

of isometric forms of seedlings is so far unknown. Bahadur *et al.*⁸ reviewed the possible reasons for the existence of handedness in plant parts and hypothesised that handedness possibly may be due to the presence of optically active substances, *i.e.*, Levo and Dextro compounds in plant metabolism. Onslow¹² (ex. Arber, 1961) suggested that the plant form is an expression of its chemical constitution. Dubrov¹¹ believes that the Geomagnetic force determines the bisymmetric status of living objects. It is possible that the left and right handed and neutral forms of seedlings in *P. vulgaris* are due to any of the causes but more experimental data are needed. According to Compton³, the direction of the folding of the first leaf is not inherited in cereals. Studies on the inheritance of handedness during the course of the present work have shown that in *P. vulgaris*, the handedness is not inherited and does not follow the typical Mendelian ratio (unpublished).



FIGS. 1-2. Photograph of Left (Fig. 1) and Right-handed seedlings (Fig. 2) of *P. vulgaris*.

Note the contortion of the first pair of leaves as indicated by black strips.

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Department of Botany,
Kakatiya University,
Warangal 506 009, A.P.,
May 26, 1979.

M. MADHUSUDANA RAO.
N. PRATAP REDDY.
BIR BAHADUR.

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STRUCTURE AND DEHISCENCE MECHANISM OF FRUIT WALL IN *ERUCA SATIVA* MILL—AN OLEIFEROUS CRUCIFER

CONSIDER BLE attention has been paid to this economically important group¹⁻⁴. Floral morphology and seed structure of several members have been worked out⁵⁻⁸. Some work is available⁹ on morphology and anatomy of seed of *Eruca sativa* but no published work is on record regarding dehiscence mechanism of the pericarp of this plant.

The siliquose fruit is the metamorphosed single bicarpellary and superior ovary. The ovary at archesporial initial stage of ovule shows almost roundish outline with uncutinized upper and inner epidermis. Its wall is 25 to 35 μ m thick and is made up of parenchymatous cells. There are two procambial strands in dorsal plane and two in commissural plane. Two masses of parenchymatous cells one opposite each procambial strand meet, interlock and fuse to form false septum. Cells in the septum are with medium density cytoplasm and large vacuoles. In the beginning cells of upper epidermis as well as inner epidermis are longer than broad (Figs. 1, 2). However, at later stages the cells of upper epidermis divide anticlinally as a result the cells of this layer become broader than long (Figs. 3, 4). The cells comprising the inner epidermis are, however, throughout longer than broad.

1. Burger, H. D., *Seedlings of Some Tropical Trees and Shrubs Mainly of South East Asia*, Translated from Dutch by Burger, R. and Festing, B., Wageningen, 1972.

At functional megaspore stage, a thin cuticle appears all over the upper epidermis. Adjacent to inner epidermis, the parenchymatous layer undergoes numerous anticlinal divisions (Fig. 2). These divided cells are thin-walled, uninucleate, sparsely cytoplasmic, vacuolate and are responsible for the formation of prosenchymatous layer (Fig. 3). Cell division and elongation in septum region is unable to compete with fruit wall development. This results in the formation of large cavities in septal tissue (Fig. 1). Secretory cells containing chemical substance 'myrosin' appear (Figs. 1-3). The myrosin cells are 150 per sq. mm.

