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# Evaluation of Rice Blast Incidence and Identification of Resistant sources in Aromatic Rice Landraces

***U. Keerthana[1,2*], A.K. Senapati[1], Manas K. Bag[2], S.R. Prabhukarthikeyan[2], Niranjan Das[3] and Mihira K. Mishra[1]***

*[1]Department of Plant Pathology, Odisha University of Agriculture and Technology, Bhubaneswar (Odisha), India.*
*[2]Crop Protection Division, National Rice Research Institute, Cuttack (Odisha), India.*
*[3]Department of Nematology, Odisha University of Agriculture and Technology, Bhubaneswar (Odisha), India.*

*(Corresponding author: U. Keerthana*)*
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**ABSTRACT: The Rice blast disease, primarily caused by the fungal pathogen *Magnaporthe oryzae*, represents a significant biotic stress factor affecting rice production in India. To identify sources of resistance to leaf blast disease within aromatic rice landraces, evaluations were conducted under both natural and induced epiphytotic conditions during the wet seasons of 2021 and 2022. A comprehensive screening encompassed 108 aromatic rice landraces, including susceptible controls (CO 39 and HR 12), cultivated within a standardized blast nursery. Disease severity pertaining to rice leaf blast was assessed utilizing a 0-9 scale. Of the rice genotypes screened, 17 were classified as resistant, 17 landraces demonstrated moderate resistance, and 74 genotypes proved susceptible to rice leaf blast disease. The identification of these resistant accessions, possessing requisite agronomic traits, suggests their potential utilization as donor parents within leaf blast resistance breeding programs aimed at developing resistant aromatic rice varieties.**

**Keywords:** Rice blast, aromatic landraces, Percent disease index, screening, resistance.

## INTRODUCTION

Rice (*Oryza sativa* L.), a prominent cereal crop of the *Poaceae* family, holds significant global importance as the primary staple food, with over 50% of the world's population, especially in Asia (Thapa and Bhusal 2020). India, ranking second in rice production after China, contributes substantially to the global production of 776.4 million tons (Mt) from 165.04 million hectares (Mha) of land (FAO, 2022). India boasts a rich and diverse genetic treasure trove of aromatic rice varieties. Each state in the country shows its array of aromatic rice, cherished for its unique qualities in special culinary preparations. In Odisha, rice cultivation thrives across diverse ecosystems and under varying climatic conditions. As an ancient state of India, Odisha stands out as a significant producer and consumer of aromatic rice. The state proudly cultivates its collection of aromatic short-grain rice varieties, found across its districts in various agro-climatic zones (Das, 2012).

Global rice production faces significant challenges due to a range of biotic and abiotic stresses (Richa *et al.*, 2016). Among biotic stresses, blast disease poses a substantial constraint to rice cultivation. In India, diseases cause an average annual yield loss of 25-30%, with leaf blast being one of the most prevalent and severe diseases affecting rice crops (Wopereis *et al.*, 2009). Under severe epiphytic conditions, rice leaf blast disease can lead to losses ranging from 70% to 90% in isolated fields or localities (Devanna *et al*., 2014).

Many traditional aromatic and basmati rice varieties are vulnerable to leaf and neck blast disease. While fungicides offer partial management, their costliness renders them inaccessible to resource-poor, small-scale, and marginal farmers. Furthermore, factors like persistent rainfall during the cropping season, emergence of resistant fungal strains, and concerns about soil, water, and environmental pollution deter the use of fungicidal sprays. Given these challenges, cultivating resistant varieties emerges as an eco-friendly, farmer-friendly, cost-effective, and practical alternative for mitigating crop losses caused by this pathogen (Sharma *et al.*, 2012). However, the pathogen's rapid evolution into new races presents a significant obstacle to achieving durable resistance, requiring continuous adaptation efforts. Hence, Continuous identification of blast-resistant donors from diverse germplasm against prevailing virulent races is essential (Sester *et al.*, 2019). Thus, this study aimed to identify leaf blast-resistant genotypes among one hundred and eight landraces of Odisha's aromatic rice.

## MATERIALS AND METHODS

**Experimental Site and Materials.** The experiment was conducted at ICAR National Rice Research Institute in Cuttack, India. A total of 108 aromatic rice landraces of the Odisha region were collected from the National gene bank, ICAR – National Rice Research Institute, Cuttack (listed in Table 1) were evaluated for resistance against rice leaf blast disease during the wet seasons of 2021 & 2022. The phenotypic screening was carried out under natural epiphytotic field conditions using a uniform blast nursery (UBN).

