

4. 外国人特別研究員との共同研究の概要（外国人特別研究員との分担状況を明らかにした上で簡潔に記述してください。）

Summary of the collaborative research (Clarify your role and the Fellow's role in the collaborative research.)

Adapting crop production to stresses is a major concern to ensure food security and sustainable farm economics in agrarian countries world-wide. Abiotic stresses such as salt stress and arsenic (As) toxicity are considered major constraints on rice productivity in many South Asian countries. In Bangladesh, the challenges associated with salinity and As toxicity are likely to be aggravated due to global warming and water shortage, and may endanger food security. Efforts to improve rice tolerance to salt and As stresses through classical breeding have had limited success and none of the existing varieties are able to endure these stresses in high levels. Dr. Mostofa's research aims to develop a new strategy to make rice more tolerant to salt and As stresses, and we hope our research will contribute to food security in countries like Bangladesh.

The central roles of strigolactones (SLs) and their analogs karrikins (KARs), which are the two new classes of plant growth regulators with similar structures in improving plant tolerance to environmental stresses have recently attracted the research community. Elucidation of SLs and KARs, as well as their signaling pathways will present a valuable strategy in protecting plants and increasing crop yield under various abiotic stresses, including soil salinity and heavy metal contaminations. With these ideas in mind, the focus of Mr. Mostofa's research project is to explore the role of SLs and KARs in protecting rice plants and enhancing grain yields under As stress and salinity, respectively. Under my guidance, Dr. Mostofa developed two feasible research plans for dissecting roles of (i) SLs in plant tolerance to As stress, and (ii) KAI2-mediated KAR signaling pathway in plant tolerance to salt stress. Dr. Mostofa worked hard to performed all the designed tasks, and we are glad that we met the planned schedules.

5. 外国人特別研究員との共同研究の成果とその評価

Results and Evaluation of the collaborative research

Through this collaborative research, we have obtained convincing data to say that SLs and KAI2-mediated KAR signaling play positive role in plant resistance to As stress and salinity, respectively. Results obtained by Dr. Mostofa during the two years of his JSPS fellowship not only have importance in basic research but also bear significance in applications. For instance, data relevant to hormone profiling and expression analysis will help elucidate the interactions of SLs with other phytohormones and signal molecules that would further enhance our understanding of genetic and molecular basis of SL actions. Detailed physiological and biochemical analysis of different stress indicators and the antioxidant system will enable us to decipher a new potential role of SLs and KARs in managing As- and salt-induced oxidative damage. Importantly, our results will provide new strategies in protecting crop plants like rice, as well as other crops, from heavy metal toxicity and salinity.

The results of Dr. Mostofa's research were shown in a number of symposiums. We are currently preparing two manuscripts from the results obtained from his research. In addition, under my guidance Dr. Mostofa wrote several review articles and contributed to other research projects in my lab, as you can see in the list of his papers published during the two years of his JSPS fellowship.

In summary, the collaborative research is very successful with a number of published papers and some other manuscripts under preparations. I appreciate the fellowship from JSPS that allowed Dr. Mostofa to successfully carried out the planned projects in my lab. We do hope to receive continuous supports from JSPS in near future.

注. 必ず様式 7 及び様式 8 を併せて**採用期間終了後 1 か月以内**に提出してください。外国人特別研究員本人には様式 7 (Form 7: Research Report) により英語又は日本語で作成いただきます。

Note: This form must be submitted along with the Fellow's Form 7 within one month of the end of the fellowship tenure.