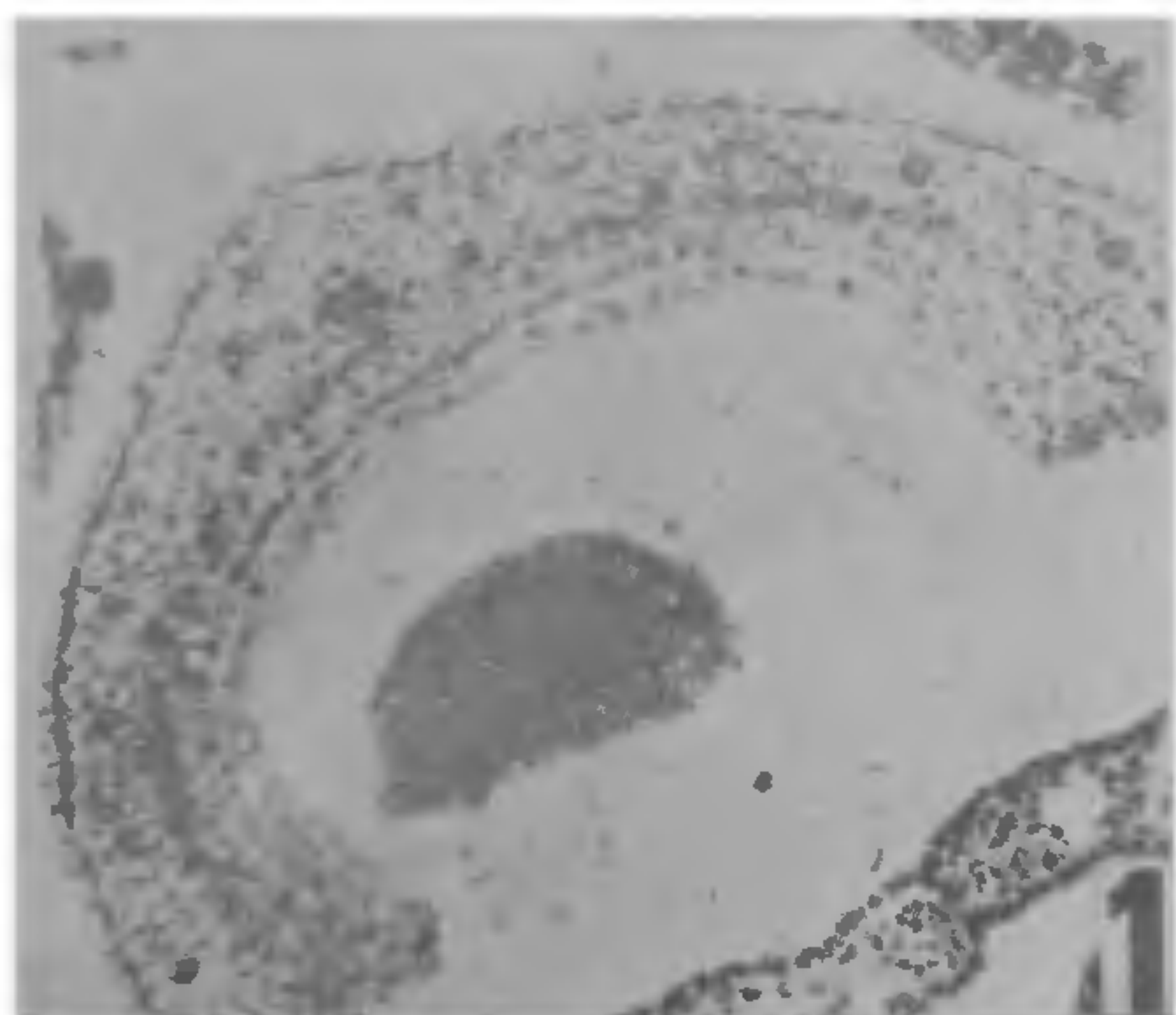


FIG. 1. T.S. ovary wall and septum at mature embryo sac stage.

