

*Research Article*

**Taxonomy of *Pinnotheres bipunctatus* Nicolet, 1849 with a distributional checklist of the Pinnotheridae of Chile and Peru, and a list of the Crustacea described by Hercule Nicolet in the Atlas of the Physical and Political History of Chile**

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**ABSTRACT.** Because the male holotype of *Pinnotheres bipunctatus* possesses a carpus of the third maxilliped larger than the propodus, the dactylus disto-medially inserted on the ventral margin of this latter article extending far beyond its tip, and a laterally expanded telson, wider than the sixth abdominal somite, it is excluded from *Pinnotheres* and assigned to *Pinnaxodes* (type species *P. chilensis*). Although males of these species can morphologically be separated, the holotype of *P. bipunctatus* resembles a juvenile, consequently, a categorical taxonomic distinction between this species and *P. chilensis* will require a comparative morphological study of the preadult stages of the latter species. A distributional checklist and host of the Pinnotheridae recorded for the Peru-Chile region is included, along with a list and the taxonomic status of the five genera and 53 species of Crustacea described by Hercule Nicolet in the “Physical and Political History of Chile”.

**Keywords:** Pinnotheridae, *Pinnaxodes*, Echinodermata, Claudio Gay, Chile.

**INTRODUCTION**

Ongoing taxonomic studies on the pinnotherid crabs of the Pacific coast of South America have prompted a reassessment of the taxonomy of the species *Pinnotheres bipunctatus* Nicolet, 1849. This small crab was the only species of Pinnotheridae described by the Swiss naturalist Hercule Nicolet in the chapter of Crustacea (Zoology, section 3) of the “Physical and Political History of Chile” by Claudio Gay (1849). The morphology of *P. bipunctatus* was analyzed and compared with the type species of *Pinnotheres* Bosc, 1802, *P. pisum* (Linnaeus, 1767), as well as other genera of Pinnotheridae of the Eastern Pacific (Campos, 2009, 2016). The long dactylus of the third maxilliped that overreaches the tip of the propodus and the subtriangular telson wider than the sixth abdominal somite are unique features that clearly support that *P. bipunctatus* does not belong to *Pinnotheres*. However, it closely resembles *Pinnaxodes chilensis* (H. Milne-Edwards, 1837), type species of the genus *Pinnaxodes* Heller, 1865. The shared morphology between *P. bipunctatus* and *P. chilensis* supports the conclusion that both are congeners, but also raises the hypothesis

that both species probably were described on the basis of two different developmental stages (juvenile and adult, respectively) of the same species.

A distributional checklist of the Pinnotheridae recorded for the Peru-Chile region is presented along with a taxonomically updated list of the species of Crustacea described by H. Nicolet.

**MATERIALS AND METHODS**

The checklist was prepared using available literature and specialized databases (Table 1). Because the holotype of *P. bipunctatus* is not extant, I relied on the original description and figures published by Nicolet (1849). The description originally written in Spanish was translated to English by Rathbun (1918). Additionally, voucher specimens of *Pinnaxodes chilensis* and *Pinnotheres pisum* were studied from material deposited in the Laboratorio de Invertebrados of the Facultad de Ciencias, Universidad Autónoma de Baja California (UABC) and the Smithsonian Institution (USNM). Drawings were made with the aid of a camera lucida attached to a stereoscopic microscope. Editing

