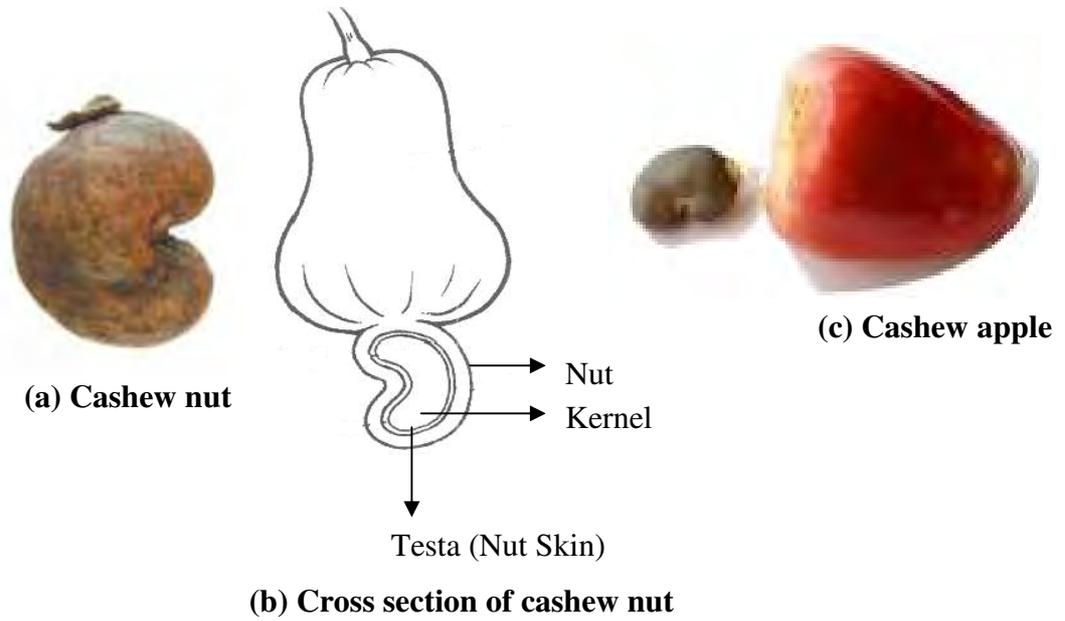


Anacardium occidentale Linn. – Cashew

- **Botanical name:** *Anacardium occidentale* Linn.
- **Family name:** Anacardiaceae
- **Common name:** Cashew, The cashew nut
- **Synonym:** *Cassavium pomiferum*
- **Common names:**
 - Sanskrit --- Agnikrita
 - English --- Cashew
 - French --- Anacardier
 - German --- Acajubaum, Kaschubaum, Nierenbaum
 - Portugese --- Cajú, cajueiro
 - Spanish --- Anacardo, marañón, merey
 - Hindi, Manipuri, Marathi, Konkani --- Kaju
 - Tamil --- Mundiri, Andima
 - Malyalam --- Kasu mavu
 - Telugu --- Munthamamidi
 - Kannada --- Godambi, Geru
 - Bengali --- Hijli Badam
- **Taxonomic Hierarchy**
 - Kingdom Plantae --- Planta, plantes, plants
 - Subkingdom Tracheobionta --- vascular plants
 - Division Magnoliophyta --- angiosperms
 - Class Magnoliopsida --- dicots, dicotyledons
 - Subclass Rosidae
 - Order Sapindales
 - Family Anacardiaceae --- cashews
 - Genus *Anacardium* L. --- anacardium
 - Species *Anacardium occidentale* L. --- Cashew



(d) Cashew nut flowers



(e) Cashew leaves



(f) Cashew nut skin - Testa

Figure 3.1: Various parts of cashew tree

➤ **Occurrence:**

Tropical America, Jamaica, South Africa, Malagasy, Mozambique, West Indies, Southeast Asia including India, Sri Lanka and Philippines.

