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TITLE: An inter-ocean comparison of coral endemism on seamounts: the case of *Chrysogorgia*

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ABSTRACT:

Abstract Aim The biogeography of seamount fauna remains poorly known, with less than 1% of the world's seamounts having been investigated. Here, we report data on the geographical isolation of species in the octocoral genus *Chrysogorgia* from south-west Pacific seamounts and slopes, and contrast the results with patterns observed in the north-western Atlantic. **Location** Seamounts of the Norfolk Ridge (NR) and Loyalty Ridge (LR), the slope of New Caledonia, and the Matthew and Hunter Islands, south-west Pacific Ocean, with comparative material from the Pacific and Atlantic oceans. **Methods** The mitochondrial gene mtMutS was used to measure diversity within *Chrysogorgia* . Community structure was analysed using rarefaction, multivariate analyses, parsimony analysis of endemism and analysis of molecular variance. The impact of underestimating species richness when using mitochondrial haplotypes was tested using simulations. **Results** Six hundred and thirty-four colonies and 31 haplotypes were sampled from New Caledonia. Contrary to what was observed in the north-western Atlantic, seamount-scale endemism of south-west Pacific *Chrysogorgia* was substantial (23% and 39% for haplotypes with $n \geq 20$ and $n \geq 2$, respectively). LR sheltered 64% of the New Caledonian haplotype diversity. Assemblages were structured less by habitat type (slope versus seamounts) than by depth. Rarefaction analyses suggested that LR and NR seamounts hold more species than the New Caledonian slope, but additional sampling in the south-western Pacific (133 colonies) revealed that some seemingly geographically restricted haplotypes from New Caledonia have wide geographical distributions, reaching as far as Taiwan. **Main conclusions** The distribution of Pacific *Chrysogorgia* is characterized by high levels of rarity, patchiness and diversity, with the levels of seamount-scale and seamount-chain-scale endemism higher than in the Atlantic. We hypothesize that the contrast between the wide geographical distribution of Atlantic *Chrysogorgia* haplotypes and the higher proportion of endemics in the Pacific is largely explained by differences in depth between the seamounts of these two regions.

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