International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

E-ISSN 2347-2677
P-ISSN 2394-0522
www.faunajournal.com
IJFBS 2021; 8(4): 35-44
Received: 18-05-2021
Accepted: 20-06-2021

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Attraction effectiveness of funnel traps in tones of blue and different heights together with a light source against apricot pests [*Tropinota hirta* (Poda, 1761) (Coleoptera: Cetoniidae)]

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DOI: https://doi.org/10.22271/23940522.2021.v8.i4a.843

Abstract
This study was conducted in order to determine the effects of different traps, attractants and food traps parameters against to *Trophinota hirta* (Poda, 1761) (Coleoptera: Ciconiidae) in the apricot orchards in Baskil district of Elazığ province in 2018. For this purpose; By hanging funnel traps containing attractive capsules including Trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol mixtures in apricot orchards, the effect of mass trapping of the pest at different height and combination of light sources was investigated. Another parameter used in the study was the number of adults captured in funnel traps, in which wine-bearing traps were placed at a ratio of 1/1. As a result of the research; It has been determined that the most successful experiment in mass trapping experiments against *T. hirta* in apricot orchards was the funnel-trap combination with Trans-cinnamyl alcohol+Trans-anethol+Methoxyphenethyl alcohol mixed with illuminated 3 and 1 m high. In this trap parameter; It was determined that statistically more *T. hirta* individuals were captured compared to other trap parameters. Statistically; In the examination of the average values; the highest number of individuals was captured with an average of 70.35 at 1 m high with 3 lights, the second at 1 m with 60.45 lights, and the third and the most at 1 m with 59.05 without light. It was determined that it was also.

Keywords: Apricot, Tropinota hirta, blue trap, attractant, food trap

Introduction
Adults of the apple blossom beetle *Tropinota hirta* (Poda, 1761)] are harmful by eating the blossoms of hard and soft stone fruit trees. It has been determined that *T. hirta* adults are harmful in raspberry, blackberry, apricot, sour cherry, peach, nectarine orchards and rose-beds in Turkey and various methods of pest control have been developed against this (Altındişli *et al*., 2013) [1]. It has been reported that apple blossom beetle adults cause serious damage to apple and pear blossoms, that it is difficult to carry out pest control against them and that the pesticides used are harmful to bees, and adults are harmful in blackberry, apricot, cherry, peach, nectarine orchards and rose-beds (Anonymous, 1995).
It has been reported that the harm of the pesticides on honey bees not only causes a decrease in bee products but also decreases agricultural production in terms of quality and quantity due to insufficient pollination (Hazır, 2008) [5]. Due to the role of honey bees in pollination during the blooming period, environmental problems are encountered in the pest control on trees during this period. Therefore; pest control methods alternative to chemical control have been developed against this pest. One of the most effective of these methods is the biotechnical control method. Biotechnical control methods gain importance because they are specific to the species and can easily adapt to environmental conditions and contribute to the restoration of the natural balance in a short time by minimizing the use of chemical pesticides against the main or economically important pests. Attractants have been used abroad and in our country against this pest (Kozar 1972; Toth and Szarukan, 1998, Toth *et al*., 2009) [6, 10, 11]. In our country, attractant trap studies have been carried out against some fruit types, especially apple and cherry (Sağdaş, 2010; Yaşar *et al*., 2013; Güvenç & Yaşar, 2014, Yaşar & Dahham, 2019) [8, 13, 4, 14]. In addition to attractants, a combination of traps was created by making use of the phototropism of the species. Although light is generally a stimulating source for nocturnal insects, there are studies revealing that individuals belonging to the order Coleoptera are captured in light traps in large quantities and used for pest control purposes (Tsurikov, 2011, Arakaki *et al*., 2015) [13, 2].

Although species such as order Coleoptera are not active at night and *T. hirta* is known to orientate towards blossoms on sunny days, especially in the region due to the lack of sunny days during apricot blooming periods, the combination of their orientation to light sources and the attraction of the light source were used in the study. (Esker *et al*., 2004) [3]. In a study conducted on the pistachio pest Agonescena pistaciae Burc. & Laut. (Hemiptera: Psyllidae), it has been determined that the traps in various tones of yellow attracted various number of adults depending at various heights. (Özgen *et al*, 2013). In this study, traps at different heights were hung on apricot trees together with other combinations in order to determine whether the differences in trap heights had an effect on the capture of *T. hirta* individuals.

On the apricot fields in Elazig and Malatya provinces; Flower sheddings have been detected due to *T hirta.* Chemical control during the blooming period against the pest causes significant damage to the beneficial insects. Especially, the productivity of apricot trees decreases as pollinator bees die. With this study, it is aimed to minimize the effects of pesticides over pollinator and honey bees through an alternative pest control approach.

