

Makoto M. Watanabe, Kiyoshi N. Satake, Tomiji Hagiwara, Sachiko Ono and Kenichi Aizawa: NIES-Collection- The Microbial Culture Collection at The National Institute For Environmental Studies

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The Microbial Culture Collection at the National Institute for Environmental Studies (NIES-Collection) was founded at 1983 as the first collection center of environmental organisms.

Although microalgae, bacteria and protozoa related to environmental problems will be preserved in this collection in the future, microalgae associated with water pollution and cleaning have been collected and preserved the most actively as the first step. The specific name, source, conditions of cultivation and preservation, purity, morphological and physiological characteristics, and environmental characteristics, of all the strains collected have been reexamined, and the revised data processed using a personal computer.

The first list of microalgae maintained in the NIES-Collection (Watanabe and Kasai 1985) offered 262 strains, together with the examples of NIES-Collection facilities, organization and fundamental pattern of research. Since then, as the result of our studies on many strains isolated by us and given by colleagues, a considerable number of new algal strains have been added and the supplementary lists (Watanabe and Kasai 1986, 1987), the second list (Watanabe and Kasai 1988) and the third list (Watanabe and Satake 1991) published. The total numbers of strains of algae in the NIES-Collection are now 510, most of which were originally isolated by phycologists in Japan during the last thirty years.

We list all the strains of microalgae preserved in the NIES-Collection together with their data on source and culture state.

Ordering and Distribution of Strains

The distribution of the strains is made through the Global Environmental Forum (GEF). All the strains are available to any academically and commercially interested individuals and organizations. Anyone who uses a strain in a paper which is subsequently published, is requested to give the full number of the strain, e.g. NIES-251, and send a reprint to the GEF. In order to prevent trouble, confusion, or difficulty in the collection, accumulation and processing of strain information and data, the distribution of any strain to a third party is strictly prohibited.

All orders for strains must be requested by letter. Orders should specify both the species name and its strain number. The address is:

Global Environmental Forum
c/o The National Institute for Environmental Studies, 16-2 Onogawa, Tsukuba, Ibaraki 305 Japan

Deliveries usually can be made within 3-4 weeks following receipt of the order, with an invoice indicating the number of cultures and the total charges (domestic individuals and organizations, ¥6,000 each; foreign ones, ¥8,000 each) and a Strain Receipt Form. The charge is made to cover the cost of production, packing, postage, etc. Upon

* Present address: Environmental Research Center, Co., Ltd., 3533-39 Kurihara, Tsukuba, Ibaraki 305 Japan.

receipt of a strain, the Strain Receipt Form should be completed and returned to the GEF within the period designated by the GEF. If any culture is received in a non-viable, impure or atypical condition, the client is urged to inform the GEF. The unsatisfactory cultures are replaced with no fee if reported within the period designated. The GEF does not assume responsibility for loss or deterioration of cultures due to strikes or delay in customs of the recipient country.

Deposition of Strains

Investigators using newly-isolated algal strains in their researches are invited to send their strains to the Collection at any time they may have no objection to their distribution to other workers according to the above rules. The decision to accept the deposit of a strain is made by Committee for Evaluating Microbial Culture Strains composed of both microbiologists from this institute and authorities from other organizations. A strain for deposit in the NIES-Collection should fit the following criteria: 1) the source of the strain and the specific name should be established, though strains which have been used in a number of studies may be accepted even if only the generic name is known, 2) it should be a stable clonal strain in axenic or unialgal state, and 3) as a rule, deposited strains are available to the general public. At the discretion of Committee for Evaluating Microbial Culture Strains, some microalgae may be accepted for deposit, even if they did not meet the above criteria.

Prospective depositors should not send live material to the NIES-Collection in the first instance. Deposits must be made by applying first to the NIES-Collection which will furnish the relevant form.

Explanatory Notes to the List of Strains

The strains are listed by genus and species in alphabetical order. Strains under the same species are given in the order of their strain numbers. The number assigned to a

strain remains the same, regardless of any change in nomenclature. The strain number should be used with initials "NIES-". A detailed example of a strain description is presented below.

Achnanthes minutissima Kützing¹; freshwater²
71³ Kosaka River, Akita⁴, 1983⁵; axenic,
clonal⁶; *isol.* A. Yuri⁷

- 1) Scientific name with author (s)
- 2) Habitat
- 3) Strain number. The number should be used with the collection initials "NIES-", e.g. NIES-71
- 4) Collection site
- 5) Collection date
- 6) State of the strain
- 7) Isolator

LIST OF STRAINS

Achnanthes lanceolata Brébisson; freshwater
406 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai

Achnanthes longipes Agardh; marine
330 Kawazu, Shizuoka, 1985; unialgal,
clonal; *isol.* T. Sawaguchi

Achnanthes minutissima Kützing; freshwater
71 Kosaka River, Akita, 1983; axenic,
clonal; *isol.* A. Yuri
407 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
408 Ashio, Gunma, 1987; clonal; *isol.* F.
Kasai
409 Ashio, Gunma, 1987; clonal; *isol.* F.
Kasai
410 Watarase River, Gunma, 1987;
unialgal; *isol.* F. Kasai
411 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
412 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
413 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
414 Ooe River (Ozegahara), Fukushima,
1987; unialgal; *isol.* F. Kasai

- Achnanthes minutissima* Kobayashi et Mayama var. *saprophila*; freshwater
372 Lake Kasumigaura, Ibaraki, 1985; axenic, clonal; *isol.* T. Sawaguchi
- Actinastrum hantzschii* Lagerheim; freshwater
415 Lake Kasumigaura, Ibaraki, 1983; unialgal, clonal; *isol.* F. Kasai
- Amphidinium britannicum* (Herdman) Lebour; marine
405 Hasaki, Ibaraki, 1987; unialgal, clonal; *isol.* T. Sawaguchi
- Amphidinium carterae* Hulburt; marine
331 Iriomote Isl., Okinawa, 1986; axenic, clonal; *isol.* T. Sawaguchi
- Anabaena affinis* Lemmermann; freshwater
40 Lake Kasumigaura, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- Anabaena circinalis* Rabenhorst; freshwater
41 Lake Kasumigaura, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- Anabaena cylindrica* Lemmermann; freshwater
19 axenic
- Anabaena flos-aquae* Brébisson ex Bornet et Flahault f. *flos-aquae*; freshwater
73 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
74 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
75 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
- Anabaena solitaria* Klebahn f. *solitaria*; freshwater
80 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
- Anabaena spiroides* Klebahn; freshwater
76 Lake Kasumigaura, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
- Anabaena spiroides* f. *crassa* (Lemmermann) Elenkin; freshwater
78 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
- Anabaena spiroides* Klebahn f. *spiroides*; freshwater
77 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
79 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
263 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
- Anabaena variabilis* Kützing; freshwater
23 unialgal
- Anabaenopsis circularis* (G. S. West) Woloszynska et Miller; freshwater
21 unialgal; *isol.* A. Watanabe
- Aphanizomenon flos-aquae* f. *gracile* (Lemmermann) Elenkin; freshwater
81 Lake Kasumigaura, Ibaraki, 1978; axenic, clonal; *isol.* M. Watanabe
- Aphanocapsa montana* Cramer; freshwater
416 Nikko, Tochigi, 1987; unialgal; *isol.* F. Kasai
- Asterionella glacialis* Castracane; marine
265 Matoya Bay, Mie, 1984; unialgal, clonal; *isol.* T. Sawaguchi
417 Maizuru Bay, Kyoto, 1985; unialgal, clonal; *isol.* C. E. Riquelme
- Astrephomene gubernaculifera* Pocock; freshwater
418 Kaisei, Kanagawa, 1981; axenic, clonal; *isol.* H. Nozaki
419 Kaisei, Kanagawa, 1981; axenic, clonal; *isol.* H. Nozaki
- Aulosira laxa* Kirchner; freshwater
50 Pusa, India; unialgal; *isol.* G. S. Venkataraman
- Brachiomonas submarina* Bohlin; marine, brackish

375 Hachinohe Harbor, Aomori, 1986;
axenic, clonal; *isol.* T. Sawaguchi

Cachonina niei Loeblich III; marine

420 Iriomote Isl., Okinawa, 1986; axenic,
clonal; *isol.* T. Sawaguchi

Calothrix brevissima G. S. West; freshwater

22 Parao Isl., 1941; unialgal; *isol.* A.
Watanabe

Calothrix crustacea Thuret; marine

266 Oshoro Bay, Hokkaido, 1972;
unialgal, clonal; *isol.* M. M. Watanabe

Calothrix parasitica (Chauvin) Thuret;
marine

267 Oshoro Bay, Hokkaido, 1972;
unialgal, clonal; *isol.* M. M. Watanabe

334 Oshoro Bay, Hokkaido, 1973;
unialgal, clonal; *isol.* M. M. Watanabe

Calothrix scopulorum (Weber et Mohr)
Agardh; marine

268 Oshoro Bay, Hokkaido, 1972;
unialgal, clonal; *isol.* M. M. Watanabe

Carteria crucifera Korschikov in Pascher;
freshwater

421 Tsuchiura, Ibaraki, 1986; axenic,
clonal; *isol.* S. Suda

Carteria inversa (Korschikov) Bourrelly;
freshwater

422 Tsukuba, Ibaraki, 1982; axenic,
clonal; *isol.* F. Kasai
423 Higashihiroshima, Hiroshima, 1983;
unialgal, clonal; *isol.* M. Erata
424 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* S. Suda

