

## DEEP GENETIC DIVERGENCE AND RECENT RADIATIONS IN SAND GOBY *POMATOSCHISTUS MINUTUS* ALONG EUROPEAN COASTS

Larmuseau Maarten H.D.<sup>1</sup>, Jeroen K.J. Van Houdt<sup>2</sup>, Jef Guelinckx<sup>3</sup>, Bart Hellemans<sup>1</sup> and Filip A.M. Volckaert<sup>1</sup>

<sup>1</sup> Katholieke Universiteit Leuven, Laboratory of Animal Diversity and Systematics,  
Ch. Deberiotstraat 32, B-3000 Leuven, Belgium  
E-mail: [maarten.larmuseau@bio.kuleuven.be](mailto:maarten.larmuseau@bio.kuleuven.be)

<sup>2</sup> Royal Museum of Central Africa, Leuvensesteenweg 13, B-3080 Tervuren, Belgium

<sup>3</sup> Katholieke Universiteit Leuven, Laboratory of Aquatic Ecology and Evolutionary Biology,  
Ch. Deberiotstraat 32, B-3000 Leuven, Belgium

Understanding evolutionary patterns is more complex in marine compared to continental species because marine species have high effective population sizes and high levels of dispersal due to an apparent lack of barriers. Moreover, phylogeographical breaks in the marine realm such as the Atlantic-Mediterranean transition remain controversial. Therefore a new high-quality phylogeographic analysis was realized for a marine demersal fish, the sand goby *Pomatoschistus minutus* (Gobiidae, Teleostei). Sand gobies of 12 locations along the full European distribution range were analyzed by sequencing a large fragment of the mitochondrial cytochrome *b* gene.

The phylogenetic results show that *P. minutus* comprises two deep genealogical lineages, the Mediterranean Sea Clade (MS-Clade) and the Atlantic Ocean Clade (AO-Clade), that date back to the Early Pleistocene (1.6-0.8 MYA). Even though the sand goby occurs only in a few northern locations in the Mediterranean, the MS-Clade contains the highest genetic diversity. The AO-Clade comprises two Evolutionary Significant Units (ESU), one off the Western Iberian Peninsula and the other in the marine systems of the North Atlantic (Bay of Biscay, North Sea, Irish Sea and Baltic Sea). This is consistent with two separate palaeorefugia during the Pleistocene glaciations: the Iberian Peninsula and the Bay of Biscay. Less haplotypes were shared among the marine systems of the North Atlantic, indicating a low present-day gene flow. The network analysis showed a recent radiation in each marine system, even in the northern Baltic Sea where the recolonization of *P. minutus* occurred only 8000 years ago. This phylogeographic pattern will be compared with putatively adaptive loci in order to study the characteristics of local adaptation in the marine environment.