



Editorial: Deep-sea taxonomy — a contribution to our knowledge of biodiversity*

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* *In*: Brökeland, W. & George, K.H. (eds) (2009) Deep-sea taxonomy — a contribution to our knowledge of biodiversity. *Zootaxa*, 2096, 1–488.

“How painfully (to me) true is your remark that no one has hardly a right to examine the question of species who has not minutely described many.” Charles Darwin in a letter to Joseph Hooker (1845)

It is with great pleasure that we finished the compilation of this, the second special volume on deep-sea taxonomy in the year commemorating Darwin (2009). It is exactly 150 years after the publication of Darwin’s most notable work “On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life”. This remains the basis of our understanding of the history and diversity of life, the latter of which is expressed by the immense number of species inhabiting our planet in past and present.

Once thought to be bare of life, the deep sea has turned out to host plenty of species (cf. Sanders & Hessler 1969, Brandt & Hilbig 2004, Martínez & Schminke 2005, Martínez Arbizu & Brix 2008), of which a large part might remain to be discovered. Estimates of species living in the deep sea, the world’s largest habitat, range from 500,000 to 10,000,000 (Grassle & Maciolek 1992, May 1992, Lamshead 1993, Rex *et al.* 1993, Martínez & Schminke 2005). Every expedition undertaken within the scope of CeDAMar (“Census of the Diversity of Abyssal Marine Life”, a field project of the “Census of Marine Life”) in recent years yielded numerous new species. To gain a better understanding of deep-sea biodiversity, zoogeography, speciation and phylogeny, not only the description of these new species is required, but also redescriptions of numerous known species are needed to provide crucial information on species morphology and allow accurate identification.

This presents an enormous challenge for biologists and especially taxonomists. This task has become even greater because of the growing loss of taxonomic expertise (Mallet & Willmott 2003, Wheeler 2004, Zhang 2008). On one hand the need for protection and conservation of biological diversity has become a focus of public and political awareness, but on the other hand a considerable indifference concerning the inventory of this diversity seems to exist. Taxonomy, the one science that contributes to this inventory of biodiversity (Wheeler 2004, 2007, Zhang 2008), is faced by growing impediments: a decrease of taxonomic chairs in universities, resulting in a lack of junior taxonomists, growing difficulties to publish taxonomic papers in high impact journals, lack of funding for taxonomic projects and lack of positions for taxonomists (Zhang 2008).

The increasing popularity of DNA-based taxonomy presents a further challenge to traditional taxonomy since it has been claimed to provide a faster and less time consuming method for species identification (e.g. Hebert *et al.* 2003, Tautz *et al.* 2002, 2003, Savolainen *et al.* 2005). However, entirely DNA-based taxonomy does not provide us with much information beyond DNA sequences, and neglects the whole range of valuable morphological information. It is certainly a useful addition to morphological methods but must not be