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REPLY COMMENT

Mangrove fish assemblages and ecological equivalence: Reply to Castellanos-Galindo & Krumme (2013)

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ABSTRACT: I considered the ecological equivalence of mangrove fish assemblages based on meta-analysis of data sets from around the world (Sheaves 2012; Mar Ecol Prog Ser 461:137–149). The comment of Castellanos-Galindo & Krumme (2013; Mar Ecol Prog Ser 474:295–298) extends on this by analysing additional data from the tropical Eastern Pacific region. This helps fill a major gap I identified (Sheaves 2012) and extends our understanding of mangrove fish assemblages at a global level. More precise information on the equivalence of mangrove fish assemblages will require an integrated approach from researchers, aimed at producing more comparable data sets. Developing a more detailed understanding is important as we begin to step beyond understanding pattern to understanding process.

KEY WORDS: Mangrove fish · Ecological equivalence · Spatial variation

Castellanos-Galindo & Krumme (2013) utilise additional and newly published data (Castellanos-Galindo et al. 2012) to extend recently developed understanding of the composition and ecological equivalence of mangrove fish assemblages around the world (Sheaves 2012). The additional analysis helps fill in one of the major gaps I identified (Sheaves 2012), and hopefully the emergence of new data will continue to flesh out our understanding of mangrove fish assemblages at a global level.

One of the greatest impediments to developing a truly global understanding of mangrove fish assemblages is the inconsistency of sampling methodologies among studies. This inconsistency is not simply a function of the need to use different sampling gears and protocols under different conditions, but also stems from the different objectives of various studies that were never intended to be included in meta-analysis. Additional difficulties arise from the diverse ways data are reported, great variation in their taxonomic resolution, differences in the scales at which studies are conducted, and differences in definitions of what constitutes mangrove fish (e.g. only those entering mangroves, those associated with mangrove shorelines, those that utilise mangrove systems). These difficulties mean that, at present, analyses need to be confined to coarse taxonomic resolution and based on robust measures like presence–absence, rather than more ecologically meaningful metrics such as biomass (Magurran & Henderson 2012). Progress towards detailed understanding needs an integrated approach from researchers around the world to overcome the data inconsistencies, and produce more comparable data sets.

Understanding the equivalence of mangrove (or any other) fish assemblages is important, as we try to

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utilise information from around the world to develop strategies to maintain ecosystems and ecosystem resilience in the face of increasing threats from sea level rise, climate change and anthropogenic impacts. While understanding equivalence of pattern is essential, it is only a first step towards the goal of understanding equivalence of process. Developing understanding of equivalence of process will also require a global approach, something that is emerging in the 'seascape' literature (e.g. Boström et al. 2011, Olds et al. 2012) and in increasing understanding of the key role of connectivity in nursery ground value (Able 2005, Sheaves 2009). Questions of equivalence should not be confined to mangroves, since the latter are just one manifestation of coastal tidal wetlands, which often have similar fauna (Sheaves et al. 2007, Davis et al. 2012) and are widely considered to perform similar ecological roles (Able 2005, Green et al. 2012).

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