AN ATTEMPT TO DETERMINE THE RELATION BETWEEN HUCUL HORSES CONFORMATION ASSESSMENT, MOVEMENT AND COURAGE TEST RESULTS PART I. STALLIONS LINE

PRÓBA OKREŚLENIA ZALEŻNOŚCI MIĘDZY OCENĄ POKROJU, RUCHEM A WYNIKAMI PRÓB DZIELNOŚCI KONI HUCULSKICH CZ. I LINIE MĘSKIE

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Abstract

The aim of the studies was an attempt to define dependences between the scores for horses exterior assessment and indicators of movement in walk and trot as well as results for courage test. Exterior assessment is an obligatory test component for Hucul breeds. The assessment covers type, body conformation, movement in walk and trot as well as overall impression and preparedness for exhibition. 116 horses were entered for the 2010 Hucul's championships in Hawlowice and Rudawka for which 348 judges' grades were awarded. The highest grade awarded was for overall impression and preparedness for exhibition while the lowest was for trot movement. Analysis of the various components of conformation showed significant variation between the lines. The tests for courage involved measuring length of steps, their frequency and rate in walk and trot. The length for steps in walk was 15.91m, for frequency was 15.86 steps in 15 seconds, with a rate of 25.08m while for trot it was 22.91m, 24.50 steps and 55.60m respectively. A positive correlation between the scores for components of conformation and length of steps in walk was observed. This tendency was distinctively noticeable in the group of individuals representing the Pietrosu and Hroby stallion lines. Among the group of individuals representing Polan stallion line, however, significant positive correlation was observed between scores for type and rate in trot (0.975; p = 0.025) as well as between scores for conformation and rate in walk (0.993; p = 0.007).

Keywords: Hucul horses, conformation, performance, stallion lines

Streszczenie

Celem przeprowadzonych badań była próba określenia zależności między oceną pokroju, wskaźnikami ruchu w stępie i kłusie oraz wynikami prób dzielności u koni huculskich. W przypadku rasy huculskiej ocena płytowa jest obowiązkowym elementem prób. Ocenie podlegają typ, budowa, ruch w stępie i kłusie oraz wrażenie ogólne i przygotowanie do wystawy. Do championatu huculskiego w Hawłowicach i Rudawce Rymanowskiej w 2010 roku zgłoszono łącznie 116 koni, co dało 348 ocen sędziowskich. Najwyżej oceniono wrażenie ogólne i przygotowanie do wystawy, najniżej zaś ruch w kłusie. Analiza poszczególnych elementów budowy wykazała różnice istotne pomiędzy liniami. Podczas przeprowadzanych prób dzielności użytkowej dokonano pomiarów długości kroków, częstotliwości i tempa w stępie i kłusie. Stwierdzono występowanie dodatnich zależności pomiędzy punktacją za elementy oceny płytowej a długością kroków w stępie. Trend ten był najbardziej wyraźny w grupie osobników reprezentujących linię ogiera Hroby i Pietrosu. W grupie przedstawicieli linii ogiera Polan stwierdzono występowanie istotnych dodatnich zależności pomiędzy oceną typu a tempem w kłusie (0,975; p=0,025) oraz oceną budowy a tempem w stępie (0,993; p=0,007).

Słowa kluczowe: konie huculskie, pokrój, użytkowość, linie męskie Detailed abstract

Detailed abstract

Badaniami objęto 116 koni huculskich uczestniczących w próbach dzielności w Hawłowicach i Rudawce Rymanowskiej w 2010 roku. Obowiązkowa ocena płytowa (tzw. championat hodowlany) polegała na ocenie typu, budowy, ruchu w stępie i kłusie oraz wrażenia ogólnego i przygotowania do wystawy przez trzech niezależnych sędziów. Ścieżka do zasadniczej próby dzielności składała się z 16, eliminacyjna 22 przeszkód naturalnych lub sztucznych, zgodnie z obowiązującym Regulaminem. Ocenie podlegało prawidłowe pokonanie przeszkód w określonej normie czasu. Każdy koń mógł uzyskać maksymalnie 130pkt (50pkt za ocenę pokroju i 80pkt za próbę terenową). Podczas przeprowadzanych prób dzielności dokonano także oceny wskaźników ruchu: pomiaru długości kroków – odległość w m odcinka drogi, na których koń wykonał 10 kroków, częstotliwości kroków – ilość wykonanych przez konia kroków w czasie 15s; tempa - ilość przebytych przez konia metrów drogi w czasie 15 s, w stępie i kłusie. Dla każdego osobnika dokonano po 2 pomiary.

