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Incidence of Rice Gall Midge, *Orseolia oryzae* (Wood-Mason) in Early and Late Sown Crop

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***Abstract*:** Field surveys were conducted to ascertain the incidence of gall midge (*Orseolia oryzae*) in four major rice-growing villages of Bapatla district *viz.*, Karlapalem, Jammulapalem, Appikatla and Kankatapalem. The study focused on five widely cultivated rice varieties *viz.* BPT 5204, BPT 2595, BPT 2270, MTU 1262 and BPT 2782. Gall midge infestation was highest in BPT 5204 (16.27 per cent silver shoots) at Kankatapalem village, followed by BPT 2595 and BPT 2270 at the same village. Relatively high incidence was also observed in BPT 5204 and BPT 2595 at Jammulapalem village. In contrast, least incidence of silver shoots was in BPT 2782 at Karlapalem, BPT 2782 at Appikatla, MTU 1262 at Karlapalem and BPT 2782 at Jammulapalem village. Overall, the results indicate that BPT 5204 and BPT 2595 were more susceptible to gall midge, while BPT 2782 and MTU 1262 exhibited relatively lower levels of infestation, suggesting potential suitability of these for cultivation in gall midge-prone areas.

***Keywords*:** Rice varieties, Survey, Gall midge, Silver shoots, Incidence

The majority of people in India rely on rice as their main source of nutrition. With 27.8% of the world's rice production, India is one of the biggest producers of white rice and has the greatest area under rice cultivation worldwide. India produces 146.7 million tonnes of rice annually on an area of 47.8 million hectares (IRRISTAT 2024). Rice is the staple food crop for most of the world population particularly in Asian countries as 2.9 billion people depend on rice and it is grown in 117 countries. The estimated yield of 787 million metric tonnes were produced every year from 162 million hectares of rice grown worldwide. Asia contributes for 90% of the world's rice production and consumption (FAO 2024)

Rice gall midge, *Orseolia oryzae* (Wood-Mason) is one of the major insect pests, causing extensive damage in several rice growing countries of Asia *viz*., Thailand, China, Sri Lanka, India, Bangladesh, Pakistan, Burma, Kampuchea, Indonesia, Laos, Nepal and Vietnam. Earlier reports have documented prevalence of rice gall midge in African countries such as Sudan, Cameroon, Mali, Upper Volta, Ivory Coast, Senegal, New Guinea, Guinea -Bissau and Nigeria. Gall midge causes an average of US $80 million in crop losses each year in India (Bentur et al*.,* 2003). The pest is endemic in parts of Jharkhand and the damage caused by it typically ranged from 10 to 70%, with an annual production loss of 20 to 70% depending on climatic conditions and varietal susceptibility (Prasad, 2011). This pest is also reported from southern Karnataka districts such as Kodagu, Mysuru, and Hassan and the infestation level in these areas ranged from 10 to 15 per cent (Vijay Kumar et al., 2008). The present study was undertaken to assess the extent of *O. oryzae* infestation among major rice varieties cultivated in key rice-growing villages of Bapatla district, Andhra Pradesh.

MATERIAL AND METHODS

Field survey was conducted in the farmer fields at Bapatla district. The villages selected for this survey were Karlapalem and Appikatla which is situated at an 15^{0}94' North latitude, 80^{0} 50' East longitude in the Krishna Agro Climatic Zone of Andhra Pradesh state of representing early sown crop (August sowings). Kankatapalem and Jammulapalem at which is situated at an 15^{0}94' North latitude, 80^{0} 50' East longitude in the Krishna Agro Climatic Zone of Andhra Pradesh state of India representing late sown situation (September sowings). The study focused on five major rice varieties grown in the district *viz.,* BPT 5204, MTU 1262 BPT 2782, BPT 2270 and BPT 2595. To ensure natural pest build-up, the selected field were not applied with granular insecticides and plant protection sprays either in nursery or in main field. Incidence of gall midge (damaged plants and silver shoots) was recorded at fortnightly intervals on each variety by observing 25 randomly selected hills at 30, 45, and 60 days after transplanting (DAT). The percent silver shoots were calculated.

