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Diatom diversity in the lakes of the Pyrenees: an iconographic reference

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ABSTRACT

Diatom diversity in the lakes of the Pyrenees: an iconographic reference

Environmental assessments and palaeoreconstructions can take advantage of the high diatom diversity present in mountain lakes. There are only a few studies dealing with the diatom flora of the Pyrenees and research on species taxonomy, distribution and ecology are still at an initial stage. With the aim of updating the list of species present and providing iconographic information for harmonising past and future studies, we report 549 taxa from a survey of 83 lakes across the geographical extent of the Pyrenean lakes comprising a broad range of environmental conditions and in the sedimentary record of the Burg lake. This study is a first step in the development of a comprehensive on-line atlas of Pyrenean diatoms including species occurrence, distribution and ecology (www.diatopyr.com). Samples were collected both from littoral epilithic substrates and the top of the sediment in the deepest zone of the lake. Additionally, we include also taxa that were present in the Late Glacial and Holocene sedimentary records of the Burg palaeolake, which were not found in the survey. The genera including more diversity were *Pinnularia*, *Gomphonema*, *Eunotia* and *Nitzschia*. About 25% of taxa remain to be determined at fine taxonomic resolution, many of them are likely to be species or varieties not described yet.

Key words: Diatom diversity, epilithon, oligotrophic lakes, mountain lakes.

RESUMEN

La diversidad de diatomeas en los lagos de los Pirineos: Una referencia iconográfica

La gran diversidad de diatomeas presentes en los lagos de montaña puede ser utilizada para el desarrollo de evaluaciones y paleoreconstrucciones ambientales. Hay pocos estudios sobre la flora de diatomeas de los Pirineos y los trabajos sobre su taxonomía, distribución y ecología están todavía en una fase inicial. Con el objetivo de actualizar la lista de especies registradas en los Pirineos y facilitar la armonización taxonómica de los trabajos pasados y futuros sobre diatomeas, se presenta un trabajo iconográfico que incluye 549 taxones encontrados en 83 lagos estudiados a lo largo de amplio rango de condiciones ambientales y en el registro sedimentario del lago Burg. Este es un primer paso para el desarrollo de un extenso atlas en Internet de las diatomeas de los Pirineos que incluya la ocurrencia, distribución y ecología de las especies (www.diatopyr.com). Las muestras se colectaron en el epiliton de la zona litoral y en la superficie de los sedimentos de la zona más profunda del lago. Adicionalmente, se incluyen taxones encontrados en el registro sedimentario del Tardiglacial y Holoceno del paleolago de Burg. Los géneros que tuvieron mayor diversidad fueron Pinnularia, Gomphonema, Eunotia *y* Nitzschia. *Alrededor del 25% de los taxones encontrados no se identificaron con una resolución taxonómica a nivel de especie, probablemente muchos de ellos corresponden a identidades taxonómicas no descritas todavía.*

Palabras clave: *Diversidad de diatomeas, epiliton, lagos oligotróficos, lagos de montaña.*

INTRODUCTION

Diatom diversity is particularly high in oligotrophic environments including mountain lakes similar as those in the Pyrenees (Lange-Bertalot & Metzeltin, 1996). Of the 1088 taxa recorded for the Iberian Peninsula, approximately 300 are registered in the Spanish Pyrenean area and Andorra (Aboal *et al.*, 2003). Likely these taxa number is still a high under-estimation of the diatom diversity in the Pyrenees as monographic studies on diatoms are limited and outdated (Hustedt, 1939; Carter, 1970). The presence of taxa not yet described is also likely. The progression in the description of new species in European freshwater ecosystems points to a large unknown diversity in remote and oligotrophic environments. Even for the Central European freshwater ecosystems that have been studied extensively, recent taxonomical investigations continue describing new taxa (Krammer & Lange-Bertalot, 1991b; Lange-Bertalot, 1993, 2001; Lange-Bertalot & Metzeltin, 1996; Krammer, 1997a, 1997b, 2002, 2003; Reichardt, 1999; Lange-Bertalot *et al.*, 2003; Werum & Lange-Bertalot, 2004; Levkov, 2009; Lange-Bertalot *et al.*, 2011). On the other hand, beyond biodiversity studies, diatoms are used in many applications, from ecological assessments (Denicola *et al.*, 2004) to environmental reconstructions (Quillen *et al.*, 2013). This has also been the case in the Pyrenean lakes; diatoms are included in the protocols for the assessment and monitoring of the ecological status of lakes (Clarke *et al.*,

Table 1. Geographic, morphological, lithological, land cover and chemical characteristic of the lakes studied. Chemical data were obtained in a unique sampling performed from 9/7/2000 to 23/8/2000 (Catalan *et al.*, 2009a). *Características geográficas, morfológicas, litológicas, cobertura de la cuenca y descripción general química de los lagos estudiados. Los datos químicos provienen de un único muestreo realizado entre 9/7/2000 to 23/8/2000 (Catalan* et al., *2009a).*

Variable	Median (range)
Altitude (m.a.s.l.)	2305 (1620-2990)
Lake area (ha)	5.5 (0.2-53.2)
Catchment area (ha)	114.6 (7-5437.9)
Maximum depth (m)	17 (0.7-123)
Relative depth (%)	6.5 (0.8-18)
Ice-cover duration (days)	185 (115-215)
Lithology (>30% lake catchment area)	
Metamorphic (%)	27.1 (0-100)
Plutonic (%)	48.2 (0-100)
Detrital (%)	17.7 (0-100)
Carbonate (%)	17.5 (0-90)
Land cover	
Glacier presence (%)	0 (0-15)
Bare rock (%)	30 (0-90)
Meadows (%)	15 (0-90)
Shrubs (%)	0 (0-60)
Coniferous (%)	0 (0-40)
Irradiance at lake bottom (%)	6.6 (0-88.8)
Summer surface temperature (ºC)	12.6 (3.8-18.5)
pH	7.0 (4.5-9.0)
Acid Neutralizing Capacity (μeq/L)	123 (0-1696)
SO_4^{2-} (μeq/L)	41.3 (10.3-1240.0)
Ca^{2+} (μeq/L)	139.5 (20.0-1195.0)
Mg^{2+} (μeq/L)	14.6 (4.0-557.3)
TP (μg/L)	3.4 (0.94-33.3)
TN (μg/L)	177.1 (43.9-967.9)
NO_3^- (μeq/L)	5.1 (0-19.9)

2005; Catalan *et al.*, 2006) and have been used in reconstructing pH and alkalinity in paleolimnological studies (Catalan *et al.*, 2009b; Catalan *et al.*, 2014). Any consistent application of diatoms as indicators requires as much taxonomic quality as accuracy in the measurement of environmental variables and adequate statistical procedures (Birks, 1994). Although discussions about the latter aspect are common (Anderson, 2000; Juggins, 2013), there is no statistical improvement able to deal with the lack of harmonised and precise taxonomy. For instance, the higher the taxonomical resolution, the better is the performance of models used to reconstruct nutrients and major-ion content (Rimet & Bouchez, 2012). Beyond the need to pursuit the best and most updated taxonomy, ecological applications will benefit from rich iconographical information facilitating the harmonisation among current studies and those of the past under a long-term situation of periodic taxonomic revisions.

METHODS

The study of the diatom species distribution was based on a survey of 83 lakes of the Pyrenees performed from 9/7/2000 to 23/8/2000 (Catalan *et al.*, 2009a). Lakes were distributed across a wide range of environmental conditions determined by bedrock, altitude and lake size changes (Table 1, Table 2, Fig. 1). The lakes were selected to achieve a stratified representation of the environmental variability and covering the geographical extremes. The taxonomical study was complemented with the taxa in the diatom record of the Burg palaeolake (Pèlachs *et al*., 2011), including a Late Glacial and early Holocene sedimentary sequence.

Two types of samples were collected at each lake in the regional study: top sediment and epilithon. Top sediment samples were from the deepest part of the lake, collected using a gravity corer and slicing the upper 0.5 cm. Epilithon sam-

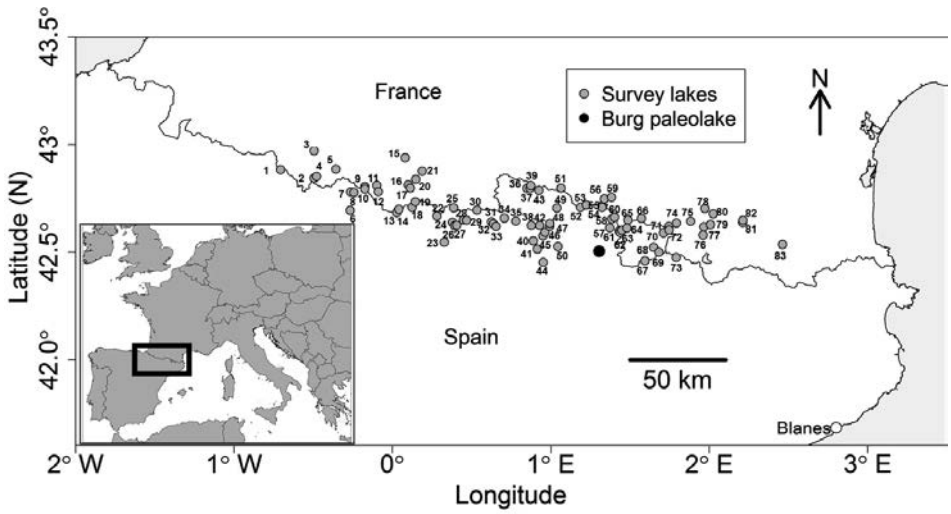

Figure 1. Map showing the location of the lakes included in the survey and Burg palaeolake (black point). Acherito (1), Bersau (2), Montagnon (3), Roumassot (4), Ormiélas (5), Asnos (6), Pondiellos sup. (7), Arnales (8), Arratille (9), Col d'Arratille (10), Estom (11), Glacé (12), Helado del Monte Perdido (13), Helado de Marboré (14), Bleu (15), Tourrat (16), Cap Long (17), La Munia Sup. (18), Barroude Inf. (19), Les Laquettes 1 (20), Port Bielh (21), Urdiceto (22), Basa de la Mora (23), Pixón (24), Bachimala Sup. (25), Sen (26), Chelau Sup. (27), Posets (28), Eriste (29), Lliterola (30), Cregüeña (31), Coronas (32), Llosás (33), Puis (34), Redon (35), Nere de Güèrri (36), Pica Palòmera (37), Monges (38), Long de Liat (39), Llebreta (40), Gran del Pessó (41), Plan (42), Montoliu (43), Filià (44), Llong (45), Gelat Bergús (46), Illa (47), Gerber (48), Airoto (49), Gran de Mainera (50), Rond (51), Inferior de la Gallina (52), Mariola (53), Senó (54), Romedo de Dalt (55), Aubé (56), Aixeus (57), Sotllo (58), Garbet (59), Pica (60), Baiau Superior (61), Negre (62), Forcat Inf. (63), Angonella de Més Amunt (64), Més amunt de Tristaina (65), Blaou (66), Gran de la Pera (67), Ensangents Sup. (68), Montmalús (69), Canals Roges (70), Albe (71) Siscar (72), Malniu (73), Compte (74), Aygue (75), Longue, Trebens (76), Blau (77), Bleu de Rabassoles (78), Gros de Camporrells (79), Laurenti (80), Negre (81), Estelat (82), L'Estagnol (83). *Mapa en el que se presenta la ubicación de los lagos muestreados y el paleolago Burg.*

Table 2. List of lakes studied. ID corresponds to the number of each lake in Figure 1. *Lista de los lagos estudiados. El número en paréntesis corresponde con el número de cada lago en la figura 1.*

ID	Lake	Latitude (ºN)	Longitude (ºE)	Altitude (m a.s.l.)
1	Acherito	42.88089	–0.70608	1875
2	Bersau	42.84062	–0.49454	2077
3	Montagnon	42.96846	–0.49387	2003
4	Roumassot	42.84925	–0.47815	1845
5	Ormiélas	42.8838	–0.35562	1974
6	Asnos	42.6918	–0.26629	2060
7	Pondiellos sup.	42.77699	–0.26312	2745
8	Arnales	42.77503	–0.24231	2305
9	Arratille	42.80158	–0.17364	2247
10	Col d'Arratille	42.79104	–0.17274	2501
11	Estom	42.80752	–0.09853	1804
12	Glacé	42.7783	–0.08845	2571
13	Helado del Monte Perdido	42.68213	0.02771	2990
14	Helado de Marboré	42.69659	0.04104	2592
15	Bleu	42.93705	0.08174	1950
16	Tourrat	42.80998	0.09966	2636
17	Cap Long	42.7951	0.11305	2845
18	La Munia Sup.	42.70615	0.12499	2537
19	Barroude Inf.	42.73264	0.14478	2377
20	Les Laquettes 1	42.83592	0.14806	2085
21	Port Bielh	42.87417	0.18846	2290
22	Urdiceto	42.66672	0.2816	2378
23	Basa de la Mora	42.54526	0.32771	1908
24	Pixón	42.63682	0.37986	2199
25	Bachimala Sup.	42.7044	0.38761	2630
26	Sen	42.62148	0.39312	2360
27	Chelau Sup.	42.62419	0.40667	2805
28	Posets	42.64681	0.4494	2550
29	Eriste	42.64646	0.46808	2411
30	Lliterola	42.69367	0.5338	2734
31	Cregüeña	42.63867	0.6253	2640
32	Coronas	42.62997	0.63848	2740
33	Llosás	42.61766	0.65483	2480
34	Puis	42.65542	0.7076	2056
35	Redon	42.64208	0.77951	2235
36	Nere de Güèrri	42.79334	0.85029	2280
37	Pica Palòmera	42.79377	0.86878	2308
38	Monges	42.62301	0.87701	2418
39	Long de Liat	42.80655	0.87398	2140
40	Llebreta	42.55083	0.89031	1620
41	Gran del Pessó	42.51264	0.91563	2493
42	Plan	42.62248	0.9307	2188

Table 2. (cont.) List of lakes studied. ID corresponds to the number of each lake in Figure 1. *Lista de los lagos estudiados. El número en paréntesis corresponde con el número de cada lago en la figura 1.*

ID	Lake	Latitude (ºN)	Longitude (ºE)	Altitude (m a.s.l.)
43	Montoliu	42.78467	0.92614	2375
44	Filià	42.45122	0.95328	2140
45	Llong	42.57431	0.95063	2000
46	Gelat Bergús	42.59106	0.96331	2493
47	Illa	42.61836	0.99348	2452
48	Gerber	42.63065	0.99471	2170
49	Airoto	42.70281	1.03922	2210
50	Gran de Mainera	42.52516	1.04585	2450
51	Rond	42.7944	1.0645	1929
52	Inferior de la Gallina	42.70618	1.18763	2270
53	Mariola	42.71737	1.22434	2276
54	Senó	42.71203	1.32291	2130
55	Romedo de Dalt	42.70601	1.32465	2110
56	Aubé	42.74549	1.33801	2094
57	Aixeus	42.61098	1.3718	2370
58	Sotllo	42.652	1.38445	2346
59	Garbet	42.7526	1.38299	1683
60	Pica	42.66079	1.4024	2880
61	Baiau Superior	42.59627	1.43188	2480
62	Negre	42.58913	1.43826	2627
63	Forcat Inf.	42.60074	1.44883	2631
64	Angonella de Mes Amunt	42.61015	1.48138	2440
65	Mes amunt de Tristaina	42.64685	1.48741	2300
66	Blaou	42.655	1.57264	2350
67	Gran de la Pera	42.45818	1.59509	2350
68	Ensangents Sup.	42.52134	1.64923	2550
69	Montmalús	42.49832	1.68263	2440
70	Canals Roges	42.58673	1.7118	2410
71	Albe	42.61835	1.74514	2355
72	Siscar	42.6014	1.74718	2187
73	Malniu	42.47378	1.79238	2250
74	Compte	42.63366	1.79306	1726
75	Aygue Longue	42.64189	1.88263	2076
76	Trebens	42.5778	1.96255	2306
77	Blau	42.61554	1.96708	2531
78	Bleu de Rabassoles	42.70038	1.97274	1920
79	Gros de Camporrells	42.62583	2.00788	2255
80	Laurenti	42.67525	2.02582	1936
81	Negre	42.63592	2.21141	2083
82	Estelat	42.64632	2.21351	2021
83	L'Estagnol	42.53361	2.46276	2164
	Burg Palaeolake	42.503929	1.304633	1821

ples were obtained by brushing five stones in the shoreline area. Stones were selected in areas between 0.3 and 1.0 m depth. The number of samples studied for sediment and epilithon was smaller than 83 provided that in some lakes was not possible to collect both or there were not diatoms in the samples.

The total number of samples processed were 778 (76 top sediment; 78 epilithon, and 624 Burg Lake core). Formaldehyde was removed from the lake survey samples before further processing. Burg Lake samples were placed directly in borosilicate tubes and rehydrated with one millilitre of Milli-Q water. Samples were digested following an oxidative procedure that started by adding 0.3 ml 1N HCl and 5 ml 30% H_2O_2. The oxidation was initially performed in a water bath at room temperature to avoid out of control exothermic reactions in samples with high metal content. The temperature of the bath was gradually increased to 70-80 ^oC, and the level of H_2O_2 was maintained until all the organic material was removed. To open the diatoms valves and make transparent some non-digested material, 1 ml 1N HCl was added. After digestion, residual dissolved chemicals were removed by washing until the sample pH reached 6.

Once the samples were cleaned, samples were kept in an ultrasonic bath during five minutes to disperse the valves. After that, the diatom suspension was diluted to obtain a suitable solution that was carefully dropped on a round glass coverslip. A large drop was added to assured that the coverslip margin was reached. The coverslips were kept undisturbed in dust-free conditions until they were completely dry. Finally, the samples were mounted in Naphrax (refractive index = 1.74).

Diatom taxonomic determination was made using a Zeiss Axio Imager A.1 differential interference contrast microscope with a plan-apochromatic 100× objective. A minimum of 1000 and 500 valves was counted from the survey lakes and Burg Lake samples, respectively. Diagnostic morphological traits were studied using a field emission scanning electron microscope Hitachi S-4100-FE. The determination was based firstly on general taxonomical studies of the diatoms of the Pyrenees (Hustedt, 1939; Carter, 1970) and European freshwater ecosystems (Krammer & Lange-Bertalot, 1986, 1988, 1991a, 1991b; Lange-Bertalot & Metzeltin, 1996; Krammer, 2000, 2002, 2003; Lange-Bertalot, 2001; Lange-Bertalot *et al.*, 2003; Krammer & Lange-Bertalot, 2004; Werum & Lange-Bertalot, 2004a; Levkov, 2009; Hofmann *et al.*, 2011; Lange-Bertalot *et al.*, 2011), and, secondly, on a large number of papers and books on specific taxonomical updates and regional iconographies (Lange-Bertalot & Krammer, 1987, 1989; Reichardt & Lange-Bertalot, 1991; Lange-Bertalot, 1993, 1997; Bukhtiyarova & Round, 1996; Krammer, 1997, 1997b; Reichardt, 1997, 1999, 2007; Håkansson, 2002; Houk, 2003; Houk & Klee, 2004; Van De Vijver *et al.*, 2004; Houk *et al.*, 2010).

Specimens that resembled a known species but showed differences in diagnostic traits or requiring additional comparisons were distinguished as *confer* ("cf."). Specimens with traits markedly different from the most similar species were operatively named using a combination of the name of the lake where they were found the first time and consecutive numbers, if necessary. They are likely new species or varieties.

Richness estimators, such as Chao, Jackknife, and Bootstrapping (Colwell & Coddington, 1995) were performed using R language and the package vegan 2.4-0 (Oksanen *et al.*, 2012; R Core Team 2015).

RESULTS AND DISCUSSION

General description of the diatom flora

The diatom taxa found in this study are listed in the iconographic catalogue. A total number of 73 genera were found in the lakes studied. The genera with more species were *Pinnularia* (40 taxa), *Gomphonema* (39), *Eunotia* (35), *Nitzschia* (32), *Navicula* (27), *Naviculadicta* (24), *Encyonema* (22) and *Fragilaria* (19). Considering the survey lakes exclusively, the ranking was similar: *Eunotia* (34 taxa), *Gomphonema* (31), *Pinnularia* (31), *Nitzschia* (30), *Navicula* (23), *Naviculadicta* (22), *Encyonema* (20) and *Fragilaria* (18).

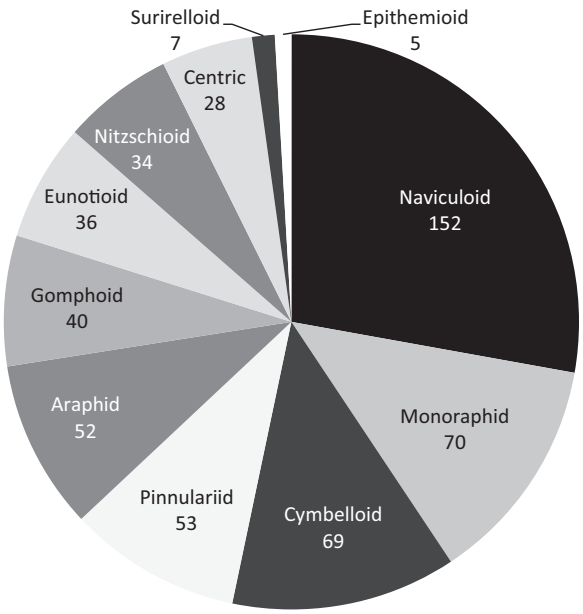

Figure 2. Taxa distribution into morphological types. *Distribución de los taxones de acuerdo con su tipo morfológico.*

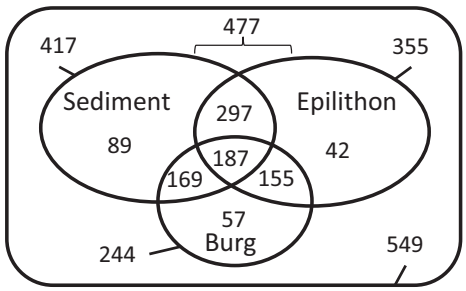

Figure 3. Total, coincident and exclusive taxa found in the lake survey set (sediment and epilithon) and Burg palaeolake samples. *Taxones totales, coincidentes y exclusivos encontrados en el muestreo regional (sedimento y epiliton) y en el paleolago de Burg.*

Considering artificial morphological types, not strictly evolutionary (Fig. 2), the highest number of taxa were in Naviculoid, Monoraphid and Cymbelloid forms, respectively. The types with the lowest number were Epithemioid, Surirelloid and Centric. This general pattern was replicated in the epilithon, sediment and Burg Lake sample sets.

The total taxa (species and infraspecies taxa) distinguished were 549: 477 in the lake survey and 244 in the Burg Lake (Fig. 3). In the lake survey, the sediment samples showed a higher number of taxa (417) than the epilithon samples (355). 89 and 42 taxa were exclusive of the sediment and epilithon samples, respectively.

A 7.6% of taxa were exclusive of epilithon samples, among them: *Chamaepinnularia* No. 1 Negre, *Eunotia tenella* (Grunow) Hustedt, *Sellaphora stroemii* (Hustedt) Kobayasi, *Fragilaria* sp. No. 6 Blaou, *Pinnularia* cf. *kuetzingii* Krammer, *Cymbella neoleptoceros* var. *tenuistriata* Krammer, *Gomphoneis* cf. *olivaceoides* (Hustedt) Carter. A 16% of taxa were only found in the sediments, among them: *Sellaphora pseudopupula* (Krasske) Lange-Bertalot, *Fragilaria* sp. No. 1 Airoto, *Navicula venerablis* Hohn & Hellerman, *Navicula* sp. No. 3 Laurenti, *Encyonema* sp. No. 1 Mora, *Navicula cryptocephala* Kützing, *Pinnularia* cf. *rumrichae* Krammer, *Geissleria similis* (Krasske) Lange-Bertalot & Metzeltin, *Cymbopleura subaequalis* (Grunow) Krammer, *Navicula trophicatrix* Lange-Bertalot, *Surirella angusta* Kützing, *Meridion circulare* var. *constrictum* (Ralfs) Van Heurck and *Stauroneis gracilis* Ehrenberg.

There were many taxa more frequent in the epilithon samples than in the sediments; the most common were: *Encyonopsis* cf. *krammeri* Reichardt, *Navicula notha* Wallace, *Pinnularia subinterrupta* Krammer & Schroeter, *Nitzschia* cf. *alpina* Hustedt, *Encyonopsis minuta* Krammer et Reichardt, *Eunotia glacialis* Meister, *Encyonema reichardtii* (Krammer) Mann, *Cymbella* cf. *neocistula* Krammer, *Cymbella* cf. *cymbiformis* Agardh, *Eunotia novaisiae* var. *altopyrenaica* Lange-Bertalot & Rivera-Rondón, *Gomphonema capitatum* Ehrenberg, *Delicata delicatula* (Kützing) Krammer, *Reimeria sinuata* (Gregory) Kociolek & Stoermer, and *Cymbella parva* (Smith) Kirchner.

Representative taxa of the sediment samples with little presence in the epilithon were: *Navicula opportuna* Hustedt, *Nitzschia garrensis* Hustedt, *Caloneis* sp. No. 2 Posets, *Sellaphora disjuncta* (Hustedt) Mann, *Diploneis* cf. *puella* (Schumann) Cleve, *Nitzschia pura* Hustedt, *Cymbella excisa* Kützing, *Sellaphora laevissima* (Kützing) Mann, *Surirella* cf. *roba* Leclercq, *Stauro-*

neis neohyalina Lange-Bertalot & Krammer, and *Pinnularia* cf. *brebissonii* var. *minuta* Krammer.

Commonness, dominance and richness

The genera with the highest species richness did not correspond with those with the highest number of dominant taxa. The genus *Achnanthidium* was the most frequently dominant taxon both in the sediment and epilithon samples (Fig. 4), although the sediment samples showed a higher variability in the dominant genus than epilithon samples.

Four species were the most frequently dominant in the sediment samples: *Achnanthidium minutissimum* (Kützing) Czarnecki (13 lakes), *Discostella stelligera* (Cleve & Grunow) Houk & Klee (11 lakes), *Denticula tenuis* Kützing (4 lakes) and *Pseudostaurosira microstriata* (Marciniak) Flower (4 lakes). The most frequently dominant in the epilithon samples were: *Achnanthidium minutissimum* (Kützing) Czarnecki (54 lakes), *Brachysira intermedia* (Östrup) Lange-Bertalot (4 lakes), *Encyonema minutum* (Hilse) Mann (3 lakes) and *Psammothidium acidoclinatum* (Lange-Bertalot) Lange-Bertalot (3 lakes).

A. minutissimum is one of the most common species recorded in the epilithon of oligotrophic lakes (Linares Cuesta *et al.*, 2007; Cantonati *et al.*, 2012; Falasco *et al.*, 2012). This species has usually been considered a complex due to its high morphological variability (Plates 41 to 46). Potapova and Hamilton (2007) found that despite some morphological groups of *A. minutissimum* apparently show a differential ecological response, it is hard to define morphological boundaries among them. Thus, the indicator potential of this morphological complex in the Pyrenean lakes, and worldwide, cannot be exploited until criteria for unambiguous morphological separation could be provided.

Rare species (frequency <3% and maximum abundance <3%) showed a similar distribution in sediment and epilithon samples (Fig. 5). Thus the total of rare species was 93 (22%) in sediment samples and 113 (32%) in epilithon samples. Genera with the highest number of rare species approximately correspond with those with the highest species number: *Eunotia*, *Gomphonema*, *Encyonema* and *Pinnularia* in the sediment samples and *Gomphonema*, *Naviculadicta*, *Nitzschia*, *Pinnularia* and *Eunotia* in the epilithon samples.

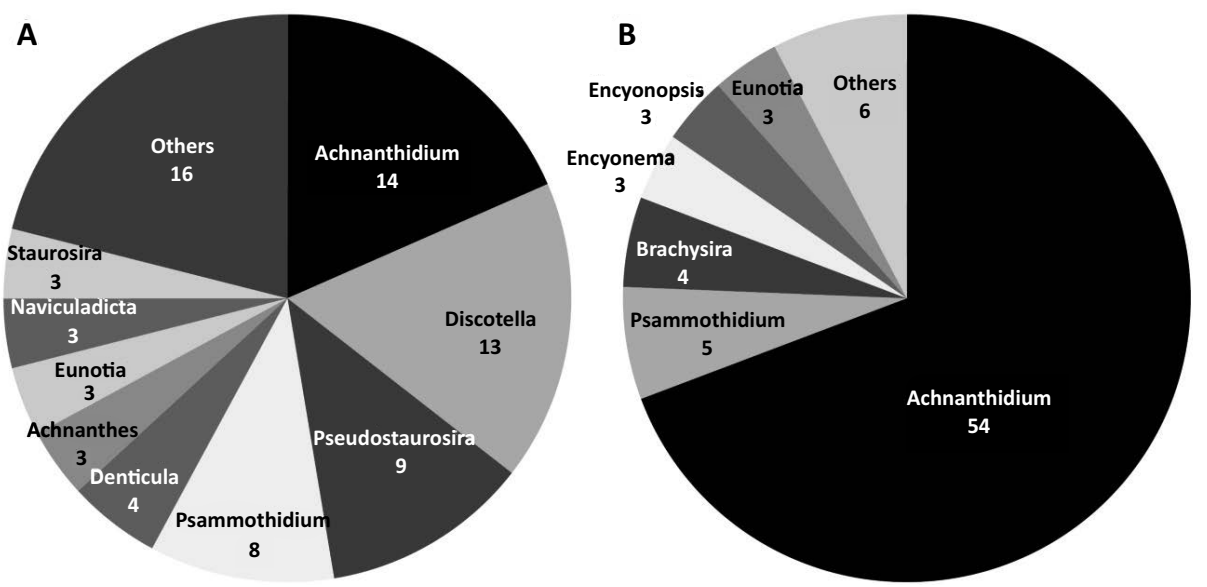

Figure 4. Frequency of lakes in which each genus was dominant in sediment (A) and epilithon samples (B) of the survey lakes. *Frecuencia de lagos en los cuales cada género fue dominante en las muestras de sedimento (A) y epiliton (B) de los lagos muestreados.*

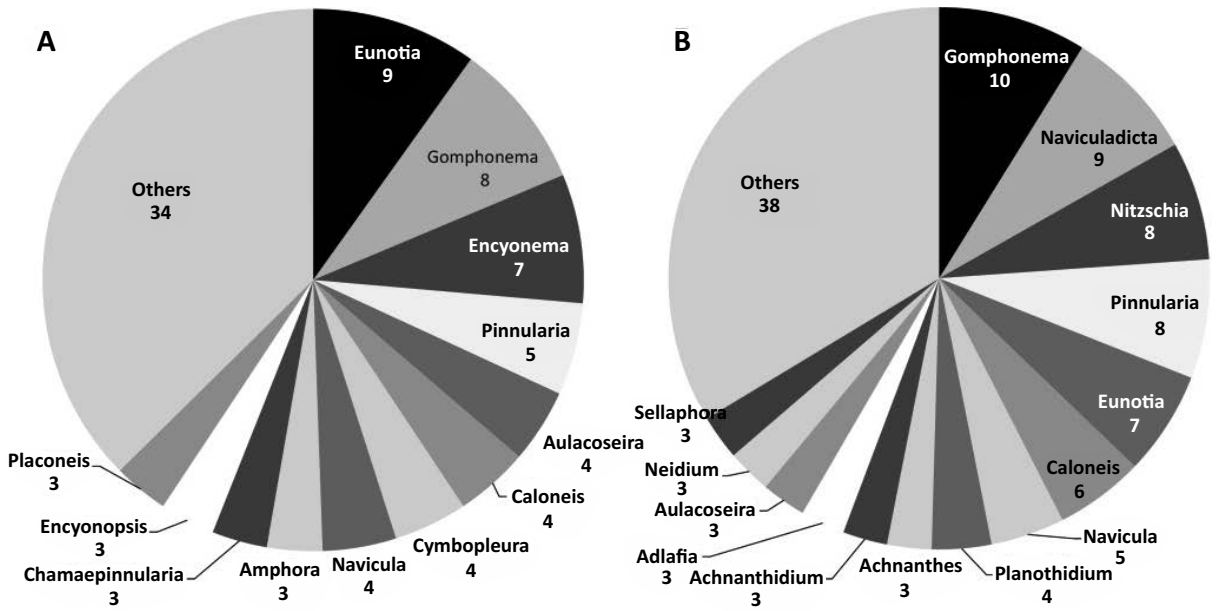

Figure 5. Rare taxa (frequency <3% and maximum abundance <3%) per genus in the sediment (A) and epilithon (B) samples. *Taxones raros (frecuencia <3% y máxima abundancia <3%) por género en las muestras de sedimento (A) y epiliton (B).*

Eunotia was mainly present in acid environments (Rivera-Rondón *et al*., in prep.) and frequently included species with rare distribution as found elsewhere (Cantonati & Lange-Bertalot, 2011). However, 34 *Eunotia* taxa were found showing a high diversity in comparison with other regions of the Iberian Peninsula (Aboal *et al.*, 2003; Ortiz-Lerín & Cambra, 2007). Despite the survey included a broad pH gradient (Table 1), the mean and many of the sampled lakes were around circumneutral conditions. Ponds were not studied, and littoral samples were collected only in the epilithic substrate. Therefore, organo-acidic environments were undersampled, which might content a good amount of additional species.

The species accumulation curves showed similar patterns of increase but richer assemblages in the sediments (Fig. 6). Richness estimators indicated that expected taxa richness could be 445-479 in sediments and 387-432 in the epilithon. As the total sediment and epilithon taxa richness found in our study were 417 and 355, respectively, we estimate that we identified about 85-93% and 79-92% of the taxa present in the sediments and epilithon, respectively. The

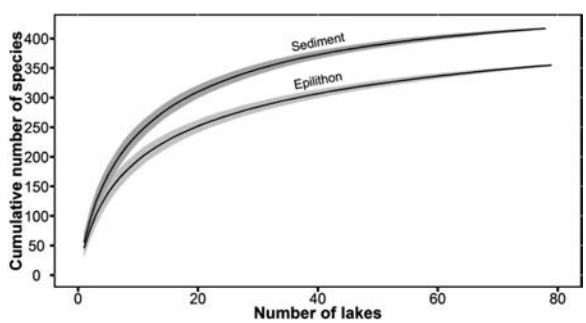

Figure 6. Comparison of the species-accumulation curves between sediment and epilithon samples. Shaded areas correspond to one standard deviation. *Comparación de las curvas de acumulación de especies entre las muestras de sedimento y epiliton. Las áreas sombreadas corresponden a una desviación estándar.*

diversity found is slightly higher than found in other studies carried out in sediment and epilithic samples of similar mountain lakes (Cameron *et al.*, 1999; Clarke *et al.*, 2005) and equivalent to other studies both in alkaline (Reavie & Smol, 2001) and acid environments (Enache & Prairie, 2002). However, the comparison with other studies could be strongly affected by differences in the taxonomic resolution. Despite our study in-

clude a representative sample of Pyrenean lakes, other types of ecosystems such as small ponds, peatlands and streams, have not been extensively studied and the expected diversity of diatom in the Pyrenees is potentially higher.

Taxonomical remarks

There is still a great potential for diatom taxonomic studies in the Pyrenees. A significant amount of the taxa found (25% of the taxa showed in the iconography) were not determined at the species level; most of them are likely new species or varieties. Among the most diverse genera, those with fewer species identified were *Pinnularia* (44% of the taxa) *Gomphonema* (39% of the taxa), *Nitzschia* (38% of the taxa) and non-*Navicula* naviculoid diatoms (36% of the taxa). Genera with little diversity but also with low species identification were *Stauroneis* (60% of the taxa) and *Caloneis* (41% of the taxa). Indeed, some of the species determined have not been described until recently. This is the case for several *Eunotia* (Cantonati & Lange-Bertalot, 2011; Lange-Bertalot *et al.*, 2011): *Eunotia neocompacta* var. *vixcompacta* Lange-Bertalot (Plate 33, Figs. 15-19), *Eunotia catalana* Lange-Bertalot & Rivera-Rondón (Plate 24, Figs. 1-12), *Eunotia novaisiae* Lange-Bertalot & Luc Ector (Plate 30, Figs. 1-10), *Eunotia novaisiae* var. *altopyrenaica* Lange-Bertalot & Rivera-Rondón (Plate 30, Figs. 12-39), *Eunotia fallacoides* Lange-Bertalot & Cantonati (Plate 35, Fig. 11). Another recently described taxa *Fragilaria pararumpens* Lange-Bertalot, Hofmann & Werum, is common in the Pyrenean lakes and Central Europe (Hofmann *et al.*, 2011). This species has been confused up to present with *Fragilaria crotonensis* Kitton and *Fragilaria rumpens* (Kützing) Carlson.

There were several cases of problematic identification. For example, some *Eunotia* specimens of a strongly acid lake showed morphological traits between *E. pseudogroenlandica* Lange-Bertalot & Tagliaventi and *E. botuliformis* Wild, Nörpel & Lange-Bertalot (Plate 31). Similarly, widespread common morphotypes were showing mixed traits, this is the case for an *Encyonema* showing traits of *E. minutum* (Hilse) Mann and *E. ventricosum* (Kützing) Grunow (Plate 105, Figs. 14-31). Some small *Nitzschia* specimens presented the same problems (Plate 117, Figs. 7-15), even when SEM images were compared.

In conclusion, the Pyrenean lakes contain a remarkable diversity in diatoms that requires further exploration and taxonomic insights. Meanwhile, the iconography provided in this study will help in the harmonisation of current and past ecological studies.

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Diatom iconography of the Pyrenean lakes

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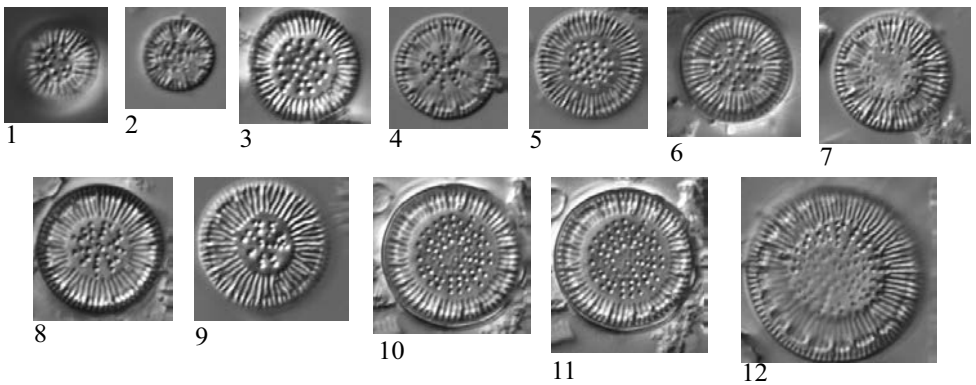
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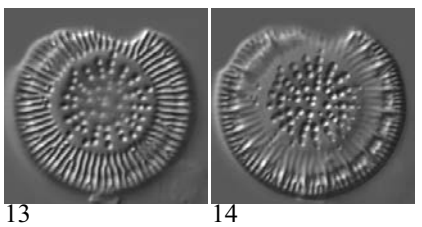
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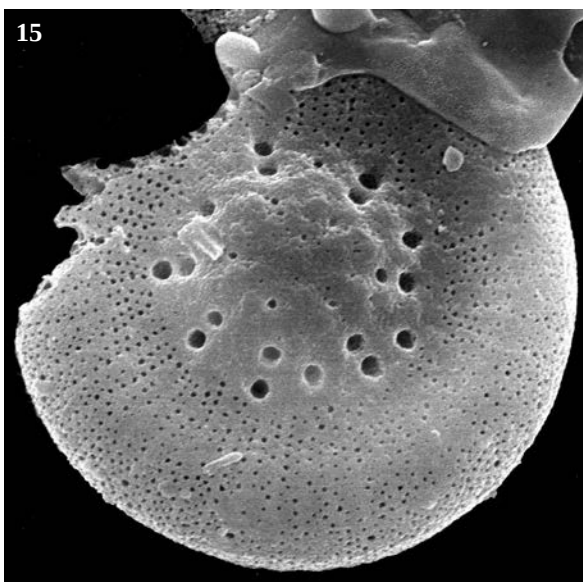
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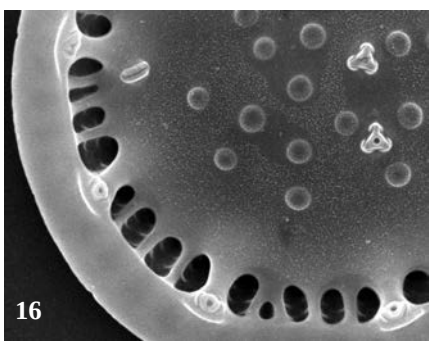
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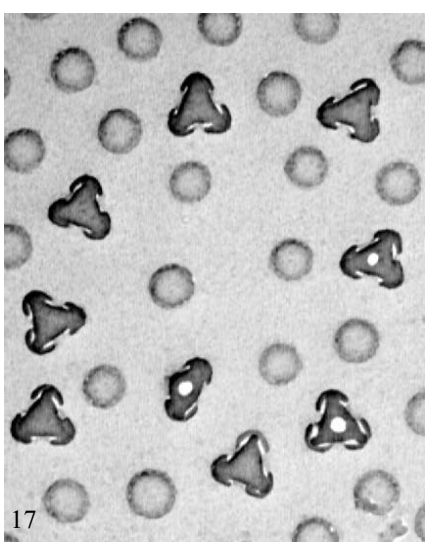
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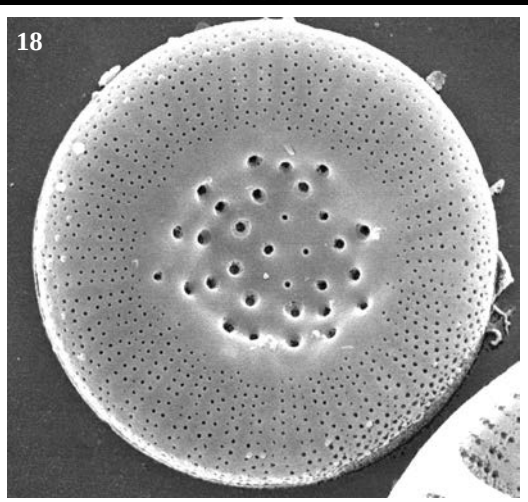
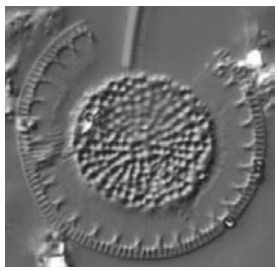

18
10 µ

Plate 2	LM: x1500 SEM: Figs. 3,5 x4000, Fig. 4 x3000

Figs. 1-3,5	*Puncticulata praetermissa* (Lund) Håkansson
Figs. 4	*Puncticulata* cf. *praetermissa* (Lund) Håkansson

Figs. 1, 2	Lake Acherito, sediment PYR01
Figs. 3,5	Lake Laurenti, sediment PYR111
Fig. 4	Lake Arnales, sediment PYR09



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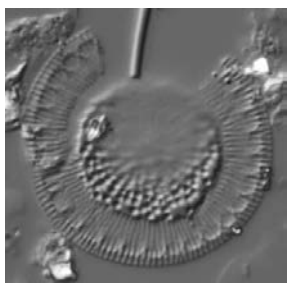

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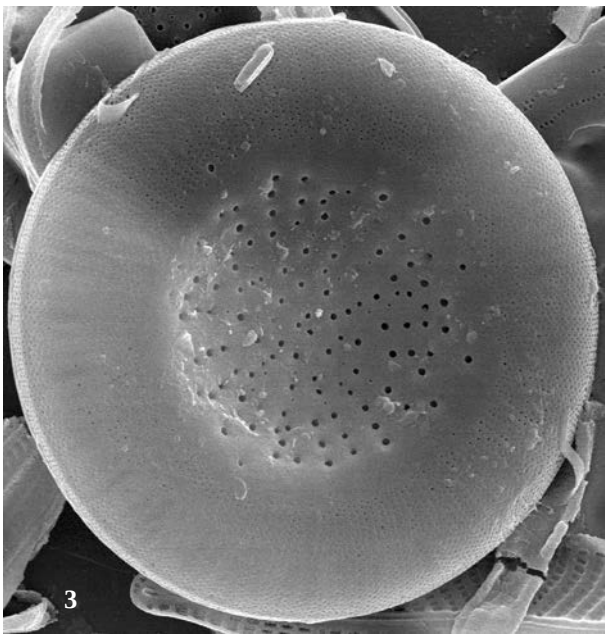
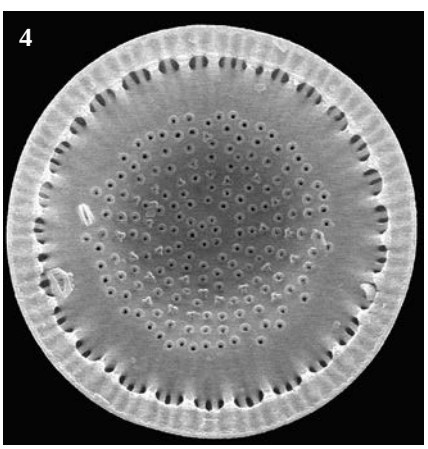
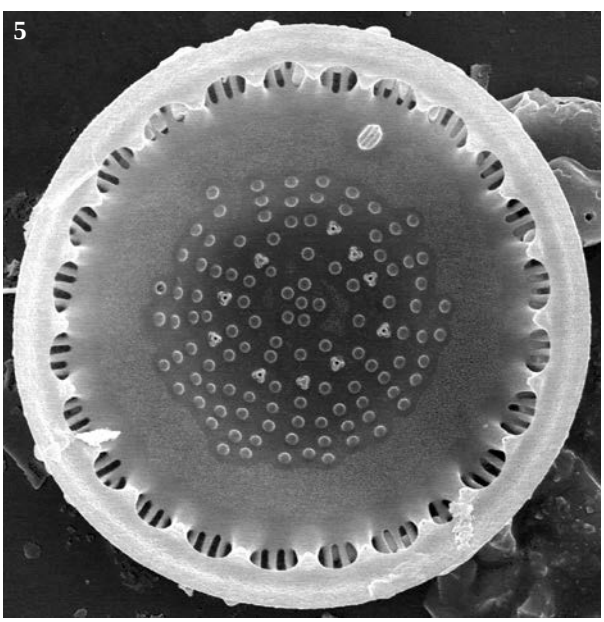


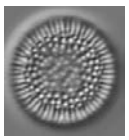




10 μ

Plate 3	LM: x1500

Figs. 1-9	*Cyclotella* sp. No. 1 Llebreta
Figs. 1, 2, 8, 9	Lake Llebreta, sediment PYR58
Figs. 3-7	Lake Estom, sediment PYR15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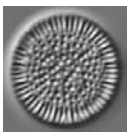
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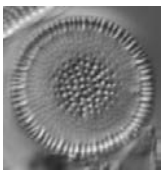
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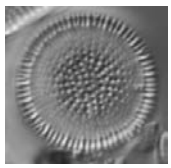
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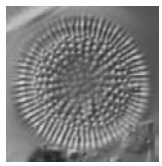
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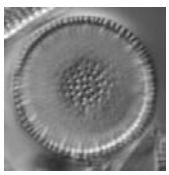
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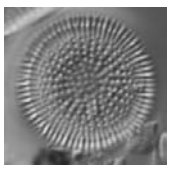
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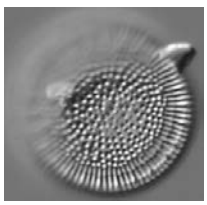
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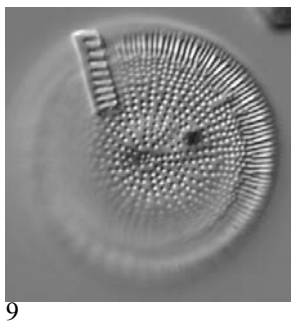
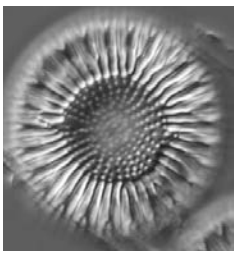

9

10 μ

Plate 4 LM: x1500

Figs. 1-12 *Cyclotella intermedia* (Manguin) Houk, Klee & Tanaka

Figs. 1-7 Lake Airoto, sediment PYR73
Figs. 8-12 Lake Sen, sediment PYR40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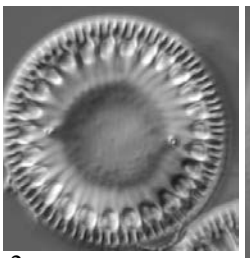
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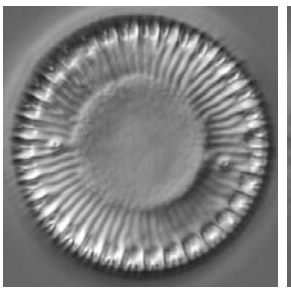
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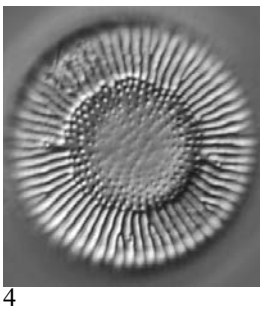
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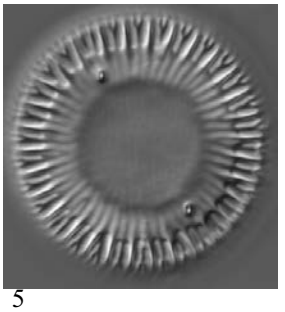
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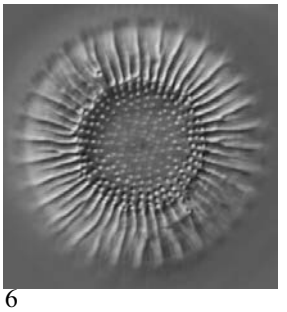
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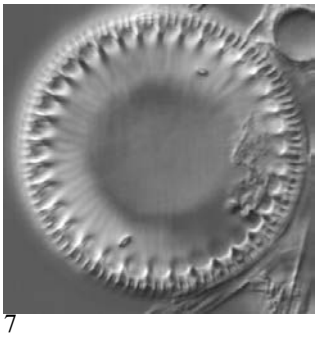
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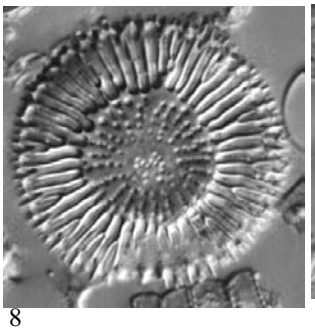
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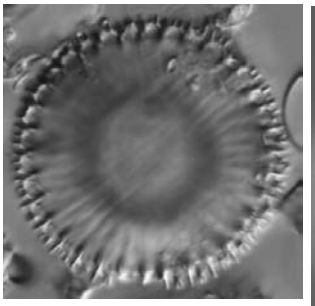
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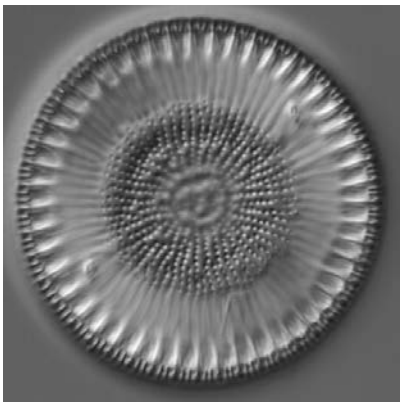
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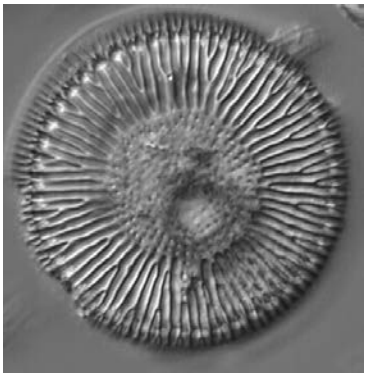
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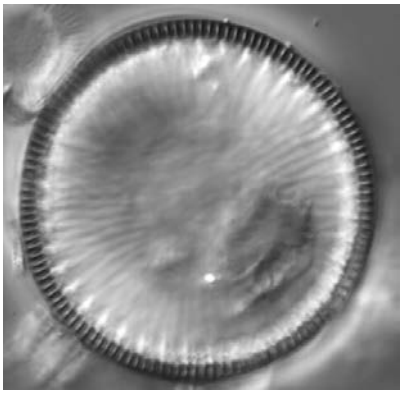
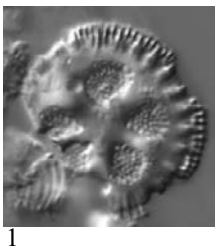

12

10 μ

Plate 5	LM: x1500 SEM: Fig. 16 x15000

Figs. 1-4	*Cyclotella antiqua* Smith
Figs. 5-16	*Cyclotella* sp. No. 3 laurenti, aff. *cyclopuncta* Håkansson & Carter
Fig. 17	*Cyclotella ocellata* Pantocsek
Fig. 18	*Cyclotella* cf. *polymorpha* Meyer & Håkansson
Fig. 19	*Cyclotella* cf. *comensis* Grunow
Fig. 20-22	*Orthosira roeseana* (Rabenhorst) O'Meara

Figs. 1-2	Lake Sen, sediment PYR40
Figs. 3,4,19,20	Lake Estom, sediment PYR15
Figs. 5-11,16	Lake Laurenti, sediment PYR111
Figs. 12, 14, 15	Lake Acherito, sediment PYR27
Fig. 13	Lake Les Laquettes 1, sediment PYR27
Fig. 17	Lake Glacé, sediment PYR42
Fig. 18	Lake Puis, epilithic EpiPYR45
Figs. 21-22	Lake Monges, sediment PYR57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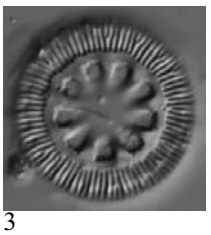
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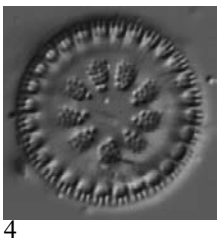
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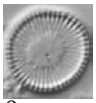
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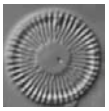
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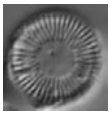
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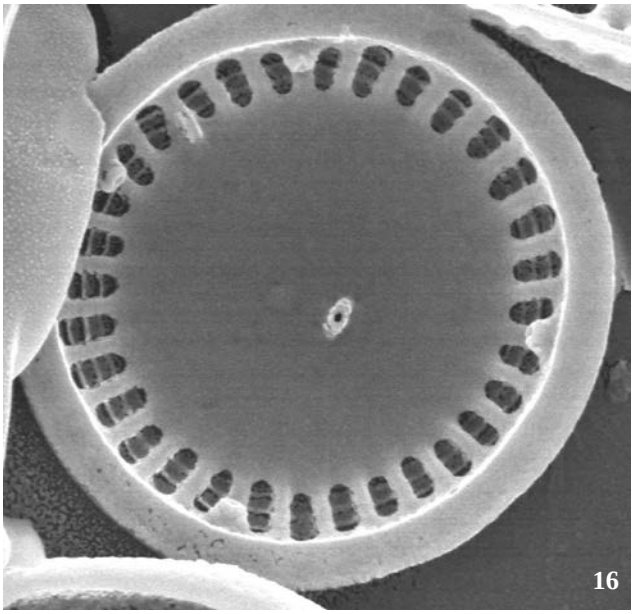
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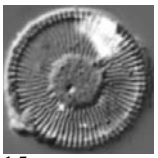
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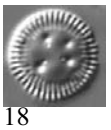
17

10 μ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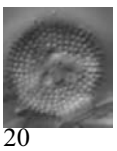
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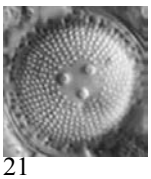
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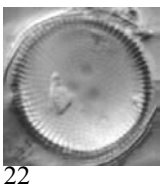
22

Plate 6	LM: x1500 SEM: x11000

Fig. 1	*Cyclotella* sp. No. 2 Llong
Figs. 2-16	*Discostella* cf. *pseudostelligera* (Hustedt) Houk & Klee emend. Genkal (*Discostella* sp. No. 1 Gerber)
Figs. 17-25	*Discostella stelligera* (Cleve & Grunow) Houk & Klee

Fig. 1	Lake Llong, sediment PYR51
Fig. 3	Lake Llebreta, sediment PYR58
Figs. 4-13	Lake Gerber, sediment PYR63
Figs. 14-16	Lake Redon, sediment REDOM
Figs 17-24	Lake Port Bielh, sediment PYR28
Fig. 25	Lake Gros de Camporrells, sediment PYR110

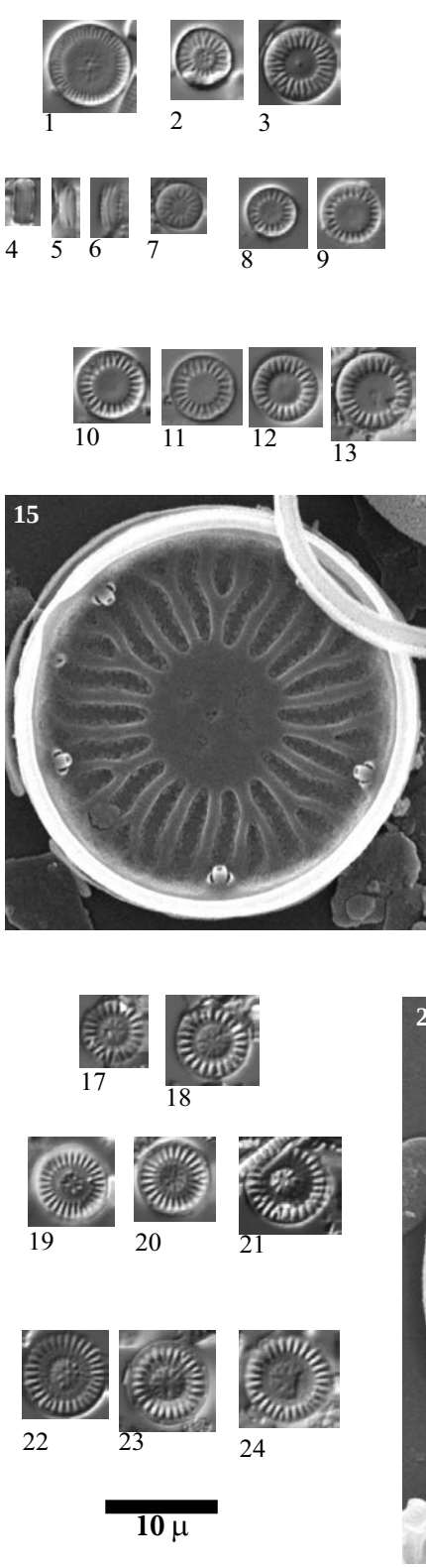
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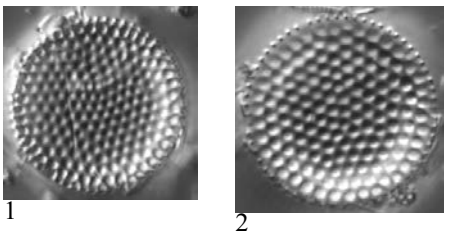
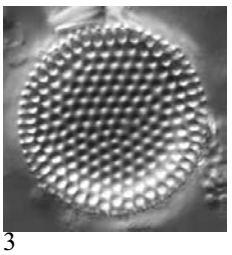
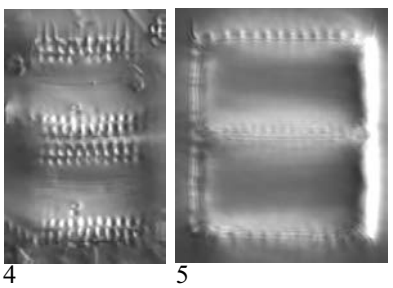
Plate 7	LM: x1500 SEM: x4000

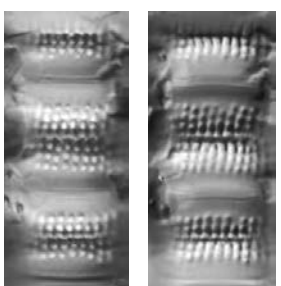
Figs. 1-11	*Aulacoseira pfaffiana* (Reinsch) Krammer

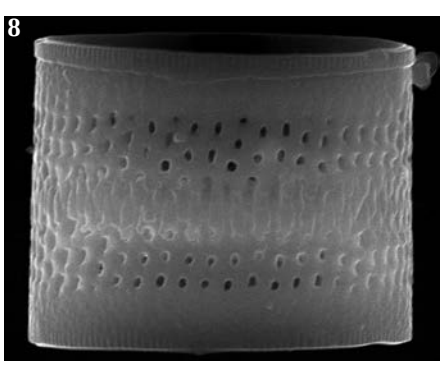
Figs. 1-5	Lake Bleu de Rabassoles, sediment PYR112
Figs. 6, 7, 9	Lake Illa, sediment PYR66
Figs. 8, 10, 11	Lake Senó, sediment PYR84

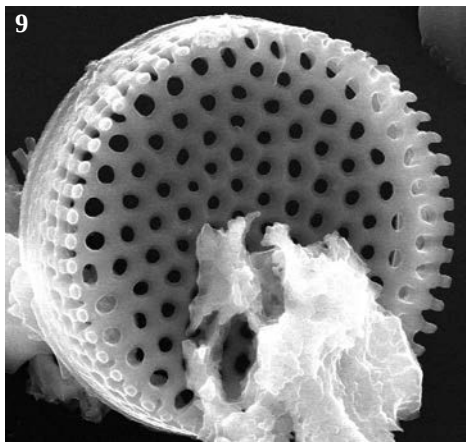


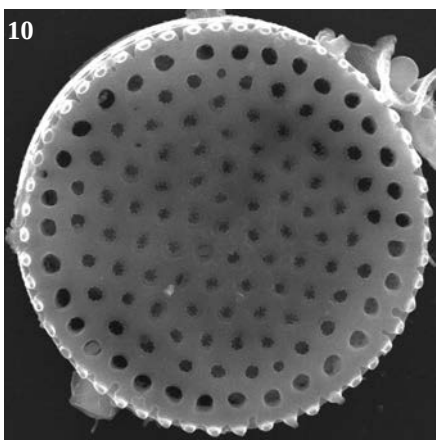


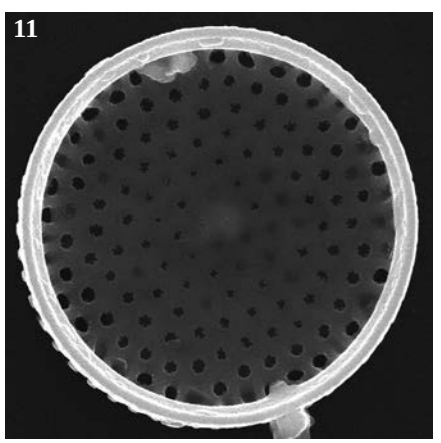












10 µ

Plate 8	LM: x1500

Fig. 1	*Aulacoseira granulata* (Ehrenberg) Simonsen
Figs. 2-4	*Aulacoseira crenulata* (Ehrenberg) Thwaites
Figs. 5-6	*Aulacoseira valida* (Grunow) Krammer
Figs. 7-11	*Aulacoseira* cf. *valida* (Grunow) Krammer
Figs. 12-15	*Aulacoseira* cf. *subarctica* (O. Müller) Haworth
Figs. 16-20	*Aulacoseira perglabra* (Østrup) Haworth

Fig. 1	Lake Forcat Inferior, sediment PYR77
Figs. 2-6, 18-22	Lake Albe, sediment PYR96
Figs. 7-8	Lake Siscar, sediment PYR126
Figs. 9-15	Lake Ensangents Superior, sediment PYR106
Figs. 16-17	Lake Llong, sediment PYR59

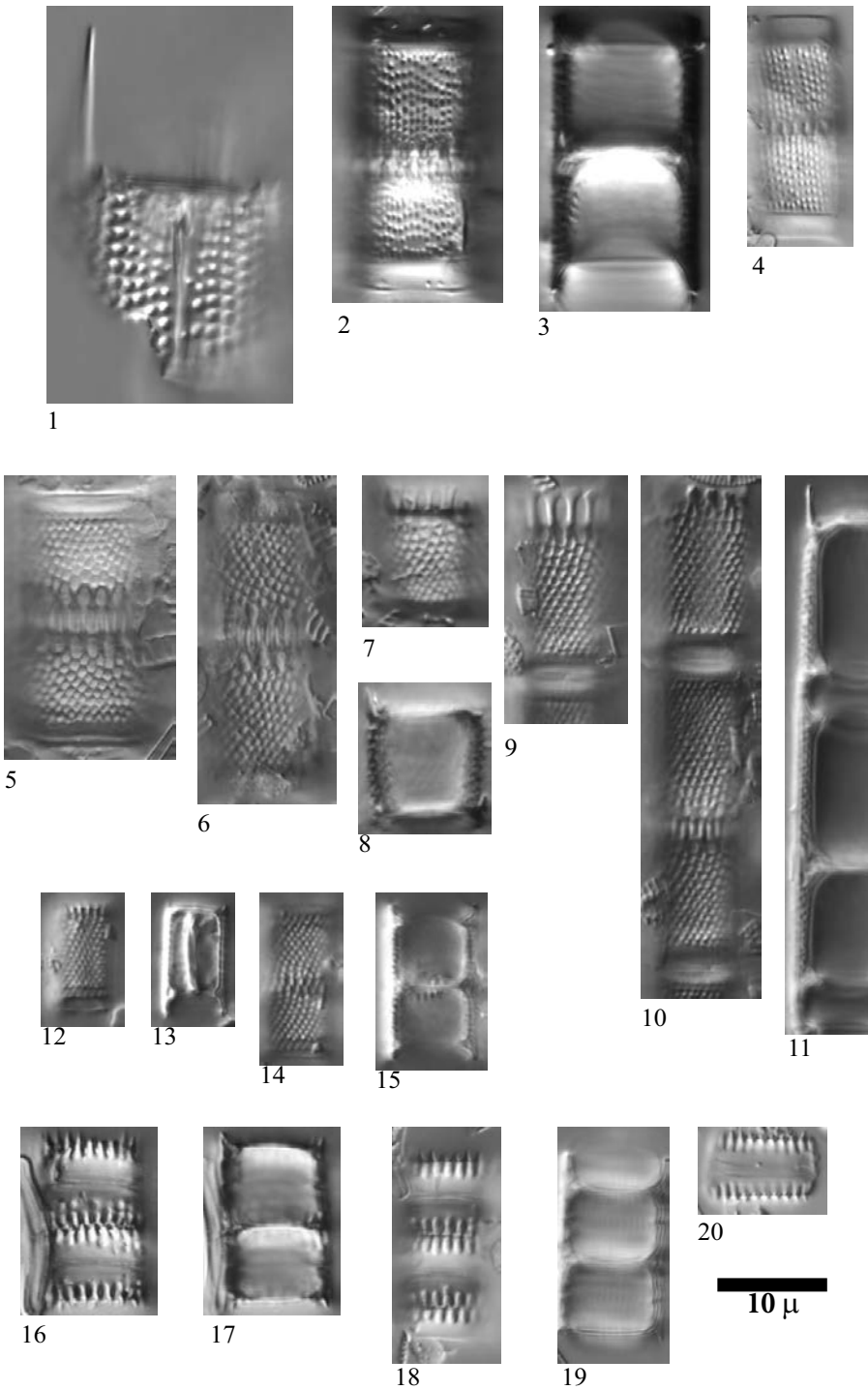

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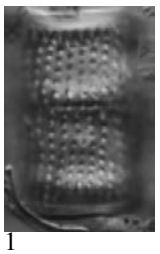
Plate 9	LM: x1500 SEM: Figs. 8-10 x4000, Fig. 11 x10000

Figs. 1-11	*Aulacoseira lirata* (Ehrenberg) Ross

Figs. 1-2, 8-11	Lake Redon, sediment REDOM
Figs. 3-4, 7	Lake Albe, sediment PYR96
Figs. 5-6	Lake Posets, sediment PYR42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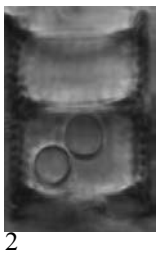
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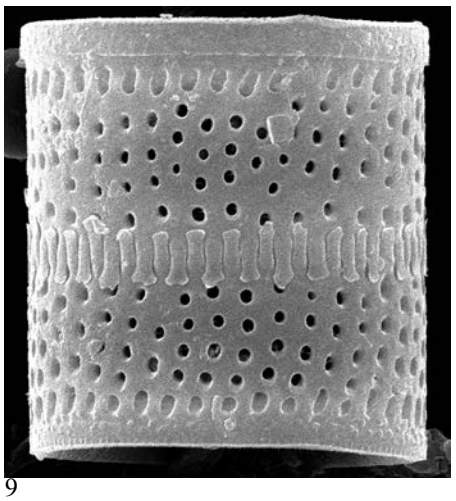
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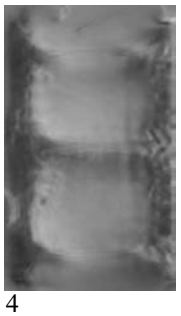
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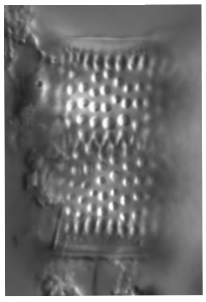
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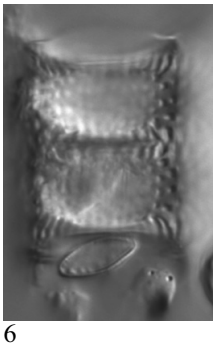
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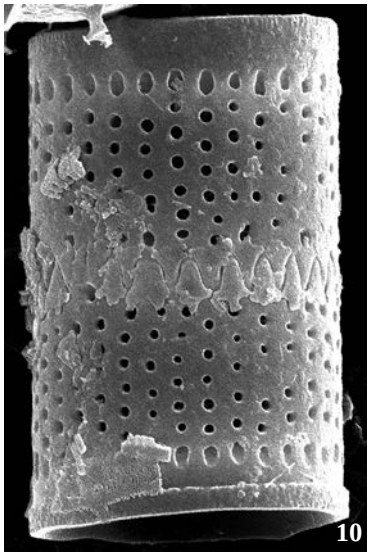
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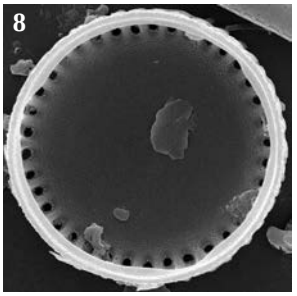
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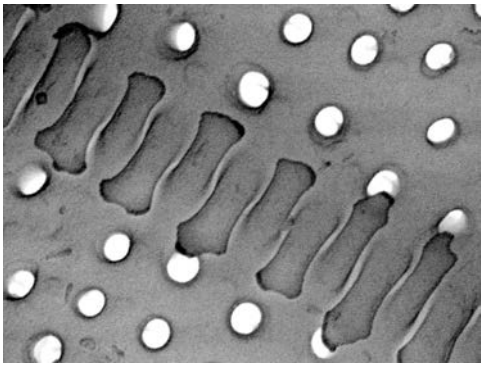
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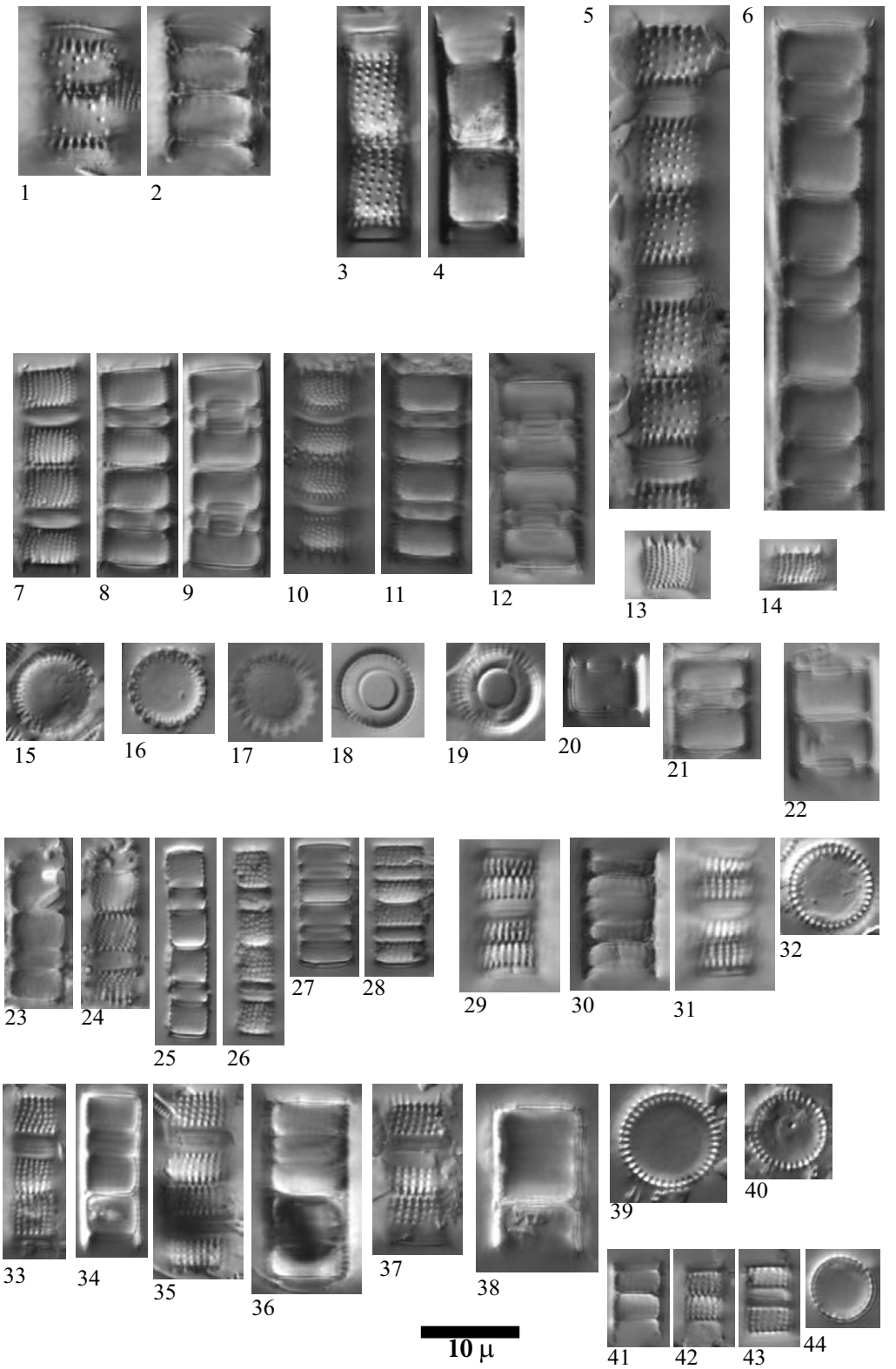
Plate 10 LM: x1500

Figs. 1-2	*Aulacoseira* cf. *lirata* var. *biseriata* (Grunow) Haworth
Figs. 3-6	*Aulacoseira* cf. *ambigua* (Grunow) Simonsen
Figs. 7-22	*Aulacoseira* sp. No. 1 Gerber
Figs. 23-44	*Aulacoseira* cf. *alpigena* (Grunow) Krammer

Figs. 1-4	Lake Redón, sediment REDOM
Figs. 5-6	Lake Cregueña, sediment PYR49
Figs. 7-22	Lake Gerber, sediment PYR63
Figs. 23-24	Lake Les Laquettes 1, sediment PYR27
Figs. 25-28	Lake Forcat Inferior, sediment PYR77
Figs. 29-32	Lake Pica, sediment PYR100
Figs. 33-40	Lake Bleu de Rabassoles, sediment PYR112
Figs. 41-44	Lake Negre, sediment PYR79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10 µ

Plate 11	LM: x1500 SEM: x4000

Figs. 1-5	*Aulacoseira distans* (Ehrenberg) Simonsen
Fig. 6	*Aulacoseira* cf. *distans* (Ehrenberg) Simonsen
Figs. 7-9	*Aulacoseira humilis* (Cleve-Euler) Genkal & Trifonova in Trifonova & Genkal
Figs. 10-16	*Aulacoseira* sp.
Figs. 17-19	*Aulacoseira* cf. *nygaardii* (Camburn) Camburn & Charles

Figs. 1-5	Lake Negre, sediment PYR79
Fig. 6	Lake Redon, sediment REDOM
Figs. 7-10, 14-16	Lake Albe, sediment PYR96
Figs. 11-13	Lake Llong, sediment PYR59
Figs. 17-19	Lake Sotllo, sediment PYR89

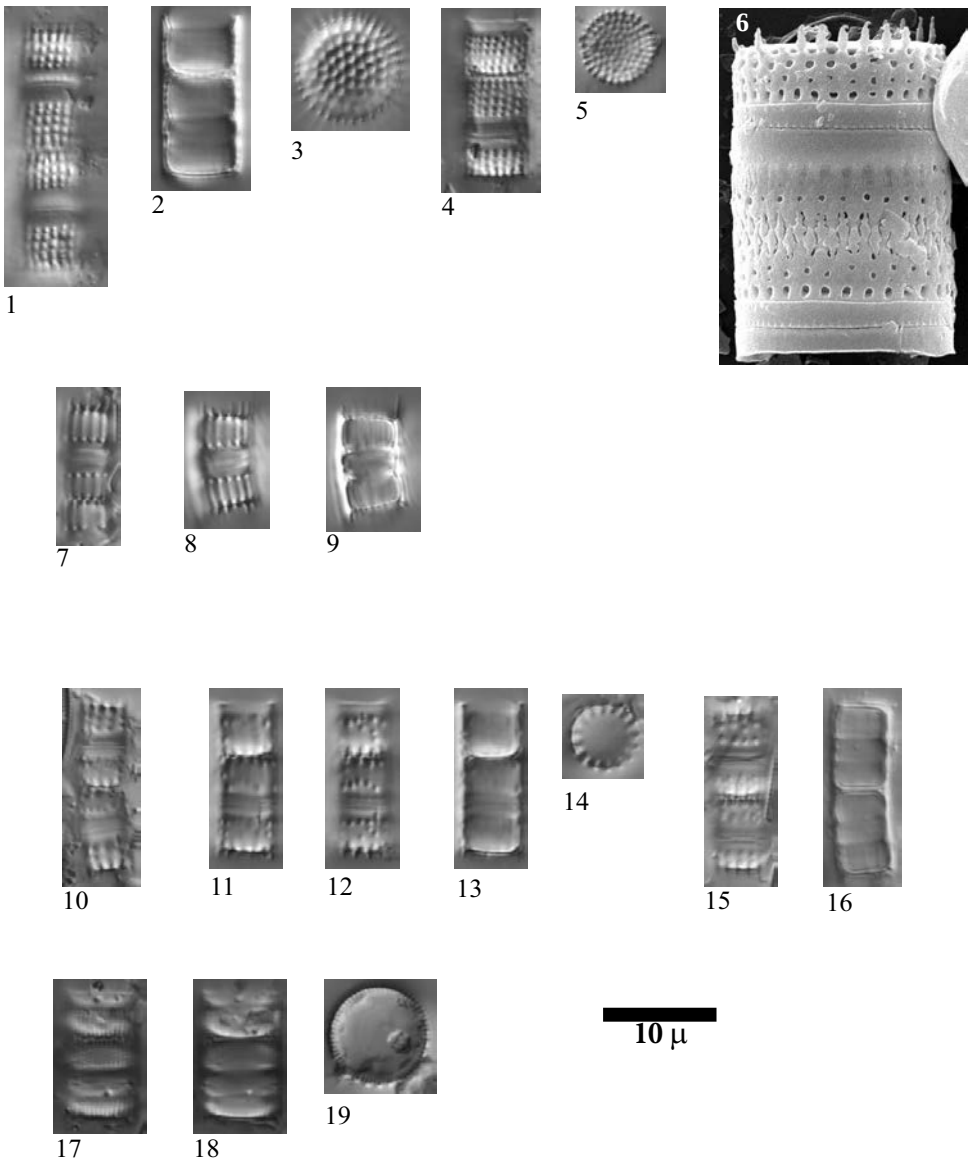
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Plate 12	LM: x1500 SEM: x6000

