

Diatom Voucher Flora for Lake Annie, a subtropical sinkhole in
Florida.

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Overview

This diatom voucher flora was a product of a modern planktonic diatom monitoring dataset and paleoecological analyses of a sediment core from Lake Annie, Florida. The diatom monitoring data and monthly Secchi disk transparency records were used to develop a transfer function to hindcast water transparency from diatoms in a sediment core (Emery Boeck et al. 2023). The modern dataset was generated from monthly (2005- 2019) collections using a 20 μ m phytoplankton net. The paleolimnological dataset was from 1-cm interval samples of a 1.66cm (~1633-2019) sediment core (Emery Boeck et al. 2023). Lake Annie is a small (37ha), deep (21m) oligotrophic, monomictic sinkhole located at the Archbold Biological Station (27°12'36.0"N 81°21'00.0"W). Lake Annie's water transparency fluctuates due to the changes in delivery of colored dissolved organic carbon to the lake caused by variability in precipitation associated with the Atlantic Multidecadal Oscillation (Gaiser et al., 2009a, 2009b). The browning of this lake is a recent phenomenon caused by two ditches that were dredged in 1930s that enhanced the effect of increasing runoff during warm phase of the Atlantic Multidecadal Oscillation (Emery Boeck et al. 2023).

All images are of specimens collected from phytoplankton net tows and the sediment core in Lake Annie. Taxa were identified to the lowest possible taxonomic unit; authorities and dates are provided for taxa that were identifiable to species or subspecific levels. Taxa identifiable only to the genus-level were denoted by "mesp" and a number. Each image is tied to specific specimen from a month/year in the phytoplankton dataset, denoted by YYYYMM, or depth in the sediment core, denoted by "LA" and a corresponding number denoting the depth in centimeters from the surface to the bottom of the core.

The microscope and slides are located at Florida International University Periphyton Lab, contact Evelyn Gaiser (gaisere@fiu.edu).

Data are available in Neotoma Paleocology Database at <https://data.neotomadb.org/55915> and <https://doi.org/10.21233/VES5-3E24>.

Contact:

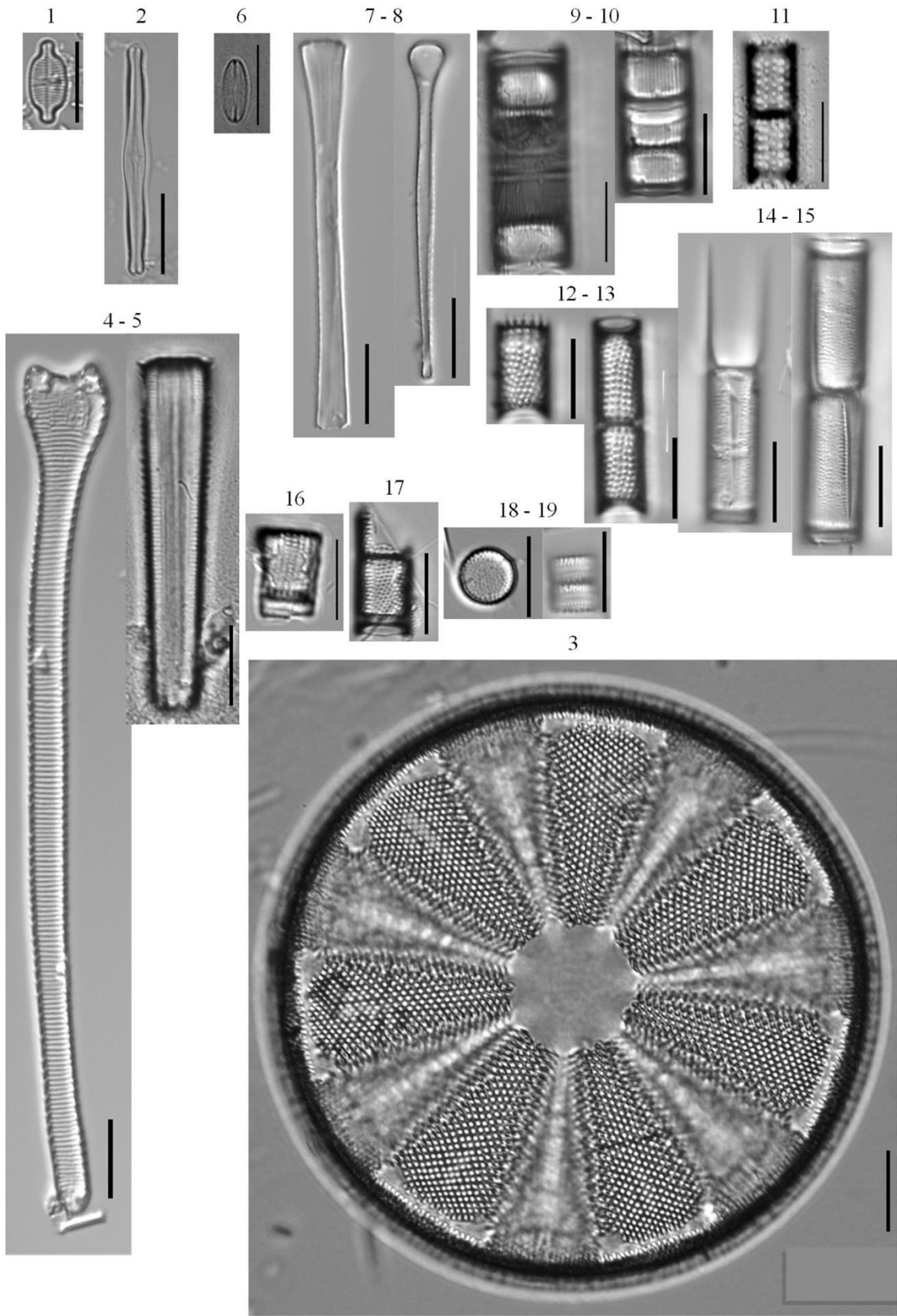
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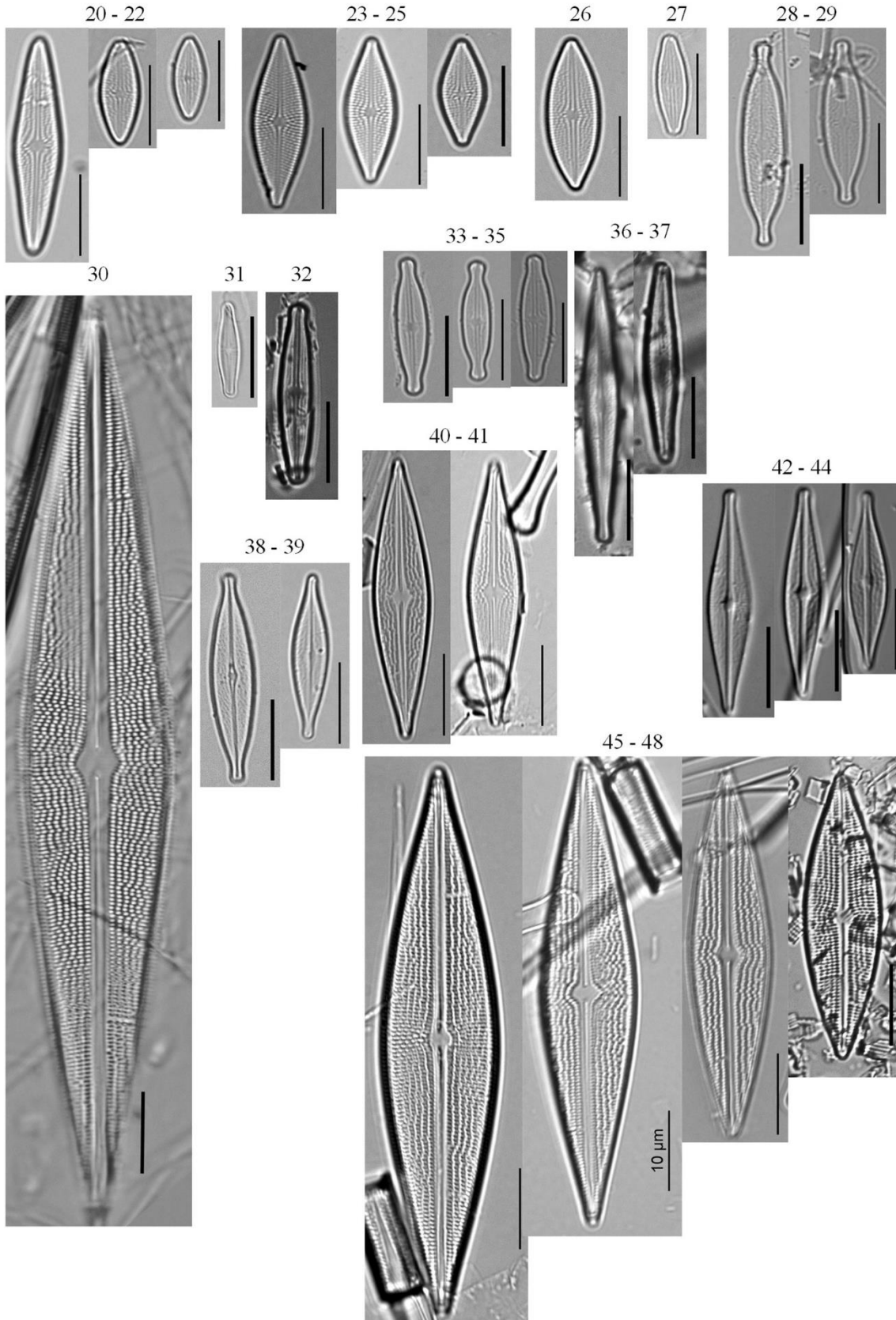
Reference:

- Emery Boeck MA, Gaiser EE, Swain HM, Brenner M, Curtis JH and Kenney WF (2023, In prep) Cyclical browning in a subtropical lake inferred from diatom records. *Front. Ecol. Evol.* doi: 10.3389/fevo.2023.1020024
- Gaiser, E. E., Deyrup, N. D., Bachmann, R. W., Battoe, L. E., and Swain, H. M. (2009a). Effects of climate variability on transparency and thermal structure in subtropical, monomictic Lake Annie, Florida. *Fundam. Appl. Limnol. / Arch. für Hydrobiol.* 175, 217–230. doi:10.1127/1863-9135/2009/0175-0217.
- Gaiser, E. E., Deyrup, N. D., Bachmann, R. W., Battoe, L. E., and Swain, H. M. (2009b). Multidecadal climate oscillations detected in a transparency record from a subtropical florida lake. *Limnol. Oceanogr.* 54, 2228–2232. doi:10.4319/lo.2009.54.6.2228.

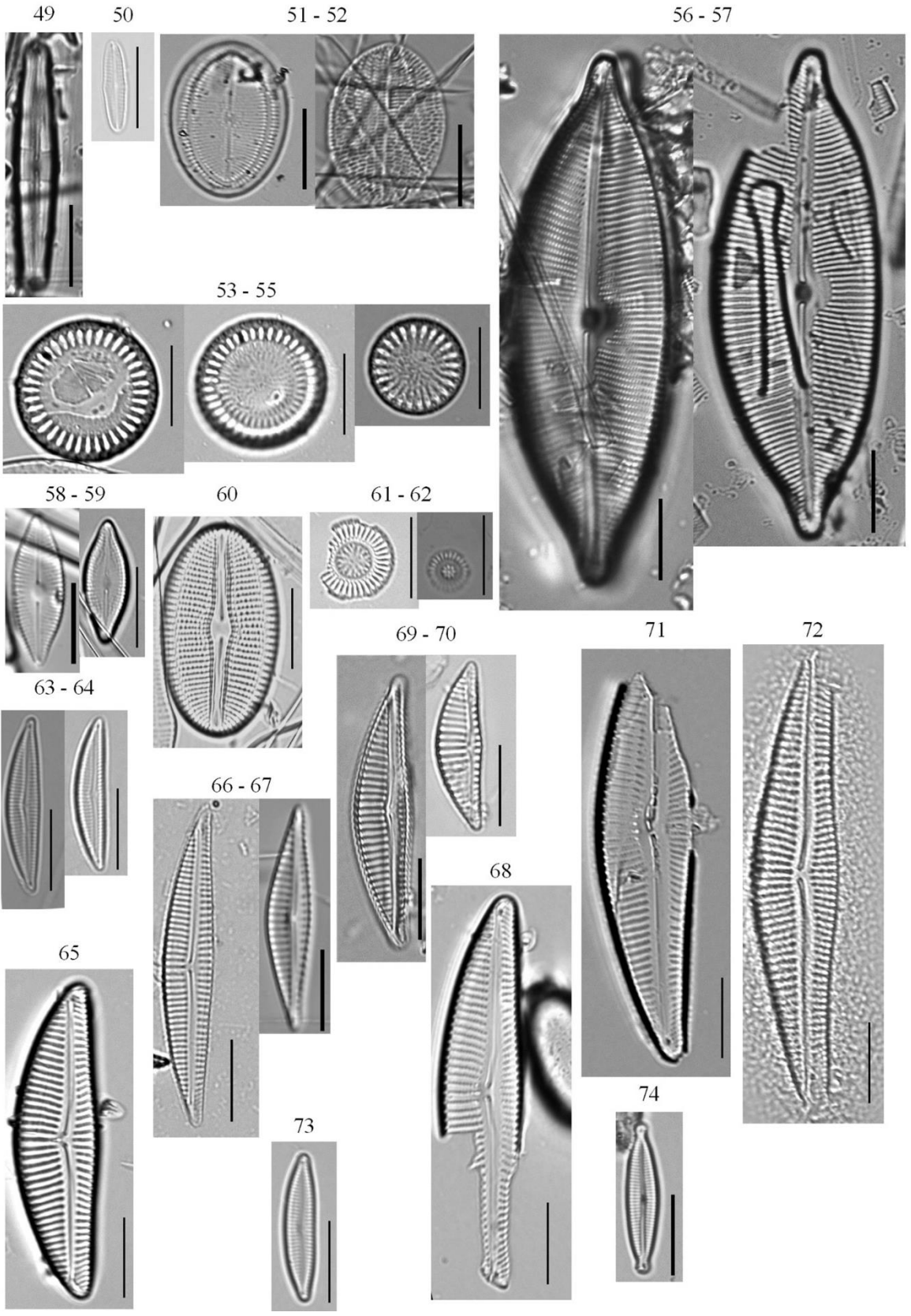
- Pl. 1 *Achnantheidium exiguum*, (Grunow) Czarn.
- Pl. 2 *Achnantheidium minutissimum*, (Kütz.) Czarn.
- Pl. 3 *Actinoptychus* mesp01
- Pl. 4 - 5 *Actinella punctata*, F.W.Lewis
- Pl. 6 *Adlafia* mesp01
- Pl. 7 - 8 *Asterionella ralfsii* var *americana*, Körner
- Pl. 9 - 10 *Aulacoseira coroniformis*, Pearce & Cremer
- Pl. 11 *Aulacoseira crassipunctata*, Krammer
- Pl. 12 - 13 *Aulacoseira granulate* cf., (Ehrenb.) Simonsen
- Pl. 14 - 15 *Aulacoseira herzogii*, (Lemmerm.) Simonsen
- Pl. 16 *Aulacoseira italica* morph two
- Pl. 17 *Aulacoseira* mesp05
- Pl. 18 - 19 *Aulacoseira tenella*, (Nygaard) Simonsen



