THE CAPTURE EFFECTS OF YELLOW STICK TRAPS IN THE DIFFERENT WAVELENGTHS TO THE ADULTS OF *AGONESCENA PISTACIAE* BURC. & LAUT. (HEMIPTERA: PSYLLIDAE) FROM TURKEY

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ABSTRACT: This study was carried out between 2008 to 2009 years in pistachio orchards in Siirt province of Turkey. For this study, various shades of yellow plates on the market on the metal plate cut 15-20 cm in length scales in different RAL (1021, 1003, 1018, 1046, 0.279, 1012, 1023, 1028) in the form of a small yellow plates glued to the edge of the trees were hung on pegs . As a control, a colorless stretch film on the metal plate suspended from the trap by passing averages were calculated for 5 applying any color tone. For this purpose, damaging pest populations are monitored on a weekly basis after the launch EZE per sheet of 20/30 nymphs / leaf, or a compound which is half of 10/15 nymphs / leaf density of the composite hanging traps and counts 1, 4 and 7 were the days. The capture effects of *A. pistaciae* was determined in the 1,4 and 7 days. The results of the study, statistical evaluation of the trap code 1016 is higher than the gravitational forces and other code groups into different tests except the control group in the trap in three groups of different tests were entered. Second experiment, the trap 1016 coded in different shades (1016A, 1016B, 1016C, 1016D, 1016, 1016F, 1016G, 1016H) activities are investigated and statistically evaluated results of studies into different groups according to 1016 B-coded into the trap, and most other groups of adult individuals were captured.

KEY WORDS: *Agonescena pistaciae*, yellow stick traps, wavelengths, capture effect.

Turkey is one of the origin of the pistachio. Pistachio was cultured for the first time in Southeastern Anatolia in Eti's period. Turkey is in the third place in pistachio production following Iran and USA 90% of the pistachio production is Southeastern Anatolia (Anonymous, 2002). There are a lot of pests effect pistachio production Bolu (2002) has determined 8 important hazardous species in the investigation made on the insect and mite fauna in the pistachio fields within Southeastern Anatolian Region. These species are: *Anapulvinaria pistaciae* Bod., *Eulecanium rugulosum* Arch.*, Kermania pistaciella Amsel., Chatoptelis* (*Hylesinus*) *vestitus* Mulsant et Rey*, Suturaspis pistaciae* Lindinger.*, Megastigmus pistaciae* Walker*, Idiocerinus stali* Fieb. and *Agonoscena pistaciae* Burck. and Laut.. *Agonoscena pistaciae* is very important pistachio pest in Turkey pistachio crops. It have aproximately six or seven generation every year. Pest appear following of middle of May in study area, and pesticides are sprayed 2 or 3 times per pear. Every year is used some insecticides on this pest in pistachio orchards in Turkey. In this reason, there are some need to alternative struggle methods except the chemical methods. Hirota & Kato (2001) indicated that the color of yellow causes reflection on the yellow objects which attract the insects at a level higher than the normal values in order words the all the phytophage insects are attracted by the color of yellow. Hadian & Seyedoleslami (2001) used yellow glued traps in order to determine the adult population density and sexual ratio of

the pistachio psyllid *Agonescena pistaciae* Burkhard & Lauterer (Hem.: Psyllidae) and found out that the yellow sticky traps are important for the seasonal population studies.

MATERIAL AND METHODS

In this study, the *A. pistaciae* adult catching effects of the yellow trap whose mixture has been adopted according to the RALE code having 8 different wave lengths has been analyzed (Table 1 & Fig. 1).

The small plates having 8 different codes located on the same trap have been hung on the traps of 1 meter and *A. pistaciae* adult catching effects in the 1st, 4th and 7th day have been determined. This study has been started on 22.09.2008 in the Center pistachio garden in the city of Siirt in 10/15 nymph/composite leaf density that is in 15 (average) nymph density that is the half of the economical injury level 20/30 nymph/composite leaf.

