

# Generalization of the Experience of using Medicinal Plants in Folk Medicine of Kalmyks (Ethnobotanical Analysis)

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## Abstract.

The article shows analysis of using medicinal plants by Kalmyk healers, emchi. The study was aimed at determining the degree of specificity of the Kalmyk branch, and its community with other branches of Tibetan medicine. The study was based on the information collected by means of questionnaires from emchis engaged in healing according to the canons of the traditional Kalmyk medicine. For the first time the differences and similarities of many centuries of using medicinal plants by various peoples have been established. The performed analysis will expand the possibilities of using medicinal plants from the flora of Kalmykia and the modern pharmacological analysis.

**Key words:** *taxons, emchis, ethnobotanical analysis, national Kalmyk medicine.*

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## INTRODUCTION

Studying the history of various ethnic groups allows revealing peculiarities of using healthful, mainly edible and medicinal plants in practical experiences accumulated by various peoples. Some useful properties of plants become known from the information obtained from traditional medicine of various nations. According to Professor G. V. Krylov/1972/, plants of folk medicine make the reserve from which scientific medicine will continue obtaining new medicines.

## METHODS

In studying folk medicine of Kalmyks, we used the comparative-and-survey method, and the methods of pharmacology-linguistic analysis. In our studies, we tried to show the possibilities of practical use of medicinal plants of wild flora of the Republic of Kalmykia in the Kalmyk variant of Tibetan medicine.

## RESULTS AND DISCUSSION

Development of folk medicine and accumulation of experience are inseparably related to the historical culture of the Kalmyks. There is no doubt that historical experience of the Kalmyk emchis is closely related to achievements of the ancient medicines of the East: Indian, Chinese, and Tibetan. The traditional system of Tibetan medicine, to which Kalmyk healers - lamas - trained in the Tibetan monasteries were close, is deeply unique. It is distinguished by the wide-spread use of plants of the local flora, peculiar approach to description of properties and species characteristics of medicinal plants. Special parts of the Tibetan medical treatises summarize information about medicinal products, plants in particular, chosen empirically and used in the centuries-old practice for the unwell. One of the translators of the canonical treatise "Jutshi" underlying the Tibetan science of healing was Kalmyk healer, lama Dambo Ulyanov. In 1901, he published a word-for-word translation of the first volume of the treatise – "Fundamentals tantra".

Unfortunately, the historical experience of the Kalmyk emchis has been lost and disappeared forever, or is on the verge of extinction. An important role in the historical past was played by destruction of the culture of the Kalmyk khuruls, Mongolian and Buryat datsans, where they learned medicine, too.

Detailed analysis of the range of medicinal plants used in the Tibetan [1]; the Buryat and the Mongolian versions [2; 3] shows direct relation between the set of herbal remedies and the floristic composition of the regions. Of course, remoteness of Tibet and India contributed to replacing some raw materials by plants of the local flora, medicinal properties of which were known to Kalmyk healers.

Description of the medicinal raw materials, their medicinal properties, indications for use of certain plants, their botanical identity were studied by the "Textbook of Tibetan Medicine"[4]; works of Badmaev P. A. [5; 6]; Bazaron E. G. [7], Bazaron E. G. and Aseeva T. A. [8]; Aseeva T. A., Basaran E. G., Batuyev [9]; Aseeva T. A., Blinova K. F. and Yakovlev [10]; Aseeva T. A., Naydakova C. A. [11]; Bedaraev B.-D., Batorova S. M. and Surkova T. A. [12]; Bogdanova, K. M., Bichikhanov M. P. [13]; Batuyev B. B. [14]; Grigoryan E. R., Parfeinikov S. A. [15]; Gritsak E. [16]; Lavrenov V. K. [17]; Makhlayuk V. P. [18]; Pastushenkov L. V. [19]; Samylina I. A. and Yakovlev G. P. [20]; Fedoseev A. P. et al. [21]; Gammerman A. F. [22]; Gammerman A. F. and Semikova B. V. [23], and others.

The "Zeichar Mihczan" treatise (XVIII-XIX century) stated the possibility of using 323 medicinal plants and provided their description. Out of this number of listed plants, 101 species have been found in the flora of Kalmykia. For example, according to old Kalmyk healers, *Phlomis tuberosa* heals lungs and throat. *Tribulus terrestris* is used for kidney diseases, urinary retention and rheumatism. In Tibetan medicine, species of genera *Malva*, *Lappula*, *Veronica*, *Scabiosa*, *Potentilla* and others are widely used. Some properties of the medicinal raw material

are often not mentioned in modern herbals, etc. For example, for *Bidens tripartita* the possibility of using flowers for brain concussion and diseases of the lymphatic system is not mentioned.

