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COMPARATIVE STUDY ON SOIL MECHANICAL COMPOSITION IN STEPPE ZONE OF MONGOLIA PLATEAU (ON THE EXAMPLE OF INNER MONGOLIAN UZEMCHIN — MONGOLIAN SUKHBAATAR PROVINCE)

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Abstract. Soil erosion and destruction is well known, but there are different rates of tendency of soil mechanical composition of the same region. In this paper, the same grassland regions in different countries were selected as the study area: the Uzemchin region of the Inner Mongolia, China and the Sukhbaatar province, Mongolia. The soil mechanical composition in the research area was determined through the field survey and laboratory analysis. Soil texture classifications in study area consists of clay, loamy sand, loam, sand, sand clay, sandy loam, silt, and silt loam, but the ratio of silt loam and sandy loam are significant, 48% and 25% respectively. Changes of average sand along the north-west direction from the south-east of in the research area tends to reduce, but changes of average clay tends to increase and changes of average silt tends to increase slightly. Chang of sand and clay tend to increase in the Uzemchin region of the research area along all soil layers, while silt tends to reduce in the Uzemchin region. But they tend to be stable relatively in Sukhbaatar region of the research area. Therefore, the quality of the soil mechanic composition of the research area in Mongolia is better than the research area in Inner Mongolia. However, the two regions have similar natural conditions. The differences of soil separate tendency found between Sukhbaatar, Mongolia and Uzemchin, Inner Mongolia in the research area will be analyzed in the next research.
Keywords: soil mechanical composition, steppe zone, Mongolian plateau, Mongolia, Inner Mongolia in China.

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Introduction

Mongolian plateau is located in the mid-latitude of the Northern Hemisphere and it belongs to the internal land of the Eurasia continent. It is bounded by the Greater Hinggan Mountains in the east, the Monoi Mountains to the south, the Altai Mountains to the west, and the Sayan, Khentii and Yablonoi Mountains to the north [Wei et al., 2016]. For the territorial location it covers all territory of Mongolia, parts of the Inner Mongolia and Xinjiang autonomous region lie on the plateau in China, and the plateau forms Buryatia of the southern part in Russia.

Mongolian plateau belongs to the region of arid and semi-arid conventional climate. However it is the area with a fragile ecosystem. Soil problems are getting more serious due to the global warmth and intensive human activities influencing in the environment. Certainly very long time is required for the creation of the soil and it is a non-renewable resource, therefore it is not easy to recover if the soil erosion, deterioration and pollution are occurred. The soil properties declare such changes very clearly.

Steppe zone of the Mongolian plateau is located in the eastern part of the Mongolian plateau. This zone is the land with a wide pastureland, where nomadic Mongolian nation has been living for a long time. Uzemchin steppe of Inner Mongolia is a part of the main pastureland of China and it is the territory, which is showing an important impact in the economic development of the northern part of China. This study is made on the example of Uzemchin region of Shiliin-gol province — Munkhkhaan soum of Sukhbaatar province. The selected region is the vital area of steppe zone of Mongolian plateau (Fig. 1).

Fig. 1. Location of the study area

Uzemchin of Inner Mongolia and Sukhbaatar of Mongolia research area are purely utilized as grazing land, basically have the same vegetation types, weather, topography, soil, grazing (Table 1).

