

CUMACEA OF THAILAND: AN ANNOTATED LIST**Les Watling¹ and Saowapa Angsupanich²**¹*Darling Marine Center, University of Maine, Walpole, ME 04573, U.S.A.*²*Department of Aquatic Science, Faculty of Natural Resources, Prince of Songkla University, Hat Yai, 90110, Songkhla, Thailand***ABSTRACT**

The first cumaceans recorded from South-East Asia were described by Sars in 1886 from material collected during the *Challenger* Expedition. During the following century eight other authors would describe a total of 79 additional species, the most recent being described by Watling and Angsupanich from the Andaman Sea BIOSHELF project. So far, 29 species are known from Thailand waters, but many more remain undescribed. A brief history of cumacean taxonomy in the region stretching from India to Indonesia and the Philippines is given and the more common species are illustrated.

INTRODUCTION

The Order Cumacea is one of the least studied crustacean groups living in Thailand waters, having been documented by only two authors (Calman 1907, 1911; Watling and Angsupanich, 2002). Calman's material was collected by the Danish scientist-explorer Dr. Theodor Mortensen in 1900. Mortensen worked along the eastern shores of the Gulf of Thailand, collecting in shallow water and among the many small islands. Watling and Angsupanich studied material collected during the biodiversity survey of the Andaman Sea shelf, primarily with samples collected during cruises of the R.V. *Chakratong Tongyai* from the shelf area off the western side of the Thailand peninsula.

Thailand falls within the Indo-Polynesian biogeographic Province, as delimited by Briggs (1995). This province extends from the islands and atolls of the mid-Pacific tropics in the east to the mouth of the Arabian Gulf in the west, north along the southern China coast and to the Amami Islands of southern Japan, and south along the coast of Queensland, Australia. Of the 116 cumacean species known from this province, only 29 are so far known from Thailand waters,

including both the Andaman Sea shelf as well as the Gulf of Thailand (see Figs. 1 and 2 for the most common species). Thirty-five species have been recorded from the India and Sri Lanka region, and 33 from the South China Sea (Table 1). The entire region is under-studied for cumaceans. Only six species are known from all of Indonesia and the Philippines. We have identified from the Andaman Sea biodiversity collections approximately 15 new species, of which one is currently described (Watling and Angsupanich, 2002).

All known cumacean species from the region, which includes India to Indonesia, are listed in Table 1. There are 33 other species known from the Indo-Polynesian Province, as defined by Briggs (1995), but they are restricted in their distribution, for example, to the Australian side of the Torres Strait. Of the four species reported from New Britain only one has so far been found elsewhere in this province, and of the 30 species known from Queensland, just two have been reported also from north of the Torres Strait. One of the species from Queensland (*Gynodiastylis bicristata*) is now known to have been misidentified (the Australian material represents a new, but related, species) and the other (*Cumella hispida*), could represent an

