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Identification of Gall midge (*Orseolia oryzae*) resistant genes in selected rice varieties/ lines by molecular markers

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Asian Rice Gall Midge (*Orseolia oryzae)* (RGM) is a major insect pest, that affects at tillering stage of rice and causes about 30%-40% of yield loss. Cultivation of resistant rice varieties is the most successful approach to controlling the pest and therefore development of RGM-resistant rice varieties is a solution for prevention of an outbreak. So far 12 gall midge-resistant genes have been identified. Those resistant genes can be used for RGM resistance development. Molecular screening was done using SSR markers RM 23956, LLR_del and gm3del3 to identify RGM-resistant genes *Gm1, Gm4* and *gm3* respectively. Molecular screening results revealed that out of the 24 tested varieties, 20 varieties carried at least one resistant gene. Among those 20 varieties, the variety 'Heen sulai' carried Gm1, Gm4 and gm3 genes. 'Gires' and 'Ptb 21' varieties harbored gm3 and Gm4 genes. 'Duru wee', 'Bg 406', 'IRBB 65', 'Bg 305', 'Bg 360' and 'Bg 380' carried Gm1 and gm3 genes. The variety 'IR 36' carried Gm1 and Gm4 genes. 'Bg 359', 'Bw 78' and 'Bg1492' varieties had only the Gm1 gene. Seven varieties/lines, 'Bg 366', 'Bw 367', 'IRGC 9091-1', 'IRGC 9070-1', 'Zenith', 'Local 2.5'and 'Bg 304' carried only the gm3 gene. These results confirmed that most varieties contained at least one resistant gene. Therefore, these RGM-resistant rice varieties can be effectively applied as donor parents for gene pyramiding to develop a rice variety with durable RGM-resistance.

Keywords: Asian Rice Gall Midge *(Orseolia oryzae),* Gm1, gm3, Gm4, RGM - resistant

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