The Protists Found in Water at the Kashibaru Marsh in Saga Prefecture, Kyushu Japan

Kenichi Nishimura

Introduction

Kashibaru Marsh is located among the Sefuri Mountains in Saga Prefecture, Japan, 591 meters high from the sea level. The total area of the marsh is as much as 8 hectares. This is known as the biggest marsh in Kyushu. The marsh is in the form of basin among mainly granite hills, and the soil is a layer of clay.

The main supply of the water into the marsh consists of flows from the mountains, spring water from the bottom, and rainfall. No water containing agricultural chemicals from the surrounding rice fields comes into the marsh due to artificial walls.

About 60 kinds of rare marsh plants are said to be native to the marsh, and rare insects such as the smallest dragonfly, *Nannophya pygmaea*, the blue bee are living in the area.

Since 1976, the marsh has been designated as Saga Natural Environment Protected Area to protect these rare natural creatures.

From August 2013 to November 2014, I visited the marsh every month except winter to find protists in water at the marsh.

Materials and Methods

I checked atmospheric temperature, water temperature and potential of hydrogen (pH) of the water. I estimated the pH with a use of indicator paper.

Then I aspirated several milliliter of water together with a small quantity of sediment with a long pipette.

The place which I took the samples was the same place every time at the marsh. I observed the samples under a microscope and photographed protists found. I sent the photomicrographs to Dr. Tsukii for his confirming identification of the species.

Results

Table 1 shows days of collection and the data. The lowest water temperature was 6℃ in March 2014 and the highest was 27℃ in August 2013. The water was clear and slightly acidic all the time.

Table 2 shows all protists found from the collected samples. In total, 35 species of protists were identified: 4 in Mastigophora, 2 in Heterokonta, 3 in Sarcodina, 4 in Ciliophora and 22 in Chlorophyta.

Besides these species, some protists, which were difficult to identify , were found in the materials. Diatoms such as *Navicura sp., Cymbella sp., or Pinnularia sp.* were commonly seen through all seasons, except wintertime.

Figure 1 shows a part of Kashibaru Marsh. Figure 2 shows all photomicrographs of the protists which I found in the marsh.

Discussion

Tsukii[1)] found a total of 299 kinds of protists from Kashibaru Marsh on 5 investigations until November 26, 2012.

Together with his report, my present investigation show that a large number of protists are living in Kashibaru Marsh. On the other hand, the protists found from other ponds or rice fields in Saga Prefecture are very scanty[2)].

The main reason of the difference is thought to be the presence of agricultural chemicals in these ponds or rice fields.

No such chemicals, which kill protists come into the marsh from surrounding rice fields due to the protection by artificial walls.

As a conclusion Kashibaru Marsh is a precious treasury for protists, especially for Chlorophyta. We should preserve the present conditions for all time.

Acknowledgement

I express my sincere thanks to Dr. Yuuji Tsukii , Professor of Hosei University, for his valuable suggestion and identification of the protists. Thanks are also due to my wife for her assistance in taking materials at the marsh.

Literatures

1) Yuuji Tsukii
http://protist.i.hosei.ac.jp/PDB/Sampling/Locations/09-Saga/Karatsu/Kashibaru-list.html
(Accessed 20 January 2015)

2) Yuuji Tsukii
http://protist.i.hosei.ac.jp/PDB/Sampling/Prefectures/index.html
(Accessed 20 January 2015)

Table 1 Days of collection and the data.

Day of Collection	Weather	Air Temp.	Water Temp.	pH
August 9, 2013	fine	—	27	6.5
October 4, 2013	fine	24	23	6.0
November 15, 2013	fine	12	10	6.5
March 7, 3014	fine	4	6	6.0
April 4, 2014	cloudy	5	8	6.5
May 1, 2014	cloudy	5	13	6.5
May 23, 2014	fine	22	18	6.0
June 20, 2014	cloudy	25	20	6.0
July 18, 2014	cloudy	25	25	6.0
August 31, 2014	fine	25	23	6.0
September 13, 2014	fine	23	21	6.0
October 3, 2014	fine	22	21	6.5
November 30, 2014	rainy	—	12	6.5

Table 2 Protists found in the marsh.