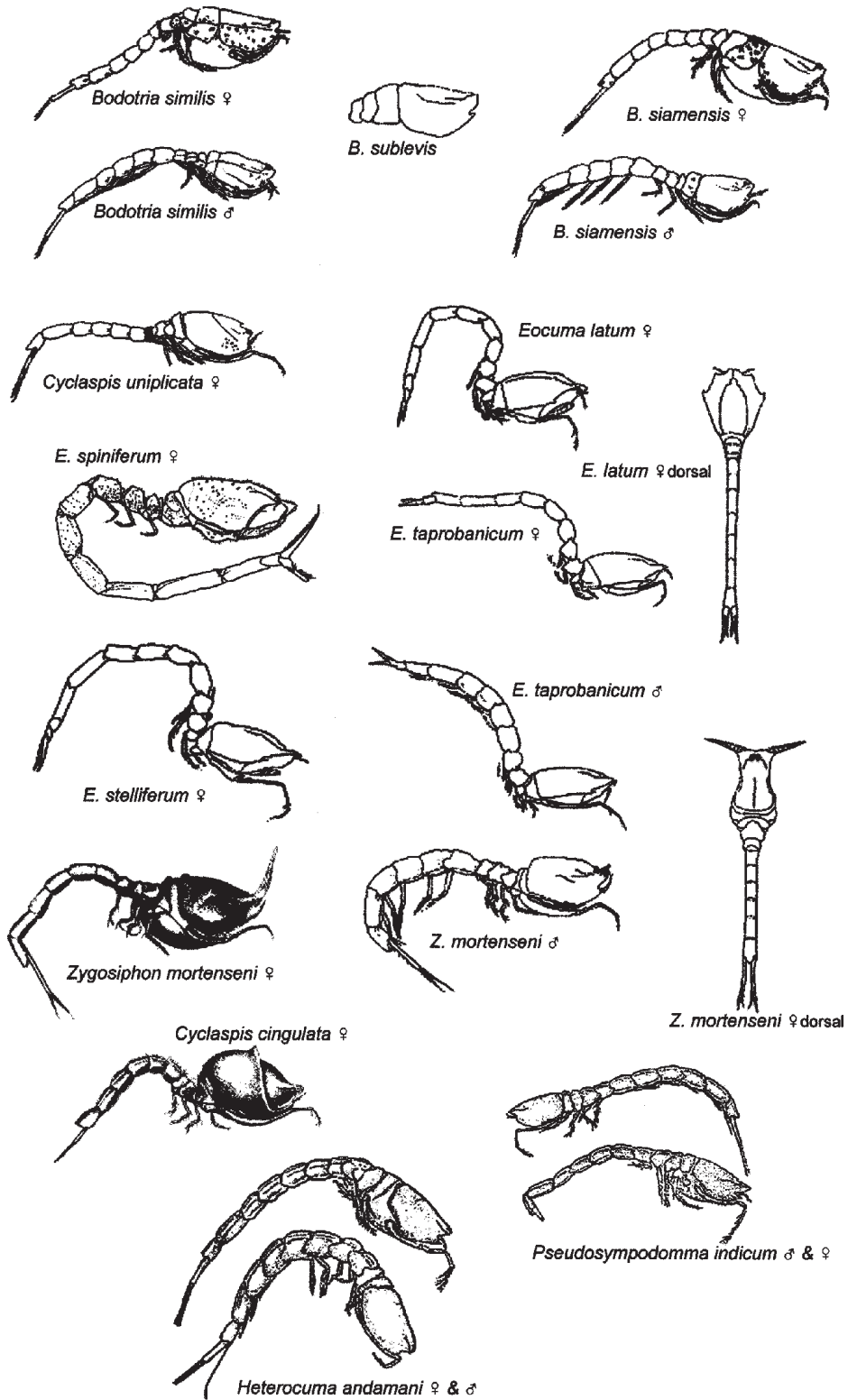


Figure 1 Common Cumacea from the Thailand seas. Family Bodotriidae.

