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Screening of groundnut genotypes (Pods) against groundnut bruchid, *Caryedon serratus* Olivier

JM Biradar, DS Mutkule, SH Gore, DN Fand, VB Pawar and NB Kumbhar

Abstract
The laboratory experiment was conducted to studies on screening of different groundnut genotypes (Pods) against *Caryedon serratus* Olivier at Department of Agricultural Entomology, Oilseed Research Station, Latur during academic year 2020-21. The relative preference by *Caryedon serratus* to twenty groundnut genotypes was studied on basis of fecundity, number of adults emerged, per cent adult emergence, mean development period, growth index, index of susceptibility, index of suitability, longevity of male and female and sex ratio. The test genotypes were grouped into five categories viz., resistant, moderately resistant, susceptible, moderately susceptible and highly susceptible based on the index of susceptibility. The genotype HOVTSB-I-2020-08 recorded minimum fecundity (11.33 eggs), low adult emergence (5.33), high mean development period (49.60 days), low growth index (0.95), low index of susceptibility (3.38) and low index of suitability (0.034) which shows the moderately resistance to *Caryedon serratus* Olivier. While genotype LSVT-I-2020-04 recorded maximum fecundity (26.67 eggs), maximum adult emergence (16.00), short mean development period (45.98 days), high growth index (1.30), high index of susceptibility (6.01) and high index of suitability (0.039) which shows moderately susceptible to *Caryedon serratus* Olivier.

Keywords: Groundnut genotypes, *Caryedon serratus*, Olivier

1. Introduction
Groundnut *Arachis hypogea* L. belongs to family Fabaceae (Leguminaceae) is the thirteenth most important food crop and fourth most important source of edible oil in the world. Groundnut is also known as peanut, earthnut, mungfali, gobbers, pindar. Groundnut is also known as "king of oilseed".

Groundnut is stored as pods and kernels and both of these are susceptible to attack of insect-pests in storage. One hundred insect species are reported to attack the groundnuts in storage (Redlinger, 1982) [11]. Out of these, eight insect species are of major importance and six minor importances. Out of dangerous pest of stored groundnut is bruchid, *Careydon serratus* Olivier. In India, *Caryedon serratus* was first reported to be infesting groundnut in Andhra Pradesh and Tamil Nadu in 1914 (Fletcher, 1914) [5]. Infestation of the harvested groundnut can occur while the crop is being in the field, stored near infested stocks or crop residue. A single grub can make a large excavation in the cotyledons, but no sign of damage is visible externally at this stage. Insect infestation caused considerable qualitative and quantitative losses to the groundnut either stored in shell for seed purpose or unshelled for milling purpose. The extent of damage in pods was recorded as 50- 70 per cent by Devi and Rao, 2000 [4] and 77.1 per cent by Kumari *et al*., 2002 [7].

The continuous usage of chemicals as prophylactic and curative treatment contaminates the groundnut and leads to serious health hazards and environmental problems. Hence development of alternative, control measure for stored grain protection such as selection of resistance groundnut genotypes to the pest which is eco-friendly methods of storage pest management. Therefore present study was undertaken to screen different groundnut (pods) genotypes against *Caryedon serratus* Olivier.

2. Material and Methods
The study on "Screening of groundnut genotype (Pods) against *Caryedon serratus* Olivier" was conducted at department of Entomology, Oilseed Research Station, Latur, Maharashtra, during 2020-21.

Total twenty genotypes were taken for screening against *C. serratus*. Five pods of each genotype were taken in a small cup and arranged in round fashion in a plastic box in three replicates. Fifteen pairs of freshly emerged adults were release at the centre of each box and closed it immediately. Three replications were maintained with the same conditions. Adults were removed after seven days of release and the pods of each genotype were transferred from small cups to plastic containers separately. The numbers of eggs laid by the insects in different treatments were counted by using illuminated magnifying lens. Later the jars were kept undisturbed under laboratory conditions till the emergence of adults. Data on no. of eggs, per cent adult emergence, mean development period, growth index, index of susceptibility, index of suitability, longevity of male and female adults and sex ratio were recorded.