Table 1

Results of ecological factors in study area

Factors	Study area	N	Mean	Minimum	Maximum	Sig.
altitude, m	Uzemchin, Inner Mongolia	29	947	811	1085	.000
	Sukhbaatar, Mongolia	25	1059	919	1269	
aspect, º	Uzemchin, Inner Mongolia	29	179.14	15.52	345.10	.776
	Sukhbaatar, Mongolia	25	188.05	17.10	344.43	
slope, º	Uzemchin, Inner Mongolia	29	0.99	0.12	3.37	.823
	Sukhbaatar, Mongolia	25	0.94	0.23	3.66	
temperature, ºC	Uzemchin, Inner Mongolia	29	1.93	1.26	2.34	.000
	Sukhbaatar, Mongolia	25	1.52	0.94	1.98	
precipitation, mm	Uzemchin, Inner Mongolia	29	0.94	0.81	1.16	.927
	Sukhbaatar, Mongolia	25	0.94	0.81	1.12	
wind speed, m/c	Uzemchin, Inner Mongolia	29	5.28	4.85	5.64	.364
	Sukhbaatar, Mongolia	25	5.22	4.92	5.61	
population, n/km^2	Uzemchin, Inner Mongolia	29	2.62	1.76	3.48	.000
	Sukhbaatar, Mongolia	25	0.42	0.26	0.68	
livestock, sheep, unit/km^2	Uzemchin, Inner Mongolia	29	47.95	46.93	48.97	.290
	Sukhbaatar, Mongolia	25	45.21	27.54	70.28	
vegetation coverage	Uzemchin, Inner Mongolia	29	.39	.16	.78	.003
	Sukhbaatar, Mongolia	25	.55	.26	.78	

Source: Topography (altitude, aspect, slope) was downloaded from the website http://srtm.csi.cgiar.org/; Weather (temperature, precipitation, wind speed) was downloaded from the website https://swat.tamu.edu/; Vegetation coverage was downloaded from the website https://modis.gsfc.nasa.gov/. They were processed using ENVI5.1 and ArcGIS10.3 programs. Population and livestock were obtained from Meteorology and Environmental Monitoring Authority of Mongolia and Meteorological Bureu of Shiliin-gol League in Inner Mongolia.

Soil texture indicates the relative content of particles of various sizes, such as sand, silt and clay in the soil. Chemical and physical properties of a soil are related to soil texture. Particle size and distribution will affect a soil's capacity for holding water and nutrients. Fine textured soils generally have a higher capacity for water retention, whereas sandy soils contain large pore spaces that allow leaching [Lindbo et al., 2012]. Therefore studying and presenting transformation law of soil mechanical composition becomes important content to know about soil physical properties and it will be prerequisite to ensure sustainable soil use. In addition, Purpose of this research is to make comparative study of soil mechanical compositionin the selected study area and induce scientific ways to use properly and protect the nature.

Research materials and methods

Results of the field surveys conducted in 2015, 2016 and late July and early August 2017 were used for this research work. When obtaining soil samples, the surface area was chosen as a representative area, representing the whole area and the location of the sampling points. Areas with flat surface were selected from the entire region in order to collect soil sampling sites and the locations of sampling points are shown in figure 2. During the research, 29 samples were taken from Inner Mongolia, China and 25 samples were collected from Mongolia. Each sample was divided into 0–5, 5–10, and 10–20 cm at the top layer of soil, taken from each three layers by using the cutting ring and 500 grams of soil was kept in each bag of high quality.

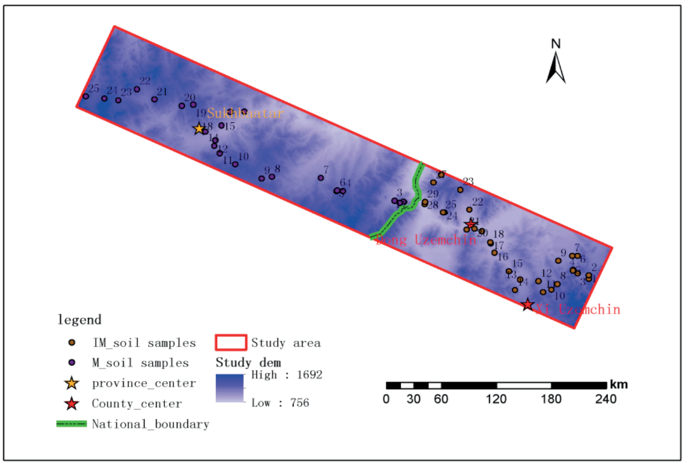

Fig. 2. Study area and spatial distribution of the soil sampling sites

The soil samples were analyzed at the soil laboratory of College of Geographical Science Inner Mongolia Normal University for the identification of mechanical composition. The method to determine soil mechanical components was based on the Laser granule meter. Soil samples were dried in the dry condition of air, sieved out with 2 mm and purified and cleaned from the substances in the soil of each sample. Then soil texture components were measured using Laser granule meter of Mastersize-3000 brand, which was created by British Malvern Company.