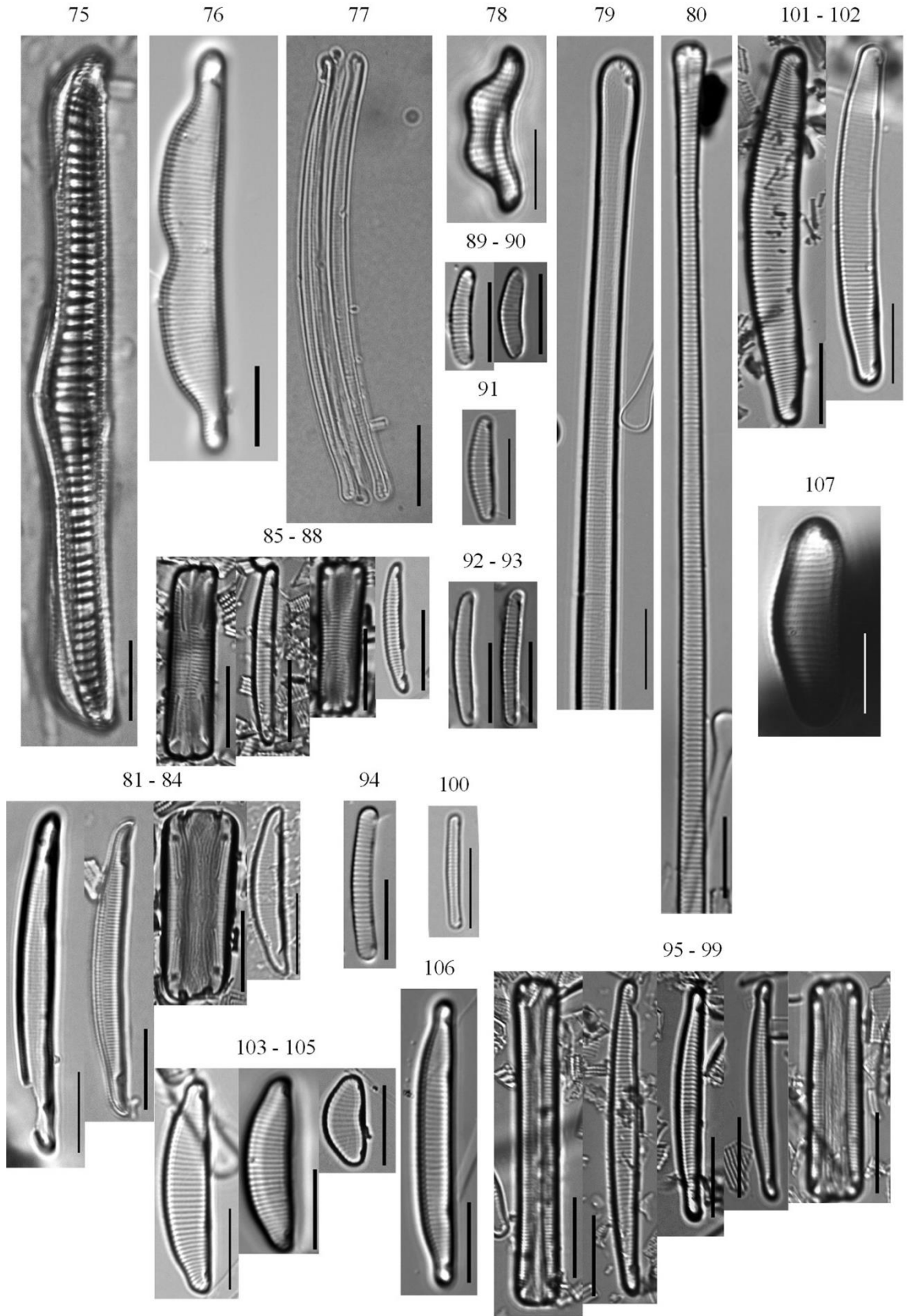
- Pl. 20 - 22 *Brachysira brebissonii*, R.Ross in B.Hartley
- Pl. 23 - 25 *Brachysira gravida*, Shayler and Siver
- Pl. 26 *Brachysira* mesp01
- Pl. 27 *Brachysira* mesp05
- Pl. 28 - 29 *Brachysira* mesp07
- Pl. 30 *Brachysira* mesp09
- Pl. 31 *Brachysira* mesp10
- Pl. 32 *Brachysira* mesp13
- Pl. 33 - 35 *Brachysira* mesp14
- Pl. 36 - 37 *Brachysira* mesp15
- Pl. 38 - 39 *Brachysira microcephala*, (Grunow) Compère
- Pl. 40 - 41 *Brachysira neoacuta*, Lange-Bert. in Lange-Bert. and Gerd Moser
- Pl. 42 - 44 *Brachysira ocalanensis*, Shayler and Siver
- Pl. 45 - 48 *Brachysira seriens*, (Bréb.) Round and D.G.Mann



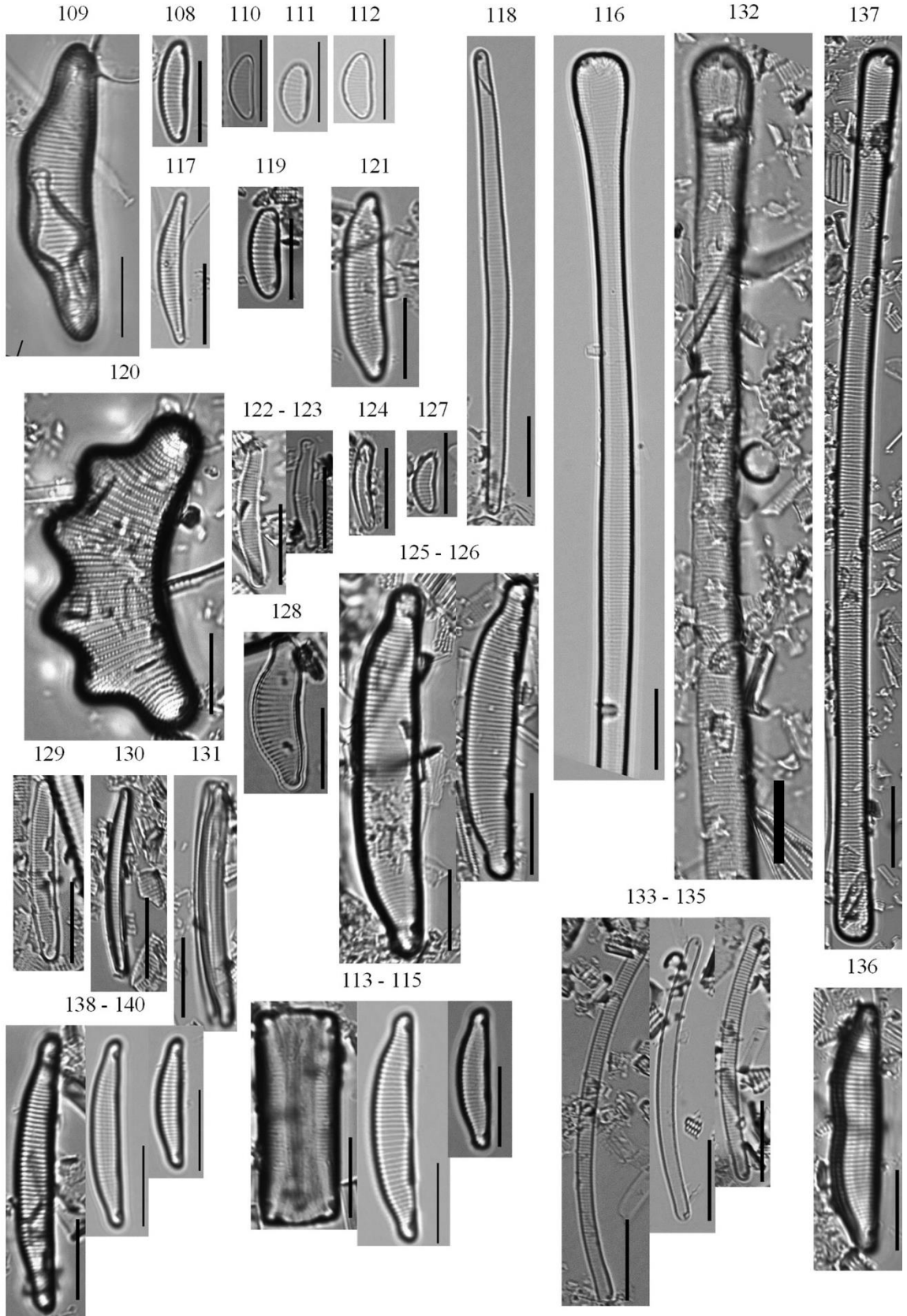
- Pl. 49 *Caloneis mesp01*
- Pl. 50 *Chamaepinnularia mesp01*
- Pl. 51 - 52 *Cocconeis placentula*, Ehrenb
- Pl. 53 - 55 *Cyclotella meneghiniana*, Kütz.
- Pl. 56 - 57 *Cymbopleura mesp01*
- Pl. 58 - 59 *Diadesmis confervacea*, Kütz.
- Pl. 60 *Diploneis mesp01*
- Pl. 61 - 62 *Discostella stelligera*, (Cleve and Grunow) Houk and Klee
- Pl. 63 - 64 *Encyonema evergladianum*, Krammer
- Pl. 65 *Encyonema mesianum*, (Cholnoky) D.G.Mann
- Pl. 66 - 67 *Encyonema neogracile*, Krammer
- Pl. 68 *Encyonema silesiacum* morph large
- Pl. 69 - 70 *Encyonema silesiacum*, (Bleisch in Rabenh.) D.G.Mann
- Pl. 71 *Encyonema vulgare* morph large
- Pl. 72 *Encyonema vulgare* cf., Krammer
- Pl. 73 *Encyonopsis mesp04*
- Pl. 74 *Encyonopsis subminuta*, Krammer and E.Reichardt



