



Contribution of Orissa to origin and nomenclature of cultivated rice (*Oryza sativa*): A review

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ABSTRACT

Rice is the highest producing grain crop in the world having wider adaptations not only to diverse agroecosystems, but also to various thermal regimes making it suitable to be grown in three different seasons i.e. *Kharif* (Rainy), *Rabi* (Winter) and *Zaid* (Summer). Hence, it is important to know the origin of this wonder crop. Many workers have made their efforts to identify the center of origin of this crop with credible information. Based on the findings of various workers, it can be concluded that the center of origin of cultivated rice (*Oryza sativa*) is Orissa or Odisha and the genus *Oryza* has been derived from the word Orissa or Orysa or Oryza.

Key words: Centre of origin, cultivated rice, nomenclature, Odisha, Orissa, *Oryza sativa*

INTRODUCTION

Rice crop having scientific name *Oryza sativa* is the highest producing cereal crop in the world with a total production of 769.23 million tons annually. Globally with a cultivated area of 163.09 million hectares, it comes next to wheat in terms of acreage. The average productivity of this crop is 4717 kg ha⁻¹. The main producing countries are China, India, Indonesia, Bangladesh, Vietnam, Thailand, Myanmar, Philippines, Cambodia, and Japan (Agricultural Statistics at a Glance, 2022). In India, it is cultivated almost in all the states in an area of 46.38 million hectares with production of 130.29 million tons. It is known as Dhanyam in Sanskrit, Dhan in Hindi, Dhana in Odia, Nel in Tamil, Nell in Malayalam, Dhan in Bengali, Vari in Telugu, Bhata in Karnataka, Jhona in Punjabi, Bhata in Marathi, Dangara in Gujarati, Dhan in Nepali, Dhan in Assamese and Phou in Manipuri. Similarly rice (de husked uncooked) is known as Tandula in Sanskrit, Arici in Tamil, Chawal in Hindi, Biyyam in Telugu, Ari in Malayalam, Akki

in Kannada, Chaula in Odia, Chal in Bengali, Caula in Punjabi, Tandula in Marathi, Bhata in Gujarati, Chamal in Nepali, Chal in Assamese and Chak hao in Manipuri.

HISTORY OF RICE CULTIVATION

Rice is an ancient crop and is expected to be domesticated about 10000 years back (ICAR, 2012). Archeological excavations in India revealed that presence of rice in India could be dated back to 4530 B.C. However, some historians opine that it is recorded from China in around 2800 B.C. But it is certain that rice is a crop of Asia, more particularly South-East Asia and is used as staple food of people from ancient times. The rice plant belongs to grass family known as *Poaceae* and genus *Oryza*. Altogether 23 species are found under the genus *Oryza*. Out of which 21 species are wild and two species are cultivated. Between the two cultivated species, *Oryza sativa* is cultivated in Asian countries and other rice growing areas where as *Oryza glaberrima* is cultivated in West African countries (Singh, 1993). Various workers of the

world have tried to identify the centers of origin of this crop. De Candolle worked extensively on the origin of crop plants of the world and concluded that India is the center of origin of rice due to prevalence of huge diversity of rice genotypes (De Candolle, 1886). Watt also worked on origin of crops and reported that South India is the center of origin of rice (Watt, 1892). However, Vavilov studied the origin of cultivated plants and reported that India and Burma should be regarded as center of origin of rice (Vavilov, 1926). Dr. K. Ramaiah, a noted rice breeder and first director of Central Rice Research Institute, Cuttack (Established in the year 1945) has worked extensively on rice origin in the world. He has reported that more than 1750 traditional land races existed at Jeypore tract of Odisha during 1955-1960. He suggested that Jeypore tract is the real center of origin of cultivated rice, which was subsequently seconded by many renowned rice workers. Oka and Chary (1962) based on their independent investigations, reported that Jeypore rice are forms of intermediate between cultivated and wild types “still staying in the midst of differentiation”. Sharma et al. (2000) working on origin of rice opined that Jeypore tract is the center of origin of Aus (early maturing rice varieties) ecotypes. A UNDP (United Nations Development Programme) publication Equator Initiative on “Tribal Communities of the Jeypore tracts of Orissa, India” reported that the Jeypore tract in the Indian state of Orissa (now Odisha) is considered as center of origin and diversity of Asian cultivated rice (*Oryza sativa*). The report also mentions that “Once Orissa was the traditional home to the largest number of rice varieties with more than 1750 varieties” (UNDP, 2012). Koraput is also recognized as one of the important agro-biodiversity hot spots of India (National Biodiversity Authority, 2023). Orissa (now Odisha) is the only state in the world where rice is grown thrice a year. In other words, it is grown in three different seasons. The *Aus* or autumn rice is locally known as *Beali* and is shown in May-June and harvested in September-October. The second rice called *Aman* or winter rice is locally called *Sarada* and is grown in June-July and harvested in November-December. The summer rice or