**Table 1.** Distributional checklist and hosts of the Pinnotheridae of Peru and Chile.

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<p><b>1. <i>Calyptraeothers politus</i> (Smith, 1870) [<i>Ostracotheres politus</i> Smith, 1870 = <i>Pinnotheres politus</i> (Smith, 1870)]</b></p> <p>Distribution: Ancón Bay and Callao (type locality), Perú to Chiloé Island, Chile (Campos, 1999).</p> <p>Host: Gastropoda: Calyptraeidae: <i>Calyptraea</i> sp., <i>Crepidula fecunda</i> Gallardo, 1979 (= <i>Crepidatella peruviana</i> (Lamarck, 1822)) (Schmitt <i>et al.</i>, 1973; Campos, 1999). Paredes &amp; Cardoso (2007) recorded <i>Pinnotheres ostreum</i> (now in <i>Zaops</i>) in <i>Trochita trochiformis</i> (Born, 1778) from Peru. Because <i>Z. ostreum</i> lives in oysters it is assumed that the recorded symbiont is <i>C. politus</i>.</p> <p><b>2. <i>Dissodactylus nitidus</i> Smith, 1870 (= <i>Dissodactylus meyerabichi</i> Bott, 1955)</b></p> <p>Distribution: West coast of Baja California peninsula from off Abreojos Point, Baja California Sur and throughout Gulf of California, Mexico to Sechura Bay, Peru (Campos <i>et al.</i>, 2009).</p> <p>Host: Echinoidea, Mellitidae: <i>Encope californica</i> Verrill, 1870, <i>E. grandis</i> L. Agassiz, 1841 and <i>E. micropora</i> L. Agassiz, 1841 (Campos <i>et al.</i>, 2009).</p> <p>Host removed: Rioja (1944) recorded <i>Mellita longifissa</i> Michelin, 1858 (now in <i>Lanthonia</i> Coppard, 2016) as a host of <i>D. smithi</i> Rioja, 1944 a species placed in synonymy with <i>D. nitidus</i> in Schmitt <i>et al.</i> (1973). Griffith (1987) discovered that <i>D. smithi</i> is in fact a junior synonym of <i>D. lockingtoni</i>, a species that inhabits species of <i>Lanthonia</i> coppard, 2016 (Campos <i>et al.</i>, 2009).</p> <p><b>3. <i>Holothuriophilus pacificus</i> (Poëppig, 1836) (= <i>Pinnaxodes silvestrii</i> Nobili, 1901 = <i>Pinnaxodes meinerti</i> Rathbun, 1904 = <i>Leucosia pacifica</i> Poëppig, 1836)</b></p> <p>Distribution: Independencia Bay, Peru; Valparaíso to Talcahuano (type locality), and Chiloé Island, Chile (Manning, 1993b).</p> <p>Host: Holothuroidea, Cucumariidae, <i>Athyonidium chilensis</i> (Semper, 1868) (Garth, 1957).</p> <p><b>4. <i>Pinnaxodes bipunctatus</i> (Nicolet, 1849) (= <i>Pinnotheres bipunctatus</i> Nicolet, 1849)</b></p> <p>Distribution: San Carlos de Chiloé, Chile (type locality) (Nicolet, 1849).</p> <p>Host: Probably in sea urchins (Nicolet, 1849).</p> <p><b>5. <i>Pinnaxodes chilensis</i> (H. Milne Edwards, 1837) (<i>Pinnotheres chilensis</i> H. Milne Edwards, 1837 = <i>Pinnaxodes hirtipes</i> Heller, 1865)</b></p> <p>Distribution: Ecuador (type locality) to Port Otway, Chile, Isla Chiloé; Tierra del Fuego; Galapagos Islands (Fenucci, 1967; Schmitt <i>et al.</i>, 1973).</p> <p>Host: Echinodermata, Echinometridae, <i>Caenocentrotus gibbosus</i> (L. Agassiz, in L. Agassiz &amp; Desor, 1846); Parechinidae, <i>Loxechinus albus</i> (Molina, 1782) and Arbaciidae, <i>Tetrapygyus niger</i> (Molina, 1782) (Fenucci, 1967; Schmitt <i>et al.</i>, 1973).</p> <p><b>6. <i>Pinnixa bahamondei</i> Garth, 1957</b></p> <p>Distribution: South of San Pedro Point at Maillen Island, 20-25 m, Seno Reloncaví (type locality), Corral in Valdivia and Concepción Bay (Garth, 1957; Retamal &amp; Yañez-Arancibia, 1972).</p> <p>Host: Tubes of the polychaete, <i>Chaetopterus variopedatus</i> (Renier, 1804), tidal belt to 45 m (Garth, 1957).</p> <p><b>7. <i>Pinnixa chiloensis</i> Garth, 1957</b></p> <p>Distribution: Lechagua, Ancud Bay, Chiloé Island, Chile (Type locality)</p> <p>Host: <i>Abarenicola affinis chilensis</i> Wells, 1963 (Garth, 1957).</p> <p><b>8. <i>Pinnixa paitensis</i> Rathbun, 1935</b></p> <p>Distribution: Paita, Peru (type locality), (Rathbun, 1935; Moscoso, 2012).</p> <p>Host: Unknown</p> <p><b>9. <i>Pinnixa transversalis</i> (H. Milne Edwards &amp; Lucas, 1842) (= <i>Pinnixa panamensis</i> Faxon, 1893)</b></p> <p>Distribution: Near Campo Don Abel, 30 km north of San Felipe, Consag Rocks and Peñasco Port (Rocky Point), Gulf of California, Mexico, to Coquimbo, Chile; Galapagos Islands; questionably to Valparaíso, Chile, and beyond (Schmitt <i>et al.</i>, 1973; Hendrickx, 1995; present study).</p> <p>Host: Tubes of the polychaete, <i>Chaetopterus variopedatus</i> (Renier, 1804), intertidal to 45 m (Garth, 1957; present study).</p> <p><b>10. <i>Pinnixa valdiviensis</i> Rathbun, 1907</b></p> <p>Distribution: Chincha Island (Peru) to Corral (type locality), Punta Arenas and Strait of Magellan, Chile (Schmitt <i>et al.</i>, 1973); Bahía San Julián, Santa Cruz, Argentina (Torres, 2006)</p> <p>Host: Records of Garth (1957) in tubes of the polychaete, <i>Chaetopterus variopedatus</i> (Renier, 1804) are inconclusive; in burrows of <i>Urechis chilensis</i> (Müller, 1852), intertidal to 45 meters (Retamal &amp; Trucco, 1973; Torres, 2006).</p>
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of the drawings was performed using the Adobe Illustrator CS and Adobe Photoshop CS computer programs.