Carteria klebsii (Dangeard) France;
freshwater

426 Tsuchiura, Ibaraki, 1986; unialgal,
clonal; *isol.* S. Suda

Carteria multifilis (Fresenius) Dill; freshwater

427 Kashiwa, Chiba, 1986; unialgal,
clonal; *isol.* M. M. Watanabe

Carteria obtusa Dill; freshwater

428 Kashiwa, Chiba, 1986; unialgal,
clonal; *isol.* M. M. Watanabe

429 Tsuchiura, Ibaraki, 1986; axenic,
clonal; *isol.* S. Suda

430 Kashiwa, Chiba, 1986; unialgal,
clonal; *isol.* M. M. Watanabe

431 Tsuchiura, Ibaraki, 1986; axenic,
clonal; *isol.* S. Suda

Carteria radiosa Korschikov; freshwater

432 Tsukuba, Ibaraki, 1985; axenic,
clonal; *isol.* S. Suda

Ceratium hirundinella (O. F. Müller)

Schrank; brackish, freshwater

376 Lake Hinuma, Ibaraki, 1986;
unialgal, clonal; *isol.* M. M. Watanabe

Chaetoceros debile Cleve; marine

270 Hachinohe Harbor, Aomori, 1985;
unialgal, clonal; *isol.* T. Sawaguchi

Chaetoceros sociale Lauder; marine

377 Shitaru Harbor, Shizuoka, 1985;
unialgal, clonal; *isol.* T. Sawaguchi

Chamaesiphon polymorphus Geitler;
freshwater

433 Lake Mashu, Hokkaido, 1987;
unialgal; *isol.* F. Kasai

Chamaesiphon subglobosus Lemmermann;
freshwater

434 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai

Characium maximum S. Watanabe; soil

154 Sasebo, Nagasaki, 1975; unialgal; *isol.*
S. Watanabe

Characium polymorphum Printz; freshwater

436 between Ghorepani and Billethadi,
Nepal, 1965; unialgal, clonal; *isol.* T.
Ichimura

Chattonella antiqua (Hada) Ono; marine

1 Harima-Nada, Seto Inland Sea, 1978;
axenic, clonal; *isol.* M. M. Watanabe

- 2 Osaka Bay, Osaka, 1982; axenic, clonal; *isol.* S. Yamochi
- 83 Off Hiketa, Seto Inland Sea, 1977; axenic, clonal; *isol.* C. Ono
- 84 Off Hiketa, Seto Inland Sea, 1972; axenic, clonal; *isol.* T. Okaichi
- 85 Shodo Isl., Kagawa, 1978; axenic, clonal; *isol.* S. Yoshimatsu
- 86 Uranouchi Bay, Kochi, 1980; axenic, clonal; *isol.* S. Yoshimatsu
- 113 Naoshima Isl., Kagawa, 1982; axenic, clonal; *isol.* S. Yoshimatsu
- 114 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* S. Yoshimatsu
- 161 axenic, clonal
- Chattonella marina* (Subrahmanyam) Hara et Chihara; marine
- 3 Osaka Bay, Osaka, 1982; axenic, clonal; *isol.* S. Yamochi
- 14 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* M. M. Watanabe
- 115 Kinko Bay, Kagoshima, 1978; axenic, clonal; *isol.* Aramaki & Yoshimatsu
- 116 Harima-Nada, Seto Inland Sea, 1981; axenic, clonal; *isol.* S. Yoshimatsu
- 117 Naoshima Isl., Kagawa, 1983; axenic, clonal; *isol.* S. Yoshimatsu
- 118 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* S. Yoshimatsu
- 121 Kagoshima Bay, Kagoshima, 1982; axenic, clonal; *isol.* T. Aramaki
- Chlamydomonas augustae* S. Watanabe var. *ellipsoidea*; soil
- 158 Sumatra, Indonesia, 1979; axenic, clonal; *isol.* S. Watanabe
- Chlamydomonas fasciata* Ettl; freshwater
- 437 Tsukuba, Ibaraki, 1984; unialgal, clonal; *isol.* S. Suda
- Chlamydomonas monadina* Stein var. *monadina*; freshwater
- 438 Lake Kasumigaura, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
- Chlamydomonas monticola* S. Watanabe; soil
- 157 Mt. Shiroumadake, Nagano, 1980; axenic, clonal; *isol.* S. Watanabe
- Chlamydomonas neglecta* Korschikov in Pascher; freshwater
- 439 Tsukuba, Ibaraki, 1984; axenic, clonal; *isol.* S. Suda
- Chlamydomonas parkeae* Ettl; marine
- 440 Izumi Bay, Nagasaki, 1986; unialgal, clonal; *isol.* S. Suda
- 441 Hachinohe Harbor, Aomori, 1985; unialgal, clonal; *isol.* S. Suda
- Chlamydomonas pulsatilla* Wollenweber; freshwater
- 122 Muroran, Hokkaido, 1966; axenic, clonal; *isol.* T. Ichimura
- Chlorella pyrenoidosa* Chick; freshwater
- 226 axenic, clonal
- Chlorella vulgaris* Beijerinck; freshwater
- 227 axenic; *isol.* A. Watanabe
- Chlorogonium metamorphum* Skuja; freshwater
- 123 Niseko, Hokkaido, 1964; axenic, clonal; *isol.* T. Ichimura
- 446 Tsuchiura, Ibaraki, 1985; axenic, clonal; *isol.* S. Suda
- Chloromonas insignis* (Anachin) Gerloff et Ettl; freshwater
- 447 Lake Kasumigaura, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
- Chlorosarcinopsis caeca* S. Watanabe; soil
- 160 Tottori, 1972; unialgal; *isol.* S. Watanabe
- Chlorosarcinopsis delicata* S. Watanabe; soil
- 153 Kyoto, Kyoto, 1975; axenic, clonal; *isol.* S. Watanabe
- Closterium acerosum* (Schrank) Ehrenberg ex Ralfs; freshwater
- 124 Daramshara, Nepal, 1965; axenic, clonal; *isol.* T. Ichimura
- 125 Rukumkot, Nepal, 1965; axenic,

- clonal; *isol.* T. Ichimura
126 Muna, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
127 Sapporo, Hokkaido, axenic, clonal; *isol.* Y. Nishihama
448 axenic, clonal
- Closterium aciculare*** W. et G. S. West
 var. *subpronum*; freshwater
258 Lake Biwa, Shiga, 1983; axenic, clonal; *isol.* M. M. Watanabe
259 Lake Biwa, Shiga, 1983; axenic, clonal; *isol.* M. M. Watanabe
260 Lake Kasumigaura, Ibaraki, 1983; unialgal, clonal; *isol.* F. Kasai
- Closterium calosporum*** Wittrock
 var. *calosporum*; freshwater
271 Vermont, U.S.A.; unialgal, clonal; *isol.* P. W. Cook
- Closterium calosporum*** var. *galiciense*
 Gutwinski; freshwater
128 Ibaraki, axenic, clonal; *isol.* M. M. Watanabe
162 Ibaraki, unialgal, clonal; *isol.* M. M. Watanabe
163 Ginama, Okinawa, 1973; axenic, clonal; *isol.* T. Ichimura
164 Ginama, Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
165 Iriomote Isl., Okinawa, 1973; axenic, clonal; *isol.* T. Ichimura
166 Kagawacho, Kagawa, 1974; unialgal, clonal; *isol.* T. Ichimura
167 Kagawacho, Kagawa, 1974; unialgal, clonal; *isol.* T. Ichimura
168 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
- Closterium calosporum*** var. *himalayense* M. Watanabe; freshwater
169 Shewaden, Nepal, 1972; unialgal, clonal; *isol.* M. M. Watanabe
170 Suke, Nepal, 1972; unialgal, clonal; *isol.* M. M. Watanabe
171 Suke, Nepal, 1972; unialgal, clonal; *isol.* M. M. Watanabe
336 Suke, Nepal, 1972; axenic, clonal; *isol.* M. M. Watanabe
- Closterium ehrenbergii*** Meneghini ex Ralfs; freshwater
228 Ebina, Kanagawa, 1975; axenic, clonal; *isol.* T. Ichimura
229 Ebina, Kanagawa, 1975; axenic; *isol.* T. Ichimura
- Closterium gracile*** Brébisson ex Ralfs; freshwater
179 Kathmandu, Nepal, 1968; unialgal, clonal; *isol.* T. Ichimura
180 Kathmandu, Nepal, 1968; unialgal, clonal; *isol.* T. Ichimura
- Closterium incurvum*** Brébisson; freshwater
181 Dhorpatan, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
337 Nawakot, Nepal, 1965; unialgal; *isol.* T. Ichimura
- Closterium moniliferum*** (Bory) Ehrenberg ex Ralfs var. *moniliferum*; freshwater
172 unialgal
173 Kitaadachigun, Saitama, 1969; axenic, clonal; *isol.* T. Ichimura
174 Ghorepani, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Closterium moniliferum*** var. *submoniliferum* (Woronichin) Krieger; freshwater
182 Kitaadachigun, Saitama, 1969; axenic, clonal; *isol.* T. Ichimura
183 Kitaadachigun, Saitama, 1969; unialgal, clonal; *isol.* T. Ichimura
- Closterium navicula*** (Brébisson) Lütkenmüller; freshwater
175 Chingkhola, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
176 Ghorepani, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
177 Billethadi, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
178 Shewaden, Nepal, 1972; unialgal, clonal; *isol.* M. M. Watanabe
- Closterium peracerosum-strigosum-littorale***

