Project Title: DNA Barcoding and Molecular Phylogenetic Analysis of Arius species (Siluriformes: Ariidae) in the Philippines

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Project Abstract:

There are eight Arius species reported in the Philippines, namely, Arius manillensis (sea catfish), A. dispar (fleshynout catfish), A. arius (threadfin sea catfish), A. maculatus (spotted catfish), A. subrostratus (shovelnose sea catfish), A. venosus (veined catfish), A. sumatranus (goat catfish), and A. thalassinus (green sea catfish) (Conlu 1986; Froese and Pauly 2009). These food fishes, locally known as kanduli, are commercially important. Only A. manillensis is endemic to the Philippines; although the other species are native to our country, these can also be found in other parts of the world. A. manillensis and A. dispar used to be the most abundant species in Laguna de Bay, but overexploitation caused a decline in the populations of these species almost to the point of extinction in the 1960s (Mercene 1978). The populations of these species have recovered since then, but there are indications that these species are still being overfished (Palma et al. 2002). A. thalassinus and A. goniaspis have been reported also in Laguna de Bay (Aldaba 1931; Conlu 1986), but Vallejo (1986) reported only two Arius species remaining in the lake, namely, A. manillensis and A. dispar. These two species are very similar morphologically. They can only be distinguished by examining the palatal tooth patch. DNA barcoding using cytochrome c oxidase I gene, however showed that the two species are not genetically distinct from each other and that they constitute a single species only based on Kimura 2-parameter (K2P) genetic distance (Santos and Quilang, manuscript in preparation). The species A. dispar was erected by Herre in 1926 using specimens collected from Laguna de Bay. Over-splitting might have occurred for these two species since Herre (1926) based his descriptions on morphological traits only. The objectives of this study are as follows:

1. confirm if A. manillensis and A. dispar are indeed two different species or are just one and the same species using molecular markers such as cytochrome b and 16 S rRNA genes;
2. establish DNA barcodes for the other Arius species using cytochrome oxidase I gene (COI);
3. establish phylogenetic relationships of available Arius species and an outgroup taxon using COI, cytochrome b, and 16 S rRNA gene sequences.

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