Using ArcGis10.3, ENVI5.1 program, we will perform geographic location maps of the study area. Using SPSS20, Origin 17and Excel programs, analysis data and materials will be compiled and processed in the form of figures and tables. Among them, the mechanical composition of 0–20 layers is calculated by the following formula [Huo et al., 1986].

$$\bar{x} = \frac{\sum_{t=1}^{n} x_t y_t}{y} \bar{x} = \frac{\sum_{t=1}^{n} x_t y_t}{y}$$

t — soil profile level;
xt — The content of an element in the corresponding soil level;
yt — Different levels of thickness (cm);
y — Thickness of the entire soil profile (cm).

Results

Soil texture classifications of the soil layer

There are many methods of classification of soil texture composition. Currently the most common internationally using rule is soil texture triangle. In the research we also used this Rule. In the United States, twelve major soil texture classifications are defined by the USDA [Ditzler et al., 2017]. The twelve classifications are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay (USDA, 1993). Soil textures are classified by the fractions of each soil separate (sand, silt, and clay) present in a soil. Classifications are typically named for the primary constituent particle size or a combination of the most abundant particles sizes, e.g. «sandy clay» or «silty clay». Determining soil texture is often aided with the use of a soil texture triangle (USDA, 1993). An example of a soil triangle is found on the right side of the page. One side of the triangle represents percent sand, the second side represents percent clay, and the third side represents percent silt. The soil triangle has been used as shown in the following table 2 and 3. In addition, soil mechanical composition influences not only in the soil water, air permeability, warmth and fertility directly, but also in the growth of the plants.

Table 2

Soil texture classifications of the soil layer in Sukhbaatar (n=25)

Sukhbaatar	Layers of soil (cm)	Soil separate (%)			Soil textures
		Clay (<0.002 mm)	Silt (0.05-0.002 mm)	Sand (2-0.05 mm)	
1	0-5	1.25	38.96	59.8	sandy loam
	5-10	0.99	71.3	27.72	silt loam
	10-20	0.28	39.23	60.46	sandy loam
2	0-5	1.43	57.56	41.03	silt loam
	5-10	2.04	53.17	44.8	silt loam
	10-20	0.82	76.7	22.46	silt loam
3	0-5	4.52	34.71	60.77	sandy loam
	5-10	8.66	36.12	55.24	sandy loam
	10-20	7.98	39.66	52.39	sandy loam
4	0-5	12.19	63.95	23.87	silt loam
	5-10	16.11	70.01	13.87	silt loam
	10-20	15.18	70.72	14.09	silt loam
5	0-5	4.29	39.97	55.7	sandy loam
	5-10	8.12	52.72	39.13	silt loam
	10-20	8.17	47.81	44	loam
6	0-5	3.11	25.66	71.23	loamy sand
	5-10	6.01	34.58	59.41	loamy sand
	10-20	3.13	8.83	88.02	sand
7	0-5	5.82	57.84	36.33	silt loam
	5-10	7.52	62.18	30.33	silt loam
	10-20	10.08	60.06	29.86	silt loam
8	0-5	9.7	63.38	26.91	silt loam
	5-10	12.9	53.27	33.87	silt loam
	10-20	10.93	25.78	63.3	sandy loam
9	0-5	5.94	61.93	32.17	silt loam
	5-10	3.74	27.56	68.72	sandy loam
	10-20	6.16	46.87	46.98	sandy loam

