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Effect of Bait and Light intensity of color traps of the population *Ocnerogyla amanda* Staudinger 1891 (LYMANTRIDAE: LEPIDOPTERA) Kane Kawai CHBUX

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KEY WORDS:
light traps, Fermentation baits trap, Ocnerogyia amanda, Kane kawai chbux

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ABSTRACT

This study was carried out in the village of Kane kawai chbux, located in the Sulamani governorate of Iraq in 2021. Two options were used to suppress population destiny: a bait trap and a light trap. The effect of color and light density on the attractiveness of adults of the moth *Ocnerogyia amanda* species of moth leaf worm of fig was studied, and the results showed that light traps yellow color were more effective than white color, Whereas the means monthly captured of adults/trap had (6.278,14.400,12.078), and white light traps means captured adults/trap monthly had (6.830,10.488,10.080)The results of the statistical analysis also showed significant differences between white light traps and yellow light intensity with (50, 100, and 150) watts of bulb power, and traps with a 50-watt bulb had less influence on adult capture. Molasses with water at 1:9 and molasses with vinegar at 1:3. The mean monthly captured adults/trap had (7.304, 3.018, and 0.041).Fermented palm sugar and water were superior in attracting a significant number of captures as compared to vinegar and molasses. Molasses and vinegar were the least attractive. The conclusion is that bait traps are an attraction and capture, and that collectors and attraction are aids to light traps that capture most adults active at night as the best method to reduce population density, these are the two selected methods and their relationship as integrated pest management methods.

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تأثيرات الطعوم وشدة ولون إضاءة المصائد الضوئية في تقليل الكثافة السكانية لعثة ورق التين في قرية كين كاوة الجبوخ من محافظة السليمانية-العراق

Ocnerogyia amanda Staudinger1891 (Lymantridae: Lepidoptera)

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الخلاصة

أجريت دراسة حقلية في قرية كين كاوة الجبوخ التابعة محافظة السليمانية العراق المدة2021. تم إستخدام خيارَين لتَقلِيلْ كثافة السكانية العُثَّة . تمت دراسة تأثِير وشدِّة ولون مَصائِدة الضوئية. وطعُومْ على جاذبية العثة البالغات المصطادة *Ocnerogyia amanda* من دودة أوراق التين ، وأَظهَرتْ النَتائج أَنَ المصائد ذات اللون الأصفَر كانَت أَكثَر جاذبية من المصائد ضوء ذات اللون الأبيض ،حَيثٌ كانَ معَد لَها الشهريا بالغة/مصيدة (6.278,14.400,12.078) ومعَدلْ مَصائِد الضُّوء الأبيض شهريًا بالغة/مصيدة

(6.830,10.488,10.080). تم إكتْشافْ وجود فُرُوق ذات دَلالة إحصائِية بَينَ مَصائِد الضوء الأبيض و الأصفرمع قوة المصباح (50 ، 100 ، و150)واط ، والمصائد ذات 50 واط كان لها تأثير أقل بالغة/مصيدة. دبس النخيل مع الماء بنسبة 1/ 9 ، والدبس بالخل بنسبة 1/ 3. وكان معَدل الشَهريا بالغة/مصيدة بَينَ (7.304. 3.018. 0.041)وكان دبس النخيل المُخمر والماء يَتَفوَقان في جذب أعداد معنوية من بالغة/مصيدة مقارَنة بالخل والدبس ، وكان الدبس والخل الأقل جاذبية مقارَنَة مع لماء.نقشت هوالنتائج مصائد طعوم جاذبة مصطادة البالغات و جمع جاذب,مساعد جاذبة في مصائد ضوئية التي تصطاد معظم البالغات , نشاط اليلي كأفضل طريقة لتقليل كثافة السكانية,وجود هاتان هما طريقتان المختارة العلاقة بينهما كطريتين الإدارة متكاملة الأفات.

