

Fine structure of the ovary in the rice leaf bug, *Trigonotylus colestialium*
(Insecta: Hemiptera): Certain organelles descending from the trophic
tissues into the oocyte

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In the adult ovaries of *T. colestialium*, certain organelles of unknown nature which descend into the oocyte through the trophic cord from the trophic tissues, were observed electron microscopically as well as histochemically.

Each ovary of this insect consists of seven ovarioles which are of a typical telotrophic type in Hemiptera. The ovariole is composed of the anterior terminal filament, the germarium, the vitellarium containing about three developing oocytes covered with the follicular epithelium, the long epithelial plug which is particular of this insect (ca. 1 mm in length), and the short pedicel connecting to the lateral oviduct. The germarium situated at the anterior part of the vitellarium is lanceolate in shape and is occupied by the apical trophic tissues arranged peripherally and the central trophic core. In some Hemiptera, such as *Oncopeltus fasciatus* (Bonhag, 1955, 1958), *Rhodnius prolixus* (Huebner & Anderson, 1972) and *Bothrogonia japonica* (Matsuzaki, 1975), the trophic tissues can be divided into three zones which based primarily on nuclear size. In the anterior zone I, many small nuclei are undergoing mitosis, in the mid-zone II, the nuclei well develop and nuclear extrusion is produced actively, and in the basal zone III some of the nuclei are degenerating. Unlike these insects, there is no such distinction in *T. colestialium*. Namely, the trophic tissues consist of only few large syncytial trophocytes with 3 or 4 amoeboid nuclei, and neither mitotic division of the trophocyte nuclei nor degenerating nuclei can be seen, at least in the trophic tissues of the ovipositing females. The cytoplasm of the trophocyte is filled with free ribosomes, and slender shaped mitochondria, short thread-like endoplasmic reticulum and some golgi bodies are also found among the ribosomes. In addition, certain organelles containing electron-dense mass are observed. The organelles show in various form; many of them are ellipsoidal in shape and about 0.6 μm in length, and the others are generally spherical in different sizes. They consist of fine fibrous component and electron dense mass which are in contact with a part of the inner surface of the organelles. The outer surface is covered with a limiting membrane, but this membrane is undetectable in the large spherical organelles. They are Feulgen- or pyronine-negative. These organelles are often observable in the cytoplasm of the trophocyte, but their numbers are few; they accumulate abundantly at the basal part of the trophic cord and they flow certainly in the oocyte through the opening of the trophic cord. Such migration of these organelles occurs actively at the previtellogenic stage of oogenesis. Subsequently, they disperse along the inner surface of the oocyte and become to distribute at the cortical and subcortical ooplasm, and stay there throughout the later stages of oogenesis. Frequently, some of them run parallel, perhaps indicating their proliferation.

It is well known in some Hemiptera that DNA droplets are often observed in the trophic core. These droplets originate from the degenerating trophocyte nuclei and migrate to the trophic core (Bonhag, 1955; Matsuzaki, 1975); they are depolymerized and become Feulgen-negative (Schrader & Leuchtenberger, 1952). In *T. colestialium*, however, no degenerating trophocytes could be observed. Therefore, the certain organelles in this insect may be different from the DNA droplets, although the origin and formative process of these organelles could not be clarified in this study.

References

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