‘PSEUDOPODIAL’ ACTIVITY OF THE GAMETE SURFACE IN ARAPHID PENNATE DIATOMS

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Some araphid pennate diatoms such as *Synedra* (*Ulnaria*) or *Tabularia* being nonmotile and sessile in their vegetative phase, nonetheless involve heterothally, and male gametangia release their gametes into surrounding water. Successful fertilization depends thus on reaching a gamete of the opposite mating type. Any locomotion organelles were unknown in pennate diatom gametes until quite recently. Specific cell surface structures that induce gamete movement and thereby promote syngamy were found in three araphid pennate diatoms, *Tabularia fasciculata*, *T. tabulata* (Davidovich et al. 2011), and *Pseudostaurosira trainorii* (Sato et al. 2011). Slender cytoplasmic projections, resembling pseudopodia arise at the surface; they elongate over a relatively short period of time, then retract and "disappear". Formation and retraction of cytoplasmic projections coincide with gamete movement in shifting manner (spinning, milling about, or moving in a chaotic fashion). This forces gamete migration on relatively long distance. Here we present evidence that yet another araphid pennate diatom, freshwater *Ulnaria ulna* (Nitzsch) P. Compere (= *Synedra ulna* (Nitzsch) Ehrenberg) reveals considerable activity of gamete surface. The general manner of projection expansion and retraction in *U. ulna* resemble those of three other mentione d species, while differ in minor details. Pseudopodia in *Ulnaria* are shorter and do not provoke as vigorous activity as that of gametes in *Tabularia*. The longest pseudopodia were found in *T. tabulata*. *Pseudostaurosira trainorii* extruded not only "threads" but also relatively big blobs. As in other species, formation of cytoplasmic projection in *U. ulna* was accompanied with change of gamete form; from spherical to angular. Finding of similar modes of male gamete motility in so distantly related araphid species suggests the existence of other diatoms which gametes may possess dynamic pseudopodium-like surface structures. The last are poorly investigated but undoubtedly important for the process of sexual reproduction. The evolutionary origin of these structures is yet to be understood.