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Chapter 6

Freshwater crustaceans of the Nakorotubu Range, Ra and Tailevu Provinces, Fiji.

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SUMMARY

A total of 12 decapod crustacean species from four genera and three families were collected during this RAP, (Varunidae: *Varuna*; Atyidae: *Atyopsis*, *Caridina*; and Palaemonidae: *Macrobrachium*). The number of taxa is less than those previously reported. This may be due to the lack of adequate sampling equipment for the habitats surveyed, such as electro-fishing gear as well as the lack of intensive survey due to time limitations.

INTRODUCTION

The crustacean fauna of Fiji is relatively poorly known with very few studies on the crustacean fauna within Fiji. George (1971) reported on the Spiny Lobster Survey in Fiji. Choy (1983, 1984, 1991) recorded a total of 9 Macrobrachium spp., 2 Palaemon spp., 11 Caridina spp., and one species each of *Antecaridina*, *Atyoidea* and *Atyopsis*. Marquet et al. (2002) compared the freshwater crustacean fauna of Vanuatu with Fiji.

A Rapid Assessment Program (RAP) was conducted between 30 November to 10 December 2009 in the Nakorotubu range of Viti Levu. This report deals with the crustacean fauna that were collected during this RAP. All materials studied have since been deposited in the Zoological Reference Collection (ZRC), Raffles Museum of Biodiversity Research, National University of Singapore with duplicates to be sent to the SPRH and Marine Biodiversity Collection centre at the University of the South Pacific, Fiji.

MATERIALS AND METHODS

Collection of the specimens were carried out using various kind of nets including minnow traps (Plate 14), which were employed mainly at night; hand collection (Plate 15) where even the smallest hand nets are not accessible; nets (Plate 16), and tray nets (Plate 17). Some of the specimens were also collected by artisanal spear fishing (Plate 18)

The habitats of the sampling sites were freshwater streams with rock and boulders on the sides, the bottom was sandy, or covered with small rocks or pebbles and gravels. The rivers were usually shallow (e.g. Station 7, Plate 21), certain region of the river were relatively deep. Some parts of the river were peppered with numerous riffles (Station 10, Plate 22). The width of the river ranged from very narrow (Station 7) to very wide (Station 10). Some of the rivers had cascades with rock pools (Station 5, Plate 20) while some were more or less even.

The detailed sampling station codes, localities and associated data are listed in Appendix 6.

RESULTS

A total of 12 decapod crustacean species from four genera and three families were collected from this RAP. The number of taxa is less than those previously reported. This may be due to the lack of adequate sampling equipment for the habitats surveyed, such as electro-fishing gear as well as the lack of intensive survey due to time limitations.

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Species List

Varuna litterata (Fabricius, 1798) (Plate 23)
Stations 1 and 9.
Common name – Pelagic Shore-Crab, Sargassum Crab, Pelagic Crab.
Type locality – India.
Remarks – This euryhaline species has an Indo-west Pacific distribution, and may be found in coastal habitats such as mangroves and estuaries. The species may also be found far inland in freshwater ponds and streams. They are able to swim short distances and may also disperse by clinging on to flotsam or floating Sargassum clumps.

Atyopsis spinipes (Newport, 1847)
Stations 8 and 11.
Common name – Torrent shrimp.
Type locality – Philippines Islands.
Remarks – *Atyopsis spinipes* has an Indo-west Pacific distribution, ranging from Madagascar to Japan and Polynesia. They prefer cooler water, and are usually found in rock crevices of fast flowing streams. It has been reported to be relatively common in the Fiji islands (Choy, 1991). This species can be easily collected by electro-fishing.

Caridina fijiana (Choy, 1983)
Station 8.
Common name – None.
Type locality – Viti Levu, Fiji.
Remarks – According to Choy (1983, 1991), *C. fijiana* is primarily a montane species recorded from altitudes above 600 m. The specimens here were collected from rock pools at the foot of a waterfall at an elevation of 570 m.

Caradina japonica (De Man, 1892)
Station 2.
Common name – Amano algae eating shrimp, Takashi Amano shrimp, The algae eater.
Type locality – Japan.
Remarks – First recorded from Fiji by Choy (1991). This species is found only in several Asian countries, but it has been collected and widely sold in the aquarium trade since it has a reputation as the best algae eater in the freshwater aquarium tank.

Caridina longirostris (H. Milne Edwards, 1837)
Stations 2, 3, 9 and 10.
Type locality – Oran, Africa.
Common name – None.
Remarks – This species is distributed in the Indo-West Pacific. This species was first recorded from Fiji in 1991 by Choy. This species is one of the common inhabitants of inland and lowland freshwater streams (Marquet et al., 2002).

