

Ethnobotanical Importance of Cucurbits in India

J. P. Singh, R. K. Beniwal and N. D. Yadava

CAZRI, Regional Research Station, Bikaner –334 004 (Rajasthan)

Ethnobotany, the discipline that provides the traditional usages of plants in a variety of forms by various ethnic and tribal groups has received much attention throughout the world. India represents one of the greatest emporia of ethnobotanical wealth. The traditional knowledge about various uses of plants is still preserved by primitive societies, ethnic races, tribal and rural in India, which has a sizeable population in various agroclimatic zones.

Cucurbits are regarded as an important group of vegetable crops particularly in arid and semi-arid region and exhibit a wide range of vegetables used for cooking, as *salads*, for pickling or as preserved vegetables. In India a number of wild species occur in grasslands, forests, and also on field hedges. Most of the cucurbits are of tropical and sub-tropical distribution, mostly climbing herbs, tendril bearing, succulent prostrate or some of are perennial in nature with tuberous rootstock. In cucurbits, the cultivated species like ridge gourd, smooth gourd, round gourd, pointed gourd are the examples of crop species that originated in India (Arora, 1996) and also the secondary centre of diversity in pumpkin (*Cucurbita* spp.) and chayote (*Sehium edule* Sw). Some of the cucurbits have remarkable adaptations to harsh deserts climate in arid ecosystem. The species like *Acanthosicyos horrida* Welw. ex Hook. f. which occurs in the extremely dry south-west African desert, shows the remarkable adaptations to xeric conditions (Singh, 1964).

Cucurbits have long been important in the internal food trade in arid region. In desert region cucurbits provide an appreciable cash income to farmers and specially the small farmers. In these areas traditional farming systems have a wide range of variability in cucurbits and provide wide range for selecting resistance or tolerance genotypes towards biotic and abiotic stresses. Many land races or folk varieties of cucurbits were developed to suit ecological and socio-economic conditions with a view to attain stability and diversification in production system. The indigenous knowledge systems built up over generations exhibit a lot of wisdom and have scope for inclusion in the modern management practices. There are no definite reports on ethnobotanical study related to the family Cucurbitaceae.

Therefore, an attempt has been made to pool the available information on utilization of cucurbits for various purposes.

Edible food

Cucurbitaceae is one of the important plant families which provides a large number of edible species in arid and semi-arid region for edible fruits, seeds, leaves, shoots and roots (Table 1). The wild cucurbits also provide added nourishment to the diet of rural and tribal population. Some of the wild cucurbits are of great importance as emergency food and also in times of famine and food scarcity in India (Table 2). Watt (1889-1896) mentioned that leaves of bitter gourd were eaten in the Khandesh area, Maharashtra during the famine of 1877-78. In Western Rajasthan species like kachri (*Cucumis callosus*) and mateera (*Citrullus lanatus*) grow wild in sandy tract especially in districts of Barmer, Bikaner, Churu and Jaisalmer. Ripe fruits of these are eaten fresh while green ones are commonly used as vegetable. The fruits of some of the cucurbits like *Cucumis melo* var. *agrestis*, *C. callosus*, *Momordica charantia* are sun dried and stored for off-season vegetable. Tender tops and shoots of pumpkin, squash, bottle gourd and pointed gourd are also used as vegetable. The tuberous roots of Kakora (*Momordica dioica*) are used to make *Tikhur*, a food product in tribal areas in Madhya Pradesh (Maheshwari, 1995). In Ethiopia, the tubers of anchote (*Coccinia abyssinica* (W. & A.) Cogn.) are eaten after boiling (Arora, 1985). In India also the roots of ivy gourds (*C. grandis*) are eaten by tribals in Varanasi district, Uttar Pradesh. (Singh and Maheshwari, 1985).

In arid region edible seeds of cucurbits provide an important source of vegetable protein. The roasted seeds of mateera (*C. lanatus*) are largely eaten in western Rajasthan. The seed of mateera (*C. lanatus*) and tumba (*C. colocyntidis*) are mixed with pearl millet grains to improve the quality and also to provide better taste and luster to the baked *chapattis* (pancake) (Shankarnarayan and Saxena, 1988). A delicious dish called *khankara* is also preferred by the inhabitants of desert by mixing the tumba seeds with the seeds of grasses viz., bhurut (*Cenchrus biflorus*) and dhaman (*Cenchrus setigerus*). Some times the seeds are mixed with flour of moth bean (*Vigna acornifolia*) to prepare breads (Singh and Pandey, 1998). The seed kernels of tumba also are eaten as food by some of the natives of African desert (Watt 1889-1896). The seeds of watermelon and snap melon are also used in different traditional preparations. The popular preparation of *Pachkutta* in Marwar includes the fruits of kachri (*C. callosus*) along with the fruits of ker (*Capparis decidua*), and *gonda* (*Cordia dichotoma*), seeds of kumut (*Acacia senegal*) and pods of *sangri* (*Prosopis cineraria*).

