INVASION GENETICS OF THE INTRODUCED ATLANTIC ROCK CRAB (*CANCER IRRORATUS*) IN ICELANDIC WATERS

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The Atlantic rock crab (*Cancer irroratus*) was first recorded in Iceland in 2006 and has since then rapidly spread throughout the country‘s southwestern and western coastal waters. The transport of larvae in ballast water is regarded as the most probable means by which introduction into Iceland occurred. As this species is commercially valuable, it may be possible to establish a viable industry harvesting rock crabs in Iceland, however to do this more information on species wide genetic diversity and demography is required. In this study genetic variation at seven microsatellite markers was analysed in samples from Iceland and five sites in North America, capturing most of the known range of this species. Our result divided samples from the native range into two groups, divided by a previously proposed barrier to gene flow, compatible with local hydrographic factors restricting larval-mediated gene flow. The Icelandic population was markedly differentiated from all other samples, but exhibited comparable levels of genetic diversity with no evidence of small population effects or genetic bottlenecks. No single population could be identified as a source for the Icelandic population. Genetic data indicate that the number of founders of the Icelandic population was sufficient to retain genetic variation. As the Icelandic population shows evidence of self-recruitment and population expansion, it may represent a potential harvestable resource in Iceland.

CONVERSATION WITH A BIOLUMINESCENT PLANKTONIC WORM (POLYCHAETA: TOMOPTERIDAE)

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The main function of bioluminescence is to communicate. Showy or inconspicuous, attractive or deterrent, light signals are exchanged in the ocean between individuals, males and females, prey and predators. Despite a remarkable diversification of the visual adaptations, especially in the deep-sea, some bioluminescent emissions escape the eyes of most marine organisms. In this context, the yellow light flashes emitted by *Tomopteris helgolandica* (Polychaeta, Annelida) could be intraspecific private communication signals. Such a function has been previously suggested in the stomiid fishes which both produce and see red light emissions. But, is *T. helgolandica* able to perceive its own light? Basically, we know that 3-days larvae develop a pair of pigmented ocelli consisting of seven large rhabdomeric sensory cells topped by a lens. These early stages are positively phototactic but behavioral observations of adult specimens of the yellow-emitter *T. septentrionalis* have revealed photophobic responses to blue light flashes simulating dinoflagellate bioluminescence. Through a similar approach, we have tested the behavioral effect of simulated bioluminescent signals on our model species. Isolated specimen were placed under infra-red lighting in a round aquarium and filmed by a coupled CCD video recording system. One camera was sensitive to the IR so we can track the animal moving. Simultaneously, an intensified camera only recorded the bioluminescent events. Manually controlled light signals were applied through a fake worm – provided with optic fibers reproducing the distribution pattern of *T. helgolandica*‘s photogenic organs – immersed in the seawater. We tested 0,2 s^{-1} flashes and continuous signals as well as five different light colors (blue, green, yellow, orange and red). The 50h of video collected were analyzed using the video tracking software Ethovision XT (Noldus Information Technology). Spontaneous light emissions have been observed during physical contacts with the fake worm and during stressfull situations like emersion but they did not seem to appear in response to the simulated light signals. They did not demonstrate specific interest in the yellow light emission but seemed attracted by the continuous blue light signals. These results lead us to reassess the virtually admitted hypothesis of intraspecific communication. We are now currently testing the hypothesis that *T. helgolandica* might, on the one side, use light signals against its predators as suggested by its responses to mechanical stimuli, and on the other side, take advantage of the bioluminescence of its own preys.