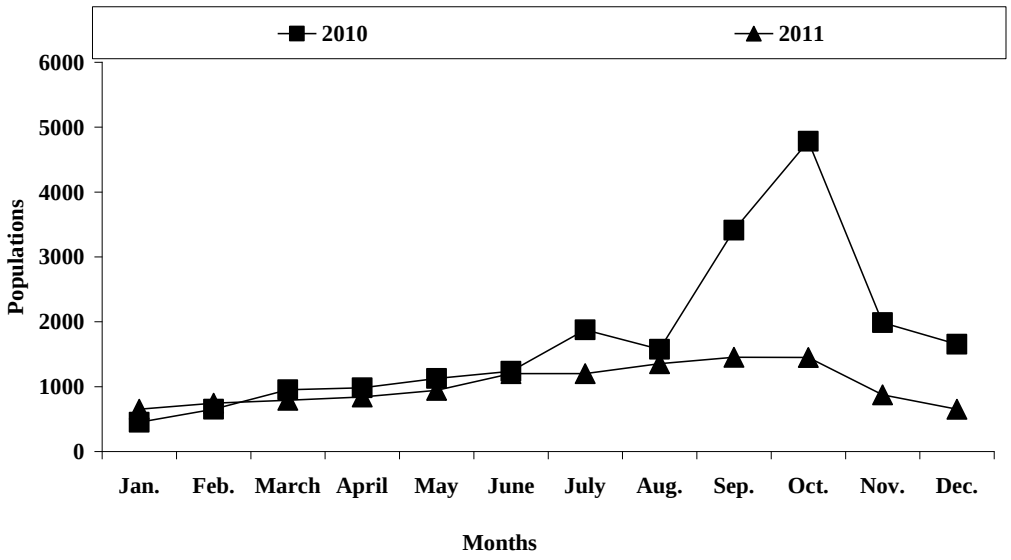

Fig.5: Population dynamics of *Aspidiotus nerii* on oleander in Giza

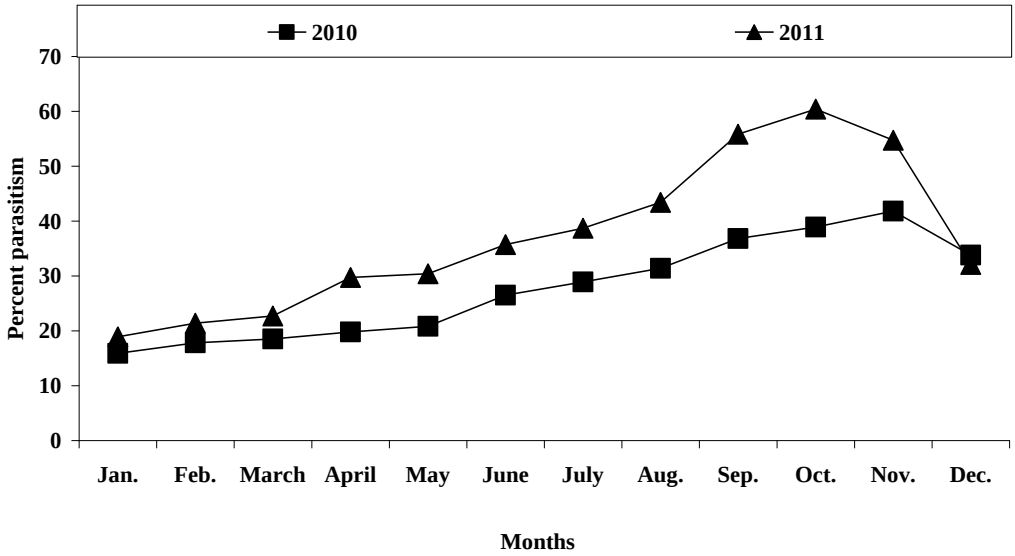

Fig.6: Percent parasitism by *Habrolepis diaspidi* associated with *Aspidiotus nerii* on oleander in Giza

