LUNDS UNIVERSITETS ÅRSSKRIFT. N. F.

HANSTRÖM, B., & WINGSTRAND, K. G., Comparative anatomy and histology of the pituitary in the egg-laying mammals, the Monotremata. 1951. Kr. 4: —.
HOLMQVIST, CH., Über eventuelle intermediäre Formen zwischen Mysis oculata Fabr. und Mysis relicta Lovén. 1949. Kr. 2: 50.
HOLMQVIST, O., Der Musculus protractor hyoidei (geniohyoideus auctt.) und der Senkungsmechanismus des Unterkiefers bei den Knochenfischen. 1910. Kr. 3: —.
— Studien in der von den Nn. trigeminus und facialis innervierten Muskulatur der Knochenfische. 1911. Kr. 7: —.
— Über die Zwischensehnen oder Myocommata in dem Musculus protractor hyoidei der Knochenfische. 1913. Kr. 1: —.
— Variationen der Nn. mandibularis trigemini und mandibularis externus facialis bei Gadus callarias sowie ihre wahrscheinliche Bedeutung. 1913. Kr. 4: —.
HÄGGQVIST, G., Epidermisstudier. 1. De Langerhans'ska cellerna. 2. Om den vitala metylenblåfärgningen av epidermis. 1919. Kr. 10: —.
HÖRBERG, T., Studien über den komparativen Bau des Gehirns von Scutigera coleoptrata L. 1931. Kr. 2: 25.
KAURI, H., Über die Ausbreitung und die Ausbreitungsumstände der Wechselkröte (Bufo viridis Laur.) im Ostseegebiet. 1948. Kr. 2: 75.
KEMNER, N. A., Die Termitenfauna von Amboina. Ergebnisse der Sunda-Expedition. 1931. Kr. 5: 25.
LANG, K., Beiträge zur Kenntnis der Süsswasserrotatorien Schwedens. 1928. Kr. 3: —.
— Marine Harpacticiden von der Campbell-Insel und einigen anderen südlichen Inseln. 1934. Kr. 4: 75.
LARSÉN, O., Beitrag zur Kenntnis des Pterygopolymorphismus bei den Wasserhemipteren. 1931. Kr. 2: 25.
— Das thorakale Skelettmuskelsystem der Heteropteren. Ein Beitrag zur vergleichenden Morphologie des Insektenthorax. 1945. Kr. 5: —.
— Der Thorax der Heteropteren. Skelett und Muskulatur. 1945. Kr. 5: 50.
— Die Ortsbewegungen von Ranatra linearis L. Ein Beitrag zur vergleichenden Physiologie der Lokomotionsorgane der Insekten. 1949. Kr. 5: 25.
LECHE, W., Morphologisch-geographische Formenreihen bei den Säugetieren. 1921. Kr. 16: —.
MALMSTEN, C. Å., Über das Gehirn von Mantis religiosa L. 1939. Kr. 1: 25.
NILSSON, A., Ön Vens recenta och subfossila landmolluskfauna. 1948. Kr. 3: 25. (Bidrag till kännedom om landmolluskfaunan i västra Skåne. 2.).
PALM, N.-B., Studies on the peristalsis of the malpighian tubes in insects. 1946. Kr. 3: —.
— The rectal papillae in insects. 1949. Kr. 2: 75.
PAPENFUSS, E., JOHNSTONE, The utility of the nematocysts in the classification of certain Scypho medusae. 1. 1936. Kr. 1: 50.
RAMADAN, M. M., Contribution to our knowledge of the structure of the compound eyes of Decapoda crustacea. 1952. Kr. 2: 75.
Reports of the Lund university Chile expedition 1948—49. 1, 2, 4, 6—8. 1951—52. Kr. 12: —, 2: —, 1: 25, 2: 75, 4: 25, 1: —.
ROSÉN, N., Beitrag zur Frage: Welches Keimblatt bildet das Skelett der Wirbeltiere? 1910. Kr. 3: —.
— Contributions to the fauna of the Bahamas. 1911. Kr. 5: —.
— Zur Kenntnis der parasitischen Schnecken. 1910. Kr. 8: —.
SJÖGREN, S. J., Das Anpassungsvermögen des Bienenstaates. 1940. Kr. 1: 25.
STJERNMAN, R. O. G., Vergleichend-anatomische Studien über die Extremitäten-Muskulatur (Vorder- und Hintergliedmassen) bei Tapirus indicus ♀ ad. et juv. 1932. Kr. 14: —.
STÅHL, F., Über das Vorkommen von inkretorischen Organen und Farbwechselhormonen im Kopf einiger Crustaceen. 1938. Kr. 1: 25.
SUNESON, S., Colour change and chromatophore activators in Idothea. 1947. Kr. 2: 75.
THORE, S., Ein Beitrag zur Kenntnis der Sehzentren im Gehirn von Sepia. 1942. Kr. 1: 75.
TRÄGÅRDH, I., Outlines of a new classification of the Mesostigmata (Acarina) based on comparative morphological data. 1946. Kr. 3: —.
URSING, B. JOHANSSON, Der Gaswechsel bei Tenebrio molitor in seiner Abhängigkeit von der Nahrung. 1920. Kr. 8: —.
— Über Entwicklung und Bau des Hand- und Fuss-Skeletts bei Bradypus tridactylus. 1932. Kr. 9: —.
— Untersuchungen über Entwicklung und Bau des Hand- und Fuss-Skeletts bei Mammalia. 2. Procavia Daemon. 1934. Kr. 4: 75.
— Zur Kenntnis der Spinndrüsen der Araneina. 1914. Kr. 1: 50.
VERHOEFF, K. W., Zur Kenntnis australischer Strongylosomiden. 1941. Kr. 1: 75.
WALLENGREN, H., Metarrhizium anisopliae och Pyrausta nubilalis Hb. 1929. Kr. 1: 50.
— Metarrhizium anisopliae såsom medel i kampen mot Pyrausta nubilalis Hb. 1931. Kr. 1: —.
— Studier över vetemyggorna. I. Kläckning, svärmning, larvernas intraflorala liv och utvandring. 1935. Kr. 6: 25. — II. Larverna i jorden. 1937. Kr. 3: —.
— Zur Biologie der Muscheln. 1905. 1. Die Wasserströmungen. Kr. 11: —. 2. Die Nahrungsaufnahme. Kr. 10: —.
WEDIN, B., The development of the head cavities in Alligator mississippiensis Daud. 1949. Kr. 2: 75.
WESTBLAD, E., Zur Physiologie der Turbellarien. 1/2. 1923. Kr. 25: —.
WESTERLUND, A., Ljusretning och fotelektriskt svar i deras kvantitativa samband. 1915. Kr. 4: —.
— Om bärnstensyrans vitala oxidation. 1916. Kr. 2: —.
— Om hästens ileo-ceko-koliska tarmområde. 1918. Kr. 20: —.

Pris kr. 11: —.

Holthuis, 1952

LUNDS UNIVERSITETS ÅRSSKRIFT. N. F. Avd. 2. Bd 47. Nr 10.
KUNGL. FYSIOGRAFISKA SÄLLSKAPETS HANDLINGAR. N. F. Bd 62. Nr 10.

REPORTS
OF
THE LUND UNIVERSITY CHILE EXPEDITION 1948—49
5.

THE CRUSTACEA DECAPODA MACRURA OF CHILE

CON RESUMEN EN ESPAÑOL

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Read before the Royal Physiographic Society, June 1, 1951.

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Introduction.

The present paper is mainly based on the collections made by the Lund University Chile Expedition 1948—1949, in Chilean waters. Though material was collected in several localities along the coast, the most intensive collecting was done in the region of Seno Reloncaví in the southern part of Chile. The material studied contains 17 species, one of which proved to be new to science, while several others up till now were only insufficiently known. The importance of this material induced me to try and give in the present paper a critical enumeration of all the forms of Decapoda Macrura reported from Chile. In several publications information concerning Chilean Macrura may be found (the oldest being Abbé MOLINA's, 1782, book on the natural history of Chile), but no comprehensive account on the Crustacea of the country has been given since that by NICOLET (1849). Dr. CARLOS E. PORTER, it is true, at several occasions announced his intention to publish a »Catálogo razonado y atlas de los Crustáceos Podoftalmos de Chile» (vide PORTER, 1922), but this work has never been published.

Of the species dealt with in the present paper, as far as necessary, descriptions and figures are given. Furthermore I have noted the synonymy of each species. Generally these synonymies are as complete as possible. In some cases, however, viz., in those of which the larger number of references is based on non-Chilean material, I have given restricted synonymies. These restricted synonymies, which always are marked as such, only list the references to the original description of the species and those to the literature, dealing with Chilean material.

The number of species of Decapoda Macrura known at present from Chile is surprisingly small, especially if one takes into account the very long coastal line of the country and the fact that Chile lies in two distinct zoogeographic regions. This small number of known Chilean species of Macrura is not entirely due to insufficient knowledge of the fauna. This is clearly illustrated by the fact that the very intensive exploration by the Lund University Expedition brought to light just one new species of the group. The total number of species of Decapoda Macrura at present known from Chile is 41. Of 4 of these species it is not certain whether they really belong to the Chilean fauna, since the Chilean records of these forms may be based on incorrectly labelled specimens. These species are *Alpheus dentipes* GUÉRIN, *Hippolyte coerulescens* (FABRICIUS), *Ibacus peroni* LEACH and *Thalassina chilensis* STEENSTRUP & LÜTKEN. Of the remaining 37 species, 5 are inhabitants of fresh water, 13 live in the deep sea or are pelagic, while 19 may be considered to be litoral forms. According to EKMAN (1935), the Chilean coast, which lies in the temperate zone, belongs to the following two zoogeographic regions: 1. the antiboreal region of South America, which includes the southern tip of South America and goes north-

ward along the east coast as far as 48° or 35° S (including the Falkland Archipelago), and along the west coast to somewhat north of Chiloé Island at 42° S., and 2. The Peruvian-North Chilean region, which extends from slightly north of Chiloé Island (about 42° S) to Northern Peru (about 6° or 4° S). The island group of Juan Fernandez belongs to the latter region. Of the 19 species of litoral Macrura which are listed here, 13 are reported from the Peruvian-North Chilean region, while 11 are known to inhabit the antiboreal region. Five of the latter are said to occur also in the Peruvian-North Chilean region. A better knowledge of the actual range of distribution of the various species is needed before a more correct insight into the problems relating to the zoogeography of the Chilean Macrura may be obtained.

It is a pleasant duty to express here my sincere gratitude to Prof. Dr. HANS BRATTSTRÖM and to Dr. ERIK DAHL, who kindly gave me the opportunity to study the present collection and who always were ready to help me with informations concerning various details.

To bring the present study to a good end, specimens from other collections had to be examined, either for comparison with the present material or to check the identifications of previous authors. For this purpose I received the most cordial help from various persons whom I wish to tender my wholehearted thanks. Dr. ISABELLA GORDON, British Museum (Natural History), London, sent me on loan several specimens described by CUNNINGHAM (1871), MIERS (1881) and BORRADAILE (1916), and kindly examined for me some type specimens of the Challenger Expedition described by BATE (1888). Prof. Dr. A. SCHELLENBERG, Zoologisches Museum der Humboldt Universität, Berlin, was so kind to provide me at two occasions with material of the Plate collections, dealt with by LENZ (1902). Drs. A. PANNING and H. CASPERS, Zoologisches Museum, Hamburg, informed me that their Museum was destroyed during the war, and that the material collected by the Hamburger Magalhaensischen Sammelreise was not available. This material came safe through the war, but is stored away in a safe place and is not yet accessible. It was therefore most fortunate that Prof. Dr. HEINRICH BALSS, Zoologische Sammlung des Bayerischen Staates, Munich, was kind enough to let me examine some of the duplicates of the just named collection, which was reported upon by him and the late Prof. Dr. F. DOFLEIN (DOFLEIN & BALSS, 1912); these duplicates being incorporated in the collection of the Munich Museum. During a visit made in May 1950 to the Museo di Zoologia dell 'Università, Turin, through the kindness of Mrs. TERESITA PAULUCCI MACCAGNO and Prof. Dr. ALCESTE ARCANGELI, I could examine some Chilean specimens of *Betaeus* reported upon by NOBILI (1901, 1902). In the Muséum National d'Histoire Naturelle at Paris, Professor Dr. LOUIS FAGE and Professor Dr. MARC ANDRÉ enabled me to examine a large number of specimens collected by the Mission scientifique du Cap Horn, reported upon by A. MILNE EDWARDS (1891). Dr. FENNER A. CHACE, JR., U.S. National Museum, Washington, D.C., Prof. Dr. H. NOUVEL of the University of Toulouse, France, and Mr. A. C. TOWNSEND, librarian of the British Museum (Nat. Hist.), London, assisted me most kindly in obtaining photostats, microfilms and information of a number of papers dealing with Chilean Crustacea, which were not available to me in Holland.

List of stations where Decapoda Macrura were collected by the Lund University Chile Expedition.

Cf. BRATTSTRÖM & DAHL: Chile Report No. 1. 1951.

St. M 13. Seno Reloncaví, Canal Tenglo between Quinta Hoffman and Immars shipyard in Puerto Montt, 41°29′16″ S, 72°58′10″ W; bottom with stones, sand and gravel, clayey in parts; depth 0—6 m; brood trawl; November 30, 1948.

St. M 14. Seno Reloncaví, Bay off Puerto Montt, 41°30′05″ S, 72°56′22″ W; fine sand with small stones and boulders and some sunken tree trunks; depth 225 m; Agassiz trawl; December 1, 1948.

St. M 16. Seno Reloncaví, Piedra Azul, 41°31′30″ S, 72°48′15″ W; bottom sandy with small stones and some detritus, one tree trunk with shipworms and shrimps in the holes; depth 40—55 m; fish trawl; December 4, 1948.

St. M 17. Golfo de Ancud, Canal Calbuco, E. of the church of Calbuco, 41°46′30″ S, 73°06′45″ W; grey sand with small stones; depth 30 m; bottom current distinct; triangular dredge and Agassiz trawl; December 14, 1948.

St. M 19. Golfo de Ancud, Estero Huito, inner part, 41°43′00″ S, 73°09′40″ W; dead algae (mostly thread-like red algae and *Ulva*) on a bottom of fine sand; depth 5 to 6 m; triangular dredge and Agassiz trawl; December 15, 1948.

St. M 20. Golfo de Ancud, Estero Huito, central part, 41°43′50″ S, 73°10′15″ W; very fine muddy sand; depth 15 m; triangular and circular dredges and Agassiz trawl; December 15, 1948.

St. M 21. Golfo de Ancud, Canal Calbuco, between Punta Meimen at Isla Calbuco and Punta Pinto at Isla Quenu, 41°48′50″ S, 73°09′40″ W; bottom with small stones with bryozoans and sponges; depth 25 m; triangular dredge and Agassiz trawl; December 15, 1948.

St. M 23. Golfo de Ancud, Isla Quenu, N.W. point, northern side, 41°49′10″ S, 73°10′00″ W; bottom with boulders and stones with sand inbetween; tidal zone; December 16, 1948.

St. M 24. Seno Reloncaví, S. of Isla Guar and W. of Bajo Pucarí, 41°44′25″ S, 72°55′45″ W; sandy bottom with *Pecten* shells; depth about 70 m; Agassiz trawl; December 16, 1948.

St. M 26. Seno Reloncaví, N.E. point of Isla Tenglo, at the lowest part of the tidal zone, 41°29′02″ S, 72°57′27″ W; bottom sand and small stones; December 17 and 18, 1948.

St. M 27. Golfo de Ancud, sound between Isla Quenu and Isla Chidguapi, 41°49′40″ S, 73°08′00″ W; bottom coarse sand with *Pecten* shells; depth 45 m; triangular dredge and Agassiz trawl; May 3, 1949.

St. M 29. Estero Reloncaví, Bahía Ralún, central part, 41°24′30″ S, 72°19′45″ W; very fine clay-like sand; depth 35—40 m; triangular and rectangular dredges and Agassiz trawl; January 4, 1949.

St. M 37. Seno Reloncaví, Punta Pilluco, 41°30′06″ S, 72°53′57″ W; bottom boulders and stones on sandy soil; litoral zone; hand collecting; January—April, 1949.

St. M 40. Seno Reloncaví, N. of Isla Quellín, 41°51′00″ S, 72°55′00″ W; small stones, probably also hard sand; depth 100 m; triangular dredge and Agassiz trawl; January 23, 1949.

St. M 41. Golfo de Ancud, E.S.E. of Isla Tac, 42°26′40″ S, 72°59′00″ W; bottom of sand and clay with small stones and many *Pecten* shells; depth 250 to 300 m; triangular dredge; January 23, 1949.

St. M 42. Golfo de Ancud, Paso Tenaun, S. of Punta Tenaun, 42°20′50″ S, 73°22′00″ W; probably a hard bottom; depth about 70 m; triangu ar dredge; January 24, 1949.

St. M 43. Golfo de Ancud, sound between Chiloé and Isla Caucahué, W. of Punta Queler, 42°08′20″ S, 73°28′20″ W; coarse sand and small stones; depth 30—40 m; triangular dredge; January 24, 1949.

St. M 46. Golfo de Ancud, Canal Caicaen, between Isla Calbuco and the main land, 41°46′15″ S, 73°09′00″ W; boulders, coarse sand and vegetable detritus; depth about 13 m; circular dredge and Agassiz trawl; January 25, 1949.

St. M 47. Seno Reloncaví, Paso Maillén, W. of Punta Puchegui, 41°33′45″ S, 73°02′05″ W; coarse sand with tubes of *Chaetopterus* and small stones covered with calcareous algae; depth about 22 m; triangular dredge; January 25, 1949.

St. M 55. Canal Chacao, Bahía de Ancud, between Punta San Antonio and Punta Colorada, 41°51′30″ S, 73°49′40″ W; rocky coast with more or less steep slopes, with boulders and rock-pools; litoral zone; hand collecting; February 25—27 and March 7, 1949.

St. M 59. Seno Reloncaví, Isla Tenglo, western point, 41°30′45″ S, 73°00′13″ W; muddy bottom with boulders and stones; litoral zone; hand collecting; March 13 and 14, 1949.

St. M 60. Seno Reloncaví, Isla Tenglo, sandy bay on the south side, 41°30′15″ S, 72°58′50″ W; litoral zone; hand collecting and digging; March 25 and 29, 1949.

St. M 80. Seno Reloncaví, Estero Reloncaví, outer part, 41°43′18″ S, 72°38′15″ W; grey mud; depth about 470 m; circular and triangular dredges and Agassiz trawl; March 30, 1949.

St. M 81. Seno Reloncaví, Estero Reloncaví, W. of Punta Iglesia, 41°41′05″ S, 72°24′30″ W; bottom mud mixed with sand; depth 200—250 m; Agassiz trawl; March 30, 1949.

St. M 83. Seno Reloncaví, Estero Reloncaví, W. of Río Puelo, 41°38′05″ S, 72°20′45″ W; bottom very fine mud, mixed with sand; depth about 170 m; triangular and circular dredges and Agassiz trawl; March 31, 1949.

St. M 87. Seno Reloncaví, Estero Reloncaví, Bahía Ralún, sound between Punta Veriles and Cayo Nahuelgúapi, 41°24′30″ S, 72°19′03″ W; bottom coarse sand with small stones, leaves, branches and mytilid shells; depth 6 m; triangular dredge; April 1, 1949.

St. M 94. Canal Chacao, W. of Rocas Amazonas, 41°46′30″ S, 73°45′45″ W; bottom with stones; depth 40 m; triangular and rectangular dredges; May 4, 1949.

St. M 95. Canal Chacao, Golfo de Quetalmahue, S.W. of Punta Aucan, 41°51′00″ S, 73°57′10″ W; bottom muddy sand and shells covered with red algae and dead algae; depth 6—7 m; triangular and rectangular dredges; May 4, 1949.

St. M 96. Canal Chacao, Golfo de Quetalmahue, S. of Punta Nagle, 41°51′40″ S, 73°55′50″ W; bottom muddy, covered with shells, sponges and dead algae; depth 11 m; rectangular dredge and Agassiz trawl; May 4, 1949.

St. M 97. Canal Chacao, Golfo de Quetalmahue, S. of Punta Arenas, 41°51′57″ S, 73°54′00″ W; bottom muddy sand with algae (kelp and *Ulva*) and sponges; depth 14 m; Agassiz trawl; May 4, 1949.

St. M 98. Bahía de Ancud, S.E. of Punta Ahui, S. of the buoy, 41°50′10″ S, 73°51′20″ W; small round stones with calcareous algae and red algae; depth 8 m; triangular and rectangular dredges; May 5, 1949.

St. M 101. Canal Chacao, S.E. of Punta Lenqui, 41°46′12″ S, 73°39′ 20″ W; bottom with small stones; depth 60—70 m; triangular and rectangular dredges; May 5, 1949.

St. M 103. Canal Chacao, N. of Punta Soledad, 41°48′50″ S, 73°31′30″ W; bottom with smaller and larger stones and worm tubes; depth 40 m; triangular dredge; May 5, 1949.

St. M 104. Golfo de Ancud, between Punta Tres Cruces and Punta Piedras, 41°50′30″ S, 73°28′30″ W; bottom with stones and clinkers; depth 50—60 m; triangular dredge; May 5, 1949.

St. M 105. Golfo de Ancud, S.W. of Punta Abtao, 41°49′24″ S, 73°22′30″ W; bottom with stones; depth 60 m; triangular dredge; May 5, 1949.

St. M 106. Golfo de Ancud, sound between the main land and Isla Abtao, S. of the church on

Isla Abtao, 41°48′40″ S, 73°21′ 00″ W; bottom with shells and coarse sand; depth 36 m; triangular dredge; May 5, 1949.

St. M 107. Golfo de Ancud, N. of Isla Abtao, 41°47′18″ S, 73°20′55″ W; bottom muddy coarse sand with some dead algae; depth 60 m; triangular dredge and Agassiz trawl; May 5, 1949.

St. M 108. Golfo de Ancud, Canal San Antonio, inner part, 41°44° 10″ S, 73°15′15″ W; bottom with coarse shell-sand with balanid shells and dead algae; depth 15 m; triangular dredge; May 6, 1949.

St. M 121. Bahía de San Vicente, Punta Liles, near San Vicente, 36°43′36″ S, 73°08′10″ W; between roots of kelp, rocky bottom; depth more than 0.5 m; hand collecting; June 9, 1949.

St. M 123. Montemar, the rocks off the Estación de Biologia Marina, 32°57′24″ S, 71°33′25″ W; rocks and rockpools with algae; litoral zone; hand collecting; September 17—21, 1948, June 15, 1949 and other days.

St. M 124. Bahía Herradura de Guayacán, northern part, 29°57′55″ S, 71°22′17″ W; hand collecting; June 21, 1949.

St. M 125. Bahía Herradura de Guayacán, southwestern part, 29°58′51″ S, 71°22′56″ W; boulders, partly of hard rock, partly of soft sandstone or conglomerate, here and there smaller stones and some sand between the stones; upper part of tidal zone; hand collecting; June 22, 1949.

St. M 127. Bahía de Coquimbo, S. of Roca Pelícanos, 29°55′56″ S, 71°21′08″ W; litoral zone; between roots of brown algae; hand collecting; June 24, 1949.

St. M 129. Puerto Mejillones del Sur, S. of Antofagasta, 23°06′30″ S, 70°28′ W; on the hull of a barge; hand collecting; June 30, 1949.

St. M 130. Punta de Lobos, S. of Iquique, 21°04′ S, 70°11′30″ W; on the hull of a barge; hand collecting; June 30, 1949.

St. M 131. Iquique, rocks in the southern part of the town, 20°13′10″ S, 70°10′19″ W; litoral zone, rocky bottom, between roots of brown algae; hand collecting; July 4, 1949.

St. M 135. Cavancha, Iquique, 20°14′07″ S, 70°10′05″ W; litoral zone, rocky bottom, between roots of brown algae; hand collecting; July 5, 1949.

St. M 138. Seno Reloncaví, E. of Isla Tenglo, N.E. point, 41°29′08″ S, 72°57′10″ W; bottom sand and small stones; depth 30—40 m; triangular dredge; July 13, 1949.

St. M 144. Seno Reloncaví, central part, E. of Isla Guar, 41°41′00″ S, 72°47′00″ W; coarse black sand with some clay and tubes of Polychaeta; depth about 250 m; triangular dredge; July 15, 1949.

St. M 148. Seno Reloncaví, E. of Isla Maillén, 41°35′35″ S, 72°58′20″ W; bottom coarse sand; depth 20—25 m; triangular dredge; July 16, 1949.

St. M 154. Arica, the roadstead, 18°28′30″ S, 70°19′25″ W; bottom rather coarse sand with shell fragments; depth about 25 m; triangular and circular dredges; September 7, 1948.

St. M 158. Tocopilla, at the rubbish dumps, about 22°05′ S, 70°13′ W; stones and rocks, strongly exposed; litoral zone; hand collecting; January 5 and 8, 1949.

St. L 5. Provincia de Chiloé, Departamento de Ancud, Isla Chiloé, small brook in a forest in the hills N.E. of Ancud, 41°51′50″ S, 73°49′20″ W; bottom of brook consisting of gravel and stones, with mud in the quieter parts; altitude abt. 50 m, hand collecting; February 23 and March 4, 1949.

St. L 8. Provincia de Llanquihue, Departamento de Puerto Varas, Río Petrohué near its outlet from Lago Todos los Santos near Petrohué, 41°08′ S, 72°23′ W; bottom consisting of larger and smaller volcanic stones and volcanic ash; depth 0—3 m; rectangular dredge; December 28, 1948.

Macrura Natantia.

Tribe Penaeidea

Family Sergestidae

Sergestes arcticus KRØYER (Figure 1).

Restricted synonymy:

Sergestes arcticus KRØYER, 1865, K. Danske Vidensk. Selsk. Skr., ser. 5 vol. 4, p. 240, pl. 3 fig. 7, pl. 5 fig. 16.
? *Sergestes nasidentatus* BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 398, pl. 72 fig. 2.
? *Sergestes nasidentatus* ORTMANN, 1893, Ergebn. Plankton-Exped., vol. 2Gb, p. 31.
? *Sergestes nasidentatus* HANSEN, 1896, Proc. zool. Soc. Lond., 1896, p. 957.
? *Sergestes nasidentatus* HANSEN, 1903, Proc. zool. Soc. Lond., 1903 pt. 1, p. 62.
Sergestes arcticus DOFLEIN & BALSS, 1912, Mitt.naturh. Mus. Hamburg, vol. 29, p. 25.
Sergestes arcticus HANSEN, 1922, Rés. Camp. sci. Monaco, vol. 64, p. 62, pl. 1 figs. 1, 2, pl. 3 figs. 3—5, pl. 4 figs. 1, 2.
Sergestes articus CECCHINI, 1928, Racc. planct. Liguria, vol. 3 pt. 2, p. 33, pl. 1 fig. 3.

Material examined:

Lund University Chile Expedition.

St. M 80. 2 specimens, 27 and 36 mm.
St. M 81. 4 specimens, 27—31 mm.
St. M 83. 11 specimens, 22—33 mm. Shrimps common in several places of the fjord.

The specimens closely agree with HANSEN's (1922) extensive description of this species. HANSEN (1922, p. 74) expresses his doubts as to the correctness of the identification of specimens of *Sergestes* from the Magellan region with the present species: »Comme le petasma se montre lui-même offrir, chez les Sergestides, les caractères les plus délicats et plus cruciaux entre espèces très semblables ou même à peine séparables, il est nécessaire d'étudier très soigneusement cet organe chez tout mâle adulte provenant de l'Atlantique sud, du détroit de Magellan, de l'Afrique et de l'Australie du Sud, etc., afin d'être certain que les spécimens provenant de ces localités, ou d'autres encore plus distantes, et absolument semblables à *S. arcticus*, appartiennent bien réellement à cette espèce, ou au contraire à quelque autre non encore reconnue.» In the shape of the body, the presence of supraorbital spines, in the shape of the telson, that of the eyes, the antennulae, antennae, legs and uropods, I could not detect any good difference with HANSEN's description and figures. The lower antennular flagellum of the male in my material sometimes is a little shorter, sometimes a little longer than the third segment of the antennular peduncle. The spine at the process of the third segment of this flagellum reaches slightly beyond the base of the sixth segment or to the middle of it. The distal part of the

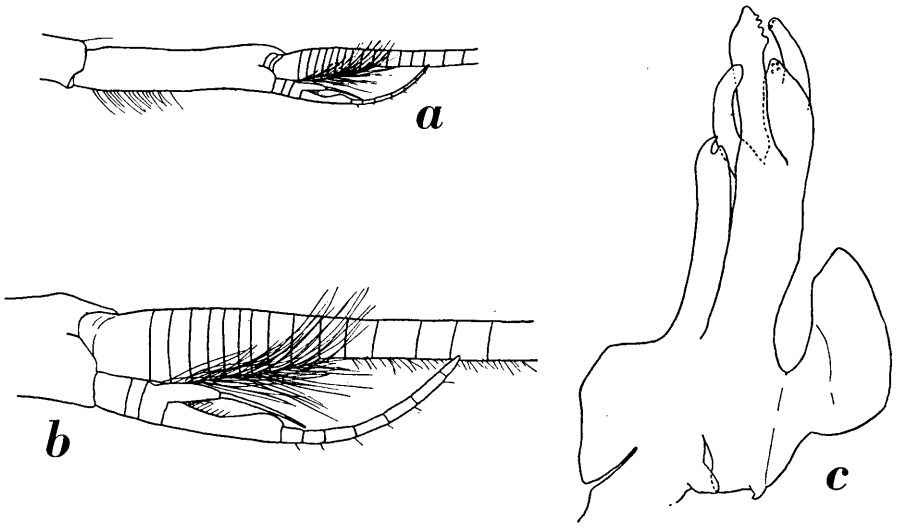

Fig. 1. *Sergestes arcticus* KRØYER. a, top of antennular peduncle; b, basal part of antennular flagella; c, petasma. a, × 15; b,c, × 32.

fourth segment is only slightly lower than the proximal. The petasma in my Chilean material is exactly like that described and figured by HANSEN, but for the fact that the various hooks are less distinct. HANSEN (1919, p. 4) already states that »the membrane around them [the hooks] is generally invaginated, frequently to such a degree that the hook is completely retracted.» This would explain why in most of my specimens, including the one figured (the male of 36 mm from *St. M 80*) the hooks are hardly visible, while in some other specimens they are more distinct. There is therefore no doubt in my mind that the present Chilean specimens indeed belong to *Sergestes arcticus*. Also CECCHINI (1928) points to the fact that *Sergestes arcticus* occurs in Chilean waters.

Colour. The colour sketch made by Dr. H. BRATTSTRÖM of a specimen from *St. M 80* closely agrees with the coloured figure of a specimen from the western Mediterranean published by HANSEN (1922) and with HANSEN's description of the colour. Dr. BRATTSTRÖM's sketch shows a colourless transparent animal, which has the internal organs of the thorax visible through the carapace as a coloured mass. The smaller anterior portion of this mass is coloured black, while the larger posterior part is of an orange-red colour. A smaller mass lies slightly below and behind the larger mass and has a pink colour. Orange red spots are present on the abdominal pleurae and probably also in the posterolateral parts of the carapace. The eyes have the cornea black. Some red spots are present on the antennular peduncles.

Sergestes nasidentatus BATE from off Chile was based on a juvenile specimen (»Mastigopus» stage). HANSEN (1896, 1903) regards this species to be a juvenile of *Sergestes arcticus* or a very closely related species. As BATE's type material of this species is lost, it is not possible to identify the form with certainty.

Distribution. Northern Atlantic Ocean from the westcoast of Norway and Greenland to the Mediterranean and the Canary Islands, also from French Congo, S. Africa, Uruguay, Chile, New Zealand and Australia. The Chilean localities are: ? between Valparaíso and Juan Fernandez, 366 m depth (BATE, 1888), between Punta Arenas (Magellan Strait) and Valparaíso, 35°6′30″ S, 73°38′ W (CECCHINI, 1928), Punta Arenas, Magellan Strait (DOFLEIN & BALSS, 1912).

Sergestes profundus BATE

Sergestes profundus p.p. BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 428.
Sergestes profundus p.p. ORTMANN, 1893, Ergebn. Plankton-Exped., vol. 2Gb, p. 32.
Sergestes profundus p.p. HANSEN, 1896, Proc. zool. Soc. Lond., 1896, p. 951.
Sergestes profundus HANSEN, 1903, Proc. zool. Soc. Lond., 1903 pt. 1, p. 69, pl. 11 fig. 3.
Sergestes profundus HANSEN, 1919, Siboga Exped., mon. 38, p. 7.
? *Sergestes profundus* ILLIG, 1927, Wiss. Ergebn. Valdivia Exped., vol. 23, p. 301.

BATE based his new species *Sergestes* profundus on two specimens. One of these, originating from the southern Atlantic, was found by HANSEN (1903) to be a *Petalidium*, probably *P. foliaceum* BATE. The other specimen originated from west of Valparaíso, 33°42′ S, 78°18′ W (depth 2500 m), and was made by HANSEN the lectotype of the species.

ILLIG (1927) refers a damaged specimen from the Gulf of Guinea to the present species, but at the same time he expresses his doubts as to whether it is possible to keep *Sergestes profundus* separated from *S. japonicus* BATE.

Tribe Caridea

Family Pasiphaeidae

Pasiphaea acutifrons BATE (Figure 2)

Pasiphaea acutifrons BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 871, pl. 141 fig. 3.
Pasiphaea forceps A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 pt. 2F, p. 51, pl. 6 fig. 2.
Pasiphaea acutifrons A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 pt. 2F, p. 53.
non *Pasiphaeia acutifrons* ? FAXON, 1895, Mem. Mus. comp. Zoöl. Harvard, vol. 18, p. 175.
Pasiphaea acutifrons RATHBUN, 1904, Harriman Alaska Exped., vol. 10, p. 22.
non *Pasiphaea acutifrons* DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 26, fig. 1.
Pasiphaea acutifrons DE MAN, 1920, Siboga Exped., mon. 39a³, p. 1.
Pasiphaea forceps DE MAN, 1920, Siboga Exped., mon. 39a³, p. 2.
Pasiphaea acutifrons SCHMITT, 1932, Journ. Wash. Acad. Sci., vol. 22, p. 334.
Pasiphaea forceps SCHMITT, 1932, Journ. Wash. Acad. Sci., vol. 22, p. 334.
Pasiphaea acutifrons BOSCHMA, 1949, Discovery Rep., vol. 25, p. 302, textfigs. 12—16, pl. 41 figs. 3, 4.

Material examined:

Lund University Chile Expedition

St. M 80. 1 cast shell.

Museum Paris

Magellan Strait, S.E. of Port Famine; depth 326 m; Mission scientifique du Cap Horn, n. 100; February 14, 1883; holotype of *Pasiphaea forceps* A. MILNE EDWARDS. — 1 specimen, 53 mm.

In a tube containing two specimens of *Sergestes arcticus* Krøy. a cast shell of a species of *Pasiphaea* was found. This shell is far from complete, the abdominal part is entirely lacking, while also several of the legs are absent. Nevertheless it shows enough characters to make the identity of the species reasonably certain.

The fragment has the rostrum well developed and sharply pointed. Backwards the rostrum is continued as a distinct rounded carina, which ends slightly before the posterior margin of the carapace. The branchiostegal spine is well developed, it reaches almost to the anterior margin of the carapace.

The eyes are absent in the fragment.

The antennular peduncle has the basal segment provided with a slender stylocerite, the top of which is broken. The remaining part of the stylocerite almost attains the end of the basal segment. The second joint is almost half as long as the first and shorter than the third.

The scaphocerite is broadest in the basal part and gradually narrows anteriorly. The anterior margin of the lamella is rounded and is overreached by the final tooth. The outer margin is convex. A spine is present at the outer side of the antennal peduncle near the base of the scaphocerite. The scaphocerite overreaches the antennular peduncle by the full length of the third joint of the latter. It reaches with about half its length beyond the antennal peduncle.

Of the first pereiopods only the joints up to the carpus are present. The anterior margin of the carpus is damaged. The merus of the first leg bears 4 or 5 spines on the posterior margin, these spines are rather regularly divided over the margin. The ischium is unarmed, the basis bears a rather indistinct antero-ventral tooth. The second leg has the fingers very slender, about as long as the palm and provided at their cutting edges with numerous sharp and slender teeth. The carpus bears a strong anteroventral spine, furthermore there is a rather sharply pointed lobe in the outer part of the anterior margin. The merus bears 11 posterior spines. The ischium is unarmed, the basis is provided with an anteroventral spine. No other legs are present in this fragment.

The characters afforded by the present shell closely agree with the description and figures of *P. acutifrons* given by BATE. BATE does not state the exact number of meral spines of the first two legs in his specimens, but judging by the figure there are 5 or 6 on the merus of the first leg and at least 8 on the merus of the second (it is possible that the top of the merus of this latter leg is broken).

A. MILNE EDWARDS (1891, p. 53) in his description of *Pasiphaea forceps* notes some not very convincing differences between his species and P. *acutifrons*. According to him *Pasiphaea acutifrons* has the body more slender than *P. forceps*, the meri of the first two legs in BATE's species are broader, the third leg is shorter and the tip of the telson has the spines differently arranged. A. MILNE EDWARDS's figures show

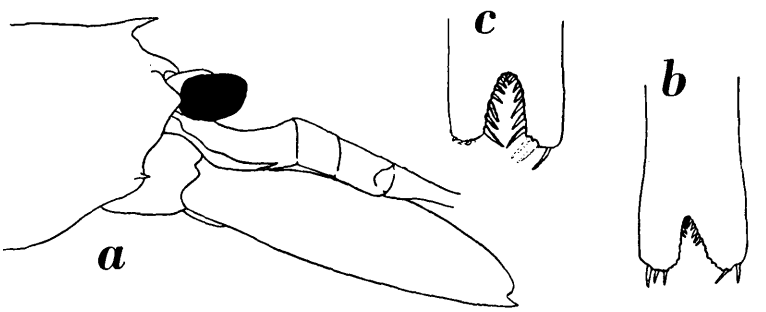

Fig. 2. *Pasiphaea acutifrons* BATE. a, anterior part of body in lateral view; b, tip of telson in dorsal view; c, tip of telson in ventral view. a and b after the holotype of *Pasiphaea forceps* A. MILNE EDWARDS; c after the lectotype of *Pasiphaea acutifrons* BATE (freehand sketch by Dr. ISABELLA GORDON). a, × 17; b, × 34.

the merus of the first leg with 2, that of the second with 4 posterior spines, while the tip of the telson, which is deeply incised in the middle, is shown to have spines on the posterior margin, but not on the margin of the incision. As most of the figures in A. MILNE EDWARDS's (1891) paper are very inaccurate, it was of the utmost importance to reexamine the type specimen of A. MILNE EDWARDS's species. During a visit to the Muséum National d'Histoire Naturelle in Paris in June 1950, I had the opportunity to study the holotype of *Pasiphaea forceps*. This specimen is about 53 mm in length and is in a rather poor condition, being strongly shrivelled. The rostrum is directed upwards and is sharply pointed, it is placed at some distance behind the anterior margin of the carapace. I am convinced that a median dorsal carina is present on the carapace, but owing to the condition of the specimen I could not observe this carina with certainty. A small but distinct branchiostegal spine is placed slightly behind the anterior margin of the carapace. The abdomen may be carinate dorsally, but this could not be stated with certainty. The pleurae of the first four segments are broadly rounded, that of the fifth is triangular with a rounded apex. The sixth segment is almost twice as long as the fifth. The telson measures about $^2/_3$ of the length of the sixth abdominal segment. It is shrivelled too and is somewhat curled. No dorsal spines could be observed. The apex of the telson is deeply incised in the middle and bears spinules over the whole length of the hind margin, including the margin of the incision. Partly these spines are still present, partly they are worn off and their former presence then only is indicated by their implantations. The situation thus is quite incorrectly figured by A. MILNE EDWARDS.The eyes are well developed, but are shrivelled. The antennular peduncle has the stylocerite pointed, reaching the end of the basal segment. The second joint of the peduncle is shorter than the third. The scaphocerite far outreaches the antennular peduncle, it is oval in shape with both inner and outer margin convex. The final tooth of the outer margin overreaches the lamella. The third maxilliped reaches slightly beyond the scaphocerite. The last segment is about 1.5 times as

long as the penultimate and about as long as the antepenultimate. The first pereiopod reaches with the fingers beyond the scaphocerite. The fingers are about $^2/_3$ of the length of the palm. The carpus is short, being about $^1/_3$ of the length of the palm; it bears an anterodorsal tooth. The merus is slightly shorter than the chela and bears 2 or 3 spines in the distal part of the posterior margin. Since in both the specimen of the University of Lund Chile Expedition and the type specimen of *Pasiphaea acutifrons* the posterior spines of the merus of the first leg are regularly distributed over the whole length of that segment, it seems rather probable that in the type of *P. forceps* there have been also some proximal spines, which now are lost. This also would explain the small number of these posterior spines in the type of *P. forceps* (namely 2 or 3, instead of 4 to 6 as in the two other specimens). The fact that in one of the second legs of the type of *P. forceps* also the proximal spines of the posterior margin of the merus are absent (here the places in which these lost spines were implanted could still be detected with some difficulty), makes this supposition quite acceptable. The ischium of the first leg is short and the basis is provided with a small antero-ventral tooth. The second leg reaches with part of the palm beyond the scaphocerite. It shows no differences from the leg of the specimen collected by the Lund University Expedition, but for the fact that the merus only bears 7 or 8 spines on the posterior margin. The third leg is slender and fails to reach the end of the scaphocerite. This and following leg are badly shrivelled.

On my request Dr. ISABELLA GORDON kindly examined the lectotype of *Pasiphaea acutifrons* BATE from Patagonia, which is present in the collection of the British Museum (Natural History). Dr. GORDON found that the posterior margin of the telson to the right of the median incision is damaged, but that the left half of this margin bears 1 spine, while presumably two more spines have been present there. There is thus no difference whatsoever in the shape of the telson of the types of *Pasiphaea acutifrons* Bate and *P. forceps* A. MILNE EDWARDS.

In my opinion it is impossible to keep *Pasiphaea forceps* separated as a distinct species from *Pasiphaea acutifrons*. Accordingly they are treated here as a single species.

It is questionable whether BATE's type material of *Pasiphaea acutifrons* is homogeneous or not, one of the two specimens forming this type material, namely, originates from Patagonia, the other from Japan. The former of these is selected here to be the lectotype.

FAXON (1895) brought 10 specimens of a *Pasiphaea* species with some doubt to *P. acutifrons* BATE, his specimens originated from the Galápagos Archipelago. RATHBUN (1902a, p. 905) considered FAXON's specimens to constitute a new species which she named *Pasiphaea faxoni*. In 1904 RATHBUN enumerated the differences between FAXON's material and the real *Pasiphaea acutifrons*.

SCHMITT (1932) pointed out that the specimens brought by DOFLEIN & BALSS (1912) to *P. acutifrons*, in reality belong to an at that time undescribed species, *Pasiphaea dofleini* SCHMITT.

Distribution. The species has been recorded in literature from the following

localities: Off Sagami Bay, Japan, 34°58′ N, 139°29′ E, depth 1400 m (BATE, 1888), E. of the northpoint of Wellington Island, Patagonia, 48°41′ S, 74°24′ W, depth 350 m (RATHBUN, 1910), off Port Churruca, Patagonia, 52°45′ 30″ S, 73°46′ W, depth 440 m (BATE, 1888), Magellan Strait southeast of Port Famine, about 53°40′ S, 70°55′ W, depth 326 m (A. MILNE EDWARDS, 1891), Magellan Strait near Port Famine, 53°41′30″ S, 70°55′00″ W, depth 300 m (BOSCHMA, 1949).

Pasiphaea dofleini SCHMITT

Pasiphaea acutifrons DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 26, fig. 1.
Pasiphaea acutifrons DE MAN, 1920, Siboga Exped., mon. 39a³, p. 2.
Pasiphaea dofleini SCHMITT, 1932, Journ. Wash. Acad. Sci., vol. 22, p. 333, fig. 1.

DE MAN (1920) already remarked (p. 2, footnote) that the material mentioned by DOFLEIN & BALSS under the name *Pasiphaea acutifrons* does not belong to that species. According to him it is probable that the specimens of the two German authors should prove to belong to *Pasiphaea faxoni* RATHBUN. SCHMITT (1932) had the opportunity of reexamining the specimens and found that they belonged to an undescribed species, which he named *P. dofleini*. This species may be readily distinguished from *P. acutifrons* by possessing no trace of the mid-dorsal carina on the carapace and by having the meri of the first legs posteriorly unarmed, while the telson is not incised posteriorly.

Distribution. The species is known only from the original specimens, which were collected at Punta Arenas, Magellan Strait (DOFLEIN & BALSS, 1912; SCHMITT, 1932). No depth has been recorded.

Family Acanthephyridae

Acanthephyra carinata BATE

Acanthephyra carinata BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 748, pl. 126 fig. 2.
Acanthephyra carinata KEMP, 1906, Sci. Invest. Fish. Br. Ire., 1905 pt. 1, pp. 20, 24.
Acanthephyra carinata DE MAN, 1920, Siboga Exped., mon. 39a³, p. 44.
Acanthephyra carinata BALSS, 1925, Wiss. Ergebn. Valdivia Exped., vol. 20, p. 257.
Acanthephyra carinata CHACE, 1936, Journ. Wash. Acad. Sci., vol. 26, p. 27.

Distribution. BATE (1888) reports a male specimen, the holotype, from Sarmiento Channel, Patagonia, 51°27′30″ S, 74°3′ 0″ W, depth 732 m. The only other known specimen of this species is a female taken off the westcoast of Sumatra, 0°16′N, 98°7′ E, depth 677 m (BALSS, 1925).

