

Early Studies of Marine Microalgae in the Philippines

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The early documented marine microalgae from the Philippines were done between 1853–1925. A total of 801 taxa were identified and distributed into three phyla, *i.e.* the Cyanobacteria, the Rhodophyta, and the Bacillariophyta. About 99% of these taxa belong to the Bacillariophyta. Of the 797 total diatom taxa identified by early scientists, there are only 281 species that are accepted as current valid names based on AlgaeBase and DiatomBase. These accepted diatom taxa belong to 63 genera. The three genera with the greatest number of species in decreasing order are *Amphora* (46), *Biddulphia* (29), and *Campylodiscus* (16). Out of the 797 diatom species, 190 species have the Philippines as the type locality and these specimens are deposited in the United States (US) – specifically, at the Farlow Herbarium and in the US National Museum in Washington, DC and in London, England at the Diatom section of the British Museum of Natural History. All these algal materials were part of the collection of four different naval scientific exploring expeditions that visited the Philippines in 1842–1910 – namely, the US Exploring (Wilkes) Expedition (1842), the HMS Challenger (1874–1875), the Italian Cruiser Vettor Pisani (1884), and the USS Albatross (1907–1910). The greatest number of microalgae collected was 743 by USS Albatross, followed in decreasing order by HMS Challenger (57), US Exploring Expedition (17), and Vettor Pisani (1). These early collections of marine microalgae provided invaluable contributions in laying the groundwork for the development of Philippine phycology.

Keywords: diatoms, HMS Challenger, marine microalgae, naval scientific expedition, USS Albatross

INTRODUCTION

Microalgae, as opposed to macroalgae, are small and microscopic algae whose identity is ascertained mainly by examination with the use of light and/or electron microscopes (Graham *et al.* 2009). They are usually unicellular, but some may be in colonial or filamentous forms, wherein each individual cell is physiologically independent. Some may aggregate their cells or filaments to form macrocolonies of definite or amorphous shape that are visible to the naked eye. Some examples of microalgae are shown in Figure 1. They may be unicellular like *Porphyridium purpureum*, a unicellular marine red

alga (Figures 1A and B), or filamentous like *Spirulina* sp. (Figure 1C). Figure 2 shows microalgae that form macrocolonies. Figure 2A shows spherical macrocolonies of the freshwater cyanobacterium, *Nostoc commune*, that are made up of aggregates of non-branching heterocystous filaments enclosed by gelatinous sheaths (B). Figures 2C and D show amorphous macrocolonies of the green alga, *Stigeoclonium tenue*, that are made up of groups of branching filaments.

Microalgae have existed for billion of years and include the oxygenic photosynthetic cyanobacteria (used to be called blue-green algae) that were responsible for having oxygenated the atmosphere (Buick 1992). They also include the typical groups of algae like the green, brown,

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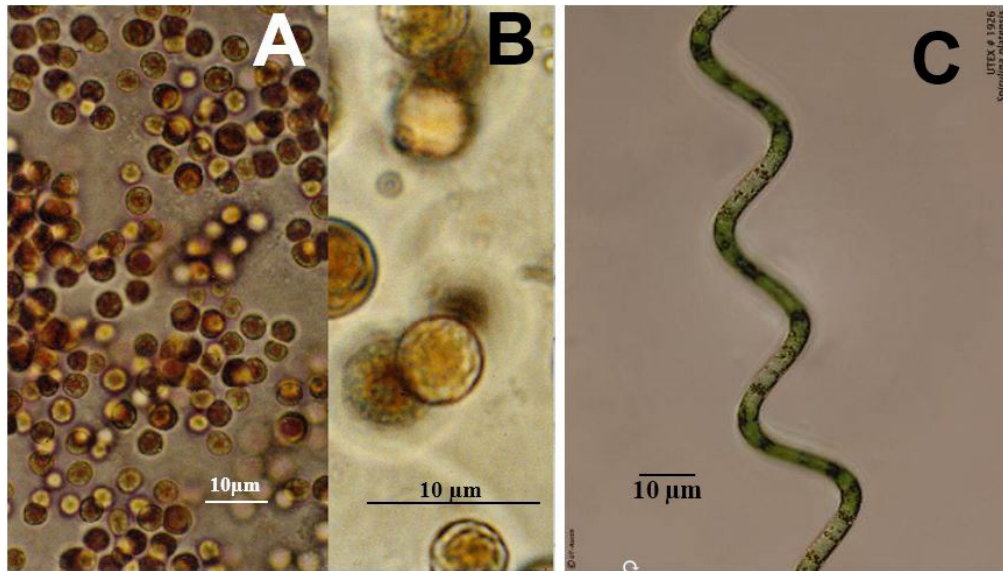


Figure 1. [A, B] *Porphyridium purpureum* (Bory) K.M. Drew & R. Ross; [C] *Spirulina major*. Kutzing ex Gomont

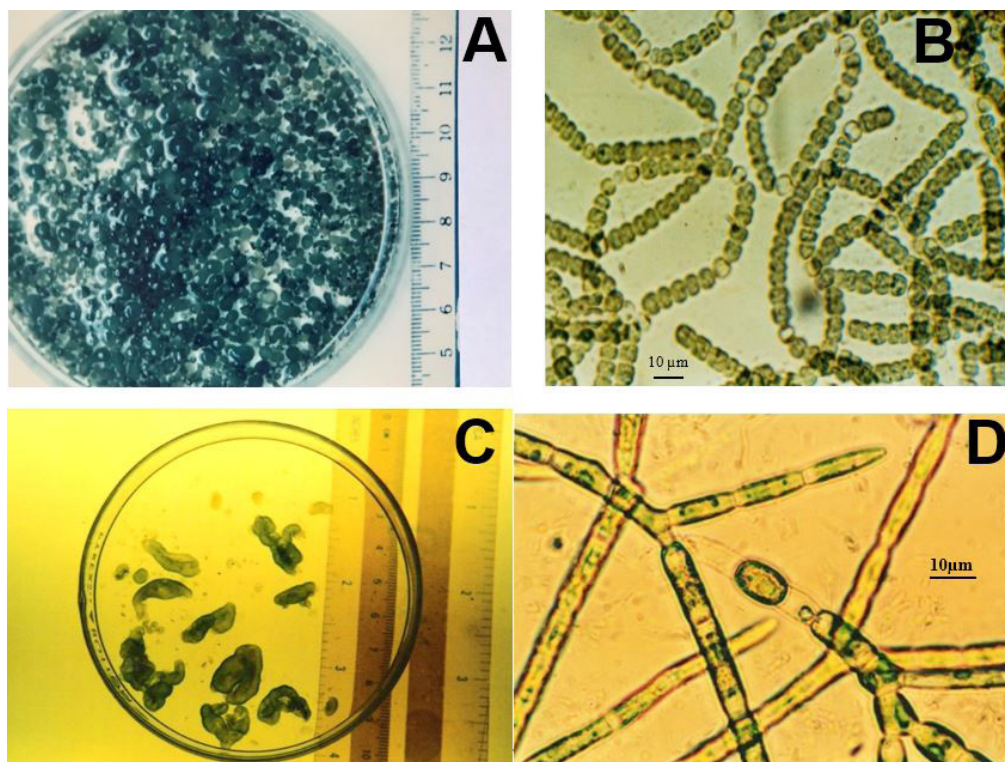


Figure 2. [A, B] *Nostoc commune* Vaucher ex Bornet & Flahault; [A] spherical macrocolonies, laboratory-cultured; [B] non-branching heterocystous filaments; [C, D] *Stigeoclonium tenue* (C. Agardh) Kützing; [C] macrocolonies, field-cultured; [D] branching filaments that usually taper into fine setae.

and red algae, as well as the diatoms and dinoflagellates. Their popularity became worldwide these past decades because of their extensive application potential in renewable energy (Chisti 2007) and biopharmaceutical and nutraceutical industries (Borowitzka and Borowitzka

1988). They also have applications in wastewater treatment (Oswald 1969) and atmospheric CO₂ mitigation (Jeong *et al.* 2003). However – despite their long history of existence, their various applications in different industries, and their roles in global biogeochemical cycles – the

history of the study of microalgae in the Philippines did not start until the mid 19th century (Bailey 1853; Harvey and Bailey 1853), about 149 years after the first macroalgal study was published in 1704 by a Jesuit pharmacist-priest, Georg Joseph Kamel (Camello) (Liao 2013). Historical accounts of Philippine phycology have traditionally given more emphasis to marine macroalgae (Cordero 1972; Velasquez 1985; Ganzon-Fortes 2012; Liao 2013). One of the first publications that gave such an account of microalgae was on cyanobacteria (Martinez 1984). Hence, there is a need to compile a more comprehensive historical account of the study of Philippine microalgae so that we could be aware of the past studies done, learn some lessons from the past, note some gaps, and see how we can provide continuity of the past studies to the present to move forward the science of microalgae, especially marine microalgae in the Philippines. This is the main motivation behind this review.

METHODS

The chosen period of this review is between 1853–1925 because this was the time when the first microalgal reports/ investigations from the Philippines were carried out through scientific naval exploring expeditions to the Philippines – including the US Exploring (Wilkes) Expedition (1842), the HMS Challenger (1874–1875), the Italian cruiser Vettor Pissani (1884), and the USS Albatross (1907–1910) These resulted in various reports documenting the microalgal samples collected (Bailey 1853; Harvey and Bailey 1853; Schmidt 1874–1959; Dickie 1876a, b; Castracane 1886; Piccone 1886; Mann 1925) However, all these works were carried out by foreign researchers, with their reports published abroad and were not easily accessible to the Filipinos at that period. In recent decades some of these works were annotated (Edgar 1979; Tuji *et al.* 2009) and information became more accessible through the World Wide Web (Jacksi and Abass 2019) such that reexamination of these reports is now possible. In the present study, all records of materials reported from the Philippines during this period were compiled. In particular, the validity of the species names reported in the studies of Bailey (1853), Harvey and Bailey (1853) [as annotated in Edgar (1979)], Dickie (1876a, b), Castracane (1886) [as rechecked by Tuji *et al.* (2009)], Piccone (1886), and Mann (1925) was checked based on AlgaeBase (Guiry and Guiry 2021) and DiatomBase (Kociolek *et al.* 2022). Where the original name remains valid, it is retained. Otherwise, the currently accepted names are updated. Type species with the Philippines as the type locality are also noted. The extensive work of Schmidt (1874-1959), however, was not checked as the status of many of the species mentioned

in this atlas remains uncertain (Kociolek *et al.* 2022). Besides, Castracane (1886) and Mann (1925) have already made extensive cross-references to this work.

RESULTS

Scientific Exploration Voyages That Visited the Philippines with Marine Microalgal Specimens

The era of European and American voyages of scientific exploration in the Age of Enlightenment (18th–19th century) was primarily motivated by scientific discoveries with some commercial and political reasons. Among these scientific voyages, four visited the Philippines and brought back a lot of marine biological materials – including microalgae, mainly diatoms. Information about these expeditions, including the [1] US Exploring Expedition or Wilkes Expedition (1838–1842), [2] the HMS Challenger Expedition (1873–1876), [3] the Vettor Pisani (1882–1885), and [4] the USS Albatross (Philippine) Expedition (1907–1910) are described in more details in Table 1. The US Exploring Expedition, known also as US EX EX or the Wilkes Expedition, was a discovery mission of the Pacific Ocean and surrounding lands conducted by the US government. Its voyage was set back by eight years due to the delay in the release of its funds by the US Congress. Therefore, despite the fact that the request was made by President Quincy Adams in 1828, its journey was only authorized in May 1836 by the succeeding president, President Andrew Jackson (Walsh 2004). The fleet of seven ships was under the command of Lt. Charles Wilkes. There were over 600 men on board, including a scientific corps of nine personnel with two botanists (Smithsonian Institution Libraries 2004). Two of its ships, USS Vincennes and the USS Flying Fish, anchored in Manila Bay on 12 Jan 1842 and stayed there for nine days collecting specimens, then continued on and moved southward to the Sulu Sea (Bryan 1939). The diatoms (microalgae) reported from this expedition were taken from those attached to the collected seaweeds and shells (Edgar 1979).

The HMS Challenger was a three-year naval expedition (1873–1876) that covered about 68,000 nautical miles (or 125,936 km) of the world's oceans. It was organized by the Royal Society of London in collaboration with the University of Edinburgh, with the use of one of the British naval ships for a prolonged exploratory voyage across the oceans of the world (Lerwill 2020). The commanding officer was Captain George Nares, with about 243 crew members – including six civilian staff members/scientists. The leader of the scientific expedition was the naturalist, Charles Wyville Thomson, with the following as the other naturalists (Henry Nottidge Moseley and Rudolf

Table 1. Scientific expeditions that visited the Philippines from 1842–1910.

