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SYNANTHROPIC FLORA AND VEGETATION OF THE KUNERMA VILLAGE, LAKE BAIKAL, CENTRAL SIBERIA

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Abstract: A list of vascular plants collected in 1986 in the Kunerma village, Central Siberia, is presented. Among the hundred three found taxa allochtonous species with Euro-Asian and circumpolar origin prevailed. In ruderal vegetation four types of trampled plant assemblages were identified. The most frequent dominant species were *Matricaria discoidea*, *Polygonum propinquum*, *Poa annua* and *Spergularia rubra*.

Key-words: Floristic, ruderal vegetation, Lake Baikal, Sideria.

Introduction

The flora of the Lake Baikal region is one of the best-known in Siberia (Malyšev and Peškova 1979). Traditionally much of the attention of florists was paid to native species. Only recently plants in towns have been also sampled and included into plant species lists (Ivanova 1978, 1979, Ivanova and Čepurnov 1983, Kiseleva 1986, 1988, Zarubin et al. 1989). However,hardly any information available about ruderal vegetation in the region because traditional Russian approaches of vegetation analysis are usually applied only to natural vegetation.

During a visit to the northern part of Lake Baikal, I studied the synanthropic flora and vegetation in Kunerma, a small village along the Baikal-Amur Railway.

The aim of this report is (1) to present a list of synanthropic plants in a village and (2) to characterise its ruderal vegetation by means of species composition.

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Průhonice - *Polygonum aviculare* agg., *Poaceae*; J. Holub, Průhonice - *Cyperaceae*.

Material and methods

The village of Kunerma is about 50 km west of the northernmost point of Lake Baikal. Kunerma was a small village until construction of the BAM railway was initiated. During the time of the construction, the number of inhabitants increased dramatically, up to about 5000. Later, when building activities ceased, the number of inhabitants decreased, to about 1000.

Most inhabitants live in provisional houses, which are in the process of being replaced by newer ones. The houses are often accompanied by a small garden where vegetables are produced. Small domestic animals (mainly chicken and dogs) are also kept in great number.

I visited the village twice in July 1986. Most plant species found in the village were collected and are now deposited in the BRNM herbarium. Species composition of plant assemblages was evaluated in 26 plots, 1 to 4 m^2 in size, where cover of all present species was estimated using a 7-degree abundance-dominance scale (Scamoni and Passarge 1963). The plots were placed into visually homogeneous stands.

Relationships among the studied plots in terms of species composition was evaluated by PCA (Gauch 1982). Abundance-dominance values were transformed in the following way: r was transformed to 1, + - 2, 1 - 3, 2 - 4, 3 - 5, 4 - 6, 5 - 7. Presence/absence of a species a plot was designated as either 0 (absent) or 1 (present).

Flora of the Kunerma village

Among the 103 taxa found in the village (Appendix 1), species distributed in Euroasia prevailed (Table 1).The proportion of circumpolar species was slightly lower. Among Asian synanthropic species, those native to steppic areas SE of Lake Baikal dominated. The number of species rarely or even not yet found in Central Siberia was unexpectedly high. Two reasons are responsible for that: (1 although the flora of Central Siberia is quite well known, most attention has been paid to places with natural vegetation; (2 invasion of European species seems to be still quite intense. More taxa introduced both from Europe and the Far East can be expected to occur in the future.

Vegetation of the Kunerma village

Ruderal vegetation in Kunerma is relatively poor on types (Table 2). Only three communities were identified dominated by *Spergularia rubra*, *Poa annua* and *Matricaria discoidea-Polygonum propinquum*, respectively.

All of them belong to trampled communities. Stands with other dominant species were rare (*Chenopodium album* and *Rumex acetosella* - Table 2).

Table 1. Total distribution of species recorded in Kunerma, Central Siberia. Three taxa not identified to species were excluded from the analysis. As the total number of species is 100, the numbers given in the table correspond to %.

Distribution	Number of species
Euro-Asian	39
Circumpolar	28
Asian	19
American	3
European	2
Europe & America	1
Escaped from cultivation	8

When dominance was taken into account (Appendix 2A), three groups of releves were identified by PCA: stands dominated by (1) *Poa annua*, (2) *Spergularia rubra* and (3) *Polygonum propinquum* and *Matricaria discoidea*. The stands dominated by *Rumex acetosella* and *Chenopodium album* were located in the PCA scatterplot within the last community. It appears that the three communities were well differentiated (Appendix 2A). When the effect of dominant species was suppressed (transformed values of dominants assigned to 1; Appendix 2B) or presence/absence data were utilised (Appendix 2C) the clear-cut differentiation disappeared. The trampled communities are thus differentiated mainly by their dominant species. The other species are not closely associated with dominants.

Stands dominated by *Spergularia rubra* differed from the rest in all thre PCA scatter plots; they were found on substrate with some proportion of slag which is a harsh environment for many species because of high content of some ions.

