INDIAN Horticulture

JULY–SEPTEMBER 2002

RESEARCH

O.P. Pareek and D.K. Samadia

For Arid Zone Farmers...

Promising indigenous cucurbit varieties

There is an abundant scope to utilize the existing indigenous genetic variability of cucurbit vegetables in hot arid ecosystem not only because of their drought hardy characteristics but also considering good productivity even under acute water and abiotic stress conditions. There was a need to identify and develop standard vareieties of these cucurbits to enable their commercial production for different uses. As a result of collection of a wide variability followed by their purification and evaluation, standard varieties AHW 19 and AHW 65 of *mateera* (*Citrullus lanatus*), AHK 119 and AHK 200 of *kachari* (*Cucumis callosus*), AHS 10 and AHS 82 of snapmelon (*Cucumis melo* var. *momordica*) and AHC 2 and AHC 13 of *salad kakdi* (*Cucumis* spp.) have been developed. This has made their systematic commercial production possible for economic sustenance to the arid zone farmers.

INDIAN arid zone is characterized by high temperature, low and erratic rainfall which limit the scope for production and productivity of vegetable crops. Even under these environmental constraints, a rich variability of some cucurbits such as *Citrullus* and *Cucumis* is found. Owing to their drought hardy characteristics, these species show high productivity under extreme conditions of the hot arid

Mouth-watering Delicacy...

Snapmelon AHS 10 (*left*) and AHS 82 (*right*): The whole and cut fruits ready for *salad* and garnishing vegetables

RESEARCH

O.P. Pareek and D.K. Samadia

For Arid Zone Farmers...

Promising indigenous cucurbit varieties

There is an abundant scope to utilize the existing indigenous genetic variability of cucurbit vegetables in hot arid ecosystem not only because of their drought hardy characteristics but also considering good productivity even under acute water and abiotic stress conditions. There was a need to identify and develop standard vareieties of these cucurbits to enable their commercial production for different uses. As a result of collection of a wide variability followed by their purification and evaluation, standard varieties AHW 19 and AHW 65 of *mateera* (*Citrullus lanatus*), AHK 119 and AHK 200 of *kachari* (*Cucumis callosus*), AHS 10 and AHS 82 of snapmelon (*Cucumis melo* var. *momordica*) and AHC 2 and AHC 13 of *salad kakdi* (*Cucumis* spp.) have been developed. This has made their systematic commercial production possible for economic sustenance to the arid zone farmers.

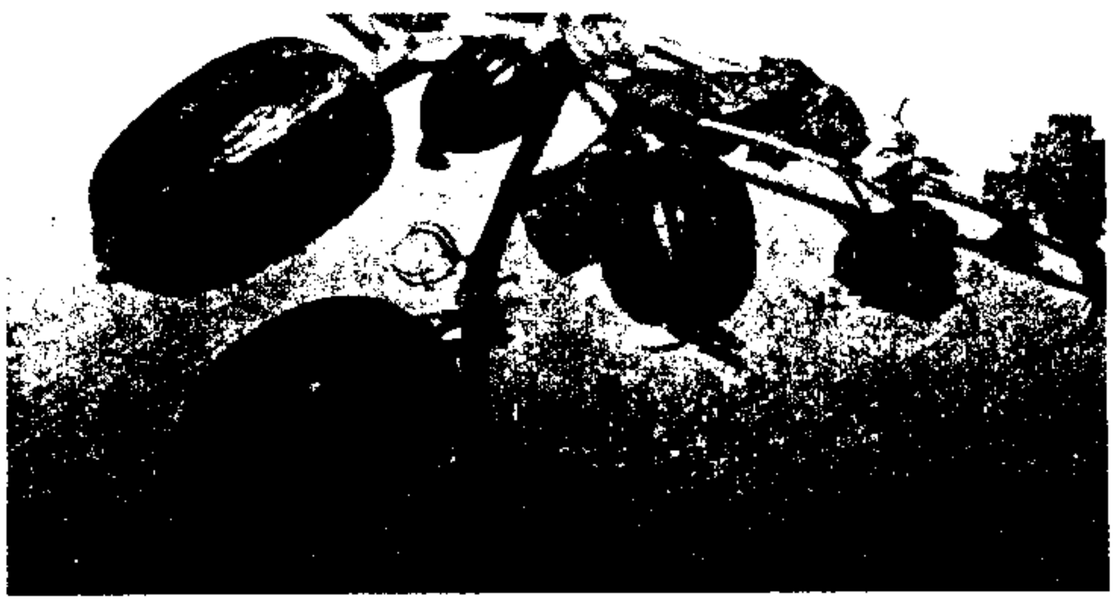
INDIAN arid zone is characterized by high temperature, low and erratic rainfall which limit the scope for production and productivity of vegetable crops. Even under these environmental constraints, a rich variability of some cucurbits such as *Citrullus* and *Cucumis* is found. Owing to their drought hardy characteristics, these species show high productivity under extreme conditions of the hot arid

Mouth-watering Delicacy...

