Int. J. Aquat. Biol. (2020) 8(2): 132-142
ISSN: 2322-5270; P-ISSN: 2383-0956
Journal homepage: www.ij-aquaticbiology.com

Original Article

A redescription of *Tenagomysis* species and *Gastrosaccus australis* from estuarine environments (Crustacea: Mysida) in Auckland region, New Zealand

Neetha Nandanie Punchihewa*

The Open University of Sri Lanka, Nawala, Nugegoda, Sri Lanka.

Abstract: Investigation of mysid habitats in estuarine waters were conducted at 59 sites throughout Auckland region from May 2006 to January 2009. This paper provides the taxonomic descriptions of the three species, collected during this survey. Among the 59 sites mysids were collected only at 26 sites: *Tenagomysis chiltoni* collected from 15 sites, *T. novaezealandiae* from 21 sites and *Gastrosaccus australis* from four sites. Ontogenetic variation observed in the size of the antennal scale, and counts of lateral spines and cleft spines of telson and uropod for both *T. chiltoni* and *T. novaezealandiae.* Such apparent characteristics should not be used alone to differentiate species. It is important to use a combination of characteristics such as shape of the rostrum, anterolateral margin of the carapace, number of articulations of carpo-propodus of thoracic limbs and shape and size of the antennal scale. Several aspects of the description of *T. chiltoni* provided by Tattersall (1923) and Hodge (1964), do not agree with the present specimens, this is due to size variations.

Article history:
Received 16 February 2020
Accepted 26 March 2020
Available online 25 April 2020

Keywords:
Estuarine
Mysida
North Island
Tenagomysis

Introduction

Seventeen mysid species have been so far described from New Zealand waters, presently accommodated within six genera: *Tenagomysis* Thomson, 1900 (10 species), *Siriella* Dana, 1850 (2 species), *Paralophogaster* Hansen, 1910 (1 species), *Euchaetomera* Sars, 1883 (2 species), *Boreomysis* Sars, 1869 (1 species) and *Gastrosaccus* Norman, 1868 (1 species). Several species have not been reported subsequent to original descriptions, but other species have proven to be more widespread, and more regularly reported: *Tenagomysis chiltoni* Tattersall, 1923, *T. macropsis* Tattersall, 1923, and *T. novae-zealandiae* Thomson, 1900. The spatial distribution of mysids validated from many locations in the South Island and few locations in the North Island. The most diverse genus *Tenagomysis* described by Thomson (1900) in New Zealand which currently comprises 15 species from Australia and New Zealand.

This paper provides the taxonomic descriptions of three species, *T. chiltoni* Tattersall, 1923, *T. novaezalandiae* Thomson, 1900 and *Gastrosaccus australis* Tattersall, 1923 which were collected during the ecological survey throughout the Auckland estuaries.

Materials and Methods

The material examined was collected as a part of reconnaissance surveys and monthly surveys to investigate the distribution of mysids throughout the greater Auckland region. Reconnaissance surveys for mysids in estuarine habitat were conducted at 59 sites extending from Mathesons Bay, north of Auckland, to Miranda in the Firth of Thames, along the east coast of the Auckland region, and from Bethells Beach, north of Manukau Heads, to Waiuku, Manukau Harbour, on the west coast of the Auckland region. Mysids were collected using a hand held dip net with a mouth area of 25×20 cm and with 500 µm mesh size, and drag along the stream bed. All mysids retained in the net along each transect were immediately collected into separate bottles containing 70% ethyl alcohol.

Selected mysid specimens were photographed using scanning electron microscopy (SEM). Further, morphology of mysid specimens was investigated under light microscope and the illustrations were

*Correspondence: Neetha Nandanie Punchihewa
E-mail: neetha_punchihewa@yahoo.co.nz