3. Results

3.1 Oviposition preference

The results revealed that all twenty groundnut genotypes were preferred by the *C. serratus* for oviposition. The fecundity of *C. serratus* varied from 11.33 to 26.67 eggs per five pods of different genotypes of groundnut (Table 1). Significantly the lowest numbers of eggs were laid on genotype HOVTSB-I-2020-08 (11.33).

Table 1: Relative preference of *C. serratus* to different genotypes of groundnut pods under free choice test

Sr. No.	Genotypes	Eggs/ 5 Pods	Adult Emergence (No.)
1	LSVT-I-2020-04	26.67(5.25)	16.00(4.11)
2	LSVT-I-2020-06	13.33(3.78)	7.00(2.82)
3	LSVT-I-2020-03	11.67(3.55)	6.33(2.69)
4	HOVTSB-I-2020-08	11.33(3.50)	5.33(2.51)
5	HOVTSB-I-2020-05	15.00(3.99)	9.00(3.16)
6	HOVTVG-I-2020-04	17.33(4.28)	10.00(3.31)
7	HOVTVG-I-2020-02	23.67(4.96)	14.33(3.91)
8	HOVTVG-I-2020-08	16.00(4.11)	10.00(3.31)
9	STVT-I-2020-01	13.33(3.77)	8.33(3.05)
10	STVT-I-2020-03	13.67(3.82)	7.67(2.94)
11	STVT-I-2020-05	24.33(5.03)	14.67(3.95)
12	STVT-I-2020-11	17.00(4.23)	9.67(3.26)
13	ISK-I-2020-02	14.33(3.91)	10.33(3.36)
14	ISK-I-2020-05	23.67(4.96)	12.33(3.64)
15	ISK-I-2020-06	13.33(3.78)	8.33(3.05)
16	ISK-I-2020-25	17.00(4.23)	8.67(3.10)
17	IVK-I-2020-13	19.33(4.50)	11.33(3.50)
18	IVK-I-2020-15	25.33(5.13)	15.67(4.08)
19	IVK-I-2020-09	16.33(4.16)	10.67(3.41)
20	IVK-I-2020-18	13.67(3.82)	8.33(3.05)
	SEm±	0.11	0.09
	CD(0.05)	0.31	0.27
	CV%	4.41	5.08

Values in parentheses are square root transformed value

Next lowest fecundity was observed on genotype LSVT-I-2020-03 (11.67) which was on par with LSVT-I-2020-06 (13.33), STVT-I-2020-01 (13.33), ISK-I-2020-06 (13.33), STVT-I-2020-03 (13.67) and IVK-I-2020-18 (13.67). Significantly the maximum number of eggs was recorded on LSVT-I-2020-04 (26.67) which was on par with IVK-I-2020-15 (25.33), STVT-I-2020-05 (24.33), ISK-I-2020-05 (23.67) and HOVTVG-I-2020-02 (23.67). In the remaining genotypes the fecundity was varied from 8.67 to 12.33.

The overall fecundity studies obtained from the pods of different genotypes of groundnut revealed that the genotypes HOVTSB-I-2020-08 (11.33), LSVT-I-2020-06 (13.33), STVT-I-2020-01 (13.33), ISK-I-2020-06 (13.33), STVT-I-2020-03 (13.67) and IVK-I-2020-18 (13.67) were least preferred by the *C. serratus* for oviposition whereas LSVT-I-2020-04 (26.67), IVK-I-2020-15 (25.33), STVT-I-2020-05 (24.33), ISK-I-2020-05 (23.67) and HOVTVG-I-2020-02 (23.67) were most preferred for oviposition.

