PRELIMINARY REPORT ON THE MICRO-FAUNA AND FLORA AMONG THE MOSSES COME FROM THE ONGUL ISLANDS

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PRELIMINARY REPORT ON THE MICRO-FAUNA AND FLORA AMONG THE MOSSES COME FROM THE ONGUL ISLANDS[1)]

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In 1960, Mr. Tatsurô Matsuda, a member of the fourth Japan Antarctic Research Expedition, collected some mosses from the Ongul Islands situated closely adjoining the Antarctic Continent, and brought them to Japan under frozen condition. The species of the mosses are, *Ceratodon purpureus*, *Bryum argenteum* and *B. inconnexum*. Except for *B. inconnexum*, the other two species are very widely distributed in the world.

It is already known that many protozoans have been found among the terestrial mosses in Europe and North America, but there is no investigation on the micro-organisms of the mosses in the Antarctic region. The observation on the micro-fauna especially on the peculiarity of it should be made if the micro-organisms are present among the mosses from the Ongul Islands. On this account the writers made observations and obtained some interesting results. This report is a preliminary one and deals with the results of the observations.

OBSERVATIONS ON THE MATERIALS

(1). At first, the observation was made as to whether the micro-organisms were seen among the mosses. The mosses preserved at about –20°C were washed with tap-water from a special well in the university campus, in which no organism was observed and then this water was examined. The micro-organisms from the mosses of four materials are shown in Table 1. The majority of the organisms are algae in these materials and protozoans and other animals are relatively few in number. As seen in this table, the species found among the mosses are unexpectedly many in number counting of about 20 species in total.

1) Contributions from the Marine Biological Station of Asamushi, Aomori-ken No. 286

Table 1

	C. purpureus		*B. argenteum*	
	Material No. 105	Material No. 112	Material No. 108	Material No. 111
Diatom a, *Pinnularia*	392 (76%)	819 (91%)	655 (69%)	318 (60%)
Diatom b, *Hantzschia*			86 (9%)	
Diatom c, *Navicula*	1	2	7	12 (2%)
Nostoc	25 (4%)	21 (2%)	93 (10%)	156 (29%)
Synechococcus	12 (2%)		1	
Penium	23 (4%)			
Nodularia	+			
Oscillatoria	+			
Chroococcus			+	
Unidentified green alga				+
Thecamoeba a, *Euglypha*	1	10 (1%)	22 (2%)	13 (2%)
Thecamoeba b, *Assulina*	21 (4%)	44 (5%)		7 (1%)
Thecamoeba c, *Difflugia*	10 (2%)		43 (4%)	
Thecamoeba d	20 (4%)			19 (3%)
Thecamoeba e, *Arcella*	3 (1%)		24 (3%)	
Amoeba	+	1	4	+
Volticella	+			
Nematode	2			1
Rotifer	5 (1%)	1	4	4
Tardigrada			1	

The number of the individuals are represented by the means of those on six slide glasses.

(2) In other continents, it is well known that many micro-organisms are found in soil. From this and from that the specific composition of the fauna varies in relatively wide range among the mosses from the Ongul Islands, it is conceivable that the mosses may not be the normal habitat of these organisms. To

solve this question, each of the materials was divided into two parts, the upper part which was of green color and the lower which was not green, and these two were examined. The result of the observation is shown in Table 2.

It can be said that the micro-organisms in the lower part are few in number compared with that in the upper part. In the soil, the micro-organisms were rarely seen. *Nostoc* was seen abundantly in the decayed moss and also on the surface of the soil. It cannot be said that the mosses are the temporary habitat of the micro-organisms mentioned above.

(3) Thus it becomes clear that many micro-organisms live among the mosses in the Antarctic region. Then the question arises as to whether these species

Table 2 a

	C. purpureus		*B. argenteum*	
	Material No. IV		Material No. 108	
	Upper part	Lower part	Upper part	Lower part
Diatom a, *Pinnularia*	1198/2146 55.8%	725/5405 13.4%	2173/4258 51.0%	193/2065 9.3%
Diatom b, *Hantzschia*			437/601 72.5%	142/398 35.7%
Thecamoeba a, *Euglypha*			3/33 9.0%	4/179 2.2%
Thecamoeba d,	2/5	5/23		

Relation between the shells and the living individuals in number. Living individuals are represented by the percentage of the whole (living individuals plus shells). Living individuals are large in number at the upper or green part of the moss.

Table 2 b

	C. purpureus		*B. argenteum*	
	Material No. VI		Material No. 108	
	Upper part	Lower part	Upper part	Lower part
Diatom a, *Pinnularia*	1198	725	2173	193
Diatom b *Hantzschia*			437	142
Nostoc sp.	33	19	216	6
Penium sp.	239	39	12	2
Rotifer	35	15	14	13

Relation between the living individuals in the two parts of the moss in number. The number of the individuals are those on three slide glasses. Living individuals are large in number at the upper part compared with the lower part.

occur among the mosses in Japan.

To compare the organisms among the materials in Japan with those among the Ongul Islands' materials, two kinds of mosses, *C. purpureus* and *B. argenteum* from various localities were observed. Though these two mosses are found on the ground in rare cases, they may be found on the roof of a building, concrete fence etc. the growing area generally being above the ground.

