

A Checklist of *Navicula* (Class Bacillariophyceae) of the Philippines

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ABSTRACT

A unified account of all known diatoms in the genus *Navicula*, class Bacillariophyceae, of the Philippines from 1886 to 1987 is presented. A total of 226 taxa are listed. Included herewith are the references that originally described or cited the taxon and the ecological/habitat records for each taxon. As much as possible, a list of exsiccata materials is given together with their repository places.

Keywords: *Navicula*, Bacillariophyceae, Philippines, diatoms

INTRODUCTION

This compendium presents a unified account of all known diatoms under the genus *Navicula* from 1886 to 1987 or within a span of over 100 years. Referencing was based mainly on available literature that deals in whole or in part on Philippine materials. In some cases Philippine exsiccata materials (diatom slides) that were found stored in the different diatom herbaria in the Western World were also noted. A wealth of these specimens were discovered at the Diatom Section of the British Museum of Natural History (BMNH) in London, England, which include the collections of Adam, Bess, Comber, etc. The collections of Mann from the USS Albatross were also observed at the Smithsonian Institution of the U.S. Museum of Natural History in Washington, D.C., U.S.A.

I have not had a chance to see the holotypes of Hustedt and Skvortzow's collections. But according to Dr. Charles W. Reimer of the Academy of Natural

Sciences of Philadelphia (ANSP), there are some collections of Skvortzow that are in Hustedt's collection, and the latter are stored in the herbarium of the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany.

The list includes 21 that are reported as new taxa (Table 1) and four species found only in Mexico (Campeche Bay) and in the marine waters of the Philippines and nowhere else according to Mann (1925), i.e., *N. approximata* var. *substauroneiformis* Grun., *N. carinefera* Grun., *N. hennedyi* var. *californica* (Grev.) Cl. and *N. margarita* Schmidt (?).

There are 226 taxa recorded here that are recognized by Patrick and Reimer (1966), Round et al., (1990), and VanLandingham (1975). Unidentified specific epithets are recorded but not enumerated. The scope and use of the list is as in the previous paper (Martinez-Goss, 1995).

Table 1. New taxa of *Navicula* reported from the Philippines

Taxon	Source	Reference
<i>Navicula biggemata</i>	Marine	Mann, 1925
<i>N. caeca</i>	Marine	Mann, 1925
<i>N. clavata</i> f. <i>corpulenta</i> (Mann) Hust	Marine	Hustedt, 1964
<i>N. delecta</i> Mann	Marine	Mann, 1925
<i>N. elegantoides</i> Hust.	Laguna de Bay; Camarines Sur, Buhi Lake	Hustedt, 1942a
<i>N. funiculata</i> Mann	Marine	Mann, 1925
<i>N. glaberrima</i> Mann	Marine	Mann, 1925
<i>N. halophila</i> f. <i>tenuirostris</i> Hust.	Rizal, Manila	Hustedt, 1942a
<i>N. hustedtii</i> f. <i>philippina</i> Skv.	Quezon City, Balara	Skvortzow, 1937
<i>N. imitans</i> Mann	Marine	Mann, 1925
<i>N. insignita</i> Hust.	Laguna de Bay, Rizal, Lyon (ponds)	Hustedt, 1942a
<i>N. luzonensis</i> Hust.	Camarines Sur, Buhi Lake (rare)	Hustedt, 1942a
<i>N. mendica</i> Mann	Marine	Mann, 1925
<i>N. mucicoloides</i> Hust.	Rizal, Lyon (ponds)	Hustedt, 1942a
<i>N. philippina</i> Skv.	Quezon City, Balara	Skvortzow, 1937
<i>N. philippinarum</i> Mann	Marine	Mann, 1925
<i>N. pulverulenta</i> (<i>pulvulenta</i>) Mann	Marine	Mann, 1925
<i>N. pugio</i> Mann	Marine	Mann, 1925
<i>N. retrostauros</i> Mann*	Marine	Mann, 1925
<i>N. spiculifera</i> Mann*	Marine	Mann, 1925
<i>N. translucens</i> Mann	Marine	Marine

*Not recognized by VanLandingham

THE LIST

- NAVICULA* Bory, p. 562, 1824; Patrick & Reimer, p. 439, 1966.
- abrupta* (Greg.) Donkin
Donkin, p. 13, 2/6, 1870;
Mann, p. 94, 1925.
- Bottom marine samples taken near the islands by the United States Steamer (USS) Albatross, Mann (1.c.).
- abruptoides* Hust.
Hustedt, p. 515, f. 1557, 1964;
Podzorski & Hakansson, p. 79, 31/8, 1987.
- LUZON: Palawan, Pto. Princesa (White Beach mangrove, root scrapings from *Rhizophora*), Podzorski & Hakansson (1.c.).
- americana* Ehr.
Ehrenberg, p. 129 (417), 1841 (1843);
Hustedt, p. 280, f. 464, 1930;
_____, p. 64, 1942a.
- LUZON: Laguna, Los Baños (ponds, Laguna de Bay); Camarines Sur, Buhi (river), Hustedt (1942a).
- MINDANAO: Lanao (Uyaan Lake), Hustedt (1942a).
- anglica* Ralfs
Ralfs in Pritchard, p. 900, 1861;
Hustedt, p. 303, f. 530-531, 1930;
_____, p. 73, 1942a.
- MINDANAO: Lanao (ponds), Hustedt (1942a).
- angusta* Grun.
Grunow, 10:528, 5/19, 1860.
- = *Navicula cari* var. *angusta* Grun.
Grunow in Van Heurck, 7/17, 1885;
Hustedt, p. 72, 1942a;
Patrick & Reimer, p. 514-515, 49/5, 1966.
- LUZON: Laguna, Los Baños (ponds), Hustedt, 1942a.

VISAYAS: Leyte, Danao Lake, Hustedt, 1942a.

approximata Grev.

Greville, p. 28, 4/4, 1859;
Mann, p. 94, 1925.

= *N. lyra* var. *approximata* (Grev.) Cl.
Cleve, p. 4 (1/1) 1878.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.); British Museum (BMNH), Adam's slide #45.1/2; TS 60/64.

_____ f. *morei* (*moreii*) (O' Meara) Hust.
Hustedt p. 416, f. 1491, 1964.

= *Navicula hennedyi* var. *niceaensis* H. Perag.
Peragallo, p. 47, 5/39 e.p., 1888.

BMNH, Comber slide #31898.

VISAYAS: Cebu.

_____ var. *substauroneiformis* (Grun.) Cl.
Grunow *in* Schmidt, *et al.*, 2/20, 21, 1874;
Mann, p. 94, 1925.

Bottom marine samples, Mann (1.c.).

_____ var. ?

BMNH, Adam's-Bess # TS497 3/2.

arvensis Hust.

Hustedt, p. 249, 20/19, 20, 1937b;
_____, p. 60, 1942a;
Patrick & Reimer, p. 483, 46/1-2, 1966.

LUZON: Batangas, Taal (Crater Lake),
Hustedt (1942a).

bacillum Ehr.

Ehrenberg, p. 130, 1838, (1839);
_____, p. 418 (130), 4/5, f. 8, 1841 (1843);
Hustedt, p. 64, 1942a.

LUZON: Manila (Reservoir); Laguna, Los Baños; Camarines Sur, Buhi (lake), Hustedt (1942a).

baileyana Grun.

Grunow *in* Schmidt, *et al.*, p. 88, 1/31, 1874;
Castracane, p. 812, 1886.

VISAYAS: Cebu, Castracane (1.c.)

= *Navicula polysticta* Grev.
Greville, p. 247,5/2, 1859.

VISAYAS: Cebu, BMNH, Comber # 31892.

barbitos Schmidt

Schmidt, *et al.*, 129/5, 1874;
Mann, p. 95, 1925.

Bottom marine samples taken around the islands by the USS Albatross, Mann (1.c.).

biformis (Grun.) Mann

Mann, p. 95, 20/6-7, 1925.

Bottom marine samples taken around the islands by the USS Albatross, Mann (1.c.).

= *Mastoneis biformis* (Grun.) Cl.
Cleve, p. 194, 1894.

LUZON: Manila, BMNH, Comber # 31904.

VISAYAS: Cebu, BMNH, Comber # 31895.

bigemmata Mann

Mann, pp. 95-96, 21/1, 1925.

Bottom marine samples taken around the islands by the USS Albatross. Type-Cat. No. 43639 deposited in the United States National Museum of Natural History (USNM), Mann (1.c.).

bipunctata O' Meara

O' Meara, p. 286, 13/5, 1872;
De Toni, pp. 78-79, 1891.

MINDANAO: Brackishwaters coming from the volcanic mountain of the island in Cagayan, Sulu Archipelago (Chimmo), O' Meara (l.c.); De Toni, (l.c.).

borneoensis Hust.

Hustedt, p. 735, f. 1712, 1966;
Podzorski & Hakansson, p. 84, 33/7, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted on cove, marine), Podzorski & Hakansson (l.c.).

brasiliensis Grun.*

Grunow, p. 152, 14/10, 1863;
Schmidt, Atlas, 6/19-21, 23/25, 31/33, 1874;
Mann, p. 97, 1925.

Bottom marine samples taken around the islands by the USS Albatross, Mann (l.c.).

BMNH, Adam's # F19.29, 40 2/18.883; TS 262 1/10-12, 6/7, TS 60/60.

VISAYAS: Cebu, BMNH, Comber's #31898, 31895, 31894.

brasiliensis var. _____ Cstr.

Castracane, p. 812, 1886.

BMNH, Adam's-Bess #706, TS 60/66.

VISAYAS: Cebu, Castracane (l. c.)

brekkaensis Peters.