The results are in agreement with the findings of Premkumar (2020) [10]. He reported that the number of eggs laid by the *C. serratus* on groundnut pods of different genotypes varied from 13.00 to 44.00. He reported minimum fecundity (13.00) of the bruchid on TMV 7 followed by VG 17017 (17.00). Similarly, according to Manjunath (2019) [8] the number of eggs laid by groundnut bruchid on different genotypes varied from 5.82 to 157.58. He reported minimum fecundity (5.82) of the bruchid on K1787 followed by K2075 (9.04) and K180 (10.10).

3.2 Adult emergence

The number of adults emerged varied from 5.33 to 16.00 per five pods of twenty groundnut genotypes (Table 1). Significantly the minimum number of adult were emerged from HOVTSB-I-2020-08 (5.33) which as on par with LSVT-I-2020-03 (6.33). Next best genotypes which recorded low adult emergence were LSVT-I-2020-06 (7.00) which was on par with STVT-I-2020-03 (7.67), STVT-I-2020-01 (8.33), ISK-I-2020-06 (8.33) and IVK-I-2020-18 (8.33). Whereas the maximum numbers of adult were emerged from LSVT-I-2020-04 (16.00) on par with IVK-I-2020-15 (15.67), STVT-I-

2020-05 (14.67) and HOVTVG-I-2020-02 (14.33). In the remaining genotypes the adult emergence varied from 8.67 to 12.33. The results showed that the genotypes which were least preferred for oviposition and took more time to complete the development resulted in low adult emergence while the genotypes which preferred high fecundity and took less time to complete the development resulted high adult emergence.

The results are in agreement with the findings of Jyothsna (2014) [6]. She recorded that the number of adults emerged from pods of different genotypes ranged from 7.67 (K1271) to 99.67 (TCGS 750). Manjunath *et al.* (2019) [8] also reported that the number of adults emerged from different groundnut genotypes varied from 9.13 to 70.76.

3.3 Per cent Adult Emergence

The per cent adult emergence of *C. serratus* on different genotypes of groundnut pods was varied from 47.22 to 72.06% (Table 2). The lowest per cent adult emergence was recorded in genotype HOVTSB-I-2020-08 (47.22%) which on par with ISK-I-2020-25 (51.21%), ISK-I-2020-05 (52.00%) and LSVT-I-2020-06 (52.38%), while maximum per cent adult emergence was recorded in ISK-I-2020-02 (72.06%). The next highest adult emergence was recorded in genotype IVK-I-2020-09 (65.14%) which at par with ISK-I-2020-06 (62.70%), STVT-I-2020-01 (62.64%), HOVTVG-I-2020-08 (62.63%), IVK-I-2020-15 (61.86%), IVK-I-2020-18 (61.27%), HOVTVG-I-2020-02 (60.47%), STVT-I-2020-05 (60.39%), HOVTSB-I-2020-05 (59.88%) and LSVT-I-2020-04 (59.87%). Genotypes IVK-I-2020-13, HOVTVG-I-2020-04, STVT-I-2020-11, STVT-I-2020-03 and LSVT-I-2020-03 were recorded per cent adult emergence 58.45%, 57.64%, 56.80%, 56.27% and 53.90% respectively.

The results are in agreement with the findings of Haritha (1999) [2]. He reported that the per cent adult emergence from different groundnut genotypes varied from 45.20% to 97.00%. Premkumar *et al*. (2020) [10] also reported that the per cent adult emergence in different genotypes varied from 7.41 to 61.46%.

3.4 Mean development period

The mean development period of *C. serratus* varied from 44.70 to 52.56 days (Table 2). *C. serratus* recorded the shortest development period in LSVT-I-2020-06 (44.70 days) which was at par with HOVTVG-I-2020-08 (45.01 days), IVK-I-2020-18 (45.09 days), IVK-I-2020-09 (45.54 days), LSVT-I-2020-04 (45.98 days), LSVT-I-2020-03 (46.44 days), STVT-I-2020-03 (46.91 days), STVT-I-2020-05 (47.36 days), STVT-I-2020-11 (47.49 days) and IVK-I-2020-13 (48.37 days). Longest mean development period of *C. serratus* was recorded in genotype ISK-I-2020-06 (52.56 days) which as on par with ISK-I-2020-25 (51.66 days), HOVTVG-I-2020-02 (50.20 days), HOVTVG-I-2020-04 (50.15 days), ISK-I-2020-02 (50.12 days), STVT-I-2020-01 (49.81 days), ISK-I-2020-05 (49.71 days), HOVTSB-I-2020-08 (49.60 days), HOVTSB-I-2020-05 (48.76 days) and IVK-I-2020-15 (48.74 days).

