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Record of *Epilachna*, leaf hopper, aphid and mealy bug population in different cultivars of brinjal

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Abstract
A field experiment was conducted during late *Kharif*, 2015-2016 at insectary, Department of Entomology, S.V. Agricultural College, Tirupati to record the population of *Epilachna*, Leaf hopper, Aphid and Mealy bug in eleven commonly grown cultivars of brinjal i.e, 6varieties and 5 hybrids. Relatively higher mean numbers of *Epilachna* beetle were seen in Arka Neelakanth, Arka Kusumakar, Jyothi, Shyamala and the damage was almost fluctuated throughout the crop. The maximum number of leafhoppers appeared on cultivars was 2-3 per leaf. The mean number of leafhoppers per leaf recorded in 11 brinjal cultivars were statistically insignificant from one another. It ranged from 1.06 to 1.49 per leaf. This may be considered as moderate incidence. Throughout the crop period, the leafhoppers, incidence was almost uniform. The mean number of aphids per leaf in 11 brinjal cultivars were in the range of 8.86 to 23.90. The highest was in Ranjitha hybrid at 100 DAT. Initial mealy bug mean population at 50 DAT ranged from 7.11 to 14.22 per plant. Except Arka Nidhi, comparatively other four Arka varieties were less preferred by mealy bug (11/plant). Hybrids had 12.37 to 14.26 per plant, being PHB-909 as highly preferred line. The mean number of aphids per leaf in 11 brinjal cultivars were in the range of 8.86 to 23.90. The highest was in Ranjitha hybrid at 100DAT.

Keywords: Brinjal cultivars, *Epilachna*, leaf hopper, aphid, mealy bug

Introduction
Brinjal (*Solanum melongena* L.), also known as egg. Plant is one of the common and popular vegetables grown throughout the world. Brinjal is the second important vegetable crop next to tomato grown in an area of 0.68 million hectares with annual production of 12.9 million tonnes accounting about 8.3 per cent of total vegetable production of the country. The area under brinjal crop in Andhra Pradesh occupies 58 thousand hectares with annual production of 1160 thousand tonnes. The damage due to insect pests is one of the major threats to the crop. This crop is vulnerable to attack of as many as 26 insect pests, starting from nursery to harvesting of the crop. In this study, 11 commonly grown cultivars i.e 6 varieties and 5 hybrids were assessed for their tolerance against *Epilachna*, Leaf hopper, Aphid and Mealy bug.

Material and Methods
The varieties selected for the field trial are Arka Kusumakar, Arka Neelakanth, Arka Nidhi, Arka Keshav, and Arka Sirisha. The seeds were brought from Indian Institute of Horticultural Research, Hessaraghatta, and Bangalore. C.V.K (variety) and the hybrids *viz.*, Jyothi, Shyamala, Utkal, PHB-909, and Ranjitha were purchased from the local market Tirupati.
The nursery of 11 cultivars maintained and the experiment was laid out in randomized block design with 11 treatments and 3 replications with plot size of 4×5 m. The crop was grown with recommended agronomic practices. The data with regard to incidence of *Epilachna*, Leaf hopper, Aphid and Mealy bug was recorded at ten days interval starting from 10 after transplanting. In each treatment, each replication, five plants were randomly tagged. In tagged plants, target insect pests incidence was recorded up to 120 days of the crop growth. For spotted leaf beetle, (*Henosepilachna vigintioctopunctata),* number of grubs present on three leaves *i.e.* one bottom, middle and one top in the tagged plants were recorded and expressed as mean number per leaf. Leaf hoppers, *(Amrasca biguttula* (Ishida) (nymphs), aphids, (*Aphis gossypii* Glover) and mealy bug (Coccidia Hystrix *insolitus* (Green)) were recorded from three (top, middle, bottom) leaves on tagged plants and expressed as mean number per leaf. The data was recorded early in the morning when the insects are relatively inactive. The data was transformed into angular values and subjected to statistical analysis.

