



## Ethnobotanical Leaflets



# The Medicinal Properties of the Papaya, *Carica papaya* L.

By Emma Dawson

Quite surprisingly, historians know little about Hippocrates, the physician often referred to as "the father of medicine". However, we do know that he was a strong advocate of the use of medicinal plants to prevent and cure diseases. He recorded between three hundred and four hundred plant remedies in his writing and during the middle ages herbal remedies were passed down from generation to generation. Although the church emphasized faith healing over other forms of healing, Christian monks would preserve many of the early Greek and Roman medical texts, later growing their own herbs in the monasteries.

By the time the colonizers settled in the new world, they brought with them some knowledge of herbal medicine. This in turn was shared with the Native Americans and other indigenous peoples of the new world who practiced ethnobotanical rituals as a daily and integral part of their lives.

Most recently beginning in the 1800's, while chemical drugs became popular with the medical establishment and those who could afford it, herbal medicine continued to be practiced by those who could not afford the later or who were strong believers in natural medicine. While chemotherapy has brought us many life-saving drugs, today nearly fifty percent of commonly used drugs are either plant derivatives or contain the equivalent of a chemical imitation of a plant compound. Indeed Digitalis, Aspirin, Reserpine, Quinine, Tetracycline and the ever useful Penicillin are all members of this list. In fact according to the World Health Organization, herbal medicine today is still the primary source of health care for approximately eighty percent of the worlds population.

## Papaya/Pawpaw

*Carica papaya* L., more commonly known as the papaya, belongs to the Caricaceae. Its classification is as follows: Division: Magnoliophyta, Class: Magnoliopsida, Subclass: Dilleniidae, Order: Violales and as previously mentioned Family: Caricaceae. It was first described by the Spanish chronicler Oviedo in 1526, from the Caribbean coast of Panama and Colombia. Soon after it was grown throughout the tropics, its distribution being aided by the abundance of its seeds. The Papaya seed is viable for up to

three years under cool, dry conditions and it is a herbaceous, dicotyledonous plant that may produce fruits for more than twenty years. The plant usually has a single trunk with several well developed branches.

The melon-like fruit varies in size and shape, and hangs from short, thick peduncles at the leaf axil. Its flowers are mostly dioecious and resembles each other until they start to develop sexual organs. The species is polygamous and can be classified into three sex types: male staminate, hermaphroditic (bisexual) and female pistillate. In addition, some plants can produce more than one kind of flowers.

The pollination mechanism of the plant is not very well known but researchers 'Baker' and 'Bawa' suggested that "pollination is performed by mimicry of the pistillate flowers to the staminate nectar-producing flowers." Another theory is that oxalate packages in the anthers of the papaya plays a role in pollination as an enrichment of the nectar. Whatever the case, we do know that the fruit is of great economic importance to tropical America where it is widely grown for its luscious fruit. The fruit which is orange-yellow when ripen, is a popular breakfast staple that is also used in jellies, preserves, fruit juices and as a beverage in certain Latin countries. In addition, the leaves and root of the plant are also used in a variety of dishes. The bark can also be used for rope making and the leaves as a soap substitute, is an excellent stain remover. Finally, in Java, even the flowers are eaten.

### **Medicinal Properties: Uses**

Papaya can be used as a diuretic (the roots and leaves), anthelmintic (the Leave and seed) and to treat bilious conditions (the fruit). Parts of the plant are also used to combat dyspepsia and other digestive disorders (papaya contains a proteolytic enzyme which soothes the stomach and aides in digestion) and a liquid potion has been used to reduce enlarged tonsils. In addition, the juice is used for warts, cancers, tumors, corns and skin defects while the root is said to help tumors of the uterus. In African a root infusion is also used for syphilis and the leaf is smoked to relieve asthma attacks. The Javanese believes that eating papaya prevents rheumatism and in Cuba the latex is used for psoriasis, ringworm and the removal of cancerous growth.

### **Medicinal Properties: Chemistry**

The milky sap of a unripe papaya contains a complex proteolytic enzyme called Papain. Although it is a protein, this enzyme is not damaged by heat. The crude extract consist of two crystallized enzymes called 'papain' and 'chymopapain'. The enzyme is similar to pepsin and hence it helps to digest protein in the body. It is therefore used to relieve indigestion. In 1982, chymopapain was approved for intradiscal injection in patients with documented herniated lumbar intervertebra discs and who had not responded to "conservative therapy".

Vitamins and traces of an alkaloid called Carpaine have also been found in the latex. Apart from natural oils the seeds of the fruit also contains carbohydrates, carpasemine, benzyl senevol and a glucoside. Papain is also used to treat commercial beer, to degumm natural silk, as a meat tenderizer and in the

production of chewing gums. Cosmetically it is used in Shampoos and in a number of face-lifting operations.

### **Medicinal Properties: Pharmacology**

Papain has an anticoagulant effect. Injection of the extract in a dog increases prothrombin and coagulation threefold. It is also claimed that the enzyme eliminates necrotic tissues in chronic wounds, burns and ulcers. As mentioned before crude papain is also of commercial importance in the brewery industry, in the food industry and in the textile industry.

In humans capaine slows down the heart and thus reduces blood pressure. However, higher doses can produce vasoconstriction and the alkaloid is reported to have anthelmintic and amoebicidal actions.

### **Toxicity**

Externally the papaya latex is an irritant to the skin and internally it causes severe gastritis. Some people are allergic to various parts of the fruit and even the enzyme papain has its negative properties. Most notable is its ability to induce asthma and rhinitis and its sister enzyme carpaine can cause paralysis, numbing of the nerve centers and cardiac depression.

### **Conclusion**

With all the medical achievements of the past decade notwithstanding, today we are seeing a surge in the popularity of herbal remedies and treatment. Why is this so one wonders? One reason is that for all the good they have done us synthetic drugs are known to have many side effects. In fact in certain instances these drugs are not even effective any more. Even so it is believed that the biggest reason for the current popularity in alternative treatment is because of our new emphasis on "preventive medicine". Now more than ever we are aware of the importance of one's lifestyle, nutritional habits and genetic history.

While prevention is better than cure it is important to investigate a wide variety of treatment options. Herbal medicine is not for everyone, however, the fact that it is available is good news for many sufferers.

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