

EVALUATION OF SOME BAITS AND TRAPS AGAINST ORIENTAL WASP *Vespa orientalis* L. (HYMENOPTERA: VESPIDAE)

SALEH MOHAMMED ALI BAS and BaTOOL ABDULLAH KARSO

Dept. of Entomology, Plant Protection Collage of Agriculture Engineering Sciences,
University of Duhok, Kurdistan region-Iraq

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ABSTRACT

This study was carried out in the fields of Collage of Agricultural Engineering Sciences \ University of Duhok. The efficiency of four types of traps and Baits were assessed to reduce the damage of the Oriental red wasp (*Vespa orientalis* L.) on honey bees and crops in the region.

Four different traps were used : wooden cage, small metal trap, Plastic white wide cylindrical trap, long cylindrical trap, as well as different baits in such trap as minced meat , Tuna fish, fesha (sheep's lung), chicken meal .

The results showed that the catch from the wooden cage was significantly higher than the rest of the traps with an average of 76 insect / trap. While metal trap was the lowest average of 26 insect / trap, fish bait was significantly highest with 67.75 insects / bait.

KEY WORDS: red wasp, traps, baits , mechanical control , *Vespa orientalis* .

INTRODUCTION

Red wasp *Vespa orientalis* L. (Hymenoptera: Vespidae), is considered to be one of the most harmful pests to honey bee in many Arab countries [Khodairy, and Awad 2013 , and Abdelaal, and defrawy, 2014] , and its one of the strongest, biggest body in eusocial insects [Gatt, and Sciberras, 2014]. In Iraq, the oriental wasp is voracity a big pest to honey bee in apiary and an cultivate pest that effects and causes injury to orchards plants [Glaïim, 2009 and Al-Mahdawi, and Al-Kinani, 2011] . Sting of wasps cause ache and allergic response in allergic persons when it stings. [Sackmann, *et al.* 2001].

The statics refer that because of hymenopteran stings , more than sixties death of persons in the United States since the past century (Akre, *et al.* 1980) also in Europe reported more than forty deaths for each year (Pollyea *et al.* 2009).

This pest also, clasp honey bee workers visiting blossoms and can go in to honey bee hives and bring off immature individual , honey, pollen and adults, and then fly back to their nests to feed their brood, consequently they cause damage to the hives and decreased productivity in honeybee products [Cranshaw, *et. al* 2011 , Khodairy, and Awad, 2013, Abdelaal, and El-defrawy, 2014, and Taha, 2014.]. In the

beginning of spring apiarists in most countries fighting wasps by catching and killing individual workers , and queens, [Havron, and Margalith, 1995] and searching for nests near the hives place , to destroying nests by using fumigants pesticides as calcium cyanide . [Boeve, *et al.*, 2014 , and Islam, *et al.*, 2015]. In addition of using pinsecticides using poisonous baits or glue trap panels. While some of the bee-keepers prefer using obtainable materials in the apiary like sticky and color traps hanging on shrubs [Abdelaal, and El- defrawy, 2014].

In conclusion of the above attempts for protecting or reducing the serious damage of our orchard trees and honeybee hives from red wasps. the present work was undertaken to investigate the effect of different types of baits and traps for discover the best bait-trap group for catching social wasps, to reduce the harm of the social wasp fauna trapped and response to food sources supports the use of poison baits.

MATERIAL AND METHODS

This research was carried out in the orchards and apiary of College Agricultural Engineering Sciences, using four different types of traps and baits as following:

A- The traps Type:

1) Long Cylindrical trap: large size, diameter 22 cm, height 50 cm, It is made of transparent

plastic, and it have two opening hole from two sides connect with funnel to entrance wasp. (fig1A)

2) Wooden trap: it is a cage form from wood and metals mesh sideways interlaced 30mesh\ inch. cage was measuring 80 *25*25cm. (fig 1B).

