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EFFICIENCY OF COLORED STICKY TRAPS INCAPTURING CABBAGE APHID, *Brevicoryne brassicae*, L., AND ITS BENIFICIAL INSECTS IN CABBAGE FIELDS AT FAYOUM GOVERNORATE.

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ABSTRACT

Using differently coloured sticky paper traps counts of captured insects of cabbage aphid, *Brevicoryne brassicae* as well as of its predators; *Orius* spp. and *Paederus alfierii* and its parasitoid *Aphidoletes aphidimyza* were carried out in two years (1998 and 1999) in Fayoum governorate. The obtained data showed that the white sticky traps were the best for capturing the cabbage aphid *B. brassicae* followed by the yellow one, then came the blue, green and red traps. The time course of count of trapped insects showed two phases : the first started on 28th of February and ended on 17th of March with a peak on 13th of March, while the second phase started on 3rd of April and ended on 24th of April with a peak on 10th of April. The other coloured sticky traps were less efficient and it can be arranged in the descending order as follows : white > yellow > blue > green > red. All traps showed the time phases of the time course of captured counts. Concerning the predators and parasites of *B. brassicae*, white traps were far more efficient in capturing them, while green traps were far inefficient.

INTRODUCTION

The cabbage aphid *Brevicoryne brassicae* L. is a serious pest in Egypt because it causes serious damage to economically important cruciferous plant. Arkhipov (1985) mentioned the cabbage aphid, *B. brassicae* as well as crucifer bug, *Eurodema* spp. were reported as serious pest of crucifers in USSR, eggs of *B. brassicae* overwinter on cabbage stumps and weeds, while adults and nymphs overwinter only in central Asia and in the Black Sea Coast of the Caucuses. Adults migrate from cruciferous weeds and seeds plants to cabbage in the second half of summer, forming large colonies. Colored sticky paper traps were used to attract *Delia antiqua* in onion fields in British Columbia and their wave length were taken in consideration (Vernon and Bartel, 1985). They authors noted that white traps were the best in trapping *D. antiqua*. Coloured traps white, yellow, grey and blue were tested for their suitability for trapping *D. antiqua* and *Thrips tabaci* Lind. (Vernon and Borden, 1983), who reported that yellow traps were most attractive for these insects. Hegab and Metwally (1991) used four modified yellow sticky paper traps for estimating the population density of whiteflies, *Bemesia tabaci*, (Gennandius) jassids and *Aphis gossypii* Glover and they reported that these traps caught some predators. Their data revealed certain significant effects on the activity of pests and their predators. Ahmed (2000) emphasized the use of yellow sticky paper traps in the control of cabbage aphid, *B. brassicae* and reported that the use of the yellow sticky paper traps

increased the infestation of cabbage by the aphid pest as they trapped a lot of the best natural enemies and thus they created suitable conditions for the reproduction of the pest.

The present work aims to study the efficiency of different coloured sticky traps in attracting cabbage aphid *Brevicoryne brassicae* and its beneficial insects in cabbage fields.

MATERIALS AND METHODS

At Fayoum governorate, an area of half feddan was cultivated with cabbage plants. No insecticides were applied throughout the experimentation period which extended from 2*th* of February to 24*th* of April of the years 1998 and 1999.

Coloured sticky traps :

For the evaluation of the efficiency of differently coloured sticky traps (white, yellow, blue, green and blue) was carried as follows : coloured card boards 20 x 30 cm, coated with sticky material were fixed to wood wedges. Five traps of each colour were used for the experimentation area. One trap of each colour was fixed at each corner of the experimentation area and one at the centre. Traps were fixed at the same height as that of the cabbage plants. The traps were replaced by new ones weekly. Counts of the trapped cabbage aphid *B. brassicae* and its predators *Orius* spp. and *Paederus alfierii* Koch were carried out for an area of 10 cm² of each trap and repeated four times. For counting the parasite of cabbage aphid trapped aphids were kept on a piece of cabbage leaf in a Petri dish and examined daily to count the emerging parasite.

