

AN ULTRASTRUCTURAL STUDY ON THE CONTRACTILE PINACOCYTE OF A FRESHWATER SPONGE. *Memoirs of the Queensland Museum* 44: 398. 1999:- Contractile cells in sponges were first observed in the oscular diaphragm of marine species, *Microciona* and *Tedania* (Bagby, 1961). They consisted of well-differentiated myocytes having myosin and actin filaments, whereas in the freshwater sponges, there are no reports of contractile apparatus or myocytes. The oscular diaphragms and body walls of freshwater sponges are contractile when stimulated. Stimulation is effective whether it is osmotic, thermal, electric, etc. According to these observations on sponges we hypothesise that pinacocytes in the oscular diaphragm and body wall must bear the contractile apparatus, and we suggested in a previous report that these cells have a network of filamentous bundles. We subsequently attempted to structurally identify the contractile filaments of the cell using the following methods: 1) Observations under light microscopy; 2) Observations under electron microscopy; 3) SDS-PAGE; 4) NBD-phalloidin staining; 5) Anti-actin gold conjugation. Pinacocytes in these sponges showed a flat and multiangular shape, measuring about 5 μm in diameter and 0.1 μm thick. Pinacocytes in the outer layer of the oscular diaphragms and body wall

had many bundles extending radially from the central nuclear zone to the peripheral region of the cell, whereas these bundles were not observed in the inner pinacocytes. Bundles were easily stained using NBD-phalloidin. Observations of thin sections showed these bundles are composed of many thin filaments of about 4-6nm diameter. These bundles ran straight in the contracted state, and were distributed in the basal region of the cell. Thin filaments in the bundle were clearly decorated with anti-actin gold conjugation. SDS-PAGE analysis of the diaphragm revealed a protein band of 45kD. These results support the idea that thin filaments of about 4-6nm in diameter in pinacocytes are composed of actin molecules. A freshwater sponge, *Ephydatia fluviatilis*, has no myocytes but has contractile pinacocytes with actin bundles. □ *Porifera, freshwater sponges, contractile filaments, ultrastructure, actin, pinacocytes.*

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