Petersen, p. 389, f. 16, 1928;
Hustedt, p. 58, 1942a.

LUZON: Rizal, Pancipit River, Hustedt (l.c.).

bruchii Grun.

Grunow in Cleve, p. 13, 1928;
Cleve, p. 36, 1895;
De Toni, pp. 177-178, 1891.

LUZON: Manila (marine), (Deby collection, BMNH).

bryophila Peters.

Petersen, p. 388, f. 13, 1928;
Hustedt, p. 60, 1942a.

MINDANAO: Lanao Lakes of Dagiangan and Uyaan, Hustedt (l.c.).

caeca Mann

Mann, p. 97, 21/3, 1925.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43641, USNM, Mann (l.c.).

capitata Ehr.Ehrenberg, p. 185, 13/20, 1838;
Van Heurck, p. 187, 25/719, 1896;
Patrick & Reimer, pp. 536-537, 52/1-2, 1966;
Podzorski & Hakansson, p. 81, 32/10, 1987.

LUZON: Palawan, Taytay, Langen (Malapakan Cove, algae encrusted on the cove, marine), Podzorski & Hakansson (l.c.).

cari Ehr.

Ehrenberg, p. 83, 1836;
_____, p. 174, 1838;
Hustedt, p. 299, fig. 512, 1930;
_____, p. 72, 1942a.

LUZON: Rizal, Malabon (Dagatan swamp), Hustedt (1942a).

MINDANAO: Uyaan Lake, Hustedt (1942a).

carinifera Grun.

Grunow in Schmidt, *et al.*, 2/1, 1874;
Mann, p. 98, 1925;
Hustedt, p. 754, f. 1730, 1966.

*Not recognized by VanLandingham, 1975.

- Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- cincta* (Ehr.) Ralfs
 Van Heurck, p. 178, 3/105a, 1896;
 Schmidt, *et al.*, 299/26-30, 1874;
 Hustedt, p. 298, f. 510, 1930;
 Pantastico, p. 194, 17/4, 1977;
 Patrick & Reimer, p. 516, 49/8, 1966.
- LUZON: Laguna, Los Baños, Mayondon (on shoreline of Laguna de Bay), Pantastico (1.c.).
- circumsecta* (Grun.) Grun.
 Grunow *in* Schmidt, *et al.*, 3/26-27, 1874;
 Cleve *et* Grunow, p. 42, 1880;
 Mann, p. 98, 1925;
 Hustedt, p. 409, f. 1487a-c, 1964.
- Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- = *Navicula polysticta* var. *circumsecta* (Grun.) Grun.
 Grunow *in* Schmidt, *et al.*, p. 89, 1/36, 42, 1874.
- BMNH, Adam's # GC 2089.
- circumtexta* Meister
 Meister *in* Schmidt, *et al.*, 394/33-35, 1874;
 Podzorski & Hakansson, pp. 81-82, 32/4, 1987.
- LUZON: Palawan, Taytay, Langen (Malapakan Cove, scrapings from sand at low tide, marine), Podzorski & Hakansson (1.c.).
- citrus* Krasske
 Krasske, p. 199, f. 14, 1923;
 Hustedt, p. 303, f. 529, 1930;
 _____, p. 66, 1942a.
- LUZON: Laguna de Bay, Hustedt (1942a).
- clavata* Greg.
 Gregory, p. 46, 5/17, 1856.
- BMNH, Adam's # F83 1/2; 4/3; 4. 120, 3/2.5.
- LUZON: Manila (on shell), BMNH, Comber # 30925, 31903.
- VISAYAS: Cebu, BMNH, Comber # 31900, 31898.
- = *Navicula clavata* var. *caribaea* Cl.
 Cleve, p. 61, 1895.
- VISAYAS: Cebu, BMNH, Comber # 31895.
- = *Navicula caribaea* Cl.
 Cleve *in* Schmidt, *et al.*, 2/17, 70/48, 1874;
 Mann, pp. 99-100, 1925.
- Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- = *Navicula wrightii* O' Meara
- LUZON: Manila, BMNH, Comber # B. 31903.
- _____ f. *corpulenta* (Mann) Hust.
 Hustedt, p. 445, f. 1510-1511, 1964.
- = *N. corpulenta* Mann
 Mann, p. 99, 22/4, 1925.
- Bottom marine samples taken around the islands by the USS Albatross. Type-Cat. No. 43642, USNM, Mann (1.c.).
- _____ f. *elliptica* (Schmidt)Hust.
 Schmidt, *et al.*, 3/13, 1874;
 Hustedt, p. 449, 1964.
- LUZON: Manila, BMNH, Comber # 31903.
- VISAYAS: Cebu, BMNH, Comber # 31898.
- _____ var. *indica* (Grev.) Cl.
 Cleve, p. 62, 1895;
 Schmidt, *et al.*, 204/12, 1874.
- BMNH, Adam's # GC 1865.6.1976; Bess #920; TS #497.2/3.4.522.2/4, F885.

= *N. indica* Grev. (*non* Ehr.)
Greville, p. 95, 9/13, 1862;
Cleve, p. 62, 1895;
Mann, p. 104, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

BMNH, Adam's # J 4201, M 68/4.

LUZON: Manila (marine), BMNH, Rae's collection.

VISAYAS: Cebu, BMNH, Comber # 31898, Rae's collection.

_____ var. *producta* ? sensu Adam

BMNH, Adam's # F886.

LUZON: Manila, BMNH, Comber # 31904.

_____ var. ?

BMNH, Adam's # TS60/61.657.

clipeiformis König

König, p. 51, 59, 2/3, 3/6, 1959;
Hustedt, p. 552, f. 1589, 1964;
Podzorski & Hakansson, p. 76, 31/9, 1987.

LUZON: Palawan, Taytay, Langen (Malapakan Cove, surface scrapings from sand at low tide, marine), Podzorski & Hakansson (1.c.).

cluthensis Greg.

Gregory, p. 478, 9/2, 1857;
Hustedt, p. 651, f. 1653a-d, 1966.

= *N. erythraea* Grun., p. 539, 5/17 (3/17), 1860;
Mann, p. 101, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

confervacea (Ktz.) Grun.

Grunow in Van Heurck, 14/36, 1880;
Woltereck, p. 37, 1941;
Hustedt, p. 63, 1942a;
Prowse, p. 41, 12/n-o, 1962;
Hustedt, p. 205, f. 1324a-d, 1962;
Podzorski & Hakansson, pp. 77-78, 1987.

LUZON: Benguet, Banaue (ponds), Woltereck, (1942); Rizal, Malabon, Dagatan (swamp), Marulay Water Reservoir, Lyon ponds; Laguna, Los Baños, Laguna de Bay; Batangas, Taal (Taal Lake, Yambo-Crater Lake, Crater Lake); Camarines Sur, Buhi (lake, river); Oriental Mindoro, Naujan (river), Calapan Lake, Hustedt (1942a); Palawan, Roxas (Caruray River, alt., c. 50 m, from rock surface), Taytay, Lake Manguao, (algae growing on floating grass roots, alt. c. 45 m), Podzorski & Hakansson, (1987).

VISAYAS: Leyte, Danao Lake, Hustedt (1942a).

MINDANAO: Lanao Lake, Hustedt (1942).

= *N. confervacea* f. *nipponica* Skv.

Skvortzow, p. 34, 2/3, 4/23, 1936;
Hustedt, p. 61, f. 23, 1942a

LUZON: Camarines Sur, Buhi Lake, Hustedt (1.c.).

consors Sch.

Schmidt, *et al.*, 48/24-27, 1874;
Mann, p. 98, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

contenta Grun.

Grunow in Van Heurck p. 109, 1885;
Van Heurck, p. 230, 5/239, 1896;
Hustedt, p. 277, f. 458a, 1930;
Skvortzow, p. 291, 1/40, 1937;
Hustedt, p. 58, 1942a.

- LUZON: Batangas, Taal (Crater Lake), Hustedt (1942a).
- _____ var. *biceps* (Arn. Ms. Grun. in V.H.) Cleve
Van Huerck, p. 230, 5/240, 1896.
- = *N. contenta* f. *biceps* (Arn. Grun in V.H.) Hust.
Hustedt, p. 277, f. 458c, 1930;
_____, p. 58, 1942a.
- LUZON: Pancipit River, Hustedt (1942a).
- _____ f. *parallela* (Peters.) Hust.
Hustedt, p. 277, f. 458b, 1930;
_____, p. 58, 1942a.
- LUZON: Camarines Sur, Buhi (lake), Hustedt (1942a).
- cryptocephala* Ktz.
Kützing, p. 95, 3/20, 26, 1844;
Donkin, p. 37, 5/14, 1871;
Van Heurck, p. 180, 3/122, 1896;
Hustedt, p. 295, f. 496, 1930;
Skvortzow, p. 291, 2/3, 1937;
Hustedt, p. 67, 1942a;
Podzorski & Hakansson, p. 87, 1987.
- LUZON: Rizal, Manila (Water Reservoir II), ponds in the Bureau of Science grounds; Laguna, Laguna de Bay; Camarines Sur, Buhi Lake; Oriental Mindoro, Naujan Lake, Hustedt (1942a); Rizal, Quezon City (Balara filters, Skvortzow, (l.c.); Palawan, Brooke's Point (scrapings from a limestone rock in Tumarabong River, alt. c. 10 m), Podzorski & Hakansson (1987).
- cf. *cryptolyra* Brockmann
Brockmann, p. 19, 3/22, 23, 1950;
Hustedt, p. 534, f. 1570, 1964;
Podzorski & Hakansson, p. 79, 32/5, 1987.
- LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted on the cove, marine), Podzorski & Hakansson (l.c.).
- cuspidata* (Ktz.) Ktz.
Kützing, p. 94, 3/24, 37, 1844;
W. Smith, p. 47, 16/131, 1853;
Van Heurck, p. 214, 4/190, 1896;
Mann, p. 99, 1925;
Hustedt, p. 268, f. 433, 1930.
- Freshwater sample as detritus from the bottom marine samples taken by the USS Albatross, Mann (l.c.).
- _____ var. *ambigua* (Ehr.) Cl.
Cleve, p. 110, 1894;
Hustedt, p. 51, 1942a.
- LUZON: Rizal (ponds in the Bureau of Science grounds); Laguna, Los Baños, Laguna de Bay (lake and ponds); Camarines Sur, Buhi Lake, Hustedt (1942a); Palawan, Roxas, Pagdanan Range, Ibangley Brookside Hill (streamside pool, alt. c. 40 m), Podzorski & Hakansson (l.c.).
- MINDANAO: Cagayan de Oro, Singnan Lake; Lanao (lake), Hustedt (l.c.).
- cyclops* Mann
Mann, pp. 99-100, 21/5, 1925.
- Bottom marine samples taken near the islands by the USS Albatross; frequently observed. Type-Cat. No. 43643, USNM, Mann (l.c.).
- delecta* Mann
Mann, p. 100, 24/5-7, 1925.
- Bottom marine samples taken around the islands by the USS Albatross; frequently observed. Type-Cat. No. 43644, USNM, Mann (l.c.).
- BMNH, Adam's # M58/31.
- dicephala* Ehr.
Ehrenberg, p. 45, 1837;
_____, p. 185, 1838;
Van Heurck, p. 188, 3/138, 1896;
Hustedt, p. 302, f. 526, 1930;
_____, p. 73, 1942a.