Some materials of *B. argenteum* grown on the ground were collected from

Table 3

	C. purpureus		*B. argenteum*		
	Thatched roof Sendai	Straw-thatched roof Fukushima	On the ground Hachinohe	Thatched roof Fukushima	Straw-thatched roof Fukushima
Diatom a, *Pinnularia*	743	556		501	832
Diatom b, *Hantzschia*	1533	172	532	533	213
Diatom d, *Navicula*	2	95	54	55	203
other Diatoms		41	3	53	50
Thecamoeba a, *Euglypha*	20	22	55	51	44
Thecamoeba b, *Assulina*	13	6		7	11
Thecamoeba c, *Diffulgia*	2	2		2	
Thecamoeba d,	13	2		9	2
Thecamoeba e, *Arcella*		2	2	2	5
Thecamoeba f, *Euglypha*	8	20		6	33
Thecamoeba g, *Centropyxis*	9	8		2	5
Thecamoeba h, *Centropyxis*	8	14	1	26	11
Thecamoeba i, *Trinema*	16	16	2	20	19
Thecamoeba j,	9	16		35	29
Tardigrada		1		1	3
Rotifer	5	1			3
Nematode	2			3	

Hachinohe City, Aomori Prefecture, but only one materials of the moss, *C. purpureus* on the ground could be secured.

For example, the micro-organisms among the mosses from five localities are shown in Table 3.

A large number of protozoans are found among the materials from the roof though they are relatively a few in number among those on the ground.

(4) The micro-organisms found in the Antarctic region which occur among the Japanese mosses are as shown in Table 4.

Table 4

	Antarctic	Japan
Algae		
Bacillariophyta		
Pinnularia sp.	+	+
Hantzschia amphioxys	+	+
Navicula muticopsis var.	+	+ allied variety
Cyanophyta		
Nostoc sp.	+	−
Nodularia sp.	+	+ allied species ?
Oscillatoria sp.	+	+ allied species ?
Synechococcus sp.	+	+
Gloeocapsa sp.	+	+
Chroococcus sp.	+	+
Chlorophyta		
Penium sp.	+	−
Unidentified species	+	−
Protozoans		
Sarcodina		
Amoeba ? sp.	+	+ allied species ?
Euglypha tuberculata	+	+
Euglypha sp.	+	+
Assulina sp.	+	+ allied species
Arcella sp.	+	+
Difflugia sp.	+	+
Trinema lineare ?	+	+
Unidentified thecamoeba	+	+
Ciliophora		
Vorticella sp.	+	+ allied species ?
Nematode	+	+ allied species ?
Rotifer	+	+ allied species
Tardigrada	+	+ allied species

Among these diatoms, *Pinnularia* sp. (Fig. 1) and *Hantzshia amphioxys* are very common in the mosses of the roof. *Navicula muticopsis* var (Fig. 2) has been found in one case in Japan, but an allied variety of this species is very common among the Japanese mosses on the roof. *Nostoc* sp. (Fig. 4), *Euglypha tuberculata* (Fig. 12) and *Assulina* sp. (Fig. 8) are very common among the Japanese mosses. *Arcella* sp. (Figs. 6, 7) is not found but an allied species is rather common in Japan. *Difflugia* sp. (Fig. 9) is sometimes seen among the Japanese materials but its allied species (Fig. 10) has not been found in Japan. Unidentified thecamoeba (Fig. 11) have been found in one case in the Japanese materials but its allied species is common. These mentioned genera are the main groups which compose the micro-

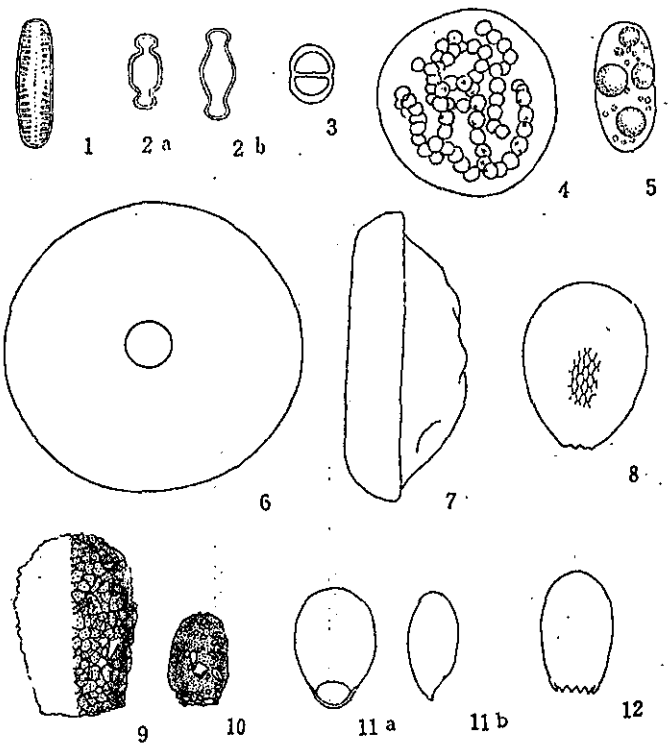

Fig. 1. *Pinnularia* sp. × 600
Fig. 2 a, b *Navicula muticopsis* var. × 600
Fig. 3. *Chroococcus* sp. × 600
Fig. 4. *Nostoc.* sp. × 600
Fig. 5. *Penium* sp. × 600
Fig. 6. *Arcella* sp. Oral side
Fig. 7. ditto side view × 600
Fig. 8. *Assulina* sp. × 600
Fig. 9. *Difflugia* sp. × 600
Fig. 10. *Difflugia* sp. × 600
Fig. 11. a, b Unidentified thecamoeba × 600 a, oral side b, side veiw
Fig. 12. *Euglypha tuberculata* × 600

flora and fauna among the Japanese mosses.

Thus it is certain that many micro-organisms live among the mosses in the Antarctic Circle as well as in other continents, and the majority of them are the ones widely distributed in the world.