الكلمات المفتاحية: العثة ورقة التين *Ocnerogyia amanda*,مصائد ضوئي ، مصائد الطعم التخمير، كين كاوة الجبوخ

INTRODUCTION

Ficus carica L., a part of the family (Moraceae), Fruits are high in fiber, potassium(Vinson, 2018), amino acids, sugar, calcium, and iron. source of vitamins C, E, and (Solomon et al., 2006) as an important source of food that most benefits humans. *F. carica* is an important component of rain forest vegetation, particularly in the lowlands(Novotny et al., 2005). In northern Iraq, *Ocnerogyia amanda* (Lepidoptera: Lymantriidae) is a serious pest of the fig tree *Ficus carica* L (Novotny et al., 2005). More notes have been previously published on the life history of the fig tree moth in Iraq(Ali et al., 2012; YS Ghani et al., 2013).The larvae devoured all the fig leaves completely, with the exception of the large midribs. Since they are night feeders, they remain concealed among the leaves on the ground during the daytime. As a result of a series of leaf damage and water-regime issues with the injured tree, the fruits may also shrink and drop. Before it was fully ripe. There may be additional causes as well, such as fruit exposure to intense sunshine and, in certain circumstances, fly infection, which slows fruit growth and results in fruit shedding. (Buxton, 1920). Moths became active at night and stopped ingesting honey-solution when they hit maturity. Moths that had been hibernating behind stones and in cracks in the ground began to emerge. After mating, each female can lay up to 75 eggs found under trees on the lower side of the leaves.

The larvae hatch in 6 days. It passes through six molts before it becomes fully-grown. It begins to build its cocoon, feeds for around 28 days, and then pupate for 7–10 days on the leaves, while the last half of June and the first half of July see the monitoring of the pupae and adults. The pest is likely to have three generations during the hotter seasons of the year, which are from April to September (Abai et al., 1986).Adults are nocturnal (Kawahara et al., 2019).The larvae of a tussock moth Lymantriinae(Schaefer, 1989) higher classification is Superfamily: Noctuoidea (Kawahara et al., 2019).this pest had been Distributing in Mesopotamia, Iraq, Iran, and Turkey in Mardin. Oman (Hacker, 2016), the United Arab Emirates (Fibiger et al., 2009)and the United Kingdom (Legrain et al., 1998).Diyala, Baghdad, and other cities are now found in the majority of Iraqi cities, especially in the Kurdistan region according to AfroMoths.net.

Some methods for reducing this pest have been developed. Noctuids, the major attractive groupings of lepidopterans, are used in traps to decrease insect populations (P J Landolt et al., 1997; Suckling et al., 1990 ;Kovancı et al., 2013) Molasses and pure grape molasses, enzymatic acids, may act as insect pest attractants. (Hughes et al., 1998) caught nearly 100 butterfly species in traps baited with grape molasses and 10% bait (grape molasses) (Peter J Landolt, 2000) .Acetic acid also attracts noctuid moths that are attracted to fermenting sweet baits. Glover, 1855(Frost, 1926,1928, 1929;Eyer, 1931;(Ditman et al., 1933) Similarly, pans of poisoned vinegar and molasses have been reported to attract and kill corn earworm moths, *Helicoverpa zea* (Boddie). For example, the sex ratio of other noctuids trapped in fermenting molasses bait was one-to-one. For example, *H. Virescens* and *M. latipes*(P. J. Landolt et al., 1997) Molasses with water was attractive(Peter J Landolt, 1995) Moths

were captured in water containing 20% molasses or 5, 10, or 20% jaggery. Although one distilled 200ml of water, after a week, it became active again, and its attractiveness was high for up to 24 days after it was made.

As well as visual lures (such as light) for suppressing the population of the pest. LEDs convert electricity to light while producing very little energy(Cohnstaedt et al., 2008). In addition, *Deilephila elpenor*, the hawkmoth, has very sensitive eyes that can recognize colors even in low light. Studies have so far used light traps and baits to examine, record, and reduce insect pest populations as well as capture a variety of insects without the need for human management.(Nabli et al., 1999 ;Goretti et al., 2011 ;Pawson et al., 2009 ;Wallner et al., 1995 and Arthurs et al., 2020).

