(*a*)

(*b*)

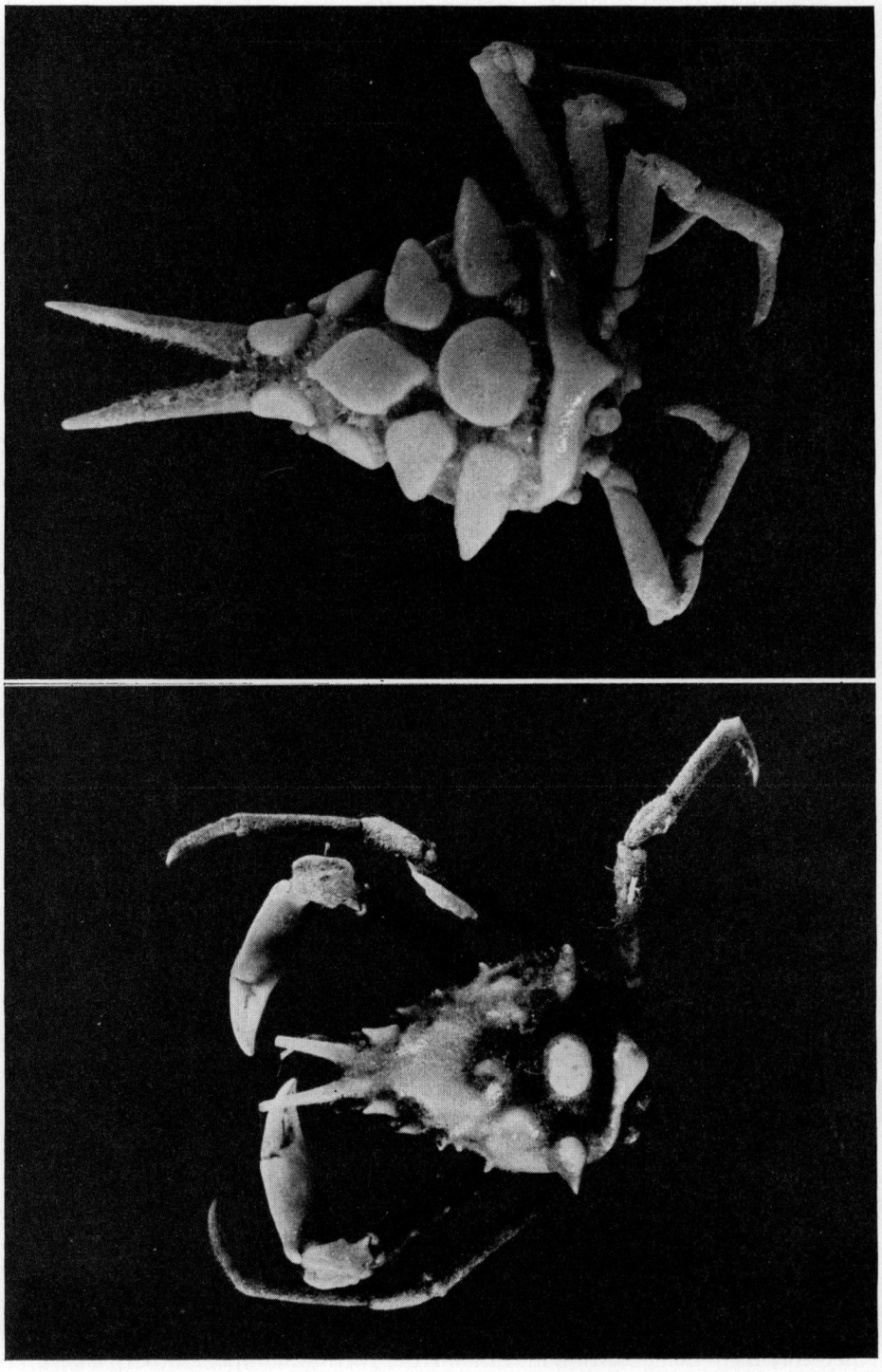

FIG. 11. (*a*) *Sphenocarcinus luzonicus* Rathbun, holotype, male, 30·2 mm, dorsal view. (*b*) *Sphenocarcinus sphenocarcinoides* (Rathbun), holotype, male, ca. 20·4 mm, dorsal view.