Table 2 continued

Sukhbaatar	Layers of soil (cm)	Soil separate (%)			Soil textures
		Clay (<0.002 mm)	Silt (0.05-0.002 mm)	Sand (2-0.05 mm)	
10	0-5	6.91	60.75	32.38	silt loam
	5-10	5.52	33.29	60.92	sandy loam
	10-20	12.18	68.71	19.11	silt loam
11	0-5	4.36	40.98	54.69	sandy loam
	5-10	5.26	32.13	62.69	sandy loam
	10-20	8.01	55.47	36.53	silt loam
12	0-5	1.69	26.06	71.57	loamy sand
	5-10	2.01	13.91	84.08	sand
	10-20	2.15	33.53	64.3	sandy loam
13	0-5	4.39	51.22	44.41	silt loam
	5-10	5.66	63.92	30.41	silt loam
	10-20	5.96	70.78	23.27	silt loam
14	0-5	4.34	39.02	56.61	sandy loam
	5-10	11.15	62.06	26.74	silt loam
	10-20	5.98	45.2	48.64	sandy loam
15	0-5	5.3	61.4	33.3	silt loam
	5-10	5.54	41.06	53.38	sandy loam
	10-20	8.31	71.84	19.87	silt loam
16	0-5	4.52	59.87	35.65	silt loam
	5-10	6.13	36.72	57.12	sandy loam
	10-20	8.11	48	43.89	loam
17	0-5	9.12	70.11	20.76	silt loam
	5-10	10.24	72.81	16.94	silt loam
	10-20	10.58	65.09	24.37	silt loam
18	0-5	10.16	70	19.87	silt loam
	5-10	16.78	66.31	16.91	silt loam
	10-20	12.22	83.24	4.54	silt
19	0-5	6.11	69.11	24.77	silt loam
	5-10	7.95	68.58	23.47	silt loam
	10-20	8.44	75.26	16.33	silt loam
20	0-5	5.26	65.78	28.96	silt loam
	5-10	7.88	65.33	26.77	silt loam
	10-20	9.83	74.42	15.74	silt loam
21	0-5	3.87	38.73	57.39	sandy loam
	5-10	3.31	29.56	67.14	sandy loam
	10-20	3.2	24.47	72.39	loamy sand
22	0-5	6.04	58.43	35.52	silt loam
	5-10	11.71	66.11	22.2	silt loam
	10-20	9.22	68.55	22.21	silt loam
23	0-5	4.71	54.47	40.8	silt loam
	5-10	7.43	49.47	43.09	loam
	10-20	11.19	59.15	29.64	silt loam
24	0-5	4.93	49.88	45.17	sandy loam
	5-10	2.83	23.67	73.49	loamy sand
	10-20	2.67	22.6	74.73	loamy sand
25	0-5	3.75	26.58	69.69	sandy loam
	5-10	7.7	46.9	45.38	loam
	10-20	7.21	39.88	52.88	sandy loam

Table 3

Soil texture classifications of the soil layer in Uzemchin (n=29)

Uzemchin	Layers of soil (cm)	Soil separate (%)			Soil textures
		Clay (<0.002 mm)	Silt (0.05-0.002 mm)	Sand (2-0.05 mm)	
1	0-5	0.6	60.56	38.86	silt loam
	5-10	0.39	54.26	45.33	silt loam
	10-20	0.46	64.15	35.4	silt loam
2	0-5	1.31	17.9	80.76	loamy sand
	5-10	2.17	19.92	77.89	loamy sand
	10-20	1.88	19.66	78.45	loamy sand
3	0-5	1.5	15.53	82.97	loamy sand
	5-10	0.86	16.72	82.46	loamy sand
	10-20	1.89	18.05	80.05	loamy sand
4	0-5	2.48	35.56	61.95	sandy loam
	5-10	4.04	47.02	48.94	sandy clay
	10-20	1.85	20.91	77.22	loamy sand
5	0-5	0.73	58.64	40.61	silt loam
	5-10	0.78	69.83	29.38	silt loam
	10-20	0.75	76.07	23.15	silt loam
6	0-5	1.02	63.55	35.44	silt loam
	5-10	0.56	64.86	34.57	silt loam
	10-20	0.68	67.61	31.73	silt loam