## RESULTS

### Systematics Account

#### Pinnotheridae De Haan, 1833

#### Pinnaxodes Heller, 1865

#### *Pinnaxodes chilensis* (H. Milne-Edwards, 1837)

Restricted synonymy: see Schmitt *et al.* (1973) for a complete synonymy.

*Pinnotheres chilensis* H. Milne Edwards, 1837: 33, (Atlas): pl. 10, fig. 2; H. Milne Edwards & Lucas, 1842-1844: 23; Nicolet in Gay, 1849: 155; Rathbun, 1918: 175-177, pl. 38, figs. 1-7; Garth, 1957: 70, 85-88, 92, fig. 9A-F; Schmitt *et al.*, 1973: 33-34; Takeda & Masahito, 2000: 99-112, fig. 1A, 2C-D; Ng & Manning, 2003: 914-916, Figs. 7a, 7b.

*Fabia chilensis* Dana, 1852: 383 (type locality, near Valparaíso, Chile).

*Pinnaxodes hirtipes* Heller, 1865: 68, pl. 6, Fig. 2 (type locality, Ecuador)

### Diagnosis

Carapace soft and yielding in female, firm, parchment-like in male. Palm of female elongate. Front slightly produced, deflexed, divided by a shallow medial sulcus. Outer maxillipeds placed nearly longitudinally; merus and ischium fused, a demarcation line sometimes visible between them; palpus three segmented, carpus slightly longer than subtrapezoidal propodus, dactylus articulated disto-medially on ventral margin of subtrapezoidal propodus, overreaching it considerably. Ambulatory legs 1-4 (pereiopods 2-5) similar in females, somewhat unequal and longer in males, dactyli slender in both sexes, longer in males, third longest in male, fourth longest in female; third ambulatory leg longest in males, second and third ambulatory legs subequal and longest in females. Abdomen of six somites and telson free, that of female wide, long, that of male narrow at base, tapering from third to sixth somite which has lateral margins concaves, telson laterally expanded, wider than somite six.

### Type species and host

By original designation and monotypy, *Pinnaxodes hirtipes* Heller, 1865 (= *Pinnotheres chilensis* H. Milne-Edwards, 1837), gender masculine. Associated with Echinodermata, Echinoidea: Echinometridae, *Caenocentrotus gibbosus* (L. Agassiz, in L. Agassiz & Desor, 1846); Parechinidae, *Loxechinus albus* (Molina,

1782); Arbaciidae, *Tetrapyrgus niger* (Molina, 1782) (Fenucci, 1967; Schmitt *et al.*, 1973).

### Distribution of type species

Ecuador (type locality) to Port Otway, Chile; Chiloé Island; Tierra del Fuego; Galapagos Islands (Fenucci, 1967; Schmitt *et al.*, 1973). To a depth of one fathom (1.83 m) (Rathbun, 1918); recent commercial catches of *L. albus* infested with *P. chilensis* came from a medial depth of 25 m (range 0-40 m) (Runil-Ojeda, 2014). Specimens collected during the Albatross expedition (see below) were caught in 104 m depth.

### Other species included in *Pinnaxodes* Heller

The following species have been included in this genus: *P. floridensis* Wells & Wells, 1961 (off North Carolina to Georgia; northwest Florida: Williams, 1984); *P. gigas* Green, 1992 (Gulf of California and West coast of Baja California: Campos *et al.*, 1998, Campos, 2016); *P. major* Ortmann, 1894 (China, South Korea, Japan, and the Russian Far East: Marin, 2014); *P. mutuensis* Sakai, 1939 (northern Japan: Takeda & Masahito, 2000) and *P. tomentosus* Ortmann, 1894 (Brazil: Ortmann, 1894; Melo & Boehs, 2004).

### *Pinnaxodes bipunctatus* (Nicolet, 1849) new combination

#### Synonymy

*Pinnotheres bipunctatum* Nicolet in Gay, 1849: 155-156 (type locality, San Carlos de Chiloé [= Ancud]); 1854, Atlas, Crustacea, pl. 1, fig. 2a-c; Milne-Edwards, 1853: 219; Rathbun, 1910: 587; Tesch, 1918: 286 (listed); Silas & Alagarwami, 1967: 1196, 1222 (listed).

*Pinnotheres bipunctatus*, Philippi, 1894, 372 (listed); Porter, 1909: 249 (in footnote); 1911: 446 (in footnote); Rathbun, 1918: 78, 159; Garth, 1957: 70, 92; Schmitt *et al.*, 1973: 40; Rodríguez, 1993: 47.

### Description (slightly modified from Nicolet, 1849 and Rathbun, 1918)

Carapace wider than long, curved along sides, narrowing slightly toward back, posterior border straight, two rather large punctate in middle. Front quadrilateral, transverse, prominent beyond curve of anterolateral borders, its anterior margin broad and slightly hollowed out, its middle occupied by a longitudinal depression bordered on each side by raised, rounded, and forward-pointing projection. Orbits small, but deep. Chelipeds and ambulatory legs robust, compressed; chelipeds shorter than pereiopods 2-4; hand short, wide, and nearly quadrate, dactylus wider than pollex and strongly curved. Ambulatory legs

(pereiopods 2-5) covered with very short, coarse hair, scarcely visible; dactyli strong, curved, and with a sharp claw. Abdomen narrow, elongate; telson subtriangular, wider than somite six. Posterior part of body rough, covered with spine-like hairs, some small ones on the inner margin of outer maxillipeds.