RESULTS AND DISCUSSION

A- Efficiency of differently coloured sticky traps :

1- White coloured sticky traps :

Fig. (1) show that white sticky traps were the best in tapping the cabbage aphid *B. brassicae* insects. During the experimentation period of the year 1998 captured aphids on 28th February were 6.3 individuals/10 cm² of the trap, count slightly increased after one week to reach 6.7 individuals/10 cm² of the trap on 6th of March, then, it sharply increased to reach a maximum of 13 individuals/10 cm² on 13th of March. During the next week, count sharply dropped to 7.3 individuals/10 cm² on 20th of March. Drop continued to reach 3.1 and 2.2 individuals/10 cm² on 27th of March and on 3rd of April respectively. In the following week count raised to reach a level of 6.2 individuals/10 cm² on 10th of April; however, this rise was followed by gradual drop to reach a level of 5.1 individuals on 17th of April and at last 2.0 individuals/10 cm².

Summarizing the above mentioned data on the count of captured individuals during the experimentation period showed two peaks. The highest was recorded on 13th of March, while the second slight one was on 19th of April.

Following the time course of the count of captured population of *B. brassicae* during the experimentation period of the year 1999, it can be concluded that it ran in a manner similar to that of the previous year, *i.e.* the year 1998. In the year 1999, the level of captured individuals started at a low level of 4.2 individuals/10 cm^2 on 28th if February, then it increased slightly through the first week to reach a level of 5 individuals/10 cm^2 on 6th of March then it raised to reach a lower maximum of 6.1 individuals/10 cm^2 on 13th March. This was followed by successive drops during the following three weeks to reach levels of 4.0, 1.0 and 0.5 individuals/10 cm^2 on 20th, 27th of March and 3rd of April, respectively. Thus, counts of captured individuals of *B. brassicae* ran the experimentation periods of the year 1998 and 1999 in parallel manner showing two phases : the first started on 28th of February during which count increased to record a peak on 13th of March with a fall on 27th of march, while the second phase started at a low level on 3rd of April, increased to a peak on 10th of April, then a fall on 24th of April.

2- Yellow coloured traps :

Fig. (2) Show the count of captured *B. brassicae* on the yellow traps show that these traps captured less numbers of this insect than those by white traps during the experimentation periods of either the year 1998 or 1999. Count started at a low level on 28th of February, slightly increased on 6th of March to reach a maximum on 13th of March. This was followed by sharp drop on 20th of March then slightly increased to realize a a low peak on 10th of April and at last a final drop on 24th of April. It is clear that using yellow traps the captured count through the experimentation period followed -though at a low level- the same time course as recorded for the white traps, *i.e.* two phases, the first with a peak on 13th of March, while the second with a peak on 10th of April. It can be concluded that yellow traps were less efficient in capturing *B. brassicae* compared to white traps.

3- Blue traps :

Fig. (3) shows that the blue traps captured low numbers of *B. brassicae*. During the experimentation period, blue traps sometimes failed to capture any of the pest. However, slight indications of two rises on 13th of March and 10th of April could be observed. It is clear that, blue traps are far inefficient in capturing *B. brassicae*. It can be concluded that the time course of trapped insects showed the two phases recorded for either white or yellow traps.

4- Green traps :

Fig. (4) shows clearly that green traps are far inefficient in capturing *B. brassicae*. However, traces of two phases with slight rises on 13*th* of March and 10th of April could be detected.

5- Red traps :

Fig. (5) shows that red traps are great inefficient in trapping *B. brassicae*.

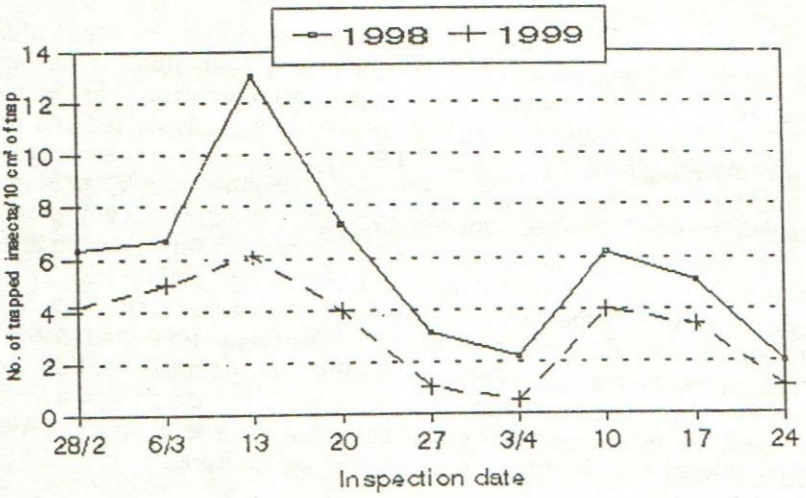

Fig. (1) Population density of B. brassicae trapped by white traps/10 cm of trap during the two Seasons of study.

