

Clownfish triggers plasticity in the acoustic communication of the three-spot damselfish

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The concept of Acoustic Niche plasticity refers to the plasticity of acoustic resources allocation within a species. Few studies have investigated this adaptability in fish species. The relationship between anemones and clownfish is one of the most well-known symbioses in coral reefs. However, other fishes also use anemones as shelter space. The three-spot damselfish (*Dascyllus trimaculatus*) can inhabit the same anemone as the orange-fin clownfish (*Amphiprion chrysopterus*). Since both Pomacentridae species communicate acoustically through the same sound production mechanism, their sounds are very similar. We show that *D. trimaculatus* produces shorter sounds when sharing its anemone with the clownfish. Moreover, *D. trimaculatus* changes its daily cycle of sound production when the clownfish is present. It decreases its sound production during the day and produces more sounds at sunset. These modifications would be used to minimize the acoustic overlap of the signals produced by the two species and to differentiate the acoustic niche of *D. trimaculatus* from the one of *A. chrysopterus*, to avoid competition. This study supports the concept of Acoustic Niche plasticity and reflects the ability of the three-spot damselfish to adapt its sound production according to the presence of another vocal species (*Amphiprion chrysopterus*) within its anemone.

