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Short Communication

COLLECTING AROIDS DIVERSITY IN NORTH EASTERN INDIA

G. Pandey, N.K. Gautam[1], B.D. Sharma and D.K. Hore

National Bureau of Plant Genetic Resources Regional Station
Shillong-793 013 (Meghalaya)

The north eastern region of India lies between 21° 57′ and 29° 28′ N 89° 40′ and 97° 25′ E and includes the states of Assam, Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram and Tripura. The aroids belonging to *Colocasia, Xanthosoma, Amorphophallus* and *Alocasia* genera are mostly used as staple or subsistance food. The corms and cormels are rich in starch and used as vegetables. The leaves and petioles of a *Colocasia* and *Xanthosoma* are cooked and eaten as vegetables. Different aroids have medicinal and ornamental importance also. Ample scope exists for explorting the potentialities of these crops. An assembly of diverse genetic stocks and understanding the nature and magnitude of variability among these genetic stocks would help in identifying the desirable cultivars for commercial cultivation. An attempt has been made to describe species distribution, their collection, maintenance and morphologial diversity observed in aroids grown under shifting cultivation [Jhuming by the tribals of north east region of India (Table 1 and 2)]. General of aroids under cultivation belong to *Colocasia* spp. (Taro), *Xanthosoma* spp. (Tannia or Co-or Yam), *Alocasia* spp. (Giant Taro) and *Amophallus* spp. (Elephant foot Yam); occupy fourth rank after rice, maize and millets in the diet of tribal people. Medicinal uses and improvement techniques have also been discussed.

DIVERSITY COLLECTED

TARO (*Colocasia esculenta* (L.) Schoot.)

Four species namely *esculenta, affinis, fallax* and *manii* are grown in NE states of India. *Colocasia esculenta* is extensively grown

[1] NBPGR Regional Station, Phagli, Shimla-171004 (H.P.)

for its edible tubers. The other species of this genus normally grow in wild habitat and are rich in oxalic acid contents. *Colocasia esculenta* is highly polymorphic in vegetative and tuber characters and different strains of this are found in the north east and known by various local names like Bish Katchu, Man Katchu, Dudh Katchu etc. The 216 accessions of taro cultivars that have been collected from various parts of NEH region (Hore and Sharma, 1986-92) show variability in their tuber shape (Cylindrical, oblong, round and tubular), petiole colour (Green, black, violet, greenish black), colour of leaf margin (green, black and brown) and petiole attachment.

Table 1 : **Distribution of aroids in north-eastern region of India (After Hooker, 1894, except *Xanthosoma* spp.)**

Species	Distribution
Colocasia asculenta (L.) Schott.	In all NE states
Colocasia affinis Schott.	Meghalaya and Assam
Colocasia fallax Schott.	Meghalaya
Colocasia mannii Hook. f.	Assam
Amorphophallus campanulatus (Roxb.) Blume ex Decne	In all NE States
Amorphophallus bulbifera Blume	Meghalaya
Xanthosoma sagittifolium (L.) Schott.	In all NE states
Xanthosoma violaceum Schott.	In all NE states
Alocasia cucullata (Lour.) Schott.	Meghalaya (Khasi Hills)
Alocasia fornicata Schott.	Assam
Alocasia navicularis Koch. & Bouche	Meghalaya (Khasi Hills)
Alocasia fallax Schott.	Meghalaya (Khasi Hills)
Alocasia macrorrhiza (L.) Schott.	In all NE states
Alocasia indica (Roxb.) Schott.	NE states

Table 2 : **Germplasm collection of Aroids from the region and their maintenance at NBPGR, Shillong**

Species	Assam	Meghalaya	Manipur	Nagaland	Mizoram	Arunachal Pradesh	Tripura	Total
Colocasia esculenta (L.) Schott.	19	48	01	22	10	15	29	144
C. affinis Schott.	12	04	-	10	05	04	02	37
C. fallax Schott.	02	13	-	04	02	01	01	23
C. mannii Hook. f.	04	05	-	-	-	01	02	12
Amorphophallus campanulatus (Roxb.) Bl. ex Decne	-	02	-	-	-	-	-	02
Xanthosoma sagittifolium (L.) Schott.	02	04	-	-	-	-	04	10
X. violaceum Schott.	-	01	-	-	-	-	01	02
A. macrorrhiza (L.) Schott.	01	02	-	-	-	-	-	03
TOTAL	40	79	01	36	17	21	39	233

In NEH region, this species is generally cultivated in *Jhum* as mixed crop. Monoculture of the species is scarcely seen. Rhizomatous tuberous type are much preferred in hills while in Assam plains corm types are more prevent. In some of the remote hilly places of this region, the taro is consumed as staple food in scarcity days, when cereals are not available. The raw and boiled stems are much relished by the domesticated swings. In Mizoram, the stems are dried and baked and used further in vegetable preparation. Processing and production of silage from Taros is unknown to the local people.