RESULTS

During the population follow up of the pests, the follow up of the adult, nymph and egg periods of the pests in 100 leaves in total gathered from 10 leaves in each gardens after the trees have come into leaf have been made. We are determined of *Agonescena pistaciae* population fluctutations in Siirt province (two different locations: Central and Aydınlar). It is demonstrated of Figs. 2, 3, 4, 5.

When the population shift of *A. pistaciae* in both traps has been analyzed, it has been found out that the population density in the center of the district is higher than that of in Aydınlar district. When the population density of each year has been analyzed, it has been found out that the population of *A. pistaciae* is higher in 2008 compared to 2009. We are used of different yellow tones to *A. pistaciae* these population levels (critical levels: 2008:2009 years) (Figs. 6, 7, 8, 9, 10, 11).

When the results of the study have been analyzed statistically, it has been observed that the attraction power of the trap code 1016 is higher than the other ones and that it is included in a different statistical group and the other three trap groups are included in a different statistical group (Table 2).

The result of the study: since the trap code 1016 has statistically been found to be more effective than the other traps, trials have been established by means of making certain color whitening and applications on the trap code 1016 (1016 A,B,C,D,E,F,G,H) (Figs. 12, 13, 14). When the results of the study have been analyzed statistically, it has been observed that the trap code 1016 B is included in a different group and that it is the trap that catches the most adults (Table 3).

When the number of the adults caught by the traps has been evaluated in terms of the days they have been caught, the 1st, 4th and 7th days have been included in a different group in terms of catching the adults and the traps that caught the most have been those hung in the 7th day (Table 4).

✶ This publication's abstract was presented in Sixth European Hemiptera Congress in Blagoevgrad, Bulgaria (25-29 June, 2012).

LITERATURE CITED

Anonymous. 2002. Agricultural Statistics (Production, Price, Levels). Government of Turkish Republic. Statistical Institute Publications Ankara 544 pp.

Bolu, H. 2002. The investigations of acari and insect fauna in pistachio areas in Souteastern Anatolia Region of Turkey. Turk. entomol. derg., 26 (3): 197-208.

Hadian, A. R. & Seyedoleslami, H. 2001. Effiency of Yellow Sticky Board Traps and Limb Jarring in the Capture of Adult Pistachio Psylla *Agonescena pistaciae* Burkhardt & Lauterer (Hom: Psyllidae). J. Sci. & Technol. Agric. & Natur. Resour., Vol. 6, No, 2.

Hirota, T. & Kato, Y. 2001. Influence of visual stimuli on host location in the butterfly, *Eurema hecabe*. Entomologia Experimentalis et Applicata, 101**:** 199-206.

Table 1. Rale codes of yellow sticky traps.

Number	Code	Name of Code
1	1021	Kadmiumgelb
2	1003	Signalgelb
3	1018	Zinkgelb
4	1046	Schwefelgelb
5	0,279	Scaniagelb
6	1012	Zitronengelb
7	1023	Werkehesgelb
8	1028	Melonengelb

Table 2. Statistical groups of different ral codes.

Level					Least Sq Mean
kod 1016	A				41,100000
kod 1012		B			28,366667
kod 1018		B	C		27,383333
kod 1023		B	C	D	25,933333
kod 1021			C	D	22,616667
kod 279			C	D	22,466667
kod 1003			C	D	22,233333
kod 1028				D	21,566667
Kontrol				E	10,000000

Table 3. Statistical groups of different 1016 ral code.

Level				Least Sq Mean
1016 B	A			31,000000
	B			25,666667
1016 H	B	C		24,666667
	B	C		24,333333
1016 E	B	C		24,333333
	B	C		24,333333
	B	C		24,000000
1016 D		C		21,333333
Kontrol			D	9,333333

Table 4. Statistical analyses of capture effects in different days.