Fig. 1	*Diatoma vulgaris* Bory
Figs. 2-8	*Diatoma mesodon* Kützing
Figs. 9-14	*Diatoma hyemalis* (Roth) Heiberg sensu Krammer & Lange-Bertalot 1991
Fig. 15	*Diatoma* sp. No. 1 Estom
Figs. 16-17	*Meridion circulare* var. *constrictum* (Ralfs) Van Heurck sensu Krammer & Lange-Bertalot 1991
Figs. 18-22	*Meridion circulare* (Greville) Agardh

Fig. 1	Lake Roumassot, sediment PYR04
Figs. 2, 7, 18	Lake Arratille, sediment PYR11
Fig. 3	Lake Posets, sediment PYR42
Figs. 4, 5, 8, 12	Lake Llebreta, sediment PYR58
Figs. 6, 19, 22	Lake Laurenti, sediment PYR111
Figs. 9-11, 13-15	Lake Estom, sediment PYR15
Fig. 16	Lake Labas, sediment PYR63
Fig. 17	Lake Estelat, sediment PYR120
Fig. 20	Lake Baiau Superior, sediment PYR76
Fig. 21	Lake Burg, sediment BURG1210

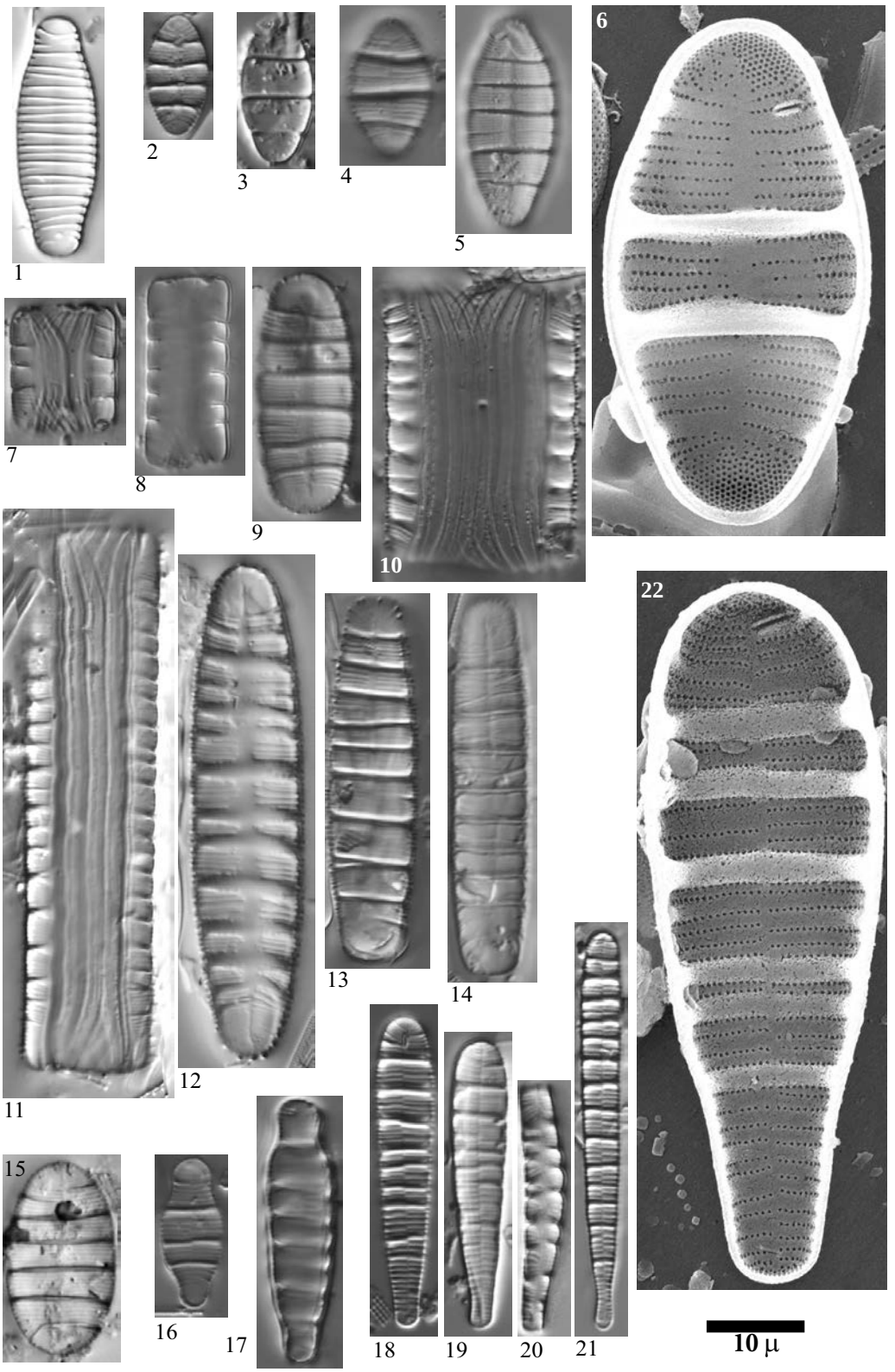
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Plate 13 LM: x1500

Figs. 1-23	*Tabellaria flocculosa* (Roth) Kützing
Figs. 23-25	*Tabellaria ventricosa* Kützing
Fig. 27	*Tabellaria fenestrata* (Lyngbye) Kützing
Figs. 28-29	*Asterionella formosa* Hassall

Figs. 1-4	Lake Pica, epilithic EpiPYR100
Figs. 5-8, 11-16	Lake Senó, epilithic EpiPYR84
Figs. 9-10	Lake Bleu de Rabassoles, epilithic EpiPYR112
Figs. 17, 19, 21	Lake L`Estagnol, epilithic EpiPYR119
Fig. 18	Lake L`Estagnol, sediment PYR119
Figs. 22, 27	Lake Llebreta, sediment PYR58
Figs. 23, 24, 26	Lake Senó, sediment PYR84
Fig. 25	Lake Senó, epilithic EpiPYR84
Fig. 28	Lake Bersau, sediment PYR03
Fig. 29	Lake Airoto, sediment PYR73

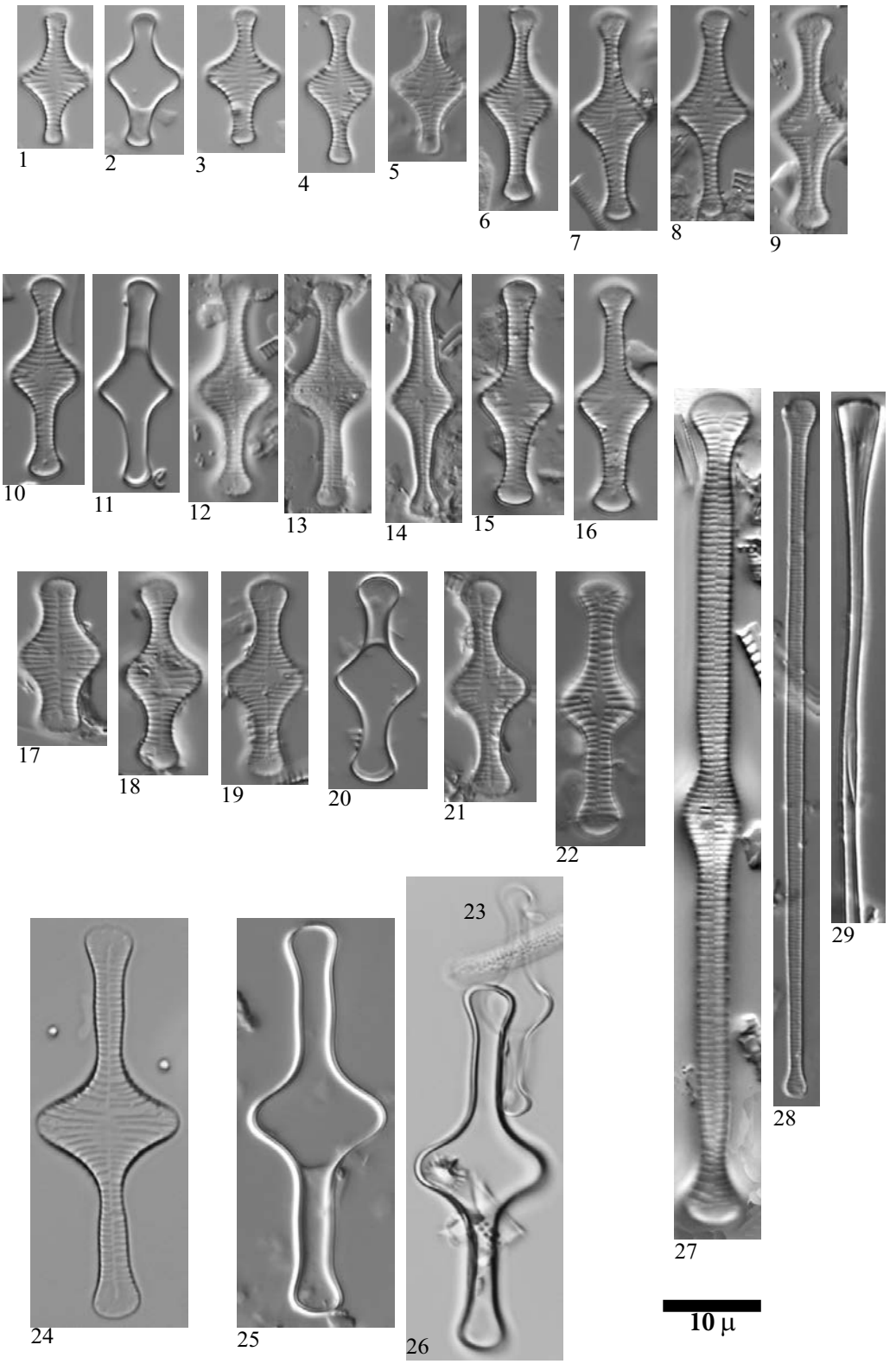
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Plate 14	LM: x1500 SEM: Figs. 4-5 x2000, Fig. 22 x6000, Fig. 25 x9000, Figs. 23-24, 26-27 x10000

Fig. 1-2	*Fragila* sp. No. 1 Airoto
Figs. 3-5, 23-28	*Fragilaria delicatissima* (Smith) Lange-Bertalot
Figs. 6-13	*Fragilaria sp. (*?nanoides)
Figs. 14-17	*Fragilaria* cf. *gracilis* Østrup
Figs. 18-19	*Fragilaria* cf. *tenera (Smith) Lange-Bertalot*
Fig. 20	*Fragilaria saxoplanctonica* nom. prov.
Fig. 21	*Fragilaria* cf. *nanana* Lange-Bertalot
Fig. 22	*Fragilaria* cf. *nanoides* Lange-Bertalot

Figs. 1, 10-13	Lake Airoto, sediment PYR73
Fig. 2	Lake Les Laquettes, sediment PYR27
Figs. 3-5, 23-28	Lake Redón, sediment REDOM
Figs. 6-9	Lake Sen, sediment PYR40
Figs. 14, 18, 20	Lake Bersau, sediment PYR03
Fig. 19	Lake Posets, sediment PYR42
Fig. 21	Lake Tourrat, sediment PYR23
Fig. 22	Lake Monges, sediment PYR57

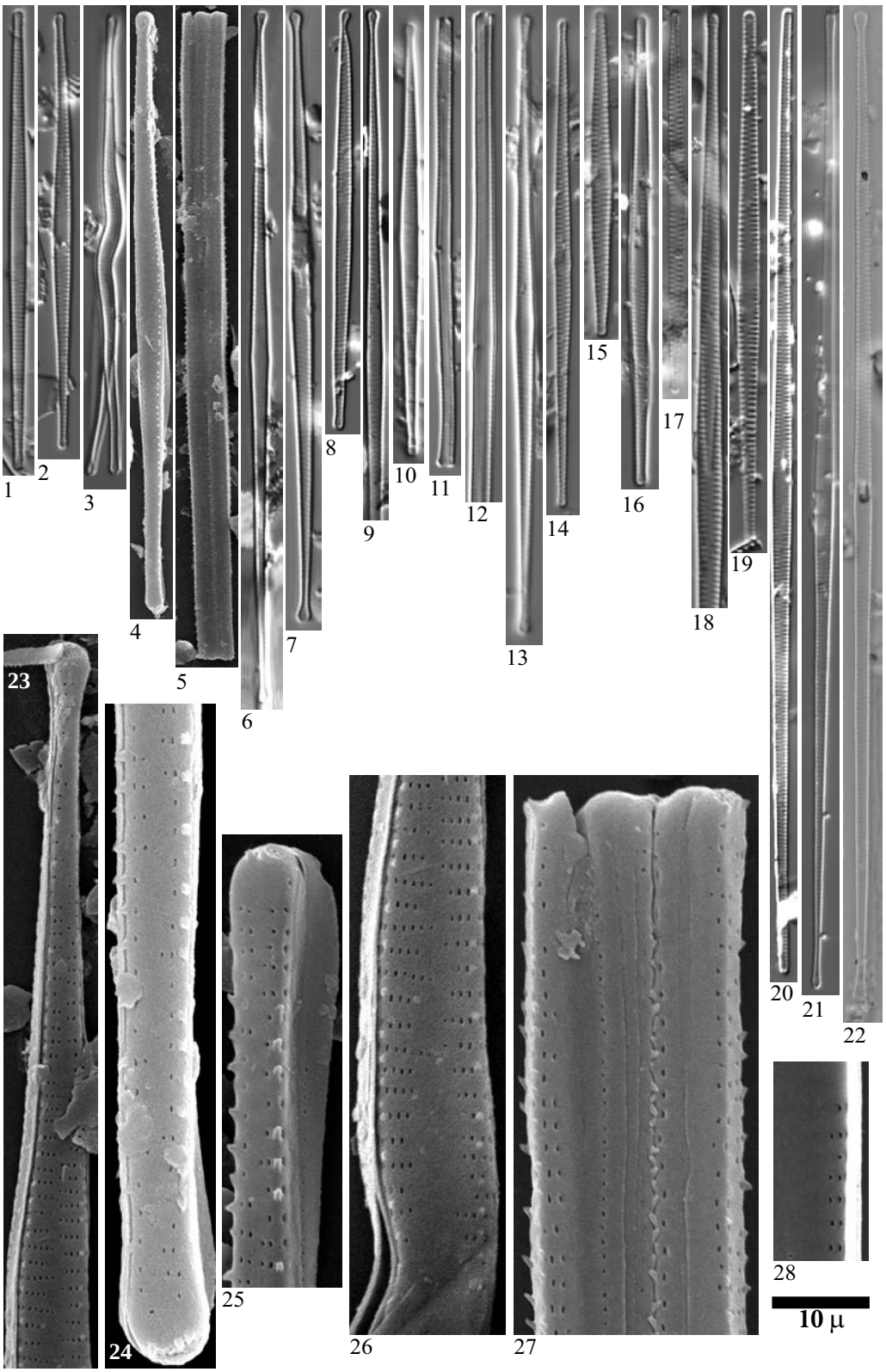
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Plate 15 LM: x1500

Figs. 1-27	*Fragilaria* cf. *pararumpens* Lange-Bertalot, Hofmann & Werum
Figs. 28-31	*Fragilaria* spp.
Fig. 32	*Fragilaria* sp.
Fig. 33-41	*Fragilaria* sp. No. 2 Bersau
Fig. 42	*Fragilaria* sp. No. 3 Airoto
Fig. 43	*Fragilaria* cf. *rumpens* (Kützing) Carlson
Figs. 44-46	*Fragilaria* cf. *perminuta* (Grunow) Lange-Bertalot
Figs. 47-48	*Fragilaria* cf. *vaucheriae* (Kützing) Petersen
Fig. 49	*Fragilaria* cf. *recapitellata* Lange-Bertalot & Metzeltin
Fig. 50	*Fragilaria* sp. No. 4 Laquettes

Figs. 1-15, 18-28, 32-41	Lake Bersau, sediment PYR03
Figs. 16-17	Lake Burg, sediment BURG1007
Figs. 29-31	Lake Sen, sediment PYR40
Figs. 42	Lake Airoto, sediment PYR73
Fig. 43	Lake Eriste, sediment PYR43
Figs. 44-45	Lake Inferior de la Gallina, sediment PYR87
Fig. 46	Lake Bleu de Rabassoles, sediment PYR112
Fig. 47-49	Lake Llebreta, sediment PYR58
Fig. 50	Lake Les Laquettes, sediment PYR27

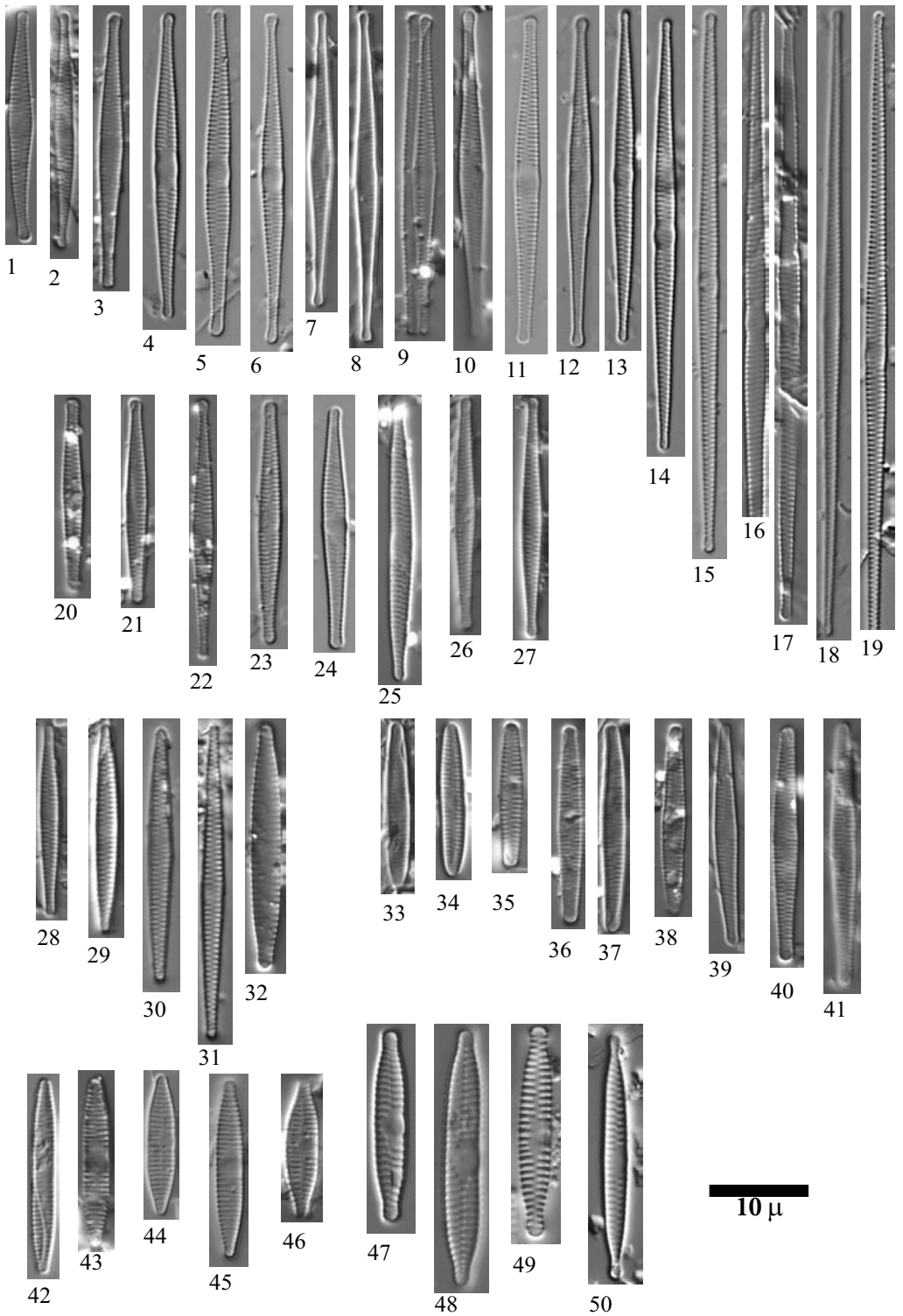
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Plate 16	LM: x1500 SEM: Fig. 11 x3500, Fig. 12 x3000

Fig. 1	*Fragilaria* sp. No. 5 Aube, aff. *F. nevadensis* Linares-Cuesta & Sanchez-Castillo
Figs. 2-8	*Fragilaria alpestris* Krasske
Figs. 9-11	*Fragilaria* sp. No. 6 Blaou
Figs. 12-14	*Stauroforma* cf. *exiguiformis* (Lange-Bertalot) Flower, Jones & Round
Fig. 15	*Fragilaria* cf. *mesolepta* Rabenhorst
Figs. 16-17	*Fragilaria* sp. No. 7 Arratille
Figs. 18-19	*Staurosira parasitoides* Lange-Bertalot, Schmidt & Klee
Fig. 20	*Pseudostaurosira* cf. *microstriata* (Marciniak) Flower
Figs 21-22	*Pseudostaurosira parasitica* (Smith) Morales
Fig. 23	*Pseudostaurosira parasitica* var. *subconstricta* (Grunow) Morales

Fig. 1	Lake Senó, sediment PYR84
Figs. 2-8	Lake Helado del Monte Perdido, sediment PYR19
Figs. 9-10	Lake Blaou, epilithic EpiPYR94
Fig. 11	Lake Port Bielh, sediment PYR28
Fig. 12	Lake Redon, sediment REDOM
Fig. 13	Lake Plan, sediment PYR69
Fig. 14	Lake Romedo de Dalt, sediment PYR85
Fig. 15	Lake Burg, sediment BURG1169
Figs. 16-17, 20	Lake Arratille, sediment PYR11
Figs. 18-19, 21	Lake Acherito, sediment PYR01
Fig. 22	Lake Sen, sediment PYR40
Fig. 23	Lake Posets, sediment PYR42

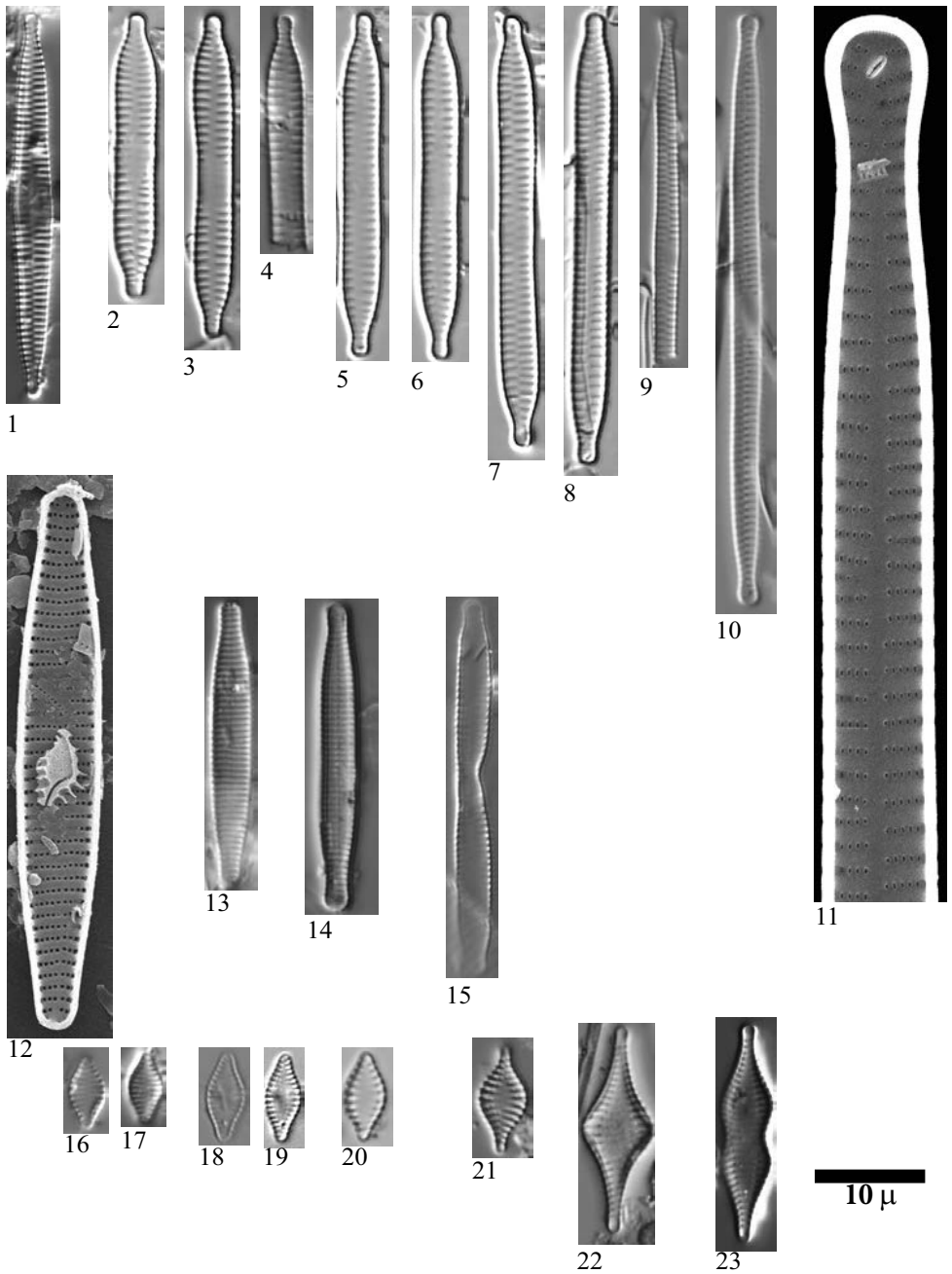
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Plate 17	LM: x1500 SEM: Figs. 9-10,13 x10000, Figs.21-22 x6000

Figs. 1-10	*Pseudostaurosira microstriata* (Marciniak) Flower
Figs. 11-12	*Pseudostaurosira* cf. *brevistriata* (Grunow) Williams & Round
Fig. 13	*Pseudostaurosira* sp.
Fig. 14	*Pseudostaurosira* sp.
Figs. 15-22	*Fragilaria* cf. *opacolineata* Lange-Bertalot

Figs. 1-4, 9-10	Lake Posets, sediment PYR42
Figs. 5-7, 11-12	Lake Arratille, sediment PYR11
Figs. 8, 14	Lake Sen, sediment PYR40
Fig. 13	Lake Port Bielh, sediment PYR28
Figs. 15, 17-18	Lake Siscar, sediment PYR126
Fig. 16	Lake Ensangents Superior, sediment PYR106
Fig. 19	Lake Canals Roges, sediment PYR124
Fig. 20	Lake Basa de la Mora, sediment PYR32
Figs. 21-22	Lake Argonella de Mes Amunt, sediment PYR78

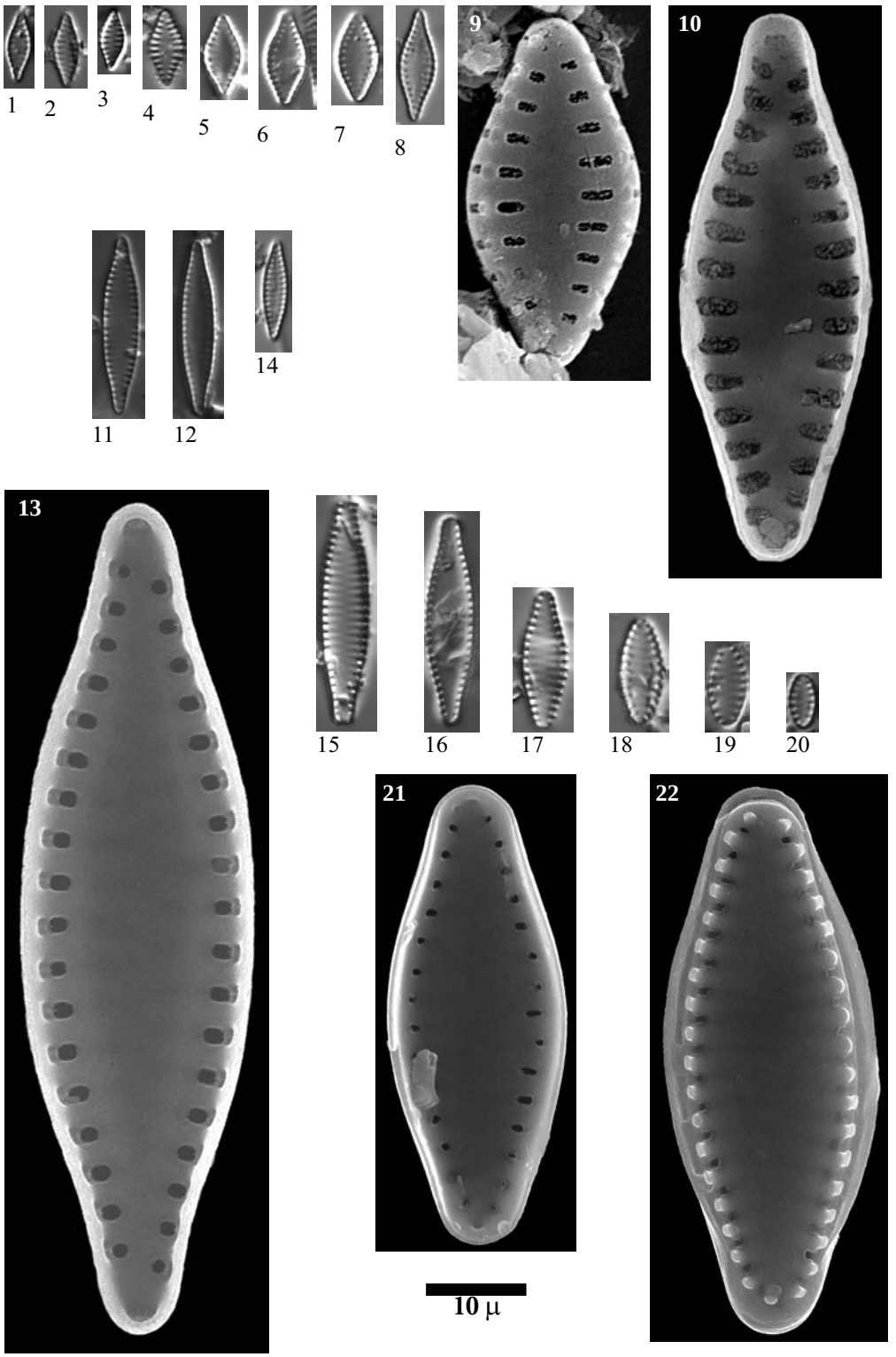
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Plate 18	LM: x1500 SEM: x6000
Figs. 1-6	*Pseudostaurosira pseudoconstruens* (Marciniak) Williams & Round
Figs. 7-8	*Pseudostaurosira* cf. *robusta* (Fusey) Williams & Round
Figs. 9-11	*Pseudostaurosira robusta (Fusey) Williams & Round*
Figs. 12-38	*Pseudostaurosira* sp. No. 1 Arratille
Figs. 39-41	*Pseudostaurosira* sp. No. 2 Acherito
Figs. 42-43	*Tabularia fasciculata* (Agardh) Williams & Round

Fig. 1	Lake Burg, sediment
Figs. 2, 11	Lake Estom, sediment PYR15
Figs. 3, 13, 15, 31-32	Lake Sen, sediment PYR40
Figs. 4-6, 12, 14, 16-21, 23-30, 33-35	Lake Arratille, sediment PYR11
Fig. 7	Lake Siscar, sediment PYR126
Fig. 8	Lake Posets, sediment PYR42
Fig. 9	Lake Burg, sediment BURG1136
Fig. 10	Lake Burg, sediment BURG1132
Figs. 22, 37-38, 42	Lake Laurenti, sediment PYR111
Fig. 36	Lake Arnales, sediment PYR09
Figs. 39-41, 43	Lake Acherito, sediment PYR01

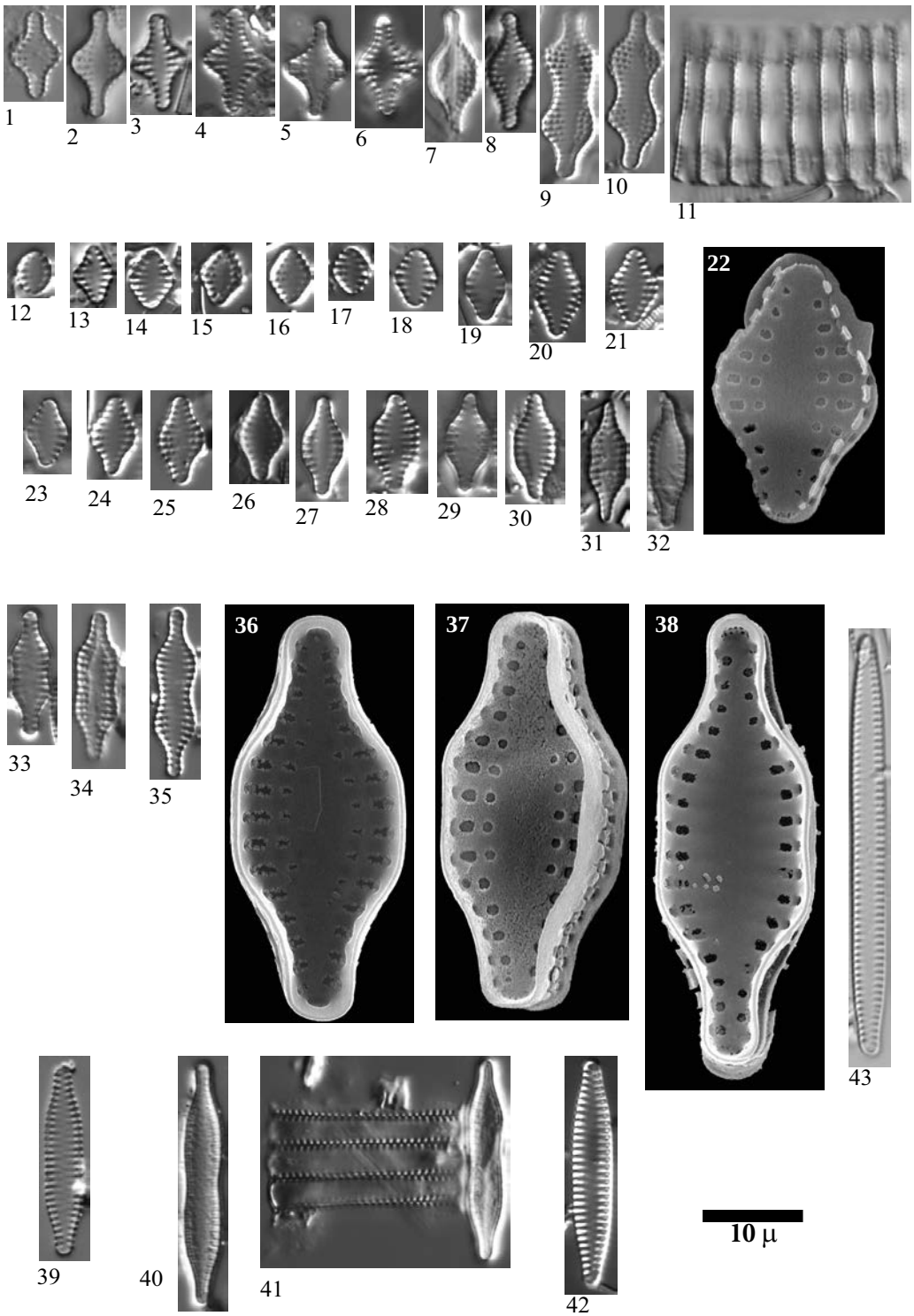
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Plate 19	LM: x1500 SEM: Fig. 3 x 20000, Fig. 4x6000

Figs. 1-4	*Pseudostaurosira* cf. *robusta (Fusey) Williams & Round*
Figs. 5-22	*Staurosirella pinnata* (Ehrenberg) Williams & Round sensu lato
Figs. 23-31	*Staurosirella* cf. *confusa* Morales
Fig. 32	*Staurosirella oldenburgiana* (Hustedt) Morales
Figs. 33-51	*Staurosirella pinnata* (Ehrenberg) Williams & Round sensu lato
Figs. 52-55	*Punctastriata* cf. *lancettula* (Schumann) Hamilton & Siver M3
Figs. 56-57	*Staurosirella leptostauron* (Ehrenberg) Williams & Round

Figs. 1, 5-8, 19-25 28-30, 33-36 41-46, 48-51	Lake Arratille, sediment PYR11
Fig. 2	Lake Posets, sediment PYR42
Figs. 3-4	Lake Roumassot, sediment PYR04
Figs. 9-12, 26-27	Lake Burg, sediment BURG 953
Fig. 13-14	Lake Sen, sediment PYR40
Figs. 15-18	Lake Posets, sediment PYR42
Fig. 31	Lake Burg, sediment BURG 857
Fig. 32	Lake Arnales, sediment PYR09
Figs. 37, 39, 40, 47 52-54	Lake Burg, sediment BURG 543
Fig. 38	Lake Burg, sediment BURG 1192
Fig. 55	Lake Burg, sediment BURG 694
Fig. 56	Lake Acherito, sediment PYR01
Fig. 57	Lake Laurenti, sediment PYR111

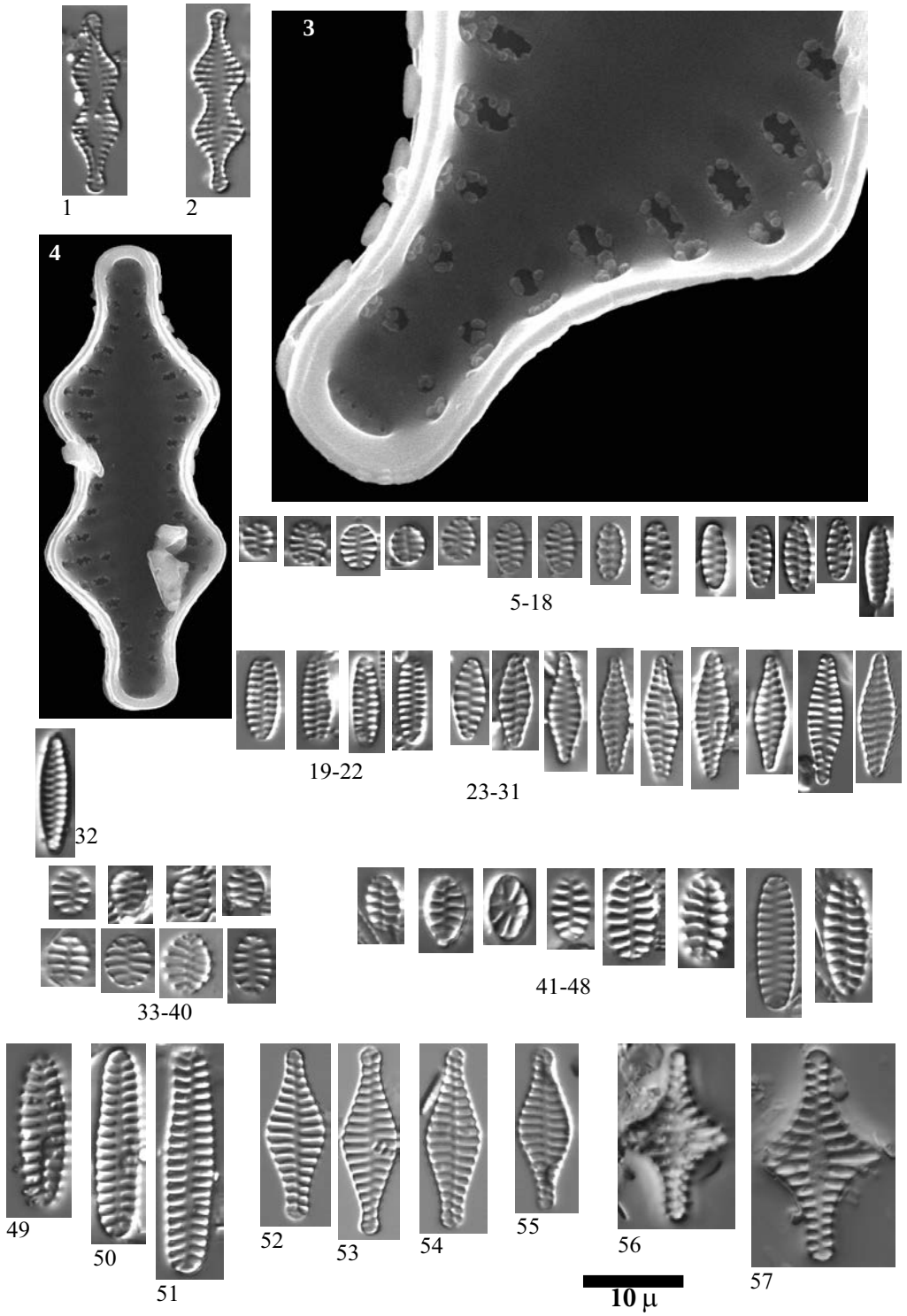
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Plate 20	LM: x1500 SEM: Figs. 1-5,9 x5000, 7-8 x10000

Figs. 1-4, 7	*Staurosirella pinnata* (Ehrenberg) Williams & Round
Figs. 5-6	*Staurosirella* cf. *confusa* Morales
Figs. 8-9	*Punctastriata lancettula* (Schumann) Hamilton & Siver

Fig. 1	Lake Gran de Mainera, sediment PYR70
Figs. 2, 5-6, 9	Lake Laurenti, sediment PYR111
Fig. 3	Lake Gors de Camporrells, sediment PYR110
Fig. 4	Lake Posets, sediment PYR42
Figs. 7-8	Lake Burg, sediment BURG 930

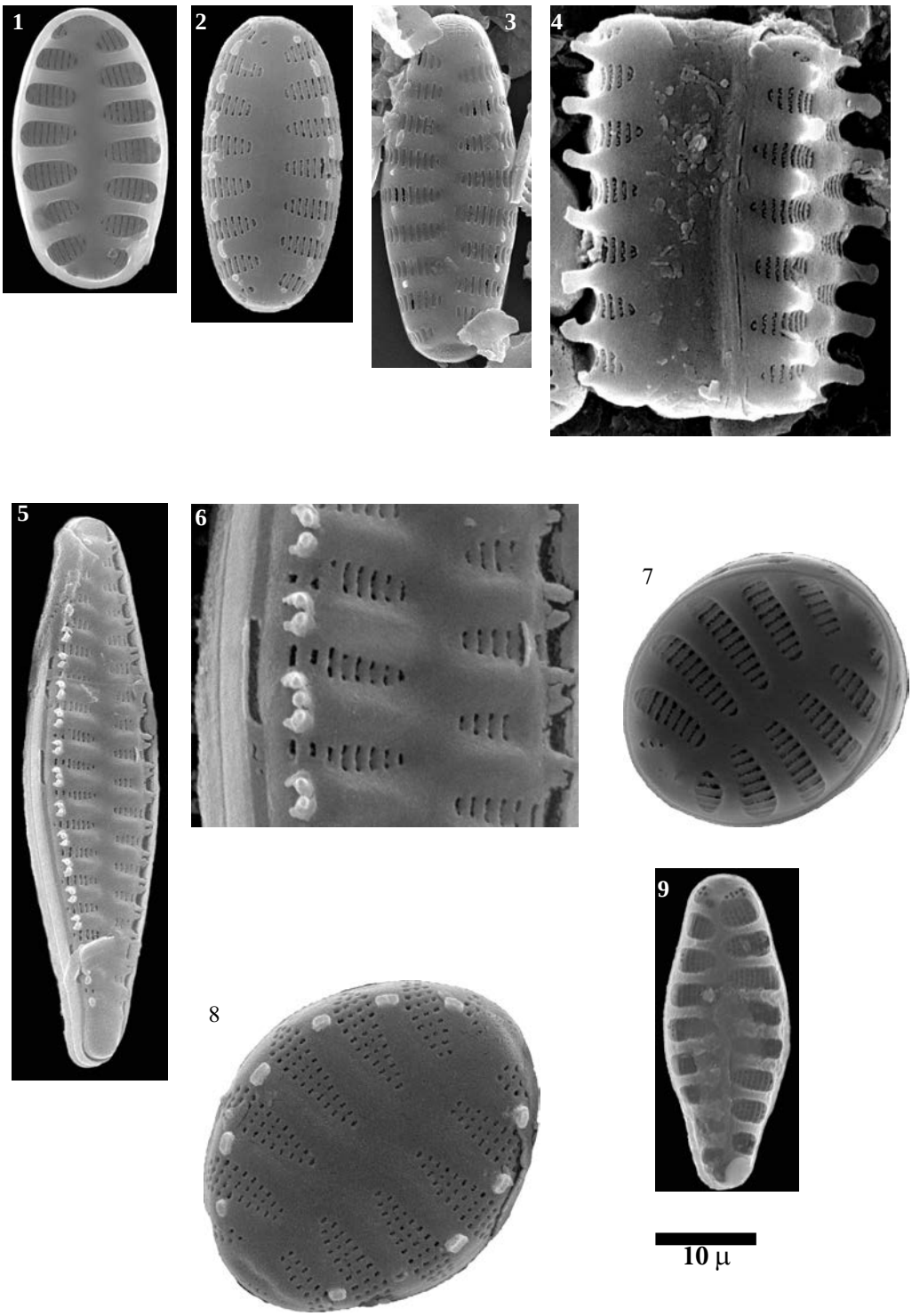
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Plate 21	LM: Figs. 1.5, 7-8 x1500, Fig. 9 x750 SEM: x6000

Figs. 1-6	*Hannaea arcus* (Ehrenberg) Patrick
Figs. 7-9	*Ulnaria biceps* (Kützing) Compère *sensu lato*

Fig. 1	Lake Llebreta sediment PYR58
Figs. 2, 7-9	Lake Arratille, sediment PYR11
Fig. 3	Lake Redon, sediment REDOM
Fig. 4	Lake Les Laquettes 1, sediment PYR27
Fig. 5	Lake Inferior de la Gallina, sediment PYR87
Fig. 6	Lake Laurenti, sediment PYR111

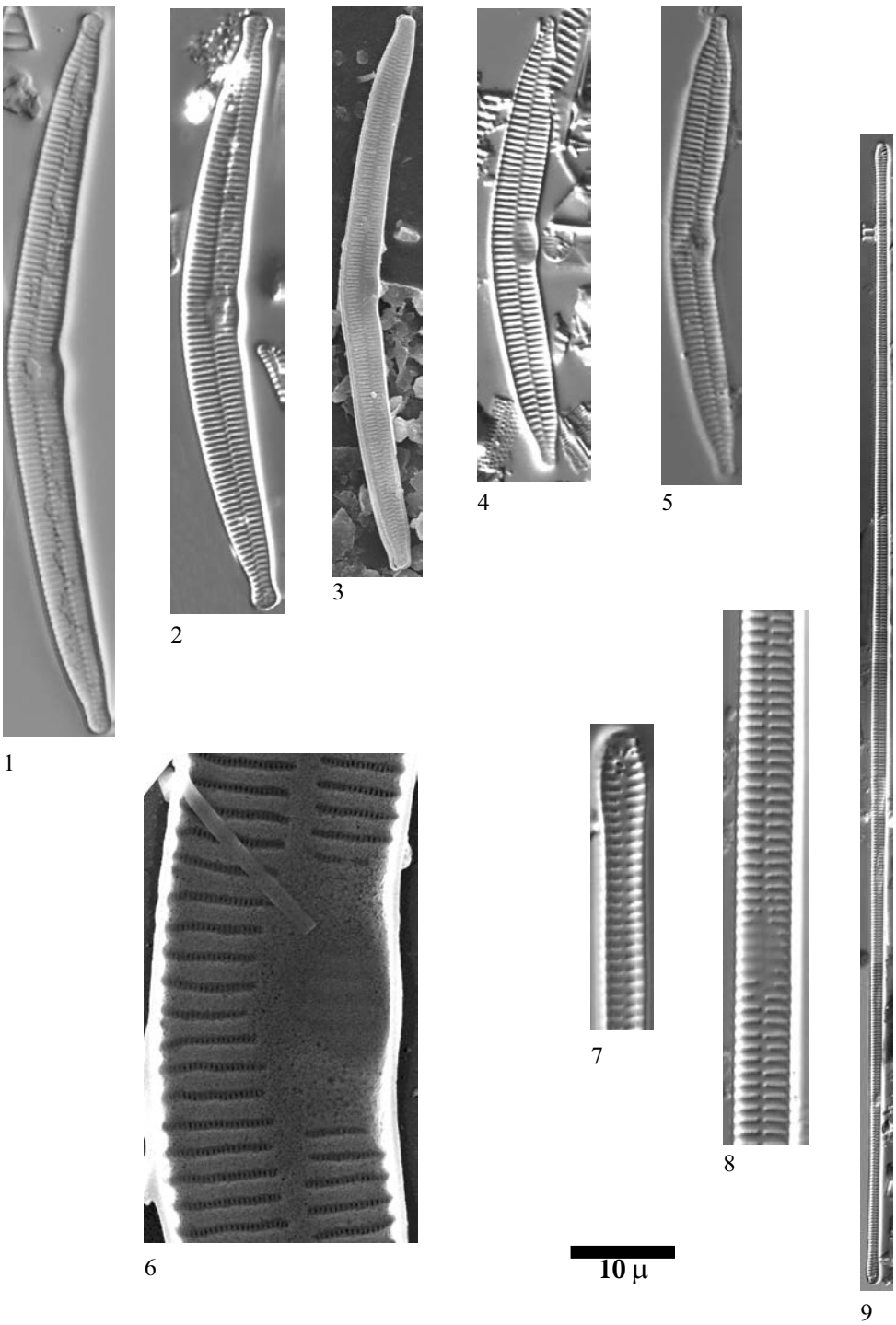
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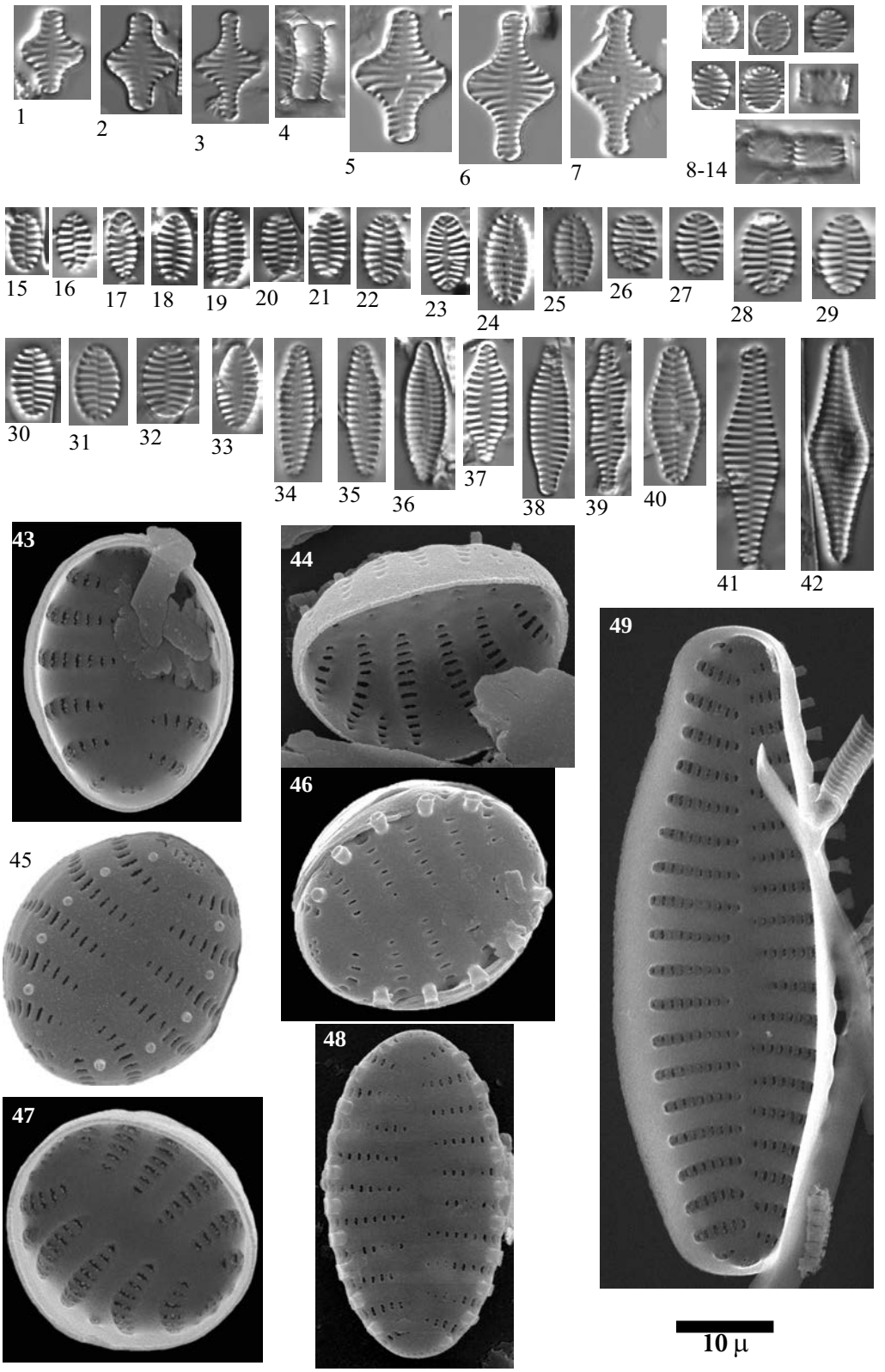
Plate 22	LM: x1500 SEM: Figs. 43-47 x10000, Figs. 48-49 x8000

Figs. 1-7	*Staurosira construens* Ehrenberg *sensu lato*
Figs. 8-32 43-48	*Staurosira construens* var. *venter* (Ehrenberg) Hamilton
Figs. 33-36	*Staurosira construens var. venter* (Ehrenberg) Hamilton
Figs. 37-39	*Staurosira construens* var. *binodis* (Ehrenberg) Hamilton
Figs. 40-42, 49	*Staurosira construens* aff. var. *venter* (Ehrenberg) Hamilton

Figs. 1-2, 4-7, 8, 10	Lake Burg, sediment BURG 543
Figs. 3, 22, 31-32	Lake Burg, sediment BURG 1136
Fig. 11	Lake Burg, sediment BURG 853
Fig. 12	Lake Burg, sediment BURG 844
Figs. 13-14	Lake Burg, sediment BURG 831
Fig. 15	Lake Estom, sediment PYR15
Figs. 16-17	Lake Sen, sediment PYR40
Figs. 19-24, 30	Lake Arratille, sediment PYR11
Figs. 26-29, 39	Lake Ormiélas, sediment PYR05
Figs. 33-35	Lake Burg, sediment BURG 513
Fig. 36	Lake Les Laquettes 1, sediment PYR27
Fig. 37	Lake Burg, sediment BURG 420
Fig. 38	Lake Burg, sediment BURG 1181
Fig. 39	Lake Asnos, sediment PYR14
Figs. 41-42	Lake Acherito, sediment PYR01
Figs. 43-47	Lake Burg, sediment BURG 930
Fig. 48	Lake Mariola, sediment PYR80
Fig. 49	Lake Port Bielh, sediment PYR28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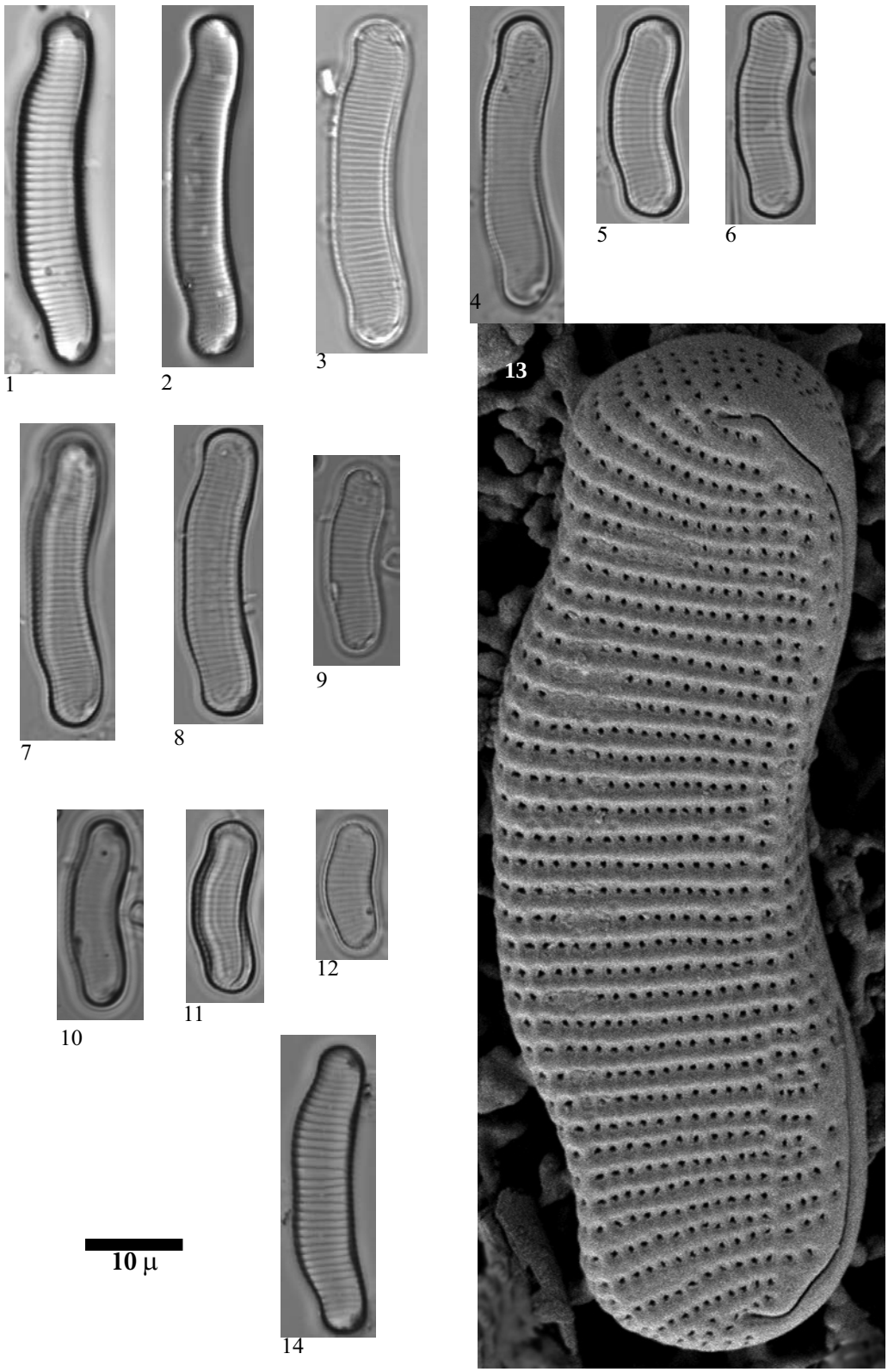
48
49
10 µ

Plate 23	LM: x1500 SEM: x7500

Figs. 1-13	*Eunotia palatina* Lange-Bertalot & Krüger
Fig. 14	*Eunotia* cf. *palatina* Lange-Bertalot & Krüger

Fig. 1	Lake Airoto, sediment PYR73
Figs. 2-13	Lake Pica, sediment PYR100
Fig. 14	Lake Monges, sediment PYR57

Fig. 13	Manfred Ruppel photo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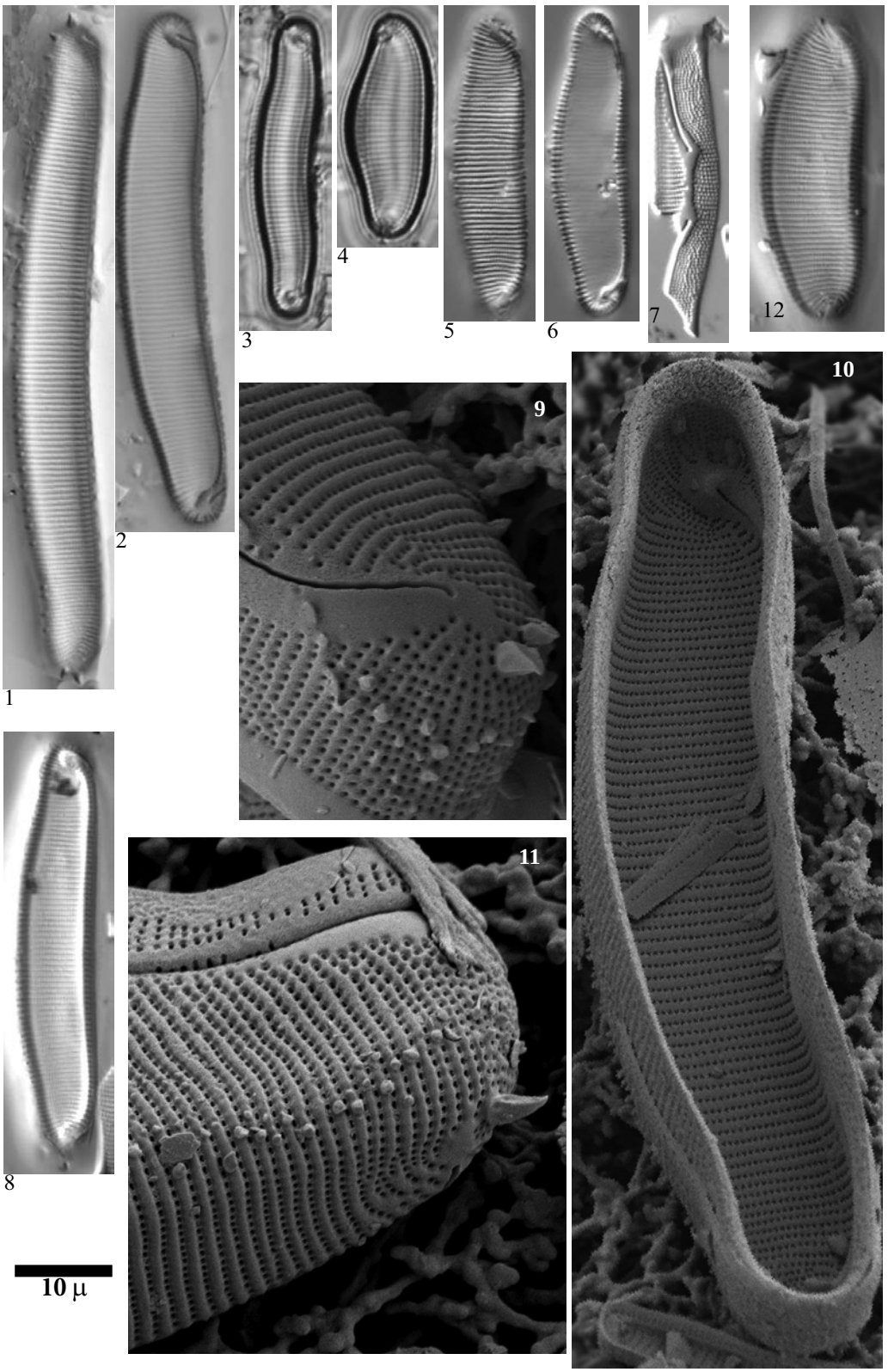
14
10 µ

Plate 24	LM: x1500 SEM: Figs. 4-5 x2000, Fig. 22 x6000, Fig. 25 x9000, Figs. 23-24, 26-27 x 10000

Figs. 1-11	*Eunotia catalana* Lange-Bertalot & Rivera-Rondón
Fig. 12	*Eunotia lapponica* Grunow ex Cleve

Fig. 1	Lake Sotllo, epilithic EpiPYR89
Figs. 2-4, 9-12	Lake Baiau Superior, sediment PYR76
Figs. 5-6	Lake Negre, sediment PYR79
Figs. 7-8	Lake Pica Palòmera, sediment PYR52

Figs. 9-11	Manfred Ruppel photos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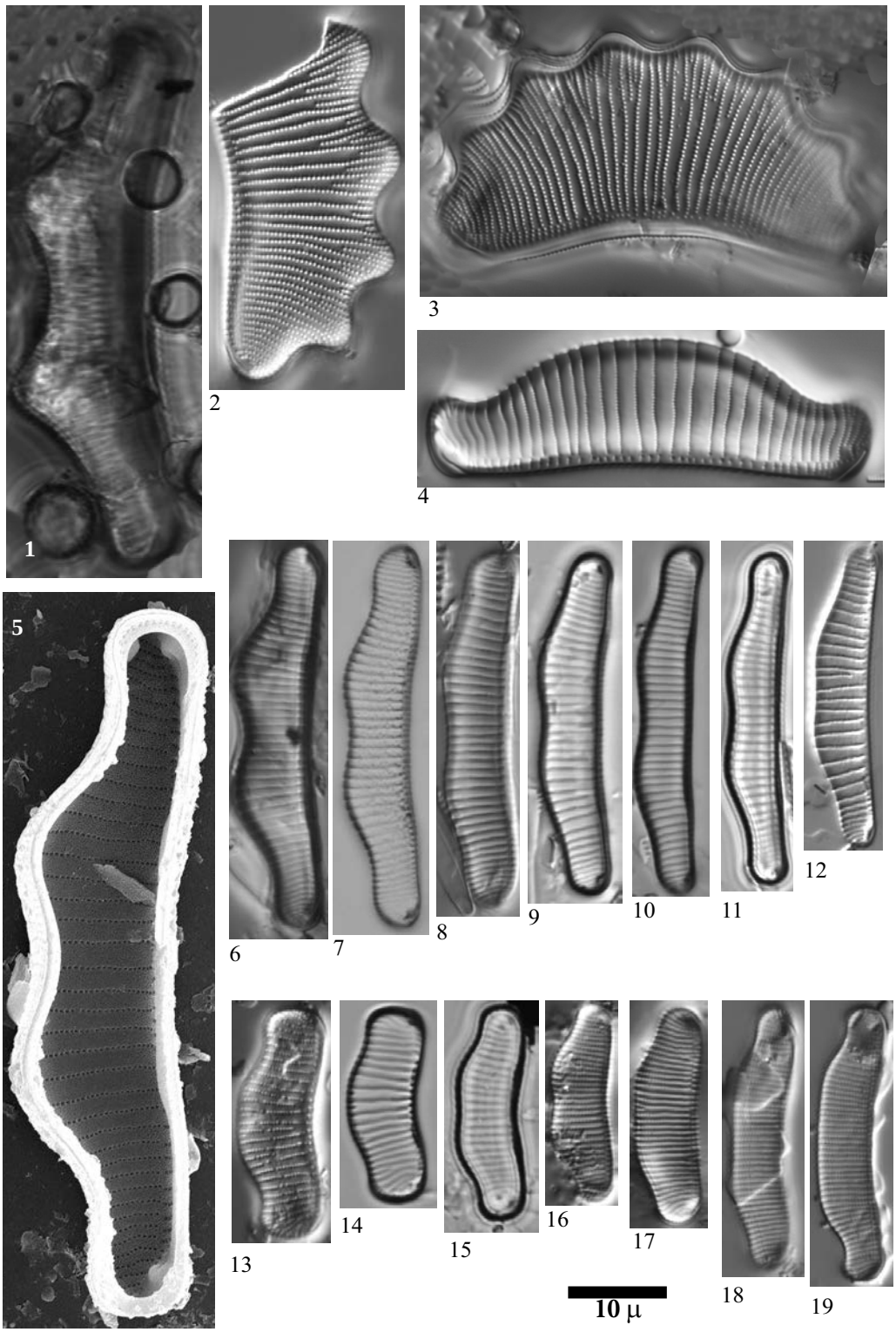
10 µ

Plate 25	LM: x1500 SEM x3500

Fig. 1	*Eunotia suecica* A. Cleve
Fig. 2-3	*Eunotia diadema* Ehrenberg
Fig. 4	*Eunotia praerupta* Ehrenberg
Figs. 5-6	?*Eunotia circumborealis* Lange-Bertalot & Nörpel
Figs. 7-9	*Eunotia* cf. *dorofeyukae* Lange-Bertalot & Kulikovskiy
Figs. 10-11	*Eunotia* cf. *circumborealis* Lange-Bertalot & Nörpel
Fig. 12	*Eunotia* aff. *minor* (Kützing) Grunow
Figs. 13-14	*Eunotia curtagrunowii* Nörpel-Schempp & Lange-Bertalot
Fig. 15	*?Eunotia meridionalis* Lange-Bertalot & Tagliaventi *? Eunotia islandica* Østrup
Figs. 16-17	*Eunotia cisalpina* Lange-Bertalot & Cantonati
Figs. 18-19	*Eunotia* sp.

