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INVENTORY OF AROMATIC FOLK RICE VARIETIES OF WEST BENGAL

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West Bengal is the richest reservoir of rice bio-diversity and thus named the rice bowl of India. The '*Bangalee*' association with rice lies in the many rituals and festivals, in happiness and sorrow, in birth and death. '*Nabannaya'*the famous harvest festival celebrated for the new harvest. The new born's first solid food - '*Annaprasan*', the auspicious marriage ceremony initiates with '*Ashirbad*' with rice grains & '*Durba'* leaves. Even after death, spreading of popped rice paves way for the departed soul. Rice grows in West Bengal in three different season's*viz*., *Aus* (autumn rice*), Aman* (winter rice) and *Boro* (summer rice). Occupies nearly 53% of the total agricultural crop areas and contributes about the same percentage (53%) towards the total production of all agricultural crops. Topped the list of the rice producing States of the country West Bengal Ranked 2nd in case of area having a percentage share of 15.8 in the National context. But has ranked 5th with respect to productivity. In this article nine folk rice varieties, popularly grown by the farming community of West Bengal*viz. Badshahbhog, Dadsaal, Gobindobhog, Gopalbhog, Radhunipagol, Radhatilak, Kalonunia, Kataribhog* and *Kaminibhog*were studied.

The state of West Bengal is an Indian state with amazing extremes in geography, people of this land along with the plant and animal life-forms. The state has its northern most extreme in the Himalayas and traverses through the Gangetic plains to the Bay of Bengal over a course of about 483 km and can demonstrate almost all the geophysical features and its associated biodiversity that the Indian subcontinent stands for. Darjeeling as the northernmost district lies cradled in the laps of the mighty Himalayas. Beyond this the state has a huge area under submontane terais which invariably is home to an immense biodiversity. The western districts

show an absolute contrast in the form of semi-arid regions with red lateritic soil and the almost dry lands of Chhotanagpur plateau, along with spread over low hills and forests of '*sal'* and '*segun'*.The eastern districts are characterised by vast riverine flood plains on both sides of the river Bhagirathi and its tributaries. The southern most part of the state is caressed by the Bay of Bengal in the deltaic regions of Sundarban mangroves and coastal regions of Midnapur (source: http://wbbb.gov.in/westbengal).Well-known Indian rice researchers, Richharia and Govindasamy (1990), in their book 'Rices of India' have provided numerous evidence to show that the country had been endowed with more than 2 lakh (2,00,000) rice varieties. This is in fact a richness of biodiversity that no other country can make claim for. Each of such rice variety is the outcome of the vision and hard work of farmers of past times who worked extensively to select rice varieties which could adapt themselves to a variety of climates, soil types, topography and agronomic practices. In the Chattisgarh region and Maharastra alone, Dr. Richharia identified more than 20,000 rice varieties. Cowel (1957), Kangle (1966), Keith (1914), Cleveland et al., (1993, 2000), Arumugasamy et al., (2006) and Sathya et al., (2007) had recorded large numbers of traditional rice varieties found in different parts of India and their adaptation to specific conditions. Deb (2005) in his famous book entitled "Seeds of Tradition, Seeds of Future" provided detailed morphological descriptions of 416 Indian folk (traditional) rice varieties, which are on the verge of extinction from farmers' fields. A World Wildlife Fund (WWF)-India survey, conducted in 1994 in six districts of southern West Bengal, recorded 137 traditional rice varieties that were found being cultivated in marginal farms (Deb, 1995). Every locality has its own set of crops, especially rice varieties which serves as the primary source of livelihood of the local farming community. Each locality's food security is also directly dependent on such crop diversity. Our climate is changing dramatically so for safeguarding our food we need to conserve crop diversity. It is quiet impossible to save crop varieties and their wild relatives only in the laboratory. Pests and diseases change their behaviour with climate, and crops can cope in the battle with pests and diseases only by means of on-farm conservation. Traditional crop landraces have evolved in response to changing local selection pressures, while still maintaining a high level of genetic variation (Soleri and Cleveland, 2004), and, therefore, are often superior to modern cultivars in marginal environmental conditions (Deb, 2009). Agroforestry and multiple cropping systems, involving species and crop genetic diversity are the most reliable methods of ensuring long term sustainability of crop production (Gliessman, 2007; Deb, 2009).

