66. *The Control of Growth and Development in Bombyx mori.* XXXII

Intercellular Microtubules Occurring in the Corpus Allatum

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It has been demonstrated in the former reports, XXVII and XXVIII, that the brain does not release brain hormone from the brain itself, while it release brain hormone from the corpus allatum *via* nerve axons from brain neurosecretory cells, and further that there exist neurosecretory granules, perhaps brain hormone, and synaptic vesicles in the axon terminal of nervous corporis allati. The present electron-microscopic study has successfully demonstrated in the axon terminal a number of microtubules as a possible route of transport of the brain hormone into the corpus allatum.

Materials and methods. Eggs of from J. 106 $\times$ Daizo were incubated at 25°C in the light condition. The corpora allata of newly ecdysed 4th instar larvae developed from them were dessected out for study. The fixation and staining for electron-microscopic observations were performed according to the Akai's method (1971).

Results and discussion. The corpus allatum of 1-day-old 4th instar larvae is supplied with many axons (Fig. 1, insert). There is a cover of the felt-like membrane between the corpus allatum cells and axon terminals (Fig. 1, fm). The corpus allatum cytoplasm contained at this stage mature Golgi apparatus and high densed mitochondria, and showed many microtubules (Fig. 1). There were two kinds of axons around the corpus allatum cells: the one consisted of axons having a number of granules (Figs. 1 and 2, mgax), while the other was of those containing a few granules (Figs. 1 and 2, fgax). Both types of axons were supplied by a number of microtubules; they were apparently connecting with the microtubules in their terminals. Also, there were many microtubules showing a relational connection between these axons and corpus allatum cells. Especially remarkable is the penetration of the microtubules into the felt-like membrane of the corpus allatum cells from the axon terminal (Fig. 2).

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Fig. 1

Fig. 2

The occurrence of the microtubules connecting the intercellular space had not been described so far, in contrast with intracellular microtubules which have been noted to occur in cells of many kinds of plants and animals. Olmsted *et al.* (1973) have viewed that the microtubules play an important role for the transport of some materials within cells. The situation seems to make it possible to relate the occurrence of microtubules with the intercellular transport of materials. The intercellular microtubules connecting between axons and the corpus allatum cells demonstrated by the present electron-microscopic study may be favourable for the possibility of the transport of brain hormone into the corpus allatum.

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Fig. 1. Thicken felt-like membrane (fm) of corpus allatum (CA) connecting with axons (ax). mgax: many granular axon. fgax: few granular axon. G: Golgi apparatus. m: mitochondria. arrows: microtubules. $\times 25,000$ (insert; $\times 1,000$).

Fig. 2. A higher magnification electron micrograph of a part of Fig. 1. mgax: many granular axon. fgax: few granular axon. fm: felt-like membrane. CA: corpus allatum. arrows: microtubules. $\times 83,000$.