

***Leptocorisa* Latreille (Alydidae) species abundance and distribution in paddy fields of Thrissur, Kerala, India**

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ABSTRACT: To understand the severity of *Leptocorisa* species (Hemiptera, Heteroptera, Alydidae) in the paddy fields, the adults and nymphal stages were collected during the agriculture season (November 2019 to March 2020). Sampling was done twice in the season, first in the panicle emerging stage and the second before harvest. The initial and final average densities of total insects varied from 1-4 individual m⁻². Two species of *Leptocorisa* were identified of which *L. oratoria* (F) was found to be the major pest in the paddy fields of Thrissur, where as *L. lepida* Breddin was relatively less prevalent.

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KEY WORDS: Rice bug, sucking, adult, nymph, *Leptocorisa oratoria*, *L. lepida*

Rice bugs are one of the few pests that feed directly on developing rice spikelet in the field, thus are the most recognized insect pests by farmers (Litsinger *et al.*, 2015). They suck the sap from rice panicles in their milky stage, leaving the grains chaffy and smelly and, thus, reducing the crop production and quantity of rice. By sucking the milk, it reduces the grain content up to 40-60 per cent, leading to grain damage during milling, reduce the quality of rice (Argente and Heinrichs, 1983; Litsinger *et al.*, 2015). The Reva district in Madhya Pradesh suffered 32 per cent of bug incidence during 2007 and 2008 (Tiwari *et al.*, 2014). Girish *et al.* (2015) reported 3-4 bugs/ hill from Dharwad, Karnataka, 0-3 insects/ hill from Allahabad (Bais *et al.*, 2017) and 15 insects/ 5 sweep nets from Varanasi (Padhan and Raghuram, 2018) were reported from Uttar Pradesh. It is important to know the distribution and abundance of major *Leptocorisa* species

infesting paddy and their density to know their level of infestation for formulating management strategies. This study is to identify the species of *Leptocorisa* found in selected paddy fields of Thrissur District, Kerala and also to find out their density during the panicle emerging stage and just before rice harvest.

Paddy fields were selected randomly. Insects were collected from selected paddy fields of Velur (10.645°N; 76.170°E), Mundathikkode (10.646°N; 76.193°E), Thangalur (10.612°N; 76.184°E), Padiyoor (10.303°N; 76.184°E) and Mullassery (10.530°N; 76.078°E) of Thrissur district, Kerala, during the agricultural season November 2019 to March 2020. Insects were collected from two plots in each field. Total area collected varied in each field- Velur (17.64 m²), Mundathikkode (20.88 m²), Thangalur (15.84 m²), Padiyoor (16.02 m²) and

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Mullassery (13.86 m²). The insects were collected along five transects. Four transects were along the field edges and one inside the field. Along each transect, insects were collected from a regularly spaced sampling point. An entomological sweep net of 0.18 m² was used for collecting insects. The number of sampling points varied according to the area of the plot. Insect collection was done two times, once during the panicle emergence and once during grain maturing stage. Only *Leptocorisa* species were collected from the sweep net by visual observation. The collected insects were identified. Identification was done using standard taxonomic keys (Ahmad, 1965; Dolling, 2006; Lahari *et al.*, 2024). Images of insects collected in different parts were taken using the Leica S8AP0 microscope with 8:1 zoom and 300 Lp/mm. Total insect density, individual insect density, adults and nymphal densities were calculated separately using the plot's total area from the collected insects. One-way ANOVA was performed for the total insect densities.

A total of 377 insects were collected during the rice panicle emergence stage and before harvest. Two species of *Leptocorisa* (Hemiptera, Heteroptera, Alydidae) were identified. One is the major pest of rice, *L. oratoria* (Fabricius, 1764) with brownish-black ventro-lateral spots on the abdomen (Ahmad, 1965) and curved paramere, tapering to point at the apices in males (Lahari *et al.*, 2024) (Figs. 1-3).