Acanthephyra approxima BATE

Acanthephyra approxima BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 755, pl. 126 fig. 8.
Acanthephyra approxima ? FAXON, 1895, Mem. Mus. comp. Zoöl. Harvard, vol. 18, p. 162.
Acanthephyra approxima KEMP, 1906, Sci. Invest. Fish. Br. Ire. ,1905 pt. 1, pp. 21, 23.
Acanthephyra approxima DE MAN, 1920, Siboga Exped., mon. 39a³, p. 43.
Acanthephyra approxima CHACE, 1936, Journ. Wash. Acad. Sci., vol. 26, p. 27.

The status of this species is rather uncertain and a reexamination of the specimens referred to it in literature is highly desirable. The single type specimen, which was collected in Sarmiento Channel, Patagonia, 51°27′30″ S, 74°3′0″ W, depth 732 m (BATE, 1888), has the rostrum damaged. FAXON (1895) placed some specimens of an *Acanthephyra* species from the Gulf of Panama and the Galápagos Islands with some doubt in BATE's species. It is probable, however, as was already supposed by DE MAN (1920), that BATE's and FAXON's specimens belong to two different species. Both KEMP (1906) and CHACE (1936) gave a key to the species of *Acanthephyra* and both considered BATE's and FAXON's specimens as conspecific. It is interesting to note that KEMP, who could examine the Challenger specimens, in his key states that *A. approxima* has the »Carapace and 1st abdominal somite carinate dorsally», while CHACE, who had access to FAXON's specimens, in his key ranges *A. approxima* under the species that have the »First abdominal somite not dorsally carinate».

Family Nematocarcinidae

Nematocarcinus proximatus BATE

Nematocarcinus proximatus BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 808, pl. 132 fig. 3.
Nematocarcinus proximatus MURRAY, 1896, Trans. Roy. Soc. Edinb., vol. 38, pp. 364, 374, 375.
Nematocarcinus proximatus DE MAN, 1920, Siboga Exped., mon. 39a³, p. 76.

Distribution. The species has been reported from near Marion Island, S.E. Indian Ocean), Japan, the Arafura Sea and from the Chilean coast, from depths between 512 and 3430 m. The Chilean records are: West of Valparaíso, 33°42′ S, 78°18′ W (depth 2516 m), and Southwest of Valdivia, 42°43′ S, 82°11′ W (depth 2654 m) (BATE, 1888).

Family Disciadidae

Discias serrifer RATHBUN

Discias serrifer RATHBUN, 1902, Proc. Wash. Acad. Sci., vol. 4, p. 290, figs. 1—4.
Discias serrifer KEMP, 1920, Rec. Indian Mus., vol. 19, p. 143.
Discias serrifer BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 330, fig. 1.
Discias serrifer GURNEY, 1939, Ann. Mag. nat. Hist., ser. 11 vol. 3, p. 391.
Discias serrifer LEBOUR, 1949, Proc. zool. Soc. Lond., vol. 118, p. 1107.

Distribution. The species is known only from two localities: Tagus Cove, Albemarle Island, Galápagos Archipelago (RATHBUN, 1902) and Masatierra, Juan Fernandez (BALSS, 1924). The female from the Galápagos Archipelago was found on a reef, the male from Juan Fernandez was collected from calcareous algae at a depth of 30 to 40 m.

Family Pandalidae

Austropandalus new genus

Definition: The rostrum is long, slender and immovable, having the upper margin provided with fixed as well as movable teeth. The carapace is smooth, not provided with longitudinal carinae. The eyes are large, having the cornea much broader than the eyestalk. The antennulae have the stylocerite rounded and short. The posterior lobe of the scaphognathite is truncate. The third maxilliped is devoid of an exopod. Epipods on the first four pairs of pereiopods. Arthrobranchs are present at the bases of all pereiopods except the fifth pair. The second legs are unequal, though in both the carpus is multiarticulate. The ischium of the first leg bears no laminar expansion.

Type. *Hippolyte Grayi* CUNNINGHAM (1871, Trans. Linn. Soc. Lond., vol. 27, p. 496, pl. 59 fig. 8).

This new genus, which at present contains the type species only, is most closely related to the genera *Pandalus* LEACH, 1814, and *Pandalina* CALMAN, 1899. It differs markedly from *Pandalus* by having part of the dorsal teeth of the rostrum immovable and by having the posterior lobe of the scaphognathite truncate. From *Pandalina* it may at once be distinguished by the presence of arthrobranchs at the bases of the first four pereiopods.

Austropandalus grayi (CUNNINGHAM) (Figures 3 and 4)

Hippolyte Grayi CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 496, pl. 59 fig. 8.
Pandalus paucidens MIERS, 1881, Proc. zool. Soc. Lond., 1881, p. 74, pl. 7 figs. 6, 7.
Nothocaris spiniserratus BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 663, pl. 132 fig. 1.
Hippolyte gaymardii CANO, 1888, Boll. Soc. Nat. Napoli, ser. 1 vol. 2, p. 181.
Pandalus paucidens A. MILNE EDWARDS, 1891, Miss. sci. Cap. Horn, vol. 6 pt. 2F, p. 43.
Pandalus paucidens PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, p. 547.
Pandalus paucidens LENZ, 1902, Zool. Jb. Suppl. vol. 5, p. 734.
Pandalus paucidens RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 607.
Pandalus (Pandalus) paucidens BORRADAILE, 1916, Nat. Hist. Rep. Brit. Antarct. Exped., Zool., vol. 3, p. 85.
Pandalus paucidens DE MAN, 1920, Siboga Exped., mon. 39a^3, p. 104.
Plesionika spiniserrata DE MAN, 1920, Siboga Exped., mon. 39a^3, p. 107.
Pandalus paucidens PORTER, 1936, Comun. Mus. Concepción, vol. 1. p. 154.
Pandalus paucidens PORTER, 1937a, Rev. Chil. Hist. nat., vol. 40, p. 339.
Hippolyte Grayi HOLTHUIS, 1947, Siboga Exped., mon. 39a^8, p. 22.

Material examined:

Lund University Chile Expedition

St. M 14. 2 specimens, 14 and 26 mm.
St. M 17. 1 specimen, 17 mm.
St. M 19. 21 specimens (3 ovigerous females, 33—36 mm), 15—36 mm.
St. M 20. 3 specimens (1 ovigerous female, 40 mm), 19—40 mm.
St. M 21. 144 specimens (76 ovigerous females, 29—49 mm), 13—49 mm. Shrimps were common among Bryozoa.
St. M 24. 24 specimens (16 ovigerous females, 31—38 mm), 16—38 mm.
St. M 27. 22 specimens (2 damaged ovigerous females), 12—32 mm.
St. M 29. 1 juvenile, 11 mm.

St. M 40. 11 specimens (5 ovigerous females, 35—46 mm), 34—46 mm.
St. M 42. 119 specimens (25 ovigerous females, 31—42 mm), 13—42 mm.
St. M 43. 12 specimens, 18—27 mm.
St. M 46. 17 specimens (3 ovigerous females, 34—36 mm), 15—36 mm.
St. M 47. 1 specimen, 20 mm.
St. M 95. 9 specimens (2 ovigerous females, 40 and 44 mm), 22—44 mm.
St. M 96. 17 specimens (3 ovigerous females, 40—42 mm), 35—42 mm.
St. M 97. 2 specimens, 39 and 42 mm.
St. M 98. 19 specimens, 36—45 mm.
St. M 101. 1 specimen, 45 mm.
St. M 104. 5 specimens (1 ovigerous female, 43 mm), 37—43 mm.
St. M 105. 7 specimens, 35—43 mm.
St. M 106. 9 specimens, 31—46 mm.
St. M 108. 11 specimens (1 ovigerous female, 43 mm), 9—43 mm.
St. M 138. 2 specimens (1 ovigerous female, 30 mm), 27 and 30 mm.
St. M 148. 9 specimens (2 damaged ovigerous females), 13—38 mm.

Museum Berlin

Calbuco, S.W. of Puerto Montt, and Cavancha near Iquique; leg. L. PLATE; Reg. No. 10447. — 2 ovigerous females, 37 and 41 mm.

Museum London

»Terra Nova» Expedition St. 42 (not 41 as BORRADAILE, 1916, states), 22°56′ S, 41°34′ W; bottom fauna; depth 73 m; Agassiz trawl; May 2, 1913: Reg. No. 1917. 1. 29. 67. 76. — 5 specimens, 38—52 mm (part of BORRADAILE's lot).

The rostrum is long and slender, it is curved upwards in the distal part and reaches with about $^1/_3$ of its length beyond the scaphocerite. The upper margin bears 6 or 7 teeth, 3 or 4 of which are placed on the carapace behind the orbit. The first dorsal tooth lies slightly behind the middle of the carapace. The first four dorsal teeth are movable, the ultimate teeth are immovably connected with the rostrum. The teeth have the top curved somewhat forwards, the antero-ventral side of these teeth bears near the apex some minute serrations, which are most distinct in the posterior teeth, being inconspicuous or even entirely lacking in the anterior. The apex is bifid by the presence of a small subapical dorsal tooth. Between this subapical tooth and the ultimate dorsal tooth the upper margin of the rostrum is unarmed for a distance which varies in length, sometimes it is slightly less than half as long as the dentate portion, sometimes it is almost as long as that portion. The lower margin of the rostrum bears 3 to 5, generally 4, immovable teeth, the distances between which become larger anteriorly. The carapace is smooth, showing no carinae. There are numerous very small body scales, which are placed in transverse rows on the carapace. The antennal spine is very strong and placed on the anterior margin of the carapace some distance below the rounded lower orbital angle. A small but distinct pterygostomian spine is present.

The abdomen also bears transverse rows of numerous minute body scales. The third abdominal segment has the posterior margin produced backwards in the middle. The pleurae of the first three segments are broadly rounded, those of the fourth and fifth segments end in a minute sharp point. The sixth abdominal segment is almost twice as long as the fifth. Its pleurae are small and sharply pointed, also the posterolateral angles end in a sharp point. The telson is almost as long as the

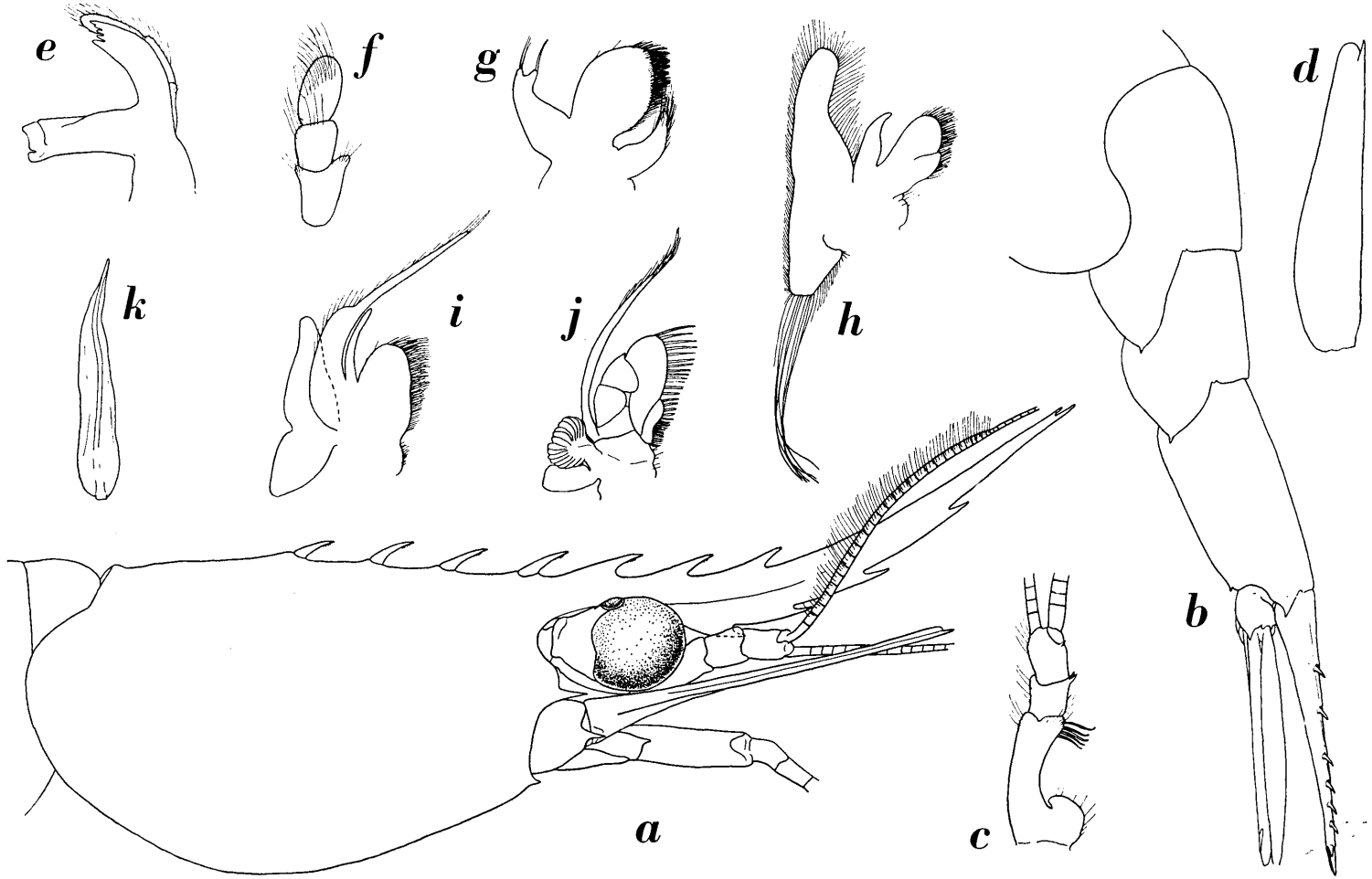

Fig. 3. *Austropandalus grayi* (CUNNINGHAM). a, anterior part of body in lateral view; b, posterior part of abdomen in lateral view; c, antennular peduncle; d, scaphocerite; e, mandible; f, mandibular palp; g, maxillula; h, maxilla; i, first maxilliped; j, second maxilliped; k, body scale. a—d, × 7; e—g, × 18; h—j, × 10; k, × 200.

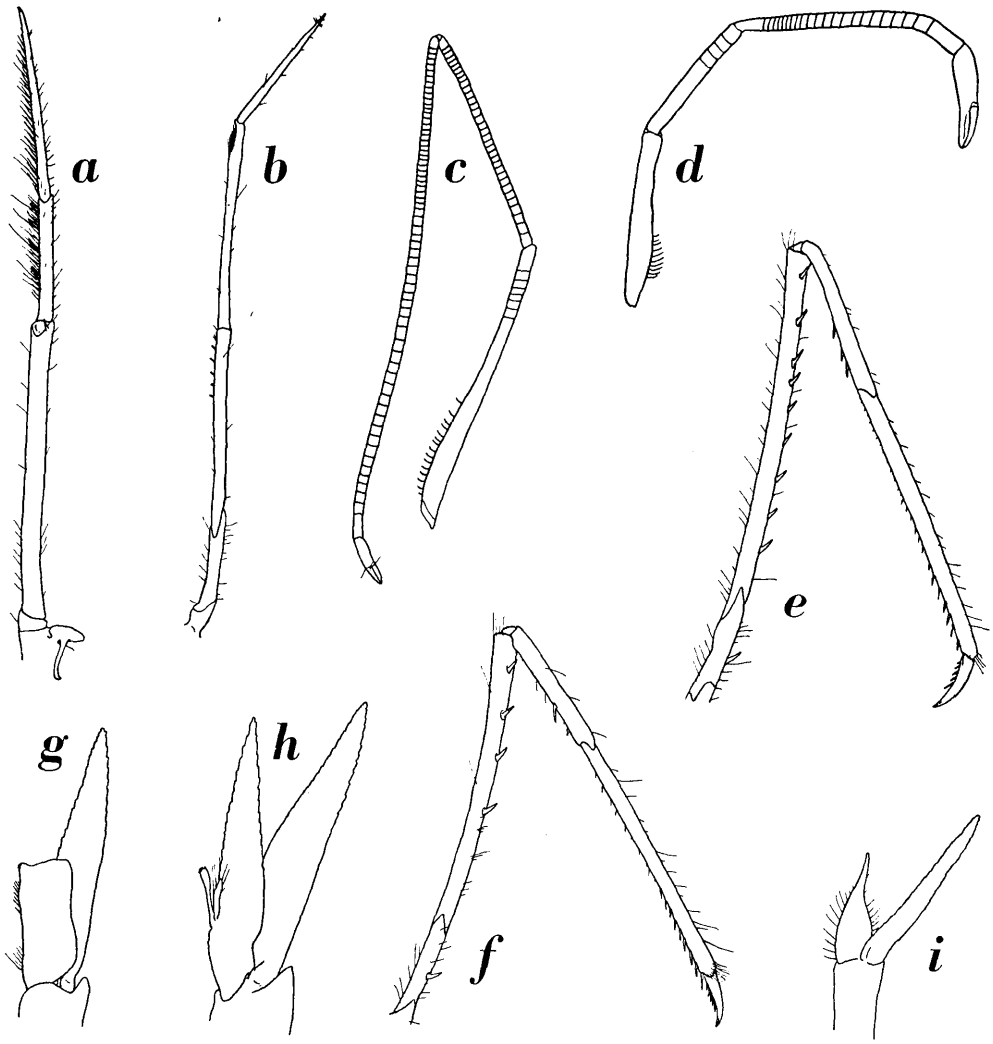

Fig. 4. *Austropandalus grayi* (CUNNINGHAM). a, third maxilliped; b, first pereiopod; c, left second pereiopod; d, right second pereiopod; e, third pereiopod; f, fifth pereiopod; g, first pleopod of male; h, second pleopod of male; i, first pleopod of female. a—f, × 7; g—i, × 10.

sixth and half the fifth abdominal segments combined. It bears five or six pairs of dorsal spines, the first of which generally stands at the end of the anterior third of the telson, the last three or four pairs are placed together in the posterior third. The posterior margin ends in a median point and bears three pairs of spines. Of these spines the intermediate are longest, the outer spines shortest. Often the dorsal spines are asymmetrically arranged, sometimes there are more spines on one half of the telson than on the other. The shorter pair of posterior spines sometimes is incomplete or wanting.

The eyes are well developed. The cornea is large and globular, it is much broader than the eyestalk. A large distinct ocellus is present.

The basal segment of the antennular peduncle is slender and at its base bears a short and broad stylocerite. The anterior margin of the stylocerite is broadly rounded. The second segment of the peduncle is somewhat shorter than the third. Together these two joints are shorter than the first. The outer flagellum has about 30 basal joints thickened, the inner flagellum is slender.

The scaphocerite overreaches the antennular peduncle with about half its length. It is slender, being about 4 times as long as broad. It is regularly narrowing towards the rounded apex. The outer margin is almost straight and ends in a strong final tooth, which somewhat overreaches the lamella.

The mandible has the incisor process ending in about 5 teeth, the molar process bears some teeth and ridges on its distal surface, a large three-jointed palp is present. The maxillula has the lower endite narrow, the upper endite is rather broad, the palp is bilobed. The maxilla has the lower endite strongly reduced and visible only as two small lobes, the upper endite is well developed and deeply incised: the upper lobe is broader than the lower. The palp is well developed, the scaphognathite is rather large and has the lower end truncate. The first maxilliped has the endites of basis and coxa only indistinctly separated, the palp is well developed, the exopod is large, having the flagellum and the caridean lobe well distinct, the epipod is large and bilobed. The second maxilliped has the last joint fused with the penultimate along the longer side, a well developed exopod is present, just like an epipod and a well developed podobranch. The third maxilliped reaches slightly beyond the end of the scaphocerite. The last joint is about 1.5 times as long as the penultimate and $^2/_3$ as long as the antepenultimate. The antepenultimate joint bears a small spine in the distal part of the outer margin. No exopod is present, but there is a distinct epipod and two arthrobranchs. The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	2	1	1	1	1	—
podobranchs	—	1	—	—	—	—	—	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	—	—	—	—	—	—

The first legs reach about as far forwards as the third maxillipeds. The chela has the fingers microscopically small. It is almost $^3/_4$ of the length of the carpus, which is about as long as the merus. The second legs are unequal. The right is the shorter, it fails to reach the end of the scaphocerite. The chela is small, it measures about $^2/_5$ of the length of the carpus. The carpus consists of 13 to 23 joints, the proximal of which often are indistinct. The first and last joints are longest. The merus is

somewhat more than half as long as the carpus; some indistinct annulations are visible in the distal part of the merus. The ischium is $^5/_4$ of the length of the merus, the proximal part of its inner margin is somewhat convex and bears a row of stiff, curved hairs. The left leg is much longer and more slender than the right. It reaches with more than half the carpus beyond the scaphocerite. The carpus is about 10 times as long as the chela and consists of about 65 to 75 joints, the first and last of these are longest. The merus is slightly less than half as long as the carpus and consists of about 34 to 40 joints. The ischium is about $^5/_4$ of the length of the merus and bears some indistinct annulations in its distal part. Here too the basal part of the ischium is broadened and bears some stiff hairs at the inner side. The third leg reaches with about half the propodus beyond the scaphocerite. The dactylus is short, it bears some 5 spines in the proximal part of the posterior margin, another spine is placed under the tip of the dactylus and pressed against the posterior margin, so that it is hardly at all visible. The propodus is about 4.5 times as long as the dactylus. The posterior margin of the propodus bears a rather large number of spinules, the distal of which are most distinct. The carpus is slightly more than half as long as the propodus. Its posterior margin bears two parallel rows of strong spines, the inner of which consists of two or three, the outer (not shown in fig. 4e) of about three to to five spines. The distal of the outer spines is by far the strongest. The merus is about twice as long as the carpus. It too bears two parallel rows of strong spines on the posterior margin. The inner of these rows consists of 8 or 9, the outer of 6 or 7 spines, the distal of which is strongest. The ischium measures about $^1/_4$ of the length of the merus, it bears one inner spine. The fourth leg is intermediate in shape between the third and the fifth. The fifth leg is distinctly shorter than the third, it reaches slightly beyond the scaphocerite (sometimes with part of the dactylus, sometimes with a very small part of the propodus). The dactylus strongly resembles that of the third leg. The propodus is about 4.5 times as long as the dactylus, it has spinules as in the third leg. There are more hairs in the distal part of the propodus of the fifth leg than in that of the third. The carpus is somewhat more than half as long as the propodus; of the two posterior rows of spines the inner bears 0 to 1, the outer 3 spines. The merus is slightly longer than the propodus, the inner row of posterior spines consists of 3 or 4, the outer row of 5 or 6 spines. Between the outer spines sometimes smaller spines are placed, so that the long spines alternate with the shorter. The ischium is about $^1/_3$ of the length of the merus, it bears one inner spine.

The males have the endopod of the first pleopod large and quadrangular, the top being broadly truncate. At the antero-internal angle a group of small curved hooks is present, some hairs are placed on the inner margin. The second pleopod of the male has the appendix masculina shorter than the appendix interna. The female has the endopod of the first pleopod ending in a long, narrow and slender point. The other pleopods have the endopod provided with a well developed appendix interna. The uropods are elongate. They are about as long as the telson. The exopod has the outer margin ending in a distinct tooth, which at its inner side bears a strong movable spine.

The eggs are numerous and rather small, being 0.45 to 0.7 mm in diameter.

In juvenile specimens the rostrum is relatively much shorter and straighter, the number of carpal joints of the second legs is smaller, and of the last three legs the dactyli are somewhat more slender, while the other joints bear less spines.

Colour. Dr. BRATTSTRÖM noted that the animals in life are transparent with red lines. In the preserved material the original colour pattern is still visible. On the carapace there is a red line parallel to and close near the lateral margin, this line extends forwards on the antennal peduncle. Backwards it suddenly curves upward (under an angle of about 90 degrees) and runs towards the median region of the carapace, where it stops short before the actual median line. Furthermore there is a V-shaped line, which occupies almost the entire lateral surface of the carapace. One of the ends of the V lies just behind the orbit, the other end lies in the postero-median region of the carapace slightly before the end of the first mentioned red line. Often a small line branches off in a postero-lateral direction from the posterior part of the V-shaped line. The antennal flagella are banded red and white. A red line runs along the inner margin of the scaphocerite. Finally some indistinct red markings are found on the lateral surfaces of the abdomen.

CUNNINGHAM's description and figure of *Hippolyte Grayi* are imperfect, but give sufficient details to ascertain the identity of his specimen with the present species. MIERS (1881) described the species as new and correctly recognized it as a Pandalid prawn. The third record of the species is that of BATE (1888), who for the third time described it as new and placed it for the third time in a different genus. As is clear from BATE's description and figure, *Nothocaris spiniserratus* is nothing else but the present species. BATE's fig. 1c in all probability is made after a juvenile specimen. MIERS's (1881) name is the one used by most subsequent authors.

CANO (1888) described a species as *Hippolyte gaymardii* EDWARDS from the Magellan Strait. As is clearly shown by CANO's description, his specimen, an ovigerous female, belongs to the present species and not to *Eualus gaimardi* (H. MILNE EDWARDS), which is a species of Hippolytidae with an arctic circumpolar distribution.

The two specimens of this species reported by LENZ (1902) from Cavancha and Calbuco, could be examined by me, they proved to be ovigerous females and agree well with the description given here.

Distribution. The species has been recorded in literature from the following localities: Cavancha near Iquique, N. Chile (LENZ, 1902), Bahía de Talcahuano (PORTER, 1936, 1937a)[1], Calbuco, Llanquihue, Chile, at about 41°45′ S, 73°40′ W (LENZ, 1902), Port Otway, Chile, 46°53′15″ S, 75°12′ W (CUNNINGHAM, 1871; BATE, 1888), Trinidad Channel, S. of Mornington and Great Wellington Islands, Chile (MIERS, 1881), Tom Bay, Concepción Channel, Madre de Dios Island, Chile (MIERS, 1881), Magellan Strait (CANO, 1888), off Punta Arenas, Magellan Strait, Chile (A.

[1] This record is not certain, since PORTER states that he includes in his list of Talcahuano Crustacea a few species that are not actually known to him from that locality, but that have been reported from localities north as well as south of Talcahuano.

MILNE EDWARDS, 1891), Gretton Bay, northern part of Wollaston Island, Chile, at about 55°38′ S, 67°15′ W (A. MILNE EDWARDS, 1891), off Cabo Frio, near Rio de Janeiro, Brazil, 22°56′ S, 41°34′ W (BORRADAILE, 1916). The species has been reported from depths between 24 and 143 m, from rocky and sandy bottoms.

The two specimens reported upon by LENZ (1902) are preserved in a single jar containing two locality labels: »Cavancha» and »Calbuco». It is of course possible that one of these specimens was found at one of the localities and the other specimen at the second locality. But since *Austropandalus* is known exclusively from the antiboreal region except for LENZ's record from Cavancha (and that of BORRADAILE, 1916, from Cabo Frio), it seems possible to me that the label »Cavancha» has been added to this lot by mistake, and that thus both specimens originate from Calbuco.

I also could examine the material referred by BORRADAILE (1916) to the present species and found far outside the antiboreal region of S. America. The material is preserved in the British Museum, and through the kindness of Dr. ISABELLA GORDON I received part of the lot on loan. The specimens indeed belong to *Austropandalus grayi* as was shown by comparison to the material of the Lund University Expedition. It is surprising to find this species, which otherwise seems to be restricted to the southernmost tip cf the South American continent, as far north as St. 42[1] (22°56′ S) of the Terra Nova Expedition. One sooner should expect the material to originate from St. 38, which lies west of the Falkland Islands. A thorough exploration of the coastal waters of the east coast of S. America perhaps may solve this and similar puzzling problems.

Family Alpheidae

Betaeus truncatus DANA (Figures 5 and 6)

Betaeus truncatus DANA, 1852, Proc. Acad. nat. Sci. Phila., 1852, p. 23.
Betaeus truncatus DANA, 1852a, U.S. Explor. Exped., vol. 13, p. 559.
Betaeus truncatus WEITENWEBER, 1854, Lotos, Praha, vol. 4, p. 14.
Betaeus truncatus DANA, 1855, U.S. Explor. Exped., vol. 13 atlas, p. 11, pl. 35 fig. 10.
Alpheus Sinuosus GUÉRIN, 1857, Sagra's Histoire Cuba, Crust., p. li.
Betaeus truncatus CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 496.
Alpheus (*Betaeus*) *scabrodigitus* MIERS, 1881, Proc. zool. Soc. Lond., 1881, p. 73.
Alpheus sinuosus KINGSLEY, 1883, Bull. Essex Inst., vol. 14, p. 124, pl. 2 fig. 6.
Alpheus truncatus KINGSLEY, 1883, Bull. Essex Inst., vol. 14, p. 125.
Alpheus scabrodigitus A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 Zool., pt. 2F, p. 49.
Alpheus truncatus PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol, 2, p. 547.
Alpheus sinuosus SHARP, 1893, Proc. Acad. nat. Sci. Phila., 1893, p. 114.
Betaeus truncatus COUTIÈRE, 1896, Bull. Mus. Hist. nat. Paris, vol. 2, p. 383.
Betaeus truncatus COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 13, 16, 18, 34. 47, 68, 111, 134, 163, 188, 189, 246, 263, 306, 313, 328, 329, 344, 461, 481, 520, 522, textfigs. 14, 91, 145, 145 bis, 171, pl. 6 fig. 3.

[1] Dr. GORDON pointed out to me that BORRADAILE made an error when he stated that his material originated from St. 41 of the »Terra Nova» Expedition. Actually the specimens were collected at St. 42. The situation of these two stations is exactly the same; at St. 41, however, plankton samples were taken, while at St. 42 the bottom fauna was collected.

Betaeus truncatus LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 733.
Betaeus truncatus DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 27, fig. 2.
Betaeus truncatus RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 605.
Betaeus truncatus DE MAN, 1911, Siboga Exped., mon 39a[1], p. 173.
Betaeus truncatus PORTER, 1936, Comun. Mus. Concepción, vol. 1. p. 154.
Betaeus truncatus PORTER, 1937a, Rev. Chil. Hist. nat., vol. 40, p. 339.

Material examined:

Lund University Chile Expedition

St. M 13. 1 ovigerous female, 17 mm, and 1 postlarva, 6 mm.
St. M 16. 6 specimens (1 ovigerous female, 22 mm), 20—30 mm. Shrimps found in large numbers in the holes of a sunken tree trunk.
St. M 19. 2 specimens, 21 and 27 mm.
St. M 23. 1 specimen, 16 mm.
St. M 27. 1 specimen, 19 mm.
St. M 29. 1 specimen, 11 mm.
St. M 40. 1 specimen, 25 mm.
St. M 42. 1 juvenile, 11 mm.
St. M 46. 6 specimens, 15—22 mm.
St. M 59. 2 specimens, 14 and 19 mm. The shrimps found in crevices in stones.
St. M 87. 6 specimens (3 ovigerous females, 23—27 mm), 16—27 mm. The shrimps found to be rather common.
St. M 98. 2 specimens, 29 and 38 mm.
St. M 106. 2 specimens (1 ovigerous female, 25 mm), 25 and 29 mm.
St. M 107. 1 specimen, 32 mm.
St. M 108. 2 specimens, 8 and 25 mm.
St. M 148. 6 specimens, 9—17 mm.

Museum Berlin

Cavancha near Iquique, N. Chile: leg. L. PLATE; Reg. No. 10459. — 7 specimens (1 ovigerous female, 36 mm), 11—36 mm. (The three smaller specimens in a separate tube with the label: »30 m Tiefe. Cavancha».)

Molle near Iquique; depth 20 m; leg. L. PLATE; Reg. No. 10457. — 5 specimens, 9—25 mm.

Guyacán near Coquimbo; leg. L. PLATE; Reg. No. 10461. — 4 ovigerous females, 21—25 mm.

Tumbes near Talcahuano, Concepción; leg. L. PLATE; Reg. No. 10460. — 3 specimens (1 ovigerous female, 20 mm), 20—26 mm.

Puerto Montt, S. Chile; leg. L. PLATE; Reg. No. 10458. — 4 specimens (3 ovigerous females, 23—26 mm), 23—29 mm.

Museum London

Puerto Bueno, W. Patagonia; December 7, 1868; leg. R. O. CUNNINGHAM. — 1 specimen in a very poor condition.

The carapace is smooth, there is no rostrum, nor are there any spines on the carapace. The antero-median part of the carapace forms a dorsal hood over both eyes, which thereby are visible in frontal view only. The orbital hood is a little depressed in the extreme anteromedian region, while a shallow median groove runs over the length of the hood. The anterior margin of the hood is slightly convex. Laterally of the orbital hood the anterior margin of the carapace is slightly concave. The anterolateral angles of the carapace are broadly rounded and produced slightly forwards. The posterior margin of the carapace shows a distinct cardiac notch at each side.

The abdomen is smooth and has the pleurae of the first four segments rounded. The pleurae of the fifth segment end in a small posteriorly directed point. The sixth segment is about as long as the fifth. Its pleurae are movably connected with

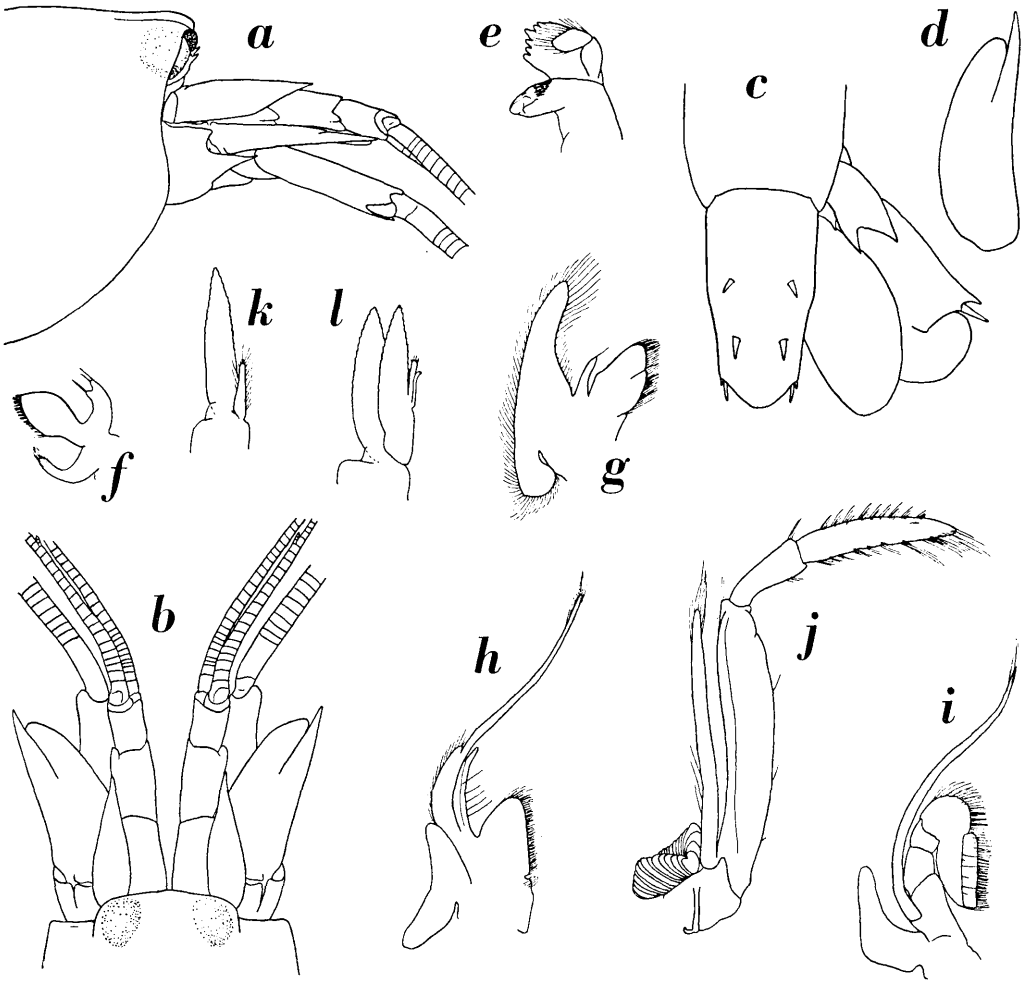

Fig. 5. *Betaeus truncatus* DANA. a, anterior part of body in lateral view; b, anterior part of body in dorsal view; c, telson and uropods in dorsal view; d, scaphocerite; e, mandible; f, maxillula; g, maxilla; h, first maxilliped; i, second maxilliped; j, third maxilliped; k, first pleopod of male; l, second pleopod of male. a—l, × 7.

the segment proper, they are triangular and pointed, strongly resembling the movable pleurae of the sixth abdominal segment in *Athanas* and *Nauticaris*. The posterolateral angles of the sixth segment are pointed too. The telson is about 1.5 times as long as the sixth abdominal segment. It is almost twice as long as broad. There are two pairs of dorsal spines, the first of which is placed slightly before the middle of the telson, the other lies about halfway between the first pair and the posterior margin of the telson. This posterior margin is convex, at each lateral angle it bears 2 spines, the inner of which is much longer and stronger than the outer, and almost reaches the tip of the telson.

The eyes are covered dorsally by the carapace, but anteriorly they are free. The cornea is rounded and pigmented. The eyestalk is very short, it bears a small but distinct spine at the anterior part of the inner side.

The basal segment of the antennular peduncle has the stylocerite rather broad and sharply pointed, reaching almost to the end of the second joint of the peduncle. The basal segment moreover bears a rather strong anteriorly curved tooth in the anteroventral region. The second segment of the peduncle is longer than the third and somewhat shorter than the first. The inner flagellum is single, the outer consists of two rami, which are fused for 8 to 18 joints (8 in very juvenile, 18 in adult specimens), while two or three joints of the shorter ramus are free.

The scaphocerite reaches about as far forwards as the antennular peduncle. It is three times as long as broad. The outer margin is straight or slightly concave in the middle, and ends in a strong tooth, which distinctly overreaches the lamella. The latter is broadest in its basal part and gradually narrows anteriorly. The antennal peduncle reaches about to the end of the scaphocerite. A broad and sharp tooth is present on the antennal peduncle near the base of the scaphocerite.

The mandible has the incisor process rather broad and provided with several teeth, the molar process bears some ridges and a small field of hairs, the palp is two-jointed. The maxillula is of the usual type with the lower endite slender, the upper broader and with the palp distinctly bilobed. The maxilla has the upper endite large, deeply bilobed and provided with many hairs. The lower endite is small, triangular, being strongly reduced. The upper margin of the upper endite is triangularly produced in the basal part. The palp and the scaphognathite are normal in shape. The maxillipeds all are provided with well developed exopods. The endites of the first maxilliped are separated by a distinct notch, the palp is long and slender, the caridean lobe narrow but distinct, the epipod is bilobed. The second maxilliped is of the normal shape, the last joint is fused with the penultimate along its longer side, a distinct epipod, but no podobranch is present. The third maxilliped reaches about to the end of the antennal peduncle or fails to reach so far. The last joint is slightly less than twice as long as the penultimate. The antepenultimate joint is somewhat longer than the two distal joints combined. A longitudinal carina runs over the posterior surface of the antepenultimate joint parallel and close to the outer margin. A slender epipod and an arthrobranch are present. The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	1	—	—	—	—	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	1	—	—	—	—	—

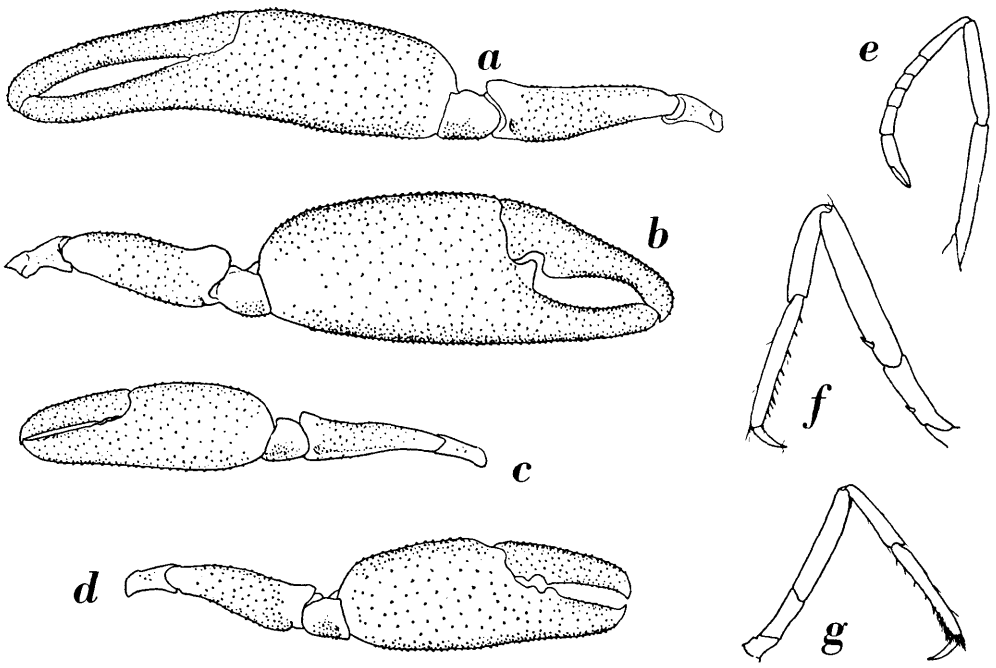

Fig. 6. *Betaeus truncatus* DANA. a, right first pereiopod of adult male; b, left first pereiopod of adult male; c, right first pereiopod of female; d, left first pereiopod of female; e, second pereiopod; f, third pereiopod; g, fifth pereiopod. a, b, × 2.7; c, d, × 4; e—g, × 5.

The first legs of the adult male (a specimen of 38 mm from *St. M 98* is described here) have the chelae strongly unequal. These legs reach with the chelae beyond the scaphocerite. The right leg in this specimen is the longer and the more slender but my other material shows that the more slender leg also may be the left. The fingers are longer than the palm, they end in a sharp curved point. The cutting edges are armed with about four small blunt teeth, which are placed close together in the extreme basal part of the fingers, the rest of the cutting edge is unarmed. The fingers gape distinctly except in the basal part where the cutting edge is toothed. The palm is somewhat compressed and narrows slightly proximally. The carpus is short and cup-shaped, measuring about $^1/_6$ of the length of the chela. The anterior margin of the carpus shows a small, about rectangular, tooth at the upper and a larger, more rounded tooth at the lower surface. The merus is about 0.8 times as long as the palm, it is triangular in transverse section. The upper margin ends in a rather acute anterior point. The ischium is short. All the joints are covered with small tubercles of a yellow horn-coloured substance. The left leg of my adult male is more robust than the right. The fingers are somewhat shorter than the palm. As in the right leg they have the tips sharp and curved, while they also gape for the larger part of their length. The cutting edge of the fixed finger, however, possesses one large tooth, which fits between two large teeth of the cutting edge of the dactylus.

These three teeth are placed in the extreme basal portion of the fingers. The palm is compressed, it is higher than that of the right leg. The other joints of the left leg are exactly similar to those of the right. In my female of 29 mm (also from *St. M 98*) the first legs are quite different from those of the male. They reach with part of the palm only beyond the scaphocerite. In this specimen too the right leg is the slenderer. It has the fingers $^5/_6$ of the length of the palm and closing over their entire length. In the basal part of the cutting edges of both fingers two indistinct teeth are visible. The palm is compressed. The carpus, merus and ischium are as in the male. The left leg too has the fingers shorter than the palm. It resembles the right leg, but it is higher, furthermore the fingers are somewhat gaping and are provided with two strong teeth each. These teeth are placed in the basal part of the cutting edge. A male of 32 mm (*St. M 107*) and one of 29 mm (*St. M 106*) resemble the large male of *St. M 98* in the shape of the robust leg; the slender first leg of the smaller specimens, however, differs from that of the larger specimen by having the fingers slightly shorter than the palm, closing over their entire length and having the teeth of the cutting edge indistinctly marked. This leg is, however, more slender than the right chela of the female from *St. M 98*. In the ovigerous females from *St. M 87*, one has only the right leg, which is shaped like the left leg of the large female, another possesses the left leg, which is like the right of the large female, the fingers being, however, more narrow. The third ovigerous female has the right leg like that of the large female, while the left is very small, probably regenerating. A non-ovigerous female of the same lot has both legs equal and like the right leg of the large female (from *St. M 98*), with the fingers somewhat narrower. A male of 19 mm, with the chelae equal and similar in shape to those of the just mentioned female, is present in the material from *St. M 59*. In a very juvenile specimen from *St. M 108* (8 mm in length), the second chelipeds are smooth and equal in shape and size. They resemble the right leg of the large female from *St. M 98*, but are more slender and have the fingers proportionally shorter. The second pereiopods are equal. In adult specimens they reach slightly beyond the scaphocerite, in juveniles they overreach that scale with part of the carpus. The carpus is about three times as long as the chela and consists of five joints. The proximal of these joints is the longest, it is about as long as the three following joints together and about twice as long as the distal joint. The merus is $^2/_3$ of the length of the carpus. The ischium measures $^4/_5$ of the length of the carpus. The third pereiopod reaches slightly less far forwards than the second leg. The dactylus is simple, it is somewhat less than $^1/_3$ of the length of the propodus. The latter has the posterior margin provided with a longitudinal row of spinules. The carpus measures $^2/_3$ of the length of the propodus, while the merus is somewhat longer than the latter joint. A strong spine is present in the basal part of the inner margin of the merus. A similar, but smaller spine is placed at the inner margin of the ischium. The ischium is less than half as long as the merus. The fourth pereiopod strongly resembles the third. The spinulation of its joints, for instance, is exactly as in the third leg. The fifth pereiopod is distinctly shorter and slenderer than the third, it reaches to or almost to the base of the scaphocerite (slightly beyond this

scale in juveniles). The dactylus is simple and about $^1/_3$ of the length of the propodus. The posterior margin of the propodus bears a few spinules, while in its distal part it is provided with transverse rows of hairs. The carpus is about $^2/_3$ of the length of the propodus. The merus is as long as the propodus and slightly more than twice as long as the ischium. There are no spinules on either merus or ischium.

