

# Endurance Test Of Aromatic Rice From Enrekang Against Bacterial Leaf Blight

Syamsia, Tutik Kuswinanti, Elkawakib Syam'un, A. Masniawati

**Abstract** : Bacterial leaf blight (BLB) caused by the bacterium *Xanthomonas oryzae* is an important disease of rice plants . BLB disease control can be carried out by planting varieties that are resistant to BLB. the endurance test of Enrekang aromatic rice needs to be done to obtain information about the level of local aromatic rice resistance to disease BLB which can be used to control the disease. Resistance test of blb disease conducted on 8 different types of local aromatic rice Enrekang using isolate of Xoo-003 which is a collection of BB-Biogen. Inoculation of bacteria-Xoo performed using Clip-way method, cutting 5 leaves on each treatment using scissors that has been dipped in Xoo suspension with  $10^8$  colony density. As a comparison (control) used Mekongga moderately resistant varieties. Resilience of local aromatic rice Enrekang on BLB is in the category of disease rather ranges, namely pare Mansur, lotong tens, tens mandoti, farming and Pinjan while the range is very parrilea categories, solo and kamida.

**Indeks Terms:** *Xanthomonas oryzae*, aromatic rice, bacterial leaf blight (BLB)

## 1. INTRODUCTION

Bacterial leaf blight disease was first discovered in Fukuoka Japan in 1884 [1]. The disease is caused by the bacterium *Xanthomonas oryzae*, gram-negative, aerobic, rod shape, size 0.4-0.7 x 0.7 - 1.8  $\mu$ m, a single polar flagellum [2]. Colonies on solid media containing glucose are round, convex, slimy and yellow pigments for producing xanthomonadin, characteristic of the genus [3]. Xoo into the rice leaf through hidatoda at the top and the edge of the leaf [4]. Symptoms caused by these bacteria classified as typical, ie starting from the formation of a wet line on the leaf blade will change to yellow and then white. These symptoms are common in tillers stage, flowering and ripening. Disease at a young plant called kresak, which may cause the leaves turn pale yellow, wither, and die. Grantham is the most destructive form of symptoms [5, 6]. These bacteria can cause damage to rice crops in the tropics and subtropics [4]. In Indonesia, the yield loss caused by bacterial leaf blight can reach 70-80% [7], whereas in India reached 6-60% and in Japan reaches 20-50% [8]. Efforts are considered effective for controlling BLB disease is by planting resistant varieties. In Indonesia, breeding resistant varieties through selection has been carried out and has successfully obtained several varieties with resistance to BLB [9]. The population of pathogenic bacteria *Xanthomonas oryzae* pv *oryzae* on rice crops are very diverse and dynamic. Some strains often arise in a particular area with one or several dominant satrain.

The structure of the population. *X. oryzae* pv. *oryzae* can be affected by environmental changes such as seasonal differences and the presence of disease-resistant genes in rice plants [10]. Xoo strains in Indonesia has been found 12 strains with different levels of virulence. Strains IV and VIII are known to dominate the BIB attack on rice crops in Indonesia [11] Rice aromatic is rice varieties that have high economic value because it is preferred by consumers. Aromatic rice demand because besides having a delicious flavor and fluffier rice also has a fragrant aroma. The demands of the social demand for food, especially rice growing both in quality and quantity is an opportunity for the development of local aromatic rice, aromatic rice especially from Enrekang. Aromatic rice from Enrekang is one type of aromatic rice that has a sharp scent. Type of aromatic rice from Enrekang is Mandoti Pulu, Salle Pare, Pare Lotong Pulu, Pinjan Pare, Pare Pallan, Solo Pare, Pare Mansur, and Pare Pare Kamida Lambau. The results of organoleptic test against nine aromatic rice varieties showed that aromatic rice from Enrekang is Pulu Mandoti and Lambau have the most fragrant aromatic levels [12]. This study aims to determine the resistance of some local aromatic rice from Enrekang against bacterial leaf blight.

## 2. MATERIALS AND METHOD

### Time and place of study

This study was conducted from September - December 2013, at Integrated Laboratory, and Greenhouse, Experimental Farm Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia.

### Research Methods

Rice seeds that have been aged 21 days were transferred to a bucket filled with soil and manure media (3:1), one clump per bucket. Rice plants that have been aged 45 days after planting inoculated with Xoo bacteria. Inoculation of Xoo isolates by Clip method, ie the end of the rice leaf cut about 2-3 cm with scissors were dipped in a suspension of Xoo with a bacteria population is  $10^8$ , then wrapped in plastic for 24 hours and incubated at 30 ° C [1]. Observations were made on five leaves on each clump of rice that had been inoculated with the bacterium Xoo to know the reaction of each type of aromatic rice against bacterial leaf blight. Disease progression was observed twice, 7 days and 14 days after inoculation. Parameters

- **Syamsia**
- Graduate students PhD, study program of Agricultural Sciences, Hasanuddin University, Makassar, Indonesia.  
Email: [umm\\_syamsiah@yahoo.com](mailto:umm_syamsiah@yahoo.com)
- **Tutik Kuswinanti**
- Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia.
- **Elkawakib Syam'un**
- Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia.
- **Masniawati**
- Faculty of Natural Science, Hasanuddin University, Makassar, Indonesia.