Results and Discussion

Henosepilachna vigintioctopunctata, Fabricius population in different varieties and hybrids

The *Epilachna* beetle started at 10 DAT. Lowest mean number of grubs per plant were recorded in Ranjitha hybrid (0.43) followed by the PHB-909 hybrid (0.73). Highest number of grubs per plant were recorded in CVK variety (3.66) followed by the Shyamala hybrid (3.00) (Table 4.14). At 20 DAT, lowest number of grubs per plant was recorded in Ranjitha hybrid (0.53), PHB- 909 hybrid (0.53). At 30 DAT lowest number of grubs per plant was recorded in Arka Nidhi (1.60), PHB-909 hybrid (1.73) which are on par with each other. Highest number of grubs per plant was recorded in Arka Kusumakar variety (3.73) followed by the Ranjitha hybrid (2.66), Shyamala hybrid (2.60) Arka Neelakanth variety (2.60) (Table.1)

Table 1. Mean number of grubs of *Henosepilachna vignitioctopunctata* on different brinjal cultivars during late *Kharif* 2015.

Variety/hybrid	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT	110 DAT	120 DAT	Mean
Arka Neelakanth	2.26 (6.26)	1.20 (5.90)	2.60 (7.50)	1.33 (7.52)	4.416 (8.48)	3.53 (9.03)	2.53 (8.90)	3.46 (11.29)	4.43 (10.24)	1.46 (5.97)	1.40 (6.84)	1.26 (6.74)	2.49
Arka Kusumakar	2.53 (8.89)	2.46 (7.09)	3.73 (5.84)	3.26 (8.87)	3.53 (7.68)	3.53 (8.95)	2.53 (8.20)	3.60 (9.68)	2.66 (9.24)	1.46 (5.68)	1.33 (6.25)	1.40 (5.73)	2.67
Arka Sirisha	1.30 (5.37)	0.33 (3.27)	2.256 (8.52)	2.93 (8.65)	3.40 (8.15)	2.73 (9.26)	3.46 (8.19)	4.46 (11.53)	3.46 (9.92)	1.46 (5.99)	1.46 (6.69)	1.46 (5.99)	2.39
Arka Keshav	2.10 (8.50)	0.50 (3.38)	1.73 (9.71)	4.00 (9.49)	3.33 (8.16)	3.40 (10.72)	2.60 (6.19)	4.60 (10.81)	3.66 (9.63)	1.66 (5.61)	1.53 (8.88)	1.53 (6.22)	2.55
Arka Nidhi	2.80 (9.38)	0.73 (4.40)	1.60 (7.26)	3.73 (9.39)	4.26 (8.76)	3.60 (9.88)	3.40 (7.79)	3.60 (11.59)	3.53 (9.42)	1.26 (6.93)	1.66 (6.52)	1.53 (7.08)	2.64
CVK	3.66 (10.19)	1.86 (6.10)	1.86 (7.19)	3.06 (9.52)	3.13 (7.25)	1.66 (9.38)	2.46 (6.47)	4.50 (10.27)	3.60 (10.28)	1.73 (6.94)	2.00 (8.12)	1.60 (6.76)	2.59
Jyothi	1.86 (7.85)	1.10 (6.10)	2.10 (6.72)	3.33 (8.24)	1.60 (6.75)	2.53 (6.48)	3.33 (7.39)	3.60 (9.21)	5.60 (12.28)	1.13 (6.76)	1.66 (7.06)	2.33 (8.78)	2.51
Shyamala	3.00 (9.41)	1.53 (5.81)	2.60 (8.19)	3.06 (10.51)	2.66 (6.78)	2.40 (8.90)	3.73 (8.62)	4.50 (10.46)	4.06 (10.34)	2.46 (7.81)	2.26 (7.10)	1.33 (7.23)	2.81
Utkal	1.50 (8.89)	0.66 (4.90)	2.40 (7.49)	3.26 (9.35)	2.80 (6.27)	0.73 (4.90)	2.66 (8.08)	3.40 (10.04)	3.33 (8.68)	1.46 (5.51)	1.46 (8.34)	1.60 (7.10)	2.10
PHB-909	0.733 (4.17)	0.533 (3.54)	1.73 (7.09)	3.25 (9.74)	2.53 (6.90)	1.66 (7.40)	3.33 (9.30)	2.46 (8.89)	2.60 (7.87)	1.66 (6.54)	1.53 (5.81)	1.66 (7.40)	1.97
Ranjitha	0.40 (10.05)	0.53 (3.54)	2.66 (8.76)	2.53 (8.90)	3.40 (9.14)	3.66 (9.09)	0.46 (6.42)	3.66 (10.25)	2.46 (10.00)	1.86 (6.90)	2.16 (8.60)	1.73 (7.70)	2.13
Mean	2.01	1.03	2.29	3.06	3.18	2.67	2.77	3.80	3.58	1.6	1.67	1.58	2.44
CD	2.00	1.06	1.72	1.50	1.74	1.83	1.67	1.66	2.14	1.29	1.56	1.20	1.62
SE(m)±	0.67	0.35	0.60	0.50	0.58	0.61	0.56	0.56	0.72	0.43	0.52	0.40	0.55