The first pleopod of the male has the endopod short and narrow, without any appendix. The first pleopod of the female has the endopod small and narrow too. The second pleopod of the male has the appendix masculina well developed, reaching distinctly beyond the appendix interna. The third to fifth pleopods of the male, and the second to fifth pleopods of the female are provided with an appendix interna only. The uropods have the basal joint provided with a large bifurcate process, which reaches over the bases of the endo- end exopod, and has the inner tooth shorter than the outer. The endopod is broadly ovate, the exopod has the outer margin ending in a strong tooth at the inner side of which there is a strong movable spine. A distinct diaeresis is present on the exopod.

The eggs are numerous and small. They are 0.5 to 0.7 mm in diameter.

A young postlarval stage (from *St. M 13*), which probably belongs in the present species, shows a pointed rostrum.

Colour. The collectors of the Lund University Expedition give the colour of the living animals as »svartaktig» (blackish), »svart-blågrön» (blackish blue-green), and »grågrönsvart» (gray-green-black). The material from Puerto Montt of the PLATE collection (Museum Berlin) was provided with a label »Im Leben schwarzgrün».

The specimen referred by CUNNINGHAM (1871) to *Betaeus truncatus* is preserved in the collection of the British Museum. It is in a very poor state. Notwithstanding this condition its identity with the present species could be proved.

Alpheus sinuosus is characterized by GUÉRIN (1857) as follows: »Espèce très-voisine de la précédente [*Alpheus Affinis*, a species incerta according to Coutière, 1899, p. 18], mais offrant, au milieu du front et à la place d'une carène, un faible sillon peu limité, mais manifestement marqué.» COUTIÈRE (1899, p. 18) identified the specimen provisionally as *Betaeus truncatus*. As in *B. truncatus* the median groove of the orbital hood generally is somewhat more distinct than in *B. emarginatus*, and as the first leg of the type of *Alpheus sinuosus* as it was figured by KINGSLEY (1883) strongly resembles that of a not fullgrown specimen of *B. truncatus*, I believe COUTIÈRE's identification to be correct.

COUTIÈRE (1899, p. 13) identifies *Alpheus laevigatus* NICOLET as the present species. I cannot agree with COUTIÈRE in this respect and regard this name as a synonym of *Alpheus emarginatus* H. MILNE EDWARDS (vide under *Betaeus emarginatus*). In the same work COUTIÈRE (1899, pp. 34, 47) identifies the specimens named *Alpheus scabrodigitus* by MIERS (1881) and A. MILNE EDWARDS (1891), with the present species. COUTIÈRE's identification may be trusted since he had access to the actual specimens of MIERS and A. MILNE EDWARDS.

COUTIÈRE (1899, p. 16) remarks that DANA's figure of *B. truncatus* represents an exception, and that the chelae in this species are rarely as elongate as shown in that

figure. The present material, however, proves that the elongate chelae are found in old specimens, and that the specimen figured by DANA must be such an old specimen. COUTIÈRE's (1899) fig. 14, said to be of *Betaeus truncatus*, shows a concave anterior margin of the orbital hood; this feature is not shown by any of my *truncatus* specimens, where this margin always is slightly convex, and I find this even a good character to distinguish *B. truncatus* from *B. emarginatus*. In the latter species, namely, the anterior margin of the orbital hood is emarginate in the middle, exactly as in COUTIÈRE's fig. 14. DOFLEIN & BALSS (1912) make a mistake when they state that the elongate chela is found in juvenile specimens only. Furthermore they say:» Auch fehlt an dem Merus der Pereiopoden ein Stachel.» This of course is not correct as the meri of the third and fourth pereiopods are provided with a distinct spine in the proximal part of the posterior margin, this spine indeed is lacking in the fifth leg. Possibly DOFLEIN & BALSS mean to say that the anterodistal spine of the merus is absent. In DANA's (1855, pl. 35 fig. 12f) figure of a pereiopod of *Betaeus scabrodigitus* (=*B. emarginatus*) such an anterodistal spine is figured on the merus. This spine in DANA's figure probably was drawn by error as I did not find such a spine in my material of *Betaeus emarginatus*, only some hairs are present there.

I could reexamine the specimens referred by LENZ (1902) to the present species and found them to be correctly identified.

Distribution. The species has been recorded in literature from: Chile (COUTIÈRE, 1896), Cavancha near Iquique, N. Chile (LENZ, 1902), Guayacán Bay near Coquimbo (LENZ, 1902), Callao, Chile[1] (GUÉRIN, 1857; KINGSLEY, 1883; SHARP, 1893), Tumbes near Talcahuano, Concepción (LENZ, 1902), Bahía de Talcahuano (PORTER, 1936, 1937a), Puerto Montt, Llanquihue (LENZ, 1902; DOFLEIN & BALSS, 1912), Isla Tenglo near Puerto Montt (DOFLEIN & BALSS, 1912), Trinidad Channel, S. of Mornington and Great Wellington Islands (MIERS, 1881), Portland Bay, Concepción Channel, about 50°10′ S, 74°40′ W (MIERS, 1881), Puerto Bueno, opposite Hanover Island, about 51° S, 74°10′ W (CUNNINGHAM, 1871), Long Island, Smith Channel, W. Patagonia (DOFLEIN & BALSS, 1912), Puerto Angosto, Santa Ines Island, Magellan Strait, about 53°25′ S, 73° W. (DOFLEIN & BALSS, 1912), Borja Bay, Cordova Peninsula, Magellan Strait, about 53°30′ S, 72°35′ W (MIERS, 1881), Orange Bay, Hardy Peninsula, Hoste Island (A. MILNE EDWARDS, 1891), Hermite Island near Cape Horn (DANA, 1852), Cape Horn (COUTIÈRE, 1896), Picton Island at about 55° S, 67° W (DOFLEIN & BALSS, 1912). The species has been recorded from depths varying between 7 and 30 m; it has been found living among algae (DOFLEIN & BALSS, 1912). In the collection of the Berlin Museum there are four specimens of this species from Molle near Iquique, which were collected by Dr. L. PLATE and identified by Dr. H. LENZ as the present species. They are, however, not mentioned in LENZ's (1902) paper on the Crustacea of the PLATE collection.

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[1] GUÉRIN states: »De Callao, au Chili.» Probably Fort Callao near Valparaíso is meant. SHARP's (1893) statement that GUÉRIN's type specimens originate from Callao, Peru, must be an error.

Betaeus emarginatus (H. MILNE EDWARDS) (Figure 7)

Alpheus emarginatus H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 357.
Alpheus laevigatus NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 215 (non GUÉRIN, 1838).
Betaeus scabro-digitus DANA, 1852, Proc. Acad. nat. Sci. Phila., 1852, p. 23.
Betaeus scabro-digitus DANA, 1852a, U.S. Explor. Exped., vol. 13, p. 560.
Betaeus scabrodigitus WEITENWEBER, 1854, Lotos, Praha, vol. 4, p. 35.
Betaeus scabro-digitus DANA, 1855, U.S. Explor. Exped., vol. 13 atlas, p. 11, pl. 35 fig. 12.
Alpheus Emarginatus GUÉRIN, 1857, Sagra's Histoire Cuba, Crust., p. li.
Alpheus laevigatus PHILIPPI, 1860, Reise Wüste Atacama, p. 169.
Betaeus scabro-digitus CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 496.
Betaeus scabro-digitus CUNNINGHAM, 1871a, Notes nat. Hist. Strait Magellan, p. 371.
non *Alpheus* (*Betaeus*) *scabrodigitus* MIERS, 1881, Proc. zool. Soc. Lond., 1881, p. 73.
Alpheus scabrodigitus KINGSLEY, 1883, Bull. Essex Inst., vol. 14, p. 125.
non *Alpheus scabrodigitus* A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 Zool., pt. 2F, p. 49.
Alpheus scabrodigitus PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, p. 547.
Betaeus scabrodigitus COUTIÈRE, 1896, Bull. Mus. Hist. nat. Paris, vol. 2, p. 384.
Betaeus emarginatus COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 11, 16, 18, 68, 188, 189, 246, 263, 306, 313, 329, 344, 461, 481, fig. 388.
Betaeus sp. NOBILI, 1901, Boll. Mus. Zool. Anat. comp. Torino, vol. 16 n. 402, p. 3.
Betaeus scabrodigitus LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 732.
Betaeus sp. NOBILI, 1902, Rev. Chil. Hist. nat., vol. 6, p. 233.
Betaeus scabrodigitus RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 605.
Betaeus scabrodigitus DE MAN, 1911, Siboga Exped., mon. 39a[1], p. 173.

Material examined:

Lund University Chile Expedition

St. M 55. 9 specimens, 27—53 mm. The shrimps were common in rockpools.

St. M 125. 5 specimens (1 ovigerous female, 36 mm), 18—36 mm.

St. M 158. 4 specimens (2 ovigerous females, 27 and 32 mm), 27—34 mm.

Museum Berlin

Cavancha near Iquique, N. Chile; leg. L. PLATE; Reg. No. 10455. — 4 specimens (1 ovigerous female, 34 mm), 26—35 mm. This jar contains a label »*Betaeus scabrodigitus* DANA, dét. COUTIÈRE».

Molle near Iquique; depth 20 m; leg. L. PLATE; Reg. No. 10456. — 1 specimen, 35 mm.

Isla de Pajaros near La Serena; leg. L. PLATE; Reg. No. 10454. — 1 ovigerous female, 36 mm.

Tumbes near Talcahuano; leg. L. PLATE; Reg. No. 10453. — 6 specimens (3 ovigerous females, 38—40 mm), 30—40 mm. This jar contains also a label »Calbuco oder Tumbes, ohne Etikett.«

Museum London

Lota, Arauco Bay, S. of Concepción; June 6, 1868; leg. R. O. CUNNINGHAM; Reg. No. 69. 37. — 2 specimens, 50 and 51 mm (1 incomplete specimen of the original lot has not been seen by me).

Museum Turin

San Vicente, Chile; leg. F. SILVESTRI; 1900. — 2 specimens, 14 and 18 mm.

As in the previous species the body is rather thick-set. The carapace is smooth, without a rostrum or any spines. An orbital hood, like in *B. truncatus* is present and forms a dorsal cover over the eyes. This orbital hood is a little depressed in the

extreme antero-median part and here its anterior margin is somewhat emarginate. Immediately laterally of the orbital hood the anterior margin of the carapace forms a blunt forwards directed angle. This margin also is produced to such an inconspicuous rounded angle near the base of the antennae. The anterolateral angle of the carapace is rounded. A cardiac notch is present in the posterior margin of the carapace.

The abdomen is smooth. The pleurae of the first five segments are broadly rounded, that of the sixth segment ends in a point. This pleura, like in the previous species, is movably connected with the rest of the segment. The posterolateral angles of the sixth segment are rounded. The telson is about 1.5 times as long as the sixth segment, the latter is of about the same length as the fifth abdominal segment. The telson is less than twice as long as broad. Its dorsal surface bears two pairs of spines, which are placed rather close together in the middle of the length of the telson. The posterior margin is broadly posteriorly produced and bears two pairs of small spines, which are placed at the posterolateral angles. The inner of these spines are somewhat longer than the outer, but largely fail to reach as far as the distal end of the telson.

The eyes dorsally are covered by the carapace. They are rather short, the cornea is broad, rounded and pigmented. A small inconspicuous tubercle is present at the antero-internal part of the eyestalk.

The basal segment of the antennular peduncle has the stylocerite strong, triangular in shape and with a sharp apex. This stylocerite reaches almost to the end of the second segment of the antennular peduncle. The second segment is about as long as the third and shorter than the first. The peduncle is much shorter and more robust than that of *Betaeus truncatus*. The inner flagellum is single, the outer consists of two rami, which are fused for their larger part (11 to 24 joints); a very small part (2 to 4 joints) of the shorter ramus is free.

The scaphocerite reaches about as far forwards as the antennular peduncle. It is almost twice as long as broad, not conspicuously narrowing anteriorly as in *B. truncatus*. The outer margin is slightly convex and ends in a tooth, which somewhat overreaches the lamella. The anterior margin of the lamella is broadly rounded. The antennal peduncle overreaches the scaphocerite for a small distance. There is a large and broad external spine near the base of the scaphocerite.

The oral parts do not differ notably from those of *Betaeus truncatus*. The third maxilliped reaches about to the middle or to the end of the scaphocerite. The ultimate joint is somewhat more than twice as long as the penultimate. Together they are about as long as the antepenultimate joint. The outer anterolateral corner of the antepenultimate joint is conspicuously produced. As in the previous species a longitudinal carina runs, near the outer margin, over the posterior surface of the antepenultimate segment. A slender epipod and an arthrobranch are present. The branchial formula is as in the previous species.

The first pereiopods are unequal. In the adult male they reach with the larger part of the chela beyond the scaphocerite. In my largest male (54 mm) in which both legs are present, the left is the most robust. The fingers are short, measuring somewhat

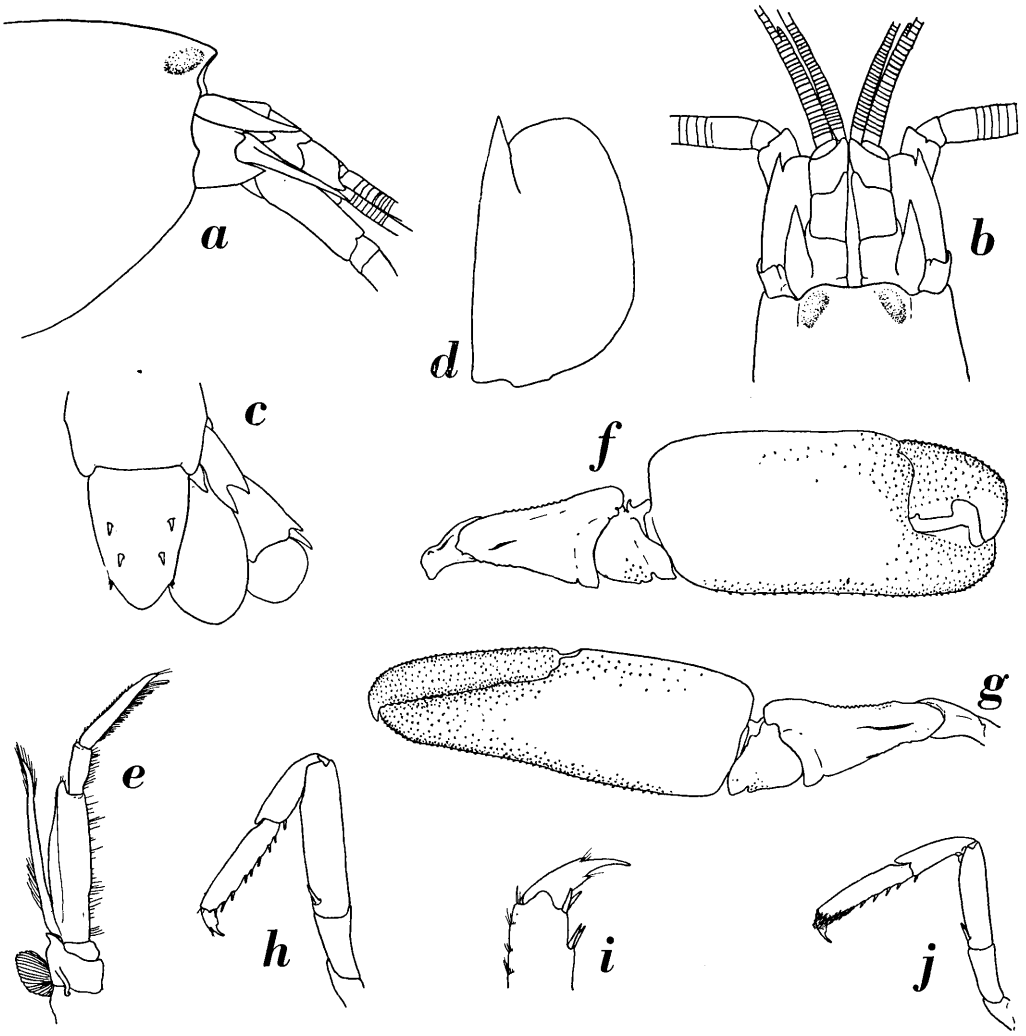

Fig. 7. *Betaeus emarginatus* (H. Milne Edwards). a, anterior part of body in lateral view; b, anterior part of body in dorsal view; c, telson and right uropod in dorsal view; d, scaphocerite; e, third maxilliped; f, left first pereiopod of male; g, right first pereiopod of male; h, third pereiopod; i, dactylus of third pereiopod; j, fifth pereiopod. a—c,e, × 3.5; d,i, × 7; f—h,j, × 3.

less than half the length of the palm. They are high and thick, the tips are strongly curved, being placed almost perpendicularly on the longitudinal axis of the fingers. The cutting edge of the dactylus bears two broad teeth in its proximal half, while the cutting edge of the fixed finger possesses one large tooth. The palm is slightly less than twice as long as high and about quadrangular in outline. It is somewhat compressed. The fingers and the distal part of the palm are thickly beset with numerous small tubercles, the lower surface of the palm also bears such tubercles.

The rest of the palm is smooth or provided with a few scattered tubercles. The carpus is short, it has $^2/_5$ of the length of the palm. In its lower part (the upper part in the figure) it bears a carina behind and parallel to the anterior margin; in its upper part (corresponding with the lower margin of the palm) a deep groove is present at some distance behind the anterior margin. In this upper part several tubercles are visible. The merus is about as long as the height of the palm. It is triangular in transverse section. In the upper part there is a deep transverse groove, which lies slightly behind the anterior margin. Ventrally this groove curves towards the anterior margin, it reaches this margin just above the anteroventral angle of the merus. Some tubercles are present, especially on the upper and lower surfaces. Furthermore there is a deep and long pit in the basal part of the outer surface and a longitudinal groove over the inner surface. The ischium is short, it bears a groove on both surfaces, while a tubercle is present in the basal part of the outer surface; the anterodorsal angle of the ischium is sharp. The right leg has the fingers more slender, they are slightly longer than the palm and close over their entire length. Their tips are small and curved. The cutting edges bear over their whole length a row of about 16 to 18 small denticles of equal size. The palm is compressed and almost quadrangular in outline. Tubercles are present in large numbers on both fingers and along the lower margin of the palm, some scattered tubercles may be seen in the upper part of the palm. The carpus, merus and ischium strongly resemble those of the left leg, but they are somewhat more slender. The first legs of the female are far smaller than those of the male and reach with a small part of the palm beyond the scaphocerite. The chelae are subequal in shape and strongly resemble the slender chela of the male. In the most robust leg the fingers are almost as long as the palm, which is distinctly less than twice as long as high. The cutting edges differ from those of the slender chela of the male by possessing only 4 denticles, which are placed in the basal part of the edge. The slender first leg shows more resemblance to the slender leg of the male. The fingers are slightly longer than the palm, they are provided with inconspicuous denticles over the entire cutting edge. The second legs reach about to the end of the scaphocerite. They do not differ essentially from those of *B. truncatus*. The chela has the fingers about as long as the palm and measures about $^1/_3$ of the length of the carpus. The latter consists of 5 joints, the proximal of which is as long as the three following (which are of the same length mutually) together, and it is almost twice as long as the distal joint. The merus is $^2/_3$ as long as the carpus and slightly shorter than the ischium. The third leg reaches about as far forwards as the second. The dactylus is rather short and broad and ends in a slender point. The anterior as well as the posterior margin of the dactylus bears a tooth slightly distally of the middle. These teeth are inconspicuous in small specimens. The propodus is about three times as long as the dactylus, it bears a row of distinct spines on its posterior margin. The carpus is about $^2/_3$ of the length of the propodus and is provided with one spine at the distal end of the posterior margin. The merus is twice as long as the carpus; a strong movable spine is placed in the proximal part of the posterior margin. The ischium is less than half as long as the merus and bears no spine. The

fourth leg strongly resembles the third. The fifth leg reaches about to the middle of the antepenultimate segment of the third maxilliped. The dactylus is like that of the third leg. The propodus is three times as long as the dactylus and bears a row of spinules along its posterior border. Furthermore there are transverse rows of hairs placed in the distal posterior part of the propodus; near the tip of this joint these hairs are so long that they obscure the dactylus. The carpus is about $^2/_3$ of the length of the propodus. It bears a distal spine on the posterior margin. The merus is about as long as the propodus and bears a distinct spine in the basal part of its posterior margin. The ischium is somewhat more than half as long as the merus; it is unarmed.

The pleopods are as in *Betaeus truncatus*, the endopod of the first pleopod of the male, however, is less slender. Moreover the uropods are strongly similar to those of the previous species. The forked process at the base of the uropods, however, has the inner tooth generally longer than the outer.

The eggs are numerous and small, they are 0.6 to 0.9 mm in diameter.

The species is best known under the name *Betaeus scabro-digitus* DANA, 1852, but the name *Alpheus emarginatus* given to the species by H. MILNE EDWARDS in 1837 is older and thus the trivial name *emarginatus* has to be used. *Alpheus emarginatus* was described by H. MILNE EDWARDS after specimens from an unknown locality. COUTIÈRE (1899), who in all probability has seen the type of MILNE EDWARDS, found it to be identical with *Betaeus scabrodigitus* of DANA.

COUTIÈRE (1899, p. 13) regards *Alpheus laevigatus* NICOLET as identical with *Betaeus truncatus* DANA. In my opinion, however, this name is a synonym of *Betaeus emarginatus*. In his original description of *Alpheus laevigatus* NICOLET distinctly states: »fronte brevi, subrotundato, in medio emarginato, appendice lamellosa antennarum externarum lata, ovata, ciliata.» NICOLET's description of the emarginate front as well as that of the broad scaphocerite leave not the slightest doubt that his specimen is a *Betaeus emarginatus*, also the rest of NICOLET's description fits for that species. The name *Alpheus laevigatus* NICOLET (1849) is invalidated by the older name *Alpheus laevigatus* GUÉRIN (1838) for a species from Timor.

Two of the three specimens of *Betaeus scabro-digitus* reported upon by CUNNINGHAM (1871, 1871a) could be examined, they proved to be correctly identified. The specimens brought by MIERS (1881) and A. MILNE EDWARDS (1891) to the present species, however, belong to *B. truncatus*.

NOBILI (1901, 1902) mentioned 2 specimens from San Vicente, Chile under the name *Betaeus* sp. These specimens are still present in the Turin Museum and were examined by me there in May 1950. Both proved to belong to *Betaeus emarginatus*, as was distinctly shown by the shape of the front and that of the scaphocerite.

Also the material of the Plate collection identified by LENZ (1902) was examined by me. LENZ's identifications proved to be correct. Not mentioned in LENZ's paper is a lot of 6 specimens of which the locality is uncertain, the specimens either originate from Tumbes (near Talcahuano, Concepción) or from Calbuco (S.W. of Puerto Montt).

Distribution. The species has been recorded in literature from the following

localities: Chile (NICOLET, 1849), Cavancha and Molle, near Iquique, N. Chile (LENZ, 1902), Isla Blanca, Bahía de la Chimba, Antofagasta, about 23°30′ S (PHILIPPI, 1860), Isla de Pajaros near La Serena (LENZ, 1902), Valparaíso (DANA, 1852), San Vicente, about 36°43′ S (NOBILI, 1901, 1902), Lota, Arauco Bay, S. of Concepción (CUNNINGHAM, 1871).

Alpheopsis chilensis COUTIÈRE

Alpheopsis chilensis COUTIÈRE, 1896, Bull. Mus. Hist. nat. Paris, vol. 2, p. 382.
Alpheopsis chilensis COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 52, 75, 84, 190, 191, 192, 193, 194, 212, 225, 247, 330, 331, 346, 347, 463, 544, figs. 27, 232.
Alpheopsis chilensis COUTIÈRE, 1899a, Bull. Soc. ent. France, 1899, pp. 375, 377.
Alpheopsis chilensis LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 732.
Alpheopsis chilensis PORTER, 1905, Rev. Chil. Hist. nat., vol. 9, p. 29.
Alpheopsis chilensis DE MAN, 1911, Siboga Exped., mon. 39a[1], p. 176.
Alpheopsis chilensis BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 330.
Alpheopsis chilensis PORTER, 1936, Comun. Mus. Concepción, vol. 1, p. 154.
Alpheopsis chilensis PORTER, 1937a, Rev. Chil. Hist. nat., vol. 40, p. 339.

Distribution. The species, which I have not seen, has been recorded in literature from: Chile (COUTIÈRE, 1896), Juan Fernandez (LENZ, 1902; PORTER, 1905), Talcahuano near Concepción (PORTER, 1905, 1936, 1937a).

Synalpheus spinifrons (H. MILNE EDWARDS) (Figure 8)

Alpheus spinifrons H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 355.
Alpheus spinifrons WHITE, 1847, List Crust. Brit. Mus., p. 75.
Alpheus spinifrons NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 214, pl. 2 fig. 2.
Alpheus Spinifrons GUÉRIN, 1857, Sagra's Histoire Cuba, Crust., p. xlviii.
Alpheus spinifrons KINGSLEY, 1883, Bull. Essex Inst., vol. 14, p. 116.
Alpheus spinifrons DE MAN, 1888, Arch. Naturgesch., vol. 53 pt. 1, p. 498.
Synalpheus spinifrons COUTIÈRE, 1898, Bull. Soc. ent. France, 1898, p. 190.
Alpheus spinifrons PORTER, 1898, Rev. Chil. Hist. nat., vol. 2, p. 33.
Synalpheus spinifrons COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 11, 13, 17, 39, 42, 419, 481.
Synalpheus neptunus p.p. COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 15, 18, 20, 25, 26, 29, 35, 40, 44, 50, 53, 76, 78, 83, 84, 85, 106, 115, 116, 149, 154, 162, 167, 171, 200, 201, 205, 296, 402, 404, 425, 447, 448, 450, 453, 454, 455, 456, 464, 466, 468, 469, 478, 486, 488, 492, 497, 498, 501, textfigs. 34, 35, 99, 105, pl. 1 figs. 6,6', pl. 3 figs. 2, 3, pl. 4 figs. 6—9, pl. 6 fig. 2.
Alpheus spinifrons DOFLEIN, 1900, S. B. Bayer. Akad. Wiss., vol. 30, p. 127.
Synalpheus spinifrons LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 733.
Synalpheus neptunus LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 733.
Synalpheus spinifrons PORTER, 1903, Rev. Chil. Hist. nat., vol. 7, p. 152.
Synalpheus tumido-manus p.p. COUTIÈRE, 1905, Fauna Geogr. Mald. Laccad. Arch., vol. 2, p. 876, pl. 73 fig. 14.
Synalpheus Latastei COUTIÈRE, 1908, Bull. Soc. philom. Paris, ser. 9 vol. 10, p. 203.
Synalpheus spinifrons COUTIÈRE, 1909, Proc. U.S. Nat. Mus., vol. 36, pp. 1, 10.
Synalpheus latastei COUTIÈRE, 1909, Proc. U.S. Nat. Mus., vol. 36, p. 25, fig. 7.
Synalpheus latastei RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 562, fig. 3.
Synalpheus Latastei DE MAN, 1911, Siboga Exped., mon. 39a[1], p. 198.
Sinalpheus spinifrons PORTER, 1917, Bol. Mus. Nac. Chile, vol. 10, p. 98.

Synalpheus neptunus BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 330.
Synalpheus spinifrons PORTER, 1940, Rev. Chil. Hist. nat., vol. 44, p. 147.
Synalpheus spinifrons PORTER, 1940a, Rev. Univ. Santiago, vol. 25 n. 3, p. 313.
Synalpheus spinifrons PORTER, 1941, Bol. Mus. Hist. nat. Lima, vol. 5, p. 460.

Material examined:

Lund University Chile Expedition

St. M 121. 1 specimen, 12 mm. Between the »roots» of big brown algae.
St. M 123. 3 specimens (1 ovigerous female, 36 mm), 14—36 mm.
St. M 127. 2 specimens (1 ovigerous female, 31 mm), 18 and 31 mm. Between the »roots» of big brown algae.
St. M 129. 1 specimen (killed in the act of moulting), 25 mm, 1 juvenile, 10 mm.
St. M 130. 1 specimen, 12 mm.
St. M 131. 3 specimens (1 ovigerous female, 31 mm), 12—31 mm. Between the »roots» of big brown algae.
St. M 135. 1 juvenile, 6 mm. Between the »roots» of big brown algae.

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Iquique, N. Chile; leg. L. PLATE; Reg. No. 10462. — 1 specimen, 9 mm.
Cavancha near Iquique, N. Chile; leg. L. PLATE; Reg. No. 10993. — 7 specimens (2 ovigerous females, 23 and 24 mm), 21—30 mm.
Molle near Iquique, N. Chile; leg. L. PLATE; Reg. No. 10463. — 2 specimens, 17 and 19 mm.
Juan Fernandez; depth 27 m; leg. L. PLATE; Reg. No. 10464. — 2 ovigerous females, 15 and 16 mm.

The rostrum is straight, narrow and pointed. It fails to reach the end of the basal segment of the antennular peduncle. Its upper surface is rounded, the lower surface is more compressed. At the base of the rostrum the lower surface passes into a lobe, which is directed vertically downwards and which has the top notched. The orbital hoods are pointed anteriorly. They reach almost to the end of the rostrum and are distinctly broader than the latter. Like the rostrum, the orbital hoods have the upper surface somewhat rounded and gradually pass into the upper surface of the carapace. The carapace is smooth, without spines or ridges. The anterolateral angles are forwards produced to a rather narrow point with a rounded tip. A distinct cardiac notch is present at each side of the posterior margin of the carapace.

The abdomen is smooth and has the pleurae of the first four segments broadly rounded. The pleura of the fifth segment is narrower and has the top rectangular with the extreme tip rounded. There seems to be no difference in the shape of the abdominal pleurae of the males and females. The sixth segment is as long as the fifth, its pleura is rectangularly rounded and the posterolateral angle is broadly rounded. The telson is about 1.5 times as long as the sixth abdominal segment and its basal breadth is about $^2/_3$ of its length. It bears two pairs of dorsal spines, the anterior of which lie about in the middle of the telson. The posterior spines are placed about midway between the anterior spines and the posterior margin of the telson. This posterior margin is broad and strongly convex. Two pairs of posterolateral spines are present, the outer being distinctly shorter than the slender inner spines. The latter slightly overreach the median portion of the posterior margin of the telson. Several rows of hairs are implanted along this posterior margin.

The eyes are entirely hidden below the orbital hoods. The corneae are small but well pigmented. A rounded lobe is present on the anterior side of the ophthalmic peduncle.

The antennula has the stylocerite well developed, reaching about to the middle of the second segment of the antennular peduncle. All the joints of the peduncle are short. The second and the third are subequal in length and together they are longer than the first. The outer flagellum consists of two rami, which are fused for 8 to 14 joints; the shorter ramus possesses 3 or 4 free joints.

The antennal peduncle reaches slightly beyond the antennular. The scaphocerite is small and fails to reach the end of the antennal peduncle. The final tooth is strong and far overreaches the reduced lamella, which for the larger part of its length is detached from the tooth; the lamella is elongate in shape. The antennal peduncle bears two spines near the base of the scaphocerite. The outer spine is longest and reaches about as far forwards as the stylocerite. The inner spine is very small.

The mandible has the incisor process broad and provided with distinct teeth; the molar process is rather blunt and bears many hair-like spinules. The palp consists of two large joints. The maxillula, maxilla, first and second maxillipeds are of the shape usually found in the present genus; the epipod of the first maxilliped is hardly bilobed. The third maxilliped reaches with its last segment beyond the antennal peduncle. This last segment bears a crown of strong spinules at its apex. The lower side of this joint is thickly covered with hairs, while some tufts of long hairs are present on the upper margin. The penultimate joint measures about ¼ of the length of the last joint. Together these two joints are about as long as the antepenultimate. The exopod reaches somewhat beyond the end of the antepenultimate joint.

The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	1	—	—	—	—	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	—	—	—	—	—	—
exopods	1	1	1	—	—	—	—	—

The first legs are strongly unequal, sometimes the left, sometimes the right is strongest. They reach with part of the palm beyond the antennal peduncle. The fingers are about half as long as the palm; they have the tips of a yellowish horn colour. The dactylus has the upper margin strongly convex. The lower side possesses a very long, hammer-shaped tooth, which is directed somewhat posteriorly and fits in a cavity of the fixed finger. The fixed finger is straight and broad, with a small

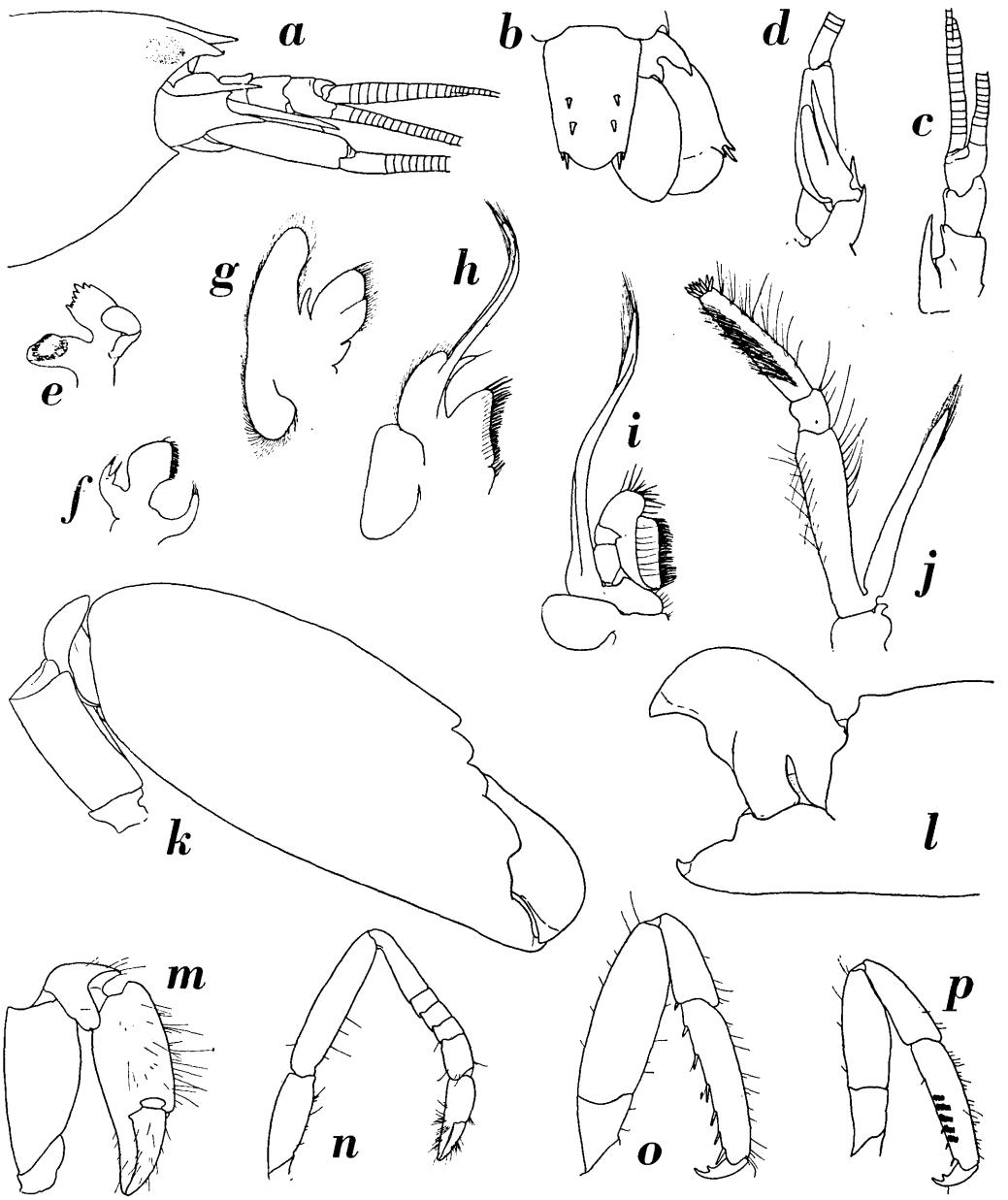

Fig. 8. *Synalpheus spinifrons* (H. Milne Edwards). a, anterior part of body in lateral view; b, telson and right uropod in dorsal view; c, antennula; d, antenna; e, mandible; f, maxillula; g, maxilla; h, first maxilliped; i, second maxilliped; j, third maxilliped; k, larger first pereiopod, outside; l, fingers of larger first pereiopod, opened, inside; m, smaller first pereiopod; n, second pereiopod; o, third pereiopod; p, fifth pereiopod. a—d, j—p, × 7; e—i, × 10.

upwards curved tip. The deep cavity for the reception of the tooth of the dactylus anteriorly shows a rather broad slit. The palm is smooth and swollen, the upper margin ends anteriorly in a blunt knob. The carpus is extremely short and deeply hollowed anteriorly, it is much shorter than high. The merus measures $^1/_4$ of the length of the chela; it is triangular in transverse section in its distal part, proximally it is laterally compressed. The lower surface is concave; the upper margin is sharp and ends anteriorly in a rectangle, there is no anterodorsal tooth. The smaller leg has the fingers less than $^2/_3$ of the length of the palm. The tips of the fingers are of a yellowish horn colour. The dactylus has the upper margin slightly convex. The cutting edge is entire, save for a rather small blunt and rounded tooth at its base. This tooth fits into a cavity at the base of the fixed finger. Scattered hairs are present on palm and fingers. The dactylus does not have a bushy tuft of hairs as have species belonging to the *laevimanus* group of the present genus. The carpus is about as long as high, it measures about $^1/_3$ of the length of the chela. It is deeply hollowed anteriorly. The merus is as long as the palm and half the fingers combined and has a shape similar to that of the merus of the larger leg. The second legs are equal, they reach with part of the carpus beyond the antennal peduncle. The chela is small and has the fingers slightly longer than the palm. The carpus is about twice as long as the chela and is slightly longer than the merus. It consists of five joints, the proximal of which is slightly less than half the total length of the carpus. The following three joints are subequal in length and measure together about $^3/_4$ of the length of the proximal joint. The distal joint is about half as long as the first. The ischium is somewhat more than half as long as the merus. The third leg reaches with the entire propodus or with the larger part of it beyond the antennal peduncle. The dactylus is distinctly bifid; the proximal claw is shorter and slightly slenderer than the distal. The propodus is about three times as long as the dactylus. It bears 6 or 7 spines, which are regularly arranged over the posterior margin. The carpus is somewhat less than half as long as the propodus, it bears a spine in the posterior distal part. The merus is somewhat longer than the propodus, it is less than three times as long as broad and is unarmed. The ischium is less than half as long as the merus. The fourth leg is very similar to the third, but it is smaller and reaches almost to the end of the antennal peduncle. The fifth leg reaches slightly beyond the base of the antennal peduncle. The dactylus has the same shape as those of the two previous legs. The propodus is almost three times as long as the dactylus. In the distal part of its posterior margin there are three spines, while about 5 obliquely transverse rows of closely placed spinules are placed on the outer surface near the posterior margin. The carpus has $^2/_3$ of the length of the propodus. The merus is distinctly shorter than the propodus and somewhat longer than the carpus. The ischium is about half as long as the merus.

The first pleopod has the endopod elongate, about rectangular in shape. In the other pleopods the endopod is leaf-shaped and possesses a small appendix interna. In none of the specimens seen by me an appendix masculina is present.

The uropods are broadly ovate. The protopod ends dorsally into two broad teeth.

The exopod has the outer margin ending into two teeth, between which there is an uncoloured movable spine.

The eggs are numerous and rather small, being 0.7 to 1.1 mm in diameter.

Through the kindness of Professor Dr. A. SCHELLENBERG, Berlin, I could examine the specimens of *Synalpheus* reported upon by LENZ (1902). LENZ's *Synalpheus spinifrons* is a juvenile, which is in a very poor condition. It is shrivelled and lacks several of its legs, among which the smaller first leg. It does not show, however, any features indicating that it should not belong to the present species. The specimen is accompanied by a label in H. COUTIÈRE's handwriting: »*Synalpheus* [BATE] *spinifrons* M. EDW.=*Alpheus spinifrons* M. EDW. H. C. dét.». Also the specimens from Juan Fernandez and Cavancha reported upon by LENZ under *Synalpheus neptunus* have been identified by COUTIÈRE as is shown by accompanying labels. The specimens from Juan Fernandez differ in a number of points from the *Synalpheus spinifrons* material collected by the Lund University Expedition. The specimens are smaller; the body and the appendages are far more slender; the rostrum reaches to the end of the basal segment of the antennular peduncle; the second segment of this peduncle is slightly longer than the third; the shorter ramus of the upper antennular flagellum consists of 6 fused and 5 free joints; the inner spine at the base of the scaphocerite is extremely short, being hardly visible; the outer spine distinctly fails to reach as far as the tip of the stylocerite; the fingers of the large cheliped are considerably less than half as long as the palm; the merus of this leg is about half as long as the palm and bears a distinct antero-dorsal spine; the shorter cheliped too has the fingers relatively longer than in the typical *S. spinifrons* and also possesses a small antero-dorsal spine on the merus; the third leg is slender, its propodus is more than four times as long as the dactylus and bears about 10 posterior spines. The material at hand is too small, however, to permit the determination of the exact status of the Juan Fernandez material, it might be a subspecies of the main land form. Examination of more material from Juan Fernandez thus is highly desirable. The other specimens mentioned by LENZ as belonging to *Synalpheus neptunus* undoubtedly are *Synalpheus spinifrons*, though they are slightly more slender than most of the material collected by the Lund University Expedition. One of the Cavancha specimens showed a minute denticle at the antero-dorsal angle of the merus of the larger cheliped.

The various names given in rapid succession to the present form by COUTIÈRE are apt to give rise to a certain amount of confusion, the more so as COUTIÈRE himself did not elucidate this intricate matter. In his extensive work on the morphology of the Alpheidae COUTIÈRE (1899) frequently refers to *Synalpheus neptunus* (DANA). On p. 453 he states that he has examined a large number of specimens, which either belong to the typical *Synalpheus neptunus* or to extremely closely related forms, which hardly may be distinguished even as varieties. Among these specimens he mentions some from Cape Lopez, W. Africa and others »provenant du Chili». The type locality of *Alpheus neptunus* DANA is the Sulu Sea. LENZ (1902), who in the identification of the Alpheids from Chile has had much assistance from

COUTIÈRE, mentions *Synalpheus neptunus* from various places in Chile. His specimens obviously belong to the same species as those brought by COUTIÈRE (1899) to DANA's species. In his study on the Alpheids of the Maldive and Laccadive Archipelagoes COUTIÈRE (1905) makes the remark that what he in his 1899 work had identified as *Synalpheus neptunus* (DANA) does not belong to that species, of which he had been able to examine the types, but that this material has to be referred to *Synalpheus tumidomanus* (PAULSON). That he also included the Chilean material in *S. tumidomanus* is shown by the range of distribution of that species as given by COUTIÈRE: »L'espèce se trouve aussi dans la mer Rouge, l'Océan Indien et le Pacifique, jusque sur la côte américaine.» In his revision of the American Synalphei, published four years later, COUTIÈRE (1909, p. 24) remarks »I have believed it possible to separate as a distinct species *S. hululensis* COUTIÈRE from the Maldives, which I have described in my work on the Alpheidae of that archipelago under the name of *S. tumidomanus* PAULSON.» COUTIÈRE does not state, however, what becomes the name of the Chilean material referred by him in 1905 to *S. tumidomanus*. Since COUTIÈRE in his 1909 paper, which has the intention to be a revision of the American species of *Synalpheus*, only mentions the new species *S. latastei* from Chile (having treated *S. spinifrons* as a species incerta), it is most logical that this new species is based on his Chilean specimens assigned formely to *S. tumidomanus* (PAULSON) and before that to *S. neptunus* (DANA). Strengthening this assumption is COUTIÈRE's remark (1909, p. 25 under *S. paulsonoides* COUT.) that some specimens from Cape Lopez, West Africa, are hardly separable from the variety *tenuispina* of *S. latastei*, which variety occurs in Brazil. These Cape Lopez specimens obviously are the same as those which are mentioned by COUTIÈRE (1899, p. 453) as belonging together with the Chilean specimens to *S. neptunus*. Summarizing we may conclude that the Chilean *Synalpheus* was considered by COUTIÈRE in 1899 to belong to *S. neptunus* (DANA), in 1905 to belong to *S. tumidomanus* (PAULSON) and in 1909 to be a distinct species *S. latastei* COUTIÈRE.

In my opinion there is hardly any doubt that *Synalpheus latastei* COUTIÈRE and *S. spinifrons* (H. MILNE EDWARDS) are identical. COUTIÈRE (1909, p. 1) considers *S. spinifrons* as a species incerta probably belonging to the *laevimanus* group of the genus *Synalpheus*. The type of *S. spinifrons* has become lost and COUTIÈRE states that he has seen no species from Chile, that agrees exactly with the descriptions and figure of *S. spinifrons*. COUTIÈRE's reason for placing *S. spinifrons* in the *laevimanus* group is the fact that NICOLET states the »lámina basilar de las antenas esternas muy pequeña, sin llegar con mucho á la estremidad del pedúnculo de estos órganos.», while in NICOLET's figure the scaphocerite is shown to be very small. NICOLET's drawing of the cephalic appendages is very inaccurate, as COUTIÈRE himself remarks, and the description of the scaphocerite by NICOLET is nothing but a translation of H. MILNE EDWARDS's original description: »Appendice lamelleux des antennes externes très-petit, n'atteignant pas à beaucoup près l'extrémité du pédondule situé au-dessous.» And compared with other Alpheids the scaphocerite of *S. latastei* indeed is small. The description of MILNE EDWARDS and the figure of NICOLET (apart from

some obvious inaccuracies) show no features that make it impossible to identify their specimens as belonging to the same species as the present specimens collected by the Lund University Expedition, and thus to *S. latastei*. As the present species is very common along the Chilean coast and as it is up till now the only species of *Synalpheus* known from that region with certainty, I do not see any reason not to identify it as H. MILNE EDWARDS's species.

