How to Cite:
Abdullah, F. A., Hajm, Q. A., & Hamed, H. N. (2022). Dietary preference for Oryzaephilus surinamensis and the role of the microwave in the control of the larval and complete phase. *International Journal of Health Sciences*, *6*(S1), 1512-1516.
https://doi.org/10.53730/ijhs.v6nS1.4900

Dietary Preference for Oryzaephilus Surinamensis and the Role of the Microwave in the Control of the Larval and Complete Phase

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***Abstract*---**The study conducted to find out the degree of nutritional preference for *Oryzaephilus surinamensis*, On three types of dates, which are brim, ascetic, and defecation, in addition to the role of micro-rays in controlling the larval and full phase of the Saw-grain beetle, As the results showed that the best type of dates is the ascetic seed, as the number of insect fed to it reached 121 adults and 30 larvae, while the lowest number of insects in the brim was 8 insects. As for the role of micro-rays, in which the insect was exposed to the larval and complete stage for 20, 40, 60 seconds, and the highest killing rate in larvae and adults was 100% at the exposure period of 60 seconds, while it was 80% at the exposure period of 20 seconds in the adults and 90% in the larvae.

***Keywords*---**complete phase, dietary preference, larval, oryzaephilus surinamensis.

Introduction

The Sawn beetle *Oryzaephilus surinsmensis* is a pest of grains and stocked material and is widespread in the world and attacks adult insects and larvae of grains and their products, it also affects other food products, as it affects dried fruits, stored dates, dried meat, and other products that humans feed on, such as sugar, Whole and larvae can be observed in all types of stored material that were previously infected with other stock pests and were poorly stored [Kalpna et al., 2022; Hajj Ismail, 2014]. Dates are attacked by some insects, whether they are in

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Manuscript submitted: 09 Nov 2021, Manuscript revised: 27 Feb 2022, Accepted for publication: 15 March 2022

the field or stored dates, and the saw grain beetle is one of the most important insects that attack dates in the store, This insect has been recorded as one of the most important insects that infect dates in Iraq and the Arabian Gulf. [Najeeb, 2001; Al-Shareefi *et al.*, 2020]. Therefore, this insect must be controlled through the use of many means and methods to limit the spread of this pest. The method of sterilizing or disinfecting dates using a microwave has been shown effective in protecting the stored dates and materials, as this method had specifications that qualify it to be an alternative method in the field of combating stored materials insects through its ability to cleanse these materials well [Mohammed *et al.*, 2020]**.**

Materials and methods

- Insect collection and breeding: The saw beetle was collected from grain stores in the city of Samarra and placed in glass bottles with a capacity of 800 ml with a quantity of dates, and the cap of these bottles was tightened with a cloth of dullness, and the farms were constantly renewed in order to get rid of the molten skins and dead insects until the start of the experiment.
- Study of the effect of food type on insect reproduction: Three types of dates were used in this study, namely (al-brim, al-zuhdi and al-trabaz). Three grains of dates for each type were placed in plastic containers with a capacity of 100 ml, then these containers were weighed with dates as shown in Table (1) Then 10 insects were added, 5 males and 5 females, to each cultivated medium or container, and their mouths were sealed with a dull cloth, then the media was transferred to the storage place at a temperature of 35 ± 2 and a relative humidity of 65% ± 5 [John, (2020)].

Table 1
Weight of the media when starting the experiment

Dates type / Weight in gram	barim	zahdi	tubrzul
First welterweight	100.535	95.335	100.110
Second welterweight	100.140	100.150	127.320
Third welterweight	100.865	100.535	123.740

- Study of the effect of microwave radiation on insect control: Use a microwave device with a power of 700 watts, for insect roles (larva, adult insect) and for different periods of time (20, 40, 60) seconds in addition to the control treatment that represents insect roles that are not exposed to radiation (zero dose). Petri dishes were used, and 10 larvae were placed in each dish and the last 10 adult insects were placed at a rate of three replicates for each repeating plate and with three treatments, the larvae and adults taken from the laboratory colony were inserted into the microwave device and were shown to a dose of 700 watts and for different exposure times of 20, 40, 60 seconds for the same dose. As for the control treatment, it is not exposed to radiation, and the dishes are returned to the incubator

at a temperature of 35 ± 2 m and a humidity of 65 ± 5 for the purpose of calculating the killing percentage after 24 and 48 hours of treatment.

Results and Discussion

The effect of the type of food on the reproduction of the insect: The results showed in Table (2) that the highest reproduction and number of insects reached 121 adults and 30 larvae in the third cultivated medium for golden dates, while it reached 94 adult insects, 25 larvae and 92 adult insects, 23 larvae in the first and second middle respectively, for golden dates. The number of adult insects was 8, 50 adult insects, 11 larvae, 30 adult insects, and 10 larvae in the first, second and third medium respectively, while the tubrzul date type was 7 adult insects, one larva, 13 adult insects, 7 larvae and 9 adult insects in the first, second and third medium. Explained in Table (2).

Table 2
Preparing the insect after treatment and incubate

Dates type	First welterweight	Second welterweight	Third welterweight
Barim	8 insect	50 insect 11 larva	30 insect 10 larva
Zahdi	94 Insect 25 Larva	92 Insect 23 Larva	121 Insect 30 Larva
Tubrzul	7 insect 1 larva	13 insects 7 larvae	9 insects

We conclude from this that dates vary in their components of carbohydrates, proteins, equivalents and antioxidants, which benefits the insect in a better type than another, and these results are consistent with what study indicated and what he mentioned (6) that the food variety has a clear effect on life aspects. For the insect, the reason for this may be due to the variation of dates in their content of nutrients such as carbohydrates And proteins, fats, and minerals, in addition to the variation in their content of trace elements such as magnesium, lead, iron and copper [Ali and Asma, 2021]. Also, the varieties of dates vary in their content of antioxidants and phenolic compounds from one variety to another [Hamza et al., 2021]. This study also agrees with the findings of that the barhi date variety is the most influential in increasing the larval and pupal stage and the number of eggs [Haji Ismail and Al-Hadidi, 2016].

