

Electron Microscopic Observation on Epidermis of Teleost, *Salmo Irideus*

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(Received January 31, 1963)

I. INTRODUCTION

Electron microscopic observations on epidermis which have been carried on by many investigators such as Odland, Clark, Hibbo, Kaname, Minato, Sakai and Motokishita have developed a great deal and various kinds of information on the epidermis in connection with several species of animals have been reported. In order to understand the exact structure of the epidermis cells, however, there remain various questions to be investigated. Hitherto a certain complicated minute cell structure at the point of contact in the epidermis of mammals has been found, but is this type of cell structure fundamentally in common to all the animals, whether or not? If different species have different types of cell structures, what is the fundamental structure in common to all?

Shibukawa, one of our colleague investigators, has had an electron microscopic observation on the skin of *misgurnus anguillicandatus* before and reported that in the corium its serrated scales embedded were identified, that among the cells of the epidermis a pretty striking interdigitation was observed and that in the cell membrane an attachment zone was present.

Now the present writers have carried out an electron microscopic observation on the epidermis of the teleost, *salmo irideus*.

II. MATERIAL AND METHOD

In making the electron microscopic preparation, the material was sectioned into slices less than 1 mm³ and they were put into 1% osmic acid solution which was prepared by mixing of 2% osmic acid and 2% veronal natrium aceticum and buffered at pH 7.4. They were fixed in it at 0°C for 1 hour. Then they were taken out in the laboratory temperature, washed in distilled water, dehydrated and embedded in the compound of styrene and metacrylate as much and then observed under the electron microscope.

III. OBSERVATION

It has been found: The epidermis of *salmo irideus* consists of 3–4 layers of cells. The cells of the deep layer are thick. Higher up the cells begin to flatten by degrees. The cells of the surface layer are uneven (Fig. 1–3). Mitochondria, which are relatively small and generally assume oval forms are comparatively thinly scattered. Generally speaking, the endoplasmic reticulum little develops and neither intracellular filaments nor vesicles can be seen. The cells of the surface layer contain dense granules (Fig. 3). The cell membrane of the surface layer has little winding, but there is striking interdigitation observed between the intracellular spaces of the deepest layer of cells and the cell membrane in this region shows distinguished winding (Fig. 2). No attachment zone, however, is observed. Between the basal layer of cells and the corium the basement membrane is present (Fig. 2, 4). The basal membrane which consists of double membranes, is about 400 Å thick. Each membrane is about 100 Å thick. The spacing of both membranes is about 200 Å.

IV. CONCLUSION

The epidermis of *salmo irideus* embedded in styrene methacrylate was observed under the electron microscope.

- 1) The epidermis of *salmo irideus* consists of 3–4 layers of cells.
- 2) Many of the mitochondria in the epidermis are small and oval-shaped.
- 3) In the epithelial cells the development of endoplasmic reticulum is retarded and there are neither any intracellular filaments nor vesicles in the cells.
- 4) The cells of the surface layer contain granules.
- 5) Between the cells of the deepest layer the striking interdigitation is observed and the cell membrane of this region shows a distinguished winding, but no attachment zone.
- 6) There is the basement membrane between the basal layer and the corium. The basal membrane which consists of double membranes is about 400 Å thick. Each membrane is about 100 Å thick. The spacing of both membranes is about 200 Å.

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Fig. 1. The epidermis of *salmo irideus* consists of 3-4 layers of cells. The cells of the deep layer are thick. Higher up the cells begin to flatten by degrees. The cells of the surface layer are uneven.

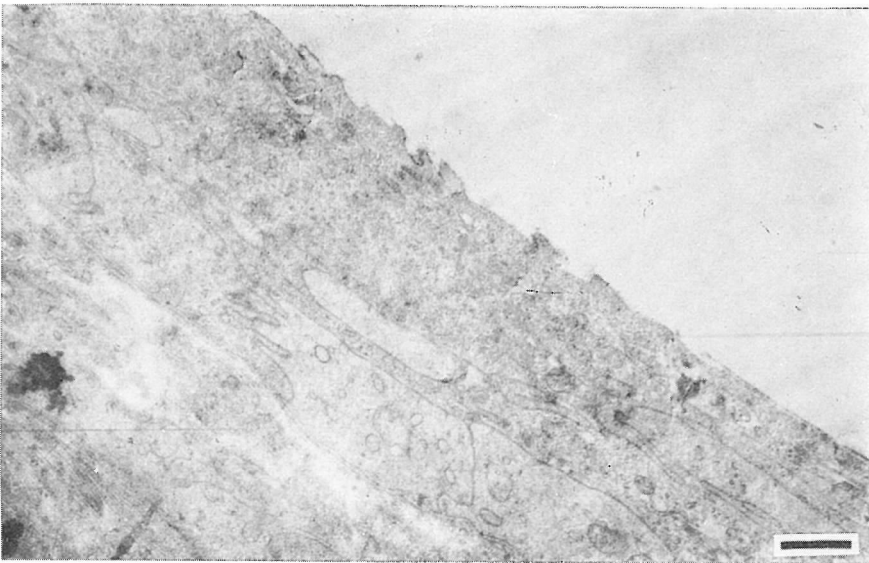


Fig. 2. Between the cells of the deepest layer striking interdigitations are observed and the cell membrane of this region shows a distinguished winding, but no attachment zone.

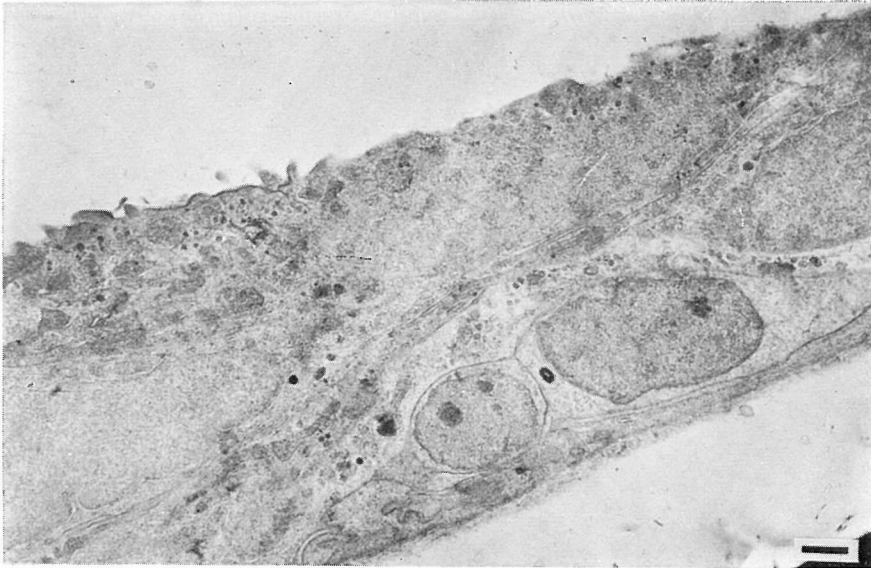


Fig. 3. In the epithelial cells the development of endoplasmic reticulum is retarded and there are neither any intracellular filaments nor vesicles in the cells.



Fig. 4. There is the basement membrane between the basal layer and the corium.