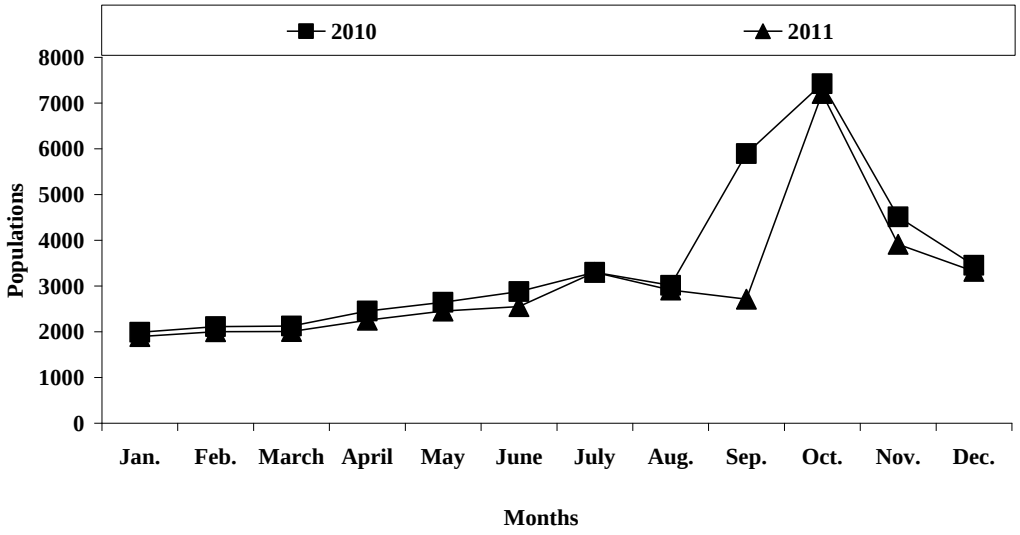

Fig.7: Population dynamics of *Chrysomphalus aonidum* on citrus in Qalyubiya

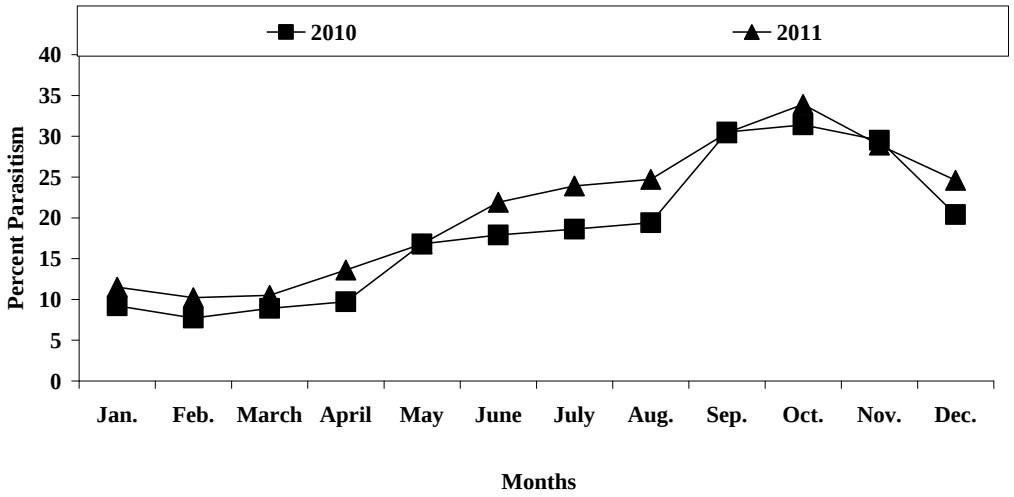

Fig.8: Perecent Parasitism by *Habrolepis diaspidi* associated with *Chrysomphalus aonidum* on citrus in Qalyubiya