Name of expedition	Place/date of visit	Scientists/collectors on board	Methods of collection (microalgae)	References
US Exploring Expedition (Wilkes) (1838–1842)	Explored the northern end of Luzon before anchoring in Manila Bay on 12 Jan 1842. Anchored off the Sulu Island on 02 Feb 1842	Scientists and collectors on board: Titian Ramsay Peale (artist and museologist), Charles Pickering (physician), James Dwight Dana (geologist), Hotario Hale (linguist and philologist), William Rich (botanist), and William Dunlop Brackenridge (horticulturist) Artists and illustrators/collector: Joseph Drayton and Alfred Agate Ship's commander: Lt. Charles Wilkes	Microalgae collected were mostly attached to seaweeds and/or shells	Bailey (1853); Harvey and Bailey (1853); Bryan (1939); Edgar (1979); Walsh (2004)
HMS Challenger Expedition (1873–1876)	Arrived in Zamboanga, Mindanao on 24 Oct 1874; proceeded in Iloilo, then in Manila on 12 Nov 1874; in January 1875, left for Hong Kong for several weeks; on 11 Jan 1875, came back to Manila, then proceeded to Cebu and Zamboanga; finally left the Philippines on 05 Feb 1875	Leaders of the scientific expedition: Charles Wyville Thomson (Scottish Naturalist) and John Murray (British Naturalist) Staff members: Henry Nottidge Moseley (naturalist), Rudolf von Willemoes Suhm (naturalist), and John Young Buchanan (oceanographer) Ship's commander: George Nares	Tow-net, trawl, and dredging	Dickie (1876a, b); Moseley (1879); Castracane (1886); Tuji <i>et al.</i> (2009); RAMM HMS Challenger (2015)
Vettor Pisani (1882–1885)	Visited San Jacinto Port in Ticao Island, Masbate, then proceeded to Cavite and in Manila in September 1884	No scientist on board Collectors: Lt. Gaetano Chierchia and Lt. Cesare Marcacci Ship's commander: Admiral Guiseppe Palumbo	Tow-net	Groeben (2008)
USS Albatross (Philippine Expedition) (1907–1910)	Sailed in Manila Bay on 28 Nov 1907 and left Manila in January 1910; used Manila as their home base for the three separate cruises in the Philippines	Director of the expedition: Dr. Hugh M. Smith Scientists on board: Frederick Chamberlain (resident naturalist), Lewis Radcliffe (assistant naturalist), Paul Bartsch (zoologist), and Harry Fasset (fisheries expert and map maker) Staff members: Clarence Wells, Albert Burrows, Alvin Seale, and Roy Chapman Andrews Ship's commander: Lt. Marbury Johnston/ MC McCormick	Mesh, nets, bottom trawl, and dredging	Smith and Williams (1999); Bagarinao (2007)

von Willemoes Suhm); the oceanographers were John Young Buchanan and John Murray, and J.J. Wild as the artist. The expedition's first visit to the Philippines was in Zamboanga on 24 Oct 1874. The voyage continued then northwards to Manila, moved southwards to Cebu, and made a final stop in Zamboanga on 29 Jan–05 Feb 1875 (Moseley 1879). Specimens were collected using tow-nets, dredgers, *etc.* (Dickie 1876a, b; Castracane 1886).

The Vettor Pisani was an Italian naval corvette equipped for scientific exploration mainly for zoological collection, hydrography, and conduct of soundings at great depths of the ocean for about three years (1882–1885). Anton Dohrn, founder and director of the then-Naples Zoological Station was the head scientist of this mission with Lt. Gaetano Chierchia as the second officer in command, who at the same time was trained as a scientist (Groeben 2008). The scientific vessel visited the Philippines,

particularly San Jacinto Port in Ticao Island in Masbate, then proceeded to Cavite and Manila in September 1884 (Piccone 1886).

The USS Albatross (Philippine) Expedition was second to the Wilkes Expedition of the US in terms of time spent and area covered but probably had greater scientific achievements than the latter due to more advancement in science and favorable political forces that converged in that period (Smith and Williams 1999).

The scientific voyage was part of the programs of the US in consolidating and assessing the natural resources – mainly the fisheries of its newly acquired territory, the Philippines – from the Spanish-American war. The voyage funding was channeled through the Bureau of Fisheries; hence, the director of the scientific expedition was Hugh McCormick Smith, with the help of Frederick Chamberlain, Lewis Radcliffe, Harry C. Fassett, Paul Bartsch, Clarence M. Wells, Albert Burrows, Alvin Seales, and Roy Chapman Andrews. There were about 70 crew members under the leadership of Lt. Commander Marbury Johnston/ W.C. McCormick during 2 1/2 years of the voyage (Smith and Williams 1999). The Philippine expedition consisted of about three individual cruises that started on 02 Feb–10 Mar 1908 in Manila and moved southwards down to Sulu. The second cruise went all over the Visayan islands, including Masbate and Marinduque, whereas the third cruise had the same route as the second cruise but extended the coverage to the southern part of Mindanao (Smith and Williams 1999). All these cruises always started and ended in Manila. The collection was mainly done for fishes, but plankton and other marine life were also collected using various collecting equipment like bottom trawls, dredgers, nets of all kinds and of different mesh sizes, hand lines, traps, *etc.* (Smith and Williams 1999)

Of these four naval scientific voyages, the most productive in terms of published papers on marine microalgae was the USS Albatross, whose collection of dredged materials and seaweeds paved the way to the first comprehensive publication on diatoms from the Philippines titled “Marine Diatoms of the Philippine Islands” by Albert Mann in 1925. This monograph described/referenced 743 diatom taxa (Tables 2 and 3). The HMS Challenger that visited the Philippines yielded at least 57 marine microalgal specimens, including 54 diatom taxa stored permanently in diatom slides (Castracane 1886, Tuji *et al.* 2009) and three cyanobacteria identified by Dickie (1876a, b). The US Exploring Expedition did its scientific exploration for a few days in the Philippines in 1842, and part of the result of this collection was a publication of a list of 17 diatom taxa (Bailey 1853; Harvey and Bailey 1853). On the other hand, the Italian naval corvette – Vettor Pisani – went to Ticao Island, Masbate then stopped in

Cavite and Manila in September 1884. In these places, the Italian vessel did some scientific collection of biological materials, including the marine red microalga (*Centroceras micracanthum* = *C. cryptacanthum*) from Cavite, Philippines (Piccone 1886) (Table 2).

Marine Microalgae from the Philippines Reported in 1853–1925 from the Scientific Voyages in 1842–1910

A total of 818 species of marine microalgae were reported from the Philippines from these four scientific expeditions over a span of 72 years (1838–1910) (Table 3). However, the actual number of total microalgae is 801 because 17 diatom taxa were reported by two different authors from three different naval expeditions. Out of these 801 taxa reported, three species belong to the Phylum Cyanobacteria, one in Rhodophyta (red algae), and 797 in the Bacillariophyta (diatoms). Among these 797 diatom species reported, only 281 taxa are currently accepted with valid names (AlgaeBase, Guiry and Guiry 2021; DiatomBase, Kociolek *et al.* 2022). The 17 diatom taxa published in the Proceedings of the Academy of Natural Sciences of Philadelphia in 1853 by Bailey and Harvey as part of the collection of the US Exploring Expedition (1842) were the earliest report of marine diatoms in the Philippines. Among the diatom taxa reported from these four expeditions, a total of 190 species were newly described with the Philippines as the type locality (Tables 2 and 3). Of these types, 137 species were reported by Mann (1925) from the USS Albatross Expedition in 1907–1910 and are currently deposited as permanent slides in the US National Museum with catalog numbers. The next greatest number of type specimens (lectotypes) from the Philippines were the eight species reported by Tuji *et al.* (2009) that were collected by the HMS Challenger (1874–1875). Castracane (1886) originally noted 54 new taxa from the Philippines out of the 259 diatom taxa he described from the HMS Challenger collections. Tuji and his colleagues subsequently examined 143 diatom slides from Castracane’s diatom collection that was available at the British Museum of Natural History. Out of these, 17 valid names were established – including eight new species – with the Philippines as the type locality. However, since Tuji *et al.* (2009) did not find all the materials collected by Castracane, for the historical record, I included in Table 2 the 54 diatom taxa that were originally described as new from the Philippines by Castracane (1886). Many of these are listed as status uncertain in DiatomBase or “...this entity requires further investigation” in AlgaeBase.

On the other hand, out of the 14 new diatom taxa described by Harvey and Bailey (1853) from the US Exploring Expedition, Edgar (1979) established four diatom lectotypes from the Philippines when he examined Bailey’s 17 diatom slides kept at Farlow Herbarium. These

Table 2. List of microalgae collected and studied from the Philippines by different scientific expeditions (1853–1925). Current valid name of species was checked and based on Algaebase (Guiry and Guiry 2021) and DiatomBase (Kociolek *et al.* 2022). Species with Philippines as the type locality is in bold.

