

## ABNORMALITIES IN ARECANUT

By

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Arecanut palm in general shows remarkable uniformity in its morphological features. In spite of this, large number of freaks have been met with. Barring very few instances of abnormal male flower (Raghavan 1957) and certain freaks of nature (Nayar 1943), no other cases of abnormalities have been recorded so far. Some of the

freaks that have been noted in respect of roots, stem, leaf, flower and fruit are discussed in this paper.

**Aerial roots.** The root system of arecanut is subterranean in nature typical of most of the palms. But in some palms roots were seen developing from the aerial

stem just above the ground level or higher up. The roots produced at the collar and

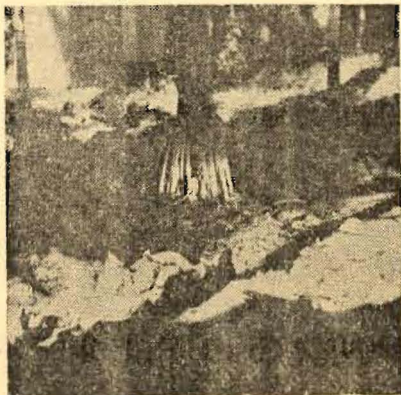


Fig. 1

just above that region in continuation of the main root producing zone of the palm (bole) were met with in the case of surface planted palms and palms in low lying areas. (Figure 1). Many of these aerial roots reach to the soil and perform the normal mechanical and physiological functions like the underground roots.

Roots from different heights emerge out from the nodes in rings (Figure 2) or from

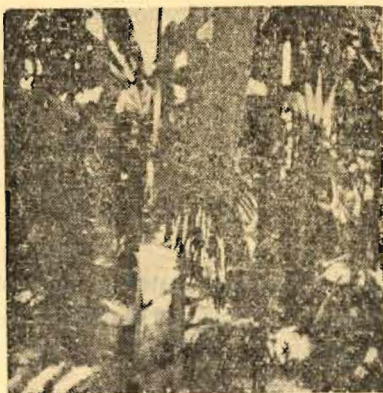


Fig. 2

the bottom of branches (Figure 5). Such roots will not reach the soil and remain

stunted. It is probable that such aerial roots are induced due to high water table, surface planting unevenness in thickness of the stem caused by unfavourable soil conditions and branching.

**Stem.** (a) Branching:—The arecanut stem was found to branch at all stages of growth. This phenomenon, however, being rather late. In one case, the stem was

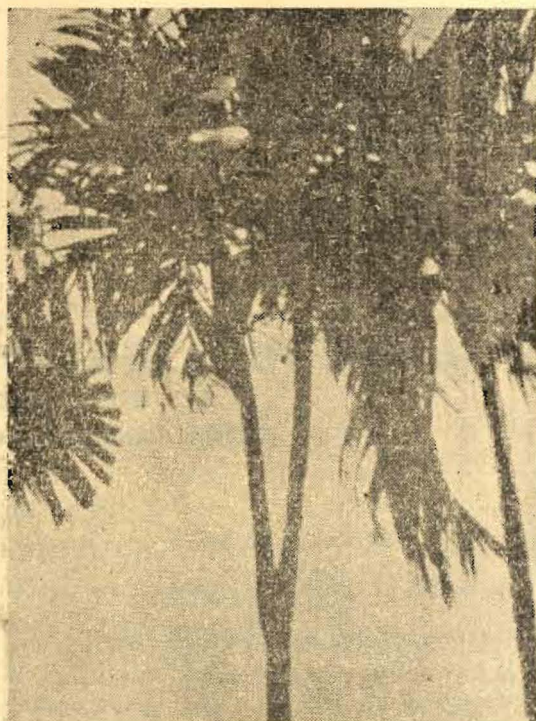


Fig. 3

branched into two (forked) at the height of about 30 feet from the ground level each branch from to a height of about 8 feet (Figure 3)

A twenty year old palm having grown to a height of about 28 feet had produced



Fig. 4

seven branches in a cluster (Figure 4) The growth of the branches was stunted and none of them had flowered. Both these were observed at Panaje (South Kanara).

In the case of another plant in the garden of Rev. Fr. E. D. Jacob at Mulanthuruthi, branching had taken place at a height of about 6 feet, the number of



Fig. 5

branches produced being thirteen (Figure 5). The branches had grown to varying heights ranging from about 2 feet to 8 feet, six of the branches had flowered and had borne stray fruits.