DOI: https://doi.org/10.22034/ijab.v8i2.834

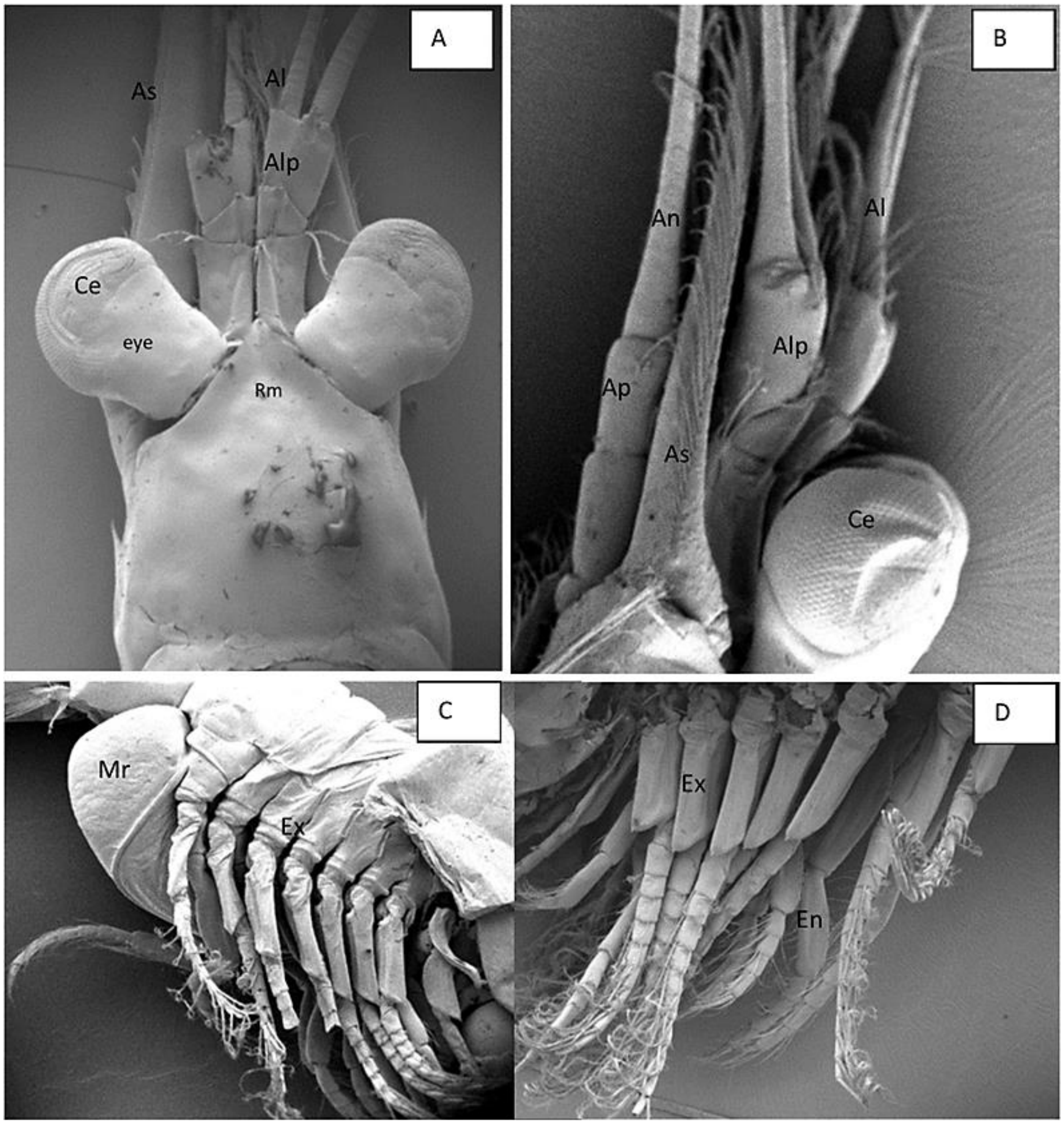

Figure 1. Scanning Electron Micrographs (SEM), *Tenagomysis chiltoni*: (A–B) anterior part of the body (♀, 13.08 mm); (C) thoracic region of the body (♀,16.00 mm); (D) thoracic appendages (♀, 13.08 mm). **Legend**: Alp, antennular peduncle; Ap, antennal peduncle; Al, antennule; An, antennae; AS, antennal scale; Rm, rostrum; Ce, cornea; En, endopod; Ex, exopod; Mr, marsupium.

made. Total body length (TL) was measured from the tip of the rostrum to the posterior end of the telson excluding the spines.

Results

Order: Mysida Boas, 1883

Family: Mysidae Haworth, 1825

Subfamily: Leptomysinae Czerniavsky, 1882

Genus: *Tenagomysis* Thomson, 1900

Tenagomysis Thomson, 1900: 483–484; Tattersall, 1918: 9–10; 1923: 289–290; Fenton, 1991: 325–326.

Tenagomysis chiltoni Tattersall, 1923
(Figs. 1-4)

Tenagomysis chiltoni Tattersall, 1923: 292–293, plate II, Figs. 5–8; Hodge, 1964: 387–394, figs. 2-3; Chapman and Lewis, 1976: 149–152, figs. 9.1–9.4 & 9.5a–b.

Material examined: 2270♀, 5.7–18.52 mm (TL), 1067♂, 5.9–16.00 mm (TL).

Distribution: East coast; Mathesons Bay (6♀, 3♂), Matakana (10♀6♂), Clevedon-Wairoa River (16♀3♂), West coast; Paturoa Bay (6♀5♂), Waitangi Falls (6♀),

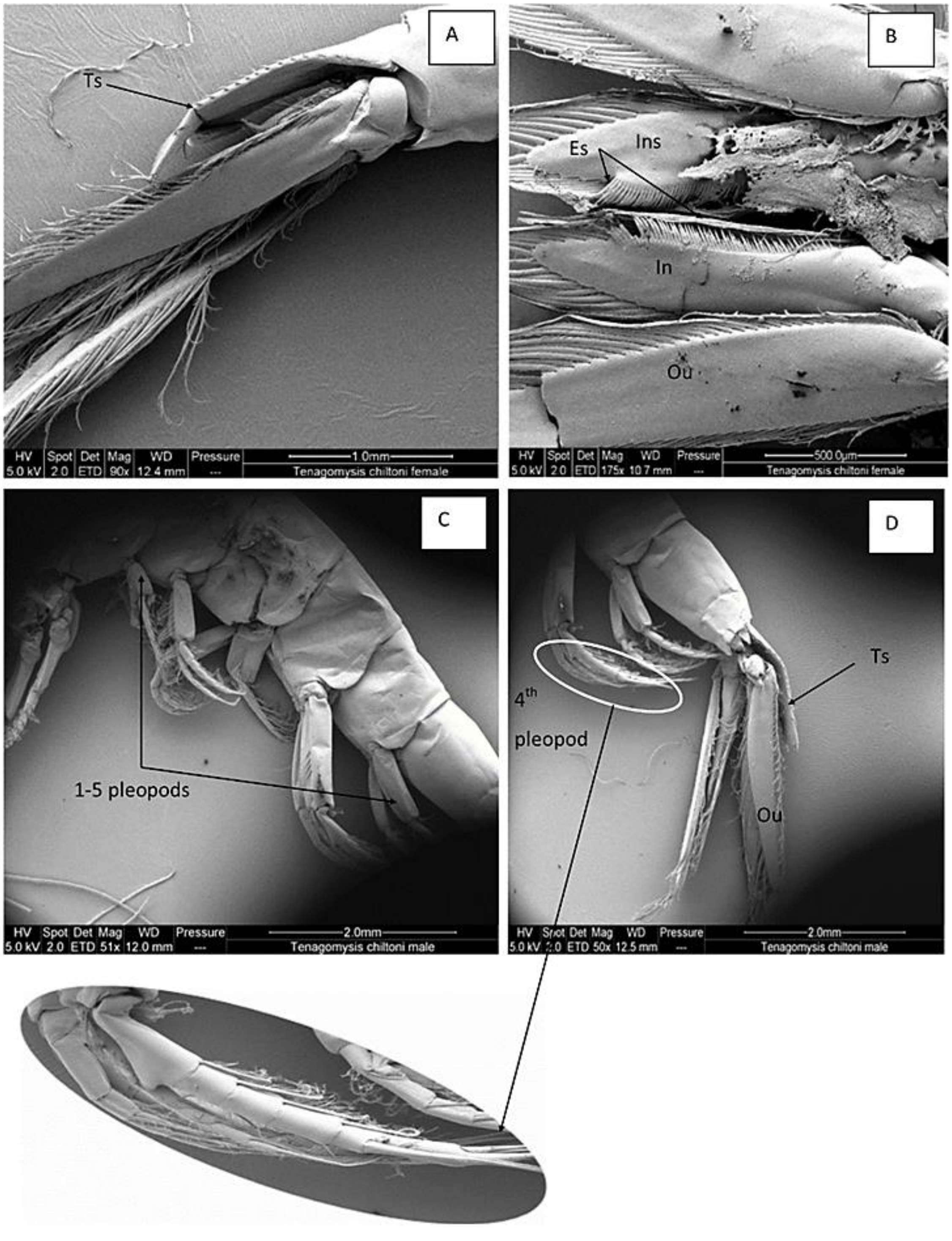

Figure 2. Scanning Electron Micrographs (SEM), *Tenagomysis chiltoni*: (A) uropod and telson, lateral view (♂, 13.54 mm); (B) uropods, ventral view (♀, 13.08 mm); (C–D) pleopods (♂, 13.54 mm). **Legend**: Ou, outer uropod (exopod); In, inner uropod (endopod); Es, endopod spines; Ts, telson spines.