Concerns in Conservation of Rice Diversity

Concerns in the free interchange of data, information and knowledge pertaining to biodiversity conservation exercises can be broadly categorised as:

a. Behavioural and psychological concerns
b. Concerns about communicating data
c. Practical concerns
d. Insufficient strategies and resources

According to Global Biodiversity Informatics Outlook, following actions are needed to be taken to overcome these kinds of concerns (GBIF,2010).

1. An improved data, information and knowledge sharing that can facilitate further development in national and international policies related to biodiversity conservation.
2. Continuation of funding required for effective and efficient dissemination of information resources and maintenance of infrastructures.
3. New research approaches can be designed and adopted to provide access to any data and information related to biological diversity.
4. Provision of appropriate access to the respective data, information and knowledge of each funded project.
5. Promotion of long-term investment for maintenance of data and information resources.
6. Provision of increase in open access to publications and reports.
7. Promotion of access to publications on which data and information are based.
8. Maintenance and emboldenment of the publication of 'data papers' that designate available data sets that academics have worked to accumulate information to be made accessible.
9. Generation of encouragement and incentives for academics and research institutions to increase admittance to data and information.
10. Establishment of infrastructure or repositories to establish and maintain easy-to use electronic information to ensure long-term access to data, information and knowledge.

Inventory: Here we discuss some aromatic folk rice varieties grown in West Bengal

1. Aromatic rice: *Kalonunia*

Description: W.W. Hunter a British author in his book 'A Statistical Accounts of Bengal' published during 1876 by Trubner & Co, London also mentioned the *Kalonunia* variety widely

cultivated in Terai area of the then Darjeeling district. In volume X he mentioned the socio-economic status of people of three districts Darjeeling, Jalpaiguri and the State of Kuchbehar. In Darjeeling district rice form the staple agricultural product of the plains or terai portion of the district. *Kalonunia* rice is black in texture and because of that when the crops are full grown, the field is looking black and the air is filled up with a special fragrance.

Etymology: Grains of *Kalonunia* are relatively small, but very much tasty; it is sold in market in higher price level than the high yielding varieties. However, it has a low yield potential. A small quantity of *Nunia* rice can fill up the belly for the whole day. A handful of *Kalonunia*paddy after decoating the paddy seed-coats could provide ample amount of cooked rice.The black variety of paddy was exclusive to them and it was very tasty indeed. It is costly and cultivated by rich people for their self consumption. It is famous for its taste and aroma. This *Kalonunia* is also known as *bhogdhan* where *bhog* means the offering of *prasada* to deity. Some people also called it *Tulsi dhan* due to its use in rituals. The boiled atap *Kalonunia* in milk will prepare a delicious food item with sugar or molasses which is popularly known as *payas. Payas* is prepared and presented in all religious ceremonies and pujas to the guests.

Applications: *Kalonunia* is an excellent aromatic rice of norther parts of West Bengal (Roy *et al*., 2014). It face highest price in the local market at any part of the year. It is much preferred by the local people for preparation of *Payas*(Porridge) during rituals and for any special functions. It can be enjoyed as everyday plain rice or as an alternative to basmati. It is considered the best tiny aromatic rice in this part of the state. This tiny, non-glutinous (not sticky) rice cooks in about 10 minutes producing a delicate aroma, taste and texture. It is traditionally seasoned with whole aromatic spices such as cinnamon sticks, cloves and cardamom pods.

Socio-Economic profile: *Kalonunia* is being cultivated by the farmers in traditional way.Generally, it is being cultivated in low fertile lands and some times in the fallow lands, like low laying lands near the road side and river. The *Kalonunia* cultivating farmers also do not take much care on inter-cultivation practices. As those practices are being followed since long, the genetic makeup of this cultivar may have been changed to low yield potential.

2. Aromatic rice: *Gobindobhog*

Description: *Gobindobhog* is short, plump, and delicate paddy, characteristic making it ideal for both sweet and savoury dishes. Its natural fragrance intensifies when cooked, filling the

kitchen with a warm, appetising aroma that can only be described as Bengal itself. *Gobindobhog* continues to hold its exceptional place as the soul of every Bengali kitchen, whispering stories of love, devotion, and belonging. This aroma comes from the rice's genetic makeup and the unique alluvial soil of the Burdwan and Hooghly districts of West Bengal, where it is primarily cultivated. The region's fertile land, fed by the river Ganges, provides the perfect balance of minerals and moisture. When combined with traditional farming techniques, this gives *Gobindobhog* rice its distinct aroma and soft texture.

Etymology: What truly distinguishes *Gobindobhog* rice from other varieties is its signature fragrance. The aroma is subtle yet unmistakable – rich, buttery, and naturally sweet.