The aim of the study is to make a comparison of the best methods used for suppressing population density in the following the effect of the use of (light and bait) traps to attract insect adults, and light traps with different powers and colors at night to attract adults.

MATERIALS AND METHODS

Study Location

Experiments were carried out in a field at Tree Fig Farm in (Latitude. 35° 18'450" N; Longitude. 45° 43'658" E) in Kurdistan of Iraq, in Sulmiani, Halabja new, during 2021. The altitude of the field was 523.8Meters, A place containing a lot of fig trees is 38 kilometers away and 35° east of Sulamani and had available electrical power to supply the light traps.

Using light traps, color, and power in orchards for the population density of adults.

Light Trap Design the local is made of a large bottle of 20 liters, colored white and yellow Figure1 (A) (Upton et al., 1991). The Berlese or Tullgren funnel; (Stanley et al., 1970;Mulhern, 1942). (White and yellow lamps with different powers of (50, 100, and 150) watts each with three replicates). At night, to attract and kill adults, the lights (50 meter distance between them) were randomly distributed. Water and Delta 25 insecticide are added for container collectors. The timing of insecticide applications can be based on the results of trapping(Gilbert, 1984) .Figure1(B) filtration Collected and recorded moths from each trap are labeled light traps according to treatments and replicated for 28 weeks during 2021 (18 April until November)

Using bait traps in orchards on the population density of adults

Bait traps like molasses with water (100 molasses/900 milter water) (P. J. Landolt et al., 1997) molasses with vinegar of grape 0.05 acetic acid made in Iran (100 of molasses/300 milter vinegar(Yücel, 2016), are three replicated and labeled and control. Fermentation is prepared by a little yeast of brewers yeast(Redzepovic et al., 2003). 3 days later before use is prepared for each fermentation (Peter J Landolt, 1995), These are in two different bottles, then in a field divided into equal liquids in bottles plastic labeled each with a volume of 2 liters, a width of 10 centimeters, and a depth of 30 centimeters (Rivero et al., 2021). When they are suspended from the branches and stem trunks of trees by wire steel carbon one millimeter because this type easily handles moderate flattening and that for hung figs from around and within the tree at a height on the surface of earth of 1.5 or 2.5 meters (Tortricidae, 2019) Figure(2) In open fields, a 25-meter distance between traps may lessen trap interference. Every 7 days, all baits were filtered.

Statistical analyses

The results were analyzed using a randomized complete block design (RCBD) and means were compared by Duncan's multiple range test ($P \leq 0.05$) using statistical software(XL-STAT.21.2.59614(Addinsoft 2019). (JMP, 2007).

Figure 1: B-process of filtrating of the insect collector and bait trap and light traps by filter flour of plate underneath.

Figure;2.-hanging a bottle bait with stem of tree

• A water bottle was used as the trap, colored white and yellow, which has a radius of 25 cm, a depth of 45 cm, and made three holes back around the nearest funnel: 12 cm long, 5 cm wide, and cut 10 cm in the cap. The remaining top covers each bottle to block the rain. The holes are 5 cm wide in order to capture insects in the collection•The height of the light trap from the ground is 140 cm, tightened by steel wire around the bottles of the light trap with pillars of 2.5 meters Hang the collection container with wire (aluminum) 3millimeters from the bottom part of the funnel for all of the light traps. The collection container measures 10 cm in diameter and 25 cm in height.

•The holder base to install the light bulb and tighten the bulb by rope cotton 2 millimeters to the opposite inside container is 10 cm, in order to attract the moths around the bulb in the shortest time, then fall down to the inside bottle collector and large amounts of debris from falling into the container and prevent moths to escape of light.

