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ORIGINAL ARTICLE

DISTRIBUTION AND TEMPORAL ABUNDANCE OF THE LESSER DATE MOTH *BATRACHEDRA AMYDRAULA* MEYRICK, 1916 (LEPIDOPTERA, BATRACHEDRIDAE) IN BASRAH PROVINCE, IRAQ

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ABSTRACT

The spatial and temporal distribution of the lesser date moth (LDM) *Batrachedra amydraula* Meyrick, 1916 (Lepidoptera, Batrachedridae), a key pest of date palms *Phoenix dactylifera* L. across Basrah Province during the fruiting season of 2024, was evaluated in this study. Results revealed that the lesser date moth was distributed in all the surveyed districts of Basrah. Al-Nashwa and Abu-Al Khaseeb Districts recorded the highest infestation surveyed, whereas Al-Dair, Safwan, Al-Sibah, and Al-Faw Districts recorded the lowest infestation rates. The cultivars Halawi, Zahdi, and Brim were the most susceptible, while the cultivars Barhi and Dieri were the least infested. The fruit developmental stage had a strong effect on the intensity of infestation, which reached its peak at the Chameri stage. Over time, monitoring revealed three peaks of infestation of the lesser date moth. These peaks occurred in late May, in early June, and in late June, which coincided with the early stages of fruit development (Chameri and Hababok). Adult activity of LDM began in early March and peaked in early May; however, adult activity disappeared by mid-July. Additionally, negative and weak positive correlations were noted between infestation and temperature and between infestation and humidity, respectively. The study concluded that *B. amydraula* is widely distributed and exhibits temporal fluctuations across Basrah, with population dynamics dependent on the environmental conditions, the susceptibility of the host plants, and the developmental stages of the plants.

Keywords: Basrah, *Batrachedra*, Date palm, LDM, *Phoenix*.

INTRODUCTION

Date palm *Phoenix dactylifera* L. is one of the most economically important fruit trees in different hot, arid to semi-arid regions of the world (Al-Karmadi and Okoh, 2024; Soomro *et al*., 2023). The date palm belongs to the family Arecaceae, which includes more than 200 genera and over 5,000 plant species (Jonoobi *et al*., 2019). Members of this family, including the date palm, are among the most important plant species in the Arab world due to their great

economic and nutritional significance (Al-Alawi *et al*., 2017; Al-Karmadi and Okoh, 2024). Iraq is considered one of the major centers of date palm cultivation globally (Khierallah *et al*., 2015), containing a diverse range of date palm varieties. The country has approximately 22 million trees unnecessary (Ibrahim, 2018), representing nearly 600 cultivars, which are distributed throughout the southern provinces of Iraq. In Basrah Province, there were 1,199,489 date palm trees, with an estimated production of around 42,764 tons in 2021 (Commission of Statistics and GIS, 2021). Iraq was ranked as the world's top producer of date palms in 2023, with a harvested area of approximately 276,000 hectares (Ozbun, 2025). Consequently, date palm cultivation is considered a strategic crop for Iraq and the neighboring Arab countries (Moustafa *et al*., 2004; Soomro *et al*., 2023).

Date palm trees are attacked by several economically important pests in Iraq and other date palm-growing regions worldwide. Among the most destructive pests are the red palm weevil, *Rhynchophorus ferrugineus* (Olivier, 1791), which is considered one of the most serious pests of date palms globally (Alderawii *et al*., 2020; Naveed *et al*., 2023); the date palm mite, *Oligonychus afrasiaticus* (McGregor, 1939), a major pest affecting fruit quality and yield in Middle Eastern and North African countries (Ali *et al*., 2024; Ben Chaaban *et al*., 2011; Mirza *et al*., 2018), and several other insect pests reported to infest date palm plantations in Iraq and neighboring regions (Al-Jassany and Al-Saedy, 2019; Khan *et al*., 2023). The lesser date moth (LDM), *Batrachedra amydraula* Meyrick, 1916 (Lepidoptera, Batrachedridae), is a highly destructive and economically important pest that attacks date fruits globally wherever date palms are grown (Jatoi *et al*., 2020; Latifian *et al*., 2021). Its infestation leads to tremendous yield loss and reduced fruit quality; this directly influences the economic value of date production (Perring *et al*., 2015).

B. amydraula is native to the Middle East and is found wherever date palms grow, including Iraq, Iran, the Gulf countries, Pakistan, and Egypt (Shayesteh *et al*., 2010; Khierallah *et al*., 2015; Khan *et al*., 2023; Jatoi *et al*., 2024). However, LDM has spread to many parts of the world due to international trade, transportation, and its adaptability to different climatic regimes; this emphasizes the need to develop efficient strategies to reduce its damage to date palms (Shayesteh *et al*., 2010; Haldhar *et al*., 2017; Javadzadeh and Hosseini-Gharalari, 2017; El-Shafie *et al*., 2018).

