

## Lineage

### Annual Distribution of the Onion Sponge

1. Literature sources were searched for information on the distribution of the onion sponge, *Tethyopsis mortenseni* (Brøndsted, 1924).
  - a. Papers dealing with the overall distribution and ecology of New Zealand sponges were reviewed (Brøndsted 1924, Bergquist 1968, Koltun 1969, 1970, Dawson 1993, Kelly 1999, Cryer et al. 2000, Page et al. 2001, Kelly et al. in press). *Tethyopsis mortenseni* has been recently synonymised to *Tethyopsis* Stewart from *Monosyringia* Brøndsted, 1924. These publications indicated that *T. mortenseni* lives predominantly off the far north of New Zealand, at depths of 60-130 m.
  - b. Using the keywords **monosyringia mortenseni** or **m mortenseni** (27 July 2003), and **tethyopsis mortenseni** or **t mortenseni** (4 September 2003), extracts were made from Aquatic Sciences and Fisheries Abstracts. Using the keyword **sponge\***, extracts were made from NIWAcat (all records at 27 July 2003). Relevant publications were obtained but none were useful in extending the recent and current distribution beyond that described above.
  - c. Using **monosyringia** (19 August 2003) and **tethyopsis** (4 September 2003), Google searches were conducted, with no publications on recent and current distribution located.
  - d. Using the keywords (anywhere or global) **sponge\* and thesis**, The University of Auckland, Auckland University of Technology, The Waikato University, Massey University, Victoria University of Wellington, University of Canterbury, and University of Otago library catalogues were checked between 7 July and 12 August 2003, with relevant theses obtained and examined. None extended the distribution of this sponge beyond that described above.
2. Museum holdings.

Holdings of *T. mortenseni* at NIWA and Te Papa were examined. Other museum holdings were not investigated because it was considered that they would not add anything to the record. Data were used to help estimate presence/absence.

- a. NIWA Greta Point. The **AllSeaBio** database was examined for records on 23 July 2003, with just one specimen recorded from off Northland. Additions made to the collection since about 1995 have not been loaded onto this database; however, those present during 1998 formed part of Dr Michelle Kelly's (NIWA Auckland, reviewer of this layer) distributional database for this species and so have

been incorporated. Additions made to the collection since about 1998, identified to species level and shelved, were searched on 19 September 2003, no specimens of *T. mortenseni* taken beyond the area described above being located.

- b. Museum of New Zealand Te Papa Tongarewa (**Te Kahui**) records of this sponge based on voucher specimens held in their collection, as well as extensive unsorted specimens, were examined by Dr Kelly during 1999 and have been incorporated in this analysis. No further specimens of *T. mortenseni* have been added to the catalogue since 1999 (B. Marshall, Collection Manager, pers. comm., 16 September 2003).
3. Ministry for Primary Industries electronic databases were not examined because in none can there be confidence in the identification of this sponge.
  4. Summary.

*T. mortenseni* is an endemic species, adults of which are found on predominantly sandy mud substrates on the continental shelf off the Three Kings Islands (60-130 m) (Bergquist 1968), and in coastal sediments off Cape Maria van Diemen (100 m) (Brøndsted 1924), and Spirits Bay (80 m) (Kelly 1999, Cryer et al. 2000). The species has also been recorded from Colville Channel (60 m) (Brøndsted 1924). Dawson's (1993) conclusion that *T. mortenseni* also lives in Antarctica is not supported (Koltun 1969, 1970, Page et al. 2001).

Because this is a relatively long-lived (>10 yrs) sessile benthic species, the seasonal distributions are the same as this annual one.

Relatively little has been published on this species. The scarcity of detailed abundance and distribution data mean that only one hotspot of distribution is defined, the bulk of the references suggesting that the species is widely distributed in the triangle enclosing the Three Kings Islands, Cape Maria van Diemen and North Cape, and particularly off Spirit's Bay (Cryer et al. 1999). *T. mortenseni* may have a disjunct distribution, based on the Colville Channel record. The species has not been recorded elsewhere on the northeast coast of New Zealand between North Cape and Colville Channel but this is probably due to insufficient sampling at the regional and local level. Presence of the species to the north and northwest of the Three Kings Islands remains uncertain because of inadequate sampling.

The above information on the distribution of *T. mortenseni*, derived equally from field collections and the published literature, was provided to an expert scientist (Dr Kelly) who integrated this information with their expert opinion to produce hand-drawn distributional zones 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.

## 5. References.

The following publications were the key references and/or the ones most useful in describing the recent/current annual distribution of the sponge *T. mortenseni*. The list is not intended to be an exhaustive bibliography of publications about this species.