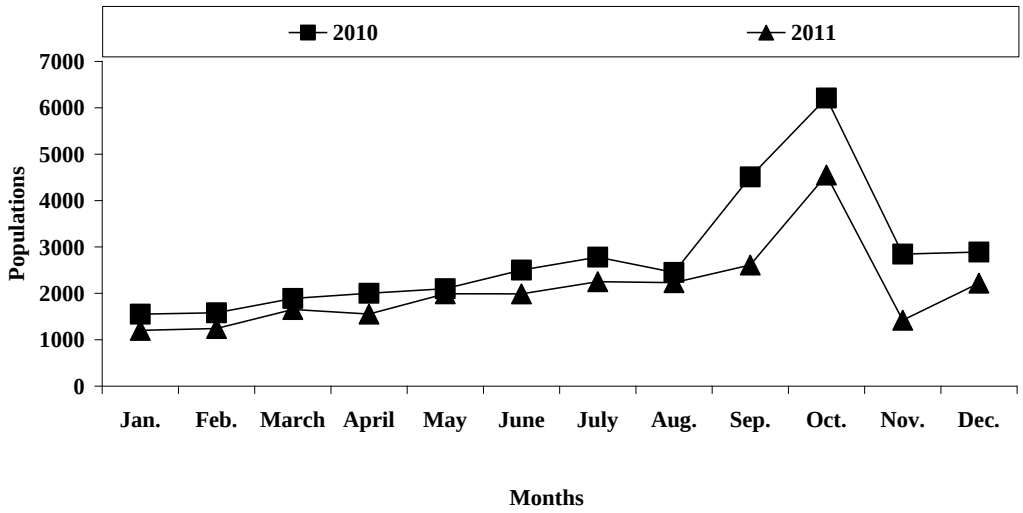

Fig.9: Population dynamics of *Chrysomphalus dictyospermi* on *Ficus nitida* in Qalyubiya

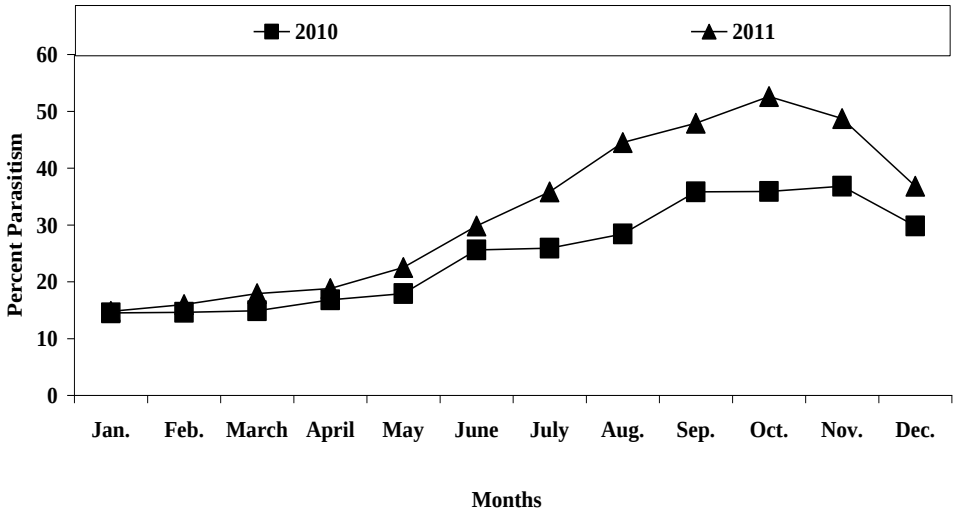

Fig.10: Perecent parasitism by *Habrolepis diaspidi* associated with *Chrysomphalus dictyospermi* on *Ficus nitida* in Qalyubiya