In Iraq, *B. amydraula* has three generations per year; the first two generations are found in late March and early May, respectively; however, the third generation ranges from early June to the following March (Al-Musafir, 2021). During its life cycle, the female lays eggs on the immature date fruits. After hatching, the larvae bore into the fruits at the Hababouk and Chameri stages. The larvae develop through several instars inside the fruits, causing severe internal tissue damage that leads to fruit drop. Severe infestation leads to fruit loss (Al-Dosary, 2010). The fallen fruits often exhibit a reddish-brown color; hence, the insect is locally known as the “Hamaira insect” (Alyouif and Mazeal, 2008; Shayesteh *et al*., 2010; Ali and Hama, 2016; Jatoi *et al*., 2020). In an attempt to determine the LDM population and provide essential ecological information for developing an effective management program (Price *et al*., 2011).

This study aimed to investigate the distribution and temporal abundance of *B. amydraula* infesting date palms in Basrah Province.

MATERIALS AND METHODS

Population density and distribution of LDM in Basrah Province: A study on the distribution of *B. amydraula* Meyrick, 1916, infesting date palm trees was conducted across Basrah Province from from 16 April to 15 July 2024. The surveyed districts included Al-Faw, Al-Sibah, Safwan, Al-Zubair, Abu-Al Khaseeb, Shatt Al-Arab, Al-Hartha, Al-Dair, Al-Nashwa, Al-Qurna, Al-Medina, and the districts of Al-Sadeq and Ezz Al-Din (Map 1).

At least five orchards were selected from each area, and ten date palm trees were examined in each orchard during each sampling event. For each tree, four fruit bunches were randomly selected to represent the four directions (north, south, east, and west). From each bunch, two spikelets were randomly chosen. A total of 1,450 date palm trees were targeted and randomly inspected across 181 date palm orchards distributed in 13 districts (Tab. 1). On each selected palm, the total number of fruits and the number of infested fruits were counted on the spikelets. Fallen fruits were collected in polyethylene bags to separate LDM-infested fruits from naturally dropped ones and to count the larvae inside.

Seasonal occurrence of LDM in date palm orchards: Monitoring was conducted from 16 April to 15 July 2024 in selected districts of Basrah Province, including Al-Zubair in the southwest, Abu-Al Khaseeb in the southeast, Shatt Al-Arab in the east, and Al-Nashwa in the north; one orchard per district (Map 1) was selected to study temporal changes in infestation levels and larval abundance among cultivars at the following locations:

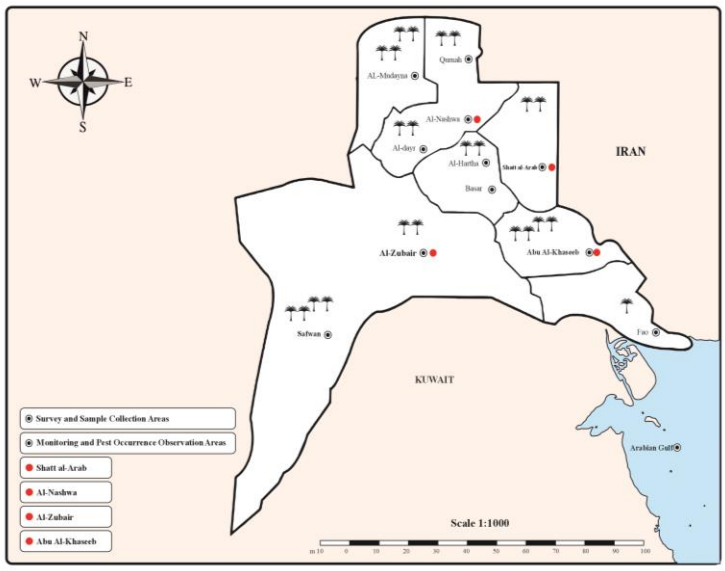
- Al-Zubair (30°22'44.8"N, 47°40'25.9"E),
- Abu-Al Khaseeb (30°28'17.5"N, 47°54'07.4"E),
- Shatt Al-Arab (30°36'35.1"N, 47°46'21.7"E), and
- Al-Nashwa (30°49'21.1"N, 47°35'07.1"E).

Larvae: The survey of infestation levels caused by the lesser date moth larvae was carried out on different date palm cultivars from selected fixed orchards in the above districts. Palm trees at all sites were selected based on uniformity in age, cultivar type, frond density, and agricultural management practices during the growing season of 2024. Samples were randomly collected from eight trees per orchard for each sampling date. Four bunches were selected per tree (representing the four directions), and two spikelets were examined from each bunch. The numbers of infested fruits on the spikelets and fallen fruits (both infested and non-infested) were recorded.

Fallen fruits were carefully examined to differentiate naturally dropped fruits from those infested by the moth. Infestation was identified based on the presence of larval feeding holes, frass, silk threads near the fruit calyx, or larvae within the fruits. Sampling was conducted every 15 days to monitor the spread of the pest. This sampling method also helped in predicting periods of peak infestation.

Distribution and temporal abundance

Adults: The population of the lesser date moth were monitored in the same orchards in four fixed sites in Basrah Province: Al-Zubair, Abu Al-Khaseeb, Shatt Al-Arab, and Al-Nashwa. Monitoring was conducted using plastic delta traps baited with sex pheromones (Alpha Scents Inc., USA), specifically designed to attract and capture male moths. Two traps per donum were installed at a height of 2–3 m within the palm canopy. Traps were checked every 15 days, and lures were replaced as needed. Captured male moths were counted in the laboratory. Meteorological data, including temperature and humidity during the sampling periods, were obtained from the Agricultural Meteorological Center of the Ministry of Agriculture in Basrah Province.