RESULTS AND DISCUSSION

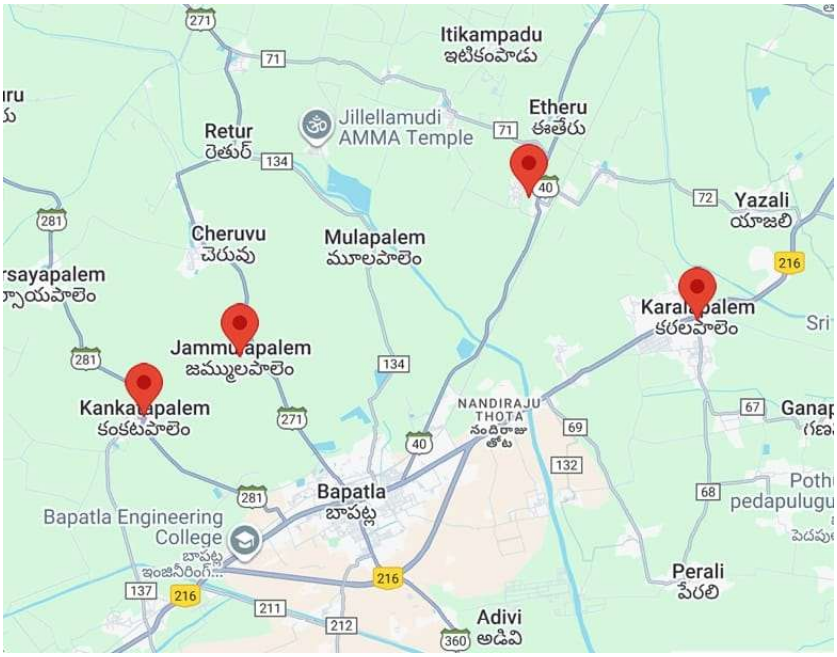
At 30 DAT among the varieties, BPT 5204 recorded the highest silver shoot incidence in all surveyed locations ranging from 10.01 to 15.20 % due to late sown in all villages. The highest incidence was in Kankatapalem followed by Jammulapalem and Appikatla while the lowest silver shoot incidence in Karlapalem village (10.01 %) due to early sown (Table: 1) BPT 2595 recorded slightly lower silver shoots than BPT 5204. Kankatapalem village recorded highest percentage (13.90 %) due to late sown of this variety than BPT 5204. Lowest incidence was in Karlapalem village

(9.27%). BPT 2270 showed moderate infestation (7.04-12.60%), whereas MTU 1262 and BPT 2782 recorded the lowest incidence (2.86-8.00%) because these varieties were early sown in all villages (Table 2).

At 45 DAT the same varietal trend continued. BPT 5204 again recorded the highest levels of silver shoot incidence in all locations (11.13 to 15.30 %) with Jammulapalem showing the peak incidence (15.30) followed by Kankatapalem (15.0%), Appikatla (12.13%) and Karlapalem (11.13 %). BPT 2595 followed closely with highest incidence (14.90 %) at Kankatapalem and lowest was in Appikatla village (12.81 %). BPT 2270 showed intermediate infestation (8.56-13.90%) with highest in Kankatapalem followed by Jammulapalem (12.53%), Appikatla (9.06%), and Karlapalem (8.56 %). The lowest damage (3.53-9.20%) was in MTU1262 and BPT 2782 in all four villages due to early sown and were at par with each other (Table 2).

At 60 DAT, gall midge incidence further increased across all varieties. BPT 5204 registered the maximum infestation (14.92–18.60%), particularly in Kankatapalem followed by Jammulapalem (16.35%) and Appikatla (15.42%). BPT 2595 showed slightly lower infestation levels, ranging from 13.89% (Karlapalem) to 16.10% (Kankatapalem) due to late sown of these two varieties. In BPT 2270, the silver shoot incidence ranged from 9.79% to 14.90 %, with the highest at Kankatapalem (14.90 %) and the lowest at Karlapalem (9.79%). The varieties MTU 1262 and BPT 2782 exhibited the least damage indicating their relative tolerance and were on par with each other. In these two varieties, highest silver shoot incidence was in Kankatapalem (8.30% and 10.40%), followed by Jammulapalem (7.70% and 7.81%), Appikatla (7.63% and 6.54%), while the lowest incidence was recorded in Karlapalem village (6.63 and 5.54%), respectively (Table .2).