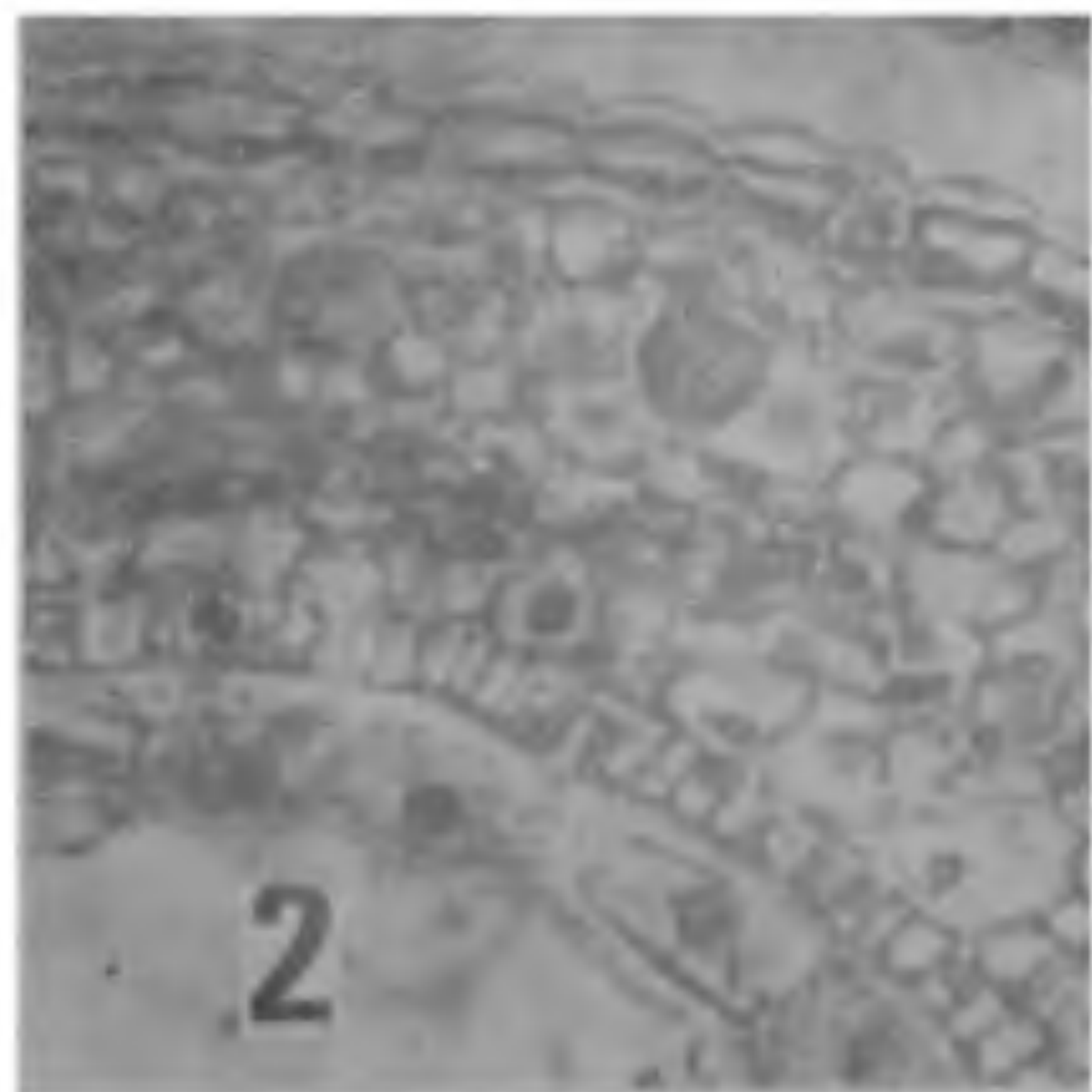


FIG. 2. Same, a part magnified.

In the ovary of an open flower, two distinct notches appear along commissural plane. The cuticle which is thick on inner epidermis shows its absence at the bottom of notches and also at the four junctions formed