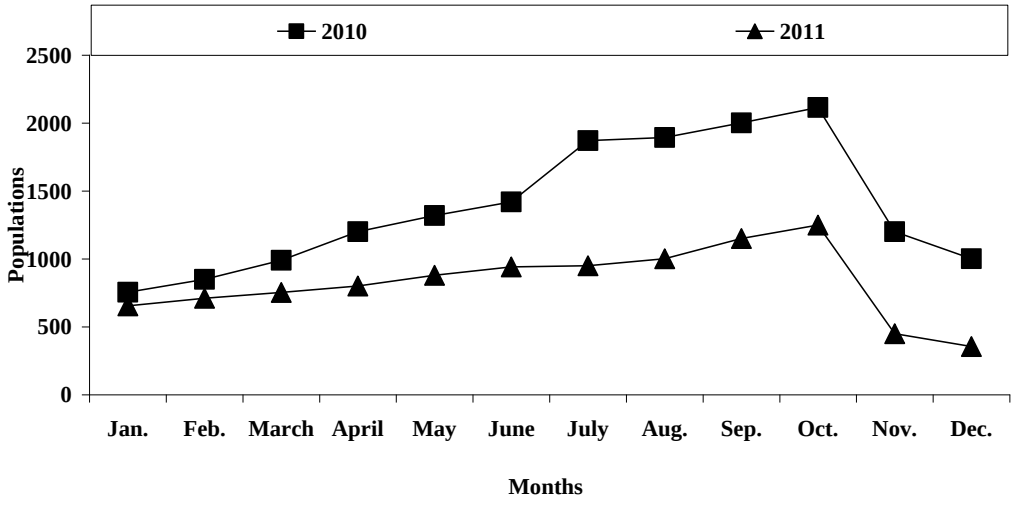

Fig.11: Population dynamics of *Hemiberlesia lataniae* on mango in Ismailia

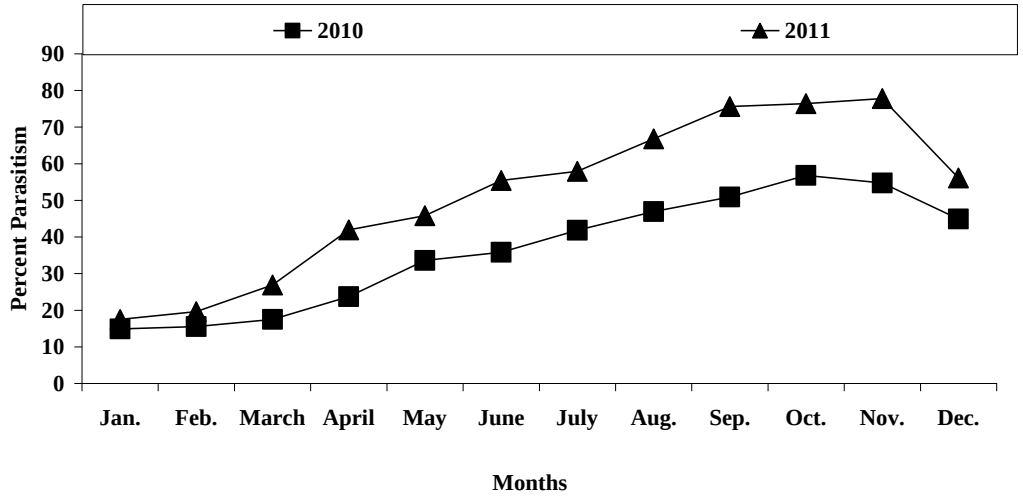

Fig.12: Percent parasitism by *Habrolepis diaspidi* associated with *Hemiberlesia lataniae* on mango in Ismailia

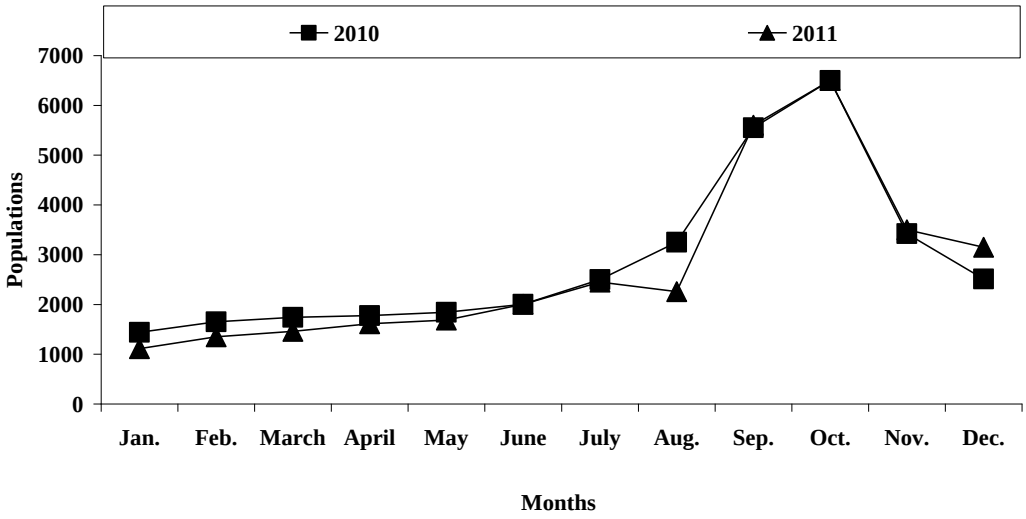

Fig.13: Population dynamics of *Lepidosaphes beckii* on mango in Sharqyia.

