SHORT COMMUNICATION

An Under-Exploited Species Bankunari {*Solena amplexicaulis* (Lamk.) Gandhi}: Its Exploration and Preliminary Evaluation

D Ram, Mathura Rai, Sudhakar Pandey, B Singh, Hira Lal and AK Pal
Indian Institute of Vegetable Research, Varanasi-221005, Uttar Pradesh

Key Words: Bankunari, Dioecious, Collection, Conservation, Evaluation

Bankunari {*Solena amplexicaulis* (Lamk.) Gandhi} is a rare dioecious plant having good market potential due to high nutritional and medicinal value. Plant parts like fruits, leaves and fleshy roots are edible. In this genus, 88 species are reported worldwide, out of which 12 species occur in India (Ambasta, 2000). Among various species, Bankunari is more diverse in nature. It is a typical hilly crop, often surviving under stress conditions (Hooker, 1985). Non-availability of sufficient quality planting material (tubers) is a major drawback in popularizing the crop.

Total of 25 accessions were collected from the Rajmahal, Hazaribagh, Tikigora hills of Santhal Pargana, Lalmattia, Chandana and nearby forest area of Ranchi (Jharkhand) during the year 1996 to 2002 by adopting random sampling method (Panse and Sukhatme, 2000). All the accessions were evaluated at research farm of Indian Institute of Vegetable Research, Varanasi. A wide range of variability was observed in leaf size, leaf margin, fruit size, shape (round, oblong, long), base (round, conical), apex (narrowly round, conical round), fruit colour (light green, dark green and yellow), flesh content, seed content and taste of fruit. The mean performances of different parameters are presented in Table 1. Inter-nodal length of collected lines varied between 6.0-14.5 cm with the mean value of 9.48 cm. The lines that pertain maximum inter-nodal length are DR-05 (14.15 cm), DR-09 (12.45 cm), DR-02 (12.15 cm) and DR-10 (12.12 cm). Average fruit weight varied from 6.00 to 13.00 g with the mean value of 9.95 g. As yield per plant some of the lines were found high yielding viz. DR-12 (480.00 g), DR-02 (444.00 g), DR-03 (442.00 g) and DR-13 (432.00 g). Average length of the vine was observed to be 2.86 m. It was observed that shape and size of

Table 1. Characterization of Bankunari germplasm

Accessions	Inter-nodal length (cm)	Fruits /plant	Fruit diameter (cm)	Fruit weight (g)	Vine length (m)	Yield/ plant (g)
DR-01	10.24	18	3.5	10	2.34	340
DR-02	12.15	21	4.0	11	3.33	444
DR-03	9.35	16	3.2	10	3.00	442
DR-04	7.24	14	3.6	9	2.89	400
DR-05	14.15	18	3.0	6	2.62	280
DR-06	6.12	12	2.1	7	2.85	185
DR-07	8.45	15	2.8	8	3.31	168
DR-08	10.12	11	4.0	8	3.00	210
DR-09	12.45	17	4.3	11	3.32	218
DR-10	12.12	15	2.9	12	3.15	338
DR-12	11.16	12	3.0	12	3.26	480
DR-13	9.32	14	3.6	13	3.30	432
DR-14	8.75	13	3.2	9	3.00	385
DR-15	7.89	12	3.3	10	2.62	300
DR-16	8.28	14	4.0	11	2.00	285
DR/NKV-48	9.00	13	3.1	12	2.21	260
DR/NKV-58	8.00	12	2.6	13	2.92	290
DR/NKV-59	6.00	10	2.2	10	2.45	330
DR/NKV-65	9.00	14	2.8	9	2.82	340
DR/NKV-70	10.00	16	2.6	8	3.00	345
Mean	**9.48**	**14.35**	**3.19**	**9.95**	**2.86**	**323.60**
Range	6 -14.15	10-21	2.1- 4.3	6-13	2-3.33	168-480

Email: pdveg@up.nic.in

Table 2. Categorization of Bankunari on the basis of tuber size, weight and days taken to sprout

Tuber size	Tuber weight (g)	Sprouting (days after planting)	Root development	Plant growth	Accessions
Small	> 120.00	18-20	Good	Weak and slender	DR/NKV-56, 65, 67
Medium	120.00-140.00	15-16	Good	Vigorous	DR/NKV-58, 59
Big	< 180.00	10-12	Poor	Normal	DR/NKV-68, 69

the fruit has no effect on total yield, while, number of fruits per plant has positive correlation with total yield. Fruit diameter ranges between 2.10 to 4.30 cm. with the mean value of 3.19 cm. The most notable genotypes collected were DR/NKV-48, DR/NKV-62, DR/NKV-65 and DR/NKV-70, which bear attractive and bigger size fruit. More number of seeds in fruit is not a desirable character in Bankunari therefore genotypes having less seed and more flesh must be given priority in selection procedure.

On the basis of tuber size, days taken by these tubers to sprout after transplanting and sprouting habits, the collected samples were grouped into three categories (Table 2). Samples with big tuber size (more than 180.00 g) showed vigorous and early sprouting as compared with that of medium (120.00-140.00 g) and small (less than 120.00 g) tuber size. It was also observed that root development in the plants with big tuber size was poor as compared to medium and small tuber size. Medium size tubers took 15-16 days for sprouting and plant stand was quite vigorous as observed in the field conditions. Plants developed by medium tuber size showed early flowering and better fruiting. Small tubers start sprouting quite late (18-20 days) and sprouts were weak and slender. The total yield obtained from the plants of bigger size tubers was lower than medium and small tuber size plants. DR/NKV-58 and DR/NKV-59 were the most notable genotypes with respect to vigorous growth and yield.

Seed of Bankunari germinates within 40 days after dispersal from mature fruit. It is difficult to recognize the male and female plants at early stages (Ram *et al.*, 2001). Male flower occurs between 58-62 days while female in 65 days after seed dispersal. It attains edible fruit maturity in 95 days and seed maturity after 110-120 days. Tuberous roots sprout very early (20-22 days) and start flowering within 48-55 days, which attain the edible maturity within 80 days (Table 2). Observations indicate that medium size tubers are the best planting materials (Ram *et al.*, 2001).

Bankunari may be important for new agricultural systems and for expanding the productive area into marginal regions where few known vegetables are in cultivation. Adequate conservation and protection measures are required to safeguard the rich diversity of Bankunari.

References

Ambasta SP (2000) *The Useful Plants of India,* NISCOM, CSIR, New Delhi. pp. 364-365.

Hooker JD (1985) *Flora of British India,* **Vol. II.**, L. Reeve and Co., London pp. 625-626.

Panse VG and PV Sukhatme (2000) *Statistical Method for Agricultural Workers.* ICAR, New Delhi.

Ram D, MK Banerjee, Pandey and Srivastava (2001) Collection and evaluation of kartoli (*Momordica dioica* Roxb. ex. Willd.). *Indian J. Plant Genet. Resour.* **14**: 114-116.