TANNIA OR NEW CO-COYAM (*XANTHOSOMA* SPP.)

Two species occur in this region viz. *Xanthosoma sagittifolium* and *X. violaceum*. The commonly available *X. sagittifolium* existing in this region has different forms. Specific distinctions of Tannia *(Xanthosoma)* can be determined by its flesh colour. In Assam and Tripura, they are called as "Dudh/Dahl Katchu" due to the presence of white latex in the stem. In Meghalaya, it grows in kitchen garden sporadically. Large scale cultivation of the species in this region was hardly seen. The species prefers moist, shady places for its proper growth. Shillong regional station is having 12 collections of Tannia. This species is much relished by the local people. In Assam and Tripura region it is much preferred to *Colocasia*. The harvested stems 4-5 in number, tied together in a bundle are sold in the market.

GIANT TARO *(ALOCASIA* SPP.)

Six species are known to occur in north-east India. Among them *Alocasia macrorrhiza* (Man Katchu), *A. Indica* and *A. Cucullata are* collected for their edible stem and root stalks. The species are grown in shady wastaland area or near the small streams. The growth of the plant is vigorous during the rainy season. The station has collected 3 samples from Assam and Meghalaya. The presence of needle like crystals of calcium oxalate in the tissues of *Alocasia.* spp. make the taste acrid. Hence the local people boil the same in water for prolonged period, drain out water and then prepare the vegetable. Since the corm is large, cylindrical (sometimes more than 12 kg. or more in wt.) it is made into pieces and sold in the local market. The larger leaves are sometimes used as umbrella during the rainy season.

ELEPHANT FOOT YAM (*AMOROPHOPHALLUS CAMPANULATUS* (ROXB.) BL. EX DECNE

To species are commonly distributed in NE Region. They are *Amorphohallus companulatus* and *A. bulbifera. A. campanulatus* is a herbaceous plant bears herispherical corm and a large solitary mottled leaf on a long petiole. This species produced five to ten carmals from each corm at the end of growing season. The corms of wild plants are irritating due to the presence of raphides (Calcium exalate). In cultivated forms, raphides are less. The corms are used for edible purpose after thorough washing and prolonged cooking.

USES

Colocasia, Xanthosoma and *Amorophophallus* are cultivated more extensively. *Alocasia* spp. are grown on a limited scale by certain tribes in north eastern region. In order to depend less on rice and maize the aroids act as staple food. *Amorophohallus* corms are usually eaten as vegetables either after boiling or baking. In *Alocasia,* the stem and tuber portions are peeled off and eaten as vegetable after thorough cooking. These crops have high medicinal value. The acrid juice of *Alocasia macrosshiz* schott. and *Amorphophallus pranii* Hook were used as contact poison (Gimlette, 1929), boiled petiole edudate used as mild laxative (Watt, 1889) and also as stimulant on the skin for removing fever blotches (Burkill, 1935). Petioles of *Colocasia esculenta* have been used for curing wounds and snake bites. *Xanthosoma spp.* decoctions have been used for reducing the body temperature (Burkill and Haniff 1930). The burned petiole in poultice form had been used as a cure for sprained muscle (Maxwell, 1960).

FUTURE RESEARCH FOR IMPROVEMENT

Tuber crops mostly constitute a group of highly cross pollinated and vegetatively propagated plants. Aroids in general, possess very little genetic variability due to the continuous vegetative methods of propagation and lack of sexual reproduction. This makes the crop improvement difficult. Most of the cultivated varieties are non flowering or shy flowering besides possessing high amount of sterility. Extreme protogyny in relation to opening of spathe and failure of spathe to separate at the neck region have been identified as the causes preventing natural need set in aroids. By hand pollination seed set could be achieved in some cultivars of *Amorophophallus* and *Colocasia* that flowered under natural

conditions. The production of true seeds and seedlings in this way can help in producing high degree of genetic variability. Gibberellic acid treatment could induce flowering in non flowering types in *Colocasia* (Unnikrishnan and Sreekumari, 1984). They also reported that with 0.2 percent calchicine treatment of *Amorohophallus* for 16 hours a tetraploid plant was obtained which showed vigorous growth and broader leaves. Using the techniques of selection, hybridization, polyploidy and irradiation, early maturing high yielding genotypes with desirables plants and tuber characters (good cooking qualities, acrid free taste, blight resistant) suitable for water logged areas can be produced.

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