Lineage – Scientific methodology

Annual distribution of the polychaete *Spio aequalis* lineage

The spionid *Spio aequalis* Ehlers, 1904 has rarely been found. It had been known only from the original description, re-examination of syntype specimens, and three additional museum records that together indicated a distribution within a narrow latitudinal range on the eastern South Island coast together with a presence on Chatham Island. It is a very large intertidal worm over 100 mm length and over 5 mm width, but had not been recorded for 59 years since last collected in 1949. However, recently live worms have been seen on the shore and collected, and thus some data on its contemporary distribution and conservation status now exists.

Spio aequalis is known only from New Zealand. It was discovered in 1897 by H. Schauinsland, a visiting German naturalist, but Ehlers (1904) did not give the placename of Schauinsland's collection site within the Chatham Island group when he described the species. Schauinsland's original specimens have been rediscovered in Germany, revealing the previously unpublished type locality as Waitangi on Chatham Island itself. Two later historic finds on the adjacent eastern coast of South Island, New Zealand are known from museum material. In 1899 *S. aequalis* was found at Moeraki by Benham, and in 1949 it was found at Squally Bay, northern Banks Peninsula by Knox. There have been no subsequent finds at the above locations, but in 2008 small populations of *S. aequalis* were discovered in two other Banks Peninsula bays. In 2009 a further population was unexpectedly found in Wellington Harbour, extending the latitudinal spread of the species to the southern tip of North Island. This population is again very small and is vulnerable to accidental eradication. For that reason the exact location of the worms is not recorded here since this document is freely available on the internet.

1. Literature sources

   Literature databases and Google were searched for any information on *S. aequalis.*

   Using the keywords **Spio** and **aequalis** searches were carried out initially (7 September 2005) in Aquatic Sciences and Fisheries Abstracts, ISI Web of Science, Google, and the catalogues of the University of Auckland, Victoria University of Wellington, Canterbury University, and Otago University. No hits were discovered additional to long-known references. Subsequently (November 2007) no new information or literature records were discovered on *Spio aequalis*

in Google, Google Scholar, ASFA, and ISI web of knowledge. No new information was available on the web as at June 2009.

2. Museum holdings

   Reports were sought on holdings of *S. aequalis* from curators at Auckland Museum, Te Papa Tongarewa Museum of New Zealand, Canterbury Museum, Otago Museum, and the NIWA Invertebrate Collection. No previously unknown specimens were reported. The world-wide holdings are as follows.

   a. Übersee Museum, Bremen, Germany, lots no. 402 and 403, *S. aequalis* syntypes, consisting of 6 fragments, one of which is an anterior end, collected by H. H. Schauinsland in 1897 (probably on 27 January) on the shore near Waitangi, Chatham Island.
   b. Otago Museum, Dunedin, Iv.092, consisting of 2 midbody fragments, collected by W. B. Benham between 9–16 November 1899 at or near Moeraki, Otago coast.
   c. Natural History Museum, London, BMNH ZB 1908.5.9.6, consisting of a single damaged anterior end donated by Benham in 1908, almost certainly originating from the Otago Museum Moeraki specimen lot. Incorrectly labelled as a syntype.
   d. NIWA Invertebrate Collection, lot number 17924, NIWA locality station Y10161, consisting of 5 anterior ends plus 4 other fragments, collected by G. A. Knox on the shore at Squally Bay, Banks Peninsula, 26 August 1949.
   e. NIWA Invertebrate Collection, as yet uncatalogued, several worms collected intertidally at Decanter Bay, and Little Akaloa Bay, Banks Peninsula, 20 February 2008.
   f. NIWA Invertebrate Collection, Specify 48030, 8 anterior ends, Wellington Harbour, 9 March 2009,

The spionid *S. aequalis* is a unique large *Spio* with distinctively thickened branchiae, a blunt prostomium, an anal opening as a large oblique slot with reduced anal cirri, and thick-walled oocytes. It occurs at low density (1-2 per m^2) in the sediment overlying or adjacent to boulder zones at the sand/rock transition of partly sheltered surf beaches. This habitat is of very limited extent and it seems probable that the total *S. aequalis* population is small, and that it is indeed as rare as previously suspected. Unjustified casual collecting of these worms should be discouraged, but discoveries at new sites should be reported.

The information on the past distribution of *S. aequalis*, derived from museum collection labels, was written by Dr Geoffrey Read (NIWA Wellington), who has examined all material and will submit for publication a redescription that brings together all that is known of the species. The information known in 2005 was reviewed by Dr Keith Probert, Department of Marine Science, University of Otago. Too little is known of the distribution of this species to allow hotspots and the 90% distribution to be shown. The 100% distributions were integrated by hand onto a large-scale map of New Zealand. The rounded lines were then digitised and imported into a GIS software package as layers. The areas of each distribution class were calculated and the layers were linked to attribute and metadata files.

3. References. The following publications are the only information sources on the spionid *S. aequalis* (excluding mentions of the name only).

Augener, H. (1926). Papers from Dr. Th. Mortensen's Pacific Expedition 1914–16. 34. Polychaeta III. Polychaeten von Neuseeland. II. Sedentaria. *Videnskabelige Meddelelser fra Dansk naturhistorisk Forening, København 81*: 157–294. [p. 164. A species description of a new *Pseudonerine* has remarks on Ehlers' *Spio* specimens]

Blake, J.A. (1984). Four new species of Spionidae (Polychaeta) from New Zealand, with comments on a syntype of *Spio aequalis* Ehlers from Chatham Island. *Proceedings of the Biological Society of Washington 97(1)*: 148–159.

Ehlers, E. (1904). Neuseeländische Anneliden. *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-Physikalische Klasse. Neue Folge 3(1)*: 1–80.

Read, G.B. (1999). Missing missed or mistaken. Glimpses of the giant spionid *Spio aequalis*. http://www.annelida.net/nz/spio-aequalis.html (accessed 4 March 2008).