

Review Form 1.7

Journal Name:	Asian Journal of Advances in Agricultural Research
Manuscript Number:	Ms_AJAAR_98920
Title of the Manuscript:	Genetic Variability of Floral and Agronomic Characteristics that Influence Outcrossing Rate Percentage of Cytoplasmic Male Sterile Rice
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<p>Compulsory REVISION comments</p> <p>1. Is the manuscript important for scientific community? (Please write few sentences on this manuscript)</p> <p>2. Is the title of the article suitable? (If not please suggest an alternative title)</p> <p>3. Is the abstract of the article comprehensive?</p> <p>4. Are subsections and structure of the manuscript appropriate?</p> <p>5. Do you think the manuscript is scientifically correct?</p> <p>6. Are the references sufficient and recent? If you have suggestions of additional references, please mention in the review form.</p> <p>7. Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments.</p>	<p>1. Cytoplasmic male sterility (CMS) is a condition under which a plant is unable to produce functional pollen (it is widespread among higher plants). CMS systems represent a valuable tool in the production of hybrid seeds in self-pollinating crop species, including maize, rice, cotton, and a number of vegetable crops. CMS occurs via the interaction of mitochondrial and nuclear genes and has been used for the production of a three-line hybrid system. However, the poor genetic diversity of sterile parents and unreliable fertility restoration has restricted its use for breeding rice hybrids. Male sterility enabled the commercialization of heterosis in rice, but a low seed set remains a constraint on hybrid dissemination. So, understanding the genetic variability of floral and agronomic characteristics is very important for improving hybrid seed sets in rice.</p> <p>2. Yes.</p> <p>3. Yes, the abstract is clearly written and I enjoyed reading this work.</p> <p>4. Yes, although I suggest taking into account the suggestions reported in point 7. below.</p> <p>5. Yes, even if the most vulnerable aspect of this work is that it is not very well framed in the context of the works in the sector that have appeared in the literature (see, suggestion 7e. below).</p> <p>6. The inclusion of the following references is recommended.</p> <p>[1] R. El-Namaky et al., <i>Putting plant genetic diversity and variability at work for breeding: Hybrid rice suitability in West Africa. Diversity</i>, 9, 27 (2017).</p> <p>[2] D.N. Duvick, <i>Heterosis: Feeding people and protecting natural resources</i>. In Genetics and Exploitation of Heterosis; Coors, J.G., Pandey, S., Eds.; American Society of Agronomy-Crop Science Society of America: Madison, WI, USA, 9 (1999).</p> <p>[3] S. Li, D. Yang, and Y. Zhu, Characterization and Use of Male Sterility in Hybrid Rice Breeding. <i>J. Integr. Plant Biol.</i>, 49, 791 (2007).</p> <p>[4] G. Dai, Z. Hua, and W. Cai, Study on application of hormone in seed production of japonica hybrid rice. <i>Hybrid Rice</i>, 14, 15 (1999).</p> <p>[5] H. Kato, and Namai, <i>Intervarietal variations of floral characteristics with special reference to F1 seed production in japonica rice (Oryza sativa L.)</i>. <i>Jpn. J. Breed.</i>, 37, 75 (1987).</p> <p>[6] S.S. Virmani, Outcrossing mechanisms and hybrid seed production practices in rice. In <i>Heterosis and Hybrid Rice Breeding</i>; Springer Verlag—International Rice Research Institute: Manila, Philippines, 79 (1994).</p> <p>[7] Q.L. Li et al., Study on high yield breeding and genetic analysis of yield components of main rice cultivars in Jilin. <i>Inst. Agric. Sci.</i>, 13, 3 (1991).</p> <p>7. The following suggestions are intended to help clarify some points.</p> <p>7a. Please ensure that all acronyms introduced in the manuscript are specified when they appear first in the text, even when they are well-known in the literature (e.g., please specify in the Abstract CMS=Cytoplasmic Male Sterile, GCV=Genotypic Coefficient of Variance, PCV=Phenotypic Coefficient of Variance, etc.).</p> <p>7b. For clarity, please explain the difference between male sterility (MS) and cytoplasmic male sterility (CMS) (<i>Cytoplasmic male sterility is total or partial male sterility in plants as the result of specific nuclear and mitochondrial interactions. Male sterility is the failure of plants to produce functional anthers, pollen, or male gametes</i>).</p> <p>7c. It would be useful to briefly recall the mechanism of cytoplasmic male sterility in rice (<i>CMS of rice with boro II cytoplasm is caused by a cytotoxic peptide and is restored by two related PPR motif genes via distinct modes of mRNA silencing</i>).</p> <p>7d. The main result of this study is that the selection of the number of grains per panicle, filled grain per panicle, and stigma length and breadth, finally enhance the seed quantity of the hybrid by making hybrid seed production more economical and profitable to the seed industry and to families. However, it was already known that panicle length (PL) is an important yield-related trait as it strongly affects yield components, such as grain number, grain density, and rice quality. Up to now, more than 200 panicle-length quantitative trait loci (PL QTLs) are identified, but, only a small number are applied in rice breeding. The author is asked to discuss this important point.</p> <p>7e. As mentioned above, in my opinion, the most vulnerable aspect of the present work is that it is not well framed within the context of the works in the sector that have appeared in the literature. For example, it is already known that the evaluation and selection of maintainer lines with good floral and agronomic</p>	

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	<p>characteristics is a fundamental step in developing new CMS lines with high outcrossing rates. High genotypic variance and high heritability estimates along with high genetic advance suggest the potential for selecting the best offspring as CMS lines. In studies previously carried out, newly-bred CMS lines have been identified as among the highest outcrossing rates. Their high panicle and stigma exertion are very important floral characteristics to achieve a suitable outcrossing rate for hybrid seed production in rice, while their outstanding agronomic traits are necessary to obtain both high seed set and grain yield. For clarity, the author is invited to highlight the added value of the results achieved in this study compared to those obtained in other works.</p>	
<p>Minor REVISION comments</p> <p>1. Is language/English quality of the article suitable for scholarly communications?</p>	<p>1. Please, check English; several typos were found.</p>	
<p>Optional/General comments</p>	<p>The present work is interesting and deserves attention. The author is advised to take into account the suggestions expressed above. This should attract the reader's interest more.</p>	

PART 2:

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<p>Are there ethical issues in this manuscript?</p>	<p><i>(If yes, Kindly please write down the ethical issues here in details)</i></p>	

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