Short Communications

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AN ABNORMAL SEEDLESS PAPAYA FRUIT RESULTING FROM VIRUS INFECTION

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In establishing the existence of a new disease attention must be paid first to the symptoms characterizing the disease. As such a disease of the papaya, not reported in the lierature before, has been studied with regard to its observable misformations. Its folliage showed two features, first its reduction which could be duly termed "Shredded Leaf diesase" and has been illustrated before [1]. Then the leaf, which is large enough, could "curl into a ball" also shown earlier [2]. Flowers appear on the main trunk of the tree. In the diseased papaya a leaf was producing a flower, as has been illustrated in [3]. The unripe fruit is round and elongated in shape, a marked difference from the shape of the like the petals of the flower, and these were fleshy and green like an unripe fruit. Obviously it was a monstrosity, a fruit bearing strong resemblence to the flower. Then the flower could change its sex, male flowers became females and bore fruits, not normal but brinjal shaped. All these features have been illustrated [3]. What was not yet observed was a fruit normal in taste but abnormal in shape. Fig. 1 is a papaya fruit which, by its shape, would be mistaken for a banana. A papaya fruit has a hollow space within, full of seeds if present; but even a a seedless variety is not devoid of this concavity. Specimen Fig. 1 was longitudinally cut and its two halves are shown in Fig. 2. There is no trace of any concavity much less of any seed. The tree had otherwise produced before payapa fruits which were normal in shape and contained seeds. The symptoms so far reported enable us to assume that of the two plant hormones, one promoting vegetative growth, the other hindering the same but acclerating reporduction, the causal agent, presumbly a virus, is detrimental to growth and induces premature reproductivity. Alongwith speciment Fig. 1 there was another abnormal banana-shaped papaya with typical fleshy yellow content, sweet and delicious like the normal fruit. The abnormality was restricted to the shape of the fruit and to the absence of concavity natural to the fruit.