Fig. 1	Lake Forcat Inferior, epilithic PYR77
Fig. 2	Lake Baiau Superior, sediment PYR69
Fig. 3	Lake Redon, sediment REDOM
Fig. 4	Lake Estelat, sediment PYR120
Figs. 5-6	Lake Mariola, sediment PYR80
Fig. 7	Lake Burg, sediment BURG830
Fig. 8	Lake Acherito, epilithic EpiPYR01
Figs. 9-11	Lake Acherito, sediment PYR01
Fig. 12	Lake Burg, sediment BURG506
Figs. 13-15	Lake Senó, sediment PYR84
Fig. 16	Lake Monges, sediment PYR57
Fig. 17	Lake Llosás, sediment PYR46
Figs. 18-19	Lake PYR127, sediment sample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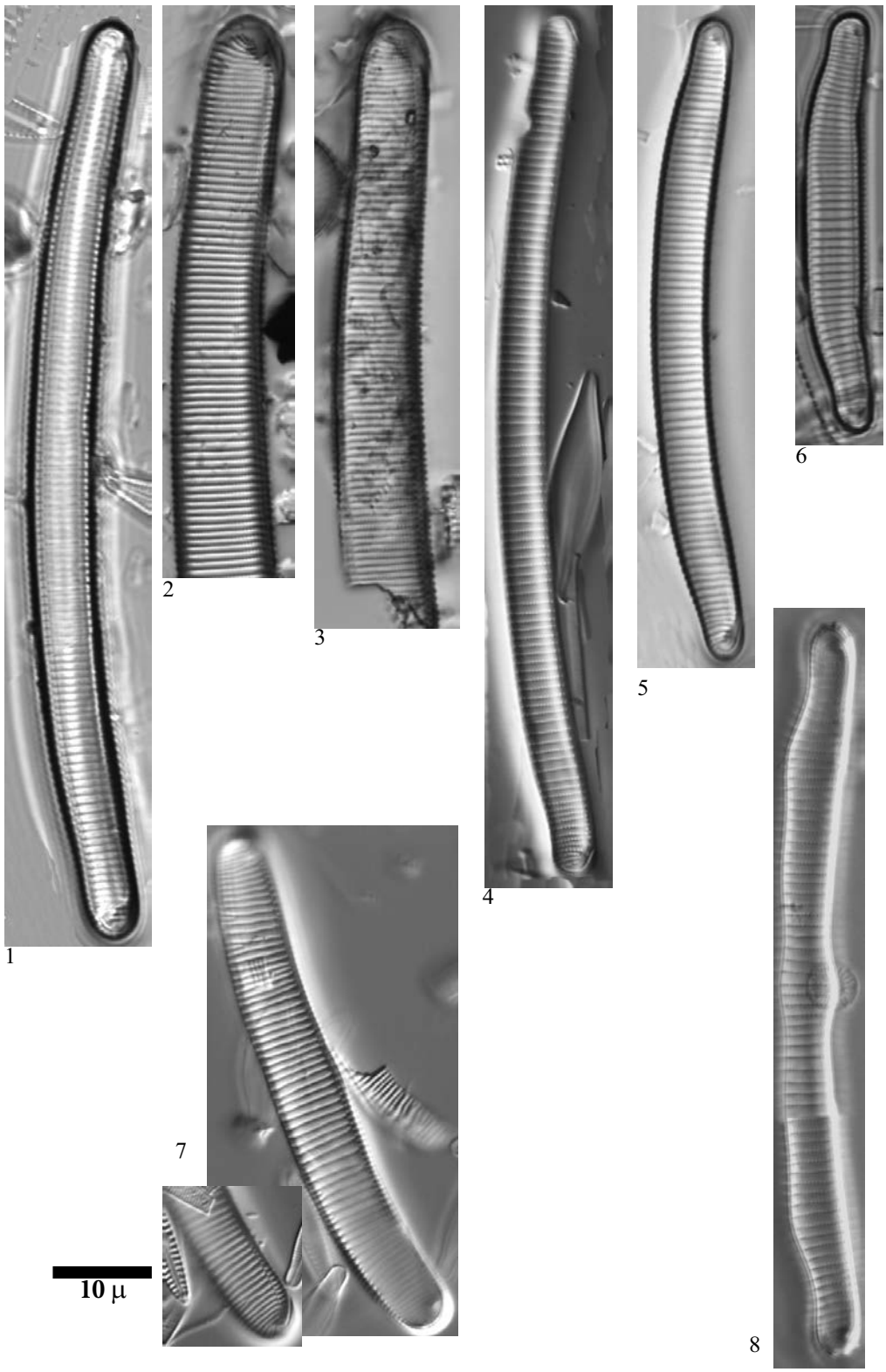
10 µ

Plate 26 LM: x1500

Figs. 1-3	*Eunotia glacialis* Meister
Figs. 4-5	*Eunotia valida* Hustedt
Fig. 6	*Eunotia minor* (Kützing) Grunow
Fig. 7	*?Eunotia minor.* primary cell?
Fig. 8	*Eunotia pectinalis* (Kützing) Rabenhorst

Figs. 1, 6	Lake Mariola, sediment PYR80
Fig. 2	Lake Illa, sediment PYR66
Fig. 3	Lake Senó, sediment PYR84
Fig. 4	Lake Blaou, epilithic EpiPYR94
Fig. 5	Lake Angonella, sediment PYR78
Fig. 7	Lake Long de Liat, sediment PYR55
Fig. 8	Lake Blaou, sediment PYR94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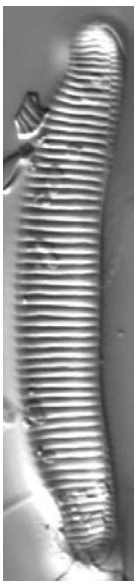
10 µ

Plate 27	LM: x1500 SEM: Figs. 4 x2000, Figs.5-6 x3000, Fig. 7 x8000

Eunotia arcus Ehrenberg sensu lato

Fig. 1	Lake Port Bielh, sediment PYR28
Fig. 2	Lake Senó, epilithic EpiPYR84
Figs. 3-4	Lake Redon, sediment REDOM
Fig. 5	Lake Laurenti, sediment PYR111
Figs. 6-7	Lake Angonella, epilithic EpiPYR78


1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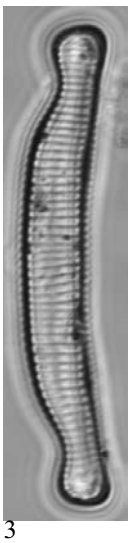
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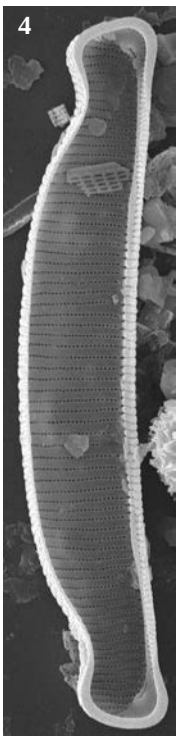
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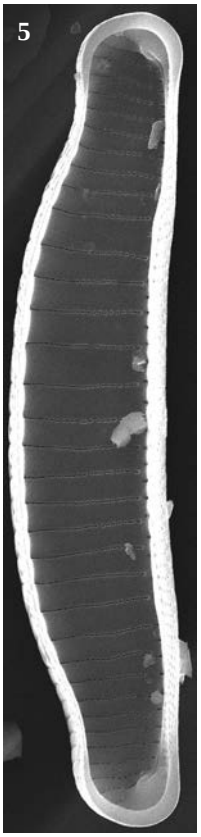
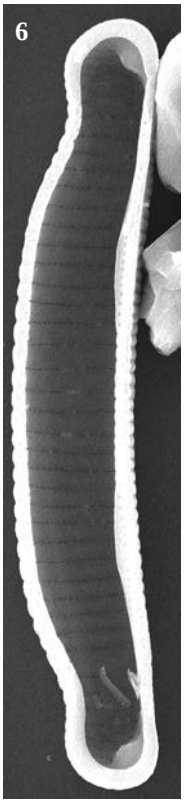

5


6

10 µ

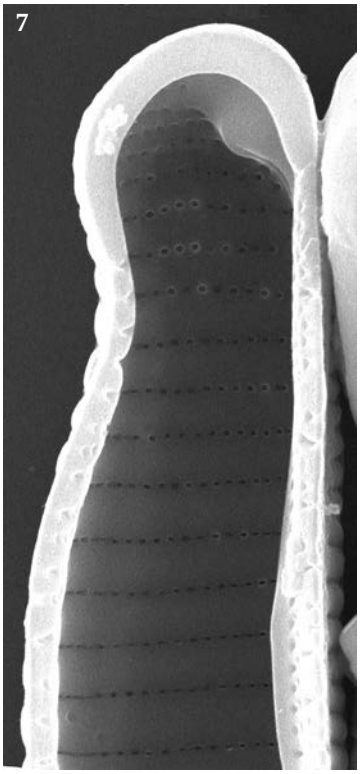
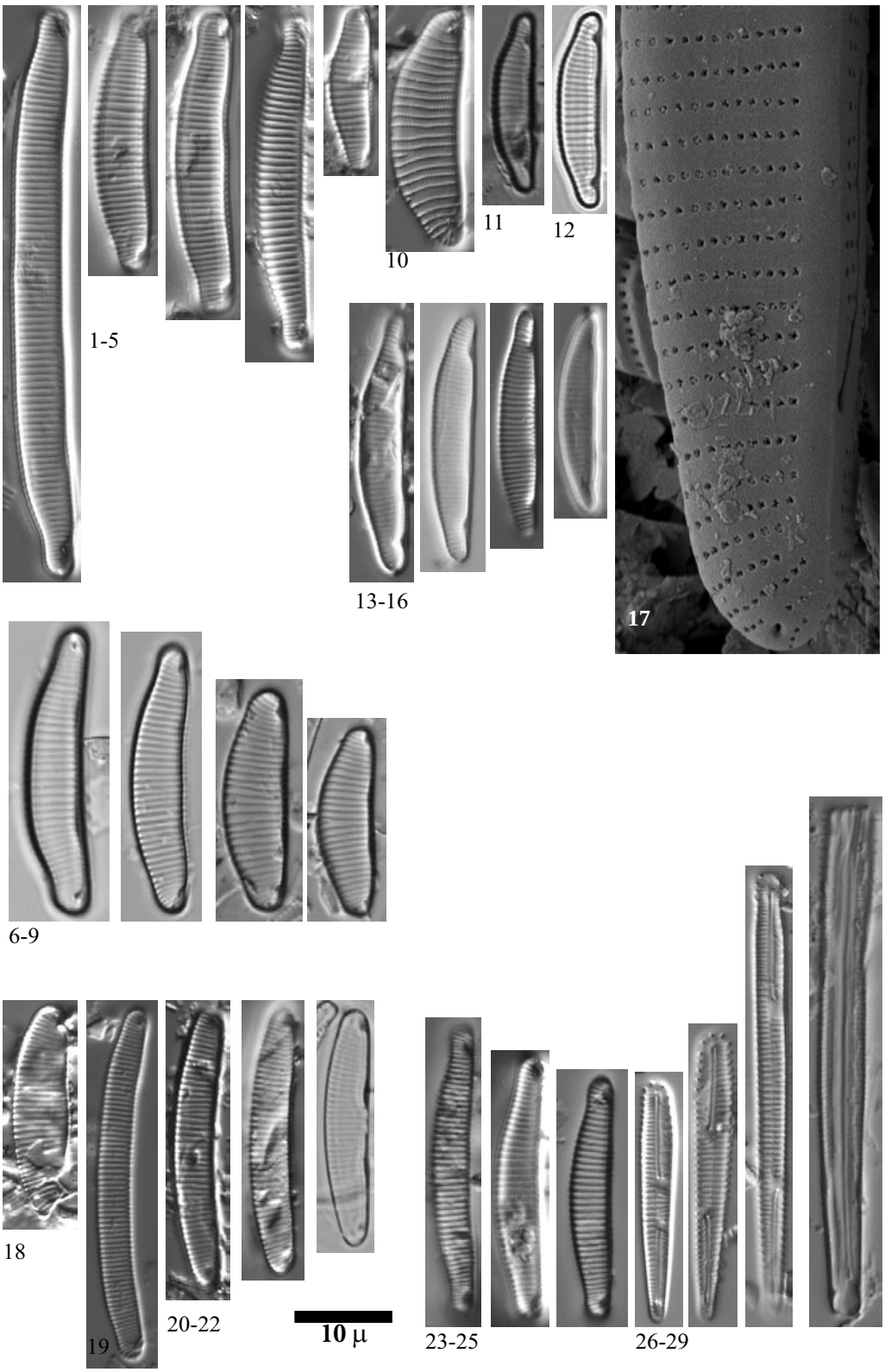

7

Plate 28	LM: x1500 SEM: x6000

Figs. 1-3	*Eunotia* aff. *soleirolii* (Kützing) Rabenhorst
Figs. 4-5	*Eunotia novaisiae* Lange-Bertalot & Luc Ector
Figs. 6-9	*Eunotia* aff. *soleirolii* (Kützing) Rabenhorst
Fig. 10	*Eunotia sudetica* O. Müller
Figs. 11-12	*Eunotia boreoalpina* Lange-Bertalot & Nörpel-Schempp
Figs. 13-17	*Eunotia incisa* Gregory
Fig. 18	*Eunotia* cf. *faba* Ehrenberg
Fig. 19	*Eunotia* sp
Figs. 20-22	*Eunotia intermedia* (Krasske) Nörpel & Lange-Bertalot
Figs. 23-25	*Eunotia* cf. *implicata* Norpel, Alles & Lange-Bertalot
Figs. 26-29	*Peronia fibula* (Brébisson in Kützing) Ross

Figs. 1-2	Lake Gelat Bergús, sediment PYR65
Figs. 3-5	Lake Monges, sediment PYR57
Fig. 6	Lake Mariola, sediment PYR80
Figs. 7-9	Lake Illa, sediment PYR66
Fig. 10	Lake Negre, sediment PYR79
Figs. 11, 16-17, 24-26	Lake Senó, sediment PYR84
Figs. 12, 27	Lake Inferior de la Gallina, sediment PYR87
Figs. 13, 20	Lake Romedo de Dalt, sediment PYR85
Figs. 14, 15	Lake Aixeus, epilithic PYR92
Figs. 18-19, 27	Lake Senó, epilithic EpiPYR84
Figs. 21, 23	Lake Sotllo, sediment PYR89
Fig. 22	Lake Baiau superior, sediment PYR76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13-16
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6-9
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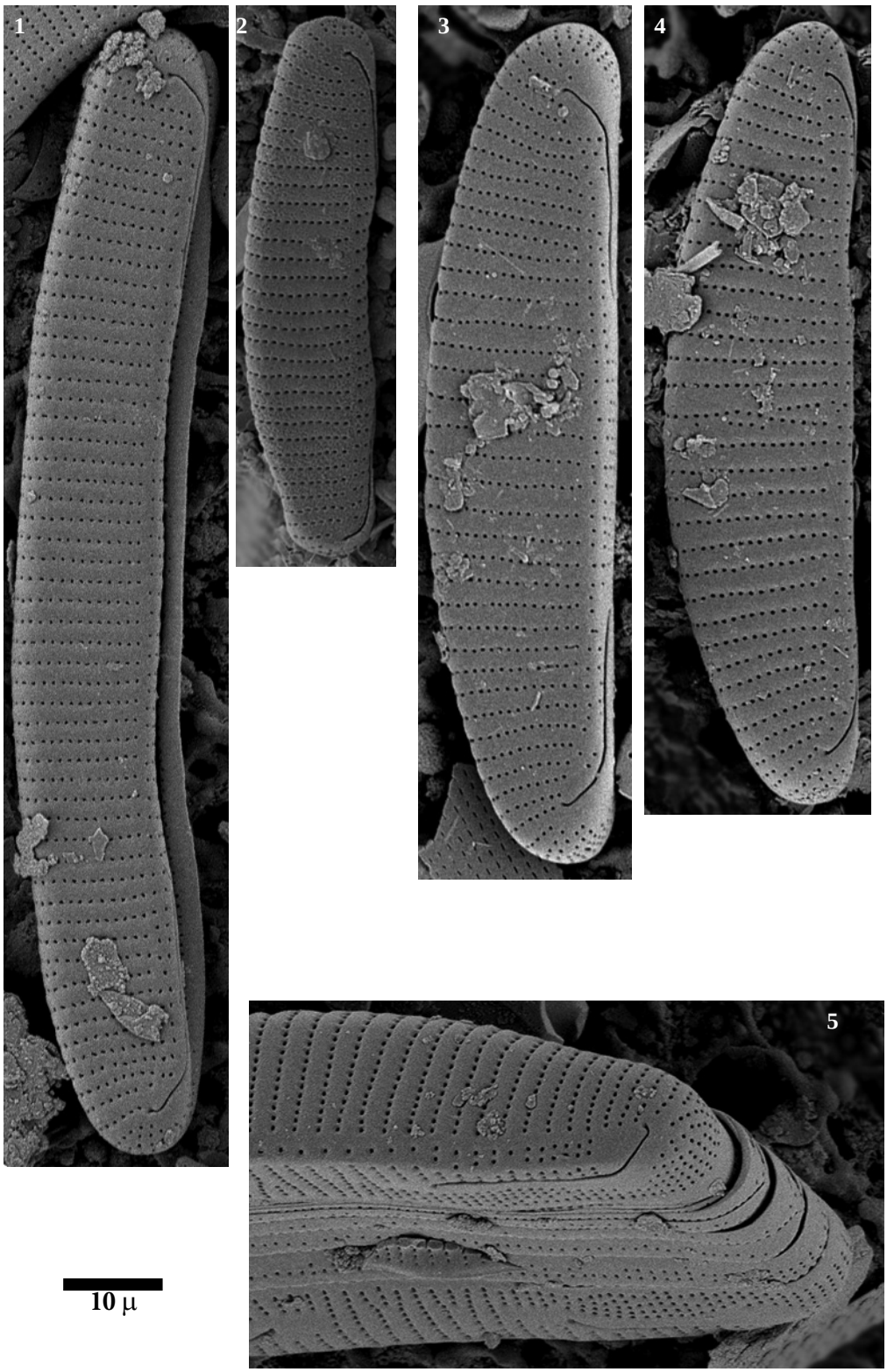
19
20-22
10 µ
23-25
26-29

Plate 29	SEM: x6000

Fig. 1	*Eunotia intermedia* (Krasske) Nörpel & Lange-Bertalot
Fig. 2	*Eunotia* cf. *botuliformis* Wild, Nörpel & Lange-Bertalot
Figs. 3-5	*Eunotia minor* (Kützing) Grunow sensu lato

Figs. 1, 5	Lake Pica Palòmera, sediment PYR52
Fig. 2	Lake Illa, sediment PYR66
Figs. 3-4	Lake Senó, sediment PYR84

Figs. 1-5	Manfred Ruppel photos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10 μ

Plate 30	LM: x1500

Figs. 1-10	*Eunotia novaisiae* Lange-Bertalot & Luc Ector
Fig. 11	*Eunotia* cf. *implicata* Norpel, Alles & Lange-Bertalot
Figs. 12-39	Eunotia *novaisiae* var. *altopyrenaica* Lange-Bertalot & Rivera -Rondón

Figs. 1, 3-8, 10, 31, 37 39	Lake Senó, sediment PYR84
Figs. 2, 9, 15, 24, 27, 34	Lake Pica Palòmera, sediment PYR52
Fig. 11	Lake Sotllo, sediment PYR89
Figs. 12-14, 17-23	Lake Baiau superior, sediment PYR76
Figs. 16, 26, 29-30, 32-22, 35-36, 38	Lake Illa, sediment PYR66
Fig. 25	Lake Mariola, sediment PYR80
Figs. 28	Lake Aixeus, sediment PYR92

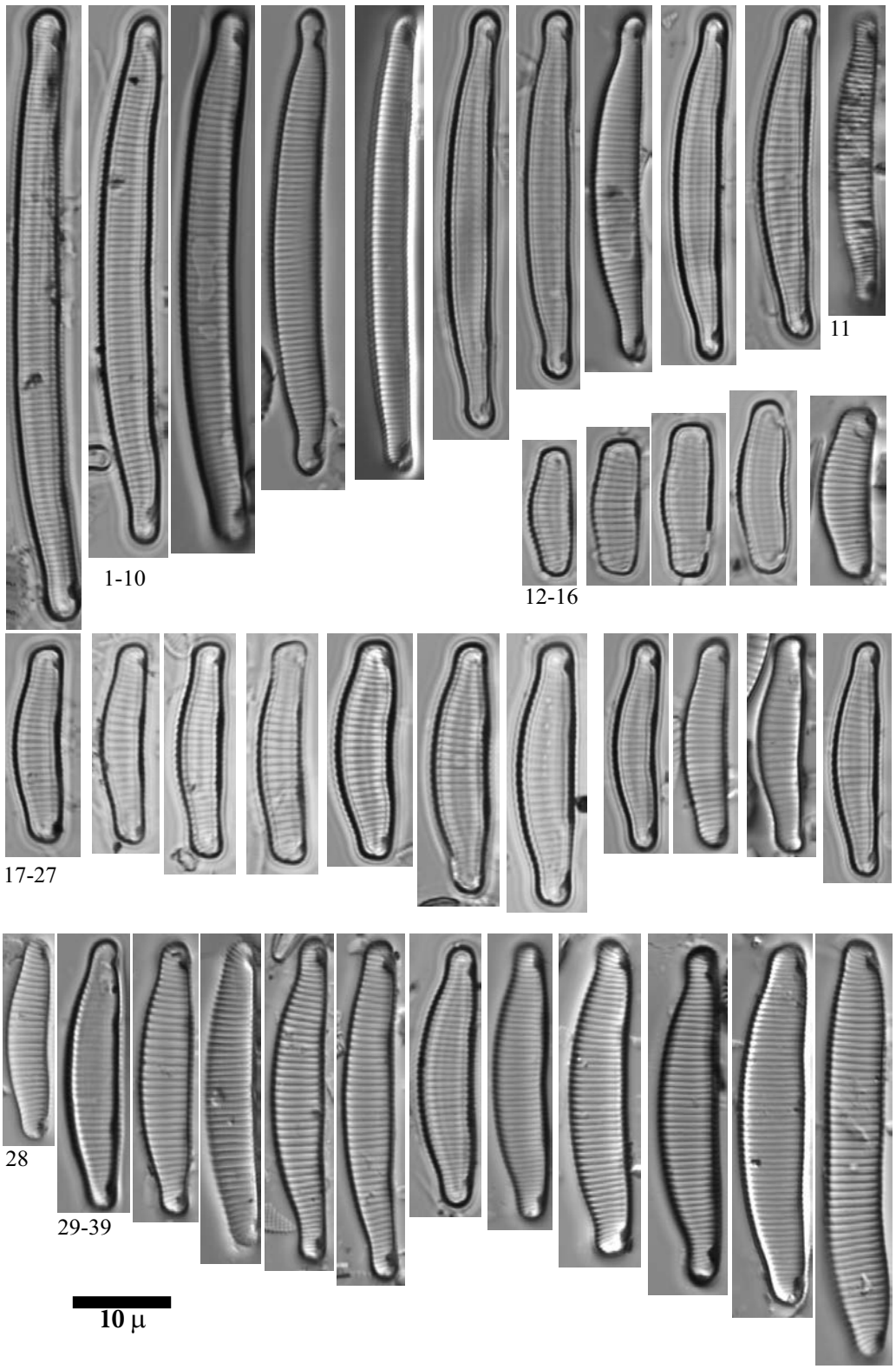
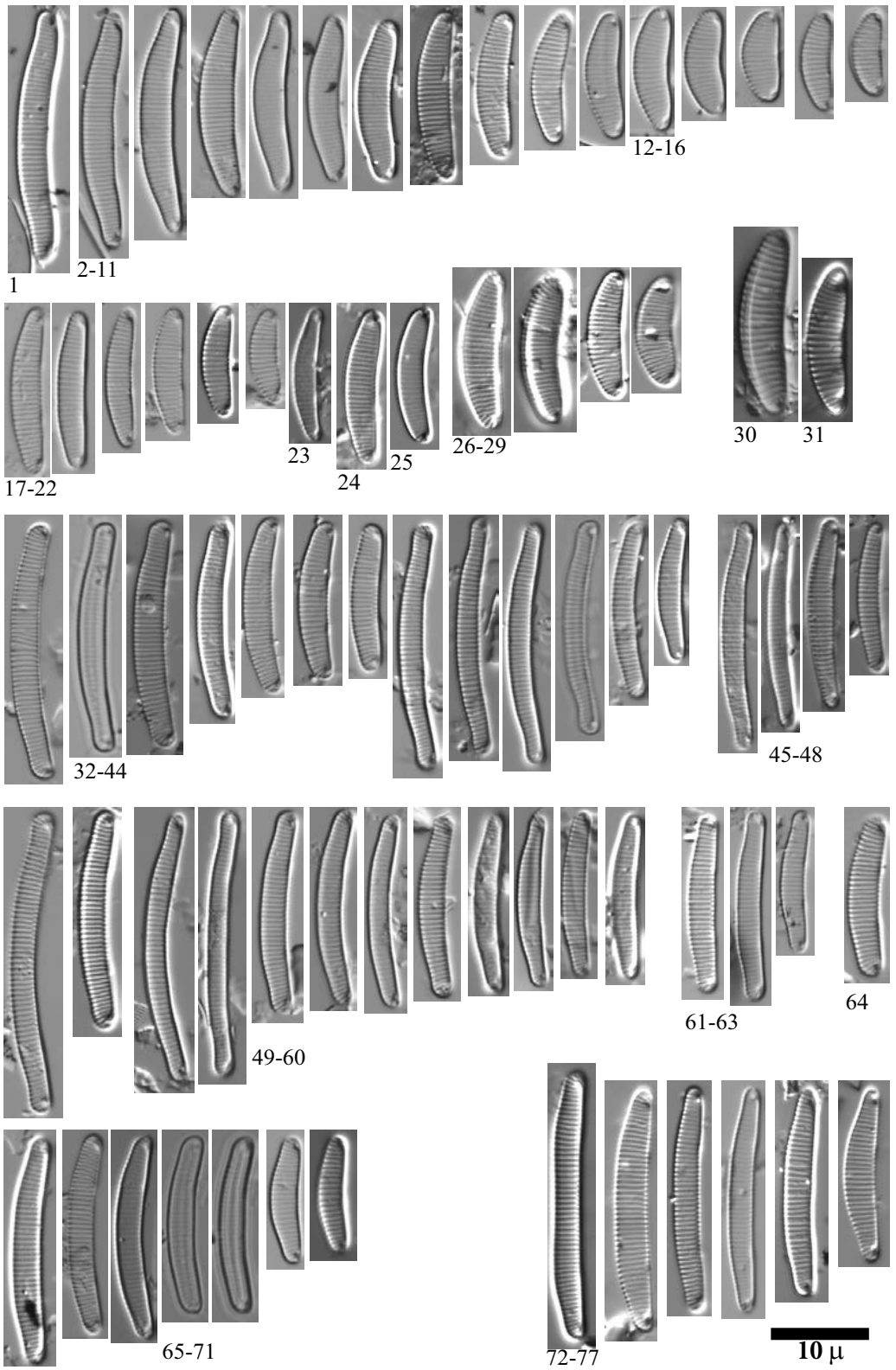

11
1-10
12-16
17-27
28
29-39
10 µ

Plate 31	LM: x1500

Figs. 1-16, 26-29	*Eunotia subarcuatoides* Alles, Norpel & Lange-Bertalot
Figs. 17-22, 24-25	*Eunotia* cf. *seminulum* Norpel-Schempp & Lange-Bertalot
Fig. 23	*Eunotia seminulum* Norpel-Schempp & Lange-Bertalot
Figs. 30-31	*Eunotia* cf. *intermedia* (Krasske) Nörpel & Lange-Bertalot
Figs. 32-71	Eunotia sp aff. *E. pseudogroenlandica* Lange-Bertalot & Tagliaventi aff. *E. botuliformis* Wild, Nörpel & Lange-Bertalot
Figs. 72-77	Eunotia spp.

Figs. 1-2, 5-7, 9-16 27, 29, 70-71, 77	Lake Pica Palòmera, epilithic EpiPYR52
Figs. 3-4, 17-18, 26, 28, 64-65, 76	Lake Nere de Güèri, epilithic EpiPYR53

Fig. 8	Lake Garbet, sediment PYR81
Figs. 19-22, 61-63, 74-75	Lake Aixeus, epilithic EpiPYR92
Figs. 23, 45-48	Lake Negre, sediment PYR79
Fig. 24, 31, 49-60, 72-73	Lake Sotllo, sediment PYR89
Figs. 25, 32-44	Lake Baiau superior, sediment PYR76
Fig. 30	Lake Les Laquettes, sediment PYR27
Figs. 66-67	Lake Senó, sediment PYR84
Figs. 68-69	Lake Pica Palòmera, sediment PYR52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26-29
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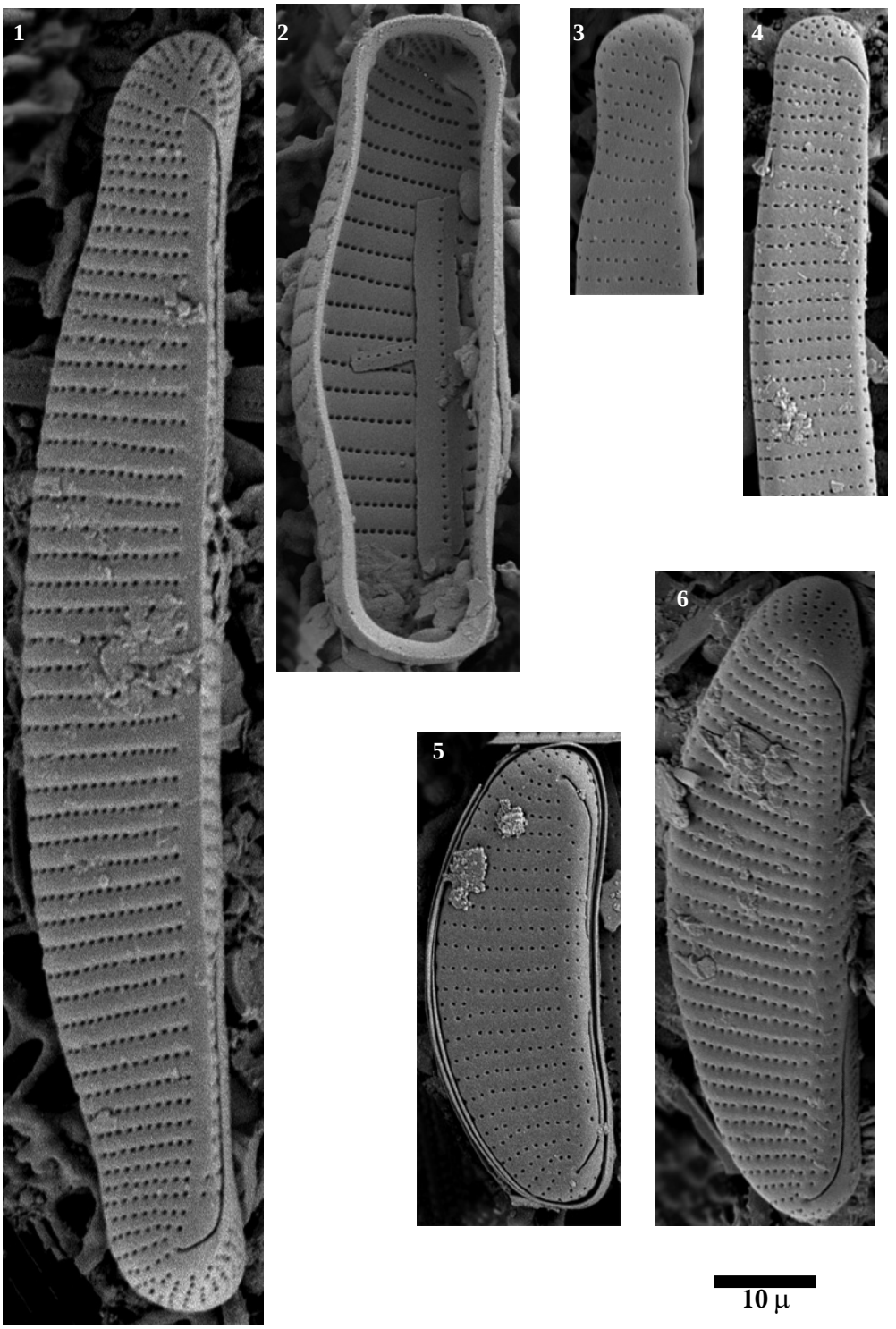
32-44
45-48
49-60
61-63
64
65-71
72-77
10 µ

Plate 32	LM: x1500 SEM: Fig. 3 x 20000, Fig. 4x6000

Figs. 1-2	Eunotia *novaisiae* var. *altopyrenaica* Lange-Bertalot & Rivera-Rondón
Figs. 3-4	Eunotia sp aff. *E. pseudogroenlandica* Lange-Bertalot & Tagliaventi aff. *E. botuliformis* Wild, Nörpel & Lange-Bertalot
Figs. 5-6	*Eunotia subarcuatoides* Alles, Norpel & Lange-Bertalot

Figs. 1, 4, 6	Lake Senó, sediment PYR84
Fig. 2	Lake Baiau superior, sediment PYR76
Fig. 3	Lake Pica, sediment PYR100
Fig. 5	Lake Pica Palòmera, sediment PYR52

Figs. 1-6	Manfred Ruppel photos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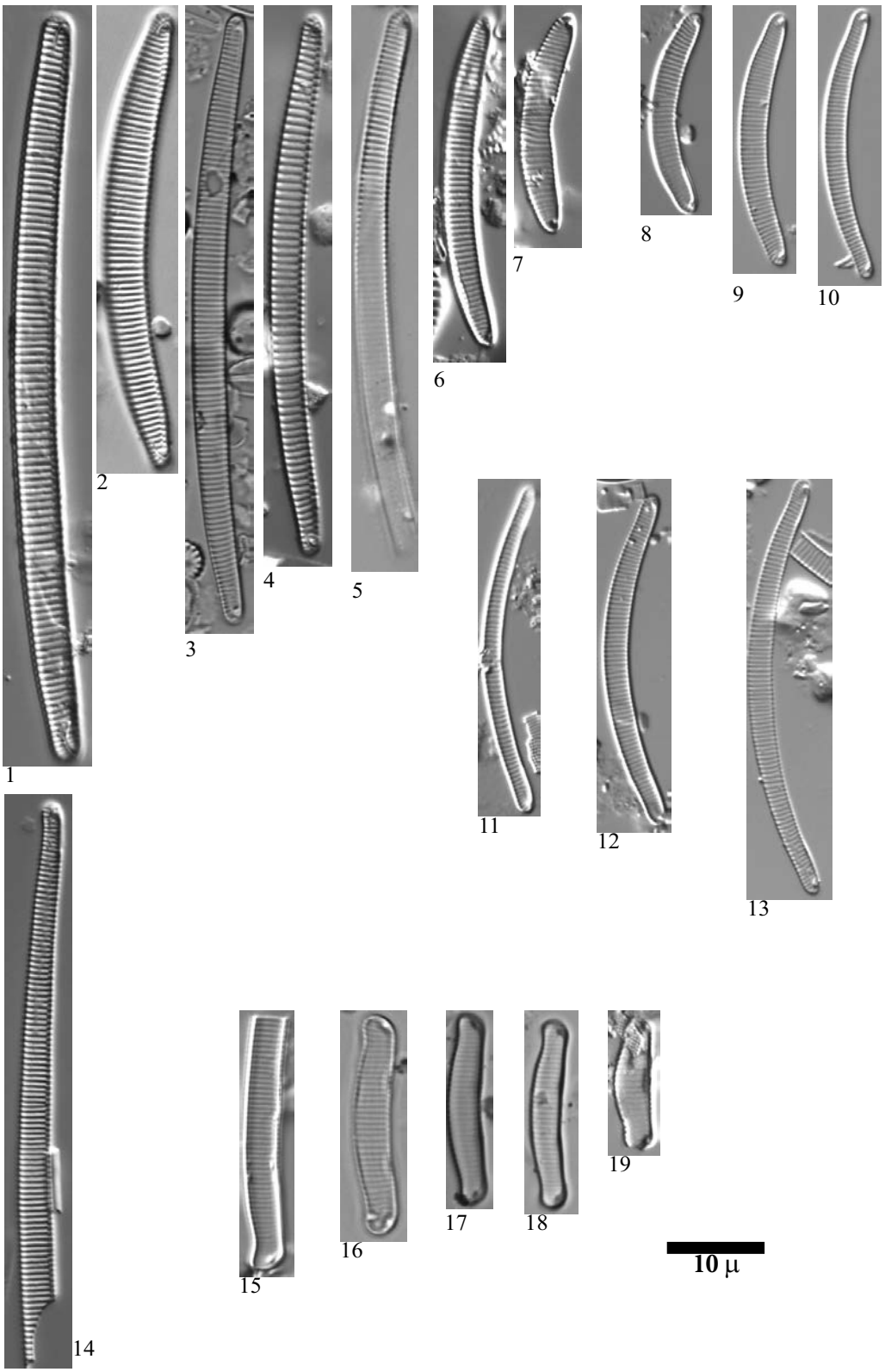
6
10 µ

Plate 33	LM: x1500

Fig. 1	*Eunotia ambivalens* Lange-Bertalot & Tagliaventi
Figs. 2-7	*Eunotia bilunaris* (Ehrenberg) Schaarschmidt
Figs. 8-13	*Eunotia mucophila* (Lange-Bertalot & Nörpel-Schempp) Lange-Bertalot
Fig. 14	*Eunotia naegelii* Migula
Figs. 15-19	*Eunotia neocompacta* var. *vixcompacta* Lange-Bertalot

Figs. 1, 4	Lake Sen, sediment PYR40
Fig. 2	Lake Inferior de la Gallina, sediment PYR87
Fig. 3	Lake Forcat inferior, sediment PYR77
Figs. 5, 6, 7	Lake Posets, sediment PYR42
Figs. 8-10, 12-13	Lake Senó, epilithic EpiPYR84
Figs. 11, 15, 17, 19	Lake Monges, sediment PYR57
Fig. 14	Lake Mariola, sediment PYR80
Fig. 16	Lake Baiau superior, sediment PYR76
Fig. 18	Lake Senó, sediment PYR84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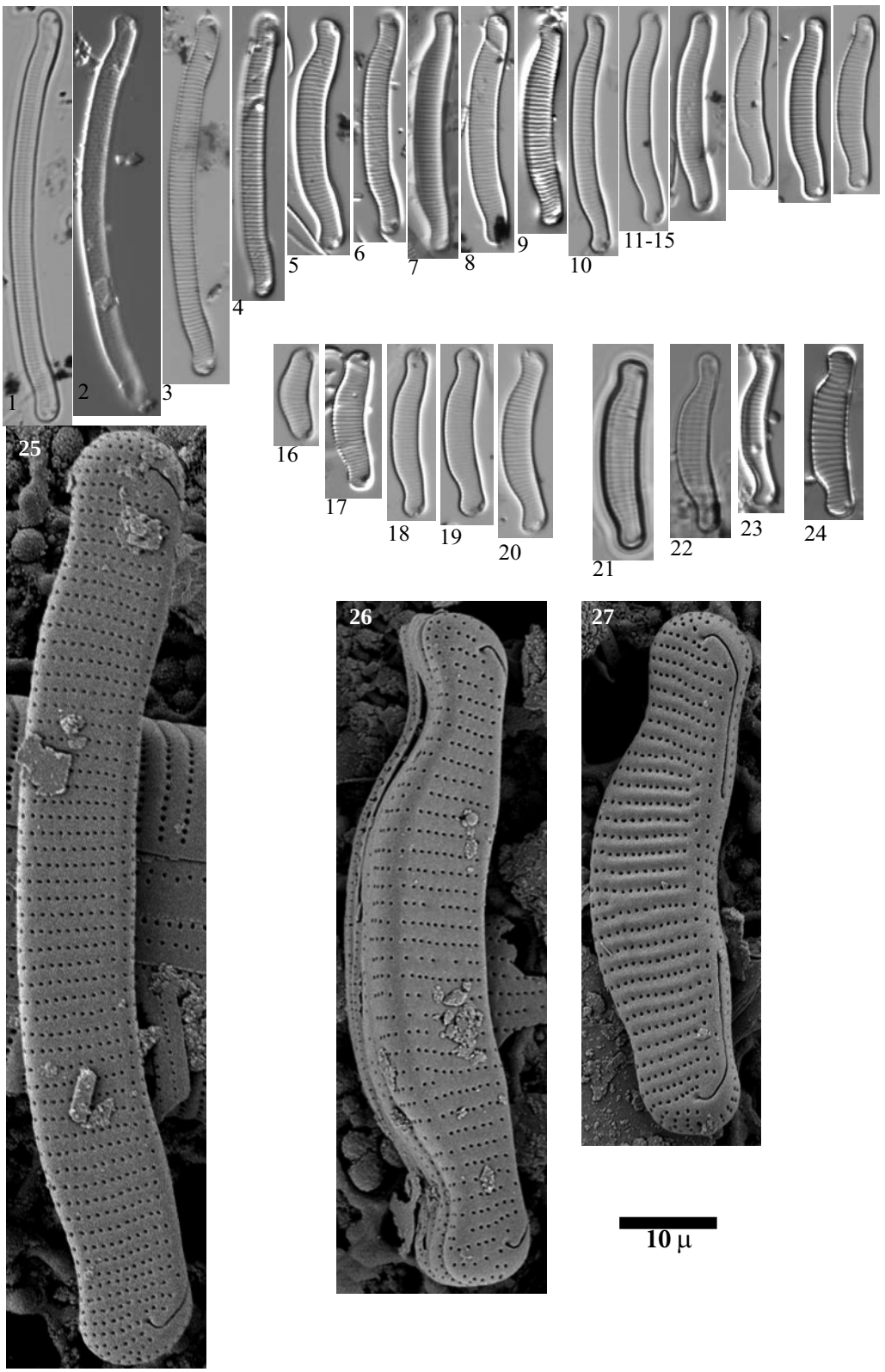
10 µ

Plate 34	LM: x1500 SEM: x6000

Figs. 1-19, 25	*Eunotia nymanniana* Grunow
Fig. 20	*Eunotia* cf. *nymanniana* Grunow
Fig. 21	*Eunotia* cf. *exigua* (Brébisson Kutzing) Rabenhorst
Figs. 22-23, 26	*Eunotia exigua* (Brébisson Kutzing) Rabenhorst
Fig. 24	*Eunotia tenella* (Grunow) Hustedt
Fig. 27	*Eunotia* cf. *exigua* (Brébisson Kutzing) Rabenhorst

Figs. 1, 3-6, 8-20, 22, 25-27	Lake Pica Palòmera, epilithic EpiPYR52
Fig. 2	Lake Aixeus, sediment PYR92
Fig. 7	Lake Negre, sediment PYR79
Fig. 21	Lake Baiau superior, sediment PYR76
Fig. 23	Lake Eriste, sediment PYR43
Fig. 24	Lake Estelat, sediment PYR120

Figs. 25-27	Manfred Ruppel photos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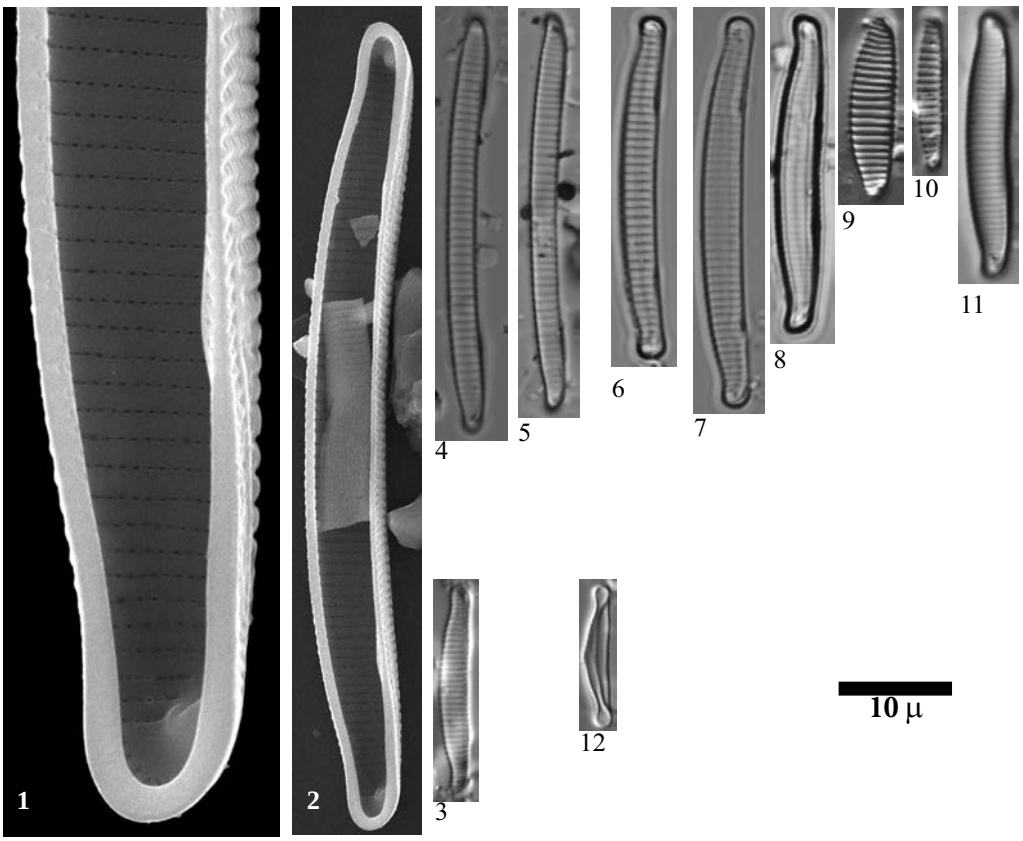
24
25
26
27
10 µ

Plate 35	LM: x1500 SEM: Fig. 1 x 6000, Fig. 2x2000

Figs. 1-3	*Eunotia paludosa* Grunow
Figs. 4-5	*Eunotia neofallax* Nörpel-Schempp & Lange-Bertalot
Fig. 6	*Eunotia groenlandica* (Grunow) Norpel-Schempp & Lange-Bertalot
Fig. 7	*Eunotia* cf. *groenlandica* (Grunow) Norpel-Schempp & Lange-Bertalot
Fig. 8-10	*Eunotia fallax* A. Cleve
Fig. 11	*Eunotia fallacoides* Lange-Bertalot & Cantonati
Fig. 12	*Eunotia microcephala* Krasske

Figs. 1-2	Lake Senó, sediment PYR84
Fig. 3	Lake Aubé, sediment PYR82
Figs. 4-5	Lake Cregüeña, sediment PYR49
Figs. 6, 10	Lake Aixeus, sediment PYR92
Fig. 7	Lake Pica Palòmera, sediment PYR52
Fig. 8	Lake Baiau superior, sediment PYR76
Fig. 9	Lake Romedo de Dalt, epilithic EpiPYR85
Fig. 11	Lake Illa, sediment PYR66
Fig. 12	Lake Monges, sediment PYR57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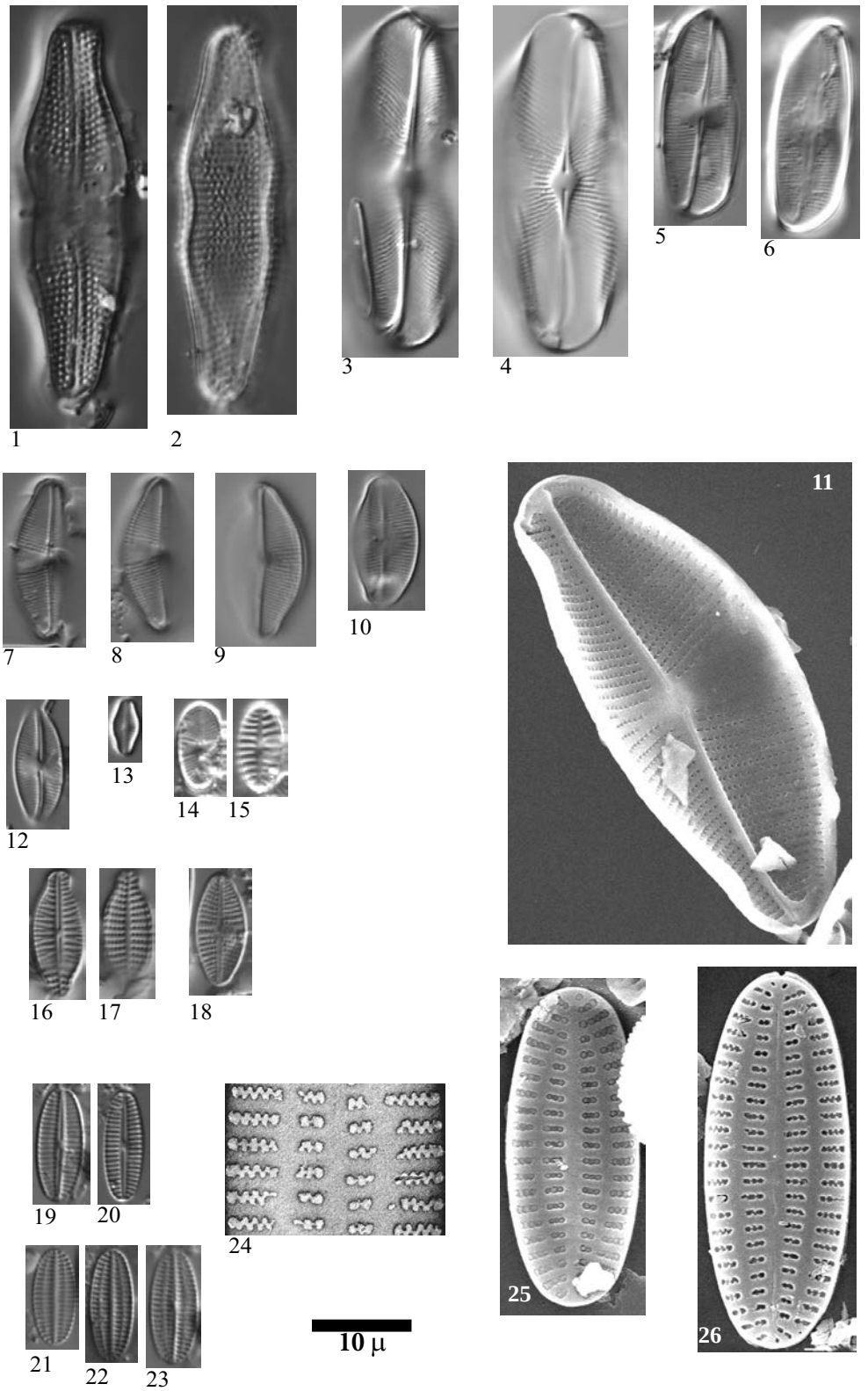
10 µ

Plate 36	LM: x1500 SEM: Figs. 11,25,26 x 5000, Fig. 24 x8000

Figs. 1-2	*Eucocconeis coarctata* (Brébisson) Lange-Bertalot
Figs. 3-4	*Eucocconeis flexella* (Kützing) Meister
Figs. 5-6	*Eucocconeis alpestris* (Brun) Lange-Bertalot
Figs. 7-11	*Eucocconeis laevis* (Østrup) Lange-Bertalot
Fig. 12	*Psammothidium altaicum* (Poretzky) Bukhtiyarova
Fig. 13	*Karayevia carissima* (Lange-Bertalot) Bukhtiyarova
Figs. 14-15	*Karayevia oblongella* (Østrup) Aboal
Figs. 16-17	*Karayevia laterostrata* (Hustedt) Bukhtiyarova
Fig. 18	*Achnanthes* cf. *punctulata* Simonsen
Figs. 19-26	*Karayevia suchlandtii* (Hustedt) Bukhtiyarova

Figs. 1-2, 13, 18-23, 23-26	Lake Posets, sediment PYR42
Figs. 3-4	Lake Ormiélas, sediment PYR05
Figs. 5-9	Lake Llebreta, sediment PYR58
Fig. 10	Lake Acherito, sediment PYR01
Fig. 11	Lake Roumassot, epilithic EpiPYR04
Fig. 12	Lake Romedo de Dalt, sediment PYR85
Figs. 14-15	Lake Forcat Inf., sediment PYR77
Figs. 16-17	Lake Tourrat, sediment PYR23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26
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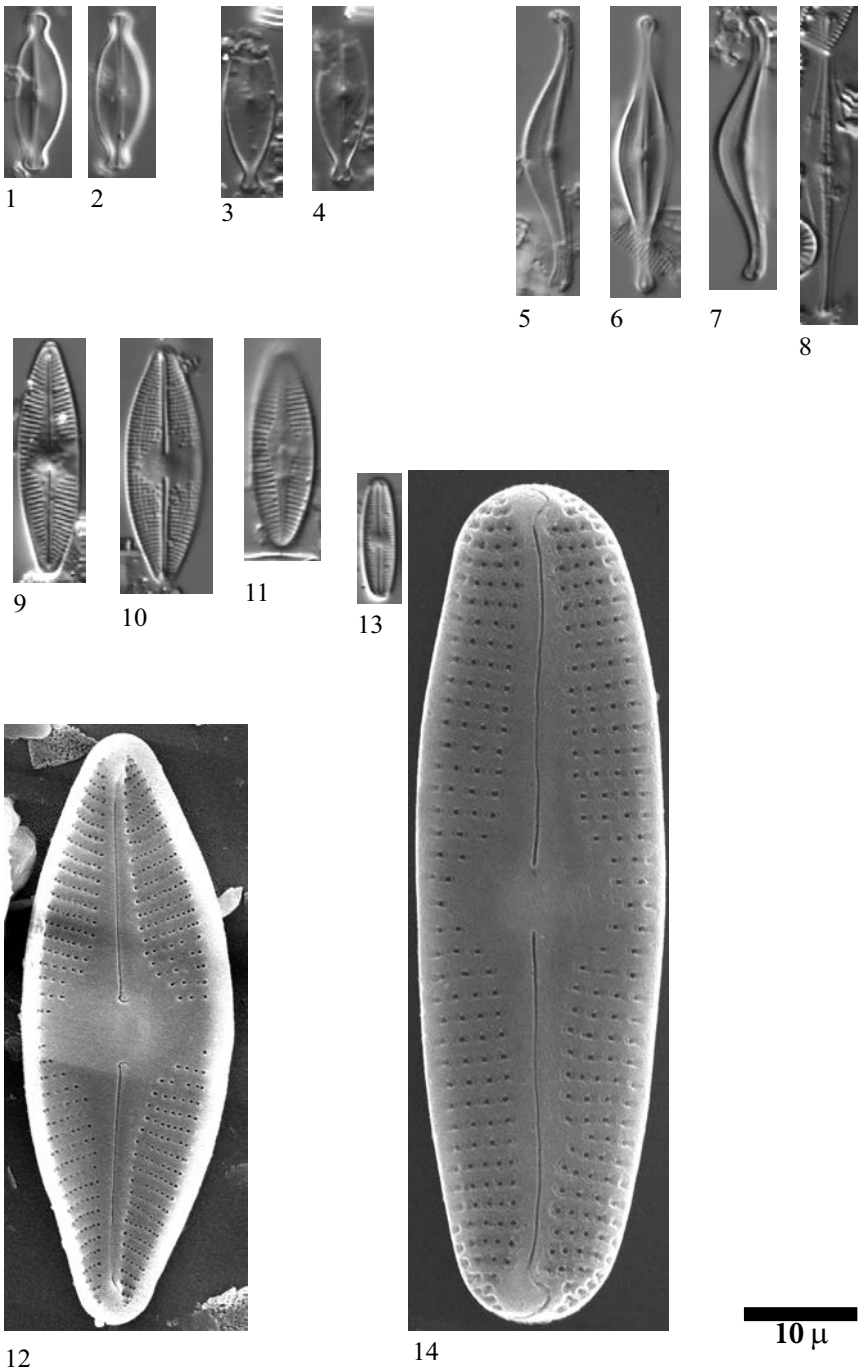
23
10 µ

Plate 37	LM: x1500 SEM: Figs. 12 x 4500, Fig. 14 x10000

Figs. 1-4	*Nupela* cf. *impexiformis* (Lange-Bertalot) Lange-Bertalot
Figs. 5-8	*Nupela* cf. *gracillima* (Hustedt) Lange-Bertalot
Figs. 9-12	*Nupela lapidosa* (Krasske) Lange-Bertalot
Fig. 13-14	*Nupela silvahercynia* (Lange-Bertalot) Lange-Bertalot

Figs. 1-2	Lake Compte, sediment PYR97
Figs. 3-4, 10, 12	Lake Garbet, sediment PYR81
Figs. 5-7	Lake Helado de Marboré, sediment PYR18
Fig. 8	Lake Long de Liat, sediment PYR55
Fig. 9	Lake Coronas, epilithic EpiPYR47
Fig. 11	Lake Posets, epilithic EpiPYR42
Fig. 13	Lake Cregüeña, epilithic EpiPYR49
Fig. 14	Lake Port Bielh, epilithic EpiPYR28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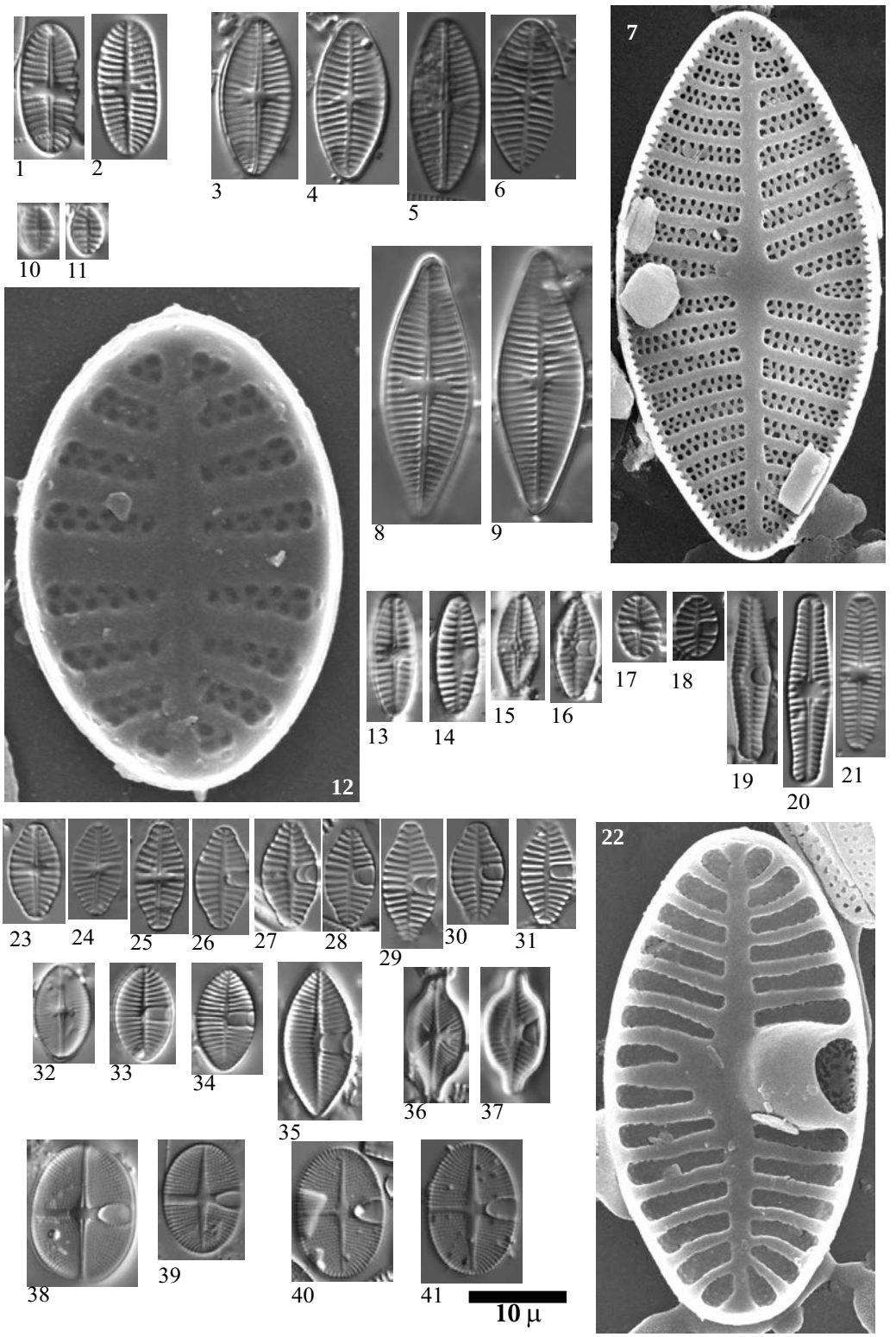
11
13
12
14
10 µ

Plate 38	LM: x1500 SEM: Fig. 7 x 6000, Fig. 12 x 4500, Fig. 22 x8000

Figs. 1-2	*Planothidium* cf. *stewartii* (Patrick) Lange-Bertalot
Figs. 3-7	*Planothidium distinctum* (Messikommer) Lange-Bertalot
Figs. 8-9	*Planothidium* cf. *distinctum* (Messikommer) Lange-Bertalot
Figs. 10-12	*Platessa* cf. *conspicua* (Mayer) Lange-Bertalot
Figs. 13-14	*Planothidium lanceolatum* (Brébisson ex Kützing) Lange-Bertalot
Figs. 15-18	*Planothidium frequentissimum* (Lange-Bertalot) Lange-Bertalot
Figs. 19-21	*Planothidium* sp. No. 1 Pondiellos
Fig. 22	*Planothidium frequentissimum* (Lange-Bertalot) Lange-Bertalot
Figs. 23-31	*Planothidium rostratum (*Østrup) Lange-Bertalot
Figs. 32-35	*Planothidium oestrupii* (Cleve-Euler) Edlund
Figs. 36-37	*Planothidium peragalli* (Brun & Héribaud) Round et Bukhtiyarova
Figs. 38-41	*Planothidium calcar* (Cleve) M.B. Edlund

Figs. 1-2	Lake Trebens, sediment PYR114
Figs. 3-9, 34-35	Lake Posets, sediment PYR42
Figs. 10-12, 22	Lake Laurenti, sediment PYR111
Figs. 13-14	Lake La Munia, sediment PYR20
Figs. 15-16, 40-41	Lake Estom, sediment PYR15
Figs. 17-18	Lake Arratille, sediment PYR11
Figs. 19-20	Lake Pondiellos, sediment PYR08
Fig. 21	Lake Cap Long, sediment PYR24
Figs. 23-31	Lake Burg
Figs. 32-33	Lake Sen, sediment PYR40
Figs. 36-37	Lake Sen, sediment PYR120
Fig. 38	Lake Barsau, sediment PYR03
Fig. 39	Lake Acherito, sediment PYR01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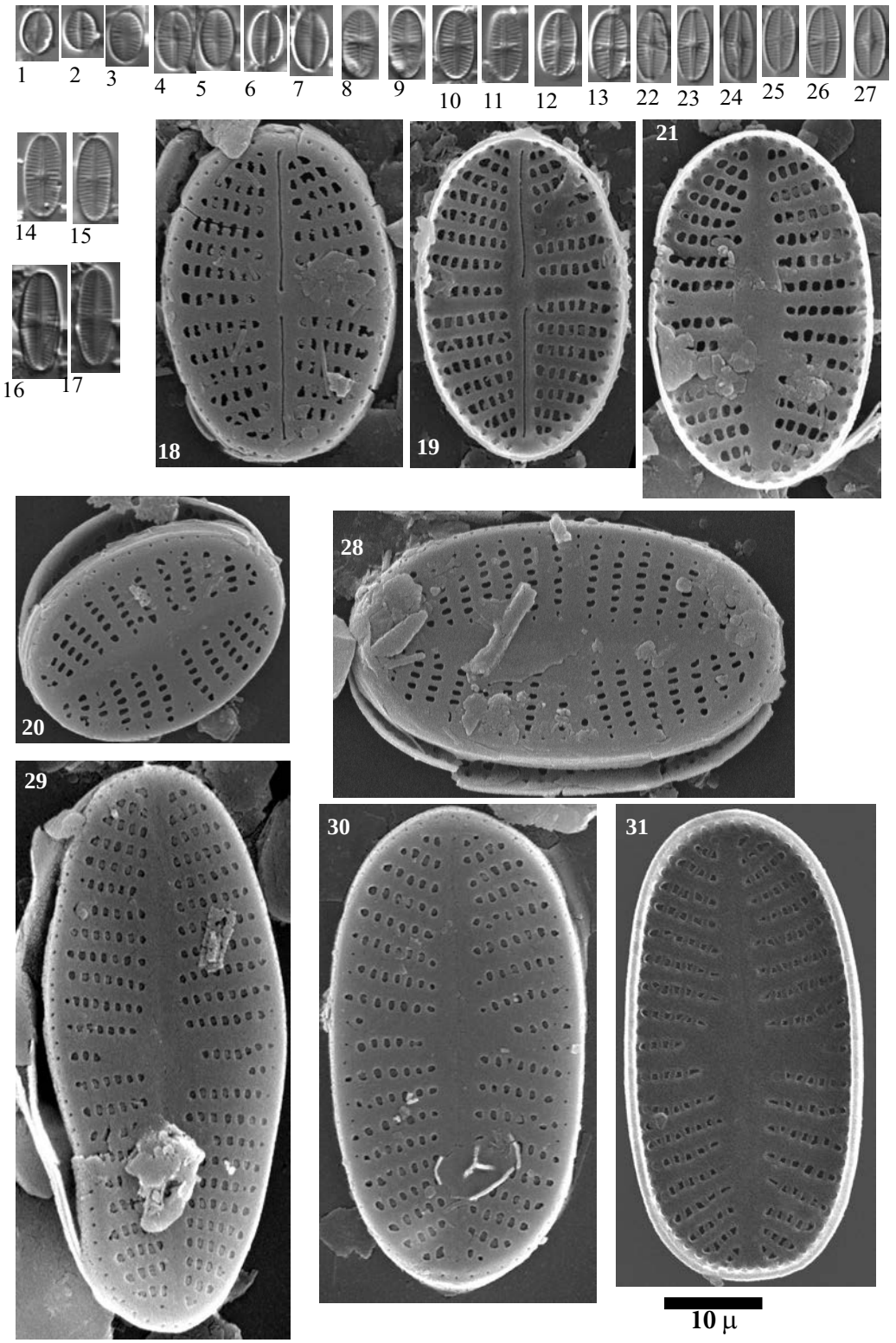
10 µ

Plate 39	LM: x1500 SEM: x10000

Figs. 1-13, 18-21	*Psammothidium microscopicum (Cholnoky) S.Blanco*
Figs. 14-17, 28-31	*Psammothidium* cf. *microscopicum (Cholnoky) S.Blanco*
Figs. 22-27	*Achnanthes* sp. No. 2 Burg

Figs. 1-17, 19, 20-30	Lake Posets, sediment PYR42
Figs. 18, 20, 21, 28	Lake Redon, sediment REDOM
Figs. 23-27	Lake Burg, sediment BURG 953
Fig. 31	Lake Angonella, epilithic EpiPYR78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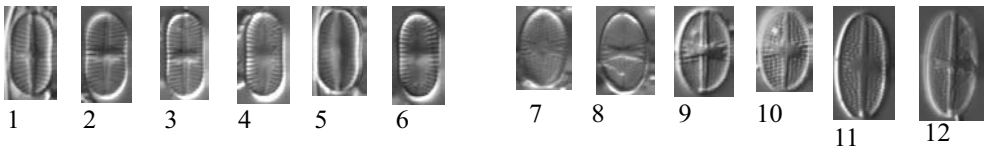
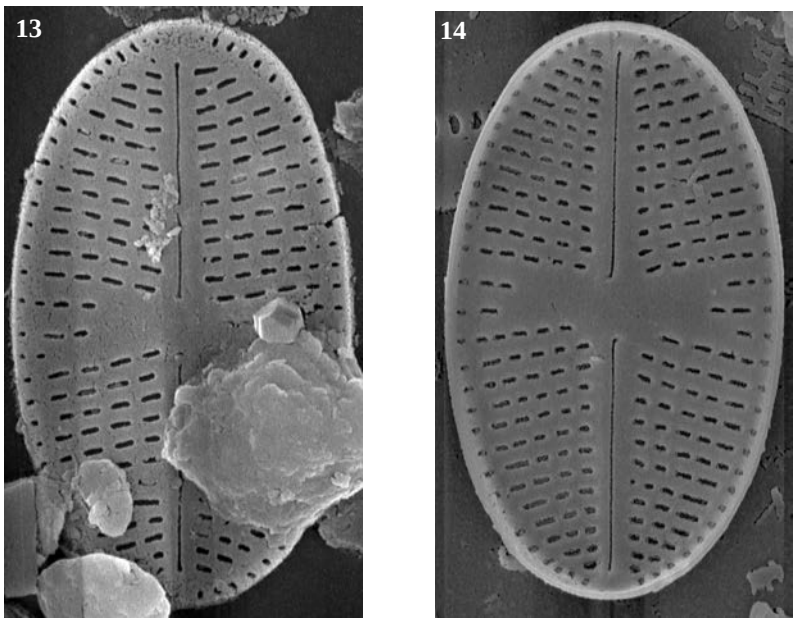
10 µ

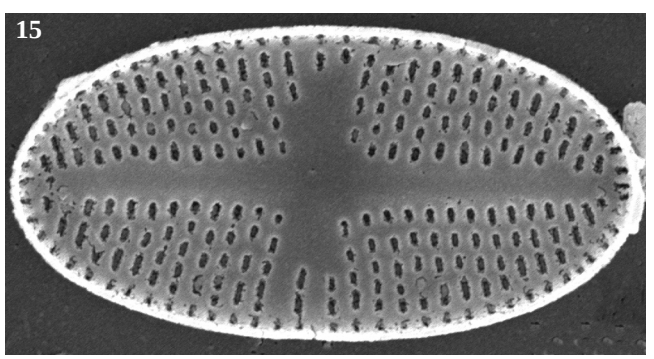
Plate 40	LM: x1500 SEM: x10000

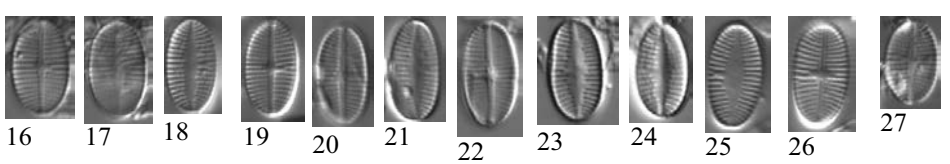
Figs. 1-6	*Psammothidium didymum* (Hustedt) Bukhtiyarova & Round
Figs. 7-15	*Psammothidium subatomoides (*Hustedt) Bukhtiyarova et Round
Figs. 16-26	*Psammothidium levanderi* (Hustedt) Bukhtiyarova & Round
Fig. 27	*Psammothidium* cf. *levanderi* (Hustedt) Bukhtiyarova & Round

Figs. 1-2, 5-6	Lake Les Laquettes, sediment PYR27
Figs. 3-4, 7-12, 16-21 25-26	Lake Posets, sediment PYR42
Figs. 14-15	Lake Mariola, sediment PYR80
Figs. 22-24	Lake Sen, sediment PYR40
Fig. 27	Lake Urdiceto, sediment PYR125







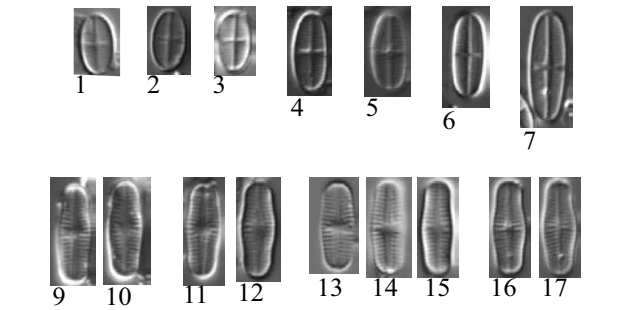


10 µ

Plate 41	LM: x1500 SEM: Fig. 8 x10000 Figs. 18,19, 24 x9000

Figs. 1-8	*Achnanthidium* sp. No. 1 Posets
Figs. 9-19	*Achnanthidium* cf. *minutissimum* (Kützing) Czarnecki sensu lato
Figs. 20-21	*Achnanthidium* cf. *kranzii* (Lange-Bertalot) Round & Bukhtiyarova
Figs. 22-24	*Psammothidium rosenstockii* (Lange-Bertalot) Lange-Bertalot
Fig. 25	*Achnanthes* sp. No. 6 Pessó
Figs. 26-32	cf. *Achnanthidium atomus* (Hustedt) Monnier, Lange-Bertalot & Ector
Figs. 33-36	*Achnanthes* sp. No. 5 Posets

Figs. 1-7, 8, 33-35	Lake Posets, sediment PYR42
Figs. 9-12	Lake Les Laquettes, sediment PYR27
Figs. 13-15, 26-27	Lake Llebreta, sediment PYR58
Figs. 16-17	Lake Gerber, sediment PYR63
Figs. 18-19	Lake Laurenti, sediment PYR111
Figs. 20-21	Lake Eriste, sediment PYR43
Figs. 22-23	Lake Arratille, sediment PYR11
Fig. 24	Lake Gran de Mainera, sediment PYR70
Fig. 25	Lake Gran del Pessó, sediment PYR56
Figs. 28-29	Lake La Munia Superior, sediment PYR20
Figs. 30-32	Lake Glacé, sediment PYR17
Fig. 36	Lake Garbet, sediment PYR81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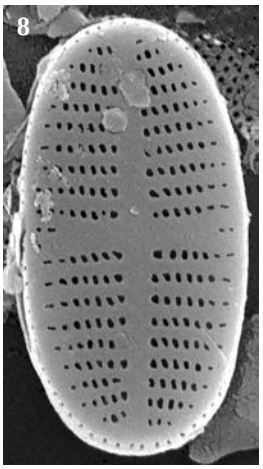
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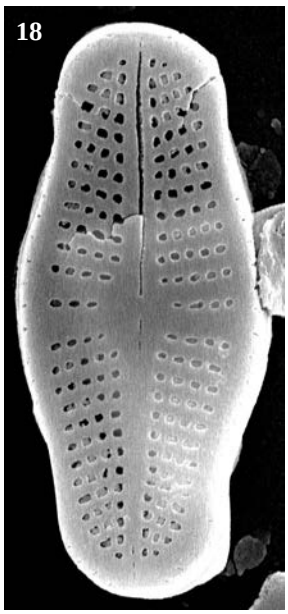
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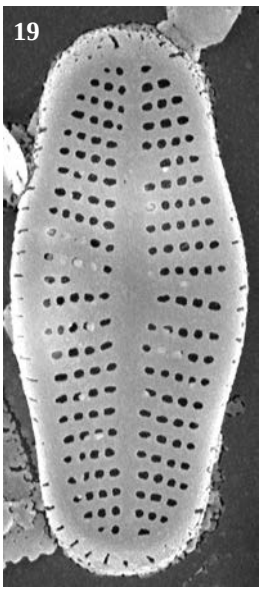
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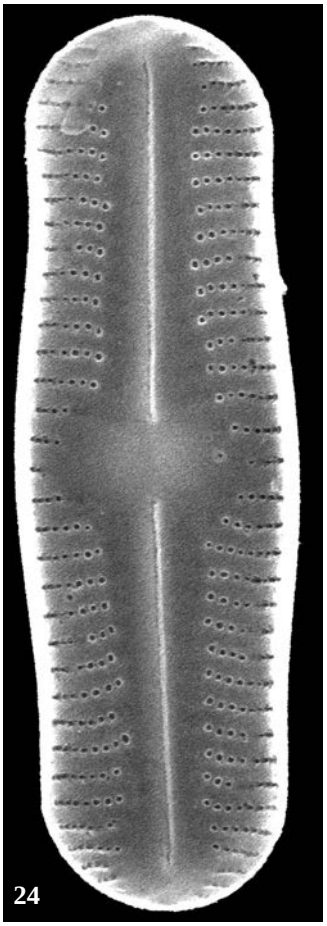
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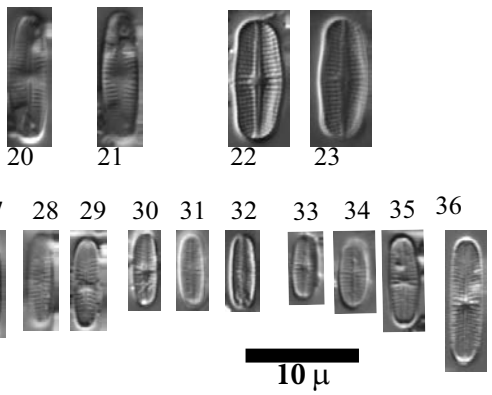
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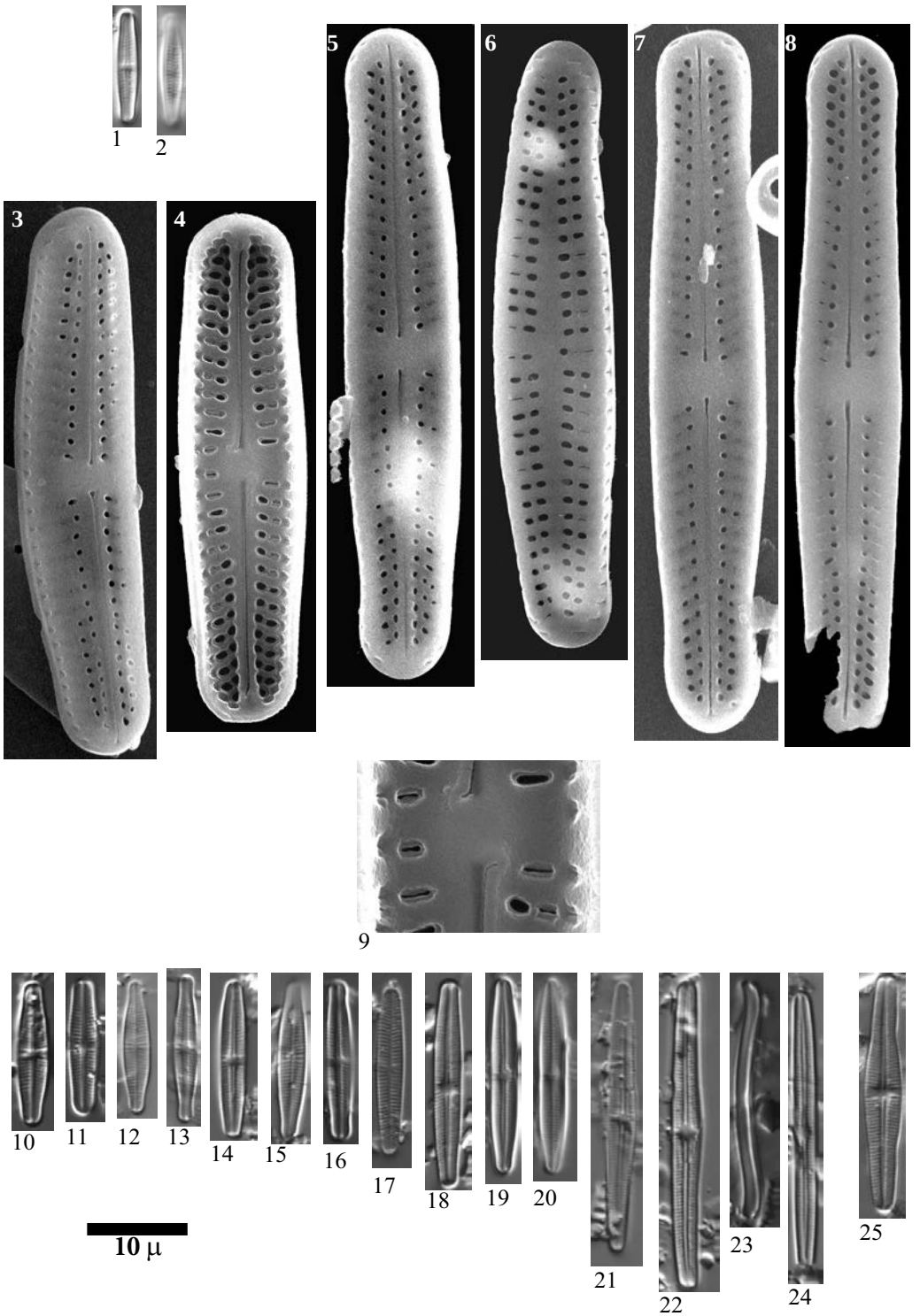
10 µ

Plate 42	LM: x1500 SEM: Figs. 3-8 x 9000 Fig. 9 x20000

Figs. 1-9	*Achnanthidium minutissimum* (Kützing) Czarnecki sensu lato
Figs. 10-20	*Achnanthidium minutissimum* (Kützing) Czarnecki sensu lato
Figs. 21-24	*Achnanthidium* cf. *minutissimum* (Kützing) Czarnecki
Fig. 25	*Achnanthidium* sp

Figs. 1-2	Lake Llebreta, sediment PYR58
Figs. 3-5, 9	Lake Roumassot, sediment PYR04
Figs. 6-8	Lake Roumassot, epilithic EpiPYR04
Figs. 10.12	Lake Chelau Sup., sediment PYR41
Fig. 13	Lake Burg
Figs. 14-24	Lake Les Laquettes, sediment PYR27
Fig. 25	Lake Pixón, sediment PYR44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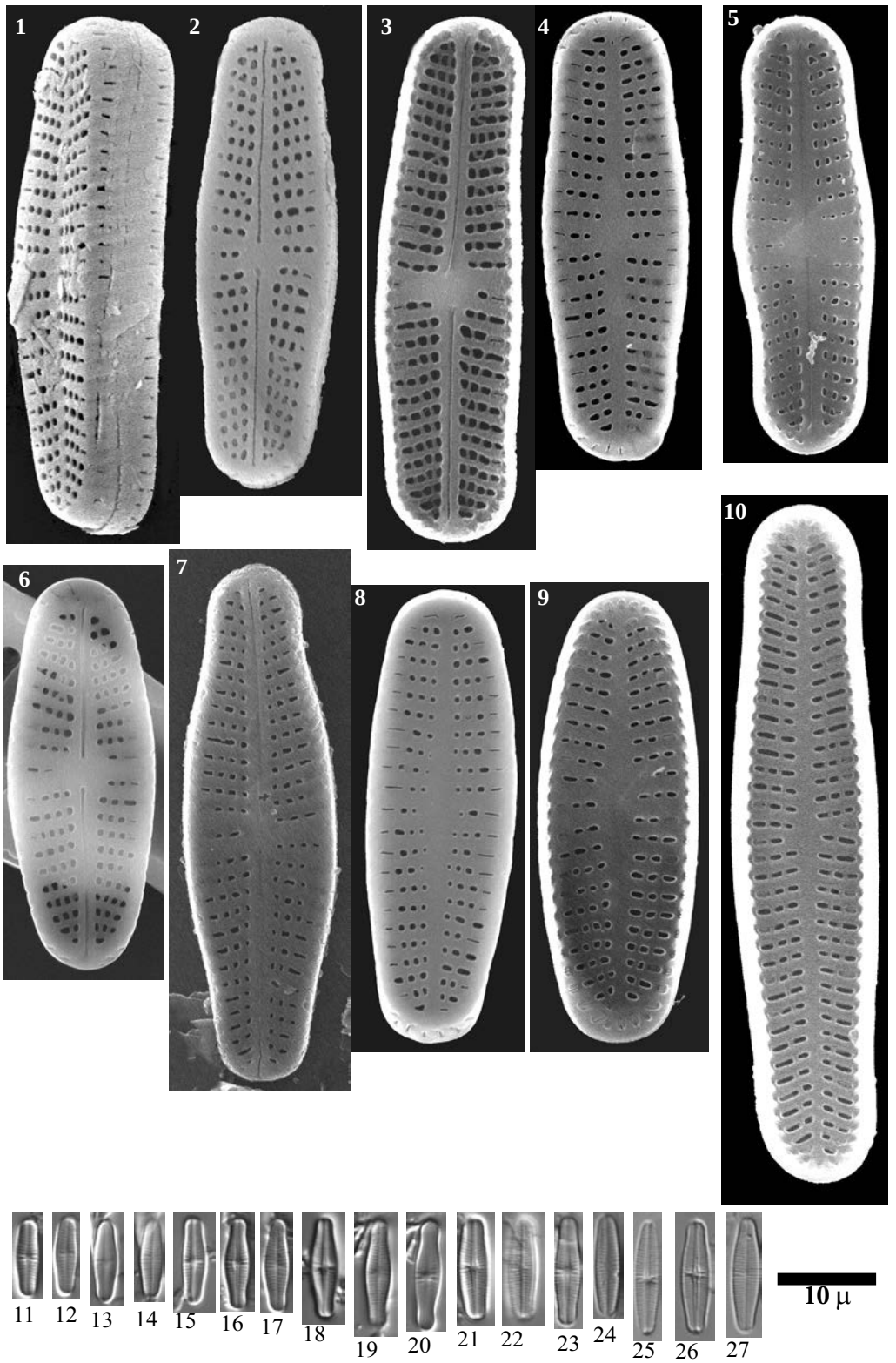
10 μ

Plate 43	LM: x1500 SEM: x9000

Figs. 1-27	*Achnanthidium minutissimum* (Kützing) Czarnecki

Figs. 1-2, 11-20	Lake Posets, sediment PYR42
Figs. 3, 8	Lake Port Bielh, epilithic EpiPYR28
Figs. 4, 6	Lake Roumassot, epilithic EpiPYR04
Figs. 5, 7	Lake Pondiellos, epilithic EpiPYR08
Fig. 9	Lake Acherito, epilithic EpiPYR01
Fig. 10	Lake Mariola, epilithic EpiPYR80
Figs. 21-22	Lake Aubé, sediment PYR82
Fig. 23	Lake Burg, sediment BURG 932
Fig. 24	Lake Burg, sediment BURG 1007
Figs- 25-27	Lake Burg, sediment BURG 831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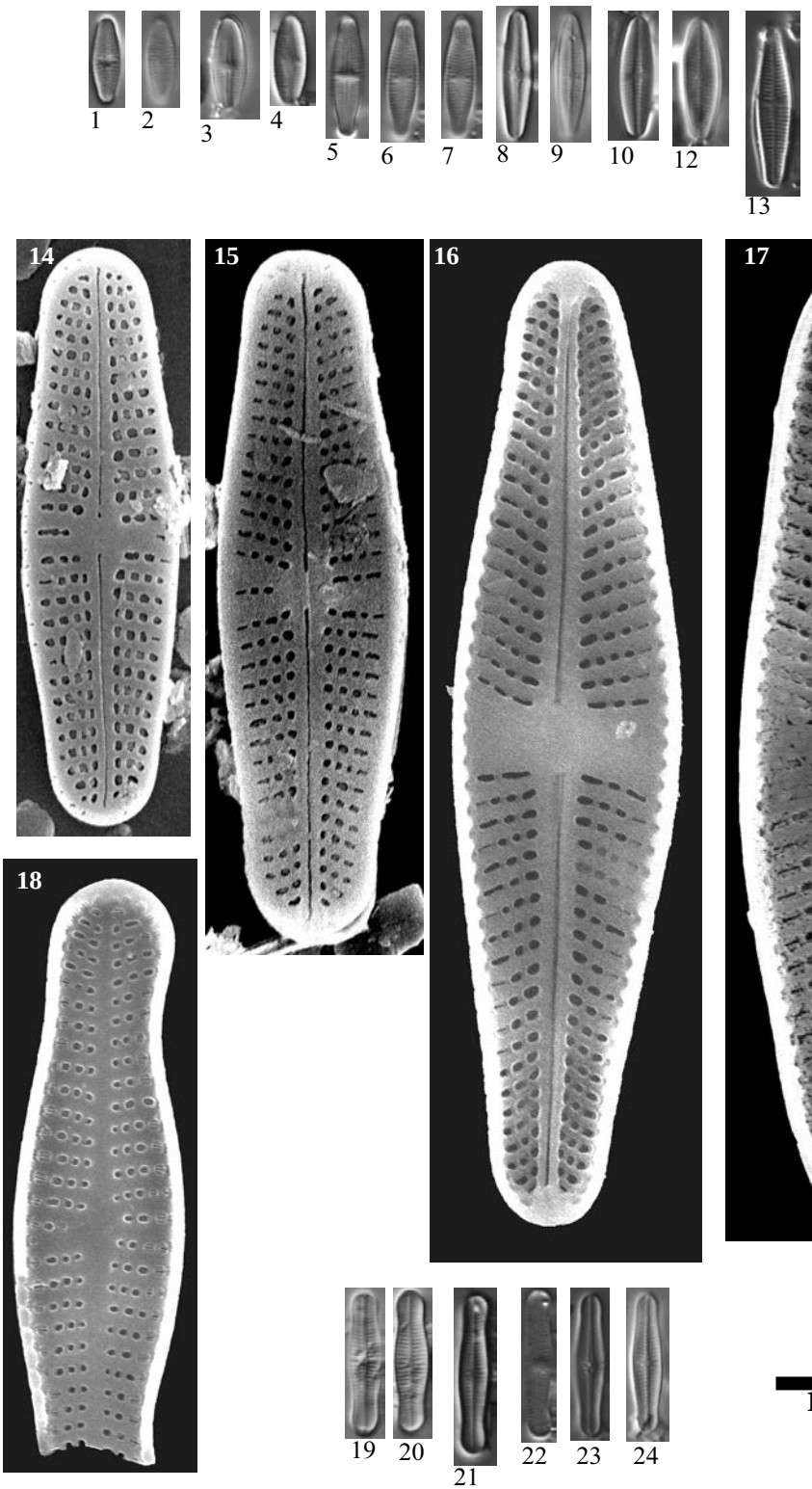
10 µ

