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Parasites of hoki, *Macruronus magellanicus*, in the Southwest Atlantic and Southeast Pacific Oceans, with an assessment of their potential value as biological tags

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ABSTRACT

The aims of the present study were to investigate the protozoan and metazoan parasite fauna of hoki *Macruronus magellanicus* in the Southwest Atlantic and Southeast Pacific and to identify parasites of potential value as biological tags for stock identification and migrations. In 2007 a total of 76 hoki were examined from three locations, two off the coast of Chile and one off the Falkland Islands. Two further samples were taken in 2009, one of 32 hoki taken from a position off the coast of Chile between those sampled in 2007 and one of 42 juvenile hoki taken off the Falkland Islands. Seventeen different parasite taxa were recorded, including eight identified to species. Seven were new host records for hoki, and at least three, and possibly as many as five, are new species. The most promising tag parasites for hoki stock identification are the long-lived larvae of the cestodes *Hepatoxylon trichiuri* and Pseudophyllidea gen. sp. and of the nematode *Anisakis* sp. Three others – the myxosporean *Myxidium baueri*, the nematode *Pseudascarophis* sp. and the acanthocephalan *Echinorhynchus longiproboscis* – were identified as potentially useful for following seasonal migrations of hoki and for estimating the proportions of fish of different origin in mixed samples.

1. Introduction

Hoki, also known as Patagonian grenadier and long-tailed hake, *Macruronus magellanicus* Lönnberg, 1907, is an abundant pelagic fish distributed throughout the Southwest Atlantic and Southeast Pacific. It is of considerable commercial value to fisheries in Chile and Argentina, while its fishery to date is not well developed in the Falkland Islands. The stock in the Pacific seems to be highly depleted, while the stock in the Atlantic appears to be in good condition.

The distribution of *M. magellanicus* ranges northwards to 33° S in the Atlantic and to 29°16′ S in the Pacific Ocean, while they have been reported southwards to the tip of the South American continent at 57° S (Wöhler and Giussi, 2004). Between austral spring and autumn they are largely distributed in their feeding grounds south of 48° S (Wöhler and Giussi, 2004); in the winter they migrate further north for spawning. Large spawning aggregations have been found between June and August in close proximity to Guamblin Island off the Chilean coast between 43° and 48° S, while smaller aggregations of spawning fish and juveniles have been found in the Southwest Atlantic in the Gulf of San Matias and to a lesser extent in the Gulf of San Jorge (Wöhler and Giussi, 2004). The spawning aggregations of *M. magellanicus* in the Gulf of San Matias and Gulf of San Jorge cannot sustain the stock biomass observed in the Southwest Atlantic, so it has been speculated that an additional spawning ground may exist on the high seas in the Southwest Atlantic or that fish may migrate from the Pacific to the Atlantic.

D'Amato and Carvalho (2005) found no genetic evidence of different populations of hoki in the Southwest Atlantic, but Machado-Schiaffino and Garcia-Vazquez (2011) did find genetic evidence of at least two population units, one in the Southwest Atlantic and one in the Southeast Pacific, with perhaps two further subpopulations in the Southwest Atlantic with a north-south division. The hoki otolith chemistry analyses of Schuchert et al. (2010) suggested a high mixture of fishes indicating the existence of one stock with two spawning grounds around South America.

The identification of stocks is important to fisheries management because different stocks may be of different sizes and may exhibit different growth rates. Management strategies would have to be adjusted in the case of acceptance of the single-stock

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