LUZON: Laguna, Los Baños (freshwater ponds), Hustedt (1942a).

_____ var. *undulata* Östr.
Östrup, p. 25, 3/33, 1918 (1920);
Hustedt, p. 73, 1942a.

LUZON: Camarines Sur, Buhi Lake, Hustedt (1942a).

diffluens Schmidt

= *Navicula diffusa* Schmidt
Schmidt, *et al.*, 2/15, 2/28, 1874;
Mann, p. 101, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

directa (W. Sm.) Ralfs
Ralfs in Pritchard, p. 906, 1861.

LUZON: Manila, BMNH, Comber # 31903, 31904.

distans (W. Sm.) Ralfs
Ralfs in Pritchard, p. 907, 1861;
Schmidt, *et al.*, 46/11-14, 1874.

LUZON: Manila (on shell), BMNH, Comber # 30925, 30926.

durandii (*durrandii*) Kitt.
Kitton in Schmidt, *et al.*, 129/1, 1874;
Castracane, p. 812, 1886;
Mann, p. 101, 21/6, 1925;
Hustedt, p. 485, f. 1540, 1964.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.);

BMNH, Adam's # TS522.1/1.
VanLandingham (1975) does not think the specimen is in accordance to Kitton.

VISAYAS: Cebu, Castracane (l. c.)

_____ var. *rhomboidea* (Cstr.) Schmidt
Schmidt, *et al.*, 129/2, 1874.

= *Navicula bullata* Norman var. *rhomboides* Cstr.
Castracane, p. 30, 30/8, 1886.

VISAYAS: Cebu, Castracane (l.c.).

_____ var ?

BMNH, Adam's # M 65/5.

elegantoides Hust.
Hustedt, p. 76, f. 142, 1942a;
Woltereck, p. 52, 1941;
Prowse, p. 42, 8/d, 1962.

LUZON: Benguet, Banaue (ponds), Woltereck (l.c.); Rizal, Manila (Lyon ponds, ponds in Bureau of Science grounds); Laguna, Los Baños, Laguna de Bay; Buhi Lake, Hustedt (l.c.).

exigua (Greg.) Grun.
Grunow in Van Heurck, 8/32, 1880;
Hustedt, p. 303, f. 538, 1930;
_____, p. 73, 1942a.

LUZON: Camarines Sur, Buhi Lake, Hustedt (1942a).

MINDANAO: Uyaan Lake, Hustedt (1942a).

forcipata Grev.
Greville, p. 83, 6/10-11, 1859;
Schmidt, *et al.*, 70/17, 1874;
Cleve, p. 65, 1895;
Van Heurck, p. 203, 4/163, 1896;
Peragallo & Peragallo, p. 130, 21/28, 1897-1908.

BMNH, Adam's # J 413.

VISAYAS: Cebu, BMNH, Comber # 31898.

_____ var. *densestriata* Schmidt
Schmidt, *et al.*, 70/14-16, 1874;
Mann, p. 102, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

_____ cf. *forcipata* var. *elongata* Perag & Perag. Peragallo & Peragallo, p. 131, 21/24, 1897-1908; Podzorski & Hakansson, p. 79, 33/1, 1987.

LUZON: Palawan, Pto. Princesa, Pto. Princesa Bay (Table Head, on sandy bottom at 15 m depth), Podzorski & Hakansson (1.c.).

_____ var. *versicolor* (Grun.) Grun. Grunow in Cleve et Möller, no. 208-210, 1879.

VISAYAS: Cebu, BMNH, Comber # 31894, 31902.

_____ var ?

BMNH, Adam's # G-211.

funiculata Mann
Mann, p. 102, 22/1-2, 1925.

Bottom marine samples taken around the islands by the USS Albatross. Type-Cat. No. 43645, USNM, Mann (1.c.).

BMNH, Adam's # TS 60/2.76.

genifera Schmidt
Schmidt, *et al.*, 2/6, 1874;
Hustedt, p. 435, f. 1505, 1964.

BMNH, Adam's # W 935.

glabrissima Mann
Mann, p. 103, 22/3, 1925.

MINDANAO: Jolo, Sulu, Sulu (bottom marine sample, rare). Type-Cat. No. 43646, USNM, Mann (1.c.).

gracilis Ehr.
Ehrenberg, p. 64, 69, 1830 (1832);
_____, p. 155, 1854;
Van Heurck, p. 179, 3/109, 1896;
Hustedt, p. 299, f. 514, 1930.

LUZON: Rizal, Manila (Tabaco River), sample taken by the ship Princess Louise, Ehrenberg (1854).

granulata Bailey
Bailey, p. 10, f. 16, 1854 (1853);
Cleve, p. 48, 1895;
Schmidt, *et al.*, 244/7, 1874;
Hustedt, p. 702, f. 1696, 1966;
Podzorski & Hakansson, p. 84, 33/14, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (surface scrapings from the sand at low tide, by the cove), Podzorski & Hakansson (1.c.).

cf. *gregaria* Donk.
Donkin, p. 10, 1/10, 1861;
Van Heurck, p. 181, 3/125, 1896;
Hustedt, p. 269, f. 437, 1930;
Podzorski & Hakansson, p. 78, 1987.

=*Navicula granulata* cf. *gregaria* Donk.
Donkin, p. 10, 1/10, 1861;
Van Heurck, p. 181, 3/125, 1896;
Hustedt, p. 269, f. 437, 1930;
Podzorski & Hakansson, p. 78, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted on the cove, marine), Podzorski & Hakansson (1.c.).

aff. *grevillei* (Ag.) Heiberg
Heiberg, p. 83, 1863;
Van Heurck, p. 232, 5/243, 1896;
Prowse, p. 43, 12/6, 1962;
Podzorski & Hakansson, p. 77, 30/9, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted on the cove, marine), Podzorski & Hakansson (1987).

grimmii (*grimmei*) Krasske
Krasske, p. 45, 1/14, 1925;
Woltereck, p. 52, 1941;
Hustedt, p. 274, f. 448, 1930;
Hustedt, p. 55, 1942a.

LUZON: Benguet, Banaue (ponds), Woltereck (l.c.); Rizal, Lyon (ponds); Camarines Sur, Buhi (river), Hustedt (1942a).

MINDANAO: Lanao (lake), Hustedt (1942a).

halophila (Grun.) Cl.

Cleve, p. 109, 1894;
Hustedt, p. 268, f. 436, 1930;
_____, p. 51, 1942a;
Woltereck, p. 52, 1941.

LUZON: Mt. Province, Banaue (ponds) Woltereck (l.c.); Rizal, Lyon (ponds); Laguna, Los Baños (pond), Hustedt (1942a).

MINDANAO: Lanao, Uyaan (lakes), Hustedt (1942a).

_____. f. *tenuirostris* Hust.
Hustedt, pp. 51-52, f. 76, 1942a.

LUZON: Rizal, Manila (ponds in the Bureau of Science grounds, rare), Hustedt (l.c.).

hamulifera Grun.

Grunow in Cleve and Grunow, p. 44, 1880;
Cleve, vol. 1, p. 154, 3/16-19, 1894;
Peragallo & Peragallo, p. 65, 8/16, 1897-1908;
Mann, p. 104, 1925;
Hustedt, p. 312, f. 1430, 1962.

Bottom sediments taken near the islands by the USS Albatross, Mann (l.c.).

hassiac Krasske

Krasske, p. 47, 2/26, 1925;
Hustedt, p. 279, f. 462, 1930;
_____, p. 216, f. 1332, 1962;
Podzorski & Hakansson, p. 81, 32/2, 1987.

LUZON: Palawan, Taytay, Lake Manguao (Danao), Podzorski & Hakansson (l.c.).

hennedyi (*henedii*) W. Sm.

W. Smith, p. 93, 1856;
Gregory, p. 40, 5/3, 1856;

Van Heurck, p. 93, 9/14, 1880-1885;
Cleve, p. 57, 1895;
Mann, p. 104, 1925.

