Brittle Star Diversity in Puysegur Trench, Aotearoa New Zealand

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Chemosynthetic communities remain among the least-sampled deep-sea ecosystems due to their sparse distribution and infrequent discovery. However, recent advances in remotely operated vehicle (ROV) and human-occupied vehicle (HOV) technologies are rapidly expanding our understanding of their biodiversity. During the 2025 joint China-New Zealand Global TREnD expedition, the first biodiversity survey of the Puysegur Trench, south of Aotearoa New Zealand, revealed significant new records and species of Ophiuroidea (brittle stars). A total of 32 submersible dives explored the trench floor, trench walls, and chemosynthetic habitats including methane seeps, wood falls, and whale falls, with ophiuroids collected on 16 dives. Two new species, discovered at a whale fall represent only the second reported occurrence of ophiuroids associated with this habitat globally. The whale fall species are difficult to classify morphologically and are likely to represent new genera. Additional collections extended the known ranges of two species and documented the first New Zealand records of three species. These findings substantially enhance our understanding of New Zealand's deep-sea ophiuroid diversity, contribute valuable data to global hadal biodiversity inventories, and demonstrate the effectiveness of HOV-based sampling in difficult-to-access environments such as hadal trenches, whale falls, and cold seeps.