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A Blessing in Disguise: Vortex-Induced Vibrations as a Soft Coral Feeding Strategy[1] MOUAD BOUDINA, FREDERICK P. GOSSELIN, STEPHANE ETIENNE, Ecole Polytechnique de Montreal — Soft corals, such as the sea plume *Antillogorgia bipinnata*, are flexible species reconfiguring their shape when exposed to water currents. Some records of *A. bipinnata* show that, while its stem sways back and forth at low frequency with the surface wave action, a peculiar motion takes place: branches vibrate at high frequency, with small amplitude, and transverse to the water flow. We inquire into the origin of these yet unreported vibrations and their impact on soft corals. Estimation of dynamical parameters along with finite element implementation of the wake-oscillator model favour vortex-induced vibrations (VIV) as the most probable origin of the observed high frequency motion. Since soft corals live on food particles, these vibrations might impact their feeding rate. With an in-house monolithic fluid-structure interaction finite element solver and Python code, we simulated trajectories of spherical particles around a circular cylinder and calculated the capture rate. We found that vibrating cylinders can capture up to 40% more particles than fixed ones at frequency lock-in. Thence, the harmful to human constructions vortex-induced vibrations turn helpful to living soft corals as they plausibly increase the rate of food capture and offer them better nutrition.

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