Such branching may possibly due to the inflorescence branches vernating into vegetative branches consequent to injury of the growing point.

(b) **Stem splitting.** A few instances in the garden of Dr. P. S. Ishwara Bhat, Badanaje House, Vittal, wherein the bottom portion of the stem of about 8 year old bearing palm was found split vertically around the stem to a height of about 2 to 3

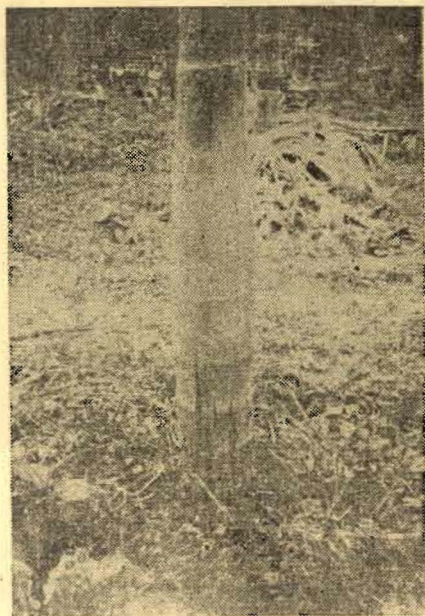


Fig. 6

feet (Figure 6). Each fissure was about 1/2 inch width and depth, about 6 inches in length. The plant was quite normal but for the slight unevenness growth of the stem. No fungus was found to be associated with this splitting. It appears to be a case of genetical or physiological disturbance.

**Suckering.** Branching of arecanut palms at the ground level termed as suckering was met with in the case of seedlings as



Fig. 7

well as grown up palms. A 'six months' old sprout was found to produce four suckers (Figure 7). A one year old seedling started producing suckers from its base one after another, the total suckers produced being six



Fig. 8

in addition to the main one (Figure 8). In a middle aged garden of about 25 years at Daithota, Panaje (South Kanara) nine suckers were found to have grown to a height of about 20 feet. All of them though



Fig. 9

having thin stem and slightly stunted growth were found to be bearing fruits (Figure 9).

Such suckering may possibly due to the meristematic activity of the ground tissues of the bole throwing out adventitious buds.

**Leaves.** Fused leaflets. The leaves of areca are pinnatisect with the leaflets which are free, arranged alternately on either side of the petiole. In the case of a four year old palm in the garden of Shri K. Ganapathy

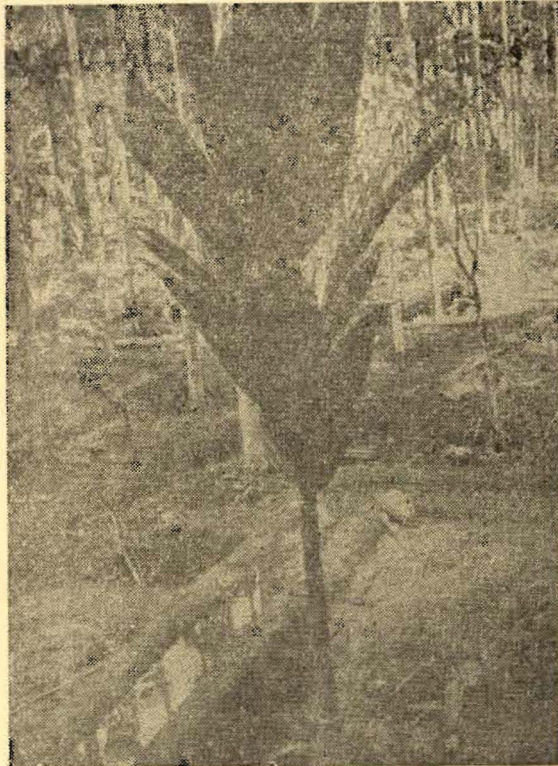


Fig. 10

Bhat, Muttathodi Village, Kasaragod Taluk, it was found that all the leaflets were fused throughout their length with a bifid tip. (Fig. 10) All the leaves produced by this particular palm right from the seedling stage were similarly fused. Another instance in the garden of Shri K. Saidali Kutty of Kumaranellur, wherein the tips of the leaflets alone fused was noted in the case of a three year old palm. All the leaves produced by this palm are showing fused tips.

**Chimera.** A three year old palm in the garden of Dr. P. S. Ishwara Bhat, Badanaje

House, Vittal, was found to have half of its leaves and leaf sheaths towards one portion



Fig. 11

of the plant having white stripes whereas leaves on the other half were found to be normal green (Figure 11).