Material and Method

The main materials of this study are the trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol mixtures placed at Baskil district of Elazig province in blue funnel traps and wine food traps and light sources apricot orchards. The attractors were impregnated with 1.5 ml small eppendorf placed in 50 ml falcon tubes with a blue cap, cotton placed at the bottom and the top section pierced with a needle. Cotton and eppendorphs on which the attractants were instilled were placed into the falcon tube by forceps. Holes were drilled in the bottom bottle in order to drain the rainwater. However no precipitation occured during the experiment. With the help of a micro pipette, 20 µl of each of the attractants used was instilled on special cotton with high liquid absorption ability (Yaşar & Dahham, 2019) [14]. As the light source, G4 capsule, 12 volt watt yellow led lamp, Catact-9189-10 ampere photocell relay were used. These cables are designed as 5 A LED with transformer, waterproof for outdoor use, and they are connected to each other with intermediate connections such as lamp holder, cable, connector and installed in way to turn on at night. Yellow LEDs have a wavelength of 500-999 lumen, can illuminate 3-8 m and a wavelength of 570-590 nm. In this study; Funnel-shaped and parliament blue traps prepared for the experiments with illuminated and non-illuminated triple attractants (mixtures consisting of Trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol) were used between 24 March and 11 April 2018 in Sultanuşağı village of Baskil district. Experiments with light and wine - no-light and wine were carried out in Baskil district Şahaplı village between 20 March and 6 April 2018; With and without light double experiments (Trans-cinnamyl alcohol + Methoxyphenethyl alcohol mixtures) were carried out in Baskil district Doğancık village between 20 March-6 April 2018. Comparisons of the trap locations were made by considering the parameters determined in the recurrence within the locations. Since there are differences in blooming period between locations, each parameter has been evaluated within itself; and accepted as the main evaluation criteria during pre-blooming and post-blooming. For mass trapping studies, the experiment consists of the following; funnel trap and its attractant suspended at a height of 1 m, illuminated funnel trap and attractant suspended at a height of 1 m, funnel trap and attractant suspended at a height of 1.5 m, illuminated funnel trap and attractant suspended at a height of 1.5 m, funnel trap and attractant placed on the ground, illuminated funnel trap and attractant placed on the ground and 5 repetitives according to the randomly selected blocks experiment pattern (Figure 1). The experiment consists 3 decares of apricot orchard from each blocks. 10 pieces of traps were suspended with 15 m intervals to the south of the trees in the first two rows in the east direction where the pest approach towards the apricot orchard. The reason for suspending towards the east direction is because the light trap turns off homogeneously during dawn in the direction where the sun first rises and that the beetle sways more towards the ground traps from the east direction according to the with preliminary studies. In the second week of March, the traps were suspended in the south direction of the trees, 1-1.5 m above the ground and 1-1.5 m per decare and with an interval of at least 15-20 m. Traps were counted weekly, and nutrient contents in attractants and wine traps were changed weekly. The counts were in the form of counting the samples taken in the field by bringing them to the laboratory. SZX7 Olympus brand microscope was used for counts.

Fig 1: Blue Colored Funnel Trap without Light and Attractant Used to Capture Tropinota hirta Adults.

The traps were checked until the first adult of the pest was captured. After the first adult was captured, mass trapping was initiated. The adults falling into the traps were counted and recorded by weekly checks. In addition, for comparison

purposes, 10 blue colored funnel traps were placed on 5 trees with 2 traps for each with 8 m intervals, and during the second week of March, food traps with wine at a ratio of 1/1 were placed and the *T. hirta* beetles fell into the traps were counted and recorded (Figure 2). Red grape wine was used as content and 3 sugar cubes were added. Then mixed with pure water in the same proportion. Although it is known that the pest feeds on flowers in sunny weather, due to the positive phototaxis properties, it has been investigated whether these characteristics of Coleoptera species stimulate *T hirta* which rests during night, (Shimoda and Honda, 2013) [9]. The lights have a photocell feature and are automatically turned on when it starts to get dark.

Fig 2: Wine-Based Food Trap Study.

Conclusions and Discussion

Among the blue color light traps and attractants suspended at different heights, it has been determined that the one to attract the most pests was the light trap+attractant at a height of 1 m at the beginning and end of the blooming time of the apricot (Table 1, Figure 3).

Table 1: Number of adult insects caught from lighted blue colored funnel traps and baits hanging at different heights.

Lighted triple					
Lighted triple 1.5 M		Lighted triple 1 M		Lighted triple	
Beginning of flowering	End of flowering	Beginning of flowering	End of flowering	Beginning of flowering	End of flowering
20	28	56	114	26	55
25	44	44	93	24	48
54	45	38	83	35	85
55	65	30	74	42	72
45	65	55	96	64	75
44	56	52	92	55	72
34	44	38	84	54	85
25	45	54	114	48	90
32	55	45	112	52	78
34	52	48	85	54	60
Total = 368	Total = 499	Total = 460	Total = 947	Total = 454	Total = 720