Bottom sediments taken near the islands by the USS Albatross, Mann (l.c.); BMNH, Adam's # E 530, M 58/14, F119.1/14.3/3.

LUZON: Manila, BMNH, Comber #30925, 31903, 31904, 30926 (on shell).

VISAYAS: Cebu, BMNH, Comber #31900.

=*Navicula hennedyi* var. *niceaensis* (*niceaensis*) H. Perag.
H. Peragallo, p. 55, 5/39, 1888.

BMNH, Adam's # M 58/22-3.

_____. f. *bacillifera* (Pantoc.) Cl.
Cleve, p. 58, 1895.

= *Navicula rugosa* Janisch
Janisch, 15/10, 11, 1888;
Cleve, p. 59, 1895.

BMNH, Adam's # E 530.

_____. var. *californica* (Grev.) Cl.
Greville, p. 29, 4/5, 1859;
Cleve, p. 58, 1895;
Mann, p. 97, 1925.

= *Navicula californica* Grev.
Greville, p. 29, 4/5, 1859;
Mann, p. 97, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.); BMNH, Adam's # M58/20-1; 24.30.

=*Navicula californica* var. *campechiana* Grun.
Grunow in Schmidt, *et al.*, 3/19, 1874;
Mann, p. 97, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

- _____ var. *furcata* Perag. & Perag.
Peragallo & Peragallo, p. 141, 24/16, 17, 1897-1908.

BMNH, Adam's # F 18 2/9.10.
- _____ f. *granulata* (Grun.) Hust.
Grunow in Schmidt, *et al.*, 3/3, 1874;
Hustedt, p. 458, f. 1519, 1964.

=*Navicula hennedyi* var. *circumsecta* Cl.
Cleve p. 58, 1895 (*non* Grunow, 1874 in
Schmidt, *et al.*, 1874).
It means Cleve thought the specimen
is not the same as in Grunow in Schmidt, *et al.*,
but VanLandingham says they are the same.

BMNH, Adam's # TS 519/3.
- _____ var. *neopolitana* Cl.
Cleve, p. 58, 1895;
Podzorski & Hakansson, p. 80, 31/12, 1987.

LUZON: Palawan, Taytay (beach on washed-
ashore seaweed), Podzorski & Hakansson (1.c.).
- _____ f. ?
BMNH, Adam's # F 120.3/7.
- hennedyi* Hust.*
Podzorski & Hakansson, p. 79, 30/1, 1987.

LUZON: Palawan, Pto. Princesa, Table Head,
South of Pto. Princesa Bay (from surface at 15 m
depth), Podzorski & Hakansson (1.c.).
- howeana* Hagelstein
Hagelstein, p. 385, 7/51, 1939;
Podzorski & Hakansson, pp. 76-77, 30/6, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan
Is. (surface scrapings from the sand at low tide in
Malapakan Cove), Podzorski & Hakansson (1.c.).
- hustedtii* Krasske
Krasske, 3:198, f. 3, 1923;
Patrick & Reimer, p. 527, 50/8, 1966.
- = *Navicula hustedtii* f. *philippina* Skv.
Skvortzow, p. 290, 1/44, 1937a.

LUZON: Rizal, Quezon City, Balara (water
filter no. 8), Skvortzow (1.c.).
- imitans* Mann
Mann, p. 104, 22/5, 6, 1925.

Bottom marine samples taken near the islands
by the USS Albatross. Type-Cat. No. 43643,
USNM, Mann (1.c.).
- indicatrix* VanLan.
VanLandingham, nom. nov.

= *N. alpha* Chol.
Cholnoky, p. 173, fig. 57, 1955 (*non* Cl. 1893).

LUZON: Manila, BMNH, Comber
#31903.
- inexacta* Mann
Mann, p. 105, 1925.

= *N. (Alloioneis) gruendleri* (Cl. *et* Grun.) Cl.
Mann, p. 104, 105, 22/7, 1925.

Bottom marine samples taken near the
islands by USS Albatross. No type designated,
Mann (1.c.).
- inhalata* Schmidt
Schmidt, *et al.*, 2/30, 1874;
Cleve, p. 57, 1895;
Mann, p. 107, 23/2, 1925;
Hustedt, p. 390, f. 1475, 1964.

Bottom marine samples taken near the islands
by USS Albatross, Mann (1.c.); marine, Cleve
(1.c.).
- insignita* Hust.
Hustedt, p. 73, f. 126, 139-141, 1942a;
Woltereck, p. 52, 1941;
Patrick & Reimer, p. 447, 40/3, 1966.

LUZON: Mt. Province, Bontoc, (Benguet, Banaue, ponds); Lyon (ponds), Woltereck (l.c.), Hustedt (l.c.); Rizal; Laguna, Laguna de Bay, Hustedt (l.c.).

insociabilis Krasske

Krasske, p. 114, 3/17, 1932;
Schmidt, *et al.*, 40/103-105, 1874;
Hustedt, p. 63, 1942a;
_____, p. 181, f. 1315a-h, 1962.

LUZON: Rizal, Pancipit River, Hustedt (1942a).

iota (jota) Cl.

Cleve, p. 134, 5/22, 1894.

VISAYAS: Cebu, BMNH, Comber # 31898.

irrorata var. *substauroneiformis* (Grun.) Cl.

Cleve, p. 56, 1895

=*Navicula approximata* var. *substauroneiformis* (Grun.) Cl.

Grunow *in* Schmidt, *et al.*, 2/20, 21, 1874;
Mann, p. 94, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

jejuna Schmidt

Schmidt, (1876) *in* Schmidt, *et al.*, 46/76, 1874;
Mann, p. 107, 1925;
Skvortzow, p. 280, 4/7, 1932.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

laevissima Ktz.

Kützing, p. 96, 21/14, 1844;
Patrick & Reimer, p. 497, 47/13, 1966.

BMNH, Adam's # GC 1994.

= *Navicula bacilliformis* Grun.

Grunow *in* Cleve & Grunow, p. 44, 2/51, 1880;
Hustedt, p. 55, 1942a.

LUZON: Camarines Sur, Lake Buhi, Hustedt (l.c.).

lagerheimii Cl.

Cleve, p. 131, 1894;
_____, p. 101, 7/1, 1894;
Woltereck, 41:37-176, 1941;
Hustedt, *in* A. S. Atlas, T. 370, f. 19-21, 1874;
Hustedt, p. 54, 1942a.

LUZON: Mt. Province, Bontoc (Banaue, ponds), Woltereck (l.c.); Laguna de Bay, Los Baños (ponds), Pancipit River; Camarines Sur, Lake Buhi, river, Hustedt (1942a).

MINDANAO: Lanao, Lanao Lake, Uyaan Lake, Hustedt (1942a).

_____ f. *intermedia* Hust.

Hustedt, *in* A. S. Atlas, T. 370, f. 22, 1874;

LUZON: Oriental Mindoro, Calapan Lake, Hustedt (l.c.).

lanceolata (Ag.) Ktz.

Kützing, p. 94, 28/38, 30/48, 1844;
Van Heurck, p. 186, 3/139, 1896;
Hustedt, p. 305, f. 540, 1930;
_____, p. 72, 1942a.

MINDANAO: Lanao, Uyaan Lake, Hustedt (1942a).

latissima Greg.

Gregory, p. 40, 5/4, 1856.

LUZON: Manila, BMNH, Comber #31904.

longa (Greg.) Ralfs

Ralfs *in* Pritchard, p. 906, 1861;
Donkin, p. 55, 8/3a-b, 1872;
Van Heurck, p. 185, 25/716, 1896;
Mann, p. 108, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

lorenzii (Grun.) Hust.

Hustedt, p. 29, f. 1188, 1961;
Podzorski & Hakansson, p. 78, 3/1, 1a, 2, 2a, 1987.

= *Stichodesmis australis* Grev.
Greville, p. 535, 13/1-4, 1863.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

LUZON: Palawan, Pto. Princesa, Table Head (from sand surface at 15 m deep of Pto. Princesa Bay), Podzorski & Hakansson (l.c.).

= *Navicula scopulorum sensu* Cl.
Cleve, p. 151, e.p., 1894.

VISAYAS: Cebu, BMNH, Comber # 31892.

lunula Cl.

Cleve, 5/5, 1894;
_____, p. 51, 1895.

BMNH, Adam's # G 211.

luzonensis Hust.

Hustedt, p. 59, f. 106, 1942a.

LUZON: Camarines Sur, Buhi Lake, Hustedt (l.c.).

lyra Ehr.

Ehrenberg, p. 419, 1/1, f. 9a, 1841 (1843);
Bailey, p. 431, 1853;
Schmidt, *et al.*, 2/16, 129/11-14, 1874;
Cleve, p. 63, 1895;
Mann, p. 108, 1925;
Podzorski & Hakansson, p. 80, 31/10, 1987.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

BMNH, Adam's-Bess #715, F 121, 2/7, M 58/15.16, TS 497.2/2.

LUZON: Manila, BMNH, Comber #31904;
Palawan, Taytay, Langen, Malapakan Is. (algae encrusted in Malapakan Cove, marine), Podzorski & Hakansson (l.c.).

= *Navicula gregoryana* Grev.
Greville, p. 10, 3/7, 1857.

LUZON: Manila, (on sponge), BMNH, Comber #33424.

VISAYAS: Cebu, BMNH, Comber # 31894.

_____ var. *cuneata* Temp. & Perag.
Tempere & Peragallo, p. 473, No. 988, 1914.

VISAYAS: Cebu, BMNH, Comber # 31894, 31898.

_____ var. *elliptica* Schmidt
Schmidt *in* Schmidt, *et al.*, 2/29, 2/34, 1874;
Cleve, p. 64, 1895;
Skvortzow, p. 272, 3/9, 1931;
Mann, p. 108, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.); marine, Cleve (l.c.).