Orua Bay (1♀), Kakamatua (1386♀601♂), Cornwallis (663♀340♂), Mill Bay (112♀71♂), Karekare Stream I (13♀10♂0), Karekare Stream II (16♀4♂), Piha Stream I (6♀4♂), Piha Stream II (12♀8♂), Piha Stream III (11♀6♂), Huia Bay (6♀6♂).

Distribution-elsewhere around New Zealand: Tidal inlet, Parakai (Tattersall, 1923); Lake Oturi, Waverley (Hodge, 1964); Stream at Piha (Chapman and Lewis, 1976); Coopers Lagoon, Forsyth and the Avon-Heathcote Estuary (Waite, 1980); lower Waikato River (Kirk, 1983); Avon-Heathcote Estuary (Roper et al., 1983; Jones et al., 1989); Estuarine systems

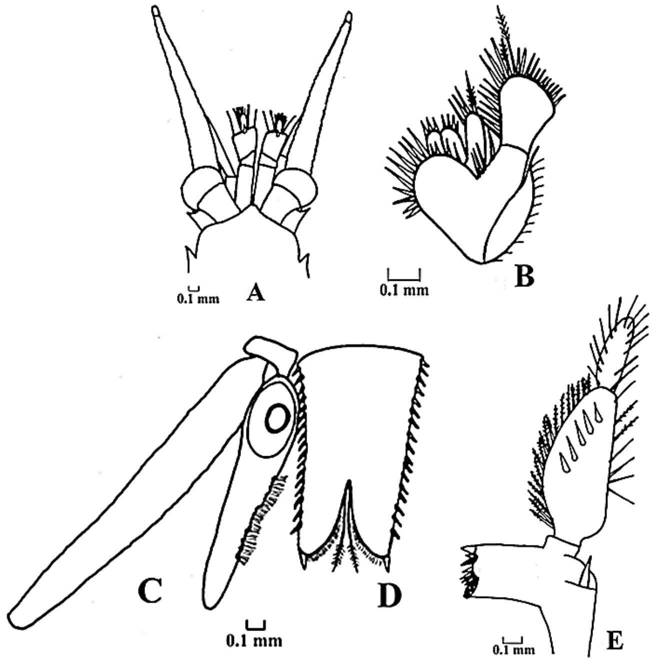

Figure 3. *Tenagomysis chiltoni*. (A) ♂, 13.64 mm; (B–E) ♀, 13.35 mm): (A) anterior part of the body; (B) maxilla; (C) uropod; (D) telson; (E) mandible.

along the East Otago coastline from the Clutha River to Oamaru and Kaikorai lagoon (Lill, 2011); Taieri River estuary (Bierschenk et al., 2008).

Habitat: Recorded from both estuarine and fresh waters, New Zealand.

Diagnosis: Antennal scale elongate; mandibles with a prominent spine; carpo-propodus of endopod of thoracic limbs 3–7 with four short subjoints, 8 with five subjoints, dactylus with distinct claw; antero-lateral angles of carapace produced into acute spines; telson with deeply cleft, with combinations of armature of the telson and uropodal endopod.

Description: Carapace leaving last 1.5–2.5 thoracic somites exposed. Front median line of the carapace bluntly pointed and sloping into concave shape rostrum. Antero-lateral angles of carapace produced into acute spines (Figs. 1A, 3A). Eyes large, about 1.1–1.8 times longer than broad, with 3/8 of eye occupied by black-pigmented cornea (Figs. 1A, 3A).

Antennal scale lanceolate, with setose margins; distal joint short and distinct; with prominent spine on outer distal corner of sympod from which scale arises. Antennal scale 7–10 times as long as broad. Antennal peduncle length approximately half that of antennal scale; peduncle extends to mid of distal segment of antennular peduncle. Antennular peduncle longer than antennal peduncle; length nearly 1.4 times that of antennal peduncle with prominent spine on (upper mid line) distal joint of antennular peduncle (Figs. 1A, B, 3A). Mandibles well- developed, with prominent spine and large lacinia. (Fig. 3E).

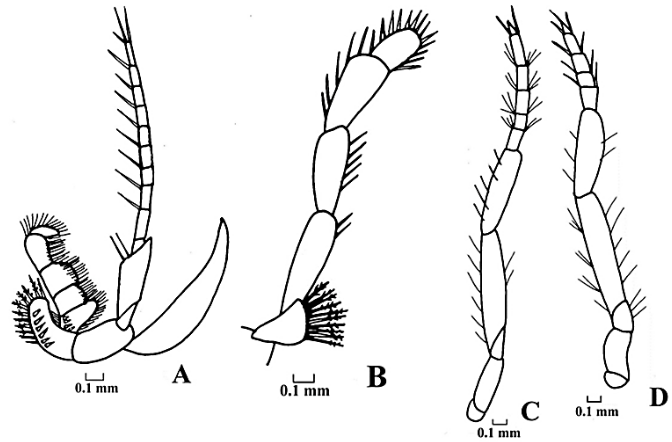

Figure 4. *Tenagomysis chiltoni*. (♀, 13.35 mm): thoracic appendages: (A) 1st leg; (B) endopod of 2nd leg; (C) endopod of 8th leg; (D) endopod of thoracic legs (3rd -7th).

Endopods of thoracic appendages well-developed. Carpo-propodus of thoracic limbs 3–7 with four short articulations, and distinct nail. Carpo-propodus of thoracic limb 8 with five articulations, and distinct nail. Outer distal corner of the basal segment of exopod produced into acute spine (Figs. 4 A–D).