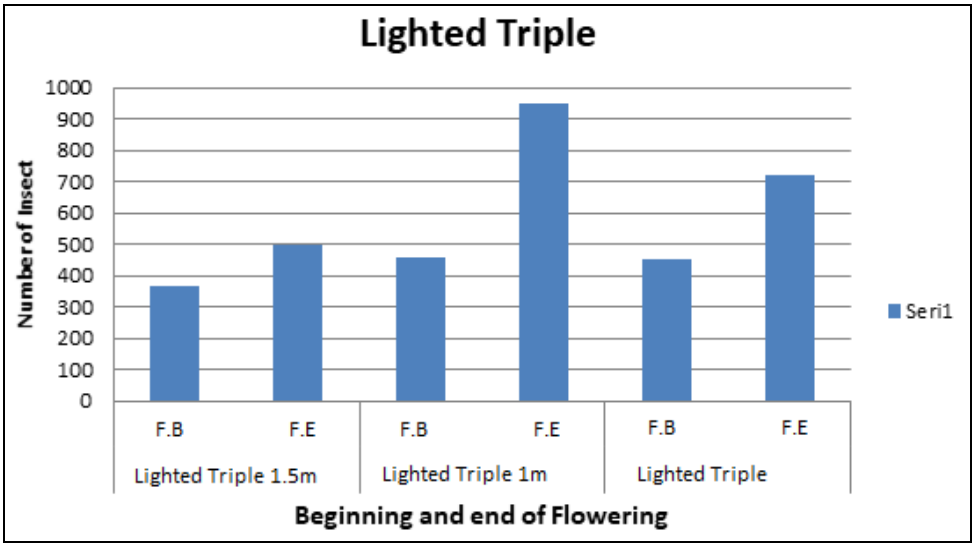

Fig 3: Number of adult insects caught at the beginning and end of flowering of the lighted blue funnel traps.

It was determined that the trap suspended without light + Trans-cinnamyl alcohol + Trans-anethole + Methoxyphenethyl alcohol (triple) attractant attracted most pests at a height of 1.5 m maximum (Table 2, Figure 4).

Table 2: Number of adult insects caught from non-lighted blue colored funnel traps and baits hanging at different heights.

Non-lighted triple					
Non-lighted triple 1.5 M		Non-lighted triple 1 M		Non-lighted triple	
Beginning of flowering	End of flowering	Beginning of flowering	End of flowering	Beginning of flowering	End of flowering
15	24	38	78	15	32
20	23	39	98	16	28
32	39	33	55	26	75
47	55	26	55	27	56
38	38	57	87	25	76
31	39	48	85	32	45
28	38	34	78	42	65
21	44	51	88	34	72
28	45	40	98	37	95
25	48	38	55	42	90
Total = 285	Total = 393	Total = 404	Total = 777	Total = 296	Total = 634

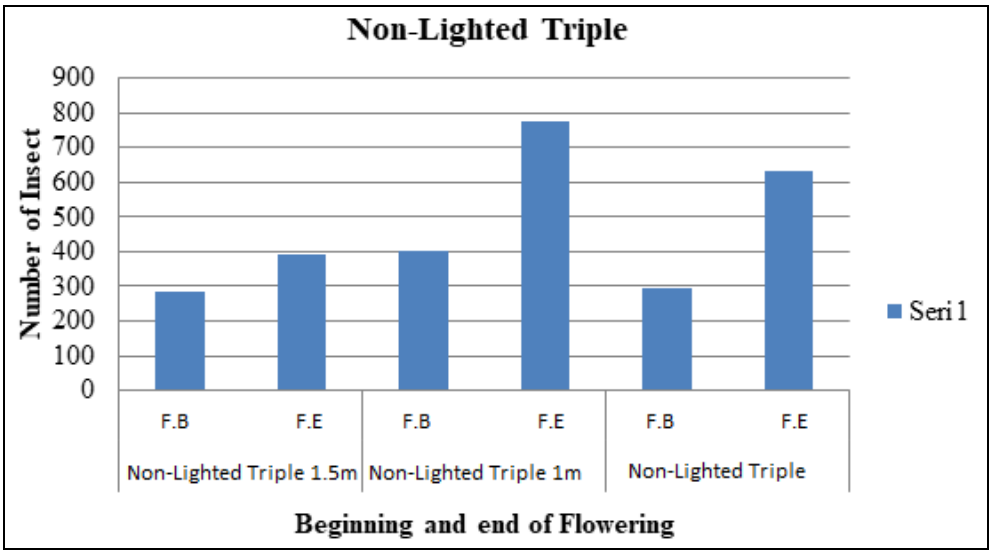

Fig 4: Number of adult insects caught at the beginning and end of flowering of the non-lighted blue funnel traps.

Table 3: Number of adult insects caught from wined non-lighted and blue-colored funnel traps hanging at different heights.