DISTRIBUTION. Bay of Sechura, W. of Matacaballa, N. Peru, depth 9 m (RATHBUN, 1910), Chile (H. MILNE EDWARDS, 1837; WHITE, 1847; NICOLET, 1849; COUTIÈRE, 1899, 1908, 1909; DOFLEIN, 1900), Juan Fernandez (LENZ, 1902), Iquique, and Molle and Cavancha near Iquique, N. Chile (LENZ, 1902), Antofagasta (PORTER, 1940, 1940a, 1941), Caldera, Atacama (PORTER, 1917), Herradura, Coquimbo (PORTER, 1903, 1917), Quintero, Valparaíso (PORTER, 1898), Taitao Peninsula, S. Chile (PORTER, 1917), Australia ? (COUTIÈRE, 1909). COUTIÈRE (1909) reports a variety *tenuispina* of this species from Desterro, Brazil, while he states that some specimens from Cape Lopez, W. Africa, probably also are referable to this variety.

Alpheus chilensis COUTIÈRE (Figure 9)

Alpheus maindroni LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 732 (non *Alpheus maindroni* COUTIÈRE, 1898).
Alpheus bouvieri chilensis COUTIÈRE, 1902, in LENZ, Zool. Jb. Suppl., vol. 5., p. 732.
Crangon bouvieri chilensis RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 606.
Crangon maindroni p.p. RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 606.
Crangon bouvieri chilensis SCHMITT, 1924, Zoologica, New York, vol. 5, p. 162.
Alpheus bouvieri chilensis BOONE, 1930. Bull. Vanderbilt mar. Mus., vol. 3, p. 161, pl. 57.
Alpheus bouvieri chilensis SIVERTSEN, 1933, Nyt Mag. Naturvid., vol. 74, p. 22.

Material examined:

Lund University Chile Expedition

St. M 37. 4 specimens (3 ovigerous females, 18—41 mm), 18—41 mm.

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Calbuco, SW. of Puerto Montt; leg. L. PLATE; syntypes of *Alpheus bouvieri* var. *chilensis* COUTIÈRE; Reg. No. 10992. — 3 specimens (1 ovigerous female, 45 mm), 32—45 mm.

Puerto Montt, S. Chile; leg. L. PLATE; Reg. No. 10452. — 1 ovigerous female, 47 mm.

The rostrum ends in a short and sharply pointed tip, which reaches beyond the orbital hoods. Dorsally the rostrum is flat and widens posteriorly. At each side it is separated from the orbital hoods by a deep posteriorly diverging groove, which ends abruptly and the inner margin of which (being at the same time the lateral margin of the rostrum) is very distinct and rather sharp. The orbital hoods cover the eyes entirely, they bear no spines. Laterally of the orbital hoods the anterior margin of the carapace is somewhat concave. No spines are present on the carapace. A rather indistinct cervical groove is present, and furthermore a more or less sharply defined pit may be observed in the median region of the carapace somewhat behind the rostrum. The cardiac notches are distinct.

The abdomen is smooth, the pleurae of all segments are broadly rounded; that of the second segment even has the lateral margin somewhat emarginate. The pleurae and the posterolateral angles of the sixth segment are also rounded. No movable plate is present near the base of the uropods. The sixth segment is about as long as the fifth. The telson is somewhat longer than the sixth abdominal segment. It bears two pairs of dorsal spines, the anterior of which is placed in about the middle of the telson, the posterior is situated about halfway between the anterior pair and the posterior margin. This posterior margin is broadly rounded and bears at each angle two spines, a shorter outer and a longer inner; the spines of each pair are placed close together.

The eyes are wholly covered by the carapace. The cornea is distinctly pigmented.

The basal segment of the antennular peduncle has the stylocerite rather broad, but sharply pointed and almost reaching as far forwards as the base of the second segment. The second segment of the antennular peduncle is elongate, being longer than the first. The third segment is again short. The outer flagellum has the two rami fused for 20 joints (in the small specimen 11 to 13 joints); 2 or 3 joints of the shorter ramus are free.

The scaphocerite just fails to reach to the end of the antennular peduncle. It is 2.5 times as long as broad. The outer margin is concave and ends in a strong sharp tooth, which distinctly overreaches the narrow lamella, that narrows regularly distally. The antennal peduncle slightly overreaches the antennular peduncle. A very small spine is present at the outer side of the antennal peduncle near the base of the scaphocerite.

The oral parts are quite typical. They do not differ essentially from those figured here for *Betaeus truncatus*. The upper lobe of the maxillular palp bears no hair. The third maxilliped fails to reach the end of the antennal peduncle. The last joint is more than twice as long as the penultimate and has apex truncate. The antepenultimate joint is slightly longer than the distal two joints combined. A carina runs over the posterior surface close near the outer margin. The exopod and the epipod are well developed, a large arthrobranch and a very small pleurobranch are present, the latter strongly resembles the reduced pleurobranch of the third maxilliped of *Alpheus strenuus* DANA as figured by COUTIÈRE (1899, p. 280, fig. 349).

The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	1	1	1	1	1	1
arthrobranchs	—	—	1	—	—	—	—	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	1	—	—	—	—	—

The first pereiopods are strongly different in shape and size. In my largest specimen

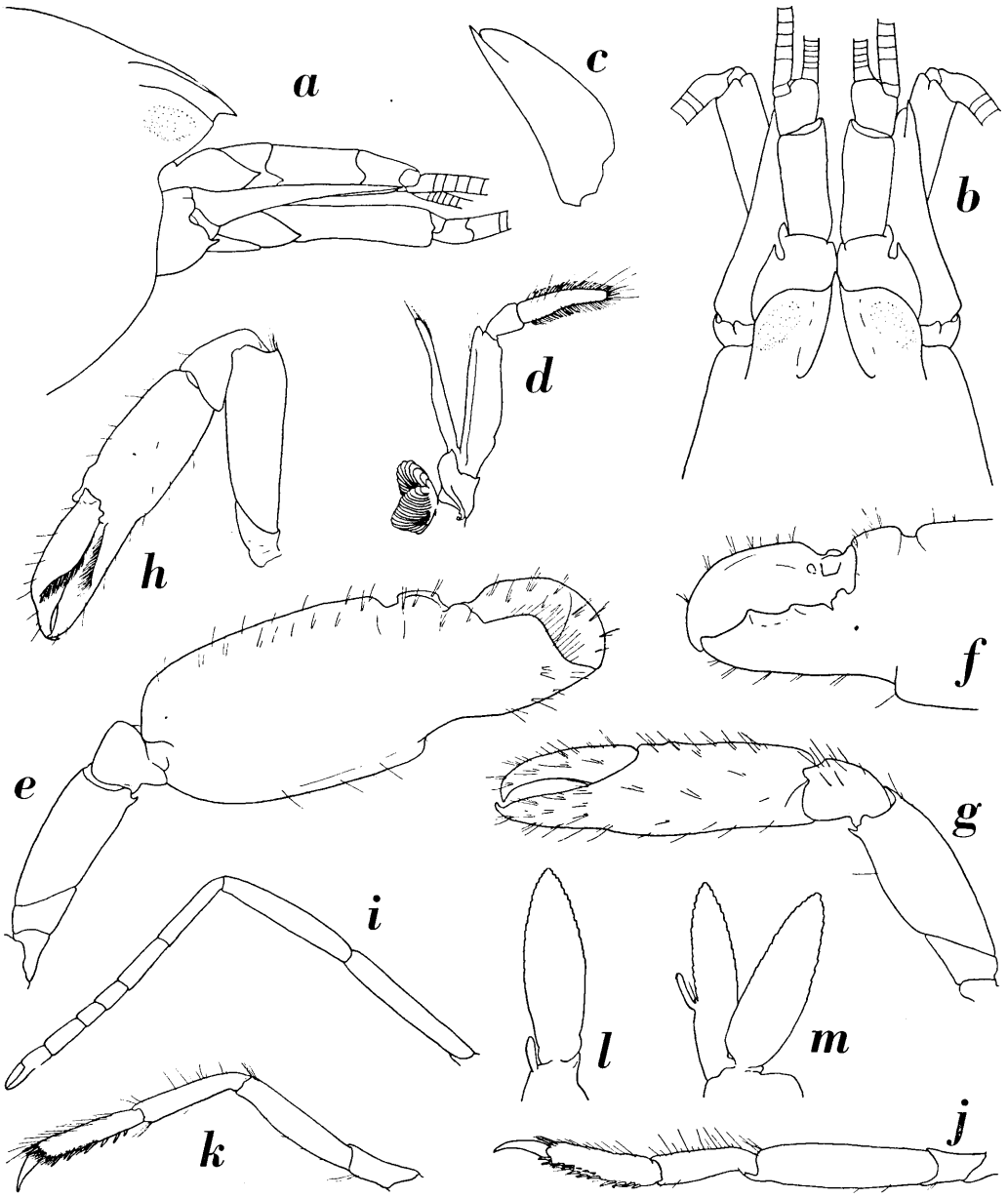

Fig. 9. *Alpheus chilensis* COUTIÈRE. a, anterior part of body in lateral view; b, anterior part of body in dorsal view; c, scaphocerite; d, third maxilliped; e, larger first pereiopod, inner side; f, fingers of larger first pereiopod, outside; g, smaller first pereiopod of female; h, smaller first pereiopod of male; i, second pereiopod; j, third pereiopod; k, fifth pereiopod; l, first pleopod of male; m, second pleopod of male. a—c,h, × 7; d, × 4.5; e—g,i—k, × 4; l,m, × 15.

the right is the smaller and reaches with part of the palm beyond the scaphocerite. The fingers of this smaller leg are unarmed, they are placed at an angle with the palm, being directed somewhat more inwards. They are somewhat shorter than the palm. Scattered hairs are present on the palm and especially on the fingers. No rows of hairs, which should give the chela a »Balaeniceps»-like shape are present in this female specimen. Except for the hairs mentioned here the palm is smooth. The carpus is short and constricted near the base; it is half as long as the palm. The merus is longer than the palm and is triangular in transverse section. The lower anterior angle of the inner surface ends in a distinct spine. No other spines or teeth are present on this joint. The ischium is short and unarmed. In the male specimen the chela of the smaller first leg is »Balaeniceps»-shaped, having oblique rows of hairs on the dactylus and the fixed finger. The large chela reaches with the larger part of the palm beyond the scaphocerite. The fingers are about half as long as the palm. The dactylus is compressed and has the upper margin evenly convex. The cutting edge bears a strong truncate tooth, which fits in a cavity of the fixed finger. At the outer side the dactylus is somewhat flattened near the base, and here it bears a distinct circular spot, which is named by COUTIÈRE (1899, p. 214) »plaque adhésive». The fixed finger bears at its cutting edge a deep pit for the reception of the tooth of the dactylus. The inner side of the cutting edge is considerably heightened and partly covers the dactylus. The palm is somewhat compressed, it is less than twice as long as high. The upper margin shows a deep and broad transverse notch some distance behind the base of the dactylus. The lower margin of the palm bears a distinct bluntly and broadly rounded tooth just below this dorsal notch. A distinct linea impressa is visible in the basal part of the palm, it is triangular in outline. The carpus is about $^1/_5$ of the length of the palm, it narrows posteriorly and has the anterior margin entire. The merus is as that of the smaller leg, it too is provided with an inner anteroventral tooth. The second pereiopod reaches with the larger part of the carpus beyond the scaphocerite. The chela is small, it measures about $^1/_4$ of the length of the carpus. The fingers are subequal in length to the palm. The carpus consists of five joints. The proximal of these is almost 1.5 times as long as the second joint. The latter is about as long as the third and fourth joints together, while the fifth joint is about half as long as the first. The merus is slightly shorter than the ischium and is about 0.6 times as long as the carpus. The third leg reaches with its dactylus beyond the antennal peduncle. The dactylus is rather narrow and simple, it is almost half as long as the propodus. The propodus has the posterior margin provided with various distinct spinules. It is somewhat longer than the carpus and about $^3/_5$ of the length of the merus. Neither carpus nor merus is provided with spinules or teeth. The fourth leg is very similar to the third. The fifth leg reaches slightly beyond the base of the scaphocerite. The dactylus is simple. The propodus is almost 2.5 times as long as the dactylus, it is as long as the carpus and distinctly shorter than the merus. There are some spinules on the posterior margin of the propodus. This margin moreover bears numerous transverse rows of hairs in its distal portion. No spines are present on the other joints.

The endopods of the second to fifth pleopods are provided with a distinct appendix interna. The endopod of the first pleopod is small and simple. The appendix masculina of the second pleopod of the male is extremely short, it is well nigh invisible and bears one hair. The uropods are broad. There is a tooth-shaped process over the base of the exopod. The latter has the outer margin ending in a tooth, which at its inner side bears a movable not-pigmented spine. A diaeresis is present on the exopod.

The eggs of my larger female are 0.6 to 0.7 mm in diameter. Both in the larger and the smaller ovigerous females the eggs are rather few and found only between the anterior pairs of pleopods. In the young female the eggs are irregularly shaped and badly developed.

In the small specimens the lateral margins of the rostrum are less sharp than in the large specimen. In one of the three small specimens the left first leg is the larger, in the other two it is the right that is the larger. In the smaller females the fingers of the smaller leg are relatively longer, being about as long as the palm and lying in the same plane as the palm. One of the females has the inner margin of the lower surface of the merus provided with a spinule in its middle. This obviously is an abnormality as the spinule does not occur in any of the other specimens.

The three smaller specimens probably are not yet adult. The females, it is true, bear eggs, but these are few, rather small and look quite underdeveloped.

Through the kindness of Dr. A. SCHELLENBERG of the Berlin Zoological Museum I was able to examine the specimens which LENZ (1902) mentioned under the names *Alpheus maindroni* COUT. and *A. bouvieri chilensis* COUT. Direct comparison of this material made it clear that the specimens belong to one species, a result which is certainly quite unexpected. In the two jars containing these two lots several labels were found. In both there is a label in the same handwriting (presumably that of Dr. LENZ) with the inscription »*Alpheus maindroni*». In the jar with the Puerto Montt specimens there is moreover a label, obviously written by COUTIÈRE, saying: »*Alpheus Maindroni* H.C. (Bull. Soc. Ent. de Fr. No. 5, 1898, p. 133, fig. 2 et 2') H.C. dét.», while the other jar contains the following label in the same handwriting: »*Alpheus Bouvieri* var. *Chilensis*, var. nov. H. COUTIÈRE dét. Oct. 1901». It seems highly probable that COUTIÈRE did not have the Puerto Montt specimens at hand when he decided that the Calbuco specimens represented a new variety of *Alpheus bouvieri*; possibly he had identified the Puerto Montt specimens at an earlier opportunity. Anyhow the two lots belong to one species, to which the present material of the Lund University Expedition belongs too.

The present form differs so much from both *A. bouvieri* and *A. maindroni* that it has to be considered a distinct species.

SCHMITT (1924) and BOONE (1930) report the present species from the Galápagos Archipelago. Reexamination of their material is very desirable to find out whether their identifications are correct. At the time these two authors published their papers so few data were known of the present species, that it seems possible that their material is specifically distinct from the typical *Alpheus chilensis*. SCHMITT gives no details of his specimens, while BOONE's description and figure are not

sufficient to confirm or disprove the identity of her material with the present form.

Biology. The collectors state that the species is rare. Furthermore they remark »Knäppte hörbart med klorna», indicating thereby that the species produces a snapping sound with the chelae, as already could be expected from the shape of the chelae. Already PLATE, who collected the material reported upon by LENZ (1902) noted this snapping sound. A label found in the jar containing PLATE's Puerto Montt specimens bears the inscription: »Schlägt die Zangen der grossen Scheere mit solchem Gewalt zusammen, dass es einen kleinen Knall giebt.»

Colour. The specimens of the University of Lund Expedition were noted to be »gråbrun-grön med rödaktiga ben» (grey-brownish green with reddish legs). PLATE (vid. LENZ, 1902) stated his specimens of the present species to be greenish yellow-red when alive (»Farbe im Leben grünlich gelbrot»).

Distribution: The species has been recorded in literature from the following localities: Eden Island, Galápagos Archipelago (SCHMITT, 1924), Webb Cove, Albemarle Island, Galápagos Archipelago (BOONE, 1933), Puerto Montt, Llanquihue, S. Chile (LENZ, 1902), Calbuco, SW. of Puerto Montt (LENZ, 1902). It is a litoral form.

Alpheus dentipes GUÉRIN

Restricted synonymy:

Alpheus dentipes GUÉRIN, 1832, Expéd. sci. Morée, Zool., pt. 2, p. 39, pl. 27 fig. 3.
Alpheus sp. MIERS, 1881, Proc. zool. Soc. Lond., 1881, p. 74.
Alpheus dentipes COUTIÈRE, 1899, Ann. Sci. nat. Zool., ser. 8 vol. 9, p. 34.
Alpheus sp. ARMSTRONG, 1940, Amer. Mus. Novit., n. 1096, p. 2.

Material examined:

Museum London

Portland Bay, W. Patagonia; depth 18 m; bottom hard sand; probably March, 1879; Cruise of the »Alert». — 1 specimen, 12.5 mm.

MIERS (1881) described a shrimp from Portland Bay, W. Patagonia (roughly at about 50°10′ S, 74°40′ W), but did not give it a name other than *Alpheus* sp. »on account of its small size». COUTIÈRE (1899), who apparently examined MIERS's specimen could identify it »de façon rigoureuse» with *Alpheus dentipes* GUÉRIN.

Through the kindness of Dr. ISABELLA GORDON I received MIERS's specimen on loan for examination. Comparison with Mediterranean material of *Alpheus dentipes* convinced me that COUTIÈRE's identification of the specimen, a male, is correct. The only difference I found between the »Alert» specimen and Mediterranean material is that in the former there is no spine, but only a blunt lobe in the upper part of the palm at the inner side of the base of the dactylus. In all probability this spine is broken here.

Since *Alpheus dentipes* GUÉRIN is known from East Atlantic waters from the Mediterranean to the Cape Verde Islands only, the correctness of the label of the present specimen must be severely doubted. Specimens from tropical American seas, which by several authors have been placed in GUÉRIN's species, at present are

considered to belong to distinct species: *Alpheus peasei* (ARMSTRONG) (West Indies: Bermuda to Curaçao) and *Alpheus clamator* LOCKINGTON (California and Lower California).

Family Hippolytidae

Nauticaris magellanica (A. MILNE EDWARDS) (Figures 10 and 11)

Nauticaris marionis p.p. BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 603, pl. 108.
Hippolyte magellanicus A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 pt. 2F, p. 46, pl. 5 fig. 2.
Hippolyte consobrinus A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 pt. 2F, p. 47, pl. 5 fig. 4.
Nauticaris marionis p.p. PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, p. 547.
Hippolyte magellanicus HODGSON, 1902, Rep. Coll. nat. Hist. Southern Cross, p. 235.
Nauticaris marionis LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 735.
Hippolyte magellanicus CALMAN, 1906, Ann. Mag. nat. Hist., ser. 7 vol. 17, p. 31 (placed in the genus *Nauticaris*)
Nauticaris marionis p.p. RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 605.
Nauticaris (*Hippolyte*) *magellanicus* DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 29.
Nauticaris Marionis chilensis DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 29, fig. 3.
Nauticaris magellanicus STEBBING, 1914, Proc. zool. Soc. Lond., 1914, p. 347.
Nauticaris magellanicus STEBBING, 1914a, Trans. Roy. Soc. Edinb., vol. 50 pt 2, p. 292.
Hippolyte consobrinus HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 21.
Nauticaris magellanica HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], pp. 6, 31.
Nauticaris marionis chilensis HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], pp. 6, 31.

Material examined:

Lund University Chile Expedition

St. M 16. 1 ovigerous female, 25 mm.
St. M 19. 3 specimens (1 ovigerous female, 24 mm), 17—24 mm.
St. M 21. 4 specimens (1 ovigerous female, 24 mm), 13—24 mm.
St. M 27. 1 specimen, 17 mm.
St. M 40. 1 specimen, 18 mm.
St. M 42. 7 specimens, 13—23 mm.
St. M 46. 8 specimens (1 ovigerous female, 29 mm), 14—29 mm.
St. M 94. 3 specimens, 25—29 mm.
St. M 98. 1 specimen, 30 mm.
St. M 103. 1 specimen, 26 mm.
St. M 148. 6 specimens (1 ovigerous female, 24 mm), 13—24 mm.

Museum Berlin

Cavancha near Iquique, N. Chile; leg. L. PLATE; Reg. No. 10450. — 1 ovigerous female, 21 mm.
Tumbes near Talcahuano, Concepción; leg. L. PLATE; Reg. No. 10994. — 1 ovigerous female, 21 mm.

Museum Munich

Magellan Strait; leg. R. PAESSLER; October 6, 1887; syntype of *Nauticaris Marionis* var. *chilensis* DOFLEIN & BALSS. — 1 specimen, 19 mm.
Port Stanley, Falkland Islands; on kelp roots; depth 1.8 m; leg. W. MICHAELSEN; August 17, 1893; syntypes of *Nauticaris Marionis* var. *chilensis* DOFLEIN & BALSS. — 5 specimens (3 ovigerous females, 24—32 mm), 17—32 mm.

Museum Paris

Grévy Island, Cape Hall; depth 65 m; temperature 3°; Mission scientifique du Cap Horn, n. 167; June 24, 1883; syntype of *Hippolyte magellanicus* A. MILNE EDWARDS. — 1 specimen, 24.5 mm.

Orange Bay, Hoste Island; depth 17 m; temperature 6.8°; Mission scientifique du Cap Horn, n. 29 bis; June 8, 1883; syntype of *Hippolyte magellanicus* A. MILNE EDWARDS. — 1 specimen, 25 mm.

Orange Bay, Hoste Island; Mission scientifique du Cap Horn; holotype of *Hippolyte consobrinus* A. MILNE EDWARDS. — 1 specimen, 15 mm.

Fleuriais Bay, Gordon Island; depth 33 m; Mission scientifique du Cap Horn. — 1 specimen, 23 mm.

The rostrum is directed straight forwards, it reaches somewhat beyond the antennular peduncle, but fails to reach the end of the scaphocerite. The upper margin bears 7 or 8 teeth, which are regularly divided over its length, leaving, however, the distance between the ultimate tooth and the apex of the rostrum larger than the intervals between the teeth themselves. The apex of the rostrum consequently is simply pointed. The first two or three teeth of the rostrum are placed on the carapace behind the orbit. They occupy slightly more than $^1/_3$ of the length of the carapace (rostrum excluded). The lower margin of the rostrum bears one or two teeth. The carapace is smooth. The antennal spine is well developed and is placed on the anterior margin of the carapace slightly below the rather sharply pointed lower orbital angle. The pterygostomian spine is distinct, though it is somewhat smaller than the antennal. No other spines are present on the carapace. There is a distinct postorbital carina, which forms the continuation of the midrib of the rostrum.

The abdomen is smooth. The pleurae of the first three segments are broadly rounded. Those of the fourth and fifth segments end in a sharp point. In the fourth segment this point is small, being especially inconspicuous in ovigerous females; the point of the fifth segment is more distinct. In the sixth segment the pleurae are rather slender and pointed, they are movably connected with the segment itself. The posterolateral angle of the segment is pointed too. The telson is slightly more than 1.5 times as long as the sixth abdominal segment. Its dorsal surface bears two pairs of spines, the first of which is placed slightly before the middle of the telson, the other pair lies about halfway between the first pair and the posterior margin of the telson. This posterior margin ends in a sharp point, while both lateral angles too are formed by a sharp, posteriorly directed point. There are two pairs of posterior spines; the inner of these is the longer. Hairs are present on the posterior margin of the telson and in the posterior third of the lateral margins.

The eyes are well developed. The cornea is rounded, well pigmented, and bears a distinct ocellus.

The basal segment of the antennular peduncle has the stylocerite long, slender, pointed, and reaching to or beyond the base of the third segment. The second and third segments are subequal in length. Together they are shorter than the first

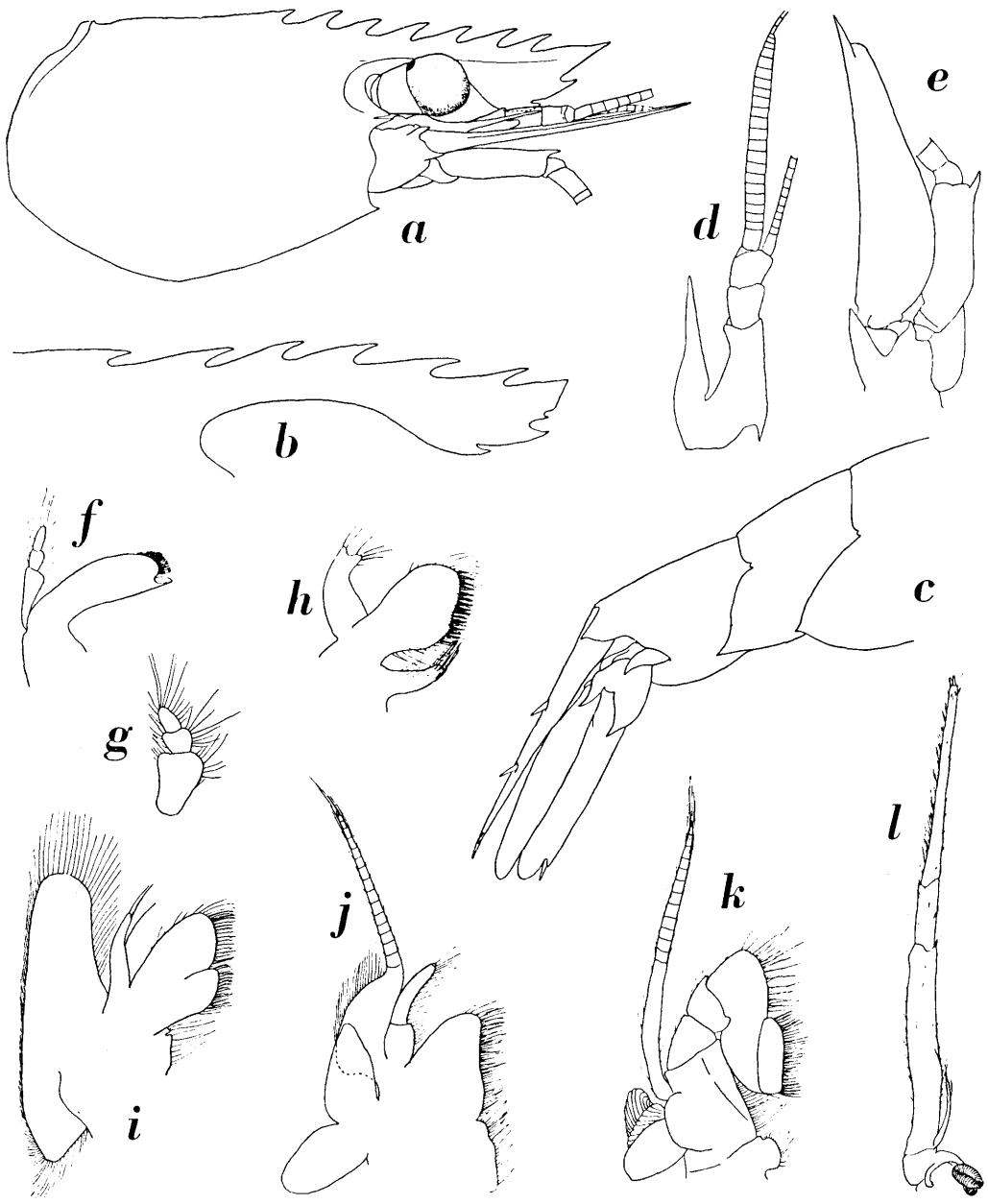

Fig. 10. *Nauticaris magellanica* (A. MILNE EDWARDS). a, anterior part of body in lateral view; b, rostrum of type of *Hippolyte consobrinus* A. MILNE EDWARDS in lateral view; c, posterior part of abdomen in lateral view; d, antennula; e, antenna; f, mandible; g, mandibular palp; h, maxillula; i, maxilla; j, first maxilliped; k, second maxilliped; l, third maxilliped. a,c—e,l, × 7; f—h, × 15; i—k, × 10.

segment. No spines are present on any of the segments. The two flagella are simple, the outer has about 10 to 20 basal joints thickened.

The scaphocerite is very slender, reaching far beyond the rostrum. It is about four times as long as broad. It is broadest near the base and gradually tapers towards the tip. The anterior margin of the lamella is narrow and rounded. The final tooth is strong and reaches with almost its entire length beyond the lamella. The outer margin is concave. The antennal peduncle reaches about to the middle of the scaphocerite; its last segment bears a distinct anterior spine. A sharp spine is present at the outer ventral side of the peduncle near the base of the scaphocerite; a more rounded tooth is placed at the upper side near the base of the scaphocerite, while a small third tooth is situated at the upper inner side.

The mandible lacks the incisor process, the molar process bears several small spinules, a well developed three-jointed palp is present. The maxillula has the lower endite narrow, the upper is broad; the palp is bilobed. The maxilla has the lower endite strongly reduced, the upper is large and deeply incised, the palp is simple, the scaphognathite well developed. All the maxillipeds bear an exopod. The endites of the first maxilliped are separated by a distinct notch; the palp is two-jointed; the exopod has the flagellum articulate, a distinct caridean lobe is present; the epipod is large and bilobed. The second maxilliped has the last joint fused with the penultimate along its longer side; the exopod is articulate; an epipod and a podobranch are present. The third maxilliped reaches with about half the distal joint beyond the scaphocerite. This joint ends into two spines, while three more spines are placed slightly below the top, and a row of spines extends along the inner margin of the joint. Some spines also are placed in the distal part of the two following joints. The ultimate joint is about three times as long as the penultimate and it is of the same length as the antepenultimate joint. A small but distinct exopod is present, it fails to reach the middle of the antepenultimate segment. An epipod and two arthrobranchs are situated at the base of the third maxilliped.

The branchial formula is as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	2	1	1	1	1	—
podobranchs	—	1	—	—	—	—	—	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	1	—	—	—	—	—

The first pereiopod reaches almost to the end of the scaphocerite. The fingers are half as long as the palm and have their tips of a dark horn colour. The tip of the dactylus ends into two sharp teeth between which fits the tip of the fixed finger. The carpus is somewhat shorter than the palm, it narrows posteriorly; its anterior

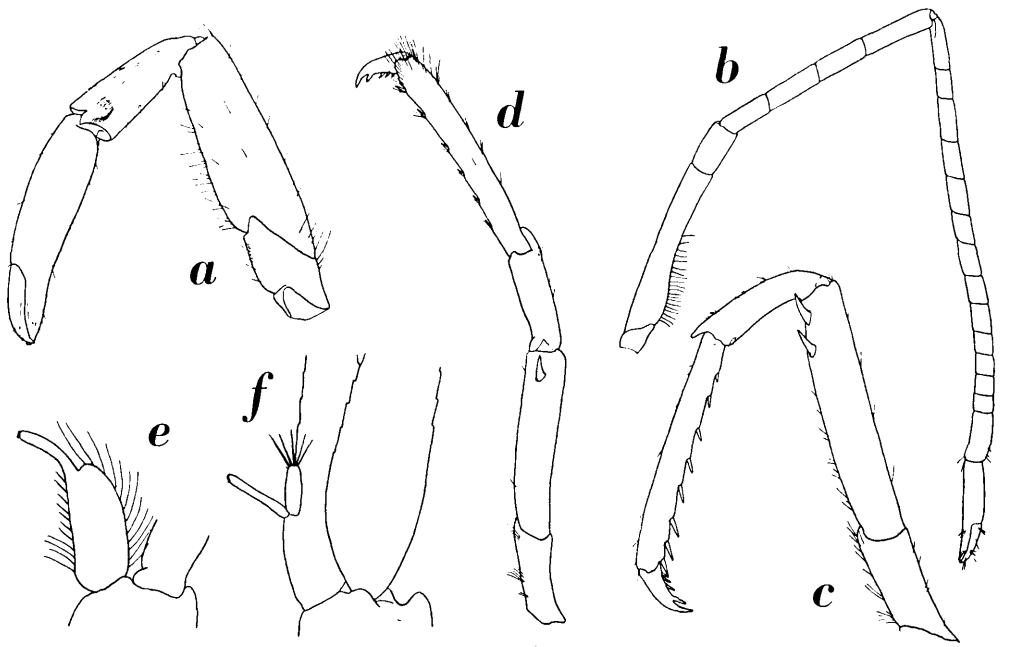

Fig. 11. *Nauticaris magellanica* (A. MILNE EDWARDS). a, first pereiopod; b, second pereiopod; c, third pereiopod; d, fifth pereiopod; e, first pleopod of male; f, second pleopod of male. a—d, × 10; e,f, × 20.

margin bears a sharp tooth at the inner side. The merus is heavy and is about as long as the chela, it bears no teeth or spines. The second legs are equal and slender. They reach with about half the carpus beyond the scaphocerite. The chela is small, it has the fingers $^2/_3$ of the length of the palm. The carpus is four times as long as the chela. It is subdivided into 14 to 16 joints, the proximal of which is longest. The merus is about 0.6 times as long as the carpus and is subdivided into 4 joints. The ischium is almost as long as the merus; one articulation is visible in its distal part. Some stiff hairs are present in the basal part of the inner margin of the ischium. The third leg reaches slightly beyond the scaphocerite. The dactylus is short, and distinctly bifid, it bears some spinules on the posterior margin. The propodus is about 3.5 to 4 times as long as the dactylus, it bears a row of strong spines on the posterior margin. The carpus is half as long as the propodus. The merus is slightly longer than the propodus and bears two strong spines in the distal posterior region. The ischium is less than half as long as the merus. The fourth leg strongly resembles the third, it only is somewhat shorter and more slender. The fifth leg reaches about to the middle of the scaphocerite. The dactylus is similar to that of the third leg. The propodus is almost four times as long as the dactylus and more than twice as long as the carpus. Its posterior margin bears a row of very small spinules. The merus is somewhat shorter than the propodus and bears one strong spine in the posterior distal part.

In the female the endopod of the first pleopod is ovate with the apex pointed, it is shorter than the exopod. The following pleopods of the female all have the endopod provided with an appendix interna. The endopod of the first pleopod of the male is short and ovate, bearing a slender appendix interna. The second pleopod of the male has the appendix masculina rather short and robust, it is shorter than the slender appendix interna. The endopods of the other pleopods of the male too are provided with an appendix interna. The uropods are elongate ovate. The protopod forms two sharply pointed processes. The longer of these processes overreaches the base of the exopod, the shorter stands over the base of the endopod. The outer margin of the exopod is about straight and ends in a tooth, which at its inner side bears a strong movable spine. An indistinct diaeresis is present.

The eggs are numerous, they are 0.35 to 0.5 mm in diameter.

Dr. ISABELLA GORDON kindly reexamined for me the paratypes of *Nauticaris marionis* BATE from the Falkland Islands. These specimens, which form part of the collection of the British Museum (Natural History) proved to possess an exopod at the base of the third maxilliped and thus belong to *Nauticaris magellanica* (A. MILNE EDWARDS).

The holotype of *Hippolyte consobrinus* A. MILNE EDWARDS, which still is present in the collections of the Museum National d'Histoire naturelle in Paris, France, was examined by me. The specimen is 15 mm long and somewhat damaged. The presence of arthrobranchs at the bases of the pereiopods and the movable pleura of the sixth abdominal segment show that it belongs in *Nauticaris*. The specimen shows all the characters of *Nauticaris magellanica*, as for instance the presence of an exopod at the base of the third maxilliped. The rostrum shows the shape which is normal for *Nauticaris magellanica*, save that the tip is broken and has more or less regenerated. This is clearly shown by the irregular shape of the extreme tip and the distal teeth. In MILNE EDWARDS's figure the rostrum is drawn far too narrow. The first dorsal tooth of the rostrum is not different from that of *N. magellanica*. The telson in the type of *Hippolyte consobrinus*, however, is abnormal in having 3 and 4 dorsal spines instead of 2 at each side. There is not the least doubt in my mind that the type specimen of *Hippolyte consobrinus* belongs to *Nauticaris magellanica*. The names *Hippolyte magellanicus* and *Hippolyte consobrinus* have been published as new by A. MILNE EDWARDS at the same time. The name *Hippolyte magellanicus* has page priority over *H. consobrinus*, so that there is not the slightest objection against the continued use of the trivial name *magellanica* for the present species. This latter name is the better known of the two.

I also could examine the type material of *Hippolyte magellanicus* A. MILNE EDWARDS. Among this material I found a specimen from Fleuriais Bay, Gordon Island, S.W. branch of Beagle Canal, which has not been mentioned by A. MILNE EDWARDS in his 1891 report.

Examination of the specimen referred by LENZ (1902) to *Nauticaris marionis* proved that it belongs to *Nauticaris magellanica*. The Berlin Museum also possesses

a specimen of the PLATE collection said to originate from Tumbes near Talcahuano, Concepción, which is not mentioned in LENZ's paper.

The specimen from the Magellan Strait and some or all of those from Port Stanley referred by DOFLEIN & BALSS (1912) to *Nauticaris marionis* BATE, and provisionally regarded by these authors as a separate variety *chilensis* of that species, could be examined by me through the kindness of Professor Dr. HEINRICH BALSS of the Zoologische Sammlung des Bayerischen Staates, Munich, Germany. It became clear from the labels accompanying this material that it has been reexamined in 1934 by Dr. BALSS, who at that time identified the specimens as *Nauticaris magellanica* (A. MILNE EDWARDS). I fully agree with Dr. BALSS in this respect: the specimens show the rostral formula characteristic for that species and moreover they are provided with an exopod at the base of the third maxilliped. DOFLEIN & BALSS (1912) state that their variety differs from the main species in the rostral formula and in the absence of the pterygostomian spine (»An der Frontalregion des Carapax steht nur ein Zahn.»). Also the figure given by DOFLEIN & BALSS (fig. 3) does not show this spine. The animal figured obviously is the largest ovigerous female (32 mm) from Port Stanley. This animal, namely, indeed lacks the pterygostomian spine of the left side and also has a tear in the left lateral margin of the carapace as shown in the above mentioned figure. That the absence of this spine here is an abnormality, is clearly shown by that such a spine is present on the right side, while moreover pterygostomian spines are distinct in all the other specimens of the same lot.

Distribution. As was shown above *Nauticaris magellanica* is the only species of the genus inhabiting the southern part of S. America. Moreover it has not been found outside that region. The species is a form from shallow water, it has been reported from depths varying between 1.8 and 6.5 m; on several occasions it has been found on kelp. The records in literature are: Cavancha near Iquique, N. Chile (LENZ, 1902), Strait Magellan (DOFLEIN & BALSS, 1912), Orange Bay, Hardy Peninsula, Hoste Island, 17 m depth (A. MILNE EDWARDS, 1891), Grévy Island, about 55°36′ S, 67°40′ W, 65 m depth (A. MILNE EDWARDS, 1891), Picton Island, 6 m depth, on kelp (DOFLEIN & BALSS, 1912), Roy Cove, Falkland Islands, 5.5 to 11 m depth, from roots of *Macrocystis* (STEBBING, 1914), Port Stanley, Falkland Islands (DOFLEIN & BALSS, 1912; STEBBING, 1914a), off Falkland Islands, 51°40′ S, 57°50′ W, depth 22 m, bottom sand and gravel (BATE, 1888).

Eualus dozei (A. MILNE EDWARDS) (Figure 12)

Hippolyte Dozei A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 Zool., pt. 2F, p. 46, pl. 5 fig. 3.

Hippolyte Dozei HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 22.

Material examined:

Lund University Chile Expedition

St. M 41. 1 ovigerous female, 17 mm.

St. M 42. 13 specimens, 6—18 mm. 8 of them (6—9 mm) washed from algae and sponges.

St. M 46. 2 specimens, 7 and 13 mm.

Museum Paris

Grévy Island; depth 65 m; temperature 3°; Mission scientifique du Cap Horn, n. 1671; June 24, 1883; holotype of *Hippolyte Dozei* A. MILNE EDWARDS. — 1 specimen, 15 mm.

The rostrum is straight and narrow, it reaches slightly beyond the end of the basal segment of the antennular peduncle. The upper margin bears three teeth, all of which are placed on the rostrum proper, the first tooth sometimes stands just over the posterior margin of the orbit. The number of teeth is smaller in juvenile specimens, being 2, or even 1 in very young animals. The ultimate tooth is separated from the apex by a distance that is much larger than the distances between the teeth themselves. The lower margin bears one subapical tooth, which gives the apex a bifid appearance; sometimes in adults this lower tooth is absent, in juveniles it is always lacking. The rostrum bears a distinct lateral carina, which merges with the posterior margin of the orbit. The lower orbital angle is broadly rounded and not very distinct. Just below this angle lies the well developed sharp antennal spine. A small but distinct pterygostomian spine is present. There are no other spines on the carapace.

Like the carapace the abdomen is smooth. The first three segments have the pleurae broadly rounded, the pleurae of the fourth segment end in a small sharp tooth, those of the fifth are sharply pointed. The pleurae of the sixth segment each bear a small denticle, the posterolateral angles of this segment are pointed. The sixth segment is almost 1.5 times as long as the fifth. The telson is about twice as long as the fifth abdominal segment. It is narrowly triangular and bears three pairs of dorsal spines, the first of which is placed slightly before the middle of the telson. The posterior margin of the telson is pointed in the middle and bears three pairs of spines. The outer of these spines are shortest, the intermediate are longest.

The eyes are well developed. The cornea is globular and broader than the stalk. A distinct ocellus is present.

The basal segment of the antennular peduncle has the stylocerite long and pointed, it reaches about to the middle of the second peduncular segment. The anterior margin of the basal segment bears a strong spine at its upper outer angle. The inner margin of the segment bears a spine slightly before the end. The second and third segments are short and each bears a strong outer anterolateral spine. The outer flagellum has 7 to 9 basal joints thickened.

The scaphocerite reaches somewhat beyond the antennular peduncle. It is about 2.5 times as long as broad. The outer margin is straight and ends in a distinct final tooth, which fails to reach the end of the lamella. The antennal peduncle reaches to the middle of the scaphocerite. A strong tooth is present near the base of the scaphocerite.

The mandible has the incisor process slender and ending into some small teeth. The molar process bears numerous spinules. A distinct two-jointed palp is present. The maxillula has the lower endite slender, the upper is broad; the palp is bilobed. The lower endite of the maxilla is reduced and consists of two short lobes. The upper endite is much larger and also bilobed. The palp and the scaphognathite are well

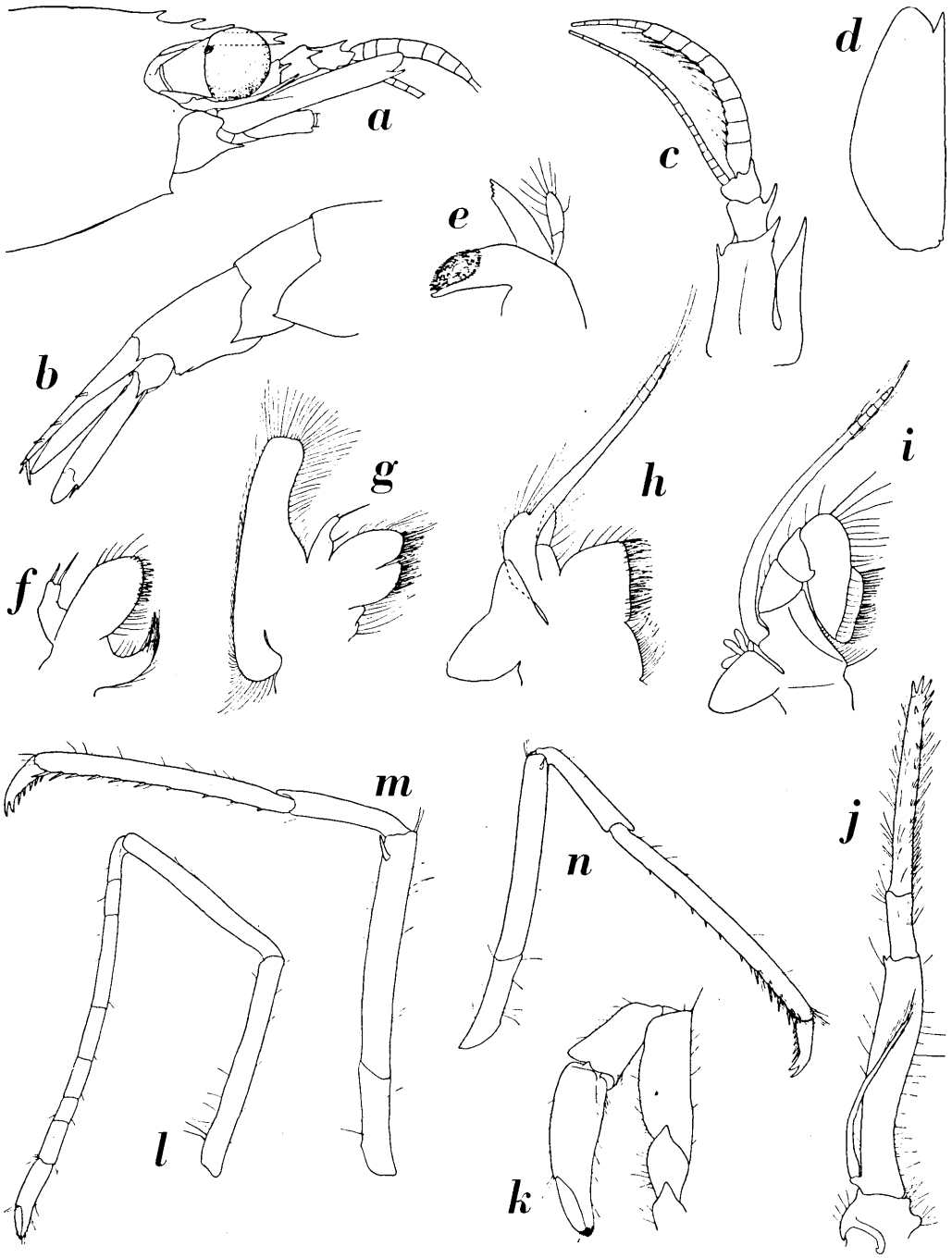

Fig. 12. *Eualus dozei* (A. MILNE EDWARDS). a, anterior part of body in lateral view; b, posterior part of abdomen in lateral view; c, antennula; d, scaphocerite; e, mandible; f, maxillula; g, maxilla; h, first maxilliped; i, second maxilliped; j, third maxilliped; k, first pereiopod; l, second pereiopod; m, third pereiopod; n, fifth pereiopod. a,b, × 10; c,d,j—n, × 15; e—i, × 25.

developed. All three maxillipeds are provided with exopods. The first maxilliped has the endites of basis and coxa separated by a distinct notch. The palp is two-jointed. The caridean lobe is rather small, and the epipod is bilobed. The second maxilliped is of the usual shape, it bears an epipod and a small podobranch. The third maxilliped reaches somewhat beyond the scaphocerite. The ultimate joint is about three times as long as the penultimate and somewhat shorter than the antepenultimate. Some spines are placed at the top of the ultimate joint and some are situated slightly lower. The antepenultimate joint has a distinct outer anterolateral tooth. The exopod fails to reach the end of the antepenultimate segment. A well developed epipod is present.