**Table 1: Rice accessions comprising aromatic landraces utilized for screening against rice blast disease.**

| Sr. No. | Local Name | Area of collection | Sr. No. | Local Name | Area of collection |
|---|---|---|---|---|---|
| 1 | Baluchi | Dhenkanal | 31 | Kalikati-1 | Kalahandi |
| 2 | Acharmati-1 | Bolangir | 32 | Kala krishna | Kalahandi |
| 3 | Acharmati-2 | Bolangir | 33 | Kukudajata | Koraput |
| 4 | Basayabhog | Sundargarh | 34 | Koiamba-543 | Koraput |
| 5 | Basanasapuri | Puri | 35 | Krishnabhog | Puri |
| 6 | Basua bhog-1 | Anugul | 36 | Kalajiri-1 | Puri |
| 7 | Baukunja | Cuttack | 37 | Karpurazeera | Kalahandi |
| 8 | Basasaphool | Bolangir | 38 | Laxmibilas-1 | Deogarh |
| 9 | Badsabhog | Bolangir | 39 | Laxmibilas-2 | Sambalpur |
| 10 | Bhatagundi | Koraput | 40 | Leelabati | Balasore |
| 11 | Baiganamanji | Bhawanipatna | 41 | Lektimachi-1 | Malkangiri |
| 12 | Basaparijata | Kalahandi | 42 | Lektimasi | Malkangiri |
| 13 | Basanapuri | Puri | 43 | Lektimachi-2 | Malkangiri |
| 14 | Basubhog | Koraput | 44 | Laser | Malkangiri |
| 15 | Basanadhan | Koraput | 45 | Mahulakuchi | Malkangiri |
| 16 | Basanaphula | Cuttack | 46 | Maguraselectioin | Ganjam |
| 17 | Deulabhog-2 | Puri | 47 | Manas | Puri |
| 18 | Dhusara | Cuttack | 48 | Manasi | Puri |
| 19 | Dubrajsena | Koraput | 49 | Mahulkuchi | Malkangiri |
| 20 | Durgabhog | Keonjhar | 50 | Nalidhan | Cuttack |
| 21 | Dhurabahila | Koraput | 51 | Nanu | Anugul |
| 22 | Dangar Basumati | Koraput | 52 | Pirima | Koraput |
| 23 | Dubraj | Koraput | 53 | Panasmanjee | Malkangiri |
| 24 | Ganjamlocal-1 | Ganjam | 54 | Badaguda | Deogarh |
| 25 | Ganjamlocal-2 | Ganjam | 55 | Benugopal | Sambalpur |
| 26 | Ganjeikali | Dhenkanal | 56 | Jayaphul | Sundargarh |
| 27 | Jaiphool | Bolangir | 57 | Benubhog | Mayurbhanj |
| 28 | Jhillipanjar | Cuttack | 58 | Samleibhog-1 | Sundargarh |
| 29 | Jhingisali | Balasore | 59 | Bhuinsasal | Deogarh |
| 30 | Karpurkali | Ganjam | 60 | Kalajira | Dhenkanal |
| | | | | | |
| 61 | Laxmikajol | Keonjhar | 85 | Karpurakanta | Cuttack |
| 62 | Shantibhog | Puri | 86 | Basumati-3 | Kendrapara |
| 63 | Sujata | Puri | 87 | Basuabhog-2 | Kendrapara |
| 64 | Thakursuna | Cuttack | 88 | Garmatia | Puri |
| 65 | Suman | Cuttack | 89 | Krisnabhog | Puri |
| 66 | Thakur bhog | Puri | 90 | Kalatulasi | Nayagarh |
| 67 | Atmasital-1 | Koraput | 91 | Kalajeera-3 | Nayagarh |
| 68 | Nagri | Koraput | 92 | Batakarua | Keonjhar |
| 69 | Pipalbasa | Sambalpur | 93 | Basumati-4 | Jajpur |
| 70 | Samleibhog-2 | Sundargarh | 94 | Kalajiri-2 | Ganjam |
| 71 | Kalazeera | Dhenkanal | 95 | Suetpotato | Jajpur |
| 72 | Laxmibilas-3 | Sambalpur | 96 | Maharaji | Kalahandi |
| 73 | Basnadhan-1 | Sundargarh | 97 | Karpurakali | Ganjam |
| 74 | Kalaziri | Ganjam | 98 | Pimpudibasa | Mayurbhanj |
| 75 | Basumati-2 | Sundargarh | 99 | Atmasital-2 | Malkangiri |
| 76 | Parijatak | Ganjam | 100 | Kalajeera-4 | Koraput |
| 77 | Magura | Ganjam | 101 | Nadiaphool | Cuttack |
| 78 | Gadakakudinga | Phulbani | 102 | Jawaphool | Bolangir |
| 79 | Gangabali | Ganjam | 103 | Kalikati-2 | Bhawanipatna |
| 80 | Karpurakranti | Ganjam | 104 | Basnadhan-2 | Bhawanipatna |
| 81 | Phulabani local | Phulbani | 105 | Basanaparijata | Bhawanipatna |
| 82 | Kalagiri | Cuttack | 106 | Ramabana Basmati | Bolangir |
| 83 | Nadiarasa | Cuttack | 107 | Nadiakata | Bolangir |
| 84 | Saragadhuli | Cuttack | 108 | Kalakanhu | Bolangir |