Map (1): Locations of surveyed (marked with ◉) and sampled (marked with ●) date palm orchards in Basrah Province, Iraq, representing the districts used to assess the distribution and temporal abundance of the lesser date moth *Batrachedra amydraula*. Designed by CorelDRAW (https://www.coreldraw.com/en/product/coreldraw)

Statistical Analysis: At the temporal stations, the infestation rates and larval densities were tested for normality and homogeneity of variance before analysis. Due to the uneven numbers of replicates (orchards and trees) among districts, an unbalanced one-way ANOVA was performed to compare infestation percentages and larval densities among districts and cultivars. To evaluate temporal variations, the data were analyzed using repeated-measures ANOVA. Post-hoc comparison tests were conducted using Tukey's HSD test to determine significant differences among cultivars. All data were analyzed using R software (version 4.4.3).

RESULTS

Distribution of lesser date moth *B. amydraula* in Basrah districts

The results of the infestation rates of LDM *B. amydraula* Meyrick, 1916, varied significantly among districts in Basrah Province (Tab. 1). The highest infestation percentages in the infested fallen fruits were recorded in Al-Nashwa (61.82%) and Abu-Al Khaseeb (61.49%). Subsequently, the infestation rates were as follows: Shatt Al-Arab (55.65%), Al-Qurna (46.62%), Al-Medina (46.38%), Safwan (44.92%), Al-Deir (44.23%), and Al-Sadeq (41.15%). The lowest infestation levels were observed in Al-Sibah (27.04%), Al-Faw (26.25%), Hartha (22.30%), Ezz Al-Din (21.98%), and Al-Zubair (18.27%). However, Al-Medina and Al-Sadeq recorded the highest mean number of larvae per infested fallen fruit (3.75 and 3.96 larvae per fruit, respectively). In contrast, Al-Deir, Safwan, Al-Sibah, and Al-Faw showed very low densities (0.07, 0.18, 0.02, and 0.00 larvae per fruit).

Table (1): Distribution and infestation levels of the lesser date moth *B. amydraula* in districts of Basrah Province during the fruiting season of 2024.

Districts	No. of date palm orchards	No. of randomly inspected palms	Infested Fallen fruits	
			Infestation %	No. of Larvae
Al-Nashwa	41	328	61.82 a	1.91 b
Abu-Al khaseeb	20	160	61.49 a	1.05 cd
Shatt Al-Arab	13	104	55.65 ab	1.33 bc
Al-Qurna	10	80	46.62 b	0.62 cd
Al-Medina	5	40	46.38 bc	3.75 a
Safwan	3	24	44.92 bcd	0.07 d
Al-Dair	25	200	44.24 bcd	0.18 d
Al-Sadeq	3	24	41.15 bcde	3.96 a
Al-Sibah	5	40	27.04 cdef	0.02 d
Al-Faw	10	80	26.25 def	0.00 d
Hartha	6	48	22.30 def	1.16 bcd
Ezz Al-Din	24	192	21.98 ef	2.12 b
Al-Zubiar	16	130	18.27 f	0.50 cd
Total	181	1450		

Different letters (a–d) indicate significant differences among sampling dates (Tukey's HSD test, $p < 0.05$).

Temporal abundance of the lesser date moth in date palm orchards in Basrah Province

Infestation: The results presented in Diagram (1) showed that LDM infestation began in Basrah at 70.15% during the first week of the infestation (20–26 April) and reached its first peak (81%) in the fifth week (18–24 May). The second peak, which was the highest, reached 88.62% was recorded in the eighth week (1–7 June), followed by a third peak (81.36%) in the eleventh week (22–28 June), indicating increased LDM activity during the early fruit development stage. A decline was observed in the 13th week (6–12 July), marking the end of the pest's active period.

Larvae: The results presented in Diagram (2) revealed that LDM larvae in fallen date fruits were recorded at a low mean number of 0.76 Larvae per fruit in the first week (20–26 April). The population increased to 2.64 larvae/fruit in the seventh week (1–7 June). The highest

larval density (5.20 larvae/fruit) was recorded in the 8th week (8–14 June); no larvae were recorded (0.0 larvae per fruit) in the 12th week (29 June–5 July) and continued.