Telson about as long as last abdominal somite, 14–17 times longer than terminal spine. Cleft deep, basal third of cleft without armature, cleft armed with pair of plumose setae and a dense row of spines on distal 2/3; cleft spine number varies ontogenetically, for individuals 3.5–17.5 mm it ranges 10–52, and those mature individuals (10.0–18.9 mm) have 32–52 spines. Telson with ontogenetically variable number of lateral spines; on individuals 10.0–18.9 mm, spines number 16–22 each side, and 10–18 spines on smaller individuals; spine number also subject to variation on an individual, with one side occasionally with 1 or 2 more spines than its opposite; terminal spine either side of telson longer than others. Endopod of uropod 1.2–1.5 times longer than telson, with 40–64 spines on inner margin; exopod of uropod 1.2–1.4 times longer

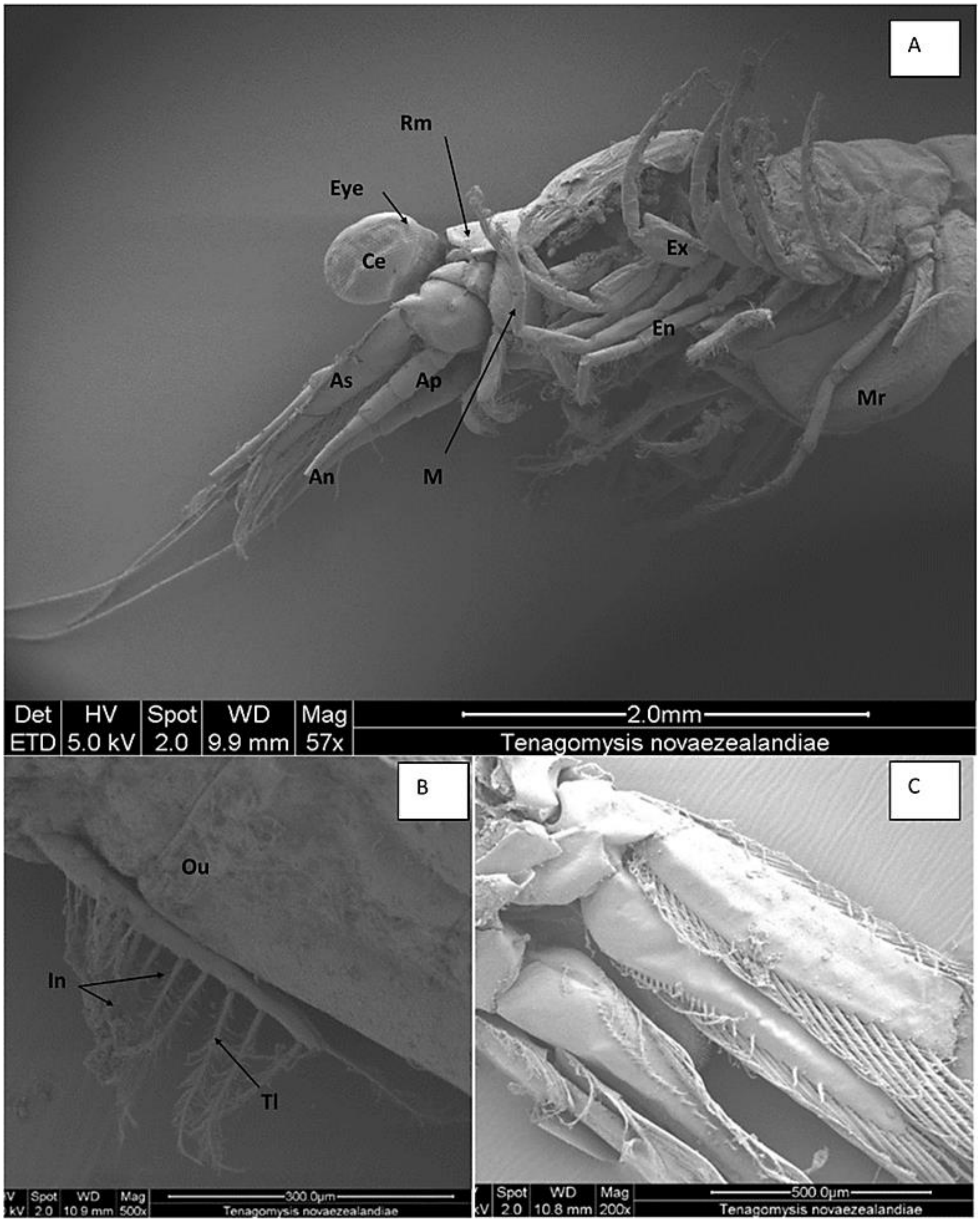

Figure 5. Scanning Electron Micrographs (SEM), *Tenagomysis novaezealandiae* (♀, 7.5 mm); (A) anterior part of the body; (B) pleopod; (C) uropods and telson, ventral view. **Legend**: Ap, antennal peduncle; An, antennae; AS, antennal scale; Mn, mandible; Rm, rostrum; Ce, cornea; En, endopod; Ex, exopod; Mr, marsupium; Tl, telson; In, inner uropod (endopod); Ou, outer uropod (exopod); Es, endopod spines.

than endopod, and 1.6–1.9 times longer than telson (Figs. 2A, B, D, 3C, D).

Tenagomysis novaezealandiae Thomson, 1900
(Figs. 5-7)

Tenagomysis novaezealandiae Thomson, 1900: 484, Pl 33, Figs. 6–8, Pl 34, figs 9–17; Chilton, 1906:703; Tattersall, 1923: 291–292; Chapman and Lewis, 1976: 149–152, Pl 30 & figs. 9.5 C, D.

Material examined: 2435♀, 3.01–10.32 mm (TL), 842♂, 3.25–8.50 mm (TL).

