gillnets, cast-nets and shore-seines at the Porto Novo fish landing centre (Lat. 11° 29′ N and Long. 79 46′ E) were utilized for external sex identification.

In *L. bindus*, the body form, morphometrics, meristics and colouration are identical in both the sexes, and it is not surprising that earlier workers overlooked the sexual dimorphism.

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EXTRACELLULAR POLYSACCHARIDES IN *TURBINARIA CONOIDES*: STRUCTURE AND ULTRASTRUCTURE

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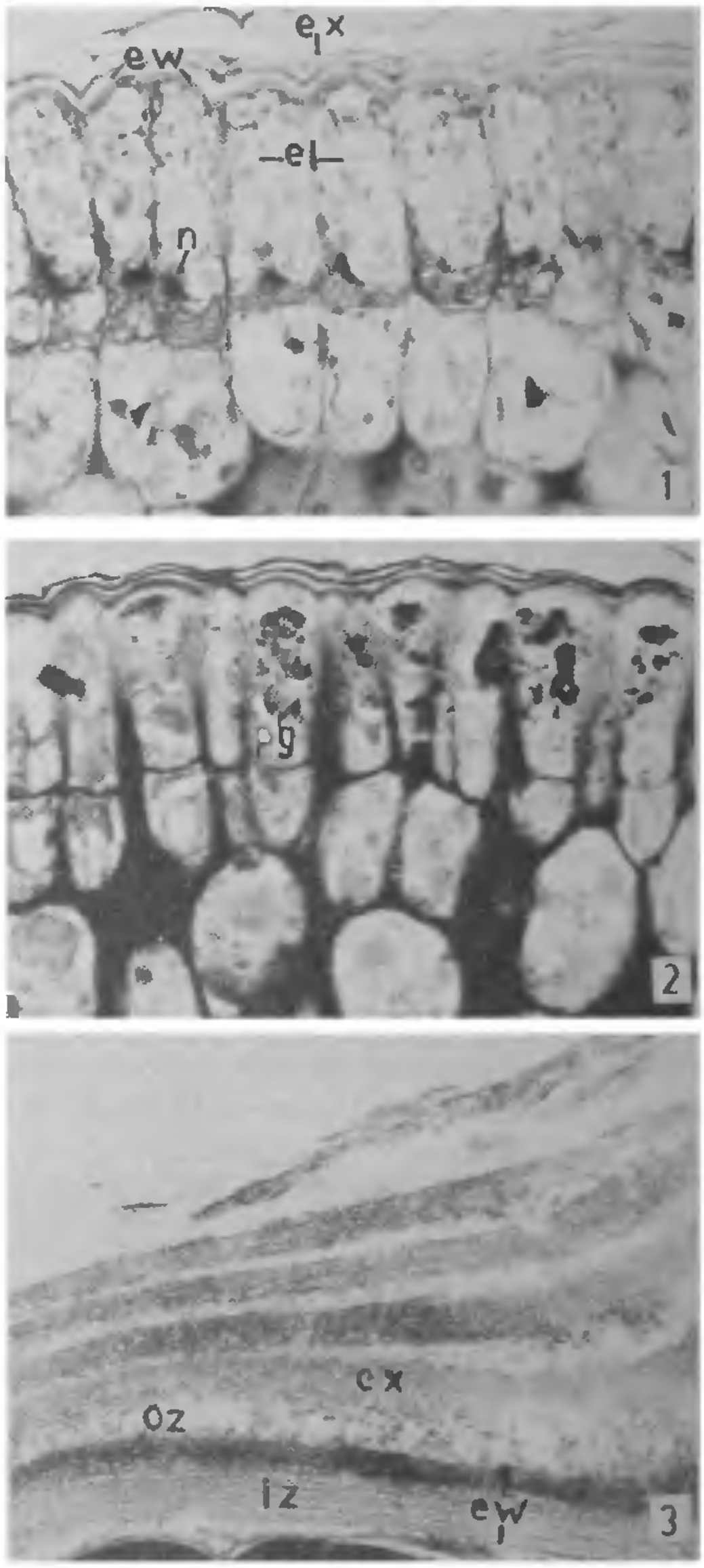
BROWN seaweeds are known to secrete a variety of substances such as polysaccharides, organic acids, peptides and tannins. The four major polysaccharides reported in brown algae are: alginic acid, cellulose, sulphated polysaccharides and laminarin[1]. The present investigation on *Turbinaria conoides* Kütz deals with the histochemistry and ultrastructure of epidermal cells and epidermal extracellular products.

T. conoides was collected during low-tide period from Okha Port (Gujarat). The apical portions of the thalli and conceptacles were fixed on the spot, in 10% aqueous acrolein[2], post-fixed in 1% mercuric chloride[3], dehydrated in methoxyethanol series, infiltrated and embedded in glycol methacrylate plastic mixture. Two micron sections were cut using glass knives and stained either with PAS reagent and aniline blue-black or 0.05% toluidine blue[2] 0 at pH 4.4 or 0.5% alcian-blue[4] at pH 0.5.