BMNH, Adam's #F 60.1/5.

VISAYAS: Cebu, BMNH, Comber #31898.

= *Navicula lyra* var. *subelliptica* Cl.
Cleve, p. 64, 1895.

Marine, Deby's collection, Cleve (l.c.).

_____ var. *elliptica* f. *bullata* (Norman) Cl.
Cleve, p. 63, 1895;
Schmidt, *et al.*, 3/8-9, 1874.

= *N. bullata* Norman
Norman, p. 8, 2/7, 1861;
Mann, p. 97, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

BMNH, Adam's # F 40, 2/12.17.

VISAYAS: Cebu, BMNH, Comber # 31894, 31897, 31898 (2), 31900.

_____ var. *granulata* Perag. & Perag. Peragallo & Peragallo, 23/5, 1897; Schmidt, *et al.*, 258/1, 1874 ____.

BMNH, Adam's # F 45 1/10.

_____ var. *indica*, sensu Adam

BMNH, Adam's # W 405.

_____ var. *insignis* Schmidt Schmidt in Schmidt, *et al.*, 2/27, 257/4, 1874; Mann, p. 108, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

= *Navicula lyra* var.? *intermedia* Perag. & Perag. Peragallo & Peragallo, p. 136 (141), 23/6 (11), 24/18, 1897.

BMNH, Adam's # F 20.2/8.

_____ var. *recta* Grev. Greville, p. 28, 4/3, 1859; Mann, p. 108, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

BMNH, Adam's # TS 497-2/5.

= *N. lyra* var. *recta* f. *typica* Perag. Peragallo, 22/8, 1891.

BMNH, Adam's # TS 522 1/4.5.

= *N. lyra* var. *recta* f. *subelliptica* Perag. & Perag. Peragallo & Peragallo, 22/7 (1897).

BMNH, Adam's # F 40 2/15.45.1/9.60 1/8. TS 497 2/10.

_____ var. *seductilis* (Schmidt) O'Meara

= *Navicula seductilis* Schmidt Schmidt in Schmidt, *et al.*, 2/35, 1874; Mann, p. 119, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

_____ var. *signata* Schmidt Schmidt in Schmidt, *et al.*, 2/4, 1874; Castracane, p. 33, 30/13, 1886.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.). Frustules found in the vicinity of the Philippines, Castracane (1.c.).

VISAYAS: Cebu, BMNH, Comber # 31893, 31895.

_____ var. *subtropica* Schmidt Schmidt in Schmidt, *et al.*, 2/24.25, 1874; Wolle, 16/14, 1890.

BMNH, Adam's # F 40 2/15.45.1/9.60 1/8. TS 497 2/10.

_____ var. ?

BMNH, Adam's # F 20.2/7.45/12-14.119.3/8. G211; TS 262.1/6-9.6/3.522 1/2.

maculata var. *caribaea* (Cl.) Cl. Cleve, p. 46, 1895.

= *Navicula caribaea* Cl. Cleve in Schmidt, *et al.*, 6/10-12, 1874; Mann, p. 97, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

maculosa Donk. Donkin, p. 25, 5/1, 1871; Schmidt, *et al.*, 259/25, 1874.

- VISAYAS: Cebu, BMNH, Comber # 31899.
 = *Navicula diffusa* Schmidt
 Schmidt (1874) in Schmidt, *et al.*, 2/28, 1874;
 Mann, p. 101, 1925.
 = *Navicula madagascarensis* Cl.
 Cleve, p. 23, 4/2, 1891;
 Mann, p. 108, 25/4, 1925.
 Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- malombensis* Otto Müller*
 Otto Müller, p. 84, 1/13, 1910.
 = *Navicula mammalis* Cstr.
 Castracane, p. 30, 20/2, 1886.
 Bottom marine samples taken near Philippine waters obtained by H.M.S. Challenger, Castracane (1.c.).
- mammalis* Cstr.
 Castracane, p. 30, 20/2, 1886.
 Neighborhood of the Philippines, Castracane (1.c.).
- manokwariensis* Choln.
 Cholnoky, p. 181, f. 71, 1963.
 = *Navicula margarita* Schmidt
 Schmidt (1892) in Schmidt, *et al.*, 174/17, 1874;
 Mann, p. 108, 1925.
 Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- margaritifera* Truan y Luard *et* Witt
 Truan y Luard *et* Witt, p. 17, 4/10, 1888.
 = *Navicula marginata* Lewis
 Lewis, p. 64, 2/1, 1861;
 Mann, p. 108, 1925.
 Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- mauriciana* V.H.
 Van Heurck, p. 11, 2/182, 1909.
 = *N. maxima* Greg.
 Gregory, p. 41, 4/19, 1855;
 Mann, pp. 108-109, 1925.
 Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- mendica* Mann
 Mann, p. 109, 23/3, 1925.
 Bottom marine sample taken near the islands by the USS Albatross. Type-Cat. No. 43650, USNM, Mann (1.c.).
- menisculus* Schum.
 Schumann, p. 56, 2/33, 1867;
 Skvortzow, p. 292, 2/8, 1937;
 Hustedt, p. 70, 1942a.
 LUZON: Rizal, Quezon City, Balara, Skvortzow (1.c.); Manila (ponds, Bureau of Science grounds); Batangas, Taal (lake); Camarines Sur, Buhi (lake); Hustedt (1.c.).
- minicans* Hanna
 Hanna, p. 200, 13/4, 1932.
 = *Navicula mimula* Mann
 Mann, p. 110, 23/4, 1925.
 Bottom sediments taken near the islands by the USS Albatross, Mann (1.c.).
- minima* Grun.
 Grunow in Van Heurck, p. 107, 14/15, 1880-1885.

*Not recognized by VanLandingham, 1975.

- = *Navicula minima* var. *atomoides* (Grun.) Cl.
Cleve, p. 128, 1894;
Hustedt, p. 56, 1942a.
- LUZON: Rizal, Manila (ponds, Bureau of Science grounds); Camarines Sur, Buhi Lake, Hustedt (l.c.).
- MINDANAO: Lanao (lake), Hustedt (1.c.).
- minuscula* Grun.
Grunow in Van Heurck, 14/3, 1880;
Skvortzow, p. 291, 1/41, 1937;
Hustedt, p. 59, 1942a.
- LUZON: Rizal, Quezon City (Balara Water Filters), Skvortzow (1.c.).
- MINDANAO: Lanao (lake, ponds), Hustedt (1.c.).
- mira* Pant. & Greguss
Greguss in Greguss, p. 212, 6/8, 1913;
- = *Navicula mirabilis* Leud.-Fortm.
Leuduger Fortmorel, p. 31, 2/21, 1879;
Mann, p. 110, 1925.
- Bottom marine sediments taken near the islands by the USS Albatross, rare, Mann (1.c.).
- modica* Hust.
Hustedt, p. 916, 41/21-23, 1945.
- = *Navicula molesta* Mann
Mann, p. 110-111, 23/5, 1925.
- BMNH, Adam's # F 119, 7/3.
- MINDANAO: Jolo, Sulu. Type-Cat. No. 43651, USNM, Mann (1.c.).
- monilifera* f. *constricta* (Perag. & Perag.) Hust.
Hustedt, p. 712, f. 1699B, 1966;
Podzorski & Hakansson, pp. 84-85, 34/1, 1987.
- LUZON: Palawan, Taytay, Langen, Malapakan Is. (surface scrapings from the sand in the cove, at low tide); Podzorski & Hakansson (1.c.).
- mucicoloides* Hust.
Hustedt, p. 59, f. 98-102, 1942a.
- LUZON: Benguet, Bontoc; Rizal, Lyon (ponds), Hustedt (1.c.).
- muralis* Grun.
Grunow in Van Heurck, 14/27, 1880;
Hustedt, p. 59, 1942a.
- LUZON: Camarines Sur, Buhi Lake, Hustedt (1.c.).
- mutica* Ktz.
Kützing, p. 93, 3/32, 1844;
Woltereck, p. 52, 1941;
Hustedt, p. 52, 1942a;
Podzorski & Hakansson, p. 85, 33/8, 1987.
- LUZON: Benguet, Banaue (ponds), Woltereck (1.c.); Laguna, Los Baños (ponds, Laguna de Bay); Batangas, Taal Lake, Crater Lake; Camarines Sur, Buhi Lake, Hustedt (1.c.); Palawan, Taytay, Langen, Malapakan Is. (algae in the cove, marine); Taytay, Lake Manguao (Danao), (alt. c. 45 m, at the end of dry season, hence, lake at its shallowest); Roxas, Pagdangan Range, Ibangley Brookside Hill (alt. c. 40 m, on epiphyllous bryophyte beside a river), Podzorski & Hakansson (1.c.).
- VISAYAS: Leyte, Danao Lake, Hustedt (1.c.).
- MINDANAO: Lanao, Uyaan Lake, Hustedt (1.c.).
- _____ var. *cohnii* (Hilse) Grun.
Grunow in Van Heurck, 10/17, 1880;
Hustedt, p. 52-53, 1942a.
- LUZON: Rizal, Lyon; Laguna, Los Baños (ponds), Hustedt (1.c.).
- MINDANAO: Leyte, Uyaan Lake, Hustedt (1.c.).

