OVIPOSITION RESPONSE OF LESSER GRAIN BORER *RHYZOPERTHA DOMINICA* (FABRICIUS, 1792) (COLEOPTERA: BOSTRICHIDAE: DINODERINAE) ON VARIOUS FOOD GRAINS

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ABSTRACT: *Egg laying response of Rhyzopertha dominica (Fabricius, 1792) on various food grains was checked under laboratory, from 9th March to 15 June 2015, the temperature and humidity ranged 25ºC – 39 ºC and 25% rh – 60% rh, about 50 grams of grains were put in jars and the results obtained are given below. Overall maximum mean number of eggs 211.47 was recorded on wheat, and gram, maize, oat, barley, millet, 187.33, 172.40, 168.33, 154.33, 133.27 was recorded respectively.*

KEY WORDS: Oviposition, *Rhyzopertha dominica* Tando Jam, food grains

INTRODUCTION

Rhyzopertha dominica is a member of the family Bostrichidae known as auger beetles or, powderpost beetles. The insects live mainly in dead and dried wood, and are pests of timber [1,2,3,4,5]. The bostrichids are closely resemble and are often mistaken for the bark and ambrosia beetles in the family Scolytidae, but they can be distinguished from the scolytids by their tuberculate and Rasp like pronotum, straight instead of elbowed antennae with threetarsi [2]. *Rhyzopertha dominica* is a holometabolous insect, i.e., it undergoes complete metamorphosis. The lifecycle includes four stages: egg, larva, pupa, and adult.

Rhyzopertha dominica eggs are deposited in clusters on grain or singly among the frass produced by the insect. The egg is opaque, whitish in color with a waxy appearance when freshly laid, but after a little while takes on a pinkish color (Kucerova' and Stejskal, 2008)[6,7]. There is pre-oviposition period of 6 days[7,8] to 15 days[8] and the oviposition period varies from 43 days at 25 ºC and 70% [09,10], further Bashir[12] recorded an alternative characters.

The present study is aimed to provide understanding of the oviposition strategy of the stored-product weevils is important for devising efficient methods to control them. The oviposition strategies of grain beetle in the genus rhyzopertha have received less attention.

MATERIAL AND METHODS

A pair of newly emerged *Rhyzopertha dominica* (Fabricius, 1792) from a laboratory colony was placed in plastic jars of 150 ml. There were 6 treatments, each treatment with 15 replications, 5 jars in each replication. Eggs were counted in each jar containing pair of beetle. Analysis was carried out through statistical software SXW 8.0, to categorize the preference of lesser grain borer.

T1	Barley	T3	Maize	T5	Oat
T2	gram	T4	Millet	T6	Wheat

RESULTS:

Egg laying response of *Rhyzopertha dominica* (Fabricius, 1792) on various food grains was checked under laboratory, from 9th March to 15 June 2015, the temperature and humidity ranged 25ºC – 39 ºC and 25% rh – 60% rh, about 50 grams of grains were put in jars and the results obtained are given below.

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on barley grains:

R_1. mean 150.80, range (139.00 - 169.00); R_2. mean 154.60, range (146.00 - 163.00); R_3. mean 157.60, range (145.00 - 169.00).

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on gram grains:

R_1. mean 182.80, range (168.00 - 206.00); R_2. mean 191.40, range (176.00 - 206.00); R_3. mean 187.80, range (178.00 - 198.00).

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on maize grains:

R_1. mean 172.60, range (163.00 - 182.00); R_2. mean 168.40, range (155.00 - 189.00); R_3. mean 176.20, range (162.00 - 189.00).

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on millet grains:

R_1. mean 133.60, range (126.00 - 141.00); R_2. mean 130.20, range (120.00 - 146.00); R_3. mean 136.00, range (125.00 - 146.00).

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on oat grains:

R_1. mean 164.20, range (151.00 - 185.00); R_2. mean 168.60, range (160.00 - 178.00); R_3. mean 172.20, range (158.00 - 185.00).

Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on wheat grains:

R_1. mean 212.00, range (200.00 - 224.00); R_2. mean 206.40, range (190.00 - 232.00); R_3. mean 216.00, range (198.00 - 232.00).

