

Studies on structure and function of the vector tissue in piscicolid leeches (Hirudinea, Piscicolidae)

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Piscicolid leeches have no penis, instead during copulation they implant spermatophores in a specialized region of the concopulant body i.e. in the copulatory region or copulatory area. The sperm is not transported toward the ovaries via gonoducts, however, under the copulatory area there is a specialized kind of the connective tissue engaged in sperm transfer, the vector tissue (VT) (conducting tissue). Old studies have only shown that this tissue is somehow involved in the sperm transport, however, the structure of this tissue and the mechanisms of sperm transfer have been unknown.

The aims of our studies were: (1) describing of the VT structure using both light and electron microscopy; (2) investigating the changes in the VT structure during sperm transfer; (3) describing of the mechanisms of sperm transfer through the VT.

In our work we used mainly specimens of *Piscicola geometra*, additionally structure of the VT were investigated in: *P. margaritae*, *P. pawlowskii*, *P. pojmanskae* and *Caspidobdella fadejewi*.

The VT is composed of 4 cell types: the vesicular and flat envelope cells form the tissue envelope, the main mass of tissue is occupied by the granular and plasmatic cells. The latter cells have prominent cytoplasmic projections, filled with a filamentous material, mainly F-actin. Additionally, numerous dorso-ventral muscles run across the VT. During copulation and sperm transfer free spaces between the granular and plasmatic cells occur. In this tissue remodelling actin cytoskeleton plays main role. In our opinion the sperm transfer may be facilitated also by muscle fibers which are always associated with the VT. The contraction of these muscles may simply push the sperm towards the ovaries. Moreover, we revealed that the characteristic VT cells occur also within the ovary wall and inside the ovary lumen. This supports earlier data, which postulated that the vector tissue appears to be an outgrowth of the ovary wall.