Analizując wyniki oceny poszczególnych elementów budowy z uwzględnieniem przynależności genealogicznej można zauważyć, iż w odniesieniu do typu najwyżej oceniono osobniki reprezentujące linię ogiera Prislop. Konie z linii ogiera Hroby uzyskały najwyższą punktację za budowę, zaś za stęp i kłus przedstawiciele linii ogiera Pietrosu. W przypadku oceny typu, budowy, ruchu w stępie i kłusie stwierdzono występowanie statystycznie istotnych różnic pomiędzy grupami reprezentującymi poszczególnie linie męskie. Długość 10 kroków w stępie wynosiła średnio 15,91 ±1,56m, częstotliwość (w czasie 15 s) - 15,86±1,95 kroków, zaś tempo

25,08 ±3,14 . Wskaźniki dla kłusa wynosiły odpowiednio: 22,91±3,37 m; 24,50 ±4,41 kroków i 55,60 ±11,52. Analizując dane dotyczące wszystkich koni stwierdzono występowanie dodatnich zależności pomiędzy punktacją za elementy oceny płytowej (budowę, stęp, kłus i ogólne wrażenie) a długością kroków w stępie. Najbardziej wyraźnie trend ten zaznaczył się w grupie osobników reprezentujących linię ogiera Hroby i Pietrosu, natomiast nie znalazł potwierdzenia wśród przedstawicieli linii ogiera Gurgul, Goral (w odniesieniu do stępa, kłusa i ogólnego wrażenia) oraz ogiera Polan.

Introduction

Hucul's horses have become one of the most popular breeds exploited as saddled horses in mountain tourism and enjoy great enthusiasm among lovers of other recreational ride forms. They have also, due to their characteristic traits, become equally valuable beyond their naturally typical mountain regions [Brzeski et. el, 1995; Krzemień and Kario, 1991, Purzyc, 2007]. This has been the outcome of intensive promotional activities for the breed that incorporates testing for courage and utility which is obligatory for individuals covered by the Genetic Resources Protection Programme and reproductive stallions [Tomczyk-Wrona, 2008; Breeding Programme,… 2007]. One of the primary aims in Hucul horse breeding is, apart from monitoring its utility values, the meticulous preservation of its specific, primitive breed traits [Mihok, 1996; Purzyc, 2007; Komosa and Purzyc, 2009]. The fact that increasing individuals are being reared in lowlands can become a threat to the exterior qualities of a typical mountain horse. This constitutes a danger for traits loss that have been established the centuries by severe living conditions. The Genetic Resources Preservation Programme presumes improvements on recreational utility related traits (i.e., movement) without any major changes to type, hence the search for links between exterior traits and utility value has become very important [Brzeski et el, 1995; Komosa and Purzyc, 2009; Tomczyk-Wrona, 2010].

The aim of the study was an attempt to ascertain dependencies between the results of conformation assessment and indicators of movement in walk and trot including results in courage tests, taking their stallion lines into consideration.

Materials and methods

116 Hucul horses participating in the 2010 courage tests in Hawlowice and Rudawka Rymanowska constitute the research material. The main test of courage covers the assessment of Hucul's conformation and path. To pass these tests the mares should have obtained at least 85 points and the stallions scoring 95 points. The eligibility of horses for Genetic Resources Protection Programme is based on these results. The path elimination test, however, is a utility value test for individuals over 4 years of age.