Treatise "Vaiduria ohnbo" provides more detailed descriptions of 275 plants, analyzes and specifies the worst raw material in terms of the therapeutic properties, which still may be used for making medicines. Along with this, plants that may replace certain raw materials are mentioned. Out of the described 275 plants, 94 species are found in the natural flora of our Republic and may mainly be used for treating inflammatory diseases of liver, lungs, gastrointestinal tract, etc. Some plants from the flora of Republic of Kalmykia in accordance with the indications of "Vaiduria ohnbo" may be used for metabolic diseases and tumors.

Our aim was not to analyze the prescriptions of certain medications, the rationality and complexity, and the wide range of therapeutic actions of which had been noted by many authors. We made the first attempt to ascertain the degree of uniqueness of the "Kalmyk branch", to identify its possible relations with the "genuinely Tibetan", "Mongol" and "Buryat" branches. For this purpose, systematic affiliation of taxa of plants used in all branches was analyzed, and for the first time preliminary ethnofloristic analysis by the method of S. M. Batorova and Yakovlev G. P., 1989 was made. During the analysis of the systematic confinedness of the species united under name "Medicinal flora" mentioned in "Zeichar Mihczan", the taxa were arranged according to the system of A. L. Takhtajan, 1980. Information about the taxa is shown in Table 1.

**Table 1. Systematic affiliation of medicinal plants' taxa in Tibetan medicine**

Taxon	Number of species/genera by branches			
	Mongolian	Genuinely Tibetan	Buryat	Kalmyk
LYCOPODIALES				
Lucopodiaceae	1/1	-	1/1	-
EQUISETALES Equisetaceae				
POLYPODIALES	-	-	1/3	1/2
Polypodiaceae				
TAXALES				
Taxaceae	2/2	2/2	4/4	-
PINALES				
Pinaceae	1/1	-	1/1	-
Cupressaceae				
EPHEDRALES	3/3	3/3	3/3	-
Ephedraceae	S	1/3	-	-
MAGNOLIALES				
Magnoliaceae	1/1	1/1	1/1	1/1
Myristicaceae				
LAURALES	-	1/1	-	-
Lauraceae	1/1	1/1	1/1	1/1
PIPERALES				
Piperaceae	S	1/2	1/3	1/1
NELUMBONALES				
Nelumbonaceae	1/3	2/3	1/2	1/1
RANUNCULALES				
Lardizabalaceae	1/1	1/1	1/1	1/1
Menispermaceae	1/1	1/1	1/1	1/1
Berberidaceae	1/1	-	1/1	1/1
Ranunculaceae	1/1	2/2	1/1	1/1
	8/11	7/11	10/32	9/17
PAPAVERALES				
Papaveraceae	2/6	2/4	2/3	2/3
Hupecoaceae	1/1	1/1	1/1	1/1
Fumariaceae	S	1/2	-	1/1
EUCOMMIALES				
Eucommiaceae	1/1	1/1	1/1	1/1
URTICALES				
Ulmaceae	1/1	1/1	1/1	1/1
Moraceae	2/2	1/1	-	1/1
Cannabaceae	1/1	1/1	1/1	-
Urticaceae	1/1	1/1	1/2	2/3
FAGALES				
Fagaceae	1/1	1/1	1/1	8/11
BETULALES				
Betulaceae	1/1	1/1	1/1	1/2
JUGLANDALES Juglandaceae				
CARYOPHULLALES				
Phytolaccaceae	S	-	-	2/2
Caryophyllaceae				
Amaranthaceae	1/1	-	-	4/6
Chenopodiaceae	2/2	3/3	8/15	1/1
POLYGONALES	1/1	-	1/1	1/2
Polygonaceae	3/3	2/2	4/6	-
PLUMBAGINALES				
Plumbaginaceae	4/9	3/10	3/14	-