Figures in parentheses are √ x+0.5 transformed values

***Epilachna* beetle damage**

Grub of *Epilachna* beetle at 25X

The grub population was 1.33 to 5.60 in various brinjal tested lines when the data of 40 to 100 DAT was considered. Later, the population was still declined. The infestation was almost fluctuated throughout the crop. The mean grub population recorded per plant was in the range of 1.03 to 3.80. From 100 DAT, the grub population started to decline. Almost all the 11 tested lines were statistically insignificant from one another with respect to mean number of grub population per plant The maximum of 5.6 grubs per plant were recorded in Jyothi during December Ist fortnight. When the crop was 90 days old, during September – October, 0.33- 4.40 grubs were seen per plant. The *Epilachna* beetle incidence in this late *Kharif* (2015 to 16) can be considered as the moderate level of infestation.

Anandhi and singh (2008) [1] reported that incidence of *Epilachna* beetle was first noticed from the 20th week after transplanting with average population of 0.27 brinjal hadda beetles per plant. Ghosh and Senapati (2002) [2] reported that the *Epilachna* beetle was recorded from April to middle of October on brinjal and the highest population was recorded (8.14 beetles per plant) during the mid-September

Leafhopper, *Amrasca biguttula biguttula* (Ishida) population on different brinjal cultivars during the crop growth period.

Nymphs of leaf hopper

Mixed symptoms due to leafhopper and aphid (Light yellow spots due to leafhoppers Curling and yellowing due to aphid)

The maximum number of leafhoppers appeared on cultivars was 2-3. The mean number of leafhoppers per leaf recorded in 11 brinjal cultivars were statistically insignificant from one another. The range was 1.06 to 1.49 per leaf (Table.2). This may be considered as moderate incidence. Throughout the crop period, the leafhopper, incidence was almost uniform. *i.e.* there was no significant difference between most of the data recorded at intervals. As the crop has not received any insecticidal sprays, it could have led to maintenance of natural enemies in sufficient density. This may be the reason for moderate incidence of leafhoppers. Moreover, heavy rains were received during the season which is unfavorable condition for leafhoppers.

Ghosh and Senapati (2002) [2] reported that highest leafhopper population (4.63 per leaf) was recorded in April- May and the lowest (0.50 per leaf) was recorded in mid-July. Samal and Patnaik (2008) [4] reported that brinjal leafhopper activity peaked at 55-65 days after transplanting. Patel *et al.* (2015) [3] reported that jassids population started from third week of February and reached to its peak level (9.53 jassids per plant) is first week of May.

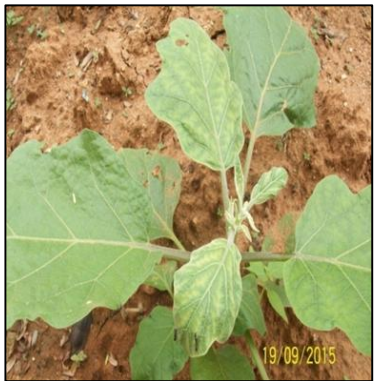
Table 2. Mean number of leaf hoppers, A*mrasca biguttula* per leaf on different brinjal cultivars during the late *Kharif*, 2015.