Non-lighted					
Wined non-lighted 1.5 M		Wined non-lighted 1 M		Wined non-lighted	
Beginning of flowering	End of flowering	Beginning of flowering	End of flowering	Beginning of flowering	End of flowering
16	24	12	28	16	20
22	32	22	24	18	21
10	15	14	16	10	15
20	26	15	20	20	23
12	24	22	35	14	22
6	14	14	18	7	11
8	18	16	17	11	21
10	24	22	20	8	12
12	24	10	21	6	13
13	25	11	22	11	14
Total = 129	Total = 226	Total = 158	Total = 221	Total = 121	Total = 172

In the study carried out with lightless and wine-based food traps, the most individuals were captured at the end of blooming and at a height of 1.5 m (Table 3, Figure 5). In the study with light and wine food traps, 1 m height was the one to attract most the pests (Table 4., Figure 6.). In the double attractant (Trans-Cinnamyl alcohol + Methoxyphenethyl alcohol) trap study, it was determined that the traps with and without light suspended at a height of 1 m attracted the most pests (Table 5, 6; Figure 7, 8).

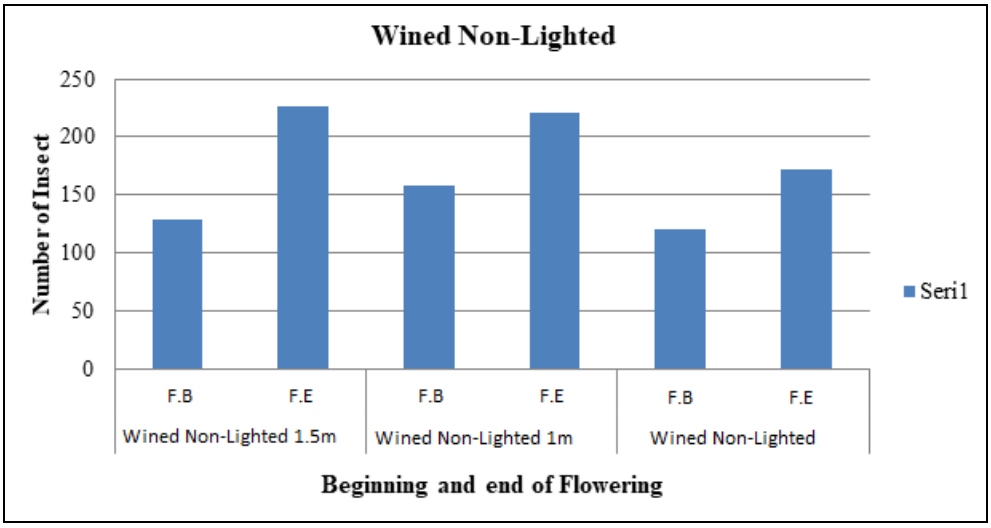

Fig 5: Number of adult insects caught at the beginning and end of flowering of the wined n0n-lighted blue funnel traps**.**

Table 4: Number of adult insects caught from wined lighted and blue-colored funnel traps hanging at different heights.

Lighted					
Wined lighted 1.5 M		**Wined lighted 1 M**		**Wined lighted**	
Beginning of flowering	**End of flowering**	**Beginning of flowering**	**End of flowering**	**Beginning of flowering**	**End of flowering**
18	21	14	32	18	24
21	24	28	44	21	25
12	18	17	11	14	18
21	23	17	24	25	28
15	21	18	38	21	27
14	33	11	21	11	34
11	28	21	21	15	26
15	18	18	24	14	15
13	24	14	26	8	17
12	28	15	25	12	18
Total = 152	Total = 238	Total = 173	Total =266	Total = 159	Total = 232

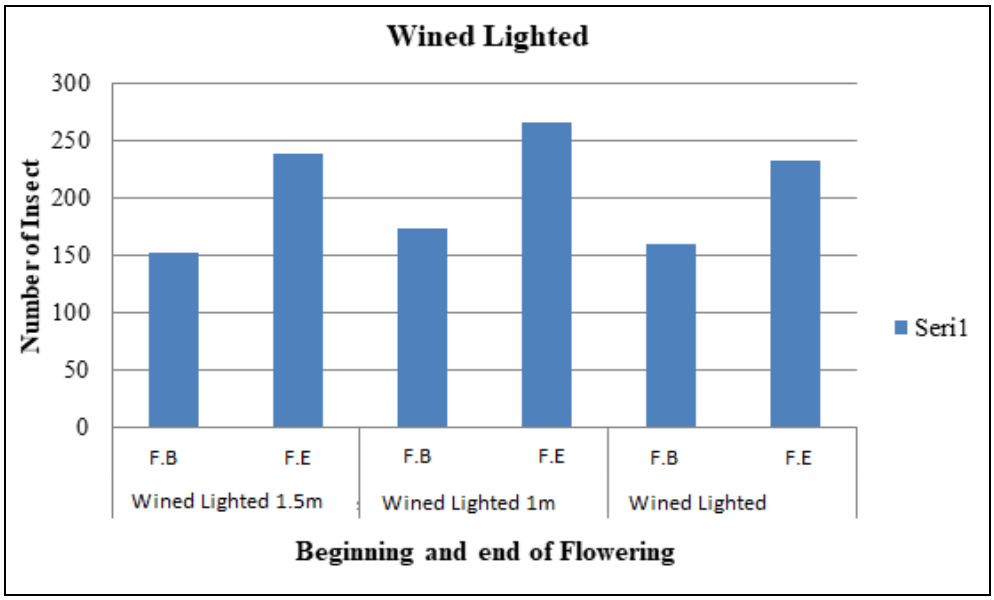

Fig 6: Number of adult insects caught at the beginning and end of flowering of the wined lighted blue funnel traps.

