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Mating behaviour of Pseudodiaptomus annandalei (Copepoda, Calanoida) in calm and turbulent waters

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Behavioral observations of male copepods reveal that they commonly follow female copepods' footprints to find their mates. Female generated environmental signals are primarily of hydromechanical or chemical quality. The intensity of hydromechanical or chemical signals is affected by the hydrodynamic conditions which in turn may modulate a copepod's ability to sense signals in their search for mates in the aquatic environment. We studied the patterns and efficiency of the copepod Pseudodiaptomus annandalei to mate at still and turbulent water conditions during day and night and in different shape and volume experimental containers. The ability of courtship in P. annandalei was recorded to be a negative function of hydromechanical disturbances as the successful mating was observed in still water only. Under turbulent condition males were not able to track a female properly. We records in the present study that both, sequential and simultaneous taxi mechanisms are used by the male P. annandalei to follow either hydromechanic or chemical signals. Our results further reveal that males follow a signal more accurately characterized as a trail. The ability of P. annandalei males to track a three-dimensional trail appears unique, and possibly depends on the persistence of fluid-borne hydromechanical or chemical signals created in low Reynolds number hydrodynamic regimes.

Keywords: Mating behavior, Turbulence, Flow, Hydrodynamic conditions