•electric lamp with a capacity of Bulbs (50,100,150) watts, yellow and white.
•Electrical wires to connect the power supply and a switch to start and cut the main power supply.

Figure 1; A- The local design of a light traps and its specifications

RESULTS and DISCUSSION

The effect of light traps on the population density of adults

The population density of weekly captured adults of *Ocnerogyia amanda* at Kane Kawai chbux for the year 2021 is represented in Table 1. It was observed that the adults began to appear in the field in the second week of April and then increased gradually until reaching the peak during mid-June, and then the population decreased gradually until reaching the season's end in the second week of November. high density of weekly captured adults/trap observed due to yellow color100 watt(33.959)adults/trap at the last week of April yellow density for each week high captured .statically analysis indicated that there were differences in the mean among weekly sample($p \leq 0.05$) in which the higher mean captured adults/trap 50 watt 100 150 yellow(6.057,12.744,12.998) than means weekly numbers captured adults/trap 50 watt 100 150 white color were(6.380,9.002 ,10.525) and high weekly captured adults in last week April captured adults/trap 26.959 100watt of white color different significantly from other week. There were significant differences between total weekly means of the adults/trap captured yellow, which were total means weekly, had 8.635white, 10.600 yellow. From this, we find that as the number of adults/trap increases between with increase intensity 50 and 150 watts similar source(Sridhar et al., 2018). The yellow color is because the wavelength is longer than the white color, and the yellow color is placed in the nearest place in the fig trees according to(Mikkola, 1972) who showed that for this reason, light wavelengths that can only attract. Although most species can detect the yellow wavelengths that lamps generate, they rarely attract moths. This research is similar According to(Athanassiou et al., 2007;Nirmal et al., 2017), these findings are significant. In the high-density stand, white and yellow traps caught many more than the other two trap colors, but this was no significant according to source(Mahmoud et al., 2014) traps capture adults in low numbers (two per trap) until mid-June are capable of color recognition even in low-light conditions noticed that by(Kelber et al., 2003). There were significant differences in means captured adults' white light density between 50, 100, and 150, disagreement by source(Al-Jallal, 2007)who showed that no significant differences between the traps of the white light density of with 160W bulb power and 250W bulb power and unaccepted by (Al, 2007) who indicated that there were no noticeable variations between the white light density traps with 160W and 250W.The effect of lamp color, white and yellow type, and light intensity (50,100,150) on the types and number of pest moths catches a correlation between lamp color and light intensity. With this result, the study was accepted by (Erdiansyah et al., 2021;Sridhar et al., 2018).agreement by (Geer et al., 2019) who observed that higher-intensity lights attract more species than lower-intensity lights, as evidenced by the fact that yellow and white incandescent bulbs have higher intensities than their LED counterparts. the data table (2) show that the adults/trap number were coincided with the increasing light intensity from 50-100,150 watt, total monthly means number of adults/trap had (9.133white color , 10.919 yellow color) and there were significant differences($p \leq 0.05$).these differences colors and intensity between months and light intensities (white, yellow).

