PREPARATION OF 3-BROMO-SALICYLIC ACID

THE direct halogenation, for example direct bromination of salicylic acid gives 5-bromo-salicylic acid along with 3-5-dibromo-salicylic acid and 2-4-6-tribromo-phenol. 3-Bromo-salicylic acid has been therefore obtained indirectly. Lellmann and Grothman[1] have prepared it from 5-nitro-salicylic acid but in poor yields. More recently, Hirwe and collaborators[2] have developed methods to obtain 3-bromo-salicylic acid from (*a*) 5-sulpho-salicylic acid and (*b*) chloralsalicylamide; in both cases, the yields are sufficiently good. However both the methods involve practical operations which are not easy to manipulate.

We have now to report a method for the preparation of 3-bromo-salicylic acid in good yields, which involves mercuration and is fairly simple. Salicylic acid is mercurated with mercuric nitrate at the temperature of boiling water. The mercury-derivative thus obtained is treated with bromine in glacial acetic acid when 3-bromo-salicylic acid is obtained in 60 per cent. yield. If the mercuration of salicylic acid is effected with mercuric acetate, instead of mercuric nitrate, the yield of the 3-bromo-salicylic acid is 50 per cent.

The compound is crystallised from alcohol in the form of needles; m.p. is 183°. The analysis for bromine are:—

Found Br 37·1 per cent.

Calculated for $C_7H_5O_3Br$, Br 36·86 per cent.

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[1] Lellmann and Grothman, *Ber.*, 1884, **17**, 2725.
[2] Hirwe and collaborators, *Pro. Ind. Acad. Sci.*, 1937, **5**, 321-25.

ON THE OCCURRENCE OF SCLEREIDS IN THE LEAF OF *OLEA DIOICA*

THE occurrence of Sclereids or stone cells within the leaf-tissue has been recorded in many plants, particularly in some of the members of Oleaceæ and Ternstrœmiaceæ. The sclereid cells are scattered within the mesophyll tissue and according to Stevens (1924) they give hardness and toughness without being an impediment to increase in size. In the present note a short account of the morphology, and development of the scleroids, within the leaves of *Olea dioica* is given.

In mature leaves the sclereid cells traverse the mesophyll tissue (Fig. 1) connecting the upper and lower epidermis. They are flattened and anchor-shaped at either ends. In some cases the cells develop branches which anastomose and form a reticulum. Similar instances of elongated stone cells traversing the mesophyll tissue have been recorded by Vesque and Pirotta (Boddle and Fritsch, 1908) in *Olea americana, O. angustifolia, O. chrysophylla, O. europea, O. undulata* and in species of *Linociera* and *Noronhia*.

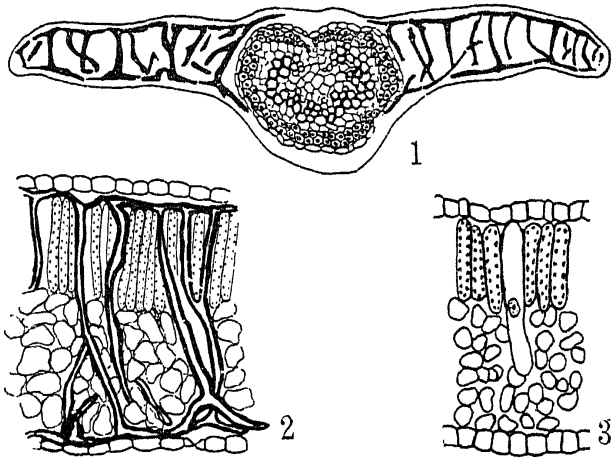

FIG. 1 Showing the sclereids within the leaf.
FIG. 2 Enlarged view showing the lumen within the sclereids.
FIG. 3 Palisade cell developing into the stone cell.

The developmental stages of the sclereid cells were traced in sections of the young leaves. The sclereid cell is the transformed palisade cell (Fig. 3). The palisade cell elongates in size becoming long and possessing a sinuous contour. The nucleus becomes slightly enlarged and migrates downwards. The cells are hayline owing to the absence of chloroplast. In the process of elongation the spongy cells are pushed aside. As development proceeds the elongated palisade cell forms short branches. The wall becomes thickened to a great extent and lignified leaving a

narrow lumen within the cell (Fig. 2). The nucleus degenerates and the degenerated mass persists even in late stages.

The sclerosed cells of the palisade tissue in *Linociera intermedia* Wight (Boodle & Fritsch, 1908) might also have a similar origin.

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Bangalore,
September 9, 1942.

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WEIRS IN SOUTH INDIA AND THEIR EFFECT ON THE BIONOMICS OF THE HILSA IN THE SOUTH INDIAN RIVERS—THE GODAVARI, THE KISTNA AND THE CAUVERY*

PRIOR to the construction of these weirs, before the nineteenth century, one should presume that the spawning Hilsa had the whole run of the rivers excepting the upper reaches, and the eggs deposited in the freshwater sections found their way unobstructed downstream and the parent fishes also returned to the sea after spawning. The reduction of the spawning areas is, therefore, comparatively recent but none the less disastrous to the Hilsa fisheries in South India.

The distance between the first weir[1] and the sea in the rivers Godavari, Kistna and Cauvery, are respectively 60, 60 and 50 miles only. At present, it is in these short river-lengths that the parent fishes should spawn and the young larvæ reared. What with such a much diminished area for spawning and with the over-fishing caused by the fishermen taking advantage of the unsuspecting Hilsa in roe congregating below the first anicut, the survival of the Hilsa even in small numbers in South Indian rivers is a matter for legitimate surprise. What then is the remedy?

"Fish-passes" suggest themselves, but to be effective they presuppose two conditions:—

1. The fish whose protection is sought should have the habit of leaping in the air or swimming up-hill.

2. There should be the habit of spawning in the upper reaches only; when a fish can spawn in sections of the river in the plains, it cannot possess the urge to go uphill; the Hilsa do not seek the upper reaches and as a matter of fact they spawn even close to river-mouths. When the above two conditions do not exist, there is no case for fish-passes.[2]

The success of the Madras Government's efforts with Hatcheries has yet to be estimated. But the stocking of Hilsa-larvæ in short river-lengths does not forebode much success. The eggs generally want running flood-water for development and hatching and possibly the larvæ also need a period of sojourn in fresh-water. The short river-lengths which alone are now available for the spawners may not afford the time and distance necessary for the hatching and rearing of the larvæ before they could enter the estuaries and thrive there. If the larvæ enter the estuarine portion sooner than they should under natural conditions, a brackish-water environment may be lethal to them. The work of the hatcheries, therefore, may be a waste and no adequate return can be expected. Then again the uncertainty of procuring spawners during the spawning season is another handicap to hatcheries. Unless one is assured of a reasonable number of spawners, at a given place, in a given time, a hatchery cannot be worked with success. The experience of the Madras Fisheries Department has shown that the chances of obtaining spawners were very fitful and that the hatchery could not be worked annually.

Further, as South Indian Rivers contain little or no water for six months in a year, fish-passes constructed will then remain idle and money will have to be spent in watching them and keeping them in good condition. It occurs to me, therefore, that wise legislation such as prohibiting fishing within a five-mile (?) length of the river from the first weir, observing a closed season of a few weeks or restricting fishing below the first weir to three days

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