Caridina weberi (De Man, 1892)
Stations 2, 3 5,9 and 10.
Common name – Long-wrist shrimp, Pugnose caridina, Short-haired shrimp.
Type locality – Indonesia.
Remarks – This relatively common species has been widely recorded from India, Japan to Polynesia. It is usually found in low numbers, and hides among the vegetations and roots along the banks of the stream, where the water speed is slower.

Caridina cf. serratirostris (De Man, 1892)
Stations 4 and 8.
Common name – Ninja shrimp, Honey shrimp and Christmas shrimp.
Type locality – Flores, Indonesia.
Remarks – This species is almost identical to *Caridina serratirostris* (De Man, 1892) but it is doubtful because C. serratirostris has been reported mostly from lowland estuarine rivers (see Cai & Shokita 2007, Cai 2007). As has been discussed by these authors and Yeo et al. (1999), the taxonomy of this species remains in flux and several species are probably in what is now called "*C. serratirostris*". This species is found in the Indo-West Pacific. This species is very popular in the aquarium trade due to its ability to change colour quickly to blend into the surrounding.

Macrobrachium australe (Guerin-Meneville, 1838)
Stations 9 and 10.
Common name – Koua river prawn.
Type locality – Tahiti, French Polynesia.
Remarks – This species has an Indo-West Pacific distribution ranging from Madagascar to Seychelles to Samoa and Marqueses Islands in French Polynesia (Holthuis 1950, 1978, Chace & Bruce 1993, Cai & Anker 2004). The species was first recorded in Fiji by Choy (1984) and is relatively common and well established in streams.

Macrobrachium idae (Heller, 1862) (Plate 26)
Stations 9 and 11.
Common name – Orana river prawn.
Type locality – Borneo.
Remarks – This species has a wide distribution in the Indo-West Pacific region ranging from Madagascar to the Admiralty Islands and South-East Asia (Cai et al., 2004). It is characterized by its very long and slender second periopods.

Macrobrachium lar (Fabricius, 1798) (Plate 24 & 25)
Stations 2, 3, 4, 5, 6, 10 and 11.
Common name – Monkey river prawn, Bracelet prawn, French bouqet Singe, Tahitian prawn.
Type locality – Dom. Daldorf, India.
Remarks – This is one of the most common species found in this RAP and the specimens collected in the RAP are exceptionally large. They are a good source of

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protein and are often collected for food or commercially reared. This species is can be found in the Indo-Pacific from East Africa to the Ryukyu Islands and the Marquesas. Some 340 individuals of M. lar were brought to Honolulu, Hawaii, from Guam in 1956. Ninety-four were released on Molokai and a year later 27 on Oahu (Brock 1960). Additional specimens were brought from Tahiti in 1961 (Maciolek, 1972). After just nine years, a large specimen was collected on the island of Hawaii (Kanayama 1967). At present M. lar is established in streams on all the main Hawaiian Islands (Devick 1991, Eldredge 1994). This species is cultured in associated with Taro in Vanuatu (Nandlal, 2005).

Macrobrachium latimanus (Von Martens, 1868) (Plate 27)

Station 8.

Common name – Mountain river prawn.

Type locality – The Philippines.

Remarks – This species is commonly found in the Indo-west Pacific, Indo-West Pacific, ranging from India and Sri Lanka to the Ryukyu Islands, the Malay Archipelago and the Marquesas. They can be found in altitudes up to 1300 m above sea level (Holthuis, 1978). Adamson (1933) wrote that in the Marquesas "these prawns are caught by the Marquesans with nets and spears, usually with a light at night". Longhurst (1970) reported a subsistence fishery for this species in Fiji. In both cases M. lar and M. australe were fished at the same time (Holthuis, 1980).

Macrobrachium lepidactyloides (De Man, 1892)

Station 2.

Common name – Malay scale prawn.

Type locality – Borneo.

Remarks – This species is very similar to *M. hirtimanus* (Oliver, 1811) in its overall morphology, which has led to misidentification (see Holthuis, 1950). Holthuis (1952) clarified the identities of *M. hirtimanus* and *M. lepidactyloides* (De Man, 1892) based on the forms of the adult male chelae.

M. hirtimanus is endemic to the Mascarenes area located between Réunion and Mauritius (Keith et al., 1999, Keith & Vigneux 2000). *M. lepidactyloides* is found in the Indo-West Pacific, ranging from the Malay Archipelago to Fiji (Holthuis 1952). It is one the economically important prawns in the Philippines (Holthuis, 1980).

DISCUSSION

The present study documented 12 freshwater decapod crustacean species from four genera and three families (Varunidae: *Varuna*; Atyidae: *Atyopsis*, *Caridina*; and Palaemonidae: *Macrobrachium*).