Plate 44	LM: x1500 SEM: x9000

Figs. 1-16	*Achnanthidium minutissimum* (Kützing) Czarnecki sensu lato
Figs. 17-24	cf. *Achnanthidium catenatum* (Bily & Marvan) H. Lange-Bertalot

Figs. 1-2, 5-9	Lake Llebreta, sediment PYR58
Figs. 3-4, 23-24	Lake Bersau, sediment PYR03
Figs. 10, 12	Lake Estom, sediment PYR15
Fig. 13	Lake Arratille, epilithic EpiPYR11
Figs. 14-15, 19-22	Lake Posets, sediment PYR42
Figs. 16, 18	Lake Port Bielh, epilithic EpiPYR28
Figs. 17	Lake Laurenti, sediment PYR111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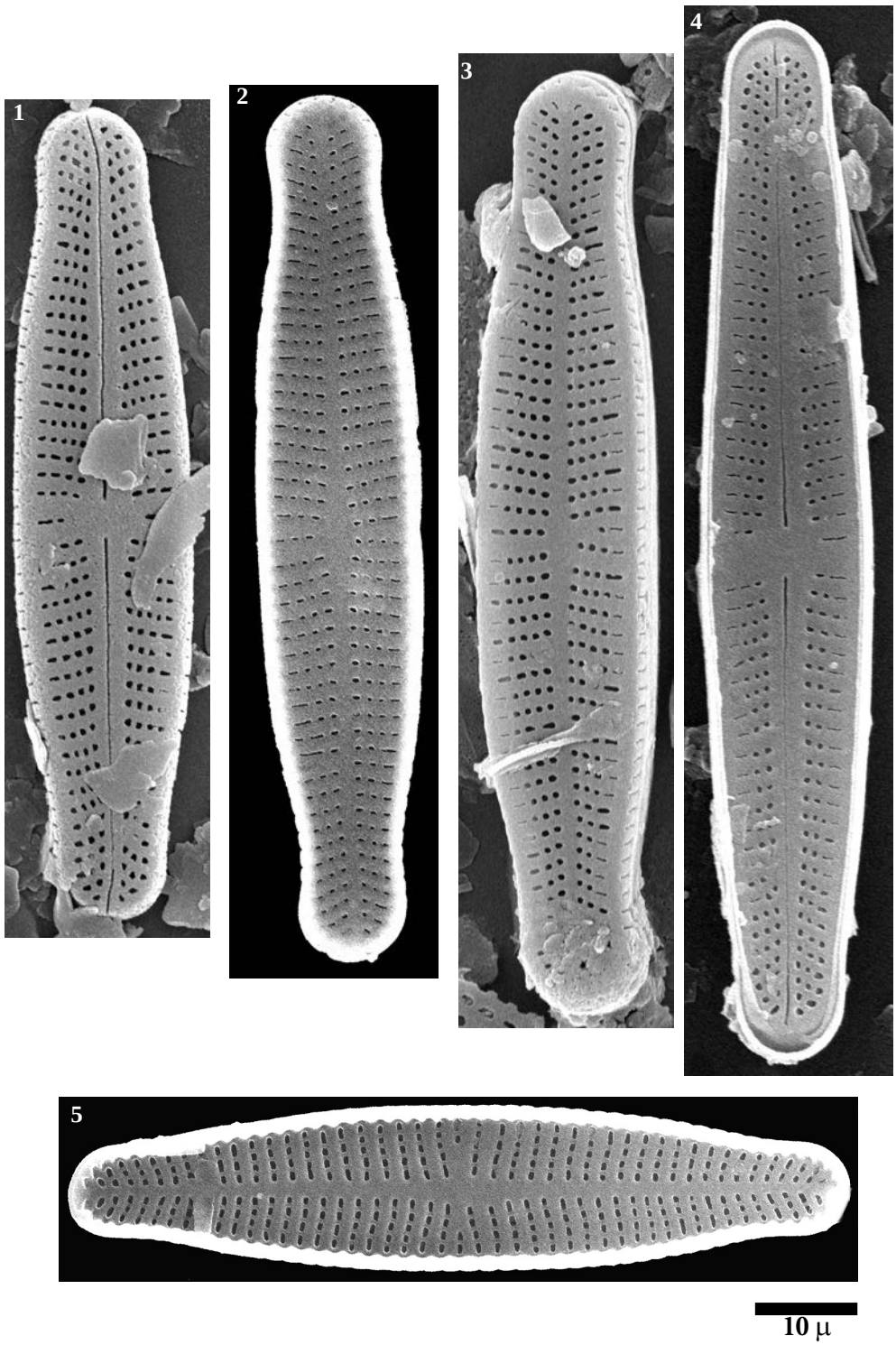
10 µ

Plate 45	LM: x1500 SEM: x9000

Figs. 1-5 *Achnanthidium minutissimum* (Kützing) Czarnecki

Fig. 1 Lake, sediment BURG 939

Figs. 2-5 Lake Redon, sediment REDOM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10 µ

Plate 46	LM: x1500 SEM: 1-4 x9000, 5 x15000

Figs. 1-3, 5-10	*Achnanthidium minutissimum* (Kützing) Czarnecki
Fig. 4	*Achnanthidium caledonicum* (Lange-Bertalot) Lange-Bertalot

Fig. 1	Lake Roumassot, sediment PYR04
Figs. 2, 4-5	Lake Port Bielh, epilithic EpiPYR28
Fig. 3	Lake Angonella, epilithic EpiPYR78
Figs. 6, 9-10	Lake Les Laquettes, sediment PYR27
Figs. 7-8	Lake Posets, sediment PYR42

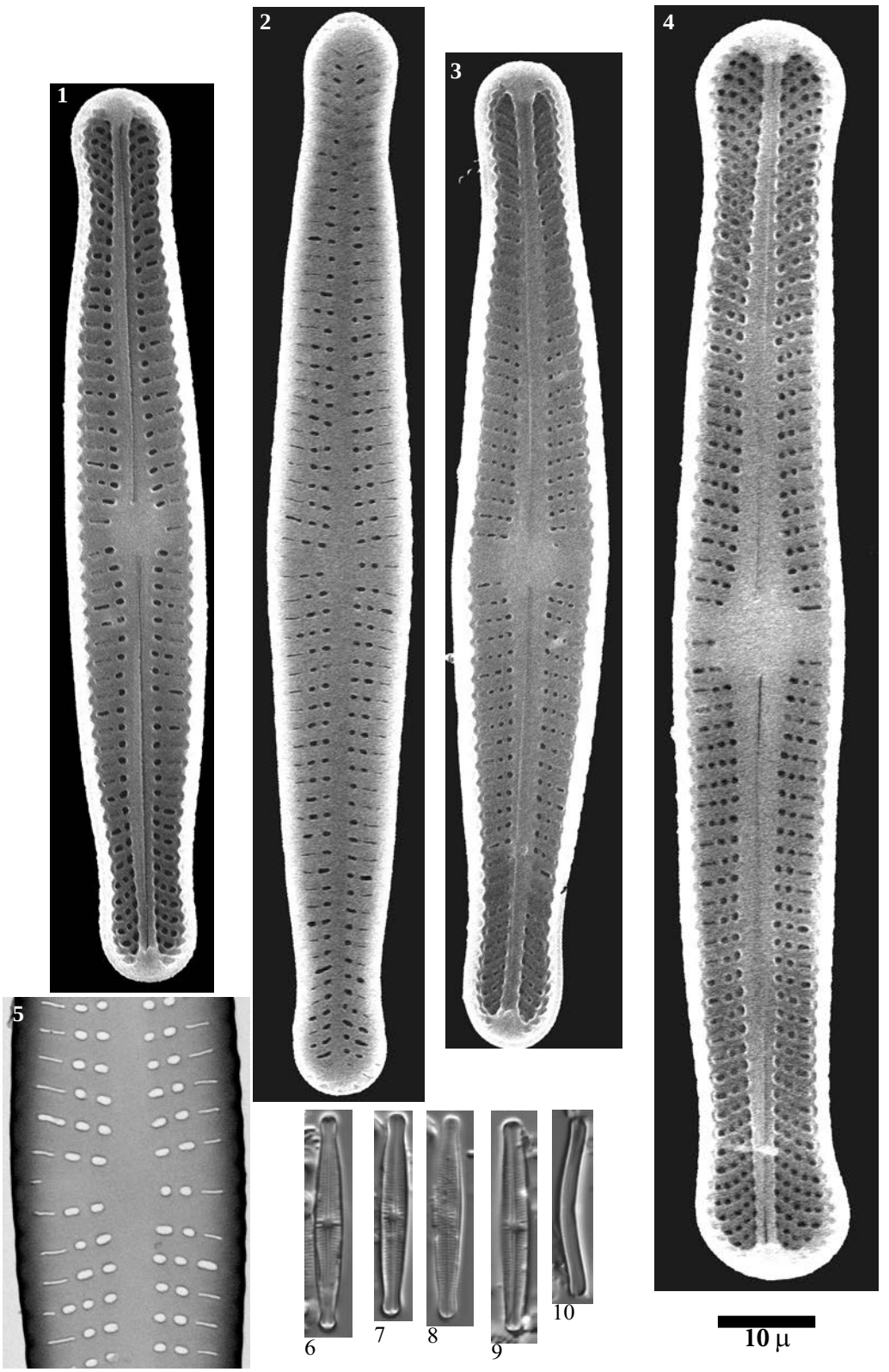
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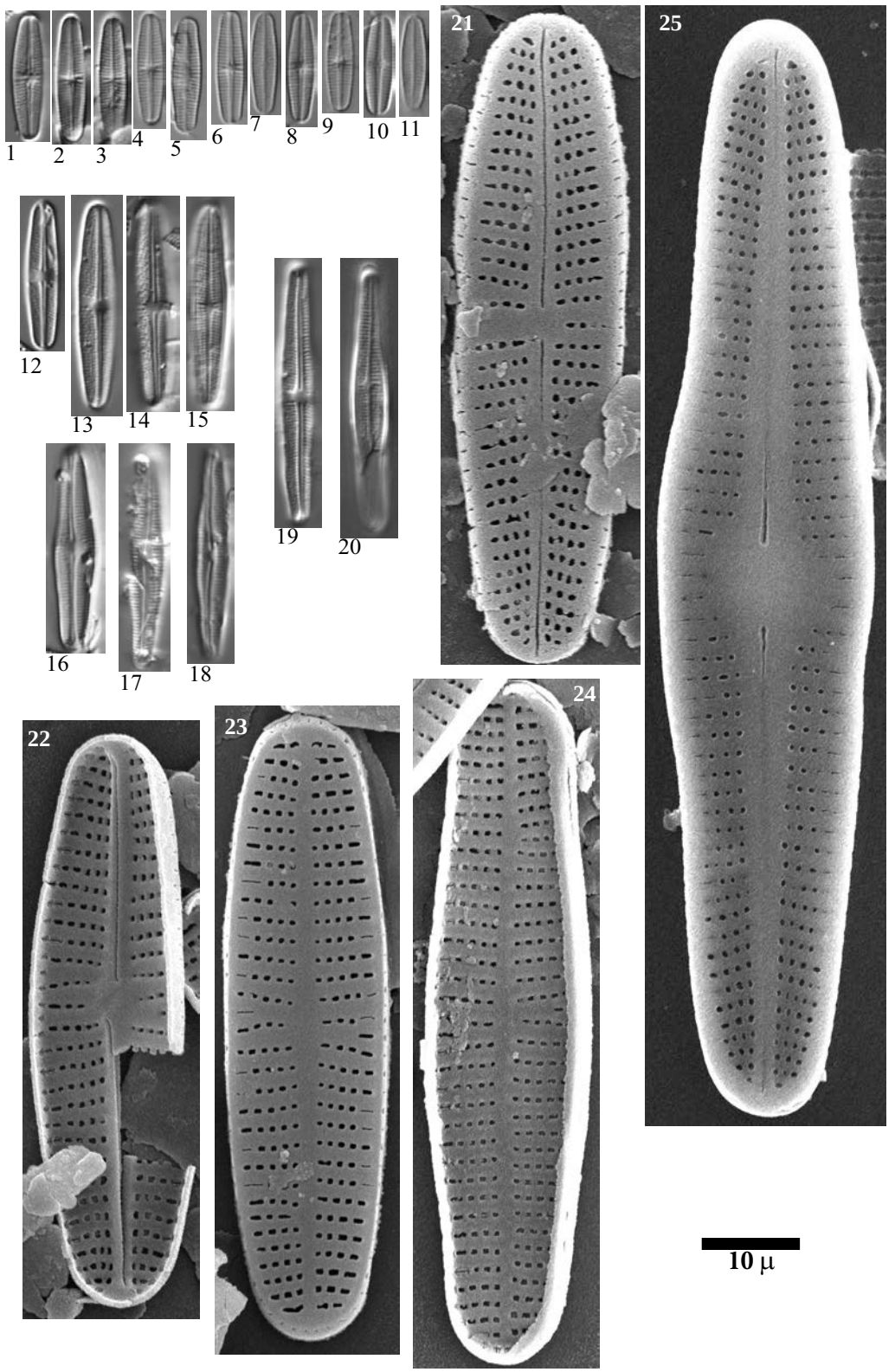
Plate 47	LM: x1500 SEM: x9000
Figs. 1-3	*Achnanthidium minutissimum* (Kützing) Czarnecki
Fig. 4-11, 21-24	*Achnanthidium* cf. *minutissimum* (Kützing) Czarnecki
Figs. 12-18	*Achnanthes* sp. No. 8 Angonella
Fig. 25	*Achnanthidium* sp.

Fig. 1	Lake Les Laquettes, sediment PYR27
Figs. 2-3	Lake Posets, epilithic EpiPYR42
Figs. 4-11, 21-24	Lake Burg
Figs. 12-13	Lake Siscar, epilithic EpiPYR98
Figs. 14-16	Lake Angonella, epilithic EpiPYR78
Figs. 17-18	Lake Basa de la Mora, epilithic EpiPYR32
Figs. 19-20	Lake Eriste, epilithc EpiPYR43
Fig. 25	Lake Port Bielh, epilithic EpiPYR28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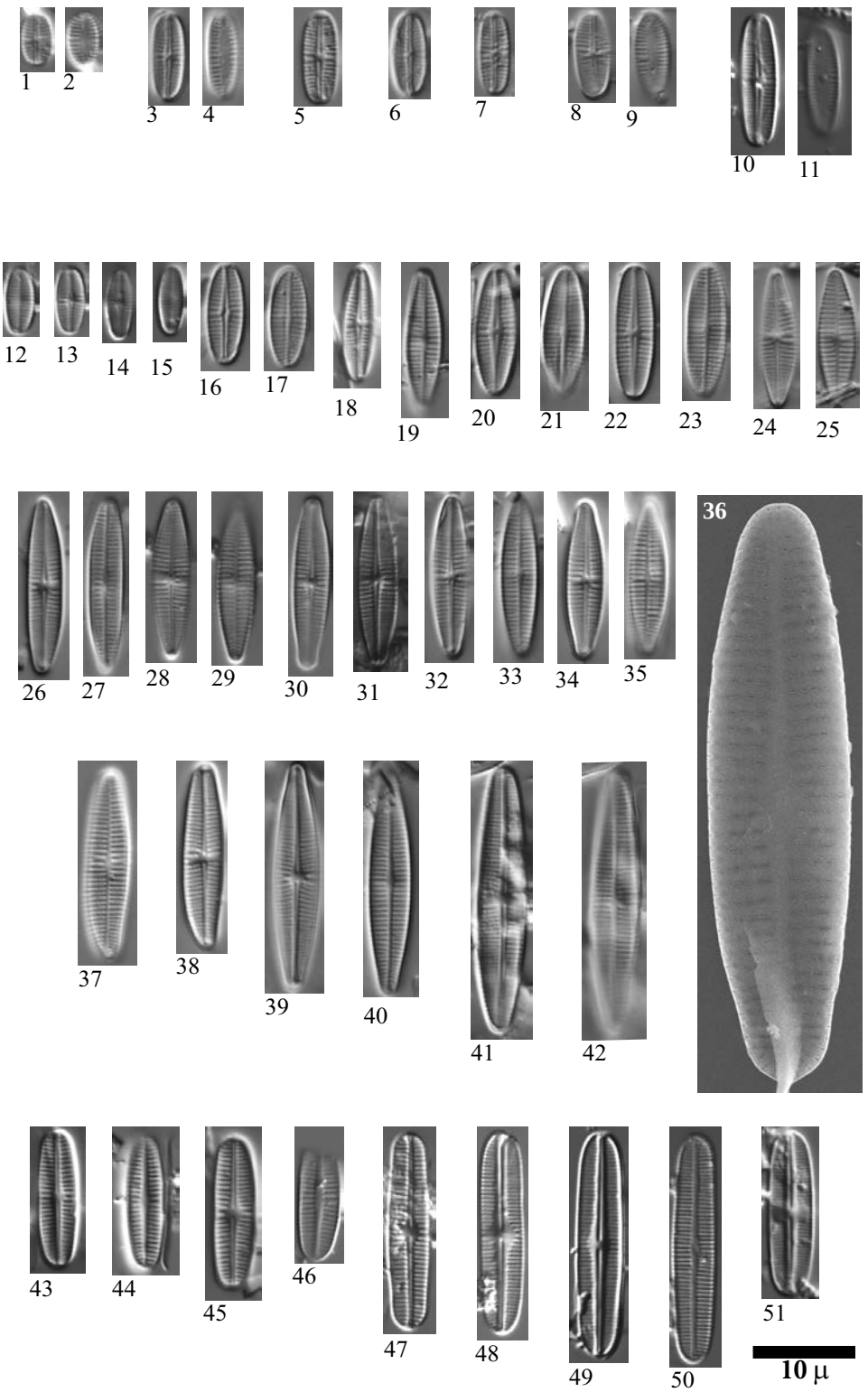
10 μ

Plate 48	LM: x1500 SEM: x10000

Figs. 1-9	*Achnanthidium pfisteri* Lange-Bertalot
Figs. 10-11	*Achnanthidium* cf. *pfisteri* Lange-Bertalot
Figs. 12-42	*Achnanthidium pyrenaicum* (Hustedt) Kobayasi
Figs. 43-46	*Rossithidium pusillum* (Grunow) Round et Bukhtiyarova
Figs. 47-50	*Rossithidium linearis* (Smith) Round et Bukhtiyarova
Fig 51	*Rossithidium petersenii* (Hustedt) Round et Bukhtiyarova

Figs. 1-9	Lake Helado de Marboré, sediment PYR18
Figs. 10-11	Lake Filià, epilithic EpiPYR71
Figs. 12-13	Lake Negre, sediment PYR11
Figs. 14-15, 43-45	Lake Les Laquettes, sediment PYR27
Figs. 16, 17-30, 32-42, 51	Lake Llebreta, sediment PYR58
Fig. 31	Lake Estom, sediment PYR15
Fig. 36	Lake Roumassot, epilithic EpiPYR04
Fig. 46	Lake Posets, Sediment PYR42
Fig. 56	Lake Coronas, sediment PYR47
Figs. 48-50	Lake L`Estagnol, sediment PYR119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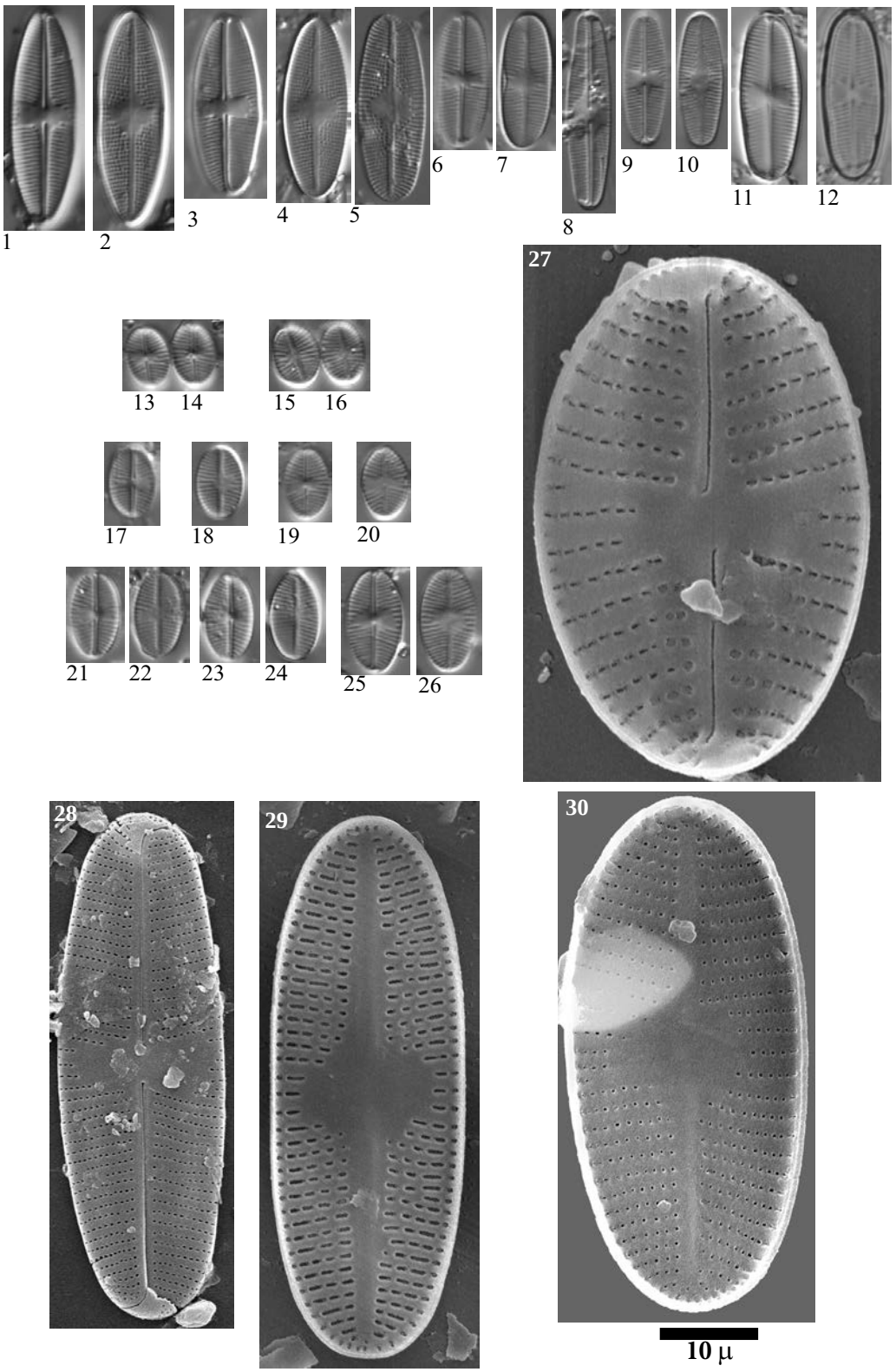
10 µ

Plate 49	LM: x1500 SEM: Fig. 25 x11000, Fig. 26 x4000, Fig. 27-28 x 7000

Figs. 1-12	*Psammothidium helveticum* (Hustedt) Bukhtiyarova et Round
Figs. 13-27	*Achnanthes helvetica* var. *minor* Flower & Jones
Figs. 28-29	*Psammothidium helveticum* (Hustedt) Bukhtiyarova et Round
Fig. 30	*Psammothidium* sp

Figs. 1-2	Lake Blaou, sediment PYR94
Figs. 3-5	Lake Posets, sediment PYR42
Figs. 6-7	Lake Llosás, sediment PYR46
Figs. 8, 29	Lake Mariola, sediment PYR80
Figs. 9-10	Lake Forcat Inf., sediment PYR77
Figs. 11-12	Lake Bleu de Rabassoles, sediment PYR112
Figs. 13-22, 25-26	Lake Negre, sediment PYR79
Figs. 23-24	Lake Cregüeña, Sediment PYR49
Fig. 27	Lake Garbet, sediment PYR81
Fig. 28	Lake Redon, sediment REDOM
Fig. 30	Lake Illa, sediment PYR66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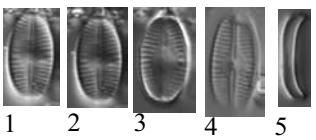
10 μ

Plate 50	LM: x1500 SEM: x 9000

Figs. 1-10	*Psammothidium scoticum* (Flower et Jones) Bukhtiyarova & Round

Figs. 1-3	Lake Posets, sediment PYR42
Fig. 4	Lake Monges, sediment PYR57
Fig. 5	Lake Eriste, sediment PYR43
Figs. 6-10	Lake Redon, sediment REDOM
Fig. 11	Lake Garbet, sediment PYR81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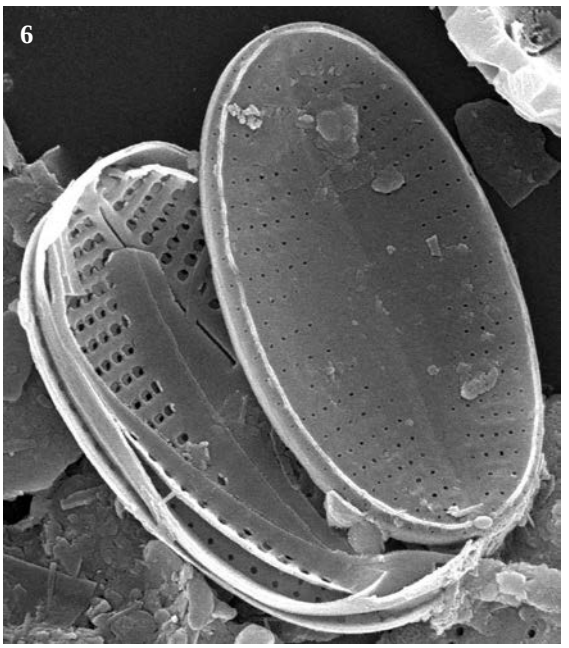
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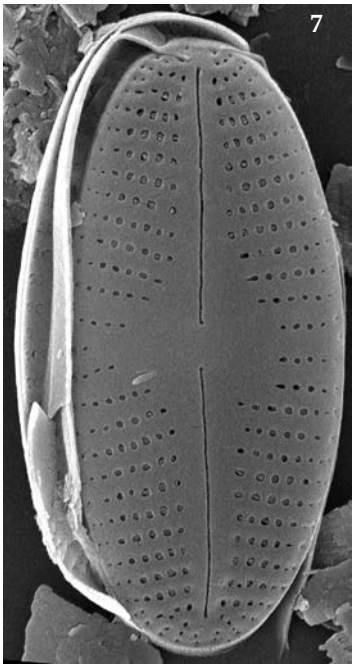
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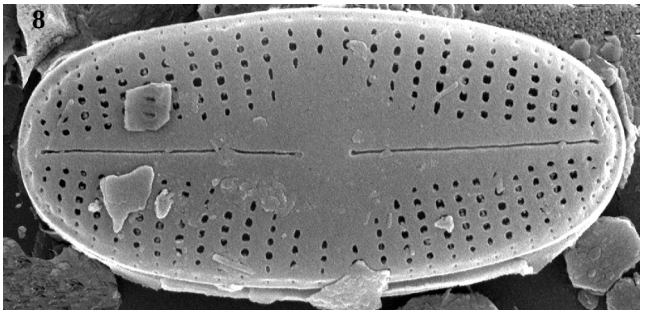
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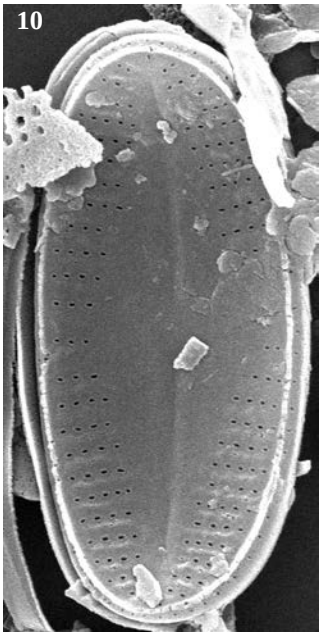
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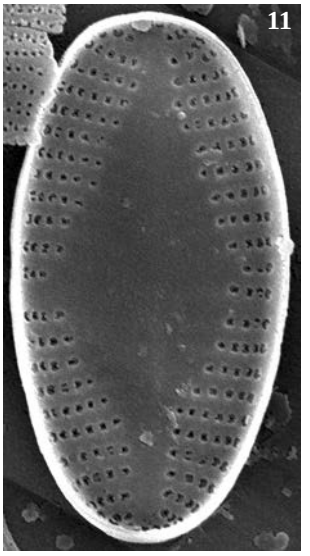
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10 μ

Plate 51	LM: x1500 SEM: x7000

Figs. 1-3	*Psammothidium bioretii* (Germain) Bukhtiyarova & Round
Figs. 4-6	*Psammothidium chlidanos* (Hohn & Hellerman) Lange-Bertalot
Figs. 7-9	*Psammothidium daonense* (Lange-Bertalot) Lange-Bertalot
Figs. 10-22	*Achnanthes* sp. No. 3 Posets
Figs. 23-24	P*sammothidium marginulatum* (Grunow) Bukhtiyarova et Round
Figs. 25-31	*Psammothidium acidoclinatum* (Lange-Bertalot) Lange-Bertalot
Figs. 32-36	*Psammothidium rossii* (Hustedt) Bukhtiyarova et Round
Figs. 37-41	*Achnanthes* sp. 7 Pixón
Figs. 42-43	*Psammothidium* cf. *daonense* (Lange-Bertalot) Lange-Bertalot
Figs. 44-49	*Psammothidium ventralis* (Krasske) Bukhtiyarova et Round
Figs. 50-53	*Achnanthes ziegleri* Lange-Bertalot

Figs. 1-2, 23-24	Lake Llebreta, sediment PYR58
Figs. 3, 6, 20-22	Lake Posets, sediment PYR42
Figs. 4-5	Lake Urdiceto, sediment PYR125
Figs. 7-9, 44-49	Lake Les Laquettes, sediment PYR27
Figs. 10-11, 32-34	Lake Siscar, sediment PYR126
Figs. 12-15, 18-19	Lake Monges, sediment PYR57
Figs. 16-17	Lake Cap Long, sediment PYR24
Figs. 25-30	Lake Bleu de Rabassoles, sediment PYR112
Fig. 31	Lake Senó, epilithic EpiPYR84
Figs. 35-36	Lake Estelat, sediment PYR120
Figs. 37-39	Lake Pixón, sediment PYR44
Figs. 40-41	Lake Blaou, sediment PYR94
Figs. 42-43	Lake Lliterola, epilithic EpiPYR33
Fig. 50	Lake Laurenti, sediment PYR111
Figs. 51-53	Lake Acherito, sediment PYR01

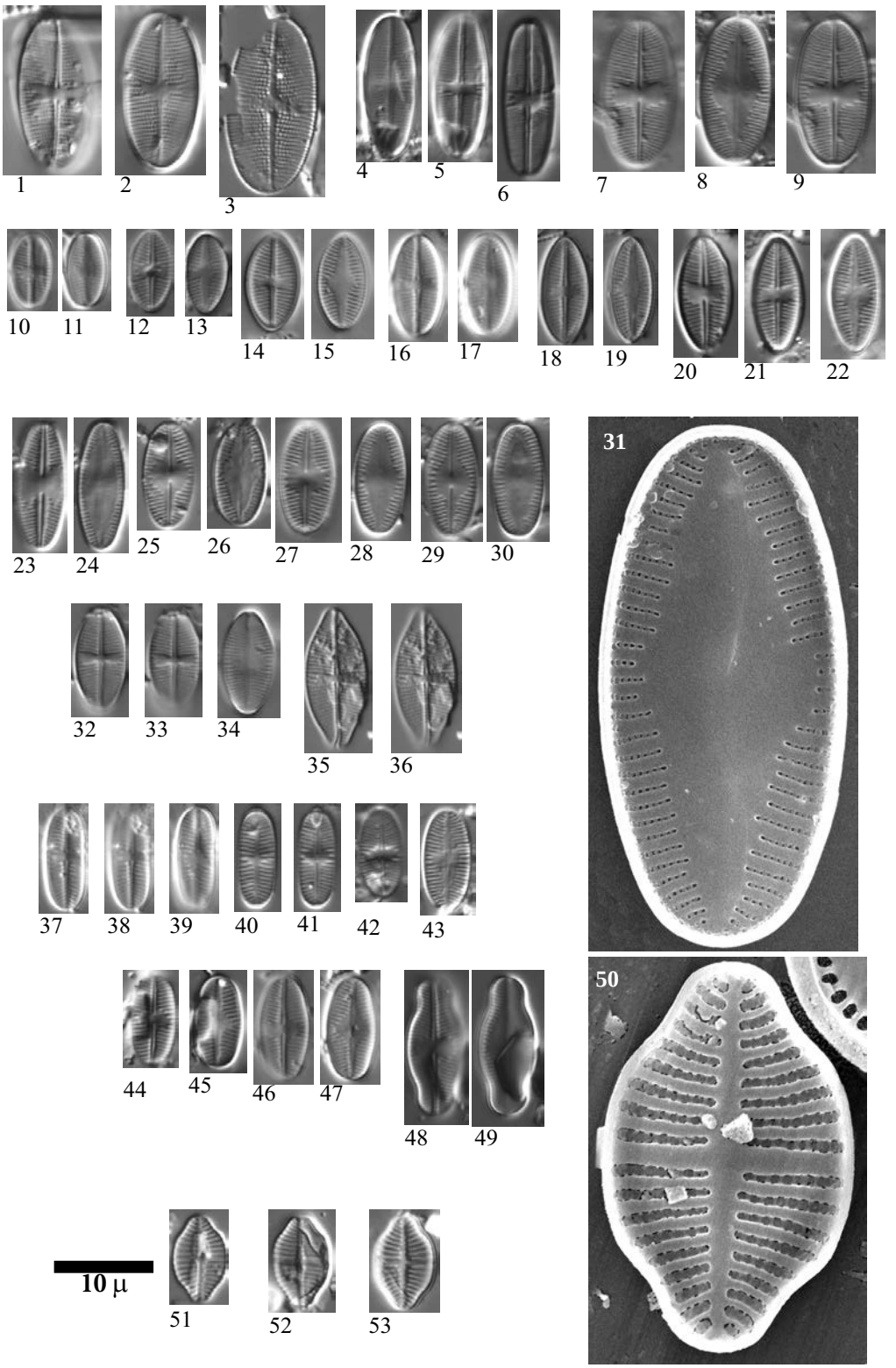
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Plate 52	LM: x1500 SEM: x4500

Figs. 1-3, 7-9	*Cocconeis euglyptoides* (Geitler) Lange-Bertalot
Fig. 4	*Cocconeis* cf. *neothumensis* Krammer
Fig. 5-6	*Cocconeis neodiminuta* Krammer

Figs. 1-2	Lake Sen, sediment PYR40
Fig. 3	Lake Estom, sediment PYR15
Figs. 4-5	Lake Laurenti, epilithic EpiPYR111
Fig. 6	Lake Acherito, sediment PYR01
Fig. 7	Lake Roumassot, epilithic EpiPYR04
Fig. 8	Lake Arnales, epilithic EpiPYR09
Fig. 9	Lake Roumassot, sediment PYR04


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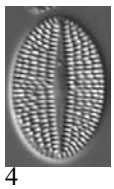
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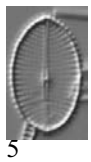
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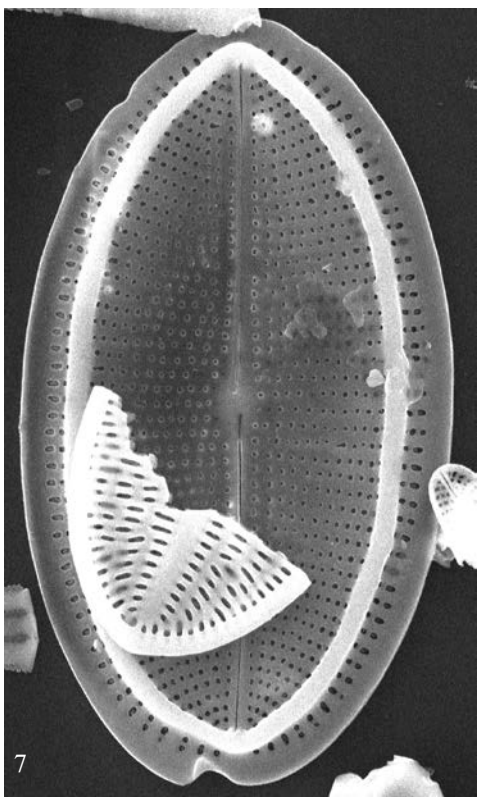
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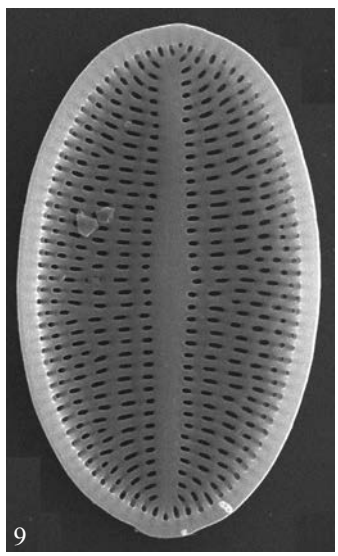
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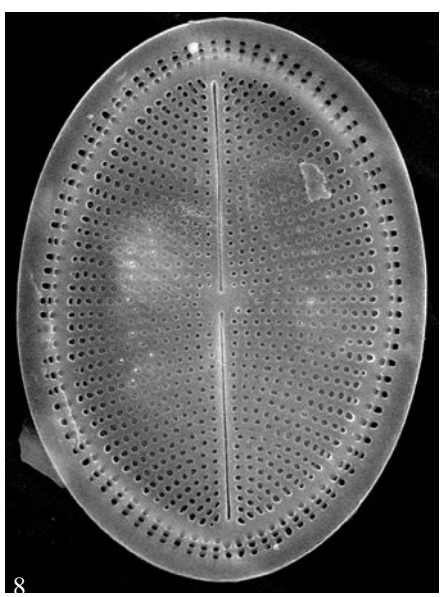
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10 μ

Plate 53	LM: x1500 SEM: x4000

Figs. 1-6	*Navicula caterva* Hohn & Hellerman
Figs. 7-8	*Navicula* cf. *caterva* Hohn & Hellerman
Figs. 9-19	*Navicula cryptocephala* Kützing
Figs. 20-23	*Navicula* cf. *cryptocephala* Kützing
Figs. 24-31	*Navicula wildii* Lange-Bertalot
Figs. 32-33	*Navicula* cf. *moskalii* Metzeltin, Witkowski & Lange-Bertalot
Figs. 34-36	*Navicula* cf. *cryptocephala* Kützing

Figs. 1-2, 5-6	Lake Sen, sediment PYR40
Figs. 3, 7-9	Lake Arnales, sediment PYR09
Figs. 4, 10-13, 19 35-36	Lake Posets, sediment PYR42
Figs. 14, 20-22, 24-31	Lake Arratille, sediment PYR11
Figs. 15, 17-18	Lake Acherito, sediment PYR01
Fig. 16	Lake Col d`Arratille, sediment PYR12
Fig. 23	Lake Mes Amunt de Tristaina, sediment PYR86
Fig. 32	Lake Helado del Monte Perdido, sediment PYR19
Fig. 33	Lake Tourrat, sediment PYR23
Fig. 34	Lake Arnales, epilithic EpiPYR09

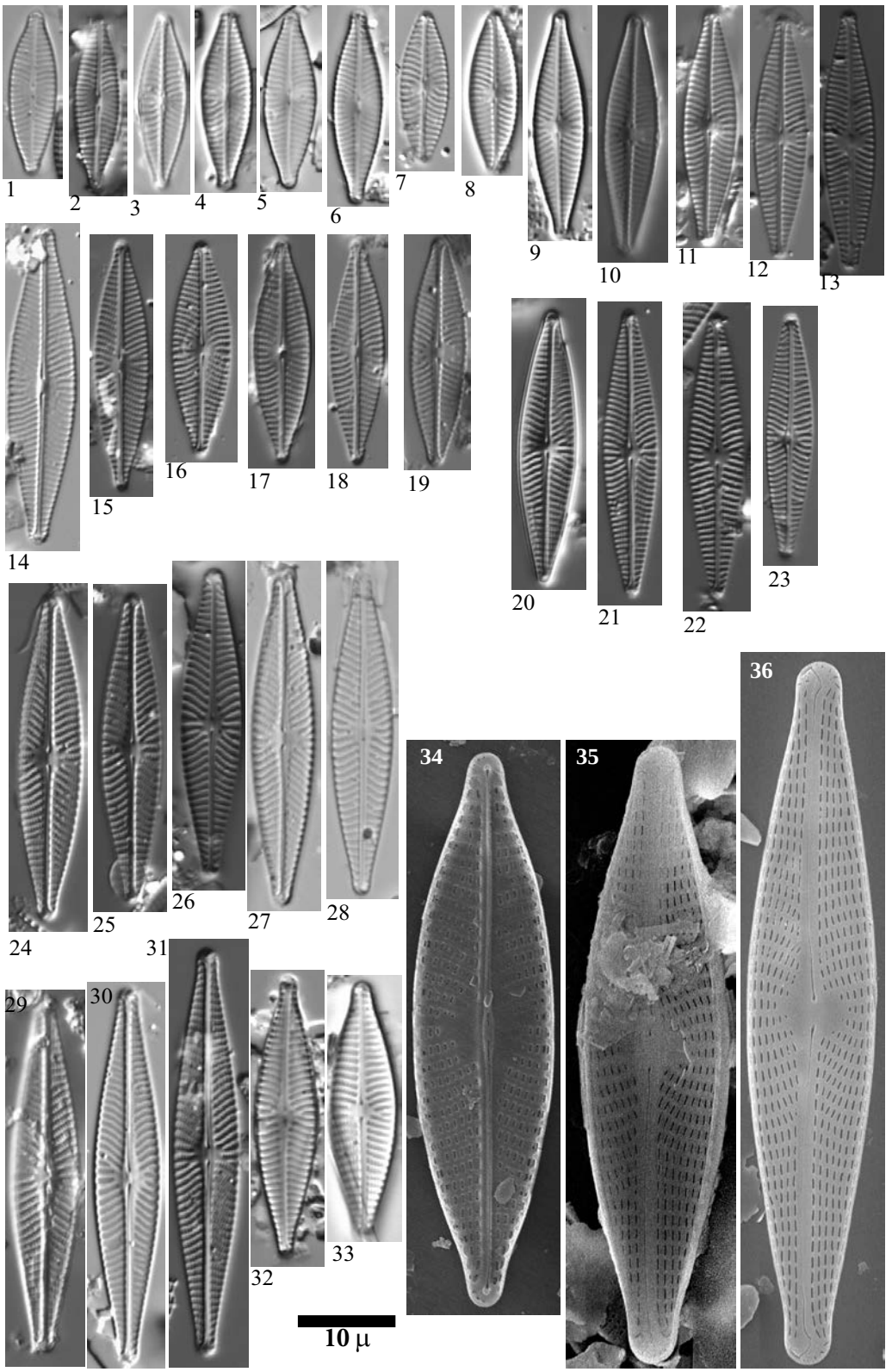
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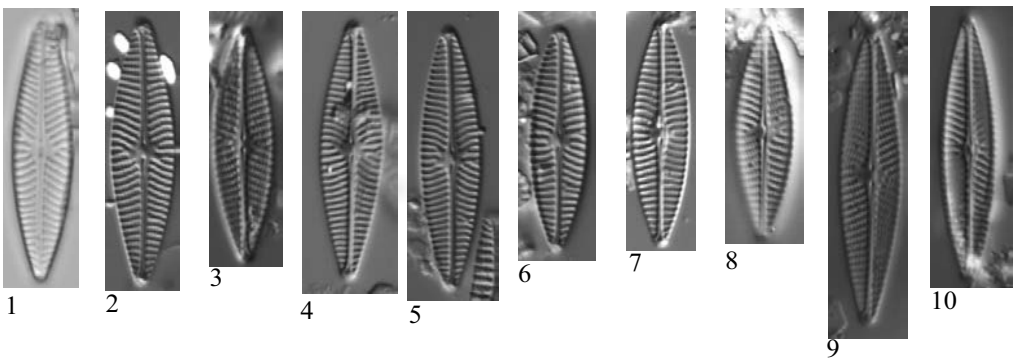
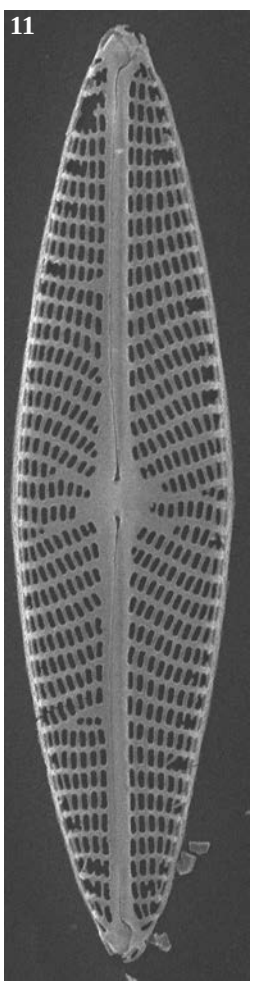
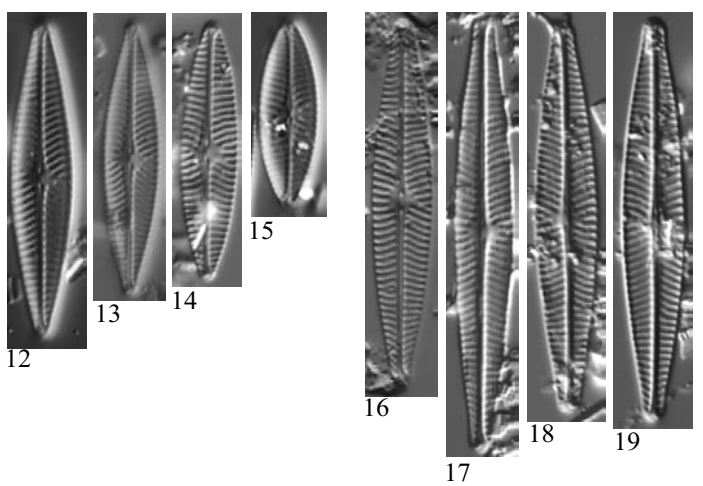
Plate 54	LM: x1500 SEM: x5000

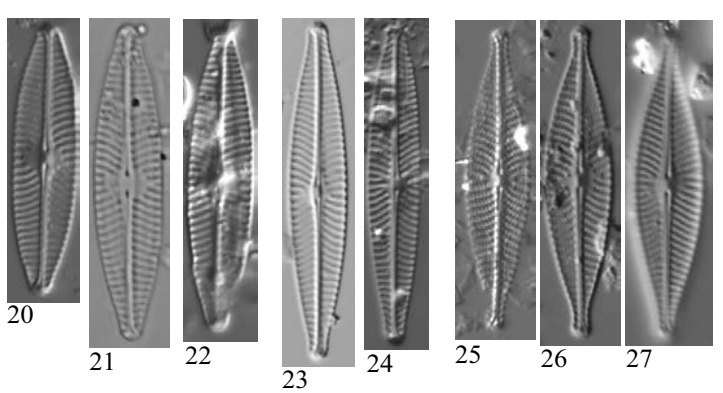
Figs. 1-15	*Navicula cryptotenella* Lange-Bertalot
Figs. 16-19	*Navicula heimansioides* Lange-Bertalot
Figs. 20-22	*Navicula exilis* Kützing
Figs. 23-24	*Navicula notha* Wallace
Figs. 25-27	*Navicula cryptofallax* Lange-Bertalot & Hofmann

Figs. 1-6, 8-10, 12, 15	Lake Arratille , sediment PYR11
Fig. 7	Lake Sen, sediment PYR40
Figs. 13-14	Lake Col d`Arretille, sediment PYR12
Fig. 16	Lake Gelat Bergús, sediment PYR65
Figs. 17-19	Lake Bleu de Rabassoles, sediment PYR112
Fig. 20	Lake Llosás, sediment PYR46
Fig. 11	Lake Port Bielh, sediment EpiPYR28
Fig. 21	Lake Baiau Superior, sediment PYR76
Fig. 22	Lake Trebens, sediment PYR114
Fig. 23	Lake Argonella, sediment PYR78
Fig. 24	Lake Mes Amunt de Tristaina, sediment PYR86
Fig. 25	Lake Burg
Figs. 26-27	Lake Acherito, sediment PYR01









10 µ

Plate 55	LM: x1500 SEM: x4000

Figs. 1, 8-13	*Navicula catalanogermanica* Lange-Bertalot & Hofmann
Figs. 2-6	*Navicula* cf. *antonii* Lange-Bertalot & Rumrich
Fig. 7	*Navicula* cf. *upsaliensis* (Grunow) Peragallo
Figs. 14-22	*Navicula pseudolanceolata* Lange-Bertalot
Figs. 23-26	*Navicula trophicatrix* Lange-Bertalot
Figs. 27-28	*Navicula subalpina* Reichardt
Fig. 29	*Navicula* cf. *libonensis* Schoeman
Figs. 30-31	*Navicula* sp. No. 9 Arratille

Fig. 1	Lake Laurenti , sediment PYR111
Figs. 2, 6	Lake Tourrat, sediment PYR23
Fig. 3	Lake Cap Long, sediment PYR24
Figs. 4-5, 12	Lake Acherito, sediment PYR01
Figs. 7, 13	Lake Barroude Inf., sediment PYR29
Figs. 8, 10-11, 24-26	Lake Col d`Arratille, sediment PYR12
Fig. 9	Lake Helado del Monte Perdido, epilithic EpiPYR19
Figs. 14-16, 23, 27-28	Lake Arratille, sediment PYR11
Fig. 17	Lake Montagnon, sediment PYR121
Figs. 18-20	Lake Arnales, sediment PYR09
Figs. 21-22	Lake Roumassot, sediment PYR04
Fig. 29	Lake Burg, sediment BURG 1195
Figs. 30-31	Lake Arratille, epilithic EpiPYR11

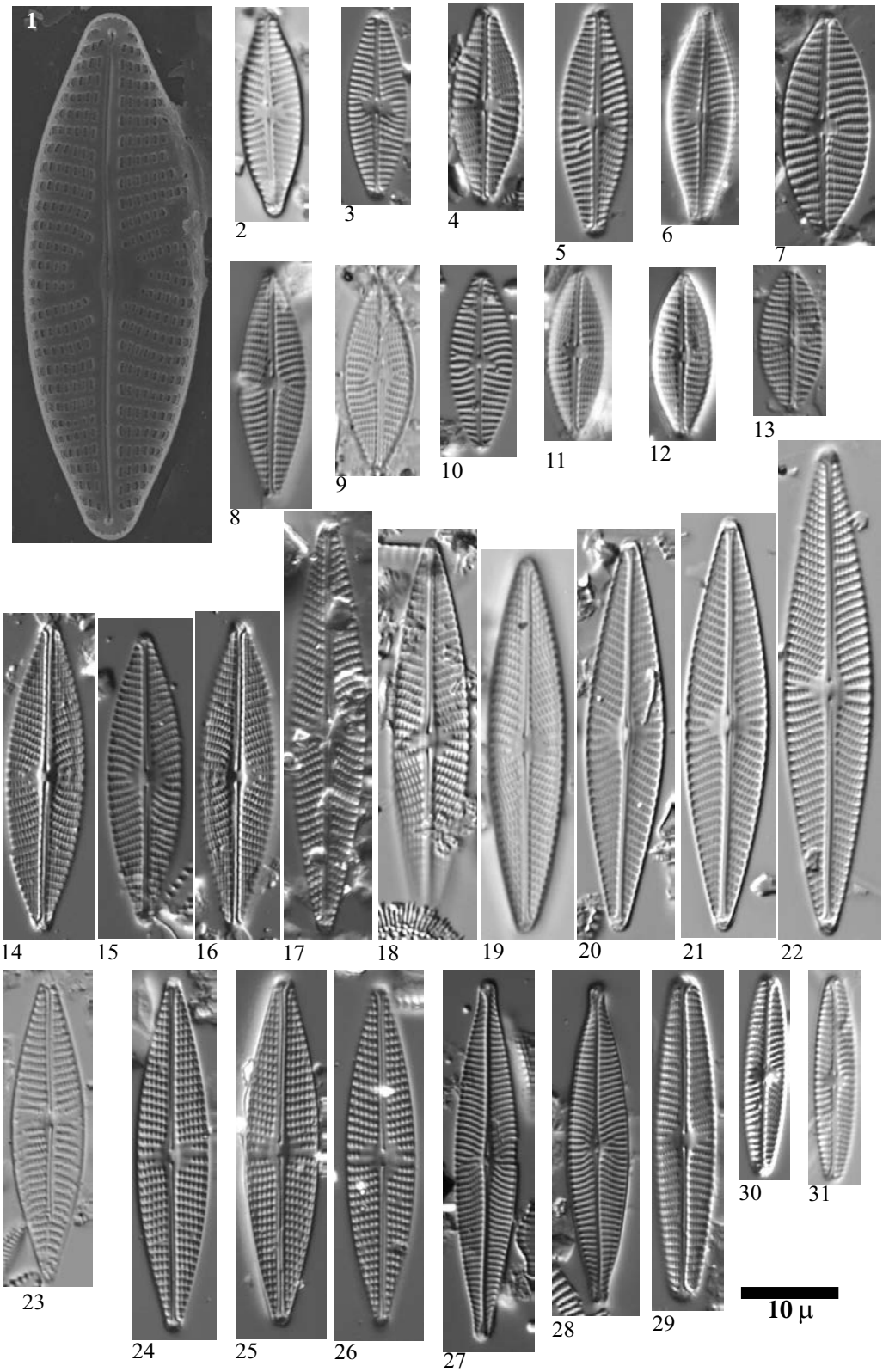

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Plate 56	LM: x1500 SEM: x3000

Figs. 1-4	*Navicula* cf. *oligotraphenta* Lange-Bertalot & Hofmann
Figs. 5-6	*Navicula* cf. *trivialis* Lange-Bertalot
Figs. 7-8	*Navicula* sp.
Figs. 9-10	*Navicula viridula* Kützing

Fig. 1	Lake Burg, BURG 1195 cm
Fig. 2	Lake Basa de la Mora, sediment PYR32
Figs. 3-4	Lake Laurenti, sediment PYR111
Figs. 5-6	Lake Burg, sediment BURG 1068
Fig. 7	Lake Burg, sediment BURG 1072
Fig. 8	Lake Burg, sediment BURG 913
Figs. 9-10	Lake Burg, sediment BURG 843

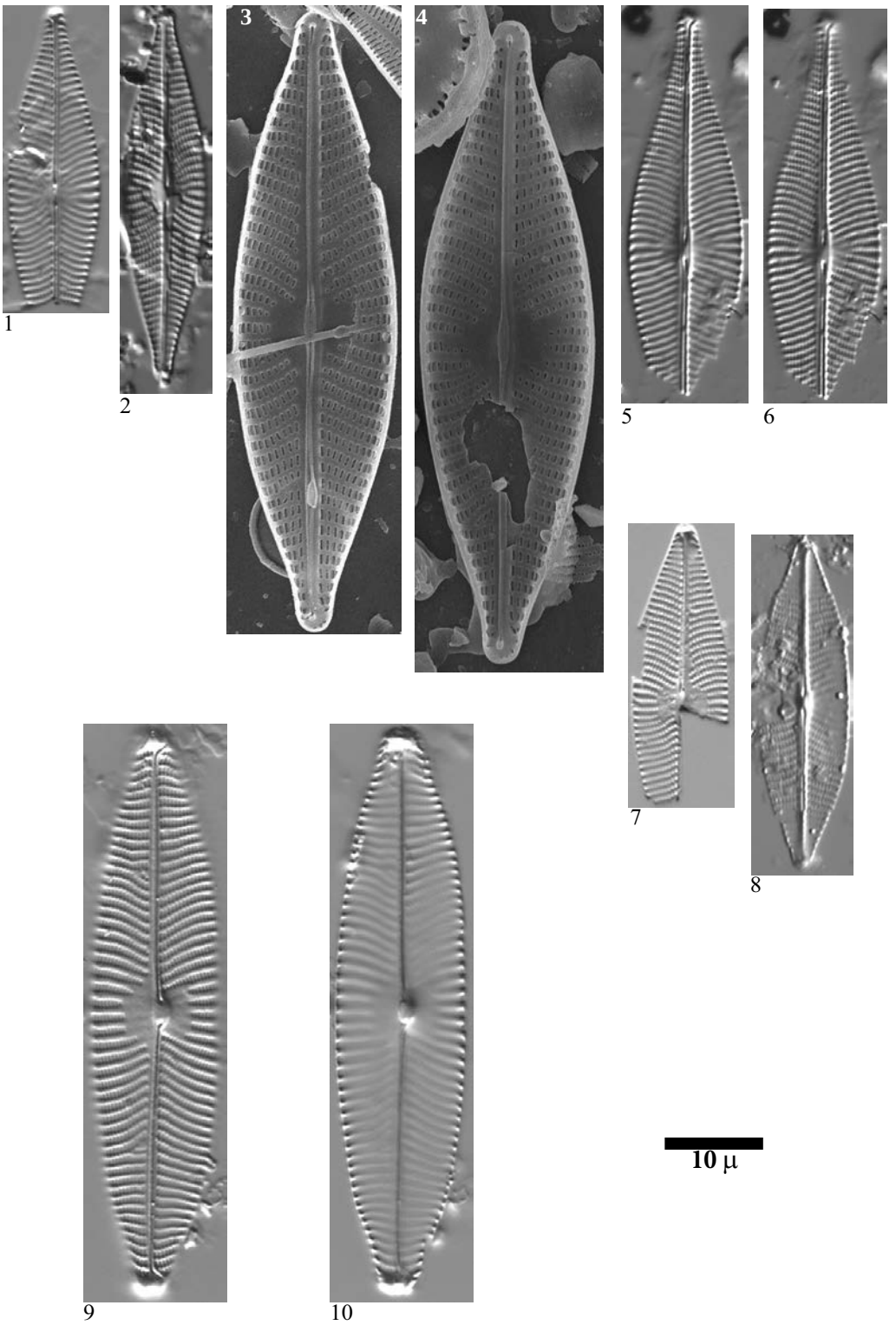
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Plate 57	LM: x1500 SEM: x2500

Figs. 1-2	*Navicula vulpina* Kützing
Figs. 3-7	*Navicula radiosa* Kützing

Figs. 1-2, 7	Lake Arratille, sediment PYR11
Fig. 3	Lake Gran de la Pera, sediment PYR102
Fig. 4	Lake Plan, sediment PYR69
Fig. 5	Lake Sen, sediment PYR40
Fig. 6	Lake Posets, sediment PYR42

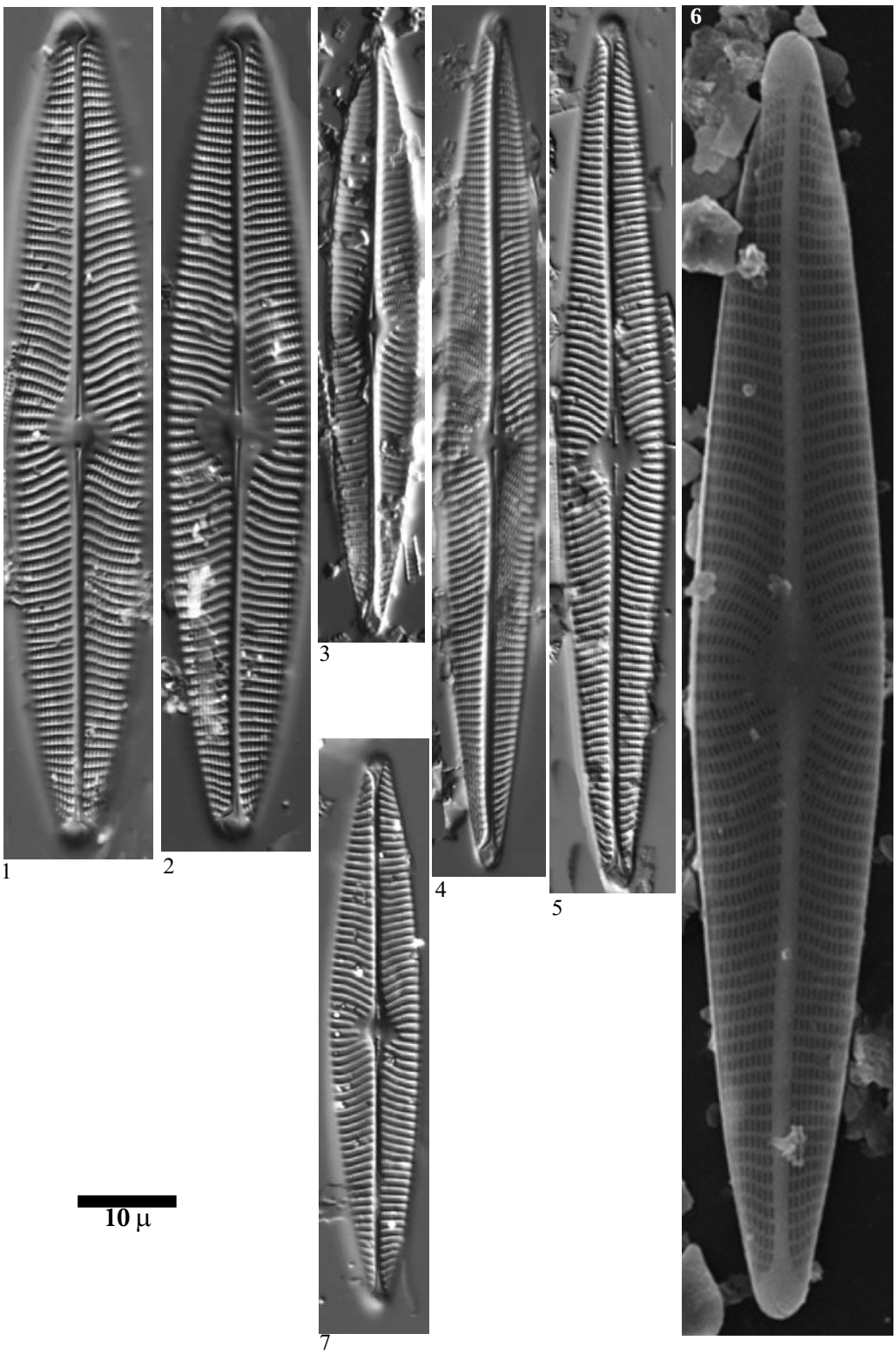
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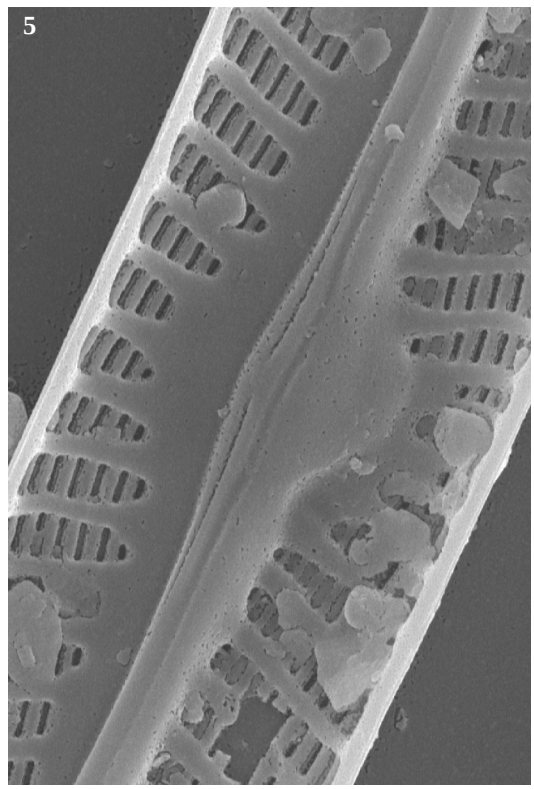
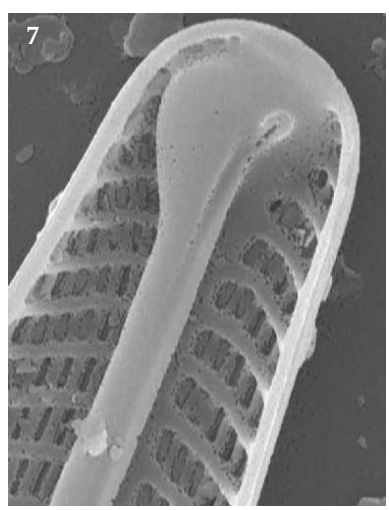
Plate 58	LM: x1500 SEM: x10000

Figs. 1-2	*Navicula venerablis* Hohn & Hellerman
Figs. 3-7	*Navicula angusta* Grunow

Fig. 1	Lake Coronas, sediment PYR47
Figs. 2-3	Lake Redon, sediment REDOM
Figs. 4-5, 7	Lake Mariola, sediment PYR80
Fig. 6	Lake Angonella, epilithic EpiPYR78





10 μ

Plate 59	LM: x1500 SEM: Figs. 10-11 x5000, Figs. 19-20 x10000, Figs. 21-22 x4000

Figs. 1-11	*Sellaphora disjuncta* (Hustedt) D. G. Mann
Figs. 12-22	*Sellaphora laevissima* (Kützing) D. G. Mann

Figs. 1, 5, 7, 13, 18	Lake Posets, sediment PYR42
Fig. 2	Lake Burg, sediment BURG 1062
Figs. 3-4, 6	Lake Inferior de la Gallina, sediment PYR87
Figs. 8-9	Lake Llebreta, sediment PYR58
Figs.10-11, 14	Lake Burg
Fig. 12	Lake Arratille, sediment PYR11
Fig. 15	Lake Burg, sediment BURG 953
Fig. 16	Lake Burg, sediment BURG 543
Fig. 17	Lake Col d`Arratille, sediment PYR12

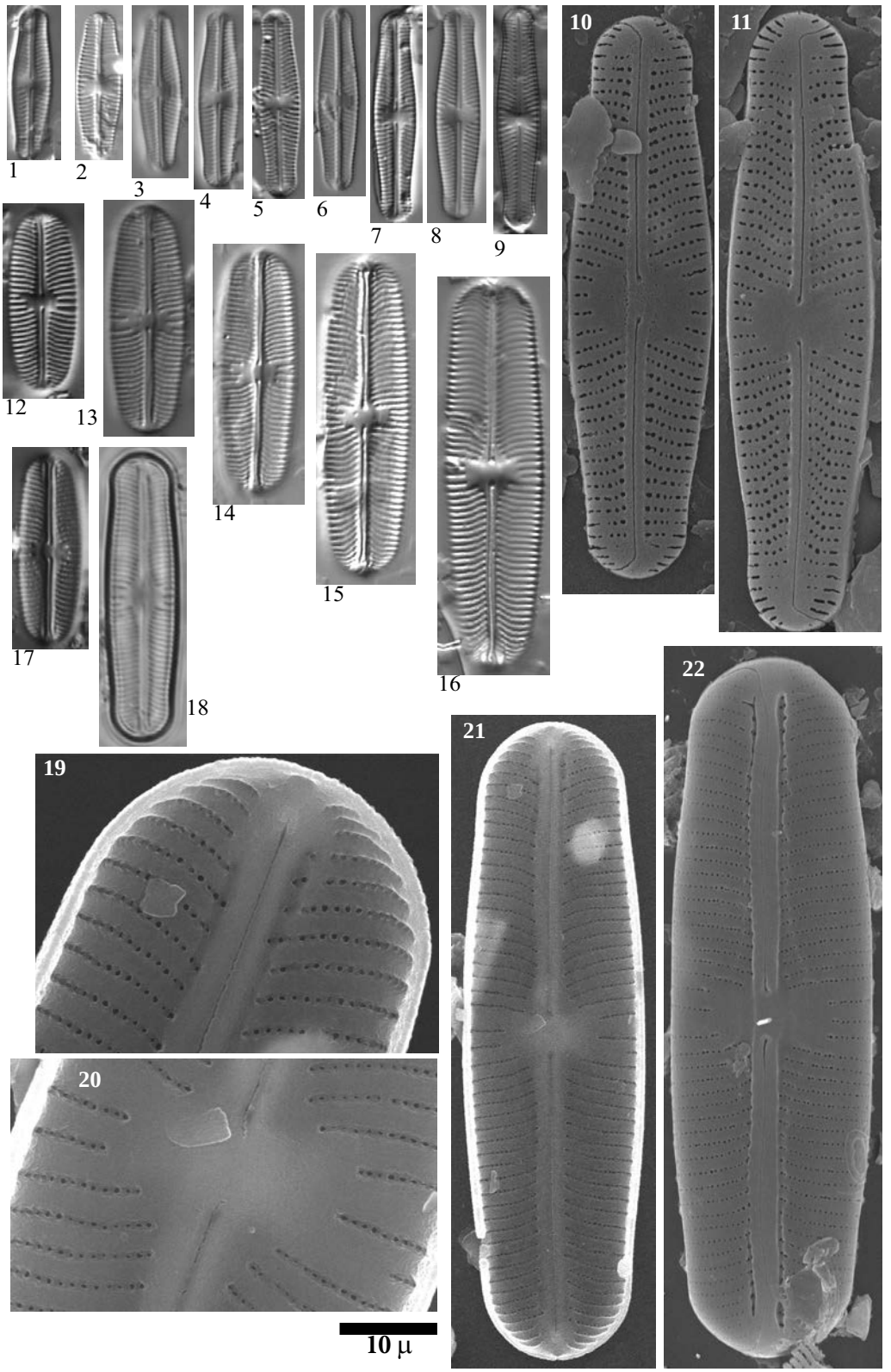

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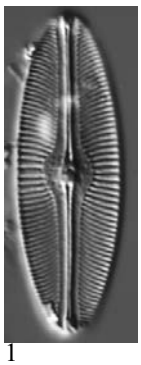
Plate 60	LM: x1500 SEM: Fig. 3 x9000, Fig. 4 x4000, Fig. 5 x3500, Fig. 6 x10000

Figs- 1-6	*Sellaphora bacillum* (Ehrenberg) D. G. Mann

Fig. 1	Lake Arratille, sediment PYR11
Figs. 2, 3-6	Lake Laurenti, sediment PYR111



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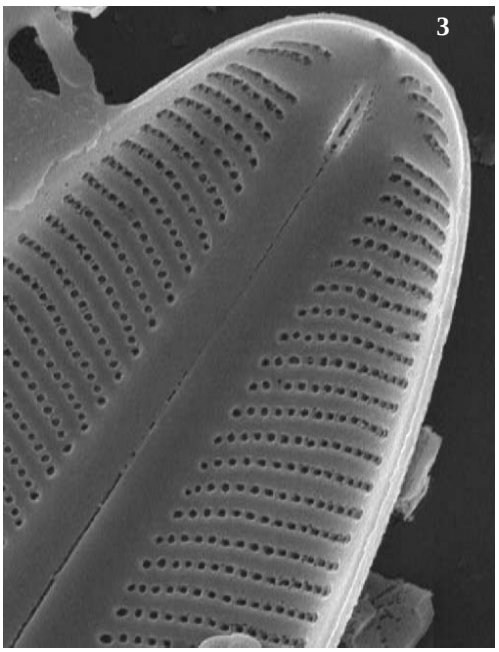

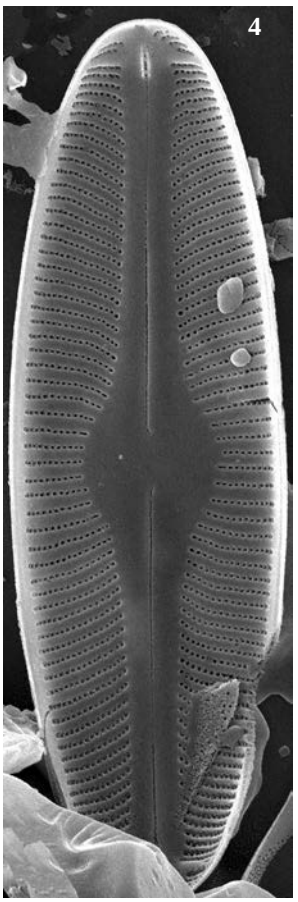

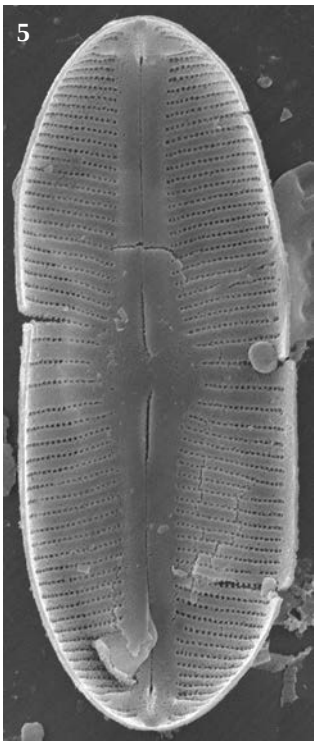

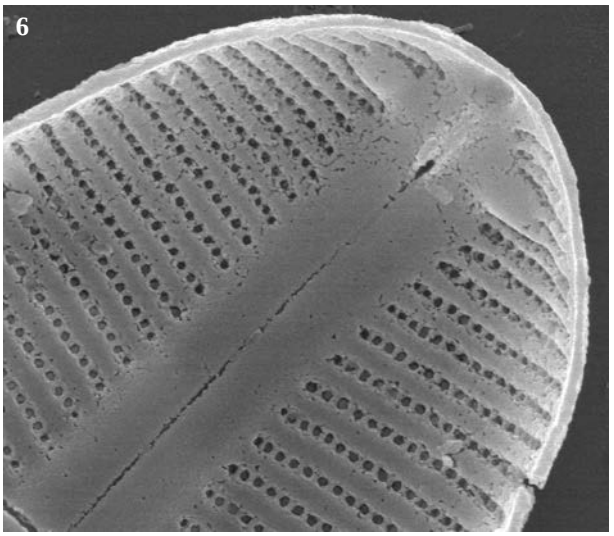

10 µ

Plate 61	LM: x1500 SEM: x6000

Fig. 1	*Sellaphora pupula* (Kützing) Mereschkowsky sensu lato cf. *Sellaphora blackfordensis* Mann & Droop
Figs. 2-11 12-14	*Sellaphora pseudopupula* (Krasske) Lange-Bertalot
Fig. 15	*Sellaphora pupula* (Kützing) Mereschkowsky sensu lato

Fig. 1	Lake Burg
Figs. 2, 6-7, 9-11	Lake Posets, sediment PYR42
Figs. 3, 5	Lake Albe, sediment PYR96
Fig. 4	Lake Arratille, sediment PYR11
Fig. 8	Lake Burg, sediment BURG 973
Fig. 12	Lake Angonella, epilithic EpiPYR78
Fig. 13	Lake Garbet, sediment PYR81
Fig. 14	Lake Laurenti, sediment PYR111
Fig. 15	Lake Acherito, sediment PYR01

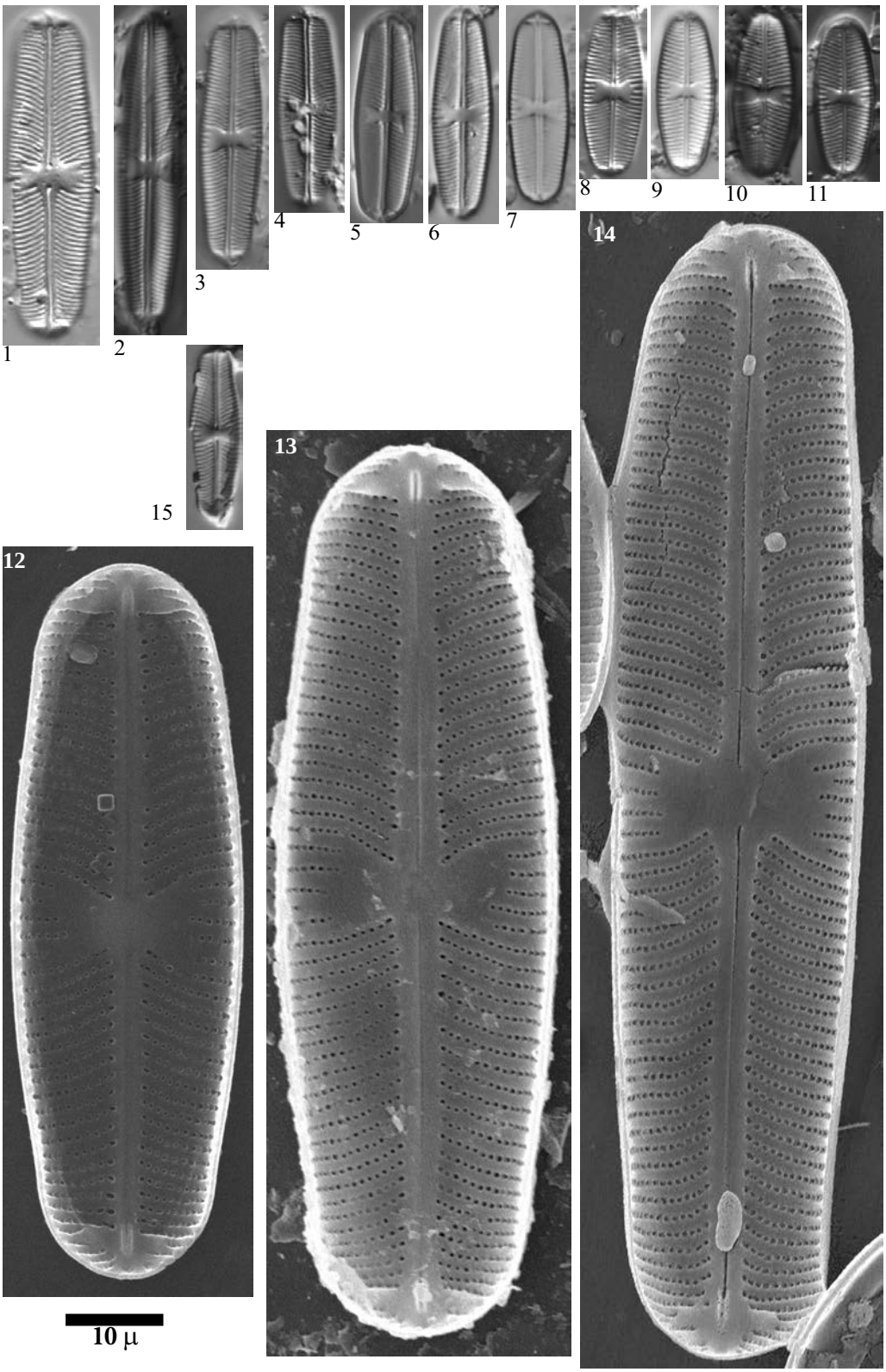
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Plate 62	LM: x1500 SEM: Figs. 3, 10 x5000, Fig. 11 x4000, Fig. 12 x6000

