

Type material deposited at the Diatom Herbarium (DIAT-CONC), University of Concepción, Concepción, Chile

Material tipo depositado en el Herbario Diatomológico (DIAT-CONC), Universidad de Concepción, Concepción, Chile

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ABSTRACT

The Diatom Herbarium of the University of Concepción, Chile (DIAT-CONC), hosted by the Department of Botany, Faculty of Natural and Oceanography Sciences. At present it hosts 7,812 slides and 3,553 containers with raw and clean material collected from marine, brackish and freshwater habitats. Among them, there are divers Collections of diatoms, and the types of 40 new species or genera. Detailed information of each type is given. Also, we propose four new taxonomic combinations.

Keywords: Chile, Concepción, Diatom Herbarium, new taxonomic combinations, types.

RESUMEN

El Herbario de Diatomeas de la Universidad de Concepción (DIAT-CONC), está ubicado en el Departamento de Botánica, Facultad de Ciencias Naturales y Oceanográficas. A la fecha, comprende 7.812 preparaciones y 3.553 frascos con material limpio o crudo, recolectado en ambientes marinos, salobres y dulceacuícolas. En este Herbario están depositadas diversas Colecciones de diatomeas, incluyendo el material tipo de 40 taxa. Se entrega información detallada de cada uno de ellos. Además, proponemos cuatro nuevas combinaciones taxonómicas.

Palabras clave: Chile, Concepción, Herbario de Diatomeas, nuevas combinaciones taxonómicas, tipos.

Diatoms (Division Bacillariophyta) are single-celled eukaryotic microalgae, basis of all aquatic food-chains, producing approximately 1/5 of the oxygen we breathe. A diatom collection is a testament of the present time for the future generations (Harvard University, Farlow Herbarium 2024), and according with Sterrenburg (1990): "the first purpose of collections is for taxonomic research, and the first prerequisite in any science is that the entities under study are unambiguously defined".

The Concepción Diatom Herbarium (DIAT-CONC), the principal and the first institutional diatom collection in Chile (Habit *et al.* 2019, Ortiz *et al.* 2023), was established in 1967 and hosted by the Department of Botany, Faculty of Natural

Sciences and Oceanography, University of Concepción, Concepción, as an initiative of Professor Patricio Rivera. The earliest related published work was a Dr. Rivera's paper published in the Noticiario Mensual del Museo de Historia Natural, Santiago, Chile, Year XI, N. 135, in the early 1967. From this time on, to the present days, the Diatom Herbarium has increased the number of records of both fossil and recent diatoms collected from fresh, brackish and marine habitats from Chile, including a few from other countries given to the Diatom Herbarium by foreign diatomists. The Herbarium contains diverse Diatom Collections, e.g. Expedición MarChile I, 1960; Bahía de Concepción, 1965-1966; Expedición Antártica, 1969; Expedición Mar Chile 8, 1972; Expedición

Hero 72-4-A and Hero 72-4 B, 1972; Expedición BIOMASS/Sibex Antarctic, 1985; Expedición Río BioBio, 1990-1991, among others.

At present, the Concepción Diatom Herbarium contains 7,812 slides (DIAT-CONC), of which 40 are new taxa types, and 3,553 are bottles (DIAT-CONC M) with raw or cleaned material, identified by a unique record number. According to the International Code of Botanical Nomenclature (Greuter *et al.* 1994), the type material of a diatom species is a single, or more than one individual, or an illustration used by the author as the nomenclatural type. It is recommended that the type material be deposited and conserved in a permanent and responsible institution.

The Herbarium also maintains an index of diatom publications which contains approximately 5,300 cards with references to books, articles, journals, separates and monographs about diatoms, all physically present in the Herbarium. Until now, the Concepción Diatom Herbarium, together with its extensive library, has been the source of information for nearly 150 contributions to the field, and is frequently consulted by researchers on systematics, morphology, ecology and biogeography.

The type material of diatom taxa deposited at de Concepción Diatom Herbarium is presented in alphabetic order and four new taxonomic combinations are proposed.

Adoneis Andrews & Rivera

Diatom Research 2(1): 2, Figs. 1-3, 1987.

Type locality: South Pacific Ocean, Mehuín, at 39°26'S 73°10'W, February 1975.

DIAT-CONC 2370, Holotypus.

Adoneis pacifica Andrews & Rivera

Diatom Research 2(1): 2, Figs. 1-26, 1987.

Type locality: South Pacific Ocean, Mehuín, at 39°26'S 73°10'W, February 1975.

DIAT-CONC 2370, Holotypus.

Achnanthes kenya Cholnoky

Osterreichischen Botanischen Zeitschrift 107: 351-365, Taf. 1, Abb. 1: 1-4, 1960.