List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
Phylum: Cyanobacteria					
<i>Lyngbya ferruginea</i> Agardh	<i>Lyngbya aestuarii</i> f. <i>ferruginea</i> Gomont	Philippines, Zamboanga		HMS Challenger (1874–1875)	Dickie (1876b)
<i>Lyngbya majuscula</i> Harvey	<i>Lyngbya majuscula</i> Harvey ex Gomont	Philippines, Zamboanga		HMS Challenger	Dickie (1876a)
<i>Oscillaria gracillima</i> Kützing nom. inval.	<i>Geitlerinema splendidum</i> (Greville ex Gomont) Anagnostidis	Philippines, Camiguin Island		HMS Challenger	Dickie (1876b)
Phylum: Rhodophyta					
<i>Centroceras cryptacanthum</i> Kützing	<i>Centroceras micracanthum</i> Kützing	Philippines, Manila, Cavite		Vettor Pisani (1884)	Piccone (1886)
Phylum: Bacillariophyta					
<i>Achnanthes cocconeiformis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43560	USS Albatross (1907–1910)	Mann (1925)
<i>Achnanthes compacta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43561	USS Albatross	Mann (1925)
<i>Achnanthes crenulata</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Achnanthes heteromorpha</i> Grunow	<i>Planothidium heteromorphum</i> (Grunow) Lange-Bertalot	Philippine Islands		USS Albatross	Mann (1925)
<i>Achnanthes hexagona</i> Brun & Cleve	<i>Achnanthes hexagona</i> Cleve & Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Achnanthes inflata</i> (Kützing) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Achnanthes longipes</i> C. Agardh	<i>Achnanthes armillaris</i> (O.F. Müller) Guiry	Philippine Islands		USS Albatross	Mann (1925)
<i>Achnanthes tenuistauros</i> Mann	<i>Achnanthes javanica</i> var. <i>tenuistauros</i> (Mann) F. Meister	Philippine Islands (type locality)	Type: US N.M. cat. No. 43562	USS Albatross	Mann (1925)
<i>Actinocyclus bipartitus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43563	USS Albatross	Mann (1925)
<i>Actinocyclus curvatus</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinocyclus decussatus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43564	USS Albatross	Mann (1925)
<i>Actinocyclus obscurus</i> Rattray	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinocyclus pruinus</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinocyclus stictodiscus</i> Mann	<i>Stictocyclus stictodiscus</i> (Grunow) R. Ross	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinocyclus splendens</i> Rattray	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinocyclus subtilis</i> (Gregory) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinodiscus schleinitzii</i> (Janisch) Mann	<i>Actinodiscus contabulatus</i> (A. Schmidt) R. Ross and P.A. Sims	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus annulatus</i> (Wallich) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus areolatus</i> (Ehrenberg) A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus hexagonus</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus hispidus</i> Grunow	<i>Radiodiscus hispidus</i> (Grunow) M. Voigt	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus janischii</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus parvus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43565	USS Albatross	Mann (1925)
<i>Actinopterychus splendens</i> (Ehrenberg) Shadbolt	<i>Actinopterychus splendens</i> (Shadbolt) Ralfs ex Pritchard	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinopterychus subangulatus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Actinoptychus trilingulatus</i> (Brightwell) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Actinoptychus undulatus</i> (Bailey) Ralfs	<i>Actinoptychus senarius</i> (Ehrenberg) Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
Allonitzschia munifica Mann	Name as is	Philippines, Sulu, Jolo (type locality)	Type: US N.M. cat. No. 43566	USS Albatross	Mann (1925)
Amphiprora limpida Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43567	USS Albatross	Mann (1925)
<i>Amphiprora oswaldii</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphiprora paludosa</i> W. Smith	<i>Entomoneis paludosa</i> (W. Smith) Reimer	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphiprora pelagica</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphiprora plicata</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphiprora temperei</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Amphitetras favosa Harvey & Bailey	Name as is	Philippines, Mindanao (type locality)	Lectotype: Farlow Herbarium, Coll. No. 2145 (Cartesian coordinates, + 27.2-8.7), Edgar 1979	US exploring expedition (Wilkes 1842)	Bailey (1853); Harvey and Bailey (1853); Edgar (1979)
<i>Amphora alata</i> Peragallo	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Amphora alternata Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43568	USS Albatross	Mann (1925)
Amphora anceps Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43569	USS Albatross	Mann (1925)
<i>Amphora angusta</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora arcuata</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora arenaria</i> Donkin	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora biconvexa</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora camelus</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora clara</i> A. Schmidt	<i>Halamphora clara</i> (A. Schmidt) Levkov	Philippine Islands		USS Albatross	Mann (1925)
Amphora clathrata Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43570	USS Albatross	Mann (1925)
Amphora compacta Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43571	USS Albatross	Mann (1925)
<i>Amphora corpulenta</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora costata</i> W. Smith	<i>Halamphora costata</i> (W. Smith) Levkov	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora crassa</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Amphora cucumeris Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43572	USS Albatross	Mann (1925)
<i>Amphora cymbifera</i> Gregory	<i>Halamphora cymbifera</i> (W. Gregory) Levkov	Philippine Islands		USS Albatross	Mann (1925)
Amphora decora Castracane	Name as is	Philippines Sea (type locality)		HMS Challenger	Castracane (1886)
Amphora dichotoma Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43573	USS Albatross	Mann (1925)
<i>Amphora deducta</i> A. Schmidt	<i>Amphora angusta</i> var. <i>deducta</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
Amphora dura Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43574	USS Albatross	Mann (1925)
<i>Amphora egregia</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Amphora exsecta</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora flexa</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43575	USS Albatross	Mann (1925)
<i>Amphora formosa</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora furcata</i> Leuduger-Fortmorel	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora fusca</i> A. Schmidt	<i>Amphora gigantea</i> var. <i>fusca</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora gibba</i> A. Schmidt	<i>Colliculoamphora gibba</i> (A. Schmidt) D. M. Williams & G. Reid	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora gigantea</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora graeffei</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora grevilleana</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora grundleri</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora henshawii</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43576	USS Albatross	Mann (1925)
<i>Amphora hyalina</i> Kützing	<i>Halamphora hyalina</i> (Kützing) Rimet & R. Jahn	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora inflata</i> Grunow	<i>Amphora costata</i> var. <i>inflata</i> (Grunow) H. Peragallo & M. Peragallo	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora intersecta</i> A. Schmidt var.?	<i>Amphora intersecta</i> A. Schmidt	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora lunaris</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43577	USS Albatross	Mann (1925)
<i>Amphora libyca</i> Ehrenberg	Name as is	Philippines, Mindanao		US exploring (Wilkes)	Bailey (1853); Harvey and Bailey (1853)
<i>Amphora magnifica</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora milesiana</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora monilifera</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora nodosa</i> Brun, variety	<i>Amphora nodosa</i> Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora obesa</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora obtusa</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora ocellata</i> Donkin	Nom. illeg.	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora oculus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora ostrearia</i> var. <i>vitrea</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora ovalis</i> Kützing	<i>Amphora ovalis</i> (Kützing) Kützing	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora pauca</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43578	USS Albatross	Mann (1925)
<i>Amphora pecten</i> Brébisson	<i>Amphora pecten</i> Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora permagna</i> Pantocsek	<i>Amphora obtusa</i> Gregory	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora philippinica</i> Castracane	Name as is	Philippine Sea (type locality)		HMS Challenger	Castracane (1886)
<i>Amphora polygonata</i> (sic) Castracane	<i>Amphora polyzonata</i> Castracane	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora praevalida</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora prismatica</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora proteus</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora pulchra</i> Greville	<i>Auricula pulchra</i> (Greville) Cleve	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Amphora recessa</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43579	USS Albatross	Mann (1925)
<i>Amphora rectangularis</i> Greville	<i>Amphora rectangularis</i> Gregory	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora rhombica</i> Kitton	<i>Tetramphora rhombica</i> (Kitton) Stepanek & Kociolek	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora schmidtii</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora sima</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43580	USS Albatross	Mann (1925)
<i>Amphora tumulifer</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora turgida</i> Gregory	<i>Halamphora turgida</i> (W. Gregory) Levkov	Philippine Islands		USS Albatross	Mann (1925)
<i>Amphora weissflogii</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Anisodiscus adeei</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43581	USS Albatross	Mann (1925)
<i>Arachnoidiscus ehrenbergii</i> Bailey	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asterolampra marylandica</i> Greville	<i>Asterolampra marylandica</i> Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Asterolampra princeps</i> Rattray	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asterolampra van heurckii</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus arachne</i> (Brèbisson) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus areolatus</i> Mann	<i>Asteromphalus heptactis</i> (Brèbisson) Ralfs	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus beaumontii</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus brookei</i> Bailey	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus elegans</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus hiltonianus</i> (Greville) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus reticulatus</i> Cleve	<i>Asteromphalus heptactis</i> (Brèbisson) Ralfs	Philippine Islands		USS Albatross	Mann (1925)
<i>Asteromphalus roperianus</i> (Greville) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Aulacodiscus kinkeri</i> A. Schmidt	<i>Aulacodiscus margaritaceus</i> var. <i>kinkeri</i> (A. Schmidt) Rattray	Philippine Islands		USS Albatross	Mann (1925)
<i>Aulacodiscus macraeanus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Aulacodiscus margaritaceus</i> Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Aulacodiscus orientalis</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Aulacodiscus pretiosus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43583	USS Albatross	Mann (1925)
<i>Aulacodiscus recedens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43584	USS Albatross	Mann (1925)
<i>Auliscus caelatus</i> Bailey	<i>Auliscus sculptus</i> (W. Smith) Brightwell	Philippine Islands		USS Albatross	Mann (1925)
<i>Auliscus compositus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Auliscus philippinarum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43585	USS Albatross	Mann (1925)
<i>Auliscus quadratus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43586	USS Albatross	Mann (1925)
<i>Auliscus reticulatus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Auliscus schmidtii</i> Gründler	<i>Auliscus reticulatus</i> var. <i>schmidtii</i> (Gründler) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Auliscus stockhardtii</i> Janisch	<i>Auliscus stoeckhardtii</i> Janisch	Philippine Islands		USS Albatross	Mann (1925)
<i>Auricula insecta</i> Grunow	<i>Thalassiosiphysa hyalina</i> (Greville) Paddock & P.A. Sims	Philippine Islands		USS Albatross	Mann (1925)
<i>Auricula japonica</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Auricula ostrea</i> Brun	<i>Auricula ostrea</i> Tempère & Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia abjecta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43587	USS Albatross	Mann (1925)
<i>Biddulphia antillarum</i> (Cleve) Boyer	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia aurita</i> (Lyngbye) Brébisson	<i>Odontella aurita</i> (Lyngbye) C. Agardh	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia balaena</i> (Ehrenberg) Brightwell	<i>Triceratium arcticum</i> var. <i>balaena</i> (Ehrenberg) Cleve-Euler	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia balearica</i> (Cleve & Grunow) Mann	<i>Triceratium balearicum</i> Cleve & Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia bicornis</i> Cleve	<i>Pseudictyota dubia</i> (Brightwell) P.A. Sims & D.M. Williams	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia birostrum</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia broeckii</i> (Leuduger-Fortmorel) Mann	<i>Triceratium broeckii</i> Leuduger-Fortmorel	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia campechiana</i> (Grunow) Boyer	<i>Triceratium campechianum</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia castellifera</i> (Grunow) Mann	<i>Triceratium castelliferum</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia cingulata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43588	USS Albatross	Mann (1925)
<i>Biddulphia concava</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia consimilis</i> (Grunow) Boyer	<i>Triceratium consimile</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia cornigera</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43589	USS Albatross	Mann (1925)
<i>Biddulphia cornuta</i> (Greville) Mann	<i>Trinacria cornuta</i> (Greville) P.A. Sims & R. Ross	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia culcitella</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia cuspidata</i> (Janisch) Mann	<i>Triceratium cuspidatum</i> Janisch	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia cycloides</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43590	USS Albatross	Mann (1925)
<i>Biddulphia discursa</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43591	USS Albatross	Mann (1925)
<i>Biddulphia distincta</i> (Janisch) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia dubia</i> (Brightwell) Cleve	<i>Pseudictyota dubia</i> (Brightwell) P.A. Sims & D.M. Williams	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia exacta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43592	USS Albatross	Mann (1925)
<i>Biddulphia expedita</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia favus</i> (Ehrenberg) Van Heurck	<i>Triceratium favus</i> Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia fimbriata</i> (Wallich) Mann	<i>Triceratium fimbriatum</i> Wallich	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia fractosa</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43593	USS Albatross	Mann (1925)
<i>Biddulphia gemina</i> (A. Schmidt) Mann	<i>Trigonium geminum</i> (A. Schmidt) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia gibbosa</i> (Bailey) Van Heurck	<i>Triceratium gibbosum</i> Harvey & Bailey	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Biddulphia grundleri</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia grunowiana</i> (Castracane) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia heteroceros</i> Grunow	<i>Cerataulus heteroceros</i> (Grunow) P.A. Sims & J. Witkowski	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia impressa</i> (Grunow) Mann	<i>Triceratium impressum</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia indica</i> (Ehrenberg) Roper	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia informis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43594	USS Albatross	Mann (1925)
<i>Biddulphia insignis</i> (Greville) Mann	<i>Triceratium insigne</i> f. <i>insignis</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia inverta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43595	USS Albatross	Mann (1925)
<i>Biddulphia juncatensis</i> (Grunow) Mann	<i>Biddulphia juncatensis</i> (Grunow) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia juncta</i> (A. Schmidt) Mann	<i>Amphipentas juncta</i> (A. Schmidt) De Toni	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia madagascarensis</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia membranacea</i> Cleve	<i>Biddulphiopsis membranacea</i> (Cleve) von Stosch & Simonsen	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia mobiliensis</i> Bailey	<i>Trieres mobiliensis</i> (Bailey) Ashworth & E.C. Theriot	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia papillata</i> (Grove & Sturt) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia pellucida</i> Castracane	<i>Triceratium pellucidum</i> (Castracane) Y.C. Guo, J. Ye, & H. Zhou	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Biddulphia pentacrinus</i> (Ehrenberg) Boyer	<i>Amphipentas pentacrinus</i> Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia petitiiana</i> (Leuduger-Fortmorel) Mann	<i>Terpsinoe petitiiana</i> (Leuduger-Fortmorel) N.I. Hendey	Philippine Islands	US N.M. cat. No. 43596	USS Albatross	Mann (1925)
<i>Biddulphia petittii</i> (Leuduger-Fortmorel) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia pulchella</i> Gray	<i>Biddulphia biddulphiana</i> (J.E. Smith) Boyer	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia punctata</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia pygmaea</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia reticulata</i> Roper	<i>Pseudictyota reticulata</i> (Roper) P.A. Sims & D.M. Williams	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia reticulata</i> var. <i>inermis</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Biddulphia retiformis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43597	USS Albatross	Mann (1925)
<i>Biddulphia robertsiana</i> (Greville) Boyer	<i>Triceratium robertsonianum</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia roperiana</i> Greville	<i>Odontella obtusa</i> Kützing	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia rudis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43598	USS Albatross	Mann (1925)
<i>Biddulphia schmidtii</i> (Janisch) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia scitula</i> (A. Schmidt) Mann	<i>Biddulphia scitula</i> Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia secedens</i> (A. Schmidt) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia setigera</i> (Bailey) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia spinulosa</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Biddulphia stokesiana</i> (Greville) Mann	<i>Entogniopsis stokesiana</i> (Greville) Witkowski, P.A. Sims, Strelnikova & D.M. Williams	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia tabellaria</i> (Brightwell) Boyer	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia temperei</i> (Brun) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia tripos</i> (Cleve) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia trisinua</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43599	USS Albatross	Mann (1925)
<i>Biddulphia tumescens</i> (Castracane) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia tuomeyi</i> (Bailey) Roper	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia turgida</i> W. Smith	<i>Odontella turgida</i> (Ehrenberg) Kützing	Philippine Islands		USS Albatross	Mann (1925)
<i>Biddulphia turrigera</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43600	USS Albatross	Mann (1925)
<i>Biddulphia undulosa</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43601	USS Albatross	Mann (1925)
<i>Campylodiscus adornatus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus adriaticus</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus ambiguus</i> Greville	<i>Coronia ambigua</i> (Greville) Ruck & Guiry	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus anceps</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger, USS Albatross	Castracane (1886); Mann (1925)
<i>Campylodiscus bellus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus biangulatus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus bilateralis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43602	USS Albatross	Mann (1925)