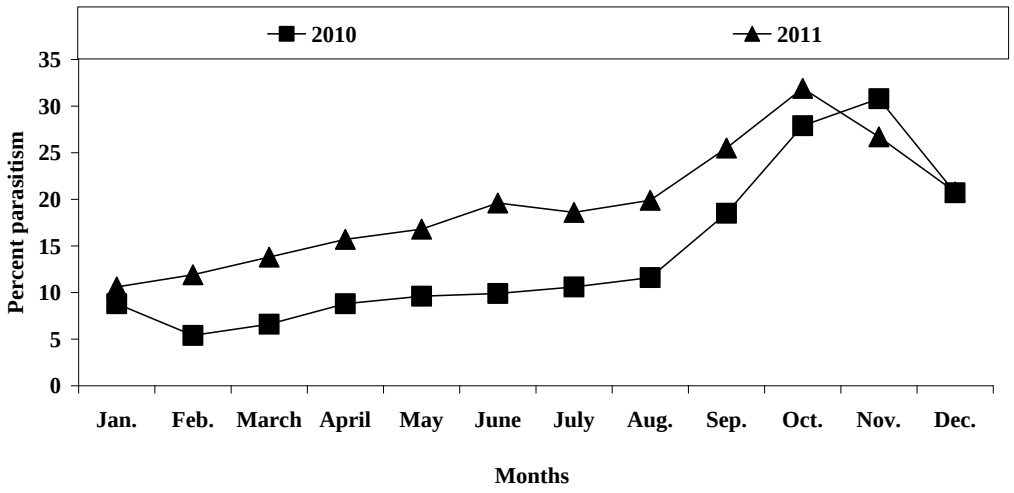

Fig.14: Percent parasitism by *Habrolepis diaspidi* associated with *Lepidosaphes beckii* on mango in Sharqyia.

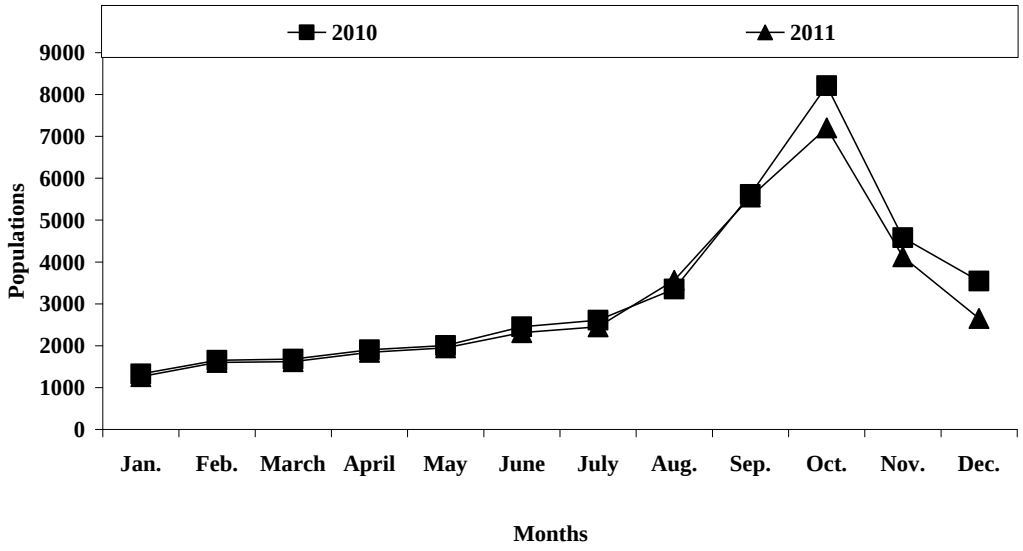

Fig.15: Population dynamics of *Lepidosaphes pallida* on mango in Qalyubiya.

