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## ***Merluccius tasmanicus* Matallanas & Lloris 2006 is a junior synonym of *M. australis* (Hutton 1872) (Gadiformes: Merlucciidae) based on morphological and molecular data**

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### **Abstract**

The high intraspecific variation among and the conservative external morphology of *Merluccius* spp. have resulted in serious identification difficulties. Four hundred and twenty fresh and preserved specimens of *Merluccius* were analyzed, including the type series of *Merluccius australis*, *M. tasmanicus* and *M. hubbsi*; specimens of *M. hubbsi* from Argentina, Brazil and Uruguay, and individuals of *M. australis* from Argentina and New Zealand were examined. The nomenclatural status of the type specimens of *M. australis* is discussed and the designation of a lectotype and a paralectotype is proposed. The comparative study of morphology, meristic, traditional and landmark-based morphometry, both external and internal, and through DNA-based Barcoding molecular tools demonstrates that *Merluccius tasmanicus* is a junior synonym of *Merluccius australis*. Meristic and morphometric characters of types of *M. tasmanicus* completely overlap those of *M. australis*, whereas *M. hubbsi* show fewer scales along the lateral line, total vertebrae, second dorsal and anal-fin rays. A trend of a longer snout and wider head in *M. australis* and *M. tasmanicus*, and larger eyes and longer pelvic fins, in *M. hubbsi* was observed. While discriminant characters were found in the internal elements (hyomandibula, urohyal and sagitta otolith) between *M. hubbsi* and *M. australis*, none were observed between *M. australis* and those reported for *M. tasmanicus*. DNA barcoding analyses found no evidence of the existence of other species of *Merluccius* besides *M. hubbsi* and *M. australis*.

**Key words:** *Merluccius* spp., meristics, morphometry, DNA barcoding, Argentina, New Zealand, lectotype, paralectotype

### **Introduction**

The Genus *Merluccius* is one of the most heavily exploited demersal fishes worldwide (Whitaker 1980; Inada 1981a; Cohen *et al.* 1990; Pitcher & Alheit 1995; Moyle & Cech 1996; Lloris *et al.* 2003). In Argentinean waters, *Merluccius* spp. have been one of the most valuable fishery resource (Bezzi & Dato 1995), representing about 40% of the total fish catch in recent years (MAGyP 2010; 2011), and currently regarded as overexploited (FAO 2010; Vaz-dos-Santos *et al.* 2010). The New Zealand hake fishery has traditionally consisted of bycatch of the much larger hoki (*Macruronus novaezealandiae* (Hector) fishery (Colman 1995), but in recent years it has also become an important target fishery (Ballara 2012).

The correct specific identification is essential for most biological studies (Vecchione & Collette 1996; Leonart *et al.* 2006), and is necessary to design effective fishery management strategies (Stauffer & Kocovsky 2007). Incorrect identifications, the use of outdated names, or the application of misleading names can have considerable economic and environmental consequences (Fischer 2013). Several detailed taxonomic studies of merlucciids have been published (Inada 1981a; Cohen *et al.* 1990; Lloris *et al.* 2003). Nevertheless, the high intraspecific variation