The effect of bait traps on the population density of adults

Tables 3, 4 describes the population density of the captured *Ocnerogyia amanda* in three different types of bait-using bottles for the year 2021 at the Kane Kawai Chbux site. It was clear of molasses water had a higher adults/trap number than molasses /vinegar in the last week of April over the weekly sample period (18 April–14 November).Whereas the increased density was found to be higher in molasses and water (24.062 adults per trap) and decreased to 8.903 adults per trap in molasses vinegar, with 0.333 adults per trap in water as the control, molasses and water had the highest adult per trap between them; there were significant differences between the baits for the study ($p \leq 0.05$) based on the highest number of adults captured per trap in molasses and water each week. Suggest that, on average, during the research year. Most adults were caught in molasses/water rather than molasses with vinegar or water only the vinegar bait was also much less common. (Peter J Landolt, 1995)who found that molasses with 5, 10, or 20 jaggeries in water produced greated adults or traps of the *Mecies laptipes* Gueene; increasing the palm sugar concentration from 5% to 20% in water resulted in a noticeable increase in the number of *Mocis latipes* trapped.Furthermore, it catches molasses with water (1:9) more than molasses with vinegar (1:3) because molasses with water (1:9) is sweeter and stays longer than molasses with vinegar (1:3). This study accepted by the source (Peter J. Landolt et al., 2011), so that molasses with water has a (1:9) greater catch of moths than molasses with vinegar. This is a significant study According to the source(Yothers, 1927)who indicated that adult codling moths were attracted to vinegar (5–50% acetic acid), a result of microbial fermentation of these sugary baits, though in much lower quantities than molasses. For more example Compared to the appeal of a variety of different acids (Adilha et al., 2018) it caught the least number of *G. molesta* adults of all the traps tested (Eyer et al., 1930). As a result, molasses with vinegar catches the least amount of molasses. In this experiment, the ratio of molasses to vinegar (1:3) attracted the fewest moths. This is study similar to(Hughes et al., 1998) The results revealed that catches were greater in April and May, but declined in the months of June, July, and August. This is a result similar to the source for example (Leeuwen et al., 1939) molasses ferments into 10% vinegar indicate that Higher molasses catches from April 29 to July 4. From July 10th until September 17th, 1.45 molasses fermented jars are available. The catches in 21 jars have been reduced, but in this study molasses/vinegar ratio is1:3. Furthermore example(P. J. Landolt et al., 1997)who observed baited with 200 ml of 10% jaggery in deionized water (5 to 16 days old) and the other trap was baited with 200 ml of deionized water. It subsequently became attractive after one week and increased in attractiveness for up to 24 days after it was made. for this reason study, the ratio of molasses to vinegar is 1:3, which is less than 10% jaggery in deionized water. Because of fewer attractive moths remaining active than in molasses with water (1:10), there are fewer captured adults in the trap. Molasses with vinegar1:3 this ratio this study lower than 1:10 molasses grape so few captured adults/trap this accepted by this example (Hughes et al., 1998) In *Costa Rica*, researchers used rotten banana and grape molasses to attract 23 and 37 lepidopteran species, respectively, in forest and grassland environments. In Finland, almost 100 butterfly species were caught in traps baited with grape molasses, honey, and beer. Molasses and 10% bait (grape molasses), and the bait traps were made with a 1:4 (food: water) ratio and 2-3 grams of yeast. Vinegar A few captured adults /traps a reason to return to this study as a researcher. For example, a mixture of acetic acid and aromatic volatiles. Secondary factors include the

synthesis of alcohol and the evolution of gas, but the production of large yeast populations and the conversion of alcohol to acetic acid are only slightly attractive or even repellent as notice that by (El-Sayed et al., 2016) Male and female moths of several pest Tortricidae were attracted.

The effects of bait traps light traps color on the population density of adults

Evident from Tables 1.2.3.4 is that moths of several noctuid genera can be present in substantially larger numbers of captured adults at the light when baiting and light trapping are done concurrently, suggesting that estimations of abundance based on light trapping data alone can be deceptive and reduce the population density of adults and the economic level of the injured(Cleve, 1971) Similarly, researchers (Peter J Landolt et al., 2018) have observed that baiting is used to catch nearly 80% of noctuid species.