Table 3 continued

Uzemchin	Layers of soil (cm)	Soil separate (%)			Soil textures
		Clay (<0.002 mm)	Silt (0.05-0.002 mm)	Sand (2-0.05 mm)	
7	0-5	0.39	42.88	56.73	clay
	5-10	0.36	47.3	52.31	sandy clay
	10-20	0.33	46.55	53.09	sandy clay
8	0-5	1.77	24.75	73.47	loamy sand
	5-10	1.71	15.07	83.2	loamy sand
	10-20	0.18	6.63	93.19	sand
9	0-5	2.25	17.29	80.48	loamy sand
	5-10	1.97	12.85	85.15	sand
	10-20	1.12	7.2	91.67	sand
10	0-5	0.4	39.76	59.86	sandy loam
	5-10	0.48	50.65	48.87	sandy loam
	10-20	0.23	33.25	66.5	sandy loam
11	0-5	0.79	62.5	36.72	silt loam
	5-10	0.63	59.89	39.49	silt loam
	10-20	1.77	54.78	43.45	silt loam
12	0-5	1.54	48.16	50.26	sandy loam
	5-10	0.9	61.55	37.55	silt loam
	10-20	0.53	60.93	38.55	silt loam
13	0-5	1.12	59.62	39.28	silt loam
	5-10	0.58	46.24	53.2	sandy loam
	10-20	0.28	26.57	73.12	loamy sand
14	0-5	0.49	35.44	64.05	sandy loam
	5-10	0.46	49.92	49.61	sandy loam
	10-20	0.26	49.03	50.73	sandy loam
15	0-5	1.8	24	74.2	loamy sand
	5-10	2.06	23.61	74.35	loamy sand
	10-20	3.23	41.25	55.51	sandy loam
16	0-5	0.39	36.89	62.7	sandy loam
	5-10	0.4	36.65	62.95	sandy loam
	10-20	0.27	43.36	56.36	sandy loam
17	0-5	3.39	31.02	65.58	sandy loam
	5-10	4.28	38.38	57.33	sandy loam
	10-20	3.14	30.97	65.89	sandy loam
18	0-5	1.39	70.77	27.87	silt loam
	5-10	1.02	69.76	29.23	silt loam
	10-20	0.99	75.89	23.1	silt loam
19	0-5	2.16	74.41	23.45	silt loam
	5-10	1.17	74.63	24.22	silt loam
	10-20	1.1	78.64	20.29	silt loam
20	0-5	2.17	67.17	26.65	silt loam
	5-10	1.31	73.23	25.49	silt loam
	10-20	1.35	86.96	11.66	silt
21	0-5	1.64	83.77	14.58	silt
	5-10	0.73	65.66	33.58	silt loam
	10-20	0.53	78.48	21.01	silt loam
22	0-5	1.92	81.62	16.43	silt
	5-10	1.25	75.59	23.19	silt loam
	10-20	1.29	82.57	16.15	silt
23	0-5	1.29	71.93	26.78	silt loam
	5-10	0.9	77.02	22.07	silt loam
	10-20	0.86	82.95	16.21	silt
24	0-5	9.07	51.18	39.72	silt loam
	5-10	8.53	43.55	47.92	clay
	10-20	7.27	38.59	54.12	sandy loam
25	0-5	1.84	74.7	23.48	silt loam
	5-10	0.89	69.07	30.06	silt loam
	10-20	0.54	78.7	19.94	silt loam
26	0-5	1.45	58.66	39.93	silt loam
	5-10	0.9	53.95	45.14	silt loam
	10-20	0.48	57.48	42.01	silt loam
27	0-5	0.87	79.11	20.01	silt loam
	5-10	0.63	83.37	16.02	silt
	10-20	0.8	87.48	11.72	silt
28	0-5	4.52	24.53	70.96	loamy sand
	5-10	2.67	22.46	74.83	loamy sand
	10-20	4.97	31.35	63.65	sandy loam
29	0-5	0.99	53.64	45.36	silt loam
	5-10	0.31	56.07	43.63	silt loam
	10-20	0.24	47.06	52.7	sandy loam

Seeing from the table 2 and 3, soil texture classifications in study area consists of clay, loamy sand, loam, sand, sand clay, sandy loam, silt, and silt loam, but the ratio of silt loam and sandy loam are significant,48% and 25% respectively. The ratio of soil types of Uzemchin and Sukhbaatar in the study area are as follows (Table 4).