The results are in agreement with the findings of Rekha *et al*. (2017) [12] who reported that the mean development period of *C. serratus* in different groundnut genotypes varied from 39.05 days (Dharani) to 54.93 days (ICGV 87846). Shivalingaswamy and Balasubramaniam (1992) [13] also reported that the mean development period in different groundnut genotypes ranged between 45.55 days and 48.99 days. Sreedhar *et al*. 2020 [14] found that minimum mean development period of 39.00 days was observed in the highly preferred groundnut genotype K 1715.

3.5 Growth index

Growth index of *C. serratus* was ranged from 0.95 to 1.44 (Table 2). The lowest growth index was recorded on genotype HOVTSB-I-2020-08 (0.95) which was significantly different from other genotypes. Next lowest growth index of *C. serratus* was recorded in ISK-I-2020-25 (0.99) and ISK-I-2020-05 (1.05) which as at par with each other. The highest growth index of *C. serratus* recorded in genotype ISK-I-2020-02 (1.44) which was at par with IVK-I-2020-09 (1.43), HOVTVG-I-2020-08 (1.39 and) IVK-I-2020-18 (1.36). Next highest growth index of *C. serratus* was recorded in genotype LSVT-I-2020-04 (1.30), STVT-I-2020-05 (1.28), STVT-I-2020-01 (1.27), IVK-I-2020-15 (1.27), HOVTSB-I-2020-05 (1.23), STVT-I-2020-03 (1.21), HOVTVG-I-2020-02 (1.21) and IVK-I-2020-13 (1.21). Genotypes HOVTVG-I-2020-04, LSVT-I-2020-06, LSVT-I-2020-03, ISK-I-2020-06 and STVT-I-2020-11 were recorded growth index 1.15, 1.17, 1.17, 1.19 and 1.20 respectively, which were at par with each other.

The results are in agreement with the findings of Premkumar *et al*. (2020) [10]. He reported growth index of *C. serratus* on different groundnut genotypes varied from 1.08 to 5.29. The lowest growth index of 1.08 was recorded in ALR 1 groundnut genotype while higher growth index was recorded in VRI 4 (5.29). Similarly, Rekha *et al*. (2017) [12] also recorded 0.47 lowest growth index in K9 and higher growth index was recorded in Dharani (1.24).

Table 2: Growth and development of *C. serratus* on different genotypes of groundnut pods under free choice test

Sr. No.	Genotypes	Adult Emergence (%)	Mean Development Period (days)	Growth Index
1	LSVT-I-2020-04	59.87(50.68)	45.98	1.30
2	LSVT-I-2020-06	52.38(46.35)	44.70	1.17
3	LSVT-I-2020-03	53.90(47.22)	46.44	1.17
4	HOVTSB-I-2020-08	47.22(43.38)	49.60	0.95
5	HOVTSB-I-2020-05	59.88(50.68)	48.76	1.23
6	HOVTVG-I-2020-04	57.64(49.38)	50.15	1.15
7	HOVTVG-I-2020-02	60.47(51.03)	50.20	1.21
8	HOVTVG-I-2020-08	62.63(52.30)	45.01	1.39
9	STVT-I-2020-01	62.64(52.31)	49.81	1.27
10	STVT-I-2020-03	56.27(48.58)	46.91	1.21
11	STVT-I-2020-05	60.39(50.99)	47.36	1.28
12	STVT-I-2020-11	56.80(48.89)	47.49	1.20
13	ISK-I-2020-02	72.06(58.07)	50.12	1.44
14	ISK-I-2020-05	52.00(46.13)	49.71	1.05
15	ISK-I-2020-06	62.70(52.36)	52.56	1.19

