

Matrilineal composition of the reconstructed stock of the Szekler Horse breed

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Conformation of Szekler horse breed

Body measurement data (height at withers recorded by stick and tape, hearth girth, cannon girth) were recorded in 2014 in Szekler Land (13 mares and 5 stallions) [5] following Hankó's survey published in 1943 [2], which served as a basis for comparison.

In addition, the three body indices were calculated as it follows:

Calculation of body indices:

Tension-I (Spannung-I) = heart girth – height at withers (by stick)

Tension-III (Spannung-III) = [height at withers (by tape) – height at withers (by stick)]*100

Cannon bone load = [cannon girth / heart girth]*1000.

Then the data were adjusted for 7 years of age and a hierarchical general linear model (sex nested in investigation) was applied for processing.

The breed in adult age has a height at the withers (by stick) of 135-140, a hearth girth of 165-172, and a cannon girth of 18-19 cm. As a result of the comparative analysis for conformation, it can be said that there is no statistically significant difference between the two studied herds (investigations) - neither in terms of body measurements (Supplement B Table 1) nor body indices (Supplement B Table 2) that means that the herd selected as the basis for rescue can be considered identical to the previous Szekler horse in terms of conformation. So we can see a Szekler horse like the one that he found, and we can still keep the habitus of the Szekler horse and regenerate its herd.

Table S1. Body measurements adjusted for 7 years of age (in cm) ([6]

Traits	n	Investigation	Sex	LSM	SEM
Height at withers (by stick)	5	Hankó	stallion	135.4	1.76
	13	Hankó	mare	137.6	1.09
	2	Ficsor	stallion	140.0	2.78
	80	Ficsor	mare	135.2	0.44
p-value/overall mean	100	0.537	0.141	137.1	1.52
Heart girth	5	Hankó	stallion	165.5	3.30
	13	Hankó	mare	172.3	2.05
	2	Ficsor	stallion	168.5	5.22
	80	Ficsor	mare	165.9	0.83
p-value	100	0.604	0.200	168.1	2.85
Cannon girth	5	Hankó	stallion	18.05	0.481
	13	Hankó	mare	18.14	0.298
	2	Ficsor	stallion	19.00	0.760
	80	Ficsor	mare	17.87	0.120
p-value	100	0.476	0.341	18.3	0.42

Table S2. Body indices adjusted for 7 years of age [6]

Traits	n	Investigation	Sex	LSM	SEM
Tension-I (Spannung-I)	5	Hankó	stallion	30.1	3.13
	13	Hankó	mare	34.7	1.94
	2	Ficsor	stallion	28.5	4.95
	80	Ficsor	mare	30.7	0.78
p-value	100	0.372	0.412	31.0	2.70
Tension-III (Spannung-III)	5	Hankó	stallion	122.2	2.38
	13	Hankó	mare	125.2	1.47
	2	Ficsor	stallion	120.4	3.76
	80	Ficsor	mare	122.8	0.59
p-value	100	0.370	0.452	122.7	2.05
Cannon bone load	5	Hankó	stallion	108.9	3.16
	13	Hankó	mare	105.5	1.96
	2	Ficsor	stallion	112.8	5.00
	80	Ficsor	mare	107.9	0.79
p-value	100	0.323	0.407	108.8	2.73