Mastigophora

Cystodinium sp. (Sep)
Euglena hemichromata (Oct*)
Merotrichia sp? (Aug*)
Merotrichia capitata (Sep)

Heterokonta

Synura sp. (Apr, Nov)
Vacuolaria sp.? (Jun)

Sarcodina

Arcella vulgaris (Apr)
Centropyxis aculeata (May)
Trinema sp. (May)

Ciliophora

Stentor fuliginosus? (Aug*)
Spirostomum sp.? (Mar)
Coleps hirtus (Apr, May)

Chlorophyta

Pediastrum angulosum (Aug*, May, Sep)
Tetracystis sp.? (Aug*)
Pleurotaenium trabecula? (Aug)
Triploceras gracile (Oct*,Aug, Sep, Nov)
Closterium navicula (Jul)
Closterium toxon (Jul, Oct)
Closterium aburuptum? (May)
Closterium dianae (Aug*May, Sep, Oct, Nov)
Closterium baillyanum (Aug*,May,Jun,Jul)
Closterium intermedium? (Nov)
Closterium ralfsii (May)
Closterium setaceum
Closterium toxon (Jul, Oct)
Closterium rectimarginatum (Oct)
Closterium rostratum (Jun, Aug)
Staurastrum subteliferum (Oct*)
Staurastrum sp. (Jul)
Staurastrum tohopekaligense (Aug*)

Paramecium bursaria (May)	*Cosmarium contractum* (Aug, Nov*,Nov)
	Cosmarium quadrifarium? (Sep)
	Cosmarium pandriforme? (Apr, May)
	Bambusina brebissonii (Sep)

(Month in which found the protist)
＊Year of 2013

Fig.1 Kashibaru Marsh. (September 13, 2014)