Evaluation of the conformation, i.e., breed championship, involves assessing the type, body conformation, movement in walk and trot including overall impression and preparedness for exhibition by 3 independent judges. A horse could score up to 10 points for each of the elements totaling a maximum of 50 points. The final score is the average of marks awarded by each of the judges. The path for the courage tests consists of 16 eliminations with 22 natural or artificial obstacles as contained in the regulations. The propriety of overcoming the obstacle within a given time space is assessed by a Panel of Judges. The achievable rate is from 140 to 220m/ minute depending on the landscape, type of subsoil and weather conditions. The maximum attainable number of points for completing the Hucul's path is 80 points.

Movement was also assessed while the tests for courage were being undertaken. Measurement of step distances was also carried out i.e., distance in meters covered by the horse in taking 10 steps, frequency of steps – number of steps made by the horse in 15 seconds, rate – distance in meters of road covered by the horse in 15 seconds in walk and trot (using the Brzeski et al. 1995 methodology). Two measurements were carried out for each individual.

The results so collated were analyzed using the Statistica 9.0 program. The significance of difference between groups was estimated using the Tukey test. The co-efficient of correlation between elements for exterior assessment and length of steps, frequency, rate in walk and trot including results of tests for courage was calculated taking their stallion lines into consideration.

Results

The conformation assessment for Hucul horses implemented in championship breeding is crucial if each individual is to fulfill the required standards for breeds. The average grades awarded each horse by three independent judges are summarized in Table 1. A total of 116 individuals, including 18 stallions and 98 mares, representing 7 stallion lines bred in Poland and Hungary were presented for assessment giving a total sum of 348 judges' grades for type, body conformation, walk, trot and overall impression as well as preparedness for exhibition. The highest rating was decisively for preparedness for exhibition for which the horses presented obtained on the average 8.47±0.45 points. It is worthy of note that this factor is not directly connected with body conformation but rather with the breeders meticulousness. Average score for type was 8.13±0.56 points while movement in trot by the horses was scored the lowest, 7.77±0.50 points. In analyzing the results for assessment of elements of body conformation taking into consideration their genealogical affinity, it can be noticed that individuals representing Prislop stallion line were scored highest in respect of type. Horses from the Hroby stallion line received the highest points for body conformation while the highest for walk and trot went to representatives of Pietrosu stallion line. Statistically significant differences were observed between groups representing various stallion lines with regards to type, body conformation, movement in walk and trot (Table 1).

Table 1. Hucul horses conformation assessment during courage tests

Stallion lines	Number		Conformation assessment elements											
			Type		Conformation		Walk		Trot		Overall impression		General assessment	
	horses	rates	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Hroby	37	111	8.27 ab	0.48	7.97abc AB	0.44	7.80a	0.59	7.79	0.49	8.58	0.50	40.42	1.78
Pietrosu	9	27	8.07	0.43	7.57a	0.51	8.26abcde AB	0.47	7.98	0.53	8.56	0.38	40.44	1.79
Gurgul	24	72	8.29cd A	0.66	7.76	0.56	7.96	0.43	7.92a A	0.47	8.52	0.47	40.45	2.07
Ousor	20	60	7.97ac	0.53	7.61 b A	0.36	7.78 b A	0.56	7.60a A	0.57	8.34	0.37	39.30	1.79
Goral	16	48	7.90bdA	0.62	7.71	0.51	7.71 c B	0.29	7.79	0.40	8.33	0.40	39.44	1.48
Polan	5	15	7.97	0.48	7.33 c B	0.24	7.63 d	0.44	7.50	0.38	8.17	0.24	38.60	1.01
Prislop	1	3	8.33	0.29	7.83	0.29	7.50	0.0	7.00	0.0	8.17	0.29	38.83	0.0
Foreign	4	12	7.87	0.43	7.75	0.26	7.58 e	0.19	7.46	0.14	8.50	0.21	39.16	0.77
General	116	348	8.13	0.56	7.76	0.49	7.83	0.51	7.77	0.50	8.47	0.45	39.97	1.82

Mean indicated by the same small letters differ significantly when $P \leq 0.05$; capital letters when $P \leq 0.01$