Distribution: East coast: Orewa-Nukumea Stream

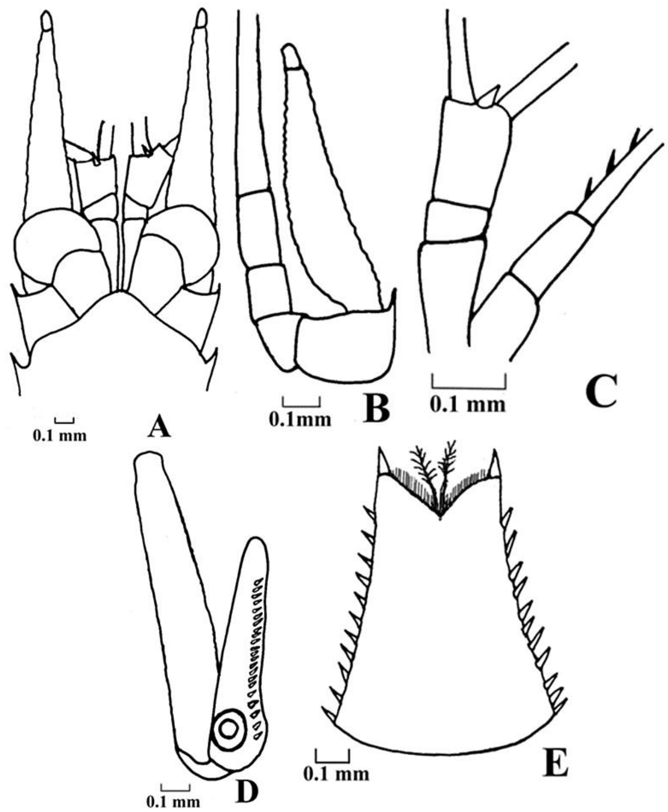

Figure 6. *Tenagomysis novaezealandiae*. (♀, 9.42 mm): (A) anterior part of the body; (B) antenna and antennal scale; (C) antennule (antennuler peduncle and antennal peduncle); (D) uropod (endopod and exopod); (E) telson.

(358♀106♂), Red Beach (6♀), Big Manly Bay (923♀310♂), Okoromai Bay (405♀150♂), Murrays Bay (Taiorahi Creek) (4♀21♂), Hobson Bay (2♀6♂), Wenderholm Beach (10♀5♂), Waiwera River (estuary) (16♀4♂), Mathesons Bay (7♀6♂); West coast: Kakamatua (506♀127♂), Cornwallis (26♀15♂), Mill Bay (3♀), Lower Nihotopu Reservoir (spillway) (10♀6♂), Karekare Stream I (15♀6♂), Karekare Stream II (21♀6♂), Piha Stream I (58♀15♂), Piha Stream II (35♀18♂), Piha Stream III (35♀18♂), Orua Bay (4♀), Paturoa Bay (5♀3♂), Armour Bay (18♀12♂).

Distribution-Elsewhere around New Zealand: Kaikorai lagoon, estuary of the Waikouaiti River, and rock pools at Brighton, all near Dunedin (Thomson, 1900); Lake Waikare (Chilton, 1906); stream at Piha (Chapman and Lewis, 1976); Avon-Heathcote Estuary (Roper et al., 1983; Jones et al., 1989); Raglan Harbour and the mouth of the Waikato River (Nipper and Williams, 1997); Taieri River (Sutherland and Closs, 2001; Bierschenk et al., 2008, unpubl. data); estuarine systems along the East Otago coast line from Clutha River to Oamaru and Kaikorai lagoon (Lill, 2011).

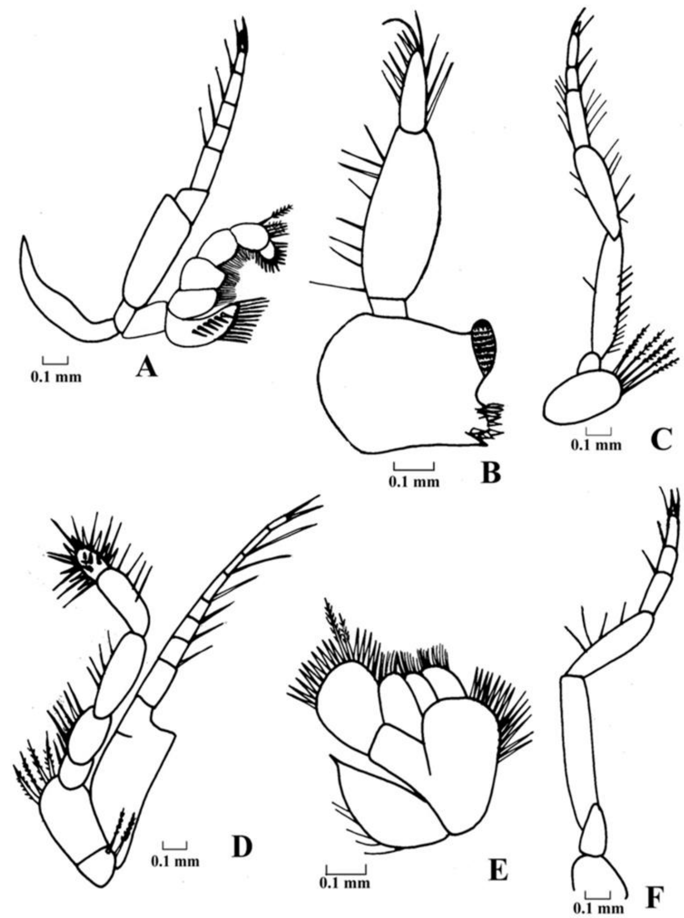

Figure 7. *Tenagomysis novaezealandiae*. (♀ 8.46 mm): thoracic appendages: (A) 1st leg; (B) mandible with mandibular palp; (C) endopod of 3rd leg; (D) 2nd leg; (E) maxilla; (F) endopod of 6th leg.

Habitat: Estuarine, capable of living in fresh waters, New Zealand.

Diagnosis: A small *Tenagomysis* species with carpo-propodus of thoracic limbs 3–8 with three articulations; mandibles without lateral spine; antero-lateral angles of carapace produced into acute spines with combinations of armature of telson and uropodal endopod

Description: Carapace leaving last three thoracic somites exposed. Front margin of carapace evenly rounded and obtusely pointed in median line between eyes. Antero-lateral angles of carapace produced into acute spines (Fig. 5A). Eyes large, about 1.3 times as long as broad, with distal half of eye occupied by black-pigmented cornea (Figs. 5A, 6A).