Type locality: Hall Tarns, Georges Valley, South Africa.

Valid name: ***Achnanthidium kenya*** (Cholnoky) Cocquyt 2007.

DIAT-CONC 2141, Type material.

DIAT-CONC 2142, Type material.

Achnanthes robusta Rivera

Gayana Botánica 25: 44, Lám. 7, Figs. 68-69, 1974.

Type locality: Río Quenuir, Llanquihue, 41°31'S 73°42'W, Chile, 27.08.1968. Temperatura del agua 11.2 °C. Col. Ohme.

DIAT-CONC 362, Holotypus.

Amphora splendida Rivera

Gayana Botánica 28: 61, Fig. 94, 1974.

Type locality: Río Andalién, Puente 3, 06.03. 1971, 36°49'S 72°53'W, Concepción, Chile.

DIAT-CONC 702, Holotypus.

Attheya zachariasii Brun var. ***curvata*** Rivera

Boletín Sociedad Biología de Concepción 47: 87-91, Figs. 4-5, 1974

Type locality: Laguna Verde, Hualpén, 36°47'S 73°09'W, Concepción, Chile 15.09.1970. Temperatura agua 14°C. Col. P. Rivera, O. Parra.

Valid name: ***Acanthoceras zachariasii*** (Brun) Simonsen var. ***curvata*** (Rivera) Rivera, Cruces et Ascencio comb. nov.

DIAT-CONC 899, Holotypus.

DIAT-CONC 899 A, Isotypus.

Cocconeis californica Grunow var. ***lengana*** Rivera in Rivera, Parra & González

Gayana Botánica 23: 29, Lám. 7, Figs. 2-7, 1973.

Type locality: Río Lengua, Concepción. 36°46'S 73°11'W, Chile, Estación 1, 15.10.1970.

DIAT-CONC 516-A, Holotypus.

DIAT-CONC 516-B, Isotypus.

Cocconeis formosa Brun var. ***marina*** Rivera

Gayana Botánica 25: 38, Lám. 14, Figs. 162-167, 1974.

Type locality: Golfo de Quetalmahue, Chiloé, 41°52'S 73°52'W, Chile, 01.11.1968. Epífita en pelillo.

Valid name: ***Cocconeis stauroneiformis*** (Rabh.) Okuno, according to Romero 1996.

DIAT-CONC 404, Holotypus.

DIAT-CONC 405, Isotypus.

Cocconeis nortina Rivera

Gayana Botánica 25: 39, Lám. 15, Figs. 168-172, 1974.

Type locality: Bahía de Coquimbo, Coquimbo, 29°53'S 71°19'W, Chile, 12.05.1969. Epífita en pelillo.

DIAT-CONC 436, Holotypus.

Cocconeis pseudocostata Romero

Nova Hedwigia 63(3-4): 361-396, 1996.

Type locality: South Pacific Ocean (bottom sediment sample), 36°49'S 72°53'W.

DIAT-CONC 4058, Holotypus.

DIAT-CONC 4059, Isotypus.

Cocconeis sedimentaria Romero

Diatom Research 11(2): 306, Figs. 1-25, 1996.

Type locality: Pacific Ocean (bottom sediments sample), 53° 09'S 70° 48'W.

DIAT-CONC 4054, Holotypus.

DIAT-CONC 4055, Isotypus.

Cyclotella stelligera Cleve & Grunow var. **major** Rivera

Gayana Botánica 28: 17, Fig. 11, 1974.

Type locality: Río Biobío, Concepción, 36°58'S 73°00'W, Chile. 28.01.1971.

Valid name: ***Discostella stelligera*** (Cleve & Grunow) Houk & Klee var. **major** (Rivera) Rivera, Cruces et Ascencio comb. nov. DIAT-CONC 559, Holotypus.

Cymbella hauckii Van Heurck var. **chilensis** Rivera

Gayana Botánica 28: 65, Fig. 100, 1974.

Type locality: Laguna La Posada, Concepción, 36°56'S 73°10'W, Chile, 06.03.1971.

DIAT-CONC 540, Holotypus.

Cymbella hauckii Van Heurck var. **chilensis** Rivera f. **stigmata** Rivera

Ciencia y Tecnología del Mar, CONA 4: 31, Fig. 12, 1979.

Type locality: Río Laraquete, Arauco, Bajo el Puente, 37°09'S 73°11'W, 28.03.1977, temperatura agua 19°C.

DIAT-CONC 2109, Holotypus.

Cymbella tumida (Bréb.) Van Heurck var. **australica** (Schm.) Hustedt f. **rostrata** Rivera

Gayana Botánica 28: 67, Fig. 105, 1974.