Sphenocarcinus stimpsoni (Miers)

Oxypleurodon stimpsoni Miers, 1886 : 38–39, pl. 6, figs. 1, 1 (*a*), 1 (*b*).
Sphenocarcinus stimpsoni.—Sakai, 1938 : 286–287, pl. 29, fig. 3.

Material examined: 9 ♂♂, 4 ♀♀ (3 ovig.), 8–23 mm, smaller ovig. ♀, 16·5 mm (USNM 49513, 49515–16, 49521-23, 49636).

Localities: N. Mindanao: N. Mindanao and vicinity, St. 5516, 1 specimen; St. 5519, 1 specimen. Negros: between Negros and Siquijor, St. 5536, 1 specimen. Cebu-Bohol: between Cebu and Leyte, St. 5409, 6 specimens. Leyte: Dupon Bay, vicinity of Leyte, St. 5404, 1 specimen; between Leyte and Cebu, St. 5403, 1 specimen. Molucca Sea: Dodinga Bay, Gillolo I., St. 5617, 2 specimens.

Habitat: 131–229 fms, globigerina ooze, sand and mud.

Remarks: *S. stimpsoni* belongs to that group of species of *Sphenocarcinus* with a few large, flattened, irregularly-shaped plates on the carapace. These are *S. luzonicus*, *S. cuneus* and *S. aurorae*. *S. stimpsoni* is distinguished from *S. luzonicus*, the other species of the four having the rostral spines distinct, by the fewer number of plates on the carapace.

The most noticeable variation in the present series concerns the rostral spines. Typically, there are outwardly curved but in two specimens they are parallel or weakly convergent apically. There is also variation in the extent to which the postorbital plate is confluent with the hepatic plate and in the shape of the hepatic plate.

This species was originally taken in the Philippine Islands by the *Challenger* Expedition (Miers, 1886).

Distribution: Central Philippine Islands, Leyte to Moluccas; Kii I., Japan.

Sphenocarcinus velutinus (Miers), comb. nov.

Pugettia velutina Miers, 1886 : 41–42, pl. 6, figs. 2, 2 (*a*), 2 (*b*); Alcock, 1895 : 206 (note only).
Pugettia veltima (sic.).—Yokoya, 1933 : 153.
Pugettia veltina (sic.).—Sakai, 1938 : 278.

Material examined: 2 ♀♀, 9·5, 12 mm (USNM 49524).

Localities: Cebu-Bohol: Between Cebu and Bohol, St. 5415, 2 specimens.

Habitat: 88 fms, fine sand.

Remarks: Alcock (1895) suggested that the correct position of this species was in the genus *Scyramathia* (now *Rochinia*). *S. velutinus* possesses flattened plates laterally and tuberosities dorsally. *S. carbunculus* Rathbun from Hawaii and *S. nodosus* Rathbun from the Philippine Islands are similar in this regard as well as having relatively short, separate rostral spines. There are general similarities as to orbital details. *S. velutinus* differs from *S. nodosus* and *S. carbunculus* in having a subtriangular, flattened, epibranchial plate.

There are no major differences between the present specimen and the original illustration and description provided by Miers.

This species has not been recorded previously from the Philippine Islands.

Distribution: Philippine Islands; Kii Islands; Japan.

Tiarinia angusta Dana

Tiarinia angusta Dana, 1852 : 113; 1855 : pl. 3, figs. 7 (*a*), (*b*); Sakai, 1938 : 322.
Tiarinia spinosirostris Haswell, 1880 : 448.

Material examined: 2 ♂♂, 9 ♀♀, 3 ovig., 9–39·5 mm, smallest ovig. ♀, 38·5 mm (USNM 47373–74, 49560, 49695).

Localities: Sulu Archipelago: Tawi Tawi Group, St. 5159, 3 specimens; St. 5160, 1 specimen; Marongas I., Shore Stn, 10.ii.1908, 6 specimens. Celebes Sea: Great Tubea I., Buton Strait, 14.xii.1909, 1 specimen.