Table: 1-effect of light traps color with intensity on the total weekly captured adults of *Ocnerogyia amanda* at village Kane kawai chbux during 2021

Days	White color with intensity captured adults/trap				Yellow color intensity captured adults/trap			
	50 watt	100 watt	150 watt	general means white	50 watt	100 watt	150 watt	general means yellow
18/04/2021	10.256 a-i	25.626 b-d	19.213 a-c	18.365 a-c	7.256 c-m	33.959 a	13.880 c-i	18.365 a-c
25/04/2021	14.589 ab	26.959 a-c	23.213 a	21.587 a	5.923 d-m	33.626 a	15.880 a-e	18.476 a-c
02/05/2021	12.923 a-c	22.959 c-f	15.213 b-g	17.032 b-e	9.923 a-j	24.626 c-e	16.213 a-e	16.920 b-f
09/05/2021	10.256 a-i	17.292 d-l	15.546 a-f	14.365 d-i	11.923 a-e	20.626 c-h	19.213 a-c	17.254 b-d
16/05/2021	7.923 c-m	15.959 e-n	9.213 d-p	11.032 i-p	8.589 b-m	14.959 f-p	16.213 a-e	13.254 f-l
23/05/2021	8.923 b-l	13.959 g-q	13.546 c--j	12.143 g-n	10.589 a-h	15.959 e-n	15.546 a-f	14.032 d-j
30/05/2021	7.256 c-m	17.959 d-k	22.213 ab	15.809 b-g	9.256 b-k	23.292 c-f	23.213 a	18.587 a-c
06/06/2021	11.256 a-g	16.626 e-m	16.880 a-d	14.920 c-h	12.256 a-d	19.626 c-i	15.546 a-f	15.809 b-g
13/06/2021	5.589 d-m	9.292 j-s	7.546 f-p	7.476 o-y	8.589 b-m	11.292 i-s	11.213 c-l	10.365 j-r
20/06/2021	6.923 c-m	9.292 j-s	8.880 d-p	8.365 n-x	8.589 b-m	9.959 j-s	10.880 d-m	9.809 l-t
27/06/2021	6.589 c-m	5.626 q-s	4.880 k-p	5.698 v-z	5.256 e-m	6.959 n-s	6.546 h-p	6.254 s-z
04/07/2021	4.923 f-m	4.959 q-s	1.546 p	3.809 yz	4.256 h-m	6.959 n-s	5.546 j-p	5.587 v-z
11/07/2021	2.256 lm	7.626 m-s	4.213 l-p	4.698 w-z	4.589 g-m	5.959 p-s	5.880 i-p	5.476 v-z
18/07/2021	2.589 k-m	6.292 o-s	2.546 n-p	3.809 yz	3.256 j-m	3.959 s	2.880 m-p	3.365 z
25/07/2021	3.923 h-m	9.292 j-s	8.213 e-p	7.143 p-z	4.589 g-m	22.626 c-g	14.213 c-h	13.809 d-k
01/08/2021	3.923 h-m	15.292 f-o	10.213 d-o	9.809 l-t	5.256 e-m	8.626 l-s	16.546 a-d	10.143 k-s
08/08/2021	4.256 h-m	9.626 j-s	7.546 f-p	7.143 p-z	3.589 i-m	18.292 d-j	10.546 d-n	10.809 i-q
15/08/2021	5.923 d-m	9.292 j-s	5.880 i-p	7.032 q-z	6.589 c-m	9.626 j-s	9.213 d-p	8.476 n-w
22/08/2021	5.589 d-m	4.292 rs	3.546 l-p	4.476 xyz	4.256 h-m	5.959 p-s	5.880 i-p	5.365 v-z
29/08/2021	5.923 d-m	7.959 m-s	4.546 l-p	6.143 t-z	4.256 h-m	8.959 k-s	7.546 f-p	6.920 q-z
05/09/2021	4.923 f-m	4.626 rs	1.213 p	3.587 yz	4.256 hi-m	8.626 l-s	4.546 l-p	5.809 u-z
12/09/2021	6.589 c-m	6.292 o-s	6.880 h-p	6.587 r-z	5.589 d-m	10.626 j-s	12.880 c-k	9.698 l-u
19/09/2021	4.589 g-m	5.626 q-s	3.880 l-p	4.698 w-z	5.589 d-m	10.292 j-s	5.546 j-p	7.143 p-z
26/09/2021	11.256 a-g	8.292 l-s	7.213 g-p	8.920 m-v	6.256 c-m	14.959 f-p	9.213 d-p	10.143 k-s
03/10/2021	9.256 b-k	8.292 l-s	6.546 h-p	8.032 o-x	11.589 a-f	11.959 h-s	6.546 h-p	10.032 k-t
10/10/2021	6.256 c-m	10.292 j-s	7.213 g-p	7.920 o-x	5.589 d-m	14.959 f-p	10.213 d-o	10.254 j-r
17/10/2021	16.256 a	13.292 h-r	10.546 d-n	13.365 e-l	11.256 a-g	32.626 ab	12.880 c-k	18.920 ab
24/10/2021	5.256 e-m	12.292 h-s	4.880 k-p	7.476 o-y	5.589 d-m	15.626 f-n	9.213 d-p	10.143 k-s
31/10/2021	6.256 c-m	10.292 j-s	6.880 h-p	7.809 o-x	4.589 g-m	20.292 c-h	13.213 c-j	12.698 g-m
07/11/2021	3.256 j-m	8.626 l-s	3.213 l-p	5.032 v-z	6.589 c-m	15.959 e-n	11.213 c-l	11.254 h-o
14/11/2021	1.923 m	9.292 j-s	2.213 op	4.476 x-z	1.923 m	7.626 m-s	3.880 l-p	4.476 x-z
means weekly	*6.380 c-m	9.002 k-s	10.525 d-n	8.635 n-w	*6.057d-m	12.744 h-s	12.998 c-k	10.600 i-q