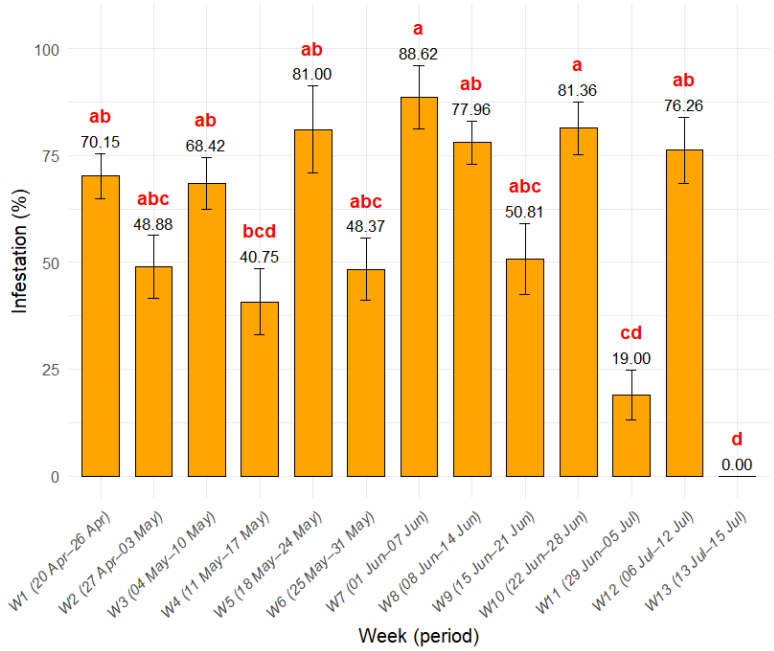


Diagram (1): Seasonal dynamics of the lesser date moth *B. amydraula* infestation on date palm cultivars in Basrah, 2024. The infestation % (mean± SE) at different sampling dates. Different letters above the bars (a–d) indicate significant differences among sampling dates (Tukey's HSD test, $p < 0.05$).

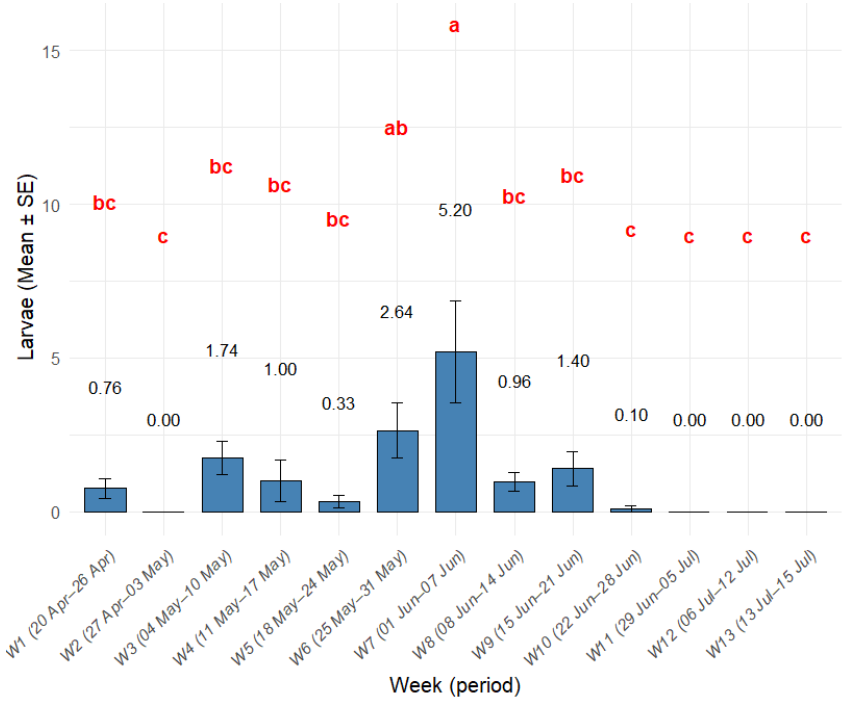


Diagram (2): Seasonal occurrence of the lesser date moth larvae *B. amydraula* in fallen date fruits, Basrah Province, during the fruiting season of 2024. Number of larvae (mean± SE) at different sampling dates. Different letters (a–d) indicate significant differences among sampling dates as determined by Tukey's HSD test at $p \leq 0.05$.

Diagram (3) revealed significant differences in infestation levels of *B. amydraula* among date palm cultivars in Basrah Province. Halawi recorded the highest infestation percentage (95.00%), followed by the cultivars Zahdi, Brim, and Sayer, with means of 88.00%, 85.00%, and 82.57%, respectively. In contrast, the lowest infestation level was observed in the cultivar Barhi, (9.56%). Intermediate infestation rates were found in the cultivars Kendar, Khadhrawi, and Khesaf, reaching 68.93%, 69.56%, and 66.67%, respectively.

The results presented in Diagram (4) revealed that the highest larval population was observed on the Sayer (1.63 larvae per fruit) and Halawi (1.56 larvae per fruit). Moderate larval densities were found in Lelwi (1.20 larvae per fruit), Brim (0.85 larvae per fruit), Chebchab (1.00 larvae per fruit), Ewidi (1.00 larvae per fruit) and Shuker (1.00 larvae per fruit). In contrast, the lowest larval counts were recorded in (0.09 larvae per fruit), Khadhrawi (0.12 larvae per fruit), Dieri (0.00 larvae per fruit), and Zahdi (0.00 larvae/ fallen fruit).

