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EDITORIAL

The Fish Barcode of Life (FISH-BOL) special issue

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The fascinating diversity of fishes coupled with their broad socio-economic importance to humanity has made them a taxonomically well-studied group. Yet despite the current recognition of some 30,000 species and the challenging identification of already known species, species are routinely discovered. Accurately assessing species diversity remains a major challenge for systematic ichthyology, particularly given the often drastic morphological shifts encountered across developmental stages and sometimes sexes, and perhaps more subtle shifts across geographic ranges. Meanwhile, more efficient harvest methods, increasing consumer demand and globalization of trade, combined with other anthropogenic impacts such as pollution and habitat loss, are causing alarming declines in the abundance and distribution of many, if not most species of fish. Climate change is likely to exacerbate these effects. Monitoring such changes and mitigating their impacts require both a more accurate inventory of species and a more scalable and cost-effective approach to their reliable identification at any life-history stage. To meet these needs, a large community of scientists joined forces in 2005 to launch the Fish Barcode of Life (FISH-BOL) campaign (Ward et al. 2009).

The present FISH-BOL special issue of *Mitochondrial DNA* provides a 5-year progress report (Becker et al. 2011) on the campaign and includes an updated "Collaborators' Protocol" (Steinke and Hanner 2011) to facilitate its continued growth and success. The implementation of standards (e.g. Hubert et al. 2008) is attributed to the overarching success of barcoding (Teletchea 2010) and to this end, the new protocol aims to refine and further advance FISH-BOL best practices for the benefit of the user community. Key to this objective is the widespread adoption of specimen imaging and reporting of identification "confidence levels" as discussed in the new protocol, which also reiterates the importance of a shared informatics workbench, the Barcode of Life Data system (Ratnasingham and Hebert 2007).

The utility of FISH-BOL derives from the contributions of many and varied researchers from around the world who are dedicated to expanding the barcode coverage for global fishes. The accumulating data already support applications of DNA barcoding which reveal market substitution (Wong and Hanner, 2008; Carvalho et al. 2011a; Hanner et al. 2011a) and enhancing our understanding of fisheries exploitation (Holmes et al. 2009; Doukakis et al. 2011). Yet the broad realization of benefits is predicated on a sustained effort to complete the construction of reference sequence library, which is the major focus of many articles in this special issue. From Africa (Lowenstein et al. 2011; Nwani et al. 2011) and Europe (Triantafyllidis et al. 2011), to Oceania (Smith et al. 2011) and South America (Carvalho et al. 2011b; Pereira et al. 2011a,b), a large number of researchers have contributed to this volume and to the FISH-BOL campaign.

As the editors of this special issue, we recognize the importance of providing scientific credit to those involved in the construction and expansion of large-scale databases such as FISH-BOL, and see the

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diverse DNA sequence and specimen data release papers herein as significant contributions to our knowledge of fish diversity. The studies highlight a number of key issues for DNA barcoding, from the inherent limitations of the barcode marker in delineating some taxa (e.g. billfishes; Hanner et al. 2011b) to the challenges of library construction when sampling nominal species far removed from original type localities (e.g. Lowenstein et al. 2011). These issues not withstanding, the papers here reinforce the point that the great majority of fish species are easily distinguished using barcodes, and that the maturity of the FISH-BOL campaign is such that it can already support a diversity of applications. Barcode coverage on a continental scale is nearly complete for North American freshwater fishes (April et al. 2011). We look forward to publishing an ongoing stream of barcode data release papers and to the eventual completion of the FISH-BOL project's objective of barcoding all the world's fish species.

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We would like to thank the authors of this issue for their contributions, and gratefully acknowledge the Consortium for the Barcode of Life for paying the required fees to make the papers in this special issue freely available online. The genesis of this special issue derives from a FISH-BOL Technical Session that took place at the 3rd International Barcode of Life Conference in Mexico City in November 2009. This issue is dedicated to future researchers who will make use of these barcodes to deepen our understanding of the ecology, natural history and taxonomy of fishes for the benefit of their conservation.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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