In the case of a bearing palm in the garden of Shri Ramavarma Raja of Vittal, had similar leaf variation extended to the bunches also. Fruits in the bunches on the side where leaves were striped showing striped nature and the nuts in the bunches on the other side normal green colour.

#### INFLORESCENCE.

**Proliferation of flowers.** In the case of normal inflorescence, the female flower after fertilization develops into a nut. In a palm at Sankramane Thota belonging to Shri Muduvalli Manjappa Hegde, Thirthahalli Taluk, it was recorded that the individual flowers in the spadix growing into bulbil like shoots. All the three bunches of this

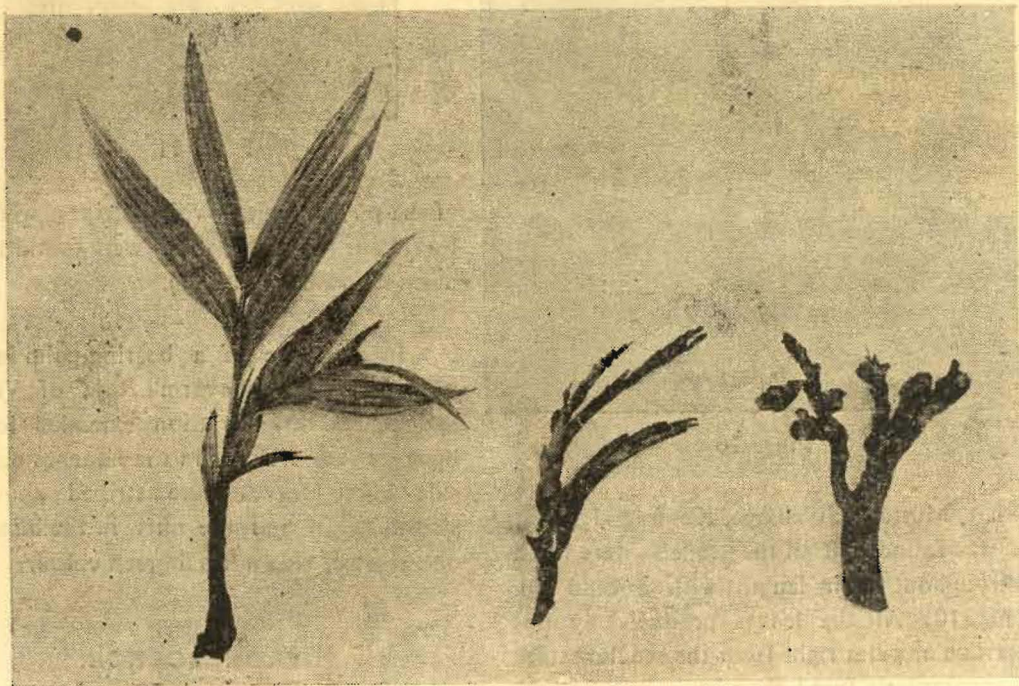


Fig. 12

45 year old palm was found to show vegetative growth to varying extent (Figure 12). An attempt was made to propagate the e bulbils by transplanting them. They failed to get established.

**Polyembryoni.** The arecanut on germination gives rise to one shoot but cases wherein more than one shoot was seen emerging from a single nut a phenomenon called "Polyembryoni" was recorded. The