#### Distribution and host

Known only from the type locality, San Carlos de Chiloé (Ancud), Chile. Probably in sea urchins (Nicolet, 1849).

#### Material examined

None. The male holotype is not extant.

#### Color

Shiny flavo (yellow-gold) (Nicolet, 1849).

#### Measurements

Length of male carapace, 1 to 2 lines. A line is an obsolete French unit of length equal to 2.3 mm (Cardarelli, 2004). According to figure 2a of Nicolet (1854), carapace length = 3.6 mm, carapace wide = 4.2 mm.

#### Additional material examined

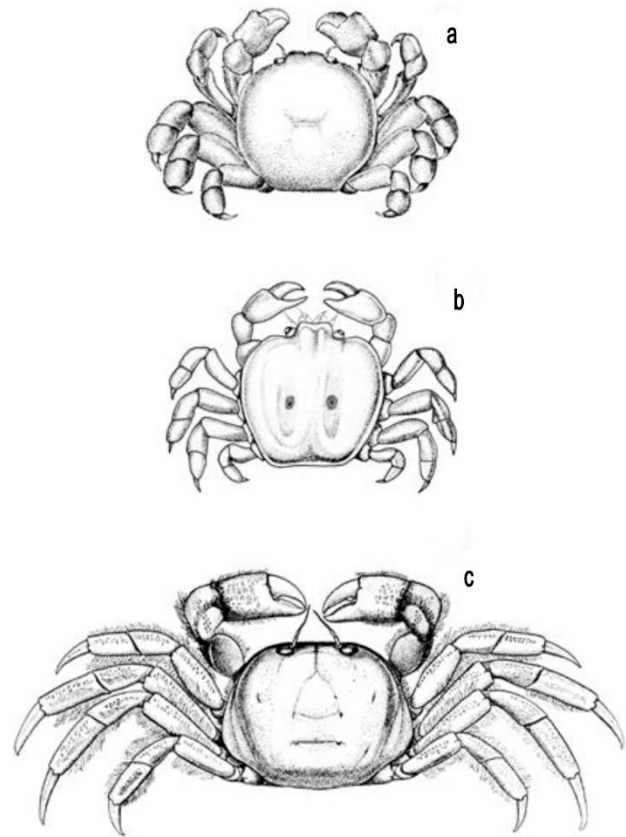
*Pinnotheres pisum*, "coast of France" UABC; *Pinnaxodes chilensis*, Albatross R/V, station 2786 (46°46'00"S, 75°16'30"W), 104 m depth, Peninsula Taitao, Gulf of Penas, 8 Feb 1888, 1 male, USNM 22112; same, 1 female, USNM 49238; 2 females, "coast of Chile" in *Loxechinus albus* (Molina, 1782), UABC.

## DISCUSSION

Garth (1957) analyzed the taxonomic status of *Pinnotheres bipunctatus* and pointed out the male described by Nicolet (1849) may belong to *P. politus* Smith, 1870 (now in *Calyptraeothers* Campos, 1990). Although both species have a similar habitus (Figs. 1a-1b), remarkable differences exist in the third maxilliped and abdomen that allow both rejecting this idea and the placement of this species in *Calyptraeothers*.