➤ **Botanical Description:**

- ***Leaves:*** The leaves are short-stemmed, simple, oval shaped, breech-oblong with notched edges and strokes. They have a pointed base and rounded tip, curved inwards. The leaves are simple, alternate, yellowish green to dark green brownish in colour, length 4 cm to 22 cm and width 2 cm to 15 cm. They have a rounded tip with a small indentation in the middle, tapering base (acutus) and a flat edge (truncatus). The petiole is about 3 cm in length, pinnate and the upper and lower leaf surfaces are smooth, not hairy.
- ***Flowers:*** The flowers are produced in a panicle up to 26 cm long. Each flower is small, pale green at first then turning reddish in colour, with five slender, acute petals 7 to 15 mm long. They are fragrant, terminal, small, androgynous, 6-12 mm long with white colored corolla. The flowers are yellowish, small and crowded at the tip of the branches.
- ***Fruit Stalk (Pseudo fruit):***

The fruit of the cashew tree is an accessory fruit (sometimes called a pseudocarp or false fruit). What appears to be the fruit is an oval or pear-shaped structure that develops from the pedicel and the receptacle of the cashew flower. The enlarged fleshy stalk of fruit is soft, watery and reddish yellow in colour. The cashew apple, is known in Central America as "marañón". It ripens into a yellow and/or red structure about 5–11 cm long. It is edible, and has a strong "sweet" smell and a sweet taste. The pulp of the cashew apple is very juicy, but the skin is fragile, making it unsuitable for transport. The fruit (nut) is ash-colored, kidney-shaped and about 2 cm long.
- ***Fruit:*** The true fruit of the cashew tree is a kidney or boxing-glove shaped drupe that grows at the end of the cashew apple. The drupe develops first on the tree, and then the pedicel expands into the cashew apple. Within the true fruit is a single seed, the cashew nut. The fruit is thick, with oval seeds, 2-3 cm in

length. The seeds are reddish brown-skinned with two large cotyledons and a small embryo.

➤ **Chemical Constituents:**

- Leaves of young cashew nut have Vitamin A, Vitamin C, protein, fat, carbohydrate, calcium, phosphorus, iron and water.
- Cashew nuts contain tannins, cardol and anacardic acid useful as anti-bacterial and anti-septic. Immature nut oil contains triglycerides, fatty acids, alkyl-substituted phenols and cholesterol. The main constituents of the free fatty acids are palmitic and oleic acids.
- The seed is surrounded by a double shell (kernel) containing an allergenic phenolic resin, anacardic acid, a potent skin irritant chemically related to the more well known allergenic oil urushiol. Anacardic acids, the by-product of cashew processing, have medicinal uses. The kernel contains 7.6-16% moisture, 18-24% protein, 43-57% fats, 19-21% carbohydrates (Leon, 1999).
- The stem bark contains a mixture of tannins (hydrolysable and non-hydrolysable), with reported anti-inflammatory activity (Mota, 1985). The bark is also reported to have activity against the lipopolysaccharide (LPS)-induced septic shock, as well as LPS-induced microvascular permeability in mice (Olajide, 2004).
- The roots of the tree are reported to have hypoglycemic potential. The crude ethanolic extract of cashew root showed hypoglycemic potencies in guinea pigs and rats (Egwim, 2005).
- The apple of cashew contains flavanoids. One anthocyanin and thirteen glycosylated flavonols were detected in a methanol-water extract (Sousa, 2007). The apple also contains aromatic volatiles (ca 3.6 [mu]/kg fresh fruit), aldehydes, carotenoids, anacardic acid and ascorbic acid (Raquel, 2003).

➤ **Uses of cashew (Dravyaguna):**

• Medicinal Uses:

Bark of cashew is reported to have antihypertensive and blood glucose lowering potential. The kernel yields oil which can serve as mechanical and chemical antidote for irritant poisons. Cashew apple and its juice exhibit anti-scorbutic property. Juice of cashew apple is also used as Diuretic, in treatment of kidney diseases, and Cholera. The shell oil is used as mild purgative, for expulsion of hookworms, for cracks in feet, warts, corns, leprosy sores. The resinous juice of seed is used in treatment of mental disorders, sexual debility and as a sequel to small pox (**Table 3.1**).

• Edible Uses:

The fleshy peduncle called cashew apple when ripe is used in beverages. The kernel is consumed as raw nuts, roasted nuts, fried nuts, salted nuts, dry fruit, and is added to cakes and deserts. In countries the leaves are used as vegetables. The wood of the tree is used as fuel (**Table 3.2**).