Table 5: Number of adult insects caught from lighted blue-colored funnel traps and baits hanging at different heights (Trans-cinnamyl alcohol+ Methoxyphenethyl alcohol).

Lighted double					
Lighted double 1.5 M.		**Lighted double 1 M.**		**Lighted double**	
Beginning of flowering	**End of flowering**	**Beginning of flowering**	**End of flowering**	**Beginning of flowering**	**End of flowering**
15	25	45	98	25	34
16	25	38	85	16	32
24	32	30	75	18	34
31	50	20	65	23	33
30	34	40	82	44	32
23	48	44	84	30	55
26	32	28	75	28	55
16	32	50	88	30	48
20	34	40	95	34	55
18	40	42	85	14	55
Total = 219	Total = 352	Total = 377	Total = 832	Total = 262	Total = 433

Table 6: Number of adult insects caught from non-lighted blue-colored funnel traps and baits hanging at different heights (Trans-cinnamyl alcohol+ Methoxyphenethyl alcohol).

Non-lighted double					
Non-lighted double 1.5 M		**Non-lighted double 1 M**		**Non-lighted double**	
Beginning of flowering	**End of flowering**	**Beginning of flowering**	**End of flowering**	**Beginning of flowering**	**End of flowering**
8	12	22	43	11	13
8	13	19	38	14	19
12	21	21	36	13	15
21	24	15	32	37	19
12	23	37	42	25	45
13	21	22	66	16	23
14	14	15	35	14	22
11	14	25	46	12	24
12	18	21	46	17	24
18	21	23	42	24	27
Total = 129	Total = 181	Total = 220	Total = 426	Total = 183	Total = 231

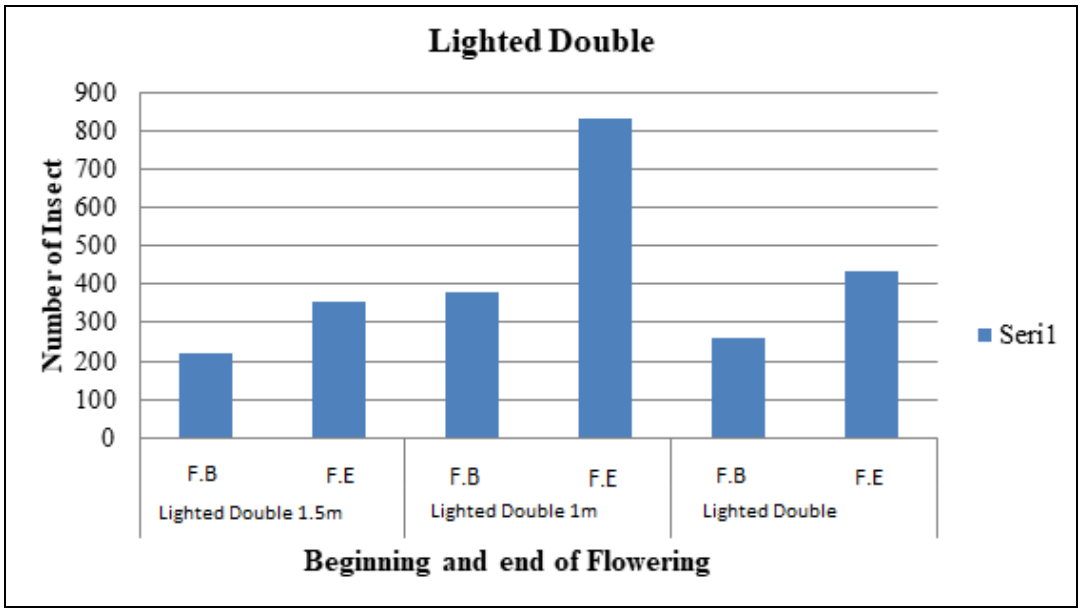

Fig 7: Number of adult insects caught at the beginning and end of flowering of the lighted double funnel traps.

