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YAMS: Their classification and description

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UBI

CLASSIFICATION

Family	: Dioscoreaceae
Genus	: Dioscorea
Species	: alata
Scientific name	: **Dioscorea alata** L.

COMMON NAMES: Greater Asiatic yam, Greater yam, Ten months yam, White yam, Asian-wing-stemmed yam, Winged yam, Water yam

LOCAL NAMES : Ubi (Visayas, Mindanao), Ube (Luzon)

DESCRIPTION

Ubi is a polymorphic species, differing especially in characteristics of the tuber and foliage. It is a climbing plant that rarely bears flowers and, when it does, male flowers usually greatly outnumber the female flowers. Varieties indigenous to the Philippines, so far as determined, are sterile. The chromosome numbers reported in this species are based on multiples of 10, such as 30, 50 and 70, and they are thought to have arisen through the hybridization of varieties with different numbers of sets of 10 chromosomes.

Tuber. It is the large underground storage organ for which the plant is grown and by which it is usually propagated. It varies in shape, size, and color and although usually produced singly occurs sometimes in clusters. It may also be branched or unbranched and its flesh may be coarse or fine.

The tuber may be shaped like an egg, a snake, a horn, a hand or a wing after which many local varieties are named. The number of possible tuber shapes, largely determined by variety, is almost limitless.

The color of the tuber is largely due to the amount of anthocyanin that is present. Anthocyanin is a glycoside pigment that has no nutritional value but gives the tuber its attractive purple coloration. Where it is absent, the flesh of the tuber is white or cream and where it is present, the flesh color ranges from pink to purple. In some varieties only the periphery of the flesh is pink, red or purple; in others the pigment is unevenly distributed throughout the tuber.

Some varieties also bear bulbils or aerial tubers in the axils of leaves which are much smaller than underground tubers but usually similar in shape and pigmentation. Like the underground tubers, the bulbils are used also as planting materials.

Root. The roots arise from the corm-like primary nodal complex at the base of the stem just above the tuber, and from the tuber itself. The adventitious roots arising from the primary nodal complex are larger and serve as the principal feeder roots of the plant. The smaller and shorter roots arising from the body of the tuber are thought to serve the same function as those of ordinary feeder roots.

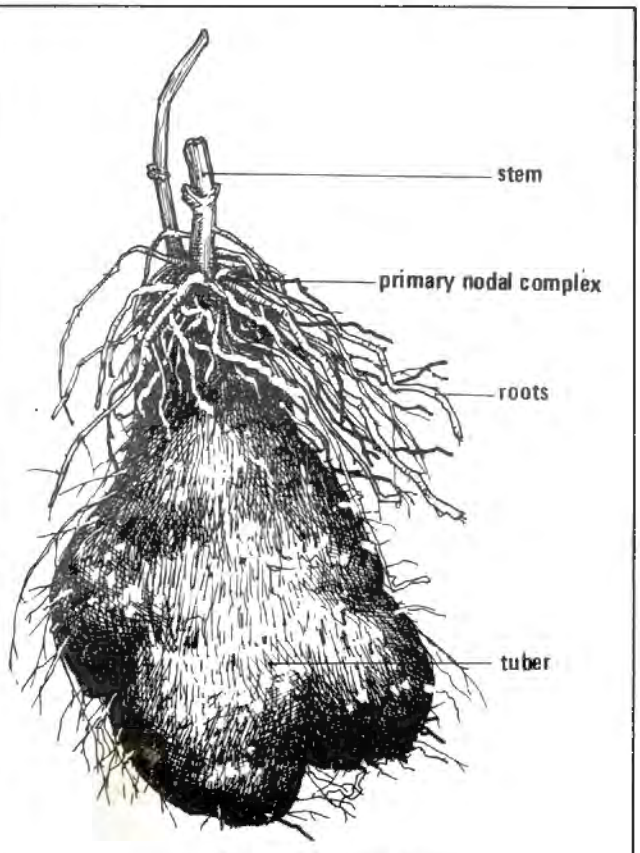

Fig. 1. Tuber and roots of ubi

Stem. The stem of ubi twines to the right and is winged, having four or more membranous wings that run along the stem's length. In some varieties, instead of wings small spines take their place. In these varieties the spines at the base are bigger and denser. The stem is usually green but the wings are sometimes reddish or purplish due to the presence of anthocyanin.