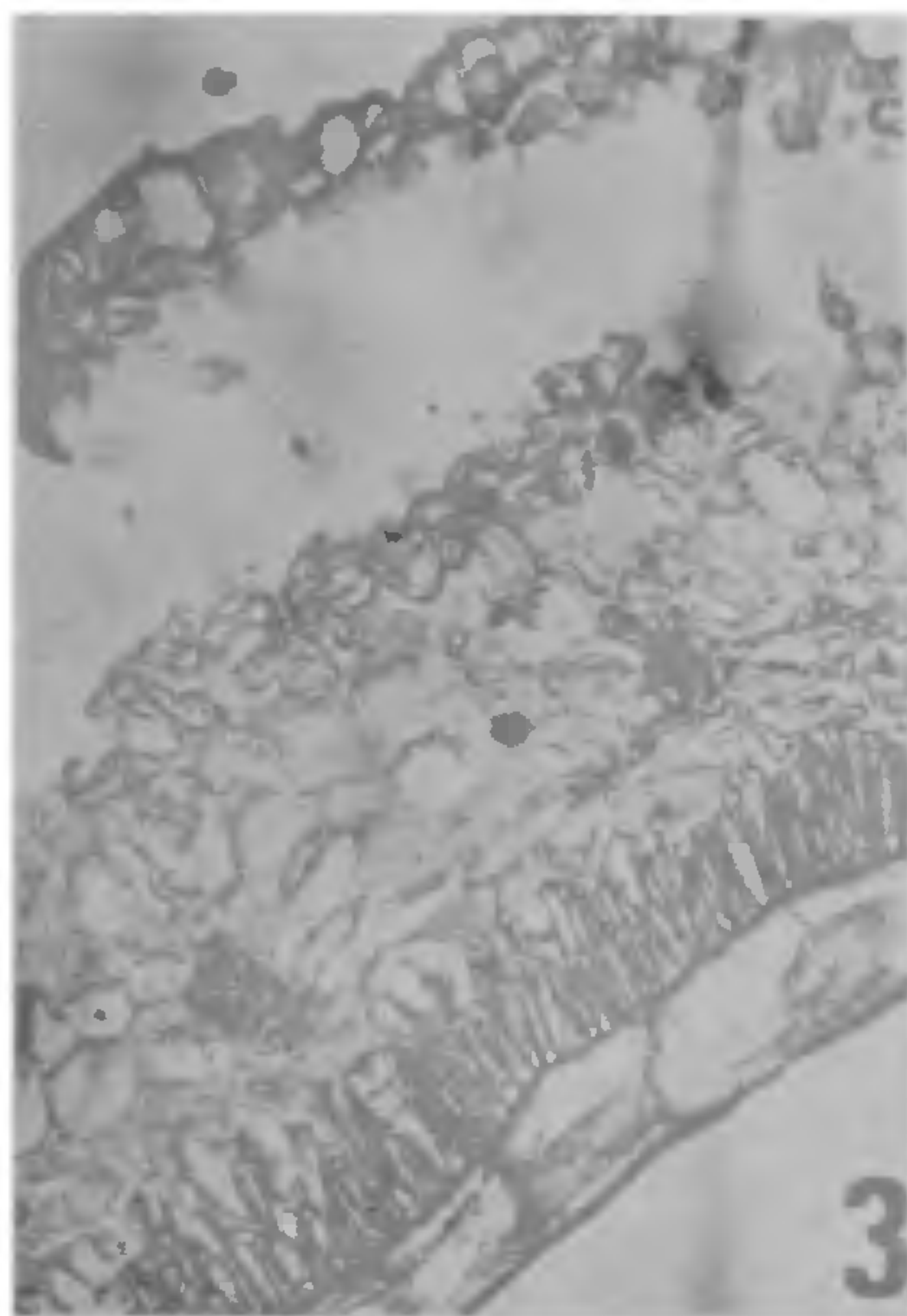


FIG. 3. T.S. pericarp mature fruit.