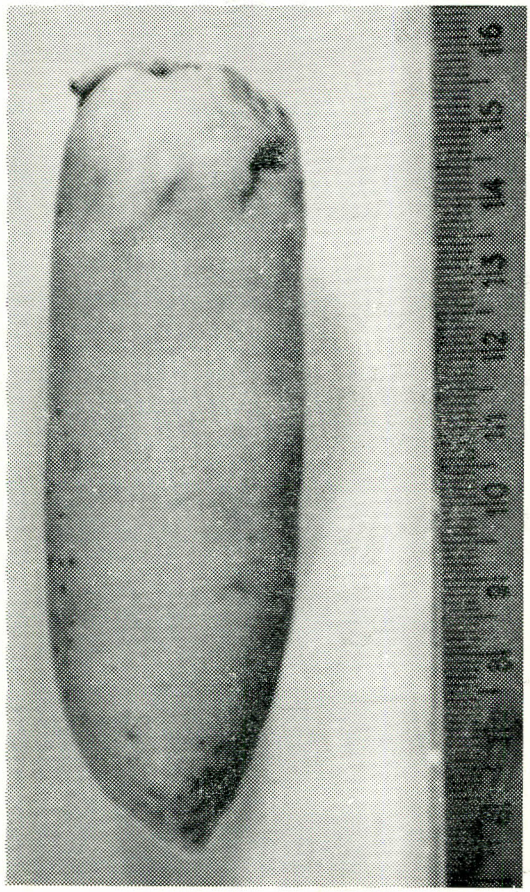

Fig. 1

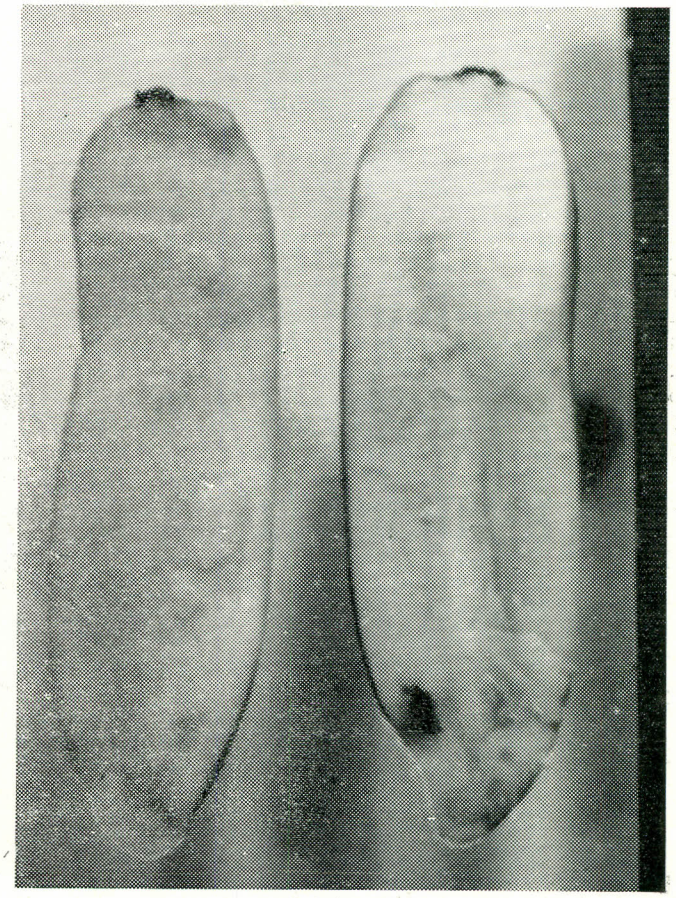

Fig. 2

flower with its five petals. In a diseased plant a fruit was found which had five digits, projections

References

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2. M.A. Faruqi, M. Rafi-uz-Zaman and S. Mahdihassan, Pakistan J. Sci. Ind. Res., **16**, 49 (1973).
3. M.A. Faruqi, M. Rafi-uz-Zaman and S. Mahdihassan, Pakistan J. Sci. Ind. Res., **16**, 248 (1973).

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

ICERYA AEGYPTIACA AS INFECTING A FIG TREE IN KARACHI

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In Karachi fruit trees are occasionally found outside on foot paths, but close to the boundary walls of residential houses. In its northern suburb only two fig trees, about 12 feet high were thus discovered and both were found infected by the scale insect, *Icerya aegyptiaca*, Dougl. One of them was so heavily infected as to give the impression that the insect was artificially grown upon it. The lac insect and others grow all round a vertical twig but only on the lower surface of a horizontal one. This is due to a gradation of insect food in the twig and we do not know the precise nature of the nutrient supporting any scale insect. The insect *I. aegyptiaca* therefore behaves like the lac insect and on the uppermost twig, in Fig. 1, has formed patches of colony only on its undersurface. The two lower twigs show heaviest infection with insects all around. Even the main ribs of leaves reveal infection. On the tree trunk injuries repaired and forming callous tissue appears to support the insect; two such spots are marked with horizontal arrows. A small shoot, revealing miserable growth, is nevertheless infected, the spot being indicated by a vertical arrow. Lac insects grow best at the base of a vertical twig, on the contrary least nearest the topmost spot. On the contrary *I. aegyptiaca*, as in Fig. 2, shows a profuse infection close to where leaves are growing. The growth at this spot is seen best on the lower surface of a horizontal twig as on a small vertical shoot surrounded all round by the insect colony. Midribs of leaves are also infected which is never the case with lac insects. Fig. 3 shows a horizontal twig curved concavely to our right and convexly to our left. The insect colony however is found all over the under surface of the twig. Two leaves reveal three main ribs well infected. Fig. 4 shows a twig horizontal and convexly curved with the insect growing only on the side facing the earth.

Fig, 1.

Fig. 2.

Fig. 3.

Fig. 4.

The tree was intensely infected with the coccid. No ant was found visiting the insect. In many cases coccid "excretes honey dew" and drops of such liquid, falling on leaves below, support soot-like growth of saprophytic fungi. No leaf was found to reveal such darkening implying the "honey dew" is free from sugars. The absence of ants as of black fungi indirectly reveal that the excreta of the insect is free from sugars. The first three photographs were kindly taken by Mr. Rafiuzzaman, of PCSIR, to whom I beg to thank again here.