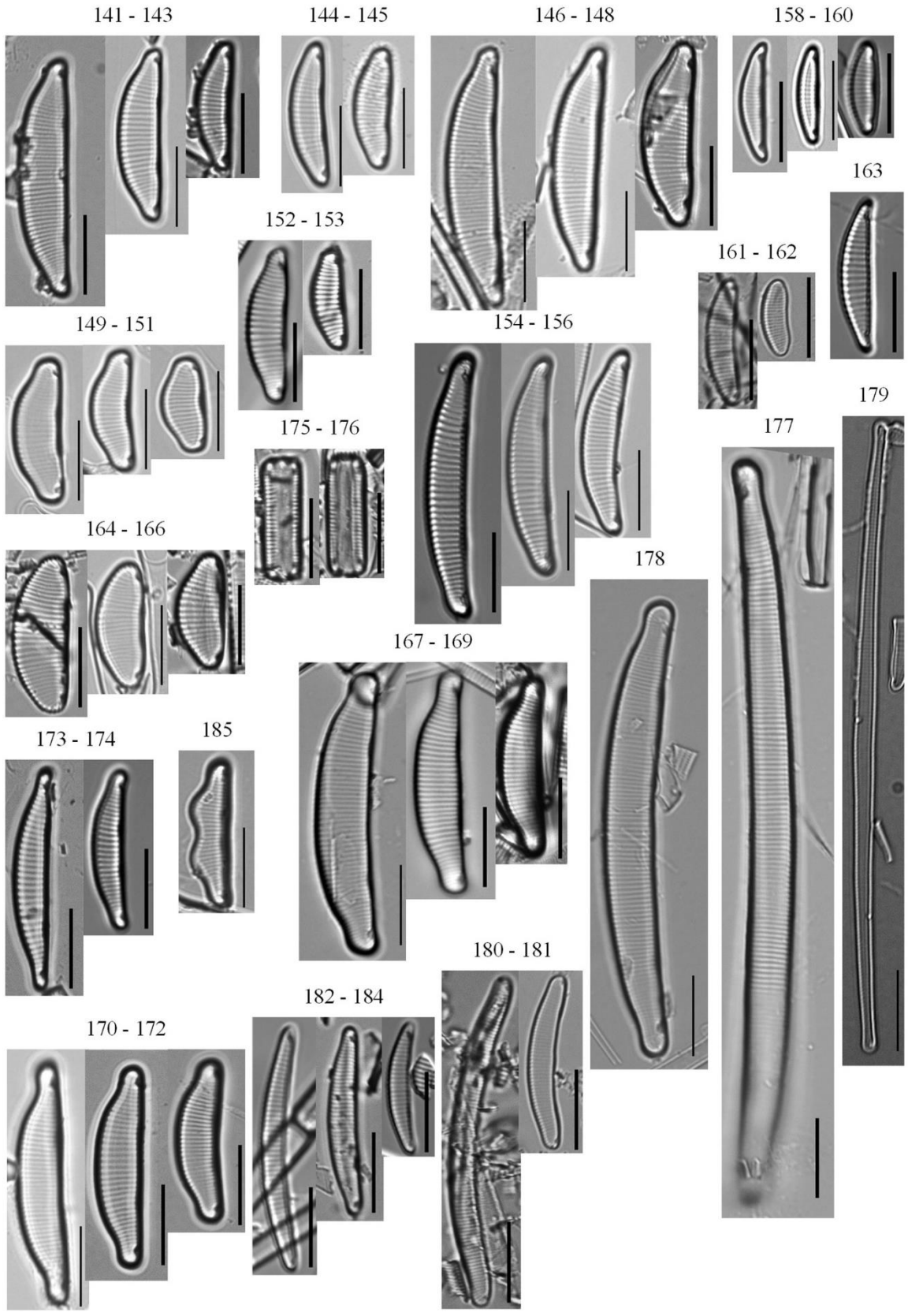
- Pl. 75 *Epithemia gibba*, Ehrenb. (Kütz.)
- Pl. 76 *Eunotia bidentula*, W.Smith
- Pl. 77 *Eunotia bilunaris* var. *mucophila*,
Lange-Bertalot, Nörpel-Schempp & E.Alles
- Pl. 78 *Eunotia camelus* cf., Ehrenb.
- Pl. 79 *Eunotia eurycephala*, (Grunow) Nörpel-Schempp & Lange-Bertalot
- Pl. 80 *Eunotia flexuosa*, (Brébisson ex Kütz.) Kütz.
- Pl. 81 - 84 *Eunotia incisa*, W.Sm. ex W.Greg
- Pl. 85 - 88 *Eunotia incisatula*, Metzeltin & Lange-Bertalot
- Pl. 89 -90 *Eunotia* mesp10
- Pl. 91 *Eunotia* mesp10 morph long
- Pl. 92 - 93 *Eunotia* mesp11
- Pl. 94 *Eunotia* mesp12
- Pl. 95 - 99 *Eunotia* mesp22 morph long
- Pl. 100 *Eunotia* mesp28
- Pl. 101 - 102 *Eunotia* mesp29
- Pl. 103 - 105 *Eunotia* mesp34
- Pl. 106 *Eunotia* mesp37
- Pl. 107 *Eunotia* mesp48



Pl. 108	<i>Eunotia mesp52</i>
Pl. 109	<i>Eunotia mesp57</i>
Pl. 110	<i>Eunotia mesp60</i>
Pl. 111	<i>Eunotia mesp63</i>
Pl. 112	<i>Eunotia mesp65</i>
Pl. 113 - 115	<i>Eunotia mesp75</i>
Pl. 116	<i>Eunotia mesp78</i>
Pl. 117	<i>Eunotia mesp79</i>
Pl. 118	<i>Eunotia mesp84</i>
Pl. 119	<i>Eunotia mesp86</i>
Pl. 120	<i>Eunotia mesp90</i>
Pl. 121	<i>Eunotia mesp93</i>
Pl. 122 - 123	<i>Eunotia mesp95</i>
Pl. 124	<i>Eunotia mesp96</i>
Pl. 125 - 126	<i>Eunotia mesp97</i>
Pl. 127	<i>Eunotia mesp98</i>
Pl. 128	<i>Eunotia mesp99</i>
Pl. 129	<i>Eunotia mesp101</i>
Pl. 130	<i>Eunotia mesp102</i>
Pl. 131	<i>Eunotia mesp106</i>
Pl. 132	<i>Eunotia mesp107</i>
Pl. 133 - 135	<i>Eunotia mesp114</i>
Pl. 136	<i>Eunotia mesp115</i>
Pl. 137	<i>Eunotia mesp116</i>
Pl. 138 - 140	<i>Eunotia mesp117</i>

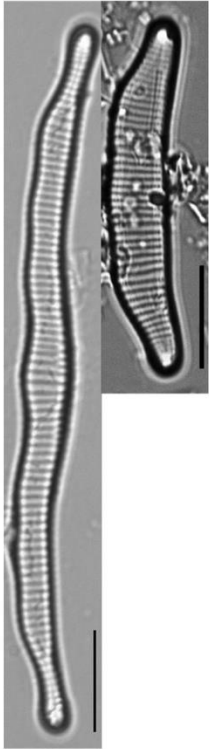


Pl. 141 - 143	<i>Eunotia</i> mesp118
Pl. 144 - 145	<i>Eunotia</i> mesp119
Pl. 146 - 148	<i>Eunotia</i> mesp120
Pl. 149 - 151	<i>Eunotia</i> mesp121
Pl. 152 - 153	<i>Eunotia</i> mesp122
Pl. 154 - 156	<i>Eunotia</i> mesp123
Pl. 158 - 160	<i>Eunotia</i> mesp124
Pl. 161 - 162	<i>Eunotia</i> mesp125
Pl. 163	<i>Eunotia</i> mesp126
Pl. 164 - 166	<i>Eunotia</i> mesp127
Pl. 167 - 169	<i>Eunotia</i> mesp128
Pl. 170 - 172	<i>Eunotia</i> mesp129
Pl. 173 - 174	<i>Eunotia</i> mesp130
Pl. 175 - 176	<i>Eunotia</i> mesp131
Pl. 177	<i>Eunotia</i> mesp132
Pl. 178	<i>Eunotia</i> mesp133
Pl. 179	<i>Eunotia</i> mesp134
Pl. 180 - 181	<i>Eunotia</i> mesp135
Pl. 182 - 184	<i>Eunotia</i> mesp136
Pl. 185	<i>Eunotia</i> mesp137

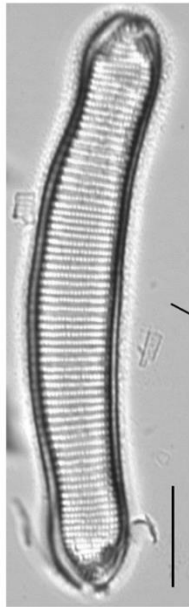


- Pl. 186 - 187 *Eunotia mesp*138
- Pl. 188 *Eunotia mesp*139
- Pl. 189 *Eunotia mesp*140
- Pl. 190 *Eunotia mesp*141
- Pl. 191 *Eunotia rabenhorstiana var elongata*,
(R.M.Patrick) Metzeltin & Lange-Bertalot
- Pl. 192 - 193 *Eunotia sarraceniae*, E.E.Gaiser & J.R.Johansen
- Pl. 194 - 196 *Eunotia tenella*, (Grunow) Hust. in A.Schmidt et al.
- Pl. 197 - 203 *Eunotia veneris*, (Kütz.) De Toni

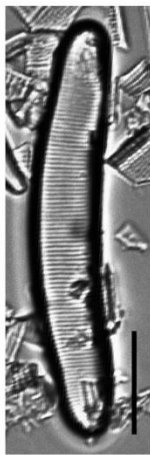
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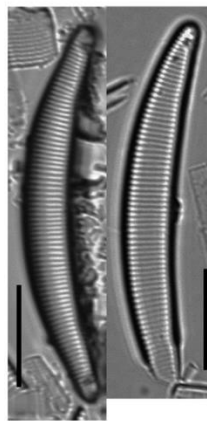
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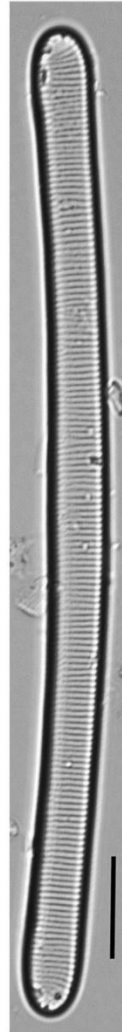
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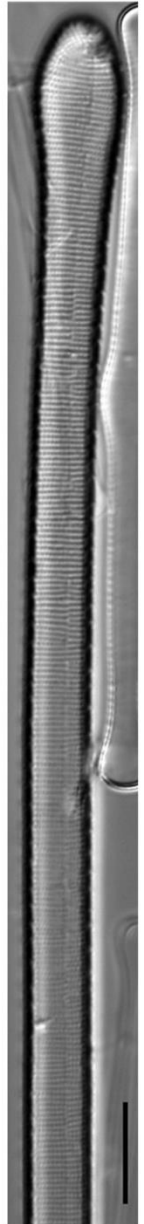
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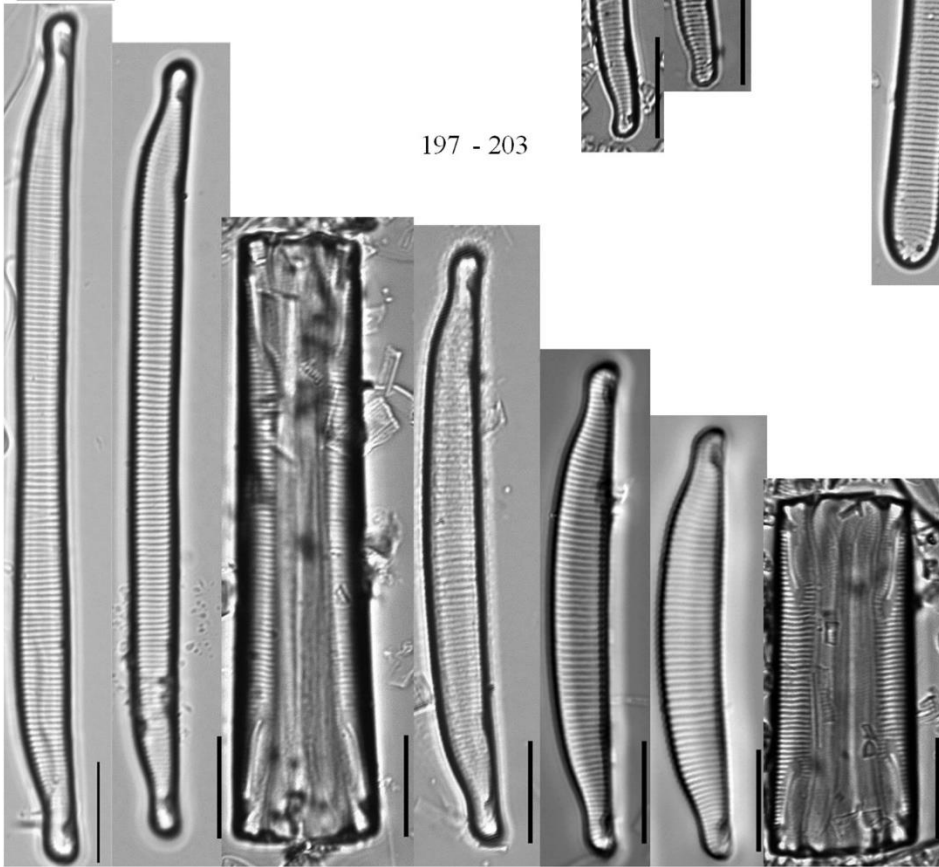
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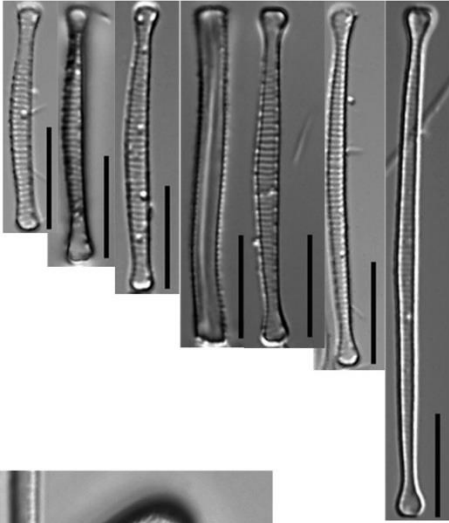


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- Pl. 204 - 206 *Eunotia waimiriorum*, C.E.Wetzel
- Pl. 207 - 208 *Eunotia yanomami*, Metzeltin & Lange-Bertalot
- Pl. 209 - 215 *Eunotia zasuminensis*, (Cabejsz.) Körner
- Pl. 216 - 218 *Eunotia zygodon*, Ehrenb.