Taxon	Number of species/genera by branches			
	Mongolian	Genuinely Tibetan	Buryat	Kalmyk
<b>VIOLALES</b>				1/2
Violaceae	1/1	-	1/1	-
Caricaceae				-
Cucurbitaceae	1/1	1/1	1/3	3/5
<b>CAPPARALES</b>	1/1	-	-	
Brassicaceae	3/3	2/4	2/3	2/2
<b>TAMARICALES</b>				
Tamaricaceae	9/10	6/7	8/11	1/4
<b>SALICALES</b>				-
Salicaceae	2/2	2/2	1/2	2/3
<b>ERICALES</b>				
Ericaceae	2/2	2/2	2/2	8/12
Empetraceae				
Pyrolaceae	1/1	1/1	4/6	1/2
	-	-	1/1	2/2
	1/1	-	1/2	1/1
<b>EBENALES</b>				
Styracaceae	1/1	-	-	-
Symplocaceae	-	1/1	-	-
<b>PRIMULALES</b>				
Myrsinaceae	1/1	-	-	-
Primulaceae	2/2	2/2	1/2	2/2
<b>MALVALES</b>				
Sterculiaceae	-	1/1	-	-
Dipterocarpaceae Malvaceae	1/1	3/3	-	-
<b>EUPHORBIALES</b>	4/5	3/3	3/5	3/5
Euphorbiaceae	3/6	3/6	2/2	2/2
<b>THYMELACALES</b>				
Thymelaceae	2/2	2/2	1/4	1/1
<b>SAXIFRAGALES</b>				
Saxifragaceae	2/5	2/5	2/2	-
Crassulaceae	2/5	2/2	2/5	1/1
Parnassiaceae	1/1	-	1/1	-
<b>ROSALES</b>				
Rosaceae	10/11	10/10	13/28	10/14
<b>FABALES †</b>				
Caesalpiniaceae	S	-	1/1	1/1
Fabaceae	21/24	20/24	25/28	13/20
<b>MYRTALES</b>				
Myrtaceae	1/1	1/1	1/1	1/1
Punicaceae	1/1	1/1	2/3	1/1
Combretaceae	S	2/3	2/3	1/2
<b>RUTALES</b>				
Rutaceae	3/3	-	3/4	3/4
Zygophyllaceae	2/2	S	1/1	2/2
Nitrariaceae	-	1/1	-	1/1
Meliaceae	1/1	1/1	1/1	1/1
Anacardiaceae	3/3	2/2	2/2	2/2
<u>Sapindaceae</u>	1/1	-	1/1	-
<b>GERANIALES</b>				
Linaceae	1/1	1/1	1/2	1/1
Geraniaceae	2/2	1/1	1/6	2/5
<b>CORNALES</b>				
Cornaceae	-	1/1	-	-
<b>ARALIALES</b>				
Araliaceae	-	1/1	-	-
Apiaceae	8/8	8/8	14/16	15/16
<b>SANTALALES</b>				
Santalaceae	1/1	1/1	1/1	1/1
<b>RHAMNALES</b>				
Rhamnaceae	1/1	1/1	1/1	1/1
Vitaceae	1/1	1/1	1/1	1/1
<b>ELAEAGNALES</b>				
Loganiaceae	1/1	1/1	1/1	1/1
Rubiaceae	3/3	2/2	2/4	2/3
Apocynaceae	1/1	-	-	2/2
Asclepiadaceae	1/1	2/2	2/2	2/2
Gentianaceae	2/7	4/9	3/12	2/16
<b>DIPSACALES</b>				
Caprifoliaceae	-	-	1/1	-
Valerianaceae	2/2	2/3	2/5	1/1
Dipsacaceae	S	-	1/1	1/1

Taxon	Number of species/genera by branches			
	Mongolian	Genuinely Tibetan	Buryat	Kalmyk
<b>POLEMONIALES</b>				
Convolvulaceae	-	-	2/2	2/2
Cuscutaceae	1/1	-	1/1	1/1
Boraginaceae	3/3	4/4	4/4	6/6
<b>LAMIALES</b>	-	2/2	1/1	1/1
Verbenaceae	9/9	9/9	11/16	14/16
Lamiaceae				
<b>SCROPHULARIALES</b>				
Solanaceae	5/5	6/6	3/3	3/4
Scrophulariaceae	6/9	2/4	8/16	8/12
Bignoniaceae	1/1	-	-	1/1
Pedaliaceae	1/1	1/1	1/1	1/1
Plantaginaceae	1/1	1/1	1/4	1/4
Acanthaceae	1/1	1/1	-	-
<b>CAMPANULALES</b>				
Campanulaceae	1/1	-	1/1	1/1
<b>ASTERALES</b>				
Asteraceae				
<b>NAIADALES</b>				
Juncaginaceae	16/26	24/29	23/57	25/46
Potamogetonaceae				
	-	-	1/1	1/1
	-	1/1	1/1	1/1
<b>LILIALES</b>				
Liliaceae	3/5	5/5	7/10	5/6
Alliaceae	S	1/2	1/9	1/4
Asparagaceae	1/1	1/1	-	1/1
Iridaceae	2/2	2/3	2/8	1/1
<b>ORCHIDALES</b>				
Orchidaceae	2/2	2/2	3/7	2/3
<b>CYPERALES</b>				
Cyperaceae	2/2	2/2	-	2/2
<b>POALES</b>				
Poaceae	14/15	6/6	5/6	6/6
<b>ZINGIBERALES</b>				
Zingiberaceae	5/15	7/7	5/7	5/7
<b>ARECALES</b>				
Arecaceae	1/1	1/1	1/1	1/1
<b>ARALES</b>				
Araceae	2/3	2/2	1/1	1/1