Level			Least Sq Mean
7	A		29,888889
4		B	25,333333
1		C	14,444444

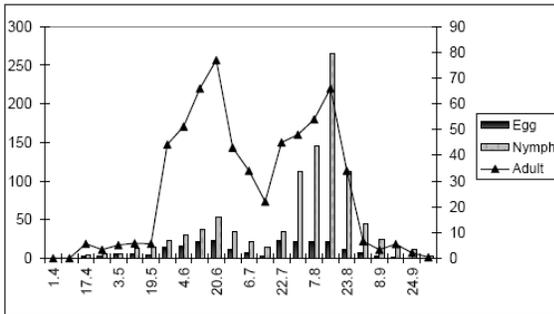Figure 1. Yellow sticky trap (different plates).

Figure 2. The population fluctutations of *Agonescena pistaciae* in Siirt (Central) in 2008.
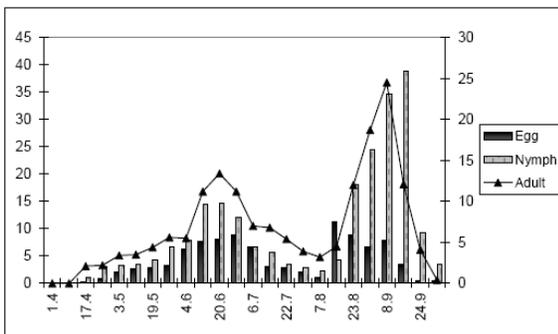

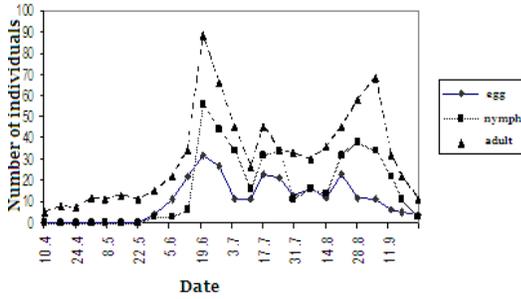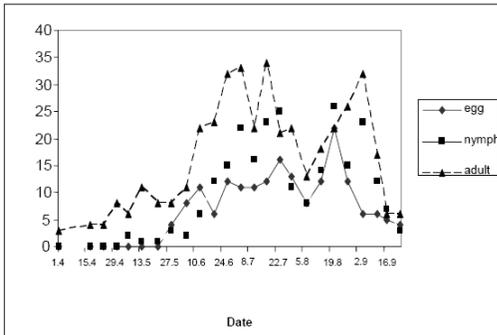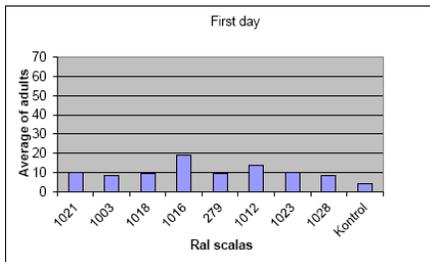Figure 3.The population fluctutations of *Agonescena pistaciae* in Siirt (Aydınlar) in 2008.

Figure 4 .The population fluctutations of *Agonescena pistaciae* in Siirt   (Central) in 2009.

Figure 5 .The population fluctutations of *Agonescena pistaciae* in Siirt (Aydınlar) in 2009.