Overall maximum mean number of eggs 211.47 was recorded on wheat, and on gram, maize, oat, barley, millet, 187.33, 172.40, 168.33, 154.33, 133.27 was recorded respectively.

Completely Randomized AOV for Eggs

Source	DF	SS	MS	F	P
Treatment	5	54221.5	10844.3	76.2	0.0000
Error	84	11960.3	142.4		
Total	89	66181.8			

Grand Mean 171.19 CV 6.97

Bartlett's Test of Equal Variances

Chi-Sq	DF	P
3.64	5	0.6030

Cochran's Q 0.2525

Largest Var / Smallest Var 2.6011

Component of variance for between groups 713.461

Effective cell size 15.0

Treatment Mean

1 154.33
2 187.33
3 172.40
4 133.27
5 168.33
6 211.47

Observations per Mean 15

Standard Error of a Mean 3.0810

Std Error (Diff of 2 Means) 4.3571

LSD All-Pairwise Comparisons Test of Eggs by Treatment

Treatment Mean Homogeneous Groups

6 211.47 A
2 187.33 B
3 172.40 C
5 168.33 C
1 154.33 D
4 133.27 E

Alpha 0.05 Standard Error for Comparison 4.3571

Critical T Value 1.989 Critical Value for Comparison 8.6646

There are 5 groups (A, B, etc.) in which the means are not significantly different from one another.

TABLE- 1. Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on various food grains.

	Barley	Grams	Maize	Millet	Oat	Wheat
N	15	15	15	15	15	15
Mean	154.33	187.33	172.40	133.27	168.33	211.47
SD	10.527	12.960	11.843	9.1063	11.690	14.687
SE Mean	2.7180	3.3462	3.0579	2.3512	3.0185	3.7921
Minimum	139.00	168.00	155.00	120.00	151.00	190.00
Maximum	169.00	206.00	189.00	146.00	185.00	232.00

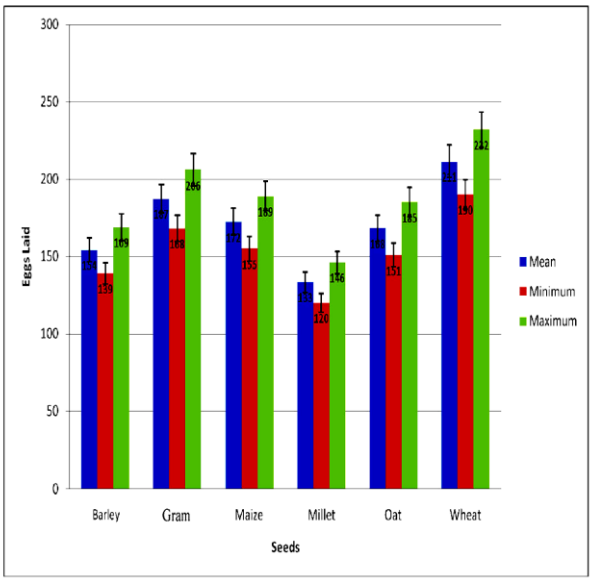

Figure 1. Egg laying behaviour of *Rhyzopertha dominica* (Fabricius, 1792) on various food grains

DISCUSSION:

According to the results, tested grains showed that maximum egg laying was recorded on wheat (211.47), then on chickpea, maize, oat, barley, millet, 187.33, 172.40, 168.33, 154.33, 133.27 respectively. The wheat is recorded as most susceptible and the millet most resistant against the egg laying of *R. dominca*. Increase in egg production was observed at higher temperatures. The eggs are laid either on grains or inside the grain. There may be many factors for preference and avoidance on particular food grain including; genetic, physical, morphological and biochemical propehes of the varieties could be considered as the predominant ones.

CONCLUSION:

Overall maximum mean number of eggs 211.47 was recorded on wheat, and on gram, maize, oat, barley, millet, 187.33, 172.40, 168.33, 154.33, 133.27 was recorded respectively. The wheat is recorded as most susceptible and the millet most resistant against the egg laying of *R. dominca*. Increase in egg production was observed at higher temperatures.

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