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Polychelid lobsters (Decapoda: Polychelida: Polychelidae) collected by the CIDARIS expeditions off Central Queensland, with a summary of Australian and New Zealand distributions

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ABSTRACT

The polychelid lobsters collected by the CIDARIS expeditions from outer shelf and slope waters off the central Great Barrier Reef are reported. Eight species in four genera are reported, including the first Queensland record of *Stereomastis nana*, the first Australian record of *Pentacheles obscurus*, and the first Indo-Pacific record of *Willemoesia forceps*.
❒ *Crustacea, Polychelidae, lobsters, Queensland, Australia, New Zealand.*

The lobsters of the infraorder Polychelida are characterised by having chelate pereopods 1–4 (often also pereopod 5). Although Polychelida includes five families, with the earliest recorded from the Triassic, only one family is currently extant, Polychelidae (see Ahyong 2009; De Grave *et al.* 2009). Thirty-seven polychelid species in six genera are known worldwide, all of which are restricted to outer slope or abyssal depths worldwide. The Australian polychelids have been reported by Griffin & Stoddart (1995), Galil (2000), Ahyong & Brown (2002) and Poore *et al.* (2008), together enumerating four genera and 17 species. In New Zealand waters, 10 species in four genera are known, most of which also occur off eastern Australia (Galil 2000; Ahyong 2007).

The CIDARIS expeditions (I–III) were conducted by James Cook University between 1986 and 1992 in outer shelf and slope waters off the central Great Barrier Reef. Eight species in four genera of polychelids were collected, of which two species and one genus are first records for Australia. The collection is reported below.

MATERIALS AND METHODS

Measurements of specimens are millimetres and refer to carapace length (cl.) measured along the midline from the apices of the rostral spines to the posterior margin of the carapace. Specimens are deposited in the collections of the Museum of Tropical Queensland, Townsville (MTQ) a campus of the Queensland Museum (QM). Synonymies are restricted to primary synonyms, studies published after 2000, and regional works.

SYSTEMATICS

POLYCHELIDA Scholtz & Richter, 1995

POLYCHELIDAE Wood-Mason, 1874

Pentacheles laevis Bate, 1878

Pentacheles laevis Bate, 1878a: 278 [type locality: Moluccas, Indonesia, 4°33'N, 127°06'E]; Galil, 2000: 291 (key), 301–305, fig. 7; Ahyong & Brown, 2002: 54–56, figs 1A, B; Ahyong & Chan, 2004: 171–173, figs 1A–C, 4A; Poore, 2004: 152, 154, fig. 39A; Ahyong & Galil, 2006: 758; Boyko, 2006:

39–40, figs 1B, 2; Ahyong, 2007: 47–49, fig. 24B; Ahyong & Chan, 2008: 64, fig. 1A; Poore et al., 2008: 91.

Pentacheles gracilis Bate, 1878b: 279 [type locality: off Fiji, 19º07.50′S, 178º19.35′E].

Polycheles granulatus Faxon, 1893: 197 [type locality: off Panama, 4º03′N, 81º31′E]; Griffin & Stoddart, 1995: 240–242, figs. 4–5.

Pentacheles beaumontii Alcock, 1894: 236 [type locality: off Colombo, Sri Lanka].

Polycheles dubius Bouvier, 1905a: 480 [type locality: off the Azores, 44º04′N, 9º81′W].

Polycheles eryoniformis Bouvier, 1905b: 644 [type locality: Madeira].

Material examined. MTQ W13540, 1 female (cl. 18.7 mm), 18°09.40′S, 148°22.08′E, 1122–1117 m, CIDARIS I, stn 9-4, beam trawl, 7 May 1986; MTQ W13755, 1 male (cl. 24.2 mm), 1 ovigerous female (cl. 55.9 mm), 17°51.71′S, 147°09.93′E, 920–881 m, CIDARIS I, stn 49-3, beam trawl, 17 May 1986; MTQ W30296, 1 female (cl. 18.9 mm), CIDARIS III, stn 8-4, 1175–1255 m, beam trawl, 12 Feb 1992; MTQ W31055 1 damaged specimen (cl, 17.0 mm), 11°13.01′S, 146°07.38′E, 1432–1503 m, CIDARIS III, stn 12-3, beam trawl, 14 Feb 1992.