Table 2. Hucul horses movement assessment during courage test at walk and trot

Stallion lines	Measurement no	Walk						Trot					
		10 steps length (m)		Steps frequency (no/15s)		Rate (m/15s)		10 steps length (m)		Steps frequency (no/15s)		Rate (m/15s)	
	n	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Hroby	74	15.70	1.73	15.80	1.65	24.77	3.39	22.78	3.25	24.46	4.56	55.32	11.77
Pietrosu	18	16.54	1.44	15.29	1.73	25.16	2.47	24.52	3.59	23.45	5.53	56.81	14.22
Gurgul	48	15.77	1.52	15.98	2.11	25.08	3.52	23.33	3.67	25.00	4.85	57.84	12.68
Ousor	40	15.94	1.29	16.21	2.34	25.52	2.96	21.82	2.12	24.73	3.37	53.91	8.40
Goral	32	16.40	1.49	15.28	1.64	24.96	2.68	23.68	4.09	23.92	4.25	55.37	12.05
Polan	10	15.40	2.00	15.85	2.44	24.07	2.60	23.05	2.94	23.96	5.61	54.83	13.60
Prislop	2	15.38	0.00	15.27	2.45	23.49	3.76	18.33	2.36	26.94	0.05	49.40	6.44
Foreign	8	15.78	1.32	17.50	1.66	27.53	2.48	21.46	2.59	25.60	1.97	54.80	6.52
General	232	15.91	1.56	15.86	1.95	25.08	3.14	22.91	3.37	24.50	4.41	55.60	11.52

Movement indicators for the Hucul horses evaluated are presented in Table 2. The length of 10 steps in walk averaged 15.91 ±1.56 m, frequency measured in 15 seconds was 15.86±1.95 steps while that for rate was 25.08 ±3.14. The corresponding indicators for trot was 22.91±3.37 m, 24.50±4.41 steps and 55.60 ±11.52. There were no statistically significant differences observed in the stores obtained by representatives of various genealogical lines (Table 2).

Table 3. Correlation between body conformation and Hucul horses movement and courage tests results

Trait	Walk			Trot			Test points	Test results
Stallion lines	Steps length	Steps frequency	Rate	Steps length	Steps frequency	Rate		
general								
Type	0.032 p=0.755	0.221* p=0.029	0.247* p=0.015	0.123 p=0.232	0.173 p=0.090	0.230* p=0.024	0.016 p=0.878	0.029 p=0.780
Conformation	0.102 p=0.321	0.104 p=0.311	0.184 p=0.072	0.145 p=0.156	0.051 p=0.619	0.134 p=0.191	0.051 p=0.622	0.113 p=0.271
Walk	0.546** p=0.000	-0.233* p=0.022	0.120 p=0.241	0.153 p=0.134	0.009 p=0.933	0.115 p=0.264	0.057 p=0.580	0.138 p=0.178
Trot	0.213* p=0.036	-0.192 p=0.059	-0.046 p=0.655	0.091 p=0.373	-0.141 p=0.169	-0.050 p=0.625	-0.125 p=0.222	0.036 p=0.727
Overall impression	0.211* p=0.038	0.019 p=0.849	0.156 p=0.126	0.005 p=0.961	0.204* p=0.046	0.184 p=0.071	0.167 p=0.101	0.088 p=0.392
General assessment	0.267** p=0.008	-0.034 p=0.737	0.154 p=0.132	0.115 p=0.264	0.073 p=0.479	0.142 p=0.165	0.081 p=0.430	0.118 p=0.249
Hroby								
Type	-0.051 p=0.794	0.470* p=0.010	0.418* p=0.024	0.187 p=0.332	0.251 p=0.189	0.351 p=0.062	0.414* p=0.026	0.135 p=0.485
Conformation	0.090 p=0.644	0.238 p=0.214	0.299 p=0.115	0.365 p=0.051	0.109 p=0.572	0.300 p=0.114	0.204 p=0.289	0.143 p=0.460
Walk	0.732** p=0.000	-0.036 p=0.851	0.523** p=0.004	0.389* p=0.037	0.310 p=0.102	0.528** p=0.003	0.265 p=0.165	0.223 p=0.246
Trot	0.415* p=0.025	0.049 p=0.802	0.337 p=0.074	0.309 p=0.103	-0.060 p=0.757	0.157 p=0.415	0.277 p=0.146	0.214 p=0.264
Overall impression	0.455* p=0.013	0.116 p=0.549	0.455* p=0.013	0.213 p=0.268	0.304 p=0.109	0.422* p=0.023	0.414* p=0.026	0.202 p=0.294
General assessment	0.404* p=0.030	0.170 p=0.377	0.475** p=0.009	0.330 p=0.081	0.263 p=0.168	0.449* p=0.014	0.451* p=0.014	0.292 p=0.124