Boro rice is locally known as *Dalua* and is sown in December-January and harvested in April-May. Both autumn and winter rice together come under kharif rice. Regional Center of M.S. Swaminathan Foundation, Chennai at Jeypore, Odisha working for conservation of native germplasms of rice and millets has reported that the center of origin of cultivated rice (*Oryza sativa*) is Jeypore tract of Odisha (Arunachalam et al., 2006). Considering the rich germplasm diversity of rice, government of India during British rule, decided to establish a Central Rice Research Institute at Cuttack, Orissa in the year 1945 to hasten rice breeding and yield improvement work (Ramiah and Ghose, 1951; Ramiah, 1953). Dr. K. Ramaiah, world’s renowned rice breeder made its founder director which was brought to the administrative control of Indian Council of Agricultural Research, New Delhi in the year 1966. International Rice Research Institute (IRRI), Manila, Philippines, was established much later in the year 1960 to speed up rice research work in the world. Orissa not only provided a large number of rice germplasm to the rest of the world for rice research but also has provided numerous food items prepared from rice compared to any other parts of the world. The processed rice products include parboiled rice (*Usunachaula*), *Aruachaula*, *Mudhi* (Popped rice), *Chuda* (Flaked rice), *Khali* (Lia), *Mudhi muan*, *Khali muan*, *Mudhi ukhuda*, *Khali ukhuda*, *Kora khali*, *Hudumba*, *Chuda muan*, *Mudhi chattua*, *Chuda chhatua* etc. Similarly, *Aruabhat*, *Usunabhat*, *Kanica*, *Khiri*, *Pakhala*, *Torani*, various *Pitha* items such as *Chakulipitha*, *Podapitha*, *Manda pitha*, *Chhunchipatra pitha*, *Enduri pitha*, *Chitau pitha* and *Gaintha pitha* etc. are the best rice gifts of Odisha to the rest of the world. Due to presence of highest number of native germplasms with three distinct growing seasons and evolution of large number of rice based products in Odisha compared to any other regions of the world, it can be scientifically confirmed that centre of origin of cultivated rice is Jeypore tract of Orissa (now Odisha). The practice of conserving germplasms from years to year is an inherited habit of the inhabitants in general and tribal population in particular. Even some persons like Mrs. Kamala Pujari a tribal farmer from Koraput district has

received *Padmashree award* from government of India for her work on conservation of hundreds of traditional rice germplasms.

CULTURAL LINKAGES OF ORISSA TO RICE

It can be rightly said that the culture of Odisha is rice culture. Here, rice panicle is considered as Goddess *Laxmi* (goddess of wealth) and worshipped. In every Thursday in the month of *Margasira* (November-December), a bunch of fresh ripened rice panicles are collected and worshipped as goddess *Laxmi* (Das, 2005; Anonymous, 2007). *Nuakhai* is another important festival, where newly harvested rice grain products are offered as *Prasad* to Goddess *Samaleswari*, the principal deity of Western Odisha. Similarly, in *Akhaya Trutiya* festival, rice seeds are worshipped and broadcasted in the field as a symbol of inviting Goddess *Laxmi* for a bumper harvest and after that auspicious beginning, the paddy sowing starts in the state (Mohanty and Mohanty, 1979). Orissa or Odisha is a religious state of India where hundreds of festivals are celebrated annually and in Oriya culture, without paddy and rice grains worship of any God or Goddess is impossible (Pattanayak, 2002).