The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	—	—	—	—	—	—
podobranchs	—	1	—	—	—	—	—	—
epipods	1	1	1	1	1	1	—	—
exopods	1	1	1	—	—	—	—	—

The first pereiopod is short and heavy, it reaches almost to the end of the scaphocerite. The fingers are 0.6 times as long as the palm. The dactylus ends in two ungues, between which fits the tip of the fixed finger. The tips of both fingers are of a dark colour. The carpus is slightly shorter than the palm, while the merus is about as long as the palm and half the fingers together. The second legs reach with about half the carpus beyond the scaphocerite. The chela is small and slender. The fingers measure $^2/_3$ of the length of the palm. The carpus is about four times as long as the chela and consists of 7 joints, the third of which (counted from the base of the carpus) is the longest. The merus is 0.6 times as long as the carpus and slightly shorter than the ischium.The third pereiopod reaches with part of the propodus beyond the scaphocerite. The dactylus is bifid and bears a row of about 5 spinules on its posterior margin. The propodus is almost four times as long as the dactylus. It bears a row of movable spines on the posterior margin, the distal spines are longer than the proximal. The carpus is about half as long as the propodus. The merus is somewhat shorter than the propodus. A strong spine is placed in the postero-distal part of the outer surface of the merus. The ischium is much less than half as long as the merus. The fourth leg is very similar to the third. The fifth leg reaches about to the end of the scaphocerite. The dactylus has the same shape as that of the third leg. The propodus is slightly more than four times as long as the dactylus. The posterior margin of the propodus bears spines and in its distal part it is provided with transverse rows of hairs. The carpus is 0.4 times as long as the propodus. The merus measures $^3/_4$ of the length of the propodus. Here too a spine is present in the postero-

distal part of the outer surface, but this spine is much less strong than that of the third leg. The ischium is less than half as long the merus.

All the specimens at my disposal have the endopod of the first pleopod small and ovate. An appendix interna is present on the endopods of pleopods 2 to 5. No appendix masculina was observed in the second pleopod. Thus probably all these specimens are females. The uropods are elongate. The protopod ends into two pointed processes, the largest of which reaches over the base of the exopod, the other over the base of the endopod. The outer margin of the exopod ends in a small tooth which at its inner side bears a long movable spine. A diaeresis is present.

The eggs are not very numerous, they are 0.5 to 0.8 mm in diameter.

The holotype of *Hippolyte Dozei* A. MILNE EDWARDS, a specimen of 15 mm from Grévy Island, could be examined by me.

Distribution. The only previous record of this species is that by A. MILNE EDWARDS, 1891, who reports it from Grévy Island, about 55°36′ S, 67°40′ W, depth 65 m.

Chorismus antarcticus (PFEFFER)

Hippolyte antarctica PFEFFER, 1887, Jb. Hamburg. wiss Anst., vol. 4, p. 51, pl. 1 figs. 22—27.
Hippolyte Romanchei A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6 pt. 2F, p. 45, pl. 5 fig. 1.
Hippolyte antarctica PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, pp. 502, 547.
Chorismus antarcticus CALMAN, 1907, Nat. Antarct. Exped. Nat. Hist., vol. 2 Crust., pt. 1, p. 1.
Hippolyte Romanchii DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 28.
Chorismus antarcticus LENZ & STRUNCK, 1914, Deutsche Südpolar Exped., vol. 15, p. 318, fig. 4.
Chorismus antarcticus BORRADAILE, 1916, Nat. Hist. Rep. Brit. Antarct. Exped., Zool., vol. 3, p. 85.
Chorismus antarcticus COUTIÈRE, 1917, Deux. Expéd. Antarct. Franç., Crust. Schizop. Décap., p. 6.
Chorismus antarcticus BALSS, 1930, Senckenbergiana, vol. 12, p. 204.
Chorismus antarcticus GURNEY, 1937, Discovery Rep., vol. 14, p. 384, figs. 89—105.
Chorismus antarcticus BAGE, 1938, Rep. Australas. Antarct. Exped., vol. 2 pt. 6, p. 8.
Chorismus antarcticus HALE, 1941, Rep. B.A.N.Z. Antarct. Res. Exped., ser. B vol. 4, p. 267.
Chorismus antarcticus HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], pp. 13, 45.

Material examined:

Museum Paris

Punta Arenas, Magellan Strait; depth 25 m; Mission scientifique du Cap Horn, n. 102; February 16, 1883; holotype of *Hippolyte Romanchei* A. MILNE EDWARDS. — 1 specimen, about 56 mm.

I had the opportunity of examining the holotype of A. MILNE EDWARDS's *Hippolyte Romanchei*. It proved to be a species of *Chorismus* as was clearly shown by the absence of arthrobranchs, the presence of an incisor process and a palp on the mandible, and by the 11- jointed carpus of the second legs. The rostrum is more slender than that figured by PFEFFER (1887) and agrees better with the figure given by LENZ and STRUNCK (1914). There is little doubt that *Hippolyte Romanchei* is identical with *Chorismus antarcticus*, as I already pointed out in 1947.

Distribution. This species has an antarctic circumpolar distribution. It is known from the Magellanic region, from South Georgia, Enderby Land, Kaiser Wilhelm II Land, the Ross Sea area and King George V Land. It was found at depths ranging between 15 and 900 m. The Chilean records are: Puerto Bueno, Smith Channel (DOFLEIN & BALSS, 1912), Charrua, Magellan Strait, 15 m depth (DOFLEIN & BALSS, 1912), Punta Arenas, Magellan Strait, 25 m depth (A. MILNE EDWARDS, 1891). COUTIÈRE's specimens, collected by the »Deuxième Expédition Antarctique Française» originate from the Antarctic region opposite S. America and perhaps even from the Magellan region. As no Station List of this expedition seems to have been published, I am uncertain as to the exact situation of the 6 stations from where COUTIÈRE reports his material.

Hippolyte coerulescens (FABRICIUS) (Figure 13)

Restricted synonymy:

Astacus coerulescens FABRICIUS, 1775, Syst. Ent., p. 414.

Hippolyte Martiali A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, vol. 6. Zool., pt. 2 F, p. 47, pl. 6 fig. 1.

Hippolyte martiali HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 15.

Material examined:

Museum Paris

Beagle Canal off Lupataya; depth 198 m; Mission scientifique du Cap Horn, n. 161; June 4, 1883; syntypes of *Hippolyte Martiali* A. MILNE EDWARDS. — 7 ovigerous females, 7—10 mm.

The specimens are in a rather poor condition, being somewhat shrivelled. The slender rostrum is short, it slightly overreaches the antennular peduncle, but falls short of the end of the scaphocerite. The upper margin bears about in its middle 1 or 2 small teeth. The lower margin bears in its middle 1 or 2 larger teeth. The rostral formulae are: $^{1}/_{1}$ (4 specimens), $^{2}/_{1}$ (1 specimen), $^{1}/_{2}$ (1 specimen), $^{2}/_{2}$ (1 specimen). A strong supraorbital spine is present. The antennal spine is small. A branchiostegal spine is present. The anterolateral angle of the carapace is rounded.

The abdomen is smooth. The pleurae of the first three segments are broad, those of the fourth and fifth segments are narrower, but all of them have the apex rounded. The postero-median part of the third segment is somewhat posteriorly produced and reaches over the fourth segment. The fifth segment on its posterior margin at each side possesses a strong posteriorly directed spine, slightly above the bases of the pleurae. The sixth segment is twice as long as the fifth and also bears two strong, posteriorly directed spines in the submedian region of the posterior margin. The telson is distinctly longer than the sixth abdominal segment. Two pairs of dorsal spines are present in the posterior half close to the lateral margins. The posterior margin of the telson is evenly rounded and bears several spinules.

The eyes are well developed and have the cornea rounded.

The antennulae have the stylocerite well developed, reaching beyond the middle of the basal segment. The anterolateral angle of the basal segment bears a strong

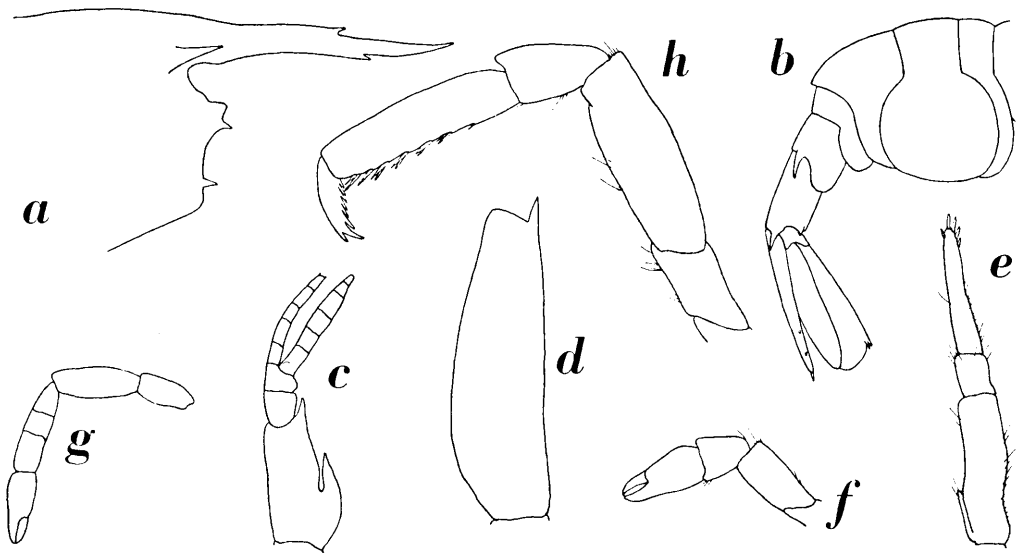

Fig. 13. *Hippolyte coerulescens* (FABRICIUS). a, anterior part of carapace in lateral view; b, abdomen in lateral view; c, antennula; d, scaphocerite; e, third maxilliped; f, first pereiopod; g, second pereiopod; h, third pereiopod. After type specimens of *Hippolyte Martiali* A. MILNE EDWARDS.

spine, which reaches almost to the end of the second peduncular segment. The two flagella are short. The outer is broader and shorter than the inner.

The scaphocerite is somewhat more than three times as long as broad. The outer margin is about straight and ends in a spine, which overreaches the lamella. The antennal peduncle bears a distinct spine at the outer side near the base of the scaphocerite.

The mandible possesses no palp; the incisor process is slender and ends in about 6 small teeth; the molar process ends in some blunt knobs and is provided with numerous spinules. The maxillula is normal in shape, with the palp simple, the upper endite not very broad and the lower slender. The maxilla has the lower endite reduced to a mere lobe, the upper endite is deeply cleft. The palp and the scaphognathite are normal. The first maxilliped has the endites of basis and coxa separated by a notch; the palp and the exopod are normal in shape, the latter has the caridean lobe distinct. The epipod is bilobed. The second maxilliped is normal, it does not possess a podobranch. The third maxilliped reaches to about the end of the rostrum. The last segment is three times as long as the penultimate and somewhat shorter than the antepenultimate. Spines are present at the top of the ultimate segment. A small exopod is present at the base of the third maxilliped.

Owing to the poor condition of the material it was not possible to ascertain the branchial formula of these specimens. A pleurobranch was seen at the bases of the various pereiopods, while epipods were not observed. It seems therefore that the branchial formula is quite normal.

The first pereiopods reach slightly beyond the base of the scaphocerite, they are short and thick-set. The fingers are less than $^2/_3$ of the length of the palm. The carpus is sligthly shorter than the palm. The merus is shorter than the chela. The second legs reach slightly beyond the end of the antennal peduncle. The fingers are shorter than the palm. The carpus is 1.3 times as long as the chela and consists of three joints, the middle of which is the shortest. The merus is almost as long as the carpus. The last three pereiopods are very similar. The third reaches slightly beyond the end of the scaphocerite. The dactylus is bifid and has the lower margin provided with spines. The propodus is somewhat more than twice as long as the dactylus and bears spines, generally in pairs, on the posterior margin. These spines are most crowded in the distal half of the margin. The carpus is somewhat more than half as long as the propodus, while the merus is about as long as that joint.

The pleopods and uropods are normal in shape.

The eggs are numerous and small.

The examination of these type specimens of *Hippolyte Martiali* proved that this species is identical with *Hippolyte coerulescens* (FABRICIUS), a species also known under the names *Hippolyte acuminata* DANA and *H. bidentata* BATE.

Distribution. *Hippolyte coerulescens* has been recorded from the Sargassum Sea in the Central Atlantic Ocean, from Bermuda and N. Carolina to Florida, from the Azores, the Canary and Cape Verde Islands, the Gulf of Guinea and S. Angola. The locality from which the specimens of the Mission du Cap Horn are said to be collected thus lies far out of the known range of distribution of the species. It also is strange that the animals were collected at a depth of 198 m, while the species is known from weeds near the surface only. A confirmation of the occurrence of this species in the Magellanic region therefore is needed.

Latreutes antiborealis new species (Figure 14)

Material examined:

Lund University Chile Expedition

St. M 17. 1 ovigerous female, 12.5 mm.

St. M 95. 10 specimens, 10—12 mm.

St. M 108. 1 ovigerous female, 17 mm (holotype).

The rostrum is high and compressed, reaching far beyond the end of the scaphocerite and being generally directed somewhat downwards. In the adult female it is distinctly higher than in the male or in juveniles. The blade of the rostrum is oval in shape. The lower margin is unarmed, the distal margin ends in some 1 to 3 teeth. The upper of the distal teeth is separated from the distal of dorsal teeth by a deep emargination. In the male the number of distal teeth is smaller than in the female. The upper margin bears 8 to 13 sharp teeth, three of which are placed behind the orbit. The first tooth is placed slightly before the middle of the carapace. The first 6 or 7 teeth are spine-like and articulate with the carapace. The other teeth are fixed. The lower orbital angle is forwards produced to a blunt lobe, which bears a

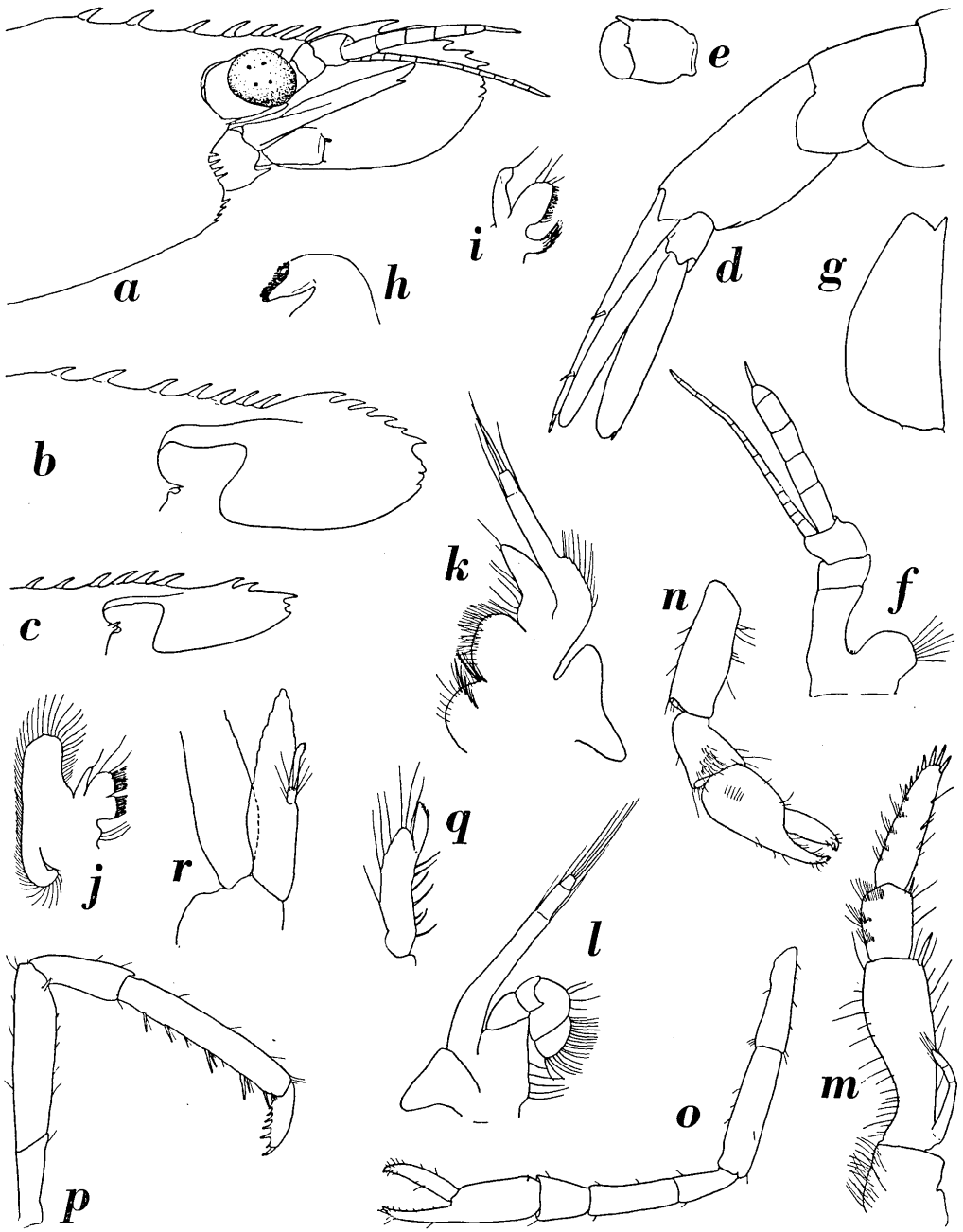

Fig. 14. *Latreutes antiborealis* new species. a, anterior part of body of female in lateral view; b, rostrum of female in lateral view; c, rostrum of male in lateral view; d, posterior part of abdomen in lateral view; e, eye; f, antennula; g, scaphocerite; h, mandible; i, maxillula; j, maxilla; k, first maxilliped; l, second maxilliped; m, third maxilliped; n, first pereiopod; o, second pereiopod; p, third pereiopod; q, endopod of first pleopod of male; r, second pleopod of male. a,b,d,e, × 18; c,f,g,n—p, × 15; h—m, q,r, × 25.

distinct sharp spine. At the level of the base of the antenna the anterior margin of the carapace is concave, here it bears three to five spines. The anterolateral angle of the carapace is provided with three or four teeth. No other spines or teeth are present on the carapace.

The abdomen is smooth. The pleurae of all segments are rounded. The posterolateral angle of the sixth segment is pointed. The fifth segment is about $^2/_3$ as long as the sixth, and is half as long as the telson. The telson is elongate triangular and bears two pairs of dorsal spines, the first of which is placed in the middle of the telson, the other stands halfway between the anterior pair and the posterior margin of the telson. This posterior margin ends in a sharp median tooth and bears two pairs of spines, the inner of which are distinctly longer than the outer.

The eyes have the cornea rounded. The stalk is slightly narrower than the cornea. Two distinct elevated tubercles are present on the inner side of the eyestalk near the base of the cornea. The upper of these tubercles is the larger. Four quadrangularly arranged pigment spots are visible on the cornea of my spirit specimens.

The basal segment of the antennular peduncle has the stylocerite short and broad, the anterior margin is broadly rounded. The second and third segments are short. The flagella are simple, the outer flagellum has five to nine basal joints conspicuously thickened (in smaller specimens this number seems to be higher than in adults).

The scaphocerite reaches distinctly beyond the antennular peduncle, but fails by far to reach the end of the rostrum. It is slightly more than twice as long as broad. The outer margin is slightly concave and ends in a final tooth which reaches about as far forwards as the lamella. The antennal peduncle reaches about halfway the length of the scaphocerite. A distinct spine is present at the outer side of the peduncle near the base of the scaphocerite.

The oral parts are quite typical. The mandible bears neither palp nor incisor process; the molar process is provided with blunt teeth and spinules. The maxillula has the lower endite slender, the upper is broad, while the palp is simple. The maxilla has the lower endite reduced to an inconspicuous lobe. The upper endite is deeply bilobed, the palp and the scaphognathite are normal. All maxillipeds bear exopods, which are articulated in their distal part. The first maxilliped has the endites of basis and coxa separated by a deep incision, the palp is large, the exopod bears a very narrow caridean lobe, the epipod is bilobed. The second maxilliped is quite normal in shape, the last joint is rather broad; an epipod is present, but no podobranch was observed. The third maxilliped reaches to the middle or about to the end of the scaphocerite. The ultimate joint is almost twice as long as the penultimate. At its distal margin it bears a row of strong spinules. The antepenultimate joint is almost 1.5 times as long as the ultimate. Both the penultimate and the antepenultimate joint are provided with a spine at the outer distal angle. The exopod is rather small and reaches slightly or distinctly beyond the middle of the antepenultimate joint. An indistinct epipod is present.

The branchial formula runs as follows.

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	1	1	1	1	1
arthrobranchs	—	—	—	—	—	—	—	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	1	—	—	—	—	—

The first pereiopod reaches about to the base of the scaphocerite. It is short and thick-set. The fingers are about as long as the palm. The latter broadens proximally. The carpus is short and conical, it is about as long as the palm. The merus is somewhat shorter than the chela. The ischium is about half as long as the merus. The second pereiopod reaches slightly beyond the middle or to the end of the scaphocerite. The fingers are somewhat shorter than the palm. The carpus is $^5/_4$ as long as the chela. It consists of three joints. The first and second joints are less distinctly separated from each other than the second and third. The first joint is about $^2/_3$ of the length of the second, while the distal joint is slightly shorter than the first. The merus is $^4/_5$ of the length of the chela. The ischium is somewhat shorter than the merus. The third pereiopod reaches slightly beyond the end of the scaphocerite. The dactylus is rather high and is provided with about 5 teeth on its posterior margin. The propodus is somewhat more than twice as long as the dactylus, twice as long as the carpus and of about the same length as the merus. The latter joint bears a movable spine in the posterior distal part of the outer surface. The ischium is about half as long as the merus. The fourth and fifth legs are very similar to the third, being only somewhat shorter. The merus of the fifth leg does not bear a spine.

The male has the endopod of the first pleopod short and ovate; it bears a distinct appendix interna. The second pleopod of the male is provided with an appendix interna and an appendix masculina. The latter is very short, being less than half as long as the appendix interna, it bears some stiff hairs. The third to fifth pleopods of the male have the endopods provided with an appendix interna only. The first pleopod of the female has the endopod short and ovate, without an appendix. The other pleopods each have the endopod provided with a single appendix interna. The uropods are elongate and narrow. The outer margin of the exopod ends in a movable spine. The posterior margin of the protopod forms blunt lobes over the bases of the exo- and endopod.

The eggs are numerous and small, they measure 0.35 to 0.55 mm in diameter.

The present new species is closely related to *Latreutes parvulus* (Stimpson) from the West Indies and the tropical West African region. It differs from that species in the more elongate rostrum and in having less spines on the third maxilliped.

Latreutes antiborealis also bears a close resemblance to the form from Santa Inez Bay, Lower California described by Chace (1937, p. 129, fig. 7) as *Latreutes* sp.

after a mutilated specimen taken from the stomach contents of an American Eared Grebe, *Colymbus nigricollis californicus* (HEERMANN).

Hippolysmata porteri RATHBUN

Hippolysmata Porteri RATHBUN, 1907, Rev. Chil. Hist. nat., vol. 11, p. 49, pl. 3 fig. 4.
Hippolysmata porteri RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 605.
Hippolysmata porteri BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 332.
Hippolysmata Porteri PORTER, 1937, Rev. Chil. Hist. nat., vol. 40, p. 258, fig. 30.
Hippolysmata porteri HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 19.

Distribution. Masatierra, Juan Fernandez (BALSS, 1924), Bay of Valparaíso (RATHBUN, 1907), Lota, Arauco Bay, S. of Concepción (PORTER, 1937).

Family Rhynchocinetidae

Rhynchocinetes typus H. MILNE EDWARDS

Rhynchocinetes typus H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 383.
Rhynchocinetes typus H. MILNE EDWARDS, 1837a, Ann. Sci. nat. Zool., ser. 2 vol. 7, p. 168, pl. 4C.
Rhynchocinetes typus H. MILNE EDWARDS & Lucas, 1843, Orbigny's Voy. Amér. mérid., vol. 6 pt. 1, p. 36, pl. 17 fig. 1.
Rhynchocinetes typus WHITE, 1847, List Crust. Brit. Mus., p. 130.
Rhynchocinetes typus NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 216, pl. 1 fig. 7.
Rhynchocinetes typus GIBBES, 1850, Proc. Amer. Ass. Adv. Sci., vol. 3, p. 197.
Rhynchocinetes typus LUCAS, 1851, Hist. nat. Crust. Arachn. Myriap., p. 188.
Rhyncocinetes typicus DANA, 1852a, U.S. Explor. Exped., vol. 13, p. 568.
Rhyncocinetes typicus DANA, 1855, U.S. Explor. Exped., vol. 13, atlas, p. 12, pl. 36 fig. 7.
Rhynchocinetes typus GIRARD, 1855, U.S. Naval Astron. Exped. S. Hemisph., vol. 2, p. 259.
Rhynchocinetes typus HELLER, 1865, Reise Novara, Zool., vol. 2 pt. 3, p. 120.
Rhynchocinetes typus CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 497.
Rhynchocinetes typus CUNNINGHAM, 1871a, Notes nat. Hist. Strait Magellan, p. 408.
Rhynchocinetes typus MIERS, 1876, Catal. Crust. New Zeal., p. 77.
Rhynchocinetes typus FILHOL, 1885, Bibl. Éc. haute Étud., vol. 30 pt. 2, p. 52.
Rhynchocinetes typus FILHOL, 1886, Miss. Ile Campbell, Zool., vol. 3 pt. 2, p. 430.
Rhynchocinetes typus ORTMANN, 1890, Zool. Jb. Syst., vol. 5, p. 507, pl. 37 figs. 7d, f—i.
Rhinococynetes typus p.p. SHARP, 1893, Proc. Acad. nat. Sci. Phila., 1893, p. 118.
Rhynchocinetes typus PORTER, 1899, Catal. Colecc. zool. Mus. Valparaíso, vol. 1, p. 14.
Rhynchocinetes typus THOMPSON, 1901, Catal. Crust. Mus. Dundee, p. 20.
Rhynchocinetes typus p.p. LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 734.
Rhynchocinetes typus PORTER, 1903, Rev. Chil. Hist. nat., vol. 7, p. 152.
Rhynchocinetes typus MCCULLOCH, 1909, Rec. Aust. Mus., vol. 7, p. 312.
Rhynchocinetes typus RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 562, pl. 52 fig. 2.
Rhynchocinetes typus KEMP, 1925, Rec. Indian Mus., vol. 27, p. 264.
Rhynchocinetes typus GORDON, 1936, Proc. zool. Soc. Lond., 1936, p. 83, figs. 5a,d, 6a,b.
Rhynchocinetes typicus PORTER, 1940, Rev. Chil. Hist. nat., vol. 44, p. 147.
Rhynchocinetes typicus PORTER, 1940a, Rev. Univ. Santiago, vol. 25 n. 3, p. 313.
Rhynchocinetes typicus PORTER, 1941, Bol. Hist. nat. Lima, vol. 5, p. 460.
Rhynchocinetes typus HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 78.

Material examined:

Lund University Chile Expedition

St. M 124. 1 specimen, 55 mm. Common in exposed rockpools.

Museum Berlin

Cavancha near Iquique, N. Chile; leg. L. PLATE; Reg. No. 10448. — 3 specimens, 72—75 mm.

Museum Leiden

»Indian Ocean»; don. Museum Paris; syntype of *Rhynchocinetes typus* H. MILNE EDWARDS. — 1 specimen, 87 mm.

GORDON (1936) published a revision of the species of the genus *Rhynchocinetes* and defined the status of the various species. Numerous records of »*Rhynchocinetes typus*» from localities outside Chile are based on specimens of other species.

H. MILNE EDWARDS (1837) stated that the type specimens of his species originate from the Indian Ocean, but his material obviously was incorrectly labelled. A syntype of the species is present in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden; on examination it proved to belong to the Chilean species. This specimen was presented to the Leiden Museum by the Muséum National d'Histoire Naturelle of Paris between 1835 and 1845. Another instance of incorrect labelling is that of the specimen of the present species, which was reported by MIERS (1876) from New Zealand. KEMP (1925), who examined this specimen found it to be a typical *R. typus*.

In the Berlin Museum there are three male specimens of the present species. According to the label they originate from Cavancha and are collected by L. PLATE. LENZ (1902) mentions only a juvenile from Cavancha, but he reports upon numerous specimens from Iquique. Since the label in the jar bears the inscription »Cavancha Iquique» it is possible that the specimens actually belong to LENZ's Iquique lot.

Distribution. The species is known only from the coasts of Peru and the Chilean mainland. The records in literature are: Lobos de Afuera, Peru (RATHBUN, 1910), Chile (WHITE, 1847; HELLER, 1865; ORTMANN, 1890; SHARP, 1893; PORTER, 1899), Iquique, and Cavancha near Iquique, N. Chile (LENZ, 1902), Antofagasta (PORTER, 1940, 1940a, 1941), Caldera Bay (GIRARD, 1855), Coquimbo (CUNNINGHAM, 1871, 1871a; PORTER, 1903), Valparaíso (H. MILNE EDWARDS & LUCAS, 1843; NICOLET, 1849; DANA, 1852a; ORTMANN, 1890; THOMPSON, 1901; PORTER, 1903; GORDON, 1936).

Rhynchocinetes balssi GORDON

Rhynchocinetes typus p.p. LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 734.
Rhynchocinetes rugulosus p.p. MCCULLOCH, 1909, Rec. Aust. Mus., vol. 7, p. 310.
Rhynchocinetes typus BORRADAILE, 1916, Nat. Hist. Rep. Brit. Antarct. Exped., Zool., vol. 3 pt. 2, p. 85.
Rhynchocinetes typus BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 331.
Rhynchocinetes typus p.p. KEMP, 1925, Rec. Indian Mus,. vol. 27, p. 264.
Rhynchocinetes balssi GORDON, 1936, Proc. zool. Soc. Lond., 1936, p. 85, figs. 7a, b,
Rhynchocinetes balssi HALE, 1941, Rep. B.A.N.Z. Antarct. Res. Exped., ser. B vol. 4, p. 270.
Rhynchocinetes balssi HOLTHUIS, 1947, Siboga Exped., mon. 39a[8], p. 77.

The species of *Rhynchocinetes* inhabiting Juan Fernandez was found by GORDON (1936) to be quite distinct from *Rhynchocinetes typus* of the coasts of the Chilean mainland. She therefore founded a new species, *R. balssi*, on the specimens recorded by BALSS from Masatierra, which were examined by her. In this new species GORDON also placed specimens from New Zealand, which, however, according to her, might prove to belong to a distinct form.

Distribution. The records in literature are: Juan Fernandez, 25 m depth (LENZ, 1902), Masatierra, Juan Fernandez (BALSS, 1924; GORDON, 1936), off North Island, New Zealand, 34°11′5″ to 34°11′9″ S, 172°8′5″ E, 80 m depth (GORDON, 1936), 7 miles E of North Cape, North Island, New Zealand, 128 m depth (BORRADAILE, 1916), Lord Howe Island, off E. Australia (MCCULLOCH, 1909; HALE, 1941).

Family Campylonotidae

Campylonotus semistriatus BATE (Figure 15)

Campylonotus semistriatus BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 768, pl. 128 figs. 1, 2.
Anchistiella Hahni A. MILNE EDWARDS, 1891, Miss. sci. Cap. Horn, vol. 6 pt. 2F, p. 41, pl. 4 fig. 2.
Campylonotus semistriatus PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, p. 547.
Campylonotus semistriatus THOMPSON, 1901, Catal. Crust. Mus. Dundee, p. 22.
Campylonotus semistriatus SOLLAUD, 1910, Bull. Mus. Hist. nat. Paris, vol. 16, p. 381, figs. 3a.
Campylonotus semistriatus SOLLAUD, 1913, Bull. Mus. Hist. nat. Paris, vol. 19, p. 185, fig. 2.
Campylonotus semistriatus SCHMITT, 1926, Biol. Res. Endeavour, vol. 5 pt. 6, p. 372.

Material examined:

Lund University Chile Expedition

St. M 80. 1 female, 92 mm. *St. M 83.* 1 female, 80 mm. *St. M 144.* 2 males, 38 and 42 mm.

Museum Paris

Lajaifwaya, Gretton Bay, Wollaston Island; depth 30 m; Mission scientifique du Cap Horn, n. 166; June 21, 1883; syntypes of *Anchistiella Hahni* A. MILNE EDWARDS. — 4 specimens, 63—80 mm.

The specimens agree with BATE's (1888) description and excellent figure. In my specimens there are four or five dorsal teeth on the rostrum, two or three of which are placed on the carapace behind the orbit. The apex of the rostrum (like in BATE's and A. MILNE EDWARDS's specimens) is simple. The lower margin bears 3 or 4 teeth. In the middorsal line of the carapace, rather close to the posterior margin, there is a tubercle, which is not mentioned by either BATE or MILNE EDWARDS, but which is shown in the figure given by the former. BATE (1888, p. 770) states that the carapace is smooth and polished. This is not true, in reality the entire surface of the carapace is closely beset with small, short, anteriorly curved hairs, which also are present on the abdomen.

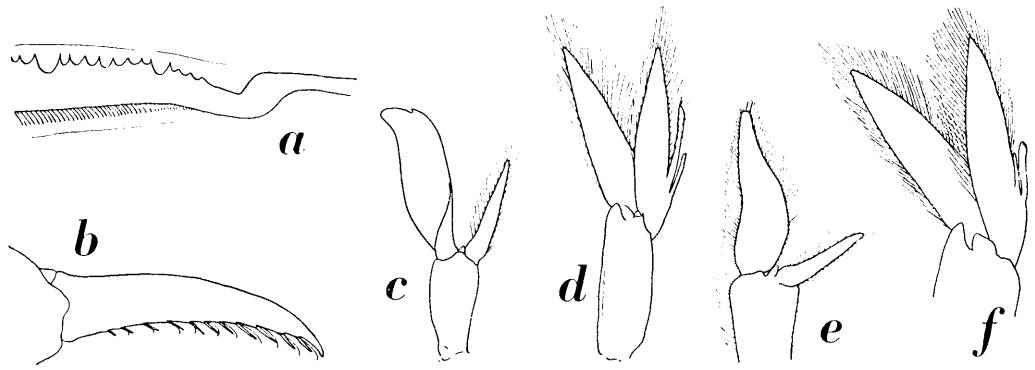

Fig. 15. *Campylonotus semistriatus* BATE. a, cutting edges of fingers of second leg; b, dactylus of third leg; c, first pleopod of male; d, second pleopod of male; e, first pleopod of female; f, second pleopod of female. a,b, × 20; c,d, × 7.5; e,f, × 4.

The eyes are enormously large as is shown in BATE's figure. In the illustration given by MILNE EDWARDS the eyes are very small; A. MILNE EDWARDS correctly described the eyes as »arrondis et volumineux», his figures are incorrect.

The stylocerite reaches beyond the middle of the second segment of the antennular peduncle, it is rather broad at the base and narrows gradually to a sharp point. The second segment of the peduncle is longer and broader than the third.

The scaphocerite shows the shape as it is given in A. Milne Edwards's figure, in my material, however, it is slightly more slender.

MILNE EDWARDS's figures of the first two pairs of legs are incorrect in showing the fingers far too short. The figures given by BATE show the relation as it is in reality. Both the first and second legs have the cutting edge of the fixed provided with numerous spinules of equal length which are placed so close together that their apices from an uninterrupted margin. The cutting edge of the dactylus bears less spinules, which, moreover, are of irregular size. No spines are present on any of the joints. The last three pairs of legs have the dactylus slender and provided at the posterior margin with a row of spinules, which at each side is flanked by a row of slender and curved hairs. Some few spinules are present on the posterior margin of the propodus of the last three pairs of legs. In my specimens the sternal spines at the base of the second legs reach beyond those of the first legs.

The peculiar shape of the pleopods has already been dealt with by BATE and SOLLAUD. The first pleopod of the male of this species has been figured by SOLLAUD (1913). The present figures show the first and second pleopods of my male and female specimens. The endopod of the female first pleopod is elongate triangular, being larger than the exopod. The second pleopod of my female specimens bears, apart from an appendix interna, a stylamblys (the name appendix masculina is not very appropriate here). The exopod of the uropods has the outer margin ending in a tooth, which at its inner side bears a movable spine. A diaeresis, which is curved strongly anteriorly, is present.

Colour. The female specimens collected by the Lund University Expedition were noted by the collectors to be »skarpt mörk orange» (bright dark orange) and »orangeröd» (orange-red). A. MILNE EDWARDS remarks about the colour of this species: »La couleur .... est rosée, le corps, les pattes et les antennes étant plus claires que le corps et traversées par des bandes à peine teintées. L'estomac se voit par transparence à travers les tissus .... Les cornés oculaires sont d'un noir brillant».

Distribution. The species is only known from the Magellanic region. It occurs in depths between 30 and 816 m, on a muddy bottom. The records in literature are: Messier Channel, 47°48'30" S, 74°47'0" W, 229 m depth, and 48°27' S, 74°30' W, 631 m depth (BATE, 1888), off Port Grappler, 49°24'30" S, 74°23'30" W, 256 m depth (BATE, 1888; THOMPSON, 1901), off Tom Bay, 50°8'30" S, 74°41'0" W, 320 m depth (BATE, 1888), Puerto Bueno, 50°56' S, 74°15' W, 73 m depth (BATE, 1888), Sarmiento Channel, 51°27'30" S, 74°3'0" W, 730 m depth (BATE, 1888), off Port Churruca, 52°45'30" S, 73°46'0" W, 448 m depth (BATE, 1888), Murray Narrows along the eastcoast of Navarin Island, connecting Beagle Canal and Ponsonby Bay, 200 m depth (A. MILNE EDWARDS, 1891), Lajaifwaya, Gretton Bay, Wollaston Island, 30 m depth (A. MILNE EDWARDS, 1891), 10 miles S.E. of Slogett Bay, Tierra del Fuego, about 55° S, 66° W, 816 m depth (A. MILNE EDWARDS, 1891).

Campylonotus vagans BATE (Figure 16)

Campylonotus vagans BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 775, pl. 122 fig. 3.
Anchistiella Hyadesi A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, Zool., vol. 6 pt. 2F, p. 38, pl. 4 fig. 1.
Anchistiella Seneuili A. MILNE EDWARDS, 1891, Miss. sci. Cap Horn, Zool., vol. 6 pt. 2F, p. 42, pl. 3 fig. 2.
Campylonotus vagans PFEFFER, 1892, Neumayer's Deutsch. Exped. Ergebn., vol. 2, p. 547.
Campylonotus vagans COUTIÈRE, 1907, Bull. Mus. Hist. nat. Paris, vol. 13, p. 412.
Campylonotus Seneuili SOLLAUD, 1910, Bull. Mus. Hist. nat. Paris, vol. 16, p. 381, figs. 1, 2a, 3d.
Campylonotus vagans SOLLAUD, 1910, Bull. Mus. Hist. nat. Paris, vol. 16, p. 381, figs. 3b, c.
Anchistiella vagans DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 26.
Campylonotus vagans SOLLAUD, 1913, Bull. Mus. Hist. nat. Paris, vol. 19, p. 185, fig. 1.
Campylonotus Seneuili SOLLAUD, 1913, Bull. Mus. Hist. nat. Paris, vol. 19, p. 185.
Campylonotus vagans SCHMITT, 1926, Biol. Res. Endeavour, vol. 5 pt. 6, p. 373.
Campylonotus seneuli SCHMITT, 1926, Biol. Res. Endeavour, vol. 5 pt. 6, p. 373.

Material examined:

Lund University Chile Expedition

St. M 46. 1 male specimen, 70 mm.

Museum Paris

Orange Bay, Hoste Island; depth 26 and 28 m; temperature 8°; Mission scientifique du Cap Horn; June 8, 1883; syntypes of *Anchistiella Hyadesi* A. MILNE EDWARDS. — 3 specimens, two of which are damaged, the other is 85 mm in length.

Locality unknown; Mission scientifique du Cap Horn; ? syntypes of *Anchistiella Hyadesi* A. MILNE EDWARDS. — 4 specimens, 51—96 mm.

Punta Arenas, Magellan Strait; depth 143 m; temperature at the bottom 6.9°, at the surface 7.2°; Mission scientifique du Cap Horn, n. 37; November 8, 1882; holotype of *Anchistiella Seneuili* A. MILNE EDWARDS. — 1 specimen, 34 mm.

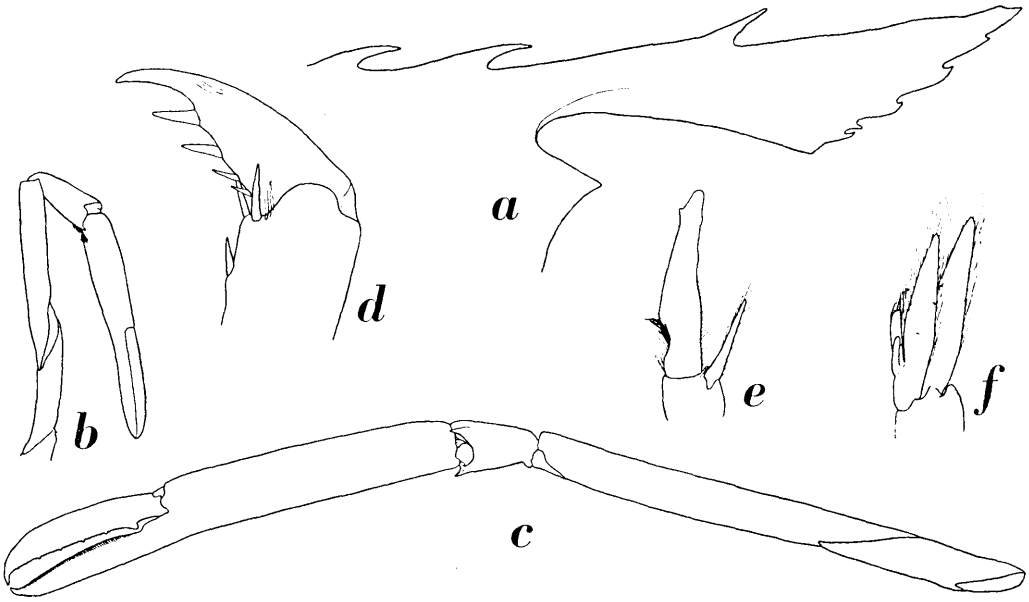

Fig. 16. *Campylonotus vagans* BATE. a, rostrum of type specimen of *Anchistiella Seneuili* A. MILNE EDWARDS in lateral view; b, first pereiopod; c, second pereiopod; d, dactylus of third pereiopod; e, first pleopod of male; f, second pleopod of male. a, × 8.5; b,c,e,f, × 3.6; d, × 20.

The specimen of the Lund University Expedition agrees with BATE's description and figures. The lower margin of the rostrum bears 7 teeth only. Like in the previous species the carapace is covered with minute anteriorly curved short hairs, which also are found on the abdomen. The fifth abdominal segment has not been correctly figured, neither by BATE nor by A. MILNE EDWARDS, since the posterior margin of the pleurae of this segment bears a sharp small tooth some distance above the sharply pointed apex; this tooth, however, may easily be overlooked. The telson bears at one side three dorsal spines, at the other four. The posterior margin of the telson ends in a sharp median point and bears three pairs of spines and some setae. The first two pereiopods are described here as they are lacking in BATE's only specimen, while moreover fig. 1 of MILNE EDWARDS's paper gives an entirely incorrect picture.