Bergquist, P.R. (1968). The marine fauna of New Zealand: Porifera, Demospongiae, Part 1 (Tetractinomorpha and Lithistida). *New Zealand Oceanographic Institute Memoir 37*.

Brøndsted, H.V. (1924). Sponges from New Zealand, Part I. Papers from Dr Th. Mortensen's Pacific Expedition 1914–1916. *Videnskabelige Meddelelser fra Dansk Naturhistoisk Forening i Kjøbenhavn 77*: 435–483.

Cryer, M.; O'Shea, S.; Gordon, D.; Kelly, M.; Drury, J.; Morrison, M.; Hill, A.; Saunders, H.; Shankar, U.; Wilkinson, M.; Foster, G. (2000). Distribution and structure of benthic invertebrate communities between North Cape and Cape Reinga. *Final Research Report for Ministry for Primary Industries Research Project ENV9805, Objectives 1–4*.

Dawson, E.W. (1993). The marine fauna of New Zealand: Index to the fauna 2. Porifera. *New Zealand Oceanographic Institute Memoir 100*.

Kelly, M. (1999). ENV9805 – A preliminary report on the biodiversity (taxonomy, systematics, and distribution) of sponges of Spirit's Bay, Northland, collected on the R.V. *Kaharoa* (23–31 January 1999). *Unpublished NIWA Report*.

Kelly, M.; Wilkinson, M.R.; Alvarez de Glazby, B.; Cook, S. de C.; Bergquist, P.R.; Campbell, H.; Buckeridge, J.S.; Reiswig, H.M.; Valentine, C. in press. Phylum Porifera – Sponges. *In: The New Zealand Inventory of Biodiversity: A Species 2000 Symposium Review*. Gordon, D.P. (ed.). Canterbury University Press, Christchurch.

Koltun, V.M. (1969). Porifera. *In: Distribution of selected groups of marine invertebrates in waters south of 35° latitude*. Buschnell, V.C.; Hedgpeth, J.W. (eds), pp 13–14, Antarctic Map Folio Series 11. American Geographical Society, New York.

Koltun, V.M. (1970). Sponges of the Arctic and Antarctic; a faunistic view. *In: The Biology of the Porifera*. Fry, W.G. (ed.), pp 285–297, Symposium of the Zoological Society of London 25. Academic Press, London.

Page, M.J.; Alcock, N.; Gordon, D.; Kelly Shanks, M.; Nelson., W.; Neill, K.; Watson, J. (2001). Preliminary assessment of the biodiversity of benthic macrofauna of the western Ross Sea, Antarctica. *Final Research Report for Ministry for Primary Industries Research Project ZBD2000/02, Objectives 2 & 3*.

#### 2007 Update.

An examination on 17 September 2007 of the **specify** database of the NIWA National Invertebrate Collection for any new (post-July 2005) collections and any new (post-July 2005) identifications of old material, did not lead to any extension in the distribution of this sponge. However, discussion with sponge specialist Dr Michelle Kelly on 22 September 2007 revealed that this sponge has now been reported on Tuatoru Knoll, northwest of White Island. It was decided that it is likely to be found along the entire east coast of the North Island to this point, paucity of records being due to the lack of suitable sampling rather than the sponge being absent. Note that, because of its scale, the distribution map cannot be taken to accurately define the local distribution of this species.

#### 2010 Update.

An examination on 12 September 2010 of the **specify** database of the NIWA National Invertebrate Collection for any new (post-August 2007) collections, any new (post-August 2007) identifications of old material, and discussion with sponge specialist Dr Michelle Kelly (NIWA) on 17 September 2010, did not lead to any extension in the distribution of this sponge. Note that, because of its scale, the distribution map cannot be taken to accurately define the local distribution of this species. As with many species, it is possible that the current known distribution of this species may be influenced by the spatial distribution of sampling effort.

#### 2012 Update.

A Google search (***Tethyopsis mortensenī***) on 9 August 2012 did not yield any information that extended or altered the above distributions.

An examination on 9 August 2012 of the **specify** database of the NIWA National Invertebrate Collection for any new (post-June 2010) collections, any new (post-June 2010) identifications of old material, and discussion with sponge specialist Dr Michelle Kelly (NIWA) on 10 August 2012, did not lead to any extension in the distribution of this sponge. Note that, because of its

scale, the distribution map cannot be taken to accurately define the local distribution of this species. As with many species, it is possible that the current known distribution of this species may be influenced by the spatial distribution of sampling effort.