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DISTRIBUTION OF NITROGEN IN MOSS COMMUNITIES IN EAST ANTARCTICA (EXTENDED ABSTRACT)

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The distribution of nitrogen in moss communities developed on ice-free areas in East Antarctica was investigated to analyze the nitrogen cycling in the ecosystem of Antarctica.

1. Organic carbon and total nitrogen in a moss-soil system of Rundvågskollane (69°50′S, 39°09′E) were analyzed with a C-N corder. Growth condition of this community was poor. Thirty-seven plots of $5 \times 5\,cm^2$ were prepared in a moss community. Experimental samples of moss block and sandy soil from different depths, *i.e.*, 0–1, 1–2.5 and 2.5–4 cm layer, were taken carefully from each plot.

Experimental samples were divided into two groups, *i.e.* moss layer and soil layer. The moss layer contained a large amount of sand particles and it was difficult to separate mosses and sand particles. Maximum carbon content and maximum nitrogen content of the moss layer were 6.84 and 0.457%, respectively. There was a very significant relationship between the carbon content and the nitrogen content in each group but the regression coefficients of them were different from each other. This can be attributed to the different C:N ratios of organic matter contained in samples. The C:N ratio of the moss layer was *ca.* 16 and that of the soil layer was *ca.* 11. It seems to reflect the C : N ratios of moss body and soil microorganisms, respectively.

Regardless of the development of mosses, *i.e.* the increase of carbon content in sample, the C : N ratios of samples in the moss layer were found to be nearly constant, *ca.* 16. This result suggests that the nitrogen content of the old part is approximately equal to that of the young part.

These facts show that nitrogen compounds in the moss body are not transported from an old part to a growing part, and the growing part does not depend on the dead or old part as a nitrogen source. Biological nitrogen fixation seems to be the nitrogen source of the moss community, since cyanobacteria covering its surface have been found to show considerable nitrogen-fixing activity.

2. The nitrogen content of moss block was measured for moss communities collected from various ice-free areas. These communities grew actively and looked green. Each moss community was horizontally divided into three layers, *i.e.* green layer (G), brown undecomposed layer (B1) and brown decomposed layer (B2).

The nitrogen content of the green layers varied considerably even among the same species (Table 1). The nitrogen content of the B1 layer was always lower than that of the G layer in the same community. Therefore, it was suggested that nitrogen in the B1 layer was utilized elsewhere.

Table 1. Carbon and nitrogen contents of moss blocks.

Species	Layers*	Sampling sites	C%	N%	C/N
Bryum pseudotriquetrum	G	Yukidori Valley	44.6	2.63	17.0
	B1		51.2	1.52	33.7
	B2		35.0	1.67	21.0
B. pseudotriquetrum	G	Rundvågshetta	49.2	1.56	31.5
	B1		51.0	0.90	56.6
	B2		38.3	1.21	31.7
B. pseudotriquetrum	G	Langhovde	46.5	2.39	19.5
	B1		48.9	1.81	27.0
	B2		36.0	1.61	22.4
B. pseudotriquetrum	G	Yukidori Valley	47.5	2.12	22.4
	B1		41.6	1.94	21.4
	R		16.8	0.86	19.5
Ceratodon purpureus	G	Langhovde	38.7	1.45	26.7
	B1		41.4	1.17	35.4
	B2		23.9	0.86	27.8
C. purpureus	G	Richardson Lake	49.5	4.06	12.2
	B1		47.2	2.32	20.3
	B2		40.4	2.84	14.2
	B2		37.6	2.55	14.7
C. purpureus	G	Richardson Lake	46.3	2.99	15.5
	B1		46.9	1.92	24.4
	B2		42.0	1.15	36.5

* G: Green layer, B1: Brown layer (undecomposed), B2: Brown layer (decomposed), R: Rizoid.

For comparison, some moss communities collected in Japan were analyzed in the same way, but no marked difference was recognized between moss communities of Japan and those of Antarctica.

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