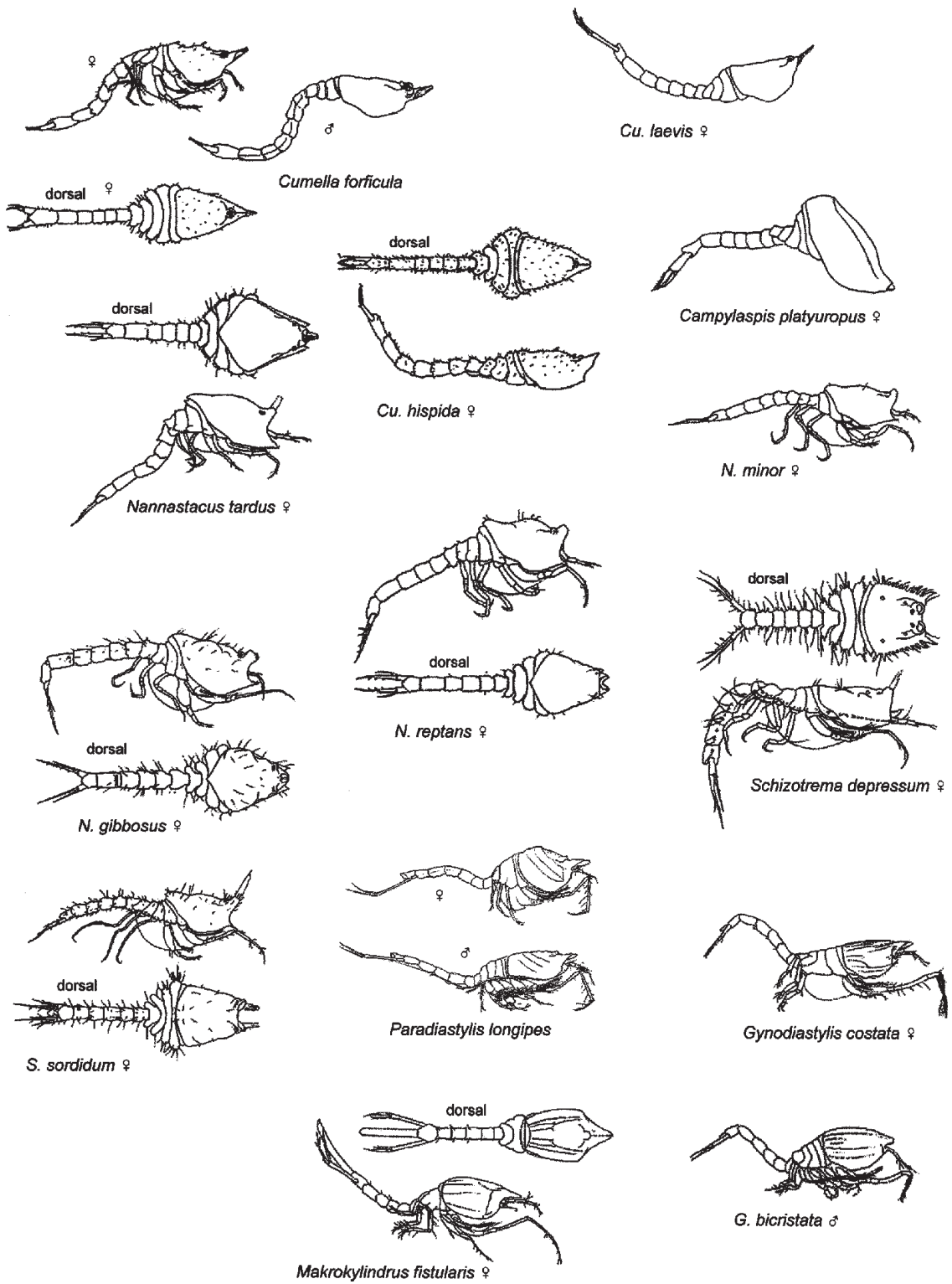


Figure 2 Common Cumacea from the Thailand seas. Families Nannastacidae, Diastylidae, and Gynodiastylidae.

introduction to South Australia. For cumaceans, at least, it does not seem likely that the Indo-Polynesian Province should include any part of the Australian continent, although much more collecting north of the Torres Strait will need to be done to determine more exactly the species distributions.

The first cumacean species were described from the Indo-Polynesian region by Sars (1886). Those specimens were collected as part of the *Challenger* Expedition from Flinders Passage (now the Torres Strait) and southern Philippines. In 1904, Calman described the first cumaceans from the Indian Ocean, comprising a collection made in the Gulf of Manaar along the northwestern Sri Lankan coast. Calman (1905) also described several new species from a small collection of cumaceans obtained by the *Siboga* Expedition in 1899 (for an interesting narrative of the expedition, views of shallow-water habitats, and description of sampling conditions, see Weber, 1902). All species were from the Indonesian Archipelago, and were collected by plankton nets or dredges. A few were from deep-sea locations and are not included in Table 1. At about the same time, Theodor Mortensen, a Danish naturalist and intrepid collector working out of the Zoological Museum in Copenhagen, was collecting specimens along the eastern shores of the Gulf of Thailand (see map and station locations in Appendix 1; details of the expedition are given in Mortensen, 1902). These collections produced many species, all of which were described by Calman in two monographs (1907, 1911). Kemp (1916) described two brackish water species from Chilka Lake, India. Zimmer (1921) described several species from Formosa (now Taiwan) collected by Sauter in 1907. Taiwan is part of the Japan Province of Briggs (1995) on its western side, and represents the northern extent of the Indo-Polynesian Province on its eastern side. At present, the exact location of the Sauter material is unknown so it is not possible to know whether the species are tropical or warm temperate.

