

THE IMPORTANCE OF WATER FLOW FOR CULTURE OF DYSIDEA AVARA SPONGES

PROJECT LEADERS

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RESEARCH THEME

Complex dynamics of fluids

PARTICIPANTS

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COOPERATIONS

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FUNDED

EU

1st 20% 2nd - 3rd 80%

START OF THE PROJECT

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INFORMATION

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PROJECT AIM

The principal aim of this research was to understand the optimal water flow requirements for the marine sponge *Dysidea avara*, so that flow parameters could be set for ex situ culture in tanks, or in situ culture in the sea. We apply in-sea investigations in combination with flow tank studies to study adaptation of body shape to flow conditions, and to study filtering efficacy in response to local flow conditions. The ultimate goal was to help insure the success of large-scale aquaculture of this sponge for obtaining biomass for extraction of its valuable terpenoid natural product avarol.

PROGRESS

Dysidea avara inhabits low flow habitats protected by rock cover or depth, with flow speeds just outside the boundary layer of 1 to 6 cm/s. Sponge morphologies vary with depth. At 4.5 m forms are globular. At 8.8 m sponges are tall, with thick protuberances. At 14 m forms have tall, thin, heavily-conulated "spiky" tree-shaped protuberances with narrow basal attachments. The morphotypes are probably responses to diminishing flows with depth. Tank experiments revealed induced mixing at the sponge surface due to the complex surface morphology. Sponges were shown to first slow down then cease pumping activity altogether when background flows reached the range of 7.5-12 cm/s. This species appeared to be able to replum its internal flow channel systems in response to altered flow conditions. Outflow openings could even be turned into inflow openings.

DISSERTATIONS

1. D. Mendola. The importance of water flow for culture of *Dysidea avara* Sponges. Wageningen Univeristy.

SCIENTIFIC PUBLICATIONS

1. Mendola, D.; Caralt, S. de; Uriz, M.J.; End, E.J. van den; Leeuwen, J.L. van; Wijffels, R.H. (2008). Environmental Flow Regimes for *Dysidea avara* Sponges. *Marine Biotechnology* 10 (5). - p. 622 - 630.