Habitat: Intertidal to 12 fms, among coral heads in tide pools.

Remarks: This species is easily distinguished from its congeners by the presence of accessory lateral spines on the rostrum.

This species was first taken in the Philippine Islands (' Sooloo ' Sea) by the U.S. Exploring Expedition (Dana, 1852).

Distribution: Philippine Islands: Gulf of Davao to Sulu Archipelago; Japan, Indonesia, northern Australia.

Tiarinia cornigera (Latreille)

Pisa cornigera Latreille, 1825 : 141.
Pericera cornigera.—Adams & White, 1848 : 18.
Tiarinia cornigera.—Alcock, 1895 : 256–257; Sakai, 1965 a : 91, pl. 42, fig. 2.

Material examined: 3 ♂♂, 6 ♀♀ (4 ovig.), 11·5–19·5 mm, smallest ovig. ♀, 11·5 mm (USNM 47361–62, 47364–66, 49564, 49863).

Localities: S.W. Mindoro: Tara I., 15.xii.1908, 1 specimen. S.E. Luzon: Batan I, 5.vi.1909, 2 specimens. Cebu-Bohol: E. side of Tagbilaran Strait, 9.iv.1908, 1 specimen. Leyte: Mahinog River, Camiguin I., 3.~~vii~~.1909, 1 specimen. Basilan: Pilas I., 12.~~viii~~.1909, 1 specimen. Sulu Archipelago: Tawi Tawi Group, 20.ii.1908, 2 specimens; St. 5165, 1 specimen.

Remarks: Alcock (1895) tentativley included *Pericera setigera* and *P. tiarata*, both described by Adams & White (1848), as synonyms of *Tiarinia cornigera*. *Tiarinia tiarata* is generally regarded as a valid species.

Habitat: Intertidal to 9 fms, among coral in tide pools.

Distribution: Central and southern Philippine Islands from Mindoro to the Sulu Archipelago; Indo-West Pacific from east Africa to Japan and Australia.

Tiarinia gracilis Dana

Tiarinia gracilis Dana, 1852 : 111–112; 1855 : pl. 3, figs. 6 (*a*)–(*d*); Buitendijk, 1939 : 259–264, text fig. 26, pl. 11, fig. 2.

Material examined: 2 ♂♂, 1 ovig. ♀, 12–27 mm, ovig. ♀, 21·5 mm (USNM 47245, 47349, 47351).

Localities: Palawan: Verde del Sur I., 6.iv.1909, 1 specimen. Negros: Guijulugan, 2.iv.1908, 1 specimen. W. Mindanao: Pilas I., S. of Zamboanga, 12.~~viii~~.1909, 1 specimen.

Habitat: Shore, tide pool.

Remarks: The three specimens have the short rostral spines, flattened carapace tubercles and three large posterior longitudinal tubercles characteristic of the species.

This species was originally taken in the Philippine Islands (' Sooloo Sea ') by the U.S. Exploring Expedition (Dana, 1852).

Distribution: Central and southern Philippine Islands; Nicobar I., Singapore, Indonesia, eastern Australia.

Discussion

The collections made by the *Albatross* have brought to 71 the total number of majid spider crabs known from the Philippine Islands (see table 2). Most of the species (51) are known from the central and southern islands of the archipelago. Twenty-one species contained in the present collections are known only from off the southern islands of the Archipelago. Despite the rather intensive collecting by the *Albatross* only 21 species of the 61 in the collection from the Philippine Islands are known from more than four localities.

The majority of species are known from the continental shelf. Of the 45 species occurring subtidally to the upper part of the continental slope (over 100 fms), 14 occur in depths of less than 20 fms and 14 are known only between 20 fms and 100 fms; nine species are found across most of the shelf and three species extend from the shelf to upper slope depths. Typical species of this group are those of the genera *Achaeus*, *Naxioides*, *Chlorinoides*, *Hyastenus*, *Phalangipus* and *Pugettia*. Eighteen species are confined to deep water. These include typical deep water forms such as species of *Cyrtomaia*, *Platymaia*, *Pleistacantha*, *Rochinia* and *Sphenocarcinus*.