Figs. 1-3	*Sellaphora stroemii* (Hustedt) Kobayasi
Figs. 4-6, 10	*Sellaphora pupula* (Kützing) Mereschkowsky sensu lato cf. *Sellaphora auldreekie* Mann & McDonald
Figs. 7-8	*Sellaphora pupula* (Kützing) Mereschkowsky sensu lato cf. *Sellaphora capitata* Mann & McDonald
Fig. 9	*Sellaphora* sp. No. 1 Ensangents
Fig. 11	*Sellaphora pupula* (Kützing) Mereschkowsky
Fig. 12	*Sellaphora* aff. *nanoides* Lange-Bertalot, Cavacini, Tagliaventi & Alfinito

Fig. 1	Lake Basa de la Mora, sediment PYR32
Fig. 2	Lake Gran de Mainera, sediment PYR70
Fig. 3	Lake Port Bielh, epilithic EpiPYR28
Fig. 4	Lake Burg, sediment BURG 927
Fig. 5	Lake Burg, sediment BURG 926
Fig. 6	Lake Arratille, sediment PYR11
Fig. 7	Lake Burg, sediment BURG 774
Fig. 8	Lake Burg, sediment BURG 782
Fig. 9	Lake Ensangents Sup., sediment PYR106
Figs. 10-11	Lake Laurenti, sediment PYR111
Fig. 12	Lake Gros de Camporrells, sediment PYR110

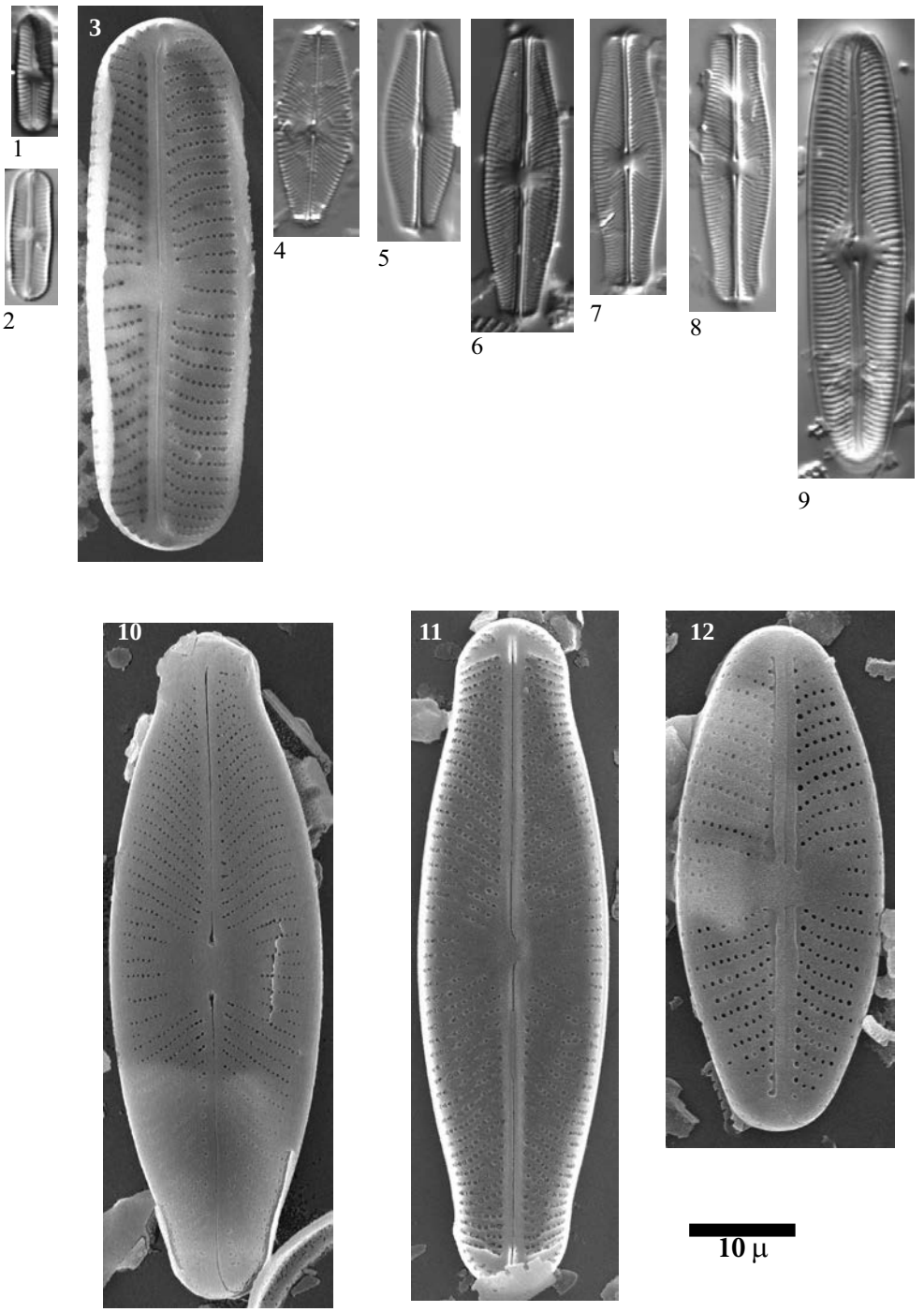
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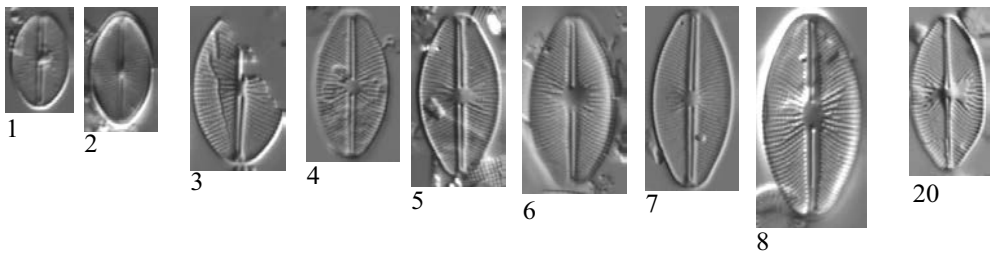
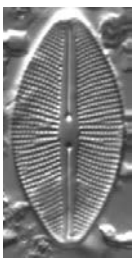
Plate 63	LM: x1500 SEM: Fig. 18 x6000, Fig. 19 x8000

Figs. 1-2	*Cavinula mollicula* (Hustedt) Lange-Bertalot
Figs. 3-10	*Cavinula cocconeiformis* (Gregory ex Greville) Mann & Stickle sensu lato
Figs. 11-19	*Cavinula pseudoscutiformis* (Hustedt) Mann & Stickle
Fig. 20	*Navicula* sp. No. 8 Sotllo

Figs. 1-2	Lake Negre, sediment PYR108
Fig. 3	Lake Laurenti, sediment PYR111
Figs. 4, 6-7, 11-12	Lake Inferior de la Gallina, sediment PYR87
Fig. 5	Lake Garbet, sediment PYR81
Figs. 8-10	Lake Blaou, sediment PYR94
Fig. 13	Lake Port Bielh, sediment PYR28
Fig. 14	Lake Arratille, sediment PYR11
Fig. 15	Lake Llebreta, sediment PYR58
Fig. 16	Lake Les Laquettes, sediment PYR27
Fig. 17	Lake Burg, sediment BURG 1187
Fig. 18	Lake Burg
Fig. 19	Lake Gros de Camporrells, sediment PYR110
Fig. 20	Lake Sotllo, epilithic PYR89

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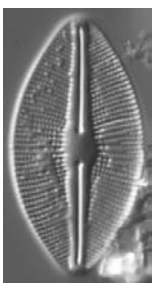
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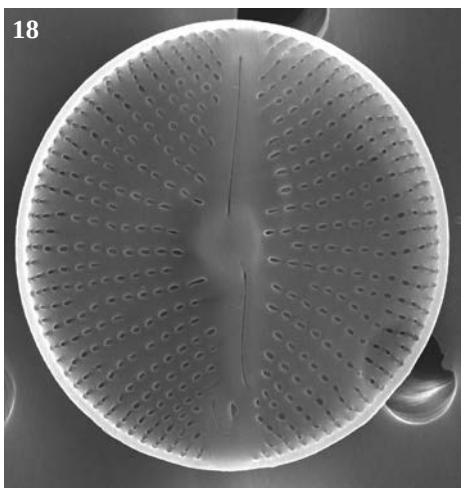


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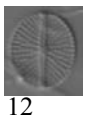
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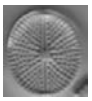
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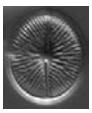
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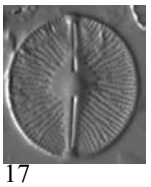
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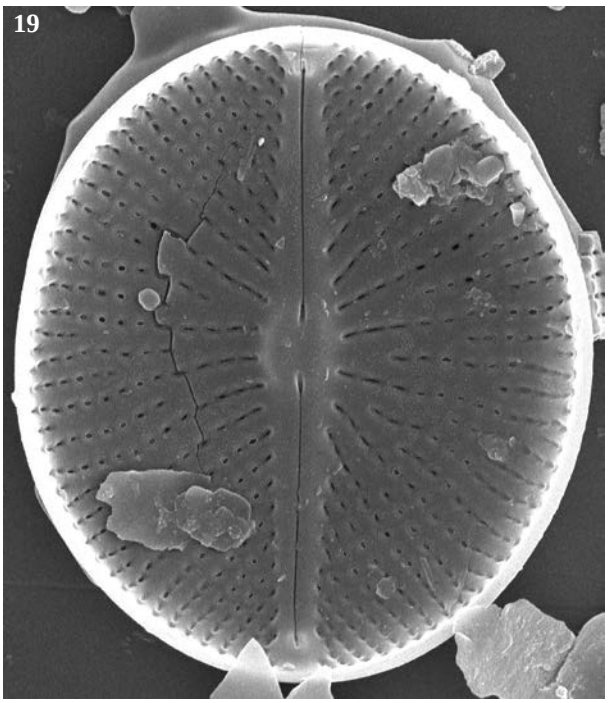

10 μ

Plate 64	LM: x1500 SEM: Fig. 7 x4000, Fig. 17 x7000

Figs. 1-4	*Placoneis ignorata* (Schimanski) Lange-Bertalot
Figs. 5-7,9	*Placoneis explanata* (Hustedt) Lange-Bertalot
Fig. 8	*Placoneis symmetrica* (Hustedt) Lange-Bertalot
Fig. 10	*Placoneis* sp. No. 1 Acherito
Figs. 11-13	*Placoneis elginensis* (Gregory) Cox sensu lato
Figs. 14-15	*Placoneis* sp. No. 3 Burg
Fig. 16	*Placoneis* cf. *abiskoensis* (Hustedt) Lange-Bertalot et Metzeltin
Fig. 17	*Placoneis paraelginensis* Lange-Bertalot

Figs. 1, 3	Lake Negre, sediment PYR96
Fig. 2	Lake Burg, sediment BURG 480
Fig. 4	Lake Burg
Fig. 5-6	Lake Burg, sediment BURG 543
Fig. 7	Lake Blaou, sediment PYR27
Figs. 8, 10	Lake Port Bielh, sediment PYR01
Fig. 11	Lake Burg, sediment BURG 1053
Fig. 12	Lake Burg, sediment BURG 1007
Fig. 13	Lake Burg, sediment BURG 845
Fig. 14	Lake Burg, sediment BURG 1031
Fig. 15	Lake Burg, sediment BURG 848
Fig. 16	Lake Burg, sediment BURG 1104
Fig. 17	Lake Burg, sediment BURG 425

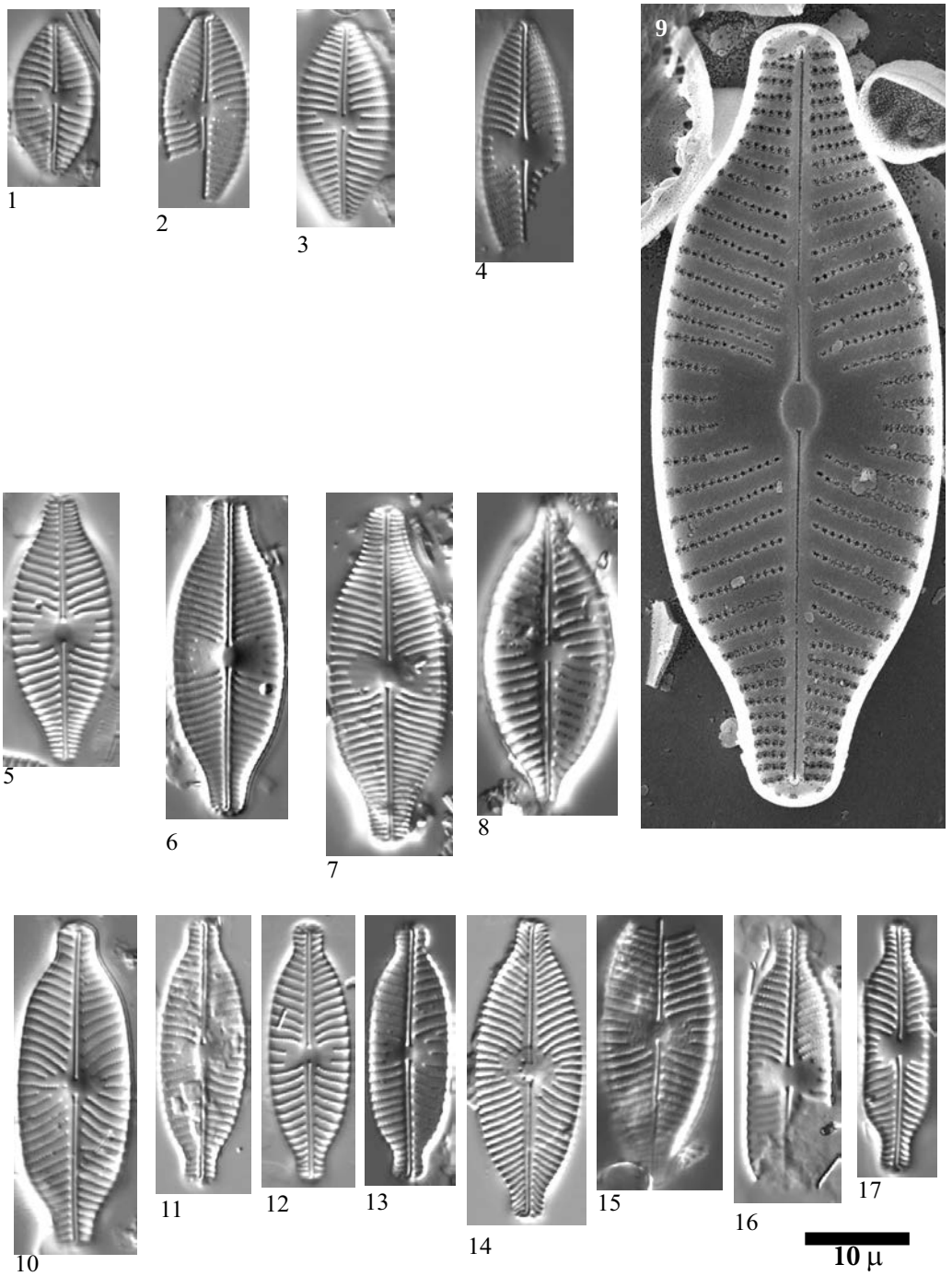
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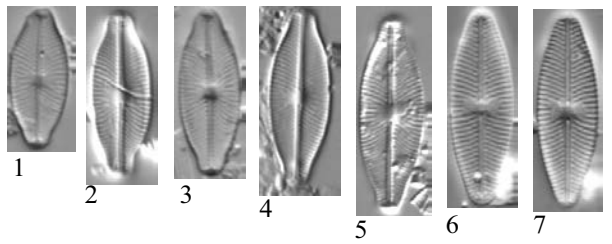
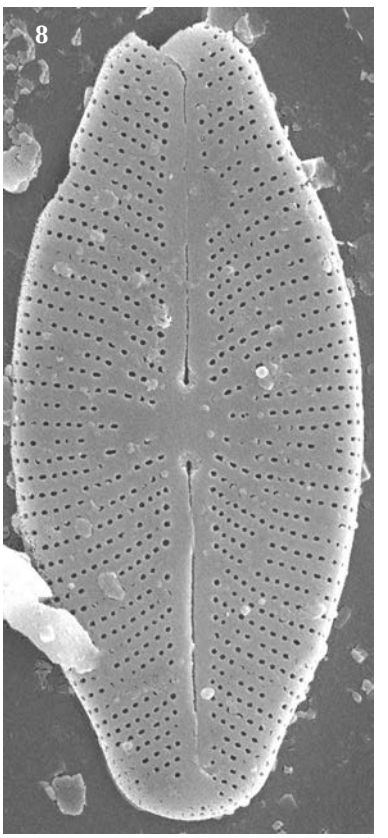
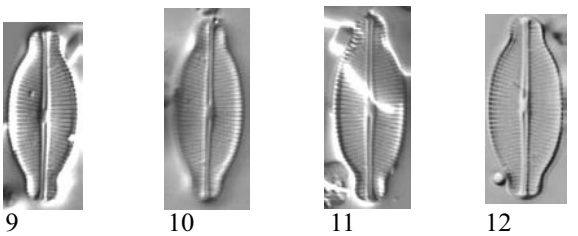
Plate 65	LM: x1500 SEM: Fig. 17 x7000

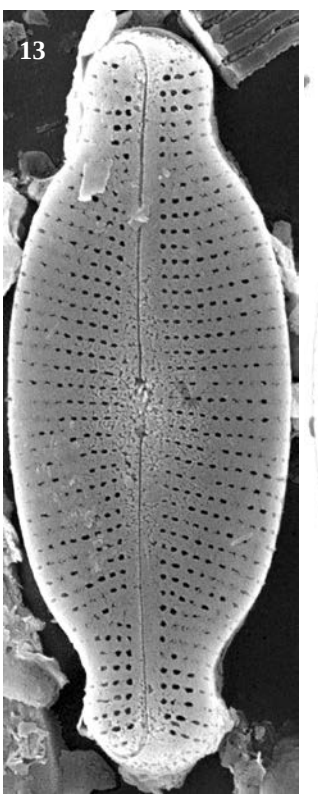
Fig. 1-4, 8 ?5-7	*Navicula* sp. No. 2 Liat
Figs. 9-16	*Navicula detenta* Hustedt

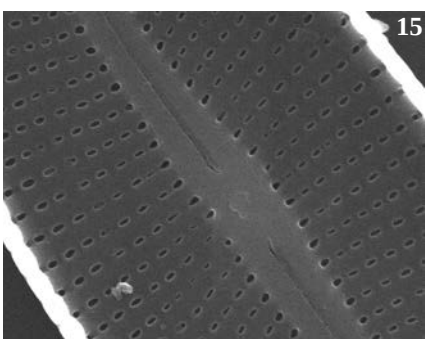
Figs. 1, 3-5, 10-13	Lake Negre, sediment PYR42
Fig. 2	Lake Negre, sediment PYR55
Figs. 6-9	Lake Negre, sediment PYR40
Fig. 8	Lake Negre, sediment PYR80
Figs. 14-16	Lake Negre, epilithic EpiPYR78

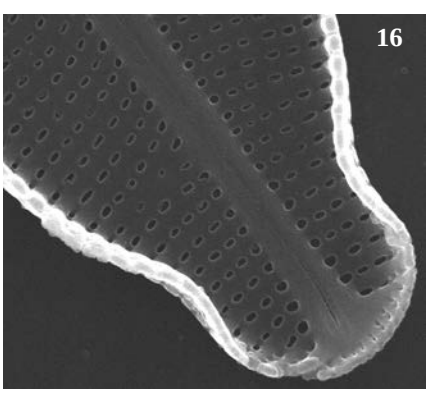












10 µ

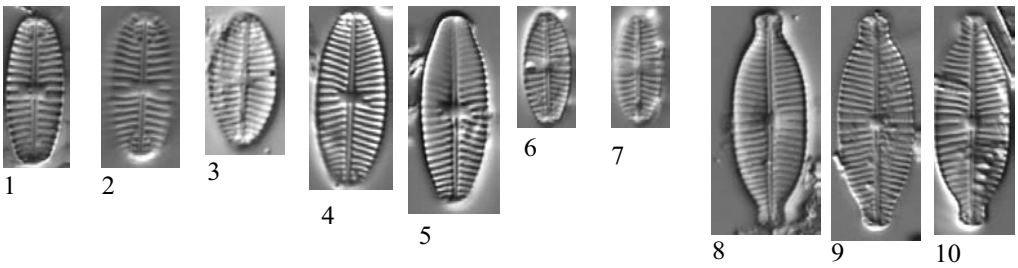
Plate 66	LM: x1500 SEM: Fig. 11 x15000, Figs. 12-13 x30000

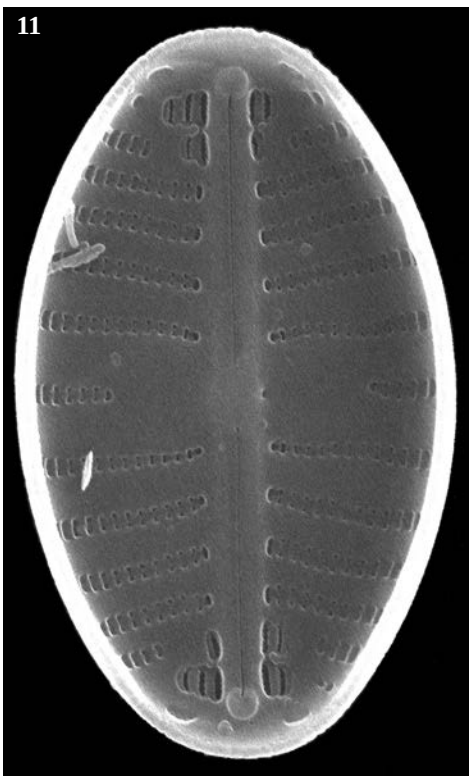
Figs. 1-2	*Geissleria* cf. *paludosa* (Hustedt) Lange-Bertalot & Metzeltin
Fig. 3	*Geissleria* sp.
Figs. 4-5	*Geissleria* cf. *moseri* Metzeltin, Witkowski & Lange-Bertalot
Figs. 6-7, 11-13	*Geissleria acceptata* (Hustedt) Lange-Bertalot & Metzeltin
Figs. 8-10	*Geissleria similis* (Krasske) Lange-Bertalot & Metzeltin

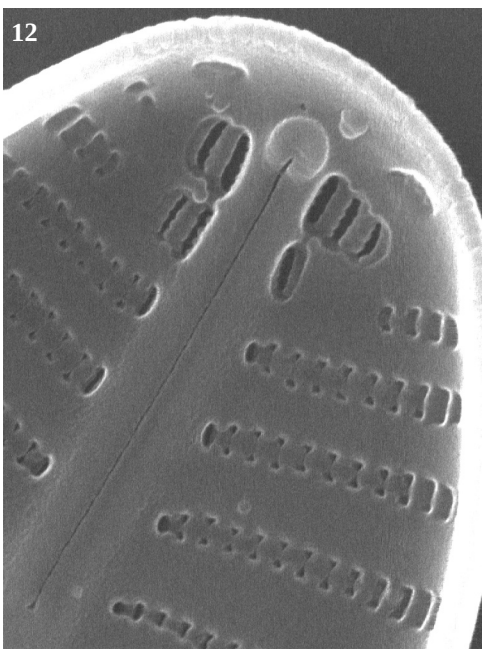
Figs. 1, 2	Lake Burg, sediment BURG 1129
Fig. 3-4	Lake Posets, sediment PYR42
Fig. 5, 8-10	Lake Sen, sediment PYR40
Fig. 11-13	LLake Roumassot, sediment PYR04
Figs. 6-7	Lake Tourrat, sediment PYR23

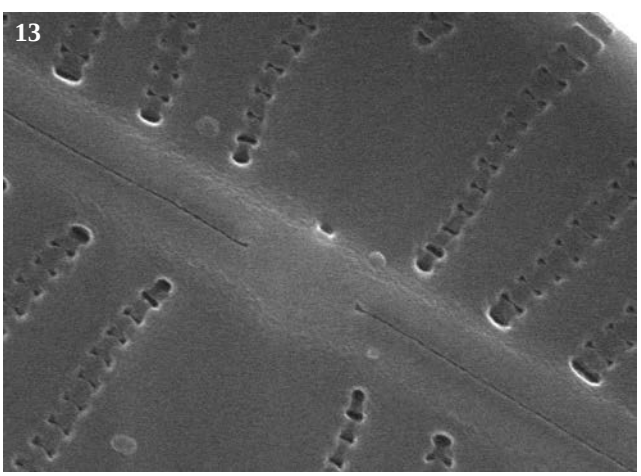
Sample information of Plate 67

Figs. 1, 3, 26, 46	Lake Posets, sediment PYR42	Fig. 31	Burg, sediment BURG 1168
Figs. 2, 4, 45	Lake Llebreta, sediment PYR58	Fig. 32	Lake Chelau, epilithic Epi-PYR41
Fig. 5	Lake Inf. Gallina, sediment PYR87	Fig. 33	Lake Estelat, sediment PYR120
Fig. 6	Lake Forcat Inf, sediment PYR77	Figs. 34-36, 38-40, 49	L. Cregüeña, sediment PYR49
Figs. 7-8, 10-11	Lake Monges, sediment EpiPYR57	Fig. 37	Lake Blau, sediment PYR113
Figs. 9, 27-28	Lake Burg	Figs. 41-42	Lake Sen, sediment PYR40
Fig. 12	Lake Pondiellos, sediment PYR08	Figs. 43-44	Lake Acherito, sediment PYR01
Fig. 13	Lake Sotllo, sediment EpiPYR89	Fig. 47	Lake Albe, sediment PYR96
Fig. 14	Burg, sediment BURG1093	Fig. 48	L. Les Laquettes, sed. PYR27
Figs. 15-18	L. Bleu de Rabassoles, sed. PYR112	Fig. 50	Burg, sediment BURG 1062
Fig. 19	Lake Plan, sediment PYR69	Fig. 51	Burg, sediment BURG 1192
Fig. 20	Lake Negre, sediment PYR79	Figs. 52, 59-62	Burg, sediment BURG 543
Fig. 21	Lake Laurenti, sediment PYR111	Figs. 53-55	Lake Arnales, sediment PYR09
Fig. 22	Lake Mariola, sediment PYR80	Fig. 56	Burg, sediment BURG 853
Fig. 23	Lake Illa, sediment PYR66	Fig. 57	Burg, sediment BURG 953
Fig. 24	Lake Llebreta, epilithic EpiPYR58	Fig. 58	Burg, sediment BURG 1069
Fig. 25	Lake Pica, epilithic EpiPYR100		
Fig. 29	Lake Cap Long, sediment PYR24		
Fig. 30	Lake Coronas, sediment PYR47		









10 μ

Plate 67 LM: x1500, SEM: x3000

Figs. 1-5	*Humidophila perpusilla (Grunow)* Lowe *et al.*
Fig. 6	*Diadesmis fukushimae* Lange-Bertalot, Werum & Broszinski
Figs. 7-9	*Krasskella kriegerana* (Krasske) Ross & Sims
Figs. 10-11	*Microcostatus krasskei* (Hustedt) J.R. Johansen & J.C. Sray
Fig. 12	*Fallacia* sp. No. 1 Pondiellos
Fig. 13	*Fallacia vitrea* (Østrup) Mann
Fig. 14	*Fallacia* cf. *insociabilis (Krasske) Mann*
Figs. 15-19	*Chamaepinnularia mediocris* (Krasske) Lange-Bertalot
Fig. 20	*Chamaepinnularia* sp. No. 1 Negre
Fig. 21	*Chamaepinnularia hassiaca* (Krasske) Cantonati & Lange-Bertalot
Fig. 22	*Chamaepinnularia* sp. No. 3 Mariola
Fig. 23	*Chamaepinnularia* sp. No. 2 Illa
Fig. 24	*Chamaepinnularia* sp 3 Julma Olkky
Fig. 25	*Luticola* sp. No. 1 Pica
Fig. 26	*Luticola* sp. No. 2 Posets
Fig. 27	*Luticola* cf. *nivalis* (Ehrenberg) Mann
Fig. 28	*Luticola* sp. No. 7 Burg
Fig. 29	*Luticola* cf. *mutica* (Kützing) Mann
Fig. 30	*Luticola* sp. No. 5 Coronas
Fig. 31	*Luticola* sp. No. 6 Burg
Fig. 32	*Luticola* sp. No. 3 Chelau
Fig. 33	*Luticola* sp. No. 4 Estelat
Figs. 34-40	*Luticola* cf. *goeppertiana* (Bleisch in Rabenhorst) Mann
Figs. 41-42	*Hippodonta costulata* (Grunow) Lange-Bertalot, Metzeltin & Witkowski
Figs. 43-44	*Hippodonta* cf. *neglecta* Lange-Bertalot, Metzeltin & Witkowski
Figs. 45-48	*Navicula medioconvexa* Hustedt
Figs. 49	*Naviculadicta multiconfusa* Lange-Bertalot
Figs. 50-52	*Navicula glomus* Carter
Figs. 53-55	*Navicula opportuna* Hustedt
Figs. 56-62	*Navicula pseudoventralis* Hustedt sensu Krammer & Lange-Bertalot 1986

See sample information in the previous page

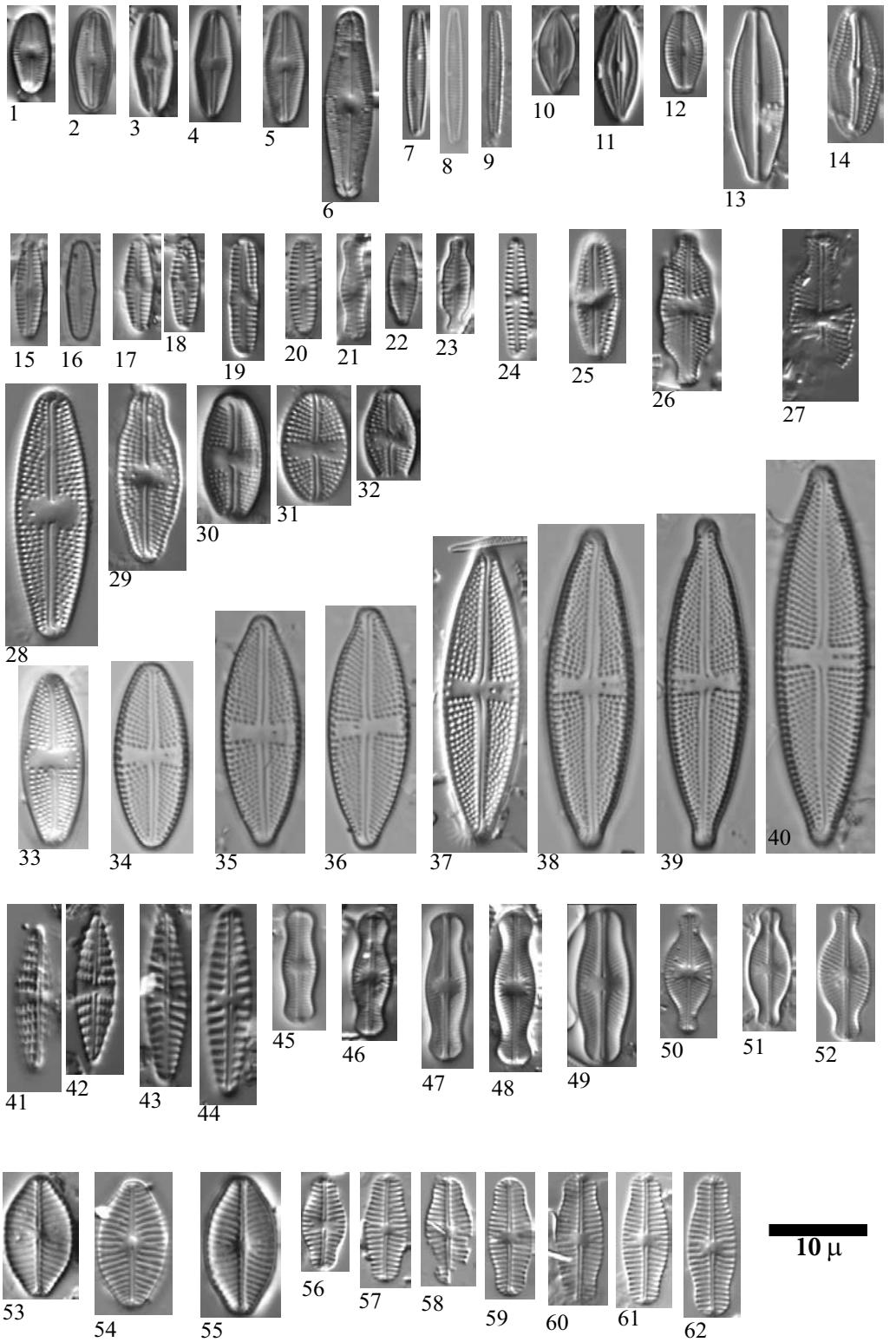

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Plate 68	LM: x1500 SEM: Figs. 12-13 x10000, Fig. 26, 32, 35-37 x6000

Figs. 1-6	*Achnanthes carissima* Lange-Bertalot
Figs. 7-13	*Humidophila schmassmannii* (Hustedt) Buczkó et Wojtal
Figs. 14-17, 26	*Genkalia* sp. (*Naviculadicta* sp. No. 3 Arratille)
Figs. 18-21	*Genkalia* cf. *digitulus* (Hustedt) Lange–Bertalot & Kulikovskiy
Figs. 22-25, 32	*Genkalia digitulus* (Hustedt) Lange–Bertalot & Kulikovskiy
Figs. 27-29	aff. *Navicula fluens* (*Naviculadicta* sp. No. 4 Arratille)
Figs. 30-31	*Naviculadicta* sp. No. 5 Arratille
Figs. 33-37	*Genkalia* cf. *digituloides* (Lange – Bertalot) Lange–Bertalot & Kulikovskiy
Fig. 38	cf. *Mayamaea atomus* (Kützing) Lange-Bertalot

Fig. 1	Lake Coronas, sediment PYR47
Figs. 2, 3-4	Lake Blaou, sediment PYR94
Figs. 5-9, 11-12, 18, 20, 22-25, 33-35	Lake Posets, sediment PYR42
Figs. 10, 19	Lake Sen, sediment PYR40
Figs. 13, 32, 36-37	Lake Redon, sediment REDOM
Figs. 14-17, 28-29, 31	Lake Arratille, sediment PYR11
Fig. 21	Lake Forcat Inf., sediment PYR77
Fig. 26	Lake Burg
Fig. 27	Lake Burg, sediment BURG 1198
Fig. 30	Lake Pondiellos, sediment PYR09
Fig. 38	Lake Burg, sediment BURG 760

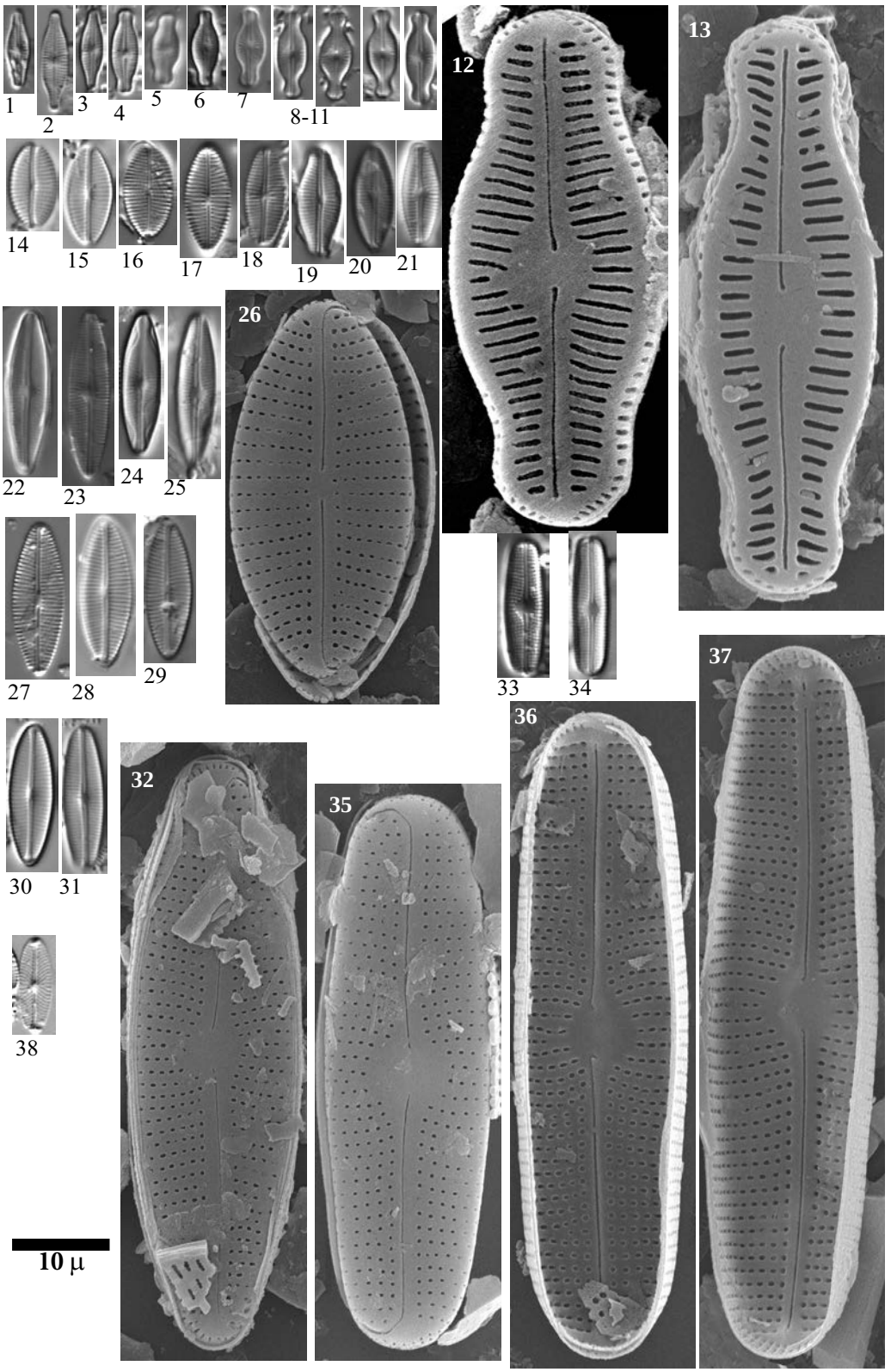
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Plate 69 LM: x1500
SEM: Fig. 50 x10000, Figs. 51-52 x13000

Fig. 1, 50 *Naviculadicta* sp. No. 1 Ensangents
Fig. 2 *Naviculadicta* sp. No. 2 Bersau
Figs. 3-8 15-21 *Eolimna* sp. No. 5 Arnales
Figs. 9-14 *Eolimna* sp. No. 6 Marbore
Figs. 22 *Eolimna* spp.
Fig. 23-26 *Navicula* sp. No. 3 Laurenti
Fig. 27 *Navicula* sp. No. 4 Laquettes
Figs. 29-34 *Sellaphora* cf. *seminulum* (Grunow) D.G. Mann
Figs. 35-40 *Sellaphora* cf. *seminulum* (Grunow) D.G. Mann
Figs. 41-43 *Navicula utermoehli* Hustedt
Fig. 44 *Navicula* cf. *submuralis* Hustedt
Figs. 45-49 *Navicula* sp. No. 7 Bergus
Figs. 51-52 *Navicula* spp.

Figs. 1, 5	Lake Ensangents, sediment PYR106	Fig. 33, 35	L. Inf. de la Gallina, sed. PYR87
Fig. 2	Lake Bersau, epilithic EpiPYR03	Fig. 34	PYR127
Figs. 3-4, 45	Lake Port Bielh, sediment PYR28	Fig. 37	L. Burg, sediment BURG 848
Figs. 6-7, 14, 20, 49	Lake Siscar, sediment PYR126	Fig. 38	L. Burg, sediment BURG 851
Fig. 8	L. Burg, sediment BURG 932	Fig. 39	L. Burg, sediment BURG 932
Figs. 9, 11	L. Helado de Marboré, sed. PYR18	Fig. 40	L. Burg, sediment BURG 853
Figs. 10-13,18, 23, 26	L. Burg	Fig. 41	L. Burg, sediment BURG 831
Figs. 12, 27	Lake Laurenti, sediment PYR111	Fig. 42-44	Lake Arratille, sediment PYR11
Fig. 15	Lake Arnales, sediment PYR09	Fig. 46	L. Burg, sediment BURG 698
Fig. 16	L. Burg, sediment BURG 906	Fig. 47-48	L. Gelat Bergús, sediment PYR65
Fig. 17	L. Burg, sediment BURG 1007		
Figs. 19, 25, 28	Lake Les Laquettes, sediment PYR27		
Fig. 22	L. Burg, sediment BURG 837		
Fig. 24	L. Burg, sediment BURG 1153		
Fig. 26	L. Burg, sediment BURG 1053		
Fig. 32	Lake Sen, sediment PYR40		

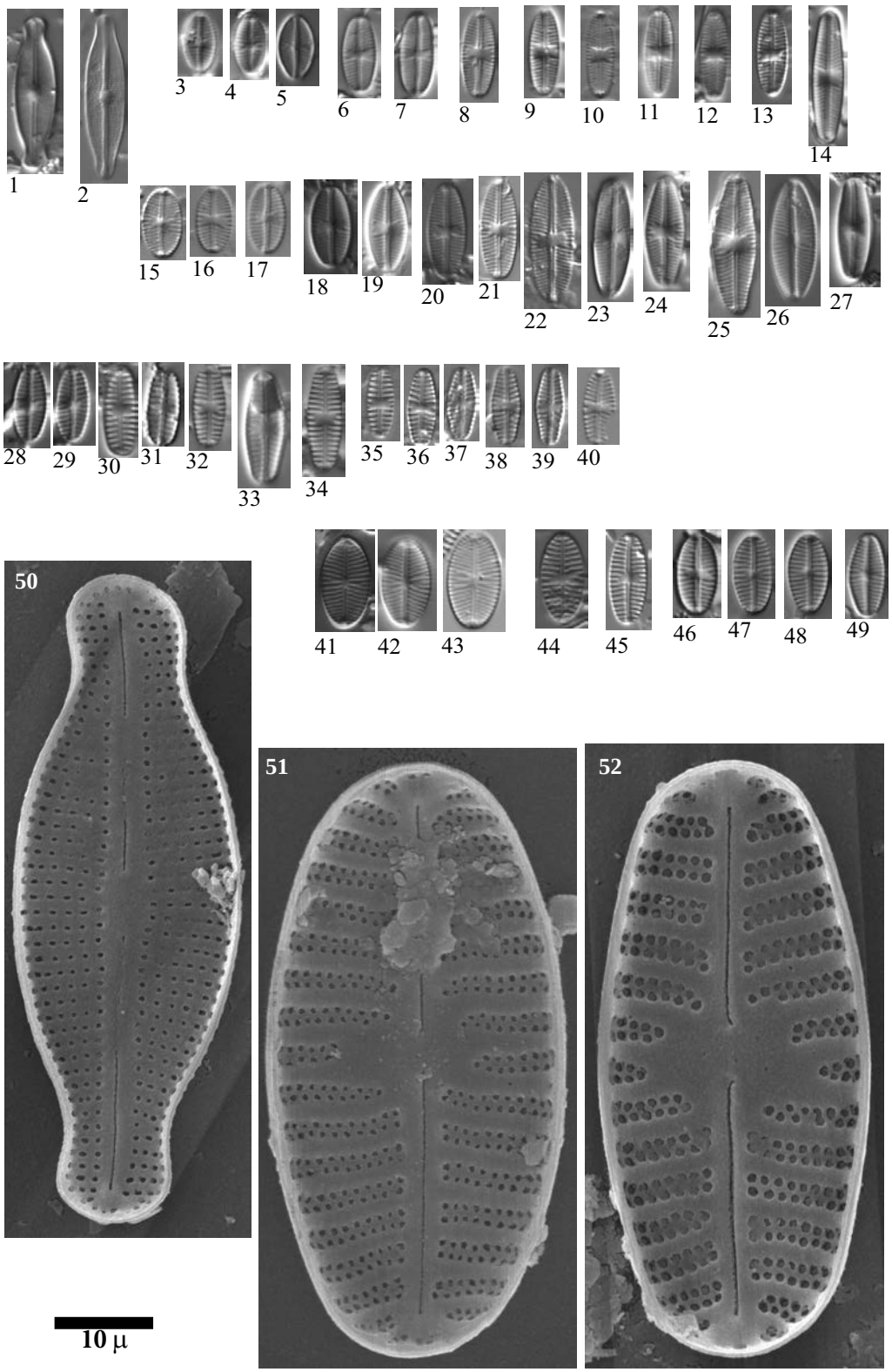
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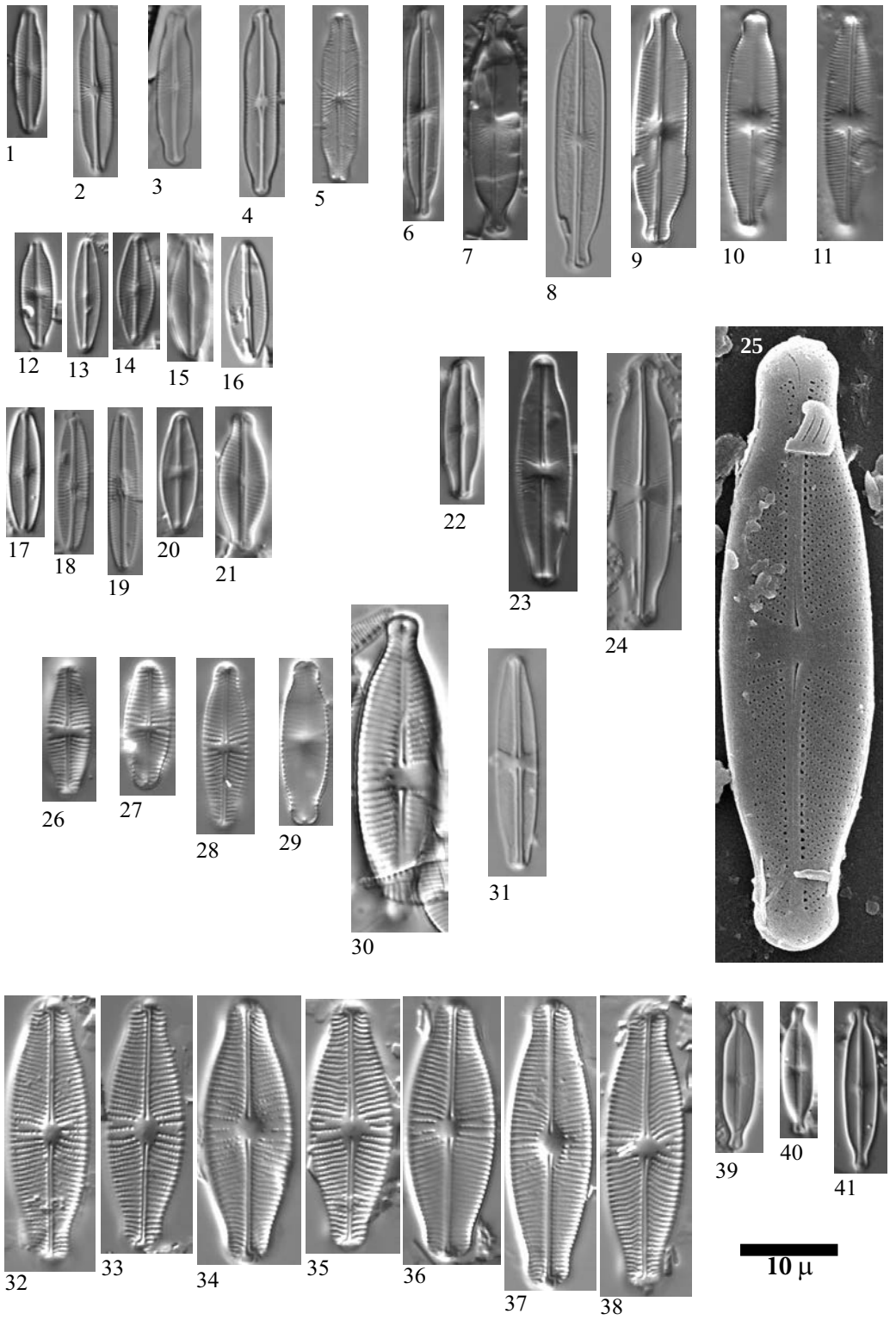
Plate 70	LM: x1500
Fig. 1	*Adlafia* cf. *suchlandtii* (Hustedt) Lange-Bertalot
Fig. 2	*Adlafia bryophila* (Petersen) Lange-Bertalot
Figs. 3-4	*Adlafia aquaeductae* (Krasske) Moser, Lange-Bertalot & Metzeltin
Fig. 5	*Adlafia* sp. No. 1 Barroude
Fig. 6	*Kobayasiella parasubtilissima* (Kobayasi & Nagumo) Lange-Bertalot
Figs. 7-8	*Kobayasiella subtilissima* (Cleve) Lange-Bertalot
Figs. 9-11	*Navicula brockmanni* Hustedt
Fig. 12	*Adlafia bryophila* (Petersen) Lange-Bertalot sensu lato
Fig. 13	*Adlafia* cf. *minuscula* (Grunow) H. Lange-Bertalot
Figs. 14-16	*Adlafia minuscula* (Grunow) H. Lange-Bertalot
Figs. 17-19	*Adlafia* cf. *suchlandtii* (Hustedt) Lange-Bertalot
Fig. 20	*Sellaphora* cf. *nanoides* Lange-Bertalot, Cavacini, Tagliaventi & Alfinito
Fig. 21	*Navicula* sp. No. 1 Laurenti
Figs. 22, 25	*Naviculadicta* cf. *difficillima* Hustedt
Figs. 23-24	*Naviculadicta* cf. *stauroneioides* Lange-Bertalot
Figs. 26-29	*Navicula absoluta* Hustedt sensu lato
Fig. 30	? *Placoneis* sp
Fig. 31	cf. *Navicula gerloffii* Schimanski
Figs. 32-38	*Navicula laterostrata* Hustedt
Figs. 39-40	*Kobayasiella* sp. 1 Seno cf. *Nupela tenuicephala* (Hustedt) Lange-Bertalot
Fig. 41	*Kobayasiella* sp. 2 Bleu

Fig. 1	Lake Coronas, sediment PYR70
Fig. 2	Lake Blaou, epilithic EpiPYR43
Fig. 3	Lake Posets, sediment PYR01
Fig. 4	Lake Sen, sediment PYR43
Fig. 5	Lake Blaou, epilithic EpiPYR29
Figs. 6, 40	Lake Sen, sediment PYR57
Fig. 7	Lake Sen, sediment PYR85
Fig. 8	Lake Sen, sediment PYR84

See next page for the others samples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10 µ

Plate 71	LM: x1500 SEM: x4500

Figs. 1-6	*Naviculadicta vitabunda* (Hustedt) Lange-Bertalot
Fig. 7	*Craticula molestiformis* (Hustedt) Mayama
Figs. 8-9	*Craticula submolesta* (Hustedt) Lange-Bertalot
Fig. 10	*Craticula* cf. *vixnegligenda* Lange-Bertalot
Fig. 11	*Craticula* sp. No. 1 Burg
Fig. 12	*Craticula cuspidata* (Kützing) Mann

Fig. 1	Lake Burg, sediment BURG 760
Figs. 2-3	Lake Port Bielh, sediment PYR28
Fig. 4	Lake Canals Roges, sediment PYR124
Figs. 5-6	Lake Burg, sediment BURG 543
Fig. 7	Lake Siscar, sediment PYR126
Fig. 8	Lake Coronas, sediment PYR47
Fig. 9	Lake Redon, sediment REDOM
Fig. 10	Lake Llosás, sediment PYR46
Fig. 11	L. Burg, sediment BURG 1070

Sample information of Plate 70

Fig. 9	L. Burg, sediment BURG 880	Fig. 35	Lake Burg, sediment BURG 694
Figs. 10-11	Lake Burg, sediment BURG 987	Figs. 39	LLake Senó, epilithic EpiPYR84
Figs. 12	Lake Mariola, epilithic EpiPYR80	Fig. 41	L. Bleu de Rabassoles, EpiPYR112
Fig. 13	Lake Arratille, sediment PYR11		
Figs. 14, 20	Lake Cap Long, sediment PYR24		
Figs. 15, 17	Lake Siscar, sediment PYR126		
Figs. 16	Lake Bleu, epilithic EpiPYR22		
Figs. 18-19	Lake Inf. de la Gallina, sediment PYR87		
Fig. 21	Lake Laurenti, sediment PYR111		
Figs. 22-23	Lake Coronas, sediment PYR47		
Fig. 24	Lake Albe, sediment PYR96		
Fig. 26	Lake Negre, epilithic EpiPYR108		
Fig. 27	Lake Burg, sediment BURG 1080		
Fig. 28-29	Lake Burg, sediment BURG 543		
Fig. 30	L. Helado Monte Perdido, sediment PYR19		
Fig. 31	Lake Mariola, sediment PYR80		
Figs. 32-34, 36-38	Lake Burg, sediment BURG 543		

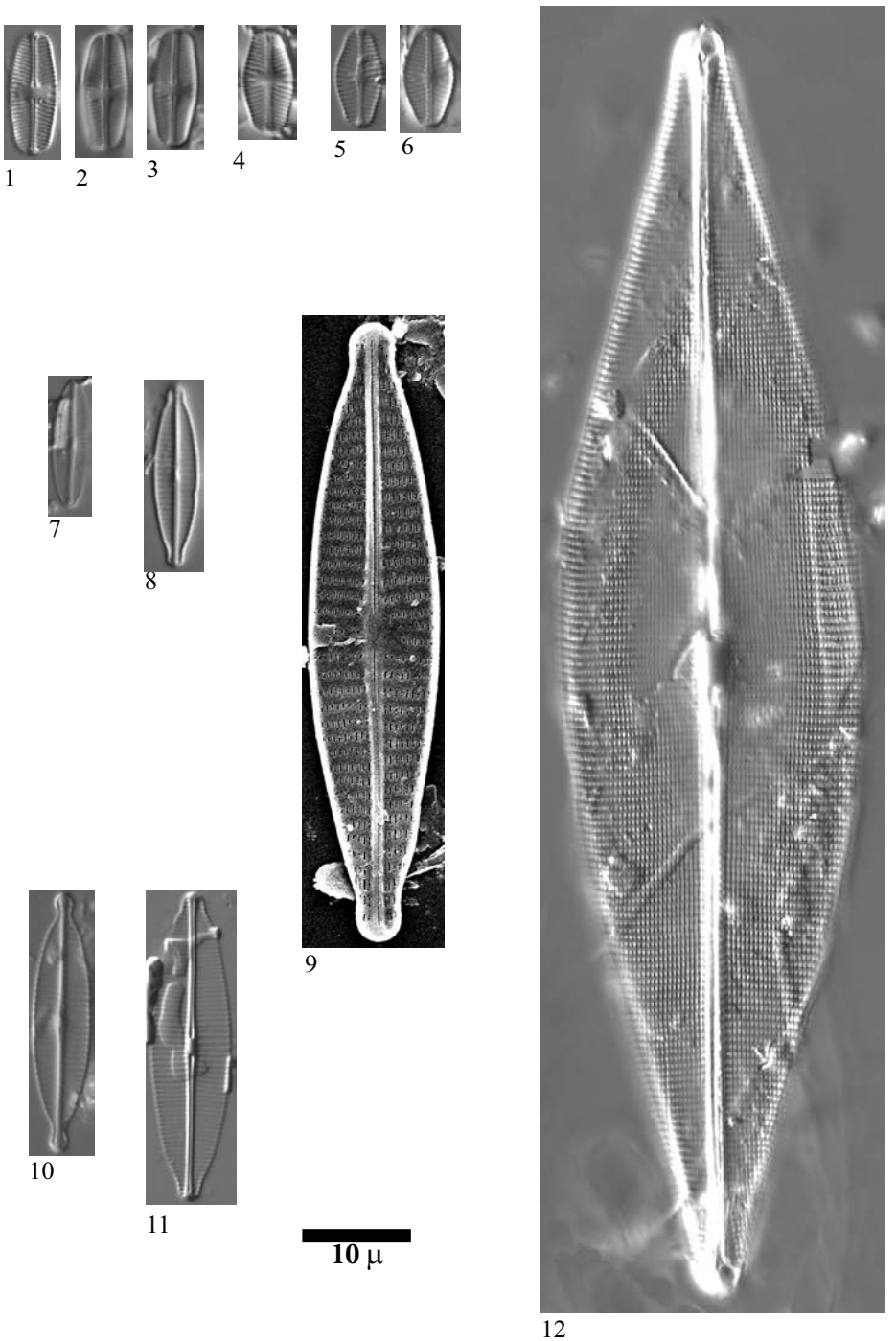
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Plate 72	LM: x1500 SEM: Fig. 4 x1100, Fig. 5 x4000, Fig. 11 x10000

Fig. 1	*Gyrosigma* sp. No. 2 Mora
Figs. 2-9	*Gyrosigma* sp. No. 1 Sen

Fig. 1	Lake Basa de la Mora, sediment PYR32
Figs. 2-3	Lake Sen, sediment PYR40
Figs. 6-7	Lake Arratille, sediment PYR11
Figs. 4-5, 9	Lake Laurenti, sediment PYR111

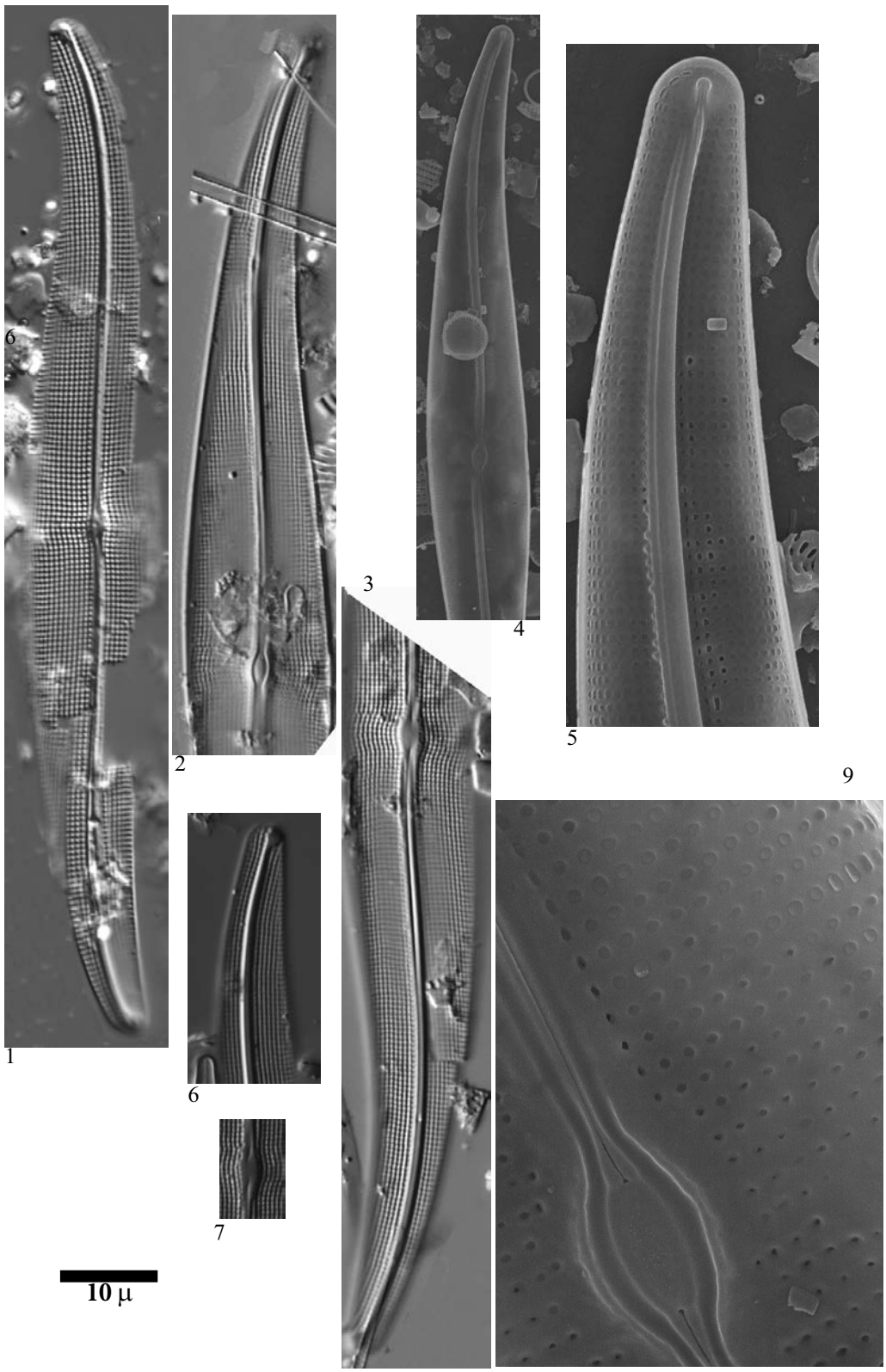
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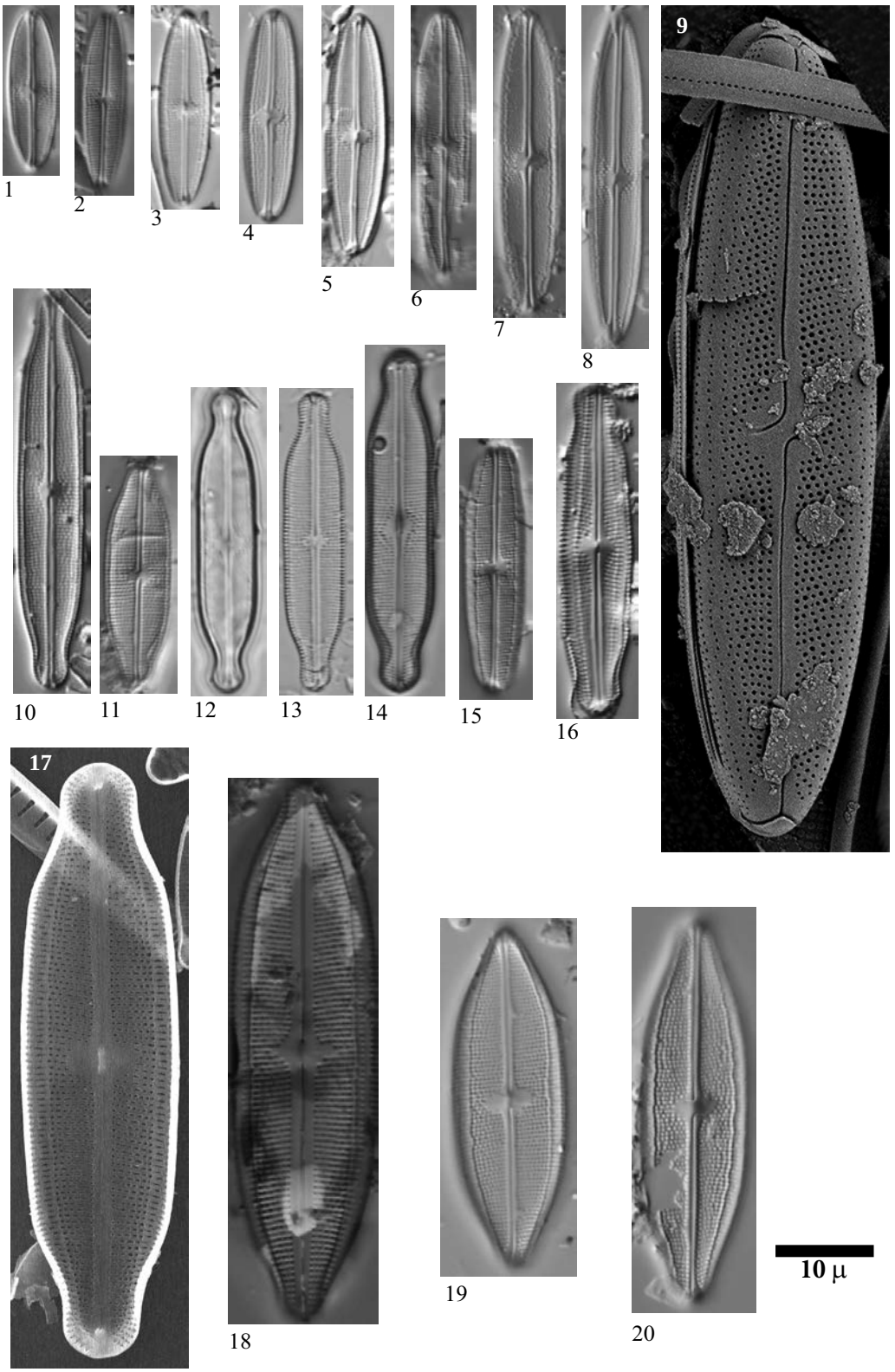
Plate 73	LM: x1500 SEM: Fig. 9 x5000, Fig. 17x2500

Figs. 1-9	*Neidium alpinum* Hustedt
Figs. 10-13	*Neidium affine* (Ehrenberg) Pfitzer sensu lato
Figs. 14-15	*Neidium longiceps* (Gregory) Ross
Fig. 16	*Neidiopsis* cf. *levanderi* (Hustedt) Lange-Bertalot & Metzeltin
Fig. 17	*Neidium* sp.
Fig. 18	*Neidium* cf. *dubium* (Ehrenberg) Cleve
Fig. 19-20	*Neidium* sp. No. 1 Illa

Figs. 1, 6, 15	Lake Gelat Bergús, sediment PYR65
Fig. 2	Lake Monges, sediment PYR57
Figs. 3, 5, 19	Lake Illa, sediment PYR66
Fig. 4	Lake Angonella, sediment PYR78
Fig. 7	Lake Negre, sediment PYR79
Fig. 8	Lake Bleu de Rabassoles, sediment PYR112
Fig. 9	Lake Bersau, sediment PYR03
Fig. 10	Lake Sen, sediment PYR40
Fig. 11	Lake Posets, sediment PYR42
Fig. 12	Lake Aixeus, sediment PYR92
Fig. 13	Lake Forcat Inf., sediment PYR77
Fig. 14	Lake Bachimala, sediment PYR31
Fig. 16	Lake Port Bielh, sediment PYR28
Fig. 17	Lake Arnales, epilithic EpiPYR09
Fig. 18	Lake Acherito, sediment PYR01
Fig. 20	Lake Senó, sediment PYR84

Fig. 9	Manfred Ruppel photo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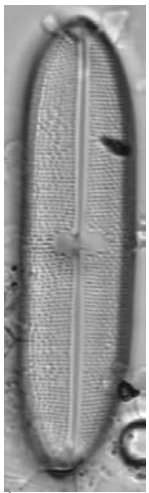
10 µ

Plate 74	LM: x1500 SEM: x3000

Figs. 1-2	*Neidium* sp. No. 2 Illa cf. Julma 1 in Lange-Bertalot & Metzeltin 1996
Fig. 3	*Neidium* sp. No. 3 cf. Julma 5 in Lange-Bertalot & Metzeltin 1996
Fig. 4	*Neidium* cf. *ampliatum* (Ehrenberg) Krammer
Fig. 5	*Neidium* sp. No. 4 cf. Julma 2 in Lange-Bertalot & Metzeltin 1996
Fig. 6	*Neidium bisulcatum* (Lagerstedt) Cleve sensu Krammer

Figs. 1, 3, 5	Lake Illa, sediment PYR66
Fig. 2	Lake Garbet, sediment PYR81
Fig. 4	Lake Arratille, sediment PYR11
Fig. 6	Lake Port Bielh, sediment PYR28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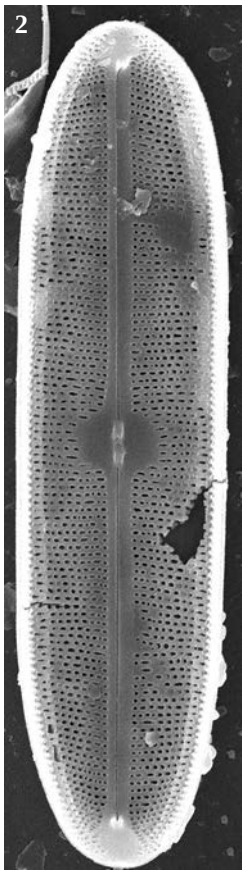

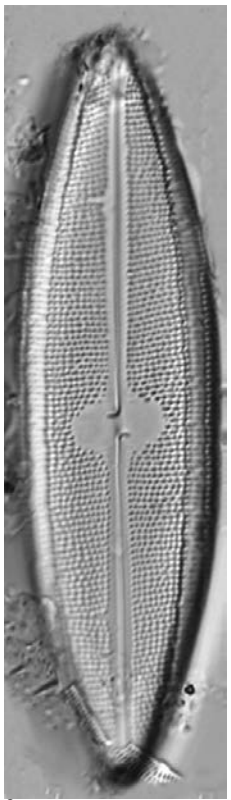
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4

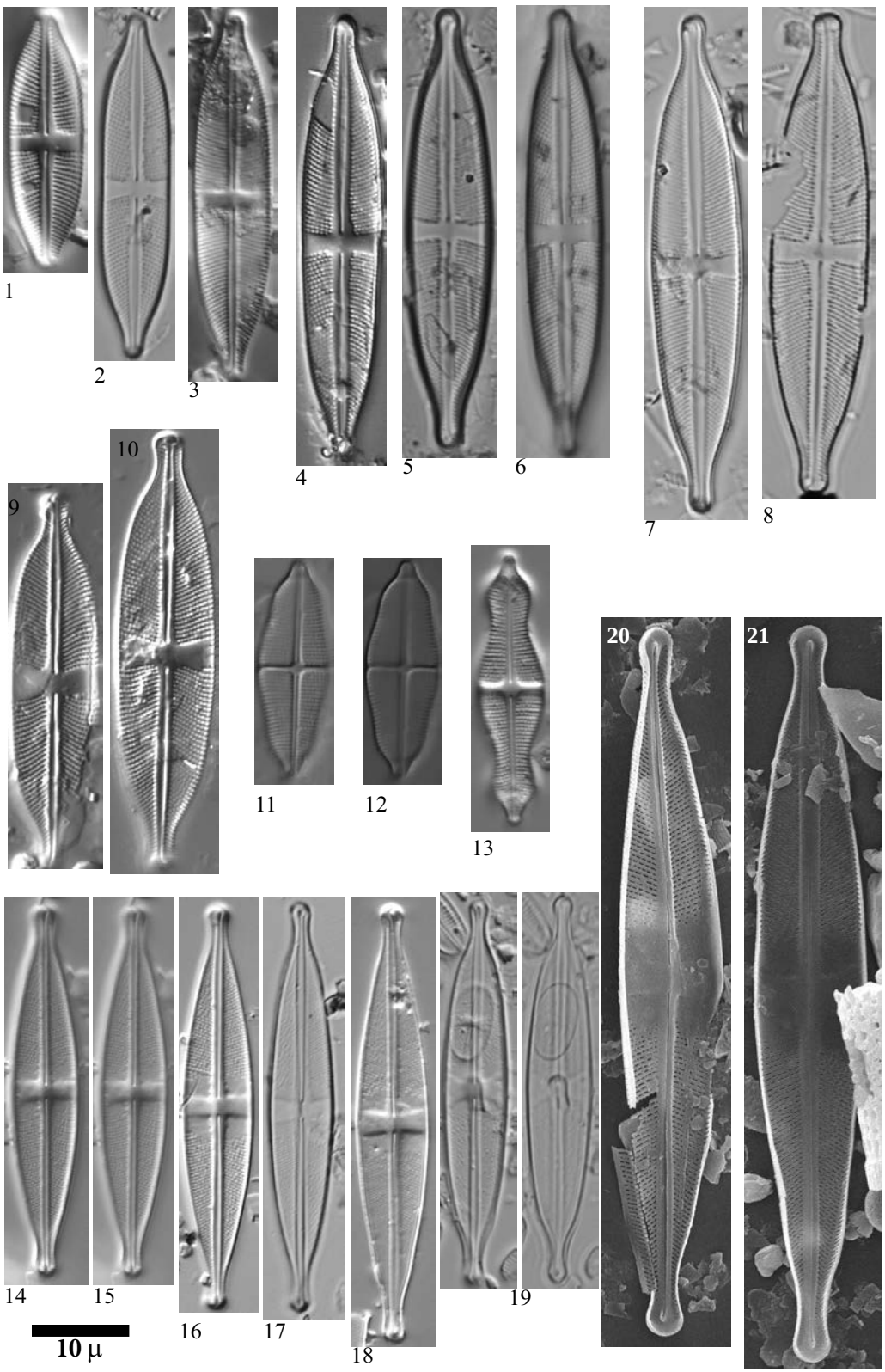

6

10 µ

Plate 75	LM: x1500 SEM: x2500

Figs. 1, 8	*Stauroneis* sp. No. 8 Illa *Stauroneis* cf. *acidoclinata* Lange-Bertalot & Werum
Figs. 2-7	*Stauroneis* cf. *acidoclinata* Lange-Bertalot & Werum
Figs. 9-10	*Stauroneis* cf. *reichardtii* Lange-Bertalot, Cavacini, Tagliaventi & Alfinito
Figs. 11-13	*Stauroneis smithii* Grunow
Figs. 14-18	*Stauroneis neohyalina* Lange-Bertalot & Kramme
Figs. 19-21	*Stauroneis* sp. No. 9 Forcat

Figs. 1, 3	Lake Illa, sediment PYR66
Figs. 2, 4, 6	Lake Posets, sediment PYR42
Figs. 5, 7, 18-19	Lake Forcat Inf., sediment PYR77
Fig. 8	Lake Baiao Superior, sediment PYR76
Figs. 9-12	Palaeolake Burg
Fig. 13	Lake Helado de Marboré, sediment PYR18
Figs. 14-16	Lake Inf. de la Gallina, sediment PYR87
Fig. 17	Lake Pixón, sediment PYR44
Figs. 20-21	Lake Redon, sediment REDOM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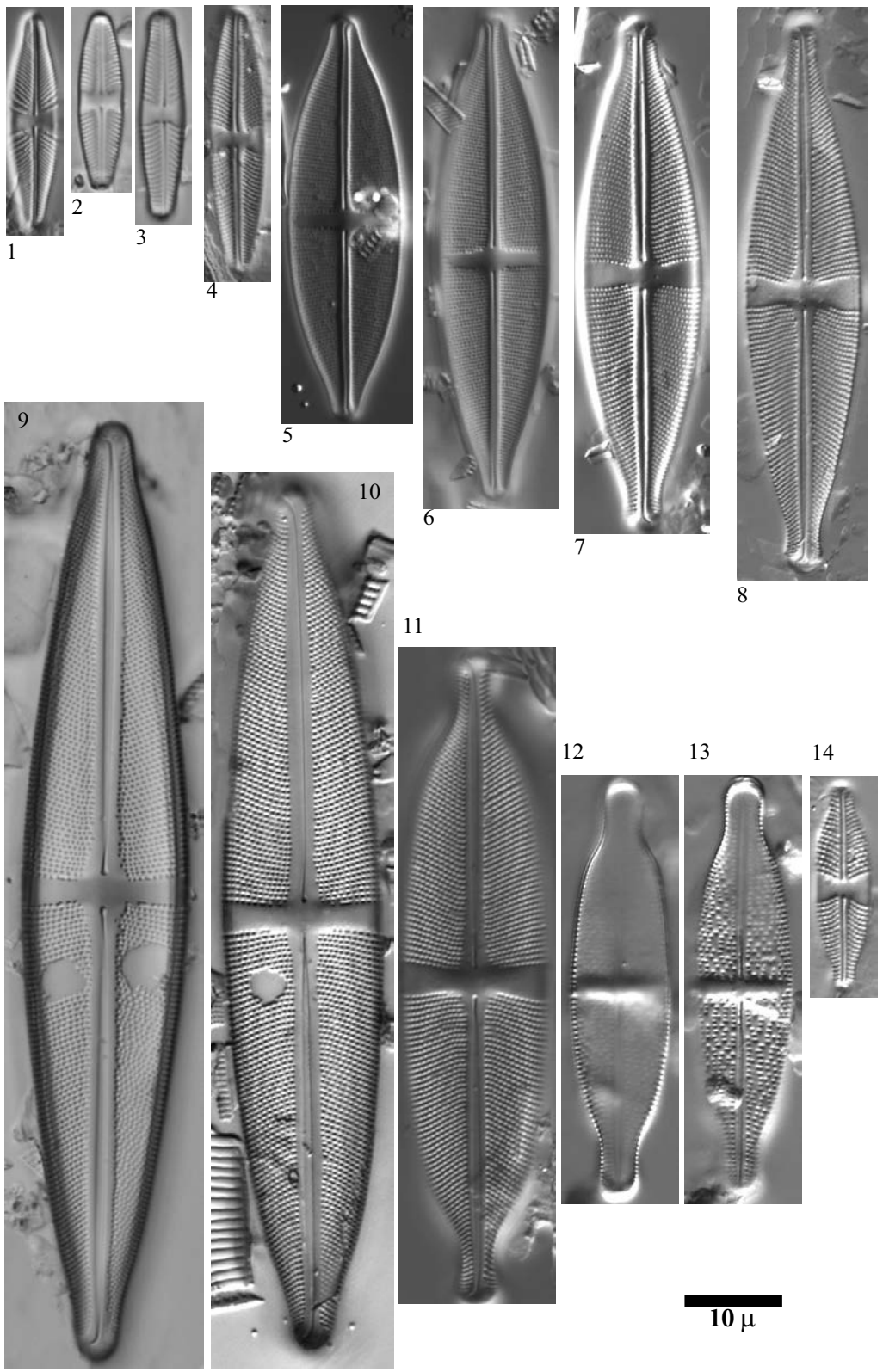
10 µ