Distribution and temporal abundance

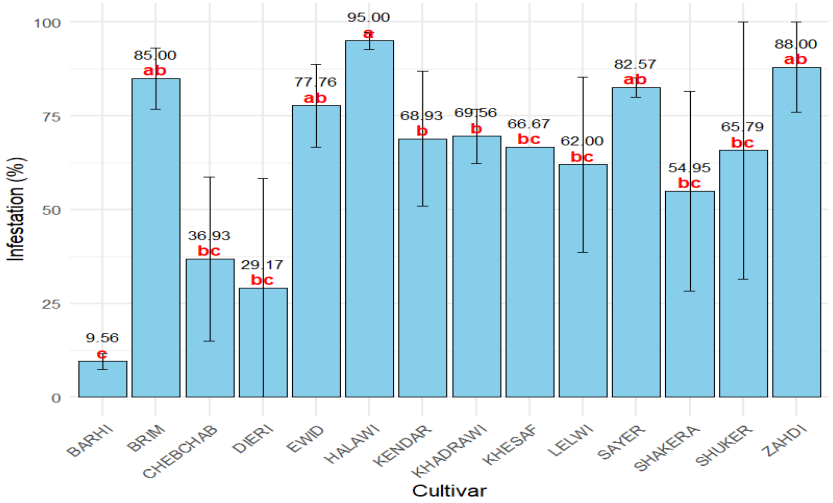


Diagram (3): Infestation percentage of the lesser date moth *B. amydraula* in fallen date fruits among date palm cultivars in Basrah Province, 2024. Infestation rates (Mean± standard error) recorded in date palm cultivars. Different letters (a–d) indicate significant differences among sampling dates (Tukey's HSD test, $p \leq 0.05$).

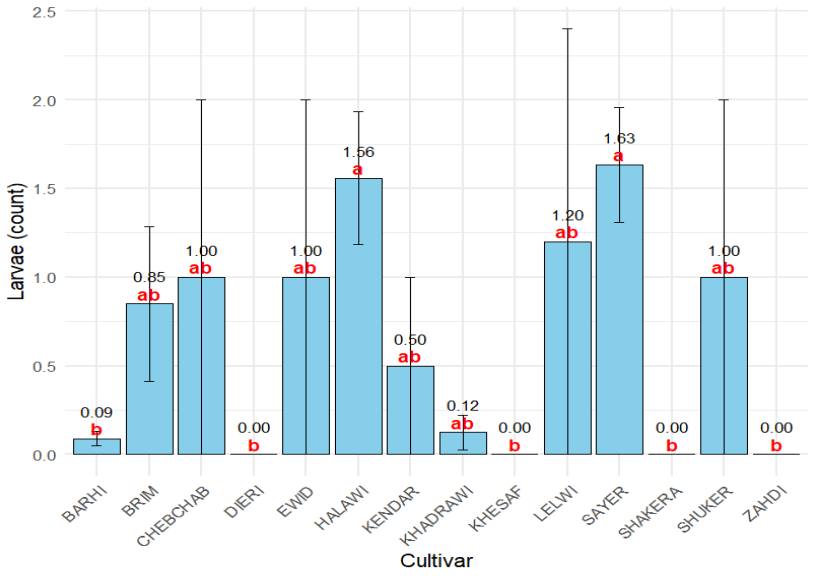


Diagram (4): Larval density of the lesser date moth *B. amydraula* in fallen date fruits among different date palm cultivars at the fixed stations in Basrah Province, 2024. Number of larvae (mean± standard error) recorded for the different date palm cultivars. Different letters above the bars (a–d) indicate significant differences among collection dates according to Tukey's HSD test ($p \leq 0.05$).

Diagram (5-A) revealed significant differences in LDM infestation levels in the studied districts. The highest infestation percentages (74.29%, 74.15% and 69.62%) were recorded in Abu Al-Khaseeb" Al-Nashwa, and Shatt Al-Arab, respectively. In contrast, Al-Zubair district exhibited a lower infestation rate of (15.47%). However, the larval populations were 2.10, 0.65, 1.77, and 0.16 larvae per fallen fruit in the aforementioned districts, respectively (Diag. 5-B).

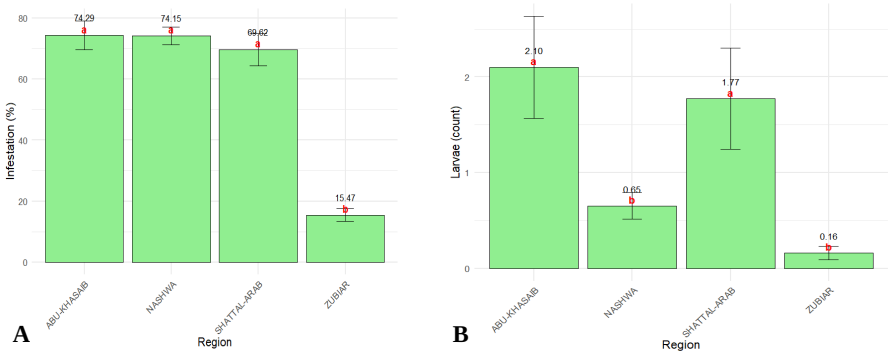


Diagram (5): Infestation percentage (A) and Larval density (B) of the lesser date moth (*Batrachedra amydraula*) in different date palm cultivars across the districts of Basrah Province. The bars represent the mean infestation rates (± standard error) recorded throughout the 2024 season. Different letters above the bars (a–d) indicate significant differences among collection dates according to Tukey's HSD test ($p \leq 0.05$).

