

## Post-Harvest Management of Kair

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**ARTICLE ID: 107**

### **Introduction:**

*Capparis decidua* commonly known as Kair, is an important indigenous shrub found growing along farm boundaries, orans, go chars (local grasslands) and wastelands, widely distributed in arid and semi-arid tracts of India. It is a densely branched shrub, reaching a height of 4-5 m, with a clear bole of 2.5 m. Its branches are tender and waxy with rough, corky, gray bark. Kair has the ability to survive in various habitats and can grow unattended and unprotected on barren lands. It has good soil binding capacity, a fair tolerance to salinity and alkalinity, and can help to improve the fertility of sand dunes and reduce alkalinity. Its xerophytic qualities, including a deep taproot system, scanty foliage, mucilaginous sap and tough conical spines make this shrub suitable for cultivation on a large scale, especially to combat soil and wind erosion on sandy wastelands. Significantly, the plant's unique capacity to tolerate drought and heat make it a good weather forecasting species, and it has played an important role in the rural economy of western Rajasthan and



**Fig.1Kair fruit**

Gujarat. It provides people with food (pickle and vegetable), medicine, fodder, wood for carving, and fuel. The plant's mature fruits serve as valuable and integral source of nutrition for villagers of arid and semiarid regions, and the immature fruits are collected from

natural stands and serve an additional source of income and nutrition for the rural poor. Medicinally, it is used to treat in cardiac and gastric troubles. It is also commonly used as a bio fence and its termite-resistant wood is used by rural people for making handles, cartwheels, and other items.

Identifying the precise country of caper's origin is near impossible, and in fact, the range of the fruit's native habitat is wide. Many variants of capers are native to the Mediterranean basin in the west, parts of North Africa, and as far east as Central Asia. As a condiment, capers date back over 5,000 years. *Capparis decidua*'s native to several countries including Chad, Egypt, Ethiopia, India, Iran, Jordan, Mauritania, Niger, Nigeria, Pakistan, Senegal, Somalia, South Africa and Sudan

Kair grows wild and unattended throughout India's arid northwest regions. In Rajasthan and Gujarat, the little berry is a staple within the rural economies. Over 7,000 tonnes of fruit are produced in the Rajasthan districts of Jodhpur and Bikaner alone. A prime reason for the fruit's significance is the tree's ability to survive in regions where no other vegetation can: Indeed, its only growing requirements are low rainfall, shallow soils, and dry, hot temperatures. Ker shrubs bear fruit two to three times a year, March - April, May -July. If the shrub bears for a third time, it will occur during the winter October - November. As a survival mechanism, highest fruiting happens during the driest times of the year. The best fruits come from the March-April crop, and the fruits from the winter crops are of significantly poorer quality.

#### **Nutritive and Medicinal Values:**

Fruits and flower buds are rich in surface wax, while seeds are rich in oils. The fruits contain alkaloids, glycosides, terpenoids, sterols, flavanoids, phenols (anti-bacterial) and fatty acids. A side from economic uses, *kairis* also tapped for its medicinal qualities. The plant has a bad smell and taste; it is carminative, tonic, emmenagogue, aphrodisiac, alexipharmac, improves the appetite; good for rheumatism, lumbago, hiccough, cough and asthma. When pickled or cooked as vegetables, the immature fruits are used to cure stomach problems, especially constipation.

#### **Harvesting**

Hand picking the fruits is a common practice for harvesting. By hand picking, only tender fruits are harvested and mature ones are avoided, hence there is no need for further

grading of the fruits. Moreover, the plants are spiny in nature, thus careful harvesting is required. Sometimes, harvesting the fruits with twigs attached is also seen but this affects the plant vigor and subsequent fruiting.

### **Maturity indices**

*Kair* comes into fruit after 4-5 yrs of age. The fruits are harvested in April-May. The fruits should be harvested when green and tender at the “small pea” stage for pickling and use as a vegetable. The stage can be judged by the size of the fruits and also by pressing the berries. It is also suggested that the fruits should be harvested 7-10 days after fruit set, when they are 5-8 mm diameter, during March-April, to fetch a better price in the market. After maturity, the seeds harden and the fruits are not preferred for consumption. The fruits of the second flowering, available in September- October, are not usually harvested as the crop load is poor.