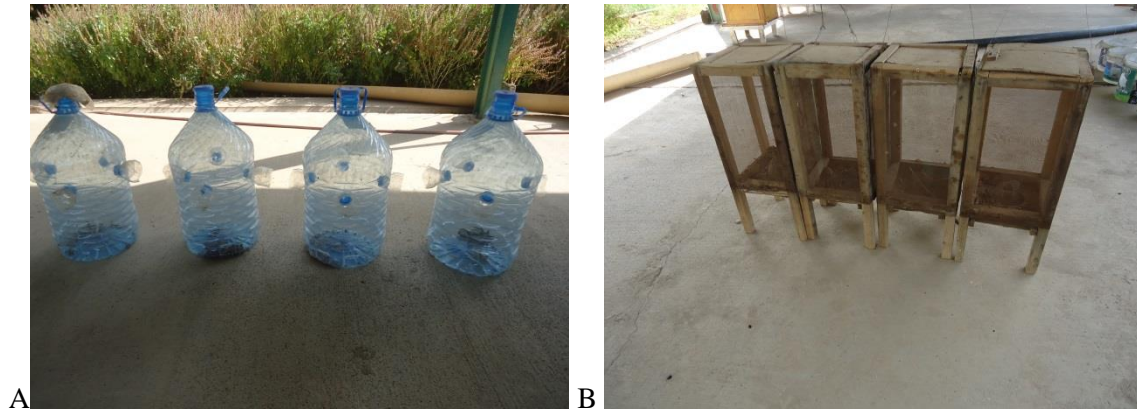


Fig. (1): A\ Long Cylindrical trap. B\ Wooden trap

3) Metal (Tin) trap : It is metal cage (local tanak), measuring with 40 cm high and 25 cm. in width, it have tow opening hole from two sides connect with funnel to entrance wasp (fig 2A).

4) White wide plastic cylindrical trap: Cylinder shape, diameter 30 cm, height 30cm, It is made of thick white plastic, and has two opening hole from two sides connect with funnel to entrance wasp (fig 2B).



Fig. (2) : A\ Metal (Tin) trap. B\ White wide plastic cylindrical trap.

B- Baits type :

Various types of baits were used: Minced meat, Tuna fish, Fesha (sheep's lung) , chicken meal .

In this study we were spread the traps around the apiary and orchard fields, consisting of three replications for each type of traps and baits. Daily traps and wasps were enumeration, as well as change the different baits every 2 days for each trap, and data recorded began from the beginning of Jun – end of November 2019 . The present study aimed to assess the efficiency of some types of local traps and the baits used and

their effectiveness to controlling red wasp damage on the numerical density of this insect.

The results were analyzed statistically using (R.C.B.D.) and Duncans test to investigate the significant between means depending on (SAS).

RESULTS AND DISSECTION

The beginning of the appearance and disappearance of red wasp workers during the activity season (June – November) 2019 .

The results showed that the Red wasp *Vespa orientalis* L. were found attacking vegetables , Orchards and honeybees *Apis mellifera* during

June to November (2019). Data in table (1) showed that the *V. orientalis* started to appear in small numbers (1 wasps/week) during the first week of June and gradually increased to reached the highest number during the fourth week of August (252 wasps/week). A sharp decline observed during the first week of October. The number of wasps decreased gradually until the fourth week of November. The monthly highest numbers of the hornets recorded in August (162.5 wasps/week) with an average temperature (42.5°C) and relative humidity (27.6%) followed by (30 wasps/week) in September with an average temperature (41.6°C) and R.H. (27.7%) and (24.5 wasps/week) in July with an average temperature (42.1°C) and R.H. (27.1 %).

The study results showed that the red wasp population started to come into view from the first week of June (1 hornets/week) and gradually increased in numbers and started declining at the end of October in the contrary to Gomaa and AbdEl-Wahab (2006) study, who

mentioned that the numbers of wasps were increased from the second week of August (51 wasps/ trap) to the fourth week of September (3301 wasps/trap). Furthermore Taha (2014) reported that the highest number of captured oriental hornet was observed during October 2011 and November 2011 with average temperature and relative humidity (24.4 °C, 69.5% and 17.3°C, 79.0%), respectively. The obtained results confirmed the findings of Shoreit, 1998 who he stated that *V. velutina*, *V. orientalis* and *V. tropica* workers reached their peak in October and also Waghchoure-Camphor, 2013 where she observed that *V. velutina* seem to be the most serious predator of *Apis mellifera* at Islamabad which causes damage to honeybee colonies if not controlled. In our study the highest peak of hornet population was observed in August with average temperature and humidity (42.1°C, 27.6%). These results agreed the observations of Shoreit 1998.