16	ISK-I-2020-25	51.21(45.68)	51.66	0.99
17	IVK-I-2020-13	58.45(49.85)	48.37	1.21
18	IVK-I-2020-15	61.86(51.84)	48.74	1.27
19	IVK-I-2020-09	65.14(53.82)	45.54	1.43
20	IVK-I-2020-18	61.27(51.52)	45.09	1.36
	SEm±	1.15	1.35	0.03
	CD(0.05)	3.32	3.87	0.09
	CV%	4.00	4.85	4.47

Values in parentheses are angular transformed values

3.6 Index of Susceptibility

Genotypes HOVTSB-I-2020-08 (3.38) and LSVT-I-2020-03 (3.95), these genotypes were not preferred for egg laying showed significantly lowest index of susceptibility. The highest index of susceptibility of *C. serratus* was recorded on genotypes LSVT-I-2020-04 (6.01), STVT-I-2020-05 (5.67) and IVK-I-2020-15 (5.65) which were at par with each other. In the remaining genotypes the index of susceptibility varied from 4.02 to 5.30 (Table 3).

In the present study index of susceptibility (SI) calculated based on the adult emergence and mean developmental period of the *C. serratus* was taken as the criteria for categorization of genotypes as given by Mensah (1986) [9]. The genotypes were classified into 5 categories *viz*., resistant (0-2.5), moderately resistant (2.6-5.0), moderately susceptible (5.1-7.5), susceptible (7.6-10.0) and highly susceptible (>10.0). Twelve genotypes *viz.*, LSVT-I-2020-06, LSVT-I-2020-03, HOVTSB-I-2020-08, HOVTSB-I-2020-05, HOVTVG-I-2020-04, STVT-I-2020-01, STVT-I-2020-03, STVT-I-2020-11, ISK-I-2020-02, ISK-I-2020-06, ISK-I-2020-25 and IVK-I-2020-18 with index of susceptibility ranging from 3.38 to 4.76 were categorized as moderately resistant. While other eight genotypes LSVT-I-2020-04, HOVTVG-I-2020-02, HOVTVG-I-2020-08, STVT-I-2020-05, ISK-I-2020-05, IVK-I-2020-13, IVK-I-2020-15 and IVK-I-2020-09 with index susceptibility ranging from 5.01 to 6.01 were categorized as moderately susceptible.

The results obtained in the present investigation are coincided with the findings of Hasanab (2009) [3]. He reported that the genotype TPT-25 which exhibited the lowest index of susceptibility (4.12) was significantly superior to the other remaining genotypes, whereas significantly the highest index of susceptibility of 13.57 recorded in GG-2 followed by TCGS-888 (10.51).

Table 3: The index of susceptibility and index of suitability of *C. serratus* on different genotypes of groundnut pods under free choice test

Sr. No.	Genotypes	Index of Susceptibility	Index of Suitability
1	LSVT-I-2020-04	6.01	0.039
2	LSVT-I-2020-06	4.35	0.039
3	LSVT-I-2020-03	3.95	0.037
4	HOVTSB-I-2020-08	3.38	0.034
5	HOVTSB-I-2020-05	4.52	0.037
6	HOVTVG-I-2020-04	4.58	0.035
7	HOVTVG-I-2020-02	5.30	0.036
8	HOVTVG-I-2020-08	5.10	0.040
9	STVT-I-2020-01	4.25	0.036
10	STVT-I-2020-03	4.35	0.038
11	STVT-I-2020-05	5.67	0.038
12	STVT-I-2020-11	4.76	0.037
13	ISK-I-2020-02	4.66	0.037
14	ISK-I-2020-05	5.10	0.035
15	ISK-I-2020-06	4.02	0.034
16	ISK-I-2020-25	4.16	0.033
17	IVK-I-2020-13	5.10	0.037
18	IVK-I-2020-15	5.65	0.037
19	IVK-I-2020-09	5.19	0.040
20	IVK-I-2020-18	4.62	0.040
	SEm±	0.13	0.001
	CD(0.05)	0.36	0.003
	CV%	4.58	5.07