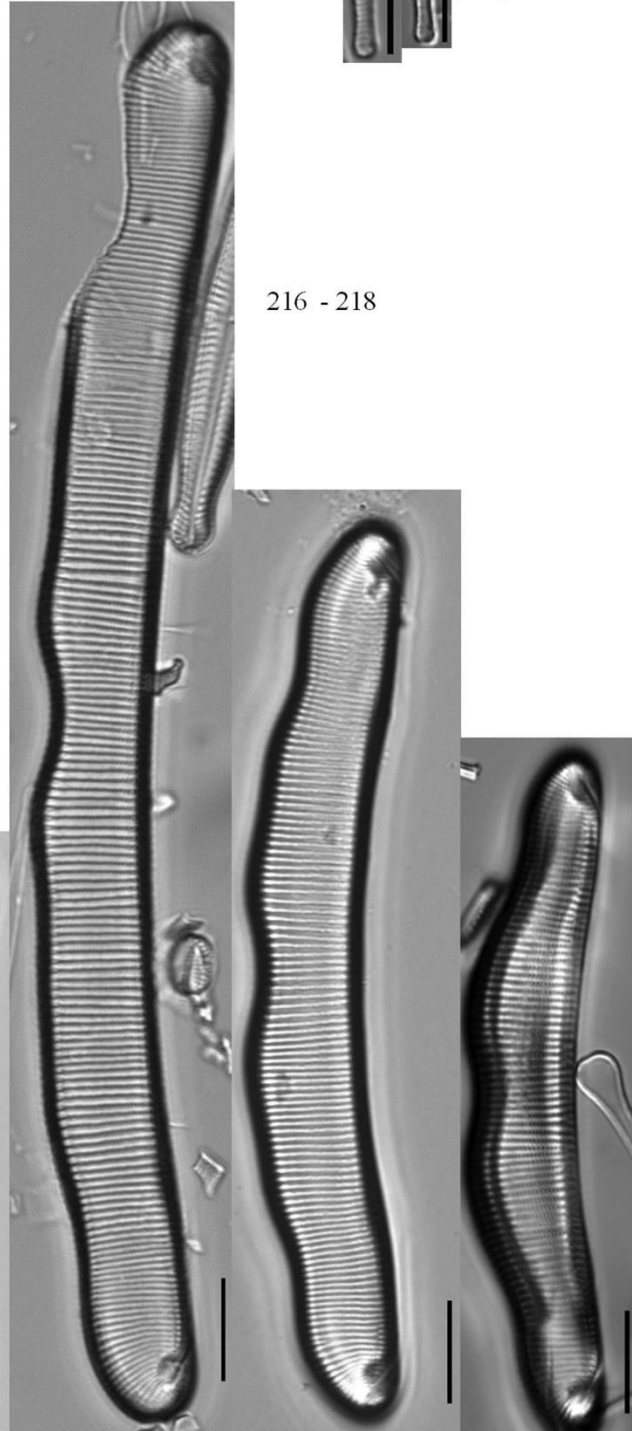
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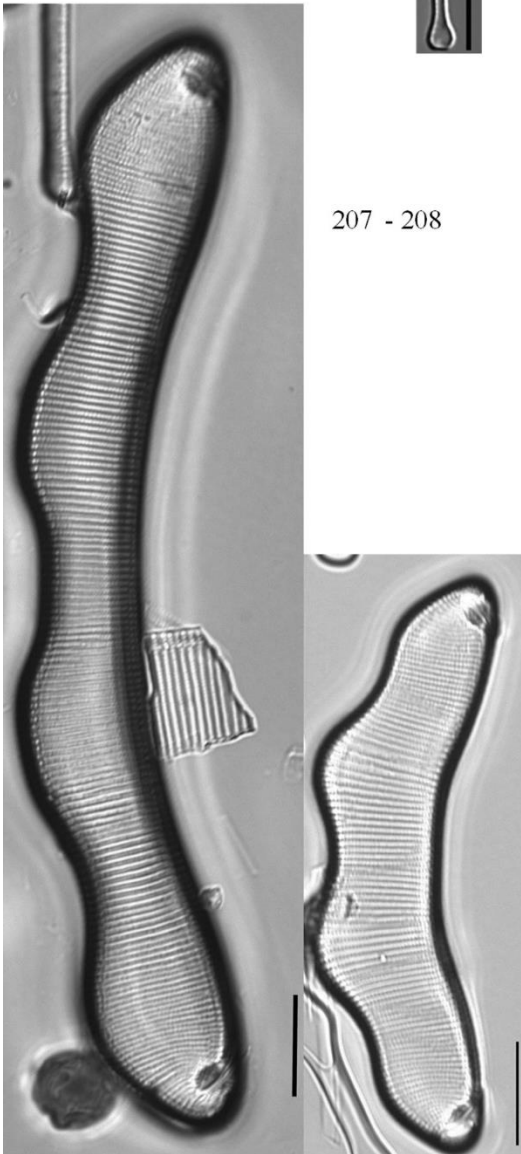
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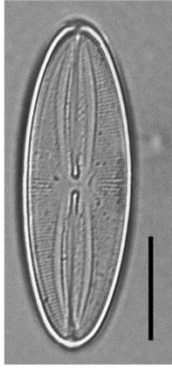


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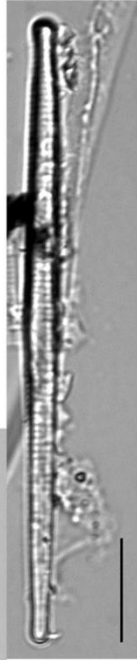


- Pl. 219 *Fallacia* mesp01
- Pl. 220 - 221 *Fragilariforma javanica*,
(Hustedt) C.E.Wetzel, E.Morales & L.Ector
- Pl. 222 *Fragilaria* mesp01
- Pl. 223 *Fragilaria* mesp02
- Pl. 224 *Fragilaria* mesp03
- Pl. 225 *Fragilaria* mesp04
- Pl. 226 - 227 *Fragilaria sepes*, Ehrenb.
- Pl. 228 - 229 *Fragilaria synegrotasca*, Lange-Bert.
- Pl. 230 - 232 *Fragilaria tenera* var. *nanana*,
(Lange-Bertalot) Lange-Bertalot & S.Ulrich

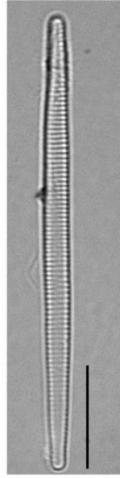
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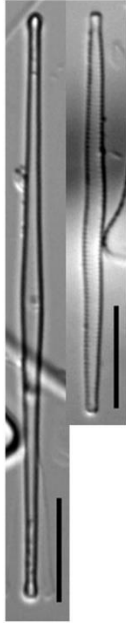
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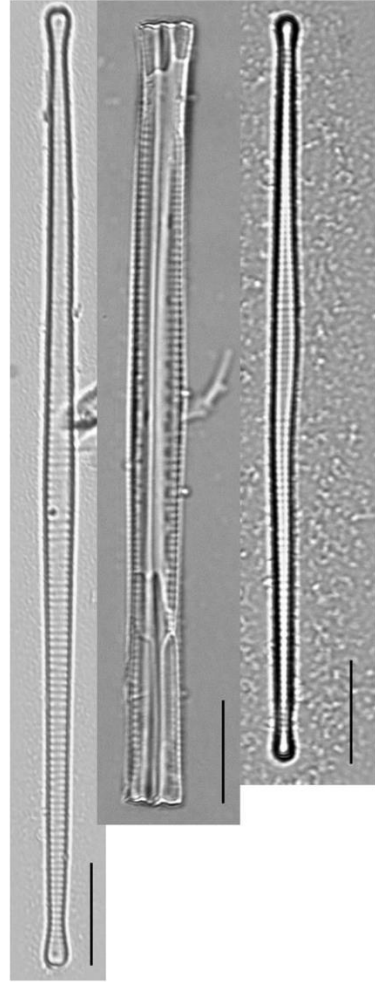
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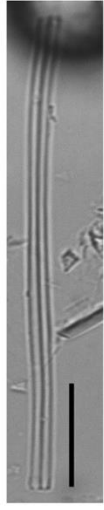
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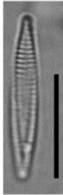
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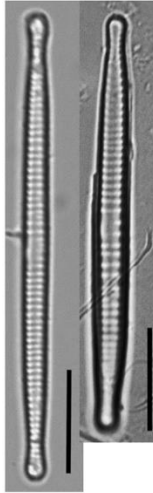
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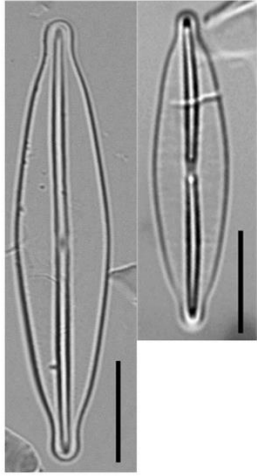


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- Pl. 233 - 234 *Frustulia crassinervia*, (Bréb.) Lange-Bert. and Krammer
- Pl. 235 *Frustulia mesp01*
- Pl. 236 - 238 *Frustulia mesp02*
- Pl. 239 *Frustulia pseudomagaliesmontana*,
Camburn and D.Charles
- Pl. 240 *Frustulia rhomboides*, (Ehrenb.) De Toni

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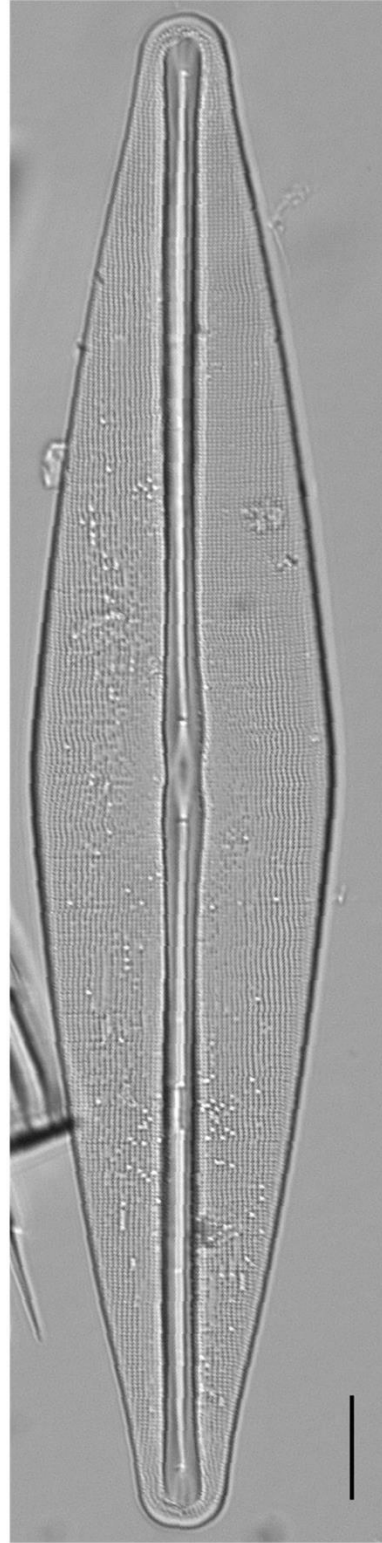
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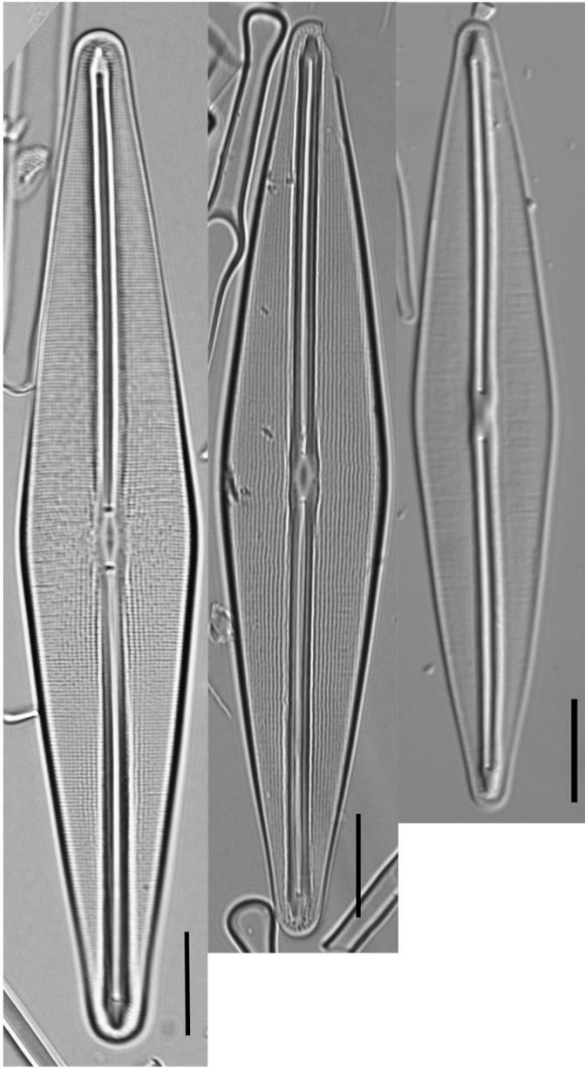
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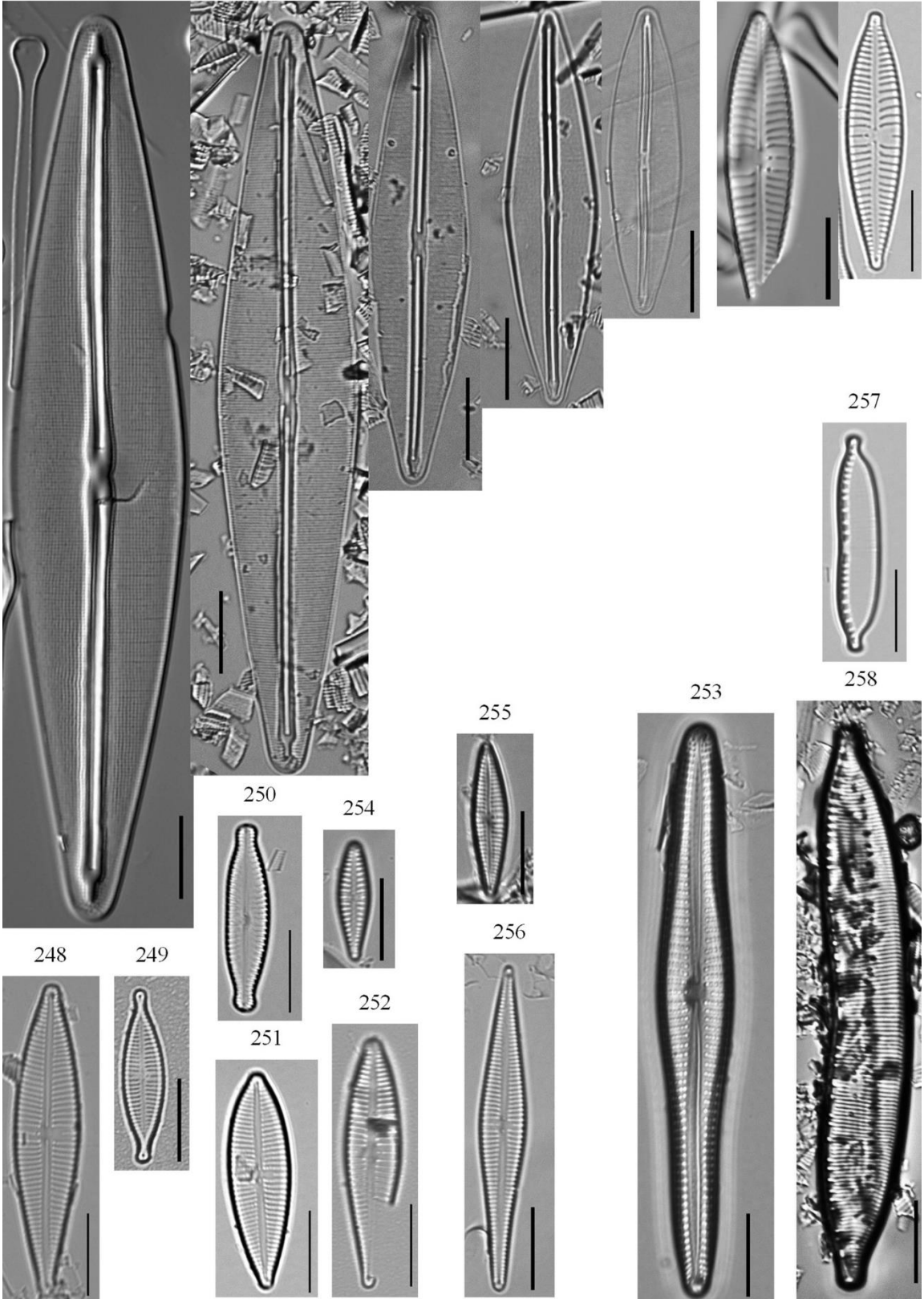
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- Pl. 241 - 245 *Frustulia saxonica*, Rabenh.
- Pl. 246 - 247 *Gomphonema exilissimum*,
(Grunow) Lange-Bertalot & E.Reichardt
- Pl. 248 *Gomphonema gracile*, Ehrenb.
- Pl. 249 *Gomphonema lagenula*, Kütz.
- Pl. 250 *Gomphonema mesp02* (*Cymbellopsis persantosana* cf.)
- Pl. 251 *Gomphonema mesp04*
- Pl. 252 *Gomphonema mesp06*
- Pl. 253 *Gomphonema mesp07*
- Pl. 254 *Gomphonema mesp09*
- Pl. 255 *Gomphonema parvulum*, (Kütz.) Kütz.
- Pl. 256 *Gomphonema vibrio*, Ehrenb.
- Pl. 257 *Hantzschia mesp01*
- Pl. 258 *Hantzschia mesp02*