Table (1) : Population density of Red Wasps caught during the study season (2019).

Month	No, of Week	Mean of caught wasp\ week	Total average \ month	% Temperature		% Humidity	
				Week	month	Week	Month
Jun.	First	1	2.75	36.1	37.1	33.3	31.6
Jun.	Second	1		38.7		30.1	
Jun.	Third	2		32.25		34.2	
Jun.	Fourth	3		41.7		28.9	
Jul.	First	5	24.25	45.2	42.1	23.3	24.1
Jul.	Second	7		37.98		22.3	
Jul.	Third	28		42.21		25.2	
Jul.	Fourth	46		43		25.5	
Aug.	First	95	162.5	42	42.5	31.98	27.6
Aug.	Second	127		42.8		25.9	
Aug.	Third	133		43		25.9	
Aug.	Fourth	252		42.45		26.7	
Sept.	First	42	30	41.15	41.6	25.4	27.7
Sept.	Second	33		38.98		30.0	
Sept.	Third	25		48.71		28	
Sept.	Fourth	20		37.7		27.46	
Octo.	First	2	1.5	35.9	30.9	32.3	44.5
Octo.	Second	1		33.2		33.78	
Octo.	Third	3		30.9		43.35	
Octo.	Fourth	1		23.7		68.7	
Nov.	First	2	0.85	21.2	19.5	61.5	78.3
Nov.	Second	1		23.4		77.5	
Nov.	Third	0		17.3		87.1	
Nov.	Fourth	0		16.3		87.3	

Traps and Baits preference**Traps:**

The results of this experiment showed in table (2) that the best trap was wooden trap that given a significantly different in the caught, which gave a highest number from wasps worker in the field reached (76 wasp \ trap) , and followed by white wide cylindrical trap reached to 47.5 (wasp \ trap) . The lowest number of red

wasp was coughed by metal (Tin) trap reached to (26 wasp \ trap) , The efficiency of metal trap was inferior as compared to the wooden trap and with plastic trap. The results confirmed the findings of scientists Bikos (1994) in Greece and by Shoreit (1998) in Egypt when used a similar type of trap with different kind of bait when used attract only wasps and not honeybees.

Table (2) : The efficiency of the trap type and the bait type in combating the red wasp

Type of bait	Minced meat	chicken meal	Tuna fish	Fesha (sheep's lung)	Mean of trap type
Type of trap					
Wooden trap	79 d	101 b	122 a	45 f	76 a
Metal (Tin) trap	28 k	30 g	42 g	16m	26 d
White Wide Cylindrical trap	43 g	55 e	72 c	34 i	47.5 b
Long Cylindrical trap	43 g	39 h	66 e	24 l	30.5 c
Mean of bait type	39 c	48 b	67.25 a	26.75 d	

Baits:

The results showed major differences between baits statistically that gave the maximum total of red wasps were attracted to the traps which contain

tuna fish reached (67.25 worker) , and followed by chicken meal bait , minced meat and fesha (sheeps lung) means of the caught oriental wasp were 48, 39 and 26.75 wasp \ bait respectively. tuna fish became rancid as a results of heat summer season through test period due to the proses of oxidation and dehydration of tuna fish fats content to short series of aldehydes and ketones that make smell that caused to attracted red wasp to tuna fish baits

the results of the current experiment appeared that wooden trap with Tuna bait was most affected to controlling red wasp which catching more than another types of baits. This result approved with (Bacandritsos,2006), when test the Comparison between many types of catch wasp traps . The research showed that the red wasp prefer tuna fish baits and attracted and significantly differ from the other baits. (Table 2). The results match with previous research [Pereira, *et.al.*, (2013).

The table (2) showed that wooden trap with tuna fish gave highest mean number of red wasp and followed by chicken meal bait and significantly differed as 122 and 101 wasp \ trap respectively. Moreover the metal (tin) trap using Fesha (sheep's lungs) bait was the lowest attractive bait tested was reached (16 wasp \ trap).

