



Antiquity of Rice and Research Issues

Debashis Chatterjee*

Department of Chemistry, University of Kalyani, West Bengal, India

*Corresponding author: Debashis Chatterjee, Department of Chemistry, University of Kalyani, Kalyani, Nadia-741235, West Bengal, India, Tel: +9133 2582 3883; E-mail: debashis.chatterjee.ku@gmail.com

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Editorial

The origin of rice (*Oryza sativa* L.) has an important issue and an archaeological rice sample can be studied by dating with radiocarbon. A detailed study is required about the origin, antiquity and spread of rice cultivation with in the country, state and cross – boundary approach. The epicenter of rice antiquity to be given to focus “Origin and Cytogenetics” so that comprehensive knowledge will be appeared.

It has long been recognized that the wild species closely related to *O. sativa* and their global distribution is important to make new species ancestral for optimize yield. The distinctions are not clear cut, as intermediates have been arising as a result of natural crossings. Species has to be distinguished from its close relative depending seasonal, grain size, longer anthers, plant and panicle characters. Research is needed to explain the current complex situation by the introduction of hybrid system. The advancement of climate change and rice production is another critical issue and several factors to be considered for research inputs such as physiological stresses, seasonal forms and variation, deceleration of production in different agro-climatic zones, climate stress vs. human selection. A special focus will be helpful to study the advancement of climate change during the Pleistocene Period and current scenario.

Human practice and rice production are on current debate. Rapid change in land use pattern, human selection, rapid modernization of agricultural practice, economics of rice production are major issues and extensive research is required to optimize these issues to find out their control, impact (long term) and operative response.

Since its origin, the spread of rice cultivation is extensive and is now being grown wherever water resource is adequate and under suitable agro-climate. Varietal diversification, speed of evolution, natural crossing, genetic diversity, cultivars choice of local genetics is

important consideration. Research is needed their role in ecological adaptation with respect to economic parent. Beeding under water-logged and lowland conditions, topo sequence of field, accumulation of toxic substances due to ill-drained field condition, low tillering, premature lodging ,deep water areas, bioclimatology are special situation for rice cultivation. Research can be motivated on these issues because limited information is now available in current literature.

Rice is the staple food for about a third of the global population with most of the world's supply coming mainly from South and Southeast Asia. As a result of the Green Revolution this region has become heavily dependent on groundwater irrigation for economic development and food security. This entire region is the world's largest user of groundwater, accounting for withdrawal of several million liters every day.

In many parts of this region, the groundwater happens to be contaminated with arsenic (As) and large-scale groundwater development has been used for irrigation-based farming practices. This has led to high deposition of as in top soils and preferential bioaccumulation of the as in several crops notably rice. The effects of the massive redistribution of As on sustainable agricultural production in many Asian countries and the impacts on food security at the local and global levels have been unappreciated and urgently urge for research to unearth several issues such as potentiality of crops particularly rice for As exposure, bioavailability of As depending on several factors e.g. role of soil pore water, color, grain size, genotype, Varsity, cultivation practice, summer vs. winter cultivation etc. Research is also needed to develop potentiality of staple diet (rice) as an alternative of as exposure variety. The importance of several soil-plant systems regarding bioaccumulation of as is another topic of current research to find out the global role of such systems.