RESEARCH ARTICLE

EFFECT OF *CRY*1AC PROTEIN EXPRESSED IN DIFFERENT IR-64 *BT* RICE EVENTS ON TARGET INSECT YSB, *SCIRPOPHAGA INCERTULAS* (WLK)

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Abstract: The studied was undertaken at the Ttransgenic containment facility, Department of Plant molecular biology and Biotechnology, College of Agriculture, Raipur during 2014 and 2015. The confirmation of different Bt transgenic rice events for insect bioassay against YSB, *Scirpophaga incertulas* to observed the effect of proteinase inhibitor (m*CryIAc*) gene on the growth and development of the insects by different methods such as cut stem and whole plant bioassay. The highest larval mortality of YSB(81.25%) was reported in IR64-3 followed by IR64-2 and amount of stem eaten after four days was lowest on IR64-4(0.0225 g) as against control plants IR64(C), (0.319 g) Whereas, in whole plant bioassay, on the leaf damage basis out of four transgenic lines and one control line the highest percentage dead heart of transgenic rice lines by whole plant assay of YSB was observed highest (36.46%) in IR64-4 followed by IR64-1 (29.17%) and lowest in IR64-2 (20.84%) while in control event percentage of dead heart was recorded more than 50 percent i.e. 60.42, 80.21&72.92 percent in IR64-C, TN-1&PTB-33, respectively.On the basis of this investigation, the effect of *Cry*1Ac protein expressed on target YSB in different IR-64 Bt rice events was exhibited significantly.There is an urgent need to generate biosafety data for Bt. rice under controlled conditions for taking policy decision about its cultivation in the country.

Keywords: Insect bioassay, YSB, *Scirpophaga incertulas*, Target insect, Effect of m*CryIAc*gene on YSB

REFERENCES

Alam, M. F., Datta, K., Abrigo, E., Vasquez, A., Senadhira, D., Datta, S. K. (1998). Production of transgenic deepwater*indica* rice plants expressing a synthetic *Bacillus thuringiensis cry* IA(b) gene with enhanced resistance to yellow stem borer. *Plant Sci*. 135: 25-30.

Chandel, G. (2005). Genetic engineering for enhancing multiple pest resistance in rice (*Oryza sativa* L.). Ph. D. thesis submitted in Indira Gandhi Krishi Vishwavidyalaya Raipur (C. G.)

Datta. K., Vasquez, A., Tu, J., Torrizo, L., Alam, M.F., Oliva, N., Abrigo, E., Khush, G.S., Datta, S.K. (1998). Constitutive and tissue specific differential expression of *cryIA(b)* gene in transgenic rice plantsconferringresistanceto rice insectpest. *Theor. Appl. Genet.* 7: 20-30.

High, S.M., Cohen, M.B., Shu, Q.Y., Altosaar, L., (2004). Achieving successful deployment of *Bt* rice.*Trends in plant science*.9:286-292

James, C. (2005). Global status of commercialized biotech/GM crops: 2005. ISAAA briefs, no. 37, ISAAA: Ithaca, New York.

Ramaswamy, C. and Jatileksono, T. (1996). Inter country comparisons of insect and disease losses. *In*: Rice Research in Asia: Progress and Priorities (eds). Evenson, RE, Herdt RW Hossain M. CAB *International in association with International Rice Research Institute, Wallingford*.pp 305-316.

Satpathi, C.R., Kaushik, Chakraborty, D., Shikari and P., Acharjee (2012).Consequences of Feeding by Yellow Stem Borer (*Scirpophaga incertulas* Walk.)On Rice Cultivar *Swarna mashuri*(MTU 7029).*World Applied Sciences Journal***, 17** (4): 532-539.

Tran, ThiCucHoa and Ho, Thi, Huynh, Nhu (2011). Development of Transgenic Rice Lines Resistant to Insect Pests Using *Agrobacterium tumefaciens*- Mediated Transformation and Mannose Selection System.*Omonrice*.18: 1-10

Tu, J., Zhang, G., Datta, K., Xu, C., He, Y., Zhang, Q., Khush, G.S., Datta, S.K. (2000). Field performance of transgenic elite commercial hybrid rice expressing *Bacillus thuringiensis*δ endotoxin. Nat. *Biotechnol*. 18: 1101-1104.

Tu, J., Datta, K., Alam, M.F., Fan, Y., Khush, G. S. and Datta, S. K. (1998). Expression and function of a hybrid *Bt* toxin gene in transgenic rice conferring resistance to insect pests. *Plant Biotechnology*.15(4): 195-203Chandel, G. 2008. Potential effect of *Bt*proteins expressing in transgenic rice lines on non-target and predatory insects. *News Letter*, South Asia Biosafety program, 4 (12): 12-19.

Wu. C., Fan. Y., Zhang. C., Oliva, N. and Datta, S.K. (1997). Transgenic fertile *japonica* rice plants expressing a modified*cry*IAb gene resistant to yellow stem borer, *Plant Cell Rep*.17: 129-132.

Ye, G.Y., Tu, J., Hu, C., Datta, K., Datta, S.K. (2001). Transgenic IR-72 with fused *Bt* gene *cryIA(b)/cryIA(c)* from *Bacillus thuringiensis* is resistant against four lepidopteran species under field conditions. *Plant Biotechnol*. 18: 125-133.

Zhu, F. Sh., Chen, H.X. and Lu, Y. Sh. (2001). Outbreak reasons and management technology of *Spodoptera litura*on economic crops.*Plant Prot. Technol. Extens*. 21 (7), 22.

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