Ruderal vegetation is poorly known in Central Siberia. The only releves from the Lake Baikal region were published by Chytrý and Pešout (1992) from the Svjatoj Nos isthmus. They identified five types of which the *Matricaria discoidea-Polygonum aviculare* (s.l.) community, represented by a single releve is similar to the community dominated by *Polygonum propinquum* and *Matricaria discoidea* which I recorded in Kunerma. More material with carefully identified *Polygonum aviculare* micro-species is needed before any conclusion on distribution and habitat affinity of trampled communities in Central Siberia can be drawn.

Table 2. Phytosociological releves of ruderal vegetation in Kunerma, northern Baikal.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Cover [%]	90	90	70	70	90	100	60	100	100	80	80	60	100	95	40	70	70	95	100	40	30	60	40	80	25	20
Area [m^2]	2	2	2	4	2	2	2	4	4	1	2	4	2	2	2	2	2	4	4	2	2	2	3	3	1	2
Dominant species																										
Chenopodium album	4		1	.	.	+	1	.	r	r	.	+	.	.	.	+	.	+	.	+	1	r	.	.	.	.
Matricaria discoidea	+	4	3	4	5	4	3	.	1	+	+	1	+	.	1	2-3	2	2	1	1	+	.	.	2	1	.
Poa annua	.	.	.	.	+	.	1	5	5	5	4	4	4	1	.	.	2	.	.	+	.	.	r	.	.	r
Polygonum propinquum	1	.	3	2	2	.	.	.	.	.	.	1	1	5	3	4	4	5	5	1	.	.	+	.	r	.
Rumex acetosella	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.
Spergularia rubra	.	.	+	.	.	r	.	.	.	.	.	.	.	.	2	.	.	.	.	.	3	3-4	4	5	3	3
Other species																										
Achillea millefolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.
Agrostis mongholica	.	.	.	.	.	.	.	r	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.
Agrostis stolonifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Artemisia cf. *mongolica*	r	r	.	r	.	.	+	.	.	r	.	.	.	.	.	.	.	.	.	r	+	r	.	.	.	r
Capsella bursa-pastoris	2	3	2	2-3	2	.	r	+	+	.	.	r	r	.	.	.	r	.	+	.	.	r	.	.	.	.
Chamaenerion angustifolium	.	.	.	.	r	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	r	r	.
Chenopodium glaucum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.
Epilobium ciliatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.
Festuca sp.	.	.	.	1	.	r	.	.	.	.	r	.	.	1	r	.	.	.	.	.	.	.	r	.	+	.
Lolium perenne	.	.	.	.	.	.	.	.	.	r	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.

Phleum pratense	.	.	.	.	.	.	.	.	r	.	r	.	r	.	.	r	.	.	+	r	.	.	.	.	.	+
Plantago major	.	+	.	2-3	2	.	+	2	1	r	1	+	.	1	+	2	+	r	.	+	+	.	2	1	+	.
Polygonum aviculare	.	.	1	.	.	.	.	.	+	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum lapathifolium	1	1	.	.	.	.	1	+	r	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Rorippa palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.
Rumex crispus	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	r
Senecio vulgaris	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Spergula arvensis	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Taraxacum officinale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.
Tripleurospermum inodorum	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.

r - one or two specimens in the plot; + - several specimens with low cover; 1 - cover <15%, 2 - 16-25%, 3 - 26-50%, 4 - 51-75%, 5 - 76-100%.

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Appendix 1.

The list of 103 species of vascular plants collected at Kunerma village, Lake Baikal region, Central Siberia (July 1986). + - escaping from cultivation in gardens ; ! - rare in the region; !! - first record for Central Siberia.

Achillea millefolium L., *Agrostis mongholica* Roshev., *A. stolonifera* L., *Alopecurus aequalis* Sobol., ! *Amaranthus retroflexus* L., + *Anethum graveolens* L., *Angelica* sp. jv., *Antennaria dioica* (L.) Gaertner, *Arabis pendula* L., *Artemisia* cf. *mongolica* (Besser) Fischer ex Nakai, + *Avena sativa* L.,

Bergenia crassifolia (L.) Fritsch, ! *Berteroa incana* (L.) DC., *Bidens radiata* Thuill.,

Calamagrostis purpurea (Trin.) Trin. subsp. *langsdorfii* (Link) Tzvelev, *Capsella bursa-pastoris* (L.) Medikus, *Carex canescens* L., ! *Cerastium davuricum* Fischer ex Sprengel, *C. vulgatum* L., *Chamaenerion angustifolium* (L.) Scop., *Chelidonium majus* L., *Chenopodium album* L., *C. glaucum* L., *Cirsium setosum* (Willd.) Bieb., + *Cosmos bipinnatus* Cav., *Crepis tectorum* L.,

Dactylis glomerata L.,

Elytrigia repens (L.) Nevski, ! *Epilobium ciliatum* Rafin., *E. palustre* L., *Equisetum arvense* L., *Erigeron acer* L.,

! *Festuca pratensis* Hudson, *F. rubra* L., *Fragaria vesca* L.,

Galeopsis bifida Boenn., *Galium spurium* L., *Geum aleppicum* Jacq., *Gnaphalium sylvaticum* L., *G. uliginosum* L.,