Remarks. The lateral carapace spination of the present series (8–12:3–4:14–16) slightly extends the documented range (7–10:3–5:12–17; Ahyong & Brown 2002; Ahyong 2007) to 7–12:3–5:12–17. In Australian waters, *Pentacheles laevis* has been reported from Western Australia to South Australia, Victoria, Tasmania, New South Wales and southern Queensland. The present records extend the known range of *P. laevis* to central Queensland.

Distribution. Worldwide, from the Indo-West Pacific, Eastern Pacific, Western and Eastern Atlantic; 212–2505 m.

Pentacheles obscurus Bate, 1878

Pentacheles obscura Bate, 1878a: 279; 1878b: 484; 1878c: 563; 1888: 143, pl. 15: fig. 2 [type locality: off New Guinea, 2°33′S, 144°04′E, 1857 m].

Pentacheles carpenteri Alcock, 1894: 235; 1901b: 174 [Carpenter's Ridge, Bay of Bengal, 2505–2616 m]; Alcock & Anderson, 1895, pl. 10: fig. 1; Galil, 2000: 305–306, fig. 8.

Material examined. MTQ W13785, 1 female (cl. 67.6 mm), 11°12.88′S, 146°07.36′E, 1426 m, CIDARIS III, stn 12-2, sledge, coll. M. Pichon, A. Birtles & P. Arnold, 14 Feb 1992; MTQ W30257, 1 ovigerous female (cl. 59.8 mm), 11°13.01′S, 146°07.38′E, 1432–1503 m, CIDARIS III, stn 12-3, beam trawl, 14 Feb 1992.

Remarks. The two specimens are the first records of the species from Australian waters and have carapace spination 5–6:3:18–20. The spination of the carapace margin posterior to the postcervical groove in the Australian specimens is lower (18–20) than that reported by Galil (2000) (27–28). In other respects, the specimens agree well with Galil's account.

Distribution. Madagascar and Gulf of Aden to Papua New Guinea, the Moluccas, Wallis and Futuna, New Caledonia and now from Queensland, Australia; 1100–3080 m (Galil 2000).

Polycheles kermedecensis Sund, 1920

Stereomastis kermadecensis Sund, 1920: 224 [type locality: Kermadec Islands, New Zealand, 29°55′S, 178°14′E, 951 m]; Ahyong & Brown, 2002: 68–71, figs. 7A–B, 8, 9; Poore, 2004: 156, fig. 40d.

Polycheles [sic] *euthrix* — Griffin & Tranter, 1995: 239–240, figs 2–3 [part, not *P. enthrix* (Bate, 1878)].

Material examined. MTQ W13544, 2 males (cl. 23.4–35.3 mm), 18°08.69′S, 147°33.97′E, 966–962 m, CIDARIS I, stn 1-4, beam trawl, 6 May 1986; MTQ W30101, 1 male (cl. 23.3 mm), 17°45.99′S, 148°39.09′E, 964–958 m, 17°45.99′S, 148°39.09′E, 964–958 m, CIDARIS I, stn 15-4, 9 May 1986; MTQ W30059, 1 male (cl. 13.5 mm), 17°36.98′S, 146°57.43′E, 672–744 m, CIDARIS I, stn 44-3, beam trawl, 16 May 1986; MTQ W30095, 1 female (cl. 22.4 mm), 17°50.679′S, 147°18.164′E, 703 m, CIDARIS I, stn 48-2, sledge, 17 May 1986; MTQ W13429, 1 female (cl. 34.1 mm), 17°51.06′S, 147°09.85′E, 904–976 m, CIDARIS I, stn 49-2, sledge, 17 May 1986; MTQ W13428, 1 male (cl. 19.8 mm), 17°51.71′S, 147°09.93′E, 920–881 m, CIDARIS I, stn 49-3, beam trawl, 17 May 1986.