The seed of buffalo gourd (*Cucurbita foetidissima* H.B.K.) are roasted or made into porridge by North American natives. They are rich in edible oil, protein and investigated for value as world food crop (Turner, 1981). Seeds of *Acanthosicyos horrida* Welw. ex Hook. f. contain a considerable quantity of fat. In South Africa they are regarded as an excellent

substitute for almonds (Singh, 1964).

Some of the wild cucurbits contain harmful substances but traditionally these are specially treated in some way to remove or reduce the effect of undesirable substances. For example, the bitter seeds of tumba are buried with common salt to wash off their bitterness, dried and mixed with bajra (pearl millet) grains and taken in times of scarcity during famines (Bhandari, 1990). In some places tumba seeds are soaked in water for three days and then washed for several times and then mixed with pearl millet grains. Watt (1889-1896) also mentioned that seed kernels of tumba are heated to boiling, then washed with cold water, dried and powdered and eaten with dried dates or used in other ways as food. He also mentioned that tumba fruits are also made into preserves with sugar, having previously been pierced all over with knives and then boiled six or seven times, until all the bitterness disappears. The fruits of *karvela* (bitter gourd) are also boiled with salt to remove the bitterness.

Table 1 : Commonly cultivated cucurbits in India

Scientific name	Common name	Local name	Parts used
<i>Benincasa hispida</i> (Thunb.) Cogn.	Ashy gourd, Wax gourd, White gourd	Petha	Fruit, seeds
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai. Syn. <i>C. vulgaris</i> Schrad.	Watermelon	Tarbooj	Fruit, seed,
<i>Citrullus fistulosus</i> Stocks	Round gourd	Tinda	Fruit
<i>Coccinia grandis</i> (L.) Voigt	Ivy gourd	Kanduri, Kundru	Fruit
<i>Cucumis anguria</i> L.	Bur gherkin		Fruit,
<i>Cucumis callosus</i> (Rott.) Cogn..		Kachri	Fruit
<i>Cucumis melo</i> L.	Musk melon	Kharbooja	Fruit, seed
<i>Cucumis melo</i> L. var. <i>momordica</i> Duth. & Full.	Snap melon	Phunt	Fruit, seed
<i>Cucumis melo</i> L. var. <i>utilissimus</i> Duth. & Full.		Kakdi	Fruits
<i>Cucumis sativus</i> L.	Cucumber	Khira	Fruits
<i>Cucurbita maxima</i> Duch. Ex Lam.	Red pumpkin, Red	Staphal	Fruit, seed
<i>Cucurbita moschata</i> Duch. ex Peir	Squash	Mitha Kaddu	Fruit, young tops/shoots
<i>Cucurbita pepo</i> L.	Marrow, Pumpkin,	Vilayati Kaddu, Kumra	Fruit, seed
<i>Cyclanthera pedata</i> (L.) Schrad.	Stuffing cucumber	Meetha karela	Fruit (Native to North America and now cultivated in hill region of north India)
<i>Lagenaria siceraria</i> (Molina) Standl.	Bottle gourd	Loki	Fruit
<i>Luffa acutangula</i> (L.) Roxb.	Angled loofah, Ridge gourd	Kall toral	Fruit
<i>Luffa cylindrica</i> (L.) M. J. Roem	Smooth, Sponge gourd	Ghia toral	Fruit, seed
Syn. <i>L. aegyptiaca</i> Mill			
<i>Momordica charantia</i> L.	Bitter gourd	Karela	Fruit

Scientific name	Common name	Local name	Parts used
<i>Momordica cochinchinensis</i> (Lour.) Spreng.	Cochin gourd	Kakrol	Fruit
<i>Momordica dioica</i> Roxb. Ex Willd.	Kaksa, Small bitter gourd	Kakora	Fruit
<i>Sechium edule</i> (Jacq.) Swartz	Chayote, Chocho	Launki	Fruit
<i>Trichosanthes anguina</i> L.	Snake gourd	Chachinda	Fruit
<i>Trichosanthes cucumeriana</i> L.		Jangli chachinda, Rambel	Fruit
<i>Trichosanthes dioica</i> Roxb.	Pointed gourd, Patol	Parwal	Fruit