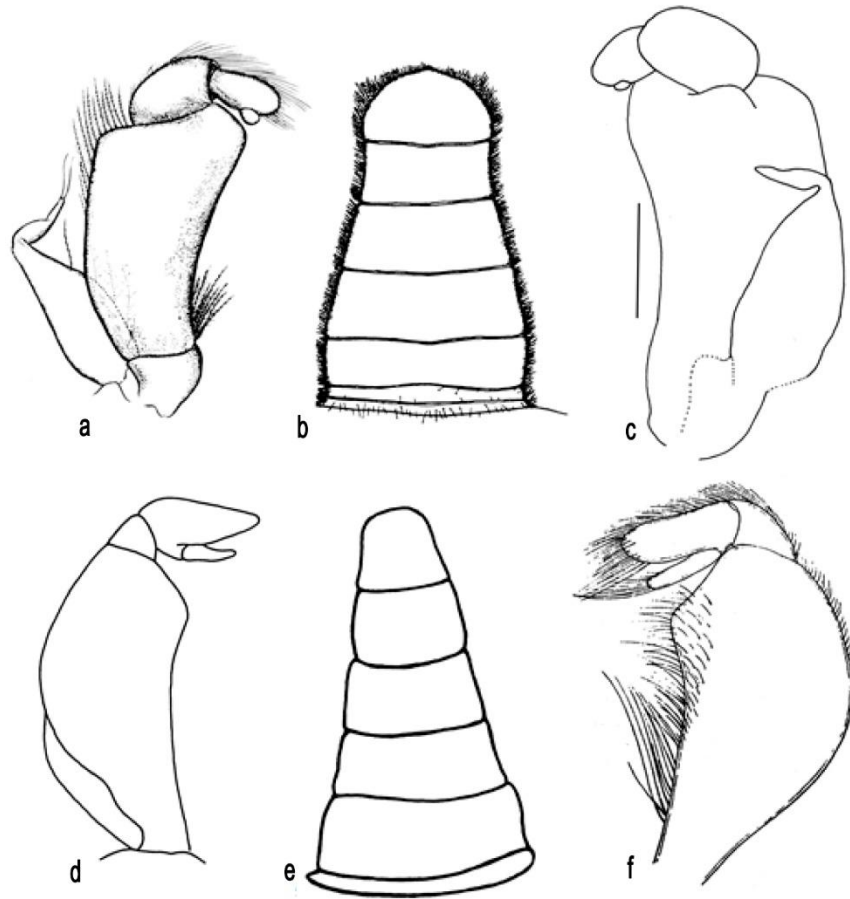
The limpet crab *C. politus* has a third maxilliped with a minute dactylus inserted subdistally on the ventral margin of propodus (Figs. 2a, 2c) and a subcircular telson (Fig. 2b). Contrarily, *P. bipunctatus* has a long dactylus inserted disto-medially on ventral margin of propodus and overreaching the tip of this latter article, and a subtriangular telson, laterally expanded, which is wider than the sixth somite (Figs. 3a-3b).

In addition, a detailed analysis of the description and figures of *P. bipunctatus* reveals that this species clearly does not belong to the genus *Pinnotheres*. The principal differences are observed in the previously described third maxilliped and abdomen. Members of the genus *Pinnotheres* have a carpus shorter than the



**Figure 1.** Male, dorsal view: a) *Calyptraeothers politus* (Smith, 1870), Seno Reloncaví, Punta Pilluco (Pelluhuin), Chile; carapace width: 3.7 mm; carapace length: 3.6 mm, b) *Pinnaxodes bipunctatus* (Nicolet, 1849) San Carlos de Chiloé, Chile; carapace width: 4.16 mm; carapace length: 3.6 mm (Nicolet, 1854). c) *Pinnaxodes chilensis* (H. Milne Edwards, 1837) Port San Pedro, Chiloé Island, Chile; carapace width: 7.3 mm; carapace length: 6.6 mm (Garth, 1957). a, c) from Garth, (1957); b) from Nicolet (1854).

propodus and a digitiform dactylus that is proximally inserted on the ventral margin of the propodus, falling short of the tip of this latter article (Figs. 2d, 2f), while the abdomen has a subcircular telson and is neither laterally expanded nor wider than the sixth somite (Fig. 2e). The morphological features and the original statement that *P. bipunctatus* probably was collected in a sea urchin support its exclusion from *Pinnotheres*, a symbiont of bivalves (Manning, 1993b). Nevertheless, these features allow the conclusion that *P. bipunctatus* is a member of the genus *Pinnaxodes* Heller. Both species, *P. bipunctatus* Nicolet new combination and *P. chilensis* (type species of *Pinnaxodes*), share a similar third maxilliped with a long dactylus that overreach the tip of the propodus (Figs. 3a, 3d, 3e, 3f) and a subtriangular telson wider than the sixth abdominal somite (Figs. 3b, 3c). Additional shared features include a produced and emarginate front, a carapace