- _____ f. *intermedia* (Hust.) Hust.
 Hustedt, p. 586, f. 1593, 1966;
 Podzorski & Hakansson, p. 85, 33/9, 1987.
- LUZON: Palawan, Roxas, Pagdangan Range,
 (Ibangley Brookside Hill, from leaf surfaces),
 Podzorski & Hakansson (1.c.).
- = *Navicula lagerheimii* var. *intermedia* Hust.
 Hustedt in Schmidt, *et al.*, 370/22, 1874;
 Hustedt, p. 54, 1942a.
- LUZON: Oriental Mindoro, Calapan Lake,
 Hustedt (1.c.).
- _____ var. *nivalis* (Ehr.) Hust.
 Hustedt, p. 290, 1911.
- = *Navicula mutica* var. *tropica* Hust.
 Hustedt, p. 233, 17/6, 1937b.
- LUZON: Laguna, Los Baños (ponds);
 Camarines Sur, Buhi Lake, Buhi River; Oriental
 Mindoro, Naujan (river), Hustedt (1.c.).
- nebulosa* Greg.
 Gregory, p. 480, 9/8, 1857;
 Mann, p. 111, 1925.
- Bottom sediments taken near the islands by
 the USS Albatross, Mann (1.c.).
- VISAYAS: Cebu, BMNH, Comber #31900.
- nippon* Skv.
 Skvortzow, p. 277, 5/17, 1936.
- = *Navicula nitescens* (Greg.) Ralfs*
 Ralfs in Pritchard, p. 898, 1861;
 Mann, p. 111, 1925.
- Bottom sediments taken near the islands
 by the USS Albatross, Mann (1.c.).
- northumbricaeformis* M. Perag
 M. Pergallo in Heribaud, et al., p. 15, 1/19, 1920;
 = *Navicula notabilis* Grev.
 Greville, p. 18, 1/19, 1863;
 Mann, p. 111, 1925.
- Bottom sediments taken near the islands
 by the USS Albatross, Mann, (1.c.).
- nummularia* Grev.
 Greville, p. 249, 5/6, 1859;
 De Toni, p. 96, 1891;
 Mann, p. 111, 1925.
- Bottom sediments taken near the islands by
 the USS Albatross, Mann (1.c.).
- = *Navicula forcipata* var. *suborbicularis* Grun.
 Grunow in Van Heurck, 10/5, 1880.
 Cleve, p. 66, 1895.
- MINDANAO: Sulu Sea (Deby Coll.).
- aff. *ny* Cl.
 Cleve, p. 75, 1/24, 1894;
 Podzorski & Hakansson, p. 75-76, 31/4, 1987.
- LUZON: Palawan, Taytay, Langen, Malapakan
 Is. (surface scrapings from sand at low tide in the
 cove, marine), Podzorski & Hakansson (1.c.).
- nympharum* Hust.
 Hustedt, 1936, in Schmidt, et al., 401/85-87,
 1874.
- = *Navicula oamaruensis* Grun.*
 Grunow, 1888, in Schmidt, *et al.*, 129/9, 1874-
 ___;
 Mann, p. 111, 1925.
- Bottom sediments taken near the islands
 by the USS Albatross, Mann (1.c.).
- obesa* O. Müll.
 O. Müller, p. 84, 2/27, 1910.

*Not recognized by VanLandingham, 1975.

= *Navicula obesa* (Grev.) Mann
Mann, pp. 111-112, 23/6, 24/1, 1925.

Bottom marine samples taken near the islands by the USS Albatross. No type designated, Mann (1.c.).

occulta Krasske
Krasske, p. 353, f. 12a-b, 1929.

= *Navicula ocellata* Mann*
Mann, p. 112, 24/2, 1925.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43652, USNM, Mann (1.c.).

oscitans Schmidt
Schmidt, 1875, in Schmidt, *et al.*, 6/41, 1874;
Mann, p. 112, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

_____ var. *subundulata* Cl. & Grove
Grove, p. 67, 10/10, 1891.

BMNH, Adam's # TS 523/5.8.

= *Navicula suboscitans* Mann
Mann, p. 122, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

pacifica (Cstr.) Mann*
Castracane p. 23, pl. 20, f. a, 1886;
Mann, p. 113, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

palpebralis var. *sempilena* (Greg.) Cl.
Cleve, p. 70, 1895.

*Not recognized by VanLandingham, 1975.

= *Navicula angulosa* var. *beta* Greg.
Gregory, p. 42, 5/8, 1856;
Mann, p. 94, 1925.

Bottom sediments, Mann (1.c.).

palustris var. *obesa* Zanon
Zanon, p. 111, 2/10, 1949.

=*Navicula pandura* Breb.
Schmidt, *et al.*, 11/1, 2, 4, 8, 9, 1874;
Mann, p. 113, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

perrotettii (Grun.) Cl.
Cleve, p. 110, 3/12, 1894;
Hustedt, p. 51, 1942a.

Diatom samples from the Philippines of slightly brackish waters derived from Dr. Rae's collection, Cleve (1.c.).

LUZON: Rizal, Manila (ponds, Bureau of Science grounds); Laguna, Los Baños (Laguna de Bay, ponds); Camarines Sur, Buhi (lake, river), Hustedt (1.c.).

philippina Skv.
Skvortzow, p. 291, 1/25, 45, 1937a.

LUZON: Rizal, Quezon City, Balara (water filter no. 8), Skvortzow (1.c.).

phillipinarum Mann
Mann, pp. 114-115, 25/1, 1925.

Bottom marine samples taken near the islands, including those from the Sulu group, taken by the USS Albatross. Type-Cat. No. 43655, USNM, Mann (1.c.).

BMNH, Adam's # F 83, 6/57; TS 523/9.

platyventris Meist.
Meister, p. 95, f. 33, 1934 (1935);
Podzorski & Hakansson, p. 81, 32/3, 1987.

LUZON: Palawan, Langen, Malapakan Is. (surface scrapings from the sand at low tide in the cove), Podzorski & Hakansson (l.c.).

VISAYAS: Cebu, BMNH, Comber # 31898, 31895, 31894.

plicatula Grun.

Cleve & Möller, slide #154-155;
Grunow *Ms.* in Cleve, p. 155, 3/28, 1894;
Mann, pp. 115-116, 24/8-9, 1925;
Podzorski & Hakansson, p. 78, 30/8, 1987.

_____ var. ?

BMNH, Adam's # F 45.2/16.

protracta (Grun.) Cl.

Cleve, p. 140, 1894;
Podzorski & Hakansson, p. 77, 33/13, 1987.

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

LUZON: Palawan, Taytay (Lake Manguao, alt. c. 45 m., end of the dry season when it was at its shallowest, surrounded by semi-deciduous rainforest), Podzorski & Hakansson (l.c.).

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae from the cove, marine), Podzorski & Hakansson (l.c.).

VISAYAS: Cebu, BMNH, Comber # 31894.

pseudobryophila Hust.

Hustedt, p. 60, 1942a;
_____, p. 114, 1942b.

plutonia O' Meara*

O'Meara, p. 286, 13/6, 1872;
De Toni, p.78, 1891.

VISAYAS: Leyte (Danao Lake), Hustedt (1942a).

MINDANAO: Sulu, Cagayan, (brackishwaters from the volcanic mountain), De Toni (l. c.).

pseudoclavata Mann

Mann, p. 116, 25/2, 1925.

praetexta Ehr.

Ehrenberg, p. 214, 1840 (1841);
Castracane, p.812, 1886;
Mann, p. 116, 1925.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43656, USNM, Mann (l.c.).

Bottom marine samples taken near the islands by the USS Albatross, Mann (l.c.).

pseudoforcipata Hust.

Hustedt, pp. 119-120 f. 11, 1942b;
Podzorski & Hakansson, p. 80, 31/67, 1987.

BMNH, Adam's # GC 2094; F 119 3/9; TS 497.1/10; TS 523/11; TS 60/81.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (from the cove, marine); Pto. Princesa (south of Pto. Princesa Bay, from the rapidly deepening zone of the Sulu Sea, hand collected from corals at 10 m depth), Podzorski & Hakansson (l.c.).

LUZON: Manila (on shell), BMNH, Comber # 30925.

VISAYAS: Cebu, Castracane (l.c.).

pseudony Hust.

Hustedt, p. 23, 8/11, 1955;
Podzorski & Hakansson, p. 80, 30/2, 1987.

_____ var. *abundans* Schmidt

Schmidt, *et al.*, 129/8, 1874;
Cleve, p. 55, 1895.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted from the cove, marine), Podzorski & Hakansson (l.c.).

*Not recognized by VanLandingham, 1975.

pugio Mann

Mann, p. 117, 26/4, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

pulverulenta (*pulvulenta*) Mann

Mann, pp. 117-118, 25/3, 1925.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43659, USNM, Mann (1.c.).

pupula Ktz.

Kützing, p. 93, 30/40, 1844;

Woltereck, p. 52, 1941;

Hustedt, p. 64, 1942a;

Podzorski & Hakansson, p. 76, 30/3, 1987.

LUZON: Benguet, Banaue (ponds), Woltereck, 1941; Rizal, Malabon, Dagatan (swamp), Manila (ponds in the Bureau of Science grounds, Pancipit River, Reservoir II); Laguna, Los Baños (ponds, Laguna de Bay), San Pablo (Bunot Lake, Bato Lake); Batangas, Taal (Yambo Crater Lake, Crater Lake); Camarines Sur, Buhi (lake, river); Payren Lake; Oriental Mindoro, Naujan Lake, Hustedt (1.c.); Palawan, Taytay (Lake Manguao, alt. 45 m, near Public Works' resthouse, at the end of the dry season, when lake was shallowest; small pool in stream bed flowing into NW side of the lake, 1.8 km from Public Work's resthouse, alt. 130 m), Podzorski & Hakansson (1.c.).

MINDANAO: Lanao (Uyaan Lake, Lanao Lake, river); Jolo, Sulu (Seit Lake), Hustedt (1.c.).