* Number with same letters within each Colum or row are not Significant by Duncan multiple Range test ($p \leq 0.05$)

Table: 2-effect of light traps color with intensity total monthly captured adults of *ocnerogyia amanda* at village Kane kawai chbux during 2021

months	white color with intensity adults/trap				Yellow color with intensity adults/trap			general means yellow
	50 watt	100 watt	150 watt	general means white	50 watt	100 watt	150 watt	
April	12.142 a	25.540 ab	21.865 a	19.849 a	6.309 b-f	33.040 a	15.532 bc	18.293 ab
May	9.175 a-c	16.873 c-e	15.798 bc	13.949 b-d	9.775 ab	19.140 bc	18.732 ab	15.882 a-c
June	7.309 b-e	9.456 e-g	10.198 c-f	8.988 d-g	8.392 a-d	11.206 c-g	11.698 c-e	10.432 d-f
July	3.142 ef	6.290 fg	4.782 fg	4.738 g	3.892 d-f	9.123 e-g	7.782 d-g	6.932 fg
August	4.842 c-f	8.540 e-g	6.998 d-g	6.793 fg	4.509 d-f	9.540 e-g	10.598 c-f	8.216 e-g
September	6.559 b-f	5.456 g	5.448 e-g	5.821 fg	5.142 c-f	10.373 d-g	8.698 d-g	8.071 e-g
October	8.375 a-d	10.140 d-g	7.865 d-g	8.793 d-g	7.442 b-e	18.340 b-d	11.065 c-f	12.282 c-e
November	2.309 f	8.206 e-g	3.365 g	4.627 g	3.975 d-f	11.040 c-g	8.198 d-g	7.738 e-g
means monthly	*6.830 b-e	10.488 d-g	10.080 c-f	9.133 d-g	*6.278 b-f	14.400 c-f	12.078 cd	10.919 d-f

* Number with same letters within each Colum or row are not Significant by Duncan multiple Range test ($p \leq 0.05$)