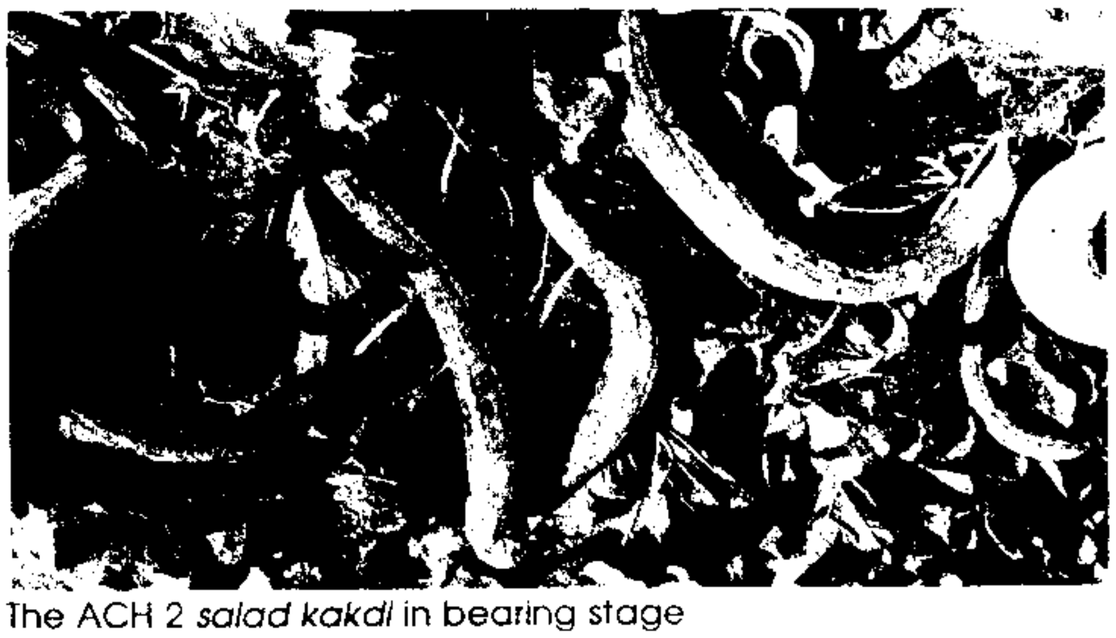
Snapmelon AHS 10 (*left*) and AHS 82 (*right*): The whole and cut fruits ready for *salad* and garnishing vegetables

Kachari AHK 200 in bearing stage

Fruits of AHC 13 (*left*) and AHC 2 (*right*) *Salad kakdi*



Salad kakdi AHC 13 in fruiting stage



The ACH 2 *salad kakdi* in bearing stage

are 31–33 cm in length and 60–65 cm in girth having edible ripe flesh thickness of 11–13 cm and non-edible flesh thickness of 1.4–1.6 cm. The flesh is dark pink, solid (firm) having good eating quality and taste and sweetness of 8.0–8.4% TSS. Seeds are big and bold. Fruit yield is 460–500 q/ha. The fruits do not crack, tolerate high temperature conditions and have excellent keeping and transport quality. It can be grown as summer as well as rainy season crop.

AHW 65

It is a dual purpose (dessert and vegetable), very early and high-yielding selection from the local variability. The fruits mature 72 days after sowing giving medium-sized round fruits with green stripes. Vine are medium in vigour (3.0 m) and

cultivation practice which uses only about one litre water per hill at the time of seed sowing in the month of March. In the absence of standard variety of *mateera*, the farmers are obliged to use heterogenous seed material collected from selected fruits (on the basis of taste). With this objective a wide variability was collected and purified. From which two high-yielding types, AHW 19 and AHW 65, were developed.

environment. The salient features of new varieties are:

Mateera

Mateera (*Citrullus lanatus*) is a drought hardy watermelon type having nutritive and sweet pulp. The ripe fruits are predominantly eaten as a dessert while immature, small green fruits (*loiya*) are used as vegetable. The seeds extracted from ripe fruits are roasted and eaten. The seed kernels are rich in oil (30–40%) which is much edible and nutritive. *Mateera* is cultivated extensively on sandy wasteland dunes as a rainfed crop following a special *bari*