The results shown in Diagram (6-A) revealed considerable differences in the infestation levels of *B. amydraula* in in infested fallen fruits across the developmental stages of date palm fruits. The highest infestation percentages of 71.38% and 60.29% were at during the Chameri and Hababok stages, respectively. In contrast, significantly lower infestation rates were observed at the Khalal and Chameri–Khalal transitional stages (36.33% and 21.72%, respectively). The results (Diagram. 6-B) showed that the highest larval density was recorded at the Chameri stage (1.25 larvae per fruit), followed by the Hababok stage (1.01 larvae/fruit). In contrast, no larvae were detected during the Chameri–Khalal transitional stage and Khalal stage (0.00 larvae per fruit).

Distribution and temporal abundance

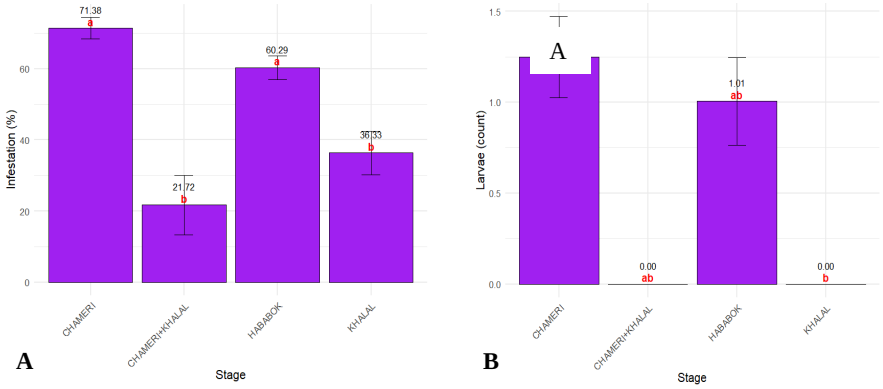


Diagram (6): Infestation percentage (A) and Larval density (B) of the lesser date moth *B. amydraula* in fallen fruits during the developmental stages of date palm fruits in Basrah, 2024. The infestation percentage (mean± standard error) in the fruit developmental stages. Different letters (a–d) indicate significant differences among collection dates according to Tukey's HSD test ($p \leq 0.05$).

Adults: The seasonal fluctuation of *B. amydraula* adults indicated distinct peaks of abundance during the monitoring period in 2024. The first adults were detected on March 1 (14.9 adults/trap), with a gradual increase through March 15 (43.1 adults/trap) and April 1 (117 adults/trap). The population density increased to 193 adults/trap on April 15. The highest peak (229 adults/trap) was recorded on May 1. Then, a steady decline in densities occurred with 83.5, 24.3, and 6.78 adults/trap on May 15, June 1, and June 15, respectively. By July, adult activity was nearly absent [0.475 adults/trap on July 1 and none on July 15 (Diag. 7)].

Diagram (8) showed that the highest density of *B. amydraula* adults was recorded in Al-Nashwa, reaching an average of 104 adults per trap, which was significantly higher than all other locations. Densities of 91.7 and 83.9 adults per trap were recorded at Shatt Al-Arab and Abu-Al Khaseeb, respectively. In contrast, Al-Zubair exhibited a remarkably low density of 4.72 adults per trap.

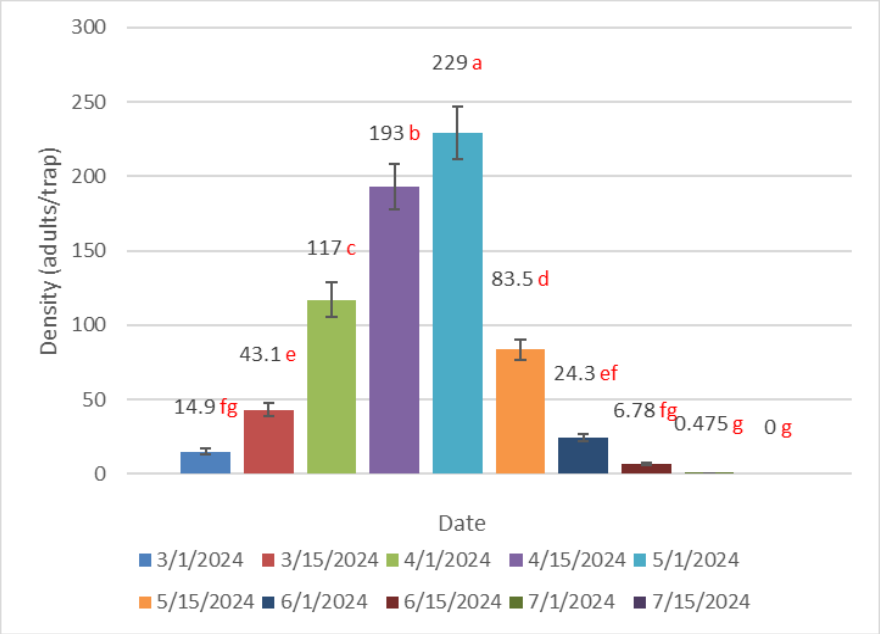


Diagram (7): Seasonal occurrence of the lesser date moth adults *B. amydraula* at different date palm orchards across the districts of Basrah Province, 2024. The adult density (mean ± standard error) during the season. Different letters (a–d) indicate significant differences among collection dates according to Tukey's HSD test ($p \leq 0.05$).

