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Short Communication

SIMILIPAL BIOSPHERE RESERVE: HOME OF CULTIVATED AND WILD *Oryza* SPECIES

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Notes on occurrence and morpho-agronomic traits of major *Oryza* species i.e., *Oryza officinalis, O. granulata, O. rufipogon* and *O. nivara* from Similipal hill ranges of Orissa are reported. Importance of the region for *in-situ* conservation for wild *Oryza* is emphasized in the paper.

Key words: Wild rice, *in-situ* conservation

Similipal Biosphere Reserve in Mayurbhanj district of Orissa is located between 21° 30' to 22° 08' N latitude and 86° 04' to 86° 37' E longitude and covers an area of 2,750 sq.km. The area is characterised by innumerable crests and valleys clad with rich forests, interspersed with countless streams and rivers and contains a confused and broken mountain system ranging from 300 to 1166 metres, thus exhibiting a great degree of topographic variation. The Similipal Biosphere Reserve is the abode of 92 species of orchids and 1,076 species of other plants including 551 species of medicinal plants. Out of which two species of orchids are endemic, eight species endangered, eight species are vulnerable and 34 species are designated as rare plants. The average rainfall of the area is 173 cm with a maximum of 225 cm and minimum of 110 cm. The rainfall is not well distributed, most of it falling during the rainy season. Relative humidity is generally high throughout the year but more in the rainy season. The mean temperature varies from 20° to 28° C. A small population of aboriginal tribes mainly Santhal, Kolha, Bhumij, Bhuiyen, Bathudi, Kharia, Gondo, Mankdias, Pauri-Bhuyan, Mahalis, Sounti and Saharas inhabited in Similipal. There are 4 villages in the core area, 61 villages in the periphery and 1,200 villages in the transitional area.

The main forest types found in the area are: northern tropical moist deciduous forests (type 3 C/C 2 e), northern tropical semi-evergreen forests (type 2B/C3), dry deciduous hill forests (type 5B/C 1c and 3C/C3), high level sal forests (type: 3C/C 2e (I) and grassland and savannah (type 3C/DS-I). Sal is the predominant type in most areas. However, it varies with the edaphic conditions and its associates vary with the type.

Three exploration trips were conducted during 1989, 2000 and 2001. The species were collected and the passport data were recorded at the collection site. The collected germplasm were later grown in the experimental garden of NBPGR Base Centre, Cuttack. Morpho-agronomical characteristics were noted and the diversity between the species was recorded.

Similipal is very rich in rice and its wild relatives. *Oryza sativa*, *O. rufipogon* and *O. granulata* were earlier reported from Similipal (Saxena and Brahman, 1989). *Oryza officinalis* was collected for the first time from Similipal in addition to the collection of all the reported species. The information on distribution of cultivated and wild *Oryza* species along with characteristics are mentioned.

Table 1. Similipal: A habitat rich in cultivated and wild rice species

Botanical name	Genome	Distribution
Oryza rufipogon	AA	Thakurmunda
Oryza nivara	AA	Similipal hill range
Oryza officinalis	CC	Khejri hills
Oryza granulata	Unknown	Meghasani, Nawana, Thakurmunda, Chahala, Dalangi
Oryza sativa	AA	Ulkudar, Gurguria, Khejari
Oryza sativa var. *spontanea*	AA	Similipal hill range

1. *Oryza officinalis* Wall. ex Watt

Oryza officinalis is a perennial, herbaceous and rhizomatous species of wild rice which is highly resistant to BPH and WBPH (Valusamy, 1981) and is reported for the first time in Orissa state. It is collected from Khejari hills of Similipal hill range, which is situated 45 km east side of Jashipur town. The approximate height of this hill is 800 metres from sea level. The plants of *O. officinalis* were grown in thick sal forest on stream banks in marshy land. The distribution of this species was very rare. It is not used for any purpose in the area. The plants of this species were erect, tall (148.5 cms) with 5.4 average number of internodes per plant. Average number of leaves per plant were 5.25 having light green colour. Average length and width of leaves (5th) were 33.45, 1.50 and 1.37 cms respectively. The panicle length varied from 27.5 to 37.5 cms with 50 to 83 grains per panicle. The average length and width of spikelets were 5.2 and 2.5 mm respectively with small awns.