Only one crab, *Varuna litterata* (Fabricius, 1798) was found, and this is not a wholly freshwater species as its larvae are still planktonic and dispersed by oceanic currents. Interestingly, old records indicate that there was one species of true freshwater crab that was described from Fiji, *Paratelphusa (Liotelphusa) insularis (*Colosi, 1919 (family Gecarcinucidae). This species is now placed in Austrothelphusa. The provenance of collection and identity of this species, however, is in doubt. Ng et al. (2008: 73) commented that "*Austrothelphusa* species are endemic to Australia, except for the poorly known *A. insularis* (Colosi 1919) supposedly from Fiji but not reported since. Two of the authors (P. K. L. Ng and P. J. F. Davie) have discussed this matter at some length with Satish Choy, who was born and raised in Fiji, and he is very certain this record is mistaken. The geographical location is also suspect – the easternmost record for any freshwater crab is in the Solomon Islands, *Sendleria salomonis* (Roux, 1934) (see also Bott 1969, 1970). The identity of *A. insularis* (Colosi 1919) remains unclear and the types need to be checked". Not surprisingly, the present survey did not uncover any trace of this species.

The 11 species of prawns are generally widespread and none have completely or highly abbreviated developments, with their larval cycle completely marine. The atyid *Atyopsis spinipes* (Newport 1847), is typically associated with clean fast flowing streams with large stones; while the various *Caridina species*: *C. fijiana* (Choy 1983), *C. japonica* (De Man, 1892), *C. longirostris* H. Milne Edwards 1837, *C. weberi* (De Man 1892), and *C.*. cf. *serratirostris* De Man 1892, are found in small streams with loose rubble and submerged vegetation. The same is also generally true of the four palaemonid species, *M. idae* (Heller 1862), *M. lar* (Fabricius, 1798), *M. latimanus* (Von Martens, 1868) and *M. lepidactyloides* (De Man, 1892). The largest of all the decapod crustaceans and the only one of any commercial value is the giant river prawn *M. lar*. The large size and healthy population of this species in the drainages sampled suggests the aquatic ecosystem in the area was pristine and relatively undisturbed by man.

REFERENCES

Adamson, A.M. 1935. Non-marine invertebrate fauna of the Marquesas (exclusive of insects). Occasional Papers of Bernice P. Bishop Museum ll (l0): l-39.

Bott, R. 1969. Flüsskrabben aus Asien und ihre Klassifikation. (Crustacea, Decapoda). Senckenbergiana biologica 50(5/6): 359–366.

Bott, R. 1970. Die Süßwasserkrabben von Europa, Asien, Australien und ihre Stammesgeschichte. Eine Revision der Potamoidea und der Parathelphusoidea. (Crustacea, Decapoda). Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft 526: 1–338.

Cai, Y. and A. Anker. 2004. On a collection of freshwater shrimps (Crustacea Dcapod Caridea) from the Philippines, with descriptions of five new species. Tropical Zoology 17: 233-266.

Cai, Y. and S. Shokita. 2006. Report on a freshwater shrimp collection (Crustacea: Decapoda: Caridea) from

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Philippines, with descriptions of four new species. The Raffles Bulletin of Zoology 54(2): 245-247.

Cai, Y., P. Naiyanetr, and P.K.L. Ng. 2004. The freshwater prawns of the genus *Macrobrachium* Bate, 1868, of Thailand (Crustacea: Decapoda: Palaemonidae). Journal of Natural History 38: 581-649.

Cai, Y., P.K.L. Ng and S. Choy. 2007. Freshwater shrimps of the family Atyidae (Crustacea: Decapoda: Caridea) from Peninsular Malaysia and Singapore. The Raffles Bulletin of Zoology 55(2): 277-309.

Chace, F. A. Jr and A. J. Bruce. 1993. The Caridean shrimps (Crustacea: Decapoda) of the Albatross Philippine expedition 1907-1910. Part 6: Superfamily Palaemonoidea. Smithsonian Contributions to Zoology 543: I-VII + 1-152.

Choy, S. and G. Marquet. 2002. Biodiversity and zoogeography of atyid shrimps (Crustacea: Decapoda: Natantia of New Caledonia. Mémoires du Muséum national d'histoire naturelle 187: 207 – 222.

Choy, S. 1983. *Caridina fijiana n*. sp.(Decapoda: Atyidae) from Nadarivatu, Fiji. New Zealand Journal of Zoology 10(2): 147 – 150.

Choy, S. 1984. On the freshwater palaemonid prawns from the Fiji Islands (Decapoda, Caridea). Crustaceana 47(3): 269 – 277.

Colosi, G. 1919. I. Potamonidi conservati nel R. Museo Zoologicao di Firenze. Bolletino Societas Entomologie Italia Firenze 50(1918): 39–62.