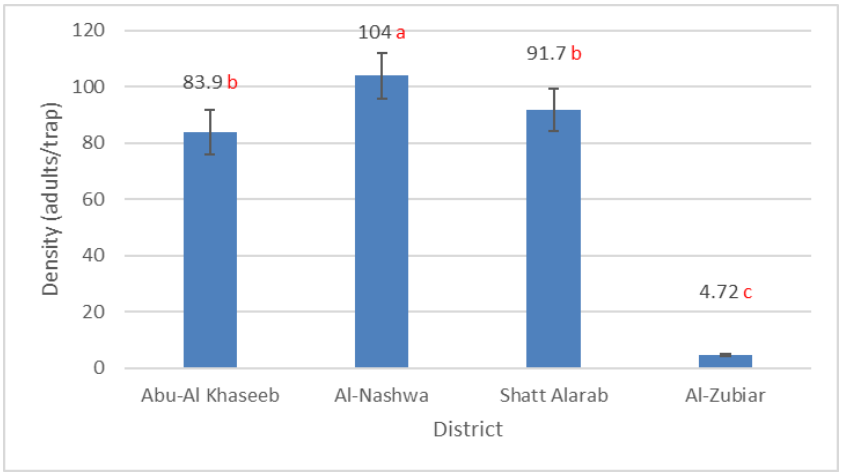


Diagram (8): Numerical density of the lesser date moth adults *B. amydraula* captured in the traps at date palm orchards in the studied districts of Basrah Province, 2024. The adult density (mean± standard error) was recorded in the districts. Different letters (a–d) indicate significant differences among collection dates according to Tukey's HSD test ($p \leq 0.05$).

Distribution and temporal abundance

Influence of temperature and humidity on infestation level

The results of diagram (9) indicated the relationships between the mean infestation percentage of LDM (*B. amydraula*) and temperature and relative humidity. The plots revealed a weak negative correlation between infestation and temperature (r = –0.33, p = 0.127) and a weak positive correlation with humidity (r = 0.35, p = 0.105).

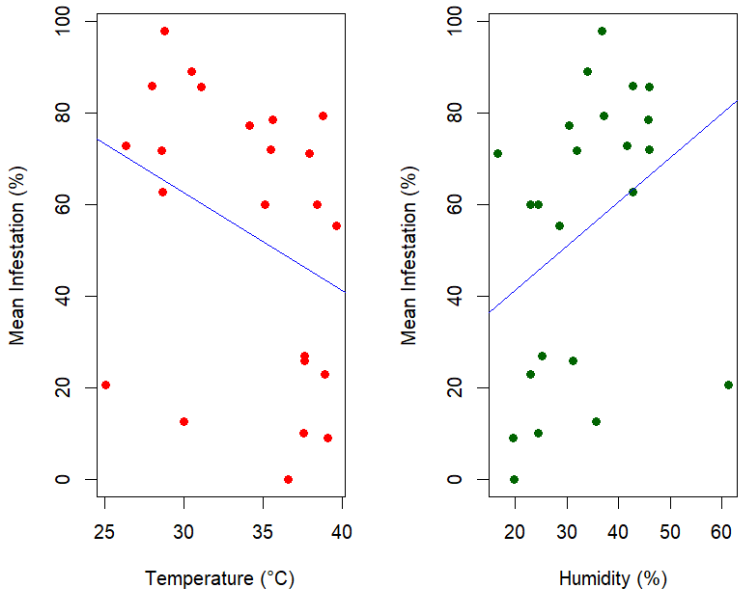


Diagram (9): The effect of temperature, (A) and humidity, (B) on the infestation rates of the lesser date moth *B.amydraula* in Basrah, 2024.

DISCUSSION

The lesser date moth population density and infestation are influenced by different factors, including the district, environmental conditions, and the susceptibility of the cultivars. Districts offer more favorable conditions for larval development and infestation. Al-Nashwa had a high LDM infestation rate due to the dense date palm cultivation. In contrast, "Al-Zubair" recorded the lowest infestation, which is attributed to the limited date palm cultivation and the drought (Alyousuf and Nikpay, 2020). This finding is consistent with those of Al-Jboory (2007), who has reported that the *B. amydraula* population is related to the high density of date palms. Shayesteh *et al.* (2010) found that temperature and humidity influence LDM infestation severity in Iran.

B. amydraula activity exhibits temporal variation from April to July, which corresponds to the early stage of date fruit development (Chameri). However, the decline of the LDM infestation occurred as the fruits reached maturity at the Khalal stage. The decrease in infestation indicated the end of the LDM generation in mid-summer, due to high temperatures. Alyouif and Mazeal (2008) indicated that the seasonal activity of LDM was

recorded from mid-April to late July in Basrah. Al-Musafir (2021) confirmed that LDM activity was positively correlated with relative humidity during May to July in southern Iraq. Jatoi *et al*. (2024) noted that increased LDM activity and larval density were due to the moderate temperatures and high relative humidity in Pakistan. A study from India reported that LDM infestation was observed during May and June in semi-arid districts (Yadav *et al*., 2025).