In making the list of medicinal plants used in other branches, the information contained in the above-mentioned work of S. M. Batorova et al. [24; 25] was used. The list of medicinal plants of the "Kalmyk branch" had been determined for the last 30 years, based on questioning of old healers and their apprentices.

Analysis of the data in Table 1 shows the differences in the number of species among all branches, but also displays some similarities between the "Buryat" and the "Kalmyk" branches, which probably is due to the

historical relations between nations and the fact that many of Kalmyk lamas and healers have been trained in Russia and in the Buryat datsans.

Detailed analysis shows that most medicinal plants of the "Kalmyk" branch belong to 10 families (Table 2).

These families include 54.9% of the total number of "medicinal flora", and 49.1 % of genera. In general, the number of taxa in various branches of Tibetan medicine is markedly different, as shown in Table 3

**Table 2. Main families of "medicinal flora" of the "Kalmyk" branch of Tibetan medicine**

Families	Number of species	% of the total number of species of "medicinal flora"	Number of genera	% of the total number of species of "medicinal flora"
Asteraceae	46	14.4	25	10.9
Fabaceae	20	6.3	13	5.7
Lamiaceae	19	6.0	14	6.1
Ranunculaceae	17	5.3	9	3.9
Apiaceae	16	5.0	15	6.5
Rosaceae	14	4.4	10	4.3
Brassicaceae	12	3.8	8	3.5
Scrophulariaceae	12	3.8	8	3.5
Caryophyllaceae	12	3.8	8	3.5
Polygonaceae	7	2.2	3	1.3
<b>TOTAL:</b>	<b>175</b>	<b>54.9</b>	<b>113</b>	<b>49.1</b>

**Table 3. The main taxa of the "medicinal flora" of various branches in Tibetan medicine**

Taxon	Mongolian	Genuinely Tibetan	Buryat	Kalmyk
Order	55	54	56	50
Family	95	81	104	84
Genus	234	219	296	230
Species	293	260	549	319

**Table 4. The data of ethnofloristic analysis of the "medicinal flora" of the various branches in Tibetan medicine**

Conditional phytochorion	Mongolian		Genuinely Tibetan		Buryat		Kalmyk	
	Number of species	% of the total number of species	Number of species	% of the total number of species	Number of species	% of the total number of species	Number of species	% of the total number of species
Tibet	119	45.7	34	11.6	19	3.46	15	4.70
Mongolia			167	57.0				
Transbaikalia					467	85.06	14	4.39
India	62	23.8	33	11.27	20	3.65	12	3.76
China	26	10.0	28	9.56	22	4.01	12	3.76
Western and Central Asia	6	2.3	5	1.7	6	1.09	5	1.57
India and China	48	18.2	26	8.87	15	2.73	10	3.13
Kalmykia							253	78.69
Total:	260	100.0	293	100.0	549	100.0	319	100.0

### CONCLUSION.

Ethnofloristic analysis allows identifying possible routes of medicinal raw materials' supply and the use of historical information about the relationship between Kalmyks and Eastern countries, where medicinal raw materials could be supplied from via the "Silk Road". We relied on the basic ethnophytochorions of the Tibetan medicine pointed by the authors of the proposed method who analyzed the relations of its "Mongolian branch". All obtained data are summarized in Table 4, and confirm the opinion of A. F. Hammerman, 1982 about the fact that with creation of the traditional medicine of various nations, the range of medicinal herbs changes, its identity is determined according to the species composition of the natural flora of this region.

It should be noted that most medicinal plants from the multicomponent therapeutic formulations of the old Kalmyk emchis, recorded during questioning, have not yet been pharmacologically studied, and may be of practical interest. They may be used as the basis for developing modern medicines for treating widely spread chronic diseases that are difficult to treat by the means of modern medicine.

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