AHW 19

It is a mid-season type developed through selection from local land races. Its vine produces 3.0–3.5 fruits. The fruits can be picked up 75–80 days after sowing. The vines are vigorous (3.5–4.0 m) bearing monoecious flowers, oblong, green to dark green coloured stripped fruits weighing 3.75 kg. The fruits andromonoecious in sex form resulting into high fruit setting. Fruits harvesting at early tend stage (100 g weight) are used as vegetable (*loiya*). A vine yields 3–4 mature fruits giving an yield of 375–400 q/ha. The fruits weigh 2.8 kg each with 25–29 cm in length and 59–61 cm in girth having 14–15 cm thick ripe flesh and 1.5–1.7 cm thick unripe flesh. The flesh is delicious, pink and solid (firm) having 8.0–8.5% TSS. It can be cultivated rainfed during rainy season and as an irrigated crop during very hot summer. The fruits have excellent keeping and transport quality.

Kachari

Kachari (*Cucumis callosus*) is a very drought hardy cucurbit vegetable, growing in arid region during rainy season. The mature fruits are usually cooked with various vegetable preparations, *chutneys*, pickle and for garnishing vegetables or as *salad*. The ripe fruits are peeled and dried whole or sliced and can be stored as such or in powder form. The dehydrated fruits are sold @ Rs 30–50/kg and thus have great potential for exploitation as an industrial crop. *Kachari* powder is used in the market in combination with chilli, turmeric, cumin, *methi*, coriander and other spices to manufacture various kinds of curry powder. Therefore, AHK 119 and AHK 200 were selected and released for cultivation under hod arid environment.

AHK 119

It is an early, high-yielding selection from the land races of *kachari*. The fruits are suitable for processing (dehydration). Fruits are small, egg-shaped having 50–60 g weight, 5–6 cm length and 4–4.5 cm diameter. Average flesh thickness is 0.4 cm and the seed cavity is 3.04 cm in width having too many seeds. The seeds are small and soft. It flowers very early, male flowers appear at 27–28 days and female flowers 38–40 days after sowing. Fruits are ready for harvesting 68–70 days after sowing and the vines continue to fruit up to 110–120 days. The vines are medium long (1.7–2.5 m) with 5–7 primary branches. On an average, 22 fruits are borne per vine giving an yield of 95–100 q/ha. It is drought hardy and can be grown under high temperature conditions. It can be sown in February–March as an irrigated summer crop and in July as a rainfed crop under the arid environment.

AHK 200

It is a very early-maturing variety possessing drought tolerance characteristics. It has been selected from the land races growing in the arid region. The fruits are suitable for granishing vegetables or as *salad*. Big-sized fruits are oblong in shape and develop tough, light-yellow skin at maturity. Fruits are 100–120 g in weight, 7.5 cm in length and 5.1 cm in diameter. Flesh thickness is 1.0 cm and the seed cavity being 2.5 cm. Seeds are few, small, soft and can be eaten as such. The flesh is sweet and tasty. The vines are medium in length (1.75–2.0 m) with 5–6 primary branches. Anthesis of the frist male flowers start after 26–27 days and female flower 32–33 days after sowing. The fruits are ready for harvesting 65–67 days after sowing and the vines continue to fruit for 90–100 days. On an average, 20 fruits can be harvested from a single vine giving an yield of 115–120 q/ha. The variety is suitable for sowing in summer as well as in rainy season under arid environment.

Snapmelon

Snapmelon (*Cucumis melo* var. *momordica*) is a very common cucurbit vegetable in arid region. Its unripe fruits are used as vegetable and to prepare *rayta*. Ripe fruits are used as dessert or *salad*. Snapmelon is cultivated mixed as well as self-sown with other rainfed crop in arid region during rainy season. It can also be cultivated in summer season. However, no standard variety is at present available and the fruit productivity and quality are highly variable and generally poor. This is also one of reasons of the low market price and poor market demand for snapmelon fruits and thus results in low market price and poor market demand for snapmelon fruits and thus results in low economic returns to the growers. Therefore, AHS 10 and AHS 82 were developed for cultivation.