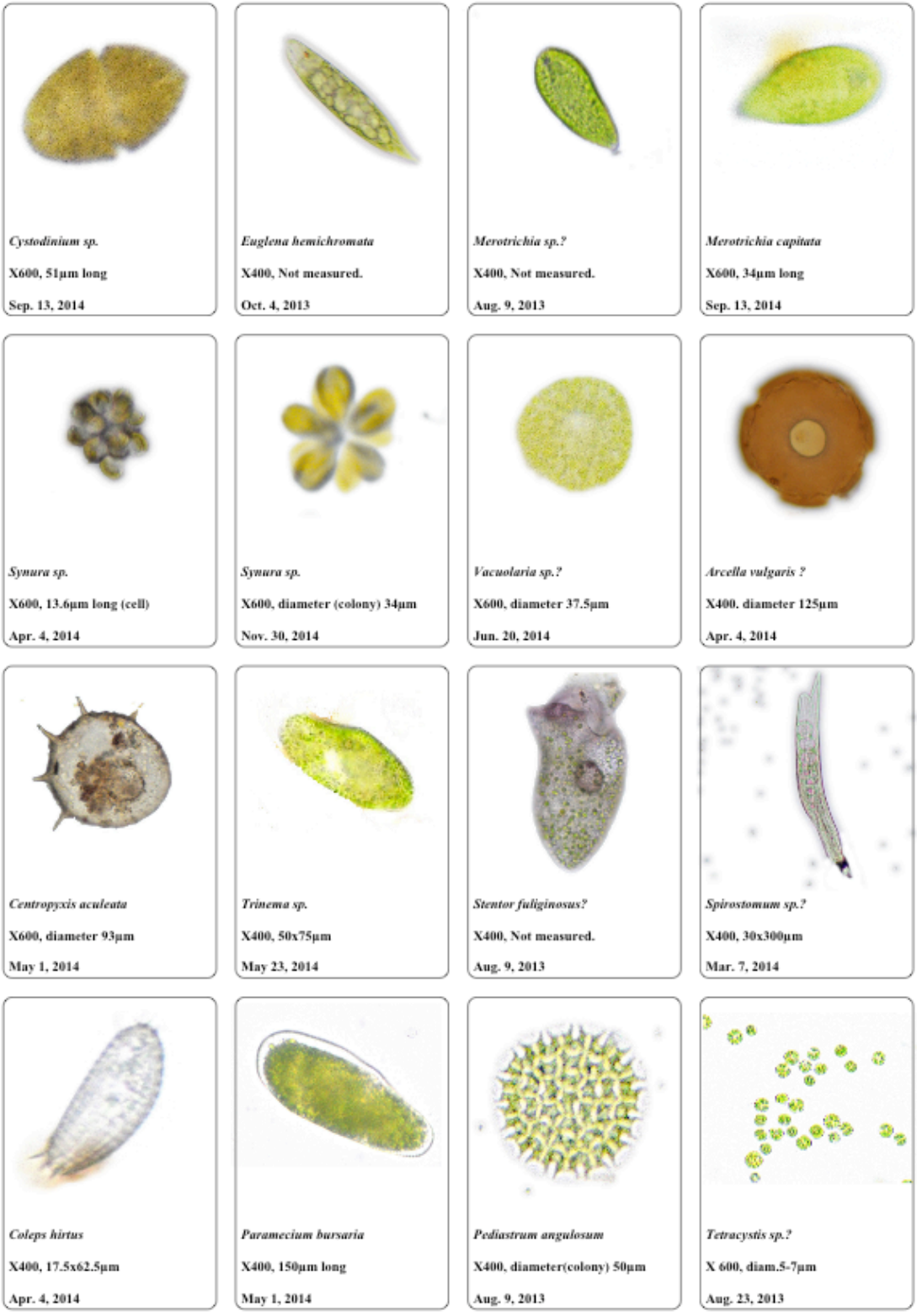

Fig.2a Photomicrographs of protists found in the marsh.

