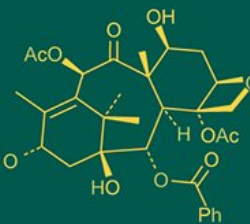
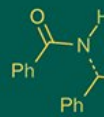
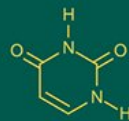
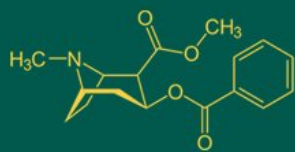


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Thasniya Jasmin N M
M.Sc. (Agri.), Department of
Entomology, BTC College of
Agriculture and Research
Station, IGKV, Raipur,
Chhattisgarh, India

Dr. Yaspal Singh Nirala
Assistant Professor,
Department of Entomology,
BTC College of Agriculture and
Research Station, IGKV,
Raipur, Chhattisgarh, India

Dr. RKS Tomar
Principal Scientist,
Department of Entomology,
BTC College of Agriculture and
Research Station, IGKV,
Raipur, Chhattisgarh, India

Dr. Vinod Kumar Nirmalkar
Scientist, Department of Plant
Pathology, BTC College of
Agriculture and Research
Station, IGKV, Raipur,
Chhattisgarh, India

Dr. NK Chaure
Principal Scientist,
Department of Agricultural
Statistics, BTC College of
Agriculture and Research
Station, IGKV, Raipur,
Chhattisgarh, India

Dr. Archana Kerketta
Associate Professor,
Department of Entomology,
BTC College of Agriculture and
Research Station, IGKV,
Raipur, Chhattisgarh, India

Corresponding Author:
Corresponding Author
Thasniya Jasmin NM
M.Sc. (Agri.), Department of
Agronomy, BTC College of
Agriculture and Research
Station, IGKV, Raipur,
Chhattisgarh, India

Screening of rice varieties for susceptibility to *Sitophilus oryzae* (L.) under laboratory conditions

Thasniya Jasmin NM, Yaspal Singh Nirala, RKS Tomar, Vinod Kumar Nirmalkar, NK Chaure and Archana Kerketta

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Abstract

Rice weevil, *Sitophilus oryzae* (L.), is an important pest of stored rice. Varietal differences can influence its development and the resulting grain loss. This study evaluated the response of eight popular rice varieties in Chhattisgarh to *S. oryzae* under free choice and no choice conditions, based on adult emergence and percentage weight loss. At 65 days after infestation, MTU 1010 showed the highest progeny emergence (27.67 adults) in the free choice test, while Mahamaya recorded the lowest emergence (1.33 adults) and grain weight loss (0.70%). Under no choice conditions, Dubraj recorded the highest progeny emergence (56.67 adults). Grain weight loss was also highest in Dubraj under both free choice (3.56%) and no choice (4.04%) tests, suggesting that it was more susceptible to *S. oryzae*. In contrast, Swarna recorded the lowest progeny emergence (15.33 adults) and grain weight loss (2.57%) under no choice test.

Keywords: Rice weevil, *Sitophilus oryzae*, varietal screening, adult emergence, weight loss, rice varieties, free choice test, no choice test

1. Introduction

Stored grain insect pests are an important constraint to the safe preservation of food grains, particularly in tropical and subtropical regions. Among the major pests associated with stored cereals, the rice weevil, *Sitophilus oryzae* (L.), is considered one of the most destructive primary pests of stored grains. It attacks a wide range of cereals, including rice, wheat, maize and sorghum and can cause considerable quantitative and qualitative losses during storage (Atwal and Dhaliwal, 2015) [4]. The pest is capable of developing within intact grains, allowing infestation to remain unnoticed during the early stages of storage. The developing larvae feed within the grain, while adults also contribute to grain damage through feeding, thereby reducing grain quality and weight.