Variety/hybrid	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT	110 DAT	120 DAT	Mean
Arka Neelakanth	0.79 (5.11)	0.87 (5.33)	1.13 (6.03)	0.63 (4.51)	0.69 (4.76)	1.39 (4.11)	0.58 (4.37)	0.597 (4.42)	1.48 (7.65)	1.35 (6.67)	1.54 (7.12)	1.70 (1.74)	1.06
Arka Kusumakar	0.68 (4.13)	0.79 (5.05)	1.22 (6.30)	1.55 (6.89)	1.50 (6.10)	1.76 (4.97)	0.58 (4.34)	0.573 (4.31)	1.37 (6.71)	1.54 (7.12)	1.36 (6.69)	1.57 (1.57)	1.20
Arka Sirisha	0.77 (5.03)	0.84 (5.24)	1.46 (6.94)	1.06 (5.84)	1.77 (7.65)	1.39 (6.14)	0.77 (5.03)	0.743 (4.93)	2.02 (7.11)	1.20 (6.51)	1.38 (6.74)	1.59 (1.55)	1.24
Arka Keshav	0.57 (4.48)	0.58 (4.37)	1.67 (7.29)	1.36 (6.20)	1.74 (7.36)	1.54 (7.04)	0.79 (5.12)	0.75 (4.96)	1.66 (7.58)	1.75 (7.59)	1.24 (6.40)	1.82 (1.25)	1.28
Arka Nidhi	0.72 (4.85)	1.30 (6.54)	0.81 (5.17)	1.54 (6.83)	1.66 (7.40)	1.47 (7.43)	1.46 (6.92)	1.57 (7.19)	1.74 (7.63)	1.19 6.66)	1.003 (5.71)	1.71 (1.71)	1.34
CVK	0.38 (4.28)	0.78 (5.06)	1.33 (6.62)	1.62 (5.32)	2.83 (7.34)	1.32 (6.26)	1.64 (5.48)	0.77 (5.03)	1.48 (7.15)	1.15 (6.16)	1.36 (6.69)	1.58 (1.58)	1.35
Jyothi	0.49 (4.01)	1.27 (6.13)	1.393 (6.75)	1.57 (6.77)	1.40 (7.19)	1.06 (5.92)	1.52 (5.74)	1.00 (5.75)	1.55 (7.15)	1.18 (6.23)	1.18 (6.22)	1.36 (1.37)	1.24
Shyamala	0.39 (3.58)	1.00 (5.73)	1.61 (7.29)	0.83 (5.34)	1.13 (6.49)	1.48 (6.98)	1.46 (5.64)	0.77 (5.04)	1.69 (7.58)	1.35 (6.67)	1.45 (6.89)	1.92 (2.55)	1.25
Utkal	0.38 (3.50)	0.73 (4.90)	1.45 (6.91)	1.57 (5.86)	1.72 (6.79)	1.68 (7.47)	0.86 (5.33)	2.57 (9.23)	1.46 (7.23)	1.47 (6.95)	1.25 (6.401)	1.49 (1.80)	1.38
PHB-909	0.56 (3.91)	1.55 (7.15)	1.34 (6.65)	1.64 (6.41)	2.31 (6.16)	1.68 (6.66)	1.68 (5.59)	1.38 (6.65)	1.50 (7.21)	1.12 (6.08)	1.36 (6.71)	1.79 (1.79)	1.49
Ranjitha	0.58 (4.13)	2.27 (8.09)	1.45 (6.85)	1.20 (6.29)	1.57 (6.51)	1.50 (6.83)	0.77 (5.04)	0.85 (5.27)	1.07 (4.92)	1.35 (6.68)	1.45 (6.92)	1.63 (1.70)	1.30
Mean	0.57	1.09	1.35	1.32	1.66	1.47	1.10	1.05	1.54	1.33	1.32	1.65	1.29
C.D	1.04	0.57	0.79	1.20	1.19	0.63	1.31	0.62	1.17	0.52	0.73	0.18	0.83
SE(m)±	0.35	0.19	0.26	0.40	0.40	0.21	0.44	0.21	0.39	0.17	0.24	0.06	0.28

Figures in parentheses are √ x+0.5 transformed values

Aphid, *Aphis gossypii,* Glover population on different brinjal cultivars:

Aphid infection in brinjal



Yellowing and curling symptoms on tender brinjal al leaves due to aphid attack

The overall mean number of aphids per leaf was highest in Ranjitha hybrid (17.03) followed by the PHB-909 hybrid (15.47) and Utkal hybrid (15.29). Arka Keshav variety and Arka Nidhi variety had 13.78 to 14.22. In the remaining lines, 10.72 to 12.21 overall mean number of aphids were recorded in the crop season (Table 3). Based on the level of incidence of aphids, all 11 the tested brinjal cultivars can be categorized as the Preferred lines (13 to 17 aphids per leaf): Ranjitha, PHB-909, Utkal, Arka Keshav, Arka Nidhi; Less preferred lines (10 to 12 aphids per leaf): Arka Neelakanth, Arka Sirisha, CVK, Jyothi and Shyamala. Presence of coccinellid predator in sufficient number may be the reason for this moderate incidence of aphids in brinjal. In addition, heavy rains received during the crop growth period also might have led to reduced level of aphid infestation.

