

The Guava

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THE guava (*Psidium guajava* L.) is native to tropical America. It is reported to have been taken at an early date by the Spaniards to the Philippines and by the Portuguese to India. It is now grown throughout the tropics where in places it has been naturalised having been spread by birds.

Guava is a member of the large dicotyledonous family Myrtaceae to which the clove, cinnamon and eucalyptus also belong. These plants, as is characteristic of members of the family, possess essential oils in some of their tissues.

The guava is a large shrub or small tree that may attain a height of 10m. It is a shallow rooter and possesses a thin trunk that is covered with a scaly, multicoloured bark. From the base of the trunk several more or less erect branches may arise. These branches repeatedly spreading laterally, Suckers are often produced from roots near to the base of the trunk.

Young twigs and suckers are green, 4-angled and winged (figure 1d), and are covered with soft hair. They bear opposite, simple oval leaves. The paired leaves are so arranged that every other pair lies in the same horizontal plane; intervening pairs lie in a plane at right angles to the former. With age a twisting of the twig takes place so that all leaves come to lie in the same plane. The angular nature of the stem is also lost with age.

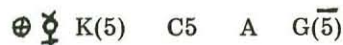
The leaves — dark green and smooth above, pale green and finely hairy below — may be up to 15 cm in length. The lateral veins arise pinnately from the midrib and curve forward to join the vein immediately in front. They are raised and prominent on the lower surface (figure 1e) but are depressed on the upper surface. The petiole is short.

Trees reach maturity at about 2 — 4 years at which time they begin to flower. In Trinidad two flowering periods are observed: December — January and July — August. Flowers are borne singly on slender peduncles (flower stalks) in the axils of the leaves on younger branches (figure 1f). Sometimes they are produced in cymes of two or three. At the junction of peduncle and flower two small bracteoles positioned opposite each other are found.

In the unopened flower the sepals form a tube which completely encloses the bud. When the flower is mature, the tube (calyx-tube) bursts into 4 — 6 irregular lobes allowing the 4 — 5 white petals to spread widely. Each petal is concave and reflexed (figure 1i). The stamens are numerous and are inserted in rows on a disc. The filaments are long (1 — 2 cm) and white; the anthers are pale yellow and dehisce longitudinally. The style is long and capitate (figure 1i).

The ovary is inferior, that is, all other floral parts are inserted at a level above it, and consists of 4 — 5 fused carpels each containing numerous ovules in axile placentation (figure 1b). Sometimes 6 loculi (compartments of the ovary) are seen (figure 1c).

The floral formula may be represented thus:



A half flower drawing and floral diagram are seen in figure 1a

and b respectively. Both self and cross pollination are known to occur. Bees and other insects have been seen visiting the flowers.

Fruits are set twice per year; February — March and August — September. Some plants are reported to fruit all year round. The fruit is a berry which is variable in shape, being either globose, ovoid or pear-shaped. At the free end the persistent calyx is seen (figure 1, g and h). The outermost portion of the fruit (the exocarp) is pale green to yellow in colour; the interior (mesocarp) is fleshy and forms a pulp of varying thickness and colour (white, yellow, pink or red) in which the numerous seeds are embedded. The embryo within the seed is curved.

The seeds remain viable for about a year. Germination takes about 2 — 3 weeks.

The plants grow from sea level to 5,000 ft. and are capable of growth over a wide range of both climatic and soil conditions. The plants may be attacked by fungi which cause blackening of the immature fruits. In Trinidad the guava flies *Anastrepha* spp. are so prevalent that it is difficult to find a fruit which is devoid of the larvae of the species.

The fruits which are rich in vitamin C are used for the preparation of jellies, jams and a sweetmeat known in the Caribbean as guava cheese. An infusion of the leaves is reported to be used in some areas for the cure of diarrhoea.

REFERENCES

- COBLEY, LESLIE S. (1976) *An Introduction to the Botany of Tropical Crops*. Second Ed. revised by W.M. Stele; Longman, London.
- PURSEGLOVE, J.W. (1968) *Tropical Crops — Dicotyledons* Volumes 1 & 2. Longman, London.