Infestation by *S. oryzae* can adversely affect both the quantity and quality of stored grain. The feeding activity of the insect reduces the nutritive value of grains, particularly through damage to the germ and endosperm and may also reduce seed viability (Gvozdenac *et al.*, 2020) [9]. In addition to direct feeding damage, insect infestation can favour the development of secondary pests and microorganisms, contributing further to deterioration and contamination of stored grains (Okram and Hath, 2019) [13]. The high reproductive capacity and internal development of *S. oryzae* make its management particularly difficult once the infestation becomes established. Therefore, preventing infestation at the storage stage is important for minimizing post-harvest losses. The degree of infestation by *S. oryzae* may vary considerably among different grain varieties. Recent studies have shown that rice variety and grain form influence the development, reproduction and damage caused by *S. oryzae*, highlighting the importance of varietal screening to identify less susceptible rice varieties (Chekol, 2025; Borah and Ahmed, 2026) [6,5].

Varietal resistance or comparatively lower susceptibility is considered an important component of stored-grain pest management because the use of less susceptible varieties can reduce pest development and associated losses (Ashamo, 2006) [3]. Host plant resistance also offers an economical and environmentally compatible approach for reducing damage caused by storage pests, particularly where access to modern storage and chemical protection measures is limited (Abebe, 2009) [1].

Hence, identifying rice varieties that show comparatively lower infestation and grain loss can contribute to the development of effective strategies for managing *S. oryzae* during storage.

Previous studies have demonstrated differences among cereal varieties in their response to rice weevil infestation, indicating the importance of varietal screening for identifying suitable grain types for storage. However, the response of rice varieties may differ depending on the conditions under which the insect is allowed to infest the grain. The study was undertaken to assess the variation in response of the selected rice varieties to *S. oryzae* and to identify varieties showing comparatively lower susceptibility based on these parameters.

2. Materials and methods

2.1 Experimental site and Location:

The experiment was carried out utilizing the facilities of the Entomology Laboratory, Barrister Thakur Chhedilal College of Agriculture and Research Station, Bilaspur, during January - March 2026.

2.2 Mass rearing and maintenance of test insects

The initial culture of *Sitophilus oryzae* was obtained from infested wheat grains collected from the local market, Bilaspur. The insects were initially reared on wheat and polished rice grains and subsequently maintained on polished rice grains to acclimatize the culture to the host grain used in the experiment. Such host conditioning helps to minimize short-term changes in insect behaviour and biology associated with a change in host grain (Dobie, 1974) [7]. Fresh rice grains were periodically provided, while frass and grain dust were removed to maintain suitable conditions for insect development. Newly emerged adults were transferred to fresh rice grains to maintain a uniform culture, while overcrowding was avoided as it may adversely affect reproductive activity (Sano, 1967) [14]. Adults obtained from the maintained culture were used for the varietal screening experiments.

2.3 Experimental details

The experiment was conducted under two laboratory conditions with a mean temperature of $25 \pm 3.1^\circ\text{C}$ and mean relative humidity of $60 \pm 9\%$. The study was conducted from January to March 2026. It comprised two types of behavioural assays, viz., free choice and no choice tests. Eight different polished rice varieties (Table 1) were procured from the local market, Bilaspur. The moisture content of the rice varieties ranged from 12.46 to 13.47%.

2.3.1 Free choice test

The relative preference of *Sitophilus oryzae* among the eight different varieties of rice grains was observed in the free choice test. About 30 grams of each rice variety were taken separately in small containers and arranged equidistantly in a circular pattern within the tray (Swamy *et al.*, 2025) [20]. Thirty pairs of newly emerged adults were released at the centre of the tray such that they would get an equal chance to choose the grains of their choice. Males and females were identified based on the rostrum structure. The male rostrum is relatively short, wide and less curved, whereas the female rostrum is relatively long, smoother, slender and more curved. Immediately after the adult release, the tray was covered with muslin cloth and secured tightly with the help of a thread to avoid insect escape. The adults were carefully

removed after seven days and the grains were transferred into separate plastic containers.

2.3.2 No choice test

One hundred grams of each rice variety were placed in separate plastic containers with three replications and ten pairs of newly emerged adult weevils were released into each container. The plastic container was covered with muslin cloth and secured with a tight rubber band. Three replications were used. The adult weevils were removed after one week in both tests. The containers were kept at ambient room temperature till the observations were completed.

Table 1: Rice varieties used for screening against *S. oryzae* L.