*difference statistically significant *at P ≤ 0.05; ** at P ≤ 0.01

In order to ascertain any eventual dependency between the graded elements of conformation, movement indicators and results in Hucul's path and courage tests a co-efficient of correlation was calculated and presented in Table 3. In analyzing the data about all the horses a positive dependence was observed between the grades for elements of exterior assessment i.e., body conformation, walk, trot and overall impression, and length of steps in walk. This tendency was most evident in group of individuals representing Hroby and Pietrosu stallion lines while this was lacking among representatives of Gurgul and Goral stallion lines (in respect of walk, trot and overall impression) as well as in Polan stallions (Table 3).

When the stallion lines affinity was taken into consideration, higher values of co-efficient of correlation were observed in individuals representing Hroby line. The most occurring significant as well as highly significant correlations were also observed among representatives of this line. The existence of negative dependence between grades for each element of conformation and points obtained in tests of courage was noted in horses from the Pietrosu line. This tendency was also observed in the final test of courage in the group from Ousor stallion line.

A high positive dependency was obtained for horses from the Polan stallion line in respect of grades between body conformation and rate in walk and number of points obtained in path as well as between grades for type and rate in trot (Table 3). It should equally be noted that individuals representing this line not only received the lowest score during the exterior assessment (Table 1) but also displayed the shortest length of steps in walk (Table 2).

Continuation of Table 3. Correlation between body conformation and Hucul horses movement and courage tests results

Trait	Walk			Trot			Test points	Test results
Stallions line	Steps length	Steps frequency	Rate	Steps length	Steps frequency	Rate		
Ousor								
Type	-0.013 p=0.961	0.332 p=0.192	0.386 p=0.126	-0.065 p=0.803	0.025 p=0.924	-0.008 p=0.977	-0.469 p=0.058	-0.598* p=0.011
Conformation	-0.121 p=0.645	0.102 p=0.695	0.083 p=0.751	0.011 p=0.966	-0.154 p=0.555	-0.124 p=0.635	0.139 p=0.595	-0.026 p=0.921
Walk	0.607 ** p=0.010	-0.302 p=239	-0.031 p=0.905	-0.208 p=0.422	-0.249 p=0.335	-0.330 p=0.195	-0.323 p=0.206	-0.187 p=0.471
Trot	0.262 p=0.310	-0.176 p=0.498	-0.044 p=0.866	-0.179 p=0.491	-0.238 p=0.357	-0.320 p=0.211	-0.565* p=0.018	-0.297 p=0.246
Overall impression	0.143 p=0.583	-0.030 p=0.909	0.015 p=0.955	-0.136 p=0.604	0.229 p=0.376	0.121 p=0.643	-0.257 p=0.319	-0.254 p=0.324
General assessment	0.255 p=0.323	-0.039 p=0.881	0.126 0.629	-0.092 p=0.725	-0.147 p=0.574	-0.179 p=0.491	-0.379 p=0.134	-0.383 p=0.129
Goral								
Type	0.081 p=0.801	0.438 p=0.154	0.398 p=0.201	-0.021 p=0.948	0.615* p=0.033	0.517 p=0.085	-0.189 p=0.557	-0.296 p=0.349
Conformation	-0.124 p=0.700	0.505 p=0.094	0.340 p=0.280	-0.073 p=0.822	0.545 p=0.067	0.416 p=0.178	-0.310 p=0.326	-0.455 p=0.137
Walk	-0.233 p=0.466	-0.0855 p=0.792	-0.187 p=0.561	0.056 p=0.862	-0.179 p=0.579	-0.084 p=0.796	0.196 p=0.541	0.317 p=0.315
Trot	-0.157 p=0.627	-0.476 p=0.118	-0.475 p=0.119	-0.099 p=0.760	-0.482 p=0.113	-0.422 p=0.171	-0.317 p=0.315	-0.058 p=0.857
Overall impression	-0.366 p=0.242	0.333 p=0.289	0.076 p=0.815	-0.090 p=0.781	0.260 p=0.414	0.172 p=0.594	-0.093 p=0.774	-0.215 p=0.502
General assessment	-0.176 p=0.585	0.404 p=0.193	0.234 p=0.464	-0.125 p=0.700	0.457 p=0.135	0.312 p=0.324	-0.101 p=0.756	-0.242 p=0.448