_____ var. *rectangularis* (Greg.) Cl. & Grun.
Cleve & Grunow, p. 45, 1880.

= *Navicula* f. *rectangularis* (Greg.) Cl. & Grun.
Hustedt, pp. 64-65, 1942a;
Podzorski & Hakansson, p. 76, 30/4, 1987.

LUZON: Palawan, Roxas, Pagdanan Range (Ibangley Brookside Hill, alt. 40 m, streamside pool), Podzorski & Hakansson (1.c.).

VISAYAS: Leyte (Danao Lake), Hustedt (1.c.).

MINDANAO: Lanao (Uyaan Lake), Hustedt (1.c.).

_____ f. *rostrata* (Hust.) Hust.

Hustedt, p. 291, 3/39, 1911;

_____, p. 64, 1942a;

_____, p. 282, 1957.

LUZON: Laguna, Los Baños (Laguna de Bay, pond); Batangas, Taal (Taal Lake); Camarines Sur, Buhi (lake), Hustedt (1942a).

MINDANAO: Lanao (pond), Hustedt (1942a).

pygmaea Ktz.

Kützing, p. 77, 1849;

Woltereck, p. 52, 1941;

Hustedt, pp. 66-67, 1942a;

Podzorski & Hakansson, p. 80, 31/11, 1987.

LUZON: Benguet, Banaue (ponds), Woltereck (1.c.); Rizal, Manila (Bureau of Science grounds, ponds), Pancipit River, Lyon (ponds); Laguna, Los Baños (ponds, Laguna de Bay); Camarines Sur, Buhi (river), Hustedt (1.c.); Palawan, Pto. Princesa (south of Pto. Princesa Bay, hand collected from sand surface at 15 m depth); Taytay, Langen, Malapakan Is. (surface scrapings from sand at low tide), Podzorski & Hakansson (1.c.).

MINDANAO: Lanao (Lanao Lake), Jolo, Sulu (Seit Lake), Hustedt (1.c.).

quarnerensoides Hust.*

Hustedt, p. 49, f. 1203, 1961; (doubtful-*fide*:

VanLandingham, p.2759,1975);

Podzorski & Hakansson, 78, 1987.

LUZON: Palawan, Pto. Princesa, Table Head (hand collected from sand surface at 15 m depth of Sulu Sea), Podzorski & Hakansson (1.c.).

*Not recognized by VanLandingham, 1975.

radiosa Ktz.

Kützing, p. 91, 4/23, 1844;
Woltereck, p. 52, 1941;
Hustedt, pp. 69-70, 1942a;
Podzorski & Hakansson, p. 82, 33/2, 3.

LUZON: Benguet, Banaue (ponds); Rizal, Malabon (Dagatan swamp), Manila (Water Reservoir III, Ponds in Bureau of Science grounds, Lyon ponds), Hustedt (1.c.); Brooke's Point (Tumarabong River over Oligocene-Miocene reef limestones, alt. 10 m, scrapings from the surface of a limestone rock), Podzorski & Hakansson (1.c.).

_____ var. *tenella* (Breb. ex Ktz.) Cl. et Möll.

(non Grun. *vide* VanLandingham, 1975);
Cleve et Möller slide no. 224, 1881;
Hustedt, pp. 69-70, 1942a;
Podzorski & Hakansson, p. 82, 33/4, 1987.

LUZON: Batangas, Taal (Volcano Lake), Hustedt (1.c.); Palawan, Pto. Princesa (Irawan River over mafic and mafic-plutonic rocks, alt. c. 150 m; scrapings from a bryophyte behind a waterfall), Podzorski & Hakansson, (1.c.).

raena (Cstr.) De T.

De Toni, p. 30, 1891;
Mann, p. 118, 1925.

Bottom marine samples taken near the islands by the USS Albatross. Type species from the Philippines (*vide*: Castracane below), Mann (1.c.).

= *Pinnularia raena* Cstr.
Castracane, p. 25-26, 15/3, 1886.

VISAYAS: Cebu, from Dr. Rae's collection,
Castracane (1.c.).

ramosissima (Ag.) Cl.

Cleve, p. 26, 1895;
Podzorski & Hakansson, p. 82, 34/3, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted from the cove, marine), Podzorski & Hakansson (1.c.).

retracta Meist.

Meister, p. 262, 4/6, 1937;
= *Navicula retrostauros* Mann*
Mann, p. 118, 25/2, 26/1, 2, 1925.

BMNH, Adam's #M 59.1/8; TS 60/59.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43660 USNM, Mann (1.c.).

rhapsoneis (Ehr.) Grun.

Grunow, p. 19, 91/17, 1867;
Podzorski & Hakansson, pp. 82-83, 32/6, 7, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae scraped from the cove), Podzorski & Hakansson (1.c.).

rhombica Greg.

Gregory, p. 40, 4/16, 1855;
Mann, p. 119, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

_____ var. *japonica* (Brun.) Cl.

Cleve, p. 152, 1894.

BMNH, Adam's #TS 523/2.

rhynchocephala (*rhynococephala*) Ktz.

Kützing, p. 152, 30/35, 1844;
Hustedt, p. 67, 72, 1942a;
delos Reyes, p. 59, pl. 4, f. 17, 1972.

LUZON: Laguna, Los Baños (Laguna de Bay); Batangas, Taal (Crater Lake); Hustedt (1.c.).

VISAYAS: (Tigbao water supply), delos Reyes (1.c.).

riparia Hust.

Hustedt, p. 52, f. 77-78, 1942a.

*Not recognized by VanLandingham, 1975.

LUZON: Rizal, Malabon (Dagatan Swamp),
Hustedt (1.c.).

robertsiana (robertsoniana) Grev.
Greville, p. 235, 3/9, 1865.

VISAYAS: Cebu, BMNH, Comber #31895.

_____ var. *cuneata* (Schmidt) Amosse'
Amosse', p. 111, 1924.

= *N. prodiga* Mann
Mann, p. 252, 53/4, 1907;
_____, p. 116, 1925.

Bottom marine samples taken near the
islands by the USS Albatross, Mann (1925).

ruttneri Hust.
Hustedt, 1936, in Schmidt, *et al.*, 402/30-38, 49-52,
1874;
_____, p. 55, 1942a.

LUZON: Camarines Sur, Buhi (lake), Hustedt
(1942a).

_____ var. *capitata* Hust.
Hustedt, 1936, in Schmidt, *et al.*, 402/47, 48,
1874;
_____, p. 55, 1942a.

LUZON: Manila (Reservoir II), Oriental
Mindoro, Naujan (river), Hustedt (1.c.).

_____ var. *rostrata* Hust.
Hustedt, 1936, in Schmidt, *et al.*, 402/39-45,
1874;
_____, p. 56, 1942a.

LUZON: Rizal, Pancipit River; Oriental
Mindoro, Naujan (Naujan Lake), Hustedt (1942a).

MINDANAO: Lanao (pond), Hustedt (1942a).

salinarum Grun.
Grunow in Cleve & Möller, slide no. 107, 1878;
Grunow in Cleve & Grunow, p. 33, 2/34, 1880;
Pantastico, p. 195, 17/3, 1977.

LUZON: Laguna, Los Baños, Mayondon,
Pantastico (1.c.).

schaarschmidtii Pantocsek
Pantocsek, p. 28, 14/121, 1886.

VISAYAS: Cebu, BMNH, Comber #31900.

schoenfeldii Hust.
Hustedt, p. 301, f. 520, 1930;
_____, p. 70, 1942a.

LUZON: Oriental Mindoro, Naujan (river),
Hustedt (1942a).

schroeteri Meist.
Meister, p. 38, f. 100, 1932;
Hustedt, p. 72, 1942a.

LUZON: Laguna, Los Baños (Laguna de Bay);
Batangas, Taal (Taal Lake); Oriental Mindoro,
Naujan (river), Hustedt (1.c.).

_____ var. *escambica* Patr.
Patrick, p. 104, 7/3, 1959;
Podzorski & Hakansson, p.83, 33/5, 1987.

LUZON: Palawan, Roxas, Pagdanan Range,
(Ibangley Brookside Hill streamside freshwater
pool, alt. c. 40 m.), Podzorski & Hakansson (1.c.).

scutelloides W. Sm.
Smith, p.9, 1856;
_____, in Gregory, p. 4, 1/15, 1856;
Hustedt, p. 66, 1942a.

LUZON: Batangas, Taal (Crater Lake);
Camarines Sur, Buhi (lake), Hustedt. (1.c.)

MINDANAO: Lanao (Lanao Lake, pond),
Hustedt (1.c.).

seminulum Grun.Grunow, p. 552, 4/3(2/3), 1860;
Hustedt, p. 56, 1942a.

LUZON: Camarines Sur, Buhi (lake);
Batangas, Taal (Crater Lake).

