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What do we know about Australian polychaete biodiversity and what we do not.

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Our knowledge of polychaete (marine Annelida) diversity in Australia has been improving over the years as a result of new region exploration, taxonomic revisions, and cryptic diversity revealed by molecular studies. In 2003, the records of Australian polychaetes (as per Australian Faunal Directory) comprised 1216 species in 56 families, mostly from shallow coastal southeastern waters. Twenty years on, we re-analysed AFD to update these estimates: currently 1606 valid species from 61 families are reported. Thus, taxonomic efforts in the past two decades have increased known species richness by about 24%, mainly from western Australia and from depths below 1000 m. While significant regions in Australia remain un-sampled or poorly sampled, newly collected specimens deposited in museums constitute an important reservoir of undescribed species. Application of molecular data to morphospecies typically leads to cryptic species being discovered, thus species richness data based on morphology is an underestimate. Furthermore, records of Australian species from shelf depths and shallower are dubious where those species have type localities in remote regions. Revisions typically reveal these records represent new species – another source of undescribed diversity. It is important to continue taxonomic work on existing collections and to promote their availability to researchers undertaking world-wide revisions.

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