Table 4

Summary of soil texture classifications in study area

Soil texture classifications	Study area	Uzemchin (Inner Mongolia)	Sukhbaatar (Mongolia)
clay	1%	2%	0%
loamy sand	13%	17%	8%
loam	2%	1%	4%
sand	3%	3%	3%
sand clay	2%	3%	0%
sandy loam	25%	22%	30%
silt	5%	8%	1%
silt loam	48%	43%	54%

Table 5

Average amount of the mechanic composition of the soil layer (n=54)

Layers of soil (cm)	Average amount of the mechanic composition								
	Study area			Uzemchin (Inner Mongolia)			Sukhbaatar (Mongolia)		
	Cl	Si	Sa	Cl	Si	Sa	Cl	Si	Sa
0–5	3.43	51.00	45.57	1.77	50.61	47.62	5.35	51.47	43.18
5–10	4.19	50.22	45.59	1.48	51.00	47.52	7.33	49.31	43.36
10–20	4.21	52.14	43.65	1.35	51.50	47.14	7.52	52.88	39.60

* Sa- Sand (%), Si-Silt (%), Cl-Clay (%)

Changes along the vertical direction of soil mechanical composition

Seeing from the table 5, changes of mechanical composition changes along the vertical direction of the soil, the more sand in study area reduces the more depth increases in the soil, while the more clay in study area increases the more depth increases in the soil. However chang of silt in soil layer is not obvious. Silt and sand cover main percentage of the mechanical composition of the soil layer inthe research area, but the ratio of clayin the soil separate ismore Sukhbaatar province of Mongolia than Uzemchin of Inner Mongolia.

Changes of the soil mechanical composition along the horizontal direction

Here the percentageof soil parameters are illustrated with number of the selected samples at all deep layers to express natural law of changes soil mechanical composition along the north-west direction from the south-east of the steppe zone in Mongolian plateau. According to the figure 3.1, 3.2, 3.3, 3.4, change of mechanical composition along the north-west direction from the south-east of in the research area in the layers of 0–5, 5–10, 10–20 and 0–20 cm shows the tendency of reducing sand, increasing dust slightly and increasing clay.

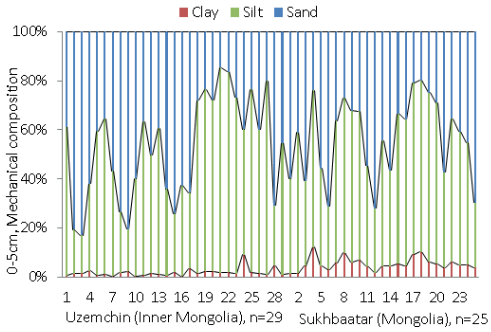

Fig. 3.1. Change of mechanical composition along the horizontal direction in the layers of 0–5 cm

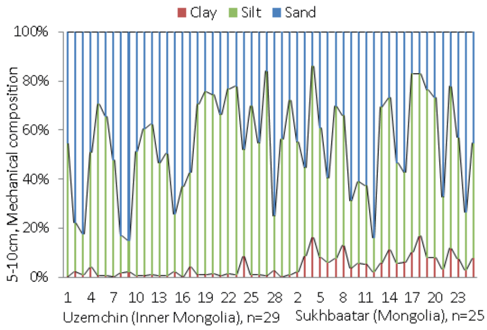

Fig. 3.2. Change of mechanical composition along the horizontal direction in the layers of 5–10 cm

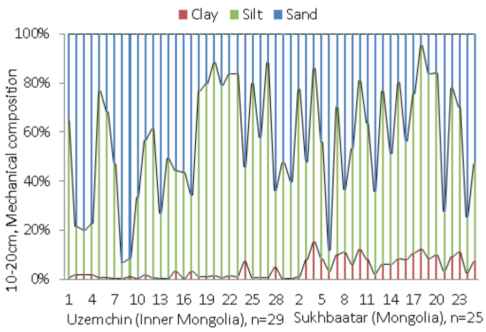

Fig. 3.3. Change of mechanical composition along the horizontal direction in the layers of 10–20 cm