### **Post harvest technology**

Fruits are sold in the local or distance market after harvesting. Due to their astringency (due to presence of phenols and tannins) fruits are not eaten fresh. Fruits astringent taste can be removed by treating these with 5 per cent salt solution or by dipping for 4-5 days in butter milk in earthen pots. After this treatment, the fruits are used as vegetable or can be dried for further use. Drying can be achieved by keeping fruits in open sunny condition and then preserve these. The dried fruits, with 5-7 per cent moisture, can be preserved for long time in airtight containers

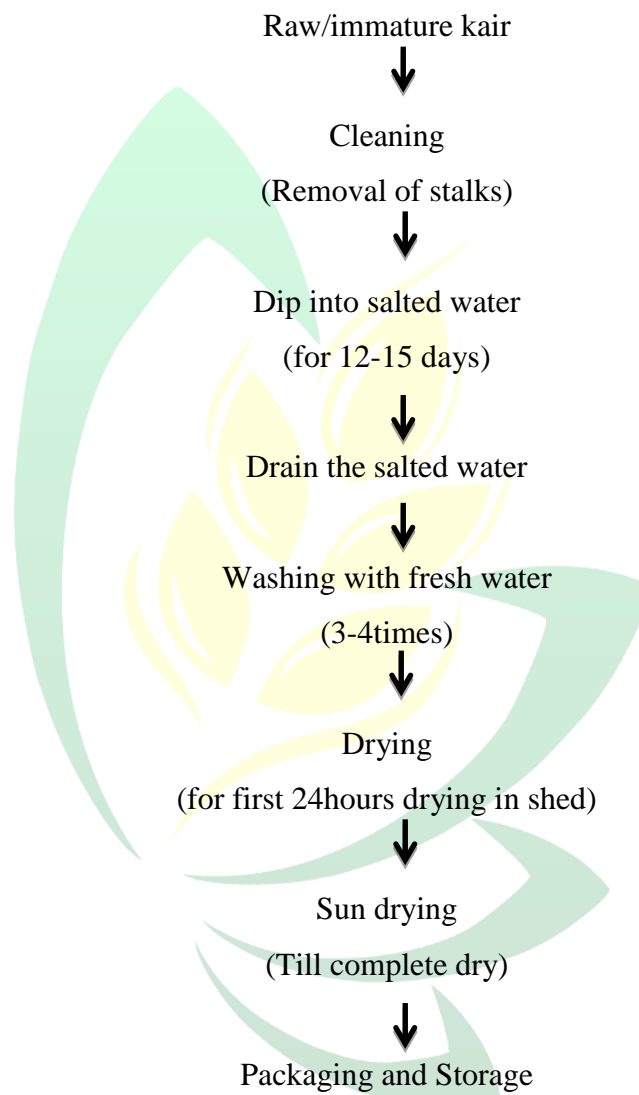
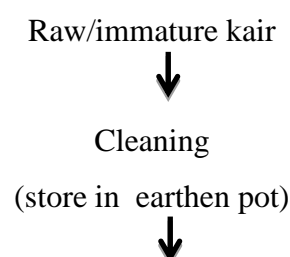
### **Storage**

The fruits are stored either in pots or in plastic containers, while processed dried fruits are stored in flexible polybags at ambient conditions of temperature and relative humidity. Dried fruits can be stored in polybags without any deterioration in the quality long time.

### **Processing/Value addition:**

The unripe/ripe fruits of *kair* are generally not eaten fresh due to their acrid taste, but can be converted into a variety of by-products after processing. The pickles are the most commonly and widely utilized post-harvest product of *kair*. The processed fruits can be utilized directly for preparation of pickles or as a vegetable or can be dehydrated for off-season utilization. Based on the size, three relative grades of processed *kair* are available in the market; big, medium and small size. In fact, the basis of size grading is the relative

maturity of fruits. The smaller fruits are more tender and of better quality than the bigger fruits. The processed fruits are stored either in pots or in plastic containers while processed dried fruits are stored in flexible polybags. The dried fruits can be stored in polybags for a year without any deterioration in the quality.

**Flow chart for dried kair:****Flow chart for kair pickle:**



Mix Curd (250 g) and sail (50 g) in per kg fruit



Add water till fruits are properly embedded



Keep the pot in sunny place after closing the lid



Drain water after 4 days

(Repeat the process at least 4 times)



Taste the fruit as it gives flat and salty test or repeat the process again, if needed



Packaging and Storage

### Other by-products

New sprouted shoots are used as fodder for camel and goat during spring summer season. The plant and its parts are widely used by traditional healers and tribal people for curing variety of ailments. The *kair* branches can be used for fencing, which are not affected by white ants and also as firewood, as it burns quickly. It is very efficacious plant for checking soil erosion by wind and water.

### Conclusion:

*Kair* has proven to be an economically important plant in Rajasthan and elsewhere. It provides varied food and medicinal uses, building materials, fuel wood, and other income-generating opportunities. It contributes to environmental sustainability due to its soil-binding capacity and its ability to improve the soil fertility of sand dunes and to reduce soil alkalinity. Extensive research and support activities are thus needed to maximize the production, propagation, and utilization of this species to help contribute to rural livelihood and enhancement of desert lands. Some of these research and support activities include the following: establishment of a germ plasm bank for seeds or suckers of *kair* from the different regions of India to conserve the plant's genetic variability; development and promotion of intensive cultivation practices for the sustainable production and utilization of *kair*; development of methods for cloning of selected germ plasms through vegetative means, as



the seed-raised plants are not necessarily true-to-type, and promote the value of the plant widely, while stressing the need for its conservation.

