

Diversity of Watermelon *Citrullus vulgaris* Linn. from Agra and Kanpur Region

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Exploration for watermelon (*Citrullus vulgaris* L.) was undertaken in south-west and central parts of Uttar Pradesh where wide range of fruit and seeds variability was observed. The species was uniformly distributed throughout south-east region of Ganga river bank at Farrukhabad and Kanpur. It exhibited considerable variation in fruit shape, rind colour and mottling, colour of stripes, glossiness, fruit size, weight and flesh colour.

Key Words: Watermelon, Diversity, Exploration, Collection

The watermelon (*Citrullus vulgaris* L. – Cucurbitaceae) is indigenous to tropical Africa. There are reports that it has been found in wild state on both sides of the equator. Pangalo (1930; 1944; 1955) has made extensive studies of Asiatic watermelon. On the basis of both field and herbarium studies, he was convinced that watermelon is indigenous to India. Watermelon is widely spread throughout the tropics and sub-tropics, but do best in the hot drier areas with an abundance of sunshine. It grows best on fertile sandy soil, particularly on sandy river banks. Uttar Pradesh is one of the largest distributing centre for watermelon. The present study was undertaken to collect the germplasm of watermelon from Mathura, Agra, Etawah, Kanpur, Farrukhabad, Etah and Hathras districts (Fig. 1).

Collection of Germplasm

South-west region (Mathura, Agra, Etawah, Kanpur, Farrukhabad and Hathras districts) of Uttar Pradesh, was surveyed for collection of watermelon germplasm. The sites were selected at a distance of 15-20 km from each other on the basis of different climatic zones so as to collect maximum variation. Mature seeds were extracted from ripe fruits (8-10) in each accession. Herbarium were also prepared for most of the sample collected. Data was collected on the vigour, earliness and productivity, shape, colour, thickness and texture of rind.

Observations

The fruits were collected from both the plains as well as from bank of river Yamuna at Mathura. The fruits were entirely spherical in shape but were small, medium or large in size and light to dark green in colour. The stripes were present mostly on medium sized fruits and

rarely on larger fruits. The diameter of the fruits ranged between 14-16 cm (small), 16-18 cm (medium) and 18-20 cm (large). Similarly, the weight of the fruits collected from the plains ranged between 0.5-2.0 kg (small), 2.0-5.0 kg (medium) and 5.0-8.0 kg (large). On the other hand, the fruits collected from Yamuna river bank were large in size as compared to those collected from the plains. The diameter of these fruits was 15-17 cm (small), 17-19 cm (medium) and 20-24 cm (large) and their weight ranged between 0.5-2.5, 2.5-7.0 and 7.0-10.0 kg respectively.

The fruits collected from the plains and bank of Yamuna river at Agra district also exhibited considerable variability in both shape and size. The fruits collected from plains were spherical but either small, medium or large in size. They were light to dark green in colour. The diameter of fruits ranged between 12-16 cm (small), 16-18 cm (medium) and 18-20 cm (large). The weight of small fruits ranged between 0.5-2.20 kg, for medium sized fruits it was between 2.20-5.50 kg and those of large fruits it was between 5.50-8.0 kg. On the other hand, the fruits collected from the bank of Yamuna river were larger than those collected from the plains. The diameter of fruits was 15-17, 17-20 and 20-25 cm with weight ranging between 0.6-2.50, 2.5-6.5 and 6.5-10.0 kg of small, medium and large fruits respectively.

The fruits collected from plains as well as from the banks of river Yamuna at Etawah district were similar to those collected from Mathura and Agra but exhibited some variation in both diameter as well as weight. The diameter of fruits collected from plains ranged between 12-14 cm (small), 14-16 cm (medium) and 16-18 cm (large). The weight of small fruits was between 0.4-2.0 kg, while those of medium sized fruits it was