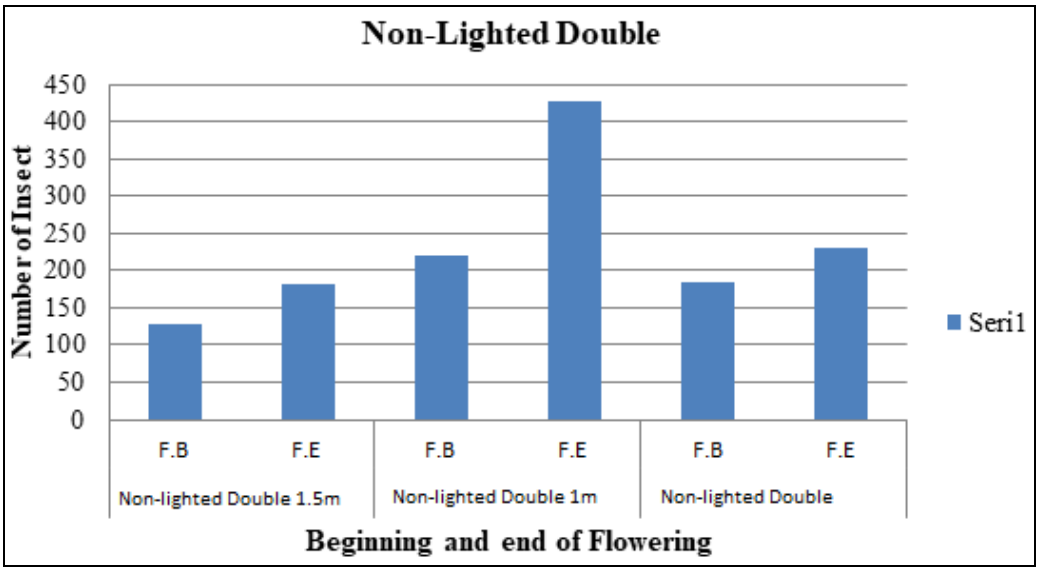

Fig 8: Number of adult insects caught at the beginning and end of flowering of the non-lighted double funnel traps.

In conclusion; in mass trapping studies against *T. hirta*, it was determined that funnel traps with a mixture of 3 with light and 3 without light attracted the most pests when suspended at a height of 1 m. In both methods, it was observed that the least number of individuals were captured in the traps suspended at a height of 1.5 m.

In the study carried out with the T hirta attraction efficiency of wine food traps without light, the highest number of pests captured in the traps that were suspended 1.5 m above and during the post-blooming. It was recorded that the least number of individuals were captured in the traps placed on the ground at the beginning and at the end of blooming.

The counting made in the wine baited traps placed on the ground and suspended 1-1.5 m above the ground, revealed that the number of individuals at the beginning and the end of the blooming were very close to each other, and when compared, it was found that more individuals were captured from the traps suspended at 1 m height.

According to the data obtained from the blue funnel traps with and without light with 2 attractants (Trans-Cinnamyl alcohol + Methoxyphenol ethyl alcohol mixtures), it was seen that *T. hirta* adults captured at 1 m height at the end of blooming were quite high. According to the data, it was seen that the number of individuals captured in the traps suspended at a height of 1.5 m at the beginning and end of blooming was low. As a result of the data, it was observed that the total number of *T. hirta* adults captured in the light funnel traps was higher than the total of the *T. hirta* adults captured in the funnel traps without light. As a result, it is thought that the white light attracts the beetles because the light increases the enlightenment period to a certain extent, with regards that the species tend more towards flowers on sunny days. However; the most important difference is thought to be related to the high weed density in the location where the efficiency of light and wine traps is high. It is estimated that the blooming period in this area is longer towards the end of blooming in relation to the phenology, and this difference makes a significant difference. In this context; When the light wine traps and traps without light are compared, it has been determined beetles are attracted more by wine baited light traps than wine baited traps without light. In a study conducted in previous years, it was reported that light traps placed in different numbers captured 542 species, 33 973 individuals belonging to 66 families belonging to the order of Coleoptera, and the light source was realized with a 100W light source. In this study, the species of Sphaeriusidae, Noteridae, Lucanidae, Byrrhidae, Elmidae, Drilidae, Lycidae, Trossitidae, Ero tylidae, Ciidae, Oedemeridae, Meloidae, Boridae, Pythidae, Pyrochroidae, Nemonychidae, Anthri bidae, Attelabidae and Dryophthoridae families are highly captured (Tsurikov, 2011) [12]. Arakaki *et al*., (2015) [2]; reported that light traps were effective in capturing the mass of sugar beet pest *Anomala albopilosa* (Coleoptera: Scarabaeidae).

As a result of this study, the evaluation of the results obtained by comparing the statistical results made with the SPSS package program regarding whether there is a difference between the applications is provided in Table 7. Normality test was performed on the obtained data. Since the data were found to be normal; among the parametric tests among the multiple comparison tests with ANOVA, (GAMES-HOWELL test was performed. There is a significant difference between p <0.05 as a result of the test (Table 7). When the P value is <0.5, a significant difference was found between the illuminated triple 1.5 m and the illuminated triple 1 m.