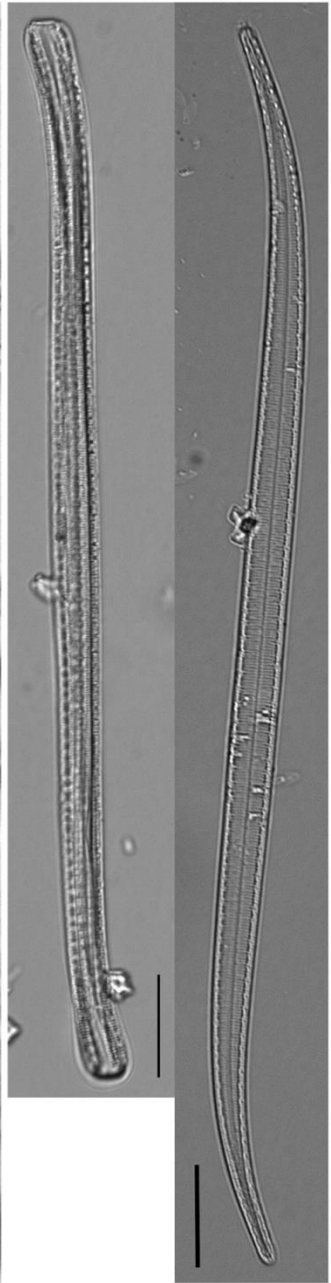
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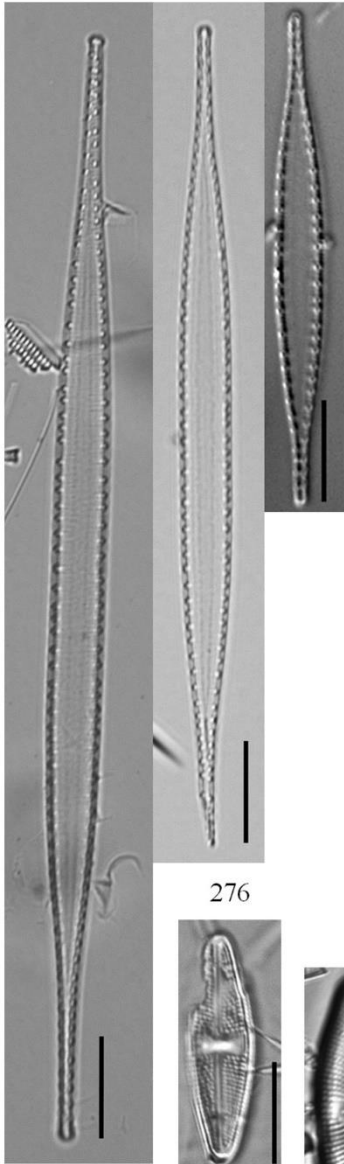
Pl. 259 *Iconella biseriata*, (Brébisson) Ruck & Nakov

Pl. 260 - 261 *Iconella curvula*, (W.Smith) Ruck & Nakov



- Pl. 262 - 264 *Iconella delicatissima*, (F.W.Lewis) Ruck & Nakov
- Pl. 265 *Iconella linearis*, (W.Smith) Ruck & Nakov
- Pl. 266 - 267 *Kobayasiella jaagii*, (F.Meister) Lange-Bert.
- Pl. 268 - 269 *Kobayasiella mesp01*
- Pl. 270 - 271 *Kobayasiella mesp03*
- Pl. 272 - 273 *Kobayasiella mesp04*
- Pl. 274 *Kobayasiella mesp06*
- Pl. 275 *Kobayasiella mesp07*
- Pl. 276 *Luticola mesp01*
- Pl. 277 - 278 *Luticola mesp02*
- Pl. 279 - 281 *Luticola mesp03*
- Pl. 282 *Luticola mesp04*
- Pl. 283 *Luticola mutica*, (Kütz.) D.G.Mann
- Pl. 284 - 285 *Mastogloia calcarea*, S.S.Lee et al.

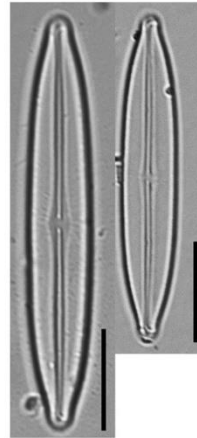
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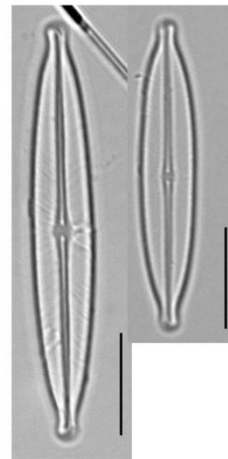
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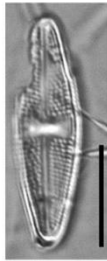
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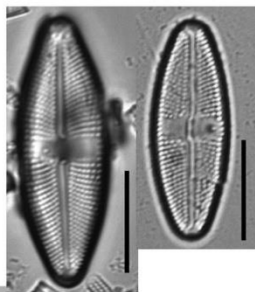
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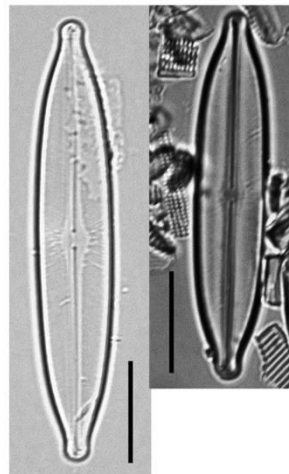
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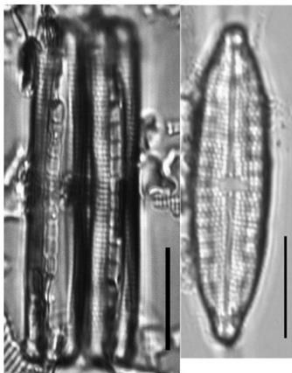
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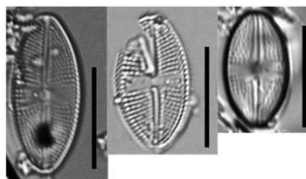
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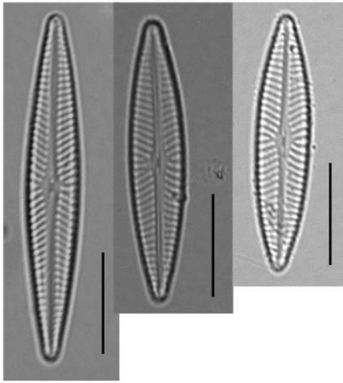


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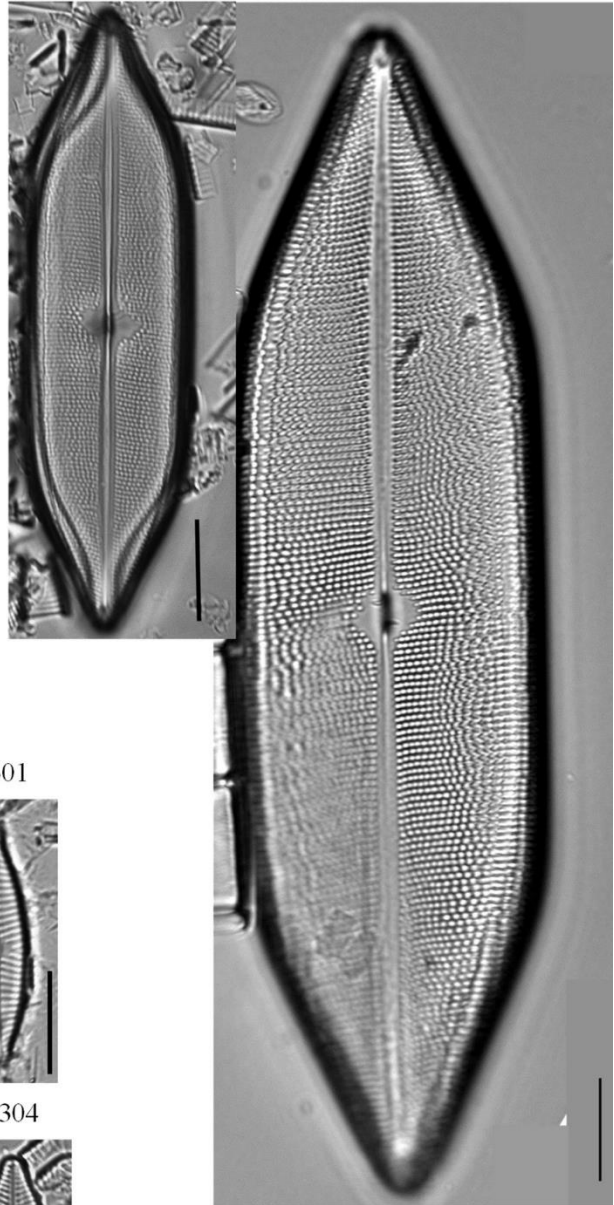


- Pl. 286 - 288 *Navicula cryptocephala*, Kütz.
- Pl. 289 *Navicula leptostriata*, E.G.Jørg.
- Pl. 290 - 291 *Navicula radiosa*, Kütz.
- Pl. 292 Naviculoid mesp01
- Pl. 293 - 294 Naviculoid mesp04
- Pl. 295 Naviculoid mesp05
- Pl. 296 Naviculoid mesp07
- Pl. 297 Naviculoid mesp10
- Pl. 298 Naviculoid mesp13
- Pl. 299 Naviculoid mesp14
- Pl. 300 Naviculoid mesp17
- Pl. 301 Naviculoid mesp18
- Pl. 302 - 303 Naviculoid mesp19
- Pl. 304 Naviculoid mesp22
- Pl. 305 - 306 Naviculoid mesp25
- Pl. 307 Naviculoid mesp26
- Pl. 308 - 309 *Neidium amphigomphus*, (Ehrenb.) Pfitzer

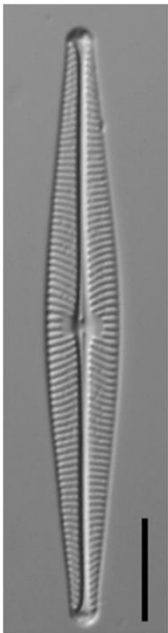
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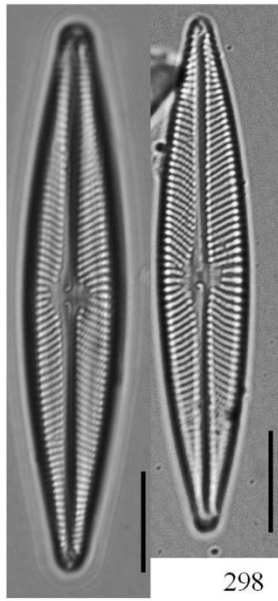
308 - 309



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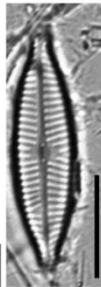