Based on mean per cent silver shoot incidence recorded a distinct varietal and location, highest per cent silver shoots in BPT 5204 (16.27) and BPT 2595 (14.97) at Kankatapalem village due to late sown of these varieties, least incidence of



Map shows surveyed villages for gall midge in Bapatla

Table 1. Overall gall midge incidence in different villages around Bapatla

Surveyed villages	Silver shoots (%)				
	BPT 5204	BPT 2595	BPT 2270	MTU 1262	BPT 2782
Karlapalem	12.02	11.99	8.46	5.07	3.98
Appikatla	13.16	12.32	9.63	6.40	4.81
Jammulapalem	14.94	13.29	12.19	8.08	6.16
Kankatapalem	16.27	14.97	13.80	8.50	7.17

Table 2. Rice gall midge incidence in rice growing areas of Bapatla district

Varieties	Silver shoots (%)														
	30 DAT					45 DAT					60 DAT				
	KP	AK	JP	KKP	MEAN	KP	AK	JP	KKP	MEAN	KP	AK	JP	KKP	MEAN
BPT 5204	10.01 (18.4)	11.93 (20.1)	13.19 (22.1)	15.20 (22.9)	12.58	11.13 (19.4)	12.13 (20.3)	15.30 (22.9)	15.00 (22.7)	13.39	14.92 (22.7)	15.42 (20.0)	16.35 (23.7)	18.60 (25.4)	16.32
BPT 2595	9.27 (17.7)	10.77 (18.6)	11.94 (20.1)	13.90 (21.3)	11.47	12.81 (20.5)	11.31 (19.6)	12.22 (20.3)	14.90 (22.2)	12.81	13.89 (21.8)	14.89 (22.2)	15.73 (22.9)	16.10 (23.6)	15.15
BPT 2270	7.04 (15.3)	9.54 (17.9)	10.80 (19.1)	12.60 (20.9)	9.99	8.56 (17.0)	9.06 (17.4)	12.53 (20.1)	13.90 (21.3)	11.00	9.79 (17.7)	10.29 (18.7)	13.24 (21.2)	14.90 (22.2)	12.05
MTU 1262	3.12 (10.1)	5.12 (13.0)	6.64 (14.8)	8.00 (16.2)	5.72	5.46 (13.4)	6.46 (14.7)	7.19 (16.2)	9.20 (17.4)	7.08	6.63 (14.8)	7.63 (16.0)	10.4 (18.8)	8.30 (16.0)	8.24
BPT 2782	2.86 (9.7)	3.86 (11.1)	4.45 (12.1)	6.10 (14.2)	4.31	3.53 (10.7)	4.03 (11.5)	6.23 (14.2)	7.70 (16.0)	5.37	5.54 (13.6)	6.54 (14.8)	7.81 (15.6)	7.70 (16.0)	6.90
C.D.	2.93	2.621	3.356	3.913		4.163	2.912	1.968	4.601		2.665	3.046	2.90	2.871	
C.V.	7.202	5.673	6.654	7.214		8.996	6.097	3.68	8.075		5.147	5.63	4.97	4.835	

Note: Figures in parenthesis are arc sine transformed values
KP: Karlapalem, AK: Appikatla, JP: Jammulapalem, KKP: Kankatapalem
*Mean of incidence recorded at 30, 45 and 60 DAT

silver shoots was recorded in BPT 2782 (3.98-6.16 %) and MTU 1262 (5.07%) across Karlapalem**,** Appikatla and Jammulapalem due to early sown of these varieties (Table 1). These results indicate that BPT 5204 and BPT 2595 were the most susceptible varieties, followed by BPT 2270, whereas MTU 1262 and BPT 2782 showed lower susceptibility to gall midge across all sowing situations.

Mamathad et al. (2020), reported higher gall midge incidence in the Cauvery and Kabini command areas of Karnataka, with silver shoot percentages of 9.03 (Mandya) followed by Mysore. Similarly, Krishna et al. (2024) conducted a roving survey in the Chittoor, Nellore, and Y.S.R. districts of the Southern Zone of Andhra Pradesh, Nellore exhibited the highest mean silver shoot damage (15.38%), followed by Y.S.R and Chittoor with BPT 5204 showing maximum susceptibility. The present study corroborates these findings, indicating that BPT 5204 followed by BPT 2595 and BPT 2270 were more susceptible to gall midge across all sowing conditions, whereas MTU 1262 and BPT 2782 showed lower susceptibility. Moreover, higher silver shoot incidence under late-sown conditions (Jammulapalem and Kankatapalem) compared with early-sown fields (Karlapalem and Appikatla) suggests that delayed planting favours pest build-up and enhances gall midge damage.

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CONCLUSION

The current survey confirms that varietal susceptibility and time of sowing play critical roles in determining gall midge incidence. Adoption of tolerant varieties such as MTU 1262 and BPT 2782 coupled with adjustment of sowing time can significantly reduce gall midge-related yield losses in Bapatla district.

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