3.7 Index of suitability

The index of suitability of *C. serratus* on groundnut genotypes varied from 0.0332 to 0.0399 (Table 3). Significantly the lowest index of suitability was found in ISK-I-2020-25 (0.0332). The highest index of suitability was found in IVK-I-2020-09 (0.0399) which as at par with HOVTVG-I-2020-08 (0.0399), IVK-I-2020-18 (0.0396), LSVT-I-2020-06 (0.0387), LSVT-I-2020-04 (0.0386), STVT-I-2020-05 (0.0377), STVT-I-2020-03 (0.0376) LSVT-I-2020-03 (0.0374), ISK-I-2020-02 (0.0371) and STVT-I-2020-11 (0.0370). Genotypes HOVTSB-I-2020-08, ISK-I-2020-06, ISK-I-2020-05, HOVTVG-I-2020-04, HOVTVG-I-2020-02, STVT-I-2020-01, IVK-I-2020-13, HOVTSB-I-2020-05 and IVK-I-2020-15 were recorded index of suitability 0.0339, 0.0339, 0.0345, 0.0352, 0.0362, 0.0355, 0.0365, 0.0366 and 0.0368 respectively, which were on par with each other. The genotype ISK-I-2020-25 was found to be superior with the lowest index of suitability as compare to all other genotypes.

The results were in agreement with the findings of Hasanab (2009) [3]. He reported index of suitability varied from 0.021 (OG-52-1) to 0.057 (K-4). Sreedhar *et al.* (2020) [14] reported that the index susceptibility of *C. serratus* in different genotypes of groundnut varied from 0.035 (Harithandra) to 0.050 (K 1715).

The data presented in the Table 4 represent grouping pods of groundnut genotypes based on index susceptibility. The index of susceptibility of *C. serratus* on different genotypes of groundnut varied from 3.38 to 6.01. Twelve genotypes *viz*., LSVT-I-2020-06, LSVT-I-2020-03, HOVTSB-I-2020-08, HOVTSB-I-2020-05, HOVTVG-I-2020-04, STVT-I-2020-01, STVT-I-2020-03, STVT-I-2020-11, ISK-I-2020-02, ISK-I-2020-06, ISK-I-2020-25 and IVK-I-2020-18 with index of susceptibility ranging from 3.38 to 4.76 were categorized as moderately resistant. Other eight genotypes LSVT-I-2020-04, HOVTVG-I-2020-02, HOVTVG-I-2020-08, STVT-I-2020-05, ISK-I-2020-05, IVK-I-2020-13, IVK-I-2020-15 and IVK-I-2020-09 with index susceptibility ranging from 5.01 to 6.01 were categorized as moderately susceptible

Table 4: Grouping pods of groundnut genotypes based on the index of susceptibility to *C. serratus*