290 - 291



298

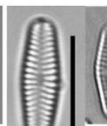
301



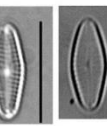
292



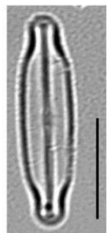
293 - 294



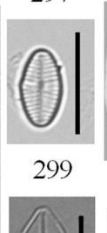
295



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297



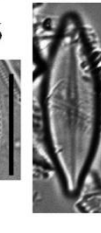
300



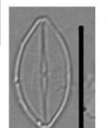
304



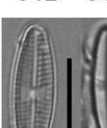
307



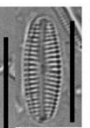
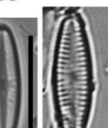
299



302 - 303

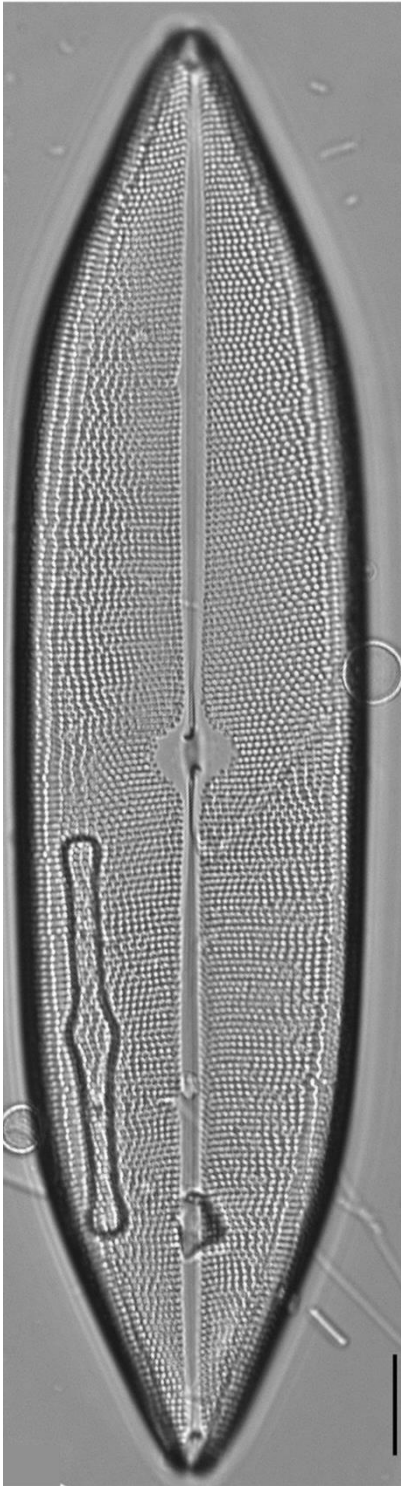


305 - 306

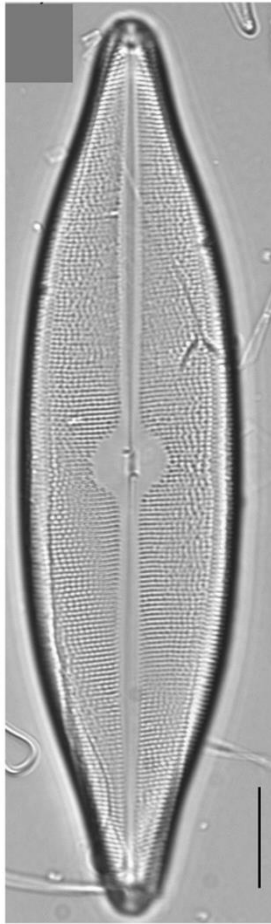


- Pl. 310 *Neidium amphigomphus* morph elongated
- Pl. 311 *Neidium amphigomphus* morph small
- Pl. 312 *Neidium ampliatum*, (Ehrenb.) Krammer
- Pl. 313 *Neidium* mesp01
- Pl. 314 *Neidium* mesp02
- Pl. 315 *Neidium* mesp03
- Pl. 316 *Neidium* mesp04
- Pl. 317 *Neidium pseudodensestriatum*, Stachura-Suchoples & Kociolek

310



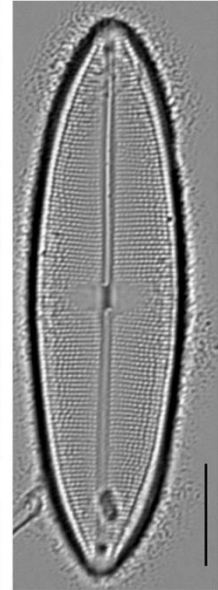
312



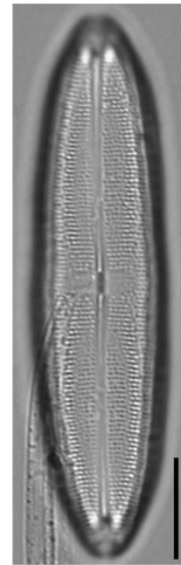
311



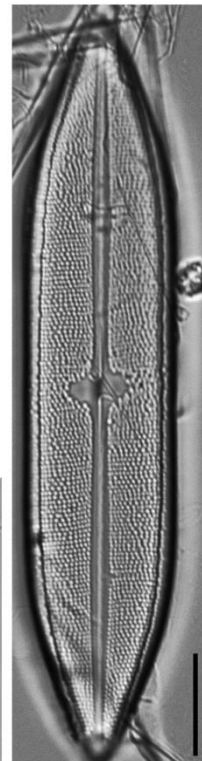
314



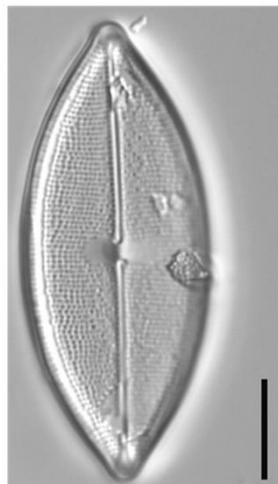
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317

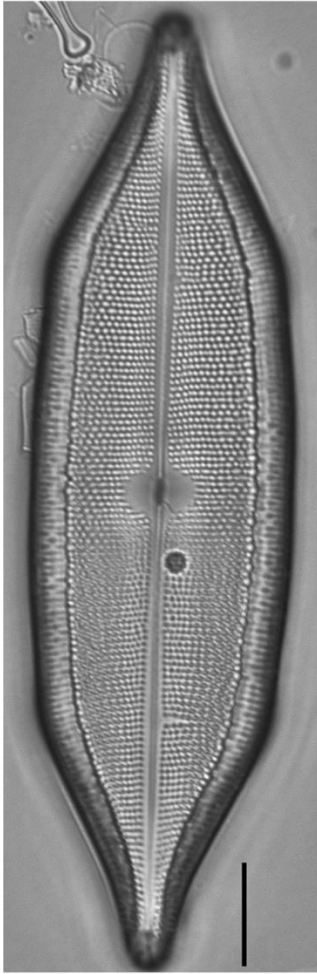


315

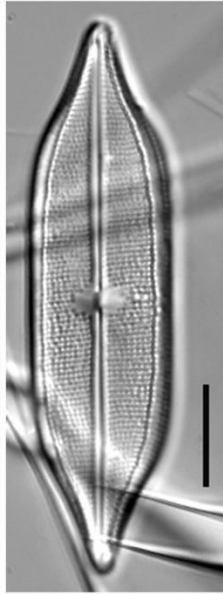


- Pl. 318 *Neidium saccoense* morph large,
- Pl. 319 *Neidium saccoense*, Reimer
- Pl. 320 *Nitzschia amphibia* var. *amphibia*, Grunow
- Pl. 321 *Nitzschia* mesp02
- Pl. 322 *Nitzschia* mesp03
- Pl. 323 *Nitzschia* mesp04
- Pl. 324 *Nitzschia* mesp05
- Pl. 325 *Nitzschia paleaeformis*, Hustedt
- Pl. 326 - 327 *Nitzschia palea*, (Kütz.) W.Sm.
- Pl. 328 *Nitzschia semirobusta*, Lange-Bert.
- Pl. 329 *Nitzschia serpentiraphe*, Lange-Bert.
- Pl. 330 - 331 *Nupela neotropica*, Lange-Bert.
- Pl. 332 *Nupela rumrichorum*, Lange-Bert.
- Pl. 333 *Orthoseira* mesp01
- Pl. 334 - 335 *Oxyneis binalis* var. *elliptica*, (Flower) Kingston
- Pl. 336 - 339 *Pinnularia amabilis*, Krammer
- Pl. 340 - 341 *Pinnularia balatonis*, (Pantocsek) Mills

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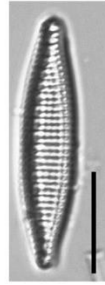
320



322



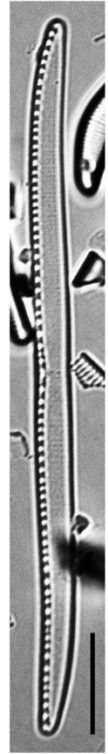
323



321

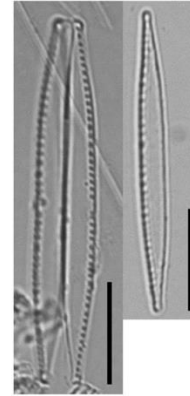


324



326 - 327

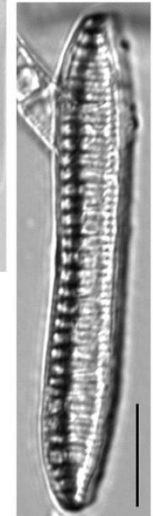
325



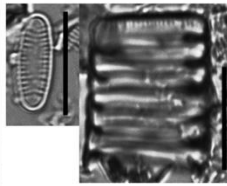
328



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334 - 335



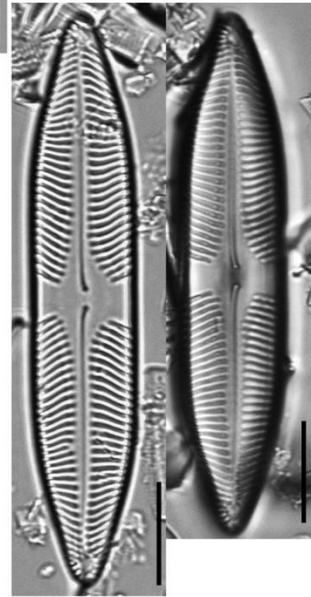
330 - 331



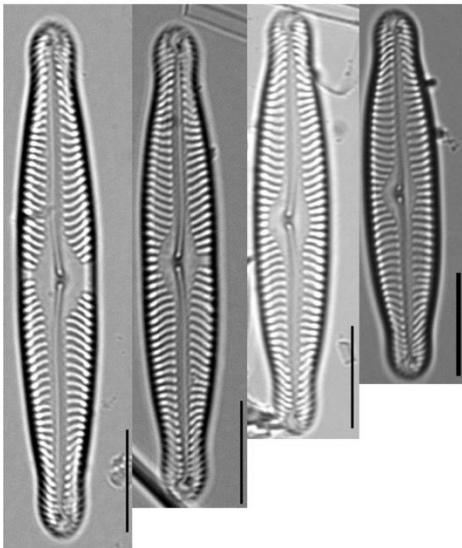
332



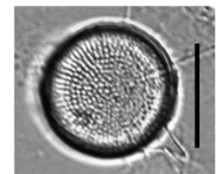
340 - 341



336 - 339

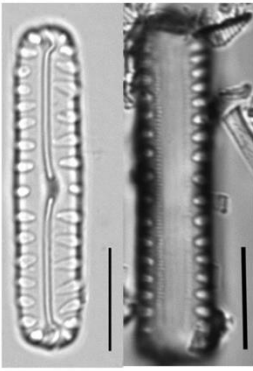


333

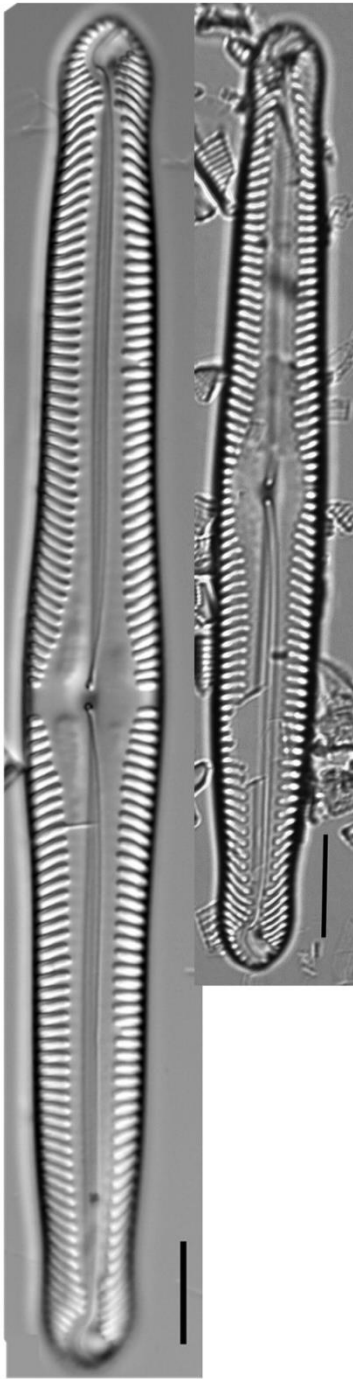


- Pl. 342 - 343 *Pinnularia borealis* cf., Ehrenb.
Pl. 344 - 345 *Pinnularia gibba*, (Ehrenb.) Ehreb.
Pl. 346 *Pinnularia* mesp05
Pl. 347 *Pinnularia* mesp06
Pl. 348 *Pinnularia* mesp08

