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NEW SPECIES AND VARIETIES OF FRESHWATER ALGAE FROM CHINA.*

LIANG CHING LI,

Research Fellow of the China Foundation for the
Promotion of Education and Culture.

During the years 1930-1932 through the generous cooperation of scientific men and friends in China and America, the writer received a rather continuous supply of Chinese freshwater algae collected at different localities and seasons. Among the algae of the eight hundred collections examined were four new species and two new varieties. The following is a description of these forms, the time and place of collection, and notes on their habitats. Both Latin and English diagnoses are given:

Scytonema crispum (Ag.) Born. var. **minus** var. nov.

(Plate I, Fig. 4.)

Strato caespitose, intricato, viridi-fuscescente vel olivaceo; filis 10-15 μ crassis, 0.51-1 centim. longis, crispis; pseudoramis conformibus; vaginis firmis, membranaceis, hyalinis; trichomatibus 7-10 μ crassis, cellulis 3.0-4.0 μ longioribus; heterocystis 8-10 μ latis, 6-10 μ longioribus; depressis vel quadratis, modo numerosis.

Plant mass caespitose, entangled, woolly, green to brown; filaments 10-15 μ in diameter, about 0.5-1 cm. in length, curled, branched; sheath firm, membranaceous, colorless; trichomes 7-10 μ in diameter, cells 3.0-4.0 μ in length; heterocysts 8-10 \times 6-10 μ , depressed or quadrate, numerous.

Similar to the species proper but distinguished by smaller dimensions of the trichomes.

"On rocks with dripping water" (Wang), Nanking, China, April 16, 1930. Type, Mr. Y. C. Wang's collection, No. 76 and 77, in the Herbarium of National Tsing Hua University, Peiping, China.

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Oedogonium sinense sp. nov.

(Plate I, Fig. 1.)

Oedogonium dioicum nannandrium, idioandrosporium (?); oogoniis singulis, ovoideis vel globoso-ellipsoideis, poro supramediano apertis; oosporis subglobosis vel oviformis, oogonia fere complentibus, laevi, fuscescentibus; cellulis vegetativis leviter capitellatis; nannandribus in cellulis suffultoriis curvatis; cellulis vegetativis 29–44 μ latis, 128–170 μ longioribus; cellulis suffultoriis 64 μ latis, 182 μ longioribus; stipite nannandribus 23 μ latis, 82 μ longioribus; antheridio exteriori, 2-cellulari, 12–14 μ latis, 15–18 μ longioribus.

Dioecious, nannandrous, idioandrosporous (?); oogonium 1, ovoid or globose-ellipsoid, poriferous, pore supramedian; oospore subspherical or oviform, almost filling the oogonium; spore wall smooth, yellow-brown; vegetative cells slightly or not capitellate; dwarf male curved, on suffultory cell; vegetative cells 29–44 \times 128–170 μ ; suffultory cell 64 \times 182 μ ; dwarf male stipe 23 \times 82 μ ; antheridium exterior, 2-celled, 12–14 \times 15–18 μ .

Distinguished from *Oedogonium nebraskense* Ohashi by its larger dimensions and smooth oospore walls.

In association with other algae in Hsuan Wu Lake, Nanking, China, April 20, 1930. Type, Mr. Y. C. Wang's collection, No. 125, in the Herbarium of National Tsing Hua University, Peiping, China.

Mougeotia sinensis sp. nov.

(Plate I, Figs. 2-3.)

Cellulis vegetativis 15–22 μ latis, 100–132 μ longioribus; cellulis conjugatio leviter geniculatis; sporangia inter 2 cellulis sitis; chromatophoro elongato cum pyrenoidibus 4–6; zygosporis ovoideis vel globosis, 25–31 μ latis, 29–31 μ longioribus, formati canali copulationis; mesosporio angulari-reticulato, fuscescentibus.

Vegetative cells 15–22 \times 100–132 μ ; conjugating cells slightly geniculate; sporangia adjoined by 2 cells; chromatophore with 4–6 pyrenoids in a single row; zygosporis ovoid to globose, 25–31 \times 29–31 μ , formed in the conjugating tube; median walls angularly reticulate, yellow-brown.