Sr. No.	Genotypes	Scale	Index of Susceptibility	Category
1	LSVT-I-2020-04	5.0-7.5	6.01	Moderately Susceptible
2	LSVT-I-2020-06	2.5-5.0	4.35	Moderately Resistance
3	LSVT-I-2020-03	2.5-.5.0	3.95	Moderately Resistance
4	HOVTSB-I-2020-08	2.5-.5.0	3.38	Moderately Resistance
5	HOVTSB-I-2020-05	2.5-.5.0	4.52	Moderately Resistance
6	HOVTVG-I-2020-04	2.5-.5.0	4.58	Moderately Resistance
7	HOVTVG-I-2020-02	5.0-7.5	5.30	Moderately Susceptible
8	HOVTVG-I-2020-08	5.0-7.5	5.10	Moderately Susceptible
9	STVT-I-2020-01	2.5-.5.0	4.25	Moderately Resistance
10	STVT-I-2020-03	2.5-.5.0	4.35	Moderately Resistance
11	STVT-I-2020-05	5.0-7.5	5.67	Moderately Susceptible
12	STVT-I-2020-11	2.5-.5.0	4.76	Moderately Resistance
13	ISK-I-2020-02	2.5-.5.0	4.66	Moderately Resistance
14	ISK-I-2020-05	5.0-7.5	5.10	Moderately Susceptible
15	ISK-I-2020-06	2.5-.5.0	4.02	Moderately Resistance
16	ISK-I-2020-25	2.5-.5.0	4.16	Moderately Resistance
17	IVK-I-2020-13	5.0-7.5	5.10	Moderately Susceptible
18	IVK-I-2020-15	5.0-7.5	5.65	Moderately Susceptible
19	IVK-I-2020-09	5.0-7.5	5.19	Moderately Susceptible
20	IVK-I-2020-18	2.5-.5.0	4.62	Moderately Resistance

3.8 Longevity of male adults

The male bruchid beetle emerged from different genotypes of groundnut were observed for their longevity. The longevity of male bruchid beetle was varied from 13.75 to 21.03 days (Table 5). Minimum life span of male bruchid beetle was observed in genotypes IVK-I-2020-18 (13.75 days) which as on par with IVK-I-2020-13 (14.29 days). Next lowest life span of bruchid beetle was found in genotypes HOVTSB-I-2020-05 (15.39 days) and LSVT-I-2020-06 (15.76 days) which as at par with each other. Longevity of male bruchid beetle on genotypes IVK-I-2020-15, ISK-I-2020-02, HOVTVG-I-2020-08, LSVT-I-2020-04 STVT-I-2020-05, HOVTVG-I-2020-04, HOVTSB-I-2020-08 and ISK-I-2020-05 were recorded 15.88, 16.22, 16.77, 16.78, 16.96, 17.12 17.22 and 17.33 days respectively, which were at par with each other. Longevity of male bruchid beetle on genotypes LSVT-I-2020-03, STVT-I-2020-11, IVK-I-2020-09 and HOVTVG-I-2020-02 were recorded 17.89, 18.40 18.90 and 19.21 days, which were at par with each other. Maximum life span of male bruchid beetle was observed in STVT-I-2020-01 (21.03 days) which as at par with ISK-I-2020-06 (20.61 days), STVT-I-2020-03 (20.31 days) and ISK-I-2020-25 (19.79 days).

The results were in agreement with the findings of Bhoraniya (2011) [1], who reported that longevity of male bruchid beetle varied from 18.83 to 22.32 days. Also reported that maximum longevity of male bruchid beetle was recorded on genotype GG-6 (22.32 days) whereas minimum on GG-20 (18.83 days).

Table 5: Longevity of male and female and sex ratio of *C. serratus* on different genotypes of groundnut pods under free choice

Sr. No.	Genotypes	Longevity of Male	Longevity of Female	Sex Ratio M/F
1	LSVT-I-2020-04	16.78	18.38	1:1.18
2	LSVT-I-2020-06	15.76	18.89	1:1.33
3	LSVT-I-2020-03	17.89	21.27	1:1.71
4	HOVTSB-I-2020-08	17.22	18.11	1:1.29
5	HOVTSB-I-2020-05	15.39	16.13	1:1.25
6	HOVTVG-I-2020-04	17.12	17.34	1:1.14
7	HOVTVG-I-2020-02	19.21	18.90	1:1.15
8	HOVTVG-I-2020-08	16.76	19.74	1:0.88
9	STVT-I-2020-01	21.03	17.97	1:1.27
10	STVT-I-2020-03	20.31	22.17	1:0.92
11	STVT-I-2020-05	16.96	18.74	1:1.20
12	STVT-I-2020-11	18.40	20.92	1:1.23
13	ISK-I-2020-02	16.22	19.23	1:1.58
14	ISK-I-2020-05	17.33	19.02	1:0.85
15	ISK-I-2020-06	20.61	17.60	1:1.50
16	ISK-I-2020-25	19.79	18.23	1:1.17
17	IVK-I-2020-13	14.29	24.04	1:1.27
18	IVK-I-2020-15	15.88	23.09	1:1.04
19	IVK-I-2020-09	18.90	19.90	1:0.88
20	IVK-I-2020-18	13.75	21.19	1:1.50
	SEm±	0.50	0.55	--
	CD(0.05)	1.45	1.58	--
	CV%	5.00	4.88	--