A total of 12 species occur in intertidal or shallow subtidal waters; five of these extend into depths up to 20 fms and one occurs in deeper water. Again, these are typical intertidal forms such as *Camposcia retusa*, *Huenia proteus*, *Menaethius monoceros*, species of *Micippa* and *Tiarinia*.

The spider crab fauna of the Philippine Islands is clearly an outlier of the Indo-west Pacific. The largest genera, *Hyastenus*, *Achaeus*, *Sphenocarcinus*, *Tiarinia*, *Maja* and *Phalangipus* are typical Indo-west Pacific genera; only *Maja* and *Sphenocarcinus* are known outside the Indo-west Pacific. A total of 26 genera are represented; 15 of these are represented by two or more species and contain 60 species among them. In general, these 15 genera are represented in about the same proportion as in the Indo-west Pacific as a whole.

A quite high proportion, however, almost 30% (19–20 species) are not known outside the Philippine Islands. Most of these restricted species are contained in the largest genera—five in the genus *Hyastenus* and three each in the genera *Sphenocarcinus* and *Maja*. Not a single genus is confined to the Philippines.

Twenty-five species (more than 35%) are widespread Indo-west Pacific forms; most of these are shallow water species. A similar number are west Pacific species; most of these, especially species of *Platymaia*, are deep water forms shared with Japan or to a lesser extent with Australia. However, apparent isolation of the Philippines is shown by the fact that 29 species found in tropical and sub tropical Australia as well as Japan are not found in the Philippines. Notable absences are some species of *Achaeus*, *Eurynome*, *Micippa*, *Perinia tumida* and *Xenocarcinus* species.

The Philippine Islands are generally considered faunistically as part of Indonesia (Ekman, 1953). Whilst this is probably true more information is needed on the fauna of other parts of Indonesia and of the Philippine Islands before any clear picture will emerge.

Table 2

List of majid spider crabs from the Philippine Islands showing bathymetric and geographic distribution

Species Name	Philippine Dist.‡			Depth (fms)				Japan	Australia	Indian O.	Pacific O.	Indonesia
	N	C	S	⩽5	6–20	21–100	>100					
*Achaeus akanensis[1]	+					+		+				
*A. brevirostris[1]			+			+						+
A. lorina[1]		+	+			+						
*A. paradicei[1]			+			+			+			
A. villosus[1]			+	+								
Aepinus indicus[5]			+			+			+	+		
†Antilibinia gilloloensis[1]							+					+
Camposcia retusa[2]		?	+	+	+			+	+	+		
*Chlorinoides aculeatus[1]			+			+		+	+	+		
*C. longispinus[1]	+		+		+	+		+	+	+		
Cyrtomaia echinata[1]	+	+	+				+					
C. horrida[1]		+	+				+	+				
*C. owstoni[1]		+					+	+				
Doclea calcitrapa[1]		+				+				+		+
*Gryphachaeus hyalinus[1]		+				+				+		
Huenia brevifrons[4]			+	+								
Huenia proteus[1]			+		+			+	+	+	+	+
Hyastenus auctus[1]			+		+	+						+
H. biformis[1]			+		+							
H. borradailei[4]			+	+	+				+	+		
*H. convexus[1]			+			+			+	+		+
H. fraterculus[1]			+		+							
*H. hilgendorfi[1]	+	+	+		+	+			+	+	+	+
H. orbis[1]			+		+							
H. planasius[1]			+		+	+			+	+		+
H. scrobiculatus[1]			+		+							
H. sebae[1]	+	+	+	+	+	+			+	+		+
*H. spinosus[1]	+	+	+		+	+			+	+	+	
H. tinaktensis[1]			+		+							
H. trispinosus[1]			+		+							+
*H. verrucosipes[1]			+		+				+			+
*H. whitei[1]	+	+	+	+	+				+	+		
†Leptomithrax sinensis[1]						+						+
Maja bisarmata[1]	+	+					+					
*M. gibba[1]		+					+			+		
M. linapacanensis[1]		+				+						
M. suluensis[1]			+		+	+						
Menaethius monoceros[1]			+	+				+	+	+	+	+
Micippa cristata[1]	+	+		+				+				+
M. philyra[1]			+		+			+	+	+		+
Naxioides hirta[3]			+		+					+		
N. rombloni[1]	+					+						
*N. spinigera[1]	+	+	+		+	+				+		
Oncinopus neptunus[2]		+			+				+	+		+
Phalangipus filiformis[1]	+	+	+		+	+			+	+		+
*P. hystrix[1]	+	+				+		+	+	+		
P. longipes[1]			+			+			+	+		+
P. retusus[1]	+	+	+	+						+		+