Among the species of *Mougeotia* in which the sporangia are joined by two cells, *Mougeotia sinensis* is the only one with angularly reticulate zygosporis.

Intermixed with *Zygnema synadelphum* Skuja and other algae, Tinghai, China, Spring, 1930. Type, Prof. C. C. Wang's collection, No. 501, in the Herbarium of National Central University, Nanking, China.

***Spirogyra wangi* sp. nov.**

(Plate I, Figs. 7-8.)

Cellulis vegetativis 30–32 μ latis, 150–350 μ longioribus, dissepimenta replicata; 2–3 chromatophoris anfractibus 1.5–4.5; cellulis fructiferis ad 72 μ inflatis; zygosporis ellipsoideis, 60–64 μ latis, 112–124 μ longioribus; mesosporio laevi.

Vegetative cells 30–32 \times 150–350 μ , with replicate end walls; 2–3 chromatophores making 1.5–4.5 turns; fertile cells inflated to 72 μ ; zygosporis ellipsoid, 60–64 \times 112–124 μ ; median wall smooth.

Characterized by the inflated fertile cells, larger zygosporis and number of chromatophores.

Growing with other filamentous algae, Hangchow, China, Spring, 1930. Type, Prof. C. C. Wang's collection, No. 40, in the Herbarium of National Central University, Nanking, China.

***Spirogyra sinensis* sp. nov.**

(Plate I, Figs. 5-6.)

Cellulis vegetativis 22–24 μ latis, 115–136 μ longioribus; dissepimentis planis; 2–4 chromatophoris, anfractibus 2.5–4.5; cellulis fructiferis medio valde inflatis fere 50 μ ; zygosporis lenticularis, diam. 38–45 μ ; mesosporio laevi.

Vegetative cells 22–24 \times 115–136 μ ; end walls plane; 2–4 chromatophores making 2.5–4.5 turns; fertile cells inflated toward the middle to about 50 μ ; zygosporis lenticular, 38–45 μ in diameter; median walls smooth.

This species is distinguished from *Spirogyra pellucida* (Hass.) Kutz. and the variety *minor* Tiffany by the smaller vegetative cells and fewer number of chromatophores in some of the cells, and by the very thick zygosporis wall.

Hsuan Wu Lake, Nanking, China, April 20, 1930. Type, Mr. Y. C. Wang's collection, No. 125, in the Herbarium of National Tsing Hua University, Peiping, China.

***Zygnema collinsianum* Transeau var. *ornatum* var. nov.**

(Plate I, Figs. 9-10.)

Cellulis vegetativis 28–32 μ latis, 34–96 μ longioribus; cellulis fructiferis uno latere (in quo conjugatio sequitur) fere inflatis; zygosporis globosis vel ovoideis, 28–32 μ latis, 32–35 μ longioribus, maturitate caeruleis, mesosporio scrobiculis magnis.

Vegetative cells 28–32 \times 34–96 μ ; fertile cells inflated slightly on the conjugating side; zygosporis, in one of the gametangia, globose to ovoid, 28–32 \times 32–35 μ , median walls pitted, blue; pits of median walls about 6 μ in diameter.

Distinguished from the type by the larger dimensions of the vegetative cells; otherwise similar.

"Floating in mass in a pool, and in the fields just in front of Nanputo Temple" (Tseng), Amoy, China, April 16, 1931. Type, Mr. C. K. Tseng's collections FB Nos. 1 and 2, in the Herbarium of the University of Amoy, Amoy, China. Subsequently found in U. S. A. (Alabama, Mississippi, and Oklahoma).

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EXPLANATION OF PLATE.

- Fig. 1. *Oedogonium sinense*, sp. nov.
Figs. 2-3. *Mougeotia sinensis* sp. nov.
Fig. 4. *Scytonema crispum* (Ag.) Born. var. *minus* var. nov.
Figs. 5-6. *Spirogyra sinensis* sp. nov.
Figs. 7-8. *Spirogyra wangi* sp. nov.
Figs. 9-10. *Zygnema collinsianum* Transeau var. *ornatum* var. nov.