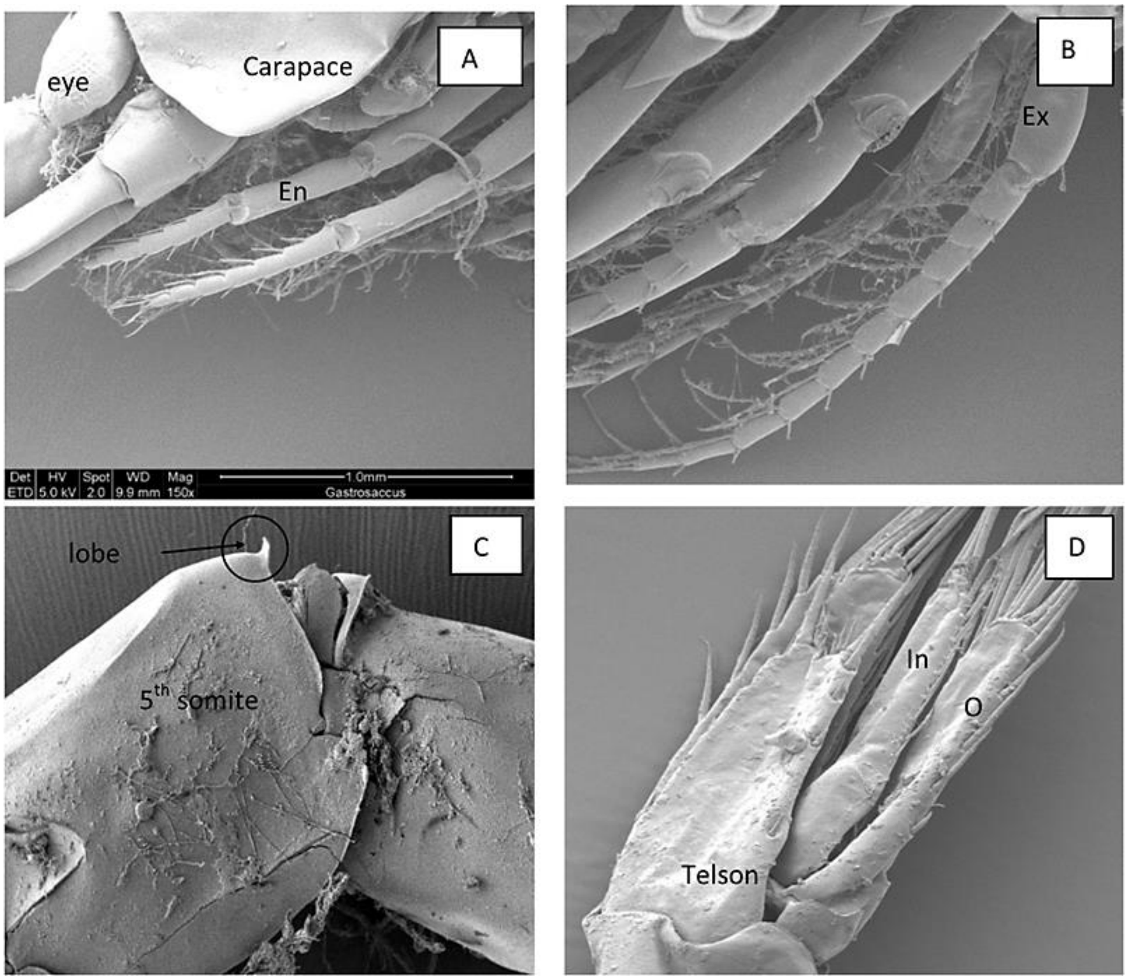

Figure 8. Scanning Electron Micrographs (SEM), *Gastrosaccus australis* (♀, 11.00 mm): A, anterior part of the body; B, thoracic legs; C, fifth abdominal somite including small lobe; D, uropods (exopod and endopod) and telson.

Antennal scale lanceolate, with setose margins; distal joint short and distinct; with prominent spine on outer distal corner of sympod from which scale arises. Antennal scale nearly 4.6-6.3 times as long as broad. Antennal peduncle length, approximately half that of antennal scale; antennal peduncle extends to proximal end of third segment of antennular peduncle, with prominent spine on (upper mid line) distal joint of antennular peduncle (Figs. 6A, C). Mandibles well-developed, with larger lacinia (Fig. 7B).

Endopods of thoracic appendages well-developed (Figs. 7A, C, D, F). Tarsal joint of thoracic limbs 3–8 with three articulations and a distinct nail. Outer corner of basal segment of exopod rounded.

Telson shorter than last abdominal somite, 9–12 times longer than terminal spine, cleft shallow, armed with a pair of plumose setae and 13–32 spines; lateral margins of telson armed with 12–15 spines on entire length, terminal spines largest (Fig. 6E). Endopod of uropod 1.2–1.6 times longer than telson, with 20–26 spines; exopod 1.5–2 times longer than endopod (Fig. 6D).

Subfamily: Gastrosaccinae, Norman, 1892

Genus: *Gastrosaccus* Norman, 1868

Gastrosaccus Norman, 1868: 153–15

Diagnosis: Carapace emarginate dorsally behind; eyes small, cylindrical; antennal scale small, shorter than peduncle, outer edge naked with a terminating spine; peduncle of antennules long and strong, outer filament swollen at base. Thoracic legs with multiarticulate tarsus; spines and setae at each articulation, no nail; first pleopods well-developed with elongated curved cylindrical peduncle and two minute one-jointed branches, other pleopods simple. First segment of pleon with a large epimeral process which acts in

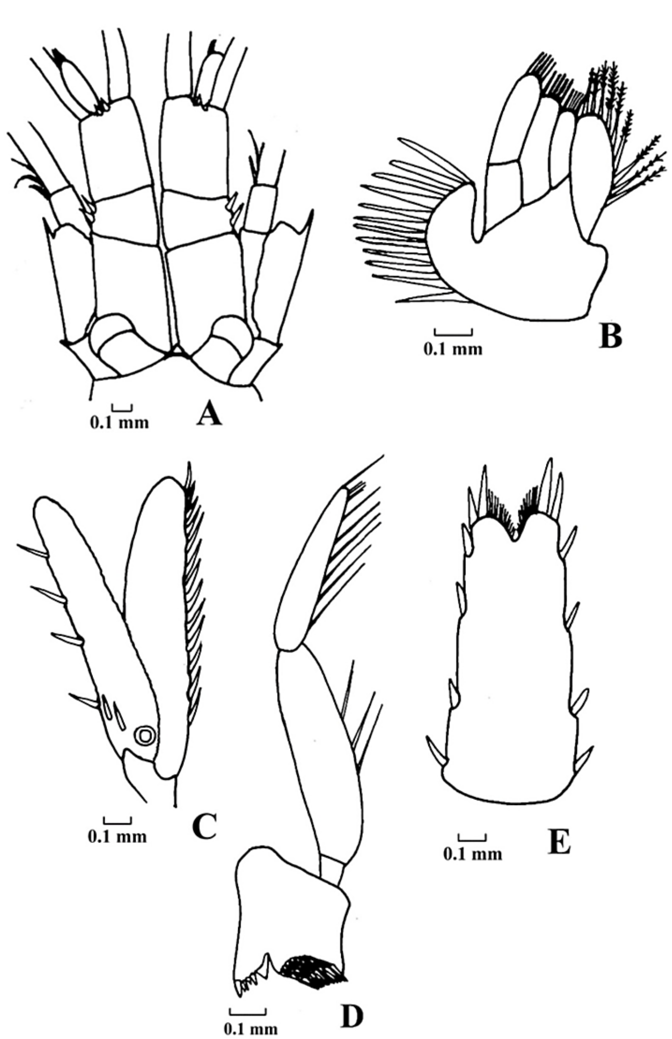

Figure 9. Gastrosaccus australis. (♀, 9.6 mm): (A) anterior part of the body; (B) maxilla; (C) uropod (endopod and exopod); (D) mandibular palp with mandible; (E) telson.

support of marsupial pouch; marsupium pouch with two pairs of marsupial lamellae. Telson quadrangular, elongated, with larger marginal spines, short cleft armed with serrations which are larger distally. Outer edge of outer uropod with series of strong spines.