Table 3. Mean number of aphids, *Aphis gossypii* per leaf on different brinjal cultivars during late *Kharif*, 2015.

Variety/hybrid	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT	110 DAT	120 DAT	Mean
Arka Neelakanth	9.37 (16.68)	10.27 (18.63)	12.27 (20.45)	16.43 (23.89)	14.21 (22.08)	13.02 (21.13)	11.40 (19.62)	11.81 (20.03)	16.13 (15.46)	11.67 (11.10)	11.73 (19.11)	8.06 (8.06)	12.12
Arka Kusumakar	8.86 (18.97)	12.15 (20.34)	12.80 (20.95)	12.76 (20.89)	10.56 (18.79)	13.00 (21.11)	12.04 (20.28)	13.13 (21.19)	10.18 (9.18)	9.13 (9.13)	10.970 (19.32)	10.86 (9.70)	11.37
Arka Sirisha	16.29 (22.42)	7.60 (16.01)	14.45 (21.91)	10.95 (19.19)	9.90 (18.25)	11.945 (20.12)	9.03 (17.48)	9.17 (17.611)	8.38 (9.38)	7.88 (7.88)	12.50 (20.03)	10.56 (10.43)	10.72
Arka Keshav	16.04 (23.07)	14.13 (22.08)	14.76 (22.02)	14.87 (22.66)	14.79 (22.61)	13.88 |(21.86)	9.73 (18.16)	12.17 (20.37)	13.45 (11.11)	15.07 (15.41)	20.197 (23.76)	11.65 (11.26)	14.22
Arka Nidhi	17.70 (23.28)	10.25 (18.67)	11.68 (19.37)	13.75 (21.7)	14.53 (22.41)	14.80 (22.60)	11.06 (19.33)	12.17 (18.85)	16.08 (14.42)	14.83 (16.16)	16.13 (23.56)	12.433 (12.08)	13.78
CVK	13.71 (20.22)	9.68 (18.10)	10.22 (18.32)	11.49 (19.80)	12.25 (20.42)	11.82 (20.09)	9.58 (18.02)	10.51 (18.88)	13.40 (12.43)	14.73 (12.40)	14.503 (22.28)	14.68 (13.93)	12.21
Jyothi	10.01 (19.29)	13.89 (21.81)	13.39 (20.20)	9.06 (17.42)	12.48 (20.40)	12.16 (20.32)	11.03 (19.37)	10.533 (18.93)	13.84 (9.50)	13.15 (13.15)	13.607 (21.48)	10.66 (10.16)	11.98
Shyamala	11.53 (20.35)	16.28 (23.73)	10.72 (19.02)	11.03 (19.17)	12.87 (20.92)	13.41 (21.36)	9.08 (17.50)	10.14 (18.55)	10.18 (7.85)	10.03 (10.03)	17.23 (25.25)	12.55 (13.22)	12.08
Utkal	18.60 (25.96)	11.89 (20.15)	14.03 (21.14)	13.92 (21.87)	13.81 (21.73)	25.86 (30.55)	13.53 (21.55)	16.54 (23.86)	15.26 (13.26)	7.93 (7.93)	18.27 (25.28)	13.85 (13.73)	15.29
PHB-909	16.08 (23.85)	16.58 (23.94)	10.41 (18.73)	13.26 (21.65)	14.88 (22.65)	14.150 (22.05)	11.80 (20.04)	13.41 (21.46)	18.10 (17.34)	21.70 (21.70)	21.06 (27.30)	14.320 (15.32)	15.47
Ranjitha	12.84 (20.70)	15.39 (22.93)	22.16 (28.98)	16.46 (23.93)	16.38 (23.86)	15.84 (23.42)	14.06 (22.00)	14.68 (22.50)	15.83 (15.16)	23.90 (23.23)	22.38 (28.22)	14.478 (15.09)	17.03
Mean	13.73	12.56	13.35	13.08	13.33	14.53	11.12	12.20	13.71	13.63	16.23	12.19	13.30
CD	2.76	2.10	2.24	2.85	2.57	2.33	2.55	2.50	1.14	1.56	4.02	1.44	2.34
SE(m)±	1.60	0.70	1.09	0.96	0.86	0.78	0.85	0.84	0.38	0.52	1.35	0.48	0.87