The first leg reaches beyond the antennular peduncle, but fails to attain the end of the scaphocerite. The fingers are slender, they are slightly shorter than the palm. The cutting edges are similarly armed as in *C. semistriatus*. The palm is only slightly compressed. The carpus is about half as long as the palm, its anterior margin bears a sharp tooth at the inner side and one at the outer side. The merus is about 1.5 times as long as the palm and about twice as long as the ischium. No spines or teeth are present on either merus or ischium. The second legs, like the first, are equal. They reach with part of the palm beyond the scaphocerite. The slender fingers are

$^3/_5$ of the length of the palm. Their cutting edges are armed exactly as in *C. semistriatus*, with the exception that in its basal part the dactylus bears a large tooth. The palm is narrow and slightly compressed. The carpus is about $^2/_7$ of the length of the palm, its anterior margin bears two sharp teeth, one at the inner, the other at the outer part of the ventral region. The merus is 1.2 times as long as the palm, it bears no spines. The ischium is short. Neither the merus nor the ischium bears any spine or tooth. The dactylus of the last three legs is much less slender than in *C. semistriatus* and bears a much smaller number of posterior teeth. In my specimen the tufts of hair at the end of the propodus also are much less distinct than in the previous species. The sternal spines at the base of the second legs are more slender, but not longer than in my material of *C. semistriatus*. No spines were observed by me at the bases of the first legs.

The first pleopods of my only (male) specimen have the endopods much larger than the exopods. The endopod is elongate with a strongly concave region in the basal part of the inner margin. This inner margin moreover bears a distinct tooth at a small distance below the apex, and it is provided with minute hooks in the region between the concavity and the tooth. The second pleopod of the male has the appendix masculina large and broad, being distinctly longer than the appendix interna. An appendix interna is present on the endopod of all other pleopods. The uropods are as in the previous species.

Anchistiella Seneuili was described by A. MILNE EDWARDS after a single damaged specimen. During a visit to the Paris Museum I could reexamine the type of this species and found that in every respect it agrees with *Campylonotus vagans* except for the shape of the rostrum. On close examination it appears, however, that the rostrum of this specimen has been broken and afterwards regenerated, thereby becoming abnormally short. The irregular shape of the top and several of the teeth prove this (vid. fig. 16a). In my opinion it is therefore not possible to regard *A. Seneuili* and *Campylonotus vagans* as two distinct species.

Colour. The following description has been prepared after a colour sketch made from the living specimen by Dr. HANS BRATTSTRÖM. Dr BRATTSTRÖM was kind enough to check this description for me.

The body is brightly coloured. The ground colour is a bright, rather pale, reddish brown. There are darker markings of the same colour on the rostrum and on the sides. The upper half of the rostrum has this darker reddish brown colour, the lower half, however, is almost colourless, being of a very pale yellowish white. An oblique dark stripe is visible in the anterolateral part of the carapace, starting from the orbit and running obliquely downwards. A horizontal dark line runs over the middle of each lateral surface of the carapace, starting somewhat before the centre of the surface and running straight backwards. Some irregular broad dark lines are present on the pleurae of the first three, perhaps four, abdominal segments. The telson and the uropods too are of this darker reddish brown colour, the uropodal endopods only are of a grey colour. In the middorsal region of the carapace bright blue spots and lines are visible: About 8 spots are placed in three longitudinal rows in the mid-

dorsal region of the anterior half of the carapace, three longitudinal blue lines are present in the posterior part. At each side of this group of lines there is a blue dot Two blue dots are present in the middorsal line of the first to third abdominal segments. The third abdominal segment possesses a bright yellow spot in the posteromedian part, where the segment is produced somewhat backwards. This yellow spot is surrounded by a dark brown margin. At each side of the spot the third segment has an oblique blue line; these two lines converge anteriorly. The posterior half of the abdomen (segments 4 to 6) bears a short transverse blue line in the anterior middorsal region and there are two submedian blue dots in the posterior part.

The eyes have the cornea deep black. The scaphocerite is bright brown.

The second leg has the fingers bright brown, being blue at the base. The palm has the distal half dark purplish brown, the proximal half is pale grey. The carpus is of a dark purplish brown colour, while the merus shows various coloured bands: a bright brown band distally, followed by a narrow grey band, then a broad purplish brown band and finally a grey band which extends on the ischium. All the coloured bands of the leg mentioned here are separated from each other by very narrow blue bands. The last three legs are banded with violet and bright yellow.

A. MILNE EDWARDS (1891) gives the following colour description of the species: »la teinte générale est rosée, relevée de taches et de bandes brunâtres, ainsi que de taches d'un beau bleu d'outremer. Les pattes de la deuxième paire, armées de grosses pinces, portent des anneaux successifs noirs, bruns, bleus, blancs et violacés, tandis que les autres pattes portent des bandes brunes, rosées et blanches.»

Distribution. The species has been recorded in literature from the following localities: Off Tom Bay, Patagonia, 50°8′30″ S, 74°41′0″ W, 320 m depth (BATE, 1888), Dixon Cove, Magellan Strait, 35 m depth (DOFLEIN & BALSS, 1912), Magellan Strait, near Punta Arenas, 18 and 143 m depth (A. MILNE EDWARDS, 1891), Naturalist Bay, eastcoast of Rous Peninsula, Hoste Island, 35 m depth (A. MILNE EDWARDS, 1891), Orange Bay, Hardy Peninsula, Hoste Island, 26 and 28 m depth (A. MILNE EDWARDS, 1891), Wollaston Island, N. of Cape Horn, 95 m depth (A. MILNE EDWARDS, 1891), east entrance of Franklin Canal, between Wollaston and Herschell Islands, 51 m depth (A. MILNE EDWARDS, 1891), South Georgia (COUTIÈRE, 1907).

Family Palaemonidae

Two species belonging to this family have been reported from the antiboreal region of South America, though they have not been found in Chile proper. These species are *Palaemon affinis* H. MILNE EDWARDS (1837) and *Leander tenuicornis* (SAY, 1818), both reported from the Falkland Islands. MIERS (1876, p. 86) remarks that *Palaemon affinis*, which species is named *Leander affinis* by him, occurs on the Falkland Islands. This is, however, very improbable since the species at present is known from New Zealand only. MIERS's specimen may have been incorrectly labelled or misidentified. *Leander tenuicornis* (SAY) for the first time has been reported from the Falkland Islands by KEMP (1925, p. 304). Since that time the

species has no more been recorded from that region. *Leander tenuicornis* is a circumtropic species, which is especially common in floating Sargassum weed; it has not yet been found on the West American coast.

Only one species belonging to the Palaemonidae is represented in Chilean waters:

Cryphiops caementarius (MOLINA) (Figure 17)

Cancer caementarius MOLINA, 1782, Saggio Stor. nat. Chili, p. 208.
Cancer caementarius MOLINA, 1786, Versuch Naturgesch. Chili, pp. 183, 308 (*Cancer Caementaroius* on p. 308).
Cancer caementarius MOLINA, 1788, Compend. Hist. geogr. nat. civ. Chili, vol. 1, p.....
Cancer caementarius GMELIN, 1789, Linn. Syst. Nat., ed. 13 vol. 1 pt. 5, p. 2986.
Cancer caementarius MOLINA, 1789, Essai Hist. nat. Chili, pp. 184, 328.
Cancer caementarius GMELIN, 1793, Linn. Syst. Nat., ed. 14 vol. 7, p. 493.
Cancer Caementarius TURTON, 1800, Linn. System of Nature, vol. 3, p. 758.
Cancer cementarius MOLINA, 1808, Geogr. nat. civ. Hist. Chili, vol. 1, pp. 144, 243.
Cancer caementarius MOLINA, 1809, Geogr. nat. civ. Hist. Chile, vol. 1, p. ...
Astacus Caementarius MOLINA, 1810, Saggio Stor. nat. Chili, ed. 2, p. 188.
Cancer caementarius POEPPIG, 1835, Reise Chile, Peru, vol. 1, p. 314.
Palaemon caementarius POEPPIG, 1836, Arch. Naturgesch., vol. 2 pt. 1, p. 143.
Palemon Gaudichaudii H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 400.
Palaemon Gaudichaudii H. MILNE EDWARDS & Lucas, 1843, Orbigny's Voy. Amér. mérid., vol. 6 pt. 1, p. 37, pl. 17 fig. 2.
Palaemon Gaudichaudii NICOLET, 1849, Gay's Hist. fis. polit. Chile, vol. 3, p. 218.
Palaemon caementarius NICOLET, 1849, Gay's Hist. fis. polit. Chile, vol. 3, p. 219.
Palemon gaudichaudii GIBBES, 1850, Proc. Amer. Ass. Adv. Sci., vol. 3, p. 198.
Palemon Gaudichaudii GIBBES, 1850a, Proc. Acad. nat. Sci. Phila., 1850, pp. 25, 28.
Cryphiops spinuloso-manus DANA, 1852, Proc. Acad. nat. Sci. Phila., 1852, p. 26.
Palaemon Gaudichaudii DANA, 1852a, U.S. Explor. Exped., vol. 13, p. 592.
Cryphiops spinuloso-manus DANA, 1852a, U.S. Explor. Exped., vol. 13, p. 595.
Cryphiops spinulosomanus WEITENWEBER, 1854, Lotos, Praha, vol. 4, p. 62.
Cryphiops spinulosi-manus DANA, 1855, U.S. Explor. Exped., vol. 13 atlas, p. 12, pl. 39 fig. 4.
Cryphiops spinulosomanus VON MARTENS, 1858, Ann. Mag. nat. Hist., ser. 3 vol 1, p. 51.
Bithynis longimana PHILIPPI, 1860a, Arch. Naturgesch., vol. 26 pt. 1, p. 164.
Palaemon caementarius HELLER, 1862, S.B. Akad. Wiss. Wien, vol. 45 pt. 1, p. 414.
Macrobrachium africanum BATE, 1868, Proc. zool. Soc. Lond., 1868, p. 366, pl. 31 fig. 3.
Palaemon Gaudichaudii VON MARTENS, 1868, Arch. Naturgesch., vol. 34 pt. 1, p. 64.
Palaemon gaudichaudii SEMPER, 1868, Proc. zool. Soc. Lond., 18 68, p. 586.
Palaemon caementarius CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 497.
Palaemon caementarius CUNNINGHAM, 1871a, Notes nat. Hist. Strait Magellan, p. 415.
Palaemon gaudichaudii MIERS, 1877, Proc. zool. Soc. Lond., 1877, p. 661.
Palaemon gaudichaudii caementarius MIERS, 1877, Proc. zool. Soc. Lond., 1877, p. 662.
Bithynis gaudichaudii ORTMANN, 1891, Zool. Jb. Syst., vol. 5, p. 748.
Bithynis gaudichaudii SHARP, 1893, Proc. Acad. nat. Sci. Phila., 1893, p. 119.
Palaemon caementarius PHILIPPI, 1894, Zool. Anz., vol. 17, p. 266.
Palaemon caementarius PHILIPPI, 1894a, Ann. Univ. Chile, vol. 87, p. 375.
Bithynis caementaria ORTMANN, 1897, Rev. Mus. Paulista, vol. 2, p. 214.
Bithynis Gaudichaudii DOFLEIN, 1899, S.B. Bayer. Akad. Wiss., vol. 29, p. 186.
Bithynis gaudichaudii LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 735.
Bithynis Gaudichaudii PORTER, 1903, Rev. Chil. Hist. nat., vol. 7, p. 152.

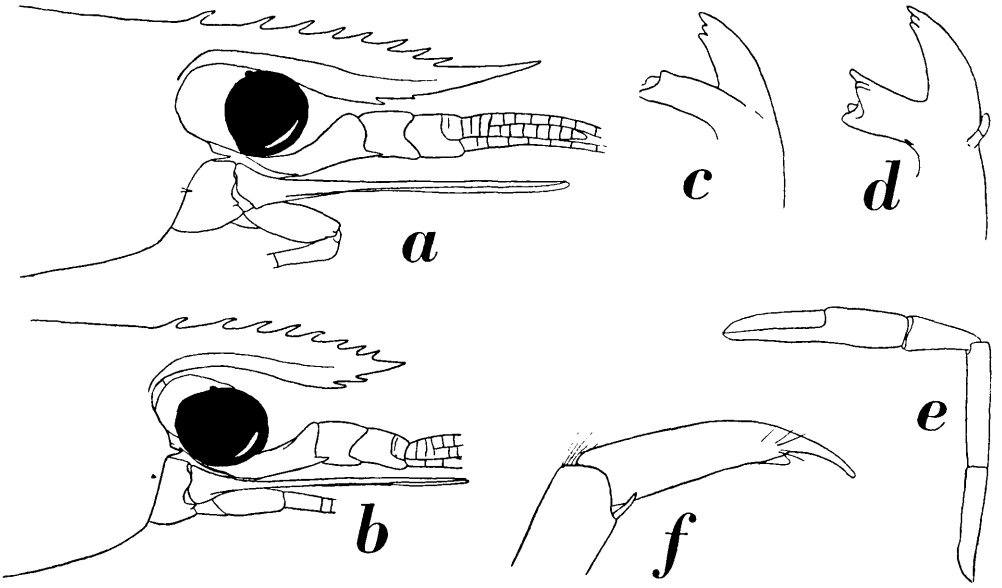

Fig. 17. *Cryphiops caementarius* (MOLINA), juvenile stages. a,b, anterior part of body in lateral view; c,d, mandible; e, second pereiopod; f, dactylus of third pereiopod. a,c,e,f, after youngest stage, Chorillos, Peru; b,d, after a more advanced stage, Miraflores, Peru. a,b,e, × 16; c.d, × 33; f, × 66.

Bithynis caementarius gaudichaudii RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, pp. 560, 604, pl. 54 fig. 1.
Bithynis caementarius RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 604.
Cryphiops spinulosomanus RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 605.
Palaemon gaudichaudii KEMP, 1925, Rec. Indian Mus., vol. 27, pp. 285, 286.
Cryphiops KEMP, 1925, Rec. Indian Mus., vol. 27, pp. 285, 286.
Cryphiops GORDON, 1935, Journ. Linn. Soc. Lond. Zool., vol. 39, p. 327.
Palaeman caementarius BOONE, 1938, Bull. Vanderbilt mar. Mus., vol. 7, p. 255, pl. 102.
Cryphiops caementarius HOLTHUIS, 1950, Siboga Exped., mon. 39a[9], pp. 11, 97.
Cryphiops caementarius HOLTHUIS, 1952, Allan Hancock Found. Publ., Occ. Pap., vol. 12, p. 137, pls. 33—35.

Material examined:

Lund University Chile Expedition

St. M 154. 1 juvenile, 18 mm.

Museum Leiden

Miraflores near Lima, Peru; in small rivulets, 20 to 50 m from the sea; leg. W. K. WEYRAUCH (n. 10. 124); June—July, 1939. — 4 juveniles, 14—18 mm.

Chorillos near Lima, Peru; in shallow pools in grassland; leg. W. K. WEYRAUCH (n. 10. 168); June, 1949. — 7 juveniles, 15—18 mm.

Juvenile specimens of the present species have not yet been described or even mentioned in literature, as far as I know. These juveniles show a number of quite

interesting features in which they differ considerably from the adults. Fortunately I had the opportunity to compare the single specimen of the Lund University Expedition with 11 specimens ranging from 14 to 18 mm of length, from the neighbourhood of Lima, Peru, which the Rijksmuseum van Natuurlijke Historie at Leiden recently received through the courtesy of Dr. W. K. WEYRAUCH of the Natural History Museum at Lima.

The specimens in which the development is most advanced, have the rostrum reaching to the end of the second or third joint of the antennular peduncle. The upper margin is provided with 7 or 8 teeth, the first of which sometimes lies behind the orbit; generally, however, all the teeth are placed on the rostrum proper. The lower margin bears 0 to 2 teeth. The tip of the rostrum in the smaller specimens is styliform. The carapace bears a strong antennal spine, while a microscopically small hepatic spine is placed some distance below the antennal and at a short distance behind the anterior margin of the carapace. The telson bears two setae between the two pairs of spines on the posterior margin.

The mandible bears a poorly developed two-jointed palp.

The second legs are equal. The fingers are slightly longer than the palm and are unarmed. The carpus is as long as the palm and somewhat more than half as long as the merus. No spinules are present on any of the joints. The last three pereiopods have the dactylus provided with a small lobe on the posterior margin close to the apex, which gives the dactylus, when seen under a strong magnification, a bifid appearance.

In the least developed specimens these features all are more strongly pronounced. Here the rostrum reaches distinctly beyond the antennular peduncle and has the apex long and styliform. The hepatic spine is slightly larger and placed very close to the anterior margin of the carapace. On the mandible no palp is present at all. The second legs are somewhat more slender, and the dactyli of the last three legs are more distinctly bifid.

In the genus *Macrobrachium* similar differences between very juvenile and adult specimens have been observed.

An extensive description of the present species and a discussion of the synonymy are given in a recent publication (HOLTHUIS, 1952).

Distribution. *Cryphiops caementarius* is a fresh water species. At least adult specimens are known exclusively from fresh water. Juveniles seem to be able to live in brackish or even in salt water; this has been observed also in the genus *Macrobrachium*, which in fact is closely related to *Cryphiops*. The present species is only known from Peru and Chile. The records in literature are: Peru (VON MARTENS, 1868; SHARP, 1893), Pacasmayo (RATHBUN, 1910), Rio Moche near Salavery (HOLTHUIS, 1952), Chancay, Peru (RATHBUN, 1910), Ancon, Peru[1] (ORTMANN, 1891, 1897), Rio Chillon near Lima (DOFLEIN, 1899), Rio Chillon near Lima (HOLTHUIS,

[1] In 1891 ORTMANN gives this locality as Ancon, Ecuador, but in 1897 he corrects it to Ancon, Peru.

1952), Chosica near Lima (HOLTHUIS, 1952), near Lima (MIERS, 1877), Rio Rimac near Villegas, between Lima and Callao (RATHBUN, 1910), Callao (BOONE, 1938; HOLTHUIS, 1952), Arequipa (RATHBUN, 1910), Vitor River (HOLTHUIS, 1952), Rio Tambo near Mollendo (BATE, 1868; DOFLEIN, 1899), Mollendo, Peru (RATHBUN, 1910; HOLTHUIS, 1952), Chile (MOLINA, 1782, 1786, 1788, 1789, 1808, 1809, 1810; GMELIN, 1789, 1793; TURTON, 1800; H. MILNE EDWARDS, 1837; H. MILNE EDWARDS & LUCAS, 1843; NICOLET, 1849; DANA, 1852, 1852a; VON MARTENS, 1868; MIERS, 1877; SHARP, 1893), N. Chile (POEPPIG, 1835), Arica (HOLTHUIS, 1952), Coquimbo (NICOLET, 1849), La Serena, Coquimbo (ORTMANN, 1891; HOLTHUIS, 1952), marshes near La Serena (CUNNINGHAM, 1871, 1871a), Rio Coquimbo near La Serena (LENZ, 1902), Rio Coquimbo (PORTER, 1903), Rio de la Ligua, Aconcagua (PHILIPPI, 1860a, 1894), Rio Aconcagua, Valparaíso (POEPPIG, 1836; PHILLIPPI, 1894), Rio Aconcagua near Culera (HOLTHUIS, 1952), Valparaíso (DANA, 1852a).

Family Glyphocrangonidae

Glyphocrangon rimapes BATE

Glyphocrangon rimapes BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 523, pl. 94 fig. 4.
Glyphocrangon rimapes MURRAY, 1896, Trans. Roy. Soc. Edinb., vol. 38, pp. 387, 394, 400, 453.
Glyphocrangon rimapes THOMPSON, 1899, Proc. Roy. Soc. Edinb., vol. 22, p. 328.
Glyphocrangon rimapes DE MAN, 1920, Siboga Exped., mon. 39a[3], pp. 215, 218.

Distribution. The only Chilean record of this deep sea species is: Near Juan Fernandez, 33°42′ S, 78°18′ W, 2500 m depth (BATE, 1888). The other records are: Near Yokohama, 34°37′ N, 140°32′ E, 3430 m depth (BATE, 1888) and between Buenos Aires and Tristan da Cunha, 37°47′ S, 30°20′ W, 3140 m depth (BATE, 1888). In all three localities the species was found on a muddy bottom.

Macrura Reptantia.

Tribe Eryonidea

Family Eryonidae

Polycheles chilensis SUND

Pentacheles laevis p.p. BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 144, pl. 15 fig. 5.
Pentacheles laevis p.p. MURRAY, 1896, Trans. Roy. Soc. Edinb., vol. 38, p. 388.
Polycheles laevis p.p. DE MAN, 1916, Siboga Exped., mon. 39a², p. 5.
Polycheles chilensis SUND, 1920, Ann. Mag. nat. Hist., ser. 9 vol. 6, p. 226.

The species is only known from a single specimen found west of Valparaíso, 33°42′ S, 78°18′ W, at a depth of 2500 m, bottom Globigerina ooze (BATE, 1888; SUND, 1920). BATE (1888) regarded the specimen as belonging to *Polycheles laevis* (BATE), but SUND (1920) proved that it is distinct. SUND is mistaken, however, when he states that the specimen is a syntype of *Pentacheles laevis* BATE, since that species was described by BATE (1878) after a single specimen from the Philippine Islands.

Stereomastis suhmi (BATE)

Pentacheles Suhmi BATE, 1878, Ann. Mag. nat. Hist., ser. 5 vol. 2, p. 278.
Pentacheles Suhmi BATE, 1879, Rep. Brit. Ass. Adv. Sci., vol. 48, p. 563.
Stereomastis suhmi BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 154, textfigs. 13, 37, 38, pl. 15 figs. 3, 4. (*Pentacheles Suhmi* on the plate).
Pentacheles Suhmi STEBBING, 1893, Hist. Crust., p. 200.
Stereomastis Suhmi DE MAN, 1916, Siboga Exped., mon. 39a², p. 5.
Stereomastis suhmi SUND, 1920, Ann. Mag. nat. Hist., ser. 9 vol. 6, p. 223.
Stereomastis Suhmi CALMAN, 1925, Rep. Fish. Mar. biol. Surv. Cape Town, vol. 4 pt. 3, p. 19, pl. 3 fig. 9.
Eryoneicus-stage CALMAN, 1925, Rep. Fish. mar. biol. Surv. Cape Town, vol. 4 pt 3, p. 20, pl. 4 fig. 10.
Stereomastis suhmi BARNARD, 1950, Ann. S. Afr. Mus., vol. 38, p. 574, fig. 105f.

Distribution. A deep-sea form known from southern S. America and S. Africa. The records in literature are: Messier Channel, W. Patagonia, 47°48′ S, 74°46′ W, 293 m depth[1] (BATE, 1878, 1879, 1888), near Magellan Strait, 52°45′30″ S, 73°46′ W, 448 m depth (BATE, 1888; SUND, 1920), off Cape of Good Hope, S. Africa, 1450—2200 m depth (CALMAN, 1925; BARNARD, 1950). The species has been found on a bottom of blue mud.

[1] BATE, 1878, gave this locality incorrectly as 47°48′ S, 74°48′ W, 220 m depth.

Willemoesia challengeri SUND

Willemoesia leptodactyla p.p. BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 163.
Willemoesia leptodactyla p.p. DE MAN, 1916, Siboga Exped., mon. 39a², p. 6.
Willemoesia challengeri SUND, 1920, Ann. Mag. nat. Hist., ser. 9 vol. 6, p. 223.

SUND, who reexamined BATE's *Willemoesia* material collected by the Challenger Expedition, found that what BATE regarded as one species: *Willemoesia leptodactyla* (WILLEMOES-SUHM) in reality has to be separated into four distinct species, three of which were given a new name by SUND. The learned Norwegian author did not compare the specimens which he named *Willemoesia challengeri* with the species described by FAXON under the name *Willemoesia inornata* from five localities between the Galápagos Islands and the Gulf of Panama. *Willemoesia inornata* FAXON (1895) seems to be closely related to, if not identical with *W. challengeri*.

Distribution. *Willemoesia challengeri* has been reported from the following localities: West of Valparaíso, 33°42′ S, 78°18′ W, 2520 m depth (SUND, 1920), West of Valparaíso, 34°7′ S, 73°56′ W, 4000 m depth (BATE, 1888; SUND, 1920). The species lives on a muddy or oozey bottom.

Willemoesia pacifica SUND

Willemoesia leptodactyla p.p. BATE, 1878, Ann. Mag. nat. Hist., ser. 5 vol. 2, p. 280.
Willemoesia leptodactyla p.p. BATE, 1879, Rep. Brit. Ass. Adv. Sci., vol. 48, p. 563.
Willemoesia leptodactyla p.p. BATE, 1888, Rep. Voy. Challenger, Zool., vol. 24, p. 163, pl. 19 fig. c.
Willemoesia leptodactyla p.p. DE MAN, 1916, Siboga Exped., mon. 39a², p. 6.
Willemoesia pacifica SUND, 1920, Ann. Mag. nat. Hist., ser. 9 vol. 6, p. 223.

The type of the present species is a specimen which BATE originally included in *Willemoesia leptodactyla*, but which according to SUND represents a distinct species. The typical *Willemoesia leptodactyla* does not occur in Chilean waters.

Distribution. The species up till now is known only from a single specimen, which was collected by the Challenger Expedition West of Valparaíso, 33°42′ S, 78°18′ W, 2520 m depth, bottom Globigerina ooze (BATE, 1878, 1888; SUND, 1920).

Tribe Scyllaridea

Family Palinuridae

Jasus lalandei (H. MILNE EDWARDS) ssp. *frontalis* (H. MILNE EDWARDS)

Restricted synonymy:

Cancer homnarus MOLINA, 1810, Saggio Stor. nat. Chili, ed. 2, p. 187 (non *Cancer Homarus* LINNAEUS, 1758).
Palinurus frontalis H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 294.
Palinurus frontalis WHITE, 1847, List Crust. Brit. Mus., p. 69.
Palinurus frontalis NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 205.
Palinurus frontalis H. MILNE EDWARDS, 1851, Ann. Sci. nat. Zool., ser. 3 vol. 16, p. 290, pl. 8 figs. 16, 17.
Palinurus frontalis ALBERT, 1898, Rev. Chil. Hist. nat., vol. 2, pp. 5, 17, 29, 1 map.

Palinurus frontalis PORTER, 1899, Catal. Colecc. zool. Mus. Valparaíso, vol. 1, p. 14.
Palinurus frontalis DOFLEIN, 1900, S.B. Bayer. Akad. Wiss., vol. 30, p. 129.
Palinurus frontalis BÜRGER, 1902, Zeitschr. wiss. Zool., vol. 71, p. 702, figs. 1—4.
Palinostus frontalis LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 736.
Palinurus Frontalis BÜRGER, 1904, An. Univ. Chile, vol. 113, p. 591, 2 pls.
Palinostus frontalis PORTER, 1905, Rev. Chil. Hist. nat., vol. 9, p. 34.
Palinurus frontalis QUIJADA, 1910, Bol. Mus. Nac. Chile, vol. 2, p. 127, pls. 5, 6.
Palinustus frontalis RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 603.
Jasus Lalandei p.p. GRUVEL, 1911, Ann. Inst. océanogr. Monaco, vol. 3 pt. 4, p. 10.
Jasus Lalandii p.p. DE MAN, 1916, Siboga Exped., mon. 39a², p. 31.
Jasus lalandei BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 333.
Jasus frontalis BAHAMONDE, 1948, Rev. Biol. Marina, vol. 1 pt. 2, p. 90, figs.
Jasus lalandei frontalis CHACE & DUMONT, 1949, Commerc. Fish. Rev., vol. 11 n. 5, p. 8, fig. 5.

Distribution. The species is known from Juan Fernandez and neighbouring islands, from Tristan da Cunha, St. Paul Island, Tasmania and New Zealand. *Jasus lalandei lalandei* (H. MILNE EDWARDS) occurs in S. Africa and S.E. Australia. The Chilean records of the present form are: Chile (H. MILNE EDWARDS, 1837, 1851; ? WHITE, 1847;? DOFLEIN, 1900), Juan Fernandez (MOLINA, 1810; NICOLET, 1849; ALBERT, 1898; PORTER, 1899; BÜRGER, 1902; LENZ, 1902; GRUVEL, 1911; BAHAMONDE, 1948), Cumberland Bay, Juan Fernandez (PORTER, 1905), Masatierra (BÜRGER, 1904; QUIJADA, 1910; BALSS, 1924), Mas Afuera and Santa Clara (ALBERT, 1898), San Ambrosia and San Felix (ALBERT, 1898; BÜRGER, 1902, 1904). Furthermore BÜRGER (1902, 1904) remarks that the species also has been reported from Easter Island. *Jasus lalandei frontalis* does not live on the coasts of the Chilean mainland; efforts have been made to acclimatize the animals at these coasts but up till now this has been in vain. The species is used for food and is of considerable economic importance.

Family Scyllaridae

Scyllarus delfini (BOUVIER)

Arctus Delfini BOUVIER, 1909, Rev. Chil. Hist. nat., vol. 13, p. 213, fig. 30.
Scyllarus delfini RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 603.
Scyllarus delfini DE MAN, 1916, Siboga Exped., mon. 39a², p. 64.
Scyllarus delfini BALSS, 1924, Skottsberg's Nat. Hist. Juan Fernandez, vol. 3, p. 333.

A German translation of Bouvier's French description of this species has been given by BALSS (1924).

Distribution. There are just two original records of this species in literature: Juan Fernandez (BOUVIER, 1909), Masatierra, Juan Fernandez (BALSS, 1924).

Ibacus peroni LEACH

Restricted synonymy:

Ibacus Peronii LEACH, 1815, Zool. Misc., vol. 2, p. 152, pl. 119.
Ibacus Peronii PFEFFER, 1881, Verh. naturwiss. Ver. Hamburg, vol. 5, p. 49.
Ibacus Peronii DE MAN, 1916, Siboga Exped., mon. 39a², p. 65.

The species is known from S. Africa and from S. and S.E. Australia, while there is one record of it from Chile: Valparaíso (PFEFFER, 1881). This one record, however, should be confirmed before the species can be definitely regarded as belonging to the Chilean fauna.

Tribe Nephropsidea

Family Parastacidae

This family of fresh water crayfishes is represented in S. America by one genus, the taxonomy of which is far from clear. The following species have been reported from Chile.

Parastacus chilensis (H. MILNE EDWARDS)

Astacus chilensis H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 333.
Astacus chilensis H. MILNE EDWARDS & Lucas, 1843, Orbigny's Voy. Amér. mérid., vol. 6 pt. 1, p. 35.
Astacus (*Cambarus*) *Chilensis* ERICHSON, 1846, Arch. Naturgesch., vol. 12 pt. 1, p. 100.
Astacus chilensis WHITE, 1847, List Crust. Brit. Mus., p. 72.
non *Astacus chilensis* NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 211, pl. 1 fig. 4.
Astacus chilensis PHILIPPI, 1882, An. Univ. Chile, vol. 61, p. ..., fig. A.
Parastacus Chilensis VON IHÉRING, 1893, C. R. Congr. Int. Zool. Moscou, pt. 2, p. 46.
Astacus chilensis PHILIPPI, 1894a, An. Univ. Chile, vol. 87, p. 377.
Astacus chilensis FAXON, 1898, Proc. U.S. Nat. Mus., vol. 20, p. 688.
Astacus chilensis PORTER, 1898, Catal. Colecc. zool. Mus. Valparaíso, vol. 1, p. 14.
Parastacus chilensis RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 602.
Parastacus chilensis FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 354, 405.
Parastacus chilensis VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.

The status of this species is still uncertain. H. MILNE EDWARDS's description is insufficient and the type of the species in the Paris Museum has not been reexamined thoroughly enough to establish the specific characters. RATHBUN (1910) says that Professor E. L. BOUVIER of the Paris Museum examined the type (a dry specimen) and found it to be a *Parastacus*, different from all the species known up to that time. The specimen brought by NICOLET (1849) to this species is regarded by later authors as a distinct species which they named *Parastacus nicoleti* (PHILIPPI) (see p. 84). It is not certain whether H. MILNE EDWARDS & LUCAS's (1843), WHITE's (1847), PHILIPPI's (1882) and PORTER's (1899) specimens really belong here.

Distribution. The records in literature are: Chilean coasts (H. MILNE EDWARDS, 1837), Chile (H. MILNE EDWARDS & LUCAS, 1843; WHITE, 1847; PHILIPPI, 1882; PORTER, 1899).

Parastacus spinifrons (PHILIPPI)

Astacus spinifrons PHILIPPI, 1882, An. Univ. Chile, vol. 61, p. ..., fig. B.
Astacus bimaculatus PHILIPPI, 1894a, An. Univ. Chile, vol. 87, p. 378.
Parastacus agassizii FAXON, 1898, Proc. U.S. Nat. Mus., vol. 20, p. 690, pl. 70 figs. 4, 5.
Parastacus Agassizii DOFLEIN, 1900, S.B. Bayer. Akad. Wiss., vol. 30, p. 132.
Parastacus agassizii LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 736.

Parastacus agassizi ORTMANN, 1902, Proc. Amer. philos. Soc., vol. 41, p. 293.
Parastacus Agassizi PORTER, 1904, Rev. Chil. Hist. nat., vol. 8, p. 258, pl. 9.
Parastacus agassizii RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 602.
Parastacus Agassizii DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 30.
Parastacus spinifrons FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 354, 406, pl. 9 fig. 1.
Parastacus bimaculatus FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 356, 405.
Parastacus bimaculatus VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.
Parastacus spinifrons VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.
Parastacus agassizi RINGUELET, 1949, Notas Mus. La Plata, vol. 17 Zool. n. 117, p. 56, textfig. 1, pls. 1—4.

Material examined:

Lund University Chile Expedition

St. L 5. 7 males, 40—66 mm, and 4 females, 34—62 mm. The crayfishes were found in the muddy parts among branches and under tufts of grass.

St. L 8. 1 juvenile male, 22 mm.

The present specimens closely agree with FAXON's descriptions and figures of this species. The rostrum in some specimens attains the end of the antennular peduncle, in others it reaches less far. Both lateral margins bear a small sharp tooth just before the tip. These teeth are obscured by hairs. The postorbital ridges show a longitudinal groove in their outer half. In adult specimens the carapace is smooth, being pitted in the lateral part. The same is true for the abdomen.

The antennal peduncle bears three spines on the ventral surface: one slightly anterior to the aperture of the antennal gland, one at the outer and one at the inner side of the base of the scaphocerite.

The merus of the larger cheliped in adult specimens possesses no dorsal spine, though in the smaller animals here a spine is distinctly visible; this spine being reduced to a mere tubercle in the adults. The lower surface of the merus is entirely covered with long soft hairs; a tuft of similar hairs may be seen in the antero-dorsal part of the inner surface of the carpus. The dactylus bears a few tubercles on the outer surface near its base. The cutting edge of both fingers bears several blunt teeth (about 8—10 in number), the largest in the middle. The teeth behind the larger tooth are larger than those placed in the distal half of the edges.

Judging by the external characters the sexes in this species are well separated, as I did not find any specimen with the genital apertures of both sexes. The genital openings of the females are large, from those of the males in all my specimens the penes are protruding, even in the juvenile of 22 mm. The females have the sternum wider than the males, but otherwise do not show distinct secondary sexual characters.

The specimen of 22 mm has the rostrum reaching distinctly beyond the antennular peduncle. The spines of the rostrum are large and pointed. Moreover the supraorbital spine here is well developed and sharply pointed. No other spines are present on the carapace. As in the adults the first pair of legs are unequal, though the difference is

far less distinct than in the adults. The merus of these legs possesses a sharp and distinct antero-dorsal spine, which is placed slightly behind the anterior margin. The lower surface of the merus bears three large spines: one placed antero-internally and two more posteriorly and close to the outer margin. The lower outer anterior angle of the merus bears a small spine. The inner margin of the lower surface of the merus is serrate behind the antero-internal spine on account of a row of small sharp tubercles. The carpus bears a spine in the upper and one in the lower part of the inner side of the anterior margin. As in the adult specimens the uropodal exopod bears two spines in the extreme distal part of the outer margin; a row of small spines is also present along the diaeresis. The uropodal endopod as in the adults possesses a spine on the outer margin, but the spine in the extreme posterior part of the median line, which occurs in my adult specimens is lacking in this juvenile.

I do not agree with FAXON in regarding *Parastacus spinifrons* and *P. bimaculatus* as distinct species. FAXON (1914, p. 356) enumerates the following differences between the two forms: »From the latter [=*P. bimaculatus*] the present species [=*P. spinifrons*] differs in having much stouter, shorter-fingered, more heavily tuberculated claws, and a somewhat longer metathorax and narrower areola.» FAXON in his descriptions of *P. spinifrons* (1914, p. 356) and *P. bimaculatus* (as *P. agassizii*, 1898, p. 691) gives the following measurements

	P. spinifrons	*P. bimaculatus*
total length of male	90 mm	83 mm
length of carapace	41 mm	38 mm
width of areola	7 mm	8.8 mm
lenght of areola	11.5 mm	10 mm
lenght chela of larger first leg	31 mm	32 mm
length dactylus larger first leg	19 mm	20 mm
length chela smaller first leg	23 mm	25 mm
length dactylus smaller first leg	16 mm	16 mm

From these figures it is evident that there is no appreciable difference in the length of the carapace nor in that of the fingers of the two forms. In the smaller first leg of *P. bimaculatus* the fingers even are relatively shorter than in that of *P. spinifrons*. The areola indeed is different according to these figures. In FAXON's specimen of *P. spinifrons* the relation between the length and the breadth of the areola is 1.6 whilst in his specimen of *P. bimaculatus* this relation is 1.1. In my material the relation between length and breadth of the areola varies between 1.2 and 1.6, so that this character seems to be of rather little value. As far as concerns the tuberculation of the large chela, in my largest specimens the palm is squamoso-tuberculate as described by FAXON for his *P. agassizii*, being punctate anteriorly. There are, however, a few actual tubercles in the upper part of the outer surface of the basal part of the fixed finger, agreeing with those described by FAXON for *P.*

spinifrons. Sometimes, especially in smaller specimens, these tubercles are less distinct.

Summarizing I do not see sufficient reason to keep the two forms separated as distinct species, the more so since they inhabit the same region.

Distribution. The species lives in fresh water and does not inhabit holes as *P. pugnax* does. It has been recorded from the following localities: Chile (PHILIPPI, 1882, 1894a), Valparaíso (FAXON, 1914), Chillán, Nuble (PORTER, 1904), Talcahuano, Concepción (FAXON, 1898), Tumbes near Talcahuano (LENZ, 1902), Contulmo, Arauco (PORTER, 1904), Lago Llanquihue, Llanquihue (DOFLEIN, 1900; LENZ, 1902), Puerto Montt, Llanquihue (DOFLEIN & BALSS, 1912), Lake Nahuel-Huapi, Argentine Cordilleras, N.E. of Puerto Montt (ORTMANN, 1902; FAXON, 1914; RINGUELET, 1949).

Parastacus araucanius FAXON

Parastacus araucanius FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, p. 353, pl. 4.
Parastacus araucanius VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.

Distribution. The species has been found in a cascade stream near Corral, Valdivia (FAXON, 1914). Faxon supposes this to be a burrowing species, but this seems to be rather doubtful to me. The shape of the animal shows a much greater resemblance to the free living *P. spinifrons* than to the burrowing *P. pugnax*.

Parastacus pugnax (POEPPIG)

Astacus pugnax POEPPIG, 1835, Reise in Chile, Peru, vol. 1, p. 314.
Astacus chilensis NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 211, pl. 1 fig. 4 (non H. Milne Edwards, 1837).
Astacus Nicoleti PHILIPPI, 1882, An. Univ. Chile, vol. 61, p. ..., fig. C.
Parastacus hassleri FAXON, 1898, Proc. U.S. Nat. Mus., vol. 20, p. 687, pl. 70 figs. 1—3.
Parastacus nicoletii FAXON, 1898, Proc. U.S. Nat. Mus., vol. 20, p. 689.
Parastacus Hassleri LÖNNBERG, 1898, Zool. Anz., vol. 21, p. 349, figs. 1—3.
Parastacus nicoletii LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 736.
Parastacus hassleri LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 737.
Parastacus hassleri ORTMANN, 1902, Proc. Amer. philos. Soc., vol. 41, p. 293.
Parastacus nicoleti ORTMANN, 1902, Proc. Amer. philos. Soc., vol. 41, p. 293.
Parastacus Nicoleti PORTER, 1904, Rev. Chil. Hist. nat., vol. 8, p. 255.
Parastacus Hassleri PORTER, 1904, Rev. Chil. Hist. nat., vol. 8, p. 256, figs. 24, 25.
Parastacus hassleri HAY, 1905, Smithson. misc. Coll., vol. 48, p. 223.
Parastacus hassleri RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 602.
Parastacus nicoletii RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 602.
Parastacus nicoleti FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 354, 406.
Parastacus hassleri FAXON, 1914, Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 354, 406.
Parastacus nicoleti PORTER, 1917, Bol. Mus. Nac. Chile, vol. 10, p. 98, fig. 61.
Parastacus hassleri RUNNSTRÖM, 1925, Bergens Mus. Skr., n. ser. vol. 3 pt. 2, p. 33.
Parastacus nicoleti VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.
Parastacus hassleri VAN STRAELEN, 1942, Bull. Mus. Roy. Hist. nat. Belg., vol. 18 n. 56, p. 9.

In 1898 FAXON described a new species of *Parastacus* which he named *P. hassleri*, at the same time he gave a new name, *P. nicoletii*, to *Astacus chilensis* NICOLET non H. MILNE EDWARDS (not knowing that PHILIPPI, 1882, had given the same name,

Astacus nicoletii, to NICOLET's species). FAXON pointed to the close resemblance between his *P. hassleri* and *P. nicoletii*. As he had no material of the latter at his disposal, the differences which he enumerated as existing between the two forms are exclusively based on his material of *P. hassleri* and on NICOLET's description and figure. Now NICOLET's figures are not so accurate that they can entirely be relied upon. The differences enumerated by FAXON to separate his *P. hassleri* from NICOLET's species for the larger part may be due to the possible inaccuracy of the figure or by an incorrect interpretation of the description. In my opinion it is highly possible that *P. nicoletii* and *P. hassleri* are synonyms and that either NICOLET's drawing is incorrect or made after a specimen which has the tubercles of the chelae better developed than the type of *P. hassleri*, but nevertheless belongs to the same species. The fact that LENZ (1902) identifies some large specimens from Tumbes as *P. nicoletii* and two juveniles from the same locality as *P. hassleri* because of the longer rostrum and the more slender chelae of the latter, already points in this direction. It furthermore seems strange that in one locality there should occur two species, which are so closely related and which have exactly the same habits. Without having access to a large material, however, this question never can be satisfactorily solved, and therefore the present procedure of uniting the two species must be considered as provisional.

POEPPIG (1835) in a narrative of a journey through Chile, Peru and Brazil mentions a crayfish from the neighbourhood of Talcahuano under the name *Astacus pugnax* POEPPIG. He states that this animal, which bears the native name »Camaron de tierra ó de la pampa» lives in holes in the moors and that it leaves these holes at night. There is no doubt that we have to do here with the present *Parastacus*, which does occur very commonly near Talcahuano and which has the habits as described by POEPPIG. POEPPIG gives no description (other than saying that it is a crayfish) or figure of the animal itself, but his description of its habits are sufficient to recognise the species and thus the name *Astacus pugnax* cannot be considered a nomen nudum[1].

Distribution. The animals live in holes in the ground and erect a kind of chimney around the entrance. The species has been recorded from the following localities: Chile (NICOLET, 1849), Chillán, Nuble (PORTER, 1904), Tumbes near Talcahuano (LENZ, 1902), Talcahuano, Concepción (POEPPIG, 1835; FAXON, 1898; LÖNNBERG, 1898; PORTER, 1904), Taitao Peninsula, S. Chile (Porter, 1917).

Tribe Thalassinidea

Family Thalassinidae

»*Thalassina chilensis* STEENSTRUP & LÜTKEN»

Thalassina scorpionides H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 316.
Thalassina scorpionides H. MILNE EDWARDS, 1838, Lamarck's Hist. nat. Anim. s. Vert., ed. 2 vol. 5, p. 383.

[1] In one of the sessions of the International Commission on Zoological Nomenclature during the Paris Congress of 1948 it has been decided that "the description of the work of an animal

Thalassina Scorpionoïdes H. MILNE EDWARDS, 1840, Hist. nat. Crust., vol. 3, p. 638.
Thalassina scorpionides NICOLET, 1894, Gay's Hist. fis. polit. Chile, vol. 3, p. 209.
Thalassina scorpionides LUCAS, 1851, Hist. nat. Crust. Arachn. Myriap., p. 176, pl. 10 fig. 3.
Thalassina scorpionoides A. MILNE EDWARDS, 1860, Ann. Sci. nat. Zool., ser. 4 vol. 14, p. 347, pl. 16 fig. 6.
Thalassina chilensis STEENSTRUP & LÜTKEN, 1862, Vid. Medd. naturh. Foren. Khb., ser. 2 vol. 3, p. 273.
Thalassina anomala RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 598.
Thalassina chilensis DE MAN, 1915, Zool. Jb. Syst., vol. 38, p. 454.
Thalassina chilensis DE MAN, 1928, Siboga Exped., mon. 39a[6], p. 4.