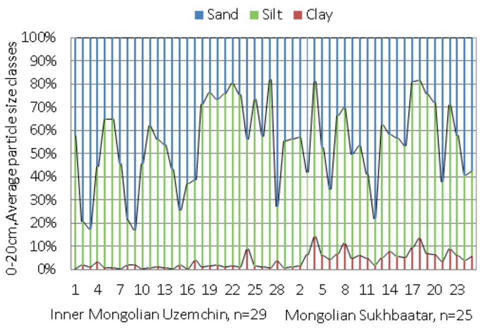

Fig. 3.4. Change of mechanical composition along the horizontal direction in the layers of 0–20 cm

When we made an analysis in the change of average mechanical composition along the horizontal direction in the layers of 0–20 cm, it calculated using the above-mentioned formula (Figure 4, 5).

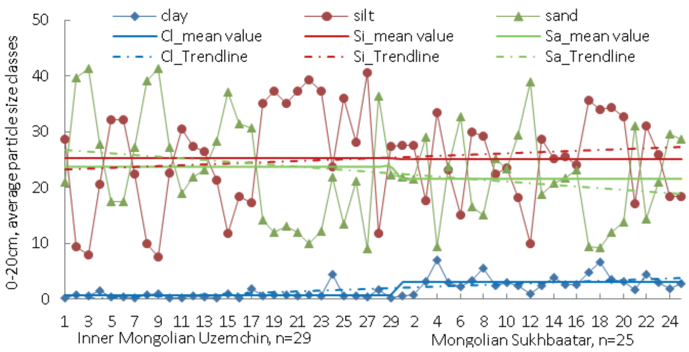

Fig. 4. Change of average mechanical composition along the horizontal direction in the layers of 0–20 cm

Seeing from the figure 4, changes of averagesand along the north-west direction from the south-east of in the research area tends to reduce, but changes of average clay tends to increase and changes of average silt tends to increase slightly. In addition, mean sand in Uzemchin is more than Sukhbaatar of in the study area, 23.77 and 21.63 respectively. Mean clay in Uzemchin is less than Sukhbaatar of in the study area, 0.81 and 3.17 respectively. However, mean silt in two regions has almost same, 25.38 and 25.19 respectively.

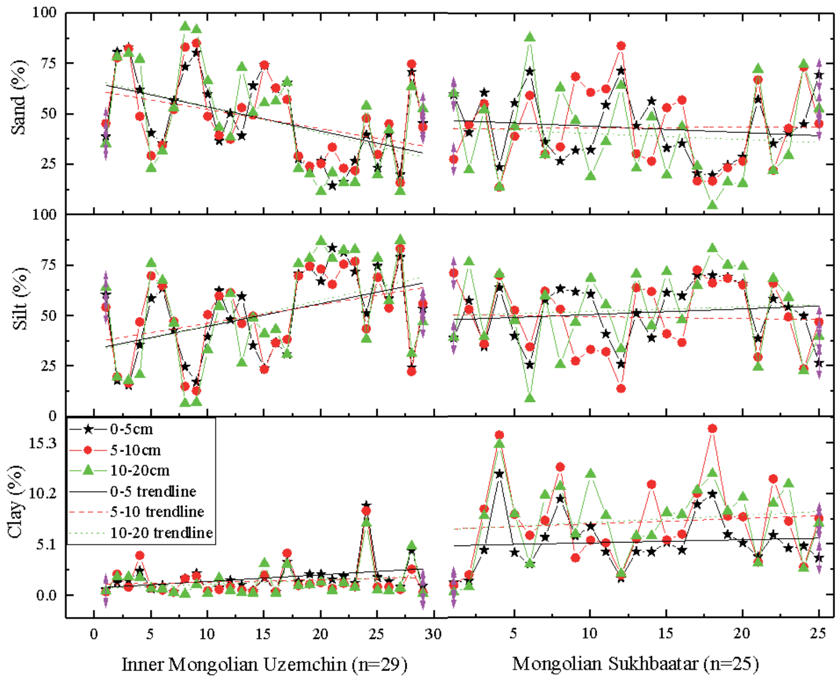

Fig. 5. Changes of soil mechanical composition along the horizontal direction

Seeing from the figure 5, change along all soil layers soil separate trendency of Uzemchin and Sukhbaatar in the research area get clearly. Sand and clay tend to increase in Uzemchin region of the research area along all soil layers, while silt tends to reduce in the Uzemchin region. But they tends stable relatively in Sukhbaatar region of the research area. Therefore quality of soil mechanic composition of the research area in Mongolia is better than the region in Inner Mongolia.