Explanation of floral formula:

- \oplus flower is radially symmetrical
- \ominus flower is hermaphrodite, i.e. possesses both male (stamens) and female (carpels) parts
- K = calyx (5) consists of five fused petals
- C - corolla 4 — 5 consists of four to five petals. Absence of brackets () indicates the petals are free
- A = androecium (male organ) consists of an infinite number of stamens. Absence of brackets () again indicates that there is no fusion of the stamens
- G = gynaecium (female organ). (5) indicates that there are five fused carpels; the line above the bracketed figure signifies that the ovary is inferior. Had the ovary been superior, the line would have been below the figure thus: $\underline{(5)}$

APPENDIX

Suggested exercise for school children

Collect a ripe guava fruit and remove the seeds from within the pulpy mesocarp. Clean the seeds carefully and soak overnight in water. Place a cylinder of blotting paper in a jam jar so that the paper makes contact with the sides of the jar. Pour sufficient water into the jar so that the paper is well moistened. Place some of the seeds between the paper and the walls of the jar. Stand the

jar on a shelf and observe it daily. Make notes and drawings of the changes seen, recording the length of time (in days) taken for each successive change to take place. Note whether the cotyledons are pushed upwards or remain roughly where the seed was originally positioned. A mark with a felt pen on the outer surface of the bottle at the time at which the seeds are placed to germinate will facilitate you in this observation. If the cotyledons are borne aloft, germination is said to be epigeal (brought above the soil level); if they remain below it is said to be hypogeal.

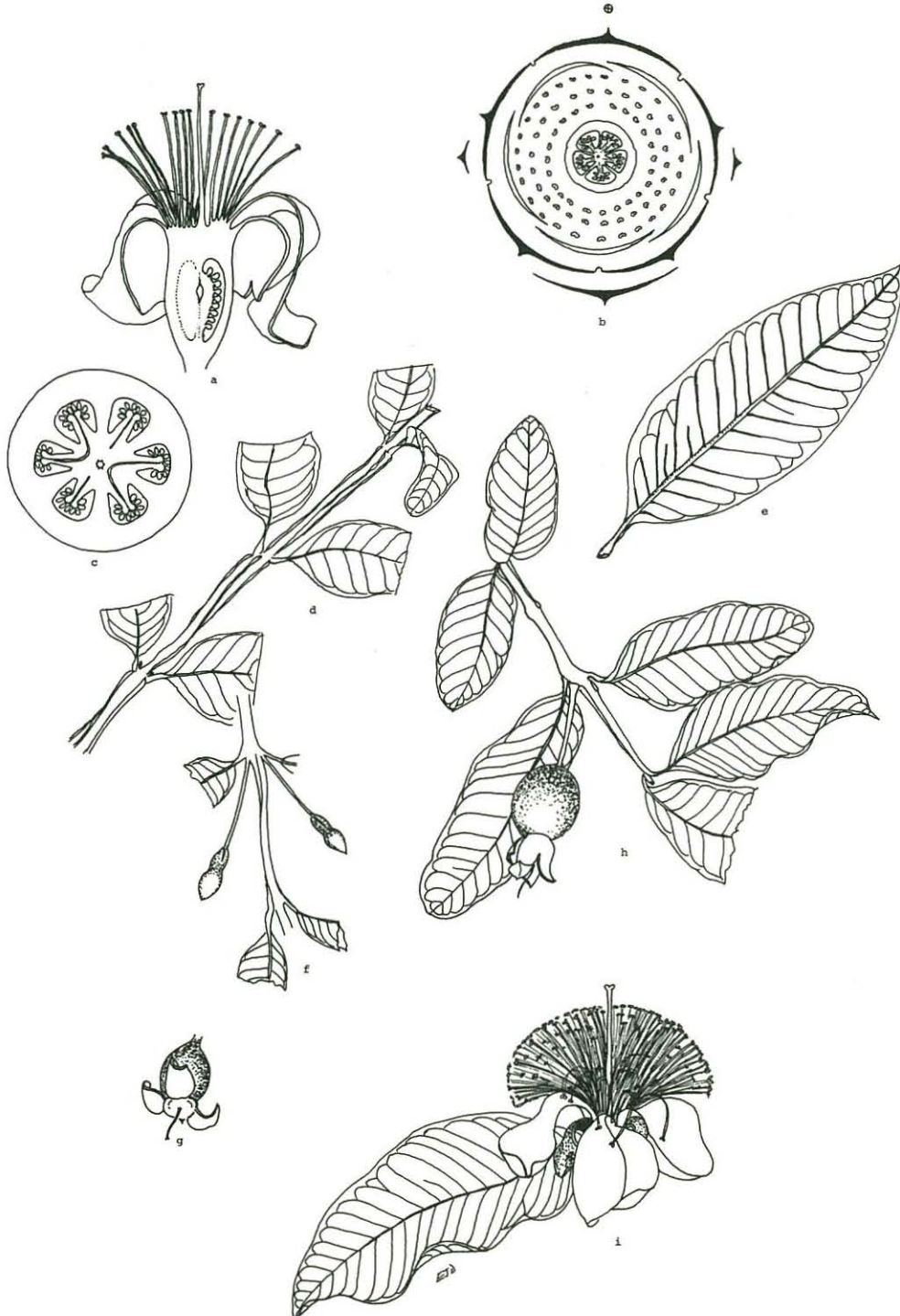


FIGURE 1. *Psidium guajava* L.