This »species» without any doubt is identical with *Thalassina anomala* (HERBST), and obviously is incorrectly assigned to the Chilean fauna. H. MILNE EDWARDS (1837) is the first to state that *Thalassina scorpionides* LATREILLE (=*Thalassina anomala* (HERBST)) originates from Chile. Afterwards no original record of the species from Chile has ever been given. All statements that the species occurs in Chile are based on H. MILNE EDWARDS's record. NICOLET (1849) for instance gives only a Spanish translation of MILNE EDWARDS's description. Finally STEENSTRUP and LÜTKEN, without having even seen Chilean material separate the supposed Chilean form from the typical *Thalassina anomala* of the Indo-westpacific region, and propose the new name *Thalassina chilensis* for it. The differences between the two forms given by STEENSTRUP and LÜTKEN are based solely on the figures given by H. MILNE EDWARDS (1837b, pl. 48 fig. 1) and GUÉRIN (1829—1844, pl. 18 fig. 4). H. MILNE EDWARDS (1837b, p. 129) does not mention the locality from which his specimen was obtained, but it is probable that he is dealing with the same specimen which he reports upon in his (1837) paper from Chile. GUÉRIN, however, gives on p. 14 of the explanation of the plates of his work as the locality from which his material originates »la mer des Indes». Furthermore DE MAN (1915) pointed out that the characters which STEENSTRUP and LÜTKEN regard as characteristic for *Thalassina chilensis* (the slenderness of the legs and the strong pubescence of the abdomen) also are found in Indian specimens of *Thalassina anomala* (HERBST). The slenderness of the legs in some Indo-westpacific specimens induced DE MAN even to separate them as a distinct variety *gracilis* DANA.

It seems therefore highly probable that H. MILNE EDWARDS's specimen was incorrectly labelled and that it actually came from the Indo-westpacific area. As we have seen under *Rhynchocinetes typus*, there are more instances in which MILNE EDWARDS's animals were labelled with an incorrect indication of the locality. *Thalassina chilensis* STEENSTRUP & LÜTKEN or *T. anomala* (HERBST) therefore should not be included in the list of the Chilean fauna.

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constitutes an 'indication' for the purposes of Article 25, even if unaccompanied by a description of the animal itself and that a name so given is not to be rejected on the grounds that it is based upon a hypothetical form" (HEMMING, 1950, p. 255).

Family Callianassidae

Callianassa uncinata H. MILNE EDWARDS (Figure 18)

Callianassa uncinata H. MILNE EDWARDS, 1837, Hist. nat. Crust., vol. 2, p. 310, pl. 25 bis fig. 1.
Callianassa uncinata NICOLET, 1849, Gay's Hist. fis. polit. Chile, Zool., vol. 3, p. 208.
Callianassa uncinata GUÉRIN, 1856, Sagra's Historia Cuba, Hist. nat., vol. 7, p. xvii.
Callianassa uncinata GUÉRIN, 1857, Sagra's Histoire Cuba, Crust., p. xliii.
Callianassa uncinata A. MILNE EDWARDS, 1860, Ann. Sci. nat. Zool., ser. 4 vol. 14, pp. 301, 316, 318, 325, 326, pl. 16 fig. 1.
Callianassa Chilensis A. MILNE EDWARDS, 1860, Ann. Sci. nat. Zool., ser. 4 vol. 14, pp. 302, 305, 307, 311, 313, 326, pl. 16 figs. 2, 2a.
Callianassa uncinata PHILIPPI, 1860, Reise Wueste Atacama, p. 169.
Callianassa uncinata A. MILNE EDWARDS, 1870, Nouv. Arch. Mus. Hist. nat. Paris, vol. 6, pp. 83, 101.
Callianassa chilensis A. MILNE EDWARDS, 1870, Nouv. Arch Mus. Hist. nat. Paris, vol. 6, pp. 84, 101.
Callianassa uncinata CUNNINGHAM, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 496.
Callianassa uncinata CUNNINGHAM, 1871a, Notes nat. Hist. Strait Magellan, p. 435.
Callianassa uncinata MIERS, 1881, Proc. zool. Soc. Lond., 1881, p. 73.
Callianassa uncinata BONNIER, 1900, Trav. Sta. zool. Wimereux, vol. 8, p. 322.
Callianassa uncinata LENZ, 1902, Zool. Jb. Suppl., vol. 5, p. 737.
Callianassa (*Trypaea*) *uncinata* BORRADAILE, 1903, Ann. Mag. nat. Hist., ser. 7 vol. 12, p. 546.
Callianassa (*Trypaea*) *chilensis* BORRADAILE, 1903, Ann. Mag. nat. Hist., ser. 7 vol. 12, p. 546.
Callianassa Uncinata VALDÉS RAGUÉS, 1909, Mis Trabajos Acad., p. 179.
Callianassa uncinata RATHBUN, 1910, Proc. U.S. Nat. Mus., vol. 38, pp. 557, 598, pl. 45 fig. 3.
Callianassa uncinata DOFLEIN & BALSS, 1912, Mitt. naturh. Mus. Hamburg, vol. 29, p. 30.
Callianassa uncinata PORTER, 1917, Bol. Mus. Nac. Chile, vol. 10, p. 97, fig. 60.
Callianassa (*Trypaea*) *uncinata* NIERSTRASZ & BRENDER À BRANDIS, 1923, Siboga Exped., mon. 32b, p. 31.
Callianassa (*Trypaea*) *chilensis* DE MAN, 1928, Capita Zool., vol. 2 pt. 6, p. 15, p.l 3 fig. 7.
Callianassa (*Trypaea*) *chilensis* DE MAN, 1928a, Siboga Exped., mon 39a^6, pp. 27, 103.
Callianassa (*Trypaea*) *uncinata* DE MAN, 1928a, Siboga Exped., mon. 39a^6, pp. 28, 102.
Callianassa uncinata PORTER, 1936, Comun. Mus. Concepción, vol. 1, p. 154.
Callianassa uncinata PORTER, 1937a, Rev. Chil. Hist. nat., vol. 40, p. 339.

Material examined:

Lund University Chile Expedition

St. M 26. 6 specimens (2 bopyrized, 52 and 64 mm), 19—67 mm.
St. M 37. 1 specimen, 85 mm.
St. M 60. 14 specimens, 24—63 mm.

The anterior margin of the carapace in the median region ends in three bluntly rounded lobes, which are of about equal size. The middle lobe is placed in the median region of the anterior margin and projects only for a very small distance over the bases of the eyes. The two other lobes are placed above the outer basal angles of the eyes; their outer margin is turned slightly or distinctly upwards. From the outer lobe the anterior margin of the carapace curves backwards to the linea thalassinica and from here it is produced forwards to the broadly rounded anterolateral angle of the carapace. The linea thalassinica is distinct and deep, as is also the cervical groove.

The sternum in both sexes is conspicuously broadened at the level of the fourth legs; posteriorly of the base of these legs it shows two broadly rounded longitudinal carinae, which are separated by a deep narrow slit.

The second segment of the abdomen is distinctly longer than the first and only sligthly longer than the third. The pleurae of the first segment are very narrow and reach far downwards, the pleurae of the other segments are broad. Those of the third to fifth segments are concave in the posterior half (this is especially distinct in the third and fourth segments). A tuft of hairs is present at the posterolateral angles of the third and fourth segments, and on the anterolateral angle of the fifth. The sixth segment is slightly longer than the fifth; its lateral margin is notched in its posterior third, while its posterior margin bears a median notch. The telson is slightly more than half as broad as the sixth segment and almost as broad as long. Posteriorly it slightly narrows, it has the lateral margins convex. The posterior margin shows a rather deep notch in the middle. At both sides of this notch the margin is convex, while laterally it gradually passes into the lateral margins. A short but very distinct tooth is placed in the median notch of the posterior margin.

The eyes reach almost to the end of the basal segment of the antennular peduncle. They are more or less triangular in outline with a rounded top. The left and right eyes touch each other with the larger part of the inner margins. No spines or ridges are present on the upper surface of the eye. The cornea lies about in the middle of the eye, being placed only slightly closer to the external margin than to the inner.

The second segment of the antennular peduncle is somewhat shorter than the first, it is about twice as long as thick. The third segment is slightly more than 1.5 times the length of the second.

The antennal peduncle falls slightly short of the end of the antennular peduncle. The last joint is practically as long as the penultimate.

The mandible ends in numerous small sharp teeth. A large three-jointed palp is present. The maxillula has the lower endite broad and truncate, the upper endite is elongate, it ends in a rather narrow triangular lobe. The palp is slender. The maxilla has both endites well developed and deeply incised; the palp and the scaphognathite are well developed. The first maxilliped has the endites of basis and coxa distinctly separated; the palp is very short; the exopod lacks the flagellum and has a broad basal part; the epipod is indistinctly bilobed, the lower lobe is acutely produced posteriorly. The second maxilliped has the last joint very short, being about $^1/_3$ of the length of the penultimate. The antepenultimate joint too is short, while the next joint is longer than the ultimate 3 joints together. A well developed exopod and a small epipod are present. The third maxilliped has the last joint about $^4/_5$ as long as the penultimate. The antepenultimate joint is again somewhat longer than the penultimate. The fourth (merus) and fifth (ischium) joints both are broader than long and form together an operculum, the breadth of which is $^3/_4$ of its length. The ischium is slightly longer than the merus. No exo- or epipod is present.

The branchial formula runs as follows:

	maxillipeds			pereiopods				
	1	2	3	1	2	3	4	5
pleurobranchs	—	—	—	—	—	—	—	—
arthrobranchs	—	—	2	2	2	2	2	—
podobranchs	—	—	—	—	—	—	—	—
epipods	1	1	—	—	—	—	—	—
exopods	1	1	—	—	—	—	—	—

The first pereiopods are very unequal in shape. The larger leg (sometimes this is the left, sometimes the right) reaches with part of the merus beyond the antennular peduncle. The chela is of an extremely peculiar shape. The dactylus has the distal part strongly curved downwards, so that it stands at about right angles to the proximal part. In the proximal part the cutting edge bears two blunt teeth. The fixed finger is slender and about straight, being slightly curved upwards. Its cutting edge is entire, but a row of small tubercles runs almost parallel to it at the inner side of the finger. The fingers are strongly gaping, their tips only touch each other. The gap formed by the fingers is extended posteriorly, since the palm is deeply excavated above the basal part of the fixed finger. The articulation between the palm and the dactylus therefore lies distally of the base of the fixed finger. The palm is distinctly higher than long, it bears a denticulated lobe near the lower basal part of the dactylus. The proximal part of the lower margin of the palm shows some crenulations. The carpus is longer than, but as high as the palm. It is in fact about as long as high. Its anterior margin is straight and it articulates along this whole margin with the palm. The posterior margin is rounded and produced slightly beyond the articulation with the merus. The upper and lower margins of the carpus are crenulated in their posterior part. The merus is about as long as the carpus. Its inner surface is smooth and shows an uncalcified line, which for the larger part runs parallel and close to the upper margin. The outer surface bears some longitudinal tuberculated ridges. A large anteriorly curved, compressed and pointed process is present in the posterior half of the ventral margin of the merus. The upper and lower margins are crenulate. The ischium is slender, it is somewhat shorter than the merus. The upper margin is smooth but for a distinct tooth near the base; the lower margin bears a row of some teeth. Two tubercles are present in the basal part of the outer surface. In the female the fingers of the large chela are less distinctly gaping. The dactylus reaches distinctly beyond the fixed finger; the distal part, which is curved downwards, is shorter than in the male. The cutting edge bears a crenulated crest in its proximal part. The palm is relatively longer and the fingers are relatively shorter than in the male. In other respects there are no distinct differences between the large chelae of the male and female. The smaller first leg is of the same shape in either sex. It reaches with part of the merus beyond the antennular peduncle. The fingers are about as long as the palm. They close over their whole length. The cutting edge of the dactylus is smooth, that of the fixed finger crenulate. The palm is longer than

high, of about equal height throughout its length. The carpus is about as long as the chela, anteriorly it is of the same height as the palm, in the proximal third of its length it rapidly narrows. The merus is $^2/_3$ of the length of the carpus; it has both upper and lower margin convex. The lower margin bears a small tooth in the middle. The ischium is slender and somewhat longer than the merus. The second legs are equal, they reach with the larger part of the carpus beyond the antennular peduncle. The fingers are more than twice as long as the palm, they taper regularly towards the apex and close over their entire length. No teeth are present on the cutting edges. The palm is distinctly higher than long. The carpus is about 1.5 times as long as the chela and about $^2/_3$ of the length of the merus. The third leg reaches with part of the propodus beyond the antennular peduncle. The dactylus is short and oval in shape. The propodus is far broader than and 2.5 times as long as the dactylus. The carpus is slightly shorter than the propodus. The propodo-carpal articulation is situated at the proximal end of the propodus. The carpus narrows proximally. The merus is slightly longer than the propodus, while the ischium is about as long as the carpus. The fourth leg reaches with its dactylus beyond the antennular peduncle. The dactylus is short and ovate. The propodus is 2.5 times as long as the dactylus. It broadens proximally. The carpus is slightly longer than the propodus and narrows proximally. The merus is again somewhat longer than the carpus and measures $^5/_4$ of the length of the ischium. The fifth leg reaches about to the end of the second segment of the antennular peduncle. It is chelate. The dactylus is as long as the fixed finger and about half as long as the palm. The carpus is about as long as the chela and has also the same length as the merus. The ischium is almost half as long as the merus.

In the male the first two abdominal segments entirely lack the pleopods. The pleopods of the third to fifth somites are well developed and have the endo- and exopods leaf-shaped. A short and broad, more or less pointed appendix interna is present on the inner margin of the endopods. In the female the first abdominal segment bears a simple slender two-jointed pleopod. The ultimate joint is narrower than the penultimate, together these two joints are somewhat shorter than the basal joint. The second pleopod is slender too, but it is biramous. The exopod is much longer than the endopod. The third to fifth pleopods are as in the male. The uropods have the exo- and endopod broadly triangular. The exopod bears two longitudinal median carinae. It is sligthly broader than long, the endopod is as long as broad. The uropods are slightly longer than the telson.

The juvenile specimen from Station M 26 lacks the large chela, but otherwise it is in a good condition. It resembles the adults in most respects. The telson, however, has the posterior margin evenly rounded and provided with two minute spinules at each posterolateral angle. The eyes have the corneae large and occupying almost the whole of the distal part of the eye.

Two of the specimens are parasitized by Bopyridae, one is a male, the other a female. These differ from the other specimens in the shape of the larger first leg. In the bopyrized male this leg strongly resembles that of a normal female, it only has

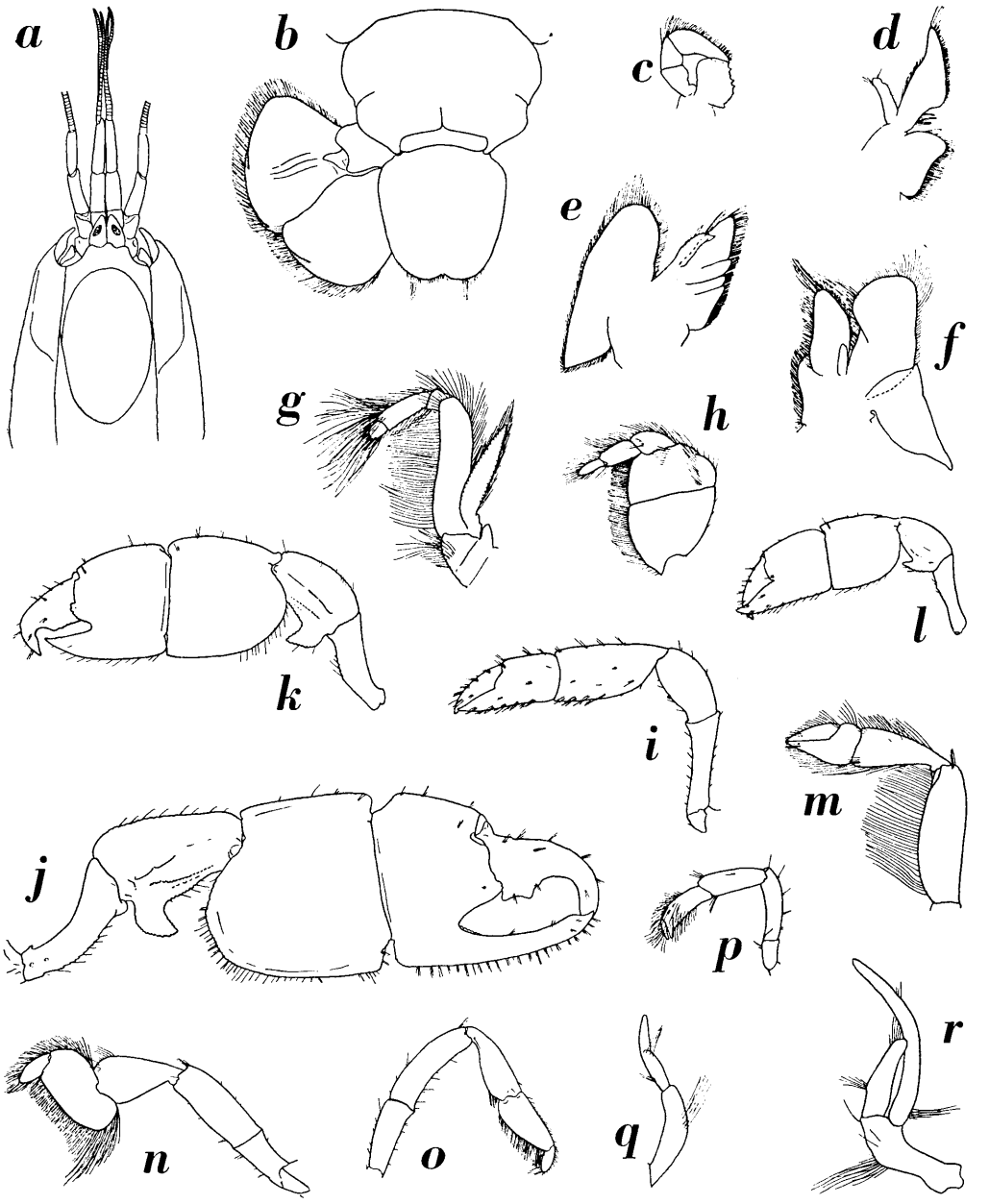

Fig. 18. *Callianassa uncinata* H. MILNE EDWARDS. a, anterior part of body in dorsal view; b, telson and left uropod in dorsal view; c, mandible; d, maxillula; e, maxilla; f, first maxilliped; g, second maxilliped; h, third maxilliped; i, smaller first leg of male; j, larger first leg of male; k, larger first leg of female; l, larger first leg of bopyrized female; m, second leg; n, third leg; o, fourth leg; p, fifth leg; q, first pleopod of female; r, second pleopod of female. a,b,h,m—p, × 2; c—d,q,r, × 4; e—g, × 3; i—l, × 1.3.

the fixed finger somewhat longer and the hook-shaped process of the merus somewhat more slender. This male specimen does not possess the smaller first leg. In the bopyrized female the larger first leg is even less developed, being only slightly larger than the smaller first leg. It strongly resembles the first leg of the type of *Callianassa chilensis* A. M. Edw. as that is figured by De Man (1928, pl. 3 fig. 7—7 c). The fixed finger, which in A. Milne Edwards's specimen is broken, is about as long as the dactylus. The ventral process of the merus is placed farther anteriorly than in De Man's figure.

A small female of 41 mm has the chelae very similar to that of the bopyrized female, one of 58 mm has the chelae intermediate in shape between that figured here for the male and that of a normal adult female.

Judging by the description and figures given of *Callianassa chilensis* A. Milne Edw., this species agrees in every respect (e.g., in the shape of the front) with the present species. The large chela as it is found in the type of *Callianassa chilensis* obviously for some reason or other is not fully developed. In all probability this is not on account of the age of the specimen, since it is stated by A. Milne Edwards that the length of his animal is 78 mm. The chela may have been broken off and afterwards regenerated, or the specimen may have been bopyrized. There is no reason whatsoever, to consider *Callianassa chilensis* to be a species distinct from *C. uncinata*, as is distinctly shown by my material.

Bonnier (1900) described a bopyrid parasite of this species under the name *Ionella Agassizii*. This parasite was found in the branchial cavity of its host. Two of the present specimens from *St. M 26* also are bopyrized. The parasites here, too, are found in the branchial cavity of the *Callianassa* specimens. Nevertheless the bopyrids brought home by the Lund University Expedition certainly do not belong to *Ionella Agassizii*; they are representatives of the genus *Ione* Latreille, all the species of which are parasites of species of the genus *Callianassa*.

Distribution. The species has been recorded from the Peruvian and Chilean coasts with some doubtful records from Cuba and Mexico. The records are: Capon, Peru (Rathbun, 1910), Chile (H. Milne Edwards, 1837; Nicolet, 1849; A. Milne Edwards, 1860, 1870; De Man, 1928), Isla Blanca, Chimba Bay, Antofagasta (Philippi, 1860), Talcahuano, Concepción (Miers, 1881; Bonnier, 1900; Porter, 1917, 1936, 1937a), Tumbes near Talcahuano (Lenz, 1902), Puerto Montt, Llanquihue (Doflein & Balss, 1912), Ancud, Chiloé Island (Porter, 1917), Quehuy Island, off Chiloé (Cunningham, 1871, 1871a), Taitao Peninsula, S. Chile (Porter, 1917), Cuba (Guérin, 1856, 1857; Valdés Ragués, 1909), Mexico (Guérin, 1856, 1857).

Callianassa brachyophthalma A. Milne Edwards (Figure 19)

Callianassa brachyophthalma A. Milne Edwards, 1870, Nouv. Arch. Mus. Hist. nat. Paris, vol. 6, p. 85.

Callianassa gigas (?) Cunningham, 1871, Trans. Linn. Soc. Lond., vol. 27, p. 496.

Callianassa (*Trypaea*) *brachyophthalma* Borradaile, 1903, Ann. Mag. nat. Hist., ser 7 vol. 12, p. 546.

Callianassa (*Trypaea*) *brachyophthalma* DE MAN, 1928a, Siboga Exped., mon. 39a[6], pp. 27, 115.

Material examined:

Lund University Chile Expedition

St. M 29. 168 specimens, 8—47 mm.

Museum London

San Carlos de Ancud, Chiloé Island; beach; leg. R. O. Cunningham; April, 1861; Reg. No. 69. 37. — 1 cast shell, about 70 mm.

The anterior margin of the carapace is in the middle produced to a distinct triangular rostrum, which is rather broad near the base and reaches beyond the middle of the eyes. From the base of the rostrum the anterior margin of the carapace is curved backwards to sligthly beyond the anterior end of the linea thalassinica. It often shows a small angle at the level of the outer side of the eyes. The anterolateral angle of the carapace is rounded. The linea thalassinica is distinct. The oval region in the anteromedian part of the carapace is sharply separated from the rest of the carapace, least distinctly so in the anterior part; the posterior part is defined by the very distinct cervical groove. This oval region occupies about $^3/_4$ of the length of the carapace.

The abdomen is as in *C. uncinata* H. MILNE EDW. The excavate parts of the third and fourth segments are rather indistinct, that of the fifth segment is placed about in the middle of the lateral margin of the pleura. The telson is about as long as the sixth segment and is slightly longer than broad. It is somewhat narrower at the top than at the base. The lateral margins are almost straight. The posterior margin is sligthly convex with a feeble and very shallow emargination in the median region. A posteromedian tooth is present.

The eyes reach to the end of the first segment of the antennular peduncle. They are only a little narrower at the top than near the base. The anterior margin thereby is rather broad and is produced to a blunt lobe at the inner angle. A small but distinct anteriorly directed spine is present near the base of this lobe. When seen in lateral view, this spine proves to be connected with the tip of the lobe by a short and narrow lamellar ridge. The cornea is rather large, it lies about central and is produced antero-internally.

The second segment of the antennular peduncle is slightly shorter than the basal segment and is about $^1/_3$ of the length of the third segment.

The antennal peduncle reaches slightly beyond the antennular peduncle. The two ultimate joints are slender and of about the same length. The basal segments are short.

The oral parts up to the first maxilliped are almost exactly as in *C. uncinata.* The second maxilliped is more slender than in that species. The dactylus is somewhat less than half as long as the propodus. The carpus is shorter than the dactylus. The merus is distinctly more than twice as long as the propodus. The exopod is well developed, but it fails by far to reach the end of the merus. An epipod is present.

The third maxilliped strongly resembles that of *C. uncinata*, especially in the broadened merus and ischium. The propodus, however, is somewhat higher than in the latter species.

The branchial formula is as in the previous species.

The first legs are strongly unequal, they reach with the entire merus, or part of it, beyond the antennular peduncle. The large leg has the fingers about as long as the palm. They close except in very large specimens, where there is a rather small gap between them. The dactylus is regularly narrowing towards the rather sharply pointed apex, which is curved downwards. The cutting edge is crenulate. The fixed finger is about straight, its cutting edge is crenulate in its proximal part; here it possesses a large tooth. In some specimens, as in the large specimen figured here, this crenulation and the tooth are absent; this may be an abnormality. The palm is distinctly longer than high, the upper and lower margins are about parallel. The carpus is about as long as the palm. The base of the carpus is strongly constricted. The distal part of the lower margin is straight and ends anteriorly in a right angle, which often possesses a sharp tip. In the specimen figured in fig. 19g the carpus is abnormal in having this anteroventral margin rounded. The merus is somewhat shorter than the carpus, it narrows anteriorly. The lower margin bears a strong, pointed process near the base. This process is curved slightly anteriorly. A longitudinal ridge runs over the outer surface of the merus; at its base this ridge is crossed by a rather deep groove. The ischium is about as long as the merus, but it is more slender. The lower margin of the ischium bears a row of blunt spinules. The smaller leg has the dactylus somewhat longer than the fixed finger. The fingers are slender and close over their entire length, they have the cutting edges crenulate. The palm is about twice as long as broad. The carpus is more than three times as long as high and is slightly longer than the chela. Its upper and lower margins are about parallel, the latter ends anteriorly in a sharp angle. The merus is $^3/_5$ of the length of the carpus and is somewhat shorter than the ischium. The second legs are equal, they reach with the whole carpus, or with the larger part of it, beyond the antennular peduncle. The chela is triangular in shape, being broad at the base and narrowing towards the tips of the fingers. The palm is $^3/_4$ of the length of the fingers. The carpus is somewhat longer than the chela, and 0.7 times as long as the merus. It narrows posteriorly. The third leg reaches with a small part of the carpus beyond the antennular peduncle. The general shape of this leg is like that of *Callianassa uncinata*, the joints, however, are more slender. The dactylus is somewhat less than half as long as the propodus. The carpus is twice as long as the dactylus and about $^2/_3$ of the length of the merus. The fourth leg reaches with the larger part of the carpus beyond the antennular peduncle. It bears an imperfect chela. The dactylus is about half as long as the palm. The fixed finger is short and blunt, being less than half as long as the dactylus, it is almost entirely concealed by the numerous hairs, which form a dense cover on the lower margin of the propodus. The carpus is slightly longer than the propodus and about $^2/_3$ of the length of the merus, which is distinctly longer than the ischium. The fifth leg reaches about to the base of the third segment

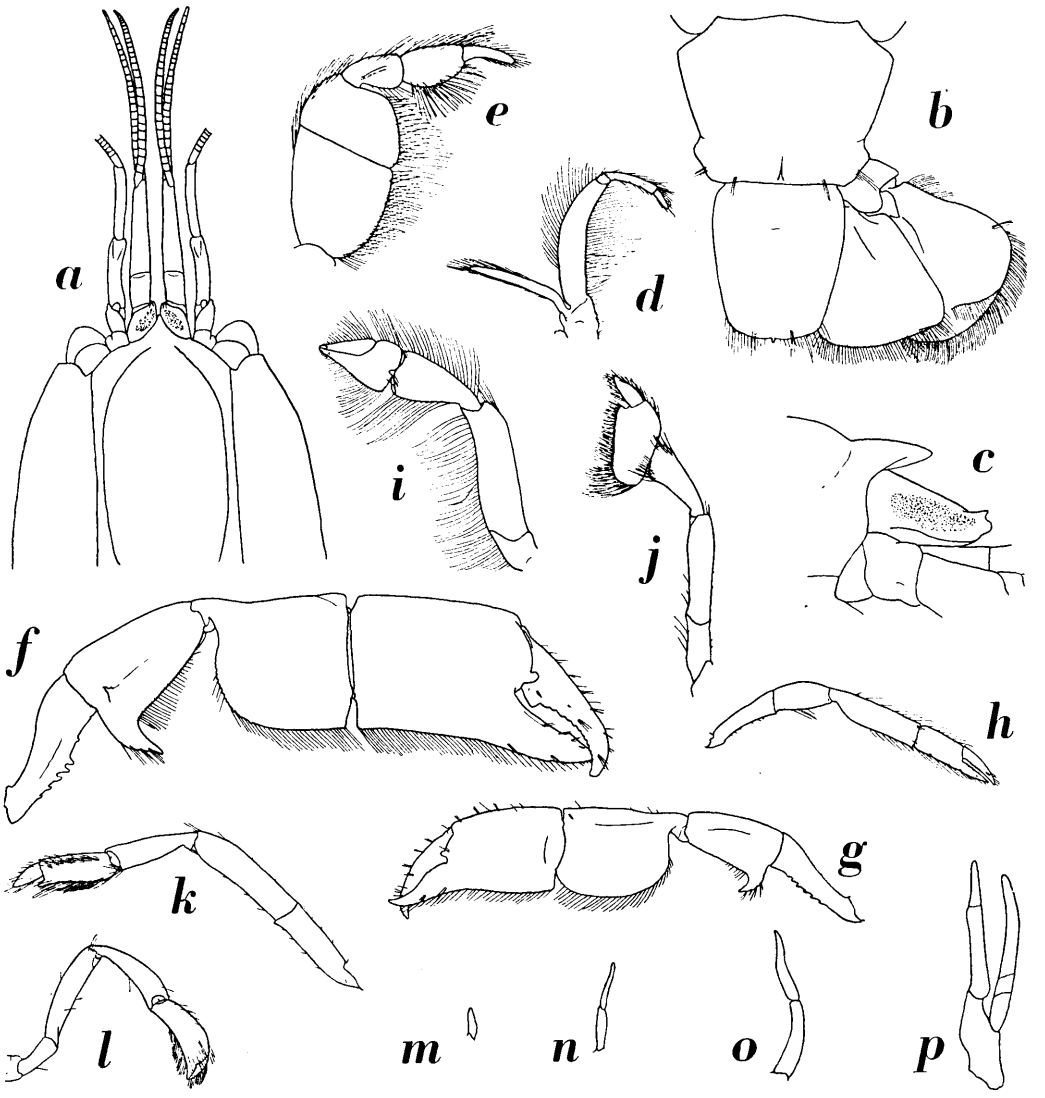

Fig. 19. *Callianassa brachyophthalma* A. MILNE EDWARDS. a, anterior part of body in dorsal view; b, telson and right uropod in dorsal view; c, eye and rostrum in lateral view; d, second maxilliped; e, third maxilliped; f,g, larger first pereiopod; h, smaller first pereiopod; i, second pereiopod; j, third pereiopod; k, fourth pereiopod; l, fifth pereiopod; m, first pleopod of male; n, second pleopod of male; o, first pleopod of female; p, second pleopod of female. a,b,e, × 3.5; c, × 7; d, × 4; f—h, × 1.8; i—l, × 2.8; m—p, × 5.

of the antennular peduncle. It has a small but perfect chela. The fingers are about $^1/_3$ of the length of the palm, they close over their entire length. The carpus is somewhat longer than the chela and about as long as the merus. The ischium is about half as long as the merus. A conspicuous coat of closely packed hairs is present in the distal part of the outer surface of the chela.

The first pleopods in both males and females are slender and two-jointed. The two joints are rather long and of about equal size. In small specimens the first pleopods often are very small and indistinct. The second pleopods of the males are reduced to one short narrow joint. In the females it consists of a rather narrow protopod, which bears a slender exopod and endopod. The exopod is slightly longer than the endopod, but since it is implanted lower on the protopod, it does not reach as far as the endopod. The latter consists of two joints, the ultimate of which is the shorter. The exopod consists of three joints, the middle of which is the shortest; the basal joint is somewhat longer than the middle joint, while the ultimate joint is much longer than the first two joints combined. The other pleopods are as in *Callianassa uncinata*, both the endo- and the exopods are leaf-shaped. The exopod is longer and narrower than the endopod, it is elongate and curved inwards. The endopod is shorter and broader, being more triangular in outline, it bears in the middle of its inner margin a short triangular appendix interna. The uropods are broad and more or less triangular in shape. The endopod bears a median longitudinal carina, the exopod also has a median longitudinal carina, which at each side is flanked by an additional carina, the outer of which is the stronger. The endopod is a little narrower than the exopod.

Small specimens differ only slightly from the adults. They have the rostrum somewhat broader, the spine on the eye is less distinct, while furthermore the large chela has the fingers closing and the process on the merus of this leg is narrower and more sharply pointed.

Callianassa brachyophthalma now has been found for the second time since the original publication. No figures of this species have ever been published, though A. MILNE EDWARDS (1870) in his description refers to »pl. II, fig. 2 à 2d». This, however, must be a printer's error since pl. 2 fig. 2 of A. MILNE EDWARDS's paper represents *Callianassa brevicaudata* A. MILNE EDW., while *C. brachyophthalma* has not been figured in that paper.

The specimen reported upon by CUNNINGHAM (1871) under the name *Callianassa gigas* (?) at present is preserved in the British Museum (Natural History). Through the good offices of Dr. ISABELLA GORDON this specimen could be examined by me. It proved to belong to *Callianassa brachyophthalma* A. MILNE EDWARDS, under which name it was already inserted in the collection of the said Museum.

Distribution. The records in literature are: Chiloé Island, S. Chile (A. MILNE EDWARDS, 1870), San Carlos de Ancud, Chiloé Island (CUNNINGHAM, 1871).

Summary.

At present 41 species of Crustacea Decapoda Macrura have been reported from Chile. Four of these probably do not belong to the Chilean fauna, since the Chilean records of these species may be based on incorrectly labelled specimens. These four species are: *Alpheus dentipes* GUÉRIN, *Hippolyte coerulescens* (FABRICIUS), *Ibacus peroni* LEACH and *Thalassina chilensis* STEENSTRUP & LÜTKEN. Of the remaining

species 5 inhabit fresh water: the prawn *Cryphiops caementarius* (MOLINA), and the crayfishes *Parastacus chilensis* (H. MILNE EDWARDS), *P. spinifrons* (PHILIPPI), *P. araucanius* FAXON, and *P. pugnax* (POEPPIG). Thirteen species are deep sea forms or have a pelagic life: *Sergestes arcticus* KRØYER, *S. profundus* BATE, *Pasiphaea acutifrons* BATE, *P. dofleini* SCHMITT, *Acanthephyra cristata* BATE, *A. approxima* BATE, *Nematocarcinus proximatus* BATE, *Campylonotus semistriatus* BATE, *Glyphocrangon rimapes* BATE, *Polycheles chilensis* SUND, *Stereomastis suhmi* (BATE), *Willemoesia challengeri* SUND, and *W. pacifica* SUND. Almost all the known Chilean material of these deep sea forms has been collected during the single trip made by the Challenger Expedition in Chilean waters and a thorough investigation of the deeper waters off Chile might reveal here the existence of a much larger number of forms. The 19 litoral species may be divided into two groups according to their geographic distribution. Part of the species, namely, inhabits the antiboreal region of South America as this has been defined by EKMAN, 1935 (i.e., the southern part of the South American continent, extending along the west coast to slightly north of Chiloé Island at about 42° S.). The following 11 species of Decapoda Macrura inhabit this region: *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Alpheus chilensis* COUTIÈRE, *Nauticaris magellanica* (A. MILNE EDWARDS), *Eualus dozei* (A. MILNE EDWARDS), *Chorismus antarcticus* (PFEFFER), *Latreutes antiborealis* new species, *Campylonotus vagans* BATE, *Callianassa uncinata* H. MILNE EDWARDS, and *C. brachyophthalma* A. MILNE EDWARDS. The Chilean coast N. of 42° S. belongs to the region named by EKMAN the Peruvian-North Chilean region, the northern limit of which lies at about 4° or 6° S, and includes the island group of Juan Fernandez. The following 13 species of Decapoda Macrura have been reported from the Chilean coasts within this region: *Discias serrifer* RATHBUN, *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Alpheopsis chilensis* COUTIÈRE, *Synalpheus spinifrons* (H. MILNE EDWARDS), *Nauticaris magellanica* (A. MILNE EDWARDS), *Hippolysmata porteri* RATHBUN, *Rhynchocinetes typus* H. MILNE EDWARDS, *R. balssi* GORDON, *Jasus lalandei* ssp. *frontalis* (H. MILNE EDWARDS), *Scyllarus delfini* (BOUVIER), *Callianassa uncinata* H. MILNE EDWARDS. The antiboreal and the Peruvian-North Chilean regions thus have five species in common: *Austropandalus grayi* (CUNNINGHAM), *Nauticaris magellanica* (A. MILNE EDWARDS), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), and *Callianassa uncinata* H. MILNE EDWARDS. The latter two are known from the larger part of the Peruvian-North Chilean region and the extreme northwestern part of the antiboreal region; the occurrence of the former three species in the Peruvian-North Chilean region, however, needs confirmation.

The collection brought together by the Lund University Expedition contains not less than 17 species (*Sergestes arcticus* KRÖYER, *Pasiphaea acutifrons* BATE, *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Synalpheus spinifrons* (H. MILNE EDWARDS), *Alpheus chilensis* COUTIÈRE, *Nauticaris magellanica* (A. MILNE EDWARDS), *Eualus dozei*

(A. MILNE EDWARDS), *Latreutes antiborealis* new species, *Rhynchocinetes typus* H. MILNE EDWARDS, *Campylonotus semistriatus* BATE, *C. vagans* BATE, *Cryphiops caementarius* (MOLINA), *Parastacus spinifrons* (PHILIPPI), *Callianassa uncinata* H. MILNE EDWARDS, *C. brachyophthalma* A. MILNE EDWARDS). This material in many instances made it possible to fix the status of species, which up till now were insufficiently known. So the occurrence of *Sergestes arcticus* in Chilean waters was confirmed, the generic position of *Austropandalus grayi* and *Eualus dozei* could be fixed, of *Alpheus chilensis* and *Callianassa brachyophthalma* for the first time an extensive description and figures are given, the early stages of *Cryphiops caementarius* now for the first time are described and figured. The synonymies of various species could be cleared as a result of the study of the material collected by the Lund University Expedition and by examination of Chilean material from various museums. The importance of the material of the Lund University Expedition not only lies in the large number of species (17) and specimens (abt. 800) secured, but also, and perhaps in the first place, in the accurate and extensive labelling of the specimens, which greatly adds to our knowledge of the habits and habitats of the species collected. It may be emphasized therefore that the present collection undoubtedly contains most important material for the advance of our knowledge of the Chilean Macrura.

All the species which up till now have been recorded from Chile are treated more or less extensively in the present paper, while their synonymy and distribution have been given.

Resumen.

Según la literatura científica pertinente, el número total de especies de Crustáceos Decápodos Macruros que pertenece a la fauna chilena es de 41. No obstante parece que cuatro de ellas no son chilenas porque los datos contenidos en los rótulos de los ejemplares probablemente son falsos. Esas cuatro especies son: *Alpheus dentipes* GUÉRIN, *Hippolyte coerulescens* (FABRICIUS), *Ibacus peroni* LEACH, and *Thalassina chilensis* STEENSTRUP & LÜTKEN. De las restantes, 5 viven en agua fresca: *Cryphiops caementarius* (MOLINA), *Parastacus chilensis* (H. MILNE EDWARDS), *P. spinifrons* (PHILIPPI), *P. araucanius* FAXON, y *P. pugnax* (POEPPIG). Trece especies se encuentran solamente en profundidades muy grandes o son pelágicas: *Sergestes arcticus* KRØYER, *S. profundus* BATE, *Pasiphaea acutifrons* BATE, *P. dofleini* SCHMITT, *Acanthephyra cristata* BATE, *A. approxima* BATE, *Nematocarcinus proximatus* BATE, *Campylonotus semistriatus* BATE, *Glyphocrangon rimapes* BATE, *Polycheles chilensis* SUND, *Stereomastis suhmi* (BATE), *Willemoesia challengeri* SUND, y *W. pacifica* SUND. Casi todos los ejemplares de estas especies del mar profundo fueron recogidas durante el único viaje de la expedición »Challenger» en aguas chilenas, e investigaciones más intensas en el océano abierto podrán, tal vez, revelar la afluencia de varias otras.

El número de especies litorales es de 19 y respecto a la distribución geográfica dos grupos pueden distinguirse. Uno de ellos se encuentra en la región antiboreal (en el

sentido de EKMAN 1935) incluyendo la parte austral del continente y extendiéndose a lo largo de la costa occidental hasta 42° S. Las siguientes especies de Decápodos Macruros viven en esta región: *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Alpheus chilensis* COUTIÈRE, *Nauticaris magellanica* (A. MILNE EDWARDS), *Eualus dozei* (A. MILNE EDWARDS), *Chorismus antarcticus* (PFEFFER), *Latreutes antiborealis* nueva especie, *Campylonotus vagans* BATE, *Callianassa uncinata* H. MILNE EDWARDS, y *C. brachyophthalma* A. MILNE EDWARDS. El resto de la costa chilena, según EKMAN, pertenece a la región peruano-chilena cuyo límite septentrional está situado entre 4°S y 6°S. En esta región también se incluyen las islas de Juan Fernández. Dentro de la parte chilena las siguientes 13 especies fueron señaladas: *Discias serrifer* RATHBUN, *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Nauticaris magellanica* (A. MILNE EDWARDS), *Alpheopsis chilensis* COUTIÈRE, *Synalpheus spinifrons* (H. MILNE EDWARDS), *Hippolysmata porteri* RATHBUN, *Rhynchocinetes typus* H. MILNE EDWARDS, *R. balssi* GORDON, *Jasus lalandei* ssp. *frontalis* (H. MILNE EDWARDS), *Scyllarus delfini* (BOUVIER), *Callianassa uncinata* H. MILNE EDWARDS. Entonces la región antiboreal y la región peruano-chilena tienen 5 especies en común: *Austropandalus grayi* (CUNNINGHAM), *Nauticaris magellanica* (A. MILNE EDWARDS), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), y *Callianassa uncinata* H. MILNE EDWARDS. Las dos últimas concurren en gran parte de la zona peruano-chilena y en el nordoeste de la zona antiboreal. La presencia de las tres primeras en la region peruano-chilena debería ser confirmada.

La colección recogida por la expedición de la Universidad de Lund está compuesta por 17 especies: *Sergestes arcticus* KRØYER, *Pasiphaea acutifrons* BATE, *Austropandalus grayi* (CUNNINGHAM), *Betaeus truncatus* DANA, *B. emarginatus* (H. MILNE EDWARDS), *Synalpheus spinifrons* (H. MILNE EDWARDS), *Alpheus chilensis* COUTIÈRE, *Nauticaris magellanica* (A. MILNE EDWARDS), *Eualus dozei* (A. MILNE EDWARDS), *Latreutes antiborealis* nueva especie, *Rhynchocinetes typus* H. MILNE EDWARDS, *Campylonotus semistriatus* BATE, *C. vagans* BATE, *Cryphiops caementarius* (MOLINA), *Parastacus spinifrons* (PHILIPPI), *Callianassa uncinata* H. MILNE EDWARDS y *C. brachyophthalma* A. MILNE EDWARDS.

Hizo posible fijar este material la posición sistemática de varias especies anteriormente poco conocidas. Por ejemplo, la presencia de *Sergestes arcticus* en mares chilenos estaba confirmada, la posición genérica de *Austropandalus grayi* y *Eualus dozei* se aclaró, por la primera vez era posible dar descripciones y dibujos detallados de *Alpheus chilensis* y *Callianassa brachyophthalma* y las etapas tempranas en el desarrollo de *Cryphiops caementarius*, anteriormente desconocidos, fueron descritos y dibujados. La sinonimia de varias especies se aclaró gracias a la colección de la expedición y a ejemplares chilenos prestados por varios museos.

La importancia del material de la expedición de la Universidad de Lund reside no solamente en el gran número de especies (17) y ejemplares ($\pm$800) recogidos sino también y, quizás sobre todo, en los datos detallados y exactos anotados en los rótulos y en los diarios de la expedición, los que proporcionan una nueva y abundante

información sobre la biología de las especies observadas. Se puede decir, entonces, que la colección tratada aquí aumenta considerablemente nuestro conocimiento sobre los Macruros chilenos.

En la presente obra todas las especies señaladas de la costa chilena, su sinonimia y su distribución geográfica han sido tratadas de una manera más o menos detallada.

Literature.

(The papers marked with an asterisk * have not been seen by me)

Albert, F., 1898. La Langosta de Juan Fernandez i la Posibilidad de su Propagacion en la Costa chilena. Rev. Chil. Hist. nat., vol. 2, pp. 5—11, 17—23, 29—31, tab.

Armstrong, J. C., 1940. New Species of Caridea from the Bermudas. Amer. Mus. Novit., n. 1096, pp. 1—10, figs. 1—4.

Bage, F., 1938. Crustacea Decapoda (in part). Sci. Rep. Australas. Antarct. Exped., ser. C vol. 2 pt. 6, pp. 1—13, pl. 4.

*Bahamonde, N., 1948. Algunos datos sobre la langosta de Juan Fernandez (Jasus frontalis M. Edw., 1837). Rev. Biol. Marina, vol. 1 pt. 2, pp. 90—120, figs.

Balss, H., 1924. Decapoden von Juan Fernandez. In: Skottsberg, C., The Natural History of Juan Fernandez and Easter Island, vol. 3, pp. 329—340, textfigs. 1—3.

—, 1925. Macrura der Deutschen Tiefsee-Expedition. 2. Natantia, Teil A. Wiss. Ergebn. Valdivia Exped., vol. 20, pp. 217—315, textfigs. 1—75, pls. 20—28.

