The outer body surface of parasitic Platyhelminthes, including monogenean parasites, is covered by a tegument consisting of a syncytial layer, cell bodies that are situated below the syncytium and muscle layers connected to the syncytium by several cytoplasmic processes. The subtegumental position of nuclei is generally thought to protect them from host responses. The family Diplozoidae (Monogenea) includes blood-feeding gill ectoparasites of freshwater fish. They exhibit extraordinary body architecture and life cycle involving a permanent fusion of two larval worms and their subsequent transformation into one individual (permanent copula).

Developmental stages of *Paradiplozoon bliccae* comprising diporpa, juvenile and adult were investigated for their anatomy using a combined approach of light, confocal and electron microscopy. The freeze-etching method proved to be a strong tool to visualize the membranous structures of tegumentary cells and muscles of the body wall. Direct labelling of filamentous actin with fluorescent phalloidin demonstrated the organization of the major muscular structures. The body wall musculature is well-developed and highly organized, with circular, intermediate longitudinal and inner diagonal muscle fibres. Wavy muscle fibres were observed. The buccal suckers and the pharynx represent the most dominant muscular structures of the worm’s forebody while the hindbody bears the prominent haptor with four pairs of clamps serving for parasite’s strong attachment to the host gills. The bundle of the muscles attached to every clamp controls the mobility of the clamp’s skeletal jaws.

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Fig. 1: The forebody musculature of Paradiplozoon bliccae (adult stage). CLSM.