Drake Passage gardens of the deep: Octocorallia

The overall aims of the R/V *Nathanial B. Palmer* (NBP) 11-03 expedition was to collect full depth and latitudinal transects of live and fossil deep-sea corals crossing the major frontal zones of the sub-Antarctic to Antarctic to investigate historic perspectives on climate and biogeography of deep-sea corals. My specific participation in the expedition was linked to studying octocorals that were sampled, specifically the very common genus, Primnoidae.

Octocorals include many well-known orders, such as sea fans, soft corals, sea whips, sea pens, and blue corals. Octocorallia, though not reef-forming, develop into dense 'corals gardens' which are important structural habitats for many associates (Krieger and Wing, 2002; Costello et al., 2005Metaxas and Davis, 2005; Stone, 2006). The Antarctic appears to be a treasure trove of diversity for some families of octocorals, in particular Primnoidae, My Ph.D. focused on by-catch from the longline Patagonian toothfish fishery around South Georgia and by far the majority of specimens caught as by-catch were octocorals, and within octocorals the Primniodae were seen most frequently. Fishing is now targeting deeper species than ever before (Clark, 1999; Koslow et al., 2000; Pauly et al., 2005); Antarctica is no exception. Gathering baseline data empirically (not haphazardly, as by-catch data is) is essential to understanding how and where these habitats form, their community structure (over depth and geographically), their community composition and even the exact delineations of individual species (by-catch often does not have accurate geographical or depth data). Little focus is given to this important vulnerable marine ecosystem and there is the risk that these species will be highly impacted before being studied.

So on a windy Punta Arena morning a squadron of intrepid scientists and crew set off south into the Drake Passage winter onboard the NBP. For the next 6 weeks we toiled against the elements in some very rough weather to sample 6 stations across a range of depths and deep-sea environments all the way down to the Antarctic continent. Sampling was very successful and over 900 specimens of Primnoidae were collected. From these samples I identified fourteen genera and 23 species.

Several of these genera and species have been found around South Georgia and the western Antarctic meaning haplotype comparisons are possible. Several genera and species have also not been previously collected so will add to phylogenetic analyses of this family. And, excitingly, of the samples collected two are species new to science. The new genus has been described (Taylor et al., in prep.) but this expedition provided whole specimens, one of which will be utilised as the holotype (to be stored in the Natural History Museum, London – paratypes to be sent to the Smithsonian Institution, Washington DC).

Outputs:
Specimens for new species and genus descriptions and revisions.
An extensive sample collection for planned phylogenetic and population genetic studies.
An informal guide of Common Octocorals of the Southern Ocean.