

## HortHorizon

## AN UNUSUAL OCCURRENCE OF VIVIPARY IN PAPAYA (*Carica papaya* L.)

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**ABSTRACT:** Vivipary is of unusual occurrence in papaya. In viviparic fruits, seeds germinate inside while still they remain attached with fruits. Such fruits are insipid in taste. If cut exposed, the germinated seeds inside the fruit look very clearly. High humidity and warm weathers appear associated with the viviparic fruits in papaya.

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**Keywords:** *Papaya, seed, vivipary.*

Papaya (*Carica papaya* L.) belongs to the family Caricaceae. Soft and juicy fruit of papaya is relished much as a dessert fruit in India. Papaya is grown primarily for its fresh ripe fruits and also for extraction of papain. Short duration, early cropping, staggered fruiting, high yielding attributes per unit time and space dimensions and suitability to growing under filler cropping along the high growing fruit crops has added towards popularity of papaya for commercial cultivation. The amenability of papaya to easy cultural practices makes it particularly popular among the growers who can't afford high cost of cultivation and are not having big size land holding. It is catching very fast in Chhatisgarh (Maske and Jain, 7).

The papaya fruit is rich in food value and its ripe fruit contain 89.6% moisture, 0.5% protein, 0.1% fat, 9.5% carbohydrate, 0.01% calcium, 0.01% phosphorus, 0.4% iron, 250mg/ 100g riboflavin, 40mg/ 100g Vit. C., 2020 IU Vitamin A and has 40 calorific value (Anon., 2). The green fruits of papaya are diuretic, mild laxative, and are used to cure piles, digestive disorders, dyspepsia of spleen and liver. Ripe and raw papaya fruits are used to prepare tutti-fruity, jam, jelly, *petha*, marmalade, syrup, wines, nectar, pickles, toffee, dehydrated flakes, and baby food, medicine, dental paste and face cream are also available in the market based on papaya. The fruit remains in demand almost all round the year.

In India, fruit cultivation is spread over 6.38 million hectares, the production is 74.87 million. Papaya stands fourth in total fruit production. It occupies 1.06 lakh hectares area and produces 41.96 lakh tonnes fruits having average productivity of 39.6 tonnes/ha. It has the highest productivity among all the fruit crops grown in India. Papaya shares 5.6 per cent of the total fruit production in the country (Anon., 4). It is grown commercially at the largest acreage in Kerala, Andhra Pradesh, West Bengal, Gujarat, Maharashtra, Chhatisgarh, Karnataka, Madhya Pradesh, and Tamil Nadu in order as they appear.

Sometimes during July 2009-10, in a papaya fruit purchased for dessert purpose, it was found having germinated seeds inside. It became a curiosity to observe as to how papaya fruit turned viviparic? The literature pertaining to vivipary was crammed into. The comprehensive account of inferences drawn is accordingly presented hereunder under the present study.

### Vivipary

It is a phenomenon in which seeds germinate precociously without maturation drying. Germination of seed takes place inside the fruits while still attached to the mother plant. Vivipary is noticed naturally in some species of mangrove like *Rhizophora mangle*, *R. mucronata*, *Bruguiera gymnorrhiza*, *Kandelia reedi*, *K. candel*, *Ceriops decandra* ( all belonging to Rhizophoraceae) in

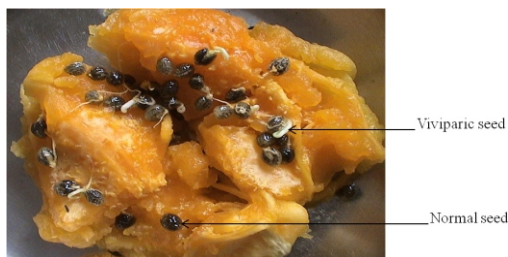


Fig. 1: Vivipary in papaya.

which it is considered as an aid to adaptation in wet ecosystem where germinated seeds after falling in mud establish itself and grow as a plant (Anon, 3). It is very often noted in *Avicennia* sp (Verbenaceae); *Aegialitis rotundifolia* (Plumbaginaceae); *Aegiceras majus* (Myrsinaceae); *Cocos nucifera* (Arecaceae); *Cucumis melo*, *Sechium edule* (both Cucurbitaceae plants); *Oryza sativa*, *Triticum aestivum*, *Zea mays* (Graminae) etc. For most plant species, vivipary is considered undesirable. This holds especially true in case of cultivated types which are grown mainly for their edible fruits.

Papaya fruits as usual remain free from viviparous seeds. In contrary, while cutting the fruits for consumption, an unusual occurrence of vivipary was observed in papaya fruit (*Carica papaya* L.; Caricaceae). The fruit was having a weight of 250 g, its  $\frac{3}{4}$  portion was characteristic yellow in colour and was slightly insipid in taste. As appeared physically, it was tree ripened fruit and was purchased from local market from a local papaya grower hailing from area around Jhalawar city during third week of July, 2009-10. As seen (Fig.1), the seeds manifest water coloured radical attached to pulp and white hypocotyls with green leaves about to open. Vivipary is considered genetic mutation but its manifestation can be modified by the environment (Stoutmeyer, 9). Increased precocious germination has been reported in susceptible species during wet season (Allard, 1). The genetics of viviparous mutant has been studied and in corn it has been reported to be associated with nine genes (Libby and Router, 6). Reduced production or insensitivity of fruit to abscisic acid

has also been marked as a feature of vivipary (Hartmann *et al.* 5). The vivipary, in observed papaya fruit, may be due to increased humidity in atmosphere consequent to rain during the period in the region. Vivipary may also had been favoured by lack of dormancy in papaya seed as in fresh papaya seed there had been high germination (Ram, 8).

## Conclusion

Papaya fruits during ripening may manifest vivipary. Of course, vivipary is controlled genetically, but, its manifestation can be modified by the environment. It appears that high humidity might play inciting role in expression of vivipary.

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