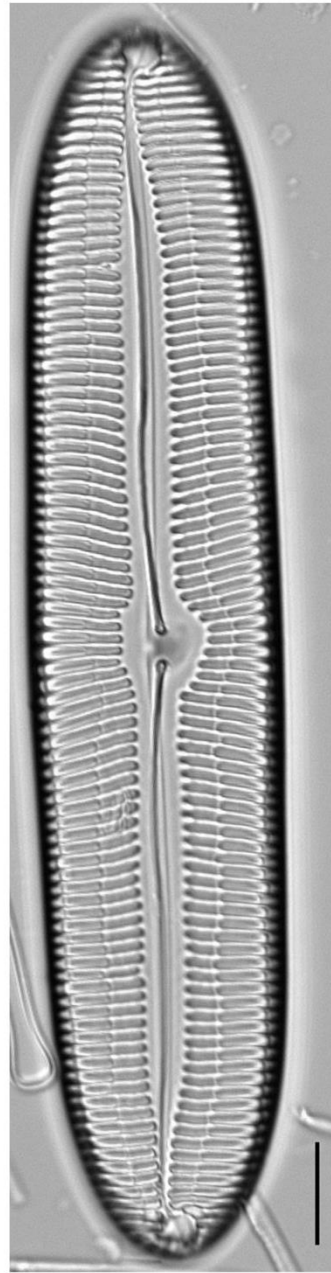
342 - 343



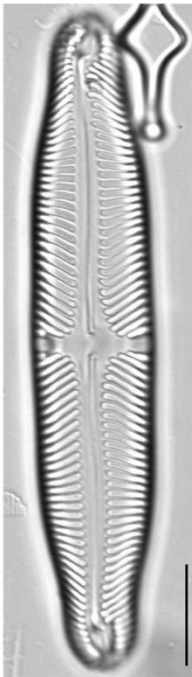
344 - 345



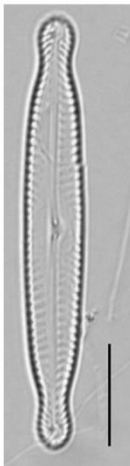
346



347

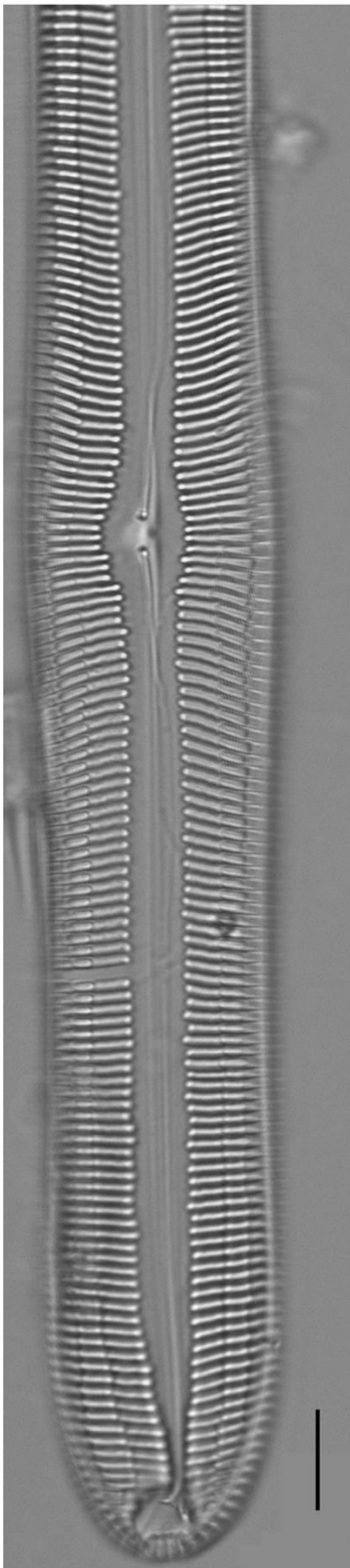


348

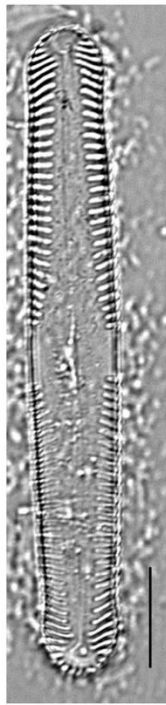


- Pl. 349 *Pinnularia* mesp09
- Pl. 350 *Pinnularia* mesp10
- Pl. 351 - 352 *Pinnularia* mesp11
- Pl. 353 *Pinnularia* mesp14
- Pl. 354 *Pinnularia* mesp16
- Pl. 355 *Pinnularia* mesp17
- Pl. 356 *Pinnularia* mesp18
- Pl. 357 *Pinnularia* mesp20
- Pl. 358 *Pinnularia* mesp21
- Pl. 359 *Pinnularia* mesp22

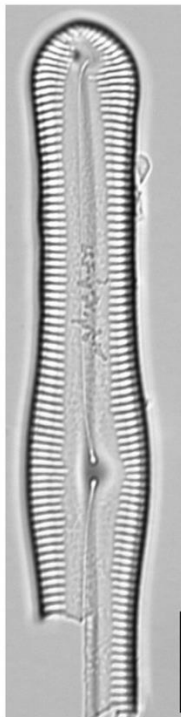
349



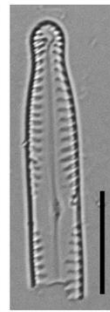
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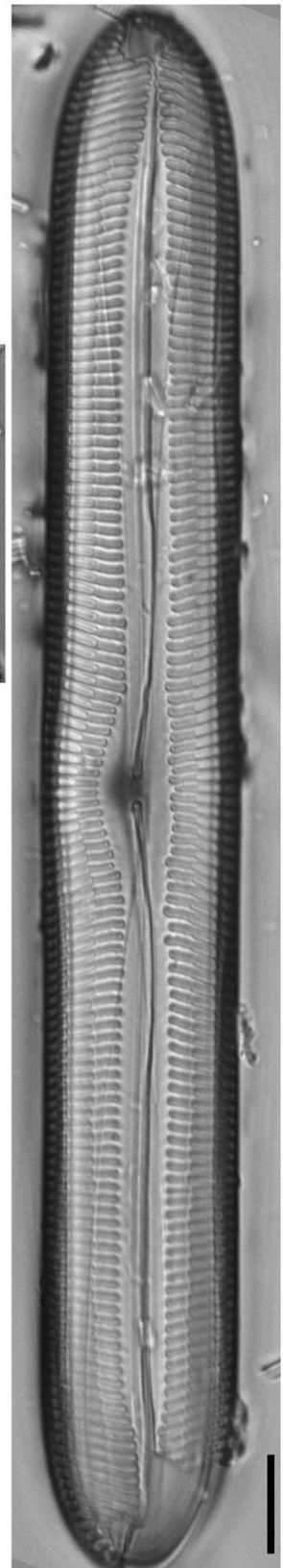
353



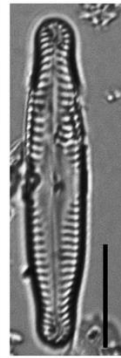
354



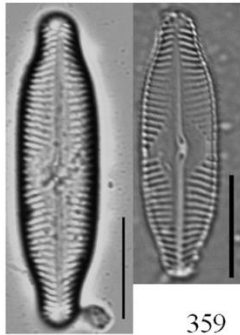
355



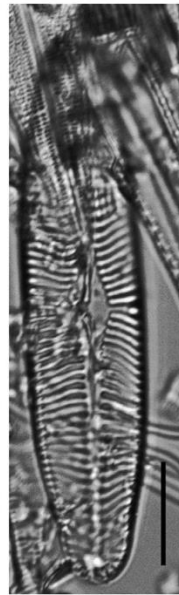
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351 - 352



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358



Pl. 360 - 361 *Pinnularia* mesp24

Pl. 362 *Pinnularia* mesp25

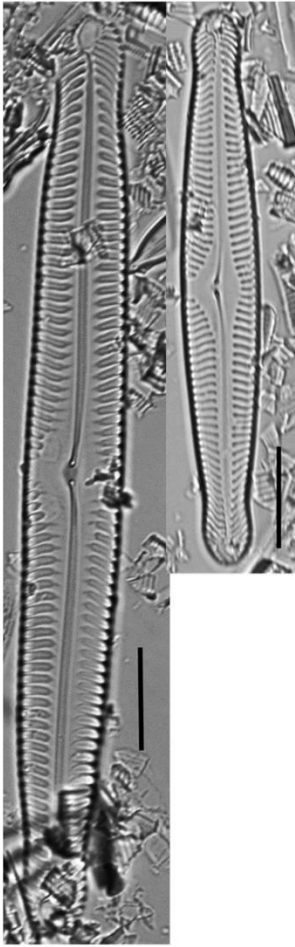
Pl. 363 *Pinnularia* mesp26

Pl. 364 *Pinnularia* mesp27

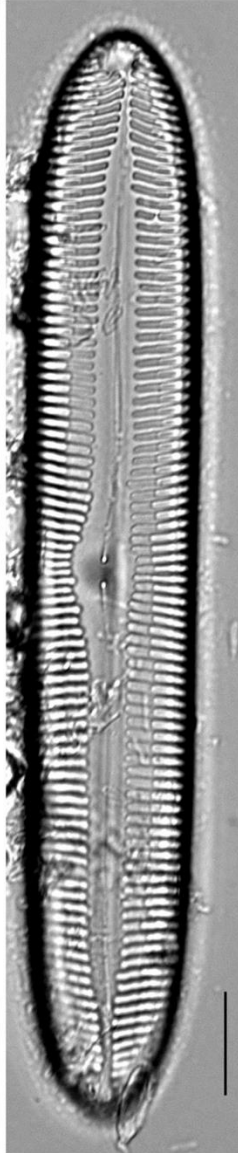
Pl. 365 - 366 *Pinnularia microstauron*, (Ehrenb.) Cleve

Pl. 367 - 369 *Pinnularia microstauron* var. *nonfasciata*, Krammer

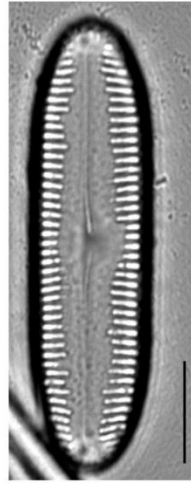
360 - 361



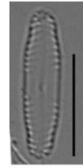
362



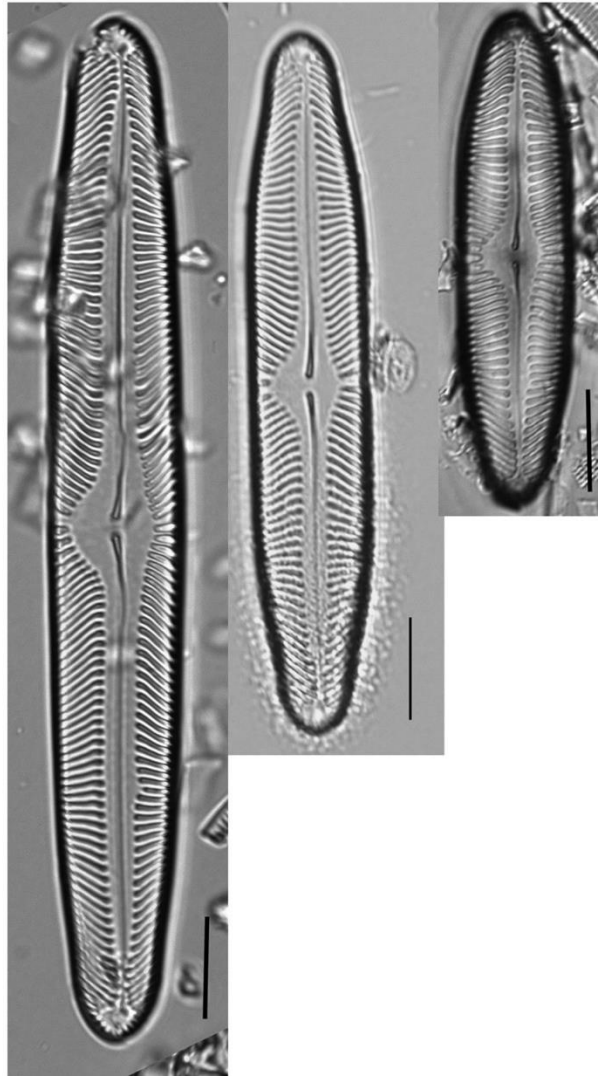
363



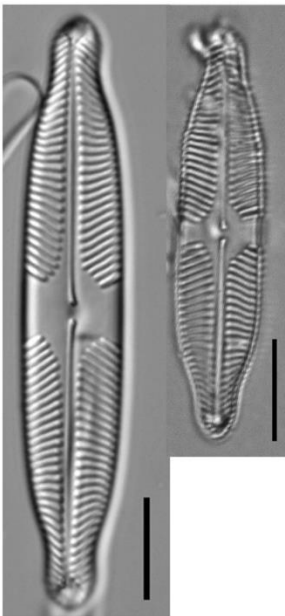
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367 - 369

