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This chapter includes concepts about the general description, cultivation details and uses of ipil, so as to general description and uses of kupang and lastly is germination of seeds specially with hard seed coat such as ipil and kupang. General Description, Cultivation details and Uses of IpilInstia bijuga belongs to the family of fabaceae, commonly known in Philippines as Ipil or Ironwood in English. It is a medium-sized tree that can reach 20-40 m in height and 150-180 m in diameter.

Mature trees has extensive root system. The outer bark is 5-8 mm thick, colored gray with orange tinge. While the inner bark is light brown mottled with brown specks. The leaves are alternate with usually two pairs of leaflets, 8-12 cm long and 5-8. 5 cm wide. It has fragrant, reddish or white flowers, borne in panicles 6-10 cm long. It has also pods 10-25 cm long and 4-6.

5 cm wide with 3-6 orbicular seeds. It is a native tree commonly found in Southeast Asian countries. It occurs along the seashore, some localities and inland forest. Here in the Philippines it is found from the Babuyan Island and north Luzon to Mindanao and Palawan. With few sizeable stands, remaining in the wild, the tree has been listed as vulnerable in the IUCN Red list of threatened species (2009).

Ipil is a plant of lowland wet tropics at elevations up to 600 m. It grows best in areas when daytime temperature are within 22-28°c. However it is susceptible to easily affected by frost.

Ipil prefers a mean annual rainfall of 2000-3000 mm, it prefers a full sun position, very well-drained fertile soils. Yet Ipil tree was found to be very tolerant of saline soils with PH 5. 5-6. 5.

Ipil was also established to be moderately drought tolerant. Maturity growth of the tree is up to 80 years. Plantation grown trees can reach 8-16 m of height 7. 5-10 cm in diameters within 7-8 years.

Ipil is producing one of the most valuable timbers of Southeast Asia. The wood is heavy hard, strong, durable, and resistant to fungi, wood bores termites, ocean water and weather. The timber is highly prized in its local area, where it is use for heavy construction. Aside from that, with its extensive root system, ipil is suitable tree for soil conservation and in water purification. Ipil tree is wind tolerant that makes it an ideal windbreak. The tree has also a high leaf litter decomposition rate. This trees also has a symbiotic relationship with a certain soil bacteria that form nodules roots and fix atmospheric nitrogen. Some of the nitrogen is utilized by the growing plant but it is also utilized by other plants growing nearby.

Other uses of ipil is its seeds can be eaten after careful preparation, traditionally soaked in salt water 3-4 days and then boiled. The seed oil of ipil can be compared to neem extracts that can repel insets and has been also used to protect stored products. The small branches of this trees can be used as firewood. The bark is a source of tannins, in which the brown due is also obtained. Ipil was also widely use as medicine even in the old times. Some of it was the bark used to treat persons suffering from a urinary condition.

Some of it was the bark used to treat persons from a urinary tract condition, treatment of rheumatism, dysentry, and diarrhea. Juice of its stem can be used for asthma. Its fruit can be used as laxative. Mixed with other plant

extracts , it can be used for toothache and sore tongue. Also for scabies and headaches. The leaves are squeezes in salt water and ingested for diabetes. The bark can also be used to treat enlarged lymph nodes and bark infusion are given to women after delivery.

The tree was aso once considered a sacred tree in Fiji. Ipil is a very useful tree. However, it takes some time to germinate Ipil because of its hard seed coat. Thus it needs further research of the proper method to germinate it easily. General Description and Uses of KupangSame as to Ipil, Parkia timoriana is another native tree with hard seed coat commonly known in English as tree bean because it is a species of flowering plant belonging in the legume family. It is a native tree in Southeast Asia and is known as “ kupang” in the Philippines. It usually grows in a lowland rainforest, mixed deciduous and dry evergreen forest.

It is cultivated for food, wood and ornamental. This is a tree growing up to 30m tall with bipinnate leaves divided into 20 to 30 or more leaflets called pinnae. Its inflorescence is a head of flowers dangling at the end of a peduncle up to 45cm long. The fruit is a long, flattened legume pod, up to 36cm long which contains up to 21 hard black seeds around 2cm long.

Its seeds, bark and sometimes leaves are reported as having medicinal uses (Burkill, Heyne, Hi schhorn, Perry, 11. cc.). Its bark can be used against scabies, boils, and abscesses. Seeds are beneficial for the treatment of hepatalgia, oedema, nephritis, diabetes and colic probably as a result of their relaxing activity. They are also used as anthelminthic. Roasted and powdered ripe seeds can be taken in as cure for colic, flatulence and

stomachache or can be also used as remedy for cholera and menstrual cramps.

Powdered seeds can be applied externally to wounds, ulcers and abdomen to relieve pain. While leaves can be ground up as remedy for colic and clean wounds. Its pods pounded with water can be used as hair shampoo. Aside from being a natural medicine, the tree is grown to provide shade commonly in coffee plantations and nurseries, also sometimes in parks, gardens and border of the road. It is good for reforestation and for the control of soil erosion. The wood of decent quality can be used in joinery, furniture interior finishes, cases, paper industry as well as fuel. Both Ipil and Kupang have hard seed coats and have a problem of easy germination.

Germination of Seeds Seeds stay inactive until right conditions are present for germination. Almost all seeds require water, oxygen, and proper temperature in order to germinate. While some seeds also require proper light; others germinate better in full light while some require darkness to germinate. Some seeds like apple seeds also require proper temperature to germinate, they are held at cold temperatures for a period of time, showing an example of pre-treatment method. When seeds are put in right conditions, moist such as water and oxygen are taken in, the embryo’s cells start to enlarge, breaking the seed coat open and a root emerges first, followed by the shoot that contains the leaves and stem.

Figure 1. 1 Seed Germination But some seed coats are so hard that water and oxygen cannot get through it. Ipil and Kupang seeds are two of the examples. Ipil and kupang reproduces almost exclusively by seeds since

cuttings have low percentage of rooting. However, these kinds of seeds have hard seed coats which prevent seed germination. This is called seed dormancy, a barrier that keeps moisture out of the seed and keeps it from germinating due to the impermeable nature of the coat to water and oxygen. In nature, these types of seeds would remain in the soil until the seed coat weathered enough to allow penetration of water and oxygen.

Germination time of seeds varies with the species, but most of the seeds with dormancy will require three to six months with some requiring up to several years. Yet there are methods called seed pre-treatments, used to break seed coat dormancy according to some studies. This includes scarification, hot water, dry heat, fire, acid, mulch, cold and warm stratification, light and many more. (The study will find out if some of these methods are also applicable to germinate Ipil and Kupang) These methods is a factor that can greatly affect germination. However, there are many other factors that can cause poor germination. Overwatering is one that may cause the plant not to have enough oxygen. Sowing the seeds too deeply may also cause them to use all of their stored energy before reaching the soil surface.

Dry conditions may also affect the plant because it doesn't have enough moisture to start the germination process and keep it going. In this study, pre-treatment methods will be used before planting Ipil and Kupang seeds. During sowing, the seed should be planted vertically with the hilum downward. It requires light and potting medium should have proper proportion of composed organic matter and sand (sandy and loamy soil).

It is suggested to grow seed in root-trainer pots or growbags to allow adequate root growth in confined space and reduces shock when replanted.