

Notes to physical properties of Zhongar Alatau waters, Kazakhstan

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Over the course of one month, the group of scientists and students from the Institute of High Mountain Biology, Žilina University and from Zhetysu University in Taldykorgan visited several mountains resorts in Zhongar Alatau mountains and collected samples for ecotoxicological research. The core of our research took place in the field, with the majority of our time spend in Zhongar-Alatau National Park. The park is characterized by steep, mountainous and rocky canyons through which streams flow. It is located in an area of mountain steppes and meadows and is known for its isolation and high biodiversity. This diversity is ensured by altitudinal zones ranging from steppes to alpine

meadows to glaciers, as well as a transitional zone between boreal, steppe and desert geographic regions. Approximately 1% of the territory of the park is forested with Sievers apple trees, which are the ancestors of all cultivated varieties of apple trees in the world. The park is 300 km long.

The aim of our research was ecotoxicology of alpine fauna. Besides it we marginally focused on the stream profile, from the foot of the Shumsky glacier downward (locality Small Bashkan), where we measured physical properties of water including total dissolved solids, hydrogen potential, dissolved oxygen, water salinity, conductivity, electrical voltage, resistance, and water temperature. Measurements were conducted at different altitudes, ranging from approximately 1290 m a.s.l. to 2890 m a.s.l. The width of the river varied from approximately 1 to 7 m and was characteristically different in each location, with varied habitats. The water temperature of the sampling points ranged from 1 to 15° C. The detailed data is presented in Tables 1 and 2.

Site name	Date	Time	GPS	River width (m)	Altitude (m a.s.l.)	Habitat + climate
Karamal	10.9.2022	15:52	N 44.8005426° E 78.9527593°	2	1536	Sunny, cloudy in places, former lead mines
Karamal	10.9.2022	16:28	N 44.7993036° E 78.8912274°	2	1313	Sunny, cloudy in places, former lead mines
Kokcu	11.9.2022	10:19	N 44.6855190° E 78.9489471°	15	1291	Cloudy, wind, light rain
Kokcu	11.9.2022	13:50	N 44.6776852° E 78.8334216°	15	1248	Cloudy, wind, light rain
Osinovaja	14.9.2022	12:30	N 45.4071203° E 80.4098124°	5	1145	Down the stream, under the cottage Osinovaja, partly cloudy
Small Bashkan	16.9.2022	21:00	N 45.2650399° E 80.1523303°	14	1488	Partly cloudy, sunny
Small Bashkan	17.9.2022	15:00	N 45.1675290° E 80.2114786°	6	1908	Partly cloudy
Small Bashkan	19.9.2022	14:28	N 45.1122576° E 80.2167669°	1.5	2890	Splashes, light rain, cleaner water; under the glacier
Small Bashkan	19.9.2022	14:30	N 45.1122576° E 80.2167669°	1.5	2890	Splashes, light rain, cloudy, dirtier water; under the glacier
Small Bashkan	20.9.2022	11:40	N 45.1375742° E 80.2049449°	7	2340	Sunny
Small Bashkan	20.9.2022	16:52	N 45.1889174° E 80.1988976°	7	1758	Partly cloudy

Table 1. Sampling point name, date and time, GPS coordinates, river width, altitude, habitat, and climate.

Site name	TDS (mg/L)	pH	Ox (mbar)	Sal	U (mV)	Ox (mg/l)	H (μ S/cm)	Ox (%)	p ($k\Omega \cdot cm$)	T ($^{\circ}C$)
Karamal	285	8.361	171.5	0	-93.1	8.73	286.0	98.9	3.50	12.7
Karamal	409	8.389	176.0	0	-106.8	8.65	409.0	99.6	2.47	15.2
Kokcu	146	8.856	175.2	0	-87.7	9.31	144.0	98.7	6.87	10.9
Kokcu	129	8.276	161.4	0	-129.6	9.67	128.9	101.5	7.76	11.1
Osinovaja	196	9.230	181.5	0	-88.8	10.12	201.0	101.9	4.98	9.3
Small Bashkan	149	8.375	176.7	0	-91.0	10.28	148.5	99.1	6.74	6.8
Small Bashkan	126	8.577	165.1	0	-98.2	9.94	122.4	98.9	7.95	5.3
Small Bashkan	148	8.477	147.1	0	-99.1	10.05	147.2	99.8	6.78	1.0
Small Bashkan	155	8.180	149.1	0	-80.7	9.66	154.6	99.7	6.43	2.7
Small Bashkan	124	8.275	160.5	0	-87.4	9.69	124.2	100.5	8.07	5.4
Small Bashkan	144	8.173	169.6	0	-92.5	9.33	143.4	99.4	6.69	8.3

Table 2. Physical properties of water at sampling points in Kazakhstan.

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