

The root is devoid of any hair covering. Oxalate of lime occurs in the form of octahedral crystals, those in the root being smaller than those in the stem and leaf.

Resin canals without any epithelial cells occur in the cortex of the root. They are not seen in the stem.

Leaves are 2-pinnatisect with linear apiculate segments. Stomata are present on both the surfaces, but are in greater numbers on the lower. They are surrounded by three or more ordinary epidermal cells. Large epidermal cells form a thicker layer than the palisade tissue. A marked xerophytic character is the presence of thick cuticle (Fig. 12).

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Leaf Crinkle—A Transmissible Disease of Papaya

IN the course of raising papaya (*Carica papaya*) seedlings in the Mycologist's pot culture house at Coimbatore, the authors came across a few seedlings which showed definite symptoms of a disease, which they believe has not been described before. The symptoms are: The stem instead of growing erect assumes a slightly zig-zag appearance. The leaves are slightly crinkled and the lobes of the palmatifid lamina curve downwards and inwards and the entire leaf assumes the shape of an inverted cup (Fig. 1). On the underside of the leaves the veinlets are thickened, slightly gnarled, dark green in colour and opaque when held against the light. The seedlings which show symptoms of the disease grow without appreciable stunting in growth and continue to exhibit the symptoms throughout. When pollarded such seedlings give rise to leaves which show the characteristic symptoms. Examination of roots, stem and leaves did not show the presence of any associated organism, nor was there any indication of any insect infestation.



FIG. 1

Left: Healthy plant. Right: Infected plant. The disease having been transmitted by grafting (photographed eight weeks after the first symptoms were noticed).

With a view to finding out if the disease is transmissible, seedlings showing symptoms were grafted to six perfectly healthy seedlings by the inarching method. Symptoms developed on three of the grafted plants within a period of 120 days.

A photograph of a normal plant and one showing the disease accompanies this note.

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Discovery of a Species of *Coeloplana* Commensal on the Star-fish *Pentaceros* *hedemanni* in the Sea off Krusadai Island, Gulf of Mannar¹

WHILE going through the literature on species of *Coeloplana* with reference to the species recently discovered by Prof. W. M. Tattersall,² the Assistant Director Dr. D. W. Devanesan and I had occasion to peruse Dr. Mortensen's paper on "Two New Ctenophores" wherein he has described *Coeloplana astericola*, a commensal on a star-fish *Echinaster luzonicus*.

On 23rd February 1939, while collecting specimens of the star-fish *Pentaceros hedemanni*

common round Krusadai Island, I noticed red patches on their bodies. When detached and examined under the microscope, they were found to be clusters of a species of *Cœloplana*. Dr. Devanesan who examined them on the 10th March 1939 is also of the opinion that their organisation and the presence of the two long tentacles with their uniserial branches left no doubt that they were *Cœloplanæ*. As they are uniformly red, they seem to be different from *Cœloplana astericola* Mortensen, which is said to be mottled red and white. Dr. Devanesan and I are continuing our observations on this new species of *Cœloplana* and hope to be able to publish ere long a brief account of its structure and habits.

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¹ Published with the permission of the Director of Fisheries, Madras.

² *Curr. Sci.*, 1939, 8, 157.

A Note on the Biology of *Lucilia sericata* Meigen (*Calliphoridae*, *Diptera*) in Baluchistan

Lucilia sericata Meigen (Family Calliphoridae, Order Diptera), the larvæ of which cause cutaneous myiasis in sheep skin is a species of great economic importance. Its attack is particularly severe in Europe, North America, South Africa and Australia. In India it has previously been recorded by Sinton (1921) and Patton (1922), the adults having been bred from cases of human cutaneous myiasis in the North-West Frontier Province. Last year the writer reported the occurrence of this sheep blowfly causing cutaneous myiasis in sheep in Baluchistan (Janjua, 1938). A study of this pest undertaken in the beginning of 1937 has revealed some interesting facts about its biology and these are recorded in this note. The identification of the species has been done by the Imperial Institute of Entomology, London, to whom I am grateful for the help rendered.

Sheep farming is one of the principal occupations of the people of Baluchistan as the area of pasturage is unlimited and the hillsides and valleys of the Province are covered with grass and other succulent plants which afford excellent grazing for sheep. But the presence of *Lucilia sericata* is causing a grave concern to the sheep farmers of Baluchistan. As a result of investigations carried out by the writer for the last three years it has been ascertained that about 20–25 per cent. of the sheep in the Quetta-Pishin, Loralai and Zhob districts of the Province are under the attack of the maggots of this fly.

The sheep attacked by the fly is easily noticed with its head bent down and not feeding normally. It is irritable, uneasy, constantly shaking and when feeding, is frequently seen to stamp one hind leg. The diseased sheep has the habit of looking back over the shoulder and wagging its tail in a characteristic manner. During rest it avoids sun and seeks the nearest shady place. The wool on the affected part shows a dirty greyish-black stain and closer examination reveals a sticky fluid with a peculiarly offensive odour. The maggots of the fly feed in the wool and the adjacent skin, causing the latter to fester and the wool to loosen and become putrid, thus exposing the inflamed flesh with the whitish maggots tunnelling into it. The injuries gradually become transformed into serious ulcers with great loss of tissue. There is a rapid loss of condition and invariably death follows.

The female flies are usually attracted to the sheep after a shower of rain during the rainy season by the odour arising from the fleece. The eggs are then laid in the wool and the maggots on hatching cause lesions in the skin. Any wound, however small, is an added attraction and sheep affected with foot-rot or those with shoulders and loins denuded of wool by rubbing or biting are frequently attacked.

The female deposits her eggs in clusters of from fifteen to twenty-seven and as many as two hundred eggs may be laid at one time. A single female during her life-time may lay about 1,000 eggs. The eggs are mostly laid on