<i>Campylodiscus brightwellii</i> Grunow	Nom. illeg.	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus browneanus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus castracanei</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus cocconeiformis</i> Grunow	<i>Tryblioptychus cocconeiformis</i> (Grunow) Hendey	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus comptus</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus concinnus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus contiguus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus crebrecoastatus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus decorus</i> Brébisson	<i>Coronia decora</i> (Brébisson) Ruck & Guiry.	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus daemelianus</i> Grunow	<i>Coronia decora</i> (Brébisson) Ruck & Guiry	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus dentatus</i> Deby	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus displostictus</i> Norman	<i>Campylodiscus displostictus</i> G. Norman <i>ex</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus emarginatus</i> Deby	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Campylodiscus eximius</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus grevillei</i> Leuduger-Fortmorel	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus hibernicus</i> Ehrenberg	<i>Iconella hibernica</i> (Ehrenberg) Ruck & Nakov	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus hodgsonii</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus horologium</i> Williamson	<i>Campyloneis horologium</i> (W.C. Williamson) M. Nizamuddin	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus humilis</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Campylodiscus incertus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus inopinus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus intermedius</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus kinkeri</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus kittonianus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus kützingii</i> Harvey & Bailey	<i>Campylodiscus kutzingi</i> Harvey & Bailey	Philippines, Mindanao (type locality)	Lectotype: Farlow Herbarium Bailey collection 2145 (Cartesian coordinates, + 27.1-9.0), Edgar, 1979	US exploring (Wilkes)	Bailey (1853); Harvey and Bailey (1853); Edgar (1979)
<i>Campylodiscus latus</i> Shadbolt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus lepidus</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Campylodiscus ligulosus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43603	USS Albatross	Mann (1925)
<i>Campylodiscus limbatus</i> Brébisson	<i>Coronia limbata</i> (Brébisson) Ruck & Guiry	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus muelleri</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus nitens</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Campylodiscus ornatus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus perspicuus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43604	USS Albatross	Mann (1925)
<i>Campylodiscus pfitzneri</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus phalangium</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus philippinarum</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Campylodiscus punctulatus</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus rabenhorstianus</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus ralfsii</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus ratrayanus</i> Deby	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Campylodiscus rivalis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus robertsonianus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus samoensis</i> Grunow	<i>Coronia samoensis</i> (Grunow) Ruck & Guiry	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus taeniatus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus triumphans</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus wallichianus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Campylodiscus zebuanus</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Campyloneis grevillei</i> (W. Smith) Grunow	<i>Campyloneis grevillei</i> (W. Smith) Grunow & Eulenstein	Philippine Islands		USS Albatross	Mann (1925)
<i>Cestodiscus cinnamomeus</i> Grunow	<i>Cestodiscus cinnamomeus</i> (Greville) Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros affine</i> Lauder	<i>Chaetoceros affinis</i> Lauder	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros boreale</i> Bailey	<i>Chaetoceros borealis</i> Bailey	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros cellulosum</i> Lauder	<i>Chaetoceros lorenzianus</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros coarctatus</i> Lauder	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros curvisetum</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros diadema</i> (Ehrenberg) Gran	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros furca</i> Cleve	<i>Chaetoceros messanensis</i> Castracane	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros (Bacteriastrum) hebes</i> Mann	<i>Chaetoceros hebes</i> Mann	Philippine Islands (type locality)	Type: US N.M. cat. No. 43605	USS Albatross	Mann (1925)
<i>Chaetoceros lorenzianum</i> Grunow	<i>Chaetoceros lorenzianus</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros (Bacteriastrum) medusa</i> Mann	<i>Chaetoceros medusa</i> Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros (Bacteriastrum) princeps</i> Mann	<i>Chaetoceros princeps</i> Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros scolopendra</i> Cleve	<i>Chaetoceros radicans</i> F. Schütt	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros sociale</i> Lauder	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Chaetoceros (Bacteriastrum) varians</i> (Lauder) Van Heurck	<i>Bacteriastrum varians</i> Lauder	Philippine Islands		USS Albatross	Mann (1925)
<i>Chrysanthemodiscus floriatus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43606	USS Albatross	Mann (1925)
<i>Cistula lorenziana</i> (Grunow) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Clavícula polymorpha</i> Grunow	<i>Synedra polymorpha</i> (Grunow & Pantocsek) H.-J. Schrader	Philippine Islands		USS Albatross	Mann (1925)
<i>Climacosphenia elongata</i> Bailey	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Climacosphenia monilifera</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Climacosphenia scimitar</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43607	USS Albatross	Mann (1925)
<i>Cocconeis apiculata</i> A. Schmidt	<i>Achnanthes apiculata</i> (Greville) Riaux-Gobin, Compère, Hinz & Ector	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis circulifera</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. 43608	USS Albatross	Mann (1925)
<i>Cocconeis circumcincta</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Cocconeis citronella</i> Mann (?)	<i>Schizostauron citronella</i> (A. Mann) Górecka, Riaux-Gobin & Witkowski	Philippine Islands (type locality)	Type: US N.M. cat. No. 43609	USS Albatross	Mann (1925)
<i>Cocconeis composita</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis curvirota</i> Tempère & Brun	<i>Cocconeis heteroidea</i> var. <i>curvirota</i> (Tempère & Brun) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis cyclophora</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis distans</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis divisa</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis fulgur</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis heteroidea</i> Hantzsch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis insignis</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis ocellata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43610	USS Albatross	Mann (1925)
<i>Cocconeis oculus-cati</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis os-pristis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43611	USS Albatross	Mann (1925)
<i>Cocconeis pellucida</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis pinnata</i> Gregory	<i>Cocconeis pinnata</i> W. Gregory ex Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis pseudomarginata</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cocconeis transversa</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus africanus</i> Janisch	<i>Azpeitia africana</i> (Janisch ex A.W.F. Schmidt) G. Fryxell & T.P. Watkins	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus apollinis</i> Ehrenberg	<i>Charcotiella apollinis</i> (Ehrenberg) Blanco & Wetzel	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus asteromphalus</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus centralis</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus cervinus</i> (Brightwell) Ralfs	<i>Hyalodiscus cervinus</i> Brightwell	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus ciliatus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43612	USS Albatross	Mann (1925)
<i>Coscinodiscus concinnus</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus decrescens</i> Castracane	Name as is	Philippine Sea (type locality)		HMS Challenger	Castracane (1886)
<i>Coscinodiscus denticulatus</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus excentricus</i> Ehrenberg	<i>Thalassiosira eccentrica</i> (Ehrenberg) Cleve	Philippines, Sooloo Sea (Sulu)		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Coscinodiscus exiguus</i> Rattray	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus gazellae</i> Janisch	<i>Ethmodiscus gazellae</i> (Janisch ex Grunow) Husted	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus heteromorphus</i> Rattray	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus janischii</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus kuetzingii</i> A. Schmidt	<i>Actinocyclus kuetzingii</i> (A. Schmidt) Simonsen	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus lentiginosus</i> Janisch	<i>Thalassiosira lentiginosa</i> (Janisch) Fryxell	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Coscinodiscus leptopus</i> Grunow	<i>Thalassiosira leptopus</i> (Grunow) Hasle & G. Fryxell	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus lineatus</i> Ehrenberg	<i>Thalassiosira leptopus</i> (Grunow) Hasle & G. Fryxell	Philippine Islands		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Coscinodiscus marginatus</i> Ehrenberg	Name as is	Philippines, Sooloo Sea (Sulu)		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Coscinodiscus megacoccus</i> Castracane	Name as is	Philippine Sea (type locality)	Lectotype: BM 33784	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Coscinodiscus micans</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus nano-lineatus</i> Mann	<i>Thalassiosira nanolineata</i> (Mann) Fryxell & Hasle	Philippine Islands (type locality)	Type: US N.M. cat. No. 43613	USS Albatross	Mann (1925)
<i>Coscinodiscus nitidulus</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus nitidus</i> Gregory	<i>Psammodiscus nitidus</i> (Gregory) Round & Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus nobilis</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus nodulifer</i> Janisch	<i>Azpeitia nodulifera</i> (A. Schmidt) G.A. Fryxell & P.A. Sims	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus normanii</i> Gregory	<i>Actinocyclus normanii</i> (Gregory ex Greville) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus oculus-iridis</i> Ehrenberg	<i>Coscinodiscus oculus-iridis</i> (Ehrenberg) Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus praetextus</i> Janisch	<i>Coscinodiscus gigas</i> var. <i>praetextus</i> Janisch ex Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus pustulatus</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus radiatus</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus radiosus</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus reniformis</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)	Lectotype: BM 33797	HMS Challenger, USS Albatross	Castracane (1886); Mann (1925); Tuji <i>et al.</i> (2009)
<i>Coscinodiscus rex</i> Wallich	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus rudis</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Coscinodiscus scitulus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43614	USS Albatross	Mann (1925)
<i>Coscinodiscus subtilis</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus symmetricus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus tubiformis</i> Tempere & Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Coscinodiscus variolatus</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger, USS Albatross	Castracane (1886); Mann (1925)
<i>Craspedodiscus insignis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cyclophora tenuis</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Cyclotella crassilineata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43615	USS Albatross	Mann (1925)
<i>Cyclotella striata</i> (Kützing) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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<i>Cymatoneis circumvallata</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cymatoneis definita</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43616	USS Albatross	Mann (1925)
<i>Cymatoneis lacunata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43617	USS Albatross	Mann (1925)
<i>Cymatoneis sufflata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43618	USS Albatross	Mann (1925)
<i>Cymatoneis sulcata</i> (Greville) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Cymbella ehrenbergii</i> Kützting	<i>Cymbopleura inaequalis</i> (Ehrenberg) Krammer	Philippine Islands		USS Albatross	Mann (1925)
<i>Cymbella gastroides</i> Kützting	<i>Cymbella aspera</i> (Ehrenberg) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Denticella biddulphia</i> Ehrenberg	Name as is	Philippine Islands		US exploring (Wilkes)	Bailey (1853)
<i>Dimeregramma bilineatum</i> (Cleve & Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Dimeregramma fluens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43619	USS Albatross	Mann (1925)
<i>Dimeregramma inflatum</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Dimeregramma minor</i> (Gregory) Ralfs	<i>Plagiogramma minus</i> (W. Gregory) Chunlian Li, Ashworth & Witkowski	Philippine Islands		USS Albatross	Mann (1925)
<i>Dimeregramma nanum</i> (Gregory) Ralfs	<i>Plagiogramma minus</i> var. <i>nanum</i> (W. Gregory) Chunlian Li, Ashworth & Witkowski	Philippine Islands		USS Albatross	Mann (1925)
<i>Dimeregramma opulens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43620	USS Albatross	Mann (1925)
<i>Dimeregramma prismaticum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43621	USS Albatross	Mann (1925)
<i>Ditylum brightwellii</i> (West) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Donkinia carinata</i> (Donkin) Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Donkinia reticulata</i> Norman	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Echinodiscus vermiculatus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43622	USS Albatross	Mann (1925)
<i>Endictya margaritifera</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43623	USS Albatross	Mann (1925)
<i>Endictya minor</i> A. Schmidt	<i>Endictya oceanica</i> var. <i>minor</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Endictya oceanica</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Epithemia zebra</i> (Ehrenberg) Kützting	<i>Epithemia adnata</i> (Kützting) Brébisson	Philippine Islands		USS Albatross	Mann (1925)
<i>Euodia janischii</i> Grunow	<i>Leudugeria janischii</i> (Grunow) Tempère ex Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Fragilaria angustata</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Fragilaria dubia</i> Grunow	<i>Hendeyella dubia</i> (Grunow) Li, Witkowski & Ashworth	Philippine Islands		USS Albatross	Mann (1925)
<i>Gaillionella sulcata</i> Ehrenberg	<i>Paralia sulcata</i> (Ehrenberg) Cleve	Philippines, Sooloo Sea (Sulu)		US exploring (Wilkes)	Bailey (1853)
<i>Glyphodesmis acus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43624	USS Albatross	Mann (1925)
<i>Glyphodesmis challengerensis</i> Castracane	Name as is	Philippine Sea (type locality)	Lectotype: BM 33794	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Glyphodesmis elongata</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Glyphodesmis margaritacea</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)	BM: 33792	HMS Challenger, USS Albatross	Castracane (1886); Mann (1925); Tuji <i>et al.</i> (2009)
<i>Glyphodesmis murrayana</i> Castracane	Name as is	Philippine Islands (type locality)	Holotype: BM 33793	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Grammatophora fundata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43625	USS Albatross	Mann (1925)
<i>Grammatophora islandica</i> Ehrenberg	<i>Grammatophora angulosa</i> var. <i>islandica</i> (Ehrenberg) Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Grammatophora marina</i> (Lyngbye) Kützing	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Grammatophora oceanica</i> Ehrenberg	Name as is	Philippines, Sooloo Sea (Sulu)		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Grammatophora probata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43626	USS Albatross	Mann (1925)
<i>Hemidiscus capillaris</i> Brun	<i>Euodia capillaris</i> Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus cuneiformis</i> Wallich	<i>Actinocyclus cuneiformis</i> (Wallich) F. Gómez, Lu Wang & Senjie Lin	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus hardmanianus</i> (H.L. Smith) Mann	<i>Palmerina hardmaniana</i> (Greville) G.R. Hasle	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus inornatus</i> Castracane	<i>Actinocyclus cuneiformis</i> (Wallich) F. Gómez, Lu Wang & Senjie Lin	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus janischii</i> Grunow	<i>Leudugeria janischii</i> (Grunow) Tempère ex Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus radiatus</i> (Castracane) Mann	<i>Actinocyclus cuneiformis</i> (Wallich) F. Gómez, Lu Wang & Senjie Lin	Philippine Islands		USS Albatross	Mann (1925)
<i>Hemidiscus ventricosus</i> (Castracane) Mann	<i>Actinocyclus cuneiformis</i> (Wallich) F. Gómez, Lu Wang & Senjie Lin	Philippine Islands		USS Albatross	Mann (1925)
<i>Henshawia biddulphioides</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43627	USS Albatross	Mann (1925)
<i>Hercotheca inermis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43628	USS Albatross	Mann (1925)
<i>Heterodictyon jeffreysianum</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Hyalodiscus annulus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43629	USS Albatross	Mann (1925)
<i>Hyalodiscus argus</i> (Grunow) Mann	<i>Podosira argus</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Hyalodiscus aspersus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43630	USS Albatross	Mann (1925)
<i>Hyalodiscus cervinus</i> Brightwell	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Hyalodiscus hirtus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43631	USS Albatross	Mann (1925)
<i>Hyalodiscus laevis</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Hyalodiscus propeplanus</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43632	USS Albatross	Mann (1925)
<i>Hyalodiscus stelliger</i> Bailey	<i>Podosira stelligera</i> (Bailey) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Hyalodiscus subtilis</i> Bailey	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Hydrosilicon rimosa</i> (O'Meara) Brun	<i>Amphiprora rimosa</i> O'Meara	Philippine Islands		USS Albatross	Mann (1925)
<i>Isthmia minima</i> Harvey & Bailey	Name as is	Philippines, Mindanao, Sooloo (Sulu) (Type locality)	Boyer Collection, PH slide X-1-7	US exploring (Wilkes), USS Albatross	Bailey (1853); Harvey and Bailey (1853); Mann (1925); Edgar (1979)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
Lauderia elongata Castracane	Name as is	Philippine Sea (type locality)		HMS Challenger	Castracane (1886)
Lauderia pumila Castracane	Denotula pumila (Castracane) Gran	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Leudugeria janischii</i> Grunow	<i>Leudugeria janischii</i> (Grunow) Tempère ex Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Licmophora debyi</i> (Leuduger-Fortmorel) Mann	<i>Licmophora debyi</i> Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Licmophora ovata</i> (W. Smith) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Mastogloia achnanthioides Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43633	USS Albatross	Mann (1925)
Mastogloia capax Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43634	USS Albatross	Mann (1925)
<i>Mastogloia cebuensis</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia cocconeiformis</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia cruciata</i> (Leuduger-Fortmorel) A. Schmidt	<i>Mastogloia cruciata</i> (Leuduger- Fortmorel) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia egregia</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia elegans</i> Lewis	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Mastogloia fusiformis Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43635	USS Albatross	Mann (1925)
<i>Mastogloia gruendleri</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Mastogloia imitatrix Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43636	USS Albatross	Mann (1925)
<i>Mastogloia javanica</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia jelineckiana</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia lemniscata</i> Leuduger-Fortmorel	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia leudugeri</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia lineata</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia oculiformis</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia ovata</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia ovum-paschale</i> (A. Schmidt) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia pulchella</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia quinquecostata</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia rhombus</i> (Petit) Cleve	<i>Mastogloia rhombus</i> (Petit) Cleve & Grove	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia sansibarica</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia seriata</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia sinuata</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia splendida</i> (Gregory) Cleve	<i>Mastogloia splendida</i> (Gregory) H. Peragallo	Philippine Islands		USS Albatross	Mann (1925)