Table: 3-effect of baits trap ratio on the total weekly captured adults of *Ocnerogyia amanda* at village Kane kawai chbux during 2021

date sampling	molasses with water captured adults/trap	molasses with vinegar captured adults	Control captured adults/trap
18/04/2021	23.395 a	12.570 a	0.000 a*
25/04/2021	24.062 a	8.903 b	0.333 a
02/05/2021	9.395 cd	5.570 c	0.333 a
09/05/2021	6.395 c-e	4.237 cd	0.000 a
16/05/2021	5.728 d-g	3.570 c-e	0.000 a
23/05/2021	4.395 e-i	1.237 f	0.000 a
30/05/2021	1.728 g-i	0.570 f	0.000 a
06/06/2021	1.728 g-i	1.237 f	0.000 a
13/06/2021	1.395 hi	0.570 f	0.000 a
20/06/2021	2.062 f-i	2.237 d-f	0.000 a
27/06/2021	1.728 g-i	0.237 f	0.000 a
04/07/2021	1.728 g-i	0.237 f	0.000 a
11/07/2021	2.062 f-i	0.237 f	0.000 a
18/07/2021	2.062 f-i	0.237 f	0.000 a
25/07/2021	0.728 i	0.570 f	0.000 a
01/08/2021	3.062 e-i	0.237 f	0.000 a
08/08/2021	6.062 d-f	0.237 f	0.000 a
15/08/2021	1.728 g-i	0.237 f	0.000 a
22/08/2021	1.395 hi	0.570 f	0.000 a
29/08/2021	5.395 e-h	0.237 f	0.000 a
05/09/2021	1.728 g-i	0.237 f	0.000 a
12/09/2021	2.062 f-i	0.903 f	0.000 a
19/09/2021	2.062 f-i	0.903 f	0.000 a
26/09/2021	2.395 e-i	0.903 f	0.000 a
03/10/2021	5.062 e-h	0.237 f*	0.000 a
10/10/2021	3.395 e-i	0.903 f	0.000 a
17/10/2021	15.395 b	1.570 ef	0.000 a
24/10/2021	9.395 cd	1.570 ef	0.000 a
31/10/2021	14.062 b	1.570 ef	0.333 a
07/11//2021	10.062 c	1.570 ef	0.000 a
14/11/2021	9.395 cd	1.903 ef	0.000 a
means weekly	5.599 d-g	*2.194 d-f	0.032 a*

Table: 4 -effect of baits trap ratio on the total monthly captured adults of *Ocnerogyia amanda* at village Kane kawai chbux during 2021

months-sampling	molasses /water captured adults/trap	molasses /vinegar captured adults/trap	control captured adults/trap
April	23.604 a	10.656 a	0.003 b
May	5.404 c	2.956 b	0.070 b
June	1.604 d	0.989 b	0.336 a
July	1.520 d	0.239 b	0.003 b
August	3.404 cd	0.222 b	0.003 b
September	1.937 cd	0.656 b*	0.003 b
October	9.337 b	1.089 b	0.003 b
November	9.604 b	1.656 b	0.003 b
mean monthly	7.304 bc	3.018 b	0.041 b*

***Number with same letters within each Colum or row are not significant by Duncan multiple Range test ($p \leq 0.05$)**

CONCLUSION

Based on the results of bait traps with molasses/water, because it has the largest mean number of captured adults compared to molasses/vinegar, it is recommended to be used to reduce the density of the adults because, if there is fermentation, it attracts both males and females. As a result, the number of bait trap replications should be increased, and the percentage of water in the molasses should be increased to attract the most moths. Also, the largest mean adult captured with yellow light is recorded at 100 watts, so it is recommended that yellow light be used at 150 watts or higher than that because the yellow color of the wavelength is more effective than white to attract and detect moths and reduce the population density. Has a large number of moths caught, especially in the spring and autumn seasons. Because moths are nocturnal. Light traps have captured more adults than baits. Thus, light traps are the best method to suppress the population. These two selected options are very important in integrated pest management. The choice is to suppress the dense population of moths before damage is exposed. Because these two methods are used together, they complement each other. The goal is to reduce the economic level of the injured density to the lowest level of economic damage, which is usually the level of the economic threshold with some spray of the starting damage.

CONFLICT OF INTEREST

The authors declare no conflicts of interest associated with this manuscript.

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