3.9 Longevity of Female adults

The female bruchid beetle emerged from different groundnut genotypes were observed for their longevity. The longevity of female bruchid beetle was ranged from 16.13 to 24.04 days (Table 5). Significantly lowest longevity of female bruchid beetle was observed in HOVTSB-I-2020-05 (16.13 days), which was significantly different from all other genotypes. Next lowest life span of female bruchid beetle was found in genotypes HOVTVG-I-2020-04 (17.34 days), ISK-I-2020-06 (17.60 days), STVT-I-2020-01 (17.97 days), HOVTSB-I-2020-08 (18.11 days) and ISK-I-2020-25 (18.23 days) which as at par with each other. Longevity of female bruchid beetle on genotypes LSVT-I-2020-04, LSVT-I-2020-06, STVT-I-2020-05, HOVTVG-I-2020-02, ISK-I-2020-05, ISK-I-2020-02 HOVTVG-I-2020-08 and IVK-I-2020-09 were recorded 18.38, 18.74, 18.89, 18.90, 19.02, 19.23 19.74 and 19.90 days respectively, which were at par with each other. Life span of female bruchid beetle on genotypes STVT-I-2020-11, IVK-I-2020-18, LSVT-I-2020-03 and STVT-I-2020-03 were recorded 20.92, 21.19, 21.27 and 22.17 days respectively, which were at par with each other. Maximum life span of female bruchid beetle was observed in IVK-I-2020-13 (24.04 days) on par with IVK-I-2020-15 (23.09 days).

The results were in agreement with the findings of Bhoraniya (2011) [1], who reported that longevity of Female bruchid beetle varied from 19.55 to 21.80 days. Also reported that maximum longevity of female bruchid beetle was recorded on genotype GG-2 (21.80 days) while minimum on Kadiri-3 (19.55days).

3.10 Sex ratio

The adults emerged from different genotypes of groundnut were identified as male and female and sex ratio was calculated for all genotypes. Table 4.5 showed that the male to female sex ratio of *C. serratus* was affected due to different genotypes. The sex ratio (male: female) of *C. serratus* was varied from 1:0.85 to 1:1.71. The genotypes ISK-I-2020-05, HOVTVG-I-2020-08, IVK-I-2020-09 and STVT-I-2020-03 produced least female as compare to males, which resulted in lower sex ratio of 1:0.85, 1:0.88, 1:0.88 and 1:0.92. Remaining genotypes which was produced more females as compare to males, which results in higher sex ratio. The highest sex ratio was recorded in LSVT-I-2020-03 (1:1.71) followed ISK-I-2020-06 (1:1.50) and IVK-I-2020-18 (1:1.50).

4. Conclusion

The genotype of groundnut pods LSVT-I-2020-06 (4.35), LSVT-I-2020-03 (3.95), HOVTSBI-2020-08 (3.38), HOVTSB-I-2020-05 (4.52), HOVTVG-I-2020-04(4.58), STVT-I-2020-01 (4.25), STVT-I-2020-03 (4.35), STVT-I-2020-11 (4.76), ISK-I-2020-02 (4.66), ISK-I-2020-06 (4.02), ISK-I-2020-25 (4.16) and IVK-I-2020-018 (4.62) were found moderately resistant to *C. serratus* based on the index of susceptibility, while other 8 genotypes were found moderately susceptible to *C. serratus*.

5. References

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