**Pathogen.** The rice blast pathogen *Magnaporthe oryzae* isolate RLB 06 (Accession number-MT093385) was obtained from the Plant Pathology section, Division of Crop Protection ICAR-National Rice Research Institute (NRRI), Cuttack, Odisha. The fungal culture was subcultured and maintained in Oat meal agar (OMA) medium and incubated in BOD at 28±1°C for further studies. Rice leaf extract agar medium (RLEA) was used for the sporulation of the *Magnaporthe* isolate.

**Methodology and disease assessment.** In the uniform blast nursery, the 108 aromatic landraces were sown on a50 cm-long row in nursery beds with a row spacing of 10 cm. One row each of susceptible checks (CO39 and HR-12) was planted after every five entries and also along the borders to facilitate the uniform spread of the disease. To ensure the disease spread at a high rate, about 30-40 ml of the spore suspension of the virulent isolate (RLB 06) of the blast pathogen (approximately $10^5$ spores/ml mixed with Tween-20 @ 0.2 %) was sprayed on 15-day-old seedlings using a glass atomizer. Observations on the blast reaction of the lines were recorded after 25 days of sowing and continued at 5 day intervals until the $40^{th}$ day of sowing or when the susceptible checks had 85% of disease symptoms, whichever occurred earlier. The range of disease reaction was scored visually on a 0–9 scale following the Standard Evaluation System (SES), IRRI, Philippines, 2013 (Table 2) and the Percent disease index (PDI) was calculated using the following formula given by Wheeler (1969).

$$\text{PDI} = \frac{\text{Sum of all individual ratings}}{\text{Total number of leaves observed}} \times \frac{100}{\text{Maximum disease grade}}$$

**Table 2: Disease rating scale used for leaf blast disease in uniform blast nursery (UBN) (IRRI, 2013).**

| Scale | Description |
|---|---|
| 0 | Lesion are not present |
| 1 | Small brown specks of pin point size or larger brown specks without sporulating center |
| 2 | Small roundish to slightly elongated, necrotic gray spots, about 1-2 mm in diameter, with a distinct brown margin. Lesions are mostly found on the lower leaves |
| 3 | Lesions type is same as in scale 2, but a significant number of lesions on upper leaf area |
| 4 | Typical susceptible blast lesions, 3 mm or longer infecting less than 4 % of leaf area |
| 5 | Typical susceptible blast lesions infecting 4-10% of the leaf area |
| 6 | Typical susceptible blast lesions infecting 11 – 25% of the leaf area |
| 7 | Typical susceptible blast lesions infecting 26 - 50% of the leaf area |
| 8 | Typical susceptible blast lesions infecting 51-75% of the leaf area and many leaves are dead |
| 9 | More than 75% leaf area affected |

**Statistical Analysis.** The data were analyzed statistical using IRRISTAT version 92, a software tool developed by the International Rice Research Institute Biometrics unit in the Philippines.

## RESULTS AND DISCUSSION

Rice blast disease poses a notable threat to aromatic rice landraces due to their genetic diversity, cultural significance, and economic value. These landraces, cherished for their unique flavours and fragrances, face the risk of genetic erosion and yield losses when affected by blast. The disease management in aromatic landraces is challenging due to their susceptibility and the need to preserve desirable traits. Moreover, rice blast jeopardizes the conservation efforts aimed at safeguarding the genetic diversity of these valuable rice varieties. Addressing this issue requires a concerted effort to develop effective disease management strategies while ensuring the preservation of the unique characteristics and cultural heritage associated with aromatic rice landraces. Similarly, identification of Rice blast-resistant donors is essential for aromatic rice genotypes as they help preserve genetic diversity, stabilize yields, reduce reliance on chemical control, enhance adaptability to diverse conditions, and improve market competitiveness. Incorporating blast resistance from donors ensures sustainable cultivation practices and strengthens the resilience of aromatic rice varieties against this pervasive disease. Hence in our study the resistant donors were identified based on the screening analysis.