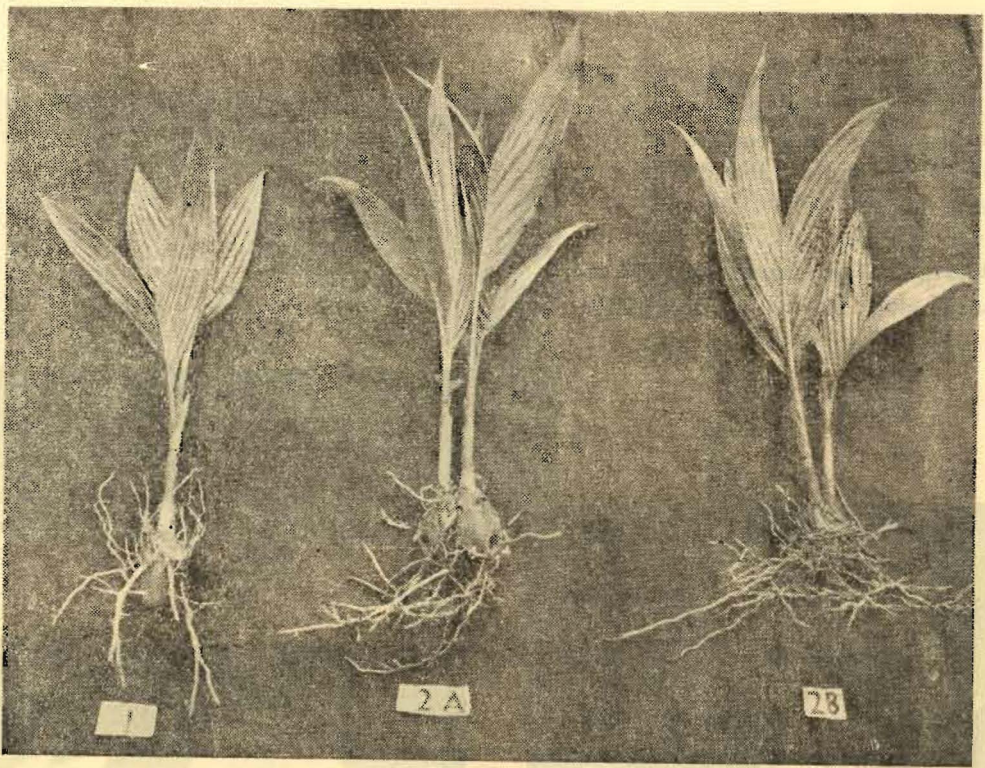


Fig. 13.

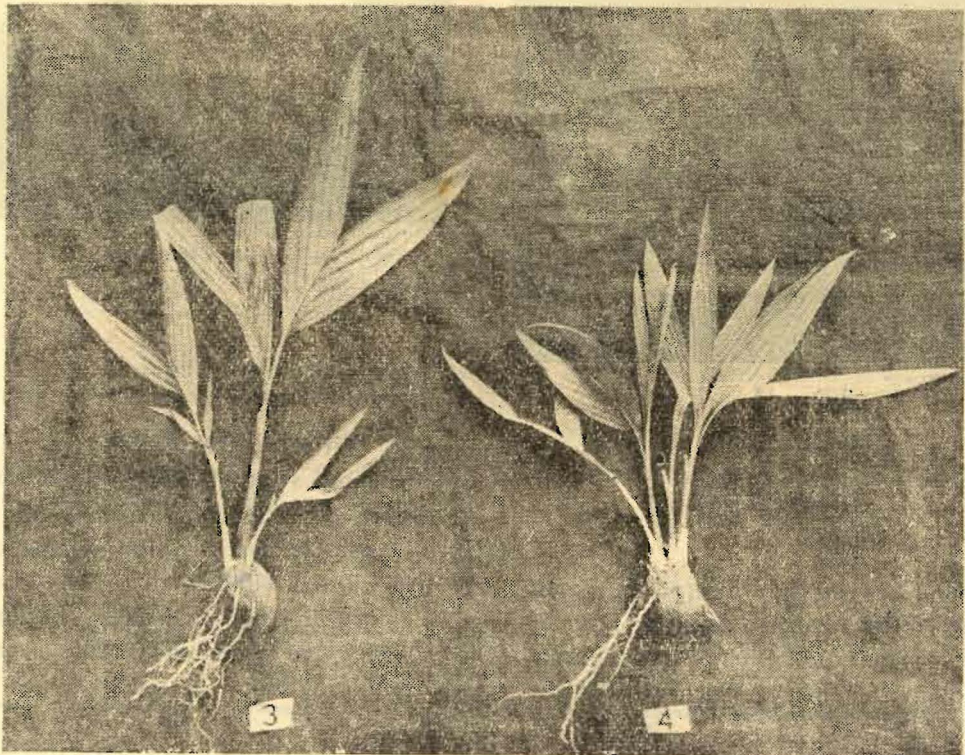


Fig. 14.

arecanut fruit is unilocular having a single ovule. Embryos varying from 2 to 4 were found to give raise polvembryonic plants (2B, 3 and 4 of Figure 13 and 14) from a single fruit.