<i>Mastogloia squamosa</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Melosira coronaria</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
Melosira dura Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43637	USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Melosira gowenii</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Melosira incompta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43638	USS Albatross	Mann (1925)
<i>Melosira madagascarensis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Melosira mediterranea</i> Grunow	<i>Melosira mediterranea</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula abrupta</i> Gregory var.?	<i>Lyrella abrupta</i> (Gregory) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula acrosphaeria</i> (Brébisson) Kützing	<i>Pinnularia gibbiformis</i> Krammer	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula aestiva</i> Donkin	<i>Diploneis aestiva</i> (Donkin) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula angulosa</i> Gregory	<i>Navicula palpebralis</i> var. <i>angulosa</i> (Gregory) Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula antillarum</i> (Cleve) Mann	<i>Trachyneis antillarum</i> (Cleve & Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula approximata</i> Greville	<i>Lyrella approximata</i> (Greville) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula aspera</i> Ehrenberg	<i>Trachyneis aspera</i> (Ehrenberg) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula barbitos</i> A. Schmidt	<i>Lyrella barbitos</i> (A. Schmidt) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula beyrichiana</i> A. Schmidt	<i>Diploneis beyrichiana</i> (A. Schmidt) Amossé	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula biclavata</i> Cleve & Grove	<i>Caloneis biclavata</i> (Cleve & Grove) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula biformis</i> (Grunow) Mann	<i>Mastoneis biformis</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula bigemmata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43639	USS Albatross	Mann (1925)
<i>Navicula bleischiana</i> Janisch & Rabenhorst	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula bomboides</i> A. Schmidt	<i>Diploneis splendida</i> Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula branchiata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43640	USS Albatross	Mann (1925)
<i>Navicula brasiliense</i> Grunow	<i>Cosmioneis brasiliiana</i> (Cleve) C.E. Wetzel & Ector	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula bullata</i> Norman	<i>Navicula lyra</i> f. <i>bullata</i> (G. Norman) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula bullata</i> var. <i>rhomboidea</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Navicula caeca</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43641	USS Albatross	Mann (1925)
<i>Navicula californica</i> Greville	<i>Lyrella californica</i> (Greville) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula campylodiscus</i> Grunow	<i>Diploneis campylodiscus</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula caribaea</i> Cleve	<i>Lyrella clavata</i> var. <i>caribaea</i> (Cleve) Siqueiros-Beltrones	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula carinifera</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula castracanei</i> Grunow	<i>Caloneis castracanei</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula chersonensis</i> Grunow	<i>Diploneis chersonensis</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula circumsecta</i> Grunow	<i>Lyrella circumsecta</i> (Grunow ex A. Schmidt) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula clavata</i> Gregory	<i>Lyrella clavata</i> (Gregory) D. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula clepsydra</i> Donkin	<i>Trachyneis clepsydra</i> (Donkin) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula coarctata</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Navicula consors</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula corpulenta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43642	USS Albatross	Mann (1925)
<i>Navicula crabro</i> (Ehrenberg) Kützing	<i>Diploneis crabro</i> (Ehrenberg) Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula cuspidata</i> Kützing	<i>Craticula cuspidata</i> (Kützing) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula cyclops</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43643	USS Albatross	Mann (1925)
<i>Navicula decipiens</i> Castracane	Nom. illeg.	Philippine Sea (type locality)		HMS Challenger	Castracane (1886)
<i>Navicula delecta</i> Mann	<i>Progonoia delecta</i> (A. Mann) H.-J. Schrader	Philippine Islands (type locality)	Type: US N.M. cat. No. 43644	USS Albatross	Mann (1925)
<i>Navicula didyma</i> Ehrenberg	<i>Diploneis didymus</i> (Ehrenberg) Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula diffusa</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula diplosticta</i> Grunow	<i>Diploneis diplosticta</i> (Grunow) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula durandii</i> Kitton	<i>Lyrella durandii</i> (Kitton) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula elongata</i> Grunow	<i>Caloneis elongata</i> (Grunow) Boyer	Philippine Islands		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925); Edgar (1979)
<i>Navicula erythraea</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula eudoxia</i> A. Schmidt variety	<i>Diploneis eudoxia</i> (A Schmidt) Jørgensen	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula excavata</i> Greville, wide variety	<i>Lyrella excavata</i> (Greville) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula eximia</i> Grunow	<i>Navicula eximia</i> (Grunow) Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula expedita</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula forcipata</i> Greville	<i>Fallacia forcipata</i> (Greville) Stickle & D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula formicina</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula funiculata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43645	USS Albatross	Mann (1925)
<i>Navicula fusca</i> (Gregory) Ralfs	<i>Diploneis fusca</i> (W. Gregory) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula gemmata</i> Greville	<i>Diploneis gemmata</i> (Greville) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula gemmulata</i> Grunow	<i>Diploneis gemmatula</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula glabrissima</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43646	USS Albatross	Mann (1925)
<i>Navicula graeffii</i> Grunow	<i>Diploneis graeffii</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula (Alloionesis) gruendleri</i> Cleve	<i>Navicula gruendleri</i> (Cleve & Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula hamulifera</i> Grunow	<i>Parlibellus hamulifer</i> (Grunow) E.J. Cox	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula hennedyi</i> W. Smith	<i>Lyrella hennedyi</i> (W. Smith) Stickle & D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula hospes</i> A. Schmidt	<i>Diploneis littoralis</i> var. <i>hospes</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula imitans</i> Mann	<i>Lyrella imitans</i> (A. Mann) D.G. Mann	Philippine Islands (type locality)	Type: US N.M. cat. No. 43647	USS Albatross	Mann (1925)
<i>Navicula indica</i> Greville	<i>Navicula clavata</i> f. <i>indica</i> (Greville) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula indigena</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43648	USS Albatross	Mann (1925)
<i>Navicula inexacta</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Navicula ingens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43649	USS Albatross	Mann (1925)
<i>Navicula inhalata</i> A. Schmidt	<i>Lyrella inhalata</i> (A. Schmidt) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula intercedens</i> A. Schmidt	<i>Progonoia intercedens</i> (A. Schmidt) Lobban	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula invenusta</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula iridis</i> Ehrenberg	<i>Neidium iridis</i> (Ehrenberg) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula janischii</i> Castracane	<i>Dictyoneis marginata</i> var. <i>janischii</i> (Castracane) Cleve	Philippines, Zebu (Cebu) (type locality)	Lectotype: BM no. 33808	HMS Challenger	Castracane (1886)
<i>Navicula jejuna</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula jugata</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula lacrimans</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula liber</i> W. Smith	<i>Caloneis liber</i> (W. Smith) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula littoralis</i> Donkin	<i>Diploneis littoralis</i> (Donkin) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula longa</i> (Gregory) Ralfs	<i>Diploneis littoralis</i> (Donkin) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula lyra</i> Ehrenberg	<i>Lyrella lyra</i> (Ehrenberg) Karayeva	Philippine Islands		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Navicula lyra</i> Ehrenberg var. <i>signata</i> A. Schmidt	<i>Navicula lyra</i> var. <i>signata</i> A. Schmidt	Philippine Islands	BM: 33809	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Navicula madagascarensis</i> Cleve	<i>Oestrupia madagascarensis</i> (Cleve) H.-J. Schrader	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula mammalis</i> Castracane	Name as is	Near Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Navicula margarita</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula marginata</i> Lewis	<i>Dictyoneis marginata</i> (Lewis) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula maxima</i> Gregory	<i>Caloneis liber</i> (W. Smith) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula mendica</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43650	USS Albatross	Mann (1925)
<i>Navicula mexicana</i> (Heiden) Mann	<i>Caloneis mexicana</i> Heiden	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula mimula</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula mirabilis</i> Castracane	Nom. Illeg.	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Navicula mirabilis</i> Leuduger-Fortmorel	<i>Progonoia mirabilis</i> (Leuduger-Fortmorel) H.-J. Schrader	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula molesta</i> Mann	Name as is	Philippines, Mindanao, Sulu, Jolo (type locality)	Type: US N.M. cat. No. 43651	USS Albatross	Mann (1925)
<i>Navicula multicostata</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula nebulosa</i> Grunow	<i>Lyrella nebulosa</i> (Gregory) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula nitescens</i> Ralfs	<i>Diploneis nitescens</i> (Gregory) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula notabilis</i> Greville	<i>Diploneis notabilis</i> (Greville) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula nummularia</i> Greville	<i>Fallacia nummularia</i> (Greville) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula oamaruensis</i> Grunow	<i>Lyrella oamaruensis</i> (Grunow ex A. Schmidt) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Navicula obesa</i> (Greville) Mann	<i>Achnanthes obesa</i> (Greville) Riaux-Gobin, Compère, Hinz & Ector	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula ocellata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43652	USS Albatross	Mann (1925)
<i>Navicula ophiocephala</i> Cleve & Grove	<i>Caloneis ophiocephala</i> (Cleve & Grove) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula oscitans</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula oswaldii</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula pacifica</i> (Castracane) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula pandura</i> Brébisson	<i>Diploneis crabro</i> var. <i>pandura</i> (Brébisson) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula partita</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43653	USS Albatross	Mann (1925)
<i>Navicula patricia</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43654	USS Albatross	Mann (1925)
<i>Navicula pelagi</i> A. Schmidt	<i>Diploneis fusca</i> var. <i>pelagi</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula petitiana</i> Grunow	<i>Caloneis petitiana</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula philippinarum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43655	USS Albatross	Mann (1925)
<i>Navicula pinguis</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula plicatula</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula praetexta</i> Ehrenberg	<i>Lyrella praetexta</i> (Ehrenberg) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula pristiophora</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula probabilis</i> A. Schmidt	<i>Caloneis probabilis</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula prodiga</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula pseudo-clavata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43656	USS Albatross	Mann (1925)
<i>Navicula pudens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43657	USS Albatross	Mann (1925)
<i>Navicula puella</i> A. Schmidt	<i>Diploneis puella</i> (Schumann) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula pugio</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43658	USS Albatross	Mann (1925)
<i>Navicula pulvulenta</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43659	USS Albatross	Mann (1925)
<i>Navicula raeana</i> (Castracane) Cleve	<i>Pinnulariosigma raëanum</i> (Castracane) Desikachary, Raja Rao & Sridharan	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula rectangulata</i> Gregory	<i>Pinnularia rectangulata</i> (Gregory) Rabenhorst	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula retinenda</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula retrostauros</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43660	USS Albatross	Mann (1925)
<i>Navicula rhombica</i> Gregory	<i>Parlibellus rhombicus</i> (Gregory) E.J. Cox	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula robusta</i> Grunow	<i>Caloneis robusta</i> Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula samoensis</i> Grunow	<i>Caloneis samoensis</i> (Grunow) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula seductilis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula semistauros</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43661	USS Albatross	Mann (1925)
<i>Navicula separabilis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula serratula</i> Grunow	<i>Diploneis serratula</i> (Grunow) Hustedt	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Navicula simulator</i> Mann	<i>Diploneis simulator</i> (A. Mann) F.W. Mills	Philippine Islands (type locality)	Type: US N.M. cat. No. 43662	USS Albatross	Mann (1925)
<i>Navicula smithii</i> Brébisson	<i>Diploneis smithii</i> (Brébisson) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula spectabilis</i> Castracane	Nom. illeg.	Philippines, Zebu (Cebu) (type locality)	BM: 33807	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Navicula spectabilis</i> Gregory	<i>Lyrella spectabilis</i> (Gregory) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula spiculifera</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43663	USS Albatross	Mann (1925)
<i>Navicula splendida</i> Gregory	<i>Diploneis splendida</i> Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula subacuta</i> (Ehrenberg) Ralfs	<i>Navicula major</i> var. <i>subacuta</i> (Ehrenberg) Fricke	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula suboscitans</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula suffocata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43664	USS Albatross	Mann (1925)
<i>Navicula sulcata</i> Greville	<i>Cymatoneis sulcata</i> (Greville) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula (Dictotyoneis) thumii</i> Cleve, misnamed	<i>Navicula thumii</i> (Cleve) Schüt	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula translucens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43665	USS Albatross	Mann (1925)
<i>Navicula turgescens</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula vacillans</i> A. Schmidt	<i>Diploneis vacillans</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula velata</i> A. Schmidt	<i>Trachyneis velata</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula venusta</i> Janisch	<i>Lyrella venusta</i> (Janisch ex Cleve) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula vesparella</i> Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula vulpecula</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula weissflogii</i> A. Schmidt	<i>Diploneis weissflogii</i> (A. Schmidt) Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula yarrensensis</i> Grunow	<i>Pinnunavis yarrensensis</i> (Grunow) H. Okuno	Philippine Islands		USS Albatross	Mann (1925)
<i>Navicula zanzibarica</i> Greville var. <i>zebuana</i> Castracane	<i>Navicula zanzibarica</i> var. <i>zebuana</i> Castracane	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Navicula zostereti</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia alata</i> Leuduger-Fortmorel	<i>Nitzschia nicobarica</i> var. <i>alata</i> (Leuduger-Fortmorel) Amossé	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia bisculpta</i> Mann	<i>Psammodictyon bisculptum</i> (A. Mann) D.G. Mann	Philippine Islands (type locality)	Type: US N.M. cat. No. 43666	USS Albatross	Mann (1925)
<i>Nitzschia campechiana</i> Grunow	<i>Tryblionella campechiana</i> (Grunow) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia cocconeiformis</i> Grunow	<i>Giffenia cocconeiformis</i> (Grunow) Round & Basson	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia distans</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia fluminensis</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia graeffei</i> Grunow	<i>Tryblionella graeffii</i> (Grunow ex Cleve) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia granulata</i> Grunow	<i>Tryblionella granulata</i> (Grunow) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia insignis</i> Gregory	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia littoralis</i> Grunow	<i>Tryblionella littoralis</i> (Grunow) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia majuscula</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Nitzschia marginulata</i> Grunow	<i>Tryblionella marginulata</i> (Grunow) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia obesa</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger, USS Albatross	Castracane (1886); Mann (1925)
<i>Nitzschia panduriformis</i> Gregory	<i>Psammodictyon panduriforme</i> (Gregory) D.G. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia plana</i> W. Smith var. <i>zebuana</i> Castracane	<i>Nitzschia plana</i> var. <i>zebuana</i> Castracane	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Nitzschia pulcherrima</i> Kitton	<i>Nitzschia pulcherrima</i> (Grunow ex Kitton) Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia spathulata</i> Brébisson	<i>Nitzschia spathulata</i> Brébisson ex W. Smith	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia superba</i> Leuduger-Fortmorel	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia tryblionella</i> Hantzsch	<i>Tryblionella hantzschiana</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia tubicola</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia valida</i> Cleve & Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia vermiculata</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger, USS Albatross	Castracane (1886); Mann (1925)
<i>Nitzschia weissflogii</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Nitzschia zebuana</i> Mann	<i>Tryblionella zebuana</i> (A. Mann) D.G. Mann	Philippine Islands (type locality)		USS Albatross	Mann (1925)
<i>Omphalopelta shrubsoliana</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)	Type: US N.M. cat. No. 43667	HMS Challenger	Castracane (1886)
<i>Omphalopsis australis</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pinnularia didyma</i> Ehrenberg	<i>Diploneis didymus</i> (Ehrenberg) Ehrenberg	Philippine Islands		US exploring (Wilkes)	Bailey (1853)
<i>Pinnularia račana</i> Castracane	<i>Pinnulariosigma račanum</i> (Castracane) Desikachary, Raja Rao & Sridharan	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Plagiogramma antillarum</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma approximatum</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma attenuatum</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma distinctum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43668	USS Albatross	Mann (1925)
<i>Plagiogramma gregorianum</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma nankooense</i> Grunow	<i>Glyphodesmis nankooense</i> (Grunow) Kolbe	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma obesum</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma papilio</i> Cleve & Grove	<i>Glyphodesmis papilio</i> (Cleve & Grove) Desikachary & Gowthaman	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma polygibbum</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma sulcatum</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Plagiogramma tessellatum</i> Greville	<i>Plagiogramma tessellatum</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma acus</i> Mann	Name as is	Philippines, Sulu Islands, Jolo (type locality)	Type: US N.M. cat. No. 43669	USS Albatross	Mann (1925)