Treatment No.	Varieties
T ₁	Swarna
T ₂	HMT
T ₃	Mahamaya
T ₄	MTU 1010
T ₅	Dubraj
T ₆	Vishnubhog
T ₇	Jeeraphool
T ₈	Pusa Basmati 1121

2.4 Observations recorded

2.4.1 Progeny emergence

The number of newly emerged adult weevils was recorded from 35 DAI (days after infestation) and subsequently at intervals up to 65 DAI. Emerged adults were counted and removed to prevent further breeding. The adult emergence data were recorded to assess the relative preference of the different rice varieties for *S. oryzae*.

2.4.2 Per cent weight loss

Per cent weight loss was determined by weighing the rice grain after removing the frass by sieving. The percentage loss in grain weight was calculated by using the formula suggested by Adams and Schulten (1978) [2].

$$\text{Per cent weight loss} = \frac{OW - CW}{OW} \times 100$$

Where, OW = Original weight of grains on a dry matter basis and CW = Current weight of grains on a dry matter basis. Observations on per cent weight loss were recorded at 65 DAI (days after infestation).

2.4 Statistical analysis

The data obtained from the experiment were subjected to statistical analysis using a Completely Randomized Design (CRD) with the help of OPSTAT statistical software. Appropriate transformations were applied to the data. The data were analysed using analysis of variance (ANOVA) and treatment means were compared using Duncan's Multiple Range Test (DMRT) at the 5% level (Duncan, 1955) [8].

3. Results and Discussion

3.1 Progeny emergence

3.1.1 Free choice test

As presented in Table 2, F₁ progeny emergence under the free choice conditions at 35 DAI (Days after infestation) ranged from 0.00 to 3.00. No emergence was observed in Swarna, Mahamaya, Pusa Basmati 1121 and Dubraj. The varieties HMT and Vishnubhog recorded 1.00 progeny each, which were statistically at par with each other. The variety

Jeeraphool exhibited 1.67 F_1 progenies. Among all the varieties, MTU 1010 resulted in higher F_1 progeny emergence, with 3.00 progenies.

Cumulative progeny emergence at 50 DAI revealed that F_1 progeny emergence ranged from 1.00 to 5.67. Low emergence was recorded in Swarna (1.00) and Pusa Basmati 1121 (1.00), which were statistically at par with each other. HMT, Vishnubhog and Jeeraphool were also statistically at par and recorded progeny emergence of 2.00, while Dubraj recorded 3.00 and MTU 1010 exhibited the highest progeny emergence of 5.67. Observation at 65 DAI (cumulative) recorded a lower F_1 progeny emergence in variety Mahamaya (1.33), followed by variety Swarna (2.67). Pusa Basmati 1121 recorded a progeny emergence of 7.33. While varieties Vishnubhog (10.67) and Jeeraphool (11.33) were statistically at par. Dubraj recorded 18.33 progenies and variety MTU 1010 exhibited greater susceptibility among the eight varieties tested under free choice conditions, with F_1 progeny emergence of 27.67. Altogether from the free choice test, it is evident that there is no variety that completely suppresses the rice weevil emergence. Varieties MTU 1010 and Dubraj were recorded to have higher progeny emergence, suggesting their higher susceptibility to rice weevil among the eight screened varieties in the experimental conditions. Whereas varieties Mahamaya and Swarna showed comparatively lower susceptibility to rice weevil, recording fewer progeny.

As the present study was conducted under free choice conditions, varietal selection may have been influenced by volatile compounds emitted from different rice varieties (Sathiyaseelan and Balaji, 2025) [15]. The difference in the number of progeny emergence indicates that the varietal characteristics play an important role in oviposition success and subsequent weevil development, as reported by Marsadi and Yuliadhi (2025) [12]. Similarly, Zhang *et al.* (2023) [21] reported that variation in metabolic and detoxification enzyme activities plays a major role in the developmental duration and population growth of the rice weevil across different rice cultivars. In milled rice, variations in the grain characteristics such as kernel hardness and nutrient composition influence the successful development and adult emergence of *Sitophilus oryzae* (Swamy *et al.*, 2022; Sharma *et al.*, 2024) [19, 16].

