Fine Structural Aspects of Wound Healing Response in the Cuticle of the Spider, *Pardosa astrigera*

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The integument of cephalothorax in the wolf spider, *Pardosa astrigera*, was consisted of outer cuticle and inner epidermal cells. And the exoskeleton was connected with the musculature by the connective tissue, known as the apodeme. At the site of tonofibril attachment, the inner cuticle was often strengthened through this apodeme. This experiment was accomplished by inducing the artificial wounds on the dorsal surface of the cephalothorax by puncturing a sharp needle. We observed the wound healing response, ranged from 6 hrs to 20 days after wounding, using electron microscope.

Shedding of the hemolymph was immediately blocked by the coagulation, and formation of the wound plug was initiated by the accumulation of hemocytes at the wounding site. It was found that the granulocyte was the most predominant hemocyte during this response. The wounds were gradually healed along with the following three responses: (1) Coagulation and wound plug formation by hemocytic migration, (2) Regeneration of the epidermal cell layer and secretion of a new cuticle, and (3) Attachment of cuticle to musculature by apodeme regeneration.

Reconstruction of the epidermal cell layer beneath the wound plug was first detected at 10 day sample, and production of new cuticle through the apical surface of the epidermal cells appeared at 14 days after wounding. After the wound was completely covered by the hemocytes, the connective tissue cells secrete the collagen fiber at 12 days after wounding. During 16 to 20 days, the projections of endosterna extended to wound barrier, and the musculature also connected to cuticle.

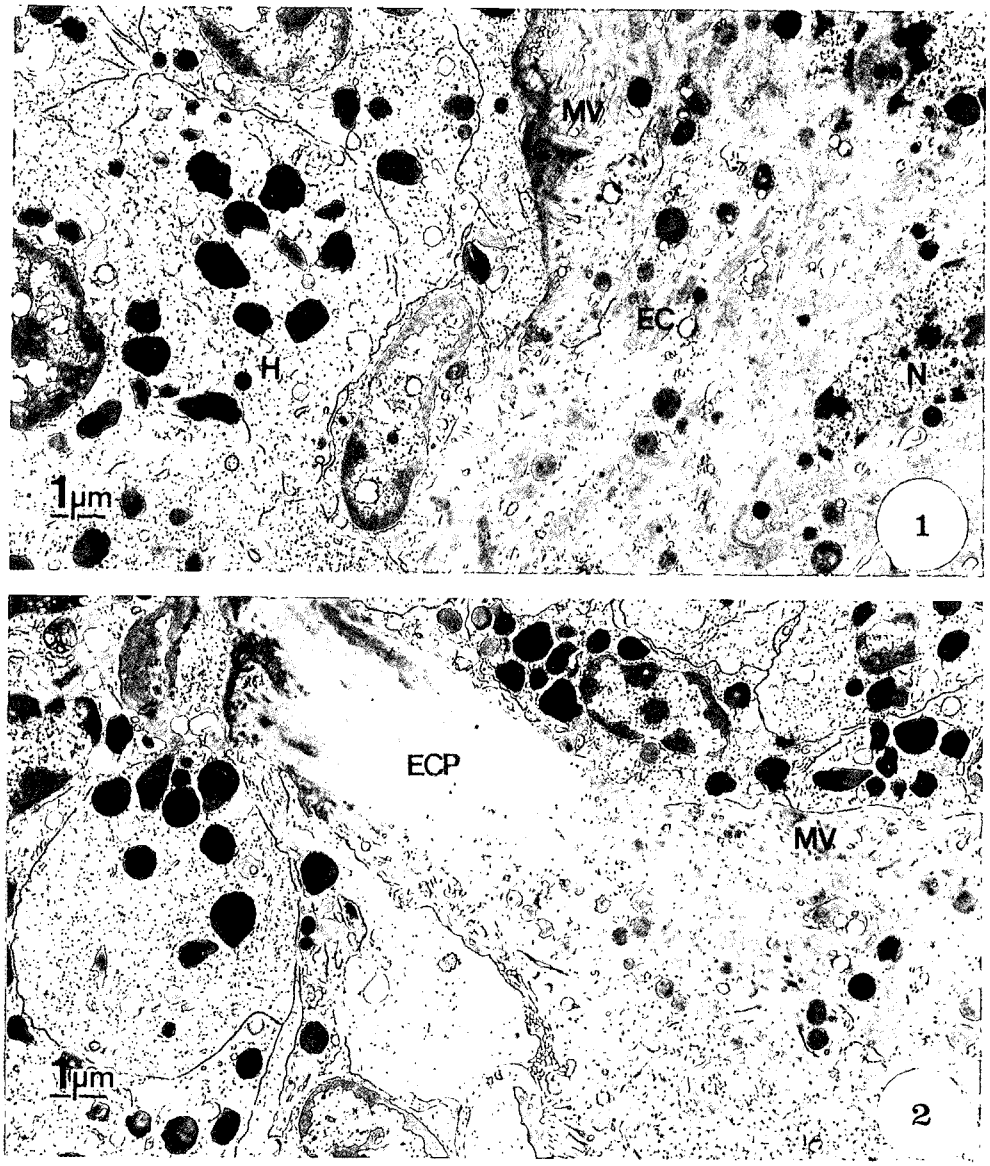

Fig. 1. 14-20 days after injury. Under the hemocytic barrier(H), the epidermal cells(EC) migrated to internal region of wound plug and was tightly attached each other. Numerous microvilli(MV) and cuticle substance(C) were found in apical surface. **Fig. 2.** The epidermal cell process(ECP) extended among the hemocyte. MV: microvilli