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<i>Pleurosigma affine</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma angulatum</i> W. Smith	<i>Pleurosigma angulatum</i> (J.T. Quekett) W. Smith	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma balticum</i> (Ehrenberg) W. Smith	<i>Gyrosigma balticum</i> (Ehrenberg) Rabenhorst	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma dolosum</i> Mann	Name as is	Philippines, Jolo , Sulu Islands, (type locality)	Type: US N.M. cat. No. 43670	USS Albatross	Mann (1925)
<i>Pleurosigma elegantissimum</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma elongatum</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma exemptum</i> Mann	Name as is	Philippines, Jolo , Sulu Islands, (type locality)	Type: US N.M. cat. No. 43671	USS Albatross	Mann (1925)
<i>Pleurosigma falx</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43672	USS Albatross	Mann (1925)
<i>Pleurosigma formosum</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma hamuliferum</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma heros</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma italicum</i> Peragallo	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma japonicum</i> Castracane	<i>Pleurosigma inflatum</i> Shadbolt	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma lanceolatum</i> Donkin	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma latum</i> Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma naviculaceum</i> Brébisson	<i>Pleurosigma inflatum</i> Shadbolt	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma nicobaricum</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma normanii</i> Ralfs	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma obesum</i> Mann	<i>Pleurosigma exemptum</i> A. Mann	Philippine Islands (type locality)	Type: US N.M. cat. No. 43673	USS Albatross	Mann (1925)
<i>Pleurosigma obtusum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43674	USS Albatross	Mann (1925)
<i>Pleurosigma prisma</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43675	USS Albatross	Mann (1925)
<i>Pleurosigma rhombeum</i> Grunow	<i>Pleurosigma rhombeum</i> (Grunow) H. Peragallo	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma rigens</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43676	USS Albatross	Mann (1925)
<i>Pleurosigma rigidum</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma simile</i> Grunow	<i>Gyrosigma simile</i> (Grunow) Boyer	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma strigosum</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma subrigidum</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pleurosigma soluense</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43677	USS Albatross	Mann (1925)
<i>Podocystis spathulata</i> (Shadbolt) Van Heurck	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Porpeia quadriceps</i> Bailey	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Pseudo-eunotia doliolus</i> (Wallich) Grunow	<i>Fragilariopsis doliolus</i> (Wallich) Medlin & P.A. Sims	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhabdonema adriaticum</i> Kützing	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Rhabdonema arcuatum</i> (Lyngbye) Kützing	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhabdonema mirificum</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhabdonema sutum</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43678	USS Albatross	Mann (1925)
<i>Rhaphoneis amphiceros</i> Ehrenberg	<i>Rhaphoneis amphiceros</i> (Ehrenberg) Ehrenberg	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhaphoneis bilineata</i> Cleve	<i>Dimeregramma bilineatum</i> (Cleve & Grunow) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhizosolenia setigera</i> Brightwell	<i>Sundstroemia setigera</i> (Brightwell) Medlin	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhoicosigma compactum</i> (Greville) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhoicosigma oceanicum</i> Peragallo	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhoicosigma robustum</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rhoicosigma weissflogii</i> Grunow	<i>Cochlearisigma weissflogii</i> (Grunow) G. Reid	Philippine Islands		USS Albatross	Mann (1925)
<i>Roperia tessellata</i> (Roper) Grunow	<i>Roperia tessellata</i> (Roper) Grunow ex Pelletan	Philippine Islands		USS Albatross	Mann (1925)
<i>Rutilaria edentula</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Rutilaria philippinarum</i> Cleve & Grove	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rutilaria pulchra</i> A. Schmidt	<i>Rutilaria philippinarum</i> Cleve & Grove	Philippine Islands		USS Albatross	Mann (1925)
<i>Rutilaria tenuicornis</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Rutilaria tulkii</i> Castracane	Name as is	Philippines, Zamboangan (Zamboanga) (type locality)		HMS Challenger	Castracane (1886)
<i>Sceptroneis cuneata</i> Grunow	<i>Synedrosphenia cuneata</i> (Grunow) Azpeitia Moros	Philippine Islands		USS Albatross	Mann (1925)
<i>Scoliopleura partistriata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43679	USS Albatross	Mann (1925)
<i>Skeletonema mediterraneanum</i> (Grunow) Brun	<i>Skeletonema mediterranea</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Skeletonema mirabile</i> Grunow	<i>Skeletonema mirabile</i> Grunow ex Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Stephanopyxis aculeata</i> (Ehrenberg) Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stephanopyxis brunii</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stephanopyxis kittoniana</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Stephanopyxis turris</i> (Greville) Ralfs	<i>Eupyxidicula turris</i> (Greville) S. Blanco & C.E. Wetzel	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictocyclus varicus</i> Mann	<i>Stictocyclus stictodiscus</i> (Grunow) R. Ross	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodesmis australis</i> Greville	<i>Climaconeis lorenzii</i> Grunow	Philippine, Sulu Islands, Jolo		USS Albatross	Mann (1925)
<i>Stictodiscus affinis</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)	BM: 33787 Depth (fathoms): 100	HMS Challenger, USS Albatross	Castracane (1886); Mann (1925); Tuji <i>et al.</i> (2009)
<i>Stictodiscus affinis</i> Castracane var. Castracane?	Nom. illeg.	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Stictodiscus affinis</i> var. <i>late-zonata</i> Castracane	<i>Stictodiscus affine</i> var. <i>late-zonata</i> Castracane	Philippines, Manila (type locality)	Lectotype: BM: 33788 Depth (fathoms): 100	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Stictodiscus argus</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus bicornatus</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus californicus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus eulensteinii</i> (Grunow) Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus japonicus</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus kittonianus</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus margaritaceus</i> Castracane	Name as is	Philippine Islands (type locality)	Holotype: BM: 33783 Depth (fathoms):705	HMS Challenger	Castracane (1886); Tuji <i>et al.</i> (2009)
<i>Stictodiscus multifurcatus</i> Bergon	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus multiplex</i> Janisch	<i>Trigonium multiplex</i> (Janisch) A. Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus nankoorensis</i> Grunow	<i>Stictodiscus californicus</i> var. <i>nankoorensis</i> Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus nitidus</i> Grove & Sturt	<i>Stictodiscus californicus</i> var. <i>nitida</i> Grove & Sturt	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus parallelus</i> (Greville) Grove & Sturt	<i>Stictodiscus gibbosus</i> (Grove & Sturt) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus radfordianus</i> Castracane	Name as is	Philippine Archipelago (type locality)		HMS Challenger, USS Albatross	Castracane (1886); Mann (1925)
<i>Stictodiscus radiatus</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)	BM: 33791	HMS Challenger, USS Albatross	Castracane (1886); Mann (1925); Tuji <i>et al.</i> (2009)
<i>Stictodiscus reticulatus</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Stictodiscus simplex</i> A. Schmidt	<i>Cladogramma simplex</i> (A. Schmidt) Kuntze	Philippine Islands		USS Albatross	Mann (1925)
<i>Stictodiscus varians</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Stoschia admirabilis</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella bertiloni</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43681	USS Albatross	Mann (1925)
<i>Surirella castracanei</i> De Toni	<i>Surirella sumbawana</i> A. Schmidt	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella ceylanensis</i> Leuduger-Fortmorel	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella comis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella concentrica</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43682	USS Albatross	Mann (1925)
<i>Surirella contigua</i> Mann	<i>Petrodictyon contiguum</i> (A. Mann) D.G. Mann	Philippine Islands (type locality)	Type: US N.M. cat. No. 43683	USS Albatross	Mann (1925)
<i>Surirella continuata</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43684	USS Albatross	Mann (1925)
<i>Surirella cuneata</i> A. Schmidt	<i>Surirella fastuosa</i> var. <i>cuneata</i> O. Witt	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella cuneatella</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43685	USS Albatross	Mann (1925)
<i>Surirella curvifacies</i> Brun	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Surirella deflexa</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella dives</i> Castracane	<i>Surirella fastuosa</i> var. <i>dives</i> (Castracane) Deby ex. F.W. Wills	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Surirella facilis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43686	USS Albatross	Mann (1925)
<i>Surirella fastuosa</i> Ehrenberg	<i>Campylodiscus neofastuosus</i> Ruck & Nakov	Philippines, Sooloo Sea (Sulu)		US exploring (Wilkes), USS Albatross	Bailey (1853); Mann (1925)
<i>Surirella fausta</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella fluminensis</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella grandiuscula</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella gravis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43687	USS Albatross	Mann (1925)
<i>Surirella hybrida</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella imitans</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43688	USS Albatross	Mann (1925)
<i>Surirella incurvata</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella intercedens</i> Grunow	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella lata</i> W. Smith	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella laxa</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella macraeana</i> Greville	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella mollis</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella multicostata</i> Castracane	<i>Suriraya castracanei</i> De Toni	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Surirella orientalis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43689	USS Albatross	Mann (1925)
<i>Surirella patens</i> A. Schmidt	<i>Surirella lorenziana</i> var. <i>patens</i> (A. Schmidt) Deby	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella recedens</i> A. Schmidt	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella reniformis</i> Grunow	<i>Surirella gemma</i> var. <i>reniformis</i> Proshkina-Lavrenko	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella schleinitzii</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella significans</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43690	USS Albatross	Mann (1925)
<i>Surirella studeri</i> Janisch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Surirella suluensis</i> Mann	Name as is	Philippine, Sulu Islands, Jolo (type locality)	Type: US N.M. cat. No. 43691	USS Albatross	Mann (1925)
<i>Surirella tahitiana</i> Castracane	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Syndendrium diadema</i> Ehrenberg	<i>Chaetoceros diadema</i> (Ehrenberg) Gran	Philippine Islands		USS Albatross	Mann (1925)
<i>Synedra capitulata</i> Castracane	<i>Thalassionema nitzschioides</i> var. <i>capitulatum</i> (HJ Schrader) JL Moreno-Ruiz	Philippine Islands		HMS Challenger	Castracane (1886)
<i>Synedra crystallina</i> (Agardh) Kützing	<i>Ardissonea crystallina</i> (C. Agardh) Grunow	Philippine Islands		USS Albatross	Mann (1925)
<i>Synedra cuneata</i> (Grunow) Peragallo	<i>Ardissonea cuneata</i> Mills	Philippine Islands		USS Albatross	Mann (1925)
<i>Synedra fimbriata</i> Castracane	Name as is	Philippine Islands (type locality)		HMS Challenger	Castracane (1886)
<i>Synedra fulgens</i> W. Smith	<i>Synedra fulgens</i> (Greville) W. Smith	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Synedra philippinarum</i> Castracane	Name as is	Philippine Islands	(type locality)	HMS Challenger	Castracane (1886)
<i>Synedra pulcherrima</i> Hantzsch	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Synedra robusta</i> Ralfs	<i>Ardissonaea robusta</i> (Ralfs) De Notaris	Philippine Islands		USS Albatross	Mann (1925)
<i>Synedra undulata</i> (Bailey) W. Smith	<i>Toxarium undulatum</i> Bailey	Philippine Islands		USS Albatross	Mann (1925)
<i>Syringidium daemon</i> Greville	<i>Cerataulina daemon</i> (Greville) Hasle	Philippine Islands		USS Albatross	Mann (1925)
<i>Tetragramma asiatica</i> Ehrenberg	<i>Terpsinoë asiatica</i> Ehrenberg	Philippine Islands		US exploring (Wilkes)	Bailey (1853)
<i>Terpsinoe intermedia</i> Grunow	<i>Terpsinoë musica</i> var. <i>intermedia</i> (Grunow) Hustedt	Philippine Islands		USS Albatross	Mann (1925)
<i>Terpsinoë musica</i> Ehrenberg	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Thalassiothrix frauenfeldii</i> Grunow	<i>Thalassiothrix frauenfeldii</i> (Grunow) Tempere & Peragallo	Philippine Islands		USS Albatross	Mann (1925)
<i>Tribrachia pellucida</i> Mann	<i>Pseudotribrachia pellucida</i> (Mann) Blanco & Wetzel	Philippine Islands	Type: US N.M. cat. No. 43692	USS Albatross	Mann (1925)
<i>Triceratium coronatum</i> Castracane	Name as is	Philippines, Zebu (Cebu) (type locality)		HMS Challenger	Castracane (1886)
<i>Triceratium favus</i> Bailey	<i>Triceratium favus</i> Ehrenberg	Philippines, Mindanao, Sulu		US exploring (Wilkes)	Bailey (1853)
<i>Triceratium grunowianum</i> Castracane	<i>Biddulphia grunowiana</i> (Castracane) A. Mann	Philippine Islands	(type locality)	HMS Challenger	Castracane (1886)
<i>Triceratium insutum</i> Castracane	Name as is	Philippine Sea	(type locality)	HMS Challenger	Castracane (1886)
<i>Triceratium orientale</i> Harvey & Bailey	Name as is	Philippines, Mindanao (type locality)	Lectotype: Farlow Herbarium Bailey Collection 2145 (Cartesian coordinates, +16.6-13.3)	US exploring (Wilkes)	Bailey (1853); Harvey and Bailey (1853); Edgar (1979)
<i>Triceratium pulvillus</i> Castracane	Name as is	Philippine Sea	(type locality)	HMS Challenger	Castracane (1886)
<i>Trigonium arcticum</i> (Brightwell) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium balaena</i> (Ehrenberg) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium bicoronatum</i> (Castracane) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium caelatum</i> (Janisch) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium cinnamomeum</i> (Greville) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium contumax</i> Mann	Name as is	Philippine Islands	Type: US N.M. cat. No. 43693	USS Albatross	Mann (1925)
<i>Trigonium diaphanum</i> Mann	Name as is	Philippine Islands	Type: US N.M. cat. No. 43694	USS Albatross	Mann (1925)
<i>Trigonium dissimile</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium dulce</i> (Greville) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium eulensteinii</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium formosum</i> (Brightwell) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium frauenfeldii</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium geminum</i> (A. Schmidt) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)