Plate 76 LM: x1500

Fig. 1	*Stauroneis* sp. No. 1 Tristaina
Figs. 2-3	*Stauroneis* sp. aff. *borrichii* Lund, No. 2 Illa
Fig. 4	*Stauroneis* sp. No. 3 Negre
Figs. 5-6	*Stauroneis siberica* (Grunow) Lange-Bertalot & Krammer
Figs. 7-8	*Stauroneis* sp. No. 4 Burg
Figs. 9-10	*Stauroneis gracilis* Ehrenberg
Fig. 11	*Stauroneis* sp. No. 5 Illa
Figs. 12-13	*Stauroneis* sp. No. 6 Burg
Fig. 14	*Stauroneis* sp. aff. *borrichii* Lund, No. 7 Burg

Fig. 1	Lake Mes Amunt de Tristaina, sediment PYR86
Figs. 2, 11	Lake Illa, sediment PYR66
Fig. 3	Lake Cregüeña, sediment PYR49
Fig. 4	Lake Negre, sediment PYR79
Fig. 5	Lake Arratille, sediment PYR11
Fig. 6	Lake Port Bielh, sediment PYR28
Fig. 7	Lake Burg, sediment BURG 616
Fig. 8	Lake Burg, sediment BURG 729
Fig. 9	Lake Posets, sediment PYR42
Fig. 10	Lake Les Laquettes, sediment PYR27
Figs. 12-13	Lake Burg, sediment BURG 755
Fig. 14	Lake Burg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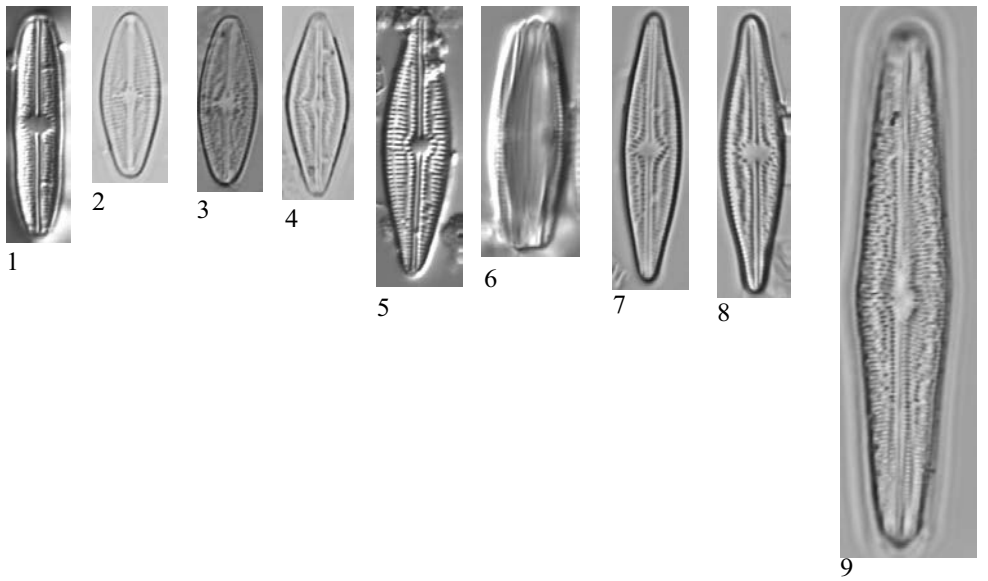
10 µ

Plate 77	LM: x1500 SEM: 11-14 x4000, 15 x25000

Fig. 1	*Brachysira zellensis* (Grunow) Round & Mann
Figs. 2-6, 10	*Brachysira brebissonii* Ross
Figs. 7-8 11-13	*Brachysira intermedia* (Østrup) Lange-Bertalot
Fig. 9	*Brachysira* cf. *brebissonii* Ross

Fig. 1	Lake Arratille, sediment PYR11
Fig. 2	Lake Baiao Superior, sediment PYR76
Figs. 3, 7-9	Lake Seno, sediment PYR84
Fig. 4	Lake Aixeus, sediment PYR92
Figs. 5-6, 13	Lake Posets, sediment PYR42
Figs. 10-11	Lake Redon, sediment REDOM
Fig. 12	Lake Port Bielh, epilithic PYR28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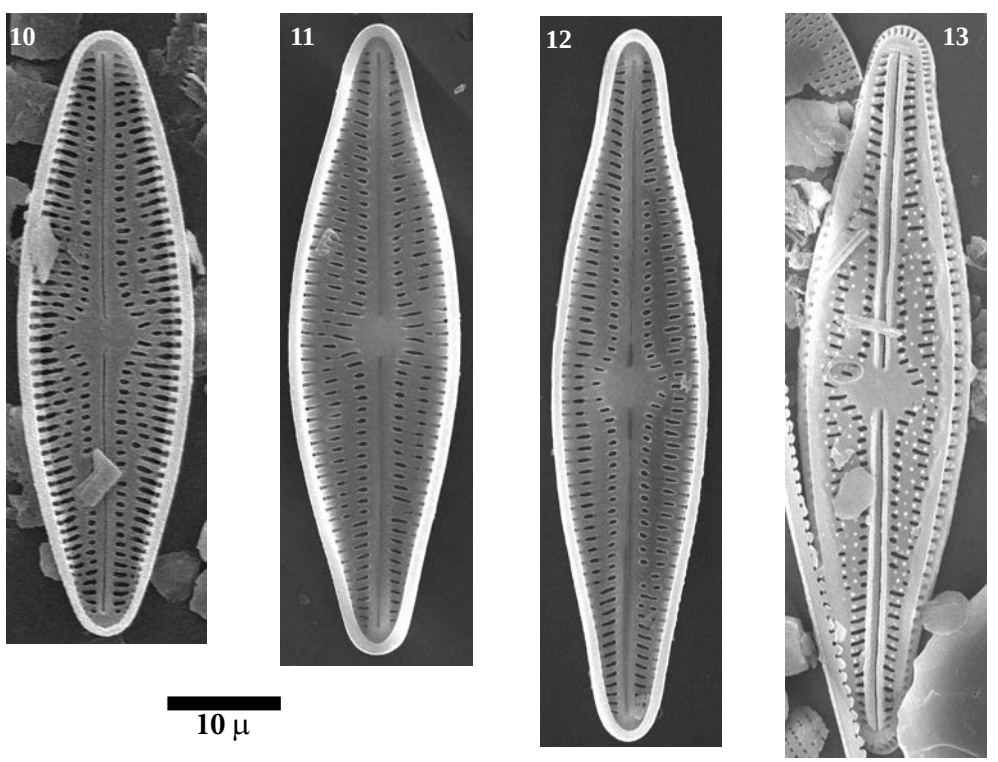
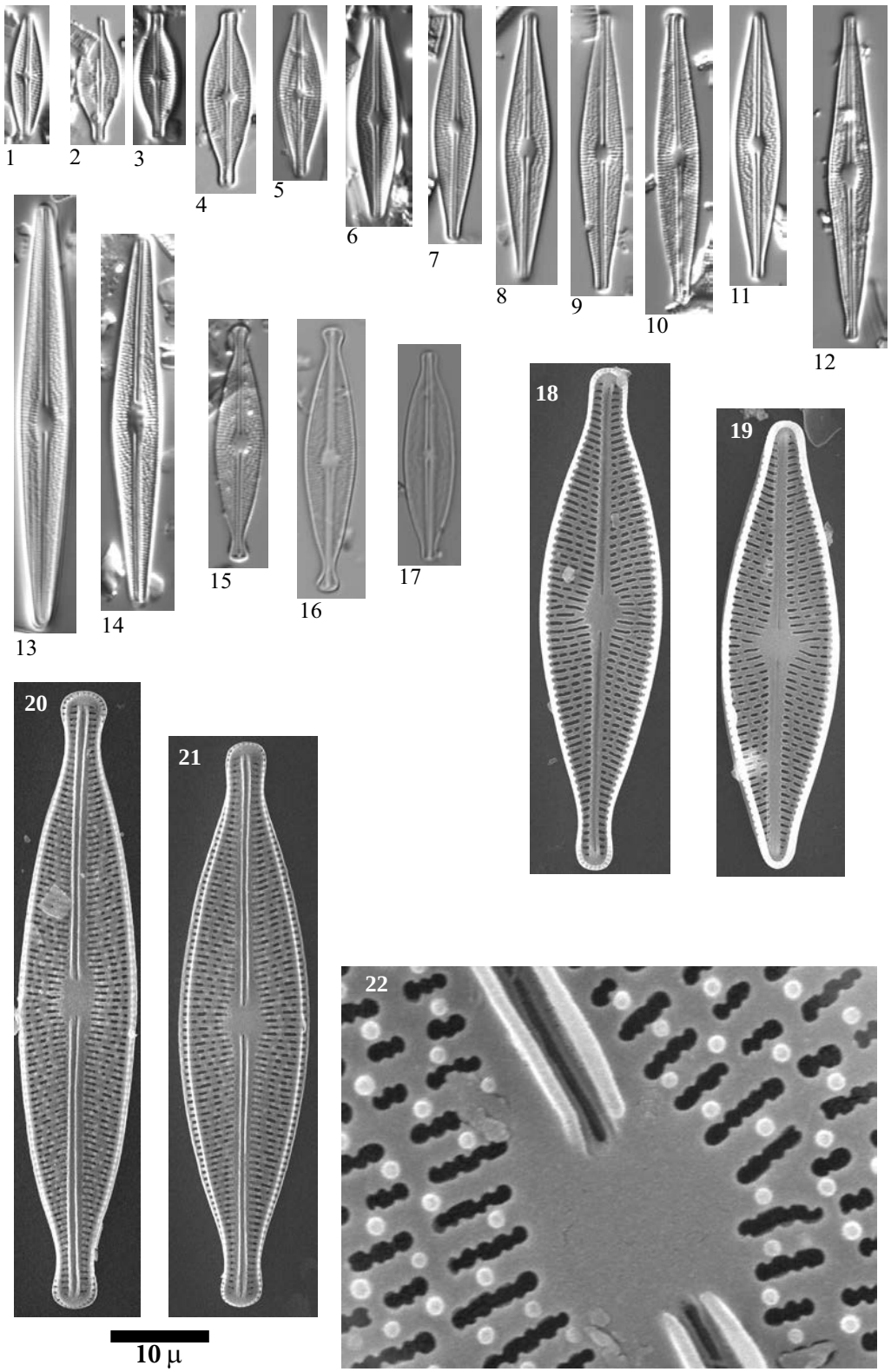

10
11
12
13
10 μ

Plate 78	LM: x1500 SEM: x4000

Figs. 1-12, 15-16 18-22	*Brachysira neoexilis* Lange-Bertalot
Figs. 13-14	*Brachysira* cf. *procera* Lange-Bertalot
Fig. 17	*Brachysira* cf. *neglectissima* Lange-Bertalot

Figs. 1, 10, 12	Lake Les Laquettes, sediment PYR27
Figs. 2-3, 15	Lake Posets, sediment PYR42
Fig. 4	Lake Sen, sediment PYR40
Figs. 5, 11	Lake Long de Liat, sediment PYR55
Figs. 7-9, 13-14	Lake Llebreta, sediment PYR58
Fig. 16	Lake Bachimala Sup., sediment PYR31
Fig. 17	Lake Arratille, sediment PYR11
Figs. 6, 18-21	Lake Port Bielh, epilithic EpiPYR28
Fig. 22	Lake Redon, sediment REDOM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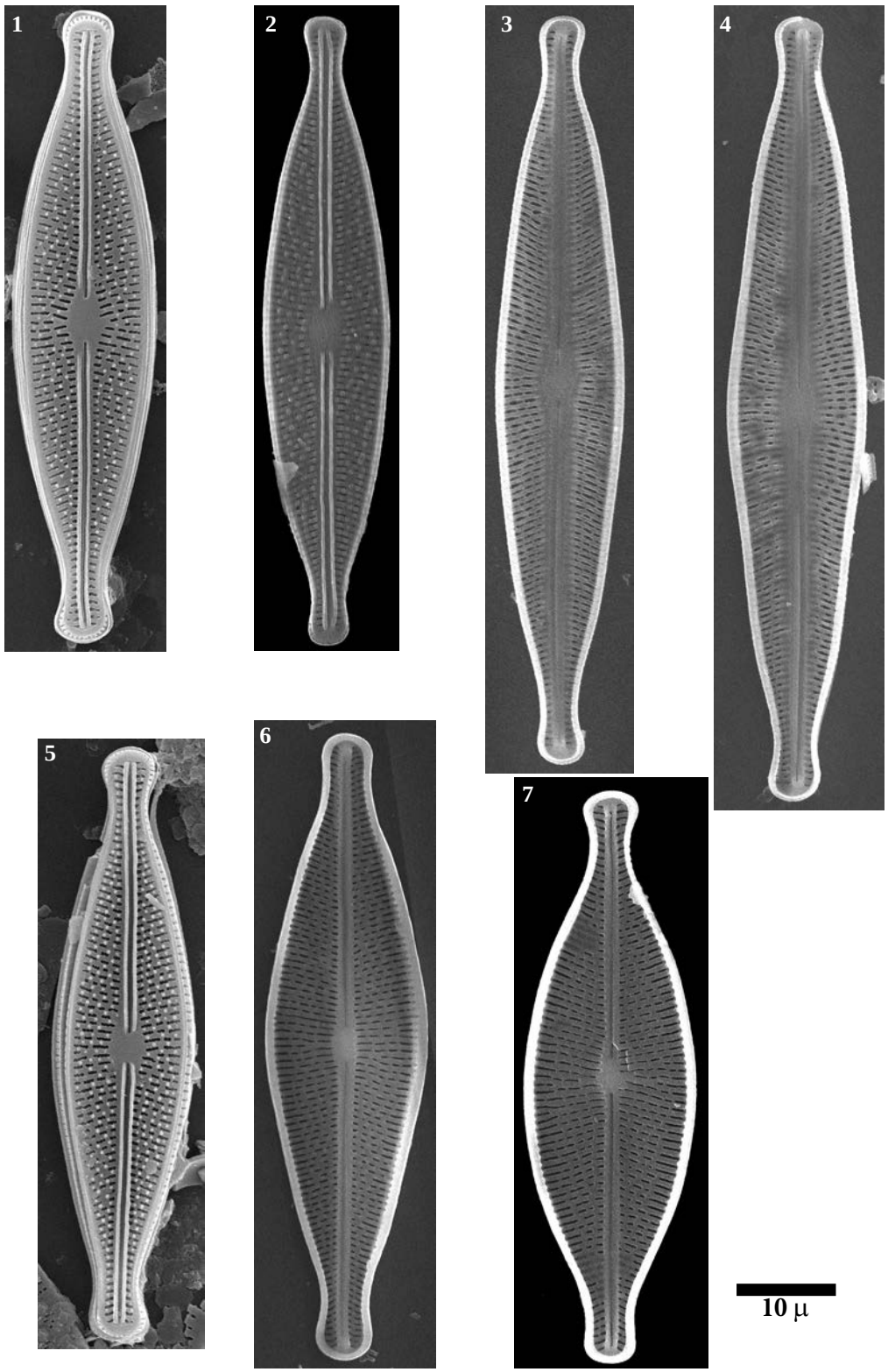
10 µ

Plate 79	LM: x1500 SEM: x4000

Figs. 1-6	*Brachysira neoexilis* Lange-Bertalot
Fig. 7	*Brachysira* cf. *vitrea* (Grunow) Ross

Figs. 1, 2, 5	Lake Redon, sediment REDOM
Fig. 7	Lake Arnales, sediment PYR09
Figs. 3-4, 6	Lake Sen, sediment EpiPYR28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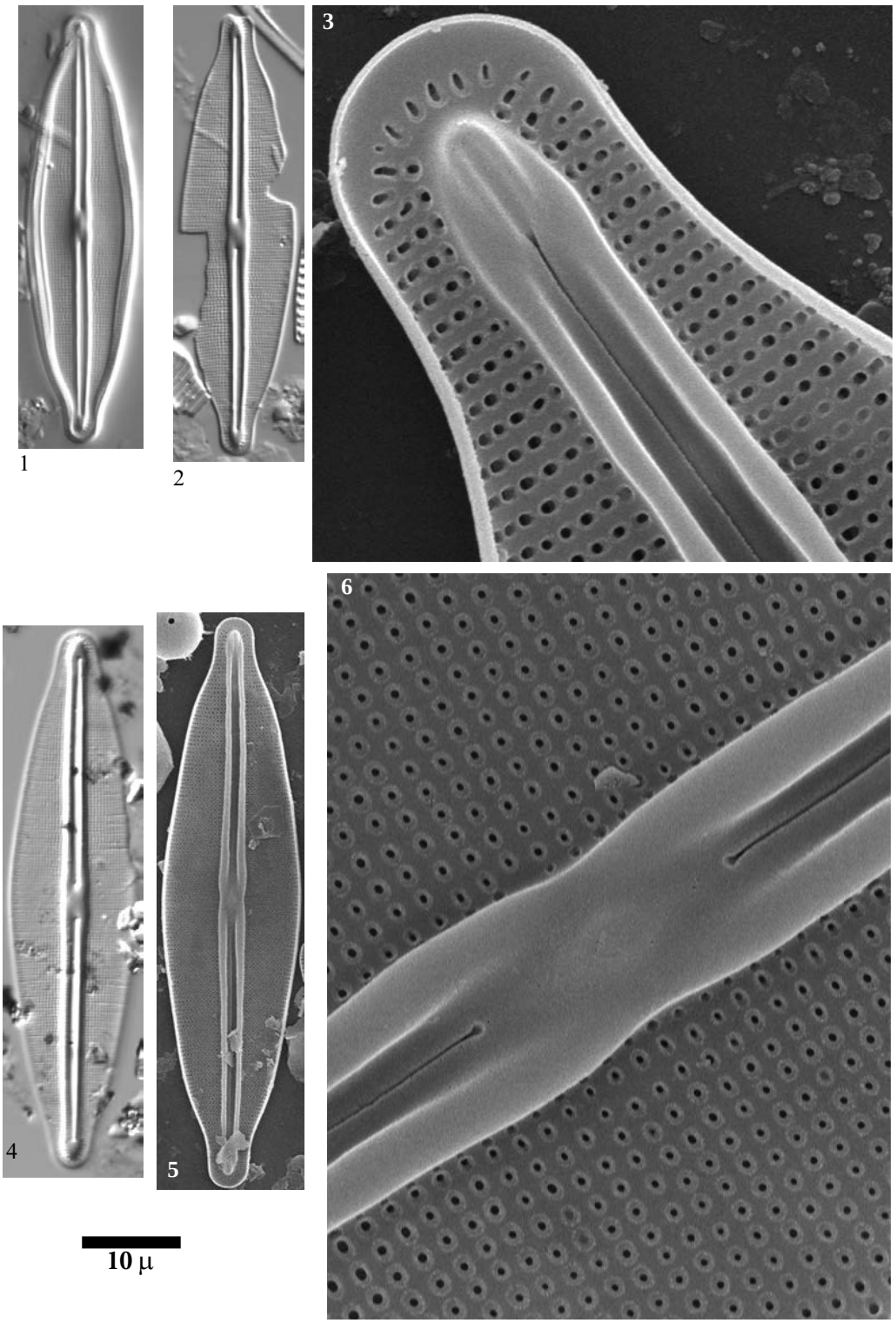
7
10 µ

Plate 80	LM: x1500 SEM: Figs. 3,6 x15000, Fig. 5 x2000

Figs. 1-6	*Frustulia crassinervia* (Brébisson) Lange-Bertalot et Krammer

Figs. 1, 2	Lake Gelat Bergús, sediment PYR65
Figs. 3, 5-6	Lake Redon, sediment REDOM
Fig. 4	Lake Pica Palomera, sediment PYR52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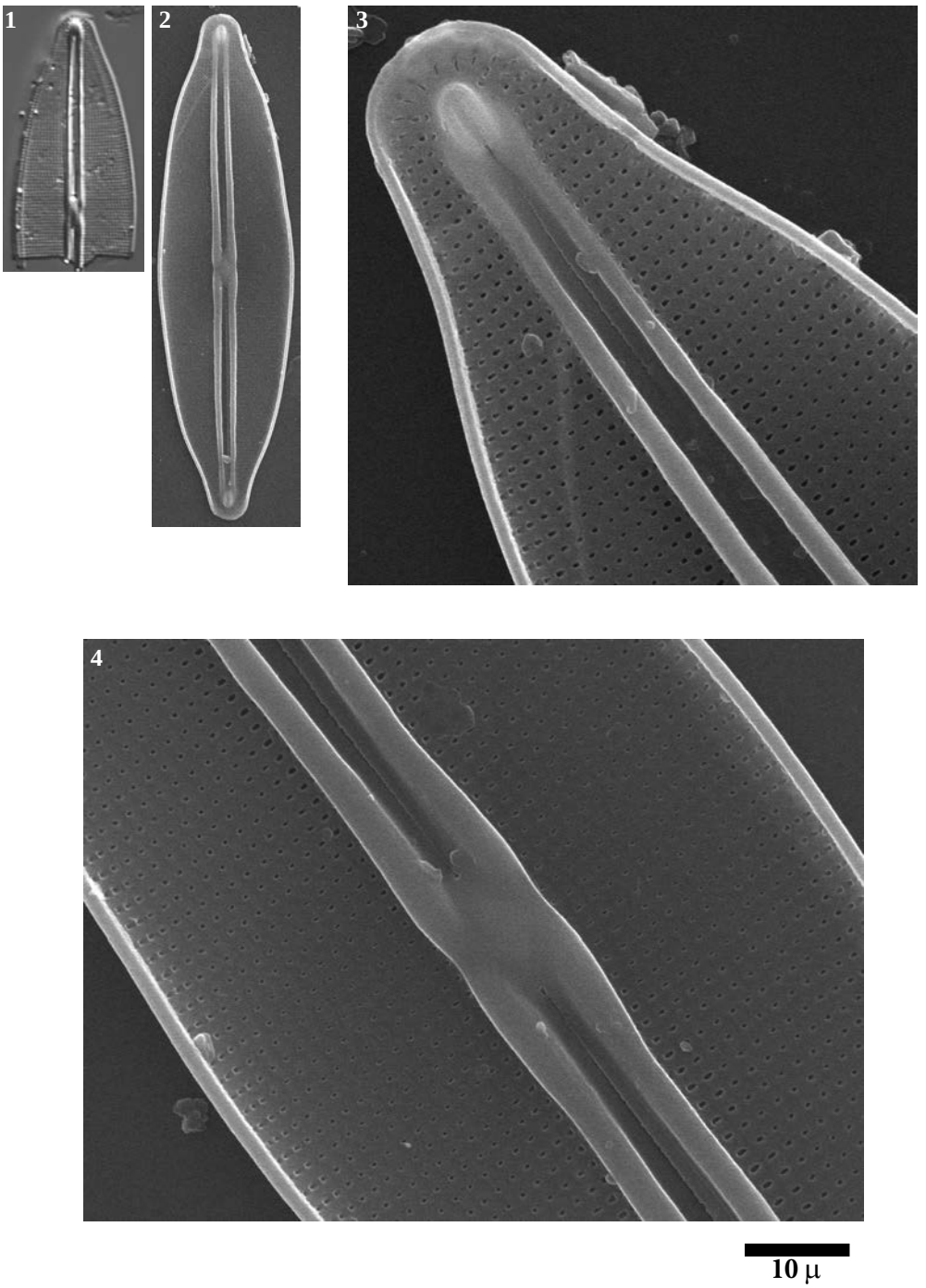
10 µ

Plate 81	LM: x1500 SEM: Fig. 2 x1500, Figs. 3-4 x10000

Figs. 1-4 *Frustulia* cf. *crassinervia* (Brébisson) Lange-Bertalot et Krammer

Fig. 1	Lake Pica Palomera, sediment PYR52
Figs. 2-4	Lake Mariola, epilithic EpiPYR80


1
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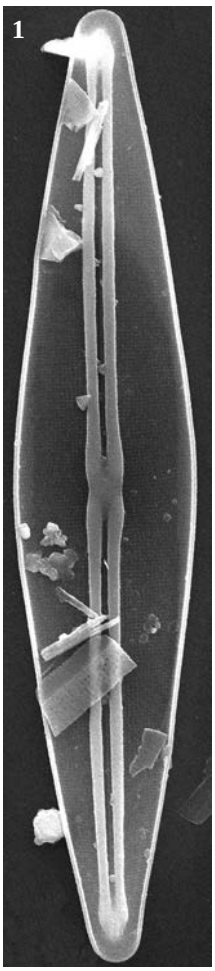
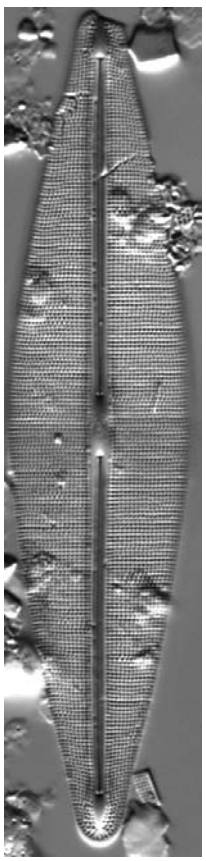
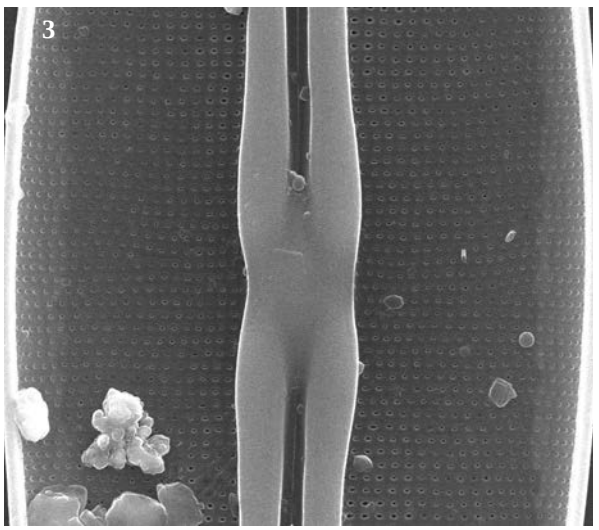
10 µ

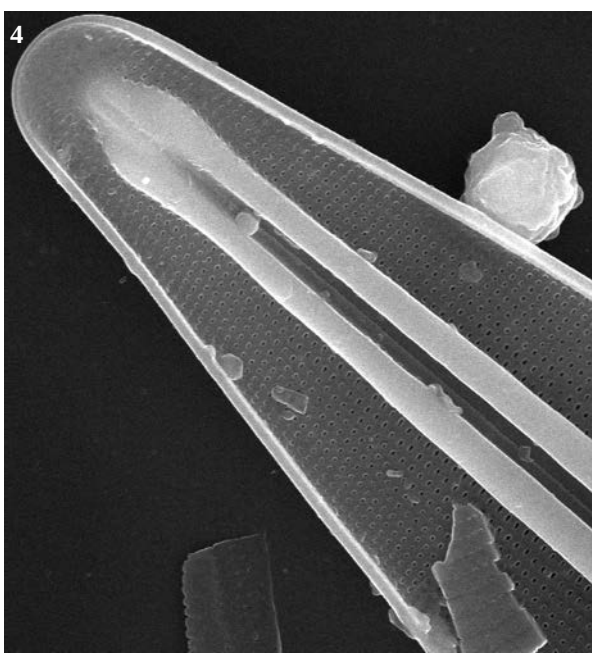
Plate 82	LM: x1500 SEM: Fig. 2 x2000, Figs. 3-4 x5000

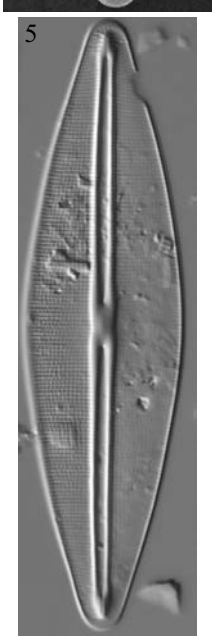
Figs. 1-6	*Frustulia* cf. *saxonica* Rabenhorst
Figs. 1, 3-5	Lake Senó, epilithic EpiPYR84
Fig. 2	Lake Monges, sediment PYR57
Fig. 6	Lake Bleu de Rabassoles, epilithic EpiPYR112

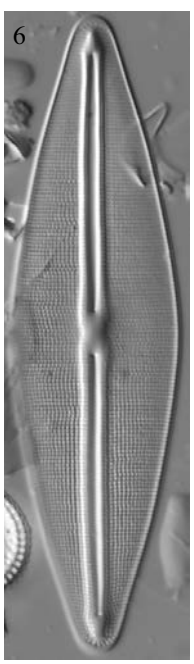










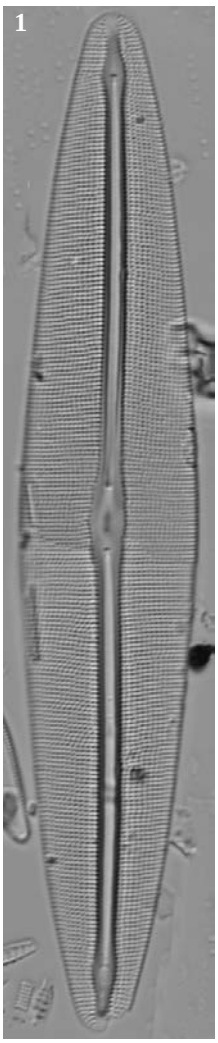


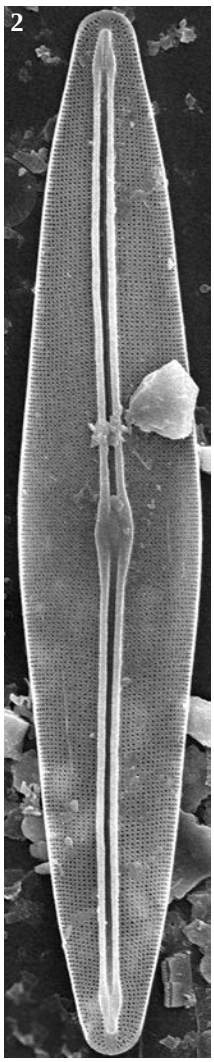
10 μ

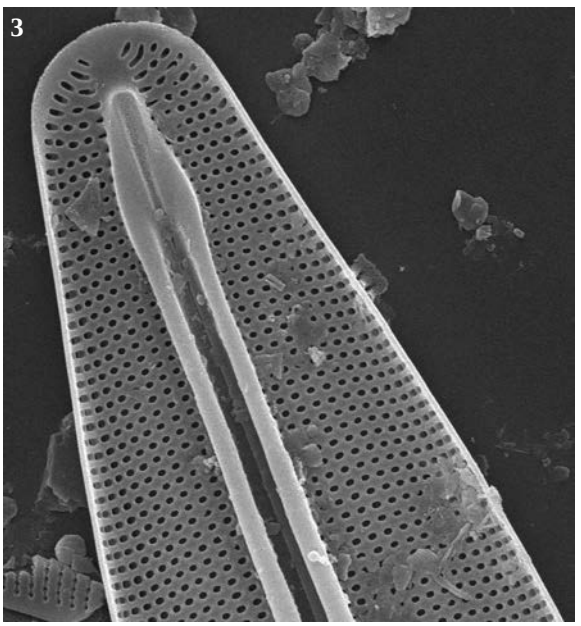
Plate 83	LM: x1500 SEM: Fig. 2 x1500, Figs. 3-4 x5000

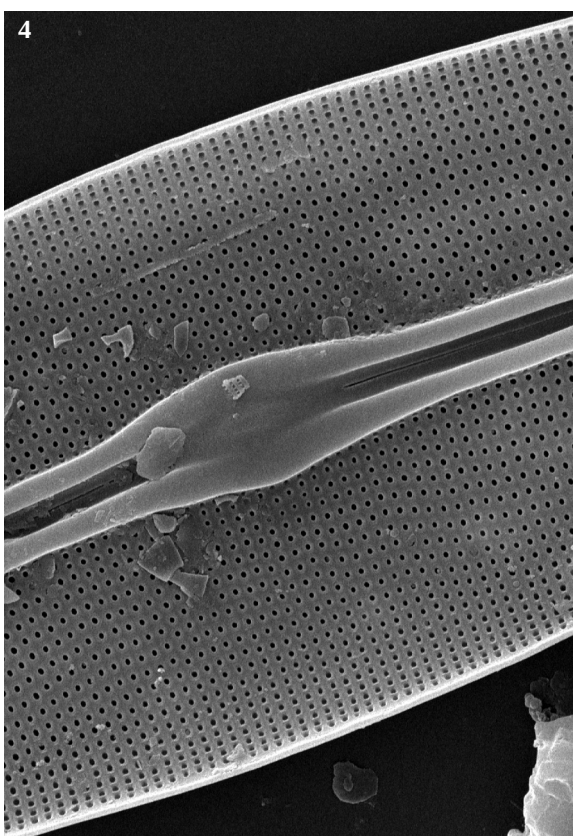
Figs. 1-4	*Frustulia erifuga* Lange-Bertalot et Krammer
Fig. 5	*Amphipleura pellucida* (Kützing) Kützing

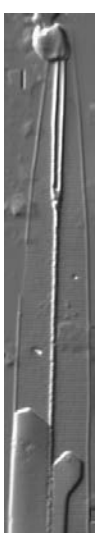
Fig. 1	Lake Senó, sediment PYR84
Figs. 2-4	Lake Redon, sediment REDOM
Fig. 5	Lake Burg, sediment BURG 1054







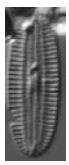




10 μ

Plate 84	LM: x1500 SEM: x3000
Fig. 1	*Diploneis* cf. *oculata* (Brébisson) Cleve
Fig. 2	*Diploneis* cf. *peterseni* (petersenii) Hustedt
Figs. 3, 10	*Diploneis* cf. *modica* Hustedt
Fig. 4	*Diploneis* sp. No. 1 Pica Palomera
Figs. 5-6	*Diploneis* cf. *puella* (Schumann) Cleve
Fig. 7	*Diploneis* cf. *parma* Cleve sensu auct nonnull.
Figs. 8-9,11	*Diploneis* cf. *subovalis* Cleve

Fig. 1	Lake Basa de la Mora, sediment PYR32
Figs. 2, 6-7	Lake Sen, sediment PYR40
Fig. 3	Lake Acherito, sediment PYR01
Fig. 4	Lake Pica Palomera, sediment PYR52
Fig. 5	Lake Arnales, sediment PYR09
Fig. 8	Lake Eriste, sediment PYR43
Fig. 9	Lake Arratille, sediment PYR11
Figs. 10-11	Lake Laurenti, sediment PYR111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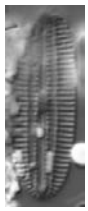
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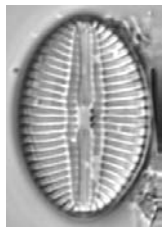
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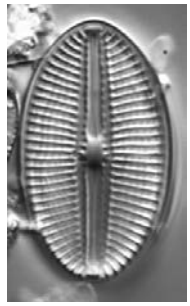
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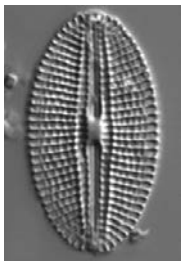
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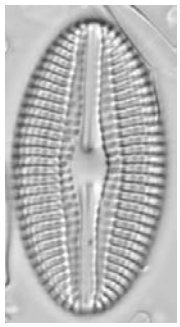
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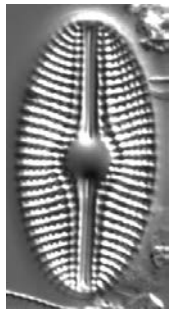
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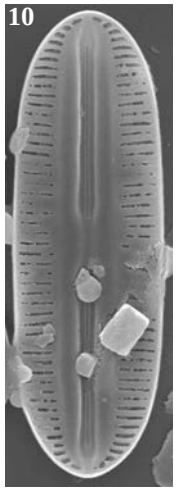
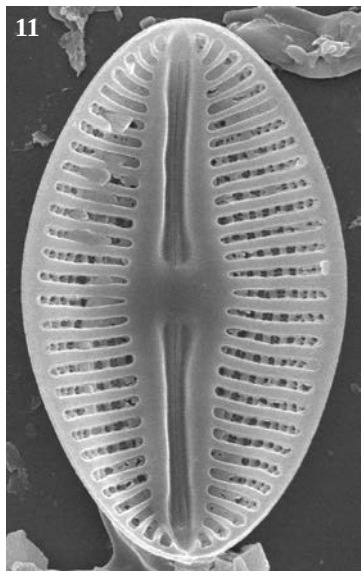


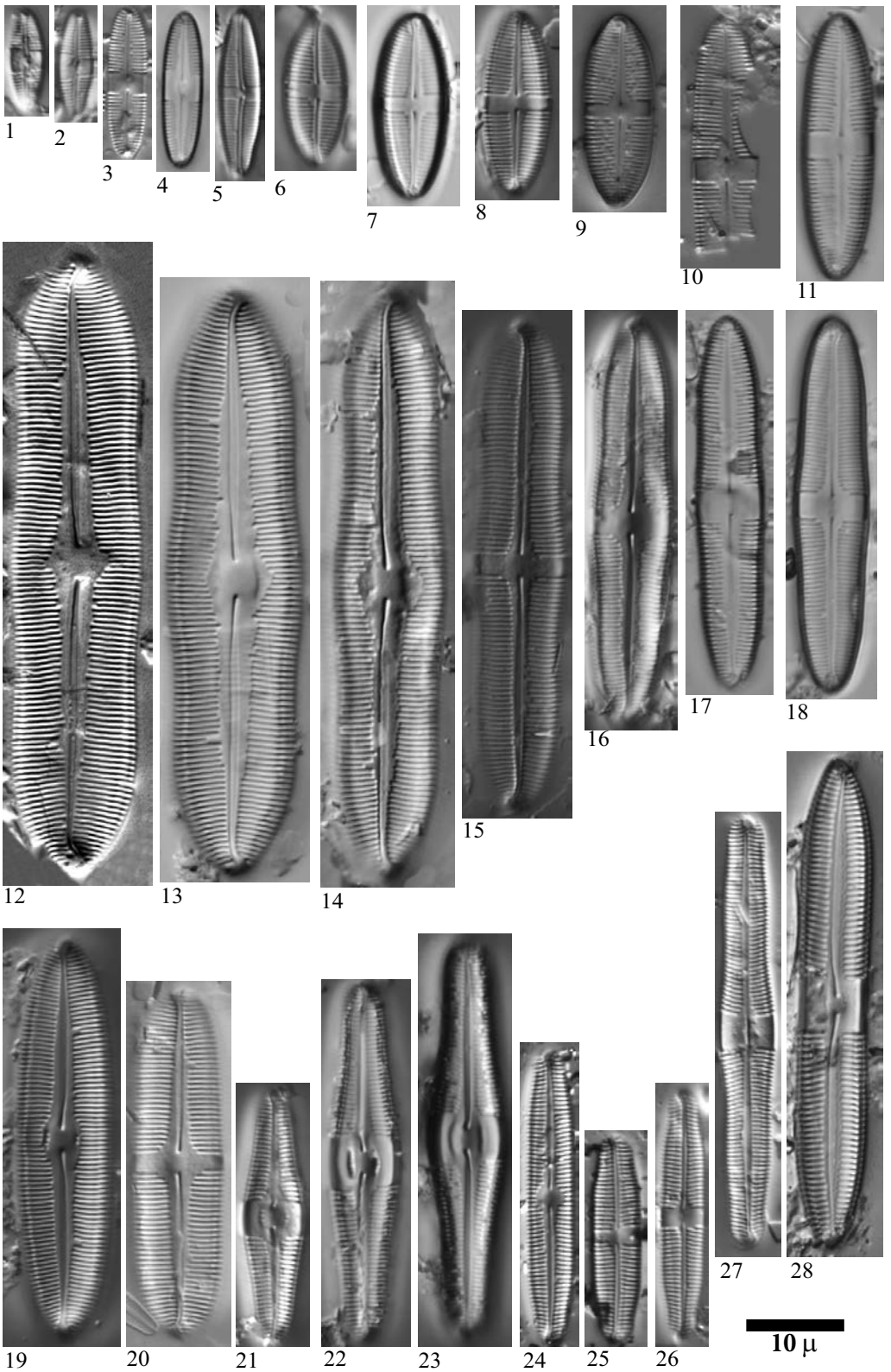


10 μ

Plate 85 LM: x1500

Figs. 1-2	*Caloneis* sp. No. 1 Munia
Figs. 3-4	*Caloneis* cf. *lancettula* (Schulz) Lange-Bertalot & Witkowski
Fig. 5	*Caloneis* cf. *vasilyevae* Lange-Bertalot, Genkal & Vechov
Figs. 6-11, 17,18	*Caloneis* sp. No. 2 Posets
Figs. 12-15	*Caloneis silicula* (Ehrenberg) Cleve sensu lato
Fig. 16	*Caloneis* sp. No. 3 Posets
Fig. 19	*Caloneis alpestris* (Grunow) Cleve
Fig. 20	*Caloneis* sp. No. 4 Burg
Figs. 21-23	*Caloneis* sp. No. 5 Acherito
Fig. 24	*Caloneis* cf. *tenuis* (Gregory) Krammer
Figs. 25-27	*Caloneis* cf. *undulata* (Gregory) Krammer
Fig. 28	*Caloneis* cf. *lauta* Carter

Figs. 1, 2	Lake La Munia Sup., sediment PYR20
Fig. 3	Lake Burg, sediment BURG 616
Figs. 4, 21-23	Lake Acherito, sediment PYR01
Fig. 5	Lake Pica Palomera, sediment PYR52
Figs. 6-11, 17-18, 28	Lake Posets, sediment PYR42
Fig. 12	Lake Burg, sediment BURG 1216
Fig. 13	Lake Estom, sediment PYR15
Fig. 14	Lake Col d`Arratille, sediment PYR12
Fig. 15	Lake Burg, sediment BURG 703
Fig. 16	Lake Pixón, sediment PYR44
Fig. 19	Lake Arratille, sediment PYR11
Fig. 20	Lake Burg
Figs. 24-25	Lake Montoliu, epilithic EpiPYR54
Figs. 26-27	Lake Long de Liat, sediment PYR55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10 µ

Plate 86	LM: x1500 SEM: Figs. 14,16 x3000, Fig. 18 x10000, Fig. 19 x15000

Fig. 1	*Pinnularia sinistra* Krammer
Figs. 2-10, 15 18-19	*Pinnularia subcapitata* Gregory
Fig. 11	*Pinnularia* sp. No. 1 Posets
Figs. 12-14	*Pinnularia* cf. *subanglica* Krammer
Figs. 16-17	*Pinnularia* cf. *rumrichae* Krammer

Fig. 1	Lake Llosás, sediment PYR46
Fig. 2	Lake Burg
Figs. 3, 11-12, 17	Lake Posets, sediment PYR42
Fig. 4	Lake Senó, epilithic EpiPYR84
Figs. 5, 10	Lake Senó, sediment PYR84
Fig. 6	Lake Burg, sediment BURG 958
Fig. 7	Lake Burg, sediment BURG 968
Fig. 9	Lake Redon, sediment REDOM
Fig. 13	Lake Arnales, sediment PYR09
Fig. 14	Lake Garbet, sediment PYR81
Figs. 16, 19	Lake Mariola, epilithic EpiPYR80

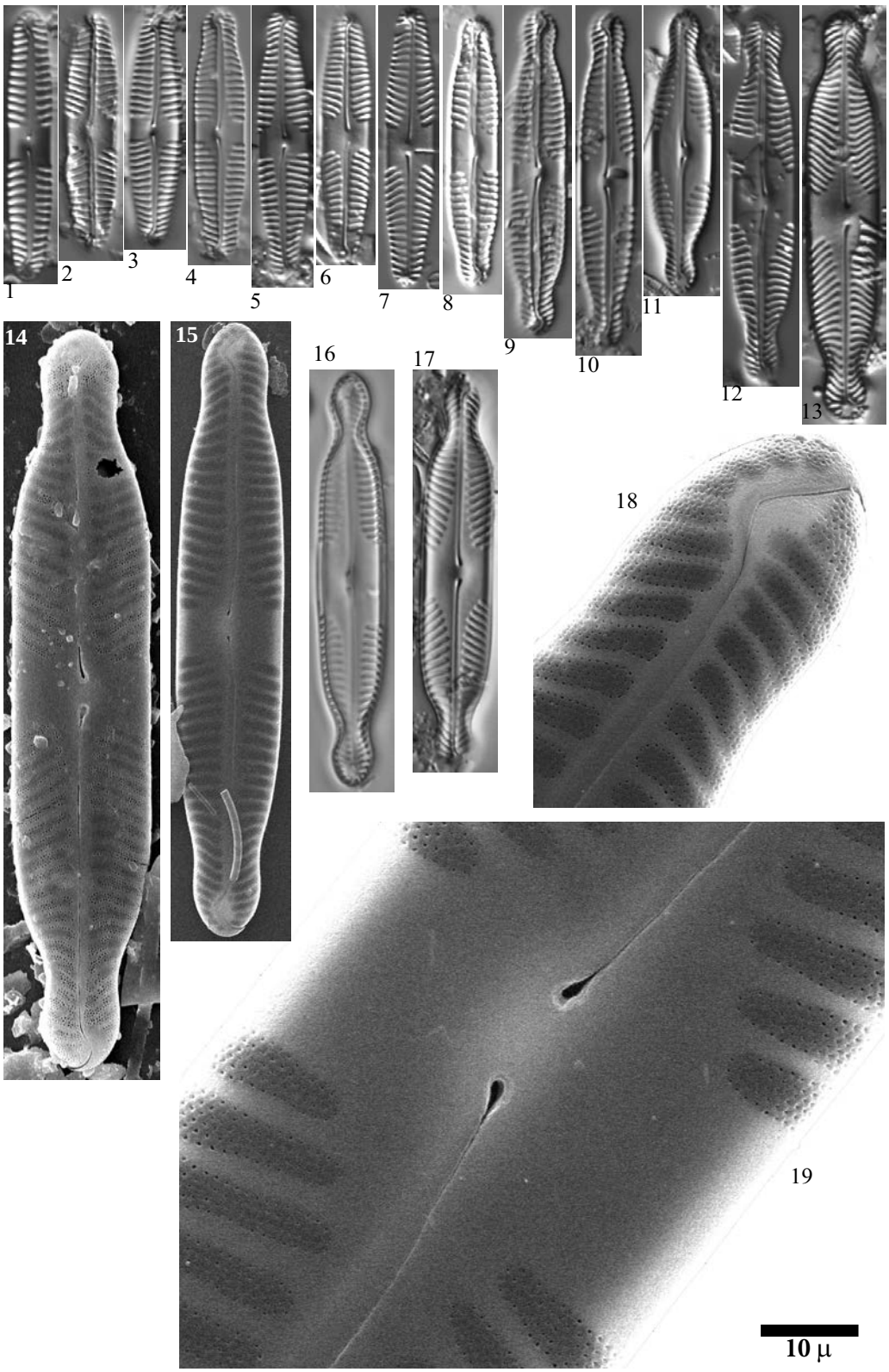
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Plate 87	LM: x1500 SEM: Fig. 13 x10000, Fig. 14 x300, Figs. 16-18 x4500

Figs. 1-2	*Pinnularia* sp.
Fig. 3	*Pinnularia* sp.
Figs. 4-10 17-18	*Pinnularia* cf. *brebissonii* var. *minuta* Krammer
Fig. 11	*Pinnularia* sp. No. 3 Plan
Figs. 12-14	*Pinnularia* sp. No. 4 Mariola
Figs. 15-16	*Pinnularia* sp. No. 6 Estelat

Figs. 1-3, 5	Lake Posets, sediment PYR42
Fig. 4	Lake Baiau Superior, sediment PYR77
Fig. 6	Lake Arratille, sediment PYR11
Fig. 7	Lake Illa, sediment PYR66
Fig. 8	Lake Ensangents Sup., sediment PYR106
Fig. 9	Lake Burg
Fig. 10	Lake Burg, sediment BURG 1187
Fig. 11	Lake Plan, sediment PYR69
Fig. 12-14, 16	Lake Mariola, sediment PYR80
Fig. 15	Lake Estelat, sediment PYR120
Figs. 17-18	Lake Redon, sediment REDOM

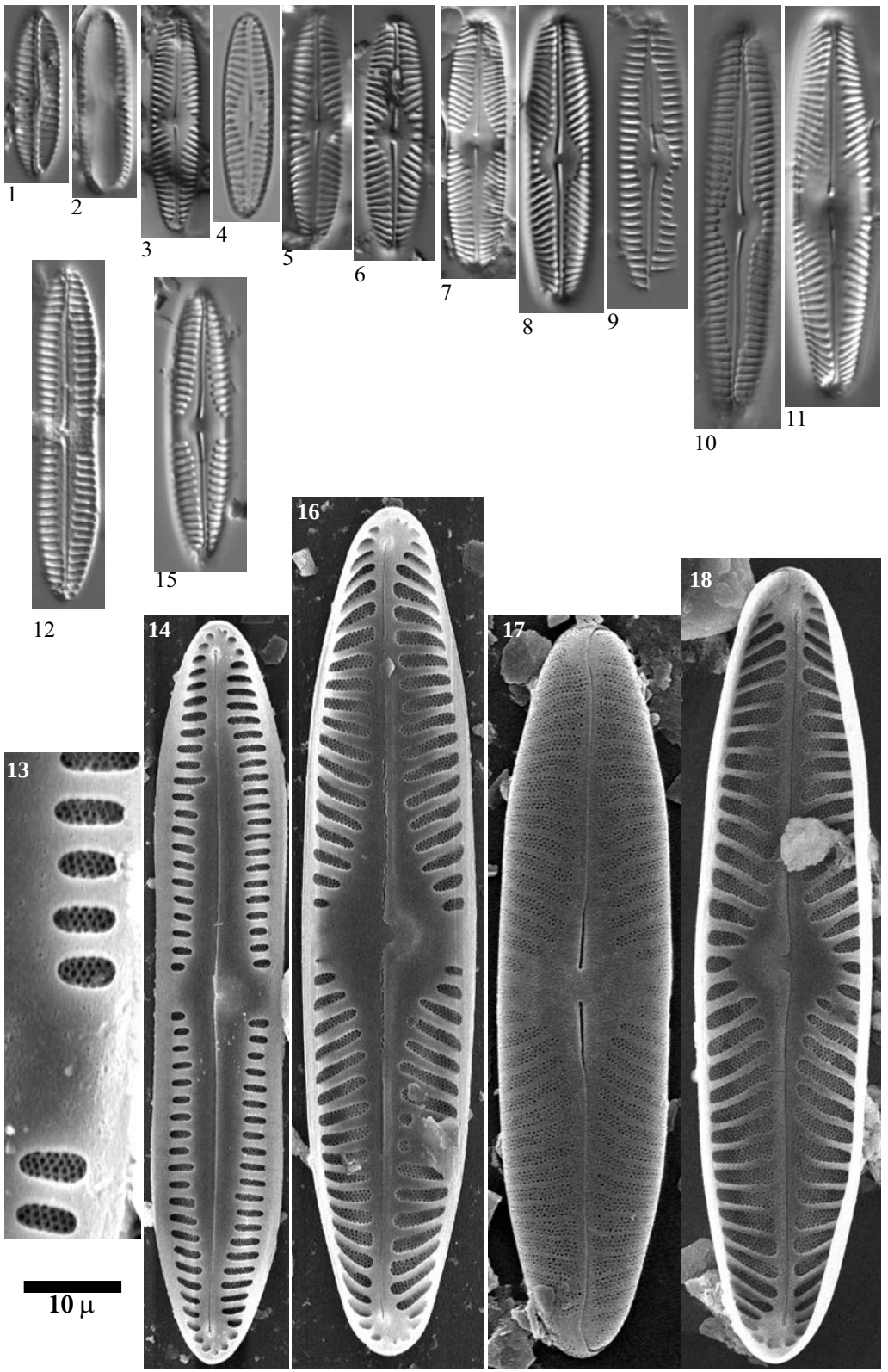
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Plate 88	LM: x1500 SEM: Fig. 15 x3000, Fig. 23 x7500, Fig. 24 x10000

Fig. 1	*Hygropetra balfouriana* (Grunow ex Cleve) Krammer & Lange Bertalot
Figs. 2-3	*Pinnularia* cf. *laucensis* Lange-Bertalot, Rumrich & Krammer
Figs. 4-6	*Pinnularia* sp. No. 12 Estelat, aff. perirrorata
Fig. 7	*Pinnularia* cf. *kuetzingii* Krammer
Fig. 8	*Pinnularia* sp. No. 7 Romedo
Fig. 9	*Pinnularia* sp. No. 8 Burg
Fig. 10	*Pinnularia subinterrupta* Krammer & Schroeter
Figs. 11-12	*Pinnularia* sp. No. 2 Illa
Fig. 13	*Pinnularia* sp
Fig. 14	*Pinnularia* sp. 15 Burg
Figs. 15-20 23-24	*Pinnularia microstauron* var. *nonfasciata* Krammer
Fig. 21	*Pinnularia* sp. No. 5 Mora
Fig. 22	*Pinnularia* sp. No. 14 Burg, aff. *Pinnularia divergens* Smith

Fig. 1	Lake Eriste, sediment PYR43
Figs. 2-3, 20	Lake Negre, sediment PYR79
Fig. 4	Lake Inf. de la Gallina, sediment PYR87
Figs. 5, 18, 23-24	Lake Mariola, epilithic EpiPYR80
Fig. 6	Lake Estelat, sediment PYR120
Fig. 7	Lake Inf. de la Gallina, epilithic EpiPYR87
Fig. 8	Lake Romedo de Dalt, epilithic EpiPYR85
Fig. 9	Lake Burg, sediment BURG 985
Fig. 10	Lake Illa, epilithic EpiPYR66
Figs. 11-12, 16-18	Lake Illa, sediment PYR66
Figs. 13-14	Lake Burg, sediment BURG 918
Fig. 19	Lake Posets, sediment PYR42
Fig. 21	Lake Basa de la Mora, sediment PYR32
Fig. 22	Lake Burg, sediment BURG 960

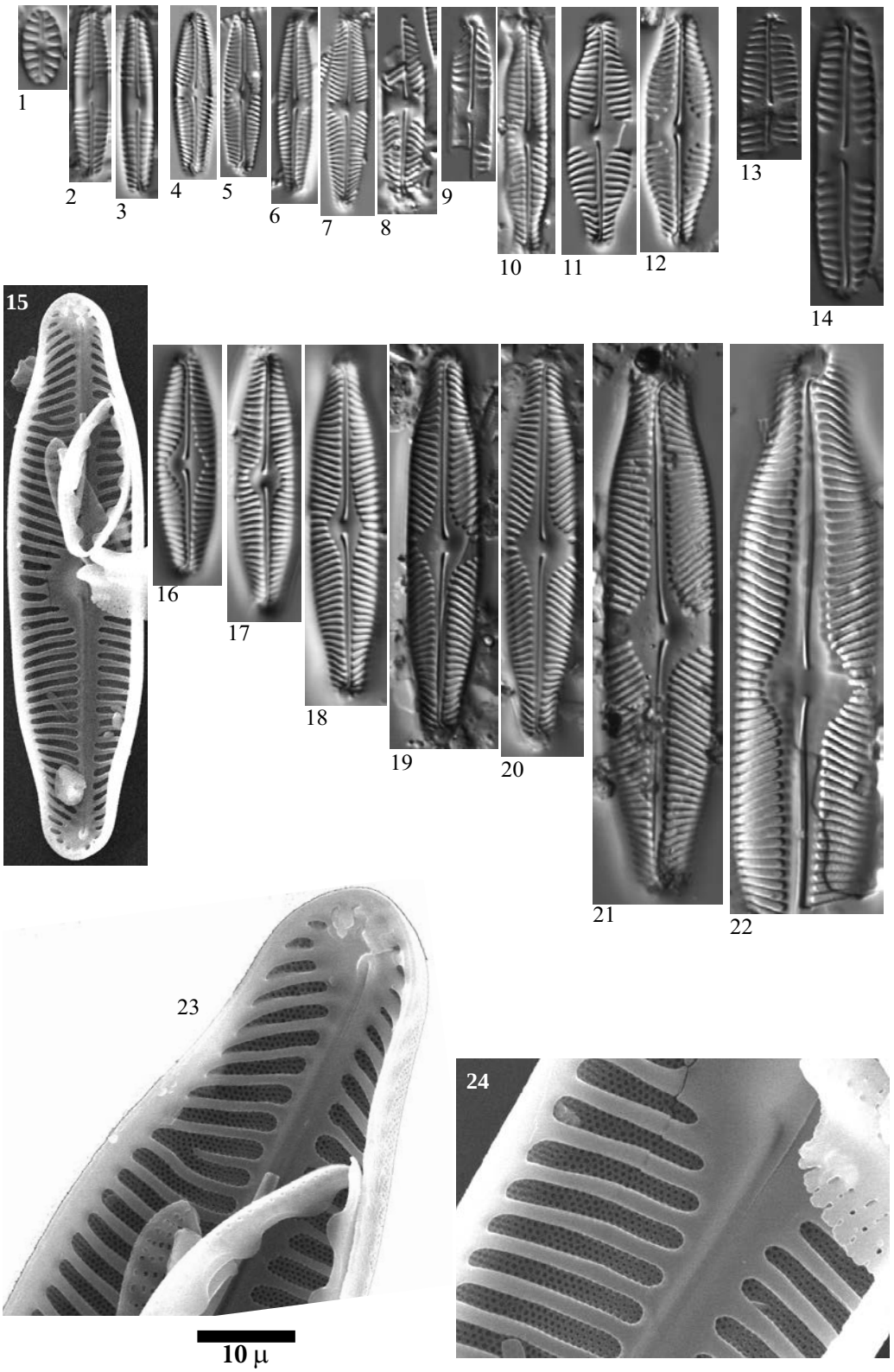
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Plate 89	LM: x1500 SEM: Fig. 7 x8000, Fig. 8 x2000

Figs. 1-3	*Pinnularia grunowii* Krammer
Fig. 4	*Pinnularia* sp. No. 13 Albe
Figs. 5-8	*Pinnularia septentrionalis* Krammer

Fig. 1	Lake Burg
Fig. 2	Lake Burg, sediment BURG 917
Fig. 3	Lake Burg, sediment BURG 796
Fig. 4	Lake Albe, sediment PYR96
Fig. 5	Lake Sen, sediment PYR40
Fig. 6	Lake Posets, sediment PYR42
Figs. 7-8	Lake Laurenti, sediment PYR111


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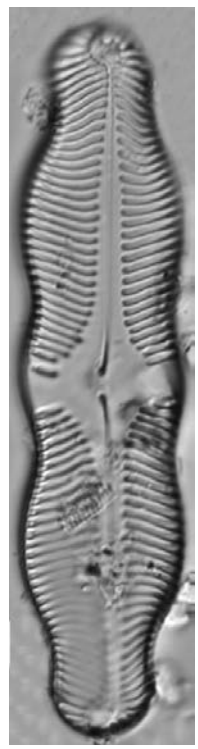
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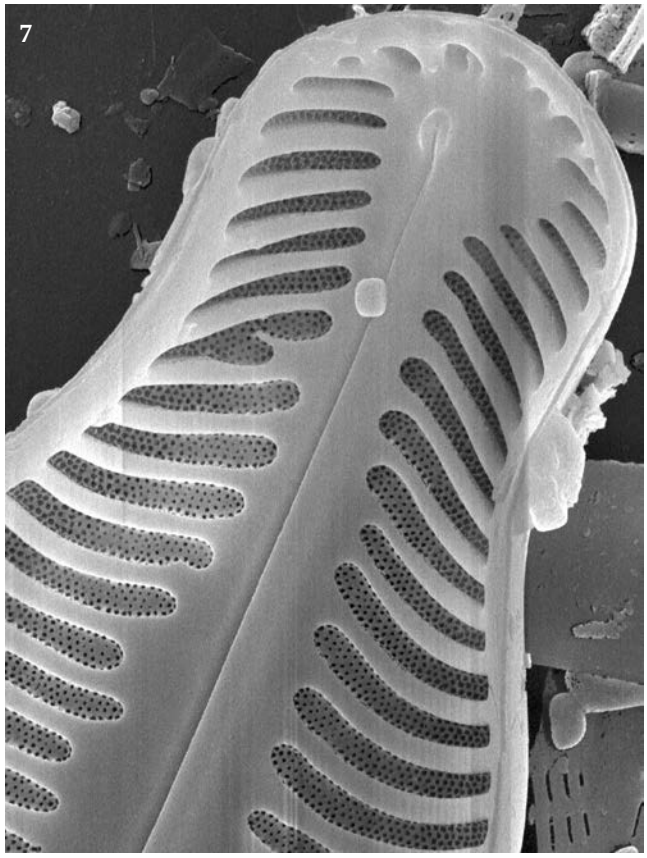
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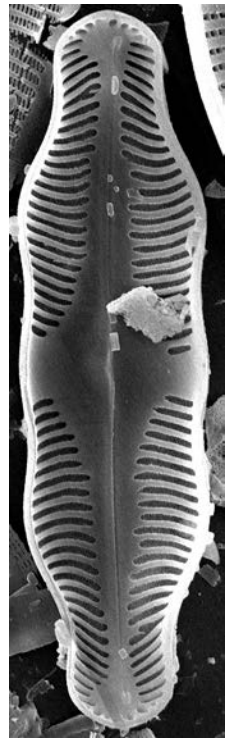
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10 μ

Plate 90 LM: x1500

Figs. 1-4	*Pinnularia borealis* Ehrenberg
Fig. 5	*Pinnularia* cf. *lata* (Brébisson) Smith
Fig. 6	*Pinnularia* sp. No. 9 Laquettes, aff. *subgibba* Krammer
Fig. 7	*Pinnularia* cf. *subgibba* Krammer
Figs. 8-9	*Pinnularia* sp. No. 10 Pica Palomera, aff. *pseudogibba* Krammer
Fig. 10	*Pinnularia* sp. No. 11 Trebens, aff. *tirolensis* (Metzeltin & Krammer) Krammer

Fig. 1	Lake Burg
Fig. 2	Lake Negre, sediment PYR79
Fig. 3	Lake Sotllo, epilithic EpiPYR89
Fig. 4	Lake Burg, sediment BURG 1057
Fig. 5	Lake Burg, sediment BURG 1195
Fig. 6	Lake Cap Long, sediment PYR27
Fig. 7	Lake Burg, sediment BURG 807
Fig. 8	Lake Pica Palomera, sediment PYR52
Fig. 9	Lake Senó, sediment PYR84
Fig. 10	Lake Trebens, sediment PYR114


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10 µ

Plate 91 LM: Figs. 1-3 x1500, Fig. 4 x800

Fig. 1	*Pinnularia* sp.
Figs. 2-3	*Pinnularia* cf. *viridis* (Nitzsch) Ehrenberg
Fig. 4	*Pinnularia* cf. *latevittata* Cleve

Fig. 1	Lake Gelat Bergús, sediment PYR65
Fig. 2	Lake Senó, sediment PYR84
Fig. 3	Lake Burg
Fig. 4	Lake Bersau, sediment PYR03

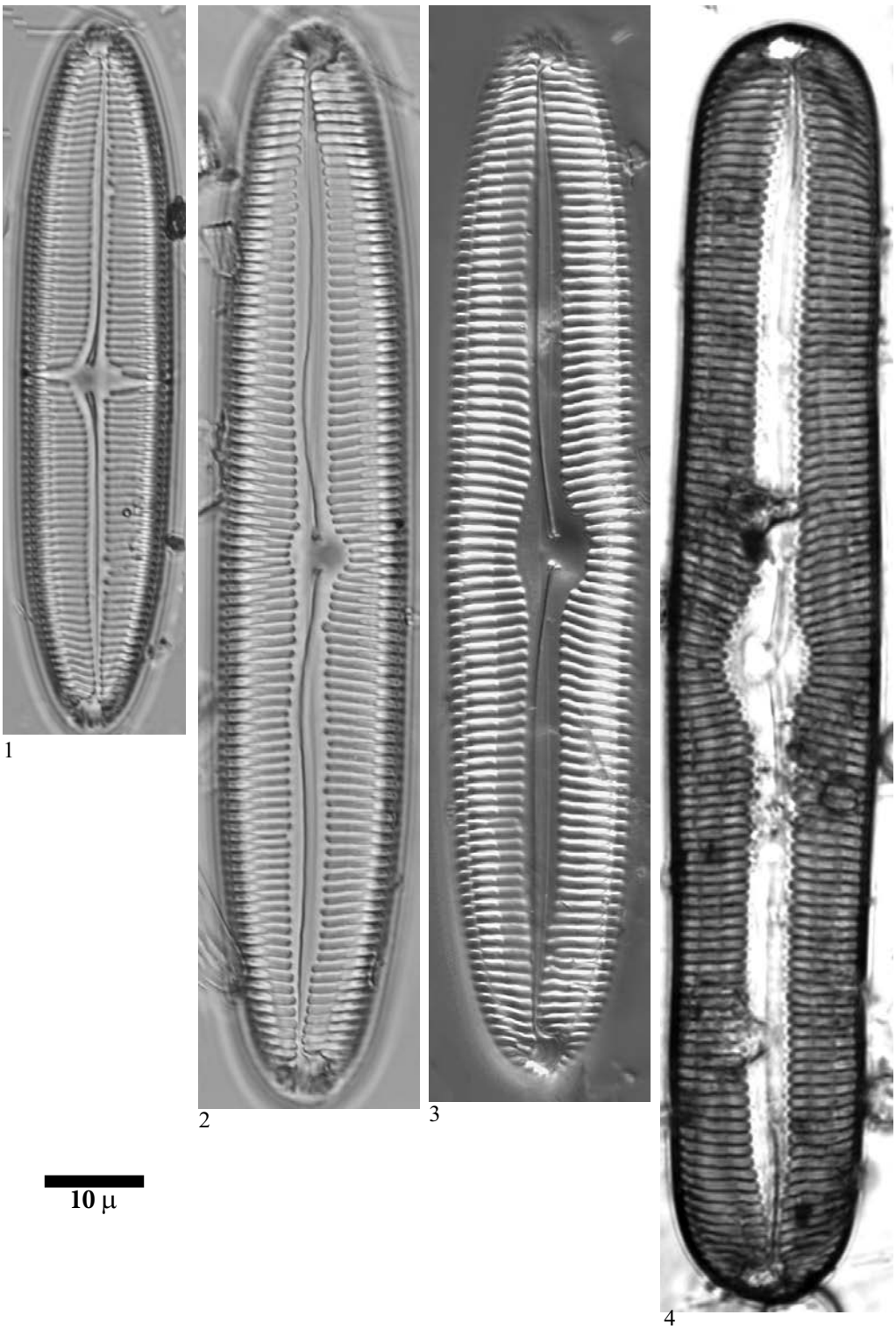
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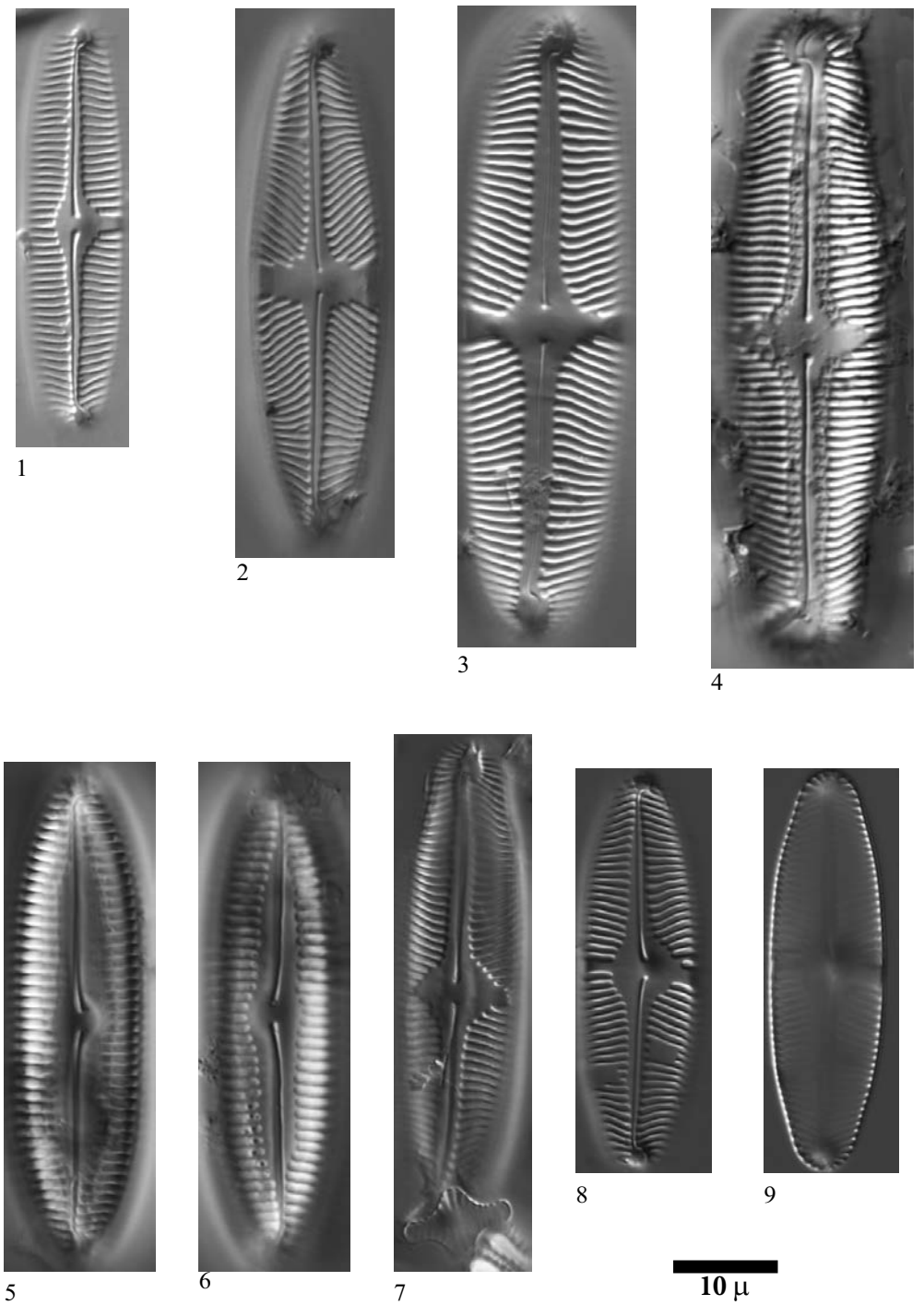
Plate 92 LM: x1500

Fig. 1	*Pinnularia* cf. *complexa* Krammer
Fig. 2	*Pinnularia* cf. *brebissonii* var. *acuta* Cleve-Euler
Fig. 3	*Pinnularia* cf. *divergens* var. *sublinearis* Cleve
Fig. 4	*Pinnularia platycephala* (Ehrenberg) Cleve
Figs. 5-6	*Pinnularia acuminata* Smith
Figs. 7-9	*Pinnula* sp. 16 Burg, aff. *P. divergens*

Fig. 1	Lake Bersau, epilithic EpiPYR03
Fig. 2	Lake Pondiellos Sup., sediment PYR08
Fig. 3	Lake Plan, sediment PYR69
Fig. 4	Lake PYR128
Figs. 5-6	Lake Illa, sediment PYR66
Fig. 7	Lake Burg, sediment BURG 838
Figs. 8-9	Lake Burg, sediment BURG 869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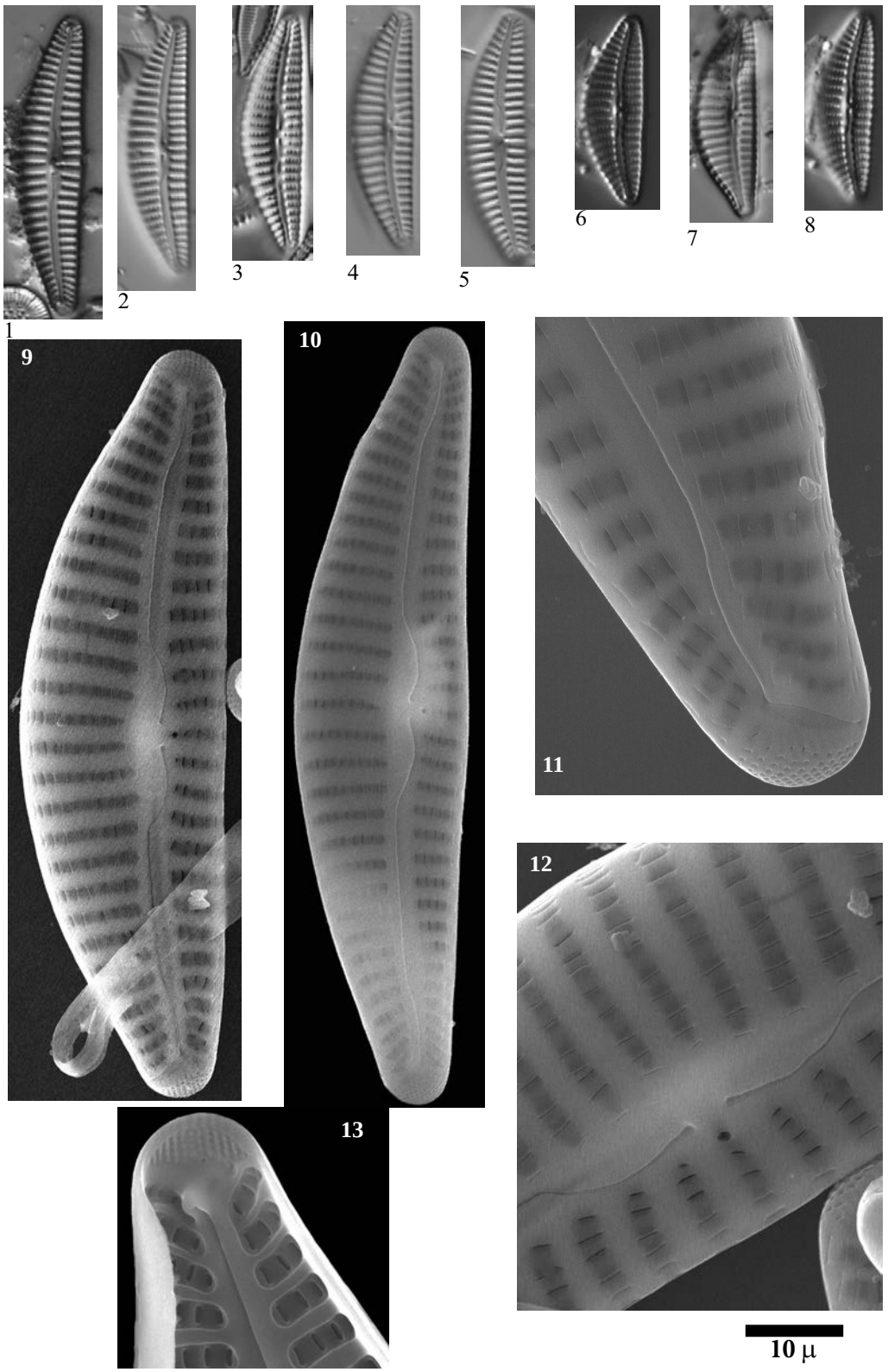
10 μ

Plate 93	LM: x1500 Fig. 9 x5000, Fig. 10 x4000, Figs. 11,13 x10000, Fig. 12 x6000

Fig. 1	*Cymbella* cf. *parva* (Smith) Kirchner
Figs. 2-13	*Cymbella parva* (Smith) Kirchner

Figs. 1, 5, 7	Lake Sen, sediment PYR40
Fig. 2	Lake Acherito, sediment PYR01
Figs. 3, 6, 8	Lake Arratille, sediment PYR11
Figs. 4, 9-13	Lake Roumassot, epilithic EpiPYR04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10 µ

Plate 94	LM: x1500 SEM: Figs. 1-2,13 x3000, Fig. 3 x10000, Figs. 4-5 x6000

Cymbella parva (Smith) Kirchner

Figs. 1, 3, 5	Lake Gran de Mainera, epilithic EpiPYR70
Figs. 2, 4	Lake Roumassot, sediment PYR04

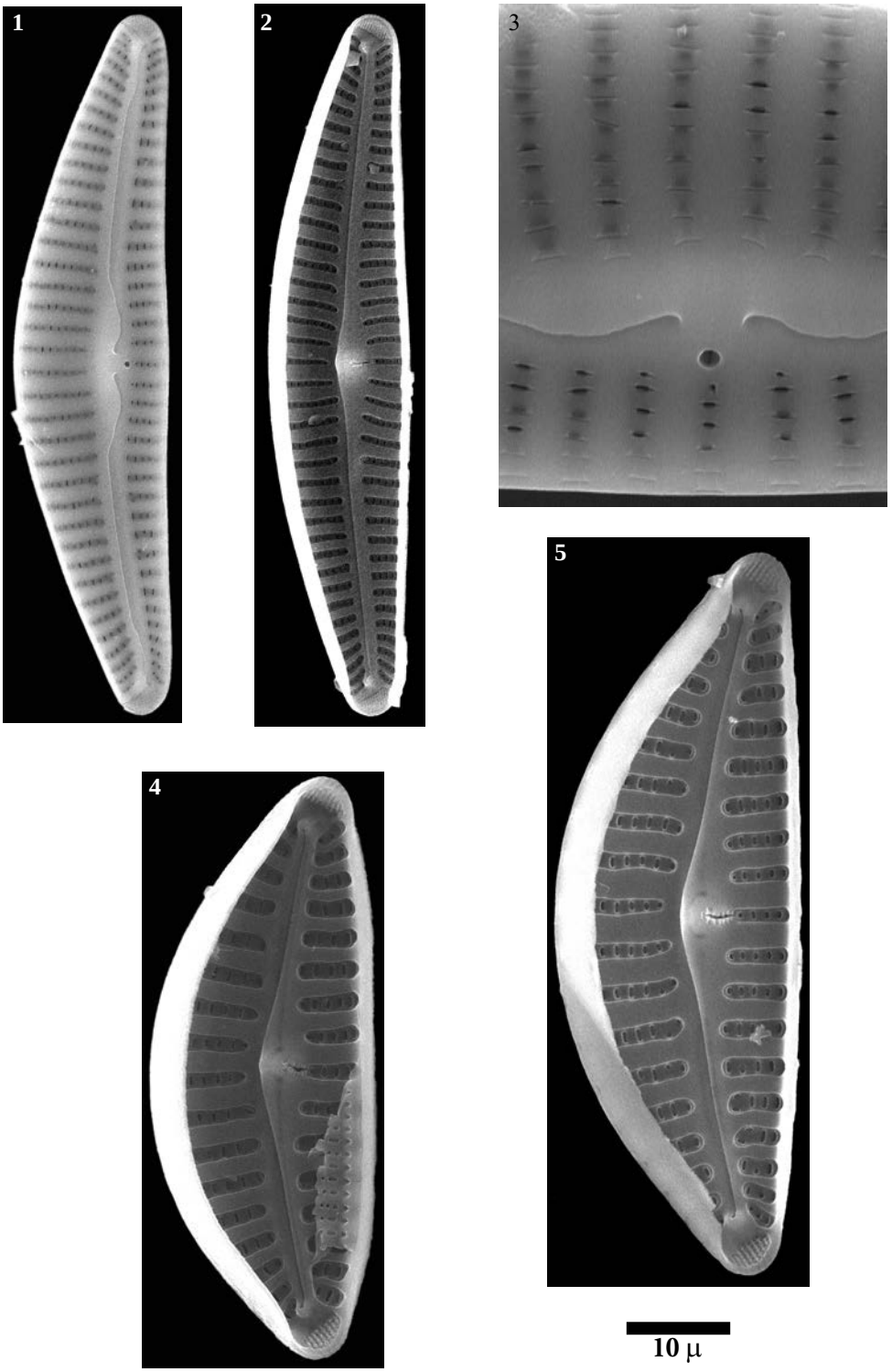
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Plate 95	LM: x1500 SEM: Figs. 2,5 x2000, Figs. 3-4 x4000, Fig. 6 x5000

