

## Endoparasites of the subantarctic fur seal *Arctocephalus tropicalis* from Gough Island

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Received 3 March 1989; accepted 19 June 1989

Two hundred and fourteen subantarctic fur seals *Arctocephalus tropicalis*, culled at Gough Island, South Atlantic Ocean, were examined grossly for endoparasites. Respiratory and alimentary tracts were searched in particular. Unweaned individuals only harboured tracheal mites *Orthohalarachne diminuata*, whilst larval cestodes *Phyllobothrium delphini* were found in subcutaneous blubber of the majority of older animals. In addition, pseudophyllidean cestodes *Diphyllobothrium* sp. predominated in the caecal area, and anisakine nematodes *Anisakis simplex* and *Contracaecum osculatum* in stomachs. *A. tropicalis* is a new host record for the tetraphyllidean cestode *Monorygma grimaldii*, an incidental parasite in this case.

Tweehonderd-en-veertien subantarktiese pelsrobbe *Arctocephalus tropicalis*, wat te Gougheiland, Suid-Atlantiese Oseaan, uitgedun is, is grofweg vir endoparasiete ondersoek. Respiratoriese en spysverteringskanale in besonder is ondersoek. Ongespeende individue het slegs tracheale miete *Orthohalarachne diminuata*, gehuisves, terwyl larwale cestode *Phyllobothrium delphini* in die onderhuidse spek van die meerderheid ouer diere gevind is. Bykomstig het pseudophyllidiese cestode *Diphyllobothrium* sp. in die gebied van die sekum en anisakiese nematode *Anisakis simplex* en *Contracaecum osculatum* in mae oorheers. *A. tropicalis* is 'n nuwe aangetekende gasheer vir die tetraphyllidiese cestode *Monorygma grimaldii*, 'n toevallige parasiet in hierdie geval.

The subantarctic fur seal *Arctocephalus tropicalis* breeds in large numbers on Amsterdam Island (37°50'S / 77°35'E) and Gough Island (40°20'S / 09°54'W) amongst others in the Southern Ocean, with vagrants from an unknown source turning up on the South African coastline (Bester 1980; Shaughnessy & Ross 1980; Hes & Roux 1983).

Very little is known of the parasites of this species since only a few of the vagrants ( $n = 9$ ) and those on Amsterdam Island ( $n = 13$ ) have been examined previously (Shaughnessy & Ross 1980; Paulian 1964). Dailey & Brownell (1972) and Dailey (1975) extracted some information from the literature with no reference to the source (locality) or numbers of seals examined. Although Dailey (1975) refers to *A. tropicalis* (Gray 1872), it is not entirely clear whether *A. gazella* may have been included since they were formerly accorded subspecific status (*A. t. tropicalis* Gray, 1872 and *A. t. gazella* Peters, 1875, respectively — King 1964).

Opportunity for the present study arose during an investigation into the reproduction, growth and feeding of the subantarctic fur seal population of Gough Island. Necropsies were performed on fur seals ( $n = 214$ ) killed by shooting when representatives of all ages (pups – 13+

years) and both sexes were collected during the period November 1977 – October 1978. The ventral blubber mass was exposed to the underlying musculature by a mid-ventral incision from chin to anus, and inspected for cestode cysts. If none were seen, further dissection of the blubber ensued to confirm absence/presence of cysts. Efforts were made to search for and collect parasites from the lungs, stomach and intestinal tract. To this end the larynx, trachea and bronchial tree were opened and examined grossly for visible parasites. The stomach, duodenum, distal 10–20 cm of the ileum, junction between ileum and large intestine (caecal area), and proximal part of the large intestine of every seal were routinely inspected. Only in some cases were the entire small intestine and colon examined.

In most cases the liver, spleen, pancreas, heart, kidneys and bladder were dissected grossly and cursorily examined for parasites. Reproductive organs (ovaries, testes, prostate gland, and uterine horns) were collected and pieces of tissue removed and fixed for the study of reproduction. This afforded an opportunity to locate any grossly visible parasites in a cursory way.

All parasites isolated were collected, counted, and fixed in either 70% alcohol or 10% formol saline, for storage and subsequent study. Samples from representative body regions in 18 fur seals, were identified at the Parasitic Worms Section of the British Museum (Natural History), England and the Queensland Institute of Medical Research, Australia.

### Acarina

Pups ( $n = 7$ ) and underyearlings ( $n = 6$ ) hosted no parasites other than tracheal mites identified as *Orthohalarachne diminuata* (Doetschmann, 1944), an acarid found in 40,8% ( $n = 82$ ) of the other seals aged two years and older ( $n = 201$ ) and probably more as they could be easily overlooked. Tending to occur in the deeper respiratory passages (Kim, Haas & Keyes 1980) and possibly responsible for sneezing and coughing, often heard in a colony of *A. tropicalis*, it has also been collected from Amsterdam Island and from vagrants in South Africa (Table 1). The pups and underyearlings were not weaned, did not take solid food, and were therefore not exposed to paratenic hosts. This is likely to explain the absence of larval/adult stages of parasites which are commonly found in older, independant seals (Table 1).