2. *Oryza granulata* Nees et Arn. Ex Watt

It is a perennial herbaceous species of wild rice collected from Dalangi hills of Similipal hill range, which is situated 8 km north side of Bisipur village at about 400-metre height from sea level. The plants of *O. granulata* were grown in thick forest on rocky slopes over red lateritic soil near stream bank. The plants of this species were semi-erect, with medium height (75.05 cms), shade loving, rhizomatous, stem having 2-4 tillers per plant. Leaves were of light green colour and their average length and width were 15.9 and 1.45 cms respectively. Average length and width of flag leaf were 8.35 and 0.76 cms respectively. The panicle length varied from 5.2 to 6.2 cms and panicle had 9-10 grains on the unbranched rachis. Average length and width of spikelets were 5.48 and 2.70 mm respectively. Spikelets were oblong having black colour, while kernel colour was brownish black. The plants of *O. granulata* collected from Jeypore tract were almost the same except that of variation in height (75.05 cms and 55 cms), internode length (8.8 cms) and grains per panicle (9-10 and 10-15) respectively. Tribal people of this area are using the seeds of this species as contraceptive.

3. *Oryza rufipogon*

It is perennial, spreading or floating, adventitious roots and extravaginal branching at higher nodes, panicles lax and well exserted, long awns, slender grains, black husk

4. *Oryza nivara*

It is aAnnual, semi-erect to decumbent, panicle compact until maturity and not well exserted, short anthers panicle with fewer primary and secondary branches, spikiest black bold, oblong and deciduous, awn-thick about 4.0-6.0 cm.

5. *Oryza sativa* var. *spontanea*

These are probably crosses of *O. sativa* and

O. nivara and *O. rufipogon* and *O. sativa*. The panicle and grain characteristics are highly variable. Seed yield is high as compared to *O. nivara* or *O. rufipogon*.

6. *Oryza sativa*

The tribal farmers are cultivating landraces of rice since long for their home consumption. As the area is inaccessible and cut off by high hills and villages are scattered, sometimes landraces are restricted to particular communities, therefore, local types are observed with varying in names and characters. Diversity is exhibited in maturity duration e.g., **earliness**: Jereng, Karanga, Kanchi, Mahulia, **medium**- Kache bhajana, Chingudisukha **late**- Bankasira, Bhajana, Golei, Mughi, **Awned**- Barasal, Sauradhan, **Puffed** - Dhabajanaa are the popular varieties among the tribals. This is suitable for puffing purpose (broadly called as murrhi).

Striking variability in these landraces was recorded in plant height (102.04-174.96 cm), leaf length (36.58-56.42 cm), leaf breadth (0.9-1.36 cm), ear bearing tillers (5.0-9.2), panicle length (23.02-290.32 cm), culm diameter (4.6-9.4 mm), panicle weight (1.3g-3.4g), number of primary branches per panicle (9.4-12.2.), number of secondary branches per panicle (15.0-41.2), total spikelets per panicle (90.2-198.6), kernel length (5.05-6.5 mm), kernel width (2.08-3.0 mm), 100 grain weight 2.16 g (Laghuna) - 2.91 g (Bhajana). The varieties vary from long bold to (20), short bold (5) and medium slender (2) types.

The *Oryza officinalis* once available in plenty near the stream banks (during 1989) are now reduced to countable number of plants. This is because the streams are now drying either due to the diversion of water for irrigation purpose or cleaning of area in the vicinity. Besides, the the grazing by wild animals are also there. Communication facilities have also replaced some traditional cultivars in the peripheral areas e.g., in Lulung and Jashipur areas-a high yielding modern varieties - Lalat landrace has replaced traditional cultivars to a considerable extent.

Forest fire and indiscriminate felling of trees and poaching of wild animals particularly tigers, elephants, and other wild animals are causing serious threat to the biodiversity in the region. Therefore, efforts should be made to create awareness among the tribal inhabitants regarding importance of *in-situ*/on-farm conservation of these valuable resources in the region.

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