• Commercial Uses:

The bark of cashew tree is used in tanning industry. It is also used as an insecticide, and an adhesive for book binding. It is used in pharmaceutical industry as substitute for gum Arabic and is also used in making ink. The juice of cashew apple is used for making wine. The cashew apple is used in preparing various juices, syrups, candies and pickles. The residue of cashew apple is used to extract pectin. Vinegar is prepared from fresh fruit of cashew. The cashew nut shell is used in the cosmetic industry, pharmaceutical industry, textile industry, paper industry, and ink making. Cashewnut shell yields a vesicant juice known in trade as Cashewnut Shell Liquid (CNSL). CNSL is used in preservation of boats, nets, and wood. CNSL is used in insulating varnishes and resins. It is also used in paint industry, particle board adhesives, thermo-plastic resins, thermosetting resins, and plastic industry. The shell oil is also used as insecticide against mosquito larvae (**Table 3.3**).

- Toxicity / Side effects:

Cashew nut allergy is the second most commonly reported tree nut allergy in the United States. The cloned allergen, designated Ana o 3, was identified as 2S albumin. This 2S albumin protein is a major allergen in cashew nut and demonstrates a possible basis for cross-reactivity with walnut 2S albumin (Jason, 2005). Pollens of *Anacardium occidentale*, can trigger an asthmatic response in allergic individuals (Fernandes, 1995). The seed contains an allergenic phenolic resin, anacardic acid, which is a potent skin irritant chemically related to the more well known allergenic oil urushiol.

Table 3.1: Medicinal uses of cashew

Plant Part	Form of application	Use / Description
Bark	--	Antihypertensive, Lowering blood sugar
Fruit	Kernel yields an oil	Mechanical and chemical antidote for irritant poisons
	Cashew apple as well as Juice of cashew apple	Antiscorbutic
	Juice of cashew apple	Diuretic, Kidney diseases, Cholera
	Shell oil	Mild purgative, Expulsion of hookworms, Cracks in feet, Warts, Corns, Leprous sores
Seed	Resinous juice	Mental disorders, Sexual debility, Palpitation of heart, Loss of memory as a sequel to small pox.

Table 3.2: Edible uses of cashew

Plant Part	Form of application	Use / Description
Fruit	Fleshy peduncle called Cashew apple when ripe	Ripe fruit, Beverages
	Cashew apple	Juice, Syrup, Candies, Pickles
	Kernel	Dessert, Raw nut, Roasted nut, Fried nut, Salted nut, Dry fruit, Added to cakes, Added to puddings, Vegetable
Leaf	After cooking	Vegetable
Wood	--	Fuel wood

Table 3.3: Commercial uses of cashew

Plant Part	Form of application	Use / Description
Bark	--	Tanning industry
	--	Insecticide, Adhesive for book binding, Pharmaceutical industry, Substitute for Gum Arabic, Ink making
Fruit	Juice from cashew apple	Wine making
	Distillation of wine made from the juice of cashew apple	Pharmaceutical industry
	Cashew apple	Juice, Syrup, Candies, Pickles
	Residue of cashew apple	Pectin extraction
	Fresh fruit	Vinegar
	Cashewnut shell	Cosmetic industry, Pharmaceutical industry, Textile industry, Paper industry, Ink making, Ice-creams
	Cashewnut shell yields a vesicant juice known in trade as Cashewnut Shell Liquid (CNSL)	Preservation of boat, Preservation of net, Preservation of wood, Insulating varnishes, Resin, Paint industry, Particle board adhesives, Thermo-plastic resins, Thermosetting resins, Plastic industry, Typewriter tools, Oil and acid proof cold setting cements, Industrial floor tiles, Automatic brake linings, Lubricant, Rubber chemicals, Postal stamping, Ink making, Castings, Encapsulation of electrical accessories, Laminates, Adhesive, Surface coating in industries, Epoxy resins, Pesticide, Dyes, Drug
	Mixed polymerisation of CNSL and Bhilwan shell liquid	Enamels, Varnish industry, Water proofing compositions, Moulding powders
	Mixed polymerisation of CNSL and Bhilwan shell liquid	Synthetic binders, Conventional binders
	Shell oil	Insecticide against mosquito larvae