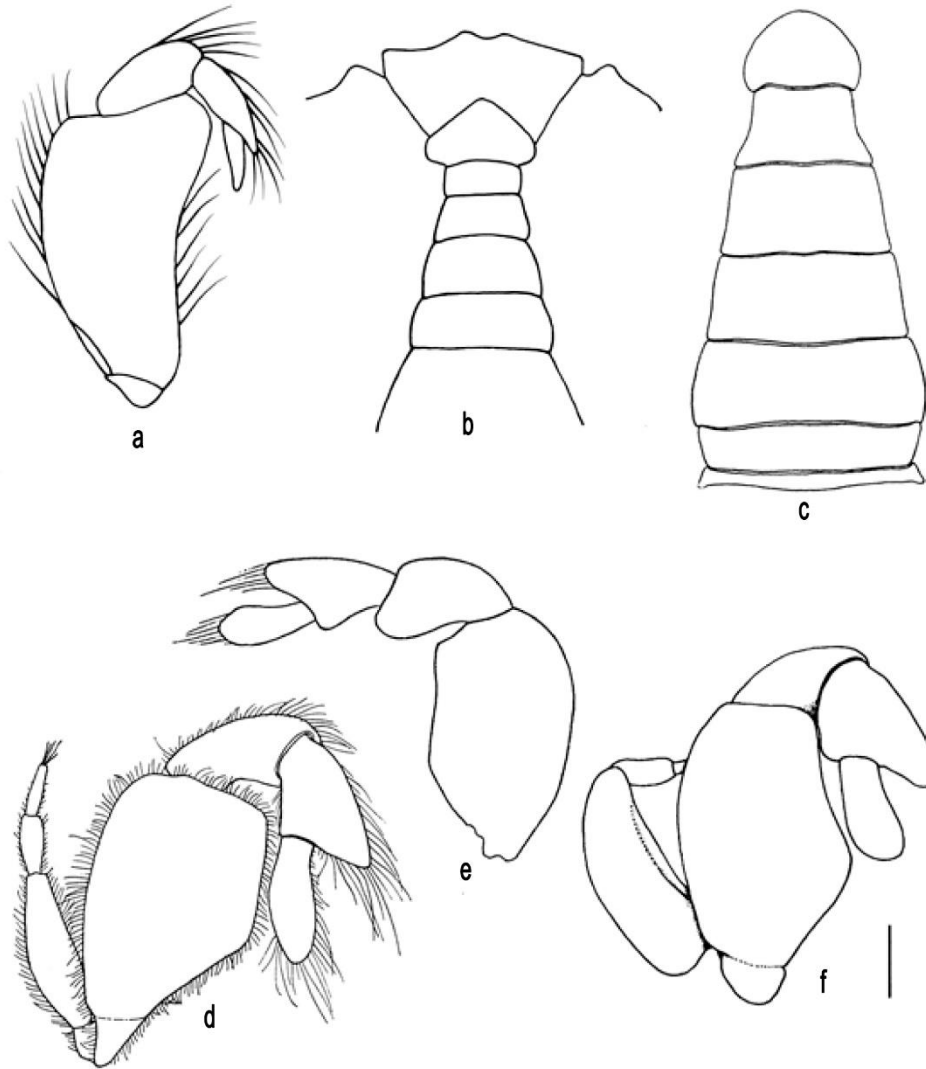
**Figure 2.** *Calyptraeothers politus* (Smith, 1870), a) third maxilliped, b) abdomen, Seno de Reloncaví, Punta Pilluco (Pelluhuin), Chile, carapace width: 3.7 mm, carapace length: 3.6 mm, not a scale; c) third maxilliped, scale: 0.78 mm. *Pinnotheres pisum* (Linnaeus, 1767): d, f) outer view third maxilliped, d) coast of France (UABC), carapace width: 8.2 mm, carapace length: 7.3 mm, not a scale, f) off Senigallia, Italy (USNM 205776) not a scale; e) abdomen, coast of France (UABC), length: 3.4 mm. a-b) from Garth (1957); c) from Campos (1999); f) from Manning (1993a).

with two large punctate and a medial sulcus that arises in the front and extends to the gastric region, and the ambulatory legs 1-3 (pereopods 2-4) are longer than the chelipeds. Moreover, the host of *P. bipunctatus* is presumably a sea urchin; if so, it would be a similar host as that of *P. chilensis*.

The main morphological differences between the male of *P. bipunctatus* and *P. chilensis* include the ambulatory legs and their dactyli, proportionally shorter in the former species and notoriously larger in *P. chilensis* (Figs. 1b-1c). However, the male described by Nicolet is a very small specimen with only 4.2 mm carapace width, while males described for *P. chilensis* are about twice in size (Rathbun, 1918; Garth, 1957). This may suggest that the above-mentioned differences might be related to the size. The shared features and the morphological differences presumably associated to the size allow to hypothesize that the male described by

Nicolet is an immature stage of *P. chilensis*; however, a categorical conclusion can currently not be established and is awaiting a morphological study on the postlarval development of this species.

With the inclusion of *P. bipunctatus* in *Pinnaxodes*, a total of 10 species in five genera of Pinnotheridae are known for the temperate coasts of Peru and Chile (Peruvian-Chilean Province *sensu* Retamal & Moyano, 2010) (Table 1). Most of these species were described between 1836 and 1907 (seven species) and only three new species of *Pinnixa* White, 1846 were added by Rathbun (1935) and Garth (1957). The genus *Pinnixa* now represents the most diverse taxa of this family along the Pacific temperate coast of South America (Schmitt *et al.*, 1973). In addition, Melzer & Schwabe (2008) recorded three juveniles of a pinnotherid harbored in the chiton *Tonicia chilensis* (Frembly, 1827) collected in Muelle Dichato, Chile (36°33'S, 72°



**Figure 3.** *Pinnaxodes bipunctatus* (Nicolet, 1849), new combination, San Carlos de Chiloé, Chile, carapace wide: 4.16 mm; carapace length: 3.6 mm (Nicolet, 1854): a), third maxilliped; b) abdomen. *Pinnaxodes chilensis* (H. Milne Edwards, 1837): c) abdomen; d-f) third maxilliped: c-d) Port San Pedro, Chiloé Island, Chile; e) Port Otway, Patagonia; f) Chile. a, b, e) not a scale; c) X21; D, X57.6; f) scale: 1 mm. a-b from Nicolet (1854); c-d) from Garth (1957); e) from Rathbun (1918); f) from Ng & Manning (2003).