Controlling the insect using a microwave: The results in Figures (1) and (2) showed a significant superiority of the method of disinfection or sterilization by microwave device, as the killing rate was 100% at a period of exposure of 60 seconds to both larvae and adult insects, while it reached 90% and 100% at exposures of 20 and 40. 1 s, respectively, in larvae, 80%, and 90%, at exposure time of 20 and 40 s, respectively, in adult insects, This study agrees with the findings of that increasing the exposure period leads to an increase in the killing rate, as exposing the treatments to a period of 90 seconds, the killing rate was 100% in all stages of the insect, and it also agrees with what indicated that the average percentage The killing of pupae of the Southern Cowpea beetle is directly proportional to the increase in energy levels and the periods of exposure to microwave radiation, as well as consistent with the findings of that the percentage of adult female killing of the Southern Cowpea beetle is directly proportional to

the increase in the duration of exposure [Al-Hamdani and Saleh, 2018; Al-Sinjari, 2005; Alex et al., 2018].

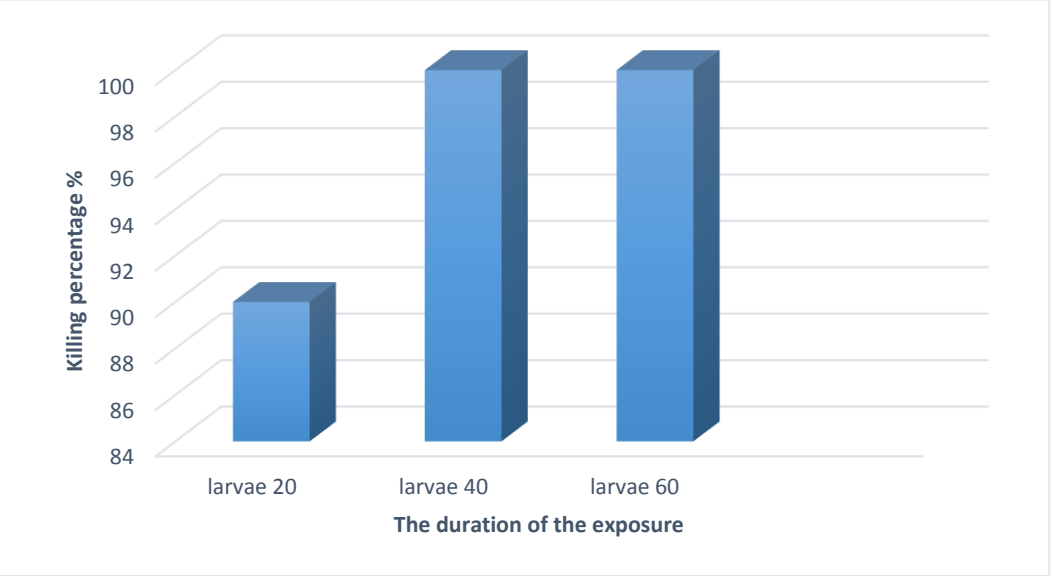

Figure 1. The effect of microwave radiation in killing the Saw Grain Beetle larvae

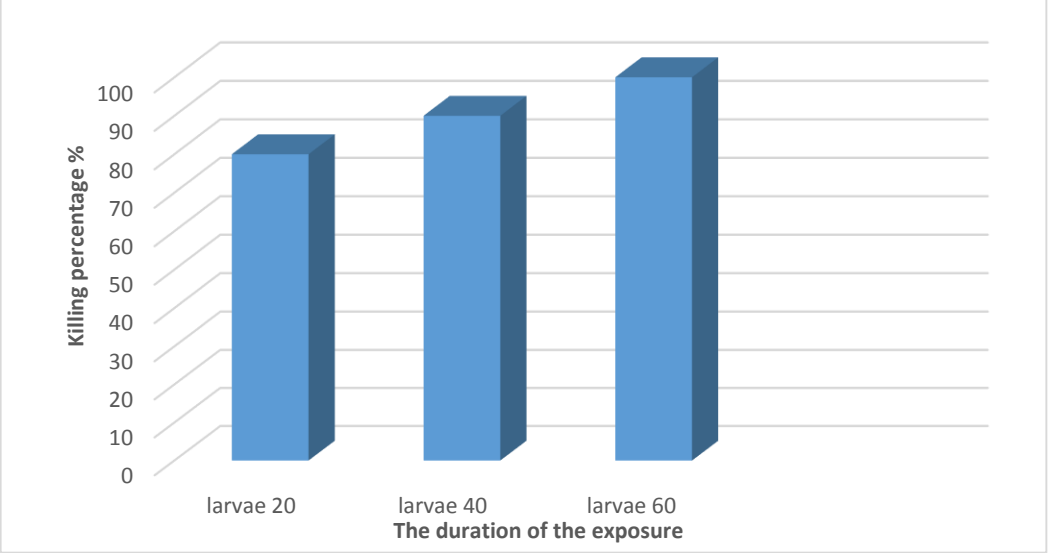

Figure 2. The effect of microwave radiation in killing Saws grain beetles

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