The aromatic landraces underwent evaluation for their resistance against the *Magnaporthe oryzae* pathogen at the ICAR National Rice Research Institute in Cuttack, India, within the uniform blast nursery. Genotypes were assessed after 25 days of sowing, coinciding with the appearance of initial symptoms in the susceptible lines (Co 39 and HR 12). Based on blast disease scoring data from two consecutive seasons in the Uniform Blast Nursery (UBN), all 108 aromatic genotypes were analysed for resistance to rice blast disease. The Percent Disease Index (PDI) was calculated using leaf blast disease scoring in the Uniform Blast Nursery, and the results are presented in Table 3. Among the tested landraces, seventy-four aromatic landraces exhibited a high Percent Disease Index (PDI) (> 60%), categorizing them as susceptible genotypes based on disease score values. Similarly, 17 aromatic landraces showed a PDI of 35-60%, classified as moderately resistant lines. A low PDI of < 35% was observed in 17 genotypes, categorized as resistant lines. Among the 17 resistant landraces, one genotype, Benugopal, recorded the lowest

PDI of 6.67%, followed by the Karpurkali landrace from Ganjam district at 8.9%. Additionally, three landraces, namely Manas, Kalazeera, and Nadiakata, exhibited a PDI of 11.1%, with no significant differences observed among them.

Screening for leaf blast resistance under the natural epiphytotic condition has been reported in 74 germplasm (Anupam *et al*., 2017), 350 accessions (Yelome *et al*., 2018) and 52 rice genotypes (Jeevan *et al*., 2023) in a uniform blast nursery and found the resistant genotypes against leaf blast. In our study, it was evident that the disease index has ranged from 6.67 % to 98.89 %. Out of the total 108 landraces evaluated only 17 genotypes were found resistance against rice leaf blast disease. Similarly, Singh *et al.* (2021) also found that 12 promising genotypes i.e. Kasturi, HPR2667, HPR 2693, HPR 2750, Bhagolta Local, Jammu Basmati, Katali, RR 600, Vallabh Basmati 21, Vallabh Basmati 22, Vallabh Basmati 23 and Vallabh Basmati 24 showed combined resistance to leaf and neck blast. In the current study majority of the landraces (74) were found susceptible against leaf blast disease. This results were in line with the results of Mondal *et al.* (2021) that the aromatic rice genotypes Gobindabhog, Konkanijoha, Kalonunia and found to be highly susceptible to leaf blast under natural conditions. Similarly, in another study it was found that Pusa Basmati 1, Improved Pusa Basmati 1, Pusa Basmati 6, Pusa Basmati 1121 and Ranbir Basmati showed susceptible reaction against both leaf and neck blast, which may be due to lack of resistance gene into these genotypes (Rathour *et al.*, 2016).