Remarks. All specimens have a distinct dorsomedian antrorse spine on abdominal somites 1–4. The lateral carapace spination (7–9:3–4:12–15) is within or close to the reported range (7–11: 4–5:12–17) (Ahyong & Brown 2002).

Distribution. Kermadec Islands, and eastern Australia from central Queensland to the vicinity of Newcastle, New South Wales; 549–976 m (Ahyong & Brown 2002; present results).

Stereomastis Bate, 1888

Stereomastis aculeata (Galil, 2000)

Stereomastis phosphorus — Griffin & Stoddart, 1995: 246–248, figs. 9–11 [part, not *S. phosphorus* (Alcock, 1894].

Polycheles aculeatus Galil, 2000: 312–315, fig. 11 [type locality: New Caledonia, 22º35.6′S, 166º26.2′E]; Ahyong & Chan, 2004: 173, figs 3D, 4B; Poore, 2004: 154, fig. 40a, 41d; Ahyong & Galil, 2006: 759.

Material examined. MTQ W31058, 1 male (cl. 20.6 mm), 17°36.98′S, 146°57.43′E, 672–744 m, CIDARIS I, stn 44-3, beam trawl, 16 May 1986.

Remarks. The lateral carapace spination (6–7:3:8–9) of the single specimen of *S. aculeata* is within the documented range (6–7:3–4:8–11) (Ahyong & Chan 2004). In Australia, *S. aculeata* ranges from Western Australia to Tasmania, New South Wales and Queensland.

Distribution. Vanuatu, New Caledonia, Lifou, the Solomon Islands, Indonesia, Australia, the East China Sea and Taiwan; 144–1053 m (Ahyong & Chan 2004).

Stereomastis auriculata (Bate, 1878)

Pentacheles auriculatus Bate, 1878a: 280 [type locality: off Kandavu Island, Fiji, 19º07.50′S, 178º19.35′E]; 1878b: 484; 1878c: 563.

Stereomastis auriculata — Bate 1888: 159.

Pentocheles auriculata — Bate 1888, pl. 16, figs 3, 4.

Polycheles auriculatus — Galil 2000: 293, 315–317, fig. 12; Ahyong & Chan 2004: 176, figs. 3A–C, 4D; Ahyong & Galil, 2006: 762; Poore *et al.*, 2008: 91.

Material examined. MTQ W30220, 1 male (cl. 24.9 mm), 1 female (cl. 17.0 mm), 17°49.45′S, 148°39.51′E, 990–1006 m, CIDARIS I, stn 14-1, beam trawl, 8 May 1986; MTQ W14172, 1 female (cl. 25.4 mm), 10°31.86′S, 145°37.67′E, 1172–1140 m, CIDARIS III, stn 9-2, beam trawl, M. Pichon, A. Birtles, P. Arnold, 12 Feb 1992.

Remarks. As reported by Ahyong & Galil (2006), the specimens in the present series have an anterior spine on the second pleuron. Lateral carapace spination (6:3–4:7) is consistent with the reported range (5–7:3:7–8) (Ahyong & Galil 2006).

Distribution. Western Australia to New Caledonia, Vanuatu, Fiji, the Philippines, Taiwan and the Marquesas Archipelago; 435–1598 m (Ahyong & Galil 2006).

Stereomastis helleri (Bate, 1878)

Polycheles helleri Bate, 1878a: 277 [type locality: N of New Guinea, 2º33′S, 144º04′E, by lectotype selection (Ahyong & Brown 2002)]; Galil 2000: 327–329, fig. 18; Ahyong & Chan 2004: 179, figs 3H, I, 4G; Ahyong & Galil, 2006: 764.