3.1.2 No choice test

The data demonstrated in Table 3 revealed that, F_1 progeny emergence under the no choice test at 35 DAI ranged from 0.00 to 5.00. Zero emergence was observed in Swarna, Mahamaya and Dubraj. The variety Pusa Basmati 1121 recorded progeny of 0.67, while the variety HMT recorded 1.00 progeny, which were statistically at par with each other. Similarly, the varieties Jeeraphool and Vishnubhog were statistically at par, with each recording progeny of 2.00. Among all the varieties, MTU 1010 resulted in higher F_1 emergence, with 5.00 progenies at 35 DAI.

At 50 DAI, recorded cumulative progeny emergence ranged from 1.00 to 15.00. Variety Mahamaya and Pusa Basmati 1121 recorded the least emergence, 1.00 progeny in each. Swarna (3.00) also recorded lower emergence. Variety HMT (6.00) and Dubraj (8.33) recorded moderate F_1 emergence. Jeeraphool recorded a progeny emergence number of 12.00 and MTU 1010 (13.67) recorded the second highest emergence, while Vishnubhog (15.00) exhibited the highest emergence.

The variety Dubraj (56.67) exhibited a higher number of cumulative progeny emergence at 65 DAI, followed by HMT (37.33) and Jeeraphool (36.33), which were statistically at par with each other. Variety with the next highest emergence was recorded in Vishnubhog (33.00), followed by MTU 1010 (22.33) and Mahamaya (18.00). The remaining two varieties were statistically at par, resulting in progeny emergence of 16.00 in Pusa Basmati 1121 and 15.33 in Swarna. The varieties Dubraj, HMT and Jeeraphool produced a higher number of progenies, indicating their higher susceptibility in no choice test towards rice weevil, while Swarna and PB1121 had lower susceptibility with fewer progeny emergence.

Rice varieties differ in their susceptibility to *S. oryzae*, owing to differences in physical and biochemical characteristics of the grains. Such varietal differences can influence weevil survival, development, progeny production, grain damage and weight loss. Therefore, screening different rice genotypes is important for identifying relatively resistant varieties and understanding their potential for reducing storage losses.

The higher progeny emergence observed in Dubraj in the present study is consistent with the findings of Songer and Yadu (2022) [17], who reported that Dubraj Selection-1 (21.66 adults/30g), an improved selection derived from the traditional Dubraj rice, was found to be more susceptible to the rice weevil. Swarna (3.33) recorded the lowest adult emergence, which is in accordance with the results obtained from no choice test. A previous study by Srivastav *et al.* (2026) [18] reported 27.66 F_1 progeny from PB 1121, in the present study, the variety PB 1121 appeared to be comparatively tolerant among tested varieties with 16.00 progeny. Kiran *et al.* (2020) [11] recorded 4.00 F_1 adults in MTU 1010 (paddy) and classified it as a moderately resistant variety, this is in contrast with the present findings of free choice test. This variation may be attributed to differences in the experimental methodology and conditions, as they evaluated 10g paddy grains with 8 females and 4 males. Furthermore, a previous study by Hasaranga *et al.* (2018) [10] reported that milled rice supported significantly higher infestation and progeny emergence of *S. oryzae* than paddy, which may explain the observed data in the present investigation. A similar study within the same range of progeny emergence observed in the present study was reported by Ashamo (2006) [4], who found that the elite variety ITA 117 recorded the highest number of progeny (55.00), while ITA 212 recorded the lowest (9.00).

3.2 Per cent weight loss

3.2.1 Free choice test

Under free choice condition, varieties Dubraj (3.56%) and MTU 1010 (3.52%) recorded the highest per cent weight loss at 65 DAI, which were statistically at par, indicating that they are the most preferred. Followed by Jeeraphool (2.94%), which was statistically at par with HMT (2.82%). Variety HMT and Pusa Basmati 1121 (2.57%) were also statistically at par. Vishnubhog and Swarna recorded 2.23% and 1.53% weight loss, respectively. Among all the tested varieties, Mahamaya (0.70%) recorded the least weight loss percentage, suggesting it was the least preferred variety (Table 2).