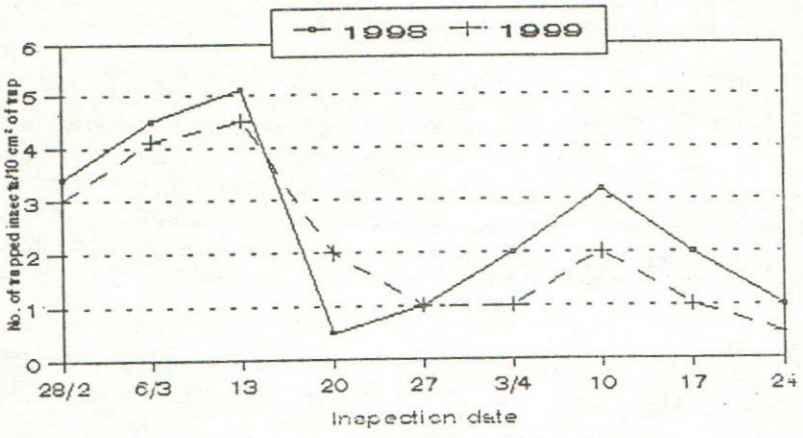

Fig. (2) Population density of *B. brassicae* trapped by yellow traps/10 cm of trap during the two seasons of study.

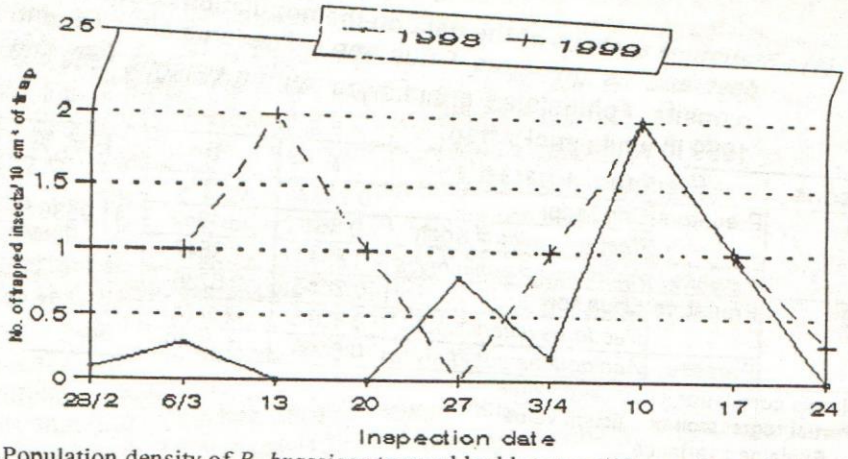

Fig. (3) Population density of *B. brassicae* trapped by blue traps/10 cm of trap during the two seasons of study.

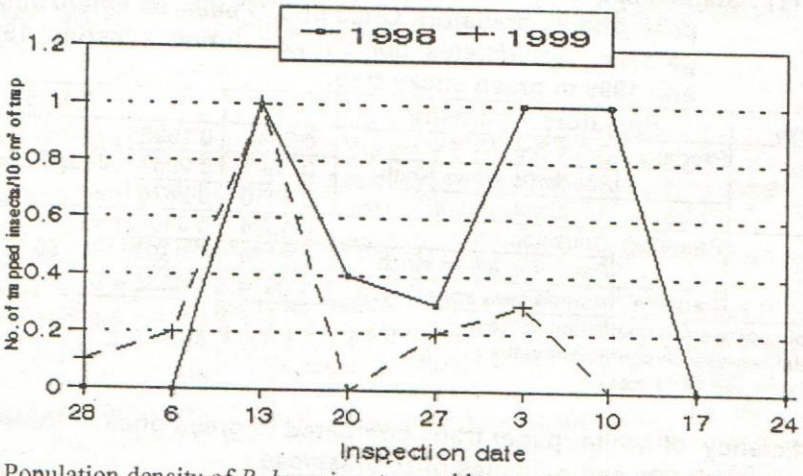

Fig. (4) Population density of *B. brassicae* trapped by green traps/10 cm of trap during the two seasons of study.