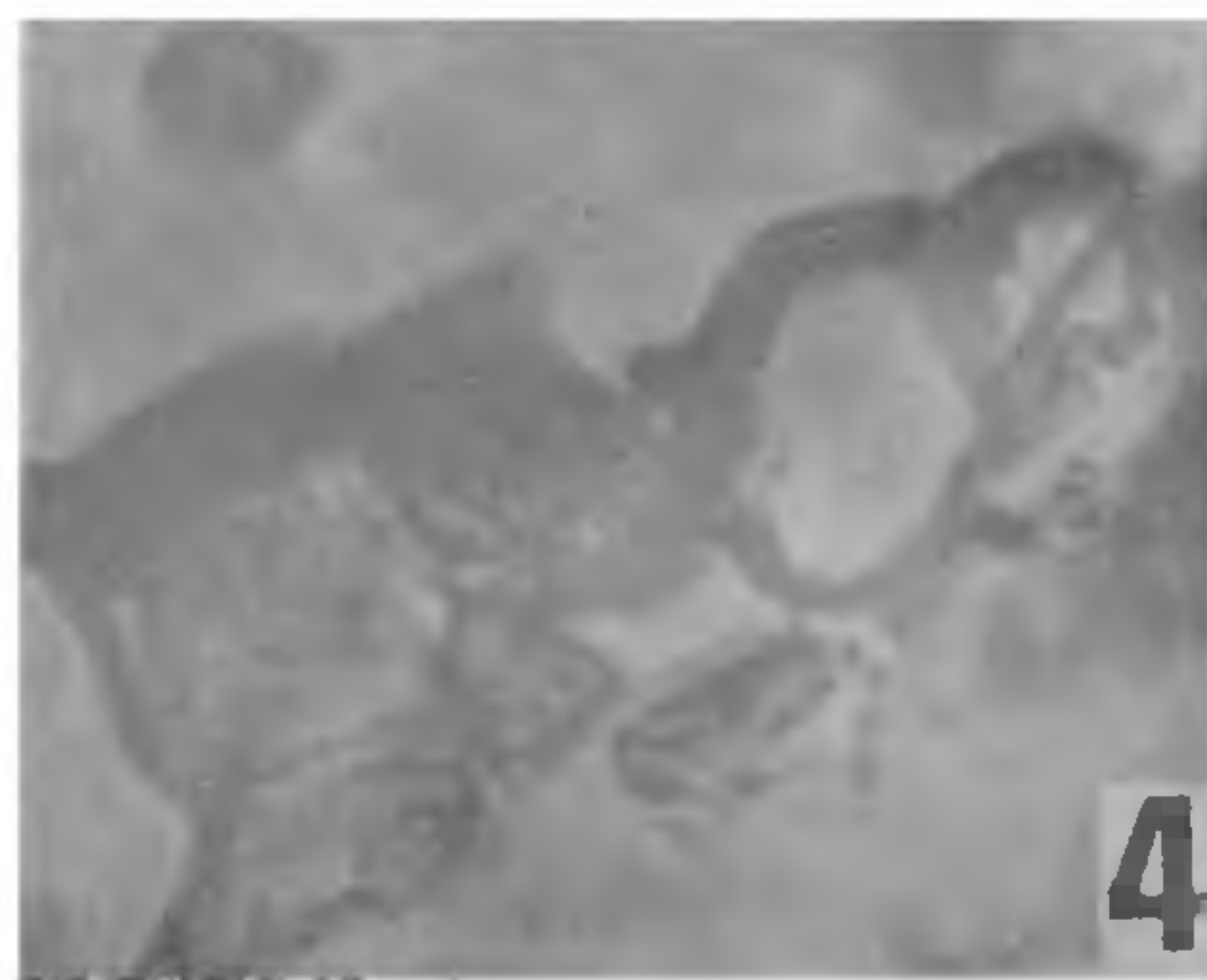


FIG. 4. Stoma on upper epidermis of mature fruit.

by meeting of septum and inner epidermis. Cells in prosenchymatous layer are broader than long and are closely packed in palisade-like fashion (Fig. 3). In the commissural region, the tissue surrounding vascular elements gets thickened (Fig. 5). A semicircular thick-walled tissue 'stomial tissue' (Abscission tissue¹⁰) is present in between thick-walled tissue which delimits the commissural framework at mature stages. Commissural framework together with the false septum constitute the 'replum' (Fig. 5). Fibers are formed from the cells of prosenchymatous layer. On external surface of pericarp functional stomata (Fig. 4) are

present. Guard cells are placed at level with upper epidermis with clear sub-stomatal cavities.

In ripe fruit, epidermal cells show contraction and commissural framework gets highly sclerified so much so that the vascular tissue cannot be clearly marked out (Fig. 5).