Applications: For Bengalis, *Gobindobhog* rice isn't just an ingredient – it's a nostalgia,it's a cultural heirloom. It has witnessed generations grow, festivals celebrated, and families come together. Its fragrance doesn't just fill the air; it fills hearts with memories.Even in today's world of global cuisines and modern diets, *Gobindobhog* continues to hold its irreplaceable place as the soul of every Bengali kitchen, whispering stories of love, devotion, and belonging.*Gobindobhog* rice cooking signifies Bengal itself, simmering in tradition and love. Over time, *Gobindobhog* became a part of Bengal's everyday life – gracing the kitchen shelves of every household and forming the base of iconic dishes like *khichuri*, *payes*, and *pulao*. It's the rice that evokes nostalgia – reminding Bengalis of festive mornings, the scent of ghee, and the warmth of family gatherings.

Cultural role: The name *Gobindobhog* comes from two words – *Gobindo* (Lord Govinda or Krishna) and *Bhog* (offering to the deity). Historically, this rice was used as a sacred offering in temples across Bengal, especially in Jagannath Puri and Nabadwip.That's how it earned the reputation of being the rice fit for the gods.

3. Aromatic rice: *Radhatilak*

Description: This variety is quiet similar to *Gobindobhog*. It is an aromatic variety and widely cultivated in Nadia district. The word has two parts: '*Radha*' and '*Tilak*', where '*Radha*', is indicated as the lover or *Gopini* of 'Lord Krishna' in Hindu mythology and '*tilak*' means sectarian mark painted by the Vaishnavas mostly on their foreheads, chests and arms (Ghosh, 2019).

Etymology: This variety is characterised with Yellow-straw coloured grain having reddish brown spot at tip, short-bold type white kernel, and pleasant aroma.

Applications: The variety has some special end-uses like *bhog* (special *khichdi*), *payas* (desert), *pistak* or *pitha*(home-made cake), etc. duringreligious festivals andsocial functions in the native areas. *Radhatilak*rice is usually adapted to rainfed mediumland in lower Gangetic alluvial region of West Bengal.

Cultural role: *Radhatilak* is an aromatic variety cherished for its role in special occasions, festivals, and traditional ceremonies, where it symbolizes prosperity and regional heritage.

4. Aromatic rice: *Radhunipagol*

Description: The *Randhunipagol* is one of the most aromatic strains of rice from West Bengal. The fairly strong aroma, can make the cook go mad – hence the name. Light on the stomach, sleek and tasty, it's a perfect as a table rice.

Etymology: *Radhunipagal i*s traditionally cultivated in *Rahr* (red and laterite) and lower Gangetic plains ofWest Bengal for about 400–500 years. The earliestrecord of *Radhunipagal* rice was found in two districtgazetteers on 24 Parganas (Hunter, 1875) and Medinipur(Hunter, 1876.

Applications: This variety is very popular in Bengali societyand culture for preparation of *bhog*(rice intermixed withpulses), *payash*(dessert), *pistak*or*pitha*(home-madecake), etc. during social functions and religious festivalsfor a long period, but its cultivation has been marginalized to small pockets of a few districts (Birbhum, Burdwan,Hooghly, Bankura, etc.) during last four decades dueto large-scale adoption of high-yielding varieties in theregion. Farmers in native areas cultivate *Radhunipagal*rice following traditional practices intermixed with a few modern technologies in recent times during *kharif*(wet) season.*Randhunipagal*rice is prized for its excellent cooking and eating qualities. It yields a soft, aromatic, and fluffy texture, making it ideal for both table rice and sweet dishes. It retains a soft, creamy texture even after cooling to room temperature.

Cultural role: Traditionally, it was consumed as table rice by those who could afford it, while others reserved it for ritualistic offerings and ceremonial dishes. The rice's aroma is strongest when it is soaked or hydrated, making it an excellent choice for raw rice-based dishes like '*Nabanna*' or '*Malida*'.

5. Aromatic rice: *Gopalbhog*:

Description: *Cultivate in a small pocket in the district Birbhum.*

Quality attributes: *T*his variety is medium tall, broad erect leaf, no awn, medium bold grain, brown husk, and lodging susceptible. Gopal means *balkrishna* and this variety is specially cultivate to offer *Bhog*to"*balkrishna"*. It is also very good as table rice.

6. *Dadsal*

Description: Is a climate-resilient aromatic rice from Assam but now cultivating in both south and North 24 Parganas.