For electron microscopy 1 mm cut receptacle tissues were fixed in 6% glutaraldehyde prepared in 0.025 M phosphate buffer at pH 6.8; post-fixed in 2% osmium tetroxide in 0.025 M phosphate buffer at pH 6.8. Dehydration was done in cold ethanol series, infiltration and embedding in Epon-araldite plastic mixtures[5]. Ultrathin sections, cut using glass knives on



Figures 1–3. Histochemistry and ultrastructure of epidermal and extracellular layers. (el, epidermal layer; ew, epidermal wall; ex, extracellular layer; iz, inner zone; n, nucleus; oz, outer zone; pg, polysaccharide granules). **1.** A portion of epidermal layer showing three extracellular layers overlying the outer tangential wall of the epidermal cell. Vacuoles contain polysaccharide granules. PAS and aniline blue-black × 780. **2.** A portion of the epidermal layer showing polysaccharide granules of varying size, TBO × 780. **3.** Electron micrograph showing two microfibrillar zones of outer tangential wall of the epidermal cell. The extracellular layers are separated from the epidermal cell wall by a space filled with microfibrils and vacuoles × 14200.

LKB ultramicrotome I, were stained with 2% uranyl acetate and lead citrate[6]. The grids were examined on Phillips electron microscope (model 300) operated at 60 kV.

The epidermal layer consisted of columnar and polarized cells and is overlaid by 1 to 5 extracellular layers deposited in orderly manner. The extracellular layers (i) contour the outer tangential walls of the epidermis; (ii) are sloughed-off periodically and (iii) are continuously replenished. The extracellular layers however, are not continuously replenished in mature receptacle epidermal cells probably due to the loss of meristematic activity.

The extracellular layers stain intensely with PAS reagent and alcian-blue and show deep-purple metachromasy with TBO. These histochemical reactions suggest that the layers consist of a mixture of alginic acid and sulphated polysaccharides. The outer tangential wall of the epidermal cell shows two differentially stained zones. The outer zone stains in the same way as the extracellular layers, and the inner zone stains moderately with PAS reagent and reddish-violet with TBO. The epidermal cells are engorged with vacuoles filled with polysaccharide granules that stain moderately with PAS reagent and reddish-violet with TBO (figures 1, 2). Histochemical reactions suggest that these granules contain alginic acid and sulphated polysaccharides. Nucleus and chloroplasts (confirmed by EM studies) are located at the basal region of the epidermal cell and they have polarized distribution.

Electron microscopic studies show the outer tangential walls of the epidermal cells to be made up of two differently oriented microfibrillar zones. In the outer zone, microfibrils are reticulate whereas in the inner are parallel. The microfibrils are interspersed with electron dense granules. The extracellular layers and the outer tangential wall of the epidermal cell is separated by space filled with microfibrils and vacuoles. Similarly the extracellular layers are also separated from one another (figure 3). The periodic sloughing-off of the extracellular layers in *Turbinaria conoides* helps the plant to keep its surface free of all epiphytic growth.

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A NEW MYCOPLASMA DISEASE IN PEANUT (*ARACHIS HYPOGAEA* L)

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PEANUT (groundnut) is known to be infected by many virus diseases like rosette, mosaic, chlorosis, marginal chlorosis, ringspot, ringmottle, bunchy top, bud necrosis, peanut mottle, peanut clump, peanut green mosaic virus and cowpea mild mottle virus[1–6]. During the survey for groundnut diseases in South Arcot district of Tamil Nadu in 1983 a new disease resembling the diseases caused by mycoplasma-like organisms was observed. The symptoms were proliferation of axillary buds, small and stunted leaves and phyllody (figure 1). Stray incidence of the disease was also observed in both *kharif* and summer of 1984.

The disease was transmitted from infected groundnut plants to healthy plants of Co–1 variety by side wedge grafting. The first symptom was observed 15 days after grafting at the basal portions of grafted shoots. Numerous branches with small leaves emerged from each axillary buds. The same was reisolated and maintained at screen house conditions. The infected groundnut plants did not produce any pods.

Remission of symptoms by the application of tetracycline compound is one of the characteristics of diseases induced by mycoplasma-like organism (MLO)[7,8]. The identification of the MLO disease can also be confirmed by the chemotheraphic effect of tetracycline antibiotic on the diseased plants. In our screen house studies also, tetracycline hydrochloride at 500 ppm was sprayed on the diseased groundnut foliage. The remission of symptoms was noticed 15 days after treatment. The treated branches of the apical portion showed enlargement of leaves and normal growth as compared to untreated In another