Similar observations were reported by Swamy *et al.* (2025) [20], who found that the highly susceptible genotype (BPT 2841) recorded 2.40% weight loss, whereas the resistant genotype (Baptala Mahsuri) recorded only 0.49% weight loss. The lower weight loss in resistant genotypes was

associated with reduced weevil population and progeny development. Although the absolute values differ from those obtained in the current study, the overall trend of greater weight loss in susceptible varieties is consistent between studies.

Under free choice condition a study by Marsadi and Yuliadhi (2025) ^[12] recorded a higher weight loss in red rice (7.68%) and a lower weight loss in white rice (4.57%). The present investigation dealt with polished white rice, so the weight loss percentage was in a similar range as that of their observation.

3.2.2 No choice test

Per cent weight loss of rice grains differed significantly among the tested rice varieties at 65 DAI, as shown in Table 3. Dubraj (4.04%) variety showed the highest weight loss and was superior to all other varieties, indicating that it was the most susceptible host among the eight tested rice varieties. Jeeraphool (3.85%) recorded the second highest weight loss and was statistically at par with Dubraj. Also, Jeeraphool was statistically at par with MTU 1010 and HMT. Varieties MTU 1010 (3.74%) and HMT (3.71%) exhibited intermediate weight loss and were statistically at par with each other. Vishnubhog recorded 3.53% weight loss, which was statistically at par with MTU 1010 and HMT, while Mahamaya (3.37%) exhibited significantly lower grain weight loss than the more susceptible varieties, it was also statistically at par with Vishnubhog. The lowest weight loss was recorded in Swarna (2.57%) and Pusa Basmati 1121 (2.63%), both of which were statistically at par, indicating comparatively greater resistance to damage caused by *S. oryzae* (Table 3).

Rice varieties differ in their susceptibility to *S. oryzae*, owing to differences in physical and biochemical characteristics of the grains. Such varietal differences can influence weevil survival, development, progeny production, grain damage and weight loss. Therefore, screening different rice genotypes is important for identifying relatively resistant varieties and understanding their potential for reducing storage losses. (Sharma *et al.*, 2024) ^[16]

These findings are comparable with those of Songer and Yadu (2022) ^[17], who reported Dubraj Selection-1 as the most susceptible variety, with 6.66% weight loss, while MTU 1001 showed the lowest weight loss (1.00%). Basmati - 370 (1.33%), MTU 1010 (1.33%), Swarna (2.33%) and HMT (2.66%) also exhibited relatively low weight loss. Although the magnitude of weight loss differed between the two studies, the observed differences are likely attributed to variation in experimental conditions.

Another similar study reported significant variation in paddy grain weight loss among rice genotypes infested by rice weevil. The lowest weight loss was recorded in JGL (0.4%), while the highest was exhibited by JGL 11118 (7.43%). The variety MTU 1010 recorded 0.86% weight loss (Kiran *et al.*, 2020) ^[11]. Similarly, significant variation in grain weight loss among basmati paddy genotypes was reported by Srivastav *et al.* (2026) ^[18]. The highest grain weight loss was observed in PB-1 (24.04%). While PB-370 (6.57%) showed the lowest. Variety PB 1121 exhibited 11.43% grain weight loss. The data difference observed in the present study may be attributed to the use of polished rice over paddy and variation in experimental conditions.

Table 2: Progeny emergence and per cent weight loss caused by rice weevil in different rice varieties under free choice test