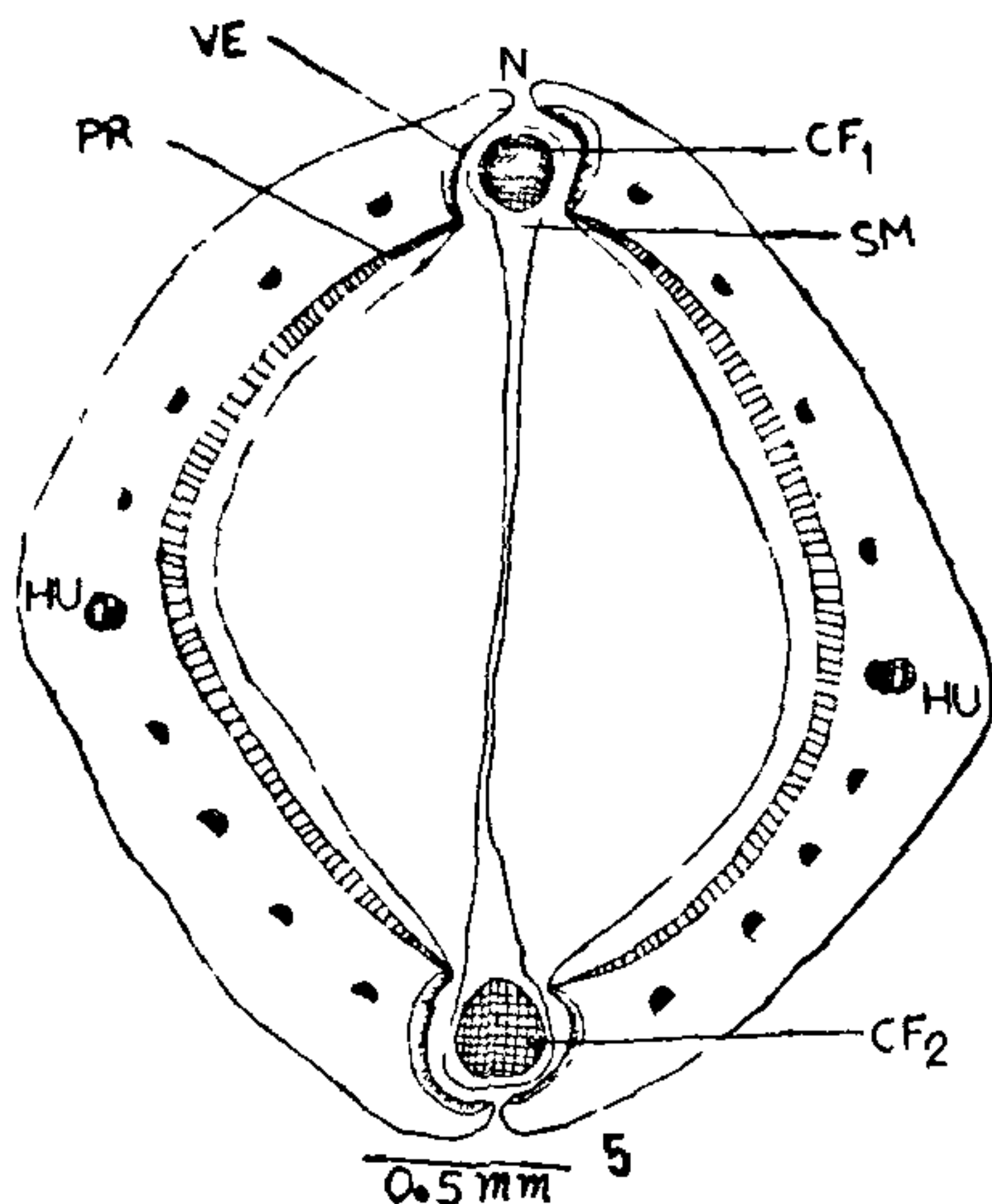


FIG. 5. T.S. field-ripe fruit.

CF₁, CF₂—Commissural frameworks; HU—Hump; N—Notch; PR—Prosenchymatous layer; SM—Septum; VE—Valve and sclerenchyma.

As the mature fruit dries up, its various tissues contract differentially due to differential wall thickenings. Thus a force of tension is created which pulls apart the valves. Consequently the stomial tissue breaks down. Notches and replum-fruit wall junctions split open. The fruit dehisces by four longitudinal clefts which separate the two valves from the replum to which seeds are attached on parietal placentae. The split extends from bottom of the valves to the base of beak above which stomial tissue is absent. Dehiscence is further aided by absence of fibrous layer in the region of replum.

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Plant Morphology and Aerobiology
Laboratory,

Department of Botany,
Kurukshetra University,
Kurukshetra 132 119,
Haryana, India, June 4, 1979,

B. B. ARORA.
L. C. LAMBA.

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THE EFFECT OF SUGARS ON THE RESPIRATION OF *PESTALOTIOPSIS* *VERSICOLOR*

RESPIRATORY studies have been carried out with a good number of fungi¹⁻⁴. But there are only a few reports on the effect of substrates on the respiration^{5,6,12}. It is known that among filamentous fungi, the rate of endogenous respiration is usually high as compared with the respiration in the presence of an exogenous substrate. Whether the substrate is oxidised at a rate higher than that of the endogenous, is often applied to identify the possible metabolic intermediate^{7,8}, and this helps in the understanding of the metabolic behaviour of the fungus. Such studies with *Pestalotiopsis versicolor* are reported in the present note.

Pure culture of *Pestalotiopsis versicolor* causing rot of *Citrus aurantium* fruits was grown in 100 ml liquid broth (Sucrose 30 g, NaNO₃ 2 g, KH₂PO₄ 1 g, KCl 0.5 g, MgSO₄ 7H₂O 0.5 g, FeSO₄ H₂O 0.1 g, distilled water 1 litre) in 250 ml Erlenmeyer flasks at 25°C for 5 days. Mycelium was collected by filtration and washed with distilled water. Starvation was effected by keeping the mycelium in sterilized distilled water for 3 to 5 days. Active and starved mycelia were taken separately, weighed and homogenized in phosphate buffer (pH 7.2). Respiration was measured using Warburg's respirometer (Umbreit *et al.*⁹), at 30°C using homogenate (2.5 ml) in the main compartment, sugars (0.5 ml of 0.5 M) in the side arm and 4-NKOH (0.2 ml) in the centre well. Controls and thermobarometer controls were maintained. Experiments were repeated three times and mean values are expressed as μ l O₂ uptake.

The results show that in active and starved mycelium, oxygen uptake increased in the presence of sugars (Table I), except in the case of lactose where it decreased. Glucose and fructose were the best respiratory substrates. These results agree with the carbohydrate requirements of the pathogen¹⁰. Nolan¹¹ has indicated that biologically, glucose is the most