Stereomastis helleri — Griffin & Stoddart, 1995: 245–246.

Material examined. MTQ W14171, 2 males (cl.19.5–22.1 mm), 10°29.21′S, 144°49.23′E, 1503–1520 m, CIDARIS III, stn 5-1, beam trawl, 10 Feb 1992; MTQ W13789, 1 female (cl. 20.1 mm), 10°54.01′S, 144°39.75′E, 1502–1475 m, CIDARIS III, stn 4-1, 10 Feb 1002; MTQ W31057, 2 females (cl. 19.4–27.7 mm), 10°51.30′S, 145°48.64′E, 1377–1362 m, CIDARIS III, stn 11-2, beam trawl, M. Pichon, A. Birtles, P. Arnold, 13 Feb 1992; MTQ W14173, 2 males (cl, 20.6–25.6 mm), 5 females (cl. 18.6–36.1 mm), 11°13.01′S, 146°07.38′E, 1432–1503 m, CIDARIS III, stn 12-3, beam trawl, 14 Feb 1992; MTQ W30262, 1 female (cl. 22.7 mm), 11°13.01′S, 146°07.38′E, 1432–1503 m, CIDARIS III, stn 12-3, beam trawl, 14 Feb 1992.

Remarks. The documented range of lateral carapace spination (5–6:3–4:6–10; Ahyong & Chan 2004) is extended in the present series (5–6:3:7–12). The species was reported from the Coral Sea by Griffin & Stoddart (1995).

Distribution. Western Indian Ocean to Australia, Indonesia, New Guinea, New Caledonia, the Solomon Islands, Japan, and Taiwan; 797–2947 m (Ahyong & Chan 2004).

Stereomastis nana (Smith, 1884)

Pentacheles nanus Smith, 1884: 359 [type locality: north-eastern United States of America, 38º44′N, 72º38′W].

Pentacheles andamanensis Alcock, 1894: 239 [type locality: off Cape Comorin, 7º04′N, 76º34′15″E].

Polycheles grimaldii Bouvier, 1905a: 481 [type locality: off Senegal, 17º16′N, 19º19′W].

Stereomastis andamanensis — Griffin & Stoddart, 1995: 244–245 [except for Coral Sea specimen = *S. galil* (Ahyong & Brown, 2002)].

Polycheles nanus — Galil 2000: 329–332, fig. 19; Ahyong & Brown 2002: 71; Poore, 2004: 156, fig. 41c; Ahyong & Galil, 2006: 765; Boyko, 2006: 41.

Material examined. MTQ W13505, 1 male (cl. 22.3 mm), 1 female (cl. 35.9 mm), 18°07.82′S, 148°15.39′E, 1115–1119 m, CIDARIS I, stn 8-1, beam trawl, 7 May 1986;