- complex; freshwater
- 51 Katsuta, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe, 1974
- 52 Katsuta, Ibaraki, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 53 Katsuta, Ibaraki, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 54 Katsuta, Ibaraki, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 55 Katsuta, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 56 Katsuta, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 57 Katsuta, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe, 1975
- 58 Mito, Ibaraki, 1975; unialgal, clonal; *isol.* M. M. Watanabe
- 59 Mito, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 60 Mito, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 61 Mito, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 62 Katsuta, Ibaraki, 1975; axenic, clonal; *isol.* M. M. Watanabe
- 63 Katsuta, Ibaraki, 1975; unialgal, clonal; *isol.* M. M. Watanabe
- 64 Lake Kasumigaura, Ibaraki, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 65 Lake Kasumigaura, Ibaraki, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 66 Piuthan, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- 67 Damchan, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- 68 Damchan, Nepal, 1965; axenic, clonal; *isol.* T. Ichimura
- 69 Lake Teganuma, Chiba, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- 70 Lake Teganuma, Chiba, 1974; axenic, clonal; *isol.* M. M. Watanabe
- 261 Katsuta, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- 262 Piuthan, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Closterium pleurodermatum* West et West; freshwater
- 449 Iriomote Isl., Okinawa, 1973; unialgal; *isol.* T. Ichimura
- Closterium praelongum* var. *brevius* Nordstedt; freshwater
- 450 Nawakot, Nepal, 1965; axenic; *isol.* T. Ichimura
- 451 Billethadi, Nepal, 1965; mixed; *isol.* T. Ichimura
- Closterium pusillum* var. *maius* Raciborski; freshwater
- 185 Billethadi, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Closterium rostratum* var. *subrostratum* Krieger; freshwater
- 338 Kathmandu, Nepal, 1968; axenic, clonal; *isol.* T. Ichimura
- Closterium selenastrum* M. Watanabe; freshwater
- 339 Mt. Yonaha, Okinawa, 1972; unialgal, clonal; *isol.* T. Ichimura
- 340 Mt. Yonaha, Okinawa, 1972; unialgal, clonal; *isol.* T. Ichimura
- Closterium spinosporum* var. *crassum* M. Watanabe; freshwater
- 186 Lake Akan, Hokkaido, 1973; axenic, clonal; *isol.* M. Watanabe
- 187 Mt. Yonaha, Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
- 341 Mt. Yonaha, Okinawa, 1972; axenic, clonal; *isol.* T. Ichimura
- Closterium spinosporum* var. *malaysiense* M. Watanabe; freshwater
- 188 Penang, Malaysia, 1974; unialgal, clonal; *isol.* M. Watanabe
- 189 Penang, Malaysia, 1974; unialgal, clonal; *isol.* M. Watanabe
- Closterium spinosporum* var. *ryukyuese* M. Watanabe; freshwater
- 191 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
- 192 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
- 193 Iriomote Isl., Okinawa, 1973;

- unialgal, clonal; *isol.* T. Ichimura
- Closterium spinosporum* Hodgetts
var. *spinosporum*; freshwater
194 Tsukudemura, Aichi, 1972; axenic, clonal; *isol.* T. Ichimura
195 Tsukudemura, Aichi, 1972; unialgal, clonal; *isol.* M. M. Watanabe
196 Tsukudemura, Aichi, 1972; unialgal, clonal; *isol.* M. M. Watanabe
197 Tsukudemura, Aichi, 1972; unialgal, clonal; *isol.* M. M. Watanabe
- Closterium tumidum* Johnson
198 Billethadi, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Closterium venus* Kützing ex Ralfs; freshwater
199 Kathmandu, Nepal, 1968; unialgal, clonal; *isol.* T. Ichimura
- Closterium wallichii* Turner; freshwater
200 Kitaadachigun, Saitama, 1969; unialgal, clonal; *isol.* T. Ichimura
201 Lake Kasumigaura, Ibaraki, 1983; axenic, clonal; *isol.* F. Kasai
202 Ghasa, Nepal, 1965; axenic, clonal; *isol.* T. Ichimura
- Coelastrum astroideum* De Notaris; freshwater
129 Lake Shoji, Yamanashi, 1981; axenic, clonal; *isol.* M. Watanabe
130 Lake Shoji, Yamanashi, 1981; axenic, clonal; *isol.* M. Watanabe
244 Lake Kasumigaura, Ibaraki, 1983; unialgal, clonal; *isol.* F. Kasai
342 Lake Kawaguchi, Yamanashi, 1981; unialgal, clonal; *isol.* M. Watanabe
- Coelastrum morus* W. et G. S. West; freshwater
231 Hachijo Isl., Tokyo, 1984; axenic, clonal; *isol.* F. Kasai
- Coelastrum proboscideum* Bohlin; freshwater
131 Near Tukcha, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Coelastrum reticulatum* (Dangeard) Senn; freshwater
132 Lake Yamanaka, Yamanashi, 1981; unialgal, clonal; *isol.* M. Watanabe
- Coelastrum reticulatum* (Dangeard) Senn var. *reticulatum*; freshwater
245 Lake Kasumigaura, Ibaraki, 1983; unialgal, clonal; *isol.* F. Kasai
- Coolia monotis* Meunier; marine
343 Hachijo Isl., Tokyo, 1984; axenic, clonal; *isol.* S. Suda
- Coscinodiscus granii* Gough; marine
273 Hachinohe Harbor, Aomori, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Cosmarium contractum* Kirchner; freshwater
133 Lake Yamanaka, Yamanashi, 1981; unialgal, clonal; *isol.* M. Watanabe
- Cosmarium hians* Borge; freshwater
452 Lake Yamanaka, Yamanashi, 1981; unialgal, clonal; *isol.* M. H. Watanabe
- Cosmocladium constrictum* (Archer) Archer; freshwater
248 Lake Biwa, Shiga, 1983; unialgal, clonal; *isol.* F. Kasai
- Cricosphaera roscoffensis* (Dangeard) Gayral et Fresnel; marine
8 Osaka Bay, Osaka, 1978; axenic, clonal; *isol.* S. Yamochi
- Cryptomonas ovata* Ehrenberg; freshwater
274 Tsuchiura, Ibaraki, 1982; axenic, clonal; *isol.* M. Ishimitsu
275 Tsuchiura, Ibaraki, 1982; axenic, clonal; *isol.* M. Ishimitsu
- Cryptomonas platyuris* Skuja; freshwater
276 Higashihiroshima, Hiroshima, 1983; axenic, clonal; *isol.* M. Ishimitsu
344 Higashihiroshima, Hiroshima, 1983; axenic, clonal; *isol.* M. Ishimitsu
- Cryptomonas rostratiformis* Skuja; freshwater