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List of microalgae	Current valid name	Place collected	Type/location	Scientific expedition	Reference
<i>Trigonium heteroporum</i> (Grunow) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium inelegans</i> (Greville) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium inglorium</i> (Greville) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium latum</i> (Greville) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium membranaceum</i> (Cleve) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium multiplex</i> (Janisch) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium pardus</i> (A. Schmidt) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium punctatum</i> (Brightwell) Mann	<i>Trigonium punctatum</i> Brightwell	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium quinquelobatum</i> (Greville) Cleve	<i>Triceratium quinquelobatum</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium radfordianum</i> (Castracane) Mann	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium (Triceratium) radiolatum</i> Janisch	<i>Trigonium cinnamomeum</i> (Greville) Mann	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium sculptum</i> Shadbolt	<i>Biddulphia sculpta</i> (Shadbolt) Van Heurck	Philippine Islands		USS Albatross	Mann (1925)
<i>Trigonium zonulatum</i> (Greville) Mann	<i>Trigonium zonulatum f. zonulatum</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Trinacria limpida</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43695	USS Albatross	Mann (1925)
<i>Trinacria tripedalis</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43696	USS Albatross	Mann (1925)
<i>Tropidoneis approximata</i> Cleve	<i>Plagiotropis approximata</i> (Cleve) Kuntze	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis fragilis</i> (Tempère & Brun) Mann	<i>Amphiprora fragilis</i> Tempère & Brun	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis javanica</i> (Cleve) Mann	<i>Auricula javanica</i> Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis lata</i> Cleve	<i>Plagiotropis lata</i> (Cleve) Kuntze	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis lepidoptera</i> (Gregory) Cleve	<i>Plagiotropis lepidoptera</i> (W. Gregory) Kuntze	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis maxima</i> (Gregory) Cleve	Name as is	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis membranacea</i> Cleve	<i>Amphiprora membranacea</i> Cleve	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis oblonga</i> (Greville) Cleve	<i>Amphiprora oblonga</i> Greville	Philippine Islands		USS Albatross	Mann (1925)
<i>Tropidoneis phantasma</i> Mann	<i>Mannsia phantasma</i> (Mann) Paddock	Philippine Islands (type locality)	Type: US N.M. cat. No. 43697	USS Albatross	Mann (1925)
<i>Tropidoneis vaga</i> Mann	Name as is	Philippine Islands (type locality)	Type: US N.M. cat. No. 43698	USS Albatross	Mann (1925)
<i>Willemoesia elongata</i> (Grunow) Mann	<i>Actinocyclus elongatus</i> var. <i>elongatus</i> Grunow in van Heurck	Philippine Islands		USS Albatross	Mann (1925)