The protein and fat content of the baits may have a major influence on its attractiveness to the wasps (Al Antary, *et.al.*, 2016) . In addition, This explanation agreed with the results reffered that bullmeat and sardinefish contain protein and fats reached (22.21%, 21.75%) , respectively. Besides, sardinefish contain more fat content than bullmeat (3.46% .2.32%). because of the sardinefish is more wet than bullmeat, the fish meat released the smell slowly with long time than the other baits. However, sardine meat in the glass trap within experiment period (24 hours) had become rancid through test period because of the proses of oxidation and dehydration of tuna fish fats content to short series of aldehydes and ketones that make smell that caused to attracted red wasp to tuna fish baits [Triqui, and Bouchriti,(2003) ; Gomes, *et.al.*, (2013)],that explained why the red wasp attracted to wooden trap with tuna fish baits more than the others.

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هه لسنگاندنا هنده ك جورين خه فكا وخارنا دژى ئستينگا روژه لاتى .
Vespa orientalis L.
(Hymenoptera: Vespidae)

پوخته

ئه ف قه كولينه ياهاتيه ئه نجام دان هه ر ژ هه يقا حيزيراني هه تا دو ماھيا چريا دووى ل سالا 2019. ژكيلگه هين كوليژا زانستين ئه ندياريا چاندني/ زانكوي دھوك- هه ريما كوردستانا عيراقى. ئه ف قه كولينه خو قه ت گريت چار جورين خه فكا و چار جورين خارني هاتينه هه لسنگاندن بو كيمكرنا زيانين ئستينگا روژه لاتى ل سهر ميشا هنگى و بهر هه مين كيلگه هين ترى و زهره واتى ژ ناوچى. هاتنه بكارئينان چار جورين خه فكين جودا وهكى خه فكا دارى، خه فكا كانزايا بچيك، خه فكا پلاستيكي ياسپى، خه فكا پلاستيكي يادريژ و چار جورين خارنين جودا ل ناف خه فكا دا وهكى گوشتى په زى (قيمه)، گوشتى ماسين تونا، ميلاكا په زى، ريفيكن مريشكا .

هاتنه دياركرن ئه ف ئه نجامه بلندترين كوئه نجامين خه فكا دارى گه هشته 76 ئستينگا/خه فكه كى
ونزمترين كوئه نجامين خه فكا كانزايا بچيك گه هشته 26 ئستينگا/خه فكه كى به لام بلندترين كوئه نجامين
خارنا ماسين تونا گه هشته 67.75 ئستينگا/خارنه كى ونزمترين كوئه نجامين خارنا ميلاكا په زى گه هشته
26.75 ئستينگا/خارنه كى

تقييم بعض الطعوم والمصائد ضد الزنبور الاحمر (*Vespa orientalis L. : Vespidae : Hymenoptera*)

الخلاصة

نقد هذا البحث في حقول كلية العلوم الهندسة الزراعية \ جامعة دهوك , حيث تم دراسة كفاءة أربعة أنواع من المصائد والطعوم في الحد من أضرار حشرة الزنبور الشرقي الأحمر (*Vespa orientalis L.*) على النحل والمحاصيل في المنطقة.

تم استخدام عدة مصائد وهي: قفص مشبك خشبي , مصيدة المعدنية الصغيرة (تنك) , مصيدة اسطوانية بيضاء , مصيدة الاسطوانية شفافة . كما تم دراسة كفاءة طعوم مختلفة في هذه المصائد مثل اللحم المفروم , السمك , رئة الأغنام (فشة) , أحشاء دواجن.

أشارت النتائج إلى تفوق نوع المصيدة قفص المشبك الخشبي معنوياً على بقية المصائد بمتوسط صيد 76 حشرة /مصيدة وأعطت المصيدة المعدنية أقل متوسط 26 حشرة /مصيدة، وتفوق طعم السمك بفرق معنوي كبير حيث كان متوسط الصيد 67.25 حشرة / طعم وكان أقل طعم فاعلية رئة اغنام (فشة) بمتوسط صيد 26.75 حشرة / طعم.

الكلمات الدالة : الزنبور الاحمر , مصائد , طعوم , مكافحة ميكانيكية .