Table 7: ANOVA

Anova					
Traps					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	109652,747	17	6450,162	29,135	,000
Within Groups	75714,250	342	221,387		
Total	185366,997	359			

Table 8: Multiple Comparisons

Dependent Variable: Traps				
Games-Howell				
(I) group	**(J) group**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
Lighted Triple 1.5 m.	Lighted Triple 1 m.	-27,000*	6,822	,038
	Wined 1.5 m.	23,850*	3,252	,000
	Wined 1 m.	21,400*	3,531	,000
	Wined	23,800*	3,311	,000
	Wined Non-Lighted 1.5 m.	25,600*	3,362	,000
	Wined Non-Lighted 1 m.	24,400*	3,249	,000
	Wined Non-Lighted	28,700*	3,183	,000
	Lighted 2'li 1.5 m.	14,800*	3,686	,026
	Non-Lighted Double 1.5 m.	27,850*	3,157	,000
	Non-Lighted Double	22,650*	3,528	,000
Lighted Triple 1 m.	Non-Lighted Triple 1.5 m.	36,450*	6,609	,001
	Wined 1.5 m.	50,850*	6,294	,000
	Wined 1 m.	48,400*	6,443	,000
	Wined	50,800*	6,325	,000
	Wined Non-Lighted 1.5 m.	52,600*	6,352	,000
	Wined Non-Lighted 1 m.	51,400*	6,293	,000
	Wined Non-Lighted	55,700*	6,259	,000
	Lighted Double 2'li 1.5 m.	41,800*	6,530	,000
	Lighted Double 2'li	35,600*	6,819	,002
	Non-Lighted Double 1.5 m.	54,850*	6,246	,000
	Non-Lighted Double 1 m.	38,050*	6,812	,001
	Non-Lighted Double	49,650*	6,442	,000
Lighted Triple	Non-lighted Triple 1.5 m.	24,800*	4,889	,002
	Wined 1.5 m.	39,200*	4,454	,000
	Wined 1 m.	36,750*	4,661	,000
	Wined	39,150*	4,497	,000
	Wined Non-Lighted 1.5 m.	40,950*	4,535	,000
	Wined Non-Lighted 1 m.	39,750*	4,452	,000
	Wined Non-Lighted	44,050*	4,404	,000
	Lighted Double 1.5 m.	30,150*	4,780	,000
	Lighted Double	23,950*	5,169	,005
	Non-Lighted Double 1.5 m.	43,200*	4,385	,000
	Non-Lighted Double 1 m.	26,400*	5,160	,001
	Non-Lighted Double	38,000*	4,660	,000
Non-Lighted Triple 1.5 m.	Non-Lighted Triple 1 m.	-25,150*	5,752	,015
	Wined 1.5 m.	14,400*	2,777	,002
	Wined 1 m.	11,950*	3,100	,038
	Wined	14,350*	2,846	,002
	Wined Non-Lighted 1.5 m.	16,150*	2,905	,000
	Wined Non-Lighted 1 m.	14,950*	2,774	,001
	Wined Non-Lighted	19,250*	2,696	,000
	Lighted Double 1 m.	-26,550*	6,110	,016
	Non-Lighted Double 1.5 m.	18,400*	2,666	,000
	Non-Lighted Double	13,200*	3,097	,013
Non-Lighted Triple 1 m.	Wined 1.5 m.	39,550*	5,387	,000
	Wined 1 m.	37,100*	5,560	,000
	Wined	39,500*	5,423	,000
	Wined Non-Lighted 1.5 m.	41,300*	5,454	,000
	Wined Non-Lighted 1 m.	40,100*	5,386	,000
	Wined Non-Lighted	44,400*	5,346	,000
	Lighted Double 1.5 m.	30,500*	5,660	,001
	Lighted Double	24,300*	5,992	,028
	Non-Lighted Double 1.5 m.	43,550*	5,331	,000
	Non-Lighted Double 1 m.	26,750*	5,984	,010
	Non-Lighted Double	38,350*	5,559	,000
Non-Lighted Triple	Wined 1.5 m.	27,000*	5,605	,008
	Wined 1 m.	24,550*	5,772	,023
	Wined	26,950*	5,640	,008
	Wined Non-Lighted 1.5 m.	28,750*	5,670	,004
	Wined Non-Lighted 1 m.	27,550*	5,604	,006
	Wined Non-Lighted	31,850*	5,566	,001
	Non-Lighted Double 1.5 m.	31,000*	5,551	,002
	Non-Lighted Double	25,800*	5,770	,014

Wined 1.5 m.	Lighted Double 1 m.	-40,950*	5,767	,000
	Lighted Double	-15,250*	3,245	,007
Wined 1 m.	Lighted Double 1 m	-38,500*	5,929	,000
Wined	Lighted Double 1 m.	-40,900*	5,801	,000
	Lighted Double	-15,200*	3,304	,008
	Non-Lighted Double 1 m.	-12,750*	3,290	,045
Wined Non-Lighted 1.5 m.	Lighted Double 1.5 m.	-10,800*	2,719	,030
	Lighted Double 1 m	-42,700*	5,830	,000
	Lighted Double	-17,000*	3,355	,002
	Non-Lighted Double 1 m	-14,550*	3,341	,014
Wined Non-Lighted 1 m.	Lighted Double 1 m.	-41,500*	5,766	,000
	Lighted Double	-15,800*	3,242	,004
	Non-Lighted Double 1 m.	-13,350*	3,228	,026
Wined Non-Lighted	Lighted Double 1.5 m.	-13,900*	2,494	,001
	Lighted Double 1 m.	-45,800*	5,729	,000
	Lighted Double	-20,100*	3,176	,000
	Non-Lighted Double 1 m.	-17,650*	3,161	,001
Lighted Double 1.5 m.	Lighted Double 1 m.	-31,900*	6,023	,002
	Non-Lighted Double 1.5 m.	13,050*	2,461	,001
Lighted Double 1 m.	Lighted Double	25,700*	6,336	,029
	Non-Lighted Double 1.5 m.	44,950*	5,715	,000
	Non-Lighted Double 1m.	28,150*	6,329	,011
	Non-Lighted Double	39,750*	5,928	,000
Lighted Double	Non-Lighted Double 1.5 m.	19,250*	3,150	,000
	Non-Lighted Double	14,050*	3,522	,030
Non-Lighted Double 1.5 m.	Non-Lighted Double 1 m.	-16,800*	3,135	,002