Leptocorisa oratoria (84%), is a major pest of lowland wet rice areas (Siwi and Van Doesburg, 1984), of Thailand, Vietnam, Philippines, India (Hasegawa, 1971), China, Japan (Dolling, 2006) and in Iran (Ghahari *et al.*, 2010). *L. lepida* (Breddin) (Figs. 4 - 6) with long cylindrical and pointed paraclypea (Ahmad, 1965) characterized by very short and slime body with dark endocorium of hemielytra, and blade-like paramere, curved with pointed apices in males (Lahari *et al.* 2024) is usually found in association with weed grass near paddy fields.

Both species of *Leptocorisa* were found in Velur, Mundathikkode and Thangaloor. In Padiyoor and

Mullassery only *L. oratoria* was found, *L. lepida* was absent.

The average densities of total insects (average density = total number of insects collected during panicle emerging stage (Initial) and just before harvest (Final)/ total sampling points X area of net opening) collected from each plot during the panicle emerging stage (Initial) and just before harvest (Final) showed statistically significant differences ($p < 0.05$). The initial and final average densities of total insects varied from one- four individuals/ m². A decrease in final density was found in all fields except in Padiyoor. In Padiyoor the total density increased from 1.996 to 2.556 individuals/ m² (Fig. 7). A study by Kandibane (2008) for phytophage Hemiptera pointed out that these kinds of insects prefer weeded plots, especially *Echinochloa colonum*, *E. crus-galli* act as a secondary host for *Leptocorisa* spp. Insect density in Padiyoor increased during the final stage may be due to the presence of their secondary host plant in the field. In all the fields, *L. oratoria* (both adult and nymph) density was higher than *L. lepida*. *Leptocorisa oratoria* density was found to decrease towards the final stage. These observations were in support with the previous studies of Ghule *et al.* (2008) in Gujarat on *Leptocorisa acuta* and Girish *et al.* (2012) in Mugad, Karnataka. *Leptocorisa oratoria* density found to be more than the economic threshold level in most sites as per the Integrated pest management package for rice (Prakash *et al.*, 2014). In other places *L. lepida* densities also found to be decreased in the final stage (Fig. 8). Adult and nymphal stages of *L. oratoria* indicate that adult density was similar during initial and final stage. Nymphs were abundant during the panicle emerging stage and following the grain maturation the nymphal densities decreased (Fig. 9). The results are supporting with the previous work done by Girish *et al.* (2015). *Leptocorisa lepida* (15%) was only found in Velur, Mundathikkode and Thangaloor. In these fields, initial densities of adult *L. lepida* was higher than the final. Only from Velur field *L. lepida* nymphal stages found. From other fields *L. lepida* nymphal stages were not found (Fig. 10).

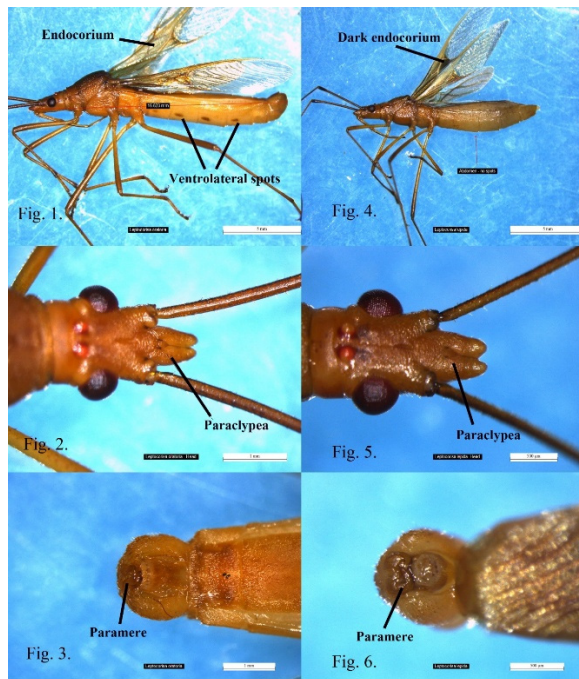


Fig.1 *Leptocorisa oratoria* (Fabricius, 1764) (Male), Fig.2 *L. oratoria* - Head, Fig.3 *L. oratoria*- Terminalia dorsal view, Fig. 4 *L. lepida* (Breddin) (Male), Fig. 5 *L. lepida*-Head, Fig. 6 *L. lepida* -Terminalia dorsal