- 277 Hongo, Hiroshima, 1983; unialgal, clonal; *isol.* M. Ishimitsu
- 278 Hongo, Hiroshima, 1983; unialgal, clonal; *isol.* M. Ishimitsu
- 345 Sugadaira, Nagano, 1982; axenic, clonal; *isol.* M. Ishimitsu
- Cryptomonas tetrapirenoidosa* Skuja; freshwater
- 279 Higashihiroshima, Hiroshima, 1983; axenic, clonal; *isol.* M. Ishimitsu
- 280 Sugadaira, Nagano, 1982; axenic, clonal; *isol.* M. Ishimitsu
- 281 Minamiizu, Shizuoka, 1983; axenic, clonal; *isol.* M. Ishimitsu
- 282 Tsuchiura, Ibaraki, 1982; axenic, clonal; *isol.* M. Ishimitsu
- 346 Sugadaira, Nagano, 1982; axenic, clonal; *isol.* M. Ishimitsu
- 347 Minamiizu, Shizuoka, 1983; axenic, clonal; *isol.* M. Ishimitsu
- 348 Higashihiroshima, Hiroshima, 1983; axenic, clonal; *isol.* M. Ishimitsu
- Cyanidium caldarium* (Tilden) Geitler; hot spring
- 250 unialgal
- Cyanophora paradoxa* Korschikoff
- 547 axenic; *isol.* E. Pringsheim
- Cylindrocystis brebissonii* Meneghini
var. *brebissonii*; freshwater
- 349 Lake Onuma, Hokkaido, 1967; axenic, clonal; *isol.* M. Haga
- Dictyochloropsis irregularis* Nakano et Isagi; aerial
- 378 Akkeshi, Hokkaido, 1982; unialgal; *isol.* Y. Isagi
- Dictyosphaerium pulchellum* Wood; freshwater
- 453 Lake Kasumigaura, Ibaraki, 1988; unialgal, clonal; *isol.* T. Yanai
- Dimorphococcus lunatus* A. Brown; freshwater
- 134 Ozegahara, Gunma, 1983; unialgal, clonal; *isol.* F. Kasai
- 135 Tsuchiura, Ibaraki, 1983; axenic, clonal; *isol.* F. Kasai
- Dinobryon divergens* Imhof; freshwater
- 284 Lake Biwa, Shiga, 1983; unialgal; *isol.* F. Kasai
- Ditylum brightwellii* (T. West) Grunow et Heurck; marine
- 350 Shimoda, Shizuoka, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Docidium undulatum* Bailey var. *undulatum*; freshwater
- 285 Oze, Fukushima, 1983; unialgal, clonal; *isol.* F. Kasai
- Draparnaldia plumosa* (Vaucher) Agardh; freshwater
- 454 Shirai River, Sapporo, 1987; unialgal; *isol.* F. Kasai
- Echinospaeridium nordstedtii*
Lemmermann; freshwater
- 137 Lake Kasumigaura, Ibaraki, 1983; axenic, clonal; *isol.* F. Kasai
- Eremosphaera gigas* (Archer) Fott et Kalina; freshwater
- 379 Shinobugaoka, Osaka, 1968; unialgal, clonal; *isol.* T. Ichimura
- Eremosphaera viridis* De Bary; freshwater
- 380 Oze, Fukushima, 1983; unialgal, clonal; *isol.* F. Kasai
- Errerella bornhemiensis* Conrad; freshwater
- 455 Between Ghorepani and Billethadi, Nepal, 1965; unialgal, clonal; *isol.* T. Ichimura
- Eudorina elegans* Ehrenberg; freshwater
- 351 Lake Biwa, Shiga, 1983; unialgal, clonal; *isol.* S. Suda
- Eudorina elegans* Ehrenberg var. *elegans*; freshwater
- 456 Chiyodaku, Tokyo, 1977; axenic, clonal; *isol.* H. Nozaki

- 457 Chiyodaku, Tokyo, 1977; axenic, clonal; *isol.* H. Nozaki
- Eudorina elegans* var. *synoica* (Ehrenberg) Goldstein; freshwater
458 Midoriku, Yokohama, Kanagawa, 1980; axenic, clonal; *isol.* H. Nozaki
- Eudorina illinoisensis* (Kofoid) Pascher; freshwater
459 Nakaharaku, Kawasaki, Kanagawa, 1984; axenic, clonal; *isol.* H. Nozaki
460 Nakaharaku, Kawasaki, Kanagawa, 1984; axenic, clonal; *isol.* H. Nozaki
- Euglena clara* Skuja; freshwater
253 Higashiyata River, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
- Euglena gracilis* Klebs; freshwater
47 axenic, clonal
48 axenic, clonal
- Euglena gracilis* var. *bacillaris* Pringsheim; freshwater
49 axenic, clonal
- Euglena mutabilis* Schmitz; freshwater
286 Takatori River, Ibaraki, 1984; axenic, clonal; *isol.* S. Suda
- Eunotia pectinalis* var. *minor* (Kützing) Rabenhorst; freshwater
461 Mt. Tsukuba, Ibaraki, 1987; unialgal; *isol.* F. Kasai
- Eunotia serra* Ehrenberg var. *serra*; freshwater
352 Tsukiyono, Gunma, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Eutreptiella gymnastica* Throndsen; marine
381 Yashima Bay, Kagawa, 1982; axenic, clonal; *isol.* S. Yoshimatsu
- Fibrocapsa japonica* Toriumi et Takano; marine
136 Tsuda Bay, Kagawa, 1978; axenic, clonal; *isol.* K. Yuki
- 462 Hasaki, Ibaraki, 1987; axenic, clonal; *isol.* T. Sawaguchi
- Fragilaria capucina* Desmazières; freshwater
391 Lake Kasumigaura, Ibaraki, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Gephyrocapsa oceanica* Kamptner; marine
353 Tsushima, Nagasaki, 1986; axenic, clonal; *isol.* T. Sawaguchi
- Glenodiniopsis uliginosa* (Schilling) Woloszynska; freshwater
463 Shizukuishi, Iwate, 1984; unialgal, clonal; *isol.* T. Sawaguchi
- Gloeomonas lateperforata* (Skuja) Ettl; freshwater
464 Tsukuba, Ibaraki, 1982; axenic, clonal; *isol.* F. Kasai
- Gomphonema gracile* Ehrenberg var. *gracile*; freshwater
465 Ashio, Gunma, 1987; clonal; *isol.* F. Kasai
- Gomphonema parvulum* Kützing var. *parvulum*; freshwater
466 Shirai River, Sapporo, 1987; unialgal; *isol.* F. Kasai
467 Shirai River, Sapporo, 1987; *isol.* F. Kasai
- Gonatozygon brebissonii* De Bary; freshwater
138 Lake Kasumigaura, Ibaraki, 1974; axenic, clonal
139 Lake Shoji, Yamanashi, 1981; axenic, clonal; *isol.* M. Watanabe
- Gonatozygon monotaenium* De Bary; freshwater
247 Tsukiyono, Gunma, 1984; axenic, clonal; *isol.* F. Kasai
287 Lake Yamanaka, Yamanashi, 1981; unialgal, clonal; *isol.* M. Watanabe
- Gonium pectorale* Müller var. *pectorale*; freshwater
468 Kohokuku, Yokohama, Kanagawa,

- 1979; axenic, clonal; *isol.* H. Nozaki
469 Kohokuku, Yokohama, Kanagawa, 1979; axenic, clonal; *isol.* H. Nozaki
- Gonium viridistellatum* M. Watanabe; freshwater
288 Okinawa, Okinawa, 1973; axenic, clonal; *isol.* M. Watanabe
289 Okinawa, Okinawa, 1973; axenic, clonal; *isol.* M. Watanabe
290 Okinawa, Okinawa, 1973; axenic, clonal; *isol.* M. Watanabe
- Gymnodinium breve* Davis; marine
140 Harima-Nada, Seto Inland Sea, 1979; axenic, clonal; *isol.* S. Yoshimatsu
- Gymnodinium fuscum* Stein; freshwater
470 Tsuchiura, Ibaraki, 1986; unialgal, clonal; *isol.* T. Sawaguchi
- Gymnodinium nagasakiense* Takayama et Adachi; marine
249 Harima-Nada, Seto Inland Sea, 1980; axenic, clonal; *isol.* K. Yuki
- Gymnodinium sanguineum* Hirasaka; marine
11 Harima-Nada, Seto Inland Sea, 1979; axenic, clonal; *isol.* M. M. Watanabe
141 Uchinomi Bay, Kagawa, 1979; axenic, clonal; *isol.* S. Yoshimatsu
- Gyrodinium falcatum* Kofoid et Swezy; marine
142 Harima-Nada, Seto Inland Sea, 1981; axenic, clonal; *isol.* S. Yoshimatsu
- Gyrodinium instriatum* Freudenthal et Lee; marine
143 Shodo Isl., Kagawa, 1978; axenic, clonal; *isol.* K. Yuki
354 Shimoda Harbor, Shizuoka, 1985; axenic, clonal; *isol.* T. Sawaguchi
- Haematococcus pluvialis* Flotow; freshwater
144 Sapporo, Hokkaido, 1964; unialgal, clonal; *isol.* T. Ichimura
- Hafniomonas montana* (Geitler) Ettl et Moestrup; freshwater
257 Tsukuba, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
- Hemidinium nasutum* Stein; freshwater
471 Tsuchiura, Ibaraki, 1987; unialgal, clonal; *isol.* T. Sawaguchi
- Heterocapsa pygmaea* Loeblich, Schmidt et Sherley; marine
472 Kashiwazaki, Niigata, 1986; unialgal, clonal; *isol.* T. Sawaguchi
473 Izuhara, Nagasaki, 1986; unialgal, clonal; *isol.* T. Sawaguchi
- Heterocapsa triquetra* Stein; marine
7 Osaka Bay, Osaka, 1981; axenic, clonal; *isol.* S. Yamochi
235 Harima-Nada, Seto Inland Sea, 1982; axenic, clonal; *isol.* S. Yoshimatsu
- Heterosigma akashiwo* (Hada) Hada; marine
4 Fukuyama Bay, Hiroshima, 1966; axenic, clonal; *isol.* H. Iwasaki *et al.*
5 Gokasho Bay, Mie, 1966; axenic, clonal; *isol.* H. Iwasaki *et al.*
6 Osaka Bay, Osaka, 1979; axenic, clonal; *isol.* M. M. Watanabe
9 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* M. M. Watanabe
10 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* M. M. Watanabe
145 Nomaie, Kagoshima, 1978; axenic, clonal; *isol.* S. Yoshimatsu
146 Shido Bay, Kagawa, 1978; axenic, clonal; *isol.* K. Yuki
293 Onagawa Bay, Miyagi, 1984; axenic, clonal; *isol.* S. Suda
- Hyalotheca dissiliens* (Smith) Brébisson ex Ralfs; freshwater
147 Nagatoro, Saitama, 1969; unialgal, clonal; *isol.* T. Ichimura
148 Nagatoro, Saitama, 1969; axenic, clonal; *isol.* T. Ichimura
149 Lake Kasumigaura, Ibaraki, 1975; axenic, clonal; *isol.* T. Ichimura
150 Lake Kasumigaura, Ibaraki, 1975; axenic, clonal; *isol.* T. Ichimura