The next flurry of taxonomic activity was begun by Fage (1945) who added nine species new to the region from a study of nocturnal plankton samples taken in the Bay of Nahtrang, Vietnam. Plankton samples, taken by the German Professor C. Dawydoff from the Gulf of Thailand, Vietnam, and the Spratley Islands were found to contain six additional new species by Zimmer (1952). As did Fage, several species were thought by Zimmer to be identical to species previously described from the Mediterranean and the Atlantic coast of southern Europe. Given the more detailed analysis of cumacean taxa these days, it is likely that some of those “extra-limital” species represent new species endemic to the Indo-Polynesian Province.

A detailed examination of the Indian fauna was undertaken by Kurian (spelled Kurien in 1951) (1954, 1961, 1963). In all, he described 15 new species and added two new genera. Two of the species were from brackish water lakes and are highly unusual in several morphological features. Radha Devi and Kurian (1981) added one additional species to the Indian fauna.

The latest contribution to our knowledge of the cumacean fauna of this region is by Petrescu, who described from Indonesian waters one species in 1992, six species in 1995, and provided keys and redescription of several species in 1997. Also in 1997, Petrescu described four new species from the South China Sea coast of Malaysia.

The list of species from the Andaman Sea shelf of Thailand was prepared during the PMBC–DANIDA International Workshop on the Biodiversity of Crustacea in the Andaman Sea at Phuket Marine Biological Center 29 Nov – 20 Dec 1998. The workshop was financed by DANIDA Scientific Cooperation Program (J. No 104), as part of a joint program between the Zoological Museum, University of Copenhagen, Denmark and Phuket Marine Biological Center, Department of Fisheries, Thailand. Coordinators and organisers were Drs Niel L. Bruce and M. Berggren, and the on-site organiser was Mr. Somchai Bussarawit.

Table 1 List of species known from Thailand and adjacent waters

	India & Sri Lanka	Andaman Sea	Gulf of Thailand	South China Sea	Indonesia & Philippines
Family Bodotriidae					
Subfamily Bodotriinae					
<i>Bodotria biocellata</i> Radhadevi and Kurian, 1989	x				
<i>Bodotria choprai</i> Kurian, 1951	x				
<i>Bodotria cochinchensis</i> Radhadevi and Kurian, 1989	x				
<i>Bodotria minuta</i> Kurian, 1961	x				
<i>Bodotria parva</i> Calman, 1907			x	x	
<i>Bodotria platybasis</i> Radhadevi and Kurian, 1981	x				
<i>Bodotria prionura</i> Zimmer, 1952				x	
<i>Bodotria similis</i> Calman, 1907	x		x	x	
<i>Bodotria sublevis</i> Calman, 1907	x		x		
<i>Cyclaspis bengalensis</i> Kurian, 1954		x			
<i>Cyclaspis chevevi</i> Fage, 1945				x	
<i>Cyclaspis cingulata</i> Calman, 1907	x		x		
<i>Cyclaspis costata</i> Calman, 1904	x				
<i>Cyclaspis herdmani</i> Calman, 1904	x			x	
<i>Cyclaspis hornelli</i> Calman, 1904	x				
<i>Cyclaspis persculpta</i> Calman, 1905					x
<i>Cyclaspis picta</i> Calman, 1904	x				
<i>Cyclaspis quadruplicata</i> Kurian, 1951	x				
<i>Cyclaspis sibogae</i> Calman, 1905					x
<i>Cyclaspis strigilis</i> Hale, 1944	x				
<i>Cyclaspis uniplicata</i> Calman, 1907	x		x	x	
<i>Eocuma affine</i> Calman, 1904	x	x			
<i>Eocuma kempii</i> Kurian, 1954	x				
<i>Eocuma latum</i> Calman, 1907	x		x	x	
<i>Eocuma stelliferum</i> Calman, 1907					
<i>Eocuma striatum</i> Kurian and Radha Devi, 1983	x				
<i>Eocuma taprobanicum</i> Calman, 1904	x				
<i>Eocuma travancoricum</i> Kurian, 1951	x				

Table 1 Continued.