Corbett (1930), mentioned about adult *L. lepida* as a species that prefer grasses. From this study, it is concluded that the major *Leptocorisa* species is found to be *L. oratoria*. Proper field practices and pest management activities needed to be taken to control these pests.

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REFERENCES

Ahmad, Imtiaz (1965) The Leptocorisinae (Heteroptera: Alydidae) of the world. Bulletin of the British Museum (Natural History). Entomology. Supplement, 5, British Museum (Natural History),

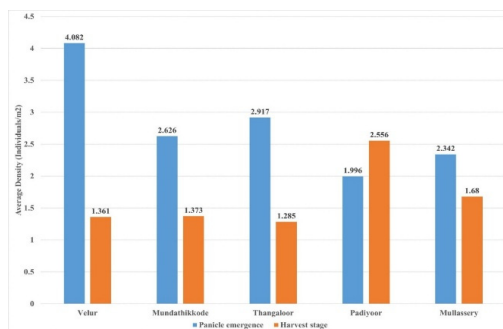


Fig. 7.

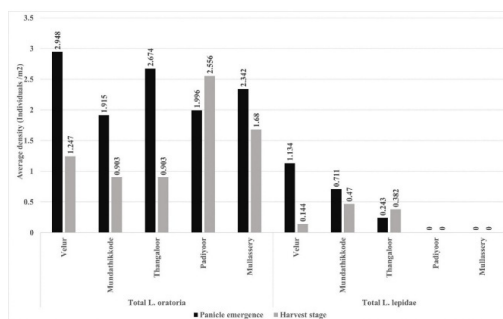


Fig. 8.

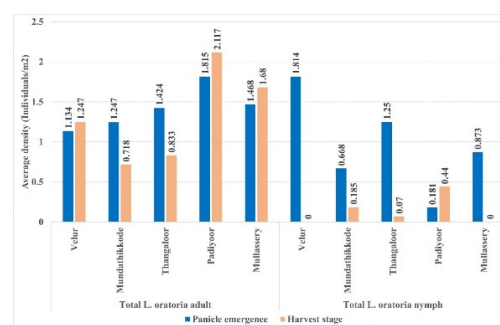


Fig. 9

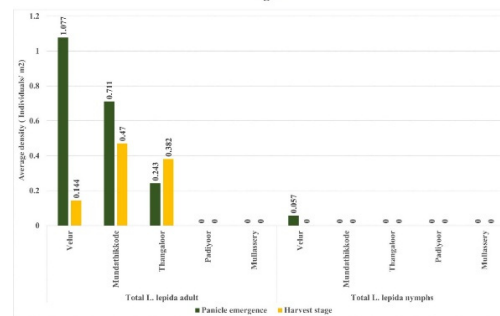


Fig. 10

Fig. 7 Average Density of Total Insects, Fig. 8 Average densities of total *L. oratoria* and *L. lepida*, Fig. 9 Average densities of *L. oratoria* adults and nymphs, Fig.10 Average densities of *L. lepida* adults and nymphs

