



## Research Paper

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# Heterosis for yield and bacterial wilt resistance in brinjal (*Solanum melongena* L.)

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**ABSTRACT :** Twenty hybrids, five lines and four testers were evaluated in the *Kharif* 2004 and 2005 with an objective to know the heterosis over the years for twelve traits *viz.*, plant height (cm), number of branches, days to 50% flowering, fruit length (cm), fruit diameter (cm), fruit weight (g), fruit yield per plant (g), fruit rind thickness (cm), fruit borer incidence, total soluble sugars, total phenol and bacterial wilt disease. Among 20 hybrids, eleven hybrids were resistant to wilt incidence in both year of 2004 and 2005 out of them two crosses, DWD-1 x Malapur, DWD-1 x Rabakavi were exhibited positive heterosis for yield (3.76%, 2004 and 9.53% 2005) and (2.56% in 2004 and 14.77% in 2005), respectively over the standard check and shows high degree of resistance to wilt incidence. This might be due to the crosses involved resistant parents like DWD-1, DWD-2 and DWD-3 to bacterial wilt and it indicates that the resistance is governed by single dominant gene. The F<sub>1</sub> DWD-1 x Malapur showed less fruit borer incidence because of high phenols and lower sugar levels and it had high significant heterotic effect for total phenol content. Parents involved in the crosses were good general combiners for the respective traits. The *sca* effect observed might be due to complement type of gene effects.

**KEY WORDS :** Brinjal, *Solanum melongena*, Heterosis, Bacterial wilt resistance, *Ralstonia solanacearum*

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The brinjal or eggplant or aubergine (*Solanum melongena* L.) represents the non-tuberous group of *Solanum* species. Brinjal is the most common, popular and widely grown vegetable crop of both tropics and subtropics of the world. Brinjal is highly productive and usually finds its place as the poor man's vegetable (Som and Maity, 2002). Except in higher altitudes, it can be grown in almost all parts of India, all the year round. Large number of cultivars is grown throughout the country depending upon the consumer's preference for the colour, size, shape and the yield are specific which changes with region. In India, immature fruits of brinjal are consumed as cooked vegetable in various ways.

Brinjal is a self-pollinated and annual herbaceous plant. Vavilov (1931) reported that India is the centre of origin. Hence, India has great potentiality in enhancing the production and productivity. The present production is not proportionate with the demand, due to cultivation of low yielding cultivars for

local preferences and many of them are susceptible to pests and diseases since they are cultivating from many years. Among the diseases of brinjal, bacterial wilt is one of the devastating diseases and severely hampers its cultivation. Recently, this disease rose to alarming proportion in the plains of India and becoming one of the limiting factors. The bacterial wilt is caused by *Ralstonia solanacearum* (Smith) Yabuchi *et al.* causes yield loss ranging from 4.24 to 86.14 per cent (Sabita *et al.*, 2000). The race I of *Ralstonia solanacearum* infects almost all solanaceous crops. The proportion of the incidence of this disease increases alarmingly due to the crop rotation with other solanaceous alternate hosts of the causal organism. Unfortunately, varietal resistance is known to fluctuate both geographically and over time due to genetic variability of strains of the pathogens as well as the difference of the microclimates. Source of resistance to bacterial wilt has been reported by many workers *viz.*, Geetha and Peter (1993), Sadashiva *et al.* (1994), Ponnuswami, (1999). The wild brinjal