Type locality: Río Andalién, Puente 3, 36°49'S 72°53'W, 06.03.1971, Concepción, Chile.

DIAT-CONC 702, Holotypus.

Cymbellonitzschia chilena Rivera, Cruces & Ascencio

Gayana Botánica 81(2): 141, Figs. 1A-G, 2 A-J. 2024.

Type locality: Laguna La Punta, in the southern portion of the Salar de Atacama. II Region Antofagasta, periphyton, 23°43'29"S. 68°14'W, Material collected 21.VII.2023.

DIAT-CONC 7811, Holotypus.

DIAT-CONC 7812, Isotypus.

Eucampia zodiacus Ehr. f. **recta** Rivera, Avaria & Cruces

Revista Chilena de Historia Natural 76: 658, Fig. 4, 2003.

Type locality: 36°42'S, 73°02'W, Bahía de Concepción, Caleta El Morro, Talcahuano, Chile. 04.12.1965, Est. 2.

DIAT-CONC 172, Holotypus.

DIAT-CONC 173, Isotypus.

DIAT-CONC 174, Isotypus.

Frankophila sudamericana Rivera & Cruces

Gayana Botánica 72(2): 374, Figs. 1 A-J, 2015.

Type locality: Salar de Aguas Calientes, Región de Antofagasta, Chile, 23° 30'S 67°33'W, 20.07.2002. 4200 m.a.s.l.

DIAT-CONC 7128, Holotypus, circle.

DIAT-CONC 7127, Isotypus

Frustulia patrickii Rivera

Gayana Botánica 28: 35, Fig. 48, 1974.

Type locality: Laguna Pineda, 36°49'S 72°55'W, 29.01.1971, Concepción, Chile.

DIAT-CONC 720, Holotypus.

Gyrosigma eximioides Rivera

Gayana Botánica 28: 37, Fig. 50, 1974.

Type locality: Arroyo Leonera, Concepción, 36°56'S 73°00'W, Chile, 04.04.1971. Temperatura agua 13°C.

DIAT-CONC 684, Holotypus.

Hantzschia amphioxys (Her.) Grun. var. **chilensis** Rivera

Gayana Botánica 28: 76, Fig. 121, 1974.

Type locality: Río Andalién, Puente 3, 36°49'S 72°53'W, Chile, 29.01.1971.

DIAT-CONC 699, Holotypus.

Minidiscus chilensis Rivera in Rivera & Koch

Proceedings of the Seventh International Diatom Symposium, Philadelphia, Pag. 281, Figs. 5-14, 1984.

Type locality: Estero Chope, Balsas. Oceanus Pacificus australis, 41°48'S 73°05'W, 29.04.1977.

DIAT-CONC 2271, Holotypus.

Navicula hawaiiensis Johansen. in Rushforth, Kaczmarska & Johansen

Bacillaria 7: 143, Figs. 79-80, 101-106, 1984.

Type locality: On lava walls near entrance of tube about 1250 m elevation. Thurstan Lava Tube, Hawaii Volcanos National Park, Hawaii County, Hawaii, 08 June 1980.

DIAT-CONC 2669, Isotypus, circled.

Navicula litoris Salah var. **irregulata** Rivera

Gayana Botánica 25: 55, Lám. 9, Fig. 97, 1974.

Type locality: Río Tubul, Arauco, 37°14'S 73°29'W, Chile, sobre pelillo. 19.08.1968. Col. Ohme.

DIAT-CONC 357, Holotypus.

Navicula stankovici Hustedt var. **chilensis** Rivera

Gayana Botánica 25: 59, Lám. 16, Figs. 182- 184, 1974.

Type locality: Río Pudeto, Chiloé, 41°52'S 73°49'W, Chile, 14.12.1968. Epífita en pelillo.

DIAT-CONC 402, Holotypus.

Navicula thurstonensis Kaczmarek. in Rushforth, Kaczmarek & Johansen

Bacillaria 7: 145, Figs. 81-83, 107-110, 125, 1984.

Type locality: On wet lava walls throughout Thurstan Lava Tube. Thurstan Lava Tube, Hawaii Volcanos National Park, Hawaii County, Hawaii, April 1982.

Valid name: **Nupela thurstonensis** (Kaczmarek) Kulikovskiy et al. 2009.

DIAT-CONC 2670, Isotypus, circled.

Nitzschia acuminata (Wm.Smith) Grun. var. **densestriata** Rivera

Gayana Botánica 25: 68, Lám. 11, Fig. 118, 1974.

Type locality: Río Pudeto, Chiloé, 41°52'S 73°49'W, Chile, 14.12.1968. Epífita en pelillo.