No record of this insect from Karachi is known, which explains the absence of references. The insect was kindly identified by the Common Wealth Bureau of Entomology, London, and their help is gratefully acknowledged.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

THE MANGO TREE IN KARACHI AS EXTENSIVELY INFECTED BY A SCALE-INSECT

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The Punjab Fruit Journal [1] Lyallpur, issued a Mango Number in 1960. However on scale-insects attacking the mango tree in Pakistan, Haq and Akmal mention (on p. 199) only the mango mealy bug, *Drosicha stebbingi* Green, while Wolfenbarger (on p. 205) records several other species from Florida. But neither of these authorities mention *Chloropulvinaria polygonata*, Ckll, so that its present finding would be its first record on mango in Karachi. I am familiar with the subrub of Nazimabad and can claim the infection of the mango tree there by *C. polygonata*, this summer, to be on a scale which can be called epidemic. The insect has been kindly identified twice, by Dr. J. Williams, of the Commonwealth Bureau of Entomology, London, and grateful acknowledgement it made again here.

Most houses in Nazimabad have small grardens with one or two mango trees. The infection by the scale-insect has been so extensive this summer that almost all trees have been suffering from it. What becomes interesting is to trace such an epidemic to some preceding cause. There are always two opposite possibilities. One assumes that the insect could spread itself more conveniently this year than previously, while the other theory tries to find some predisposing factor on the host tree itself. A clue to the proper explanation comes from critically observing those trees which have escaped infection. The average mango tree in the house gradens is about 15 ft in height. The insect *C. polygonata* secretes minute quantities of honey dew and is visited by the black ant *Camponotus compressus*. Flies are also attracted to the honey dew and thereby transport young larvae of the scale insect from tree to tree. Nothing, however, can explain how its spread was specially acclerated this year. Now the few trees that were found to be free from infection were about 30 ft. almost double the

height of the average tree. Once we consider the root system, Musahibuddin Khan [2] would explain it normally reaching the depth of 5 ft but can go upto 15 ft. and over. It means that the taller trees, with roots striking the depth of 15 ft. are very near the subsoil water level and can resist drought better than others. Two years ago there had been an exceptionally long summer and even supply of drinking water was severely curtailed so that the average mango trees were subjected to a long drought. They survived dessication, not to have died earlier, and some actually did, but most were predisposed to infection, which subsequently resulted in extensive attack by the insect *C. polygonata*. The infection has been so intense that several trees have succumbed to it. The insect sucking the juice caused such a dehydration that trees gradually dried up as in drought. In the neighbouring graden, of the late Prof. Zaidi, a tree about 10 ft. height bore such a heavy infection as though the insect was being artificially cultivated upon it. Fig. 1 shows almost every leaf with one or more white spots representing the insect. Then a few vertical branches have been covered all round by the insect, whereas the lower horizontal one to the left shows infection only on the surface facing the earth. Fig. 2 shows other branches of the same tree, the vertical or nearly so, infected all round, whereas the horizontal ones covered only along the lower surface. Fig. 3 is an enlarged portion of Fig. 2 which clearly shows the vertical stem, on our right completely covered by the insect whereas the stem, on the left, showns only

Fig. 2

Fig. 1

Fig. 3

its lower side thus attacked. Other white spots on the stems all depict the insect which secretes a white wax. This differential intensity of infection, revealed by vertical and horizontal stems, is due not to geotropism by the insect, as to food gradient, or sap distribution on the part of the tree. Even shoots arise from the lower surface of horizontal stem. A phenomenon, such as Fig. 3 specially illustrates, must be familiar to most obsrevers of scale insects. Above all lac insects grow all round on a vertical stem but only along the lower side of a horizontal one. Eeven here I have maintained that a predisposition on the part of the host plant leads to a successful cultivation.

References

1. Mango Number: The Punjab Fruit Journal, Lyallpur, **23,** 82 (1960).
2. Ref. 1, page 113.