**Table 3: Percent disease index of aromatic rice for leaf blast resistance in the uniform blast nursery (UBN).**

| Sr. No. | Local name | Resistant reaction | PDI* | Sr. No. | Local name | Resistant reaction | PDI* |
|---|---|---|---|---|---|---|---|
| 1 | Baluchi | MR | 55.56(48.20)$^{gh}$ | 31 | Kalikati-1 | S | 97.78(82.22) $^{u}$ |
| 2 | Acharmati-1 | R | 28.89 (32.49)$^{d}$ | 32 | Kala krishna | S | 94.44 (76.49) $^{p-s}$ |
| 3 | Acharmati-2 | S | 84.44 (67.33)$^{mn}$ | 33 | Kukudajata | S | 96.66(79.80)$^{q-u}$ |
| 4 | Basayabhog | S | 86.67 (69.38)$^{mn}$ | 34 | Koiamba-543 | S | 96.22 (79.05)$^{q-u}$ |
| 5 | Basanasapuri | S | 84.44(67.33)$^{mn}$ | 35 | Krishnabhog | S | 97.33 (81.10)$^{stu}$ |
| 6 | Basua bhog-1 | S | 94.26 (77.09)$^{p-t}$ | 36 | Kalajiri-1 | S | 93.33 (75.13)$^{pq}$ |
| 7 | Baukunja | S | 95.50 (77.96)$^{p-u}$ | 37 | Karpurazeera | S | 95.55(78.02) $^{p-u}$ |
| 8 | Basasaphool | S | 63.33 (52.77)$^{i}$ | 38 | Laxmibilas-1 | R | 18.89(25.76) $^{c}$ |
| 9 | Badsabhog | S | 85.55 (68.32)$^{mn}$ | 39 | Laxmibilas-2 | S | 93.33(75.13) $^{pq}$ |
| 10 | Bhatagundi | R | 17.78 (24.92)$^{c}$ | 40 | Leelabati | R | 30.00 (33.21) $^{d}$ |
| 11 | Baiganamanji | S | 85.56 (68.32)$^{mn}$ | 41 | Lektimachi-1 | R | 31.11 (33.90)$^{d}$ |
| 12 | Basaparijata | MR | 52.22 (46.27)$^{fg}$ | 42 | Lektimasi | S | 72.22 (58.19) $^{k}$ |
| 13 | Basanapuri | S | 95.55(78.02)$^{p-u}$ | 43 | Lektimachi-2 | S | 88.89 (70.56) $^{no}$ |
| 14 | Basubhog | S | 97.11(80.64)$^{r-u}$ | 44 | Laser | S | 94.44 (76.49) $^{p-s}$ |
| 15 | Basanadhan | S | 95.55(78.02)$^{p-u}$ | 45 | Mahulakuchi | R | 28.89(32.51) $^{d}$ |
| 16 | Basanaphula | S | 93.55 (75.39)$^{pq}$ | 46 | Magura selection | S | 95.55(78.02) $^{p-u}$ |
| 17 | Deulabhog-2 | MR | 51.11 (45.63)$^{fg}$ | 47 | Manas | R | 11.11(19.46) $^{b}$ |
| 18 | Dhusara | MR | 38.89 (38.58)$^{e}$ | 48 | Manasi | R | 27.77(31.80) $^{d}$ |
| 19 | Dubrajsena | S | 84.44 (66.78)$^{mn}$ | 49 | Mahulkuchi | S | 94.44(76.49) $^{p-s}$ |
| 20 | Durgabhog | MR | 42.22 (40.52)$^{e}$ | 50 | Nalidhan | S | 85.55(67.68) $^{mn}$ |
| 21 | Dhurabahila | S | 94.44 (76.49)$^{p-s}$ | 51 | Nanu | MR | 41.11 (39.87) $^{e}$ |
| 22 | DangarBasumati | S | 62.22 (52.07)$^{hi}$ | 52 | Pirima | S | 63.33 (52.73) $^{i}$ |
| 23 | Dubraj | S | 65.11 (53.79)$^{ij}$ | 53 | Panasmanjee | R | 30.00 (33.21) $^{d}$ |
| 24 | Ganjamlocal-1 | S | 95.55 (78.02)$^{p-u}$ | 54 | Badaguda | MR | 51.11 (45.63) $^{fg}$ |
| 25 | Ganjamlocal-2 | MR | 51.11(45.63)$^{fg}$ | 55 | Benugopal | R | 6.66(14.96) $^{a}$ |
| 26 | Ganjeikali | MR | 42.22(40.52)$^{e}$ | 56 | Jayaphul | R | 31.11(33.90) $^{d}$ |
| 27 | Jaiphool | R | 28.89(32.51)$^{d}$ | 57 | Benubhog | MR | 50.00(44.99) $^{fg}$ |
| 28 | Jhillipanjar | S | 62.22 (52.07)$^{hi}$ | 58 | Samleibhog-1 | R | 28.89(32.52) $^{d}$ |
| 29 | Jhingisali | S | 95.56 (78.02)$^{p-u}$ | 59 | Bhuinsasal | MR | 51.11(45.63) $^{fg}$ |
| 30 | Karpurkali | R | 8.89 (17.35)$^{ab}$ | 60 | Kalajira | S | 73.33 (58.91)$^{k}$ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 61 | Laxmikajol | MR | 41.11 (39.88) $^{e}$ | 85 | Karpurakanta | S | 85.33(67.50) $^{mn}$ |
| 62 | Shantibhog | MR | 40.00(39.23) $^{e}$ | 86 | Basumati-3 | S | 83.33(65.92) $^{lmn}$ |
| 63 | Sujata | S | 73.33(58.91) $^{k}$ | 87 | Basuabhog-2 | S | 74.44(59.63) $^{k}$ |