Rice Variety	Progeny Emergence***			Per cent weight loss at 65 DAI
	35 DAI	50 DAI	65 DAI	
Swarna	0.00 *(1.00) ^d	1.00 (1.41) ^d	2.67 (1.91) ^f	1.53 **(7.07) ^e
HMT	1.00 (1.41) ^c	2.00 (1.73) ^c	13.33 (3.79) ^c	2.82 (9.66) ^{bc}
Mahamaya	0.00 (1.00) ^d	0.67 (1.28) ^d	1.33 (1.52) ^g	0.70 (4.79) ^f
MTU 1010	3.00 (2.00) ^a	5.67 (2.58) ^a	27.67 (5.35) ^a	3.52 (10.80) ^a
Dubraj	0.00 (1.00) ^d	3.00 (2.00) ^b	18.33 (4.40) ^b	3.56 (10.86) ^a
Vishnubhog	1.00 (1.41) ^c	2.00 (1.73) ^c	10.67 (3.42) ^d	2.23 (8.58) ^d
Jeeraphool	1.67 (1.63) ^b	2.00 (1.73) ^c	11.33 (3.51) ^d	2.94 (9.87) ^b
Pusa Basmati 1121	0.00 (1.00) ^d	1.00 (1.41) ^d	7.33 (2.89) ^e	2.57 (9.22) ^c
SEm (±)	0.04	0.05	0.06	0.19
CD (5%)	0.11	0.16	0.06	0.58
CV (%)	4.97	5.39	3.24	3.76

*Figures in parentheses are square root transformed values; ** Figures in parentheses are angular transformed values; Means with same letter grouping are not significantly different at the 5% level (DMRT); DAI - days after infestation; ***Cumulative progeny emergence

Table 3: Progeny emergence and per cent weight loss caused by rice weevil in different rice varieties under no choice test

Rice Variety	Progeny Emergence**			Per cent weight loss at 65 DAI
	35 DAI	50 DAI	65 DAI	
Swarna	0.00 *(1.00) ^d	3.00 (2.00) ^f	15.33 (4.03) ^f	2.57 *(9.22) ^e
HMT	1.00 (1.41) ^c	6.00 (2.65) ^e	37.33 (6.19) ^b	3.71 (11.10) ^{bc}
Mahamaya	0.00 (1.00) ^d	1.00 (1.41) ^g	18.00 (4.36) ^e	3.37 (10.56) ^d
MTU 1010	5.00 (2.45) ^a	13.67 (3.83) ^b	22.33 (4.83) ^d	3.74 (11.14) ^{bc}
Dubraj	0.00 (1.00) ^d	8.33 (3.05) ^d	56.67 (7.59) ^a	4.04 (11.58) ^a
Vishnubhog	2.00 (1.73) ^b	15.00 (4.00) ^a	33.00 (5.83) ^c	3.53 (10.82) ^{cd}
Jeeraphool	2.00 (1.73) ^b	12.00 (3.61) ^c	36.33 (6.11) ^b	3.85 (11.31) ^{ab}
Pusa Basmati 1121	0.67 (1.28) ^c	1.00 (1.41) ^g	16.00 (4.12) ^f	2.63 (9.32) ^e
SEm (±)	0.05	0.03	0.07	0.14
CD (5%)	0.15	0.07	0.22	0.42
CV (%)	5.83	1.55	2.33	2.25

*Figures in parentheses are square root transformed values; ** Figures in parentheses are angular transformed values; Means with same letter grouping are not significantly different at the 5% level (DMRT); DAI - days after infestation; ***Cumulative progeny emergence

4. Conclusion

None of the tested rice varieties showed complete resistance to *S. oryzae*. Under the free choice test, Mahamaya recorded the lowest progeny emergence (1.33) and grain weight loss (0.70%), whereas under the no-choice test, Swarna showed the lowest progeny emergence (15.33) and weight loss (2.57%). Dubraj was the most susceptible variety, recording the highest progeny emergence (56.67) and grain weight loss (4.04%) under no choice conditions. Dubraj also recorded the highest weight loss (3.56%) in free choice conditions, while MTU 1010 recorded the highest progeny emergence (27.67) under the free choice test. The relative rankings differed between the two test conditions, showing that varietal response depended on whether host choice was available. Within the scope of this laboratory study, the screening indicated that the Dubraj variety is comparatively more susceptible to rice weevil attack under storage conditions.

