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SHORT COMMUNICATION

# Species composition of by-catch from milkfish (*Chanos chanos*) fry fishery in selected sites in the Philippines as determined by DNA barcodes

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**Abstract**

Milkfish fry fishery, an important industry in the Philippines, uses non-selective fishing gears and pushnets in coastal areas which lead to the capture of other non-targeted juvenile aquatic species. Unfortunately, information on the amount and the identity of by-catch species is lacking thus the extent of impact of the fry fishery is not known. In this study, the species composition of milkfish fry fishery by-catch sampled from selected coastal areas that are known to be fry collection sites in the country were identified and assessed through the use of DNA barcoding. Analyses revealed that by-catch fish species of the milkfish fry industry included Black Tiger shrimp (*Penaeus monodon*), Tarpon (*Megalops cyprinoides*), Glass perchlets (*Ambasis gymnocephalus* and *Ambasis buruensis*), Ladyfish (*Elops hawaiensis*), Snapper (*Lutjanus fulviflamma*), Cardinal fishes (*Apogon hyalosoma* and *Sphaeramia orbicularis*), Whiptin silver biddy (*Gerres filamentosus*), Mullet (*Liza sp.*), Anchovy (*Encrasicholina heteroloba*), and Tiger perch (*Terapon jarbua*), almost all of which are potential marketable food fish and culture species. The results of the study provide preliminary information, as well as awareness, on the species composition of milkfish fry by-catch.

**Keywords**

By-catch, *Chanos chanos*, DNA barcoding, juvenile fish, Philippines

**History**

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## Introduction

The Philippines, widely known as the marine center of biodiversity, is home to a lot of species and is extremely rich in marine and freshwater domains (Sanciangco et al., 2013). Hence the fisheries sector is culturally, socially and economically significant to the country since it provides income, employment, nutrition, foreign exchange earnings and stability to it (Green et al., 2003). In particular, a part of this sector which experience increasing demands are specialized fisheries that target postlarvae or early juveniles of certain fish species marketable as delicacies or as seed stock for aquaculture.

Milkfish fry fishery, according to the milkfish fry resource assessment conducted by Ahmed et al. (2001), is one of the most prevalent fry fishery in the country that experiences growing demands in the recent years with an annual demand of 1.65 billion nationally. However, according to the assessment, milkfish production has been declining, from 225,026 t in 1981 to 150,151 t in 1996, due to the shortage in milkfish fry supply in the wild. The underlying reasons for wild milkfish fry shortage was linked to overexploitation, environmental pollution, illegal fishing, appearance of large numbers of fish predators, open access fishing and conflicts in use rights, coupled with the increasing demand for fry.

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The problem in decreasing wild milkfish fry resource is also compounded by the fact that a large number of postlarvae and other juvenile species are captured as by-catch in milkfish fry fishery due to the use of non-selective fishing gears and push nets, therefore threatening the population of these other fry species. These by-catch species are assumed to be discarded as unwanted and are destroyed on coastal shores (Hermes, 2004). However, although it is known that the milkfish fry fishery produces large numbers of postlarvae and juvenile by-catch, information on the amount of discarded by-catch and its species composition is still lacking. This raises an important management concern regarding identity and the extent of loss of these discarded marine fry resources.

Efficient management efforts begin with correct species identification since effective conservation and protection is species specific (Nwani et al., 2011). However, the high diversity and morphological plasticity in fish and their diverse developmental stages are difficult to identify by using morphological features alone (Zhang & Hanner, 2012). Ko et al. (2013) points out that molecular identification by means of DNA barcoding can guarantee identification of larval fish to the species level.

DNA barcoding is a rapidly emerging tool for species identification which uses short DNA fragments. Numerous studies have already established that sequence diversity in a 650-bp fragment of the mtdna COI already provides strong species-level resolution for a wide variety of animal groups (Ferri et al., 2009; Hubert et al., 2008; Ramadan & Baeshen, 2012; Ward et al 2005). Specifically in the Philippines, the utility of DNA barcoding in resolving identities of juvenile fish species has been presented in various studies (Agmata et al., 2013; Asis