Leaf. The leaves are ovate and glabrous. They vary in shape and size (10-30 cm x 5-20 cm) and their arrangement on the stem is usually opposite although alternate arrangement can also be observed occasionally. Varietal differences in leaf shape, determined mainly by the width and depth of sinus between the lobes, can readily be noted. Other varietal differences can also be found in the thickness, folding and undulation of the blade, green color intensity, and anthocyanin coloration particularly in plants just a few weeks old. The petiole is usually long (6-12 cm) and its wings are usually enlarged at the base. Spines present on the stems may not be found on the petioles.

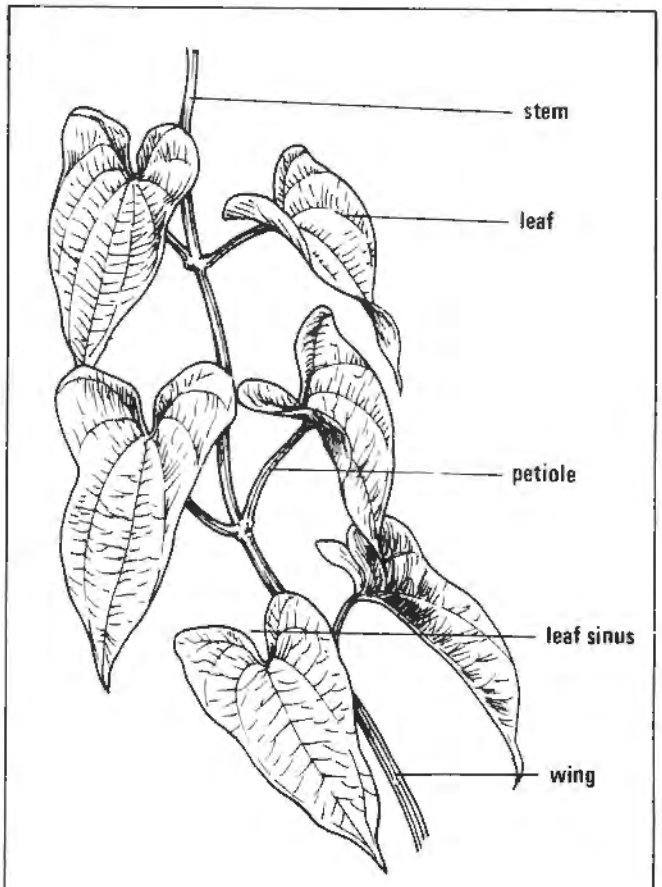

Fig. 2. Stem and leaves of ubi

Flower. Make and female flowers are borne on different plants. Male flowers are produced in panicles while female flowers are borne on spikes. Both panicles and spikes arise from leaf axils. There are usually more male flowers in a male plant than there are female flowers in a female plant. Most varieties, however, do not produce any flower at all.

Male flowers have three sepals, three petals and six stamens. The petals and sepals are greenish or whitish. The pollen grains, as seen under the microscope, are usually malformed. The female flowers which are bigger than the male flowers and greenish or purplish in color have trilocular ovaries with each locule containing two ovules. The also have three stigmas.

Fruit. It is a trilocular capsule. The junctions of the locules are extended out into flattened wings. Capsules produced by fruit-bearing varieties in the Philippines are usually underdeveloped. They often dry up while still small and when split they reveal small flattened seeds less than one millimeter broad.

Seed. The ubi seed is very small, flattened, and surrounded by a membranous wing. Two seeds may be produced by each locule. Seeds produced by Philippine varieties have not been known to germinate.

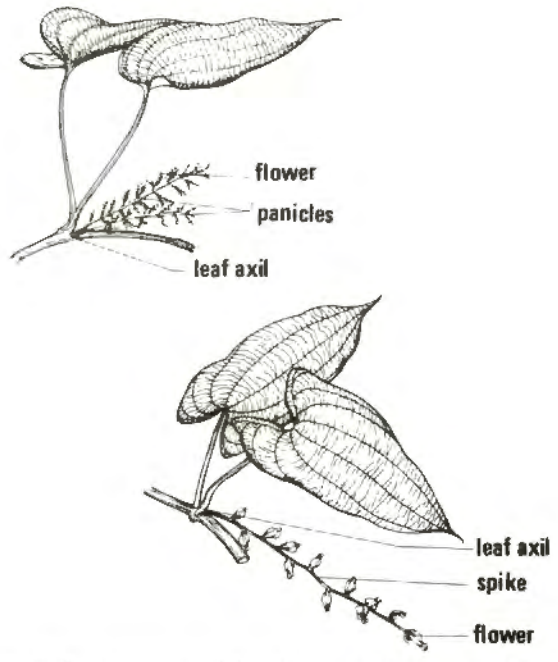

Fig. 3. Male (above) and female (below) flowers of ubi as borne on the stem

TUGUI

CLASSFICATION

Family	: Dioscoreaceae
Genus	: Dioscorea
Species	: esculenta
Scientific name	: **Dioscorea esculenta** (Lour.) Burk.