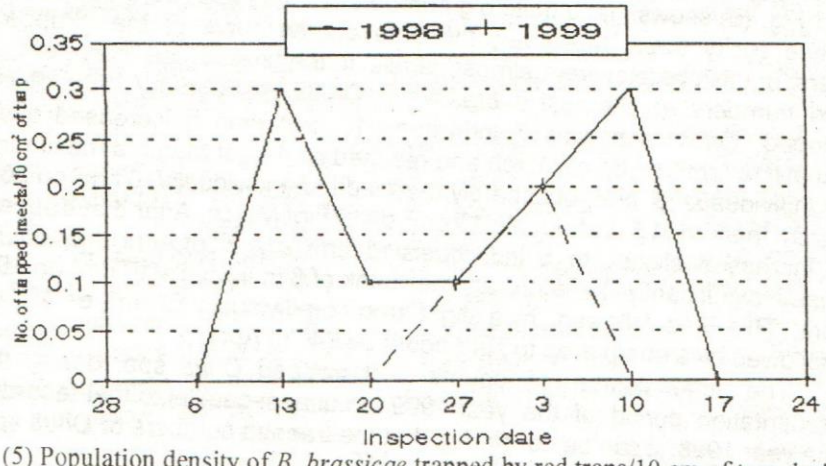

Fig. (5) Population density of *B. brassicae* trapped by red traps/10 cm of trap during the two seasons of study.

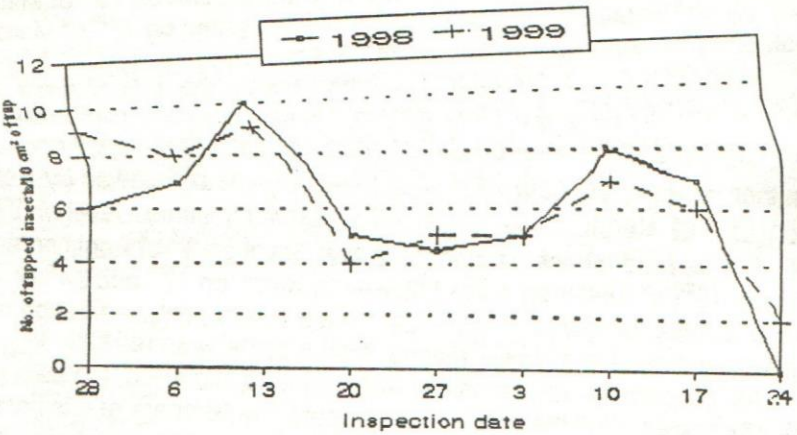

Fig. (6) Population density of the predator *Orius* spp. trapped by white traps/10 cm of trap during the two seasons of study.

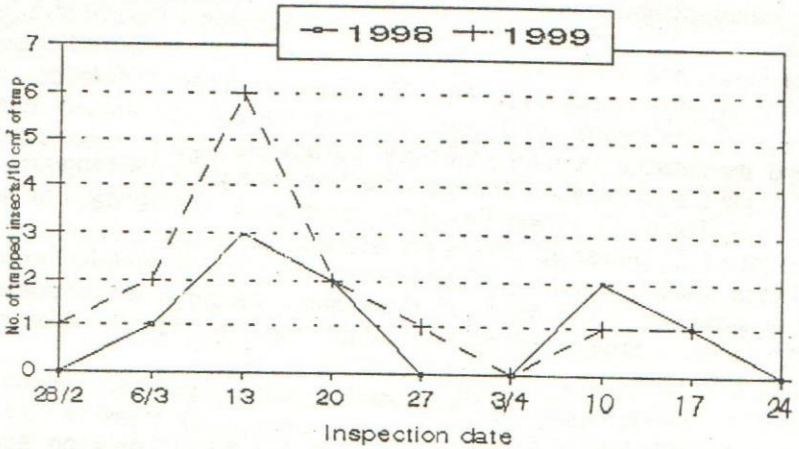

Fig. (7) Population density of the predator *P.alfierii* trapped by white traps/10 cm of trap during the two seasons of study.

