Social and ecological roles for cleanerfishes in temperate reef communities

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Project Summary

How important are social cues to reef fishes? Social information can cause many individuals, within and across species, to behave similarly, to meet mutual needs (e.g., threat avoidance, resource acquisition). Changes in ocean acidity, temperature, and alterations to habitat type and complexity associated with climate change and other human-driven impacts will alter seascapes. The degree of resilience that systems have to such change will be in part dependent on the integrity of interactions among species to maintain energy flows. The importance of social interactions to community function has generally been overlooked.

The most obvious social influence upon reef fish behaviour in the Mediterranean Sea comes from the activity of cleaner fishes. These are composed of different species of the wrasse family, that are either devoted to the cleaner lifestyle, or act as cleaners while juveniles. While cleaners are generally believed to remove parasites from larger fishes, they may also consume mucous, or “cheat” the host by biting the skin. Facultative cleaners combine cleaning activities with other dietary items, but it is unknown what conditions favour one dietary mode over another. It has been suggested that cleaners have an important role in maintaining fish diversity and health on tropical reefs, but no such assessment has been made in temperate regions.

This study aims to understand the sociobiological importance of cleaner fishes to reef fish community structure, and understand the direct and indirect feeding relationships of cleaner fishes by employing a novel application of stable isotope analysis. This study will suit a numerate and analytically minded student with a desire to work across disciplines. The project will involve a combination of field work at sea (including scuba diving), laboratory experiments, analytical chemistry and ecological and statistical modelling. Stable isotope analyses will be undertaken in collaborating laboratories, and training will be given. The student will garner a range of skills relevant to a research career, but applicable to multiple career paths.