COMMON NAMES: Lesser yam, Asiatic yam, Lesser Asiatic yam, Chinese yam, Potato yam

LOCAL NAMES : Tugui, Tugue, Tongo, Tuñgo (Luzon), Apali (Central and Western Visayas, Mindanao) Tam-is (Western Visayas Apari (Estern Visayas)

DESCRIPTION

Tugui is a thorny, climbing vine that grows to a maximum height of three meters. Its tubers are generally smaller than those of ubi and appear to be more variable than the foliage. Like ubi, it rarely bears flower. Flower-bearing varieties in the Philippines are, as far as it is known, females. This species also exhibits chromosome numbers that are multiples of 10. The chromosome numbers reported are 40, 90 and 100.

Tuber. The tubers of tugui are produced in clusters and are borne at the end of stolons of varying lengths. Each stolon bears only one tuber but a plant can have 5 – 20 tubers. Tubers vary in shape and size but many varieties produce tubers that are almost cylindrical, each weighing 200 grams or less. Few varieties, notably the wild ones, have irregular or branched tubers some of which may weigh several kilograms each.

The surface of the tuber is smooth and the bark or skin is thin. The flesh is usually white or cream and fine-grained. In a few varieties, the cortex and periphery of the tuber flesh is purple due to the presence of anthocyanin. When cooked, the tuber tastes sweeter than that of ubi.

Root. The same kind of roots found in ubi are found in tugui. In tugui, however, the roots arising from the primary nodal complex have sharp spines that vary in length. Wild varieties

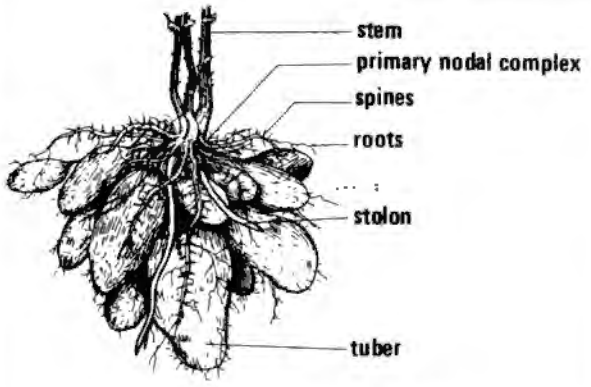

Fig. 4. Tubers and roots of tugui

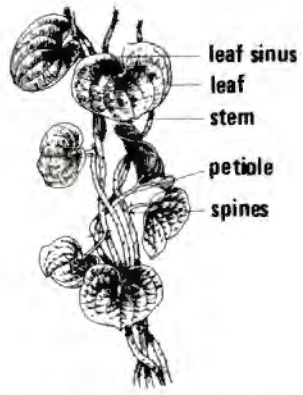

Fig. 5. Stem and leaves of tugui

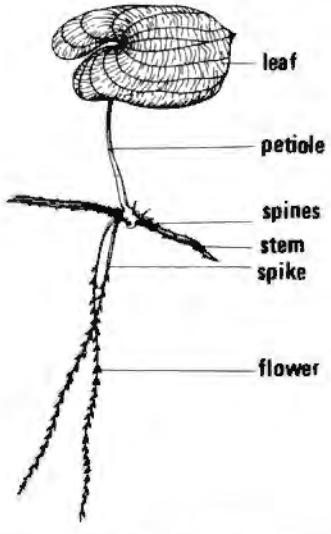

Fig. 6. Female flower of tugui as borne on the stem

usually have longer spines than cultivated ones. Spines are not found on stolons.

Stem. The stem which is small, cylindrical, spiny and usually pubescent twines to the left in climbing and is light green to purple in color.

Leaf. Leaves are alternate, simple, broadly cordate, light green in color and, in some varieties, pubescent. The base of the petiole is enlarged by two to five prominent spines.

Flower. Like ubi, tugui is a dioecious species. Only female flowers, however, have been observed in the Philippines and consequently, no fruit has been observed in this crop. The female flowers which are light green in color are borne on long spikes and measure 2 mm long and 1 mm broad.

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