AHS 10

It is an early, high-yielding selection from the local land races growing in the arid region. Fruits become ready for harvesting 67–69 days after sowing. The fruits are oblong and medium in size, 850–950 g in weight, 17–20 cm in length and 9.7–10.5 cm in diameter. Edible flesh thickness is 2.1–2.6 cm, the fruit cavity being 5.5–6.1 cm wide. The whitish pink flesh is sweet in taste having 4.5–5.0% TSS. Male flowers appear 26 days after and female flowers 38 days after sowing. Ripe fruits can be harvested in 67–69 days and up to 120 days after sowing. The vines of this variety are medium in vigour with 2.5 m length. It is highly productive giving 4.0–4.5 fruits/plant and up to 225–230 q/ha under high temperature conditions of summer. It can be grown both as irrigated as well as rainfed rainy season crop.

AHS 82

This selection from the local genetic material collected in the arid region yields uniform, medium-sized and long fruits. Sowing can be done twice in a year, i.e. in summer (February–March) and in rainy season (June–July). Male flowers appear 28 days after and female flowers 35 days after sowing. First harvesting can be done 67–70 days after sowing which continues up to 110–115 days. Plants are vigorous with average vine length of 2.25 m. Each vine bears 4.5–5.0 fruits/plant giving yield of 245–250 q/ha. Fruits are 900–950 g in weight, 22.5–24.5 cm in length and 9.0–9.2 cm in diameter. The edible flesh thickness is 2.21–2.41 cm with 5.4–6.0 cm wide fruit cavity. The flesh is very sweet (4.3–4.9% TSS), tasty and light-pink in colour.

Salad kakdi

Of the 6 *Cucumis* species found in India, *C. sativus* and *C. melo* are widely cultivated. North-western arid part of Rajasthan is rich in the land races of *C. melo* var. *momordica* and *C. callosus*. As a result of natural crossing among different species of *Cucumis*, several new forms have

stabilized which are quite different from the traditional forms. Some of the natural combinations of *Cucumis* species resemble cucumber and long melon. They are commonly used and called *salad kakdi*. Besides *salad*, tender fruits can be used for garnishing vegetables. The unripe mature fruits are cooked as vegetable. It is quite drought hardy and the vine attain good vigour even under high temperature conditions and stresses, and are highly productive. In order to develop standard commercial varieties for arid agroclimate AHC 2 and AHC 13, were stablized for use as *salad*.

AHC 2

It is a selection from the local strains of natural combinations of *Cucumis* species. Fruits are medium-long with light green skin without furrows. It matures very early and gives high yield of uniform, long fruits borne in abundance. Harvesting starts 8–12 days after fertilization. Male flowers appear within 33–35 days and female ones 45 days after sowing. Fruits become ready for harvesting 53–55 days after sowing and the vines continue to bear up to 90–100 days. Fruits of 275–300 g weight are suitable for slicing when their length is 30–35 cm and diameter 3.0–3.5 cm. The seeds are soft and devoid of bitter principle. The flesh is crisp textured and solid. The flesh thickness is 1.4–1.5 cm. The vines of this variety are medium long (2.10-2.15 m) with 6–7 branches. About 12–15 immature fruits can be easily harvested giving an average fruit yield of 4 kg/vine and up to 175–202 q/ha. Sowing can be done in February–March for summer crop and in July for rainy season crop.

AHC 13

It is a very early and highly productive slicing type variety. It has profuse bisexual flowering. Small fruits at very early stage (only after 3–6 days of fertilization) can be used for slicing. Fruit are oblong in shape with dark green stripes on the skin. The vines of this type are medium in length (2.1 m) with prolific bearing ability. Male flowers appear after 28–30 days and bisexual flowers 34–35 days after sowing. First harvesting can be obtained 50 days after sowing which continues up to 90–100 days after sowing. Timely continuous picking of fruits ensures good yield. About 20–25 fruits are borne per vine. The tender fruits weigh 75–100 g each which are about 5.5–7.0 cm in length and 4.4–5.0 cm in diameter. The flesh is cripsy and tasty with about 1.0 cm thickness. Seeds are soft and devoid of bitter principle. On an average, 2.15 kg tender fruits can be harvested per plant with an yield potential of 85–125 q/ha. This variety has excellent heat tolerance and can be grown in February–March and June–July under hot arid situations.

SUMMARY

The Central Institute for Arid Horticulture, Bikaner, has a large collection of semi-cultivated land races of *mateera* (a type of watermelon, *Citrullus lanatus*), *kachari* (*Cucumis callosus*), snapmelon or *phoot* (*Cucumis melo* var. *momordica*) and *salad kakdi* (*Cucumis* species). Since these are under-exploited crops, their high-yielding varieties have been identified for systematic cultivation.

For further interaction, please write to: Dr O.P. Pareek (formerly Director) and Dr D.K. Samadia (Scientist), Central Institute for Arid Horticulture, Beechwal, Bikaner 334 006.