—, 1930. Die Dekapoden (Crustaceen). Zoologische Ergebnisse der Reisen von Dr. Kohl-Larsen nach den subantarktischen Inseln bei Neuseeland und nach Südgeorgien. Senckenbergiana, vol. 12, pp. 195—210, textfigs. 1—5.

Barnard, K. H., 1950. Descriptive Catalogue of South African Decapod Crustacea. Ann. S. Afr. Mus., vol. 38, pp. 1—837, figs. 1—154.

Bate, C. S., 1868. On a new Genus, with four new Species, of Freshwater Prawns. Proc. zool. Soc. Lond., 1868, pp. 363—368, pls. 30, 31.

—, 1878. On the Willemoesia Group of Crustacea. Ann. Mag. nat. Hist., ser. 5 vol. 2, pp. 273—283, pl. 13.

—, 1879. On the Willemoesia Group of Crustacea. Rep. Brit. Ass. Adv. Sci., vol. 48, pp. 561—564.

—, 1888. Report on the Crustacea Macrura collected by H. M. S. Challenger during the years 1873—76. Rep. Voy. Challenger, Zool., vol. 24, pp. i—xc, 1—942, textfigs. 1—76, pls. 1—150.

Bonnier, J., 1900. Contribution à l'étude des Épicarides. Les Bopyridae. Trav. Sta. zool. Wimereux, vol. 8, pp. 1—475, textfigs. 1—62, pls. 1—41.

Boone, L., 1930. Crustacea: Anomura, Macrura, Schizopoda, Isopoda, Amphipoda, Mysidacea, Cirripedia, and Copepoda. Scientific Results of the Cruises of the Yachts »Eagle» and »Ara», 1921—1928, William K. Vanderbilt, Commanding. Bull. Vanderbilt mar. Mus., vol. 3, pp. 1—221, pls. 1—83.

—, 1938. The marine Algae, Coelenterata, Annelida Polychaeta, Echinodermata, Crustacea and Mollusca of the World Cruises of the Yachts »Ara», 1928—1929, and »Alva», 1931—1932, »Alva» Mediterranean Cruise, 1933, and »Alva» South American Cruise, 1935, William K. Vanderbilt, Commanding. Bull. Vanderbilt mar. Mus., vol. 7, pp. 1—372, textfigs. 1—22, pls. 1—152.

Borradaile, L. A., 1903. On the Classification of the Thalassinidea. Ann. Mag. nat. Hist., ser. 7 vol. 12, pp. 534—551, 638.

—, 1916. Crustacea, Part I. — Decapoda. Nat. Hist. Rep. Brit. Antarct. Exped., vol. 3 pt. 2, pp. 75—110, figs. 1—16.

Boschma, H., 1949. Ellobiopsidae. Discovery Rep., vol. 25, pp. 281—314, textfigs. 1—16, pls. 38—41.

Bouvier, E. L., 1909. Arctus Delfini, Sp. Nov. Carcinologie. Rev. Chil. Hist. nat., vol. 13, pp. 213—215, fig. 30.

Brattström, H. & Dahl, E., 1951. General Account, Lists of Stations, Hydrography. Reports of the Lund University Chile Expedition 1948—49. 1. Lunds Univ. Årsskr., n. ser. sect. 2 vol. 46 n. 8, pp. 1—88, figs. 1—5, maps 1—8.

Bürger, O., 1902. Ein Fall von lateralem Hermaphroditismus bei Palinurus frontalis M.-E. Zeitschr. wiss. Zool., vol. 71, pp. 702—707, figs. 1—4.

—, 1904. Un Caso de Hermafroditismo lateral en la Langosta de Juan Fernández (Palinurus Frontalis M.-E.). An. Univ. Chile, vol. 113, pp. 591—599, 2 pls.

Calman, W. T., 1906. Notes on some Genera of the Crustacean Family Hippolytidae. Ann. Mag. nat. Hist., ser. 7 vol. 17, pp. 29—34.

—, 1907. Crustacea. I. Decapoda. Nat. Antarct. Exped. 1901—1904, Nat. Hist., vol. 2, pp. 1—7.

—, 1925. On Macrurous Decapod Crustacea collected in South African waters by the S.S. »Pickle». With a note on specimens of the genus Sergestes by H. J. Hansen. Rep. Fish. mar. biol. Surv. S. Afr., vol. 4 pt. 3, pp. 1—26, pls. 1—4.

Cano, G., 1888. Crostacei raccolti dalla R. Corvetta Caracciolo nel viaggio intorno al globo durante gli anni 1881—82—83—84. Boll. Soc. Nat. Napoli, ser. 1 vol. 2, pp. 161—184, figs. 1—3.

Cecchini, C., 1928. Sergestidi. Raccolte planctoniche fatte dalla R. Nave »Liguria» nel viaggio di circonnavigazione del 1903—05 sotto il comando di S.A.R. Luigi di Savoia, Duca degli Abruzzi. Volume III. — Fascicolo II. Crostacei — Parte V, pp. 31—60, pls. 3, 4.

Chace, F. A., 1936. Revision of the bathypelagic prawns of the family Acanthephyridae, with notes on a new family, Gomphonotidae. Journ. Wash. Acad. Sci., vol. 26, pp. 24—31.

—, 1937. Caridean Decapod Crustacea from the Gulf of California and the West Coast of Lower California. The Templeton Crocker Expedition. VII. Zoologica, New York, vol. 22, pp. 109—138, figs. 1—9.

Chace, F. A. & Dumont, W. H., 1949. Spiny Lobsters — Identification, World Distribution, and U.S. Trade. Commerc. Fish. Rev., vol. 11 n. 5, pp. 1—12, figs. 1—7.

Coutière, H., 1896. Note sur quelques genres nouveaux ou peu connus d'Alphéidés, formant la sous-famille des Alphéopsidés. Bull. Mus. Hist. nat. Paris, vol. 2, pp. 380—386.

—, 1898. Sur quelques variétés de Synalpheus laevimanus Heller (Crust.). Bull. Soc. ent. France, 1898, pp. 188—191, figs. 1—4.

—, 1899. Les »Alpheidae», morphologie externe et interne, formes larvaires, bionomie. Ann. Sci. nat. Zool., ser. 8 vol. 9, pp. 1—559, textfigs. 1—409, pls. 1—6.

—, 1899a. Sur le genre Metabetaeus Borradaile (Crust.). Bull. Soc. ent. France, 1899, pp. 374—377.

—, 1905. Les Alpheidae. In: Gardiner, J. S., The Fauna and Geography of the Maldive and Laccadive Archipelagoes. Being the Account of the Work carried on and of the Collections made by an Expedition during the years 1899 and 1900, vol. 2 pt. 4, pp. 852—918, pls. 70—79.

—, 1907. Sur quelques larves d'Eucyphotes provenant de l'expédition antarctique suédoise. Bull. Mus. Hist. nat. Paris, vol. 13, pp. 407—412, 3 textfigs.

—, 1908. Sur quelques nouvelles espèces d'Alpheidae. Bull. Soc. philom. Paris, ser. 9 vol. 10, pp. 191—216.

—, 1909. The American species of Snapping Shrimps of the Genus Synalpheus. Proc. U.S. Nat. Mus., vol. 36, pp. 1—93, figs. 1—54.

—, 1917. Crustacés Schizopodes et Décapodes. Docum. sci. 2me Expéd. Antarct. Franç., Crust. Schiz. & Décap., pp. 1—8, figs. 1—17.

Cunningham, R. O., 1871. Notes on the Reptiles, Amphibia, Fishes, Mollusca, and Crustacea obtained during the voyage of H.M.S. »Nassau» in the years 1866—69. Trans. Linn. Soc. Lond., vol. 27, pp. 465—502, pls. 58, 59.

—, 1871a. Notes on the Natural History of the Strait of Magellan and West Coast of Patagonia made during the Voyage of H.M.S. »Nassau» in the Years 1866, 67, 68, & 69, pp. i-xvi, 1—517, 21 pls., 1 map.

Dana, J. D., 1852. Conspectus Crustaceorum quae in Orbis Terrarum Circumnavigatione, Carolo Wilkes e Classe Reipublicae Foederatae Duce, lexit et descripsit. Proc. Acad. nat. Sci. Phila., 1852, pp. 10—28.

—, 1852a. Crustacea. United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles Wilkes, U.S.N., vol. 13, pp. 1—1620.

—, 1855. Crustacea. United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles Wilkes, U.S.N., vol. 13 atlas, pp. 1—27, pls. 1—96.

Doflein, F., 1899. Amerikanische Decapoden der k. bayerischen Staatssammlungen. S. B. Bayer. Akad. Wiss., vol. 29. pp. 177—195.

—, 1900. Weitere Mitteilungen über dekapode Crustaceen der k. bayerischen Staatssammlungen. S. B. Bayer. Akad. Wiss., vol. 30, pp. 125—145, figs. 1—3.

Doflein, F. & Balss, H., 1912. Die Dekapoden und Stomatopoden der Hamburger Magalhaensischen Sammelreise 1892/93. Mitt. naturh. Mus. Hamburg, vol. 29, pp. 25—44, figs. 1—4.

Ekman, S., 1935. Tiergeographie des Meeres, pp. i—xii, 1—542, figs. 1—244.

Erichson, W. F., 1846. Uebersicht der Arten der Gattung Astacus. Arch. Naturgesch., vol. 12 pt. 1, pp. 86—103.

Fabricius, J. C., 1775. Systema Entomologiae, sistens Insectorum Classes, Ordines, Genera, Species, adiectis Synonymis, Locis, Descriptionibus, Observationibus, pp. 1—832.

Faxon, W., 1895. The Stalk-eyed Crustacea. Reports on an Exploration off the west Coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U.S. Fish Commission Steamer »Albatross», during 1891, Lieut. Commander Z. L. Tanner, U.S.N., commanding. Mem. Mus. comp. Zoöl. Harvard, vol. 18, pp. 1—292, textfigs. 1—6, pls. A—K, 1—57, 1 map.

—, 1898. Observations on the Astacidae in the United States National Museum and in the Museum of Comparative Zoology, with Descriptions of new Species. Proc. U.S. Nat. Mus., vol. 20, pp. 643—694, pls. 62—70.

—, 1914. Notes on the Crayfishes in the United States National Museum and the Museum of Comparative Zoölogy with Descriptions of new Species and Subspecies to which is appended a Catalogue of the known Species and Subspecies. Mem. Mus. comp. Zoöl. Harvard, vol. 40, pp. 347—427, pls. 1—13.

Filhol, H., 1885. Considérations relatives à la Faune des Crustacés de la Nouvelle-Zélande. Bibl. Éc. haut. Étud., vol. 30 pt. 2, pp. 1—60.

—, 1886. Catalogue des Crustacés de la Nouvelle Zélande, des îles Auckland et Campbell. Passage de Vénus. Mission de l'île Campbell, Zool., vol. 3 pt. 2, pp. 349—510, pls. 38—55.

Gibbes, L. R., 1850. On the carcinological Collections of the Cabinets of Natural History in the United States. With an Enumeration of the species contained therein, and descriptions of new species. Proc. Amer. Ass. Adv. Sci., vol. 3, pp. 165—201.

—, 1850a. Catalogue of the Crustacea in the Cabinet of the Academy of Natural Sciences of Philadelphia, August 20th, 1847 with Notes on the most remarkable. (With Additions and Observations by the Committee.). Proc. Acad. nat. Sci. Phila., 1850, pp. 22—30.

Girard, C., 1855. Description of certain Crustacea, brought home by the U.S.N. Astronomical Expedition. U.S. Naval Astron. Exped. S. Hemisph., vol. 2, pp. 254—262.

Gmelin, J. F., 1789. Caroli à Linné, Systema Naturae per Regna Tria Naturae, secundum Classes, Ordines, Genera, Species cum Characteribus, Differentiis, Synonymis, Locis, ed. 13 vol. 1 pt. 5, pp. 2225—3020. (Leipzig edition).

—, 1793, Caroli à Linné, Systema Naturae, per Regna Tria Naturae, secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis, ed. 14 vol. 7, pp. 1—538. (Coimbra edition).

Gordon, I., 1935. On new or imperfectly known species of Crustacea Macrura. Journ. Linn. Soc. Lond. Zool., vol. 39, pp. 307—351, figs. 1—27.

—, 1936. On the Macruran Genus Rhynchocinetes, with Description of a new Species. Proc. zool. Soc. Lond., 1936, pp. 75—88, figs. 1—7.

Gruvel, A., 1911. Contribution à l'étude générale systématique et économique des Palinuridae. Mission Gruvel sur la côte occidentale d'Afrique (1909—1910). Résultats scientifiques et économiques. Ann. Inst. océanogr. Monaco, vol. 3 pt. 4, pp. 5—56, textfigs. 1—22, pls. 1—6.

Guérin Méneville, F. E., 1829—1844. Iconographie du Règne animal de G. Cuvier, ou représentation d'après nature de l'une des espèces les plus remarquables et souvent non encore figurées, de chaque genre d'animaux. Avec une texte descriptif mis au courant de la science. Ouvrage pour servir d'atlas à tous les traités de Zoologie, vol. 2 Crust., pls. 1—104; vol. 3 Crust., pp. 1—48.

—, 1832. I.re Classe. Crustacés. Expédition scientifique de Morée, Zool., vol. 2, pp. 30—50, pl. 27.

—, 1856. Crustaceos. In: Sagra, R. de la, Historia fisica politica y natural de la Isla de Cuba, Historia Natural, vol. 7, pp. v—xxxii, pls. 1—3.

—, 1857. Crustacés. In: Sagra, R. de la, Histoire physique, politique et naturelle de l'île de Cuba, Crust., pp. i—lxxxvii, pl. 2.

Gurney, R., 1937. Larvae of Decapod Crustacea. Pt. IV. Hippolytidae. Discovery Rep., vol. 14, pp. 351—403, figs. 1—137.

—, 1939. A new Species of the Decapod Genus Discias Rathbun from Bermuda. Ann. Mag. nat. Hist., ser. 11 vol. 3, pp. 388—393, figs. 1—13.

Hale, H. M., 1941. Decapod Crustacea. Rep. B.A.N.Z. Antarct. Res. Exped., ser. B vol. 4, pp. 257—285, figs. 1—16.

Hansen, H. J., 1896. On the Development and the Species of the Crustaceans of the Genus Sergestes. Proc. zool. Soc. Lond., 1896, pp. 936—970.

—, 1903. On the Crustaceans of the Genera Petalidium and Sergestes from the »Challenger», with an Account of Luminous Organs in Sergestes challengeri, n. sp. Proc. zool. Soc. Lond., 1903, pp. 52—79, pls. 11, 12.

—, 1919. The Sergestidae of the Siboga Expedition. Siboga Exped., mon. 38, pp. 1—65, pls. 1—5.

—, 1922. Crustacés décapodes (Sergestides) provenant des Campagnes des yachts Hirondelle et Princesse-Alice (1885—1915). Rés. Camp. sci. Monaco, vol. 64, pp. 1—232, pls. 1—11.

Hay, W. P., 1905. Instances of Hermaphroditism in Crayfishes. Smithson. misc. Coll., vol. 48, pp. 222—228, fig. 27.

Heller, C., 1862. Beiträge zur näheren Kenntniss der Macrouren. S.B. Akad. Wiss. Wien, vol. 45 pt. 1, pp. 389—426, pls. 1, 2.

—, 1865. Crustacea. Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857—58—59 unter den Befehlen des Commodors B. von Wüllerstorf-Urbair, Zool., vol. 2 pt. 3, pp. 1—280, pls. 1—25.

Hemming, F., 1950. The Official Record of Proceedings of the International Commission on Zoological Nomenclature at its Session held in Paris in July 1948. Bull. zool. Nomencl., vol. 4, pp. 1—760.

Hodgson, T. V., 1902. Crustacea. Report on the Collections of Natural History made in the Antarctic Regions during the voyage of the »Southern Cross», pp. 228—259, pls. 29—40.

Holthuis, L. B., 1947. The Hippolytidae and Rhynchocinetidae collected by the Siboga and Snellius Expeditions with Remarks on other Species. The Decapoda of the Siboga Expedition. Part IX. Siboga Exped., mon. 39a8, pp. 1—100, figs. 1—15.

—, 1950. The Palaemonidae collected by the Siboga and Snellius Expeditions with Remarks on other Species. I. Subfamily Palaemoninae. The Decapoda of the Siboga Expedition. Part X. Siboga Exped., mon. 39a9, pp. 1—268, figs. 1—52.

—, 1952. A general Revision of the Palaemonidae (Crustacea Decapoda Natantia) of the Americas. II. The Subfamily Palaemoninae. Allan Hancock Found. Publ., Occ. Pap., vol. 12, pp. 1—396, textfig. 1, pls. 1—55.

Ihéring, H. von, 1893. Parastacus. Congr. Int. Zool. Moscou, 1893 pt. 2, pp. 43—49.

Illig, G., 1927. Die Sergestiden der Deutschen Tiefsee-Expedition. Wiss. Ergebn. Valdivia Exped., vol. 23, pp. 279—354, figs. 1—131.

Kemp, S., 1906. On the occurrence of the genus Acanthephyra in deep water off the West coast of Ireland. Sci. Invest. Fish. Br. Ire., 1905 pt. 1, pp. 1—28, textfigs. 1, 2, pls. 1, 2.

—, 1920. On the occurrence of the Caridean genus Discias in Indian waters. Notes on Crustacea Decapoda in the Indian Museum. XIV. Rec. Indian Mus., vol. 19, pp. 137—143, textfigs. 1—3, pl. 8.

—, 1925. On various Caridea. Notes on Crustacea Decapoda in the Indian Museum. XVII. Rec. Indian Mus., vol. 27, pp. 249—343, figs. 1—24.

Kingsley, J. S., 1883. Carcinological Notes; Number V. Bull. Essex Inst., vol. 14, pp. 105—132, pls. 1, 2.

Krøyer, H., 1865. Forsög til en monographisk Fremstilling af Kraebsdyrslaegten Sergestes. Med Bemaerkninger om Dekapodernes Höreredskaber. K. Danske Vidensk. Selsk. Skr., ser. 5 vol. 4, pp. 217—302, pls. 1—5.

Leach, W. E., 1815. The zoological Miscellany; being Descriptions of new, or interesting Animals, vol. 2, pp. 1—154, pls. 61—120.

Lebour, M. V., 1949. Some New Decapod Crustacea from Bermuda. Proc. zool. Soc. Lond., vol. 118, pp. 1107—1117, figs. 1—6.

Lenz, H., 1902. Die Crustaceen der Sammlung Plate. (Decapoda und Stomatopoda). Fauna Chilensis, vol. 2 pt. 3. Zool. Jb. Suppl., vol. 5, pp. 731—772, pl. 23.

Lenz, H. & Strunck, K., 1914. Die Dekapoden der Deutschen Südpolar-Expedition 1901—1903. I. Brachyuren und Macruren mit Ausschluss der Sergestiden. Deutsche Südpolar-Exped., vol. 15, pp. 257—345, textfigs. 1—5, pls. 12—22.

Lönnberg, E., 1898. Some biological and anatomical facts concerning Parastacus. Zool. Anz., vol. 21, pp. 334, 335, 345—352, figs. 1—3.

Lucas, H., 1851. Histoire naturelle des Crustacés, des Arachnides et des Myriapodes; précédée de l'Histoire naturelle des Annélides, par M. le Comte de Castelnau, pp. 1—601, pls. 1, 1—7, 1—20, 1—13, 1—3, 1, 1.

McCulloch, A. R., 1909. Studies in Australian Crustacea. No. 2. Rec. Aust. Mus., vol. 7, pp. 305—314, textfigs. 16, 17, pls. 88, 89.

Man, J. G. de, 1888. Bericht über die von Herrn Dr. J. Brock im indischen Archipel gesammelten Decapoden und Stomatopoden. Arch. Naturgesch., vol. 53 pt. 1, pp. 215—600, pls. 7—22a.

—, 1911. Family Alpheidae. The Decapoda of the Siboga Expedition. Part II. Siboga Exped., mon. 39a[1], pp. 133—465. (plates 1—23 belonging to this monograph were published as a supplement in 1915).

—, 1915. Macrura. Zur Fauna von Nord-Neuguinea. Nach den Sammlungen von Dr. P. N. van Kampen und K. Gjellerup in den Jahren 1910—1911. Zool. Jb. Syst., vol. 38, pp. 385—458, pls. 27—29.

—, 1916. Families Eryonidae, Palinuridae, Scyllaridae and Nephropsidae. The Decapoda of the Siboga Expedition. Part III. Siboga Exped., mon. 39a[2], pp. 1—122, pls. 1—4.

—, 1920. Families Pasiphaeidae, Stylodactylidae, Hoplophoridae, Nematocarcinidae, Thalassocaridae, Pandalidae, Psalidopodidae, Gnathophyllidae, Processidae, Glyphocrangonidae and Crangonidae. The Decapoda of the Siboga Expedition. Part IV. Siboga Exped., mon. 39a[3], pp. 1—318, pls. 1—25.

—, 1928. A Contribution to the Knowledge of twenty-two Species and three Varieties of the Genus Callianassa Leach. Capita Zool., vol. 2 pt. 6, pp. 1—56, pls. 1—12.

—, 1928a. The Thalassinidae and Callianassidae collected by the Siboga-Expedition with some Remarks on the Laomediidae. The Decapoda of the Siboga Expedition. Part VII. Siboga Exped., mon. 39a[6], pp. 1—187, pls. 1—20.

Martens, E. von, 1858. On the Occurrence of Marine Animal Forms in Fresh Water. Ann. Mag. nat. Hist., ser. 3 vol. 1, pp. 50—63.

—, 1868. Notiz über Palaemon Gaudichaudii und Niloticus. Arch. Naturgesch., vol. 34 pt. 1, pp. 64—67.

Miers, E. J., 1876. Catalogue of the stalk- and sessile-eyed Crustacea of New Zealand, pp. 1—196, pls. 1—3.

—, 1877. On a Collection of Crustacea, Decapoda and Isopoda, chiefly from South America, with descriptions of New Genera and Species. Proc. zool. Soc. Lond., 1877, pp. 653—679, pls. 66—69.

—, 1881. Crustacea. Account of the Zoological Collections made during the Survey of H.M.S. »Alert» in the Straits of Magellan and on the Coast of Patagonia. Proc. zool. Soc. Lond., 1881, pp. 61—79, pl. 7.

Milne Edwards, A., 1860. Monographie des Décapodes macrures fossiles de la famille des Thalassiniens. Ann. Sci. nat. Zool., ser. 4 vol. 14, pp. 294—357, pls. 11—16.

—, 1870. Révision du genre Callianassa (Leach) et description de plusieurs espèces nouvelles de ce groupe faisant partie de la collection du Muséum. Nouv. Arch. Mus. Hist. nat. Paris, vol. 6, pp. 75—101, pls. 1, 2.

—, 1891. Crustacés. Mission scientifique du Cap Horn. 1882—1883, vol. 6, Zool. pt. 2F, pp. 1—54, pls. 1—7.

Milne Edwards, H., 1837. Histoire Naturelle des Crustacés, comprenant l'anatomie, la physiologie et la classification de ces animaux, vol. 2, pp. 1—532, atlas, pp. 1—32, pls. 1—42.

—, 1837a. Note sur le Rhynchocinète, nouveau genre de Crustacé décapode. Ann. Sci. nat. Zool., ser. 2 vol. 7, pp. 165—168, pl. 4C.

—, 1837b. Les Crustacés. In: Cuvier, G., Le Règne Animal distribué d'aprés son organisation, pour servir de base à l'histoire naturelle des animaux, et d'introduction à l'anatomie comparée, ed. 4 vol. 17, pp. 1—278; vol. 18, pls. 1—80.

—, 1838. Arachnides, Crustacés, Annélides, Cirrhipèdes. In: Lamarck, J. B. P. A. de, Histoire naturelle des Animaux sans Vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la Détermination des caractères essentiels de l'Animal, sa Distinction du Végétal et des autres corps naturels; enfin, l'Exposition des principes fondamentaux de la Zoologie, ed. 2 vol. 5, pp. 1—699.

—, 1840. Histoire naturelle des Crustacés, comprenant l'anatomie, la physiologie et la classification de ces animaux, vol. 3, pp. 1—638.

—, 1851. Observations sur le squelette tégumentaire des Crustacés décapodes, et sur la morphologie de ces animaux. Ann. Sci. nat. Zool., ser. 3 vol. 16, pp. 221—291, pls. 8—11.

Milne Edwards, H. & Lucas, H., 1843. Crustacés. In: Orbigny, A.d', Voyage dans l'Amérique méridionale (le Brésil, la république orientale de l'Uruguay, la république Argentine, la Patagonie, la république du Chili, la république de Bolivia, la république du Pérou), exécuté pendant les années 1826, 1827, 1828, 1829, 1830, 1831, 1832 et 1833, vol. 6 pt. 1, pp. 1—37, pls. 1—17.

Molina, G. I., 1782. Saggio sulla Storia naturale del Chili, pp. 1—367, 1 map.

*—, 1786. Versuch einer Naturgeschichte von Chili, pp. i—xvi, 1—328, 1 map. (German edition of Molina's 1782 work).

*—, 1788. Compendio de la historia geografica, natural y civil del reino de Chili, vol. 1, pp. i—xx, 1—418, 1 map (vol. 2, pp. i—xvi, 1—382, 3 maps was published in 1795) (Spanish edition).

—, 1789. Essai sur l'histoire naturelle du Chili, pp. i—xvi, 1—351. (French edition).

—, 1808. The geographical, natural and civil History of Chili. With Notes from the Spanish and French Versions, and an Appendix, containing copious extracts from the Araucana of Don Alonzo de Ercilla, vol. 1, pp. i—xii, 1—271, 1 map; vol. 2, pp. i—viii, 1—305, app., pp. i—iv, 1—68. (U.S. edition).

*—, 1809. The geographical, natural, and civil history of Chili. To which are added, notes from the spanish and french versions, and two appendixes, by the english editor; the first, an account of the archipelago of Chiloé, from the Description historial of P. F. Pedro Gonzalez de Agüeros; the second, an account of the native tribes who inhabit the southern extremity of South America, extracted chiefly from Falkner's Description of Patagonia. 2 vols. (English edition).

Molina, G. I., 1810. Saggio sulla Storia naturale del Chili, ed. 2, pp. i—v, 1—306, 1 map.

Murray, J., 1896. On the Deep and Shallow-water Marine Fauna of the Kerguelen Region of the Great Southern Ocean. Trans. Roy. Soc. Edinb., vol. 38, pp. 343—500, textfigs., 1 map.

Nicolet, H., 1849. Crustaceos. In: Gay, C., Historia fisica y politica de Chile segun documentos adquiridos en esta republica durante doce años de residencia en ella y publicada bajo los auspicios del supremo gobierno, Zool., vol. 3, pp. 115—318, pls. 1—4.

Nierstrasz, H. F. & Brender à Brandis, G. A., 1923. Die Isopoden der Siboga-Expedition. II. Isopoda Genuina. I. Epicaridea. Siboga Exped., mon. 32b, pp. 57—121, pls. 4—9.

Nobili, G., 1901. Decapodi raccolti dal Dr. Filippo Silvestri nell'America meridionale. Boll. Mus. Zool. Anat. comp. Torino, vol. 16 n. 402, pp. 1—16.

—, 1902. Decapodi raccolti dal Dr. F. Silvestri nell Chile. Rev. Chil. Hist. nat., vol. 6, pp. 233—238.

Ortmann, A., 1890. Die Unterordnung Natantia Boas. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und z.Z. im Strassburger Museum aufbewahrten Formen. I. Theil. Zool. Jb. Syst., vol. 5, pp. 437—542, pls. 36, 37.

—, 1891. Versuch einer Revision der Gattungen Palaemon sens. strict. und Bithynis. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und z.Z. im Strassburger Museum aufbewahrten Formen. II. Theil. Zool. Jb. Syst., vol. 5, pp. 693—750, pl. 47.

—, 1893. Decapoden und Schizopoden der Plankton-Expedition. Ergebn. Plankton-Exped., vol. 2Gb, pp. 1—210, pls. 1—10.

—, 1897. Os Camarões da Agua doce da America do Sul. Rev. Mus. Paul., vol. 2, pp. 173—216, pl. 1. (In this and the following paper the author signs with the initials A.E. instead of just A. as in his previous papers).

—, 1902. The geographical Distribution of Freshwater Decapods and its bearing upon ancient Geography. Proc. Amer. philos. Soc., vol. 41, pp. 267—400, figs. 1—8.

Pfeffer, G., 1881. Die Panzerkrebse des Hamburger Museums. Verh. naturw. Ver. Hamburg, vol. 5, pp. 22—55.

—, 1887. Die Krebse von Süd-Georgien nach der Ausbeute der Deutschen Station 1882—83. 1. Teil. Jb. Hamb. wiss. Anst., vol. 4, pp. 41—150, pls. 1—7.

—, 1892. Die niedere Thierwelt des antarktischen Ufergebietes. In: Neumayer, G., Die deutschen Expeditionen und ihre Ergebnisse Herausgegeben im Auftrage der deutschen Polar-Commission, vol. 2, pp. 455—574.

Philippi, R. A., 1860. Reise durch die Wueste Atacama auf Befehl der Chilenischen Regierung im Sommer 1853—54 Unternommen, pp. i—ix, 1—192, 1—62, pls. 1—27.

—, 1860a. Bithynis, ein neues Genus der langschwänzigen Krebse. Arch. Naturgesch., vol. 26 pt. 1, pp. 161—164.

*—, 1882. Zoolojía chilena. Sobre los Astacus. An. Univ. Chil., vol. 61, pp. 624—628, 1 pl.

—, 1894. Carcinologische Mittheilungen. Zool. Anz., vol. 17, pp. 264—266.

—, 1894a. Dos Palabras sobre la sinonimia de los Crustáceos, Decápodos, Braquiuros o Jaivas de Chile. An. Univ. Chile, vol. 87, pp. 369—379.

Poeppig, E., 1835. Reise in Chile, Peru und auf dem Amazonenstrome während der Jahre 1827—1832, vol. 1, pp. i—xviii, 1—466. (Vol. 2, pp. i—viii, 1—464, 1 map, has been published in 1836).

—, 1836. Crustacea chilensia nova aut minus nota. Arch. Naturgesch., vol. 2 pt. 1, pp. 133—144, pl. 4.

Porter, C. E., 1898. Contribucion a la Fauna de la Provincia de Valparaiso. Excursion a Quinbero en el Mes de Febrero de 1898. Rev. Chil. Hist. nat., vol. 2, pp. 31—33.

—, 1899. Catálogo metódico provisional de las colecciones zoolójicas. Museo de Historia Natural de Valparaiso. — I. Artrópodos i Vermes chilenos, pp. 1—16.

Porter, C. E., 1903. Breve Nota acerca de los Crustaceos colectados en Coquimbo por el Dr. F. T. Delfin i Descripcion de una nueva Especie. Carcinolojía Chilena. Rev. Chil. Hist. nat., vol. 7, pp. 147—153, fig. 2.

—, 1904. Algunos datos sobre dos Parastácidos. Materiales para la Fauna carcinolojica de Chile. III. — Rev. Chil. Hist. nat., vol. 8, pp. 254—261, textfigs. 24, 25, pl. 9.

—, 1905. Sobre algunos Crustáceos de Juan Fernandez. Materiales para la Fauna carcinolójica de Chile. IV. — Rev. Chil. Hist. nat., vol. 9, pp. 27—35, textfig. 1, pls. 2—4.

*—, 1906. Sobre los Crustáceos colectados en los Vilos por don J. N. Thomas. Rev. Chil. Hist. nat., vol. 10, pp. 128—138, figs. 1, 2, pls. 1, 2.

—, 1917. Los Crustáceos de la Espedicion a Taitao. Bol. Mus. Nac. Chile, vol. 10, pp. 94—101. figs. 60, 61.

—, 1922. Los Estudios sobre Carcinologia Chilena (Apuntes históricos y bibliográficos). Rev. Chil. Hist. nat., vol. 25, pp. 595—608, textfigs. 54—56, pl. 65, 1 unnumbered pl., 1 unnumbered textfig.

*—, 1936. Enumeración metódica de los Crustáceos Podoftalmos de la Bahía de Talcahuano. Carcinologia Chilena. Comun. Mus. Concepcion, vol. 1, pp. 150—154.

—, 1937. Sobre algunos Decapodos raros o poco conocidos. Carcinologia Chilena XXVI. Rev. Chil. Hist. nat., vol. 40, pp. 252—259, textfigs. 29, 30, pls. 17, 18.

—, 1937a. Enumeracion metodica de los Crustaceos Podoftalmos de la Bahía de Talcahuano. Carcinologia chilena XXVII. Rev. Chil. Hist. nat., vol. 40, p. 336—339.

—, 1940. Algunos Crustaceos de la costa de Antofagasta. Rev. Chil. Hist. nat., vol. 44, pp. 145—147.

*—, 1940a. Algunos Crustáceos de la costa de Antofagasta. Rev. Univ. Santiago, vol. 25 n. 3, pp. 311—313.

—, 1941. Algunos Crustaceos de la Costa de Antofagasta. Bol. Mus. Hist. nat. Lima. vol. 5, pp. 458—460.

Quijada, B., 1910. Teratolojía animal. Catálogo ilustrado i descriptivo de las anomalías organicas conservadas en el Museo Nacional. Bol. Mus. Nac. Chile, vol. 2, pp. 103—148, pls. 1—10.

Rathbun, M. J., 1902. Brachyura and Macrura. Papers from the Hopkins Stanford Galapagos Expedition, 1898—1899. VIII. Proc. Wash. Acad. Sci., vol. 4, pp. 275—291, textfigs. 1—4, pl. 12.

—, 1902a. Descriptions of new Decapod Crustaceans from the West Coast of North America. Proc. U.S. Nat. Mus. vol. 24, pp. 885—905.

—, 1904. Decapod Crustaceans of the Northwest Coast of North America. Harriman Alaska Exped., vol. 10, pp. 1—190, textfigs. 1—95, pls. 1—10.

—, 1907. South American Crustacea. Rev. Chil. Hist. nat., vol. 11, pp. 45—50, textfig. 1, pls. 2, 3.

—, 1910. The stalk-eyed Crustacea of Peru and the adjacent coast. Proc. U.S. Nat. Mus., vol. 38, pp. 531—620, textfigs. 1—3, pls. 36—56.

Ringuelet, R., 1949. La Morfología y el Mecanismo de Sujeción de las Crías de Parastacus Agassizi Faxon. Notas Mus. La Plata, vol. 14 Zool. n. 117, pp. 55—59, textfig. 1, pls. 1—4.

Runnström, S., 1925. Beitrag zur Kenntnis einiger hermaphroditischen Dekapoden Crustaceen. Bergens Mus. Skr., n. ser. vol. 3 pt. 2, pp. 1—115, textfigs. 1—13, pls. 1—5.

Schmitt, W. L., 1924. The Macrura and Anomura collected by the Williams Galapagos Expedition, 1923. Zoologica, New York, vol. 5, pp. 161—171, figs. 39—41.

—, 1926. Report on the Crustacea Macrura (Families Penaeidae, Campylonotidae and Pandalidae) obtained by the F.I.S. »Endeavour» in Australian Seas. With notes on the species of »Penaeus» described by Haswell and contained, in part, in the collections of the Maclay Museum, at the University of Sydney. Biol. Res. Endeavour, vol. 5, pp. 311—381, pls. 57—68.

—, 1932. A new species of Pasiphaea from the Straits of Magellan. Journ. Wash. Acad. Sci., vol. 22, pp. 333—335, fig. 1.

Semper, C., 1868. Some remarks on the New Genus Macrobrachium of Mr. Spence Bate. Proc. zool. Soc. Lond., 1868, pp. 585—587.

Sharp, B., 1893. Catalogue of the Crustaceans in the Museum of the Academy of Natural Sciences of Philadelphia. Proc. Acad. nat. Sci. Phila., 1893. pp. 104—127.

Sivertsen, E., 1934. Littoral Crustacea Decapoda from the Galapagos Islands. The Norwegian Zoological Expedition to the Galapagos Islands 1925, conducted by Alf Wollebaek. VII. Nyt Mag. Naturvidensk., vol. 74, pp. 1—23, textfig. 1, pls. 1—4.

Sollaud, E., 1910. Sur l'identité des genres Anchistiella A. Milne-Edwards et Campylonotus Bate. Bull. Mus. Hist. nat. Paris, vol. 16, pp. 377—383, figs. 1—3.

—, 1913. Nouvelles observations sur les Crevettes du genre Campylonotus Bate (=Anchistiella A.M.-E.), type d'une nouvelle famille de Caridea: les Campylonotidae. Bull. Mus. Hist. nat. Paris, vol. 19, pp. 184—190, figs. 1, 2.

Stebbing, T. R. R., 1893. A History of Crustacea. Recent Malacostraca, pp. i—xvii, 1—466, textfigs. 1—32, pls. 1—19.

—, 1914. Crustacea from the Falkland Islands collected by Mr. Rupert Vallentin, F.L.S. Part II. Proc. zool. Soc. Lond., 1914, pp. 341—378, pls. 1—9.

—, 1914a. Stalk-eyed Crustacea Malacostraca of the Scottish National Antarctic Expedition. Trans. Roy. Soc. Edinb., vol. 50 pt. 2, pp. 253—307, pls. 23—32.

Steenstrup, J. & Lütken, C., 1862. Mindre Meddelelser fra Kjøbenhavns Universitetets zoologiske Museum. Vidensk. Medd. naturh. Foren. Kbh., 1861, pp. 267—283, pl. 7 fig. 2.

Straelen, V. van, 1942. A propos de la distribution des écrevisses, des homards et des crabes d'eau douce. Bull. Mus. Hist. nat. Belg., vol. 18 n. 56, pp. 1—11.

Sund, O., 1920. The »Challenger» Eryonidea (Crustacea). Ann. Mag. nat. Hist., ser. 9 vol. 6, pp. 220—226.

Thompson, d'A. W., 1899. On a supposed Resemblance between the Marine Faunas of the Arctic and Antarctic Regions. Proc. Roy. Soc. Edinb., vol. 22, pp. 311—349.

—, 1901. A Catalogue of Crustacea and of Pycnogonida contained in the Museum of University College, Dundee, pp. 1—56.

Turton, W., 1800. A General System of Nature, through the three Grand Kingdoms, of Animals, Vegetables, and Minerals: systematically divided into their several Classes, Orders, Genera, Species, and Varieties, with their Habitations, Manners, Economy, Structure and Peculiarities. Translated from Gmelin's last Edition of the celebrated Systema Naturae, By Sir Charles Linne: amended and enlarged by the Improvements and Discoveries of later Naturalists and Societies, With appropriate Copper-plates, vol. 3, pp. 1—784.

Valdés Ragués, P., 1909. Clasificación »Gundlach» de Crustáceos cubanos. In: Valdés Ragués, P., Mis Trabajos Académicos, pp. 163—187.

Weitenweber, W. R., 1854. Aus James Dana's Conspectus of the Crustacea. Lotos, Praha, vol. 4, pp. 5—14, 35—38, 60—63, 107—115, 153—157, 251—254.

White, A., 1847. List of the specimens of Crustacea in the collection of the British Museum, pp. i—viii, 1—143.

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Tryckt den 10 oktober 1952.

LUNDS UNIVERSITETS ÅRSSKRIFT. N. F.

AGRELL, I., The collemboles in nests of warmblooded animals with a method for sociological analysis 1945. Kr. 1: 75.
ALSTERBERG, G., Die respiratorischen Mechanismen der Tubificiden. 1922. Kr. 20: —.
— Die Sinnesphysiologie der Tubificiden. 1924. Kr. 6: —.
ANDER, K., Die Insektenfauna des baltischen Bernsteins. 1942. Kr. 5: 25.
— Revision der Orthopterensammlungen Zetterstedts. 1943. Kr. 1: 75.
ARDÖ, P., Some notes on phyllopods in temporary pools on the Alvar of Öland in South Sweden 1948. Kr. 2: 25.
AXELSSON, J., Inheritance of rate of feathering in chickens of White Leghorns, Rhode Island Reds and Barnevelders. 1931. Kr. 1: 50.
— Undersökningar rörande hönsäggens kläckningskvalitet. 1930. Kr. 2: 25.
— Variation and heredity of some characters in White Leghorns, Rhode Island Reds and Barnevelders. P. 1—2. 1932. Kr. 14: —; 7: 50.
BACKLUND, H. O., Swedish enchytraeida. 1. 1946. Kr. 2: 50; 2. 1947. Kr. 3: —.
BENGTSSON, S., Beiträge zur Kenntnis der paläarktischen Ephemeriden. 1909. Kr. 2: —.
— Braconologische Beiträge. 1918. Kr. 6: —.
— Kritische Bemerkungen über einige nordische Ephemeropteren, nebst Beschreibung neuer Larven. 1930. Kr. 2: 50.
— Plecopterologische Studien. 1933. Kr. 5: —.
BRINCK, P., Nomenklatorische und systematische Studien über Dytisciden. III. 1945. Kr. 2: —.
— & WINGSTRAND, G., The mountain fauna of the Virihaure area i Swedish Lapland. I—II. 1949—51. Kr. 4: 50; 11: —.
BROMAN, I., A mammal (Procavia) with intraabdominal yolk-sac. 1929. Kr. 0: 75.
— Om Jacobsonska organets konstruktion och funktion. 1918. Kr. 8: —.
— Über die Entstehung des Septum pericardiaco-peritoneale, des Ligamentum falciforme hepatis und der Lebersegmentierung bei den Gymnophionen. 1913. Kr. 4: —.
BRUNDIN, L., Zur Kenntnis einiger in die Atheta-Untergattung Metaxya M. & R. gestellten Arten (Col. Staphylinidae). 1943. Kr. 3: 50.
CARLGREN, O., A contribution to the knowledge of the structure and distribution of the cnidae in the Anthozoa. 1940. Kr. 4: —.
— Die Mesenterienanordnung der Halcuriiden. 1918. Kr. 6: 50.
— Further contributions to the knowledge of the cnidom in the Anthozoa especially in the Actiniaria 1945. Kr. 2: 25.
— Zur Kenntnis der Lucernariiden Lipkea, Capria und Brochiella. 1933. Kr. 2: —.
DAHM, A. G., Phagocata (= Fonticola) from South Sweden (Turbellaria Tricladida Paludicola). Taxonomical-ecological and chorological studies. 1949. Kr. 2: 75.
DAHR, E., Die Atembewegungen der Landpulmonaten. 1925. Kr. 2: 50.
— Studien über die Respiration der Landpulmonaten. 1927. Kr. 10: 50.
— Studien über Hunde aus primitiven Steinzeitkulturen in Nordeuropa. 1937. Kr. 4: 50.
— Untersuchung über Temperaturstörungen bei Gaswechselbestimmungen mit Kroghs Mikrorespiro, meter 1931. Kr. 3: —.
FREIDENFELT, T., Morphologisch-systematische Bemerkungen über Ergasilus Sieboldii Nordm. nebst vorläufigen Mitteilungen über die Lebensgeschichte des Tieres. 1910. Kr. 1: —.
GISLÉN, T., A reconstruction problem. Analysis of fossil Comatulids from N. America. 1934. Kr. 5: 50.
— A revision of the recent Bathycrinidae with a study of their phylogeny and geographical distribution. 1938 Kr. 2: —.
— Contributions to the ecology of Limnadia. 1937. Kr. 1: 25.
— Investigations on the ecology of Echiurus. 1940. Kr. 3: 50.
— On the young of a stalked deep-sea crinoid and the affinities of the Hyocrinidae. 1939. Kr. 1: 25.
— Physiographical and ecological investigations concerning the littoral of the Northern Pacific. Sect. I—II/IV. 1943—44. Kr. 4: 75; 5: 75.
— The number of animal species in Sweden. 1940. Kr. 1: 75.
— & BRINCK, P., Subterrana vatten på Gotland med speciell hänsyn till Lummelundaströmmen. 1—2 (på eng.). 1948—50. Kr. 3: —; 5: 25.
GRANVIK, H., On mammals from the eastern slopes of Mount Elgon, Kenya Colony. 1924. Kr. 3: 50.
HANSSON, Å., Ist die Verwendung von Aluminium in der Bienenzucht den Bienen gefährlich? 1939. Kr. 1: 25.
HANSTRÖM, B. A comparative study of the pituitary in monkeys, apes, and man. 1948. Kr. 3: —.
— Beitrag zur Diskussion des Kopflappens der Polychäten. 1930. Kr. 2: 25.
— Bemerkungen über das Gehirn und die Sinnesorgane der Onychophoren. 1935. Kr. 2: 50.
— Bemerkungen über das Komplexauge der Scutigeriden. 1934. Kr. 1: 50.
— Das Nervensystem und die Sinnesorgane von Limulus polyphemus. 1926. Kr. 7: 50.
— Der Lobus dorsomedialis von Lygaeus equestris. 1943. Kr. 1: —.
— Die chromatophoraktivierende Substanz des Insektenkopfes. 1940. Kr. 1: 50.
— Einige Parallelen im Bau und in der Herkunft der inkretorischen Organe der Arthropoden und der Vertebraten. 1941. Kr. 1: 75.
— The brain, the sense organs, and the incretory organs of the head in the Crustacea Malacostraca. 1947. Kr. 3: 50.
— The hypophysis in a tiger (Felis tigris) and an Indian elephant (Elephas maximus). 1946. Kr. 2: 25.
— The pituitary in some South-American and Oriental mammals. 1950. Kr. 1: —.
— The pituitary of the marmosets, an interesting family of the primates. 1952. Kr. 1: 25.
— Über das Vorkommen eines Nackenschildes und eines vierzelligen Sinnesorganes bei den Trilobiten. 1934. Kr. 1: 50.