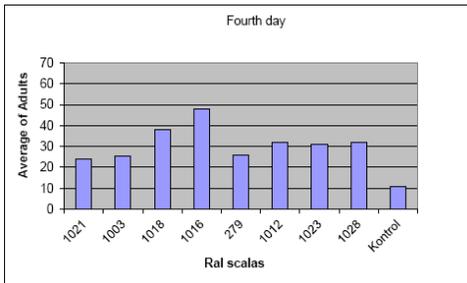Figure 6 .The capture effects on first day of *Agonescena pistaciae* in the different ral codes (2008).
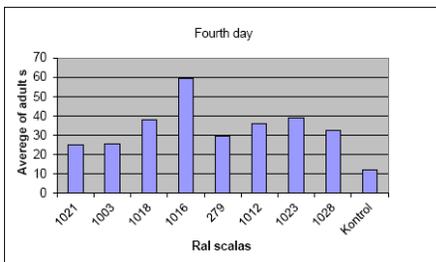
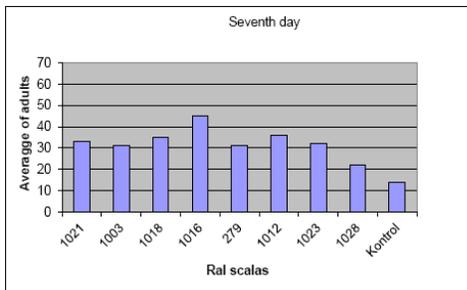Figure 7. The capture effects on fourth day of *Agonescena   pistaciae* in the different ral codes (2008).
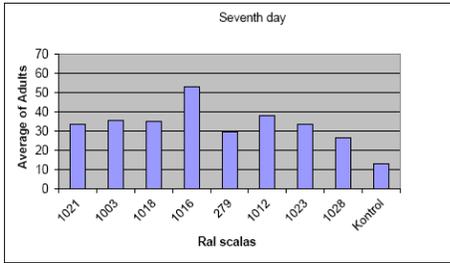
Figure 8. The capture effects on seventh day of *Agonescena pistaciae* in the different ral codes (2008).
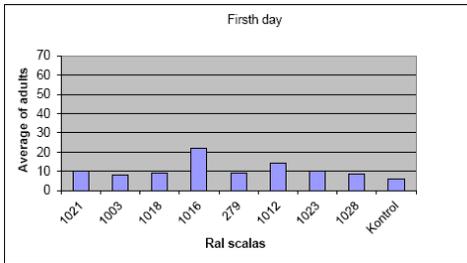
Figure 9.The capture effects on first day of *Agonescena pistaciae* in the different ral codes (2009).

Figure 10. The capture effects on fourth day of *Agonescena pistaciae* in the different ral codes (2009).

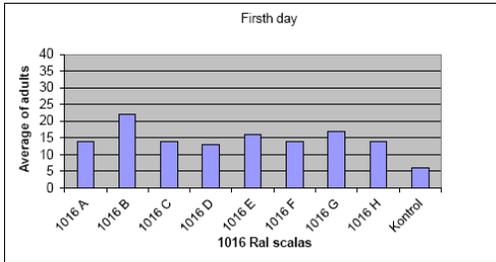Figure 11. The capture effects on seventh day of *Agonescena pistaciae* in the different ral codes (2009).

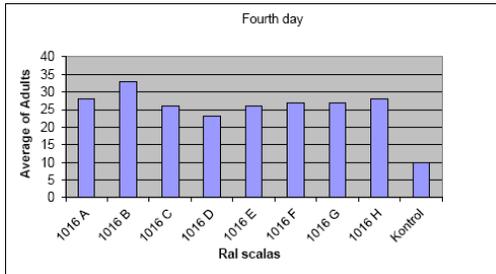Figure 12. The effects on *A.pistaciae* of different tones of 1016 trap (1st Day).

Figure 13. The effects on *A.pistaciae* of Different tones of 1016 trap (4th Day).
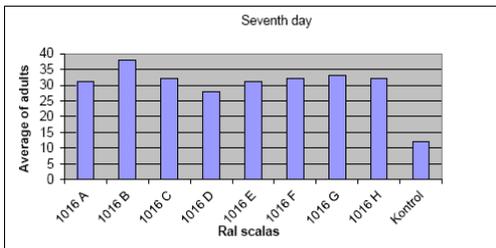

Figure 14. The effects on *A.pistaciae* of Different tones of 1016 trap (7th Day).