| 64 | Thakursuna | MR | 44.44(41.80) $^{ef}$ | 88 | Garmatia | S | 95.56(78.02) $^{p-u}$ |
| 65 | Suman | S | 62.22(52.07) $^{hi}$ | 89 | Krisnabhog | S | 77.78(61.88) $^{kl}$ |
| 66 | Thakur bhog | S | 74.44(59.63) $^{k}$ | 90 | Kalatulasi | S | 93.33(75.13) $^{pq}$ |
| 67 | Atmasital-1 | S | 96.67(79.80) $^{q-u}$ | 91 | Kalajeera-3 | S | 77.77(61.88) $^{kl}$ |
| 68 | Nagri | S | 93.77(75.66) $^{pq}$ | 92 | Batakarua | S | 95.55(78.02) $^{p-u}$ |
| 69 | Pipalbasa | S | 95.55 (78.02) $^{p-u}$ | 93 | Basumati-4 | S | 92.22(73.88) $^{op}$ |
| 70 | Samleibhog-2 | S | 71.55 (57.77) $^{jk}$ | 94 | Kalajiri-2 | S | 96.44 (79.41) $^{q-u}$ |
| 71 | Kalazeera | R | 11.11(19.46) $^{b}$ | 95 | Suetpotato | S | 95.55 (78.02) $^{p-u}$ |
| 72 | Laxmibilas-3 | MR | 51.55(45.89) $^{fg}$ | 96 | Maharaji | S | 97.55 (81.63) $^{tu}$ |
| 73 | Basnadhan-1 | S | 95.55(78.02) $^{p-u}$ | 97 | Karpurakali | MR | 51.77 (46.01) $^{fg}$ |
| 74 | Kalaziri | S | 83.77 (66.26) $^{lmn}$ | 98 | Pimpudibasa | S | 73.33(58.91) $^{k}$ |
| 75 | Basumati-2 | S | 96.00 (78.69) $^{q-u}$ | 99 | Atmasital-2 | S | 85.55 (67.68) $^{mn}$ |
| 76 | Parijatak | R | 29.78 (33.07) $^{d}$ | 100 | Kalajeera-4 | S | 83.55 (66.09) $^{lmn}$ |
| 77 | Magura | S | 93.33 (75.13) $^{pq}$ | 101 | Nadiaphool | S | 82.44 (65.24) $^{lm}$ |
| 78 | Gadakakudinga | MR | 40.00 (39.23) $^{e}$ | 102 | Jawaphool | S | 93.33 (75.13) $^{pq}$ |
| 79 | Gangabali | S | 93.55 (75.39) $^{pq}$ | 103 | Kalikati-2 | S | 98.89 (82.69) $^{u}$ |
| 80 | Karpurakranti | S | 94.22(76.21) $^{pqr}$ | 104 | Basnadhan-2 | S | 84.44 (66.78) $^{mn}$ |
| 81 | Phulabani local | S | 96.44 (79.41) $^{q-u}$ | 105 | Basanaparijata | S | 73.33(58.91) $^{k}$ |
| 82 | Kalagiri | S | 61.11(51.42) $^{hi}$ | 106 | Ramabana Basmati | S | 86.66(68.61) $^{mn}$ |
| 83 | Nadiarasa | S | 62.66(52.34) $^{hi}$ | 107 | Nadiakata | R | 11.11 (19.46) $^{b}$ |
| 84 | Saragadhuli | S | 86.66(68.61) $^{mn}$ | 108 | Kalakanhu | S | 72.22 (58.19) $^{k}$ |
| SE(m) | | | 4.148 | | SE(m) | | 4.148 |
| C.D (@5%) | | | 1.487 | | C.D (@5%) | | 1.487 |

R – Resistant; MR – Moderately resistant; S- Susceptible.

*values in the parentheses indicate corresponding arcsine transformed values. Means in a column followed by same superscript letters are not significantly different according to Duncan's multiple range test at $P \leq 0.05$.

## CONCLUSIONS

The threat posed by rice blast disease to aromatic rice landraces is multifaceted, impacting their genetic diversity, cultural significance, and economic value. The challenge of managing this disease in aromatic landraces is compounded by their susceptibility and the imperative to preserve desirable traits. Furthermore, rice blast undermines conservation efforts aimed at safeguarding the genetic diversity of these valuable rice varieties. Identifying and incorporating blast-resistant donors into aromatic rice genotypes is essential to mitigate these risks. Our study contributes to this effort by identifying resistant donors through screening analysis. These identified genotypes can be used as potential donors for developing the resistant lines.

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**Conflicts of Interest.** None.

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