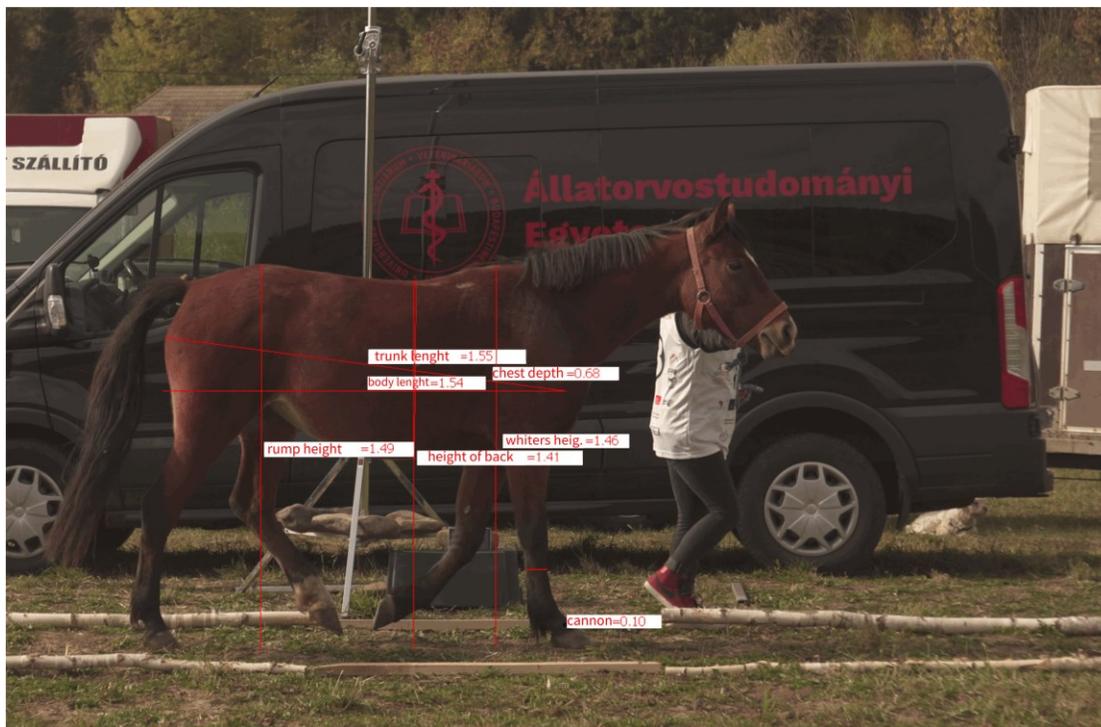


Figure S8. Measuring pictures of VATEM at Kászon from side (1) and above (2) view, 2021

Table S3. Body measurements adjusted (by use of second degree regression) for 7 years of age (in cm) derived from the VATEM method (n=19 mares, P-value shows the age effect on the trait)

Traits	LSM	SEM	P-value
Trunk length	148.2	2.41	0.798
Sacral height	136.5	2.52	0.227
Dorsal height	130.8	2.00	0.224
Withers' height	137.3	2.43	0.146
Chest depth	65.0	0.40	0.101
Shoulder width*	30.7	1.22	0.028
Chest width**	35.8	1.61	0.033
Rump-I	48.2	1.98	0.093
Rump-III	19.2	0.96	0.841
Rump length	31.1	1.39	0.296

*Shoulder width: *distance between the greater tubercle of the left and right humerus bones*

**Chest width: *width of breast measured just behind the elbows*



Figure S9. Szekler mare with foal at Kászontíz (Romania)



Figure S10. Szekler Horses driven in a two-in-hand carriage in Zabola at the Mikes estate (Romania)



Figure S11. Szekler Horse in everyday work in Kászonfeltíz (Romania)



Figure S12. Szekler Horses in forestry work near Csíkszentkirály (screen shot from the movie "Székely lóra székely!" by Dénes Daczó (Romania))

References (numbering according to the main text)

2. Hankó, B. *Székely lovak* (in Hungarian). Nagy Jenő és Fia Könyvnyomdája: Kolozsvár, Magyarország, 1943; p. 26.
5. Bodó, I.; Hecker, W.; Surján, Gy. *A székely ló* (in Hungarian). Pharma Press Nyomdaipari Kft.: Budapest, Magyarország, 2021; pp. 50–53.
6. Ficsor, Cs. A székely ló fajta-regenerálását támogató küllemteni összehasonlító vizsgálat (A comparative study of conformation supporting the breed regeneration of the Szekler horse, in Hungarian). M.Sc. Thesis. Szent István University, Faculty of Agricultural- and Environmental Sciences, Gödöllő, 2016
7. Gáspárdy, A.; Ficsor, Cs.; Simon, L.; Bodó, I. A possible rescue of Székely Horse. The breed “Székely ló” is extinct, but the type “Székely ló” lives on (in remote areas of the Carpathian Mountains). Paper on “*Unrecognised and Isolated Populations of rare Breeds and Varieties*” 9th European Seminar on Agrobiodiversity and Annual Meeting of the SAVE Network, Lake Kerkini National Park, Greece, 11-13 September 2015.
https://www.save-foundation.net/images/konferenzen/2015/Andras_Gaspardy_Szekely_Horse_2015.pdf

Figures S9-S12 courtesy of Mereklye Association.