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Effect of viscosity on Lingulodinium Polyedrum micro swimmer motility and properties[1] LOURDES MNICA BRAVO ANAYA, Laboratoire Interdisciplinaire de Physique (LiPhy), HUGUES BODIGUEL, FRDRIC PIGNON, Laboratoire Rhologie et Procds, MARVIN BRUN-COSME-BRUNY, PHILIPPE PEYLA, SALIMA RAFAI, Laboratoire Interdisciplinaire de Physique (LiPhy), LABORATOIRE INTERDISCIPLINAIRE DE PHYSIQUE (LIPHY) COLLABORATION, LABORATOIRE RHOLOGIE ET PROCDS COLLABORATION — *Lingulodinium Polyedrum* (LP) microalgae is a marine protist, belonging to the dynoflagellata gender that emits bright blue light flashes once submitted to a shear stress. It carries an equatorial flagellum and a longitudinal one, allowing the swimming. In this work, we studied the effect of viscosity on LP microswimmer motility and bioluminescence properties through rheological measurements and a bright field microscopy imaging. The microalgae velocity dependency on the viscosity of the medium was measured in the presence of different concentrations of selected polymers. Xanthan was selected due to its shear-thinning behavior and a hydrolyzed polyacrylamide was also chosen due to its Newtonian behavior at concentrations lower than C*. These polymers were found to be biocompatible and stable in seawater and in presence of LP. The swimming velocity of LP microswimmer was found to be inversely proportional to the suspension viscosity for both polymers, suggesting that the force needed to stop the swimming LP cell remains constant. Finally, it was observed that the applied shear rate necessary for LP microalgae to emit bioluminescence decreases while increasing the suspension viscosity.

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