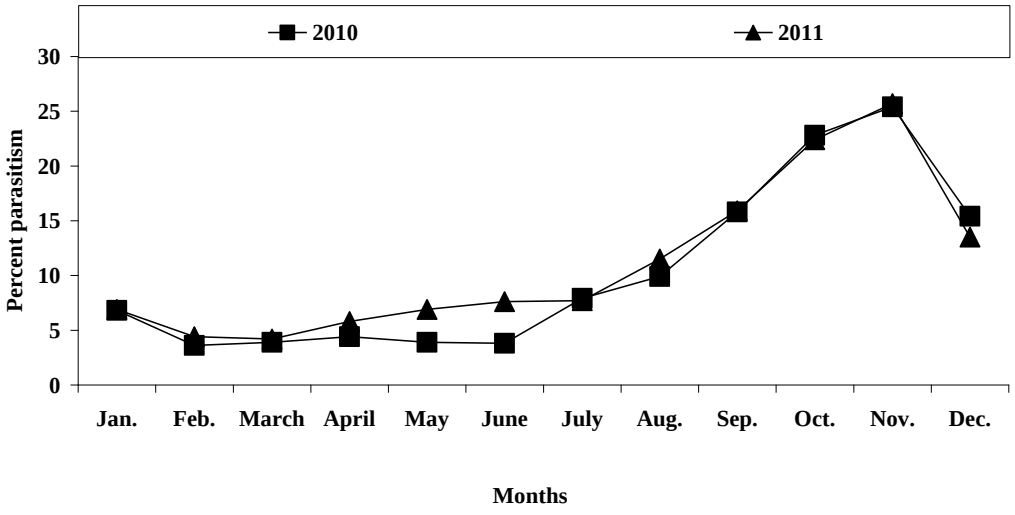

Fig.16: Percent parasitism by *Habrolepis diaspidi* associated with *Lepidosaphes pallida* on mango in Qalyubiya.

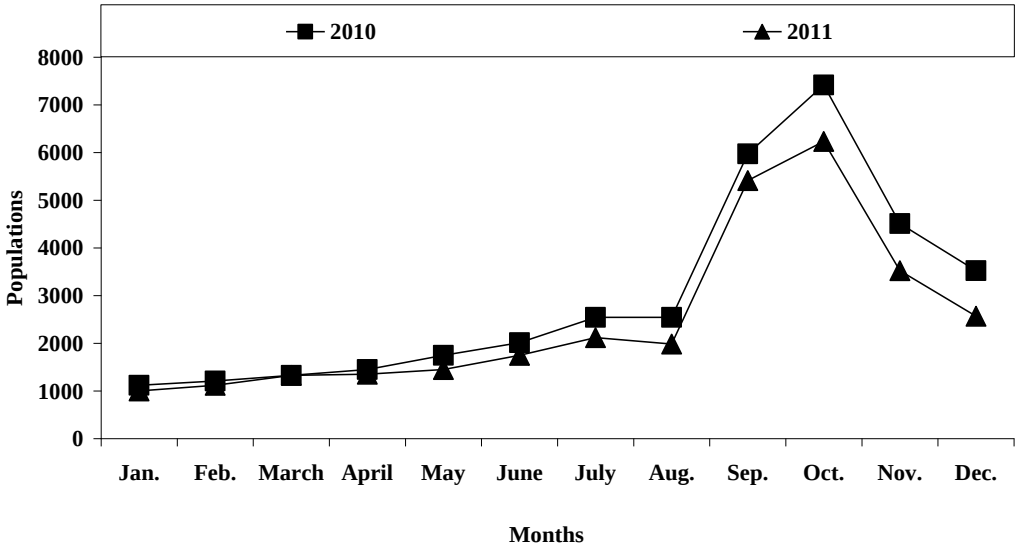

Fig.17: Population dynamics of *Mycetaspis personata* on date palm in North Sinai .

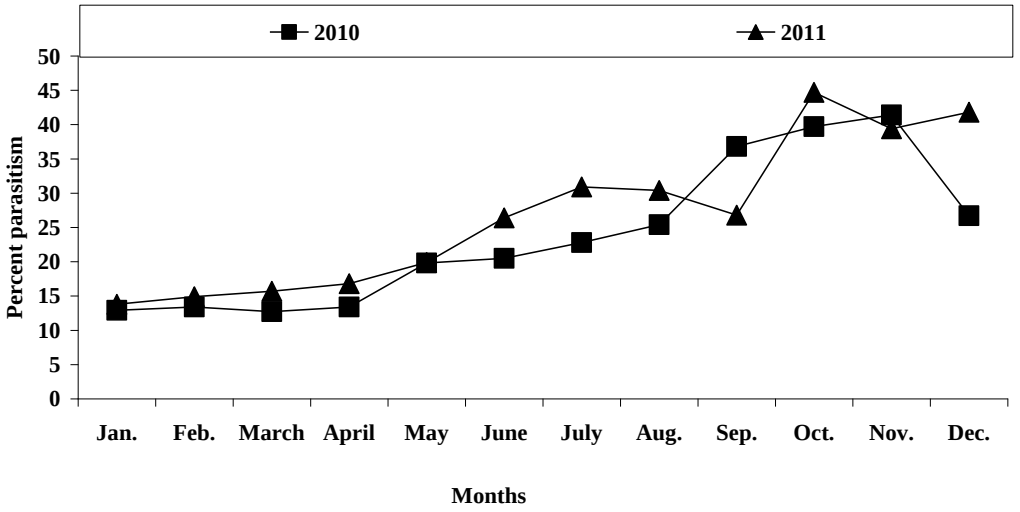

Fig.18: Percent parasitism by *Habrolepis diaspidi* associated with *Mycetaspis personata* on date palm in North Sinai