Table 3. Summary of number of microalgal taxa reported from the Philippines (1853–1925) per naval scientific expedition that visited the Philippines in 1842–1910.

Name of naval scientific expedition that visited the Philippines (1842–1910)	No. of published microalgal taxa from the Philippines (1853–1925)	No. of type species with Philippines as type locality	No. of currently accepted taxa (from the original publication)	Reference
USS Albatross	743 (Bacillariophyta)	137	275	Mann (1925)
HMS Challenger	54 (Bacillariophyta)	49	8	Castracane (1886)
	3 (Cyanobacteria)	0	0	Dickie (1876a, b)
US exploring expedition (Wilkes)	17 (Bacillariophyta)	4	4	Harvey and Bailey (1853)
Vettor Pisani	1 (Rhodophyta)			Piccone (1886)
Total	818	190	287*	

*Six of these are duplicates, *i.e.* same species reported by different authors. Hence, only 281 valid names are currently recognized.

include *Amphitetras favosa*, *Campylodiscus kutzingii*, *Isthmia minima*, and *Triceratium orientale* (Table 2). All the diatom specimens examined from Bailey’s collection were originally attached to seaweeds (Edgar 1979).

No new species was described in the other groups of microalgae from the Philippines. The earliest report of species of cyanobacteria from the Philippines was in 1876, as part of the botanical collections of H.N. Moseley, the naturalist from the British HMS Challenger Expedition (1874) (Dickie 1876a, b). Dickie identified these specimens as *Lyngbya majuscula*, *L. ferruginea*, and *Oscillaria gracillima* (Table 2). The species of *Lyngbya* were collected in the vicinity of Zamboanga City in Mindanao (Dickie 1876a), whereas *O. gracillima* was obtained from Camiguin Is. in northern Mindanao (Dickie 1876b). The earliest report of marine red microalga from the Philippines was in 1886 by Piccone in the book entitled “*Alge del Viaggio di Circumnavigazione della Vettor Pisani*.” The specimen was identified as *Centroceras micracanthum* (= *C. cryptacanthum*) that was collected in Cavite by the Italian ship called Vettor Pisani in 1884. This report of marine red microalga appeared about 182 years after the first marine red macroalga was reported from the Philippines in 1704 (Liao 2013).

DISCUSSION

The early studies on Philippine marine microalgae (1853–1925) within a span of 72 years dealt mainly on taxonomy with about 99% on diatoms, followed in decreasing order by Cyanobacteria and Rhodophyta. One reason for this is probably because these expeditions employed mainly tow-nets, trawl, and dredge to collect samples (Table 1); hence, only diatoms that are in the water column or associated with the bottom were collected.

The Wilkes Expedition also collected macroalgae hence the diatoms identified were those on the surface of these macroalgae or on shells. Besides, the diatom exoskeletal structures – which are the essential features in diatom taxonomy – were better preserved in liquid preservatives used in those days (Round *et al.* 1990). Furthermore, the microscopy technique – an essential feature in the study of diatoms – developed fast in Europe and North America at that time. In fact, J.W. Bailey was requested to do the diatom taxonomy from the materials of the US Wilkes Expedition because he was an expert on microscopy, being a geologist by profession, and not because he had algological experience (Edgar 1979).

As these early works on Philippine microalgae were mainly on diatoms, with a few mentions of cyanobacteria and one species of the red alga, this subsequent discussion will mainly focus on diatoms and cyanobacteria. The study of diatom taxonomy by Filipino researchers did not start until about a century after the first papers that reported diatoms from the Philippines were published (Bailey 1853; Harvey and Bailey 1853). Still, diatoms were just examined as a part of other phytoplankton/algae in estuaries, ponds, and guts of milkfish (Esguerra 1951; Bersamin 1957; Villadolid 1957). Among the various reasons for this gap could be the lack of experts on diatom taxonomy and microscopy techniques, few available good high-resolution light microscopes, and lack of scanning electron microscopes. Subsequently, more diatom taxonomic works were embedded in the phytoplankton studies of lakes and rivers (Gonzales 1961; de los Reyes 1972; Pantastico 1977; Lontoc-Relon 1988; Tamayo-Zafaralla 2014). Additionally, studies on the applied aspects of diatoms have been done in relation to the fishery industry (de la Peña 2007; Fortes and Pinosa 2007; de la Peña and Franco 2020). In recent years, papers that dealt solely with diatoms were mainly on freshwater or brackish water species, including the works of Martinez-

Goss (1997) on new species of *Nitzschia* and *Tryblionella* from Laguna de Bay, the paleolimnological study of the same lake using diatoms by Antoine *et al.* (1997), and a study on the diversity of centric diatoms from Taal Lake by Rott *et al.* (2001). Subsequently, Ohtsuka *et al.* (2009) put out their checklist of diatoms from the brackish water lake of Laguna de Bay.

The study of marine diatom taxonomy in the Philippines by Filipino scholars lagged very much behind. Since the comprehensive study of diatom taxonomy in the Philippines by Albert Mann (1925), there has been no study of a similar scale done by Filipino researchers. Mann's book was followed by the publication of "Freshwater and Marine Diatoms from Palawan (a Philippine Island)" by Podzorski and Håkansson (1987). Eventually, marine diatoms from Lian, Batangas were examined by Lontoc-Relon (2000a, b), a Filipino researcher, 75 years after Mann (1925). It is not another 11 years later that Martinez-Goss and Evangelista (2011) reported nine species of *Mastogloia* epiphytic on the brown seaweed *Sargassum* spp. in Lian, Batangas and Plaridel, Quezon, and added *Mastogloia smithii* Thw. ex W. Sm. as a new record for the country. Martinez-Goss and Lopez (2011) further examined other diatoms epiphytic on *Sargassum* spp. An example of a marine diatom, *Grammatophora oceanica*, noted in Mann's diatom monograph (Mann 1925) was also observed (Figures 3A and B). With limited progress made on marine diatom taxonomy in the Philippines, the status of many of the type species reported from the Philippines by Mann (1925) and others (*e.g.* Schmidt 1874–1956, Castracane 1886) remains uncertain or unverified, as indicated by both AlgaeBase (Guiry and Guiry 2021)

and DiatomBase (Kociolek *et al.* 2022). There remains a lot of work to be done on Philippine diatom taxonomy and this is definitely a wide-open area for future studies.

On the other hand, while only three cyanobacteria species were documented from the collection of the early navigational expeditions (Dickie 1876a, b), studies on the taxonomy of these organisms received a great push with the initiative pioneered by the National Scientist Gregorio T. Velasquez with his classic works on filamentous myxophyceae of the Philippines (Velasquez 1940, 1941). His and his students' works on cyanobacteria have been coined as the rebirth of Philippine phycology (Cordero 1972). Thus, of the various groups of microalgae, studies on cyanobacteria have advanced the most in terms of the number of publications, the number of applications in agriculture and in industries, and the establishment of cyanobacterial production companies in the Philippines. From the three species first noted in 1876 by Dickie (1876a, b), the number of cyanobacteria species reported from the Philippines has increased by a hundred-fold in the 1980s, and still counting (Martinez 1984). Since the 1940s, more papers are published by Filipino researchers that dealt with basic studies, such as taxonomy and ecology (Velasquez 1940, 1941, 1962; Soriano and Velasquez 1952; Pantastico *et al.* 1976; Lacap *et al.* 2005, 2007; Peralta *et al.* 2006; Sanchez and Cao 2019; Martinez-Goss *et al.* 2019) and morpho-cytology (Martinez *et al.* 1985; Martinez and Querijero 1986), as well as on applied studies such as mass cultivation (Martinez *et al.* 1987; Zafaralla *et al.* 1989; Querijero-Palacpac *et al.* 1990). The establishment of the International Rice Research Institute in 1960 (Chandler 1992), adjacent to the campus

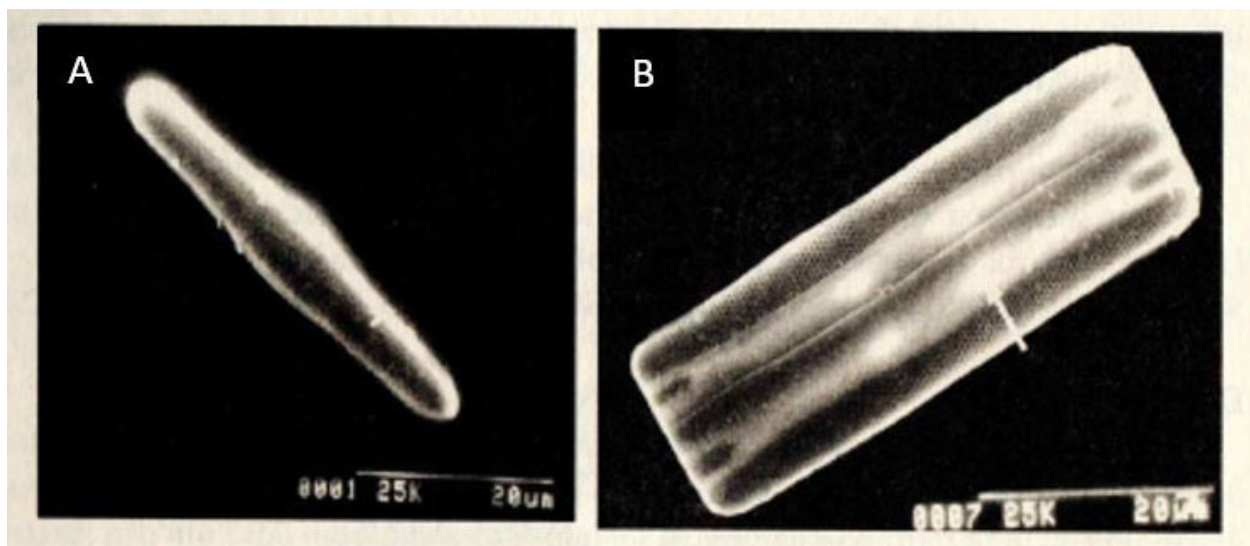


Figure 3. *Grammatophora oceanica* (Ehrenberg) Grunow: [A] SEM of valve view; [B] SEM of girdle view [after: Martinez-Goss and Lopez (2011)].

of the University of the Philippines Los Baños, could have facilitated research on the use of cyanobacteria as biofertilizers in rice production (Pantastico and Gonzales 1976; Martinez *et al.* 1977; Martinez *et al.* 1981; Bandonill *et al.* 2020). On the other hand, the use of another cyanobacterium, *Spirulina*, as feed (Gerpacio *et al.* 1990) and food (Zafaralla 1985; Braganza *et al.* 2002; Tiburcio *et al.* 2007a, b) – and, ultimately, the establishment of *Spirulina* production plants in the country – may have been the result of growing world-wide trend on the use of more natural health food products. Lately, the focus has been on the application of another Philippine cyanobacterium, *Nostoc commune*, as a food source and source of nutraceuticals and pharmaceuticals (Briones *et al.* 1997; Briones-Nagata *et al.* 2007; Martinez-Goss *et al.* 2021).

Work on cyanobacteria has gone beyond research and development studies with the establishment in the past decades of three *Spirulina* commercial companies in the Philippines such as the Aztec Food Growers Corporation in Cainta, Rizal and the Spirulina Filipina Foundation, Inc. in Cabangan Point, Subic Bay Freeport Zone, Zambales, just to name a few.

It appears that the realization of commercial potential helps to drive studies on cyanobacteria in the past. Such potential was not well-recognized with diatoms, which nonetheless are important primary producers of the marine environment. With this review, it is hoped that an awareness of the importance of marine diatoms, their biodiversity, and their roles in the marine environment will be given more attention in the coming years. The monograph on Philippine marine diatoms by Albert Mann (1925) has certainly laid a good foundation for future floristic study on the taxonomy of marine diatoms in the Philippines.

ACKNOWLEDGMENTS

The author acknowledges the patience of Ms. Roselyn P. Padernal in doing several revisions of this manuscript; the unselfish help in taxonomy of Dr. William Sm. Gruezo and Prof. Jiro T. Adorador; the Museum of Natural History, together with the Office of the Vice Chancellor for Community Affairs of the University of the Philippines Los Baños for having invited me to give a talk in celebration of the Quincentennial Commemoration of the Philippines in 2011 titled “Early Records of Algae in the Philippines” that led to the publication of this paper; and, lastly, the meticulous observations and justifiable comments of the reviewers that greatly improved this paper.

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