- MINDANAO: Lanao (Lanao Lake, pond);
Hustedt (l.c.).
- semistauros* Mann*
Mann, 119-120, 26/5, 1925.
- Bottom marine samples taken near the islands
by the USS Albatross, Type-Cat. No. 43661,
USNM, Mann (l.c.).
- sigma* Brun
Brun, p. 39, 16/5, 1891;
Brun later homonym, *Fide* VanLandingham p. 2799,
1975;
Podzorski & Hakansson, p. 75, 29/12, 1987.
- LUZON: Palawan, Pto. Princesa, Table Head
(from sand surface at 15 m depth of Sulu Sea),
Podzorski & Hakansson (l.c.).
- spectabilis* Greg.
Gregory, p. 481, 9/10, 1857;
Cleve, p. 60, 1895;
Mann, p. 121, 27/1-2, 1925;
Podzorski & Hakansson, pp. 80-81, 32/1, 1987.
- Bottom marine samples taken near the islands
by the USS Albatross, Mann (l.c.).
- Diatom samples (presumably from Dr. Rae's
collection), Cleve, 1894, p. 60, 1895.
- BMNH, Adam's # J 4006; Bess 1709/3; G 211;
F 40.2/16.45.1/11.
- LUZON: Palawan, Pto. Princesa, Table Head
(from the sand surface at 15 m depth of Sulu Deep
Sea), Podzorski & Hakansson (l.c.).
- VISAYAS: Cebu, BMNH, Comber #318931.
- _____ var. *controversa* (Schmidt) Cl.
Schmidt, *et al.*, 3/5, 1874;
Cleve, p. 60, 1895.
- _____ var. *emarginata* Cl.
Cleve p. 60, 1895.
- = *Navicula excavata* var. _____ Schmidt
Schmidt *in* Schmidt, *et al.*, 3/22-25, 1874.
- VISAYAS: Cebu, BMNH, Comber
#31899.
- _____ var. *excavata* (Grev.) Cl.
Cleve, p. 61, 1895;
- = *N. excavata* Grev.
Greville, p. 130, 12/15, 1866;
Mann, p. 102, 1925.
- Bottom marine samples taken near the
islands by the USS Albatross, Mann (l.c.).
- BMNH, Adam's # F 83.1/9.119.2/4; TS
522.2/2.
- = *N. oswaldii* Janisch
Janisch, 1, 15/12, 1888;
Mann, p. 113, 1925.
- Bottom marine samples taken near the
islands by the USS Albatross, Mann (l.c.).
- _____ var. *minuta* Cl.
Mereschkowsky, p. 320, 2/9-12, 1902.
- = *Navicula hennedyi* var. *minuta* Cl.
Cleve, p. 7, 1/15, 1881.
- VISAYAS: Cebu, BMNH, Comber
#31894.
- _____ var. ?
- BMNH, Adam's # F 931; Bess 1710/3; TS 497.
2/7-9.
- spiculifera* Mann*
Mann, pp. 121-122, 26/8, 1925.

*Not recognized by VanLandingham, 1975.

Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 4663, USNM, Mann (1.c.).

spiralis O' Meara*
De Toni, p. 74, 1891.

MINDANAO: Saline waters from the volcanic crater, Cagayan, Sulu Archipelago, De Toni (1.c.).

studerri sensu Comber*

LUZON: Manila (sponge), BMNH, Comber # 30924.

subarvensis Hust.
Hustedt, p. 60, f. 107-108, 1942a.

LUZON: Camarines Sur, Buhi (Buhi Lake), Hustedt (1.c.).

= *N. lyra* var. *subcarinata* Grun.
Grunow, 1874, *in* Schmidt, *et al.*, 2/5, 1874;
Mann, p. 108, 1925.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

BMNH, Bess 62; F 40 2/19; TS 497.2/6, 522, 2/6, 3/8.

LUZON: Manila, BMNH, Comber #31903.

subdecipiens De T.
De Toni, p. 147, 1891.

= *N. decipiens* Cstr.
Castracane, p. 32, 27/17, 1886.

From Philippine marine diatom collection of Dr. Rae, Castracane (1.c.).

subdecussis Hust.
Hustedt, pp. 75-76, f. 136-138, 1942a.

LUZON: Rizal, Manila (Reservoir II), Hustedt (1942a).

subforcipata Hust.
Hustedt, p. 533, f. 1569, 1964;
Podzorski & Hakansson, p. 75, 31/51, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (surface scrapings from sand at low tide), Podzorski & Hakansson (1.c.).

subrhynchocephala Hust.
Hustedt, p. 156, 1/11, 1935;
_____, p. 67, 1942a.

LUZON: Rizal, Manila (Reservoir II, Pancipit River); Laguna, Los Baños (pond, Laguna de Bay, Payren Lake); Batangas, Taal (Crater Lake); Camarines Sur, Buhi (Buhi Lake, river), Hustedt (1942a).

VISAYAS: Leyte (Danao Lake), Hustedt (1942a.).

suluensis O' Meara*
De Toni, p. 80, 1891.

MINDANAO: Brackishwaters in the crater of a volcanic island, Cagayan, Sulu, De Toni (1.c.).

takoradiensis Hendey
Hendey, p. 67, 1/8, 1958;
Podzorski & Hakansson, p. 77, 30/7, 1987.

LUZON: Palawan, Pto. Princesa, Table Head (from sand surface at 15 m depth of the Sulu Sea), Podzorski & Hakansson (1.c.).

tenera Hust.
Hustedt, p. 259, 18/11-12, 1937a;
_____, p. 67, 1942a.

LUZON: Rizal, Manila (Pancipit River); Batangas, Taal (Crater Lake); Hustedt (1942a).

terminata Hust.
Hustedt, p. 589, f. 1594, 1966;

*Not recognized by VanLandingham, 1975.

- = *N. mutica* var. *tropica* Hust.
 Hustedt, 1936 in Schmidt, *et al.*, 405/39-42, 1874;
 _____, pp. 53-54, 1942a.
 LUZON: Laguna, Los Baños (pond); Camarines Sur (Buhi Lake); Oriental Mindoro, Naujan (Naujan River), Hustedt (1942a).
- translucens* Mann
 Mann, p. 123, 26/9, 1925.
 Bottom marine samples taken near the islands by the USS Albatross. Type-Cat. No. 43665, USNM, Mann (1.c.).
- tripunctata* (O.F. Müll.) Bory*
 Bory, p. 128, 1822;
 Podzorski & Hakansson, p. 83, 33/6, 1987.
 LUZON: Palawan, Taytay, Langen, Malapakan Is. (scrapings from sand surface at low tide), Pto. Princessa, Honda Bay (scraping from coral reefs at the edge of an atoll), Podzorski & Hakansson (1.c.).
- uniseriata* Östrup
 Östrup, p. 8, 1/9, 1913;
 Podzorski & Hakansson, pp. 77, 33/12, 1987.
 LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae encrusted from cove), Podzorski & Hakansson (1.c.).
- variostrata* Krasske
 Krasske, p. 197, f. 12, 1923;
 Hustedt, p. 55, 1942a.
 LUZON: Laguna (Laguna de Bay), Hustedt (1.c.).
- venusta* Janisch
 Janisch, 15/17, 1888;
 Mann, p. 124, 1925.
- Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
- venustissima* Kitt.
 Kitton, p. 101, 1889;
 Kitton in Leuduger-Fortmorel., p. 17, 2/3, 1892.
 BMNH, Adam's # GC 2177.
- viminea* Hust.
 Hustedt, 1934 in Schmidt, *et al.*, 397/10-11, 1874;
 Podzorski & Hakansson, p. 83, 32/8-9, 1987.
 LUZON: Palawan, Taytay, Langen, Malapakan Is. (surface scrapings from sand at low tide), Podzorski & Hakansson (1.c.).
- viridula* (Ktz.) Ehr.
 Ehrenberg, p. 53, 1836.
 = *Navicula viridula* Ktz.
 Kützing, p. 23, 13/12, 1833;
 Hustedt, p. 72, 1942a.
 LUZON: Laguna, Los Baños (pond); Camarines Sur, Buhi (Buhi Lake), Hustedt (1.c.).
- werestschangini* (*werestschangini*) Skv. & Meyer
 Skvortzow & Meyer, p. 20, 1/64, 1928;
 Podzorski & Hakansson, p. 85, 34/5, 1987.
 LUZON: Palawan, Taytay, Langen, Malapakan Is. (surface scrapings from sand at low tide), Podzorski & Hakansson (1.c.).
- yarrensis* (*jarrensis*) Grun.
 Grunow 1876, in Schmidt, *et al.*, 46/1-6, 1874;
 Mann, p. 126, 1925;
 Podzorski & Hakansson, p. 79, 31/3, 1987.
 Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).
 BMNH, Adam's # GC 2190; TS 262.1/4.5.18.6/1.2.89.

*Not recognized by VanLandingham, 1975.

LUZON: Palawan, Taytay, Langen, Malapakan Is. (algae scraped from the cove), Podzorski & Hakansson (1.c.).

zanzibarica Grev. var. *zebuana* Cstr.
Greville, p. 129, 12/22, 1866;
Castracane, p. 31, 28/8, 1886;
A. Schmidt, 1888 in A. Schmidt, *et al.*, 129/4, 1874.

VISAYAS: Cebu, Castracane (1.c.).

zostereti (*zosteretii*) Grun.
Grunow, p. 528, 4/23, (2/23) 1860;
Mann, p. 125, 1925;
Podzorski & Hakansson, pp. 83-84, 33/10, 1987.

Bottom marine samples taken near the islands by the USS Albatross, Mann (1.c.).

LUZON: Palawan, Taytay, Langen, Malapakan Cove (scrapings from the cove), Pto. Princessa, White Beach (on mud surface in a mangrove), Honda Bay (coral scrapings from a bay), Podzorski & Hakansson (1.c.).

sp. (*miniscula*)
Podzorski & Hakansson, p. 81, 19/11, 1987.

LUZON: Palawan, Taytay, Langen, Malapakan Cove (scraping from sand surface at low tide), Podzorski & Hakansson (1.c.).

sp. 1
Esguerra, p. 174, 1951;
Villadolid, p. 21, 1957.

sp. 2
BMNH, Adam's-Bess # M64-66; TS 80; Bess 22/6.714; TS 522.2/3.7.3/3.

VISAYAS: Cebu, Castracane, p. 812, 1886.

sp. 3
White chalk collected by the ship Princess Louise to Manila, under Capt. Wendt (1830-34). Identification by Dr. Meyer. Ehrenberg, Atlas, p. 177, pl. 1, 1854.

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