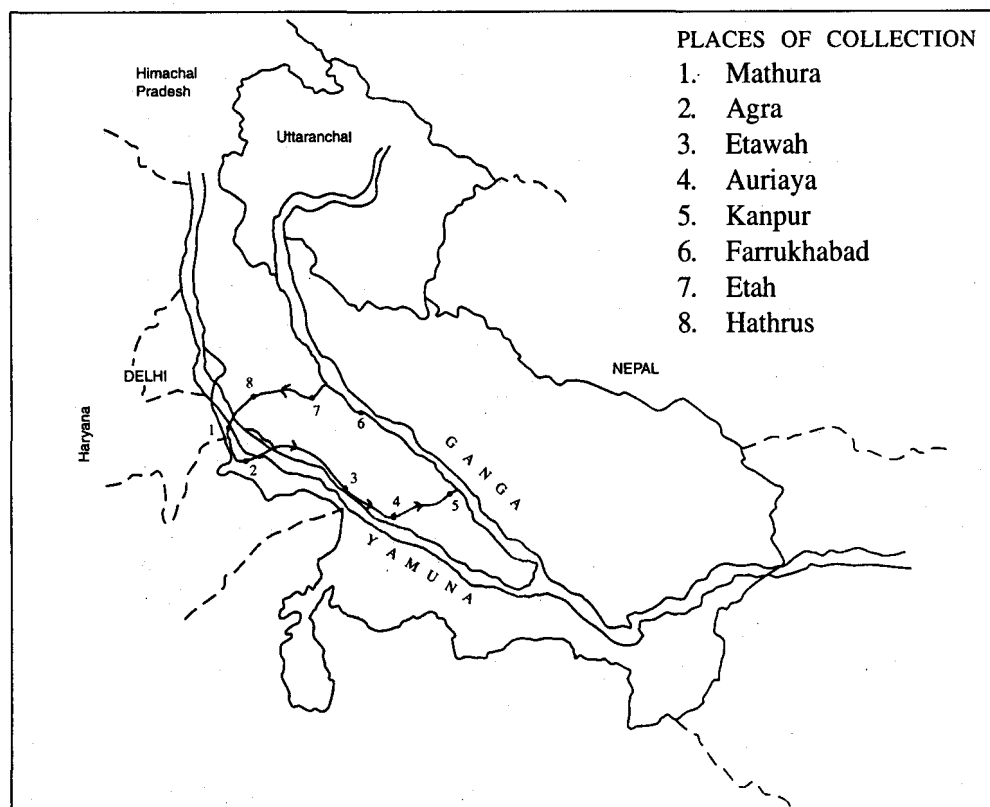


Fig 1: Exploration route map for collection of Watermelon from parts of U.P.

2.0-5.50 kg and those of large fruits it was between 5.50-7.00 kg. On the other hand, fruits collected from the bank of Yamuna were either small (14-16 cm) or medium (16-18 cm) or large (18-22 cm) and their weight ranged between 0.5-2.0, 2.0-6.0 and 6.0-8.0 kg respectively.

The fruits of watermelon collected from plains as well as from the bank of river Ganga are commonly known as Katri in Kanpur district. The fruits were either spherical or elongated. These were small, medium and large in size. The colour of fruits was light to dark green or even greenish brown in colour. The diameter of spherical fruits ranged between 14-16 cm (small), 16-18 cm (medium) and 19-21 cm (large) with 1.0-2.5, 2.5-5.0 and 5.0-7.0 kg weight in small, medium and large fruits respectively. On the other hand, spherical fruits collected from bank of river Ganga were either small (15-18 cm) or medium (18-20 cm) or large in size (21-28 cm) with 2.0-5.0, 5.0-7.0 and 7.0-13.0 kg weight respectively. On the other hand, the elongated fruits collected from river bank were 25-60 cm long with a diameter of 14-16 cm. The weight of such fruits was between 5-10 kg. These were light green or greenish brown in colour without stripes.

The fruits collected from the plains and bank of river Ganga in district Farrukhabad were either spherical or elongated and light to dark green in colour. The fruits were either small (12-14 cm) or medium (14-16 cm) or large (18-20 cm) in size. The weight of fruits ranged between 0.5-3.0 kg (small), 3.0-7.0 kg (medium) and 7.0-8.0 kg (large). Similarly, the fruits collected from the bank of river Ganga were small (15-18 cm), medium sized (18-22 cm) and large (22-26 cm) and their weight ranged between 2.0-5.0 (small), 5.0-8.0 (medium) and 8.0-14 kg respectively. Elongated fruits (20-50 cm long with 10-12 cm diameter and 3.0-7.0 kg weight) were also collected from the Ganga river bank. These were light green and with stripes.