Conclusion

Soil mechanical composition in the research area was determined through the field survey and laboratory analysis. Soil texture classifications in study area consists of clay, loamy sand, loam, sand, sand clay, sandy loam, silt, and silt loam, but the ratio of silt loam and sandy loam are significant,48% and 25% respectively.

Changes of mechanical composition changes along the vertical direction of the soil, the more sand in study area reduces the more depth increases in the soil, while the more clay in study area increases the more depth increases in the soil. However chang of silt in soil layer is not obvious. Silt and sand cover main percentage of the mechanical composition of the soil layer in study area, but the ratio of clayin the soil separate ismore Sukhbaatar province of Mongolia than Uzemchin of Inner Mongolia; Changes of average sand along the north-west direction from the south-east of in the research area tends to reduce, but changes of average clay tends to increase and changes of average silt tends to increase slightly. In addition, mean sand in Uzemchin is more than Sukhbaatar of in the study area, 23.77 and 21.63 respectively. Mean clay in Uzemchin is less than Sukhbaatar of in the study area, 0.81 and 3.17 respectively. However, mean silt in two regions has almost same, 25.38 and 25.19 respectively.

Chang of sand and clay tend to increase in Uzemchin region of the research area along all soil layers, while silt tends to reduce in the Uzemchin region. But they tends stable relatively in Sukhbaatar region of the research area. Therefore quality of soil mechanic composition of the research area in Mongolia is better than the research area in Inner Mongolia. However the two regions have similar natural conditions, the reason will be analyzed in the next research, whichdifferencesof soil separate tendency having between Sukhbaatar, Mongolia and Uzemchin, Inner Mongolia in the research area.

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СРАВНИТЕЛЬНОЕ ИССЛЕДОВАНИЕ МЕХАНИЧЕСКОГО СОСТАВА ПОЧВЫ В СТЕПНОЙ ЗОНЕ МОНГОЛЬСКОГО ПЛАТО (НА ПРИМЕРЕ УЗЕМЧИНСКОГО РАЙОНА ВНУТРЕННЕЙ МОНГОЛИИ — ПРОВИНЦИИ СУХЭ-БАТОР)

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Аннотация. Феномены почвенной эрозии и ее разрушения широко известны, однако скорость изменения механического состава почвы в одном и том же регионе может отличаться. В статье в качестве области исследованя были выбраны похожие районы степной зоны разных стран: Уземчинский район Внутренней Монголии (Китай) и провинция Сухэ-Батор (Монголия). Механический состав почвы в исследуемой области был определен с помощью полевого обследования и лабораторного анализа. Классификация текстуры почвы в исследуемой области включает глину, супесок, супесчаный суглинок, песок, суглинок, песчаный суглинок, ил и иловатый суглинок, доля иловатого суглинка и песчаного суглинка значительна — 48 и 25% соответственно. Изменения среднего содержания песка в направлении с юго-востока на северо-запад исследуемой области имеют тенденцию к снижению, в то время как содержание глины увеличивается, а среднее содержание ила немного повышается. В Уземчинском районе исследуемой области содержание песка и глины имеет тенденцию к увеличению на всех слоях почвы, в то время как содержание ила снижается. Однако в Сухэ-Баторском районе эти показатели относительно стабильны. Таким образом, качество механического состава почвы в исследуемой области Монголии лучше, чем во Внутренней Монголии. Однако, несмотря на схожие природные условия в двух регионах, необходимо проанализировать причину различий в тенденции изменения почвы исследуемой области Сухэ-Батора (Монголия) и Уземчина (Внутренняя Монголия).
Ключевые слова: механический состав почвы, степная зона, Монгольское плато, Монголия, Внутренняя Монголия в Китае.

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