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A checklist of the helminth parasites of marine mammals from Argentina

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Abstract

Based on published records and new data accumulated by the authors, we generated a list of the helminth parasites of marine mammals from off the coast of Argentina. We found 49 reports of helminths parasitizing cetaceans and pinnipeds from Argentina from 1952 to 2015. The list includes 54 taxa of helminths (8 acanthocephalans, 24 nematodes, 11 cestodes and 11 trematodes) associated with 18 species of cetaceans and 5 species of pinnipeds. Most of the records represent adults (5 acanthocephalans, 16 nematodes, 6 cestodes and 11 trematodes), followed by larvae (10 nematodes and 3 metacestodes) and juveniles (4 acanthocephalans and 2 cestodes). The checklist contains 24 named species (5 acanthocephalans, 8 nematodes, 4 cestodes and 7 trematodes) and 30 undetermined helminth taxa (3 acanthocephalans, 16 nematodes, 7 cestodes and 4 trematodes). The present account contains a parasite/host lists and information on the habitat, developmental stage and distribution of the parasites listed, repositories of their type and voucher specimens and references. A host-parasite list is also presented. The data compiled on the helminth of marine mammals from Argentina in the present study revealed gaps in the knowledge of their taxonomic identification, composition, distribution, host specificity and life cycles. These gaps are also briefly discussed in order to provide an outline for future research.

Key words: Acanthocephala, Nematoda, Cestoda, Trematoda, Carnivora, Cetacea, South West Atlantic

Introduction

Argentina has the third longest coastline in South America, extending about 4,725 km long from the borders of the La Plata River to the southern tip of South America (Barragán Muñoz *et al.* 2003). This region is considered to be one of the most productive ecosystems in the oceans and represents one of the largest continental shelves worldwide (Croxall and Wood 2002). The continental shelf, also known as Patagonian shelf, presents a complex oceanographic area, as two major marine currents coexist: the cold Malvinas and the warm Brazilian currents (Miloslavich *et al.* 2011). The interaction of these two currents produce an upwelling event, which allows a high biological activity, providing the conditions for the zooplankton development and, hence, a high diversity and abundance of squids and fish. The high abundance of zooplankton, squids and fish in this area sustains significant populations of top predator species, *i.e.* sea birds and marine mammals (see Croxall and Wood 2002 and references therein).

To date, 47 species of marine mammals (10 carnivores and 37 cetaceans) have been recorded in Argentinian

ancylostomids (*Uncinaria hamiltoni*) and anisakid nematodes (*Contracaecum ogmorhini* s.s., *C. miroungae*, *C. osculatum* s.l. and *Pseudoterranova cattani*) (Mattiucci *et al.* 2003, 2008; Nadler *et al.* 2013; Timi *et al.*, 2014), and in polymorphid acanthocephalans (*Corynosoma australe* and *C. cetaceum*) (see Sardella *et al.* 2005). Molecular genetic markers are necessary to reliably identify several species of parasitic helminths from marine mammals (*e.g.* anisakid nematodes or diphyllbothriid cestodes), from which their systematic and nomenclature is controversial and confused by using exclusively morphological characters (Mattiucci and Nascetti 2008; Scholz *et al.* 2009; Mattiucci *et al.* 2014).

Most of the helminth parasites from the present checklist use marine mammals as definitive hosts, *i.e.* in these hosts the parasite reach sexual maturity is able to reproduce (Aznar *et al.* 2012). Only in the case of the cestodes *Phyllobothrium delphini*, *Phyllobothrium* sp. and *Scolex pleuronectis*, which mature and reproduce in sharks, marine mammals act as intermediate or paratenic hosts (Agustí *et al.* 2005a; Randhawa 2011). As many as three parasite taxa found in this study (*i.e.* *Contracaecum* sp., *Andracantha* sp. and *P. chasmagnathi*) use fish-eating birds as definitive host (*i.e.* cormorants or seagulls) (see Hernández-Orts *et al.* 2013b and references therein). In marine mammals, these parasites probably do not mature or cannot reproduce (Aznar *et al.* 2012; Hernández-Orts *et al.* 2013b).

The specific identity of the intermediate/paratenic hosts for most helminth parasites of marine mammals from Argentina is unknown and, therefore, their life cycles remain to be described. With the exception of ancylostomid nematodes (*Uncinaria* spp.) that have a direct life cycle, the life cycle of helminth parasites maturing in marine mammals is complex, including intermediate or paratenic hosts (*e.g.* Dailey 2005; Hernández-Orts 2013). Larvae of helminth parasites (*e.g.* third-stage larvae of anisakid nematodes or diphyllbothrid plerocercoids) of marine mammals are a cause for concern because they can infect humans who consume raw or undercooked fish, and may cause disease known as anisakiosis or diphyllbothriosis (Mattiucci and Nascetti 2008; Scholz *et al.* 2009). Currently, larval forms of helminth parasites from marine mammals have been reported infecting several species of cephalopods and fish inhabit the coast of Argentina (*e.g.* González and Kroeck 2000; Timi 2007; Hernández-Orts 2013; Hernández-Orts *et al.* 2013b; Cantatore and Timi 2014 and references therein). In addition to the potential health problem caused by these parasites, the identification of their larval forms in Argentina waters, especially by using molecular methods (*e.g.* Hernández-Orts *et al.* 2013b; Timi *et al.* 2013), will contribute to a better knowledge of the biology and transmission of helminths infecting this group of hosts.

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