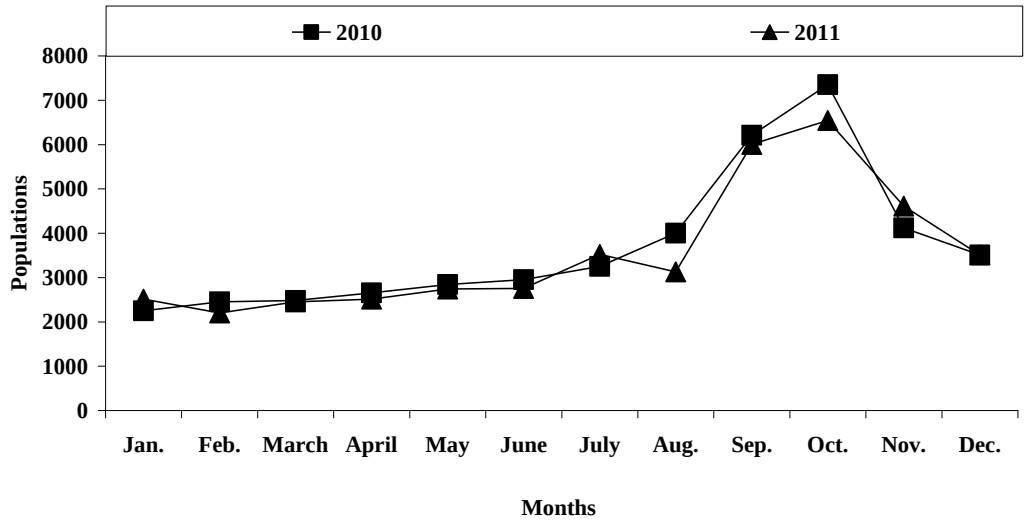

Fig.19: Population dynamics of *Parlatoria ziziphi* on citrus in Cairo

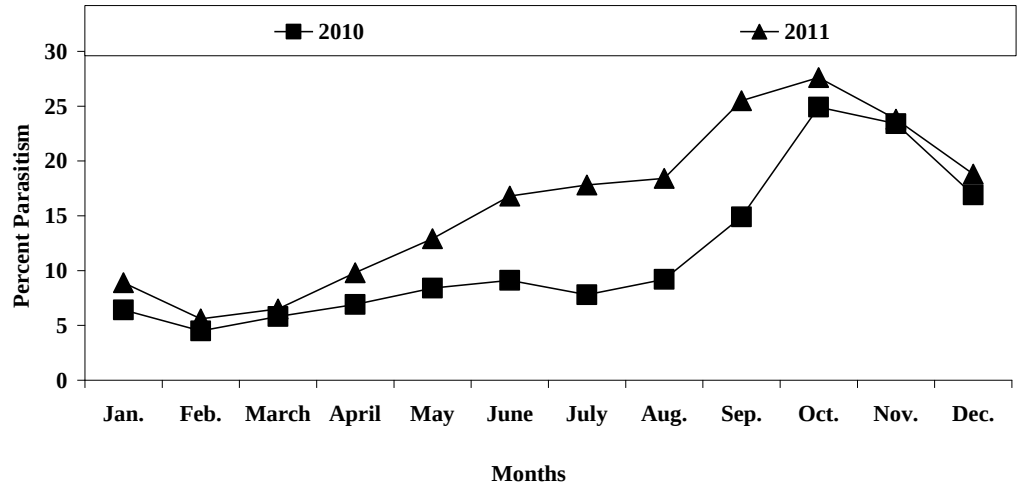

Fig.20: Perecent Parasitism by *Habrolepis diaspidi* associated with *Parlatoria ziziphi* on citrus in Cairo