Hyalotheca dissiliens var. *dissiliens* f.
tridentula (Nordstedt) Boldt; freshwater
294 Tsukuba, Ibaraki, 1982; unialgal,
clonal; *isol.* F. Kasai

Hydrodictyon reticulatum (Lagerheim)
Lagerheim; freshwater
295 Kitakawachigun, Osaka, 1968;
unialgal, clonal; *isol.* T. Ichimura

Katodinium rotundatum (Lohmann)
Loeblich; marine
356 Hachinohe Harbor, Aomori, 1985;
axenic, clonal; *isol.* T. Sawaguchi

Lagerheimia ciliata (Lagerheim) Chodat;
freshwater
382 Lake Kasumigaura, Ibaraki, 1983;
unialgal, clonal; *isol.* F. Kasai

Leptocylindrus danicus Cleve; marine
383 Mera Harbor, Shizuoka, 1985;
unialgal, clonal; *isol.* T. Sawaguchi

Lobomonas monstrosa Korschikov;
freshwater
474 Iwaki, Fukushima, 1984; unialgal,
clonal; *isol.* S. Suda

Melosira ambigua (Grunow) O. Müller;
freshwater
20 Tsuchiura, Ibaraki, 1983; axenic,
clonal; *isol.* F. Kasai

Melosira granulata var. *angustissima* O.
Müller; freshwater
332 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* F. Kasai

Melosira granulata var. *angustissima* f.
spiralis Hustedt; freshwater
333 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* T. Hiwatari

Merismopedia tenuissima Lemmermann;
freshwater
230 Tsukuba, Ibaraki, 1984; unialgal,
clonal; *isol.* F. Kasai

Mesostigma viride Lauterborn; freshwater
296 Mitsukaido, Ibaraki, 1985; unialgal,
clonal; *isol.* S. Suda
475 Mitsukaido, Ibaraki, 1986; unialgal,
clonal; *isol.* S. Suda
476 Mitsukaido, Ibaraki, 1986; unialgal,
clonal; *isol.* S. Suda
477 Mitsukaido, Ibaraki, 1986; unialgal,
clonal; *isol.* S. Suda

Micractinium pusillum Fresenius; freshwater
151 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* F. Kasai

Micrasterias crux-melitensis (Ehrenberg)
Hassall ex Ralfs; freshwater
152 Kathmandu, Nepal, 1968; unialgal,
clonal; *isol.* T. Ichimura

Micrasterias foliacea Bailey ex Ralfs var.
foliacea; freshwater
297 Higashihiroshima, Hiroshima, 1983;
unialgal, clonal; *isol.* F. Kasai

Microcystis aeruginosa Kützing f. *aeruginosa*;
freshwater
44 Lake Kasumigaura, Ibaraki, 1974;
axenic, clonal; *isol.* M. M. Watanabe
87 Lake Kasumigaura, Ibaraki, 1982;
axenic, clonal; *isol.* M. H. Watanabe
88 Lake Kawaguchi, Yamanashi, 1981;
unialgal, clonal; *isol.* M. H. Watanabe
89 Lake Kawaguchi, Yamanashi, 1981;
axenic, clonal; *isol.* M. H. Watanabe
90 Lake Kawaguchi, Yamanashi, 1981;
unialgal, clonal; *isol.* M. H. Watanabe
91 Lake Kasumigaura, Ibaraki, 1982;
unialgal, clonal; *isol.* M. H. Watanabe
99 Lake Suwa, Nagano, 1982; unialgal,
clonal; *isol.* M. H. Watanabe
100 Lake Suwa, Nagano, 1982; unialgal,
clonal; *isol.* M. H. Watanabe
101 Lake Suwa, Nagano, 1982; unialgal,
clonal; *isol.* M. Watanabe
298 Lake Kasumigaura, Ibaraki, 1982;
axenic, clonal; *isol.* M. Watanabe
299 Lake Kasumigaura, Ibaraki, 1979;
unialgal, clonal; *isol.* N. Takamura

- Microcystis aeruginosa* f. *flos-aquae* (Wittrock) Elenkin; freshwater
 98 Lake Kasumigaura, Ibaraki, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 478 Lake Kasumigaura, Ibaraki, 1977; unialgal; *isol.* O. Yagi
- Microcystis elabens* var. *minor* Nygaard; freshwater
 42 Lake Kasumigaura, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- Microcystis holsatica* Lemmermann; freshwater
 43 Lake Kasumigaura, Ibaraki, 1974; unialgal, clonal; *isol.* M. M. Watanabe
- Microcystis viridis* (A. Brown) Lemmermann; freshwater
 102 Lake Kasumigaura, Ibaraki, 1982; axenic, clonal; *isol.* M. H. Watanabe
 103 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
- Microcystis wesenbergii* Komárek; freshwater
 104 Chiyodaku, Tokyo, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 105 Lake Kasumigaura, Ibaraki, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 106 Lake Kasumigaura, Ibaraki, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 107 Lake Kawaguchi, Yamanashi, 1981; axenic, clonal; *isol.* M. H. Watanabe
 108 Lake Suwa, Nagano, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 109 Lake Yogo, Shiga, 1982; unialgal, clonal; *isol.* M. H. Watanabe
 110 Lake Kasumigaura, Ibaraki, 1978; unialgal, clonal; *isol.* M. Watanabe
 111 Lake Kasumigaura, Ibaraki, 1978; axenic, clonal; *isol.* M. Watanabe
 112 Lake Suwa, Nagano, 1982; axenic, clonal; *isol.* M. Watanabe
- Microthamnion kutzingianum* Nägeli; freshwater
 479 Toyohira River, Sapporo, 1987; unialgal; *isol.* F. Kasai
- Monomastix minuta* Skuja; freshwater
 255 Tsuchiura, Ibaraki, 1983; axenic, clonal; *isol.* S. Suda
 256 Oze, Gunma, 1983; axenic, clonal; *isol.* S. Suda
- Monoraphidium circinale* (Nygaard) Nygaard; freshwater
 480 Tsuchiura, Ibaraki, 1983; mixed; *isol.* S. Suda
- Monoraphidium contortum* (Thuret) Komárková-Legnerová; freshwater
 384 Lake Unagiike, Kagoshima, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Monoraphidium griffithii* (Berkeley) Komárková-Legnerová; freshwater
 385 Urizura, Ibaraki, 1984; axenic, clonal; *isol.* T. Sawaguchi
- Myxosarsina burmensis* Skuja; freshwater
 481 Mt. Tsukuba, Ibaraki, 1987; unialgal; *isol.* F. Kasai
- Nephroselmis* aff. *rotunda*; marine
 482 Ieshima Isls., Hyogo, 1984; unialgal, clonal; *isol.* S. Suda
- Nephroselmis astigmatica* Inouye et Pienaar; marine
 252 Tateyama Harbor, Chiba, 1983; axenic, clonal; *isol.* I. Inouye
- Nephroselmis olivacea* Stein; freshwater
 483 Tsuchiura, Ibaraki, 1986; unialgal, clonal; *isol.* S. Suda
 484 Tsuchiura, Ibaraki, 1986; axenic, clonal; *isol.* S. Suda
 485 Tsuchiura, Ibaraki, 1986; unialgal, clonal; *isol.* S. Suda
- Nephroselmis viridis* Inouye; marine
 486 Harima-Nada, Seto Inland Sea, 1983; unialgal, clonal; *isol.* S. Suda
- Nitzschia longissima* var. *reversa* Grunow; marine
 358 Kawazu, Shizuoka, 1985; unialgal,