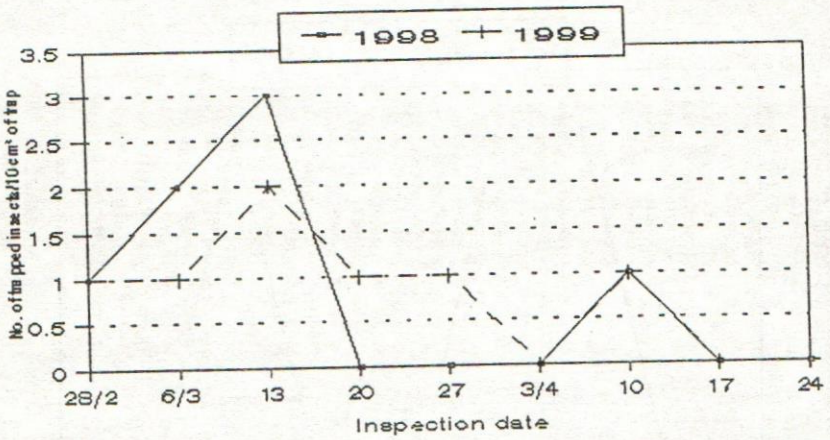

Fig. (8) Population density of the predator *A. aphidimyza* trapped by white traps/10 cm of trap during the two seasons of study.

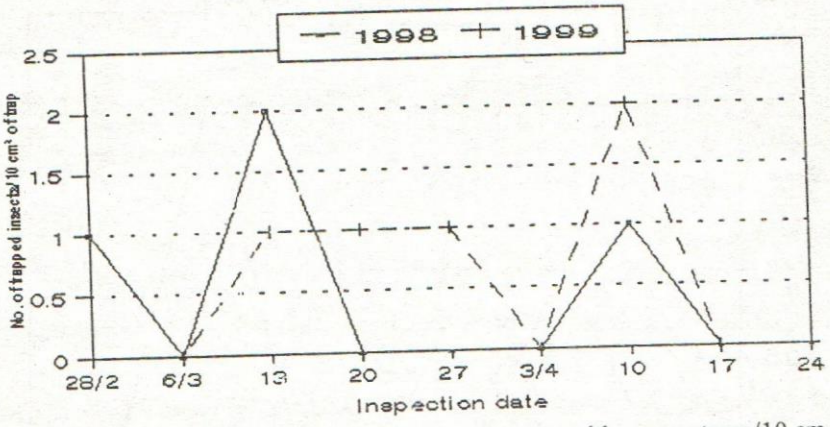

Fig. (9) Population density of the predator *Orius* spp. trapped by green traps/10 cm of trap during the two seasons of study.

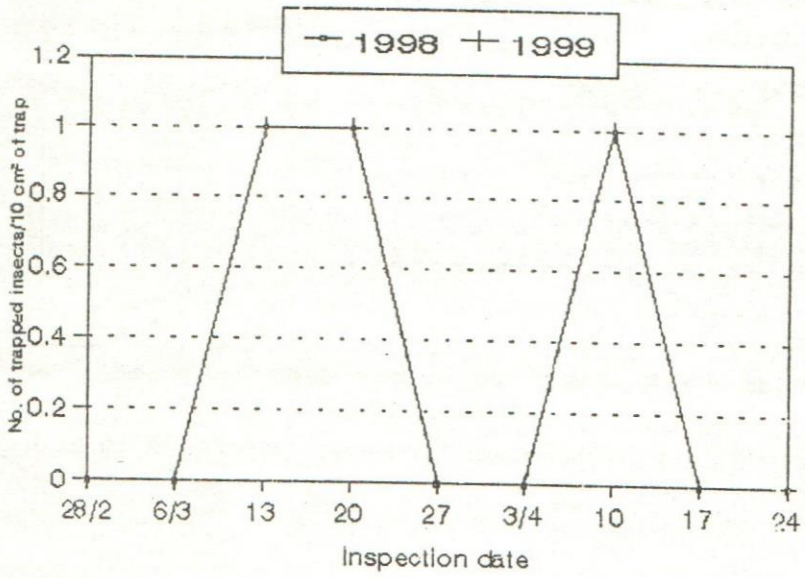

Fig. (10) Population density of the predator *P. alfierii* trapped by green traps/10 cm of trap during the two seasons of study.