### Trematoda

Trematodes have never been isolated from *A. tropicalis*, nor from any other *Arctocephalus* spp. with the exception of *A. australis*. Lack of work on the genus, as well as superficial inspection of organs where they might be found within the parenchyma or in small ducts (pancreas; gastrointestinal and hepatobiliary systems) may be the reason for this.

### Cestoda

The larval tetraphyllidean *Phyllobothrium delphini* (Bosc, 1802), belonging to one of the three different

**Table 1** Presence and locality of endoparasites in *A. tropicalis*. Locations are designated as follows: A = Amsterdam Island, U = unknown, V = vagrants in South Africa, and G = Gough Island

	Location	Locality in host	Source
<b>Acarina</b>			
Family Dermanyssidae			
Species <i>Orthohalarachne diminuata</i>	A, V,	Respiratory system	Paulian 1964, Shaughnessy & Ross 1980, present study
<b>Cestoda</b>			
Family Diphyllbothriidae			
<i>Diphyllbothrium</i> sp.	U, G	Large/Small intestine	King 1964, present study
Phyllobothriidae			
<i>Phyllobothrium</i> sp.	V	Blubber	Shaughnessy & Ross 1980
<i>Phyllobothrium delphini</i>	U, G	Blubber	King 1964, present study
<i>Monorygma grimaldii</i>	G	Testis	Present study
Tetrabothriidae (immatures)	G	Duodenum	Present study
<b>Nematoda</b>			
Family Heterocheilidae			
<i>Anisakis simplex</i>	V, G	Stomach, duodenum and ileum	Shaughnessy & Ross 1980, present study
<i>Porrocaecum decipiens</i>	A, U	Stomach	Paulian 1964, Dailey & Brownell 1972
<i>Contraecum osculatum</i>	A, U, V, G	Oesophagus, stomach	Paulian 1964, Dailey & Brownell 1972, Shaughnessy & Ross 1980, present study
<b>Acanthocephala</b>			
Family Polymorphidae			
<i>Corynosoma australe</i>	V	Small intestine	Shaughnessy & Ross 1980
<i>Corynosoma strumosum</i>	U	-	King 1964

cestode families isolated from *A. tropicalis* (present study) occurred in the blubber of 95,5% ( $n = 192$ ) of seals older than underyearlings. Commonly a cetacean parasite in this stage, and of elasmobranch fishes as adults, Dailey (1975) considered it an incidental parasite of pinnipeds in the southern hemisphere. This is clearly not the case based on information presented here. On the other hand, the larval tetraphyllidean, *Monorygma grimaldii* (Moniez, 1889), isolated from the enlarged testis of an eight-year-old male *A. tropicalis* at Gough Island (this study) occurs incidentally. The genus *Monorygma*, ubiquitously distributed among cetaceans and localized in abdominal musculature or appended to viscera (Geraci & St. Aubin 1987) has never been reported for the Pinnipedia (*vide* Dailey & Brownell 1972; Dailey 1975). The unusual position of *M. grimaldii* in the testis probably reflects migration from the intestines (Geraci & St. Aubin 1987). Immature tetrabothriid cestodes were located in the duodenum of one specimen only. The pseudophyllidean *Diphyllbothrium* sp. were identified from the caecal area, which harboured parasites in 16,4% ( $n = 33$ ) of all *A. tropicalis* examined (present study).

#### Nematoda

Both adult (stomach) and larval (duodenum and ileum) nematodes *Anisakis simplex* (Rudolphi, 1809) were identified. *A. simplex* was first reported for *A. tropicalis*

by Shaughnessy & Ross (1980). *Contraecum osculatum* (Rudolphi, 1802) located in the stomach (this study) were found in other populations of *A. tropicalis* as well (Table 1). *Porrocaecum decipiens* (Krabbe, 1878), listed by Paulian (1964) and Dailey & Brownell (1972) as stomach nematodes in *A. tropicalis* were not found but might have been excluded from the sample selected arbitrarily for specialized identification. Nematodes occurred in 41,3% ( $n = 83$ ) of all stomachs examined and ranged between 1–505 with a mean of 62,6 individuals either free or attached to the gastric mucosa, and were sometimes associated with ulcers. Similarly Stroud & Roffe (1979) frequently found granulomatous ulcers associated with pure or mixed nematode populations comprising *A. simplex*, *C. osculatum* and *P. decipiens* in 10 species of marine mammals. Ulceration may in fact be caused by penetration of the gastric mucosa by both larval and adult nematodes (*vide* Geraci & St. Aubin 1987).

#### Acanthocephala

As one of the two principal genera of acanthocephalans which localize in the intestine of marine mammals *Corynosoma* was not identified in the present study, although *C. australe* (Johnston, 1937) and *C. strumosum* (Rudolphi, 1802) were found in *A. tropicalis* elsewhere (King 1964; Shaughnessy & Ross 1980). This may have resulted from the incomplete searching of the entire

small intestine, or absence from the samples used for identification in the present study.

### Acknowledgements

Logistic and financial support were provided formerly by the South African Department of Transport, and latterly by the Department of Environment Affairs on advice of the South African Scientific Committee for Antarctic Research. Allan Seabrook provided excellent assistance in the field. Dr D.I. Gibson and Dr R. Domrow identified the parasites for which I am extremely grateful.

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