

Dr.A.B.Mishra

Department of Botany

Sri.J.N.M.P.G.College,Lucknow

## COFFEE

**Botanical name- *Coffea Arabica***

**Family-*Rubiaceae***

**Vernacular name- *Coffee***

**Coffee** is a brewed drink prepared from roasted coffee beans, which are the *seeds of berries* from the *Coffea* plant. The *Coffea* plant is native to subtropical Africa and some islands in southern Asia. The plant was exported from Africa to countries around the world. Coffee plants are now cultivated in over 70 countries. The two most commonly grown species are *arabica*, and *robusta*. Once ripe, coffee beans are picked, processed, and dried. Coffee beans are roasted to varying degrees, depending on the desired flavour. Roasted beans are ground and brewed to produce coffee as a beverage. Coffee is slightly acidic and can have a stimulating effect on humans because of its *caffeine* content. Coffee is one of the most popular drinks in the world.

### ***Coffee processing-***

**Coffee production** is the industrial process of converting the raw fruit of the coffee plant into the finished coffee. Seed or bean are recovered after fruit pulp is removed, which is then dried. While all green coffee is processed, the method that is used varies and can have a significant effect on the flavour of roasted and brewed coffee.

### **Step 1-*Plucking-***

A coffee plant usually starts to produce flowers three to four years after it is planted, and it is from these flowers that the fruits of the plant (commonly known as coffee cherries) appear, with the first useful harvest possible around five years after planting. The cherries ripen around eight months after the emergence of the flower, by changing colour from green to red, and it is at this time that they should be harvested. In most coffee-growing countries, there is one major harvest a year.

In most countries, the coffee crop is picked by hand or by machine, whether picked by hand or by machine, all coffee is harvested in one of two ways

### **Strip picked**

All coffee fruit is removed from the tree, regardless of maturation state. This process can be facilitated through the use of mechanical strippers.

### **Selectively picked**

Only the ripe cherries are harvested and they are picked individually by hand. Pickers rotate among the trees every eight to ten days, choosing only the cherries, which are at the peak of ripeness. The green berries will become a deep red colour as they ripen. Because this kind of harvest is labour-intensive, and thus more costly,

it is used primarily to harvest the finer arabica beans. Red berries, with their higher aromatic oil and lower organic acid content, are more fragrant, smooth, and mellow. As such, coffee

---

picking is one of the most important stages in coffee production.

### **Step-2-*Wet process-***

In the wet process, the fruit covering the seeds/beans is removed before they are dried. Coffee processed by the wet method is called wet processed or washed coffee. The wet method requires the use of specific equipment and substantial quantities of water.

The coffee cherries are sorted by immersion in water. Bad or unripe fruit will float and the good ripe fruit will sink. The skin of the cherry and some of the pulp is removed by pressing the fruit by machine in water through a screen. The bean will still have a significant amount of the pulp clinging to it that needs to be removed. This is done either by the classic ferment-and-wash method or a newer procedure variously called machine-assisted wet processing.

In the ferment-and-wash method of wet processing, the remainder of the pulp is removed by breaking down the cellulose by fermenting the beans with microbes and then washing them with large amounts of water. The fermentation process has to be carefully monitored to ensure that the coffee doesn't acquire undesirable, sour flavours.

For most coffees, mucilage removal through fermentation takes between 24 and 36 hours, depending on the temperature, thickness of the mucilage layer and concentration of the enzymes. The end of the fermentation is assessed by feel, as the parchment surrounding the beans loses its slimy texture and acquires a rougher "pebbly" feel.

In machine-assisted wet processing, fermentation is not used to separate the bean from the remainder of the pulp; rather, this is done through mechanical scrubbing. In addition, removing mucilage by machine is easier and more predictable than removing it by fermenting and washing.

After the pulp has been removed what is left is the bean surrounded by two additional layers, the silver skin and the parchment. The beans must be dried to a water content of about 10% before they are stable. Coffee beans can be dried in the sun or by machine.

After the drying process (in the sun and/or through machines), the parchment skin is thoroughly dry and crumbly, and easily removed in the hulling process. Most often a machine called a huller is used to crunch off the parchment skin before the beans are shipped.

### ***Dry process-***

Dry process, also known as unwashed or natural coffee, is the oldest method of processing coffee. The entire cherry after harvest is first cleaned and then placed in the sun to dry on tables or in thin layers on courtyards.

The coffee cherries are spread out in the sun. As the cherries dry, they are raked or turned by hand to ensure even drying and prevent fungal growth. It may take up to 4 weeks before the cherries are dried to the optimum

moisture content, depending on the weather conditions. The drying operation is the most important stage of the process, since it affects the final quality of the green coffee.

## **Milling**

The final steps in coffee processing involve removing the last layers of dry skin and remaining fruit residue from the now-dry coffee, and cleaning and sorting it. These steps are often called dry milling.

## **Hulling**

The first step in dry milling is the removal of what is left of the fruit from the bean, whether it is the crumbly parchment skin (endocarp) of wet-processed coffee, the parchment skin and dried mucilage of semi-dry-processed coffee, or the entire dry, leathery fruit covering of the dry-processed coffee. Hulling is done with the help of machines, which can range from simple millstones to sophisticated machines.

## **Polishing**

This is an optional process in which any silver skin that remains on the beans after hulling is removed in a polishing machine. This is done to improve the appearance of green coffee beans and eliminate a by-product of roasting called chaff.

## ***Cleaning and sorting***

Most fine coffee goes through a battery of machines that sort the coffee by density of bean and by bean size, all the while removing sticks, rocks, nails, and miscellaneous debris that may have become mixed with the coffee during drying. The final step in the cleaning and sorting procedure is called colour sorting, or separating defective beans from sound beans on the basis of colour rather than density or size.

## ***Grading-***

Grading is the process of categorizing coffee beans on the basis of various criteria such as size of the bean, where and at what altitude it was grown, how it was prepared and picked, and how good it tastes, or its cup quality.

## ***Roasting***

Roasting transforms green coffee into the aromatic brown beans. Most roasting machines maintain a temperature of about 550 degrees Fahrenheit. The beans are kept moving throughout the entire process to keep them from burning. When they reach an internal temperature of about 400 degrees Fahrenheit, they begin to turn brown and the caffeol, a fragrant oil locked inside the beans, begins to emerge. This process called pyrolysis is at the heart of roasting — it produces the flavour and aroma of the coffee we drink.

After roasting, the beans are immediately cooled either by air or water. Roasting is generally performed in the importing countries because freshly roasted beans must reach the consumer as quickly as possible. ***Grinding-***

How coarse or fine the coffee is ground depends on the brewing method. The length of time the grounds will be in contact with water determines the ideal grade of grind. Generally, the finer the grind, the more quickly the coffee should be prepared. That's why coffee ground for an espresso machine is much finer than coffee brewed in a drip system.

---