- clonal; *isol.* T. Sawaguchi
- Nitzschia palea* (Kützing) W. Smith;
freshwater
487 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
488 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
489 Ashio, Gunma, 1987; clonal; *isol.* F.
Kasai
- Nostoc commune* Vaucher; freshwater
24 Kurobe Valley, Toyama; unialgal;
isol. A. Watanabe
38 Marble Point; unialgal; *isol.* O.
Holm-Hansen
- Nostoc linckia* (Roth) Bornet et Flahault;
freshwater
25 Kagoshima, Kagoshima; unialgal;
isol. M. Ishikawa
- Nostoc linckia* var. *arvense* C.B.Rao;
freshwater
28 Kagoshima, Kagoshima; unialgal;
isol. M. Ishikawa
- Nostoc minutum* Desmazières; freshwater
26 Ishigaki Isl., Okinawa; unialgal; *isol.*
M. Ishikawa
29 Ishigaki Isl., Okinawa; unialgal; *isol.*
M. Ishikawa
- Oedogonium obesum* (Wittrock) Hirn;
freshwater
203 axenic, clonal; *isol.* E. Saito
- Olisthodiscus luteus* Carter; marine
15 Tamano, Okayama, Seto Inland Sea;
axenic, clonal; *isol.* I. Inouye
- Oltmannsiellopsis unicellularis* Inouye et
Chihara; marine
359 Ieshima Isls., Hyogo, 1984; axenic,
clonal; *isol.* S. Suda
- Oltmannsiellopsis viridis* (Hargraves et
Steele) Chihara et Inouye; marine
360 Onagawa Bay, Miyagi, 1984; axenic,
clonal; *isol.* S. Suda
- Oscillatoria agardhii* Gomont; freshwater
204 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* S. Suda
205 Lake Kasumigaura, Ibaraki, 1982;
unialgal, clonal; *isol.* M. Watanabe
- Oscillatoria amphibia* Agardh; marine
361 Asaji Bay, Nagasaki, 1985; unialgal,
clonal; *isol.* M. M. Watanabe
- Oscillatoria animalis* Agardh; freshwater
206 unialgal; *isol.* F. Murano
- Oscillatoria laetevirens* (Crouan) Gomont;
freshwater
31 Kawaji, Tochigi; unialgal; *isol.* M.
Ishikawa
- Oscillatoria limnetica* Lemmermann;
freshwater
36 Nakano, Tokyo; unialgal; *isol.* F.
Murano
- Oscillatoria raciborskii* Woloszynska;
freshwater
207 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* S. Suda
- Oscillatoria rosea* Utermohl; marine
208 Asaji Bay, Nagasaki, 1983; unialgal,
clonal; *isol.* Y. Ichimura
- Oscillatoria tenuis* Agardh; freshwater
33 Setagaya, Tokyo; unialgal; *isol.* M.
Ishikawa
- Oxyrrhis marina* Dujardin; marine
494 Hachinohe, Aomori, 1988; mixed;
isol. T. Sawaguchi
- Pandorina morum* (Müller) Bory; freshwater
242 Lake Ozenuma, Fukushima, 1983;
axenic, clonal; *isol.* S. Suda
243 Lake Ozenuma, Fukushima, 1983;
axenic, clonal; *isol.* S. Suda
362 Lake Ozenuma, Fukushima, 1983;
axenic, clonal; *isol.* S. Suda
- Pediastrum angulosum* (Ehrenberg) ex

- Meneghini var. *angulosum*; freshwater
 300 Higashihiroshima, Hiroshima, 1983;
 unialgal, clonal; *isol.* F. Kasai
- Pediastrum boryanum* (Turpin) Meneghini;
 freshwater
 209 Lake Kasumigaura, Ibaraki, 1982;
 axenic, clonal; *isol.* M. H. Watanabe
 301 Lake Shoji, Yamanashi, 1981;
 unialgal, clonal; *isol.* M. Watanabe
- Pediastrum duplex* Meyen; freshwater
 212 Lake Kawaguchi, Yamanashi, 1981;
 unialgal, clonal; *isol.* M. H. Watanabe
- Pediastrum duplex* Meyen var. *duplex*;
 freshwater
 210 Tsukuba, Ibaraki, 1983; axenic,
 clonal; *isol.* A. Yuri
 213 Tsukuba, Ibaraki, 1983; unialgal,
 clonal; *isol.* T. Hiwatari
- Pediastrum duplex* var. *gracillimum* W. et
 G. S. West; freshwater
 211 Lake Kasumigaura, Ibaraki, 1983;
 axenic, clonal; *isol.* F. Kasai
 214 Tsukuba, Ibaraki, 1983; unialgal,
 clonal; *isol.* T. Hiwatari
- Pediastrum simplex* Meyen; freshwater
 215 Lake Biwa, Shiga, 1982; axenic,
 clonal; *isol.* M. H. Watanabe
 302 Lake Kasumigaura, Ibaraki, 1983;
 axenic, clonal; *isol.* F. Kasai
- Pediastrum tetras* (Ehrenberg) Ralfs;
 freshwater
 216 Lake Kasumigaura, Ibaraki, 1982;
 unialgal, clonal; *isol.* M. H. Watanabe
- Pedinomonas minor* Korschikov; freshwater
 363 Tsukuba, Ibaraki, 1984; axenic,
 clonal; *isol.* S. Suda
- Penium margaritaceum* (Ehrenberg) ex
 Brébisson; freshwater
 217 Rumalbhara, Nepal, 1965; axenic,
 clonal; *isol.* T. Ichimura
 303 Tsukiyono, Gunma, 1984; axenic,
 clonal; *isol.* F. Kasai
- Peridinium bipes* f. *globosum* Lindemann;
 freshwater
 495 Lake Onogawa, Fukushima, 1985;
 unialgal, clonal; *isol.* T. Sawaguchi
- Peridinium bipes* f. *occultatum* (Lindemann)
 Lefèvre; freshwater
 364 Lake Unagiike, Kagoshima, 1985;
 axenic, clonal; *isol.* T. Sawaguchi
 496 Isobe, Mie, 1986; unialgal, clonal;
isol. T. Sawaguchi
 497 Lake Kizaki, Nagano, 1988; unialgal,
 clonal; *isol.* T. Sawaguchi
- Peridinium cunningtonii* Lemmermann;
 freshwater
 498 Shiogama, Miyagi, 1988; unialgal,
 clonal; *isol.* T. Sawaguchi
- Peridinium inconspicuum* subsp. *remotum*
 (Lefèvre) Lefèvre; freshwater
 499 Iwai, Ibaraki, 1985; unialgal, clonal;
isol. T. Sawaguchi
- Peridinium penardiforme* Lindemann;
 freshwater
 386 Kochi, Kochi, 1982; unialgal; *isol.* S.
 Yoshimatsu
- Peridinium polonicum* Woloszynska;
 freshwater
 500 Shiogama, Miyagi, 1988; axenic,
 clonal; *isol.* T. Sawaguchi
- Peridinium volzii* Lemmermann; freshwater
 365 Ajiro, Iwate, 1984; axenic, clonal;
isol. T. Sawaguchi
 501 Tsuchiura, Ibaraki, 1986; unialgal,
 clonal; *isol.* T. Sawaguchi
- Peridinium wierzejskii* Woloszynska;
 freshwater
 502 Tsuchiura, Ibaraki, 1985; unialgal,
 clonal; *isol.* T. Sawaguchi
- Peridinium willei* Huitfeldt-Kaas; freshwater
 304 Tsukiyono, Gunma, 1984; axenic,

