ELECTRON MICROSCOPICAL STUDIES ON THE EGG OF THE GEPHRYEAN, URECHIS UNICINCTUS

BULLETIN OF THE MARINE BIOLOGICAL STATION OF ASAMUSHI,
VOL. XI, NO. 4, 1963

ELECTRON MICROSCOPICAL STUDIES ON THE EGG OF THE GEPHRYEAN, *URECHIS UNICINCTUS*

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When the ripe unfertilized eggs which were present in the segmental organs were fixed *in situ* in DALTON's fixatives containing osmium tetraoxide and potassium bichromate dissolved in isotonic NaCl solution (instead of sea water usually employed) at pH 7.2 adjusted by KOH and embedded in the mixture of styrene and N-butylmetachrylate. The profiles of the ultrathin section showed some large doughnut shaped structures measuring 3μ in diameter. Serial sections revealed, however, that this structure is a thick walled bottle possessing a rather small mouth. The thick wall has double membraneous structures and some double membraneous cristae. Based on these observations, these structures were assumed to be identified with mitochondria. Such giant mitochondria were found to involve within the bottle sometimes the lipid substance which appeared strongly electrodense and sometimes some other small mitochondria. The localization of mitochondria seemed to be limited to the egg cortex rather than the area surrounding the nucleus. PALADE (1959)[1] reported the resembling mitochondria in the pancreas of fasting guinea-pig. When the ripe unfertilized eggs were put into sea water from the segmental organs, the giant mitochondria were found to disintegrate or divided successively into several small mitochondria within a few minutes,, measuring 1μ or somewhat smaller in diameter. The structure of small mitochondria resembles the giant ones, except that its small diameter and the occurrence of a large number of small mitochondria in egg cortex.

Annulate lamella which were reported to occur in molluscan eggs could be also observed attached to the nuclear membrane. At the dissolution of the membrane of the germinal vesicle, the folding of the nuclear membrane was found to appear.

1) PALADE, G.E. 1959 T. HAYASHI Ed. Subcellular Particles. p.64-83.

PLATE XI.

Fig. 1. Electron micrograph of a portion of the unfertilized egg which was fixed *in situ* in segmental organ. Doughnut shape profiles of mitochondria are observed. Some of them involve lipid substance (L). Surface of the egg is covered with thick layer of vitelline coat and protoplasmic protrusions from the egg penetrate the layer. L, lipid substance; M, mitochondria,; NE, nuclear envelope; P, protoplasmic protrusions from the egg; V, vitelline coat; Y, yolk granule. ×7,500

Fig. 2. Electron micrograph of a portion of the unfertilized egg which was fixed six minutes after being put into sea water. Doughnut shape profile is not seen and mitochondria show various shapes and diameters, suggesting the disintegration of doughnut shape profile into small mitochondria.