

The Most Worn Bead Plant



It's called *Coix lacryma-jobi* in botanical nomenclature, but don't let that put you off. That's just the Latin way of saying "Job's Tears." The annual grass produces a fruit shaped like a teardrop. Since no one shed more tears than the Biblical Job, its name in the West, and thus in the botanical literature, was secured. An alternate name, used by Catholic rosary makers is "Mary's Tears."

Job's Tears were once an important source of food. Botanists disagree over its place of origin. The great, N.I. Vavilov (a victim of the pseudoscience that dominated Stalin's USSR) placed its origin in the Greater Sundas. These are the four largest islands of Indonesia (Borneo, Sumatra, Java and Sulawesi, formerly the Celebes). Anglo-Indian botanists believe it originated in northeast India.

In either case, it was domesticated very early for food. Maybe even before rice. In the wild, the fruit has a hard, shiny coat. After domestication, this coat becomes less hard and easier to cook into a porridge. It ranks --- along with wheat and barley in the Near East; beans, corn, squash and pepper in the Americas; and rice in Asia -- as one of the earliest domesticated plants.

What makes this plant so important to the bead world is that the fruit is perfect for stringing. It is one of the rare natural beads in either the plant or animal kingdoms. At its tip is a hole that allows the flower to emerge. When picked off the stem, the rounded end breaks off, leaving a hole. The inside is so soft that it is easily pierced. Hence, an instant bead.



Two varieties of Job's Tears. On the left is the *stenocarpa* variety from the Karens of Thailand. On the right is the *monilifer* variety from the Bontoc, the Philippines



How long have Job's Tears been used for beads? We will probably never know. One was found in Timor (one of the smaller Indonesian islands) dating to about 3000 B.C. It was reported as a "bead," but there is no other evidence to support this idea.

However, from a recently excavated site in western India comes indisputable proof that Job's Tears were used as beads around 2000 B.C. A beadmaking shop was uncovered, where the workers were crafting beads from steatite (soapstone). Within the shop were many Job's Tears, apparently to be strung up with the steatite beads.

At a southern Indian archaeological site dated to the first century or so, a wire was excavated with five Job's Tears strung on it. Job's Tears are common finds in south Indian sites. Archaeologists were calling them "rice beads," because the plant grows wild in rice fields. Now they know what they are.

Today Job's Tears are everywhere. The plant has been introduced to many countries, where it is used as a food supplement (you can buy it in health food stores in the US). I recently ran across a photo of myself taken in New York City in 1968 or 1969. I was wearing a triple strand of colored Job's Tears. (I wonder where it is now.)

An article published in 1925 said that you can't color Job's Tears, but, of course you can. Maybe there was no known way to color them before 1925, or maybe the author didn't know what she was talking about. It was in an obscure publication, retrieved for me by the late Elizabeth Harris from the Los Angeles Library. She said it took her nearly a day to find and hoped it was worthwhile. Yes, Elizabeth, it was. Thanks again.



Coix lacryma-jobi L.

Poaceae

Job's-tears, Adlay, Millet

Source: James A. Duke. 1983. Handbook of Energy Crops. unpublished.



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Uses

Weed to some, necklace to others, staff-of-life to others, job's tear is a very useful and productive grass increasingly viewed as a potential energy source. Before *Zea* became popular in South Asia, *Coix* was rather widely cultivated as a cereal in India. Still taken as a minor cereal, it is pounded, threshed and winnowed, as a cereal or breadstuff. The pounded flour is sometimes mixed with water like barley for barley water. The pounded kernel is also made into a sweet dish by frying and coating with sugar. It is also husked and eaten out of hand like a peanut. Beers and wines are made from the fermented grain. Chinese use the grain, like barley, in soups and broths.

Folk Medicine

According to Hartwell (1967-1971), the fruits are used in folk remedies for abdominal tumors, esophageal, gastrointestinal, and lung cancers, various tumors, as well as excrescences, warts, and whitlows. This folk reputation is all the more interesting when reading that coixenolide has antitumor activity (List and Horhammer, 1969-1979). Job's tear is also a folk remedy for abscess, anodyne, anthrax, appendicitis, arthritis, beriberi, bronchitis, catarrh, diabetes, dysentery, dysuria, edema, fever, gotter, halitosis, headache, hydrothorax, metroxenia, phthisis, pleurisy, pneumonia, puerperium, rheumatism, small-pox, splenitis, strangury, tenesmus, and worms (Duke and Wain, 1981). Walker (1971) cites other medicinal uses.