REFERENCES

1. Abd-Rabou, S. 1997. Parasitoids attacking some species of scale insects (Homoptera: Coccoidea: Diaspididae) in Egypt. Proceeding of the First Scientific Conference of Agricultural Sciences, Faculty of Agric. Assiut Univ., Vol. II, 727-736.
2. Bénassy, C., G. Euverte. 1968. Notes on *Chrysomphalus dictyospermi* in Morocco. Al Awamia 24:95-111.
3. Coll, M., S. Abd-Rabou. 1998. Effect of oil emulsion sprays on parasitoids of the black parlatoria, *Parlatoria ziziphi*, in grapefruit BioControl 43(1):29-37.
4. Cilliers, C. J. 1970. Observations on circular purple scale *Chrysomphalus aonidum* (Linn.), and two introduced parasites in western Transvaal citrus orchards Biocontrol Volum 16(3):1971 127-148.269-284.
5. Compere, H., D.P. Annecke. 1961. Descriptions of parasitic Hymenoptera and comments (Hymenopt.: Aphelinidae, Encyrtidae, Eulophidae). Journal of the Entomological Society of Southern Africa 24:44.
6. Hassanein, F.A., A.R. Hamed. 1986. On the population dynamics of *Hemiberlesia lataniae* Signoret and its parasite *Habrolepis apsidioti* Compere and Annecke in Egypt (Homoptera: Diaspididae, Hymenoptera: Encyrtidae). Bulletin of the Entomological Society of Egypt (Economic Series) 1986:63-72.
7. Mohammad, Z.K., M.W. Ghabbour , M.H. Tawfik. 2001. Population dynamics of *Aonidiella orientalis* (Newstead) (Coccoidea: Diaspididae) and its parasitoid *Habrolepis aspidioti* Compere & Annecke (Hymenoptera: Encyrtidae). Entomologica, Bari 33:413-418
8. Noyes, J.S. and M. Hayat. 1994. Oriental mealybug parasitoids of the Anagyrini (Hymenoptera: Encyrtidae) pp.407 CAB International, Oxon, UK.
9. Tawfik, M.H., Z.K. Mohammad. 2001. Ecological studies of two scale insects (Hemiptera, Coccoidea) on *Morus alba* in Egypt. Bollettino di Zoologia Agraria e Bachicoltura 33(3):267-273.
10. Trjapitzin, V.A. 1989. Parasitic Hymenoptera of the Fam. Encyrtidae of Palaearctics. *Opredeliteli po Faune SSSR* 158:293 Zoologicheskim Institutom Akademii Nauk SSR, Leningrad

المدى العوائلى وتواجد طفيل هابروليبس ديا سبيدس

على الحشرات القشرية المسلحة فى مصر

شعبان عبد ربه ، هدى بدارى

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقي – جيزة

يعتبر طفيل هابروليبس ديا سبيدس من أهم الطفيليات المؤثرة فى المكافحة البيولوجية للحشرات القشرية المسلحة . تم فى هذا العمل دراسة دور هذا الطفيل فى المكافحة البيولوجية للحشرات القشرية المسلحة فى مصر أثناء الفترة من 2010-2011 بالاضافة الى المدى العوائلى لهذا الطفيل. وقد أظهرت النتائج مصاحبة طفيل هابروليبس ديا سبيدس ل 10 أنواع من الحشرات القشرية المسلحة وهى

Aonidiella aurantii (Maskell)*, Aonidiella citrina* (Coquillett), *Aspidiotus nerii* Bouche *, Chrysomphalus aonidum* , *Chrysomphalus dictyospermi* (Morgan), *Hemiberlesia lataniae* (Signoret)*, Lepidosaphes beckii* (Newman), *Lepidosaphes pallida* (Maskell), *Mycetaspis personata* (Comstock), *Parlatoria ziziphi* (Lucas)

وقد تم دراسة التوزيع الموسمى لهذا الطفيل اثناء الفترة من 2010 -2011 على الأنواع سابقة الذكر فى ثمانية محافظات وهى بنى سويف و الجيزة و الأسماعيلية و جنوب سيناء و القاهرة و البحيرة و القليوبية و الشرقية. وقد سجل أعلى درجة تطفل 56.8 و 77.8% مع مصاحبة لحشرة المانجو القشرية المسلحة كما بلغت أقل نسبة للتطفل 14.9 و 17.5 % خلال عامى الدراسة . و يتضح من النتائج ان طفيل هابروليبس ديا سبيدس من الطفيليات الهامة فى مكافحة الحشرات القشرية المسلحة مصر.