

Interspecific Transplantation of Germ Disc Cells from the American to the Asian Horseshoe Crab Eggs

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For the understanding of the role of presumptive germ disc cells at the stage of germ disc appearance, we tried the transplantation experiment. Up to the present the transplantation of embryonic cells has not succeeded in horseshoe crabs.

Intraspecific transplantation of germ disc cells has been performed in an Asian horseshoe crab, *Tachypleus (Carinoscorpius) rotundicauda* and in an American species, *Limulus polyphemus* (Fig. 1). Secondary embryos were formed in the egg transplanted with the cells (Fig. 2). The results suggest that the transplanted germ disc cells either induced secondary individual or autonomously differentiated as an embryo.

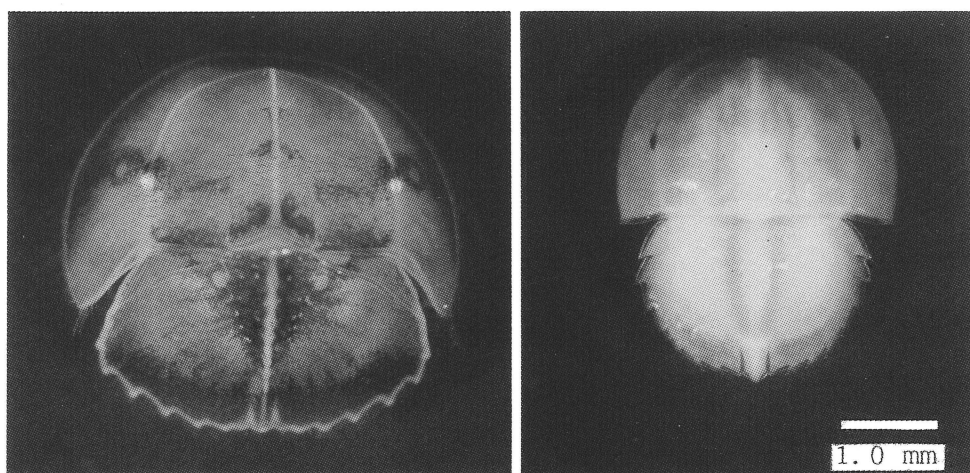


Fig. 1 The first instar larvae. Left: *Tachypleus rotundicauda*, Right: *Limulus polyphemus*.

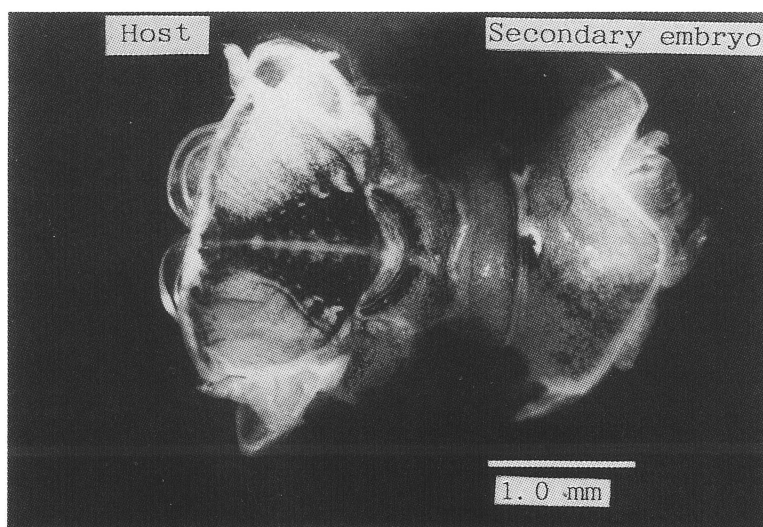


Fig. 2 Obtained double monster (secondary embryo) after the intraspecific transplantation in *Tachypleus rotundicauda*.

To test those possibilities we carried out interspecific transplantation of the germ disc cells from an American to an Asian horseshoe crab. The two species were separated in Jurassic period (200,000,000 years ago), and are with conspicuous differences in morphology. The interspecific transplantation produced secondary embryos, which had the characteristics exclusively of the Asian species (Fig. 3), nevertheless induced after transplantation of germ disc cells from the American species. This rules out the possibility that the secondary embryos were formed as the results of development of the transplanted germ disc cells. The transplanted germ disc cells may have given instructions of formation of an individual to the adjacent cells. That is, the cells might be regarded as an organizer when transplanted. The role of the germ disc cells in the original embryo is to be investigated.

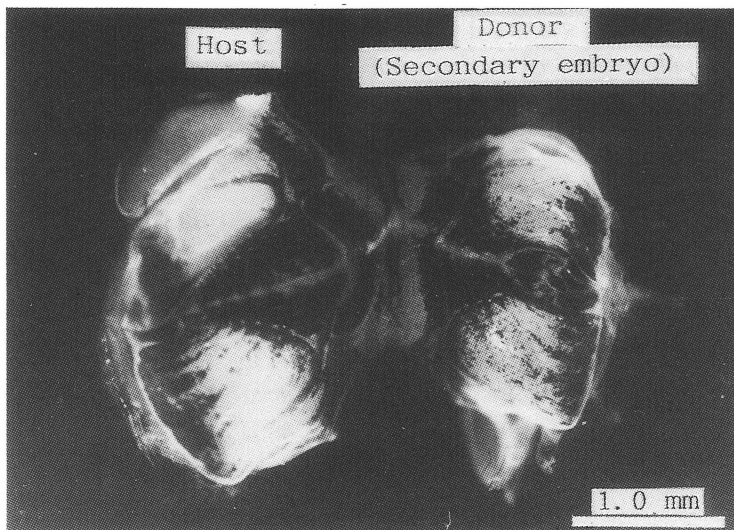


Fig. 3 The secondary embryo induced after the interspecific transplantation from *Limulus polyphemus* to *Tachypleus rotundicauda*. All characteristics of the secondary embryos showed those of *Tachypleus rotundicauda*.