- clonal; *isol.* T. Sawaguchi
366 Tsuchiura, Ibaraki, 1985; axenic, clonal; *isol.* T. Sawaguchi
- Phacus agilis* Skuja; freshwater
387 Kashiwa, Chiba, 1986; axenic, clonal; *isol.* M. M. Watanabe
- Phaeocystis pouchetii* (Hariot) Lagerheim; marine
388 Hachijo Isl., Tokyo, 1984; unialgal; *isol.* T. Sawaguchi
- Phormidium foveolarum* Gomont; freshwater
32 Lake Shirakaba, Nagano; unialgal; *isol.* M. Ishikawa
34 Sendai, Miyagi; unialgal; *isol.* M. Ishikawa
- Phormidium foveolarum* Gomont; freshwater
503 Mt. Tsukuba, Ibaraki, 1987; unialgal; *isol.* F. Kasai
504 Miyata River, Ibaraki, 1987; unialgal; *isol.* F. Kasai
505 Watarase River, Gunma, 1987; unialgal; *isol.* F. Kasai
- Phormidium jenkelianum* G. Schmid; freshwater
506 Watarase River, Gunma, 1987; unialgal; *isol.* F. Kasai
507 Watarase River, Gunma, 1987; unialgal; *isol.* F. Kasai
- Phormidium luridum* (Kützing) Gomont; freshwater
508 Takatori River, Ibaraki, 1984; unialgal, clonal; *isol.* S. Suda
- Phormidium molle* Gomont; freshwater
509 Watarase River, Gunma, 1987; unialgal; *isol.* F. Kasai
- Phormidium mucicola* Huber-Pestalozzi et Naum; freshwater
510 Mt. Tsukuba, Ibaraki, 1987; unialgal; *isol.* F. Kasai
- Phormidium ramosum* Boye-Petersen; freshwater
305 Takatori River, Ibaraki, 1984; unialgal, clonal; *isol.* S. Suda
511 Watarase River, Gunma, 1987; unialgal; *isol.* F. Kasai
- Phormidium tenue* (Meneghini) Gomont; freshwater
30 Akita, Akita; unialgal; *isol.* M. Ishikawa
512 Nagoya, Aichi, 1981; axenic; *isol.* N. Yamada
- Pinnularia acrosphaeria* W. Smith var. *acrosphaeria*; freshwater
367 Tsukiyono, Gunma, 1984; unialgal, clonal; *isol.* T. Sawaguchi
- Pinnularia gentilis* (Donkin) Cleve; freshwater
368 Tsukiyono, Gunma, 1985; unialgal, clonal; *isol.* T. Sawaguchi
- Pinnularia gibba* Ehrenberg; freshwater
513 Shirai River, Sapporo, 1987; unialgal; *isol.* F. Kasai
- Planktonema lauterbornii* Schmidle; freshwater
514 Lake Kasumigaura, Ibaraki, 1988; axenic, clonal; *isol.* Y. Niiyama
- Plectonema radiosum* (Schiederm.) Gomont; freshwater
515 Nikko, Tochigi, 1987; unialgal; *isol.* F. Kasai
- Pleurotaenium cylindricum* var. *stuhlmanni* (Hieronymus) Krieger; freshwater
306 Niimi, Okayama, 1983; unialgal, clonal; *isol.* F. Kasai
- Pleurotaenium ehrenbergii* var. *curtum* Krieger; freshwater
307 Nakagun, Wakayama, 1969; axenic, clonal; *isol.* T. Ichimura
308 Nakagun, Wakayama, 1969; axenic, clonal; *isol.* T. Ichimura
311 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura

- Pleurotaenium ehrenbergii* (Brébisson) De Bary var. *ehrenbergii*; freshwater
 309 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
 310 Iriomote Isl., Okinawa, 1973; unialgal, clonal; *isol.* T. Ichimura
- Pleurotaenium nodosum* (Bailey) Lundell var. *nodosum*; freshwater
 312 Higashihiroshima, Hiroshima, 1983; unialgal, clonal; *isol.* F. Kasai
- Pleurotaenium ovatum* Nordstedt; freshwater
 313 Niimi, Okayama, 1983; unialgal, clonal; *isol.* F. Kasai
- Polydriopsis spinulosa* (Schmidle) Schmidle; freshwater
 232 Tsukuba, Ibaraki, 1984; unialgal, clonal; *isol.* F. Kasai
- Prorocentrum balticum* (Lohmann) Loeblich III; marine
 516 Hachinohe, Aomori, 1988; unialgal, clonal; *isol.* T. Sawaguchi
- Prorocentrum dentatum* Stein; marine
 314 Hiuchi-Nada, Seto Inland Sea, 1979; unialgal, clonal; *isol.* S. Yoshimatsu
- Prorocentrum gracile* Schütt; marine
 315 Harima-Nada, Seto Inland Sea; axenic, clonal; *isol.* S. Yoshimatsu
- Prorocentrum lima* (Ehrenberg) Dodge; marine
 517 Lake Obuchinuma, Aomori, 1987; unialgal, clonal; *isol.* T. Sawaguchi
- Prorocentrum mexicanum* Osorio Tafall; marine
 317 Harima-Nada, Seto Inland Sea; axenic, clonal; *isol.* S. Yoshimatsu
- Prorocentrum micans* Ehrenberg; marine
 12 Osaka Bay, Osaka, 1981; axenic, clonal; *isol.* S. Yamochi
 218 Yashima Bay, Kagawa, 1978; axenic, clonal; *isol.* K. Yuki
- 316 Matoya Bay, Mie, 1984; axenic, clonal; *isol.* T. Sawaguchi
- Prorocentrum minimum* (Pavillard) Schiller; marine
 237 Osaka Bay, Osaka, 1982; axenic, clonal; *isol.* M. M. Watanabe
 238 Harima-Nada, Seto Inland Sea, 1983; axenic, clonal; *isol.* S. Yoshimatsu
- Prorocentrum triestinum* Schiller; marine
 13 Osaka Bay, Osaka, 1982; axenic, clonal; *isol.* M. M. Watanabe
 219 Nomi Bay, Kochi, 1980; axenic, clonal; *isol.* S. Yoshimatsu
- Protoceratium reticulatum* (Claparède et Lachmann) Bütschli; marine
 318 Matoya Bay, Mie, 1984; axenic, clonal; *isol.* T. Sawaguchi
 319 Naoshima Isl., Kagawa, 1982; axenic, clonal; *isol.* S. Yoshimatsu
- Protogonyaulax affinis* Inoue et Fukuyo; marine
 518 Harima-Nada, Seto Inland Sea, 1980; axenic, clonal; *isol.* S. Yoshimatsu
- Protogonyaulax catenella* (Whedon et Kofoid) Taylor; marine
 220 Tsuda Bay, Kagawa, 1980; axenic, clonal; *isol.* S. Yoshimatsu
 519 Owase Bay, Mie; axenic, clonal; *isol.* T. Okaichi
 520 Hachinohe Harbor, Aomori, 1988; unialgal, clonal; *isol.* T. Sawaguchi
- Protogonyaulax tamarensis* (Lebour) Taylor; marine
 239 Harima-Nada, Seto Inland Sea, 1982; axenic, clonal; *isol.* S. Yoshimatsu
 521 Hachinohe, Aomori, 1988; unialgal, clonal; *isol.* T. Sawaguchi
- Pseudocarteria mucosa* (Korschikov) Ettl; freshwater
 522 Izumi, Miyagi, 1985; unialgal, clonal; *isol.* S. Suda
 523 Higashiyata River, Ibaraki, 1983;

- unialgal, clonal; *isol.* S. Suda
524 Izumi, Miyagi, 1985; unialgal, clonal;
isol. S. Suda
- Pseudopleurococcus printzii* var. *longissimus*
 S. Watanabe; soil
159 Kyoto, 1975; unialgal; *isol.* S.
 Watanabe
- Pterosperma cristatum* Schiller; marine
221 Harima-Nada, Seto Inland Sea, 1983;
 axenic, clonal; *isol.* S. Suda
- Pyramimonas* aff. *amylifera*; marine
251 Yashima Bay, Kagawa, 1982; axenic,
 clonal; *isol.* S. Yoshimatsu
320 Onagawa Bay, Miyagi, 1984; axenic,
 clonal; *isol.* S. Suda
- Pyramimonas parkeae* Norris et Pearson;
 marine
254 Hachijo Isl., Tokyo, 1984; axenic,
 clonal; *isol.* S. Suda
- Pyramimonas tetrarhynchus* Schmarda;
 freshwater
525 Sapporo, Hokkaido, 1986; axenic,
 clonal; *isol.* S. Suda
- Pyrophacus steinii* (Schiller) Wall et Dale;
 marine
222 Harima-Nada, Seto Inland Sea, 1981;
 axenic, clonal; *isol.* S. Yoshimatsu
321 Matoya Bay, Mie, 1984; axenic,
 clonal; *isol.* T. Sawaguchi
- Scenedesmus acuminatus* var. *tetradesmoides*
 G. M. Smith; freshwater
92 Lake Kasumigaura, Ibaraki, 1983;
 axenic, clonal; *isol.* T. Hiwatari
- Scenedesmus acutus* Meyen; freshwater
94 Kosaka River, Akita, 1983; axenic,
 clonal; *isol.* A. Yuri
95 Tsukuba, Ibaraki, 1983; axenic,
 clonal; *isol.* S. Suda
120 Tsukuba, Ibaraki, 1983; axenic,
 clonal; *isol.* S. Suda
- Scenedesmus dimorphus* (Turpin) Kützing;
 freshwater
93 Lake Kasumigaura, Ibaraki, 1983;
 axenic, clonal; *isol.* F. Kasai
119 Ozegahara, Gunma, 1983; unialgal,
 clonal; *isol.* S. Suda
- Scenedesmus quadricauda* (Turpin) Brébisson
 sensu Chodat; freshwater
96 Lake Shoji, Yamanashi, 1981; axenic,
 clonal; *isol.* M. Watanabe
- Scenedesmus serratus* (Corda) Bohlin;
 freshwater
97 Lake Shoji, Yamanashi, 1981;
 unialgal, clonal; *isol.* M. Watanabe
- Schroederia setigera* (Schröder)
 Lemmermann; freshwater
246 Lake Kasumigaura, Ibaraki, 1983;
 axenic, clonal; *isol.* F. Kasai
- Scrippsiella precaria* Montresor et Zingone;
 marine
526 Hachinohe, Aomori, 1988; unialgal,
 clonal; *isol.* T. Sawaguchi
- Scrippsiella trochoidea* (Stein) Loeblich III;
 marine
369 Hachinohe Harbor, Aomori, 1985;
 axenic, clonal; *isol.* T. Sawaguchi
- Selenastrum capricornutum* Printz; freshwater
35 axenic, clonal
- Skeletonema costatum* (Greville) Cleve;
 marine
16 Harima-Nada, Seto Inland Sea, 1982;
 unialgal, clonal; *isol.* M. M. Watanabe
17 Harima-Nada, Seto Inland Sea, 1983;
 unialgal, clonal; *isol.* M. M. Watanabe
223 Shodo Isl., Kagawa, 1979; unialgal,
 clonal; K. Yuki
323 Off Kishiwada, Osaka Bay, 1985;
 axenic, clonal; *isol.* S. Yamochi
324 Off Kobe, Osaka Bay, 1985; axenic;
isol. S. Yamochi
- Spinoclosterium cuspidatum* (Bailey) Hirano;