Valid name: **Tryblionella acuminata** Wm. Smith 1853 var. **densestriata** (Rivera) Rivera, Cruces et Ascencio comb. nov.

DIAT-CONC 401, Holotypus.

Pinnularia brevicostata Cleve var. **intermedia** Manguin f. **cuneata** Rivera

Gayana Botánica 28: 55, Fig. 82, 1974.

Type locality: Laguna Pineda, 36°49'S 72°55'W, 29.01.1971, Concepción, Chile.

DIAT-CONC 720, Holotypus.

Pinnularia pinedana Rivera

Gayana Botánica 28: 53, Figs. 79-80, 1974.

Type locality: Laguna Pineda, 29.01.1971, 36°49'S 72°55'W, Concepción, Chile.

DIAT-CONC 720, Holotypus.

Pinnularia pinedana Rivera var. **attenuata** Rivera

Gayana Botánica 28: 54, Fig. 81, 1974.

Type locality: Río Andalién, Puente 3, 36°49'S 72°53'W, 05.05.1971, Concepción, Chile.

DIAT-CONC 708, Holotypus.

Pinnularia tropica Hustedt. var. **densestriata** Rivera

Gayana Botánica 28: 58, Fig. 88, 1974

Type locality: Arroyo Leonera, Concepción, 36°56'S 73°00'W, Chile. 06.03.1971.

DIAT-CONC 681, Holotypus.

Stauroneis araucana Rivera

Ciencia y Tecnología del Mar, CONA 4: 28-31, Figs. 1-11, 1979.

Type locality: Río Laraquete, Arauco, Bajo el Puente, 37°09'S 73°11'W, 28.03.1977, temperatura agua 19°C.

DIAT-CONC 2109, Holotypus.

Stauroneis turfosa Tarnav & Jitária var. **reimeri** Rivera

Gayana Botánica 28: 40, Fig. 55, 1974

Type locality: Arroyo Leonera, Concepción, 36°56'S 73°00'W, Chile, 06.03.1971.

DIAT-CONC 682, Holotypus.

Synedra gaillonii (Bory) Ehr. var. **densestriata** Rivera

Gayana Botánica 25: 31, Lám. 14, Figs. 153-155, 1974.

Type locality: Golfo de Quetalmahue, Chiloé, 41°52'S 73°52'W, Chile, 11.07.1969. Epífita en pelillo.

Valid name: **Tabularia gaillonii** (Bory) Bukhtiyarova 1995 var. **densestriata** (Rivera) Rivera, Cruces et Ascencio comb. nov.

DIAT-CONC 458 (ex 106). Holotypus.

Thalassiosira coronata Gaarder

Report on the "Michael Sars" North Atlantic Deep-Sea Expedition 1910. University of Bergen, pag.30, Fig.17, 1951.

Type locality: 49°32'N 10°49'W, Michael Sars Expedition, St. 3, N°8, 8-40 m., 10.04.1910.

DIAT-CONC 2342, Type material.

Thalassiosira frenguelliopsis Fryxell & Johansen in Johansen & Fryxell

Phycologia, 24(2): 168, Figs. 6, 67-68, 71, 81, 1985.

Type locality: Agulhas 1980, St. 20, 50°06'S 11°46'E, 28.03.1980 0-200 m.

DIAT-CONC 2728, Isotypus.

Thalassiosira gerloffii Rivera

Bibliotheca Phycologica 56: 73, Figs. 164-183, 1981.

Type locality: Canal Sarmiento, Isla Esperanza, 51°12'S 74°05'8"W. Hero 72-4-B, St. 12, 10.10.1972.

DIAT-CONC 2216, Holotypus.

Thalassiosira maculata Fryxell & Johansen in Johansen & Fryxell

Phycologia 24(2): 170, Figs. 13, 69-70, 72-74, 77-80, 1985.

Paratype location: Islas Orcadas, St. 5A, 56°07'S 59°59'W, 10.09.1978, 0-250 m.

DIAT-CONC 2729. Paratypus, circled.

DIAT-CONC 4059, Isotypus.

Thalassiosira pacifica Gran & Angst

Publications Puget Sound Biological Station 7: 437, Fig. 12, 1931.

Type locality: Friday Harbor, 21.03.1928.

DIAT-CONC 2344, Type material.

DIAT-CONC 2345, Type material.

***Thalassiosira poro-irregularata* Hasle & Heimdal**

Nova Hedwigia, Beiheft 31: 573, Figs. 55-64, 71-72, 1970.

Type locality: Talcahuano (Bahía de Concepción), ca. 36°42'S 73° 02'W Chile, February, 1967.

DIAT-CONC 2663, Type material.

DIAT-CONC 2664, Type material.

DIAT-CONC 2665, Type material.

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