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TITLE: Cold-water corals and large hydrozoans provide essential fish habitat for Lappanella fasciata and Benthocometes robustus

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ABSTRACT:

Many fish species are well-known obligatory inhabitants of shallow-water tropical coral reefs but such associations are difficult to study in deep-water environments. We address the association between two deep-sea fish with low mobility and large sessile invertebrates using a compilation of 20 years of unpublished in situ observations. Data were collected on Northeast Atlantic (NEA) island slopes and seamounts, from the Azores to the Canary Islands, comprising 127 new records of the circalittoral Labridae Lappanella fasciata and 15 of the upper bathyal Ophiididae Benthocometes robustus. Observations by divers, remote operated vehicles (ROV SP, Luso, Victor, Falcon Seaeye), towed vehicles (Greenpeace) and manned submersibles (LULA, Nautile) validated the species association to cold water corals (CWC) and large hydrozoans. L. fasciata occurred from lower infralittoral (41 m) throughout the circalittoral, down to the upper bathyal at 398 m depth. Smaller fishes (< 10 cm) tend to form larger schools up to five individuals, with larger fishes (10?15 cm) occurring alone or in smaller groups at greater depths. The labrids favoured areas with large sessile invertebrates (> 10 cm) occurring at < 1 body-length, swimming inside or in close vicinity to the tallest and most complex three-dimensional structure in the field of observation. These included hydrozoans (Polyplumaria flabellata, Nemertesia antennina), CWC (e.g. Antipathella wollastoni, Acanthogorgia armata, Stichopathes sp.), and less frequently sponges (e.g. Pseudotrachya hystrix). B. robustus presented a coral-cryptic behavior, being recorded in the bathyal zone between 350 and 734 m depth, always inside CWC (e.g. Acanthogorgia spp., Antipathella spp., Callogorgia verticillata, Dendrophyllia alternata, Leiopathes spp.), and remaining within the coral branching. B. robustus were collected with baited traps providing biological information and dietary information reinforcing the trophic linkage between the CWC habitat and this predator. Gathered evidence renders CWC and hydroid gardens as Essential Fish Habitats for both species, being therefore sensitive to environmental and anthropogenic impacts on these Vulnerable Marine Ecosystems. The Mediterranean distribution of L. fasciata is extended to NEA seamounts and island slopes and the amphi-Atlantic distribution of B. robustus is bridged with molecular data support. Both species are expected to occur throughout the Macaronesia and Mediterranean island slopes and shallow seamounts on habitats with large sessile invertebrates.

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