Various types of fruits were collected from plains as well as from the bank of Ganga in Etah district. The fruits were either small, medium or large sized. These were light to dark green or some times greenish brown in colour. Stripes were also present on their surface. It was interesting to note the presence of a small beak at the distal end of fruits. The diameter of small, medium and large fruits ranged between 12-14, 14-16 and 18-22 cm respectively with fruit weight ranging between

0.5-2.0, 2.0-6.0 and 6.0-8.0 kg in small, medium and large fruits respectively. On the other hand, the fruits collected from the bank of river Ganga were small (16-18 cm), medium (18-20 cm) or large (20-24 cm) in size and their weight was between 2.0-8.0, 8-10 and 10-12 kg respectively in small, medium and large fruits. The weight of fruits with a peak ranged between 4-8 kg.

The fruits of watermelon collected from the plains of Hathras were spherical, small, medium or large in size and light to dark green in colour. The strips were sometimes present only on the large fruits. The diameter of fruits was 10-12 cm (small), 12-14 cm (medium) and 14-18 cm (large) and fruit weight ranged between 0.3-2.0, 2.0-5.0 and 5-7 kg respectively.

The germplasm collected from plains of Mathura district was brown and black in colour and they were 9.0x0.70 cm in size. The weight of 100 seeds was 5.70 g. On the other hand, the seeds collected from the bank of river Yamuna were small (1.16 x 0.82 cm) in size with 9.20 g weight of 100 seeds and black in colour with prominent margin.

The seeds collected from the plains of Agra were 0.86x0.69 cm in size and 100 seed weight was 5.13 g. On the other hand, the seeds collected from the bank of river Yamuna were brownish black in colour and their size was 1.24x0.82 cm with 9.42 g weight of 100 seeds.

The germplasm of watermelon collected from plains at Etawah was brownish black in colour. The seed size was 0.96x0.72 cm with 6.23 g 100 seed weight. However, the seeds size (1.34x0.85 cm) and 100 seed weight (8.92 g) of germplasm collected from bank of river was slightly higher than those collected from plains.

The seeds collected from plains as well as bank of river Ganga (Katri) at Kanpur were white, brown, dark brown or black in colour with pointed end. The seed size and 100 seed weight was 9.0x0.61 cm and 6.00 g respectively in plains. On the other hand, seed size (1.14x0.85 cm) and 100 seed weight (8.00 g) was slightly higher from those collected from the bank of Ganga river.

The seeds collected from plains as well as Ganga river bank of Farrukhabad district also exhibited variability. The seeds were either brown, black or half brown and half black. The seed size in plains was 0.78x0.61 cm and their 100 seed weight was 4.32 g. On the other hand, the seeds of 1.6x0.74 cm size with 9.32 g 100 seed weight were collected from the bank of river Ganga.

In Etah, the seeds also exhibited some variation. The colour of seeds was brown, black and whitish black. The size of seeds was 0.92x0.73 cm with 100 seed weight as 5.92 g in plain area. On the other hand, the seeds collected from the bank of river Ganga were 1.12x0.82 cm in size and their seed weight was 9.20 g.

The germplasm collected from Hathras district was brown and light black in colour with white lines. The size of seeds was 1.10x0.80 cm and their 100 seed weight was 7.25 g.

Thus, the germplasm collected shows rich genetic diversity in watermelon. The landrace variability is of considerable interest as it is attuned to sandy river bank conditions but also adapted to agro-ecological niches. The germplasm varied in fruit shape (elongated and spherical) and colour (light to dark green) with or without strips. The seeds also exhibited great deal of diversity in colour, shape and weight. There is need of biochemical and molecular evaluation of these collections. These findings will be of great use in hybridization programmes and in the development of new varieties.

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