CONTRIBUTION OF ORISSA TO IT'S NOMENCLATURE

The scientific name of cultivated rice is *Oryza sativa* and belongs to the family Poaceae. As per Wikipedia, it has been derived from two Latin words '*Oryza*' and '*Sativa*'. '*Oryza*' means rice and '*Sativa*' means cultivated. Latin word means the language of ancient Roman Empire. In Rome, the cultivated crops are mainly wheat, barley, and millets not rice. The staple food of people is wheat. Moreover, in nineteenth century, photo insensitive varieties were not developed, and the climate of ancient Rome was not suitable for its cultivation. There was no reporting of prevalence of rice germplasm from Rome. The rice crop has not been originated from Rome also. In nomenclature, some indication is always kept regarding the identity of the product. Hence, it is unlike that its nomenclature will take Roman words or say Latin words. In contrast, the then Orissa was having

rice cultivation from ancient times with huge germplasm diversity and is the center of origin of cultivated rice. During East India company's rule in India, rice was exported from Orissa to European nations. Even during the great Orissa famine called "*Na Anka Durbhikhya*" in the year 1866, in which more than one million people died due to starvation because of low rice production, it was exported to the tune of 33000 tonnes from Orissa to outside. As Dadabhai Naroji's statement in BBC during great Orissa famine, a whopping 200 million pounds of rice was exported from India to Europe (BBC.com). This proves that there was rice export from Orissa during medieval times too. Let us discuss the nomenclature issue of *Oryza*. The center of origin of cultivated rice belongs to Jeypore tract of *Orissa*. Earlier the name of the state of Odisha was *Orissa* and the language of the people was *Oriya* or *Orya*. These two words Orissa and Oriya / Orya are spelled and written differently by different people during those days due to pronunciation difference. For example: Orissa is written as *Oryssa* or *Orysa*. As the letter 'S' and 'Z' are interchangeably used, some people might have spelled it as *Orysa* or *Oryza*. The people of Orissa are called *Oriyas* and the word *Oriyas* is written as *Oryas* or *Oryaz* etc. Some of the historians are in the opinion of that the word *Oryza* has been derived from the word *Arisa*, or *Ariza* which is a famous *pitha* (rice cake) prepared from rice in Orissa. They believe that the word *Oryza* has come from combination of two words such as "*Orysa*" and *Arisa* or *ariza* ($Ory + Za = Oryza$). This *Arisa* or *Ariza* is a tasty rice cake and the first food given to Lord Buddha by the Oriya trader *Tapassu* and *Bhallika* soon after his enlightenment (Mohanty et. al, 2007). Later on, the genus name *Oryza* might have been used in *Latin* language as alien terms are directly used. As tomato an alien crop to India, and when it is incorporated in Hindi, it has taken the name tomato.

CONCLUSION

Based on the review of various rice scientists of the world, it is found that more than 1750 different land races of cultivated rice (*Oryza sativa*) were recorded in Jeypore tract of Odisha, which is highest diversity in the world with respect

to rice germplasm inventory. The historical and evolutionary perspectives strongly indicate the origin of rice to the state of Orissa, India. National Biodiversity Authority and UNDP (United Nations Development Programme) publicized the same origin giving the authenticity. If we analyze the nomenclature issue, it strongly indicates that rice is originated from Orissa. The seasonal, export evidence, availability of largest products, many other socio-cultural and religious facts also lead the same. More so, the world-famous scientists like K. Ramaiah substantiated with more research results and facts to authenticate the origin to Jeypore tract of Orissa. Hence, it can be concluded that the center of origin of cultivated rice is Jeypore tract of Odisha. Similarly, it can be concluded that the genus *Oryza* has been derived from the name *Orissa/ Orisa/ Orysa/ Oryza* of the then Orissa state (now Odisha) from where cultivated rice has been originated. The word sativa generally refers to cultivated and has been given to many plants as species name in the binomial nomenclature. Such as oat (*Avena sativa*), cannabis (*Cannabis sativa*), taramira or rocket (*Eruca sativa*), lettuce (*Lactuca sativa*), Alfalfa (*Medicago sativa*), black cumin (*Nigella sativa*), parsnip (*Pastinaca sativa*) and many others.

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