Applications: Consumed especially as table rice. This variety is available in local markets.

7. Aromatic rice: *Badshabhog*

Description: Probably one of the most popular aromatic rice varieties from Bengal.It is being cultivated in largest area under traditional aromatic rice varieties in West Bengal.

Etymology: *Badshahbhog* as the name suggests is "fit for the kings".

Quality attributes: The short, slim white rice is perfect for the special winter meals. *Badshahbhog* is traditionally used under special occasions and best suited for pulao and other savory dishes.

Applications: It is an aromatic variety and widely cultivated in Aman season.The short, slim white rice is perfect for winter meal. The variety is iconic dishes like *khichuri*,*payesh*, and *pulao*.*Badshabhog* is an aromatic variety suitable for special dishes.

8. Aromatic rice: *Kataribhog*

Description: *Kataribhog* rice is a traditional, medium-aromatic rice variety native to Malda and Dakshin Dinajpur, it is primarily cultivated in the Dinajpur district, with some cultivation reported in adjacent areas of Bangladesh.*Kataribhog* rice offers a mild to moderate fragrance with notes of sweetness and nuttiness, enhancing its appeal in various culinary preparations without overpowering other flavours.

Etymology: The name *Kataribhog* derives from Bengali linguistic roots, combining "*katari*," which translates to "sword" or "dagger" in reference to the rice's sharp, slender, and pointed

grains, and "*bhog*," denoting "enjoyment" or "delicacy," underscoring its esteemed status as a flavorful aromatic variety suitable for special dishes. This nomenclature reflects traditional agricultural descriptors in the Bengal region, where grain morphology and sensory qualities often inform varietal names. Such naming conventions tie into broader Bengali traditions of classifying rice based on aesthetic and gastronomic attributes, as seen in other varieties like *Gobindabhog*.

Quality attributes: *Kataribhog* rice is renowned for its moderate aroma intensity. This fragrance arises from natural volatile compounds, providing a distinctive sensory appeal that enhances its culinaryvalue without overpowering other ingredients.Compared to hybrid rices, *Kataribhog* offers superior flavour retention due to its aromatic profile and cooking characteristics

Applications: *Kataribhog* rice serves as a key ingredient in traditional Bengali sweets and savoury dishes due to its delicate aroma and non-sticky texture, which allows it to absorb flavors effectively while maintaining firm grains. It is prominently featured in payesh, a slow-cooked rice pudding made by simmering the rice in milk with sugar, cardamom, and nuts until creamy, offering a sweet, nutty profile ideal for festive occasions. In savory preparations, it excels in khichuri, a one-pot dish combining the rice with roasted moong dal, vegetables, and mild spices, where its subtle caramel notes enhance the overall harmony without becoming mushy.*Kataribhog* rice complements fish curries and vegetable stir-fries, where its mild sweetness balances bold spices.

Cultural Role: *Kataribhog* rice holds a prominent place in Bengali culture, particularly as an aromatic variety cherished for its role in special occasions, festivals, and traditional ceremonies, where it symbolizes prosperity and regional heritage. Its distinctive fragrance and texture make it a preferred choice for celebratory feasts that evoke the essence of Bengal's culinary traditions. In Bengali literature, *Kataribhog* is referenced as asuperior aman (winter) rice variety, comparable to elite types like *Badsabhog*. Conservation efforts underscore *Kataribhog*'s importance as an heirloom variety.

9. Aromatic rice: *Kaminibhog*

Description: *Kaminibhog*is a traditional, aromatic, and bold-grained rice variety that originates from the Sundarbans region of West Bengal. It is a small-grained rice, sometimes described as glutinous, and is often categorized within the short, white, aromatic rice group’

Etymology: *Kaminibhog* is a bold, scented rice that is often parboiled or processed into flattened rice (chira). This scented rice is native to the Sundarbans and grows well in deep water.Kaminibhog are often cultivated in low-lying, saline-prone areas. Farmers receiving high economic returns despite the lower yield per hectare compared to modern varieties.

Applications: Due to its aroma and texture, it is frequently used for making rice flakes (*chira*) and for preparation in religious rituals.

Conclusion

Not much research has been done for developing strategies and protocols specifically for aromatic rice probably because the general protocols followed for rice conservation are suitable for conservation of aromatic rice as well. Aromatic rice has export-worthy bright future in West Bengal. But only grain quality and varietal screening need to be improved to change the status of aromatic rice production in West Bengal.

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