The mean difference is significant at the 0.05 level.*

In examining the averages; It was observed that the most capturing was at 1 m with an average of 70.35 in the illuminated triple, the second capturing most at 1 m in the illuminated double with 60.45, and the third most at 1 m in the triple without light with 59.05 (Table 8).

Table 8 shows which one has the better capturing when a comparison is made between those with significant differences. The triple with light 1 m has captured more than the triple with light 1.5 m.

Table 9: Descriptive

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lighted Triple 1.5 m	20	43,35	13,228	2,958	37,16	49,54	20	65
Lighted Triple 1 m	20	70,35	27,494	6,148	57,48	83,22	30	114
Lighted Triple	20	58,7	18,979	4,244	49,82	67,58	24	90
Non-Lighted Triple 1.5 m	20	33,9	10,853	2,427	28,82	38,98	15	55
Non-Lighted Triple 1 m	20	59,05	23,323	5,215	48,13	69,97	26	98
Non-Lighted Triple	20	46,5	24,33	5,44	35,11	57,89	15	95
Wined Lighted 1.5 m	20	19,5	6,039	1,35	16,67	22,33	11	33
Wined Lighted 1 m	20	21,95	8,624	1,928	17,91	25,99	11	44
Wined Lighted	20	19,55	6,653	1,488	16,44	22,66	8	34
Wined Non-Lighted 1.5m	20	17,75	7,144	1,597	14,41	21,09	6	32
Wined Non-Lighted 1 m	20	18,95	6,013	1,345	16,14	21,76	10	35
Wined Non-Lighted	20	14,65	5,254	1,175	12,19	17,11	6	23
Lighted Double 1.5 m	20	28,55	9,838	2,2	23,95	33,15	15	50
Lighted Double 1 m	20	60,45	25,076	5,607	48,71	72,19	20	98
Lighted Double	20	34,75	13,194	2,95	28,57	40,93	14	55
Lighted Double 1.5 m	20	15,5	4,936	1,104	13,19	17,81	8	24
Lighted Double 1 m	20	32,3	13,123	2,934	26,16	38,44	15	66
Lighted Double	20	20,7	8,603	1,924	16,67	24,73	11	45
Total	360	34,25	22,723	1,198	31,89	36,6	6	114

This study is the first study on the attraction efficiency of the attractants and wine baited traps against apple blossom beetle adults. In previous years, there are some studies conducted with other cultivated plants on the effectiveness of these attractants. Toth *et al*. (2009) [11]; reported that when trans-cinnamyl alcohol and Trans anethol are used together with blue and white traps, it attracts more harmful *T. hirta* pests in cherry and apple plants. Sağdaş (2011) [8], on the other hand, obtained a parallel result with the results of this study in his study in the cherry orchard in Afyonkarahisar. Güvenç and Yaşar (2014) [4], on the other hand, reported that Trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol mixtures attracted *T. hirta* pest at 1.5 m height. Güvenç and Yaşar (2014) [4], on the other hand, reported that Trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol mixtures attracted T. hirta pest at 1.5 m height. In this study, it was determined that the same attractants captured 947 individuals in the light traps and traps suspended at a

height of 1.5 m. The main possible factors for this difference are as follows; the fact that the flower structure and blooming time of both trees are different, the possibility that the pest population is different in the locations where the studies will be carried out, the blooming period of apricot trees is between 15-20 days and the blooming period of apricots vary in different time periods in Elzaığ according to the species. Also; with the same parameters, it is seen that approximately 1/3 of the individuals captured in the cherry tree were captured with a triple without light and at 1.5 m height.

Apart from physiological factors in apricot, it has been demonstrated with this study that Trans-cinnamyl alcohol + Trans-anethol + Methoxyphenethyl alcohol mixtures can be used at the end of blooming in the pest control against apple blossom beetle which causes flower shedding, that it is important in terms of being an alternative to pesticide control, and that it is a safely applicable method in integrated pest control on apricot. It is believed that the wine-based food traps used in the study can be used as an alternative method in terms of pest control to some extent.

Acknowledgement

This study was supported under the project number 1919B011700687 of the TÜBİTAK 2209-A program in 2017/2018. We thank TÜBİTAK for their support.

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