

Domestication of Plants: Definition

Domestication is the hereditary restructuring of wild plants into domestic and cultivated forms in response to human needs. Domestication is the process of placing a plant species under human control and progressively altering it by careful selection, genetic alteration, and handling to make it more useful to people. Domesticated species include renewable energy sources that have supplied food and fuel other advantages to humans.

Origins of Domestication

1. During the Mesolithic Period, the earliest attempts at plant domestication were performed in the Old World.
2. Before 9500 BCE, the first effective domestication of plants and animals occurred, signaling the start of the Neolithic Period.
3. Primitive agriculture did not appear as a form of social activity until the Neolithic Period, when domestication was well established. (The Neolithic Period began at various times around the world, although it is widely agreed that it began between 10,000 and 8,000 BCE.)
4. Although the bulk of domesticated plants that are currently used by humans was chosen and cultivated during the Neolithic Period, there were a few notable exceptions.

N. I. Vavilov postulated that crop plants evolved from wild species in diverse places, which he called "primary centres of origin." With the movement of man, the crops moved from these locations to other ones. However, despite the fact that they did not originate there, certain crop species exhibit a wide range of shapes in specific regions. Secondary centres of origin for these species are places like these.

INTRODUCTION TO CEREAL GRAINS, LEGUMES

Cereals

Cereals are plants which yield edible grains and includes rice, wheat, corn, barley, and oats. Cereal grains are the fruit of plants belonging to the grass family (*Gramineae*). Cereal grains provide the world with majority of its food calories and about half of its protein. They are also good source of micronutrients such as calcium, iron and vitamins of group B. Cereals are staples and are consumed in large quantities by majority of population in the world either directly or in modified form as major items of diet such as flour, bran and numerous additional ingredients used in the manufacture of other foods. Asia, America, and Europe produce more than 80 percent of the world cereal grains. Cereals are easy to store because of low moisture content, easy to handle and providing variety to the diet. The principle cereal grains grown in India are wheat, rice, corn, sorghum **and** barley.

Legumes

Legumes are next to cereals as an important source of proteins. They are flowering plants having pods which contain bean or peas. There are basically two groups of legumes. First is high-protein high-oil group like soybean, groundnut, lupine, etc. which are mainly used for processing and contains high protein (~ 35%) and oil content (15- 45%). The second group comprises the moderate- protein low-oil types like cowpea, gram, pea, lentil etc. India is one of the largest pulse growing countries in the World. Different pulses grown in India are chickpea (bengal gram/chana), pigeon pea (tur/arhar), green gram (moong), black gram (urad), lentils (masur).

Oils

Oils are chemically hydrocarbon liquid at room temperature, usually containing oleic acid and are extracted from natural resources by breakdown of fats. Chemically fatty oils consist of one part called glycerol attached to three other parts called fatty acids. On the basis of origin, oils can be classified into vegetable oils, animal oil and minerals.

Vegetable oils are following two types depending on their behavior on heating

1. Essential oil – They are also common in fruits, barks, leaves, seeds & root
2. Fatty oils or fixed – These are mostly present in the seeds of various plants eg- cotton, corn, coconut etc.

Sugar

The term sugar is the generic term for any disaccharides and monosaccharides. Sugars are an essential structural component of living cells and a source of energy in many organisms. Sugars are classified based on the number of monomeric units present. The term simple sugars denote the monosaccharides. The term table sugar or granulated sugar actually refers to sucrose, which is a disaccharide made of two monosaccharides: glucose and fructose. Sucrose is a form of sugar that many people are familiar with. It is used in food preparation, such as in cakes, pastries, and desserts. The general formula: $C_n (H_2O)_n$

Starch

Starch is a tasteless, fluffy white powder that is insoluble in cold water, alcohol, and other solvents. Starch is a polysaccharide made up of 1,4 linkages between glucose monomers. The chemical formula of the starch molecule is $(C_6H_{10}O_5)_n$.

Plant fibres

Plant fibres can be defined as fibres that are obtained from plant sources. Some plant fibres examples are jute, cotton, and flax plant fibres.

Chemically plant fibres consist of long molecules of carbohydrates. The majority of carbohydrates in the plant fibres are cellulose. Cellulose, which is one of the most abundant molecules, is a polysaccharide containing several linear chains of $\beta(1 \rightarrow 4)$ D-glucose units. The presence of cellulose provides strength to the plant fibres.