MTQ W13504, 1 male (cl. 21.2 mm), 6 females (cl. 19.7–25.2 mm), 18°09.40′S, 148°22.08′E, 1122–1117 m, CIDARIS I, stn 9-4, beam trawl, 7 May 1986; MTQ W30073, 2 females (cl. 21.0–26.9 mm), 18°10.06′S, 148°32.44′E, 1121–1123 m, CIDARIS I, stn 11-4, beam trawl, 8 May 1986; MTQ W31059, 1 female (cl. 24.2 mm), 17°45.99′S, 148°39.09′E, 964–958 m, CIDARIS I, stn 15-4, 9 May 1986; MTQ W13543, 1 female (cl. 36.0 mm), 17°45.44′S, 148°01.30′E, 1147–1132 m, CIDARIS I, stn 18-1, beam trawl, 10 May 1986; MTQ W30166, 1 male (cl. 22.6 mm), 17°46.53′S, 147°48.82′E, 1224–1223 m, CIDARIS I, stn 20-3, sledge, 10 May 1986; MTQ W300803, 1 male (cl. 17.3 mm), 17°45.04′S, 147°48.14′E. 1228–1223 m, CIDARIS I, stn 20-4, beam trawl, 10 May 1986; MTQ W30226, 2 males (cl. 22.3–22.7 mm), 1 female (cl. 21.1 mm), 17°19.58′S, 147°47.61′E, 1187–1200 m, CIDARIS I, stn 24-2, beam trawl, 11 May 1986; MTQ W30187, 2 females (cl. 20.9–26.9 mm), 17°18.73′S, 147°37.20′E, 1128–1178 m, CIDARIS I, stn 25-1, 11 May 1986; MTQ W30132, 1 damaged female, 17°19.76′S, 147°28.05′E, 1310–1357 m, CIDARIS I, stn 27-2, beam trawl, 11 May 1986; MTQ W30207, 1 male (cl. 21.2 mm), 1 female (cl. 20.5 mm), 17°18.21′S, 147°19.76′E, 1414–1400 m, CIDARIS I, stn 28-1, 12 May 1986; MTQ W30217, 1 female (cl. 20.7 mm), 17°18.96′S, 147°11.16′E, 1406–1402 m, CIDARIS I, stn 30-2, 12 May 1986; MTQ W31060, 1 female (cl. 24.3 mm), 16°58.67′S, 147°11.40′E, 1564–1545 m, CIDARIS I, stn 33-1, beam trawl, 13 May 1986; MTQ W30213, 1 female (cl. 20.2 mm), 16°58.67′S, 147°11.40′E, 1564–1545 m, CIDARIS I, stn 33-1, 13 May 1986; MTQ W13339, 1 male (cl. 18.2 mm), 16°50.83′S, 147°10.61′E, 1609–1607 m, CIDARIS I, stn 35-3, sledge, 14 May 1986; MTQ W30170, 1 male (cl. 19.4 mm), 1 female (cl. 23.3 mm), CIDARIS I, stn 35-4, 1473–1590 m, 14 May 1986; MTQ W30051, 1 male (cl. 25.0 mm), 14°08.66′S, 147°00.04′E, 1444–1454 m, CIDARIS II, stn 9-3, beam trawl, 2 Sep 1988; MTQ W13784, 1 female (cl. 30.3 mm), 10°51.30′S, 145°48.64′E, 1377–1362 m, CIDARIS III, stn 11-2, beam trawl, M. Pichon, A. Birtles, P. Arnold, 13 Feb 1992; MTQ W31056, 4 males (cl, 20.9–21.9 mm), 3 females (cl. 19.7–22.2 mm), 11°13.01′S, 146°07.38′E, 1432–1503 m, CIDARIS III, stn 12-3, beam trawl, 14 Feb 1992.

Remarks. In Australia, *S. nana* is known from Tasmania, Victoria and New South Wales (Griffin & Stoddart, 1995, as *S. andamanensis*; Ahyong & Brown 2002). Records of *S. nana* from Western Australia (George, 1983) and the Coral Sea (Griffin & Stoddart 1995, as *S. andamanensis*) are referrable to *S. galil* (Ahyong & Brown, 2002). Thus, the series of *S. nana* collected by CIDARIS I–III constitute the first reliable records of *S. nana* from Queensland waters. The lateral carapace spination of the present series (5–6:3:6–9) extends the previously documented range (5–6:3:6–7) (Ahyong & Galil 2006).

Distribution. Widely distributed throughout the Indo-West Pacific region and Atlantic Ocean; 300–4000 m (Galil 2000).

Willemoesia Grote, 1873

Willemoesia forceps A. Milne Edwards, 1880

Willemoesia forceps A. Milne Edwards, 1880: 64 [type locality: off Santa Cruz, Cuba, 24°33′N, 84°23′W, 3512 m]; Galil, 2000: 361–362, fig. 31.

Material examined. MTQ W13561, 1 female (cl 35.6 mm), 16°54.54′S, 147°14.35′E, 1473–1590 m, CIDARIS I, stn 35-4, no. 129, 14 May 1986.