	India & Sri Lanka	Andaman Sea	Gulf of Thailand	South China Sea	Indonesia & Philippines
<i>Iphinoe calmani</i> Fage, 1945		x	x	x	
<i>Iphinoe insolita</i> Petrescu, 1992					x
<i>Iphinoe ischnura</i> Zimmer, 1952			x?		
<i>Iphinoe pigmenta</i> Kurian, 1961	x				
<i>Iphinoe sanguinea</i> Kemp, 1916	x				
<i>Zygosphon mortenseni</i> Calman, 1907	x		x		
Subfamily Vaunthompsoniinae					
<i>Gigacuma halei</i> Kurian, 1951	x				
<i>Heterocuma andamani</i> Kurian, 1954		x			
<i>Heterocuma armatum</i> Kurian, 1954	x				
<i>Pseudosymphodoma indicum</i> Kurian, 1954	x				
<i>Vaunthompsonia dawydoffi</i> Zimmer, 1952				x	
<i>Vaunthompsonia media</i> Zimmer, 1952				x	
Family Diastylidae					
<i>Dimorphostylis horai</i> Kurian, 1956		x			
<i>Dimorphostylis longitelson</i> Kurian, 1963	x				
<i>Makrokyllindrus fistularis</i> (Calman, 1911)	x	x	x		
<i>Paradiastylis belone</i> Fage, 1945	x			x	
<i>Paradiastylis brachyura</i> Calman, 1904	x				
<i>Paradiastylis culicoides</i> Kemp, 1916	x				
<i>Paradiastylis longipes</i> Calman, 1905	x		x		
Family Gynodiastylidae					
<i>Gynodiastylis bicristata</i> Calman, 1911			x		
<i>Gynodiastylis costata</i> Calman, 1911			x		
Family Nannastacidae					
<i>Campylaspis minuta</i> Radhadevi and Kurian, 1989	x				
<i>Campylaspis pacifica</i> Sars, 1886					x
<i>Campylaspis platyropus</i> Calman, 1911	x		x		
<i>Campylaspis robusta</i> Radhadevi and Kurian, 1989					

Table 1 Continued.

	India & Sri Lanka	Andaman Sea	Gulf of Thailand	South China Sea	Indonesia & Philippines
<i>Campylaspis tubulata</i> Fage, 1945				x	
<i>Cumella (Cumella) forficula</i> Calman, 1911			x	x	
<i>Cumella (Cumella) hastata</i> Fage, 1945				x	
<i>Cumella (Cumella) hispida</i> Calman, 1911			x	x	
<i>Cumella (Cumella) indosinica</i> Zimmer, 1952			x	x	
<i>Cumella (Cumella) laevis</i> Calman, 1911				x	
<i>Cumella (Cumella) siamensis</i> Zimmer, 1952				x	
<i>Cumella (Cumella) similis</i> Fage, 1945			x	x	
<i>Nannastacus agnatus</i> Calman, 1911					
<i>Nannastacus gibbosus</i> Calman, 1911		x	x	x	
<i>Nannastacus minor</i> Calman, 1911			x	x	
<i>Nannastacus muelleri</i> Petrescu, 1997				x	
<i>Nannastacus pardus</i> Calman, 1905					x
<i>Nannastacus reptans</i> Calman, 1911			x		
<i>Nannastacus sauteri</i> Zimmer, 1921				x	
<i>Nannastacus stebbingi</i> Calman, 1904	x				
<i>Nannastacus suhmi</i> Sars, 1886					x
<i>Nannastacus tardus</i> Calman, 1911			x		
<i>Nannastacus wisseni</i> Petrescu, 1997				x	
<i>Nannastacus zimmeri</i> Calman, 1911	x			x	
<i>Procampylaspis andamanensis</i> Watling and Angsupanich, 2001		x			
<i>Scherocumella brachydactyla</i> (Calman, 1905)					x
<i>Scherocumella fagei</i> Petrescu, 1997				x	
<i>Scherocumella malayensis</i> Petrescu, 1997				x	
<i>Scherocumella stephensi</i> (Fage, 1945)				x	
<i>Schizotrema bidens</i> Fage, 1945				x	
<i>Schizotrema bifrons</i> Calman, 1911	x				
<i>Schizotrema depressum</i> Calman, 1911			x		
<i>Schizotrema macrodactylus</i> Fage, 1945				x	
<i>Schizotrema sordidum</i> Calman, 1911			x	x	