56°W, 1 m). According to these authors, the third maxilliped morphology of these juveniles suggests a closer relationship with the genus *Orthotheres* Sakai, 1969. However, the morphology of the third maxilliped of these minute crabs supports a different generic assignment that will be discussed elsewhere.

#### Species described by Hercule Nicolet

Claudio Gay (1847) in the preface of the “Physical and Political History of Chile” (Zoology, section 1) explicitly pointed out that the entomologist Hercule Nicolet was in charge of the section of Crustacea (Zoology, section 3) of his monumental treatise. This statement fully complies with article 50.1 and 50.1.1 of

the International Code of Zoological Nomenclature that deals with the identity of authors. Nicolet (1849) described five genera and 53 species new to the fauna of Chile (Table 2) of which only the genus *Orchestoidea* Nicolet, 1849 and nine species remained without taxonomic changes. These include one Decapoda (*Pagurus villosus* Nicolet, 1849), two Amphipoda (*Orchestia gayi* Nicolet, 1849, *Orchestoidea tuberculata* Nicolet, 1849), four Isopoda (*Oniscus armatus* Nicolet, 1849, *Porcellio liliputanus* Nicolet, 1849, *Sphaeroma propinqua* Nicolet, 1849, *S. gayi* Nicolet, 1849) and two Tanaidacea (*Tanais macrocheles* Nicolet, 1849, *T. gayi* Nicolet, 1849). Additionally, 12 species remained valid but have been

**Table 2.** Genera and species of Crustacea described by Hercule Nicolet in Claudio Gay (1849). Original taxonomic name at left is followed by the currently name accepted. Sources of taxonomic information are: Martens & Behen (1994); Leistikow & Wägele (1999); Guerra-García & Thiel, (2001); Schmalfuss (2003); González *et al.* (2008); Hayes *et al.* (2012); Kotov *et al.* (2013); Brandão *et al.* (2015); Mees *et al.* (2015); Walter & Boxshall (2015); Anonymous (2016); Boxshall *et al.* (2016).

Decapoda	
1. <i>Alpheus laevigatus</i> Nicolet (1849)	<i>Betaeus harfordi</i> (Kingsley, 1878)
2. <i>Pagurus gayi</i> Nicolet (1849)	<i>Pagurus comptus</i> White (1847)
3. <i>Pagurus villosus</i> Nicolet (1849)	<i>Pagurus villosus</i> Nicolet (1849)
4. <i>Porcellana tuberculifrons</i> Nicolet (1849)	<i>Petrolisthes tuberculatus</i> Guérin (1835)
5. <i>Liriopea</i> Nicolet (1849)	<i>Haliscarcinus</i> White (1846)
6. <i>Liriopea lucasii</i> Nicolet (1849)	<i>Haliscarcinus planatus</i> Fabricius (1775)
7. <i>Atelecyclus chilensis</i> Nicolet, in Gay (1849)	<i>Peltarion spinulosum</i> (White, 1843)
8. <i>Trichodactylus granaries</i> Nicolet (1849)	<i>Hemigrapsus crenulatus</i> H. Milne- Edwards (1837)
9. <i>Pinnotheres bipunctatus</i> Nicolet (1849)	<i>Pinnaxodes bipunctatus</i> Nicolet (1849) new combination
Cumacea	
10. <i>Cuma gayi</i> Nicolet (1849)	<i>Diastylis gayi</i> Nicolet (1849)
Amphipoda	
11. <i>Amphitoe chilensis</i> Nicolet (1849)	<i>Nomen dubium</i>
12. <i>Amphitoe gayi</i> Nicolet (1849)	<i>Melita gayi</i> Nicolet (1849)
13. <i>Caprella brevicollis</i> Nicolet (1849)	<i>Caprellina longicollis</i> Nicolet (1849)
14. <i>Caprella longicollis</i> Nicolet (1849)	<i>Caprellina longicollis</i> Nicolet (1849)
15. <i>Caprella spinifrons</i> Nicolet (1849)	<i>Caprella penantis</i> Leach (1814)
16. <i>Gammarus chilensis</i> Nicolet (1849)	<i>Nomen dubium</i>
17. <i>Hyale lucasii</i> Nicolet (1849)	<i>Apoehyale grandicornis</i> Krøyer (1845)
18. <i>Lalaria</i> Nicolet (1849)	<i>Aora</i> Krøyer (1845)
19. <i>Lalaria longitarsus</i> Nicolet (1849)	<i>Aora typica</i> Krøyer (1845)
20. <i>Nicea</i> Nicolet (1849)	<i>Hyale</i> Rathke (1837)
21. <i>Nicea lucasii</i> Nicolet (1849) (= <i>Hyale lucasii</i> Nicolet (1849))	<i>Apoehyale grandicornis</i> Krøyer (1845)
22. <i>Orchestia gayi</i> Nicolet (1849)	<i>Orchestia gayi</i> Nicolet (1849)
23. <i>Orchestoidea</i> Nicolet (1849)	<i>Orchestoidea</i> Nicolet (1849)
24. <i>Orchestoidea tuberculata</i> Nicolet (1849)	<i>Orchestoidea tuberculata</i> Nicolet (1849)
25. <i>Talitrus chilensis</i> Nicolet (1849)	<i>Orchestoidea tuberculata</i> Nicolet (1849)
Isopoda	
26. <i>Armadillo granarius</i> Nicolet (1849)	<i>Cubaris granaria</i> Nicolet (1849)
27. <i>Desmarestia</i> Nicolet (1849)	<i>Edotia</i> Guérin-Ménéville (1843)
28. <i>Desmarestia chilensis</i> Nicolet (1849)	<i>Edotia chilensis</i> Nicolet (1849)
29. <i>Idotea angustata</i> Nicolet (1849)	<i>Cleantis gayi</i> Miers (1881)
30. <i>Jaera curvicornis</i> Nicolet (1849)	<i>Joeropsis curvicornis</i> (Nicolet (1849))
31. <i>Oniscus angustata</i> Nicolet (1849)	<i>Benthana angustata</i> Nicolet (1849)
32. <i>Oniscus armatus</i> Nicolet (1849)	<i>Oniscus armatus</i> Nicolet (1849)
33. <i>Oniscus bilineata</i> Nicolet (1849)	<i>Benthana bilineata</i> Nicolet (1849)
34. <i>Oniscus bucculentus</i> Nicolet (1849)	<i>Deto bucculenta</i> Nicolet (1849)
35. <i>Oniscus tuberculatus</i> Nicolet (1849)	<i>Deto bucculenta</i> Nicolet (1849)
36. <i>Porcellio chilensis</i> Nicolet (1849)	Generic ascription very doubtful Schmalfuss (2003)
37. <i>Porcellio gayi</i> Nicolet (1849)	<i>Nomen dubium</i>
38. <i>Porcellio granarius</i> Nicolet (1849)	<i>Nomen dubium</i>
39. <i>Porcellio liliputanus</i> Nicolet (1849)	<i>Porcellio liliputanus</i> Nicolet (1849)
40. <i>Porcellio pulcher</i> Nicolet (1849)	<i>Nomen dubium</i>
41. <i>Sphaeroma propinqua</i> Nicolet (1849)	<i>Sphaeroma propinqua</i> Nicolet (1849)
42. <i>Sphaeroma gayi</i> Nicolet (1849)	<i>Sphaero magayi</i> Nicolet (1849)
Tanaidacea	
43. <i>Tanais gayi</i> Nicolet (1849)	<i>Tanais gayi</i> Nicolet (1849)
44. <i>Tanais macrocheles</i> Nicolet (1849)	<i>Tanais macrocheles</i> Nicolet (1849)