Remarks. The specimen is in delicate condition and lacks both major chelipeds. Diagnostic features, however, are clearly visible in the distinct oblique grooves on the abdominal tergites, lateral carapace spination (14:13–15:27–30), unsculptured abdominal tergite 5, and rounded telson apex. Carapace spination is similar to the reported range (14–19:14–15:29–40) (Galil 2000).

Of the four recognised species of *Willemoesia*, only *W. leptodactyla* (Thomson, 1873) occurs in both the Atlantic and Indo-West Pacific; *W. inornata* Faxon, 1893, is known only from the eastern Pacific; *W. pacifica* Sund, 1920, ranges across the Indo-Pacific. *Willemoesia forceps* was previously known only from the Atlantic Ocean, so the present specimen constitutes the first record of the species from the Indo-Pacific region, and the second species of *Willemoesia* known from Australia after *W. pacifica* (see Griffin & Stoddart 1995, as *W. bonaspei* Kensley, 1968).

Galil (2000) reported an upper capture depth for *W. forceps* at 1760 m, so the present record expands the known bathymetric range into shallower water.

TABLE 1. Geographical distribution of polychelids fron New Zealand and around Australia according to States and Territories (+ indicates presence). Based on Galil (2000), Ahyong & Brown (2002), Ahyong (2007), Poore *et al.* (2008). New Zealand is abbreviated as NZ. Australian States are abbreviated as follows: NSW = New South Wales, NT = Northern Territory, QLD = Queensland, SA = South Australia, TAS = Tasmania, VIC = Victoria, WA = Western Australia.

	QLD	NSW	VIC	TAS	SA	WA	NT	NZ
Pe. laevis Bate, 1878	+	+	+	+	+	+		+
Pe. obscurus	+							
Pe. validus A. Milne-Edwards, 1880		+		+	+			+
P. baccatus Bate, 1878	+	+						
P. coccifer Galil, 2000						+		
P. enthrix (Bate, 1878)	+	+						+
P. kermadecensis (Sund, 1920)	+	+						+
P. martini Ahyong & Brown, 2002		+						
P. typhlops Heller, 1862	+	+				+		
S. aculeata Galil, 2000	+	+		+		+		
S. auriculata (Bate, 1878)	+					+		
S. galil (Ahyong & Brown, 2002)	+					+		
S. helleri Bate, 1878	+							
S. nana (Smith, 1884)	+	+		+				+
S. sculpta (Smith, 1880)	+							+
S. suhmi (Bate, 1878)		+						+
S. surda (Galil, 2000)		+	+					+
W. pacifica Sund, 1920					+			+
W. forceps A. Milne Edwards, 1880	+							
W. leptodactyla (Willemoes-Suhm, 1873)								+

Distribution. West Africa, Azores, Sargasso Sea to the Caribbean Sea (Galil 2000) and now from Queensland, Australia; 1473–4064 m.

GENERAL REMARKS

The results of the present study include the first Queensland record of *Stereomastis nana*, the first Australian record of *Pentacheles obscurus*, and the first Indo-Pacific record of *Willemoesia forceps*. Nineteen species in four genera of Polychelidae are now known from Australia. Ten species in four genera are known from New Zealand waters (Galil 2000). None are endemic to Australia, but the majority occur in eastern Australia with some also occurring off

South Australia and Western Australia. None are presently recorded from the Northern Territory. In Australian waters, *Polycheles coccifer* is presently known only from Western Australia and *Willemoesia pacifica* only off South Australia. Most New Zealand polychelids, apart from *W. leptodactyla*, also occur off eastern Australia. Most polychelids occurring in Australian and New Zealand waters are widespread in the Indo-West Pacific or beyond. Only *P. kermedecensis* is regionally endemic, being presently known only from localities between eastern Australia, the Kermadec Islands, and mainland New Zealand (Ahyong & Brown 2002). General Australian and New Zealand distributions are summarised in Table 1.

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