Male pleopods biramous; peduncle of first pair margined with long setae, peduncle of remaining pairs naked; inner branches of first, fourth and fifth pairs very small, outer branch of fourth pair very long with nearly seven articulations without setae, gradually becoming more slender distally.

Gastrosaccus australis Tattersall, 1923
(Figs. 8-10)

Gastrosaccus australis Tattersall, 1923: 282–283,

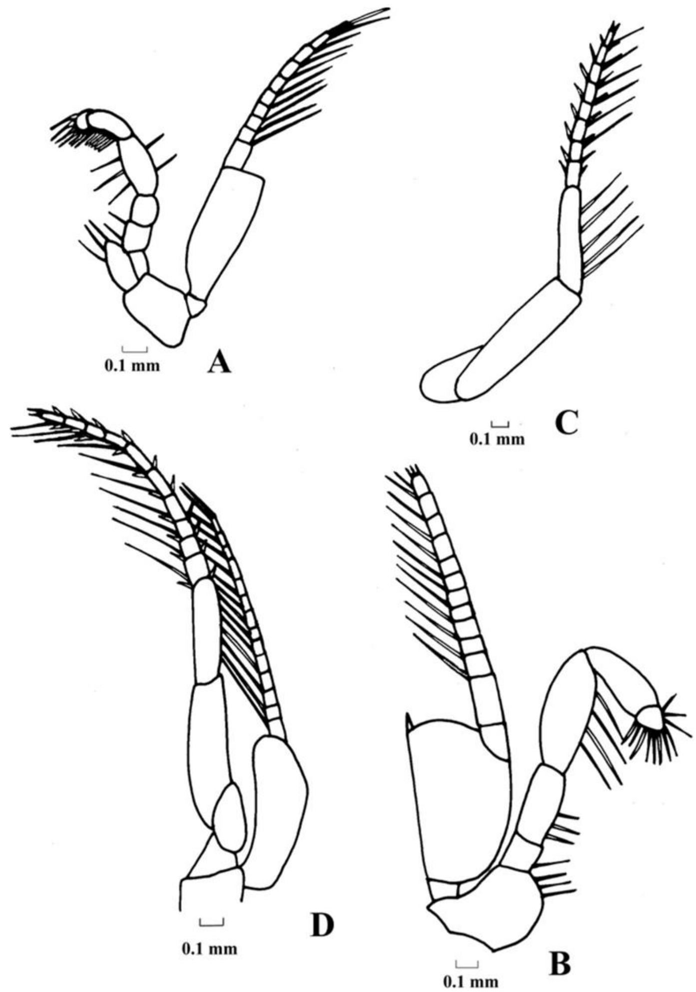

Figure 10. Gastrosaccus australis. (♀, 8.9 mm): (A) 1st leg; (B) 2nd leg; (C) 8th leg; (D) endopod of 4th leg.

Pl 1, Figs 7–9, Pl II figs. 1–4.

Material examined: 23♀, 9.6-12.6 mm (TL) (All 23, mature♀ with broods).

Distribution: East coast: Big Manly Bay, 7♀, Orewa-Nukumea stream 2♀ and Awanohi Bridge, 2♀; West coast: Kakamatua 12♀.

Distribution-Elsewhere around New Zealand: Sprits Bay near north Cape (Tattrsall, 1923), Avon Heathcote Estuary (Roper et al., 1983; Jones et al., 1989); estuarine systems along the East Otago coast line from Clutha River to Oamaru and Kaikorai lagoon (Lill, 2006); Taieri River (Bierschenk et al., 2008).

Habitat: Estuarine, capable of living in fresh waters.

Diagnosis: A *Gastrosacus* species with posterior margin of fifth abdominal somite with a short median process (lobe), six spines on inner margin of endopod of uropod; endopod slightly longer than exopod and

Table 1. Major diagnostic criteria of each species.

Character	*T. chiltoni*	*T. novaezealandiae*	*G. australis*
Length of adult females (mm)	10.00–18.5	6.00–10.31	9.60–12.60
Length of males (mm)	5.90–15.64	3.25–8.48	Not found
Rostrum	Obtuse with a blunt apex	Rounded	Short obtusely rounded rostrum with pseudo-rostral process
Antennal scale	Long, lanceolate in shape	Short, lanceolate in shape	Short & stout, rounded apex with anterior-lateral margin extend as a strong spine
Telson cleft	Deep	Shallow	Shallow
Number of cleft spines of Telson (Juvenile to adult)	10–52 (body size 3.5–17.5 mm); 32–52 (body size 10.0–18.9 mm)	13–32	6
Number of lateral spines of Telson (Juvenile to adult)	10–22	12–15	11–12
Carpo-propodus of thoracic limbs (endopod)	3–7 with 4 articulations and 8 with 5	3–8 with 3 articulations	4–8 with 8–10 articulations and 3 with 5
Special features	A prominent acute spine on the body of the mandible immediately outside the attachment of the palp.		

six large lateral spines on telson (A species of the Spinifer group).

Description: Carapace large, leaving half of last thoracic somite exposed. Front margin of carapace produced into short obtusely rounded rostral plate with prominent pseudo-rostral process below rostral plate, being triangular and acute in dorsal view (Fig. 9A). Eyes small, about 1.6 times as long as broad, with approximately 1/3 of eye occupied by black pigmented cornea (Figs. 8A, 9A).