**Polycarpy.** The monocarpic ovary of arecanut develops into a one seeded fruit.

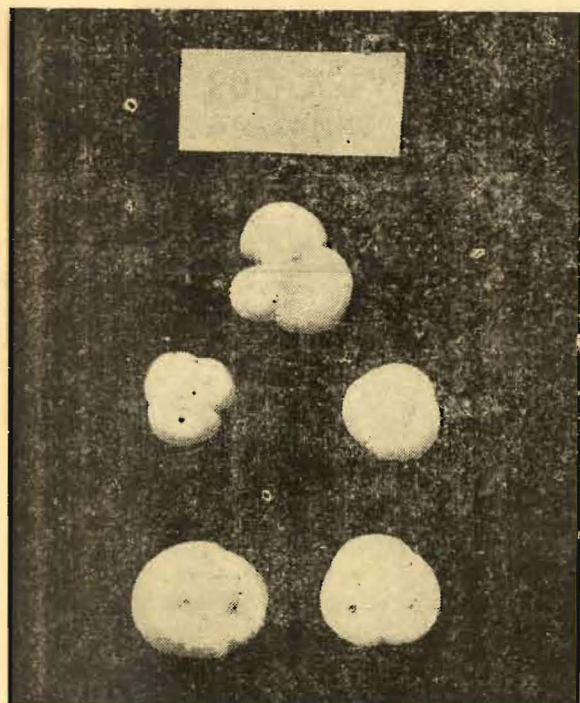


Fig. 15.

Instances of two seeded (bicarpellary) and three seeded (tricarpellary) nuts were found to occur. (Figure 15). Each of the seed was found to have an embryo. Such a fruit with

two nuts (bicarpellary) gave rise to two plants (Figure 2A of 13) showing thereby that both the embryos of the nuts were active.

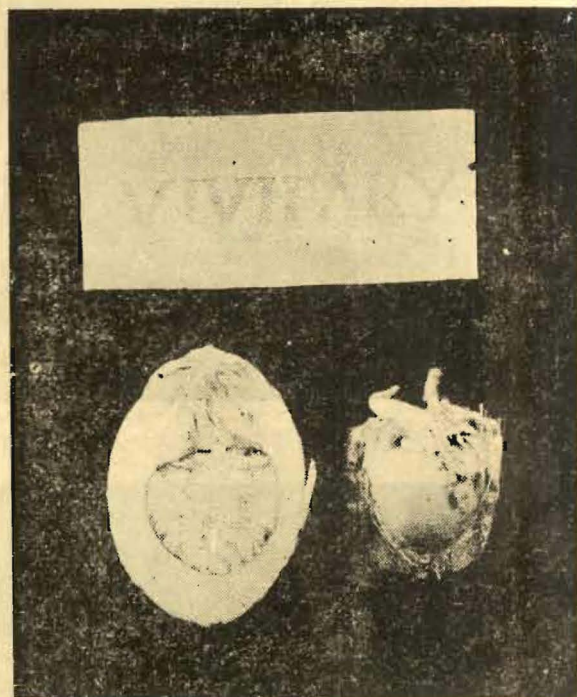


Fig. 16.

**Vivipary.** The embryo of a fully ripe arecanut fruit embedded in the endosperm starts its activity when the nut is given favourable conditions for germination. Nuts in all the bunches of a palm located in a garden in Maikke Village, Puttur Taluk, were found to germinate while on the bunch producing shoot and roots. When the nuts

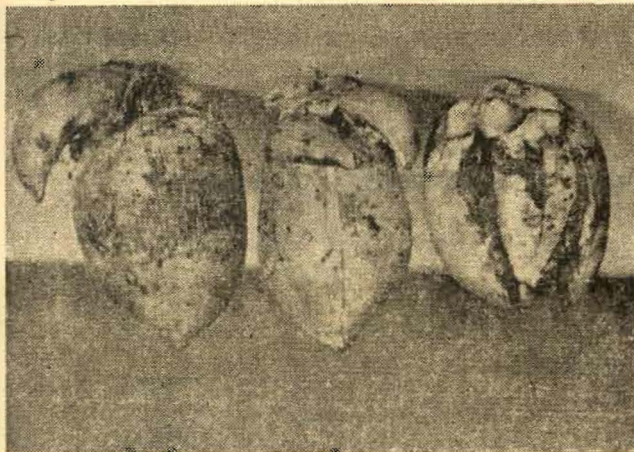


Fig. 17.

between 7 and 8 months maturity were examined embryo was found to have started activity (Figure 16) All the nuts in all the

bunches produced in this tree year after year has been reported to germinate similarly.

Horned arecanut fruit having one, two and three horns were noticed (Figure 17). The horn when cut opened was found to be full of fibrous tissues only. From the mode of development of these horns, they appear to be the over developed staminodes.

Further study in regard to the above are underway.

#### ACKNOWLEDGEMENT

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