measured were diseases leaf area using a standard system of evaluation of the International Rice Research Institute (IRRI), 1996, ie:

0 = no symptoms

1 = 1-5% leaf damage, (R = resistant)

3 = 6-12% leaf damage (MR = moderately resistant)

5 = 13-25% leaf damage (MS = moderately susceptible)

7 = leaf damage reaches 26-50% (S = susceptible)

9 = damage reaches 51-100% (HS = highly susceptible)

### 3. RESULTS AND DISCUSSION

Infected plants show symptoms of yellowish white patches that begins at the tip of the leaf cutouts former. Further spread throughout the leaf surface in accordance with the level of resistance of rice plants to Xoo bacteria that are infected. Bacterial leaf blight is a disease that infects systemically with symptoms such as gray patches of white along the veins. In symptoms was evident at stadia tillering, where the incidence of the disease increases with plant growth and peaked at stadia flowering [6]. The observation of disease symptoms of bacterial leaf blight in rice plants after inoculation with isolates Xoo-003 showed varying symptoms. At the age of 7 days after inoculation, there are three types of rice that has not shown any symptoms of bacterial leaf blight, are Pare Mansur, Parrilea and Solo, and there are 5 types of aromatic rice already showing symptoms of the BLB disease, namely lotong tens, tens mandoti, bitter melon farming, pare Pinjan and kimida and Mekongga (control) (Table 1, 2 and 3). Level of symptoms

of rice infected BLB varied from highly resistant, resistant and moderately. Cells bacterial of Xoo grow and multiply very quickly. At the beginning of growth, both in the leaves of rice varieties resistant or susceptible, within 2-4 days from the bacterial cells proliferate 10-104 into a 107-108 cells / ml. Furthermore, the development of Xoo in rice leaf of varieties resistant are slower than susceptible varieties. This is the impact of the development of disease resistance varieties in field [7]. Resilience of local aromatic rice against BLB disease at 14 days after inoculation showed a change in the level of resistance. At the age of 7 days after inoculation, varieties of pare Mansur, and Solo Parrilea not show symptoms, but on day 14 after inoculation, varieties of Mansur pare showed symptoms of damage about 43.5% (moderately susceptible), varieties of parrilea shows damage about 59.36 % (highly susceptible), and varieties of solo show damage about 55.13% (highly susceptible).

### 4. CONCLUSION

Based on the research and discussion that has been done, we can conclude some of the following: resilience of local aromatic rice from enrekang against bacterial leaf blight in the category is moderately susceptible, ie. varieties pare Mansur, lotong tens, tens mandoti, Pinjan bitter melon, bitter melon farming and categories are very susceptible, ie. varieties parrilea, solo and kamida

### Acknowledgements

The author would like to thank the Head of the integrated laboratory, and greenhouse, experimental farm Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia, for the facilities provided so that this research can be done well

**Table 1. Response of rice Aromatic from Enrekang against isolates bacteria of Xoo-003**

Number	Rice Varieties	7 days after inoculation			14 days after inoculation		
		Disease Leaf Area (%)	Score	Category	Disease Leaf Area (%)	Score	Category
1	Pare Mansur	0	0	NS	43.5	7	S
2	Pulu Lotong	3.33	1	R	42.73	7	S
3	Pulu Mandoti	16.67	5	MS	38.59	7	S
4	Pare Lambau	20	5	MS	33.32	7	S
5	Pare Pinjan	3.30	1	R	38.90	7	S
6	Parrilea	0	0	NS	59.36	9	HS
7	Solo	0	0	NS	55.13	9	HS
8	Kamida	3.33	1	R	65.48	9	HS
9	Mekongga	20	5	MS	46.72	7	S

Note : 0 = no symptoms

1 = 1-5% leaf damage, (R = resistant)

3 = 6-12% leaf damage (MR = moderately resistant)

5 = 13-25% leaf damage (MS = moderately susceptible)

7 = leaf damage reaches 26-50% (S = susceptible)

9 = damage reaches 51-100% (HS = highly susceptible)

**Table 2. Grouping Rice Based on resistance Scoring Against Isolates of Xoo-003 at the age of 1 week after inoculation**

Score	Category	Rice Varieties
0	NS	Pare Mansur, Parrile, Solo
1	R	Pulu lotong, Pare Pinjan, kamida,
3	MR	-
5	MS	Pulu Mandoti, Lambau, Mekongga
7	S	-
9	HS	-

**Table 3. Grouping Rice Based on resistance Scoring Against Isolates of Xoo-003 at the age of 2 week after inoculation**

Score	Category	Rice Varieties
0	NS	-
1	R	-
3	MR	-
5	MS	-
7	S	Pare Mansur, Pulu Lotong, Pulu Mandoti, Pare Lambau, Pare Pinjan, Mekongga, Parrilea, Solo, Kamida
9	HS	

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