According to the results of the present study, cultivars such as Halawi, Zahdi, and Brem were susceptible to LDM infestation. In contrast, the Barhi cultivar exhibited the highest level of resistance. In Iraq, Al-Musafir (2021) reported that Zahdi was the most susceptible, whereas Al-Halawi had the lowest LDM infestation during the 2019/2020 growing season in Basrah and Babylon Provinces. However, Alyousif and Mazeal (2008) found that Halawi and Sayer recorded the highest infestation rates and losses, whereas Barhi was the least infested. This supports the hypothesis that local environmental conditions and cultivar genetics affect pest suitability.

These variations in the susceptibility of date palm cultivars can be attributed to differences in the physical and chemical properties of the date fruits (Idder *et al*., 2015; Abdul-Hamid *et al*., 2020). Aziz (2005) reported that larval abundance was related to the fruit growth stage; LDM prefers early-ripening cultivars with higher moisture content (Shayesteh *et al*., 2010). Al-Musafir (2021) reported that cultivar susceptibility is influenced by fruit skin hardness, moisture, and sugar content of the fruit. Similarly, Harhash *et al*. (2003) noted that the pest prefers soft fruits during the fruit developmental stages.

The chemical and physical properties of cultivar fruits have a significant impact on LDM infestation rates. Babar *et al*. (2023) reported marked differences in LDM population density among date palm cultivars, with higher infestations being associated with susceptible varieties. In contrast, cultivars such as Heman exhibited comparatively lower larval abundance, indicating a degree of resistance. Ali *et al.* (2019) demonstrated significant cultivar-dependent differences in infestation intensity, with Medjool and Khalas cultivars showing severe infestation, while the Barhi cultivar consistently recorded the lowest infestation levels across fruit developmental stages. Thus, Khajehzadeh and Latifian (2013) suggested the selection of resistant cultivars as part of integrated LDM management (IPM) programs.

CONCLUSIONS

The study concluded that the LDM population exhibited spatial and temporal variation in date palm cultivation in Basrah Province. This pest was active during the early fruiting stages (Hababok and Chameri). Then, its activity declined as the fruits matured. The pest was found in all surveyed districts, although Al-Dair, Safwan, Al-Sibah, and Al-Faw exhibited lower infestation rates. However, Al-Nashwa, Abu-Al Khaseeb, and Shatt Al-Arab recorded high infestation rates. Temporal monitoring revealed three infestation peaks occurring in late May, early June, and late June. These peaks coincided with the early stages of fruit development. Adult moth activity began in early March, peaked in early May, and disappeared by mid-July.

Distribution and temporal abundance

A weak negative correlation with temperature and a weak positive correlation with humidity were observed. Cultivars Halawi, Zahdi, and Brim were most susceptible to LMD, whereas Barhi and Dieri were least infested. These findings indicate that *B. amydraula* is widely distributed and exhibits clear temporal fluctuations across the province. Population dynamics are influenced by environmental conditions, host plant susceptibility, and the developmental stages of fruit. Therefore, highly infested districts should be identified as priority areas for LDM management, including the selection of resistant cultivars to decrease the population of this moth in Basrah Province.

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CONFLICT OF INTEREST STATEMENT

"The author has no conflicts of interest to declare".

LITERATURE CITED

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التوزيع المكاني والوفرة الزمنية لدودة التمر الصغرى *Batrachedra amydraula* Meyrick, 1916 (Lepidoptera, Batrachedridae) في محافظة البصرة، العراق

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الخلاصة

هدفت هذه الدراسة إلى تقييم التوزيع المكاني والزماني لحشرة الحميرة *Batrachedra amydraula* (Meyrick, 1916) (Lepidoptera, Batrachedridae)، بوصفها إحدى أهم آفات نخيل التمر *Phoenix dactylifera* L. في محافظة البصرة خلال الموسم 2024. أظهرت النتائج انتشار الحشرة في جميع المناطق التي شملتها الدراسة، حيث سُجلت أعلى نسب الإصابة في أقضية النشوة وأبي الخصيب، في حين كانت نسب الإصابة أقل في أقضية الدير وسفوان والسيبة والفاو. وبينت الدراسة اختلاف حساسية أصناف النخيل للإصابة، إذ كانت أصناف الساير،الحلاوي والبريم الأكثر تعرضاً للإصابة، بينما سجل صنفا البرحي والديري أقل نسب إصابة. كما كان لمرحلة تطور الثمار تأثير واضح في شدة الإصابة، إذ بلغت ذروتها خلال طور الجمري. وأظهرت الدراسة وجود ثلاث ذروات للإصابة بحشرة الحميرة تمثلت في أواخر أيار وبداية حزيران و أواخر حزيران، وتزامنت هذه الذروات مع المراحل المبكرة من تطور الثمار (الجمري والحبابوك). بدأت فعالية الحشرات الكاملة في أوائل شهر آذار وبلغت ذروتها في أوائل أيار، ثم اختفت تدريجياً بحلول منتصف تموز. كما لوحظ وجود ارتباط سلبي بين شدة الإصابة ودرجة الحرارة، وارتباط إيجابي بينها وبين الرطوبة النسبية. وتوصلت الدراسة إلى أن حشرة الحميرة

منتشرة على نطاق واسع في محافظة البصرة وتُظهر تقلبات زمنية واضحة، وأن ديناميكية مجتمعها تعتمد بشكل رئيس على الظروف البيئية وتنوع الاصناف المزروعة.