Devick, W. S. 1991. Patterns of introductions of aquatic organisms to Hawaiian freshwater habitats. pp. 189-213. In New directions in research, management, and conservation of Hawaiian freshwater stream ecosystems. Proceedings of the 1990 Symposium on Freshwater Stream Biology and Management, State of Hawaii.

Eldredge, L.G. 1994. Introduction of commercially significant aquatic organisms to the Pacific Islands. Perspectives in Aquatic Exotic Species Management in the Pacific Islands 1994: Volume 1. SPC Inshore Fisheries Research Project Technical Document No. 7 SPREP Reports and Studies Series No. 78 (A report jointly commissioned by the South Pacific Commission and the South Pacific Regional Environment Programme).

Englund, R.A. 2010. Hawaii Biological Survey, Bishpop Museum, Observational and Findings from 7 April 2003 site visit of unnamed stream flowing into Pila'a Bay, Kaua'i. Hawaii Biological Survey, Bishop Museum.

George, R.W. 1971. Report of the first tour of a Spiny Lobster Survey in Fiji, Western Samoa, American. Samoa and Tonga, 20 October-23 December 1970. South Pacific Islands Fisheries Development Agency. FAO, FI:SF/SOP/Reg., 102/4: 1-19.

Holthuis, L.B. 1950. The Decapoda of the Siboga Expedition. Part X. the Palaemonidae collected by the Siboga and Snellius expeditions, with remarks on other species, Part I: Subfamily Palaemoninae." Siboga-Expeditie. Leiden 39(a9): 1-268, figs 261-252.

Holthuis, L.B. 1952. On some Indo-westpacific Palaemoninae (Crustacea Decapoda Caridea). Zoologische Mededelingen Leiden 31(18): 201–211.

Holthuis, L.B. 1980. Shrimps and prawns of the world. An annotated catalogue of species of interest to fisheries. FAO species catalogue. Vol.1. FAO Fisheries Synopsis, Vol. 1, no. 125, 271 p.

Holthuis, L.B. 1978. A collection of decapod Crustacea from Sumba, Lesser Sunda Islands, Indonesia. Zoologische Verhandelingen 162:1 – 55.

Jenkins, A. and Mailautoka, K. 2009. Synopsis of results from freshwater and estuarine surveys in Kubulau District, Vanua Levu, Fiji.

Kanayama, R. K. 1967. Hawaii's aquatic animal introductions. 47th Annual Conference Western Association of State Game and Fish Commissioners. 8 p.

Keith, P., E. Vigneux and P. Bosc. 1999. Atlas des poissons et crustacés d'eau douce de La Réunion. Patrimoines Naturels (MNHN/SPN), 39: 1-136.

Keith, P. and E. Vigneux. 2000. First capture of *Macrobrachium lepidactylus* (Hilgendorf, 1879) (Palaemonidae) on Reunion Island, followed by a commentary on *Macrobrachium hirtimanus* (Oliver, 1811). Crustaceana 73 (2): 215-222.

Longhurst, A.R. 1970. Crustacean resources. FAO Fisheries Techical Papers (97): 252-305.

Maciolek, J. A. 1972. Macrobrachium lar as a culture prawn in the tropical insular Pacific. pp. 550-555. In Proc. 52nd Ann. Conf. Western Assoc. State Game and Fish Commissioners.

Marquet, G. 1991. Freshwater crustaceans of French Polynesia: taxonomy, distribution and biomass (Decapoda). Crustaceana 61(2): 125 – 140.

Marquet, G., N. Taiki, L. Chadderton and P. Gerbeaux. 2002. Biodiversity and Biogeography freshwater crustaceans (Decapoda: Natantia) from Vanuatu, A comparison with Fiji and New Caledonia. Bulletin Français de la Pêche et de la Pisciculture 364 : 217-232.

Nandlal, S. 2005. Monoculture of the native freshwater prawn Macrobrachium lar in Vanuatu, and integrated with Taro in Wallis and Futuna. Secretariat of the Pacific Community, Marine Resources Division, New Caledonia, SPC Fisheries Newsletter No. 112.

Ng, P. K. L., D. Guinot and P. J. F. Davie. 2008. Systema *Brachyurorum*: Part I. An annotated checklist of extant brachyuran crabs of the world. The Raffles Bulletin of Zoology Supplement 17: 1-286.

Roux, J. 1934. Notes de carcinologie mélanesienne. II. Une nouvelle espèce de Potamonidae des îles Salomon. Revue Suisse de Zoologie 41(11): 229–234.

Yeo, D. C. J., Y. Cai and P. K. L. Ng. 1999. The freshwater and terrestrial decapod crustacea of Pulau Tioman, Peninsular Malaysia. The Raffles Bulletin of Zoology Singapore, Supplement 6: 197 244.

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