

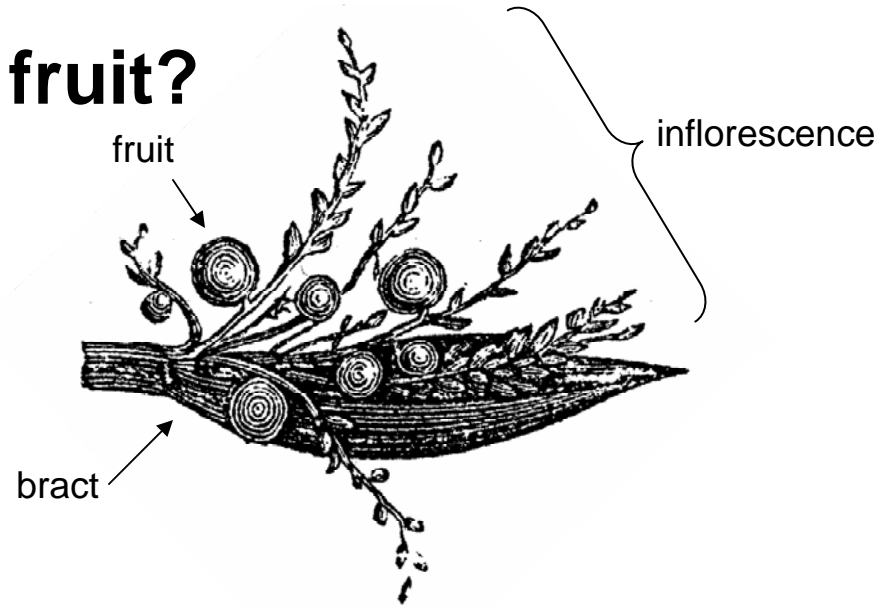
Do palms have flowers and fruit?

Palm reproduction: Flowers, bees and seeds

The adult palm starts to flower after a long juvenile stage, usually several years after the seed germinates. Palm flowers are small and often go unnoticed. They are usually divided in parts of three.

In an old palm a bud is found directly above the leaf and grows out as the flowering stalk.

The flowering stalk is termed an **inflorescence**.



Thrinax morrisii with inflorescences



Young *Pseudophoenix* beginning to flower for the first time

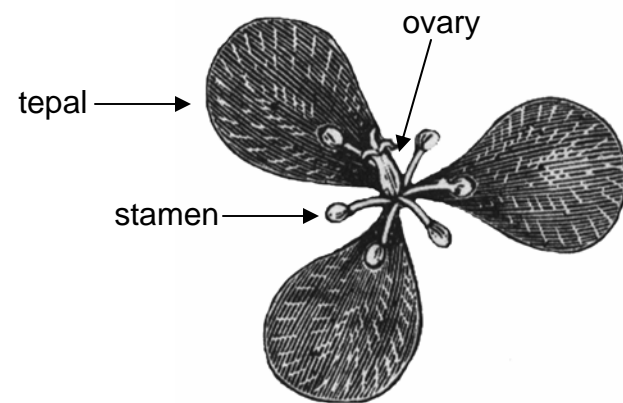
The ovary of the flower ripens into a fruit that contains a seed. Usually, the fruit changes color when the seed is mature.



Cherry palm (*Pseudophoenix sargentii*) open flowers with green petals, yellow stamens, and swollen ovary.



Chamaedorea palm (*Chamaedorea seifrizii*) with red flower stalks (inflorescence axes). The green fruit are beginning to change to black as they ripen.



typical monocot flower – flowers sometime do not have distinct petals and sepals, instead they have tepals

Know your coconuts...

A coconut begins as a tiny flower at the tip of an inflorescence. The first flowers to open are at the tips of the inflorescence branches.

Each flower has 3 green sepals on the outside, followed by 3 whitish petals, 6 yellow stamens and a little central structure (the aborted ovary).

The first flowers to open are male flowers; they only produce pollen and never coconuts.

After all the male flowers have opened and fall off, the large female flower buds at the base of the inflorescence branches open. No stamens are present but the large ovary (= young coconut) receives pollen from other male flowers by way of an insect (usually a bee) and the young seed within is fertilized.

The ovary grows into the large coconut. Using the terms of biology, the coconut is a fruit, that is, the matured ovary. The “nut” inside the fibrous husk is the seed.



Female flowers have a very large rounded ovary.

After pollination, the ovary develops into the coconut, which is a “fruit” in scientific terminology.



Male flowers have hard petals and soft yellow anthers that release the pollen.

Bees and other insects transfer the pollen to the female flowers.

The embryo in the seed begins to grow after the coconut falls from the tree. Part of the embryo, a very specialized cotyledon, expands into the seed cavity and absorbs the nutritious white endosperm (= "meat") and transfers nutrients and water to the other part of the embryo that pushes out of the seed (through one of the "eyes" of the nut) to form the visible, green seedling.



Coconut seedlings at different stages of growth.

The young seedling has to push its leaves and roots out of the tough coconut fibers.



A young coconut seedling with half the coconut cut away.

The broken nut has the white meat (endosperm) and the yellowish cotyledon filling the hollow space inside the nut.

The seedling has pushed itself out of the nut and is growing through the fibers.



A germinated coconut cut in half. The yellowish cotyledon (“coconut apple”) fills the hollow space of the nut and is surrounded by the white endosperm. The cotyledon is in the process of digesting the endosperm for use by the seedling which is still imbedded in the fibers of the coconut fruit.

Some palm species germinate like the coconut, with the seedling next to the seed, usually close to the soil surface.

Other palms are amazing in the way they can burry their seedlings deep into the soil. In the fishtail palm or our native cabbage palm, the embryo pushes itself out of the seed and then forms a stalk (= sheath of the cotyledon) that pushes the main part of the seedling deep into the soil and several inches away from the seed.

Palm seedlings dug up from the soil under palm trees. Three seedlings on right side are from the Christmas palm. Each grows next to its seed. The four to the left are from the Fishtail palm. Each seedling is pushed away from the seed and grow from below level of the seed.



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The cotyledonary sheath * is visible as the dark stalk connecting seed and seedlings on the left. All cotyledonary blades are within the seeds.