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The Annelid Community of a Natural Deep-sea Whale Fall off Eastern Australia

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Abstract. In the deep ocean, whale falls (deceased whales that sink to the seafloor) act as a boost of productivity in this otherwise generally food-limited setting, nourishing organisms from sharks to microbes during the various stages of their decomposition. Annelid worms are habitual colonizers of whale falls, with new species regularly reported from these settings and their systematics helping to resolve biogeographic patterns among deep-sea organic fall environments. During a 2017 expedition of the Australian research vessel RV *Investigator* to sample bathyal to abyssal communities off Australia's east coast, a natural whale fall was opportunistically trawled at ~1000 m depth. In this study, we provide detailed taxonomic descriptions of the annelids associated with this whale-fall community, using both morphological and molecular techniques. From this material we describe nine new species from five families (Dorvilleidae: *Ophryotrocha dahlgreni* sp. nov. *Ophryotrocha hanneloreae* sp. nov., *Ophryotrocha ravarae* sp. nov.; Hesionidae: *Vrijenhoekia timoharai* sp. nov.; Nereididae: *Neanthes adriangloveri* sp. nov., *Neanthes visicete* sp. nov.; Orbiniidae: *Orbiniella jamesi* sp. nov.), including two belonging to the bone-eating genus *Osedax* (Siboglinidae: *Osedax waadjum* sp. nov., *Osedax byronbayensis* sp. nov.) that are the first to be described from Australian waters. We further provide systematic accounts for 10 taxa within the Ampharetidae, Amphinomidae, Microphthalmidae, Nereididae, Orbiniidae, Phyllodocidae, Protodrilidae, Sphaerodoridae and Phascolosomatidae. Our investigations uncover unique occurrences and for the first time enable the evaluation of biogeographic links between Australian whale falls and others in the western Pacific as well as worldwide.

Keywords: polychaete, chemosynthesis, organic fall, bathyal, Bathymodiolinae, Pacific Ocean
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