Figures in parentheses are $\sqrt{x+0.5}$ transformed values

Mealy bug, *Coccidia Hystrix insolita* Green Population on different brinjal cultivars

Mealy bug infestation in brinjal

Initial mealy bug mean population at 50DAT was 7.11 to 114.22 per leaf. later it was fluctuated later. In most of the lines, the population was slightly raised up to 80 days (12.80 to 116.73). The highest was in PHB- 909. Later, in most of the lines again, the number per plant decreased slightly. However, in Arka Nidhi and CVK, 18.20 to 18.97 (higher of all data) number of mealy bugs were recorded (Table 4). By considering the overall mean number of mealy bugs per plant in different cultivars or lines, it can be inferred that except Arka Nidhi, comparatively all other four Arka varieties are less preferred by mealy bug (11/plant). The other lines had 12.37 to 14.26 per plant, being PHB-909 as highly preferred line. Patel *et al.* (2015) [3] reported that the population of mealy bug was reached to peak level (15.33 mealy bug per plant) in the last week of April.

Table 4. Mean number of mealy bugs, *Coccidia Hystrix insolita* per plant on different brinjal cultivars during the *Kharif*, 2015.

Variety/hybrid	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT	110 DAT	120 DAT	Mean
Arka Neelakanth	-	-	-	-	7.86 (16.22)	8.58 (16.94)	11.24 (19.58)	14.8 (12.15)	9.93 (18.30)	9.96 (18.38)	9.80 (18.21)	14.66 (22.49)	10.85
Arka Kusumakar	-	-	-	-	8.40 (16.77)	10.13 (18.53)	10.56 (18.92)	14.60 (14.46)	11.60 (16.06)	9.47 (17.89)	9.80 (18.20)	14.66 (22.35)	11.15
Arka Sirisha	-	-	-	-	13.920 (21.86)	13.66 (21.62)	13.58 (21.59)	13.10 (13.06)	7.720 (16.08)	9.32 (17.75)	10.20 (18.61)	9.30 (17.74)	11.35
Arka Keshav	-	-	-	-	7.10 (15.44)	10.52 (18.88)	12.50 (20.73)	13.467 (13.00)	11.60 (17.09)	10.26 (18.66)	11.60 (19.81)	9.83 (18.23)	10.85
Arka Nidhi	-	-	-	-	14.20 (22.08)	10.06 (18.48)	14.42 (22.28)	15.33 (15.13)	9.65 (15.97)	11.53 (19.77)	16.60 (23.84)	18.97 (25.78)	13.84
CVK	-	-	-	-	7.13 (15.39)	8.29 (16.72)	13.31 (21.38)	14.2 (14.91)	13.00 (19.48)	11.30 (19.61)	13.53 (21.52)	18.20 (25.21)	12.37
Jyothi	-	-	-	-	9.46 (17.90)	11.97 (20.23)	15.16 (22.90)	12.8 (14.02)	13.53 (18.81)	10.56 (18.91)	15.60 (23.19)	15.93 (23.50)	13.12
Shyamala	-	-	-	--	9.88 (18.30)	11.48 (19.76)	13.70 (21.71)	15.80 (15.80)	11.93 (20.62)	12.93 (21.05)	15.87 (23.39)	15.56 (23.14)	13.39
Utkal	-	-	-	-	9.11 (17.53)	10.28 (18.69)	14.00 (21.95)	15.36 (15.37)	11.46 (20.18)	11.03 (19.29)	15.30 (23.01)	16.96 (24.30)	12.93
PHB-909	-	-	-	-	11.67 (19.95)	11.70 (19.91)	13.4 (21.44)	16.73 (15.93)	14.46 (20.30)	12.53 (20.70)	15.66 (22.72)	17.93 (25.03)	14.26
Ranjitha	-	-	-	-	12.04 (20.27)	11.68 (19.96)	13.33 (21.74)	13.87 (13.25)	11.04 (21.72)	13.42 (21.46)	11.633 (19.91)	15.73 (23.35)	12.84
Mean	-	-	-	-	10.07	10.75	13.2	14.55	11.44	11.11	13.23	15.24	12.44
CD	-	-	-	-	2.41	2.10	2.03	1.37	1.59	2.30	2.64	2.07	2.07
SE(m)±	-	-	-	-	0.81	0.71	0.68	0.46	0.53	0.77	0.89	0.69	0.69

Figures in parentheses are $\sqrt{x+0.5}$ transformed value

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