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Appendix 1 Details of Collecting Stations of Dr. Theodor Mortensen in the Gulf of Thailand (from Mortensen, Th. 1902. Det. Kungla Dansk Videnskabernes Selskabs Skrifter, naturvidenskab og matematisk Afdeling). Original locality names have been retained in this table.

The Siam Expedition 1 Oct 1899 – 1 Jun 1900.

21 Dec. 1899	Koh Kong
22 Dec. – 3 Jan. 1900	Lem Ngob (town on the mainland, about 12°N, opposite the island Koh Chang in the eastern part of the Gulf). Hand-collecting in the mangrove, <i>etc.</i> Dredging and trawling at depths to about 5 fms. Also collecting in small ponds in the wood 31 Dec 1899 and 3 Jan 1900.
4 Jan.	Koh Chang, hand-coll. dredging, <i>etc.</i> Also collecting
8 Jan.	in freshwater, ponds and small rivers.
8 Jan.	(Koh Mayseh ?) Island S. of Koh Chang, shore-coll., surface-fishing.
9 Jan.	Koh Mak (S. of Koh Chang), land- and shore-coll., thrownet, dredging at 4 fms, S. of Koh Kahdat, dredgings at 1 and 6 fms.
10 Jan.	Koh Kut, land-coll. dredging at 10 fms, off the north coast.
11 Jan.	Koh Kahdat, land-coll. dredgings <i>etc.</i>
12 Jan.	Koh Chang, land-coll. wood, ponds, and brooklets,
21 Jan.	shore-coll., fishing with seine-net, <i>etc.</i> , dredgings and trawlings around the island in depths down to about 10 fms.
22 Jan.	Koh Kahdat and Koh Mak, shore-coll.
23 Jan.	Dredgings 1) N. of Koh Kut 2) two miles N. of Koh Kong, at about 8 fms. Fishing with shore-seine at Koh Kong.
24 Jan.	The fishing-grounds at Koh Kong. Dredging at 10–15 fms. W. of Koh Kong.
25 Jan.	The fishing-grounds at Koh Kong. Trawling at 6 fms. W. of Koh Kong.
26 Jan.	Dredging at 6–7 fms near the mainland, off the southern end of Koh Kut.
27 Jan.	1) Trawling about 3 miles E. of the southern end of Koh Kahdat. 2) Trawling about 5 miles E. of the southern end of Koh Mak. 3) Trawling about 2 miles W. of the northern end of Koh Kut (to off Koh Rate Yai) at about 11 fms.
28 Jan.	N. of Koh Kong, surface fishing. Trawlings and dredgings 1) about 15 miles S. of Koh Kut, 17–20 fms. 2) about 20 miles W of Koh Kut, 28–30 fms, mud and sand. 3) about 12 miles E. of Koh Mak, about 20 fms, mud.
29 Jan.	Trawlings W. of Koh Chang at 20 fms, mud.
30 Jan.	Koh Chik (Klung) shore-coll., on the rocks.
31 Jan.	1) Trawling 18 miles W of Koh Chang, at 20 fms, mud. 2) Unsuccessful trawling 35 miles W. of Koh Chang, 30 fms. 3) Dredging 20 miles S. of Koh Samit at 2 fms, mud.
1 Feb.	Dredgings 1) 1 mile S of Koh Chuen, about 30 fms, shells; 2) 6 miles E. of Cap Liant, 9 fms, shells, 3) 15 miles E. of Koh Chuen, 10 fms, shells; 4) 4–6 miles S. of Koh Samit, 14–18 fms, sand and mud.
2 Feb.	Dredging 20 miles S.E. of Koh Samit, 13–14 fms, sand and mud.
3 Feb.	Koh Samit, the lotus-pond and rock-pools. Dredging 4 miles S. of Koh Sakait (W. of Rayong river), 9 fms, shells.
4 Feb.	Dredgings in the sound between Koh Mesan and Cap Liant at 9 fms, shells and sand.