+ *Helianthus annuus* L., ! *Heracleum dissectum* Ledeb., *Hieracium umbellatum* L., ! *Hordeum jubatum* L.,

Juncus compressus Jacq.,

Lappula consanguinea (Fischer ex Meyer) Guerke, *Lathyrus pratensis* L., *Lepidium densiflorum* Schrader, *Leymus secalinus* (Georgi) Tzvelev, !! *Lolium perenne* L.,

Maianthemum bifolium (L.) F.W.Schmidt, *Matricaria discoidea* DC., ! *Melilotus albus* Medikus,

Phleum pratense L., *Pinus sylvetris* L., *Plantago major* L., *P. media* L., ! *Poa annua* L., *P. palustris* L., *Polygonum aviculare* L., *P. convolvulus* L., *P. lapathifolium* L., *P. propinquum* Ledeb., *Populus tremula* L., *Potentilla norvegica* L., *Potentilla supina* L., *Puccinellia tenuiflora* (Griseb.) Scribner et Merr.,

Ranunculus propinquus C.A. Meyer, + *Rheum undulatum* L., *Rhinanthus angustifolius* C.C. Gmelin s.l., *Rorippa palustris* (L.) Besser, *Rubus idaeus* L., *Rumex acetosa* L., *R. acetosella* L., + *R. ambiguus* Gren., *R. crispus* L.,

Salix sp., !! *Saponaria officinalis* L., ! *Scleranthus annuus* L., + *Secale cereale* L., ! *Senecio vulgaris* L., *Setaria viridis* (L.) Beauv., *Silene repens* Patrin, *Solidago dahurica* Kitag., ! *Sonchus arvensis* L., ! *Spergula arvensis* L., ! *Spergularia rubra*, *Stellaria media* (L.) Vill., ! *Sysimbrium loeselii*,

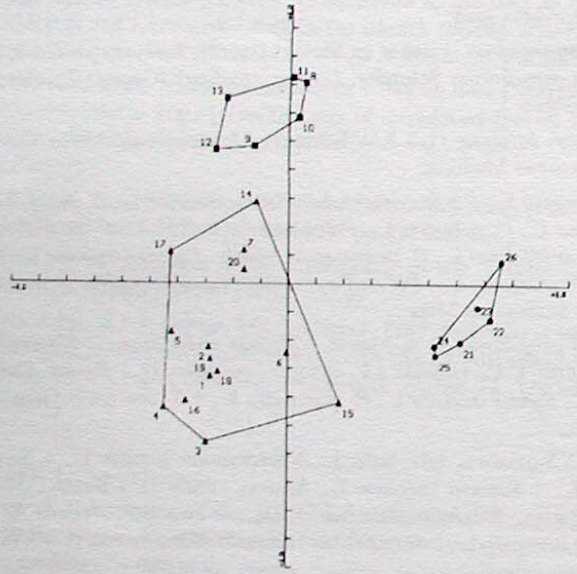
Tanacetum vulgare L., *Taraxacum officinale* Wigg., *Thalictrum simplex* L., *Trifolium lupinaster* L., ! *T. pratense* L., *T. repens* L., ! *Tripleurospermum inodorum* (L.) Sch. Bip., ! *Tussilago farfara* L.,

Vaccinium myrtillus L., *Veronica longifolia* L., *Vicia cracca* L., *Viola* sp., *Xanthium sibiricum* Patrin ex Widd.,
+ *Zea mays* L.

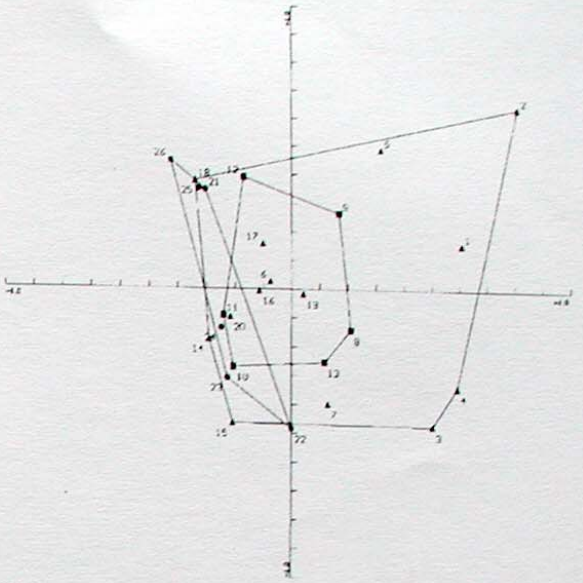
Appendix 2.

PCA scatter plot of samples. The envelopes and symbols denote plant communities dominated by *Spergularia rubra* (circles), *Poa annua* (rectangles) and *Matricaria discoidea* - *Polygonum propinquum* (triangles). The stands dominated by *Chenopodium album* (No. 1) and *Rumex acetosella* (No. 20) labelled also by triangles. The numbers correspond to Table 1. A - quantitative data; B - cover values of dominant species assigned to 1; C - presence/absence data.

A



B



C