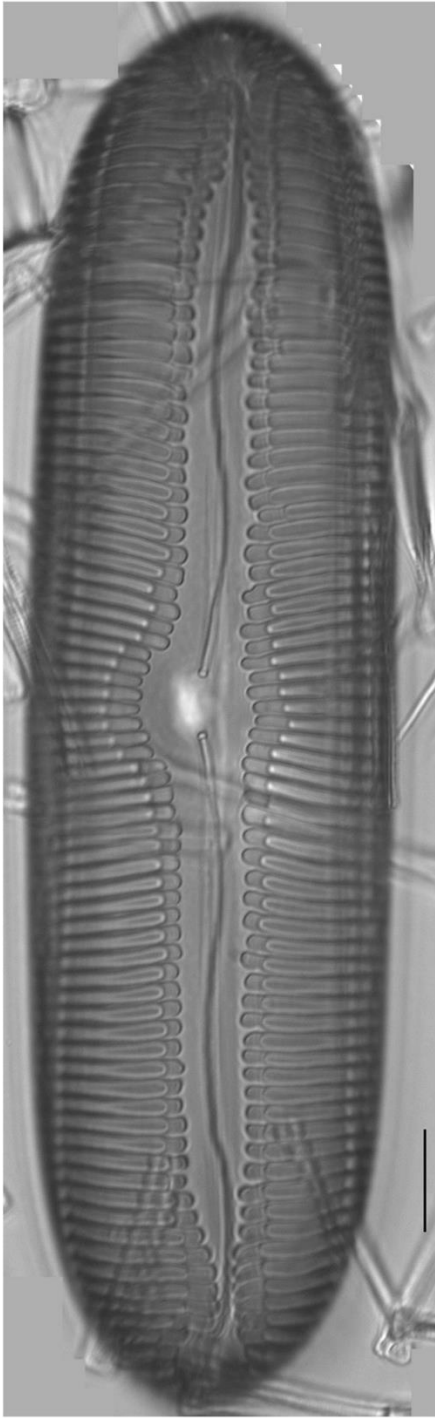


365 - 366

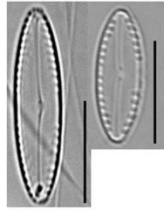


- Pl. 370 *Pinnularia oomensis* cf.
- Pl. 371 - 372 *Pinnularia pogoi*, R.P.Scherer
- Pl. 373 - 374 *Pinnularia turfosiphila*, E.E.Gaiser & J.R.Johansen
- Pl. 375 *Placoneis mesp01*, Mereschkowsky
- Pl. 376 *Planothidium apiculatum* cf., (R.M.Patrick) Lange-Bert.
- Pl. 377 *Planothidium lanceolatum*, (Bréb. ex Kütz.) Lange-Bert.
- Pl. 378 *Rhopalodia gibberula*, (Ehrenb.) O.Müller
- Pl. 379 - 380 *Rossithidium nodosum*, (A.Cleve) Aboal
- Pl. 381 - 382 *Sellaphora mesp01*
- Pl. 383 *Sellaphora mesp02*
- Pl. 384 *Sellaphora mesp03*
- Pl. 385 *Sellaphora mesp04*
- Pl. 386 *Sellaphora mesp05*
- Pl. 387 *Sellaphora rectangularis*,
(W.Gregory) Lange-Bertalot & Metzeltin
- Pl. 388 *Sellaphora tridentula*

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371 - 372



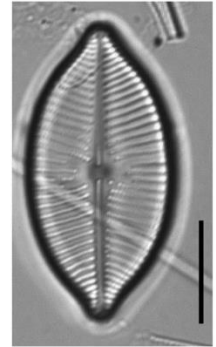
376



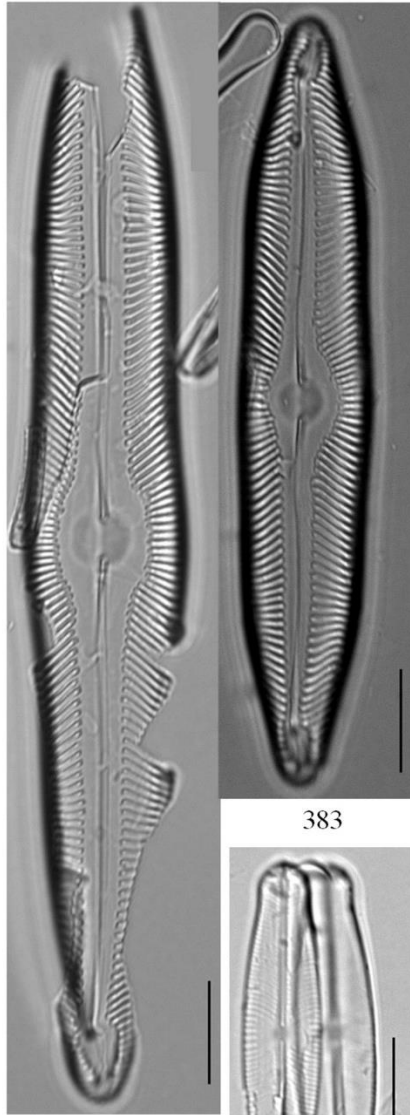
377



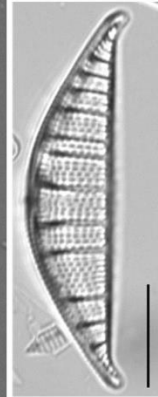
375



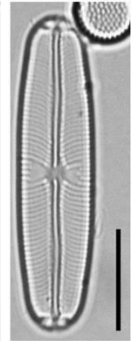
373 - 374



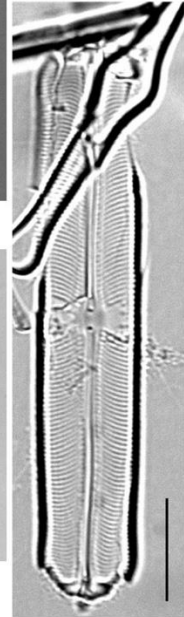
378



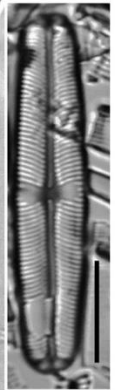
384



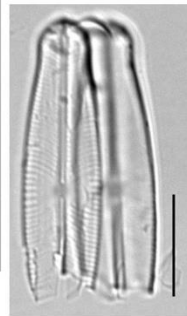
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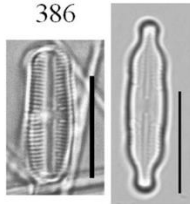
387



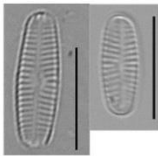
383



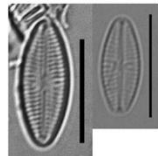
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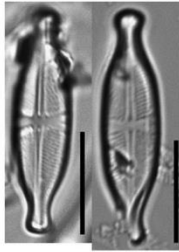


- Pl. 389 *Stauroneis mesp01*
- Pl. 390 - 391 *Stauroneis mesp02*
- Pl. 392 *Stauroneis mesp03*
- Pl. 393 *Stauroneis phoenicenteron*, (Nitzsch) Ehrenb.
- Pl. 394 - 395 *Staurosira construens*, Ehrenb.
- Pl. 396 - 398 *Surirella cuspidata*, (Hustedt) D.Kapustin & Kulikovskiy
- Pl. 399 *Surirella grunowii*, Grunow
- Pl. 400 *Surirella mesp01*

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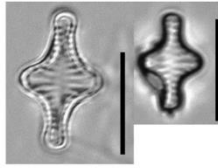
390 - 391



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394 - 395



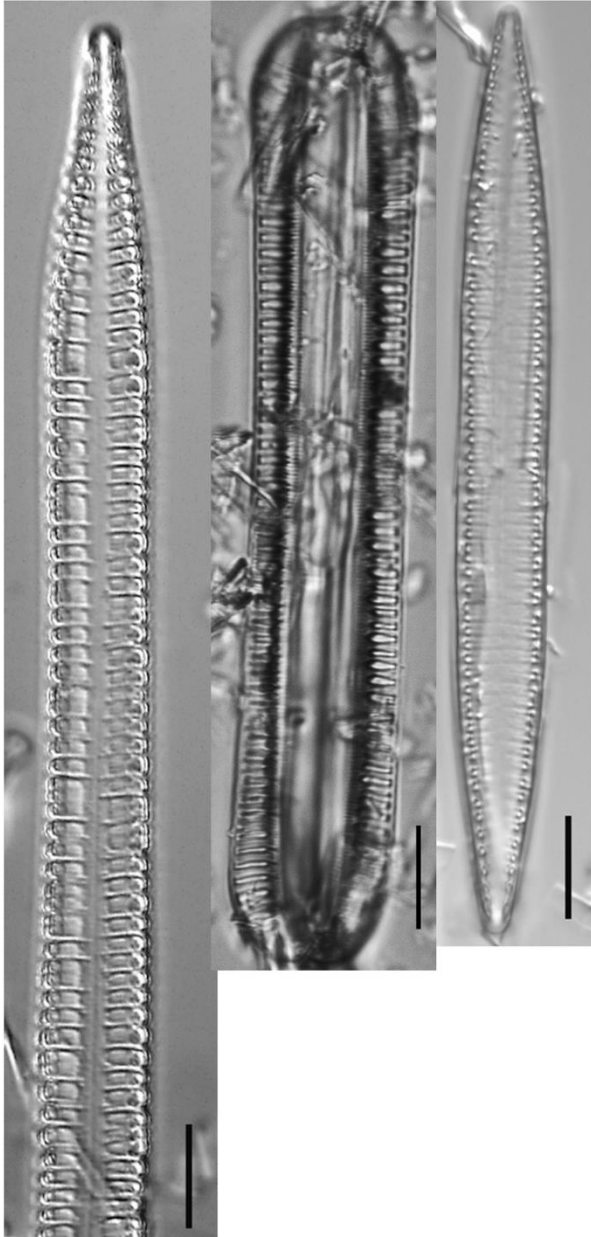
393



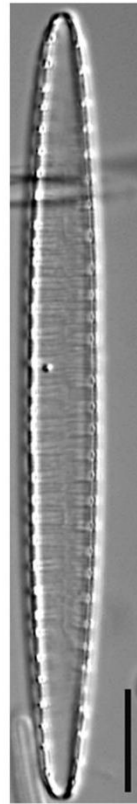
399



396 - 398

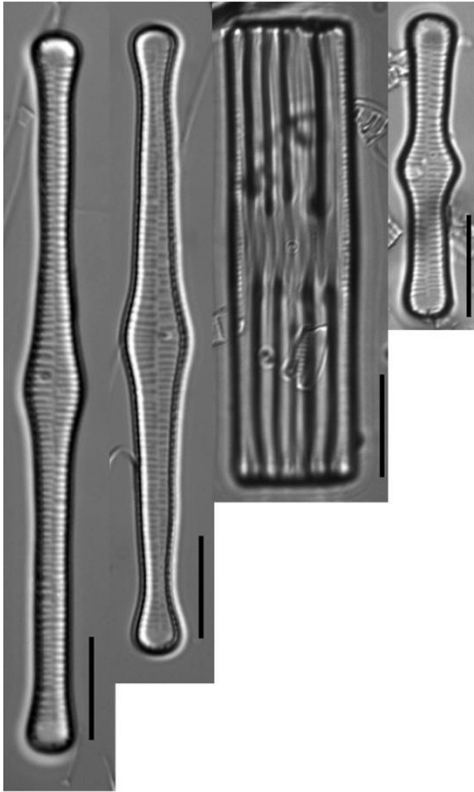


400



- Pl. 401 - 404 *Tabellaria fenestrata*, (Lyngb.) Kütz.
- Pl. 405 - 408 *Tabellaria flocculosa*, (Roth) Kütz.
- Pl. 409 *Tabellaria mesp01*
- Pl. 410 - 411 *Tetramphora sulcata*, (Brébisson) Stepanek & Kociolek
- Pl. 412 *Ulnaria ulna*, (Nitzsch) Compère
- Pl. 413 *Urosolenia eriensis*, (H.L.Sm.) Round and R.M.Crawford
- Pl. 414 *Urosolenia longiseta*, (O.Zacharias) Edlund & Stoermer

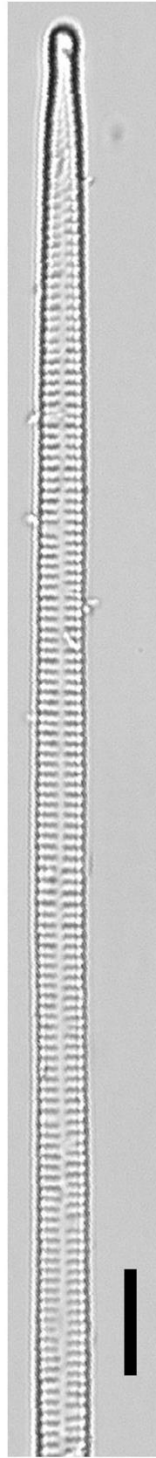
401 - 404



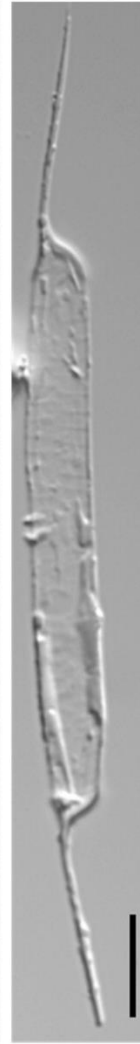
409



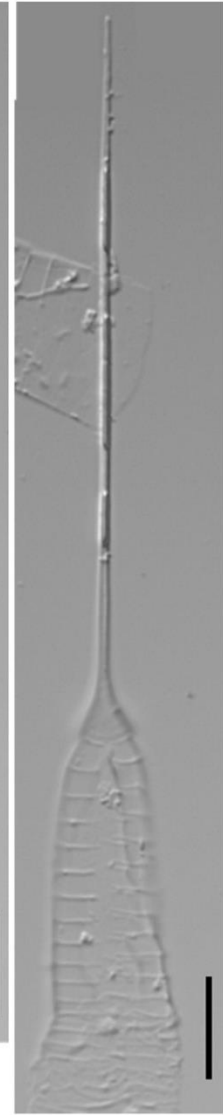
412



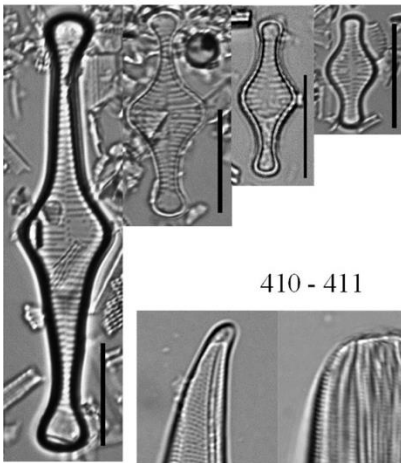
413



414



405 - 408



410 - 411

