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| Category | : 8th Rice Genetics Symposium |
| Select Theme | : Genes for Hybrid Rice |
| Endorsement email | : |
| Genes for Hybrid Rice Keyword 1 | : male sterile |
| Genes for Hybrid Rice Keyword 2 | : CGMS |
| Genes for Hybrid Rice Keyword 3 | : |
| Title of Entry | : Fine mapping and candidate gene analysis of thermosensitive genic male sterility gene in TGMS line TNAU 60S of Rice (<i>Oryza sativa</i> L.) |
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| Select only one type of presentation | : 15 minute oral presentation |
| Abstract | : In Rice, Cytoplasmic Genic Male Sterility (CGMS) is the most popular type of male sterility for the production of hybrids. Although effective, CGMS system is expensive and cumbersome. Maintaining the CGMS lines and choosing an appropriate restorer line for developing the fertile hybrids are major limitations. One of the possible alternatives is the two-line breeding system which can achieve by using Thermosensitive genic male sterility (TGMS) for the production of hybrids in Rice which shows variation in expression of male sterility based on the temperature differences as generally fertile under low temperature and sterile under high temperature. The genes responsible for TGMS and those elucidating male sterility mechanisms and reversibility to fertility would be of great significance to provide a foundation to develop new male sterile lines in Rice. In this study, genetic analysis based on F ₂ population derived from a cross between TNAU 60S and IET 21009 revealed that a single recessive gene controls male sterility in TNAU 60S. Marker analysis combined with bulked segregant analysis was used to locate the target gene on chromosome 2. Fine mapping with 86 SSR markers on chromosome 2 between 20.0 cM and 27.0 cM revealed that TGMS gene is located at 24.3 cM between two SSR markers RM12713 and RM12722. Six differentially expressed genes were identified from this region like in previous findings from Rice genome annotation project. Out of six genes, two genes LOC_Os0212610 and LOC_Os0212680 that encodes hsp20 and P450 respectively were considered as candidate genes for thermo sensitive genic male sterility in TNAU 60S because of very high differential expression between sterile (high temperature condition) and fertile (low temperature condition) samples. So, these markers (RM12713 and RM12722) could be used as flanking markers for marker assisted |

breeding and enable transfer of gene into elite Rice genotypes. These results help in promoting two line breeding which is advantageous over three line breeding of hybrid production in India and also helps in development of more diverse male sterile lines in Rice.

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