References

1. Abebe F, Tefera T, Mugo S, Beyene Y, Vidal S. Resistance of maize varieties to the maize weevil *Sitophilus zeamais* (Motsch.) (Coleoptera: Curculionidae). Afr J Biotechnol. 2009;8(1):5937-5943.
2. Adams JM, Schulten GGM. Loss caused by insects, mites and micro-organisms in post-harvest grain loss assessment methods. St. Paul: American Association of Cereal Chemists; 1978. p. 193.
3. Ashamo MO. Relative susceptibility of some local and elite rice varieties to the rice weevil, *Sitophilus oryzae* L. (Coleoptera: Curculionidae). J Food Agric Environ. 2006;4(1):249-252.
4. Atwal AS, Dhaliwal GS. Agricultural pests of South Asia and their management. 8th ed. New Delhi: Kalyani Publishers; 2015. p. 547.
5. Borah L, Ahmed, R. Host susceptibility and infestation potential of *Sitophilus oryzae* L. on indigenous rice varieties of Assam. Uttar Pradesh J. Zool. 2026;47(14), 308–317.
6. Chekol, GM. Influence of rice variety and grain form on the development and infestation of *Sitophilus oryzae* (L.): A comparative analysis. PLOS ONE, 2025;20(12), e0338131.
7. Dobie P. The laboratory assessment of the inherent susceptibility of maize varieties to postharvest infestation by *Sitophilus zeamais* Motsch (Coleoptera: Curculionidae) infesting field corn. J Entomol Sci. 1974;21:367-375.
8. Duncan DB. Multiple range and multiple F tests. Biometrics. 1955;11(1):1-42.
9. Gvozdenac S, Tanaskovic S, Vukajlovic F, Prvulovic D, Ovuka J, Visacki V, et al. Host and ovipositional preference of rice weevil (*Sitophilus oryzae*) depending on feeding experience. Appl Ecol Environ Res. 2020;18(5):6663-6673.
10. Hasaranga GDGSA, Wijayarathne LKW, Prasanna PHP, Karunarathne KGPB, Rajapakse RHS. Effect of paddy variety, milling status and aeration on the progeny emergence of *Sitophilus oryzae* L. (Coleoptera: Curculionidae). J Stored Prod Res. 2018;79,116-122.
11. Kiran SA, Padmasri A, Kumar BA, Madhavi M. Varietal preference of different rice genotypes by rice weevil *Sitophilus oryzae* (L.). J Entomol Zool Stud. 2020;8(4):1954-1961.
12. Marsadi D, Yuliadihi KA. Effects of rice varieties on attractiveness, population development and weight loss caused by *Sitophilus oryzae* during storage. J Biodivers Biotechnol. 2025;5(2):65-70.
13. Okram S and Hath TH. Biology of *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) on stored rice grains during different seasons in Terai agro-ecology of West Bengal. Int J Curr Microbiol Appl Sci. 2019;8(4):1955-1963.
14. Sano I. Density effect and environmental temperature as the factor producing the active form of *C. maculatus*. J Stored Prod Res. 1967;2(3):187-195.
15. Sathiyaseelan M, Balaji K. Efficacy of food bait attractants in reducing *Sitophilus oryzae*. J Ecol. 2025;52(4):781-785.
16. Sharma KR, Raju SVS, Singh SK, Singh R, Dhanapal R, Kumar R. Differential preference of grain of landrace

- and commercial rice genotypes to *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) attack. J Stored Prod Res. 2024;108:102373.
17. Songer G, Yadu YK. Screening of promising rice varieties against rice weevil (*Sitophilus oryzae*) under laboratory condition. Pharma Innov J. 2022;11(8):1262-1265.
 18. Srivastav S, Singh DV, Kumar S, Sharma S, Kumar A, Bhawana, *et al.* Deciphering host preference and resistance of Basmati rice varieties against *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae). J Exp Agric Int. 2026;48(2):565-576.
 19. Swamy SVSG, Sandeep RD, Ramesh D, Wesley BJ, Ramarao CV. Influence of grain traits on susceptibility of rice cultivars to stored product insects. Cereal Res Commun. 2022;50:1137-1144.
 20. Swamy SVSG, Suneel Kumar GV, Krishna Veni B. Relative susceptibility of rice genotypes to lesser grain weevil *Sitophilus oryzae* (L.). Indian J Ecol. 2025;52(Sp 6):1745-1749.
 21. Zhang L, Wang H, Liu G. The rice cultivar affects the population growth and physiological enzyme activity of *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) reared on rice grains. J Stored Prod Res. 2023;104:102163.