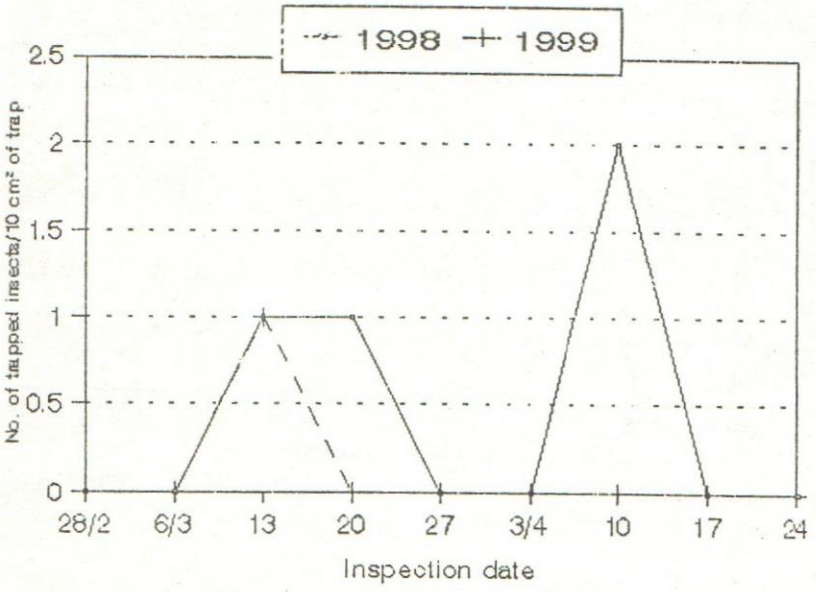

Fig. (11) Population density of the predator *A. aphidimyza* trapped by green traps/10 cm of trap during the two seasons of study.

cabbage pest *B. brassicae* but even were of deleterious effect as they captured a lot of the pest natural enemies which favoured the infestation of cabbage by its pest. Our data are in agreement with those of Vernon and Borden (1983) who found that white traps were more attractive to *D. antiqua*, also Vernon *et al.* (1989) found that traps painted white were 4 times more attractive to *D. antiqua*. Vernon (1986) in British Columbia indicated that colours with peak reflective wave lengths between 400 and 470 nm, at or above 30 % reflectance, were the most preferred to adults of *Detia antiqua*.

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كفاءة المصايد الورقية الملونة فى إصطياد منّ الكرنب وحشراته النافعة من حقول الكرنب فى محافظة الفيوم

سعاد على على إبراهيـــــم
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درست كفاءة مصايد ورقية مختلفة الألوان لإصطياد منّ الكرنـــب وبعـض مفترســاته وطفيلياته. وقد أظهرت النتائج أن المصايد الورقية البيضاء هى الأكفـأ فى إصطياد منّ الكرنـب. وقد أوضح عدد المنّ المصطاد أنه يمر بمرحلتين الأولى تبدأ فى ٢٨ فبراير وتنتهى فى ١٧ مارس ويحقق عدد المنّ المصطاد زيادة قصوى فى ١٣ فبراير. أما المرحلة الثانية فتبدأ فى الثالث مـــن أبريل وتنتهى فى ٢٤ أبريل وتحقق زيادة قصوى فى ١٠ أبريل.

أظهرت المصايد الملونة المستخدمة المرحلتين السابق ذكرهما بالنسبة لعدد المنّ المصطاد ولكنـــها كانت أقل كفاءة فى إصطياد المنّ وبـــالترتيب التنـــازلى التـــالى : الصفـــراء > الزرقـــاء > الخضراء > الحمراء.

درست كفاءة المصايد البيضاء والخضراء فى إصطياد المفترس أوريس والمفترس بيـــدوروس وكذلك الطفيل أفيدوليتيس وتبين أن المصايد البيضاء أكفأ من المصايد الخضراء فى إصطياد هذيـن المفترسين والطفيل. كما إتضح أن عدد الأفراد المصطاده يمر بالمرحلتين السابق ذكرهما، كما لـــم يختلف عدد الأفراد المصطاده فى موسم عام ١٩٩٨ عنه فى موسم عام ١٩٩٩.