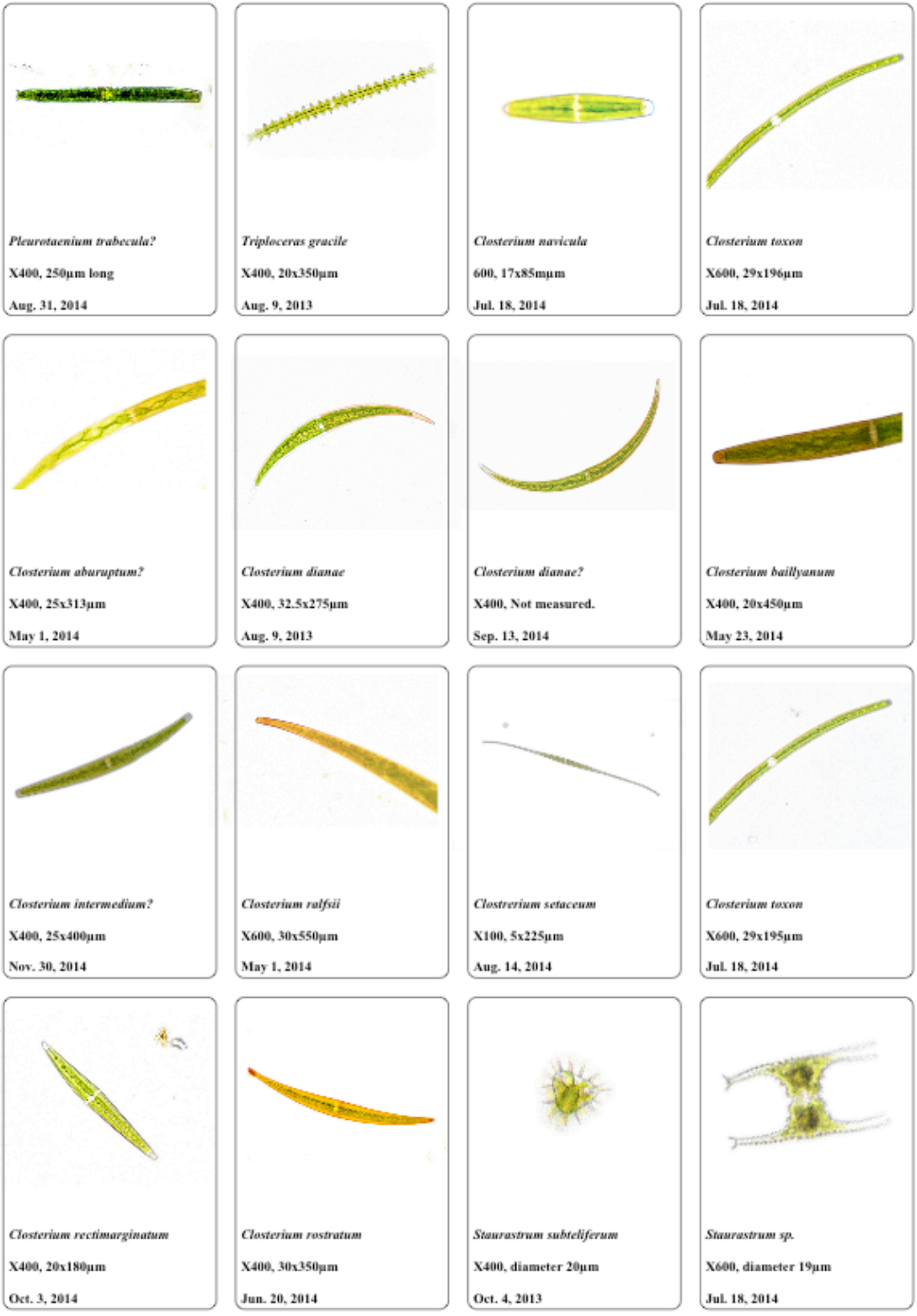

Fig.2b Photomicrographs of protists found in the marsh.

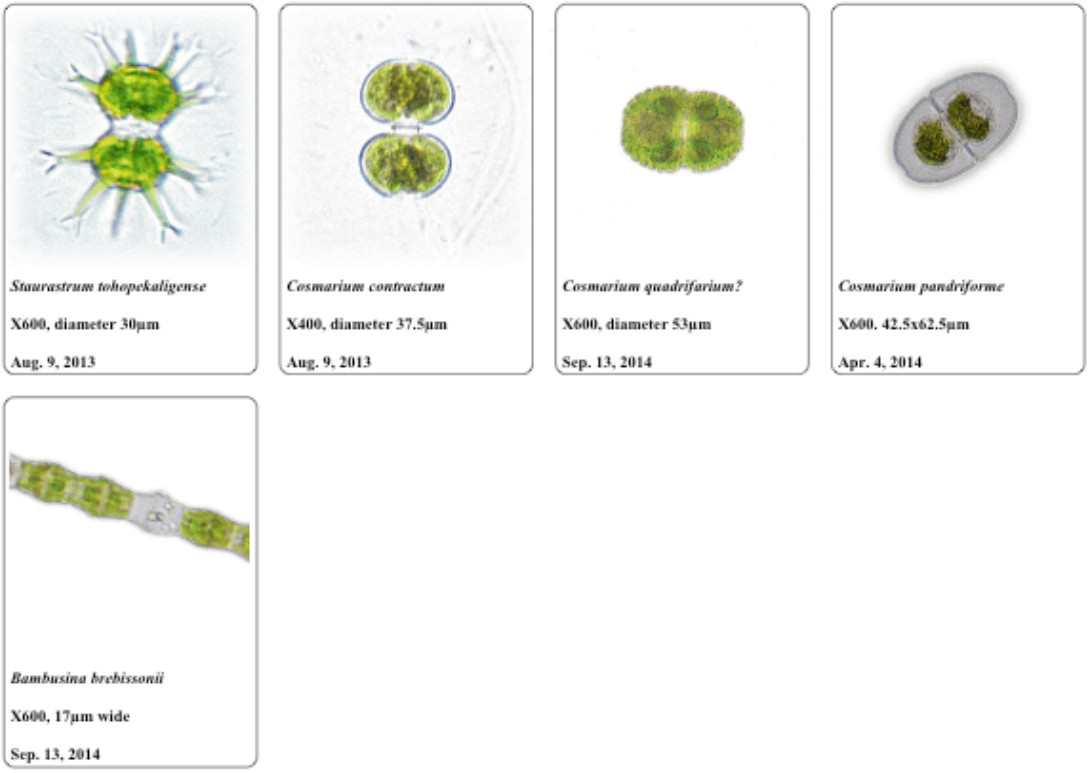

Fig.2c Photomicrographs of protists found in the marsh.