- London. pp 1–156.
- Argente A.M. and Heinrichs E.A. (1983) Residues of carbaryl, lindane and monocrotophos on rice treated for control of rice bug, *Leptocorisa oratorius* (Fab.). Crop protection 2(3): 361–369.
- Bais B., Kumar A., Husain Khan H., Sahu R. and Kaiwart P.K. (2017) Efficacy of Certain Chemical Insecticides against Rice Gundhi Bug (*Leptocorisa acuta* Thunberg) Under Field Condition. International Journal of Current Microbiology and Applied Sciences 6(9): 1697–1701.
- Corbett G.H. (1930) The bionomics and control of *Leptocorisa acuta* Thunb. With notes on other *Leptocorisa* spp. in Malaya, Scientific series No.4, Department of Agriculture Straits settlements and Federation Malay State 1(4): 40
- Dolling W.R. (2006) Superfamily Coreoidea Leach, 1815. Catalogue of the Heteroptera of the Palaearctic Region, 5 (Berend Aukema and Christian Rieger), The Netherlands Entomological Society, Netherlands. pp1–101.
- Ghahari H., Carpintero D.L., Moulet P., Linnvuori R.E and Ostovan H. (2010) Annotated catalogue of the Iranian broad-headed bugs (Hemiptera: Heteroptera: Alydidae). Acta Entomologica Musei Nationalis Pragae 50(2): 425–436.
- Ghule S.D., Patel K.G. and Pandya H. V. (2008) Seasonal incidence of Rice ear head bug (*Leptocorisa acuta* Thun.) of paddy in south Gujarat. Insect Environment 14 (1): 7–8.
- Girish V.P., Hegde M. and Balikai R.A. (2015) Evaluation of newer insecticides and botanical on ear head bug and yellow stem borer population in paddy. International Journal of Agricultural and Statistical Sciences 11(1): 211–213.
- Girish V.P., Mahabaleshwar H, Hanamaratti N.G. and Balikai R.A. (2012) Population dynamics of leafhopper, grasshopper, horned caterpillar and earhead bugs under different planting methods of rice ecosystem. Journal of experimental biology 15(2): 1–4
- Hasegawa H. (1971) Distribution and taxonomy of rice bugs in Southeast Asia. In: Proceedings of a Symposium on Tropical Agriculture Researches. Symposium on rice insects, 19–24 July, 1971, Tropical Agriculture center, Ministry of Agriculture and Forestry, Tokyo. pp229–234.
- Kandibane M. (2008) Diversity and abundance of phytophage hemiptera in an irrigated rice ecosystem of Tamilnadu. India. Asian Journal of BioScience 3 (1): 102–106
- Lahari S., Kalleshwaraswamy C.M., Hanumanthaswamy B.C. and Naveena N.L. (2024) Taxonomy and genetic diversity of rice earhead bugs, *Leptocorisa* spp. (Hemiptera: Alydidae) from India. Phytoparasitica 52 (3): 43.
- Litsinger J.A., Barrion A.T., Canapi B.L., Libetario E.M., Pantua P.C., Cruz C.G., Apostol R.F., Lumaban M.D., Bandon J.P. and Macatula R.F. (2015) *Leptocorisa* rice seed bugs (Hemiptera: Alydidae) in Asia: a review. Philippine Entomologist 29(1): 1–103.
- Padhan S. and Raghuraman M. (2018) Bio-Efficacy of newer insecticides against Rice Gundhi Bug, *Leptocorisa acuta* (Thunberg) in Varanasi region. Journal of Pharmacognosy and Phytochemistry 7(3): 2068–2071.
- Prakash A., Bentur J.S., Prasad M.S., Tanwar R.K., Sharma O.P., Bhagat S., Sehgal M., Singh S.P., Singh M., Chattopadhyay C. and Sushil S.N. (2014) Integrated pest management for rice. National Centre for Integrated Pest Management, New Delhi, India. pp9.
- Siwi S.. and Van Doesburg P.H. (1984) *Leptocorisa* Latreille in Indonesia (Heteroptera, Coreidae, Alydinae). Zoologische Mededelingen 58(7): 117–129.
- Tiwari A., Prakash Pandey J., Tripathi K., Pandey D., Pandey B. and Shukla N. (2014) Effectiveness of Insecticides and Biopesticides against Gundhi Bug on Rice Crop in District Rewa (M.P.), India. International Journal of Scientific and Research Publications 4(1): 451–454.

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