Continuation

Cladocera	
45. <i>Daphnia granaria</i> Nicolet (1849)	<i>Species inquirenda</i>
46. <i>Daphnia spinifera</i> Nicolet (1849)	<i>Scapholeberis spinifera</i> Nicolet (1849)
47. <i>Lyncerus albicans</i> Nicolet (1849)	<i>Chydorus albicans</i> Nicolet (1849) ( <i>Species inquirenda</i> )
48. <i>Lyncerus armatus</i> Nicolet (1849)	<i>Pleuroxus armatus</i> Nicolet (1849) ( <i>Species inquirenda</i> )
49. <i>Lyncerus nasutus</i> Nicolet (1849)	<i>Pleuroxus nasutus</i> Nicolet (1849) ( <i>Species inquirenda</i> )
Podocopida	
50. <i>Cypris ochracea</i> Nicolet (1849)	<i>Incertae sedis</i>
51. <i>Cypris vimaculata</i> Nicolet (1849)	<i>Incertae sedis</i>
52. <i>Cypris violacea</i> Nicolet (1849)	<i>Incertae sedis</i>
53. <i>Cythere ostraum</i> Nicolet (1849)	<i>Species inquirenda</i>
Siphonostomatoida	
54. <i>Caligus gayi</i> Nicolet (1849)	<i>Species inquirenda</i>
Cyclopoida	
55. <i>Cyclops brevicorins</i> Nicolet (1849)	<i>Species inquirenda</i>
56. <i>Cyclops denticulatus</i> Nicolet (1849)	<i>Species inquirenda</i>
57. <i>Cyclops gayi</i> Nicolet (1849)	<i>Species inquirenda</i>
58. <i>Cyclops longicorinis</i> Nicolet (1849)	<i>Tropocyclops prasinus</i> Fischer (1860)
59. <i>Cyclops miles</i> Nicolet (1849)	<i>Species inquirenda</i>

transferred to another genus, while the remaining 32 species included junior synonyms or species poorly known taxonomically and have been considered *incertae sedis*, *nomen dubium* or *species inquirenda*. The second decapod species and the only pinnotherid described by Nicolet is *Pinnaxodes bipunctatus* new combination, which is herein considered a valid species; however, it remains unclear whether it is a juvenile and consequently a junior synonym of *P. chilensis* as previously discussed.

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