Cymbella lange-bertalotii Krammer

Fig. 1	Lake Arratille, sediment PYR11
Figs. 2-6	Lake Port Bielh, sediment EpiPYR28

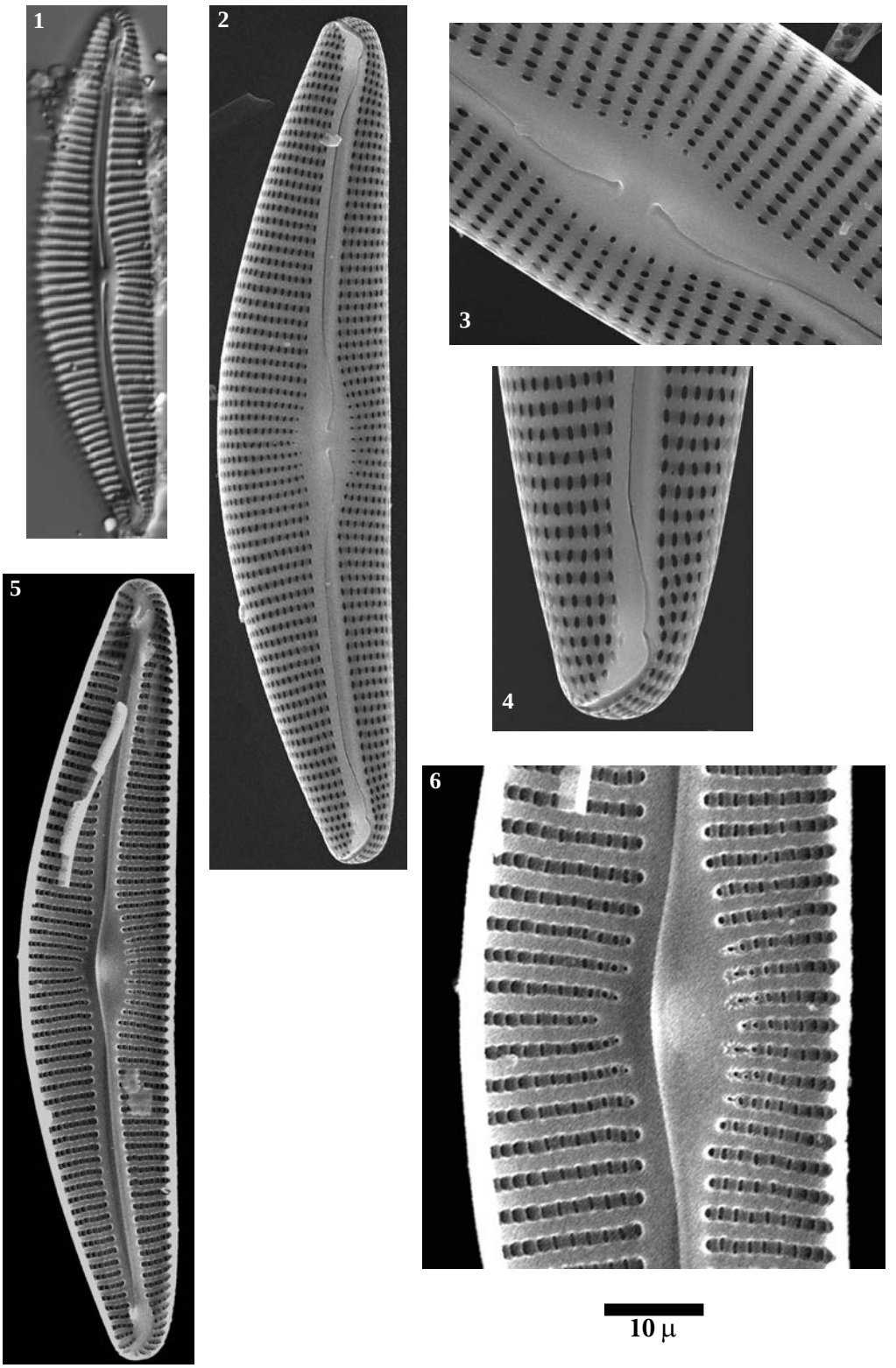
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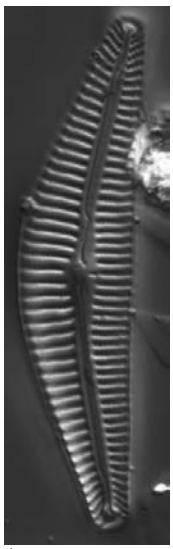
Plate 96	LM: x1500 SEM: Fig. 3,6 x6000, Fig. 5 x1500, Fig. 7 x10000

Figs. 1-2	*Cymbella* cf. *cymbiformis* Agardh
Figs. 3-7	*Cymbella cymbiformis* Agardh

Fig. 1	Lake Arratille, sediment PYR11
Fig. 2	Lake Sen, sediment PYR40
Figs. 3-7	Lake Roumassot, sediment PYR04
Fig. 4	Lake Posets, sediment PYR42



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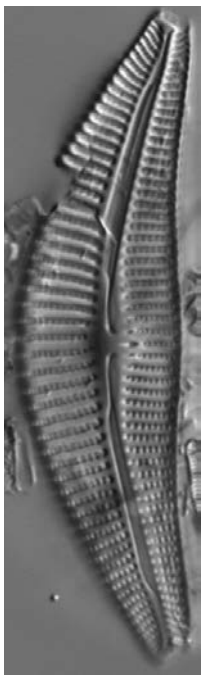

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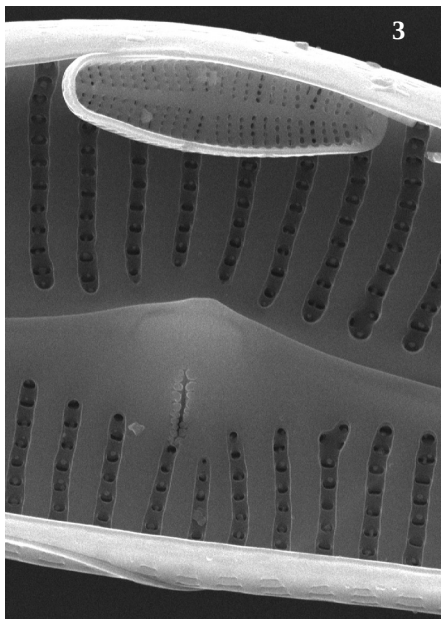

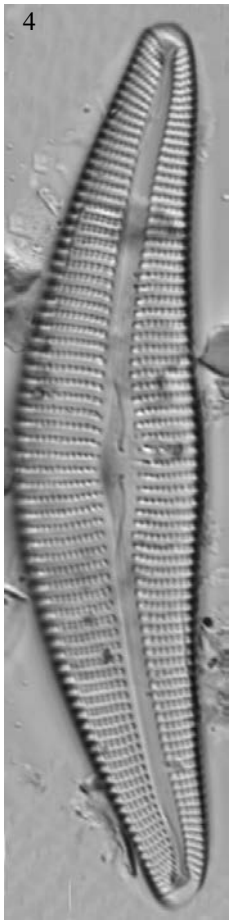

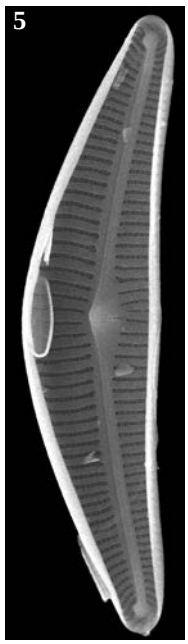

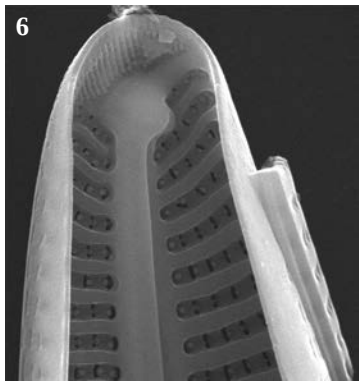

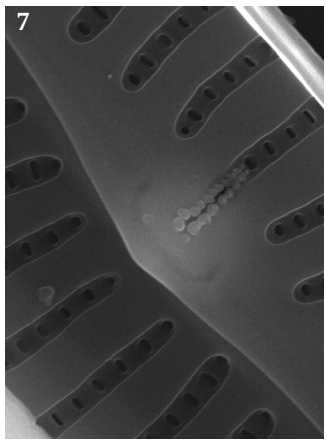

10 µ

Plate 97	LM: x1500 SEM: Fig. 2 x1500, Figs. 3-4 x6000

Cymbella cf. *cymbiformis* Agardh

Fig. 1	Lake Gran de Mainera, sediment PYR70
Figs. 2-4	Lake Burg, sediment BURG 939
Fig. 5	Lake Burg

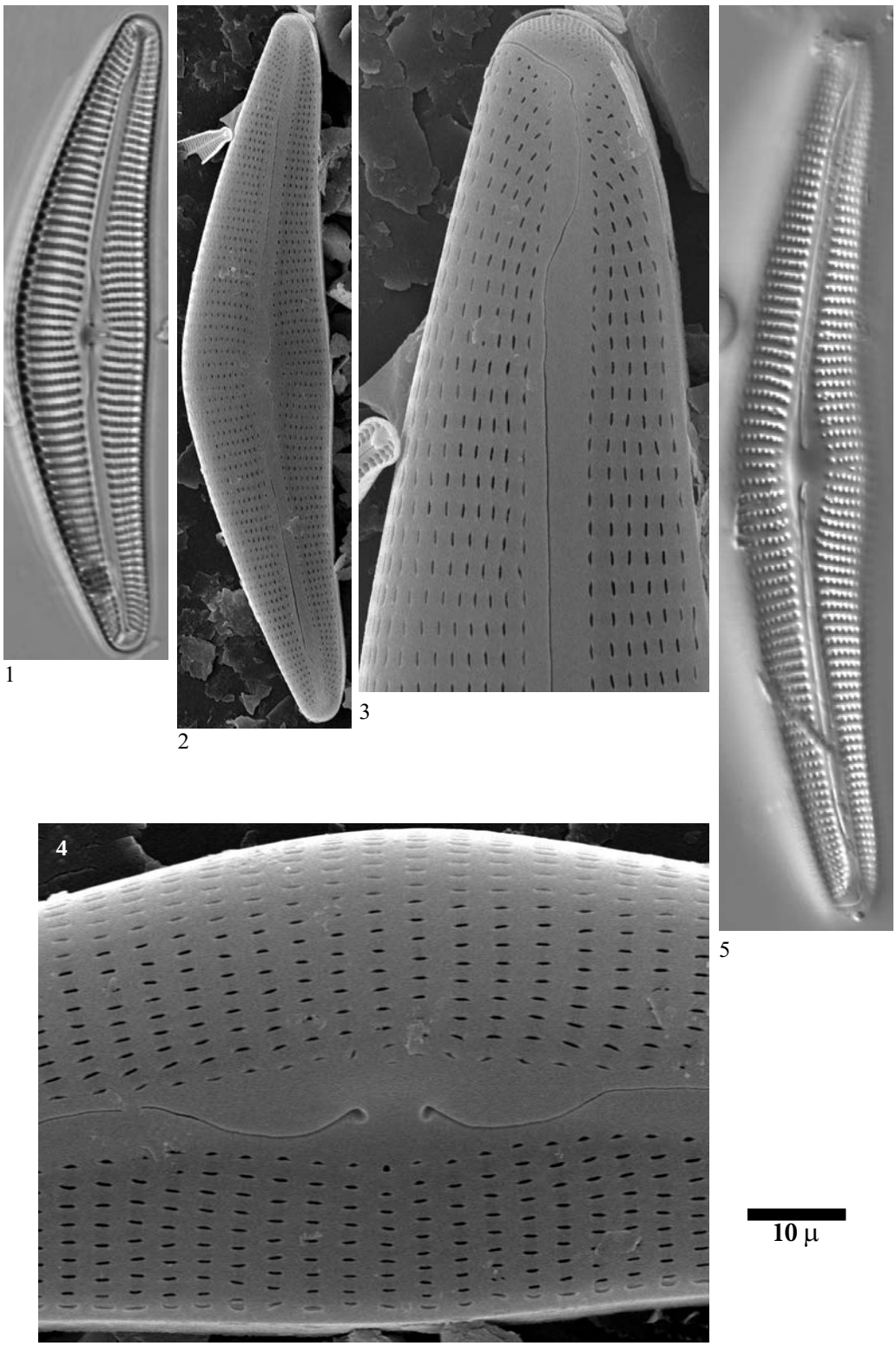
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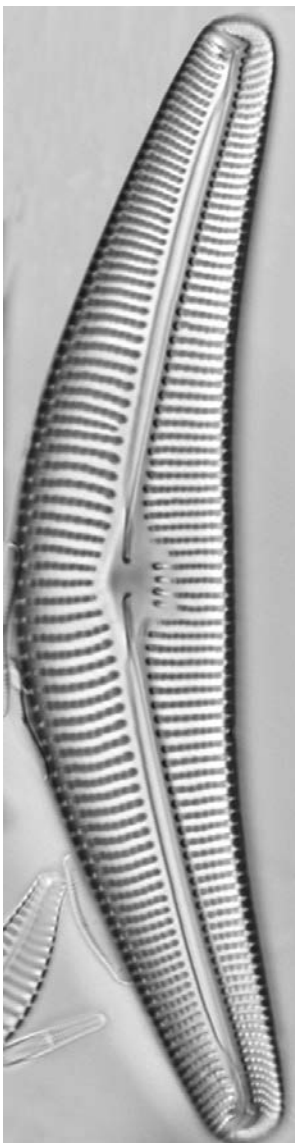
Plate 98	LM: x1500 SEM: x6000

Figs. 1-4	*Cymbella dorsenotata* Østrup

Fig. 1	Lake Arratille, sediment PYR11
Fig. 2	Lake Arnales, sediment PYR09
Figs. 3-4	Lake Roumassot, sediment PYR04



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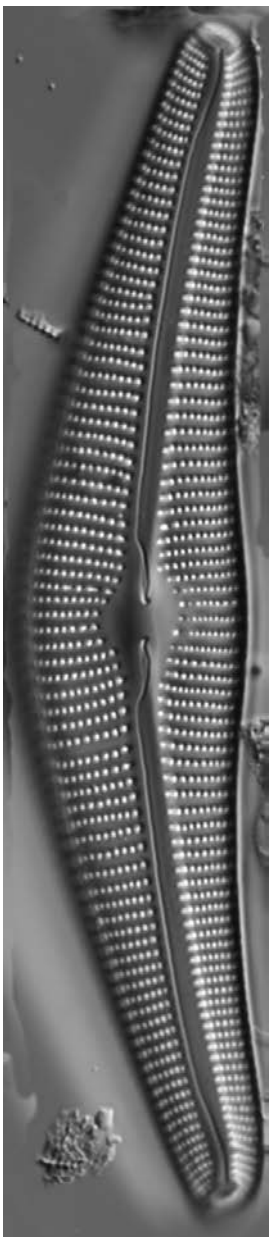

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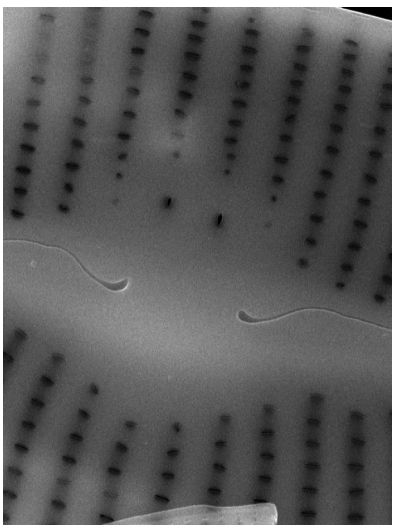

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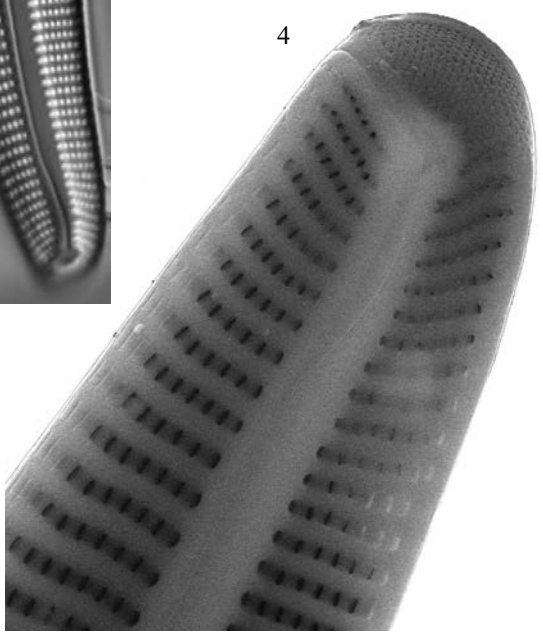

10 µ

Plate 99 LM: x1500

Figs. 1-2	*Cymbella neoleptoceros* var. *tenuistriata* Krammer
Figs. 3-5	*Cymbella* cf. *neocistula* Krammer
Figs. 6-7	*Cymbella excisa* Kützing
Figs. 8-11	*Cymbella* cf. *subcistula* Krammer
Figs. 12-13	*Cymbella* cf. *proxima* Reimer

Figs. 1-2	Lake Acherito, sediment PYR01
Figs. 3, 5-7	Lake Posets, sediment PYR42
Figs. 4, 9-11, 13	Lake Gros de Camporrells, sediment PYR110
Fig. 8	Lake Angonella de Mes Amunt, sediment PYR78
Fig. 12	Lake Arnales, sediment PYR09

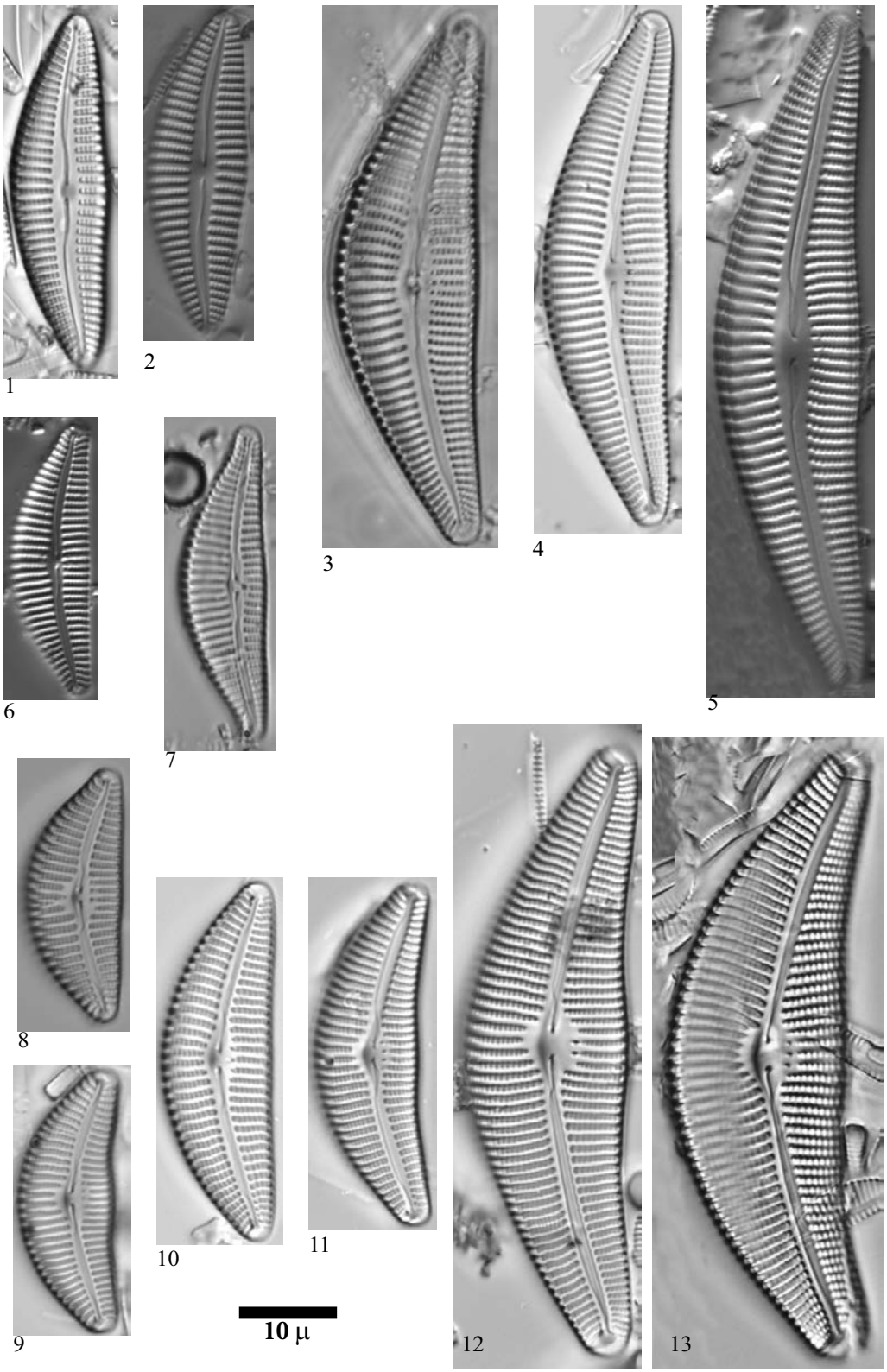
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Plate 100 LM: x1500

Figs. 1-4	*Cymbopleura acuta* var. *angusta* Krammer
Fig. 5	*Cymbella subcuspidata* Krammer
Fig. 6	*Cymbopleura apiculata* Krammer
Figs. 7-8	*Cymbopleura* cf. *hercynica* (Schmidt) Krammer
Fig. 9	*Cymbopleura* sp. No. 2 Burg
Fig. 10	*Cymbopleura* sp
Fig. 11	*Cymbopleura anglica* (Lagerstedt) Krammer
Figs. 12-13	*Cymbopleura naviculiformis* (Auerswald) Krammer

Fig. 1	Lake Forcat Inf., sediment PYR77
Fig. 2	Lake Bleu de Rabassoles, sediment PYR112
Figs. 3-4	Lake Sotllo, sediment PYR89
Fig. 5	Lake Les Laquettes, sediment PYR27
Fig. 6	Lake Plan, sediment PYR69
Fig. 7	Lake Posets, sediment PYR42
Fig. 8	Lake Eriste, sediment PYR43
Fig. 9	Lake Burg, sediment BURG 1021
Fig. 10	Lake Burg, sediment BURG 833
Fig. 11	Lake Arratille, sediment PYR11
Fig. 12	Lake Pixón, sediment PYR44
Fig. 13	Lake Burg

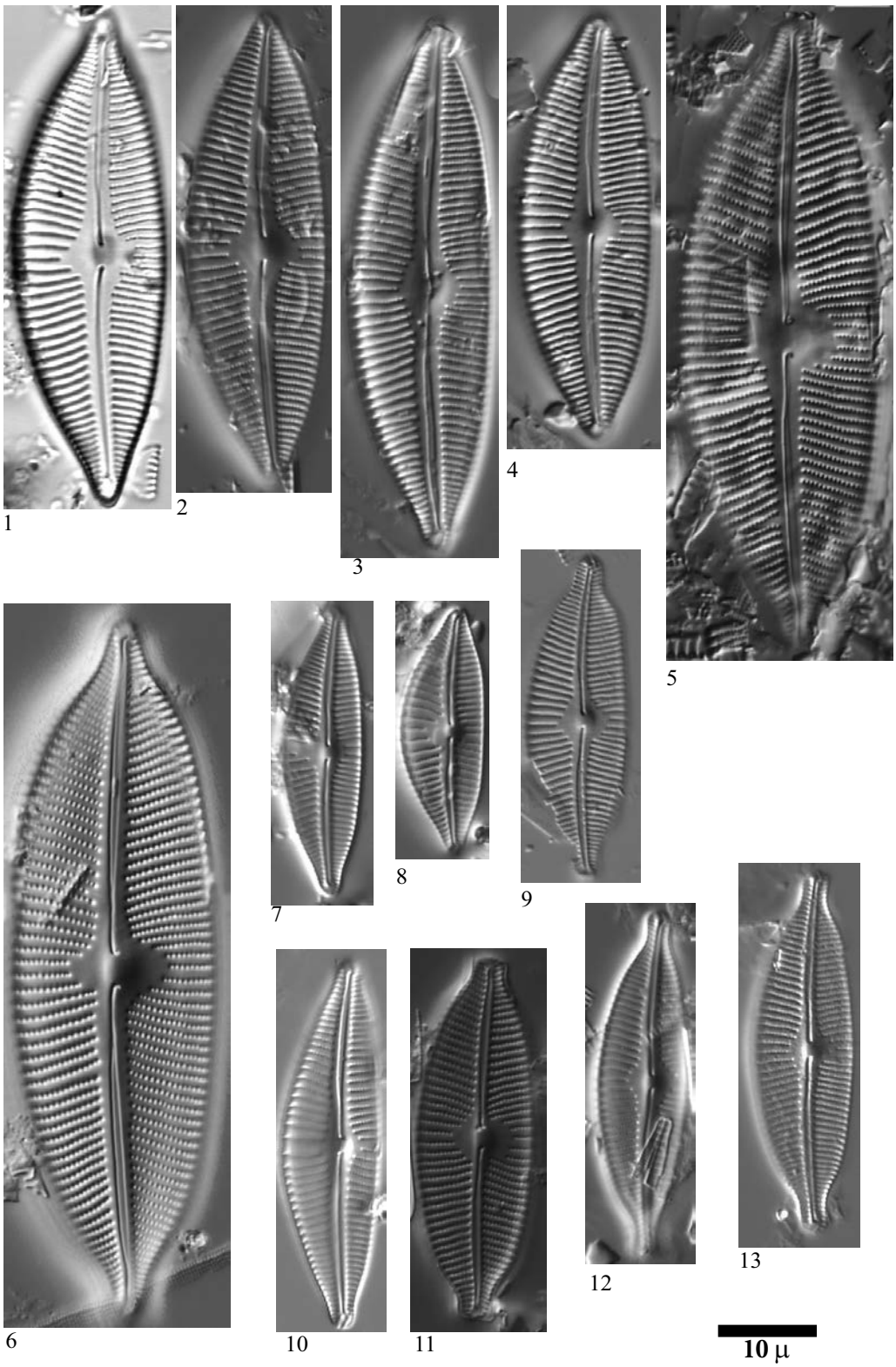
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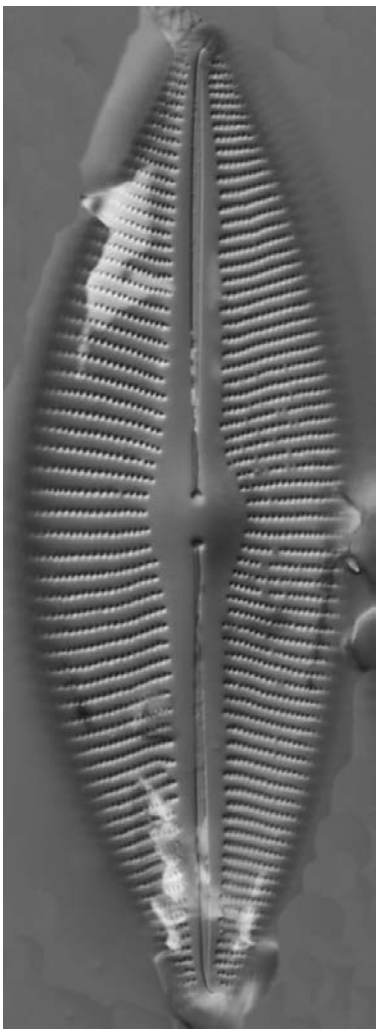
Plate 101 LM: x1500

Figs. 1-2	*Cymbopleura inaequalis* (Ehrenberg) Krammer
Fig. 3	*Cymbopleura subaequalis* var. *truncata* Krammer
Fig. 4	*Cymbopleura subaequalis* (Grunow) Krammer
Figs. 5-6	*Cymbopleura* cf. *subaequalis* (Grunow) Krammer

Figs. 1, 4	Lake Arratille, sediment PYR11
Fig. 2	Lake Ormiélas, sediment PYR05
Fig. 3	Lake Urdiceto, sediment PYR125
Figs. 5-6	Lake Monges, sediment PYR57



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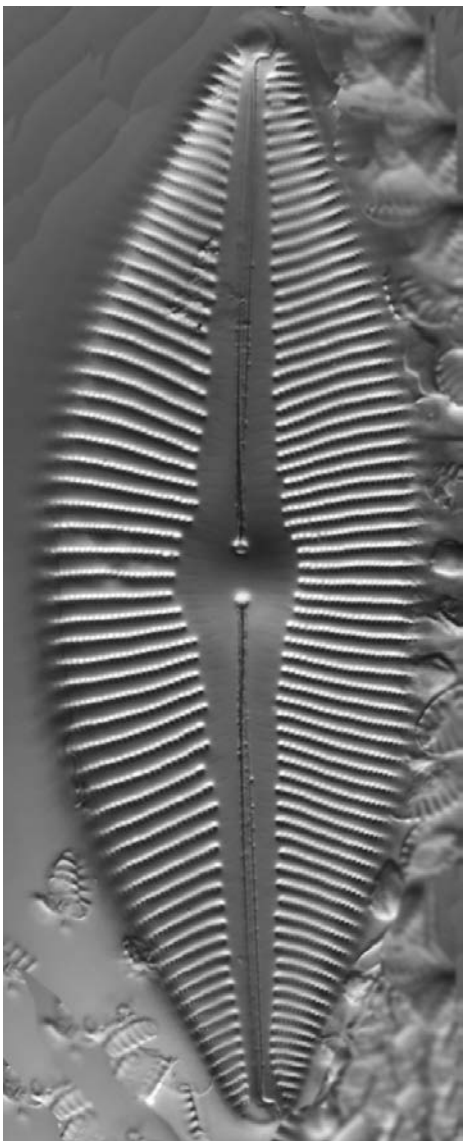

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10 µ

Plate 102	LM: x1500 SEM: x10000

Figs. 1-4	*Delicata delicatula* (Kützing) Krammer
Fig. 5	*Cymbella* sp cf. *lancettula* (Krammer) Krammer
Figs. 6-8	*Cymbopleura* cf. *pyrenaica* Le Cohu & Lange-Bertalot
Fig. 9	*Cymbella* sp.
Figs. 10-16	*Encyonopsis aequalis* (Smith) Krammer
Figs. 17-23	*Encyonopsis* aff. *aequalis* (Smith) Krammer *Encyonopsis* aff. *kriegeri* (Krasske) Krammer

Fig. 1	Lake Arratille, sediment PYR11
Fig. 2	Lake Posets, sediment PYR42
Figs. 3-4	Lake Gran de Mainera, epilithic EpiPYR70
Fig. 5	Lake Bachimala Sup., sediment PYR31
Fig. 6	Lake Estom, sediment PYR15
Figs. 7-8	Lake Rond, sediment PYR72
Figs. 9, 19-20	Lake Senó, sediment PYR84
Figs. 10-11, 13-18, 21-23	Lake Sotllo, sediment PYR89
Fig. 12	Lake Negre, sediment PYR79

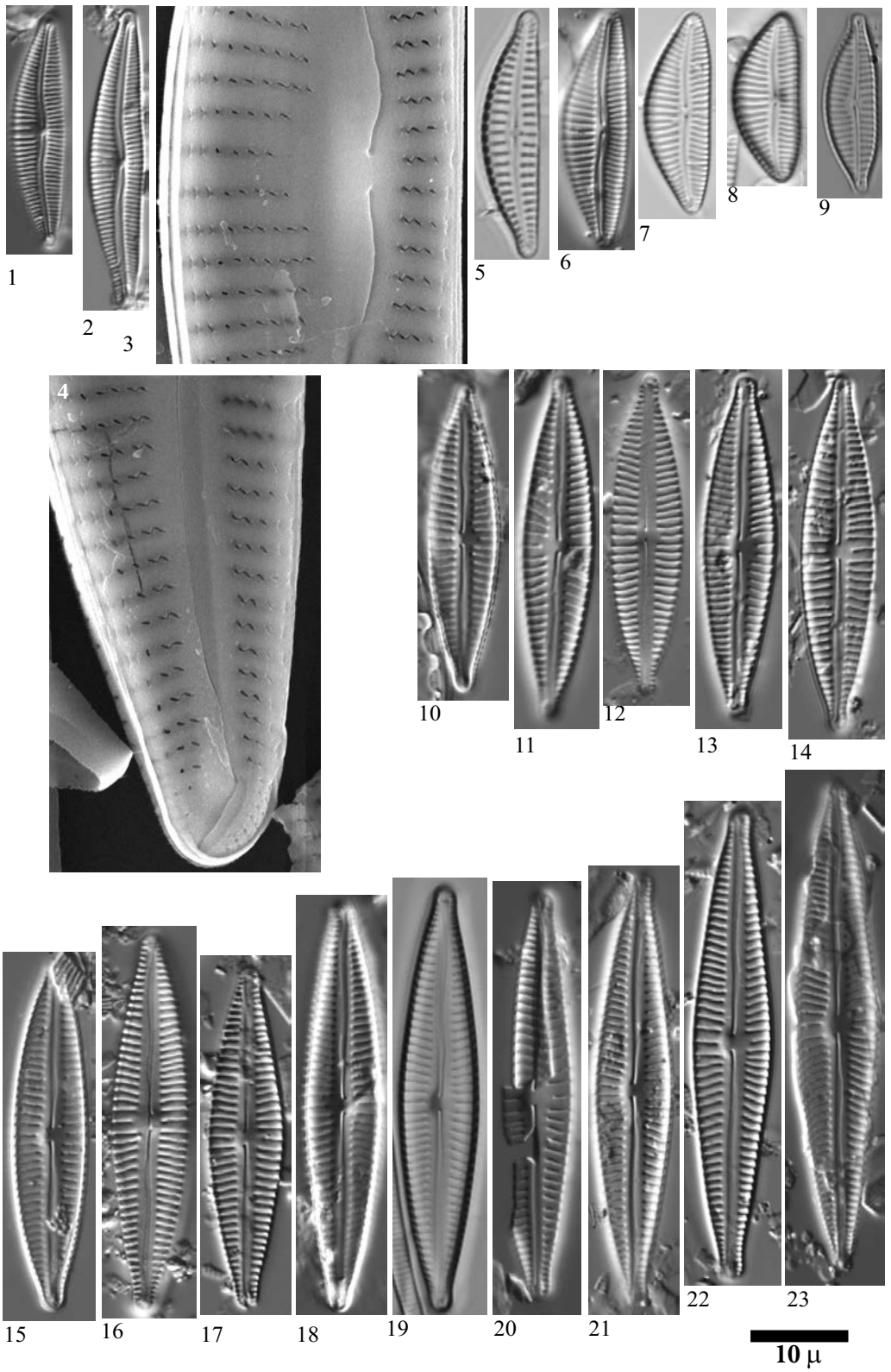
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Plate 103	LM: Figs. 1.5, 7-8 x1500, Fig. 9 x750 SEM: Fig. 16 x10000, Figs. 17-19 x5000

Figs. 1-2	*Encyonopsis grunowii* Krammer
Figs. 3-5	*Encyonopsis cesatii* (Rabenhorst) Krammer
Figs. 6-7	*Encyonopsis* cf. *falaisensis* (Grunow) Krammer
Fig. 8	*Encyonopsis descripta* (Hustedt) Krammer
Fig. 9	*Encyonopsis* cf. *lanceola* (Grunow) Krammer
Figs. 10-19	*Encyonopsis subminuta* Krammer & Reichardt
Figs. 20-22	*Encyonopsis microcephala* (Grunow) Krammer
Figs. 23-24	*Encyonopsis minuta* Krammer et Reichardt
Figs. 25-26	*Encyonopsis* sp. No.1 Nere
Figs. 27-34	*Encyonopsis* cf. *krammeri* Reichardt

Fig. 1	Lake Llosás, sediment PYR46
Fig. 2	Lake Senó, sediment PYR84
Figs. 3-5, 8, 10, 19, 23	Lake Posets, sediment PYR42
Figs. 6-7	Lake Basa de la Mora, sediment PYR32
Fig. 9	Lake Filià, sediment PYR71
Fig. 11	Lake Bersau, sediment PYR03
Figs. 12-13	Lake Burg, sediment BURG 831
Fig. 14	Lake Arretille, sediment PYR11
Fig. 15	Lake Burg, sediment BURG 1127
Fig. 20	Lake Helado de Marboré, sediment PYR18
Figs. 21-22, 27-34	Lake Acherito, epilithic EpiPYR01
Fig. 24	Lake Col d`Arratille, sediment PYR12
Fig. 25	Lake Col d`Arratille, epilithic EpiPYR12
Fig. 26	Lake Nere de Güèri, epilithic EpiPYR53

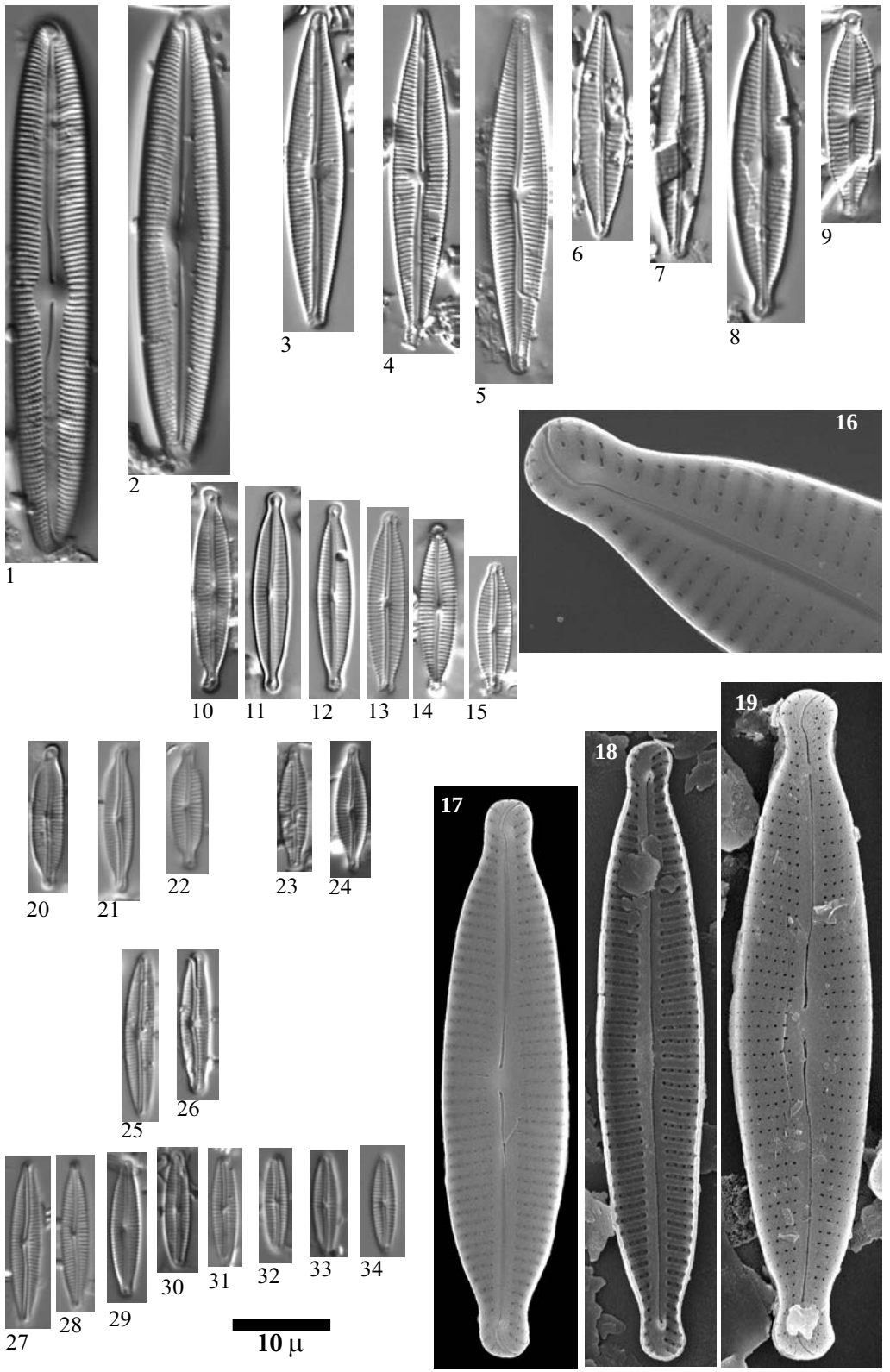
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Plate 104	LM: x1500 SEM Figs 11,15 x4000, Fig. 16 x10000

Figs. 1-2	*Encyonema vulgare* Krammer
Figs. 3-16	*Encyonema silesiacum* (Bleisch) Mann
Figs. 17-19	*Encyonema lange-bertalotii* Krammer

Figs. 1-2	Lake Angonella, sediment PYR78
Figs. 3-5, 10, 19	Lake La Munia Sup., sediment PYR20
Figs. 6, 12	Lake Arratille, sediment PYR11
Fig. 7	Lake Sen, sediment PYR40
Figs. 8-9, 13-14	Lake Posets, sediment PYR42
Fig. 17	Lake Arnales, sediment PYR09
Fig. 18	Lake Rond, sediment PYR72
Fig. 11, 15-16	Lake Port Bielh, epilithic EpiPYR28

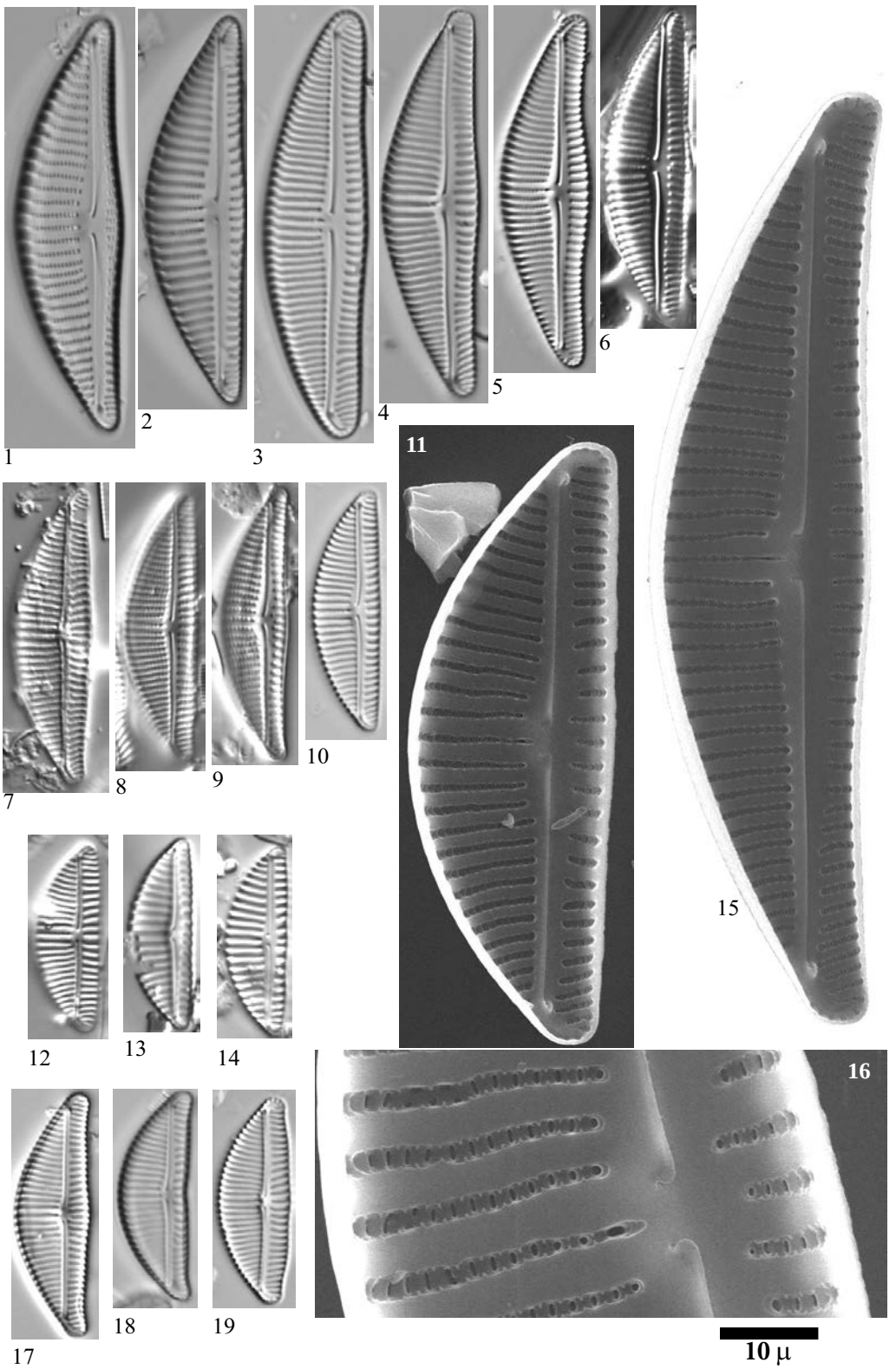
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Plate 105	LM: x1500 SEM: Figs. 45,46,48 x6000, Fig. 47 x10000

Fig. 1	*Encyonema* sp. No. 9 Gerber
Figs. 2-7	*Encyonema* sp. No. 10 Burg, aff. *minutum* (Hilse) Mann
Figs. 8-10	*Encyonema* sp. No. 1 Mora
Fig. 11	*Encyonema* sp. No. 8 Filia
Fig. 12	*Encyonema* sp. No. 2 Sen
Fig. 13	*Encyonema* sp.
Figs. 14-31,45	complex *Encyonema minutum* (Hilse) Mann *Encyonema ventricosum* (Kützing) Grunow
Figs. 32-34	*Encyonema* sp.
Figs. 35-40	*Encyonema ventricosum* (Kützing) Grunow
Fig. 41	*Encyonema* sp. No. 7 Barroude
Figs. 42-44,48	*Encyonema reichardtii* (Krammer) Mann
Figs. 46-47	*Encyonema minutum* (Hilse) Mann

Fig. 1	Lake Gerber, sediment PYR63	Fig. 40	Lake Eriste, sediment PYR43
Figs. 2-4, 7, 14	Lake Burg	Fig. 41	L. Barroude Inf., sediment PYR29
Fig. 5	Lake Burg, sediment BURG 831	Figs. 42-43	Lake Cap Long, sediment PYR24
Fig. 6	L. Burg, sediment BURG 1007	Fig. 18	Lake Pixón, sediment PYR44
Fig. 8	L. Col d`Arratille, sed. PYR12	Fig. 45	L. Roumassot, sediment EpiPYR04
Fig. 9	L. Basa de la Mora, sed. PYR32	Figs. 46-47	Lake Roumassot, sediment PYR04
Fig. 10	Lake Glacé, sediment PYR17	Fig. 48	L. Pondiellos Sup., sed. EpiPYR08
Fig. 11	Lake Filià, sediment PYR71		
Figs. 12, 18-19, 22, 25, 27	Lake Sen, sediment PYR40		
Figs. 13, 15-16, 20-21, 23, 26, 35-36	Lake Posets, sediment PYR42		
Fig. 24	Lake Bersau, sediment PYR03		
Fig. 29	L. H. Monte Perdido, sed. PYR19		
Fig. 30	L. Bleu de Rabass., sed. PYR112		
Figs. 17, 28, 31	L. Arratille, sediment PYR11		
Figs. 32-34	L. Ormiélas, sediment PYR05		
Figs. 37-39	L. Angonella, sediment PYR58		

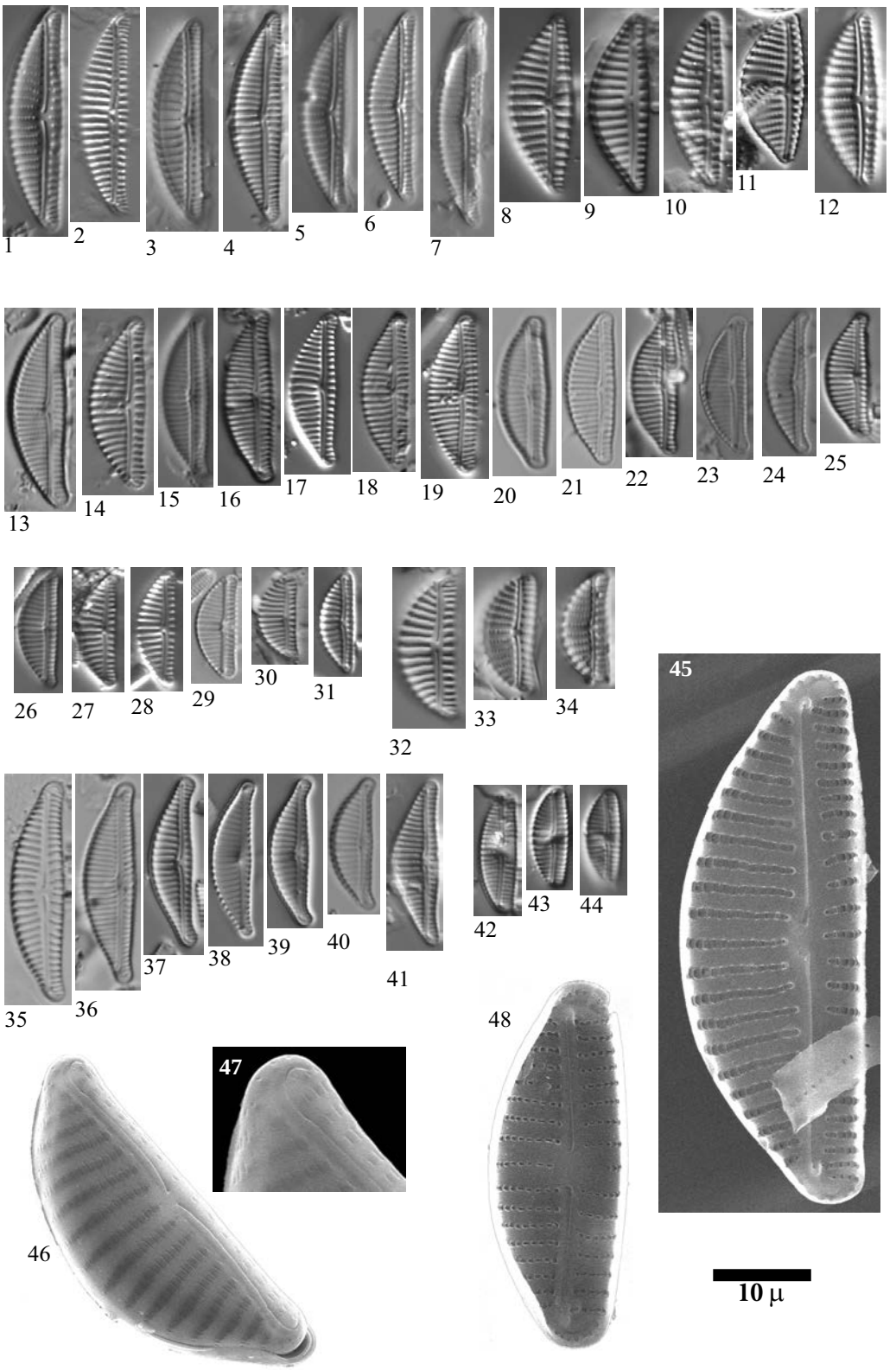
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Plate 106	LM: x1500 SEM: Figs. 1, 3, 4 x10000, Figs. 5,6 x4000, Fig. 7 x2000

Figs. 1-2	*Encyonema minutum* (Hilse) Mann
Figs. 3-7	*Encyonema ventricosum* (Kützing) Grunow

Figs. 1-2	Lake Laurenti, sediment PYR111
Figs. 4-5	Lake Redon, sediment REDOM
Figs. 6-7	Lake Pondiellos, epilithic EpiPYR08
Fig. 3	Lake Posets, sediment PYR42

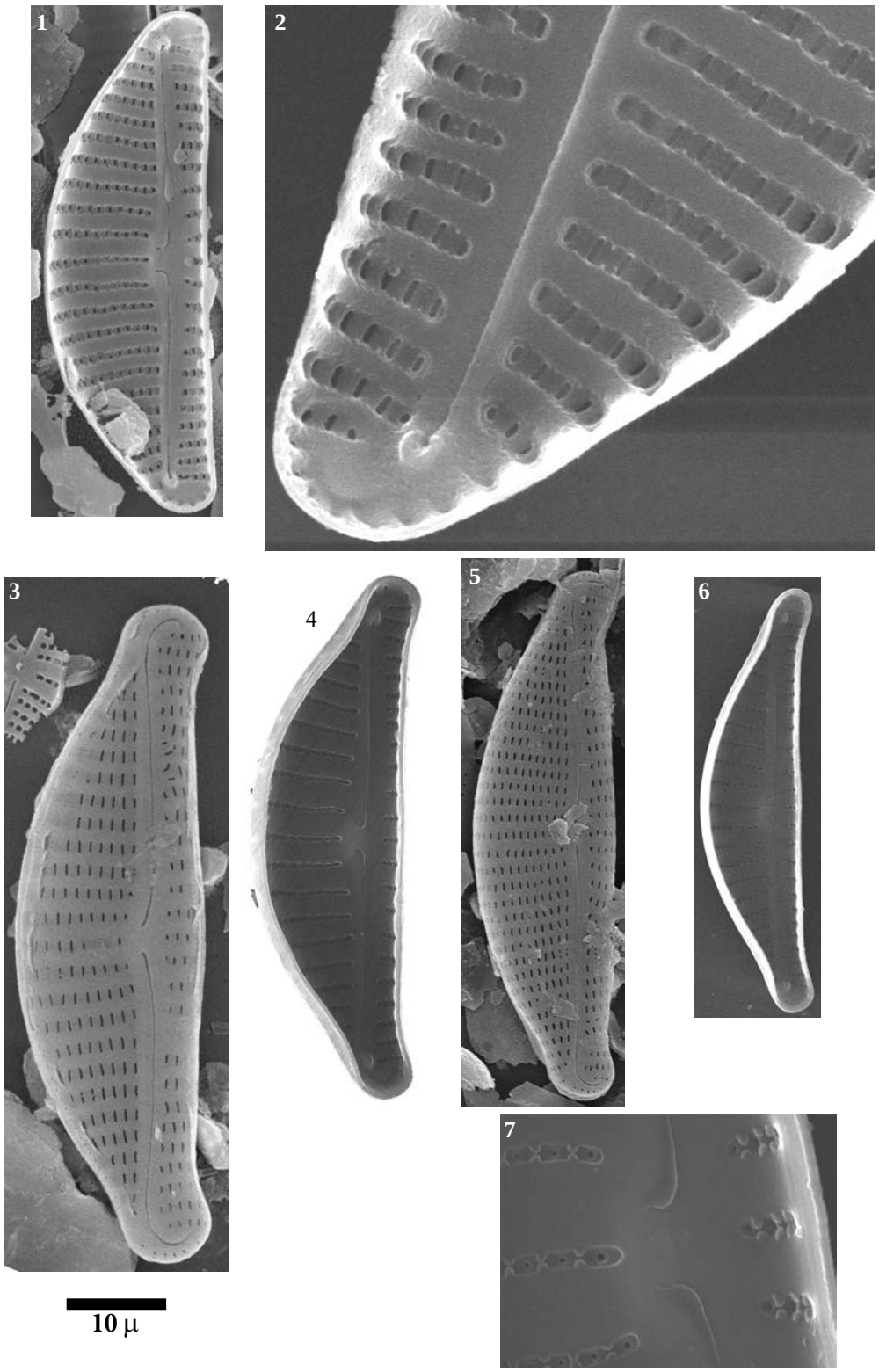
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Plate 107	LM: x1500 SEM: Figs. 14-16 x6000, Figs. 17-18 x4000

Figs. 1-4, 14	*Encyonema perpusillum* (Cleve) Mann
Figs. 5-9, 15-16	*Encyonema gaeumannii* (Meister) Krammer
Figs. 10-13 17-18	*Encyonema neogracile* Krammer

Figs. 1-2	Lake Aubé, sediment PYR82
Figs. 3-4	Lake Monges, sediment PYR57
Figs. 5-7	Lake Blaou, sediment PYR94
Fig. 8	Lake Posets, sediment PYR42
Fig. 9	Lake Les Laquettes, sediment PYR27
Figs. 10-13	Lake Bleu de Rabassoles, epilithic EpiPYR112
Fig. 14	Lake Illa, sediment PYR66
Fig. 15	Lake Mariola, sediment PYR80
Figs. 16-18	Lake Redon, sediment REDOM

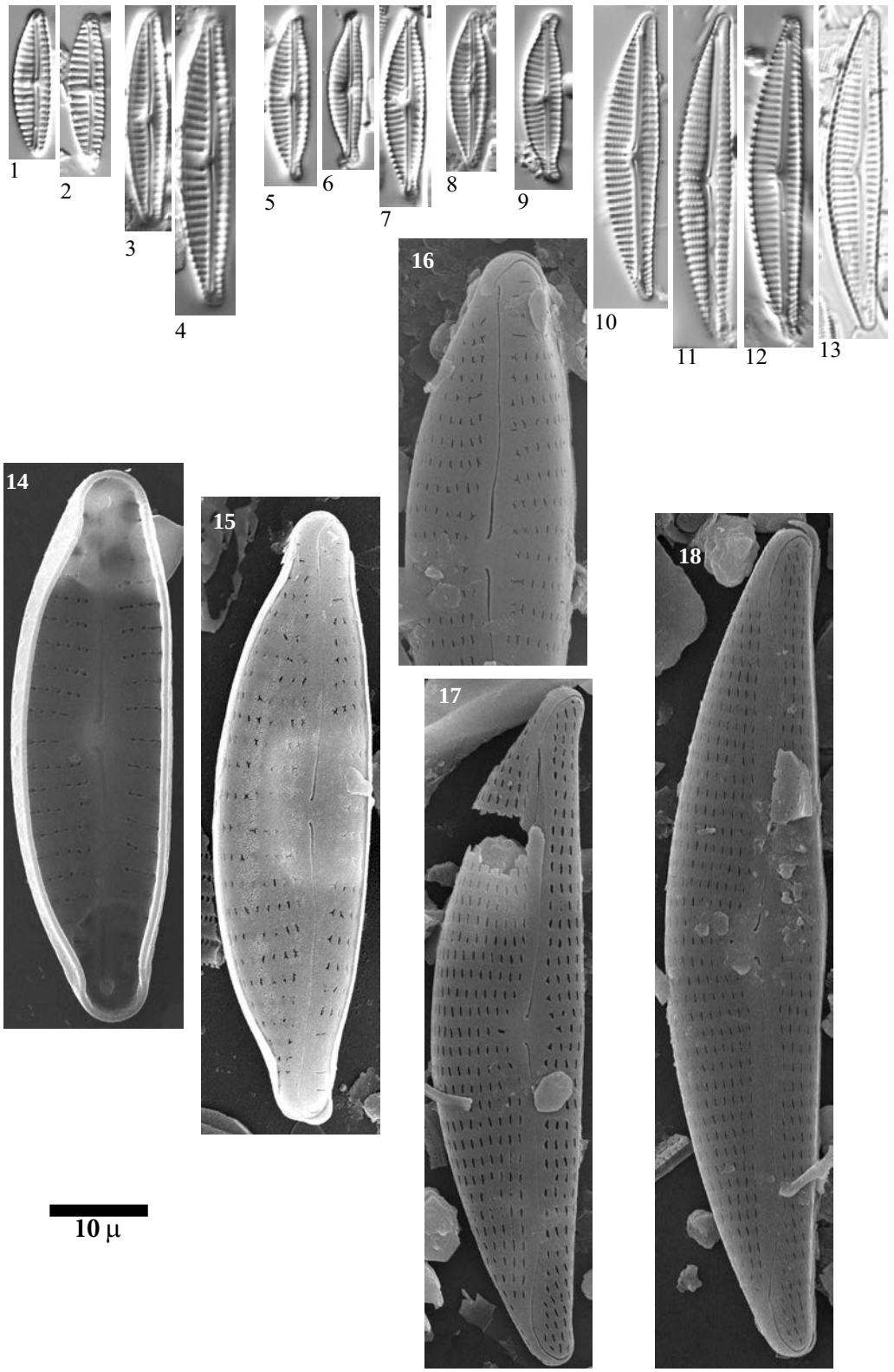
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Plate 108	LM: x1500 SEM: x3000

Figs. 1-3	*Encyonema caespitosum* Kützing
Figs. 4-6	*Encyonema* cf. *obscurum* var. *alpina* Krammer
Fig. 7	*Encyonema* sp. No. 3 Sen
Fig. 8	*Encyonema silesiacum* (Bleisch) Mann
Figs. 9-10	Primary cells?
Figs. 11-14	*Encyonema* sp. No. 5 Pica Palomera
Figs. 15-16	*Encyonema* sp. No. 6 Seno
Figs. 17-22	*Encyonema hebridicum* Grunow ex Cleve
Figs. 23-27	*Reimeria sinuata* (Gregory) Kociolek & Stoermer emend Sala, Guerrero & Ferrario

Figs. 1-3, 27	Lake Estom, sediment PYR15
Figs. 4-5, 7	Lake Basa de la Mora, sediment PYR32
Fig. 6	Lake Arnales, sediment PYR09
Figs. 8, 21-22	Lake Arratile, sediment PYR76
Figs. 9-10	Lake Posets, sediment PYR11
Figs. 11, 13	Lake Pica Palomera, sediment PYR52
Fig. 12	Lake Mes Amunt de Tristaina, sediment PYR86
Fig. 14	Lake Burg
Fig. 15	Lake Senó, sediment PYR84
Fig. 16	Lake La Munia Sup., sediment PYR20
Fig. 17	Lake Mariola, sediment PYR80
Figs. 18, 20	Lake Negre, sediment PYR79
Fig. 19	Lake Monges, sediment PYR57
Fig. 23	Lake Laurenti, sediment PYR111
Fig. 24	Lake Les Laquettes, sediment PYR27
Fig. 25	Lake Llebreta, sediment PYR58
Fig. 26	Lake Helado del Monte perdido, epilithic EpiPYR19

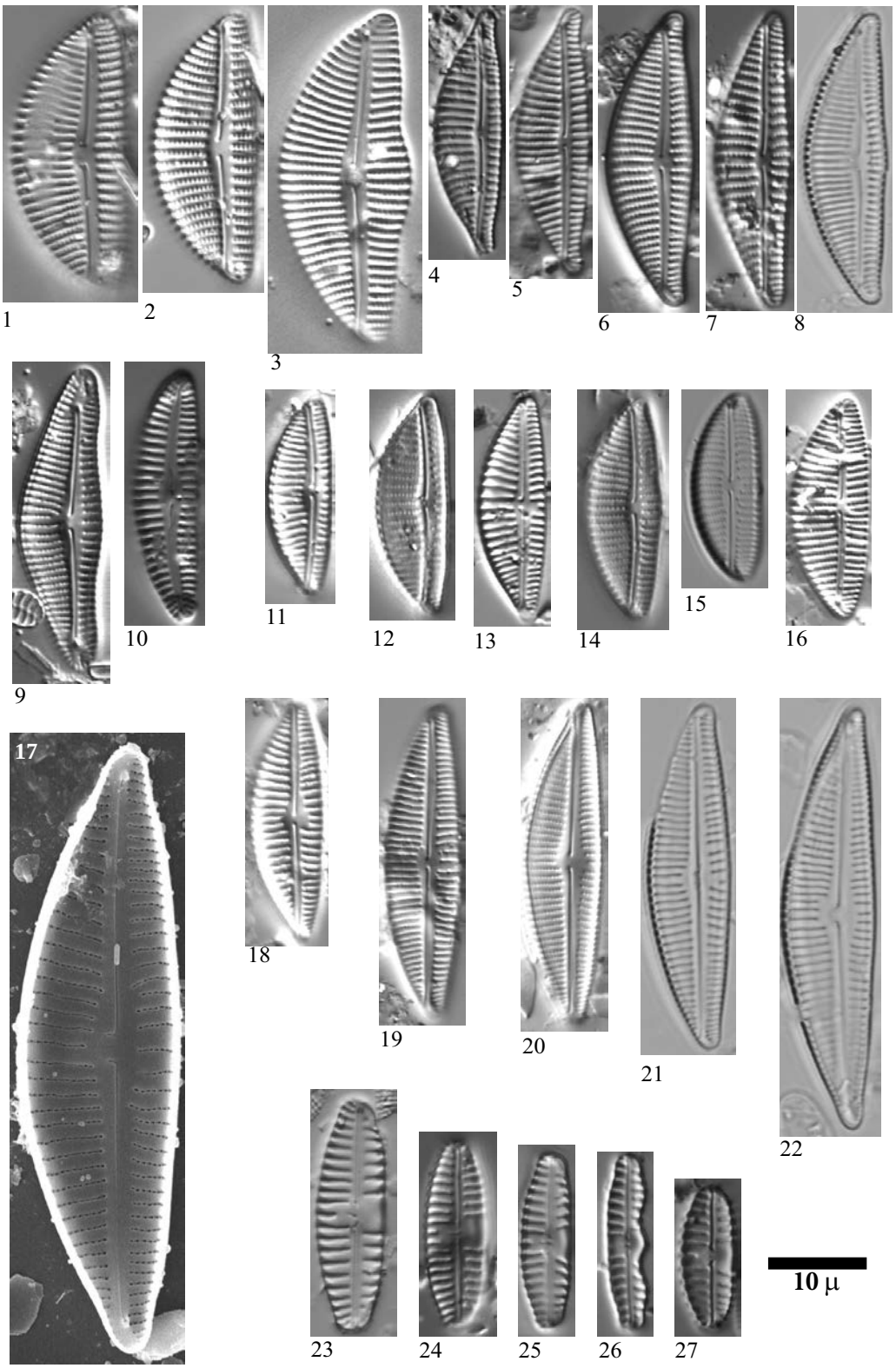
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Plate 109	LM: x1500 SEM: Fig. 14 x8000, Fig. 15 x6000, Figs. 22-24 x3000
Figs. 1-2, 14	*Amphora pediculus* (Kützing) Grunow
Figs. 3-4	*Amphora neglecta* f. *densestriata* Foged
Figs. 5,15	*Amphora* cf. *inariensis* Krammer
Fig. 6	*Amphora* sp.
Figs. 7-11	*Amphora* cf. *eximia* Carter
Figs. 12-13	*Amphora* sp. No. 1 Sen
Fig. 16	*Amphora oligotraphenta* Lange-Bertalot
Fig. 17, 22	*Amphora* cf. *affinis* Kützing
Figs. 18-20, 23-24	*Amphora copulata* (Kützing) Schoeman & Archibald
Fig. 21	*Amphora lange-bertalotii* Z. Levkov & D. Metzeltin

Fig. 1	Lake Llebreta, sediment PYR58
Fig. 2	Lake Estanés, sediment PYR02
Figs. 3, 7, 8, 9, 13, 16	Lake Sen, sediment PYR40
Figs. 4, 10-12, 19, 21	Lake Posets, sediment PYR42
Figs. 5-6	Lake Pondiellos Sup., sediment PYR08
Fig. 17	Lake Basa de la Mora, sediment PYR32
Fig. 14-15, 22, 24	Lake Laurenti, sediment PYR111
Fig. 18	Lake Arratille, sediment PYR11
Fig. 20	Lake Pixón, sediment PYR44
Fig. 23	Lake Arnales, epilithic EpiPYR09

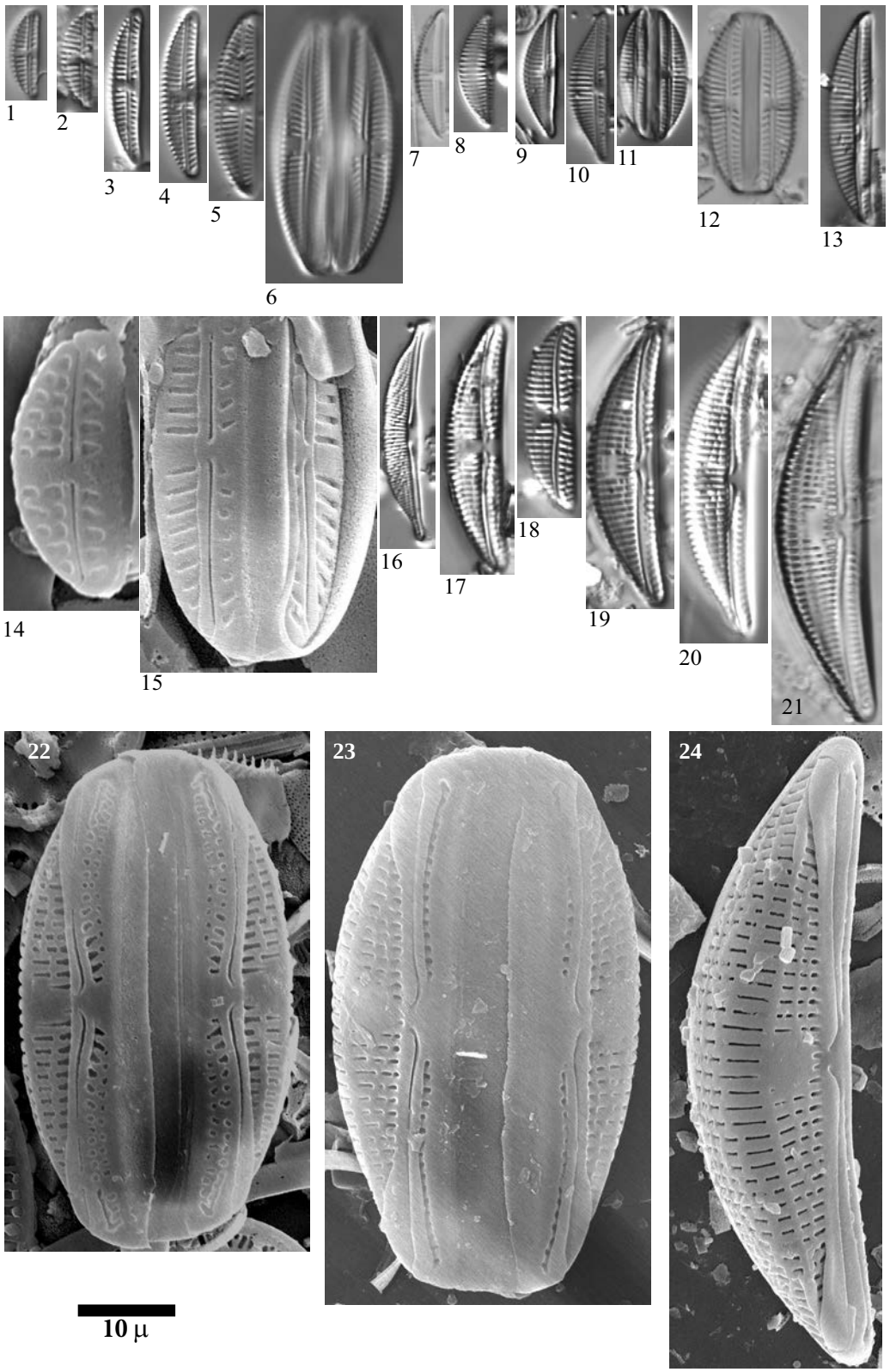
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Plate 110	LM: x1500 SEM: Fig. 10 x10000 Fig. 11 x2000

Fig. 1	*Gomphonema coronatum* Ehrenberg
Fig. 2	*Gomphonema* cf. *acuminatum* Ehrenberg
Figs. 3-4	*Gomphonema acuminatum* Ehrenberg
Figs. 5-6, 10-11	*Gomphonema capitatum* Ehrenberg
Fig. 7	*Gomphonema* cf. *truncatum* Ehrenberg
Figs. 8-9	*Gomphonema truncatum* Ehrenberg

Fig. 1	Lake Llebreta, sediment PYR58
Figs. 2, 5-6	Lake Posets, sediment PYR42
Figs. 3-4	Lake Burg
Fig. 7	Lake Burg, sediment BURG 1176
Figs. 8-9	Lake Angonella de Més Amunt, sediment PYR78
Figs. 10-11	Lake Gran de Mainera, epilithic EpiPYR70

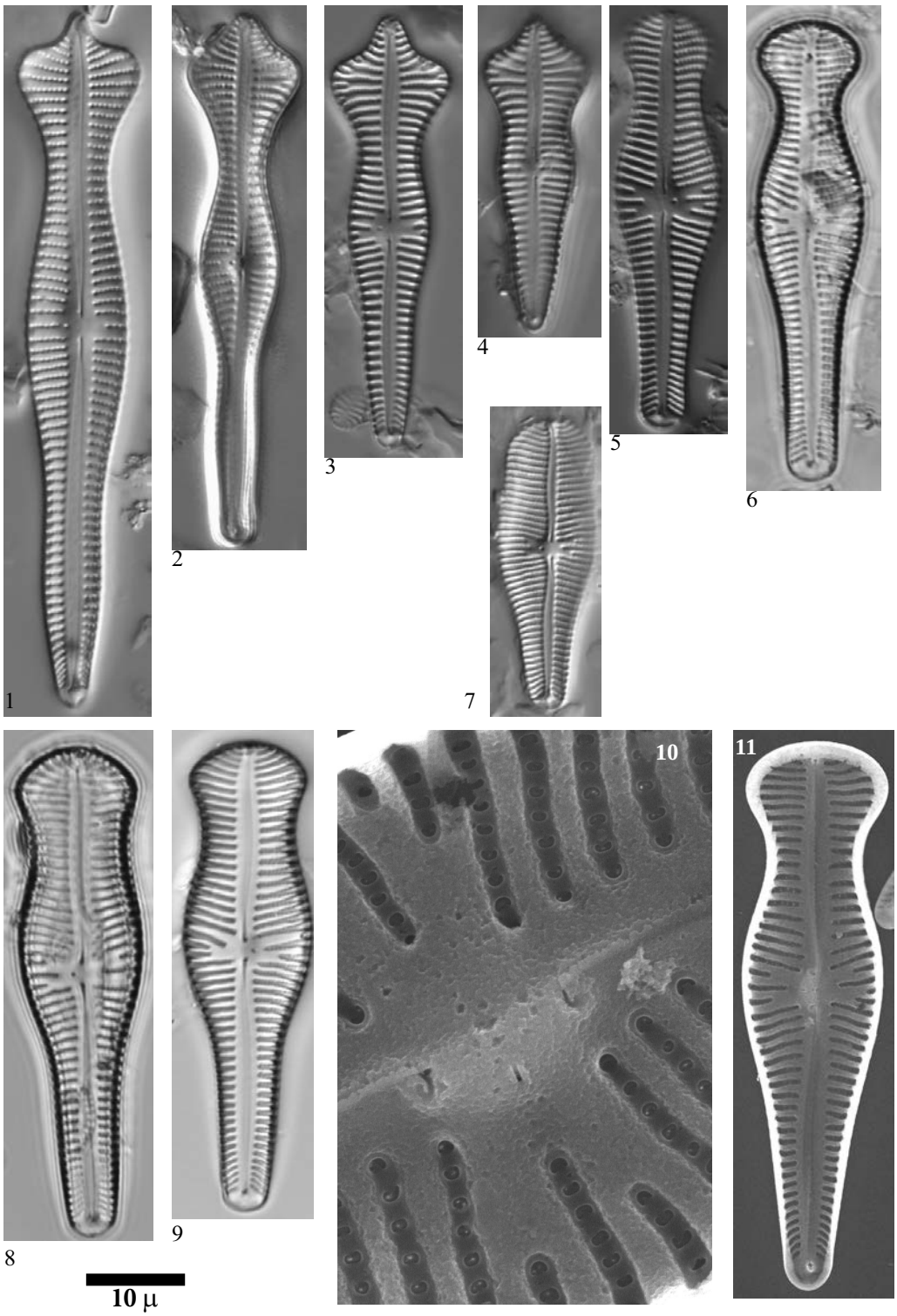
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Plate 111 LM: x1500

Figs. 1-2	*Gomphonema brebissonii* Kützing
Figs. 3-5	*Gomphonema montanum* Schumann
Figs. 6	*Gomphonema clavatum* Ehrenberg
Figs. 7-8	*Gomphonema subclavatum* (Grunow) Grunow
Fig. 9-10	*Gomphonema* cf. *subclavatum* (Grunow) Grunow
Fig. 11	*Gomphonema* sp. No. 1 Acherito
Fig. 12	*Gomphonema* sp. No. 2 Laquettes
Figs. 13-25	*Gomphonema lateripunctatum* Reichardt & Lange-Bertalot
Fig. 26-27	*Gomphonema vibrio* Ehrenberg

Fig. 1	Lake PYR128
Fig. 2	Lake Gran del Pessó, sediment PYR56
Figs. 3-4	Lake Cregüeña, sediment PYR49
Fig. 5	Lake Més Amunt de Tristaina, epilithic EpiPYR86
Fig. 6	Lake Compte, sediment PYR97
Fig. 7	Lake Forcat Inf., sediment PYR77
Fig. 8	Lake Siscar, sediment PYR126
Fig. 9	Lake Romedo de Dalt, sediment PYR85
Fig. 10	Lake Inferior de la Gallina, sediment PYR87
Figs. 11, 24, 26-27	Lake Acherito, sediment PYR01
Figs. 12, 15-19, 21-22	Lake Les Laquettes, sediment PYR27
Fig. 13	Lake Arratille, sediment PYR11
Fig. 14	Lake Asnos, sediment PYR14
Figs. 20, 25	Lake Rond, sediment PYR72
Fig. 23	Lake Gros de Camporrells, sediment PYR110