Table 2.—(*continued*)

Species Name	Philippine Dist.‡			Depth (fms)				Japan	Australia	Indian O.	Pacific O.	Indonesia
	N	C	S	⩽5	6–20	21–100	>100					
Pisa sinope[2]		?	?									
Platymaia bartschi[1]	+	+	+				+	+				+
P. fimbriata[1]	+	+	+				+	+				+
*P. wyvillethomsoni[1]	+	+	+			+	+	+	+			+
Pleistacantha moselyi[1]	+	+	+			+	+	+		+		
*P. oryx[1]	+	+					+	+		+		+
*P. sanctijohannis[1]	+					+	+	+				
Prosphorachaeus suluensis[1]			+		+			+				
Pugettia leytensis[1]		+					+					
P. mindanaoensis[1]		+	+				+					
Rochinia pulchra[1]		+					+	+		+		
*R. riversandersoni[1]		+					+			+		
Sargassocarcinus sublimis[1]			+			+						
Schizophrys aspera[2]		+	+	+	+			+	+	+	+	+
Sphenocarcinus auritus[1]		+					+					
S. luzonicus[1]		+					+					
S. nodosus[1]		+					+	+				
S. sphenocarcinoides[1]		+					+					
S. stimpsoni[1]		+	+				+	+				+
*S. velutinus[1]		+				+		+				+
Tiarinia angusta[1]			+	+	+			+	+			+
T. cornigera[1]		+	+	+	+			+	+	+		+
T. gracilis[1]		+		+					+	+		+
T. tiarata[2]		?	+	+								+
Tylocarcinus styx[4]			+	+				+	+	+	+	

*New record; †recorded by Rathbun (1916) from outside the Philippines; [1]this report; [2]Adams and White (1848); [3]Miers (1886); [4]Ward (1941); [5]Griffin (1972).

‡N is the area north of Mindoro (approx. 13°30′N); S is the area south of Negros-N. Mindanao (approx. 9°N); C is the central area between 9° and 13°30′N including the island of Palawan to the west.

Summary

The Philippine cruise of the U.S. Fisheries Steamer *Albatross* 1907–10 collected 61 species of spider crabs from the Philippine Islands bringing the total number of species known from the area to 71; 28 new species were described by Rathbun and the present report records 19 species not previously known from the area; included are nine widespread Indo-west Pacific forms, four previously known from Japan and four Indian Ocean species.

Hyastenus sebae White is renamed *H. whitei* and the former name is applied to *H. oryx* A. Milne Edwards. *Hyastenus tuberculosus* Rathbun is confirmed as a synonym of *H. convexus* Miers, *Platymaia remifera* Rathbun is reduced to synonomy with *P. wyvillethomsoni* Miers and *Chorilia sphenocarcinoides* Rathbun is transferred to the genus *Sphenocarcinus*.

The majority of species (51) occur around the central and southern islands of the archipelago and most of these (35 species) occur at varying depths on the continental shelf. Twelve species occur intertidally and 21 species are known from depths over 100 fms, some occurring as deep as 800 fms.

The spider crab fauna is clearly part of the Indo-west Pacific, 25 species being widespread ones; 26 species are shared with Japan, 24 with Australia

and 31 with the Indian Ocean. However, 20 species appear to be confined to the Philippine Islands. The relationships of the Philippine fauna with that of the rest of Indonesia is not yet clear

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