Fumigatories and Masticatories

- **Fumitories**- Those substances which are used for smoking. E.g.- Beedi, Cigarette, Cigar, Charas.
- **Masticatories**- Those substances which are used for chewing.
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Hydroponics

Hydroponics process of growing plants in sand, gravel, or liquid, with added nutrients but without soil.

Intellectual property rights

Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

Technology Information Forecasting and Assessment Council

- TIFAC (Technology Information Forecasting and Assessment Council) is an autonomous organization set up in 1988 by the government of India under the Department of Science & Technology to: look ahead in technology domain; assess the technology trajectories; and support innovation by networked actions in select areas of national importance.

Traditional knowledge (TK)

Traditional knowledge (TK) also known as indigenous traditional ecological knowledge includes facts, theories, concepts about the characteristics which describe the objects events, behavior and interconnections.

Traditional Knowledge Digital Library (TKDL)

The Traditional Knowledge Digital Library (TKDL) is an Indian digital knowledge repository dedicated to traditional knowledge, particularly medicinal plants and formulas utilised in Indian medical systems. The library's goal is to safeguard the country's historic and traditional knowledge from exploitation through bio – piracy and illegitimate patents by digitising it and classifying it according to worldwide patent classification methods.

Ethnobotany

Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of a local culture and people.

The term Ethnobotany was coined by J.W Harshberger in 1895 to indicate the plants used by the aboriginal people.

AYUSH

AYUSH stands for Ayurveda, yoga and Naturopathy, Unani, Siddha and Homoeopathy systems of medicine.

These systems are based on traditional medical philosophies. These systems have a holistic approach on health, disease and treatment.

National Medicinal Plants Board

The National Medicinal Plants Board has been established by the Government of India to coordinate with all matters relating to Medicinal Plants and Support Policies and Programs for growth of trade, export, conservation and cultivation.

Medicinal Plants used by Tribes

Tribal people are famous for their knowledge about different medicinal plants and their uses, since ancient time. Study medicinal plant remedies to prevent or treat a disease is called as phytotherapy.

Indian Pharmacopoeia

A Pharmacopoeia (Pharmacopeia or pharmacopoea) derived from Gr. Pharmacopoiia making of healing medicine or meaning "drug-making".

Indian Pharmacopoeia Commission (IPC) is an autonomous institution of the ministry of health and family welfare which sets standards for all drugs that are manufactured, sold and consumed in India.

Indian Pharmaceutical Association (IPA)

IPA engages the pharmacists of various aspects of pharmacy profession and to promote the highest professional and ethical standards of pharmacy."

It strives to focus the image of pharmacists as competent healthcare professionals, sensitize the community, government and others on vital professional issues and support pharmaceutical education & sciences in all aspects."

Inert Constituents of Drugs

The chemical compounds, even so present in plant and animal kingdom, which do not possess any definite therapeutic values as such but are useful as an adjunct either in the formulation of a 'drug' or in surgery are collectively known as inert constituents of drugs.

Glycosides

Glycosides are molecules in which a sugar is bound to a non-carbohydrate moiety, typically a small organic molecule. They play a crucial role in the medicinal properties of plants and are used for various therapeutic purposes, such as treating heart conditions and managing pain.

Flavonoids

Flavonoids are a diverse group of phytonutrients (plant chemicals) found in almost all fruits and vegetables. They are known for their antioxidant properties and have been studied for a wide range of potential health benefits, including anti-inflammatory, anticancer, and neuroprotective effects.

Collection of wild herbs

The collection of wild herbs is a practice that involves gathering plant materials from their natural habitats for various uses, including medicinal, culinary, and sometimes even spiritual purposes. It's important to approach this practice with respect for the environment and knowledge of sustainable harvesting techniques to ensure the conservation of plant biodiversity.

Here are some key points to consider when collecting wild herbs:

- **Biodiversity Conservation:** It's crucial to maintain healthy and diverse plant populations. Over-harvesting, habitat loss, and climate change are major threats to wild plant resources.
- **Sustainable Practices:** Ethical considerations and sustainable harvesting methods are essential to prevent the depletion of plant species. Some wildcrafters follow self-imposed standards to ensure the longevity of wild herbs as a renewable resource.
- **Knowledge and Identification:** Familiarize yourself with local plant life and learn to distinguish common herbs from rare ones. This helps in making informed decisions about which plants to collect.
- **Legal and Ethical Guidelines:** Be aware of any legal restrictions or ethical guidelines in your area regarding the collection of wild herbs. Some regions may have specific rules or endangered species lists to consider