Chemistry

Per 100 g, the seed is reported to contain 380 calories, 11.2 g H₂O, 15.4 g protein, 6.2 g fat, 65.3 g total carbohydrate, 0.8 g fiber, 1.9 g ash, 25 mg Ca, 435 mg P, 5.0 mg Fe, 0 ug beta-carotene equivalent, 0.28 mg thiamine, 0.19 mg riboflavin, 4.3 mg niacin, and 0 mg ascorbic acid. According to Hager's Handbook

(List and Horhammer, 1969-1979), there is 50-60% starch 18.7% protein (with glutamic-acid, leucine, tyrosine, arginine, histidine, and lysine) and 5-10% fatty oil with glycerides of myristic- and palmitic-acids.

Description

Annual (in the temperate zone) but perennial where frost is absent or mild, freely branching upright or ascending herb 1-2 m tall, the cordate clasping leaf blades 20-50 cm long, 1-5 cm broad. Spikelets terminal, and in the upper axils, unisexual, staminate spikelets two-flowered, in twos or threes on the continuous rachis; pistillate spikelets three together, one fertile, and two sterile; glumes of the fertile spikelet several-nerved, all enclosed finally in a bony beadlike involucre, the grain, white to bluish white, or black, globular orvoid, 6-12 mm long.

Germplasm

Reported from the Indochina-Indonesia Center of Diversity, Job's Tears or cvs thereof is reported to tolerate laterite, low pH, photoperiodic latitude, poor soil, slope, virus, and waterlogging. ($2n = 10, 20$) (Duke, 1978)

Distribution

Native perhaps to southeast Asia, but now rather pantropical as cultigen and weed. Listed as a serious weed in Polynesia, a principle weed in Italy and Korea, a common weed in Hawaii, Iran, Japan, Micronesia, and Puerto Rico, also in Australia, Borneo, Burma, Cambodia, China, Congo, Colombia, Costa Rica, Dominican Republic, Fiji, Ghana, Guatemala, Honduras, Hong Kong, India, Iraq, Melanesia, Nepal, Pakistan, Peru, Philippines, Rhodesia, Senegal, South Africa, Sudan, Thailand, United States, and Venezuela (Holm et al, 1979).

Ecology

Ranging from Cool Temperate Moist to Wet through Tropical Very Dry to Wet Forest Life Zones, Job's Tears is reported to tolerate annual precipitation of 6.1 to 42.9 dm (mean of 31 cases = 17.9) annual temperature of 9.6 to 27.8°C (mean of 31 cases = 21.5) and pH of 4.5 to 8.4 (mean of 23 cases = 6.2). (Duke, 1978, 1979)

Cultivation

Propagation by seeds, sown during monsoon (in India) at rate of 6-10 kg/ha. Seed dibbled 2.5 cm deep, at spacing of 60 x 60 cm. One intercultivation, before the plants tiller, and shade on ground may be necessary. Sufficient rains in early stage of growth and a dry period when grain is setting are necessary for good yields. Plants respond well to liberal applications of organic manure.

Harvesting

Crop harvested in 4-5 months after sowing. Plants are cut off at base and grain separated by threshing. Seeds are dried in sun prior to milling. Adlay flour milled and used with wheat flour for baking purposes.

Yields and Economics

Yields vary as to strains cultivated in different countries: yield of unhusked grains in Philippine Islands is about 3.5 T/ha; in Sri Lanka, 2.1 T/ha. In some areas 40-75 bu/acre is considered good under average

conditions. Loss in hulling is about 30-40% in Philippine Islands and 70% in Sri Lanka. Adlay is extensively cultivated in Philippine Islands, Indochina, Thailand, Burma, and Sri Lanka, and is used as an auxiliary food crop, especially as a substitute for rice. It does not enter international trade, although it is used locally in large quantities.

Energy

According to the phytomass files (Duke, 1981b), annual productivity ranges around 5 MT/ha, but few data are available. Duke's field observations in Panama suggest that in Tropical Fresh Water Swamp situations, standing biomass visually suggests closer to 10-20 MT/ha. In Mali, it provides only 45-53 MT fresh fodder/ha. If perennial in the tropics, there is the good possibility that 2 MT grain and 10 MT biomass could be harvested renewably, with proper soil management.

Biotic Factors

Following fungi attack adlay: *Cladosporium herbarum*, *Curvularia coicis*, *Diplodia coicis*, *Epicoccum hyalopes*, *Fusarium equiseti*, *F. graminearum*, *F. moniliforme*, *F. semitectum*, *Helminthosporium coicis*, *Ophiobolus graffianus*, *Phyllachora coicis*, *Phyllosticta coixicola*, *Ph. coix-lacrimae*, *Puccinia operta*, *Nigrospora sphaerica*, *Trilletia okudaire*, *T. taiana*, *Uredo operta*, *Ustilago coicis*, *U. lacrymae-jobi*. Leaf-gall virus and the nematode *Meloidogyne incognita acrita* also attack this plant. Most losses are due to rats and parrots.

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[Complete list of references for Duke, Handbook of Energy Crops](#)

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