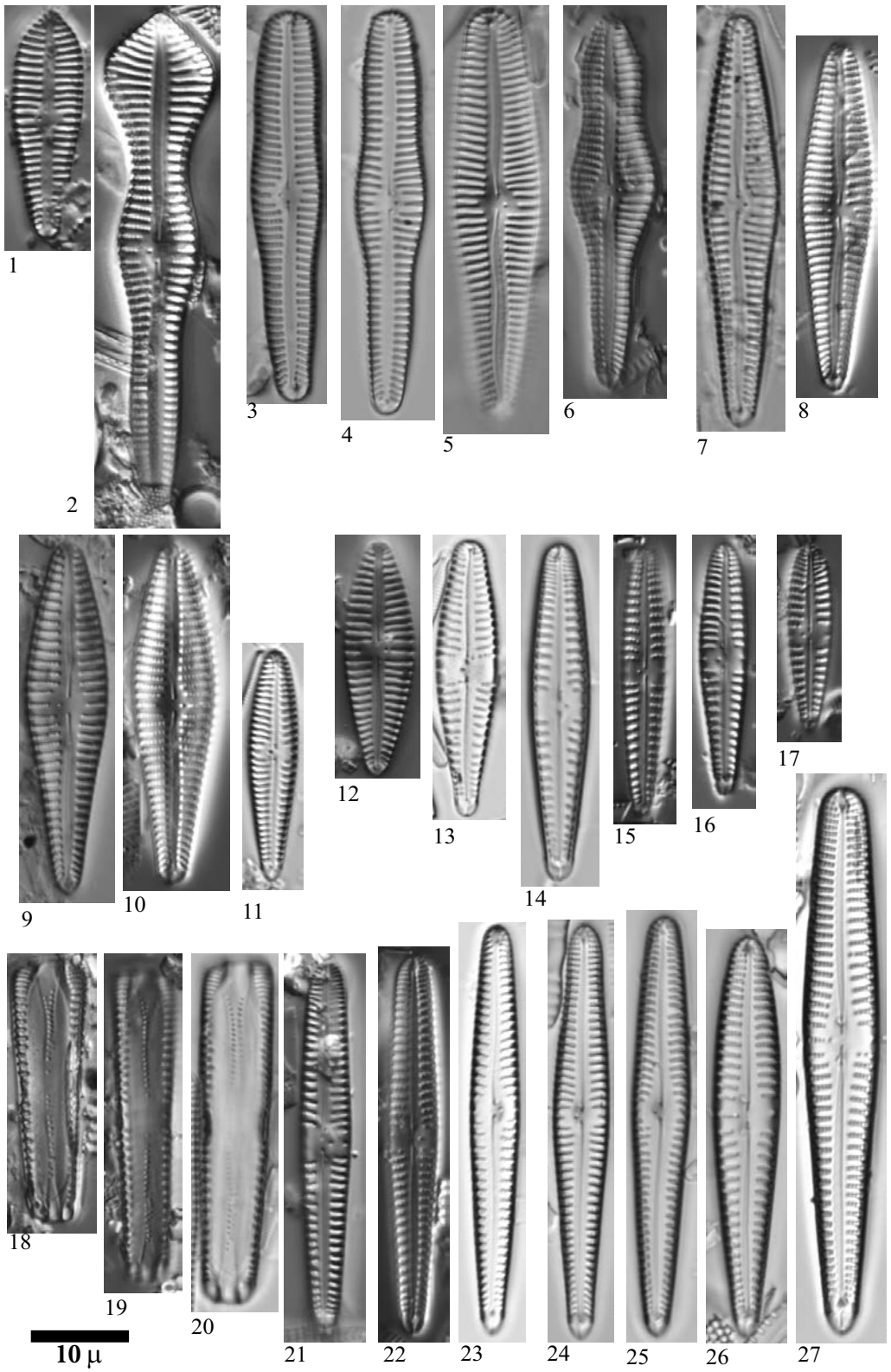
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Plate 112	LM: x1500 SEM: Figs. 4-5 x5000, Figs. 6-7 x15000, Fig. 8 x10000

Figs. 1-8	*Gomphonema lateripunctatum* Reichardt & Lange-Bertalot
Figs. 1, 4, 6-7	Lake Roumassot, epilithic EpiPYR04
Fig. 2	Lake Les Laquettes, sediment PYR27
Figs. 5, 8	Lake Port Bielh, epilithic EpiPYR28

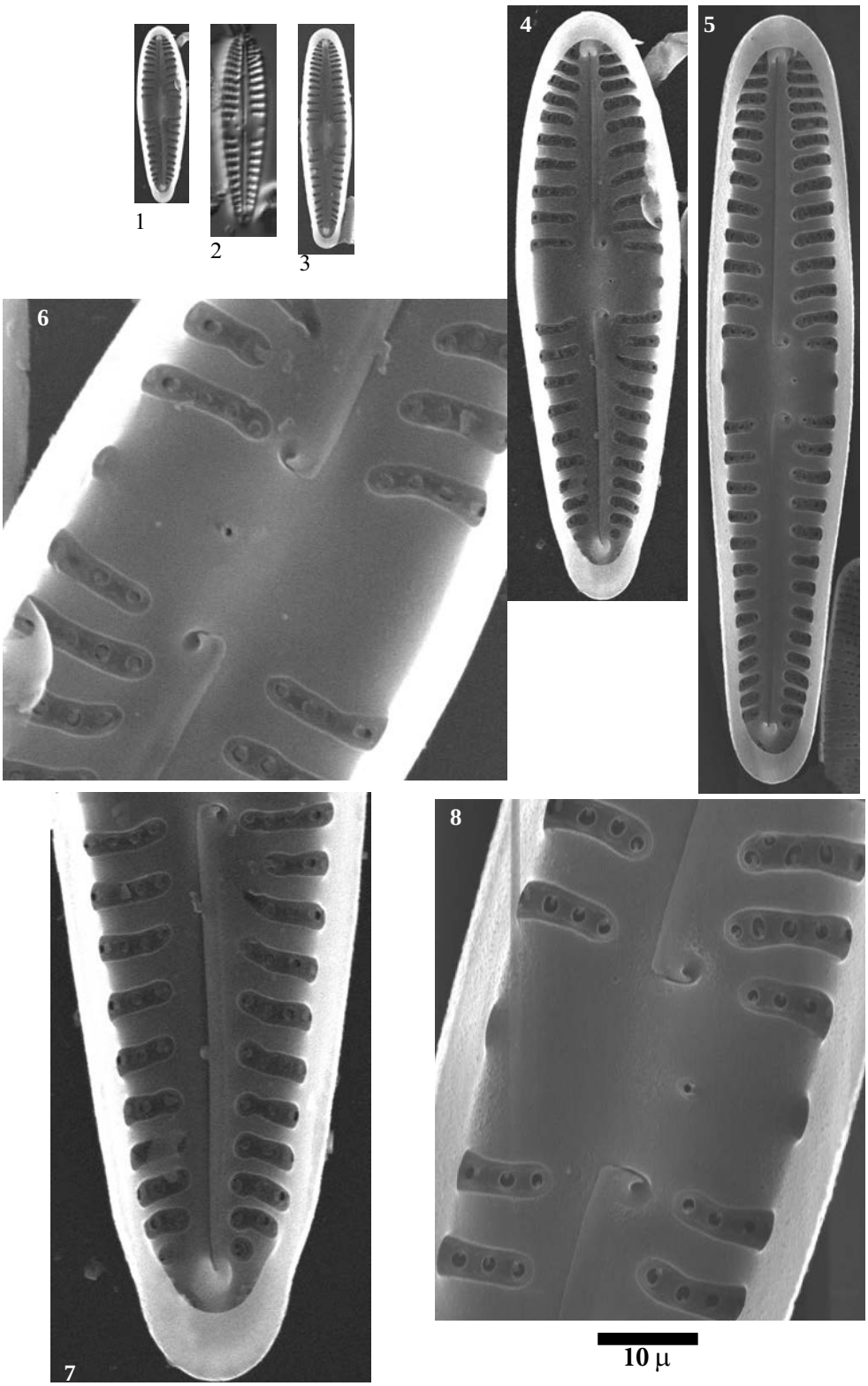
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Plate 113	LM: x1500 SEM: Fig. 42 x5000

Fig. 1-2	*Gomphonema* cf. *designatum* Reichardt
Fig. 3	*Gomphonema* cf. *minusculum* Krasske
Figs. 4-7	*Gomphonema* cf. *pumilum* (Grunow) Reichardt & Lange-Bertalot
Figs. 8-10	*Gomphonema* cf. *elegantissimum* Reichardt & Lange-Bertalot
Figs. 11-12	*Gomphonema* cf. *pseudotenellum* Lange-Bertalot
Figs. 13-17	*Gomphonema* cf. *minusculum* Krasske
Fig. 18	*Gomphonema* sp. No. 4 Posets
Figs. 19-20	G*omphonema* cf. *lacus-vulcani* Reichardt & Lange-Bertalot
Fig. 21	*Gomphonema* sp. No. 5 Chelau
Figs. 22-30	*Gomphonema* sp. No. 6 Inferior
Fig. 31	*Gomphonema* sp. No. 7 Burg
Fig. 32	*Gomphonema* sp. No. 8 Laquettes
Fig. 33	*Gomphonema occultum* Reichardt & Lange-Bertalot
Figs. 34-35	*Gomphonema tergestinum* (Grunow) Fricke
Fig. 36	cf. G*omphonemopsis* sp. No. 1 Compte
Figs. 37-42	*Gomphonema* sp. No. 9 Posets
Figs. 43-48	*Gomphoneis* cf. *olivaceoides* (Hustedt) Carter
Figs. 49-50	*Gomphonema* sp. No. 10 Inferior
Fig. 51	*Gomphonema* cf. *rhombicum* Fricke
Fig. 52	*Gomphonema* sp. No. 11 Ormiélas aff. *G. tenue*

Fig. 1	Lake Helado de Marboré, sediment PYR18
Fig. 2	Lake Pondiellos Sup., epilithic EpiPYR08
Fig. 3	Palaelake Burg, sediment BURG 804
Figs. 4, 45	Lake Arratille, sediment PYR11
Fig. 5	Lake Tourrat, sediment PYR23
Figs. 6, 8-9, 12-13, 30	Lake Acherito, sediment PYR01
Fig. 7	Lake Compte, sediment PYR97
Fig. 10	Lake Gran de Mainera, sediment PYR70
Figs. 11, 32	Lake Les Laquettes, sediment PYR27
Fig. 14	Lake Roumassot, sediment PYR04
Fig. 15	Lake Acherito, epilithic EpiPYR01

Sample information continued on the next page

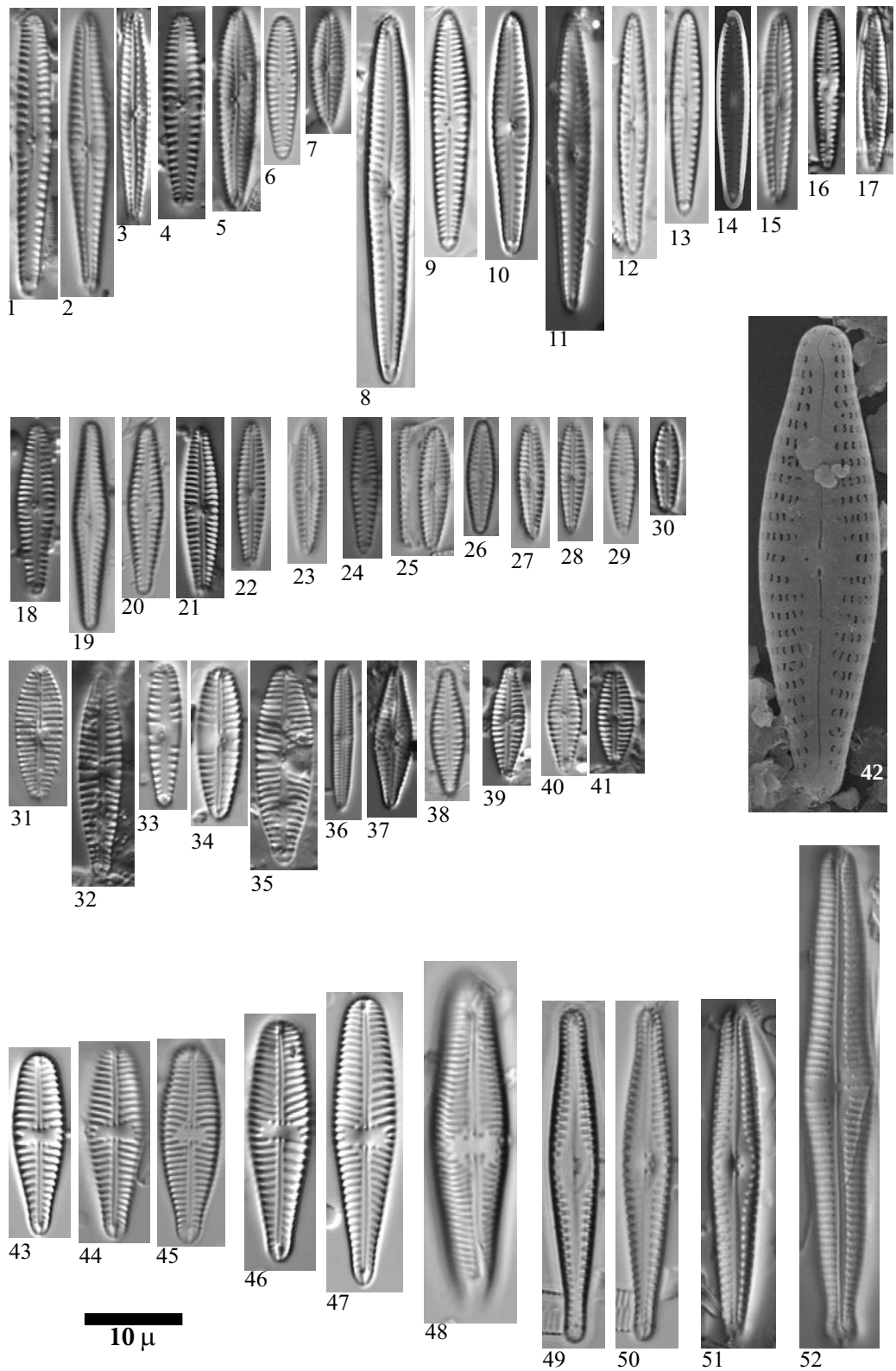
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Plate 114	SEM: Fig. 1 x6000, Figs. 2-3, 5-7 x15000 Fig. 4 x4000

Figs. 1-3	*Gomphonema* cf. *minusculum* Krasske
Figs. 4-7	*Gomphonema* sp.
Figs. 1-7	Lake Roumassot, sediment PYR04

	Sample information of Plate 113
Figs. 16-17	Lake Port Bielh, sediment PYR28
Figs. 18-20, 37, 42	Lake Posets, sediment PYR42
Fig. 21	Lake Chelau Sup., sediment PYR41
Figs. 22-29, 49-50	Lake Inf. de la Gallina, sediment PYR87
Fig. 31	Lake Burg
Fig. 33	Lake Bleu epilithic EpiPYR22
Figs. 34, 43-44, 46-48	Lake La Munia Sup., sediment PYR20
Fig. 35	Lake Cap Long, sediment PYR24
Figs. 36-41	Lake Compte epilithic EpiPYR97
Fig. 51	Lake Trebens, sediment PYR114
Fig. 52	Lake Pica Palomera epilithic EpiPYR52

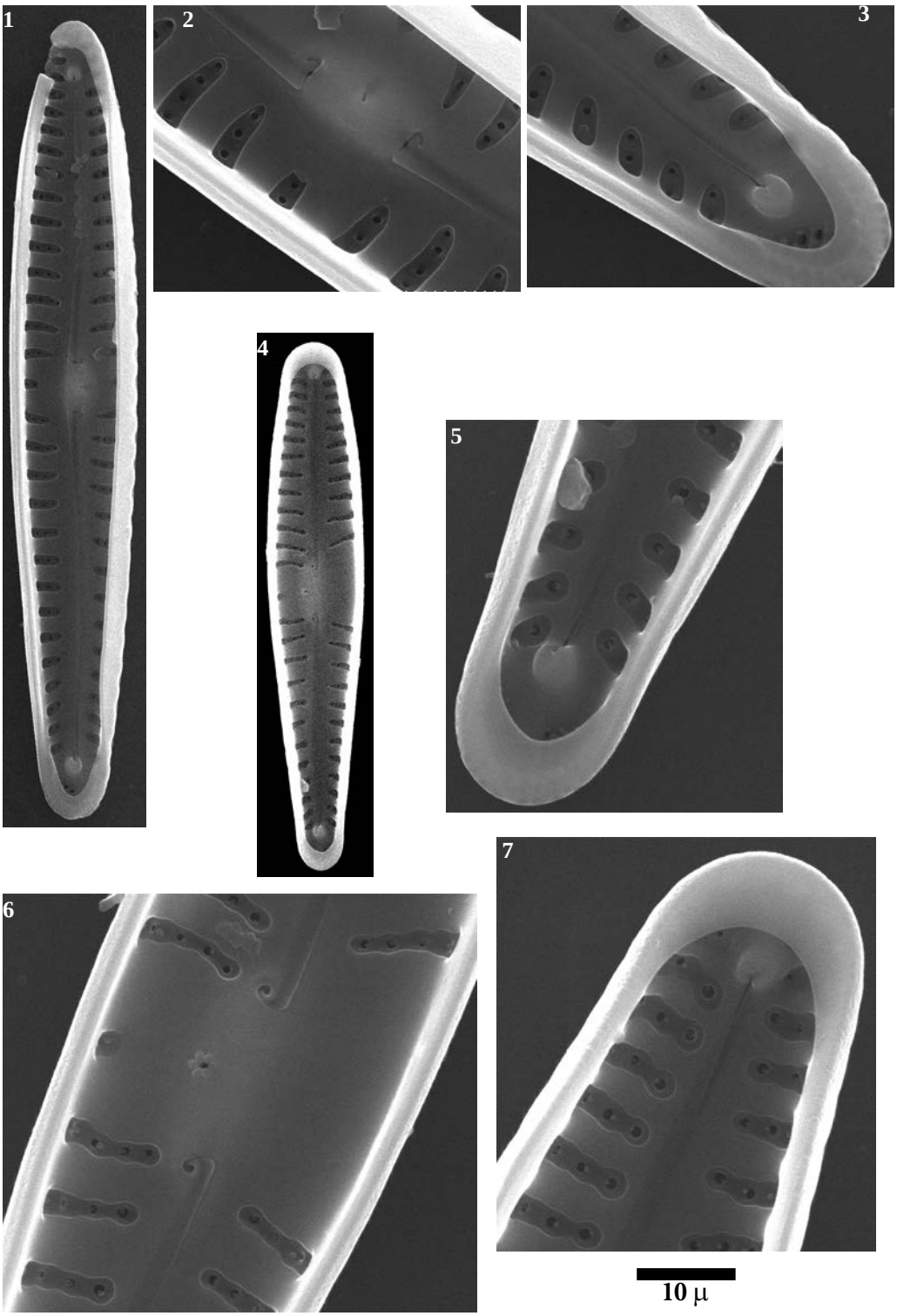
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Plate 115 LM: x1500

Fig. 1	*Gomphonema sarcophagus* Gregory
Fig. 2	*Gomphonema* sp. No. 12 Burg
Fig. 3	*Gomphonema lapponicum* (Cleve) Cleve-Euler
Fig. 4	*Gomphonema micropus* Kützing
Fig. 5	*Gomphonema* sp. No. 13 Gerber
Fig. 6	*Gomphonema* sp. No. 14 Cap Long
Figs. 7-10	*Gomphonema* sp. No. 15 Coronas
Figs. 11-13	*Gomphonema* cf. *cymbelliclinum* Reichardt & Lange-Bertalot
Figs. 14-15	*Gomphonema parvulum* (Kützing) Kützing sensu lato
Fig. 16	*Gomphonema parvulum* (Kützing) Kützing sensu lato
Fig. 17-21	*Gomphonema* sp. No. 16 Estagnol
Figs. 22-24	*Gomphonema* sp. No. 17 Gerber
Fig. 25	*Gomphonema* cf. *gracile* Ehrenberg
Figs. 26-31	*Gomphonema* cf. *hebridense* Gregory
Figs. 32-33	*Gomphonema auritum* Braun
Figs. 34-37	*Gomphonema* sp. No. 20 Laquettes
Figs. 38-44	*Gomphonema* spp aff. *Gomphonema parvulum* (Kützing) Kützing sensu lato
Fig. 45-47	*Gomphonema* cf. *acidoclinatum* Lange-Bertalot & Reichardt
Fig. 48-50	*Gomphonema* sp. No. 18 Laquettes
Fig. 51	*Gomphonema* sp. No. 19 Laquettes

Fig. 1	Lake Burg, sediment 970
Fig. 2	Lake Burg, sediment 473
Figs. 3, 11-12, 15, 28	Lake Cregüeña, sediment PYR49
Fig. 4	Lake Rond, sediment PYR72
Figs. 5, 22-23	Lake Gerber, sediment PYR63
Fig. 6	Lake Cap Long, epilithic EpiPYR24
Fig. 7	Lake Coronas, sediment PYR47
Figs. 8-9, 18, 20-21	Lake L´Estagnol, sediment PYR119
Figs. 10, 13, 19, 24	Lake Inf. de la Gallina, sediment PYR87
Figs. 14, 27	Lake Bachimala Sup., sediment PYR31
Figs. 16, 25	Lake Mariola, sediment PYR80

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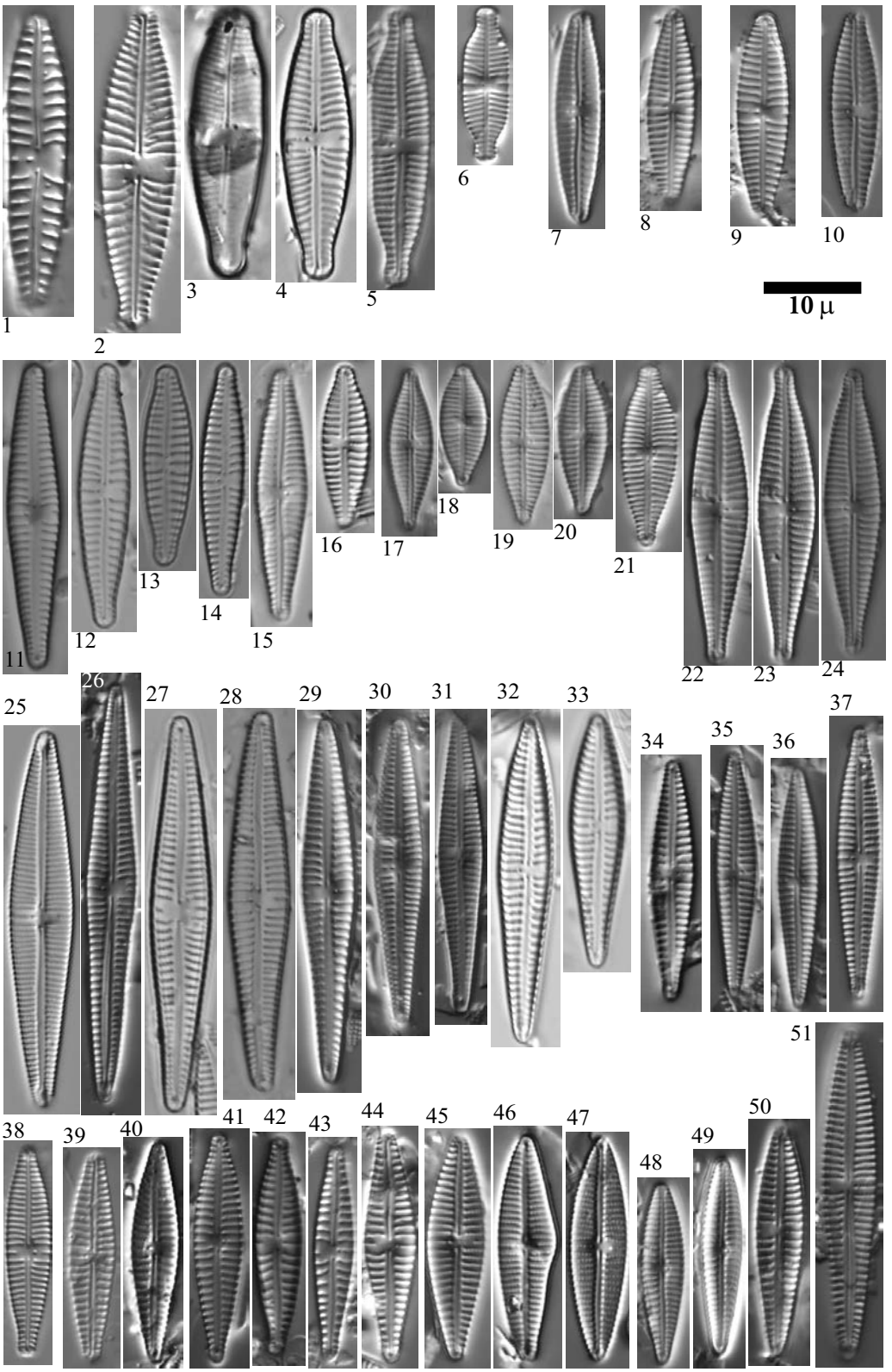
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Plate 116	SEM: Fig. 1 x1800, Figs. 2, 4 x15000, Fig. 3 x9000

Figs. 1-4	*Gomphonema hebridense* Gregory
Figs. 1-4	Lake Port Bielh, sediment EpiPYR28

	Sample information of Plate 115
Figs. 17, 38-39	Lake Burg
Figs. 26, 29-31, 35-37, 41-43, 48-51	Lake Les Laquettes, sediment PYR27
Fig. 32	Lake Arratille, sediment PYR11
Fig. 33	Lake Acherito, sediment PYR01
Figs. 34, 40	Lake Sen, sediment PYR40
Fig. 44	Lake Eriste, sediment PYR43
Fig. 45	Lake Pixón, sediment PYR44
Figs. 46-47	Lake Pica, sediment PYR100

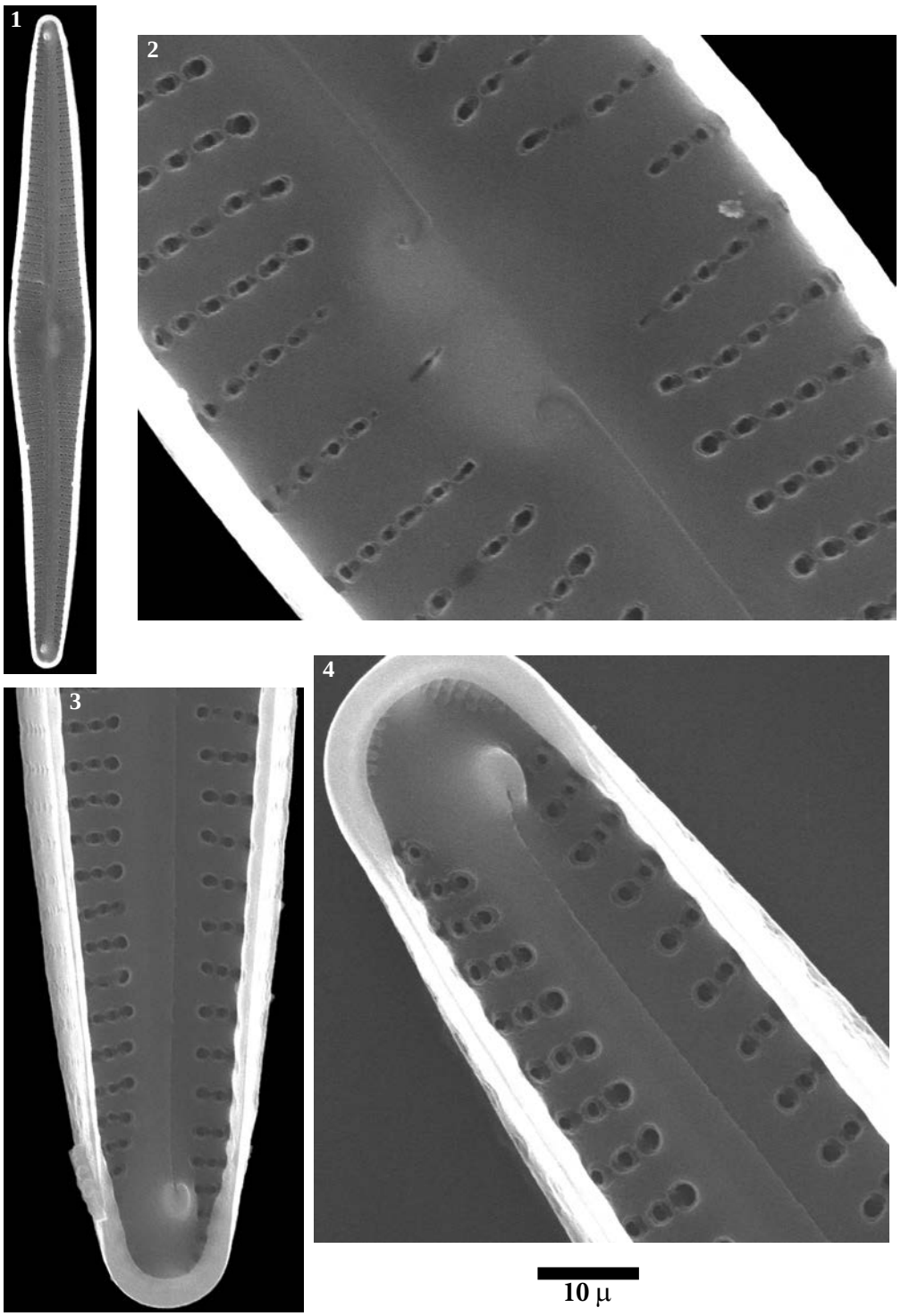
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Plate 117	LM: x1500 SEM: 4-7, 8, 13, 14 x8000 20 x5000

Figs. 1-6	*Nitzschia* sp. No. 4 Airoto
Figs. 7-15	*Nitzschia* spp Fig. 9-10, 12 *Nitzschia* sp. No. 6 Sen Fig. 11 *Nitzschia* sp. No. 5 Arratille
Figs. 16-20	*Nitzschia* sp. No. 1 Sen

Figs. 1, 3, 19-20	Lake Posets, sediment PYR42
Fig. 2	Lake Illa, sediment PYR66
Fig. 4	Lake Redon, sediment REDOM
Fig. 5	Lake Roumassot, epilithic EpiPYR04
Fig. 6	Lake Roumassot, sediment PYR04
Fig. 7	Lake Port Bielh, epilithic EpiPYR28
Fig. 8	Lake Garbet, sediment PYR81
Figs. 9, 15	Lake Gran de Mainera, sediment PYR70
Fig. 10	Lake Rond, sediment PYR72
Fig. 11	Lake Arratille, sediment PYR11
Figs. 12, 16-18	Lake Sen, sediment PYR40
Fig. 13	Lake Laurenti, sediment PYR111
Fig. 14	Lake Arnales, epilithic EpiPYR09

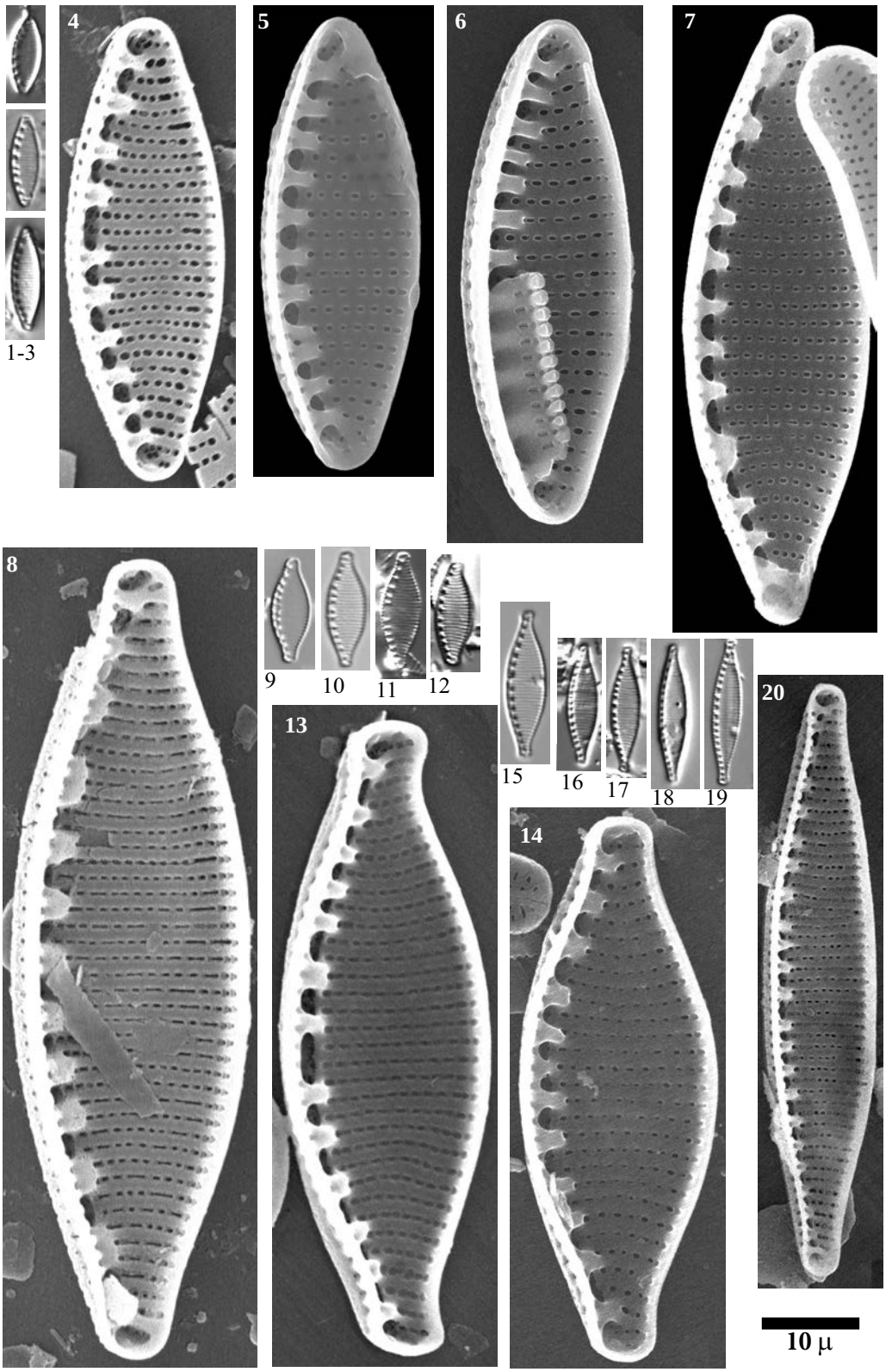
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Plate 118	LM: x1500 SEM: x8000

Figs. 1-4	*Nitzschia* cf. *frustulum* (Kützing) Grunow
Figs. 5-6	*Nitzschia* cf. *inconspicua* Grunow
Figs. 7-13	*Nitzschia* cf. *alpina* Hustedt
Figs. 14, 27-30	*Nitzschia* sp
Figs. 15-18	*Nitzschia acidoclinata* Lange-Bertalot
Fig. 19-22	*Nitzschia* cf. *perminuta* (Grunow) Peragallo M1
Figs. 23-26, 31	*Nitzschia* cf. *perminuta* (Grunow) Peragallo M2

Fig. 1	Lake Roumassot, epilithic EpiPYR04
Fig. 2	Lake Etriste, sediment PYR43
Fig. 3	Lake Estom, sediment PYR15
Figs. 4-6, 16	Lake Burg
Fig. 7	Lake Filià, sediment PYR71
Fig. 8	Lake Llebreta, sediment PYR58
Figs. 9-13, 14, 28-30	Lake Posets, sediment PYR42
Figs. 15, 17	Lake Bersau, sediment PYR03
Figs. 18, 20-22	Lake Inf. de la Gallina, sediment PYR87
Fig. 19	Lake Arratille, sediment PYR11
Fig. 23	Lake Sen, sediment PYR40
Fig. 24	Lake Gelat Bergús, sediment PYR65
Figs. 25-26	Lake Basa de la Mora, sediment PYR32
Fig. 27	Lake Redon, sediment REDOM
Fig. 31	Lake Port Bielh, epilithic EpiPYR28

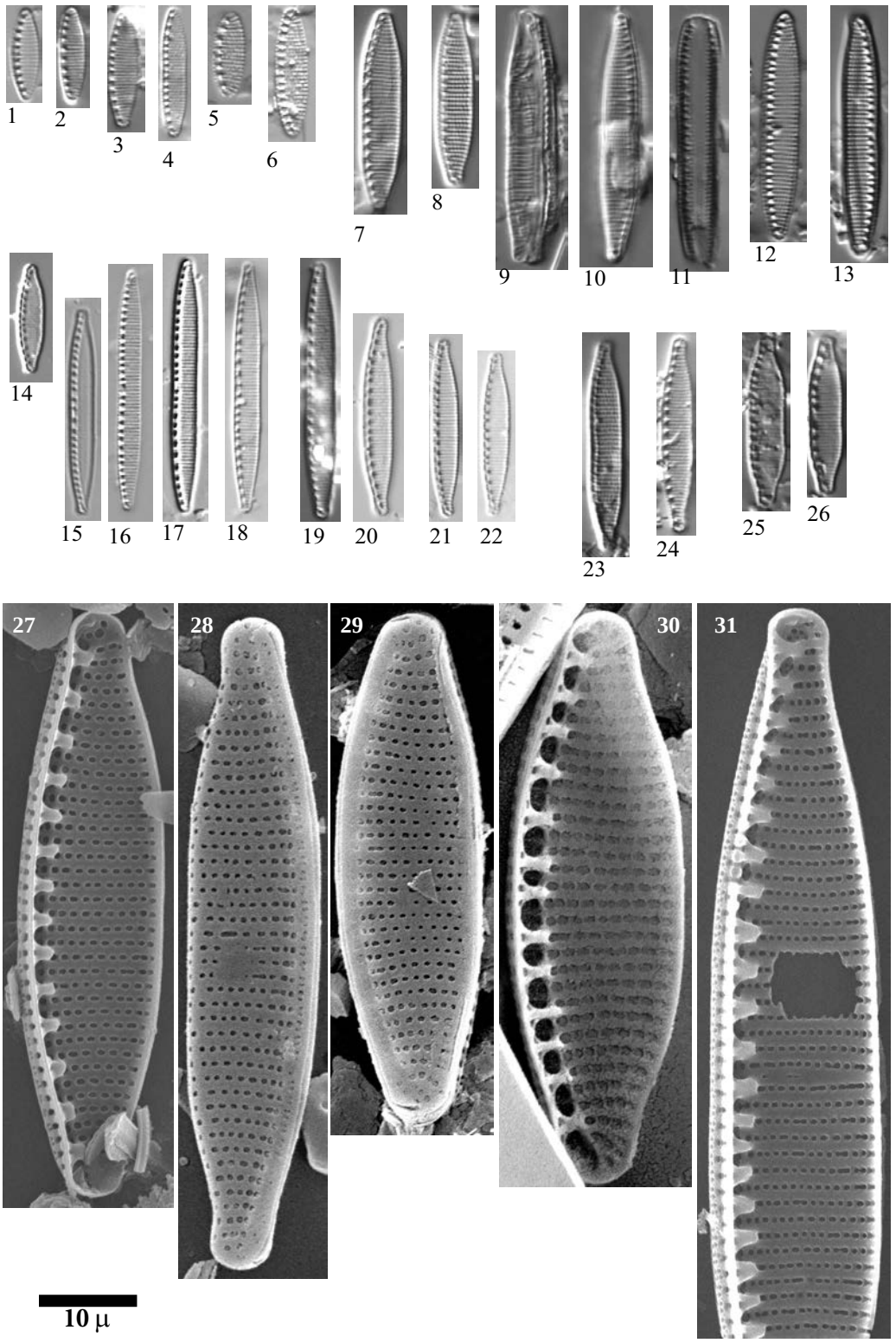
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Plate 119	LM: x1500 SEM: Figs. 8-9 x6000, Fig. 10 x4500

Fig. 1	*Nitzschia* sp. No. 16 Mora
Figs. 2-3	*Nitzschia* cf. *pumila* Hustedt
Figs. 4-5, 10	*Nitzschia* cf. *pumila* Hustedt
Figs. 6-9	*Nitzschia* sp. No. 2 Posets
Figs. 11-17	*Nitzschia* cf. *bryophila* (Hustedt) Hustedt
Figs. 18-23	*Nitzschia* sp. No. 15 Burg, aff. *bryophila* (Hustedt) Hustedt
Figs. 24-28	*Nitzschia* cf. *bryophila* (Hustedt) Hustedt
Fig. 29	*Nitzschia* sp.
Fig. 30	*Nitzschia* sp. No. 13 Coronas
Fig. 31	*Nitzschia* sp. No. 3 Airoto
Figs. 32-33	*Nitzschia palea* var. *debilis* (Kützing) Grunow

Fig. 1	Lake Basa de la Mora, sediment PYR32
Fig. 2	Lake Arnales, sediment PYR09
Fig. 3	Lake Burg, sediment BURG 1116
Figs. 4-8, 29	Lake Posets, sediment PYR42
Fig. 9	Lake Pondiellos Sup., epilithic EpiPYR08
Fig. 10	Lake Port Bielh, epilithic EpiPYR28
Fig. 11	Lake Inf. de la Gallina, sediment PYR87
Fig. 12	Lake Illa, epilithic EpiPYR66
Figs. 18-23	Lake Burg
Figs. 24-26	Lake Sen, sediment PYR40
Fig. 27	Lake Més Amunt de Tristaina, sediment PYR86
Fig. 28	Lake Pixón, sediment PYR44
Fig. 30	Lake Coronas, epilithic EpiPYR47
Fig. 31	Lake Airoto, sediment PYR73
Fig. 32	Lake Pondiellos Sup., sediment PYR08
Fig. 33	Lake Lliterola, sediment PYR33

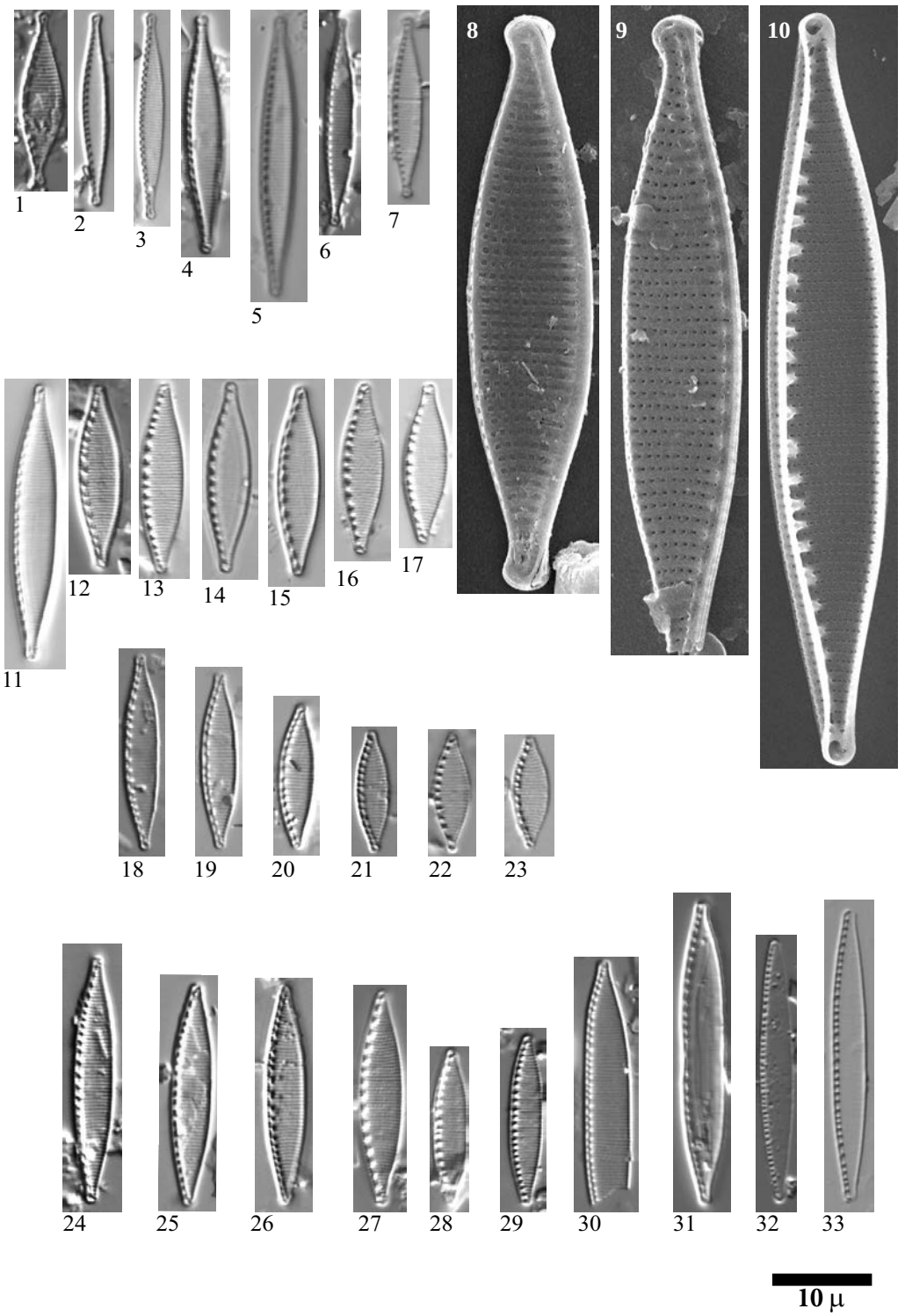
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Plate 120	LM: x1500 SEM x3000

Figs. 1-3	*Nitzschia* sp. No. 7 Posets
Figs. 4-6	*Nitzschia* cf. *paleacea* (palacea) Grunow
Figs. 7-8	*Nitzschia* sp. No. 11 Burg
Figs. 9-10	*Nitzschia* sp. No. 12 Burg
Figs. 11-12	*Nitzschia* sp. No. 8 Bergeus
Figs. 13-16	*Nitzschia gracilis* Hantzsch
Fig. 17	*Nitzschia* cf. *linearis* var. *subtilis* Hustedt
Figs. 18-19	*Nitzschia pura* Hustedt
Figs. 20-22	*Nitzschia* cf. *dissipata* (Kützing) Grunow
Fig. 23	*Nitzschia garrensis* Hustedt
Fig. 24	*Nitzschia* sp. No.10 Mora
Fig. 25	*Nitzschia rectiformis* Hustedt
Fig. 26	*Nitzschia* sp. No. 9 Mora
Fig. 27	*Nitzschia* sp. No. 14 Burg
Fig. 28	cf. *Nitzschia amphibia* var. *fossilis* Grunow
Figs. 29-30	*Hantzschia* cf. *amphioxys* (Ehrenberg) Grunow
Figs. 31-32	*Hantzschia* cf. *rhaetica* Meister

Figs. 1-3, 18, 21, 28-29	Lake Posets, sediment PYR42	Fig. 20	Lake Sen, sediment PYR40
Figs. 4-6	Lake Compte, sediment PYR97	Fig. 22	Lake Albe, sediment PYR96
Fig. 7	L. Burg, sediment BURG 1006	Fig. 23	Lake Acherito, sediment PYR01
Fig. 8	L. Burg, sediment BURG 1007	Figs. 24, 26	L. Basa de la Mora, sediment PYR32
Figs. 9-10	Lake Burg	Fig. 25	L. Més Amunt de Tristaina, sediment PYR86
Fig. 11	Lake Eriste, sediment PYR43	Fig. 27	L. Burg, sediment BURG 755
Figs. 12, 30	L. Gelat Bergús, sed. PYR65	Figs. 31-32	L. Burg, sediment BURG 1195
Fig. 13	L. Inf. Gallina, epilit. Epi-PYR87		
Fig. 14	L. Urdiceto, sediment PYR125		
Fig. 15	Lake Illa, sediment PYR66		
Fig. 16	L. L`Estagnol, epil. Epi-PYR119		
Fig. 17	L. Pondiellos Sup., epil. EpiPYR08		
Fig. 19	Lake Mariola, sediment PYR80		

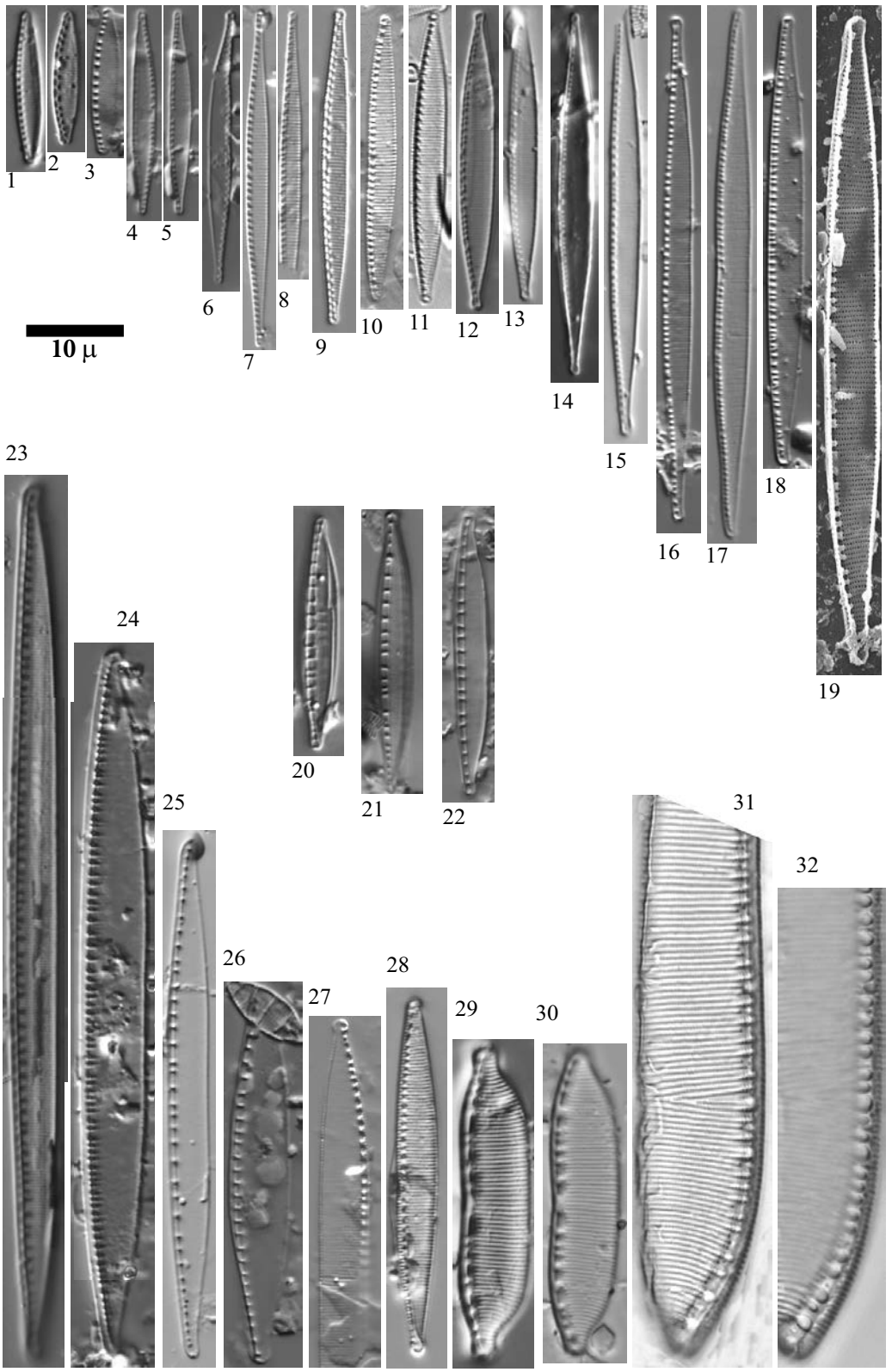
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Plate 121	LM: x 1500 SEM: Figs. 6, 7 x3000, Fig. 8 x400, Fig. 9 x2000, Fig. 10 x10000

Figs. 1-7	*Nitzschia angustata* (W. Smith) Grunow
Figs. 8-10	*Nitzschia rectiformis* Hustedt

Figs. 1, 3-5	Lake Estom, sediment PYR15
Fig. 2	Lake Posets, sediment PYR42
Figs. 6-7	Lake Port Bielh, epilithic EpiPYR28
Figs. 8-10	Lake Redon, sediment REDOM

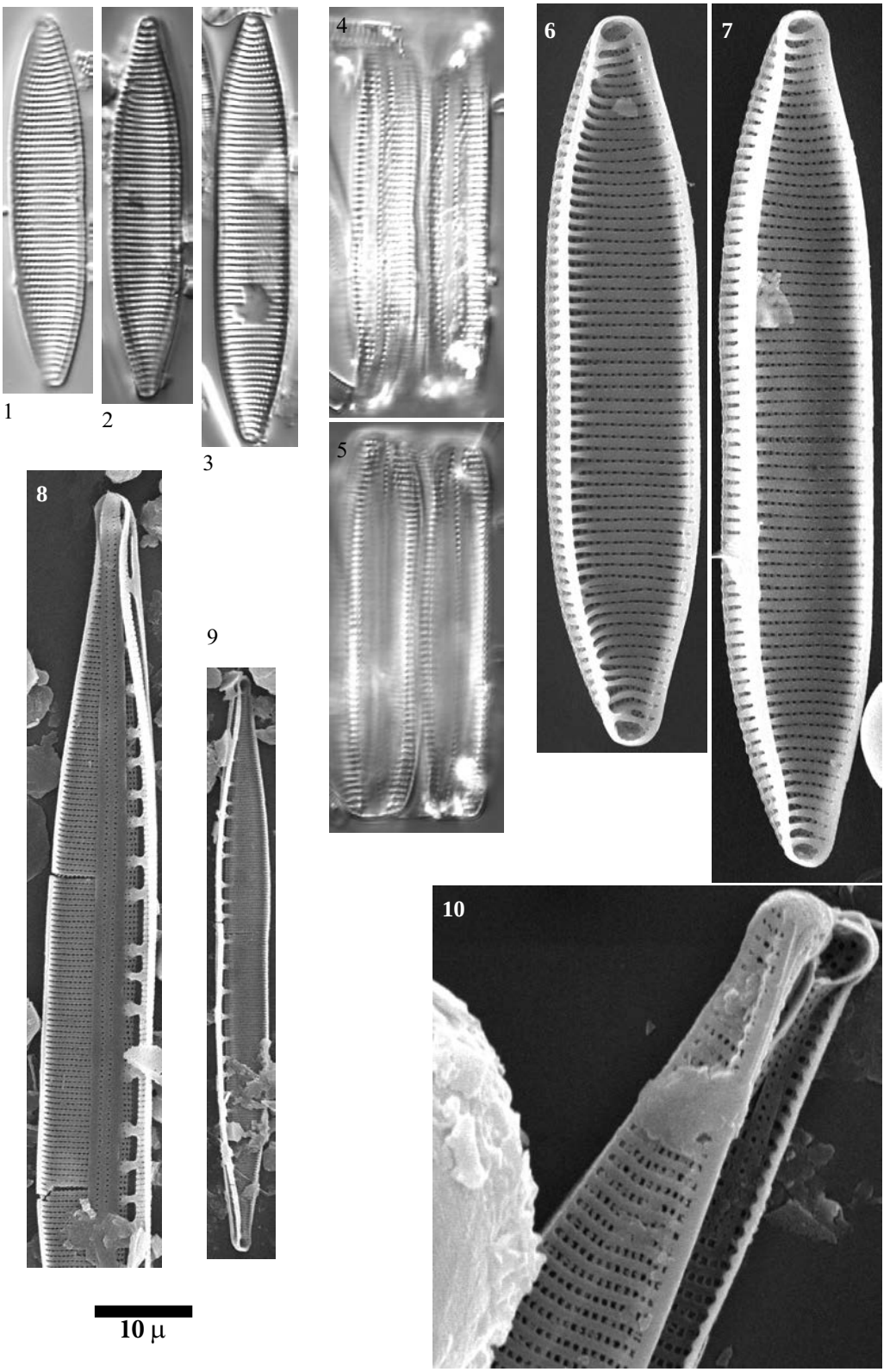
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Plate 122	LM: x1500 SEM: Figs. 6,7,12 x10000, Figs. 13-15 x5000

Figs. 1-15	*Denticula tenuis* Kützing

Figs. 1-2, 5, 8-9, 12, 14	Lake Posets, sediment PYR42
Figs. 3-4, 10-11	Lake Sen, sediment PYR40
Figs. 6, 7	Lake Roumassot, sediment PYR04
Figs. 12, 15	Lake Pondiellos Sup., epilithic EpiPYR08
Fig. 13	Lake Port Bielh, epilithic EpiPYR28

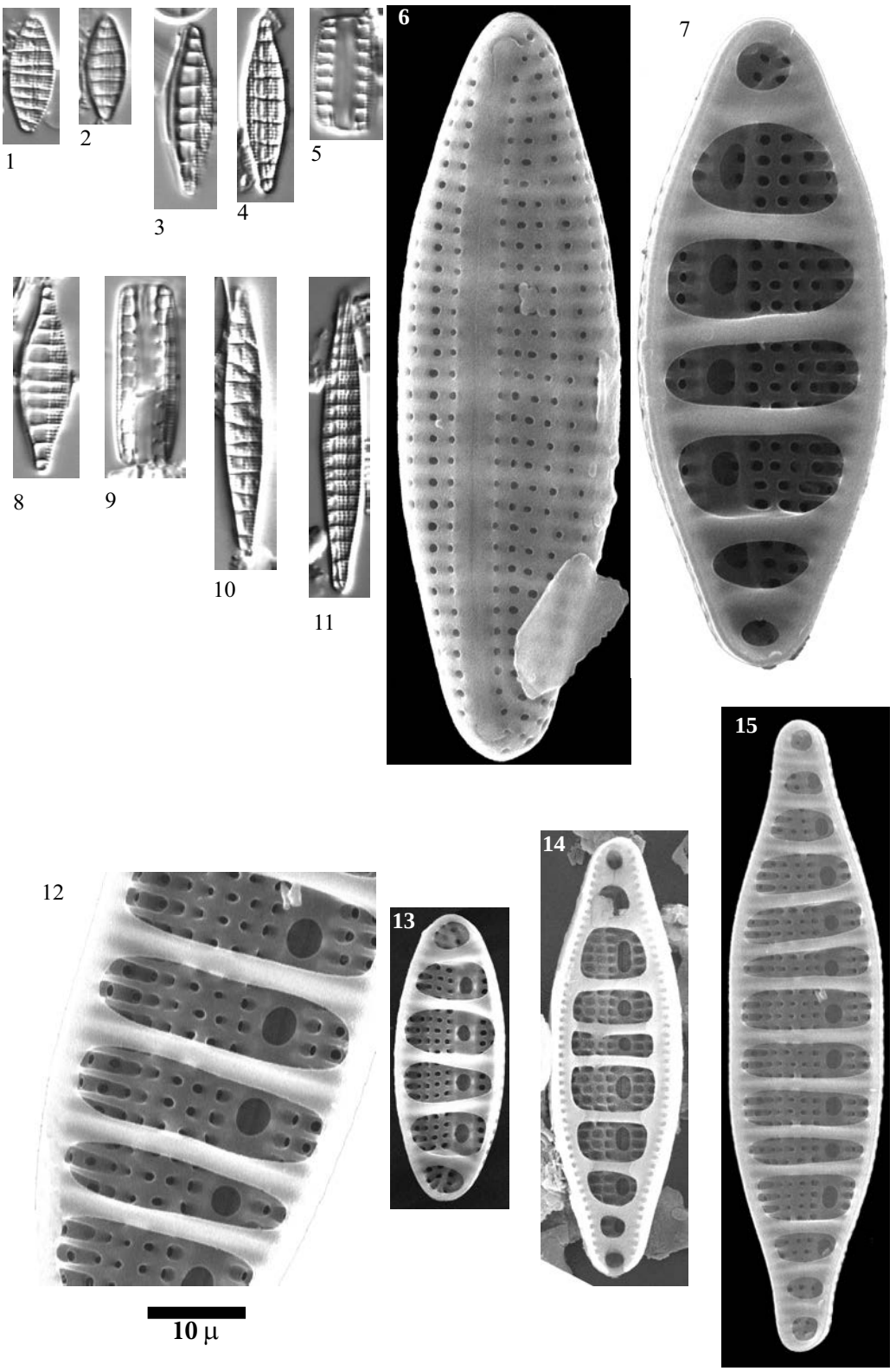
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Plate 123	LM: x1500 SEM: x3000

Figs. 1-6	*Epithemia turgida* (Ehrenberg) Kützing
Figs. 7-10	*Epithemia* cf. *adnata* (Kützing) Brébisson
Figs. 11-17	*Epithemia sorex* Kützing

Figs. 1-9, 11	Lake Burg, sediment BURG 1115
Figs. 10, 15-16	Lake Burg, sediment BURG 1104
Fig. 12	Lake Burg, sediment BURG 1116
Fig. 17	Lake Roumassot, sediment PYR04

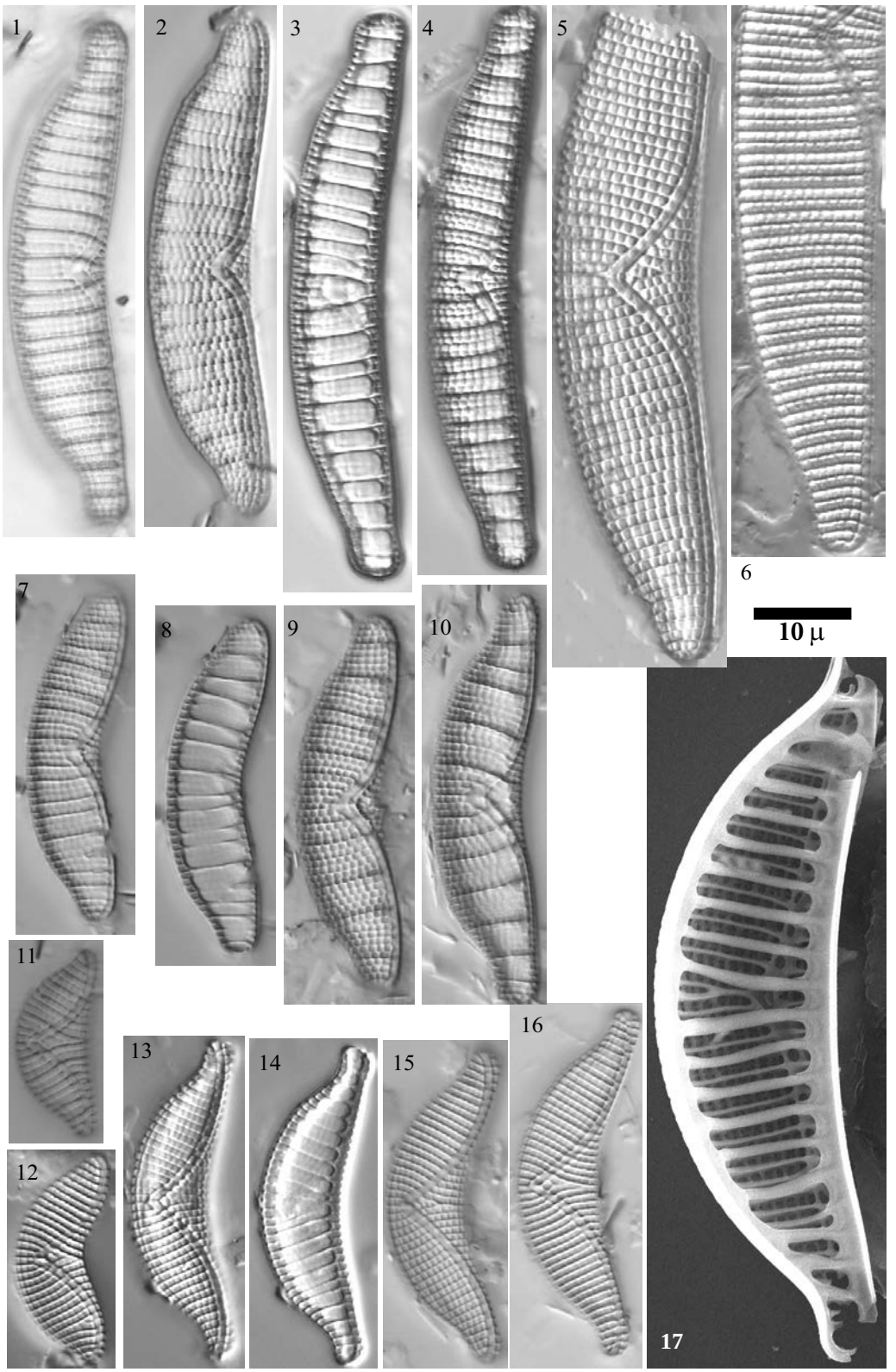
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Plate 124	LM: x1500

Figs. 1-2, 7-8	*Epithemia goeppertiana* Hilse
Fig. 3	*Epithemia* cf. *goeppertiana* Hilse
Figs. 4-6	*Rhopalodia gibba* (Ehrenberg) Müller
Fig. 9	*Epithemia cistula* (Ehrenberg) Ralfs

Figs, 1-2, 7-8	Lake Estom, sediment PYR15
Fig. 3	Lake Burg, sediment sample
Figs. 4-6	Lake Burg, sediment BURG 519
Fig. 9	Lake Acherito, sediment PYR01

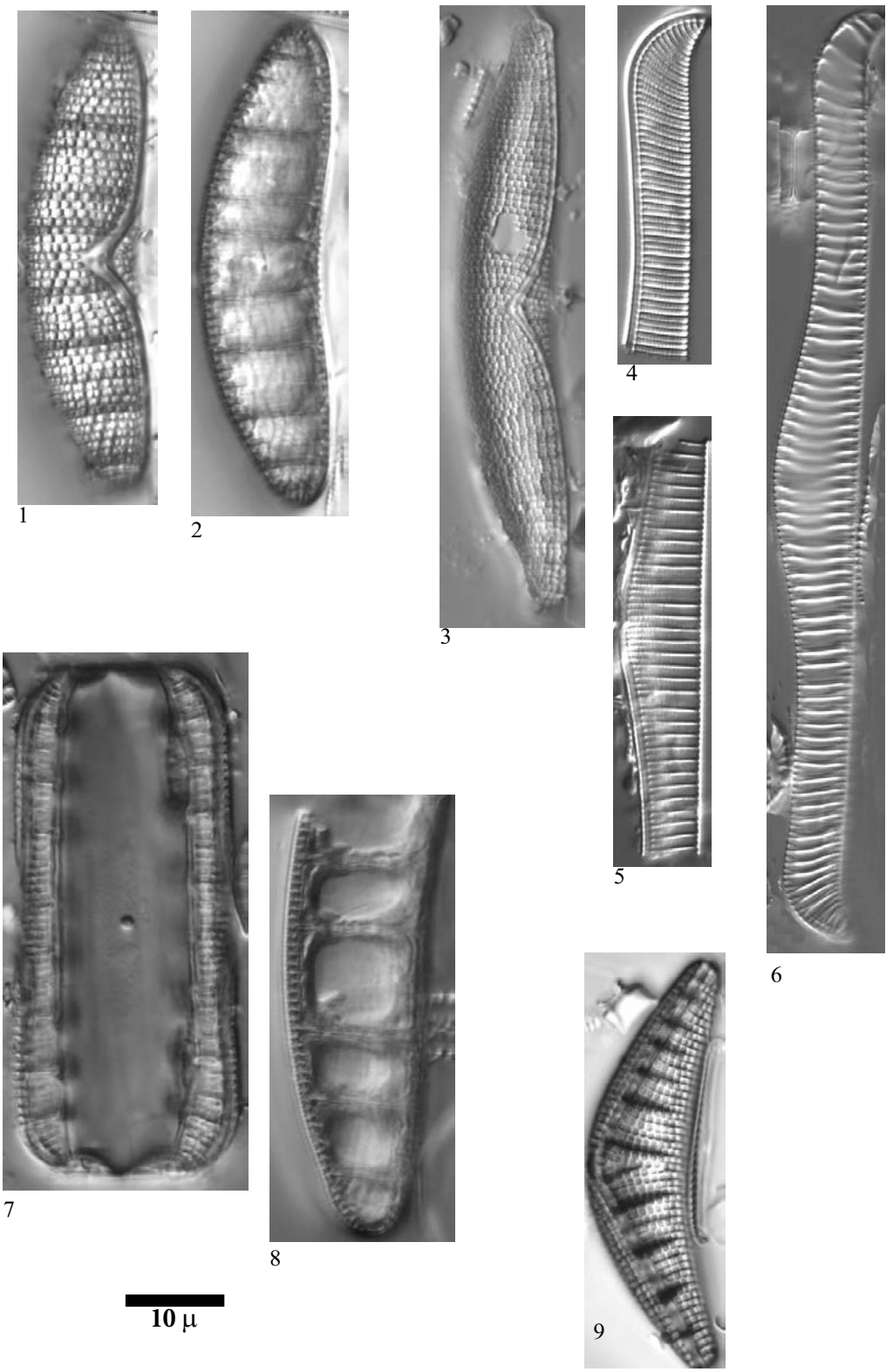
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Plate 125	LM: x1500 SEM: Fig. 2 x8000, Fig. 3 x4000

Figs. 1-3	*Surirella cf. roba* Leclercq
Figs. 4-5	*Surirella cf. bohemica* Maly
Figs. 6-7	*Surirella angusta* Kützing
Fig. 8	*Surirella helvetica* Brun

Figs. 1-2	Lake Posets, sediment PYR42
Fig. 3	Lake Redon, sediment REDOM
Figs. 4-5	Lake Forcat Inf., sediment PYR77
Fig. 6	Lake Coronas, sediment PYR47
Fig. 7	Lake Les Laquettes, sediment PYR27
Fig. 8	Lake Tourrat, sediment PYR23

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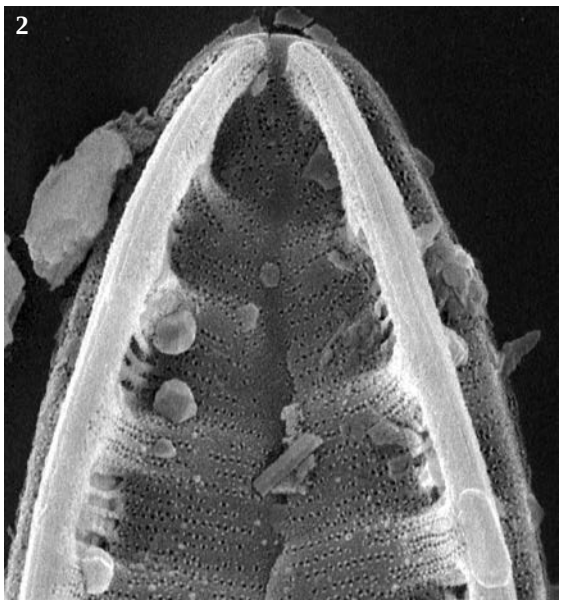

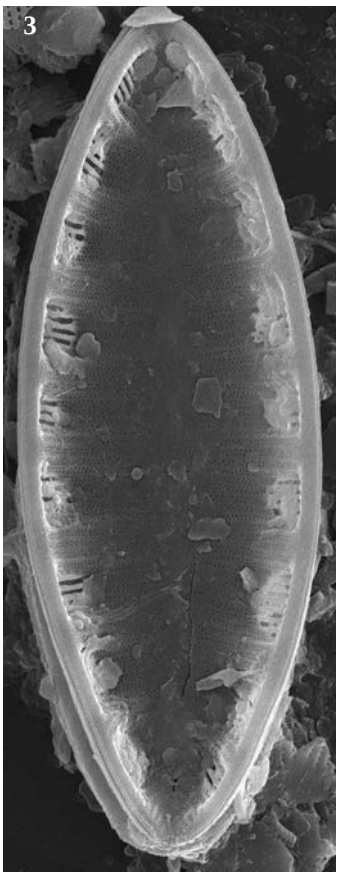

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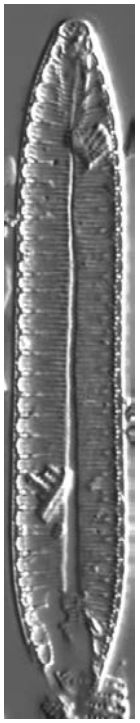

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10 µ

Plate 126 LM: x1500

Fig. 1	*Surirella* aff. *robusta* Ehrenberg
Fig. 2	*Surirella* cf. *linearis* Smith
Figs. 3-5	*Stenopterobia densestriata* (Hustedt) Krammer
Figs. 6-11	*Stenopterobia delicatissima* (Lewis) Van Heurck

Figs. 1, 7	Lake Les Laquettes, sediment PYR27
Fig. 2	Lake Gran de Mainera, sediment PYR70
Figs. 3-6	Lake Romedo de Dalt, sediment PYR85
Figs. 8-11	Lake Bleu de Rabassoles, sediment PYR112

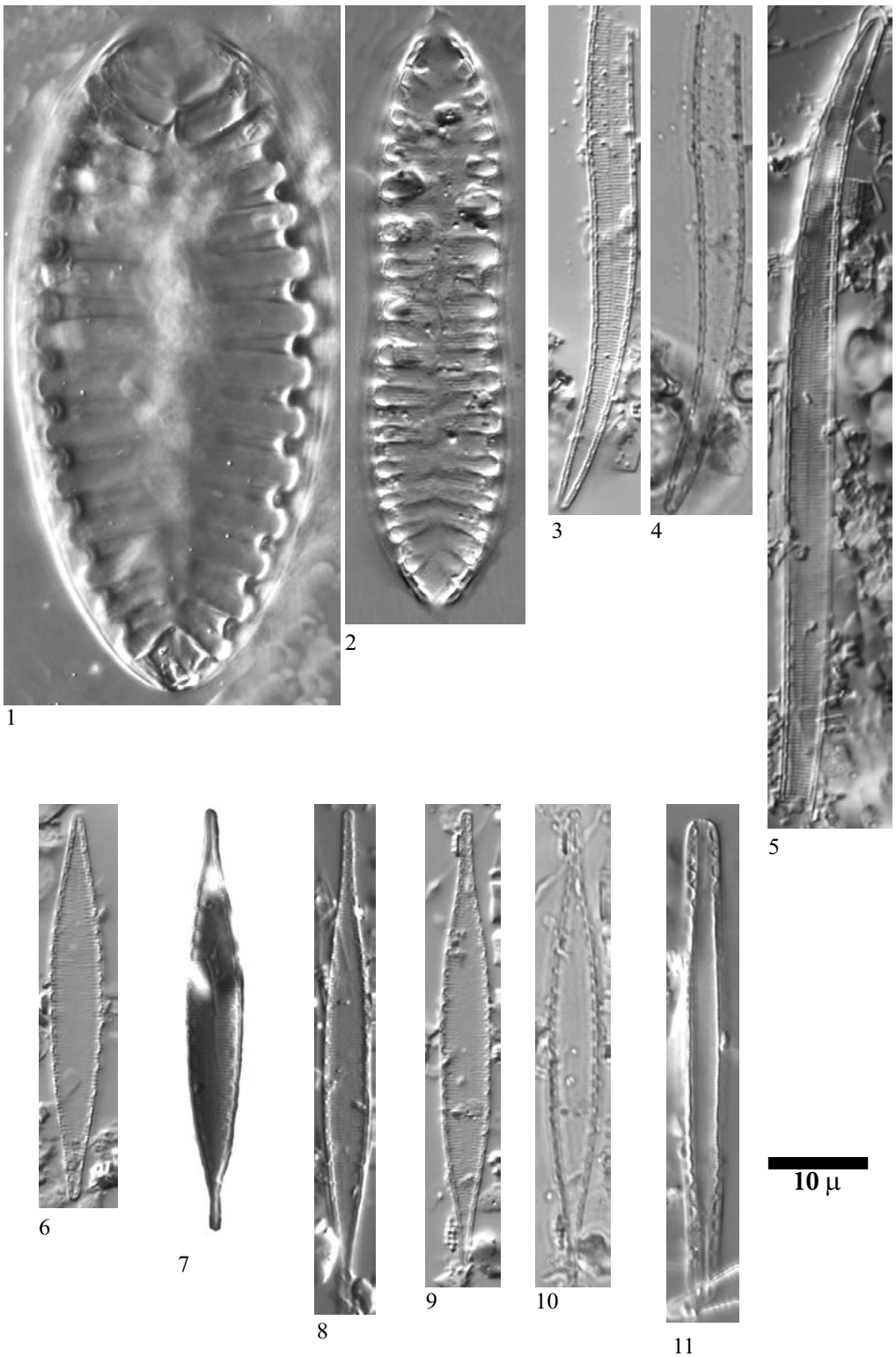
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Plate 127	LM: x900 SEM: Fig. 1 x900, Fig. 3 x4500

Figs. 1-3	*Cymatopleura elliptica* (Brebisson) Smith

Figs. 1, 3	Lake Laurenti, sediment PYR111
Fig. 2	Lake Col d`Arretille, sediment PYR12


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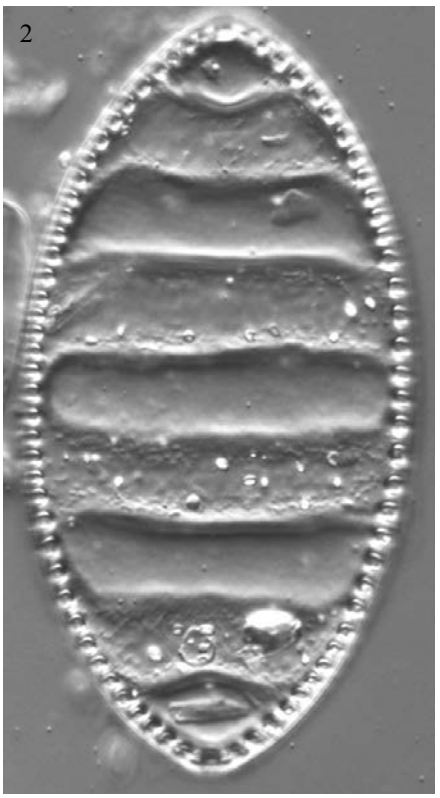
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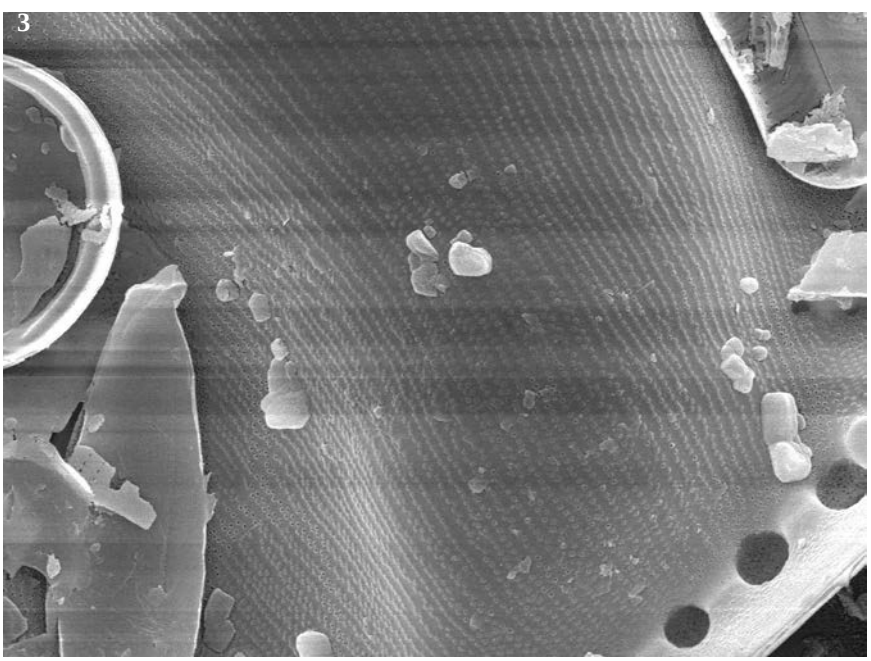
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10 µ