Antennal scale small, rounded apex, with setose margins (except outer margin), anterior-lateral margin of antennal scale extends as a strong spine; about three times as long as broad, extends up to margin of first segment of antennular peduncle. Antennal scale length approximately two third that of antennal peduncle; antennal peduncle extending beyond distal joint of antennular peduncle. Antennular peduncle with two prominent spines on outer margin of second segment; two spines and small process on (upper mid line) distal joint of antennular peduncle (Fig. 8A). Mandibles well-developed, with large lacinia (Fig. 8D). Posterior median margin of fifth abdominal somite produced into a small process (Fig. 8C).

Endopods of thoracic appendages well-developed. Carpo-propodus of thoracic limbs 4–8 (endopod) with 8–10 joints; third with seven joints (Fig. 10A–D). Telson about 1.1 times long as last abdominal somite, 5–6 times longer than terminal spine, and more than twice as long as broad at base. Cleft armed with 11–12 spines on each side; lateral margins of telson armed with four spines arranged their entire length and another two terminal spines on apical lob. Endopod of uropod slightly longer than exopod of uropod. Exopod with 13–15 spines; endopod with six spines spread on inner margin (Figs. 9C, E).

Discussions

Of particular note is the ontogenetic variation observed in the size of the antennal scale, and counts of lateral spines and cleft spines of telson and uropod (endopod spines). A small mysid may differ considerably from a larger specimen. This has been found true for *T. chiltoni*. Therefore, several aspects of the description of *T. chiltoni* provided by Tattersall (1923) and Hodge (1964) do not agree with the present specimens.

The antennal scale of *T. chiltoni* was described by Tattersall (1923) as being 10 times as long as was broad; Hodge (1964) described it as nine times long as it was broad; and the present specimens have a antennal scale about 8-10 times as long as broad (24% of current specimens agree with Hodge, 1964), and 21% Tattersall,1923). Additionally, Tattersall (1923) described this species with 16–18 lateral spines on the telson, and Hodge (1964) recorded 16–20 spines, whereas the number of spines on specimens reported herein is in the range 10–22, although it is subject to ontogenetic variation; unfortunately Tattersall (1923) did not report the number of cleft spines for this species, although Hodge (1964) recorded 32–36 on each border, and in this current study 32–52 were counted on mature animals. A second difference concerns the number of spines on the uropods, according to Hodge (1964) being 55–60 spines, whereas these number 40–64 on adult Auckland region specimens. Some of this variation could be attributable to the different ontogenetic stages reported by these earlier two authors, as Tattersall's *T. chiltoni* specimens ranged 8–10 mm and the average length of Hodge's specimens was 12.5 mm, while specimens of 5.5–18 mm were examined in this study.

Examination of extant type material of this species is required to determine whether all forms attributed to it truly are conspecific. Certain characters of *T. novaezealandiae* show similar ontogenetic variations to *T. chiltoni*. Such apparent characteristics as lateral and cleft spines and proportions of different body regions should not be used alone to differentiate species.

The number of carpo-propodus joints on the 8th leg for *T. chiltoni* described by Tattersall (1923) was four, in addition to a distinct nail, whereas present specimens referred to this species have five short joints, as did those referred to this taxon by Hodge (1964). Tattersall (1923) described this species with only the last thoracic somite being exposed; whereas those specimens referred to this species from the Auckland region have the last 1.5–2.5 thoracic somites exposed, again similar to Hodge (1964).

Tattersall (1923) described only five female specimens (8–10 mm), so that a complete description is impossible and the variations may be related to size and the preservation condition of the animal. Thus, in identification of mysid species, it should be important to use combination of characters. The size of the species, with their significant ontogenetic variations also important in combination with other major characters (Table 1). Therefore, the present study considered combination of all the characters to differentiate *Tenagomysis* species. These included, adult size of the species (both male and female), shape of the rostrum, anterolateral margin of the carapace, the carpo-propodus of thoracic limbs, shape and size of the antennal scale, and counts of lateral spines and cleft spines of telson and uropod (endopod spines).

Acknowledgment

This project was funded by the Auckland University of Technology, Auckland, New Zealand. Dr. Steve O' Shea is hereby acknowledged for his support given to me during my study.

References

Chapman M.A., Lewis M.H. (1976). An introduction to the freshwater Crustacea of New Zealand. Auckland and London: Collins.

Fenton G.E. (1991). Three new species of *Tenagomysis* from the coastal waters of south-eastern Tasmania (Crustacea: Mysidae: Mysinae: Leptomysini). Memoirs of Museum Victoria, 52(2): 325-335.

Hodge G. (1964). A redescription of *Tenagomysis chiltoni* (Crustacea: Mysidacea) from a freshwater coastal lake in New Zealand. New Zealand Journal of Science, 7: 387-395.

Jones M.B., Greenwood J.G., Greenwood J. (1989). Distribution, body size, and brood characteristics of four species of mysids (Crustacea: Peracarida) in the Avon-Heathcote Estuary, New Zealand. New Zealand Journal of Marine and Freshwater Research, 23: 195-199.

Lill A.W.T., Closs G.P., Savage C., Schallenberg M. (2011). Annual secondary production of two estuarine mysid species (Mysidacea: Mysidae) inhabiting an intermittently closed estuary, south-eastern New Zealand. New Zealand Journal of Marine and Freshwater Research, 62(7): 823-834.

Melland K., Willassen E. (2007). The disunity of "Mysidacea" (Crustacea). Mollecular Phylogenetics and Evolution, 44(3): 1083-1104.

Nipper M.G., Williams E.K. (1997). Culturing and toxicity testing with the New Zealand mysid species. Australian Journal of Ecotoxicology, 3(2): 117-129.

Roper D.S., Simons M.J., Jones M.B. (1983). Distribution of zooplankton in the Avon Heathcote Estuary, Christchurch. New Zealand Journal of Marine and Freshwater Research, 17: 267-278.

Sutherland D.L., Closs G.P. (2001). Diel patterns of mysid drift (Crustacea: Mysidacea) in the Taieri River Estuary, New Zealand. New Zealand Journal of Marine and Freshwater Research, 35: 197-200.

Tattersall W.M. (1918). Euphausiacea and Mysidacea. Australian Antarctic expedition, 1911– 1914. Scientific Reports. Series C Zoology and Botany, 5(5): 1-15.

Tattersall W.M. (1923). Crustacea. Part VII: Mysidacea. British Antarctic (Terra Nova) Expedition, 1910. Natural History Report (Zoology), 3(10): 273-304.

Thomson G.M. (1900). On some New Zealand Schizopoda. Journal of the Linnean Society of London, Zoology, 27(178): 482-486.