*difference statistically significant *at P ≤ 0.05; ** at P ≤ 0.01

Continuation of Table 3. Correlation between body conformation and Hucul horses movement and courage tests results

Trait	Walk			Trot			Test points	Test results
Stallions line	Steps length	Steps frequency	Rate	Steps length	Steps frequency	Rate		
Polan								
Type	-0.698 p=0.302	0.738 p=0.262	0.672 p=0.328	-0.085 p=0.915	0.867 p=0.133	0.975* p=0.025	0.384 p=0.616	-0.927 p=0.073
Conformation	-0.713 p=0.287	0.873 p=0.127	0.993 ** p=0.007	-0.863 p=0.137	0.906 p=0.094	0.740 p=0.260	0.961* p=0.039	-0.256 p=0.724
Walk	0.890 p=0.110	-0.836 p=0.164	-0.615 0.385	0.077 p=0.923	-0.769 p=0.231	-0.865 p=0.136	-0.423 p=0.575	0.923 p=0.077
Trot	0.000 p=1.00	-0.051 p=0.949	-0.097 p=0.903	-0.438 p=0.562	-0.384 p=0.616	-0.602 0.398	0.272 p=0.728	0.715 p=0.285
Overall impression	0.161 p=0.839	0.107 p=0.893	0.512 p=0.488	-0.705 p=0.295	0.377 p=0.623	0.183 p=0.817	0.512 p=0.488	0.365 p=0.635
General assessment	0.607 p=0.393	-0.446 p=0.554	-0.113 p=0.887	-0.438 p=0.562	-0.346 p=0.653	-0.561 p=0.439	0.091 p=0.909	0.914 p=0.086
Pietrosu								
Type	0.688 p=0.059	0.125 p=769	0.463 p=0.248	0.586 p=0.127	0.444 p=0.270	0.602 p=0.114	-0.793* p=0.019	0.113 p=0.790
Conformation	0.617 p=0.103	-0.514 p=0.193	-0.088 p=0.835	0.310 p=0.455	-0.127 p=0.765	0.084 p=0.844	-0.457 p=0.255	0.542 p=0.165
Walk	0.694 P=0.056	-0.523 p=0.184	-0.060 p=0.887	0.125 p=0.767	-0.036 p=0.933	0.044 p=0.917	-0.258 p=0.537	0.308 p=0.458
Trot	0.805* p=0.016	-0.452 p=0.260	0.054 p=0.899	0.339 p=0.411	0.111 p=0.794	0.259 p=0.536	-0.416 p=0.305	0.202 p=0.631
Overall impression	0.745* p=0.034	0.296 p=0.477	0.639 p=0.088	0.173 p=683	0.467 p=0.243	0.435 p=0.281	-0.321 p=0.439	0.388 p=0.343
General assessment	0.805* p=0.016	-0.316 p=0.446	0.173 p=0.681	0.354 p=0.390	0.236 p=0.573	0.364 p=0.376	-0.614 p=0.105	0.337 p=0.414
Gurgul								
Type	0.360 p=0.100	-0.161 p=0.475	0.038 p=0.866	0.249 p=0.263	-0.253 p=0.256	-0.053 p=0.814	0.265 p=0.233	0.324 p=141
Conformation	0.365 p=0.095	-0.015 p=0.947	0.161 p=0.474	0.189 p=0.400	-0.102 p=0.653	0.036 p=875	0.043 p=0.848	0.211 p=0.345
Walk	0.334 p=0.129	-0.347 p=0.114	-0.124 p=0.583	-0.036 p=0.873	-0.272 p=0.221	-0.232 p=0.298	0.222 p=0.321	0.265 p=0.233
Trot	-0.062 p=0.784	-0.343 p=0.118	-0.315 p=0.153	-0.155 p=0.490	-0.159 p=0.479	-0.235 p=0.292	0.047 p=0.835	-0.007 p=0.974
Overall impression	-0.043 p=0.849	-0.179 p=0.426	-0.176 p=0.433	-0.224 p=0.316	-0.059 p=0.796	-0.198 p=0.377	0.258 p=0.247	0.209 p=0.351
General assessment	0.291 p=0.190	-0.250 p=0.261	-0.065 p=0.775	0.049 p=0.827	-0.241 p=0.280	-0.169 p=0.452	0.249 p=0.264	0.341 p=0.121