Appendix 1 continued.

5 Feb.	Dredgings (down to 25 fms) 1) W. of Koh Kam; 2) near Koh Chuen; 3) N. of Koh Mesan (about 15 fms).
6 Feb.	Dredgings at Koh Kam, 5 fms, coarse sand; N. of Koh Kam., 10 fms; W of Koh Kam, 5 fms.; and between Koh Mesan and Koh Chuen, 15 fms.
7 Feb.	Dredgings between Koh Mesan and Koh Rial, 3–5 fms, and 38 fms; and in the sound between Koh Mesan and Cap Liant at 5–8 fms.
8 Feb.	Dredgings in Rayong bay.
9 Feb.	Koh Samit, the lotus-pond, land-coll., fishing. Dredging about 2 miles S. of Koh Tulu, sand and mud.
10 Feb.	Koh Plit and Koh Chik, shore-coll., <i>etc.</i>
11 Feb.	From Koh Chik to Koh Chang.
12 Feb. – 14 Feb.	Koh Chang.
15 Feb.	Koh Chang, surface-fishing. Dredgings N. of Koh Kahdat at 4–5 fms.
16 Feb.	Koh Kahdat, dredgings on bottom of corals, of shells, and sandy mud, especially rich fauna off the north-east coast, at about 5 fms.
17 Feb.	Dredgings S. of Koh Mak, 4–10 fms, and north of Koh Kahdat. Also surface-fishing.
18 Feb.	Dredgings north of Koh Kahdat.
19 Feb. – 21 Feb.	Koh Chang, land- and shore-coll., coll. on the coral reef.
22 Feb.	Dredging off Tung Kaben at 6 fms, sand and mud.
23 Feb.	Dredgings 1) off Koh Sakait, 5–6 fms, hard bottom; 2) between Koh Chuen and Hin Chalan, about 30 fms ; 3) off Koh Kram about 30 fms.
24 Feb.	Dredgings 8 miles N.W. of Koh si Chang, about 10 fms, mud.
25 Feb. – 28 Feb.	Bangkok.
1 Mar.	Dredgings 10 miles W. of Koh si Chang, about 10 fms.
2 Mar.	Dredgings 1) off Koh Lan, 30 fms; 2) between Koh Rin and Cliff Rock (N. of Koh Kram), 15 fms; 3) off Koh Kram, 30 fms; 4) east of Koh Kram, 15 fms.
3 Mar.	Dredgings 1) off Koh Chuen, 30 fms, 2) in 3 places between Koh Chuen and Koh Chang, about 15 fms, mud and shells.
4 Mar.	Dredgings S. of Koh Kahdat, 8–5 fms, mud and sand, and W. of Koh Kut, about 15 fms.
5 Mar.	Koh Kong. Dredgings off the southern end of Lern Nam, 4 fms, mud.
6 Mar.	Northern end of Koh Chang, shore-coll.
7 Mar.	Koh Chang, coll. on the coral reef, <i>etc.</i> ; shore-coll. at Klong Prao on the west coast of Koh Chang.
8 Mar.	Klong Prao (Koh Chang), fishing with hook, <i>etc.</i>
9 Mar.	Dredging off Klong Prao; shore-coll. on Koh Lom; dredgings off the northern end of Koh Chang.
10 Mar. – 11 Mar.	Koh Chang, shore-coll.
12 Mar. – 13 Mar.	Koh Chang, surface fishing off the southern end, shore coll. off Koh Sarlak and at Koh Prao.
14 Mar. – 15 Mar.	Klong Salakpet (Koh Chang), land-coll.
16 Mar.	Klong Salakpet, land-coll. Koh Sarlak, shore-coll.
18 Mar.	Koh Chang, collecting in shallow water in the bay.
21 Mar.	Rayong, shore-coll.; dredgings near Koh Kram.
22 Mar. – 27 Mar.	Bangkok



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29 NOV. - 20 DEC.