Table 2 : Wild cucurbits used in tribal and rural areas in India

Scientific name	Local name	Utilization
<i>Citrullus colocynthis</i> (L.) Schrad	Tumba	Seeds after washing mixed in pear millet grains for making <i>Chapati</i> .
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Mateera	Fruit pulp is used as cooling drink in western Rajasthan. Unripe fruits locally called as <i>Loela</i> are used for vegetable.
<i>Coccinia grandis</i> (L.) Voigt	Kanduri	Ripe fruits are eaten fresh and unripe ones used for curry. Roots are boiled and eaten in Varanasi, UP (Singh and Maheshwari 1985). Young shoots also eaten in Manipur (Sinha, 1996).
<i>Cucumis callosus</i> (Rott.) Cogn.	Kachri	Fruits eaten fresh or used for curries. Fruits also preserved for future consumption.
<i>Cucumis melo</i> L. var. <i>agrestis</i> Naud.	Kachri, Pehnta	Fruits used as vegetable and also preserved.
<i>Cucumis melo</i> L. var. <i>momordica</i> (Roxb.) Duthie & Fuller	Barokachro	Immature fruits as vegetable and ripe fruits eaten fresh.
<i>Diplocycos palmatus</i> (L.) C. Jeffrey	Kau-karela (Assam)	Fruits are eaten in Assam (Borthakur, 1996) and also by Kani tribe in Kerala (Radhakrishnan <i>et al.</i> , 1996)
<i>Edgaria daryllingensis</i> Cl.	-	Young buds are used for curry in Kurseji region, West Bengal (Jain and Sinha, 1988).
<i>Hodgsonia macrocarpa</i> (Bl.) Cogn. Syn. <i>Hodgsonia heteroclitia</i>	Kha-un (Mizoram), Kagoba, <i>Thi-be</i> (Garos)	Seeds are roasted and kernels eaten. Much liked by Mizo and Manipur tribals (Aroa, 1981).
<i>Kedrostis rostrata</i> (Rott.) Cogn. Syn. <i>Bryonia rostrata</i> Rottl., <i>Rhynchoscarpa foetida</i> C.B. Clarke		Leaves are used for flavoring purposes in Peninsular India (Singh <i>et al.</i> , 1990).
<i>Solena heterophylla</i> Lour. Syn. <i>Melothria heterophylla</i>	Gomoth, Lambi shebot (Manipur)	Fruits eaten raw in Rajasthan (Singh and Pandey, 1998). Roots, leaves and fruits also eaten in Manipur (Sinha, 1996).
<i>Melothria perpusilla</i> Cogn	Bankundri, Birkundri	Fruits are used as vegetable in Purulia district, West Bengal (Jain and Sinha, 1988).
<i>Melothria zeylanica</i> Cl.	Gam	Whole plant used as vegetable in Mahabaleshwar, Maharashtra (Jain and Sinha, 1988).

Scientific name	Local name	Utilization
<i>Momordica balsamina</i> L.	Bankarela	Fruits are cooked as vegetable.
<i>Momordica charantia</i> L. var. <i>muricata</i> (Willd.) Chakraborty	Tika Karela	In Assam, leaves, shoots and fruits eaten as vegetable (Borthakur, 1996).
<i>Momordica dioica</i> Roxb. ex Willd.	Kakora	Tuberous root, tender leaves and fruits eaten as vegetable.
<i>Momordica tuberosa</i> Cogn.	Kadavanchi	Fruits mainly used in Maharashtra and Tamil Nadu.
<i>Trichosanthes nerifolia</i>	-	Used as edibl greens by tribals of Tamil Nadu (Ravishanker, 1996).

Medicinal importance

Traditional medicines especially the herbal medicines, have recently received much attention the world over. Some of the species have lead to isolation of new chemical substances for preparation of herbal drugs. Since ancient times, indigenous culture worldwide have employed a variety of cucurbits to cure various ailments (Robinson and Decker-Walters, 1997). In India, cucurbits like *Bemincasa hispida*, *Diplocycus palmatus*, *Citrullus lanatus*, *Cucumis utilisissimus*, *Luffa acutangula*, *Momordica charantia*, *Trichosanthes angina*, *T. cordata* etc have an important place in traditional system of medicine. Watt (1889-1896) mentioned that in sunstrokes pieces of cucumber are put on the bed so that the patient may breathe moistened air in order to neutralize the heat of his body. The fruits of red pumpkin are cut into small circular chips, is a good application to relieve burning of hands and feet in fever. Several wild as well as cultivated species are used in tribal and rural areas to cure many diseases and ailments (Table 3 and 4).

Table 3 : Cucurbits used in ethnomedicine in rural and tribal areas in India

Scientific name	Local names	Utilization
<i>Citrullus colocynthis</i> (L.) Schrad.	Tumba (Rajasthan) Kaduvrindavan (Maharashtra)	In Rajasthan, <i>Bilis</i> use roots in jaundice, urinary disorders and rheumatism; root decoction is used in earache in Barmer; immature fruits stuff with salt and ajwain, put it for few days and then taken to cure stomach ache (Singh and Pandey, 1998); roots also used as purgative to relieve constipation and seed oil is applied on skin diseases at Nachna, Jaisalmer. Leaves and fruits used as anthelmintic and alopecia in Maharashtra (Kumbhojkar <i>et al.</i> , 1999). In Andhra Pradesh, it is used in piles (Rao, 1989).
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai.	Mateera (Rajasthan)	In western Rajasthan, fruit juice is used against sunstrokes. Regular use of fruit pulp is supposed to cure the stone formation.