- freshwater
325 Higashihiroshima, Hiroshima, 1983;
 unialgal, clonal; *isol.* T. Ichimura
- Spirulina platensis* (Nordstedt) Geitler; salt
 water
39 Lake Chad, Chad; axenic, clonal
46 Lake Texcoco, Mexico; axenic, clonal
- Spirulina platensis* (Nordstedt) Geitler;
 freshwater
45 Lake Kasumigaura, Ibaraki, 1975;
 unialgal, clonal; *isol.* M. M. Watanabe
- Spirulina subsalsa* Oersted; freshwater
27 axenic, clonal
- Spirulina subsalsa* Oersted; marine
527 Shikabe, Hokkaido, 1976; unialgal,
 clonal; *isol.* M. M. Watanabe
- Staurastrum dejectum* (Brébisson) Ralfs;
 freshwater
224 Lake Yamanaka, Yamanashi, 1981;
 unialgal, clonal; *isol.* M. Watanabe
- Staurastrum inconspicuum* Nordstedt;
 freshwater
390 Oze, Gunma, 1983; unialgal, clonal;
isol. F. Kasai
- Staurastrum paradoxum* Meyen; freshwater
528 Lake Kasumigaura, Ibaraki, 1982;
 unialgal, clonal; *isol.* M. H. Watanabe
- Stephanopyxis palmeriana* (Greville) Grunow;
 marine
327 Hachijo Isl., Tokyo, 1984; unialgal,
 clonal; *isol.* T. Sawaguchi
- Stichococcus bacillaris* Nägeli; freshwater
529 Watarase River, Gunma, 1987;
 unialgal; *isol.* F. Kasai
530 Watarase River, Gunma, 1987;
 unialgal; *isol.* F. Kasai
- Stigeoclonium aestivale* (Hazen) Collins;
 freshwater
531 Miyata River, Ibaraki, 1987;
 unialgal; *isol.* F. Kasai
- Stigeoclonium fasciculare* Kützing
 var. *fasciculare*; freshwater
532 Lake Mashu, Hokkaido, 1987; clonal;
isol. F. Kasai
- Synedra ulna* (Nitzsch) Ehrenberg var. *ulna*;
 freshwater
370 Lake Kasumigaura, Ibaraki, 1985;
 unialgal, clonal; *isol.* T. Sawaguchi
- Synura peterusonii* Korschikov; freshwater
233 Higashiyata River, Ibaraki, 1983;
 axenic, clonal; *isol.* S. Suda
- Synura spinosa* Korschikov; freshwater
234 Tsuchiura, Ibaraki, 1983; axenic,
 clonal; *isol.* S. Suda
- Tabellaria flocculosa* (Roth) Kützing;
 freshwater
225 Oze, Fukushima, 1983; unialgal,
 clonal; *isol.* M. M. Watanabe
371 Tsuchiura, Ibaraki, 1985; unialgal,
 clonal; *isol.* T. Sawaguchi
- Tetracystis chlorococcoides* (Korschikov)
 S. Watanabe; soil
155 Mt. Eboshidake, Nagasaki, 1975;
 axenic, clonal; *isol.* S. Watanabe
- Tetraedron incus* (Teiling) G. M. Smith;
 freshwater
392 Tsukuba, Ibaraki, 1984; unialgal,
 clonal; *isol.* F. Kasai
- Tetraselmis cordiformis* (Carter) Stein;
 freshwater
18 Oniishi, Gunma, 1980; axenic,
 clonal; *isol.* M. M. Watanabe
533 Mitsukaido, Ibaraki, 1985; axenic,
 clonal; *isol.* S. Suda
- Thalassionema nitzschioides* (Grunow)
 Hustedt; marine
534 Matoya Bay, Mie, 1984; unialgal,
 clonal; *isol.* T. Sawaguchi

- Thalassiosira pacifica* Gran et Angst; marine
535 Hachinohe Harbor, Aomori, 1987;
unialgal, clonal; *isol.* T. Sawaguchi
- Tolypothrix tenuis* Kützing; freshwater
37 Borneo; unialgal; *isol.* A. Watanabe
- Treubaria triappendiculata* Bernard;
freshwater
394 Lake Kasumigaura, Ibaraki, 1983;
axenic, clonal; *isol.* F. Kasai
- Ulothrix variabilis* Kützing; freshwater
329 Takatori River, Ibaraki, 1984;
unialgal, clonal; *isol.* S. Suda
- Ulothrix zonata* (Weber et Mohr) Kützing;
freshwater
536 Hitachi, Ibaraki, 1987; unialgal; *isol.*
F. Kasai
537 Shirai River, Sapporo, 1987;
unialgal; *isol.* F. Kasai
- Urnella terrestris* Playfair; soil
156 Pokhara, Nepal, 1975; axenic, clonal;
isol. S. Watanabe
- Uroglena americana* Calkins; freshwater
395 Lake Biwa, Shiga, 1978; monoxenic;
isol. Y. Ishida
- Uronema confervicolum* Lagerheim;
freshwater
538 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
- Uronema gigas* Vischer; freshwater
539 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
540 Miyata River, Ibaraki, 1987;
unialgal; *isol.* F. Kasai
- Volvox aureus* Ehrenberg; freshwater
241 Nagatoro, Saitama, 1969; unialgal,
clonal; *isol.* T. Ichimura
396 Koshokugun, Nagano, 1983;
unialgal; Y. Ogasawara
- Volvox aureus* Ehrenberg var. *aureus*;
freshwater
541 Lake Yamanaka, Yamanashi, 1981;
axenic, clonal; *isol.* H. Nozaki
542 Lake Yamanaka, Yamanashi, 1981;
axenic, clonal; *isol.* H. Nozaki
- Volvox carteri* Stein; freshwater
397 Ichinomiya, Aichi, 1983; unialgal,
clonal; *isol.* Y. Ogasawara
398 Ichinomiya, Aichi, 1983; unialgal,
clonal; *isol.* Y. Ogasawara
- Volvox prolificus* Iyengar; freshwater
543 unialgal, clonal; *isol.* Y. Ogasawara
- Volvox tertius* Meyer; freshwater
544 Kisofukushima, Nagano, 1986;
unialgal; *isol.* Y. Ogasawara
- Volvulina steinii* Playfair; freshwater
545 Hayama, Kanagawa, 1980; axenic,
clonal; *isol.* H. Nozaki
546 Hayama, Kanagawa, 1980; axenic,
clonal; *isol.* H. Nozaki

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References

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渡辺 信・佐竹 潔・萩原富司・小野幸子・相沢賢一：NIES コレクションー
国立環境研究所微生物系統保存施設

国立環境研究所微生物系統保存施設で保存されている微細藻類510株について、それらの分譲条件・方法及び寄託条件・方法と共に、各々の種名、株番号、採集地、採集年、株の状態及び分離者名を掲載した。(305 茨城県つくば市小野川16-2 国立環境研究所生物圏環境部環境微生物研究室／微生物系統保存施設)