*difference statistically significant *at P ≤ 0.05; ** at P ≤ 0.01

Discussion

Various authors [Jastrzębska and Tomczak, 2008; Kaproń et al., 2010] have drawn attention to necessity of seeking for methods enabling early assessment of horses' performance disposition. Exterior assessment that evaluates conformation traits and basic gaits ought to reflect exterior accuracy and propriety of movement as well as indicate the linkage with utility. This grade is, indeed a critical binding factor in

describing, licensing, performance tests that are verifiable in horses at maturity [Breeding Programme, 2007].

While a positive dependency between the grade for movement and length of steps in walk (correlation co-efficient value ranging from 0.213 to 0.546) was observed in the group of horses studied, no clear dependency was, however, noticed in respect of current field and courage tests. The researches conducted by Jastrzębska and Tomczak (2008) in respect of connection between biometric and cold-blooded stallion's assessment and courage tests showed significant dependency among individuals from the state stud farms which received marks over 83 points. Kaproń et al. (2010) on the other hand draws attention to the relatively weak bond between exterior assessment and utility of half-blood stallions applied by the Polish Association of Horse Breeders. The afore-mentioned authors have thus proposed a more elaborate assessment that would take into consideration scoring natural movement. Kolstrung and Pierzchała (2008) underscore the fact that it would be purposeful to employ computer image analysis of a horses' movement as an additional means for accurate assessment of the propriety of movement and length of steps.

Komosa and Purzyc (2009) have drawn attention to the characteristic movement, primitive mountain breed with relatively short trunk, short scapula and metatarsus in Hucul horses. These authors demonstrate that Polish Konik horses, when compared with Hucul's, are characterized by being shorter at the withers, but longer scapula. This is of significant importance in terms of movement. Górecka et al, (2003) gave the measurement of step lengths in Polish Konik horses as between 138.2 and 145.1cm in walk and 224.2 and 247.7cm in trot. This result was undoubtedly lower those obtained in our study. The authors have also, in the analyzed group of Polish Konik horses, demonstrated the existence of links between the length of steps in walk and trot and other elements of courage tests.

The studies conducted by Brzeski et al., (1995) on the movement of Hucul horses showed the length of loose step in walk after training to be 7.56m whilst in trot to be 10.37m. Results obtained in our studies were decisively higher i.e., 15.91m and 22.91m respectively. Significantly lower results were, however, observed in respect of frequency of steps in 15 seconds. This fact could signal the loss of Hucul horses' primitive traits perhaps due to intensive saddle exploitation, where focus including selection is on ease of movement as well as increasing number of horses being reared in stud farms located beyond their typical mountain environment. Purzyc (2009) has also, in his assessment, drawn attention to the steady increase of morphometric traits in Hucul horses. Likewise, the abundance and availability of protein rich feed could contribute to changes in biometric indicators with possible consequences parameters of movement.

The analysis revealed a relatively low correlation between conformation assessment and courage test results in Hucul horses. What also seems disturbing is the fact that the movement indicators (length and frequency of steps) observed could imply obvious changes in Hucul horses' typical traits.

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