

Figure S1 : Geographic distribution of the studied Arabian horse populations sampling

Supplementary Table S1. Dam lines of Polish Arabian origin and their known strains

Dam line (year of birth)	Origin	Strain (substrain) <sup>1</sup>
Adjuze db (1869)	Imp from Arabia in 1870 to Tiaret Stud (France)	Kuheilan
Bent-El-Arab db (1880)	Imp from Arabia in 1885 to Babolna Stud (Hungary)	Kuheilan
Ferida db	Imp from Arabia in 1845 to Jarczowce Stud (Poland)	Maanaqy (Sbaili)
Mlecha db	Imp from Arabia in 1845 to Jarczowce Stud (Poland)	Kuheilan (Dajani)
Rodania db (~ 1869)	Imp from Arabia in 1881 to Crabet Park Stud (GB)	Kuheilan (Rodan)
Sahara db ~	Imp from Arabia in 1845 to Jarczowce Stud (Poland)	Kuheilan (Moradi)
Selma db (~1865)	Imp from Arabia in 1894 to Crabbet Park Stud (GB)	Hamdani (Simri)
Semrie db (1896)	Imp from Arabia in 1896 to Babolna Stud (Hungary)	Kuheilan
Scherife db (1896)	Imp from Arabia in 1902 to Babolna Stud (Hungary)	Kuheilan
Milordka (~1816)	Unknown Origin to Slawuta Stud (Poland)	Saqlawi <sup>2</sup>
Wołoszka (~1810)	Unknown Origin to Slawuta Stud (Poland)	Saqlawi <sup>2</sup>
Szamrajówka (~1816)	Unknown Origin to Slawuta Stud (Poland)	Saqlawi <sup>2</sup>
Ukrainka (~ 1815)	Unknown Origin to Slawuta Stud (Poland)	Saqlawi <sup>2</sup>

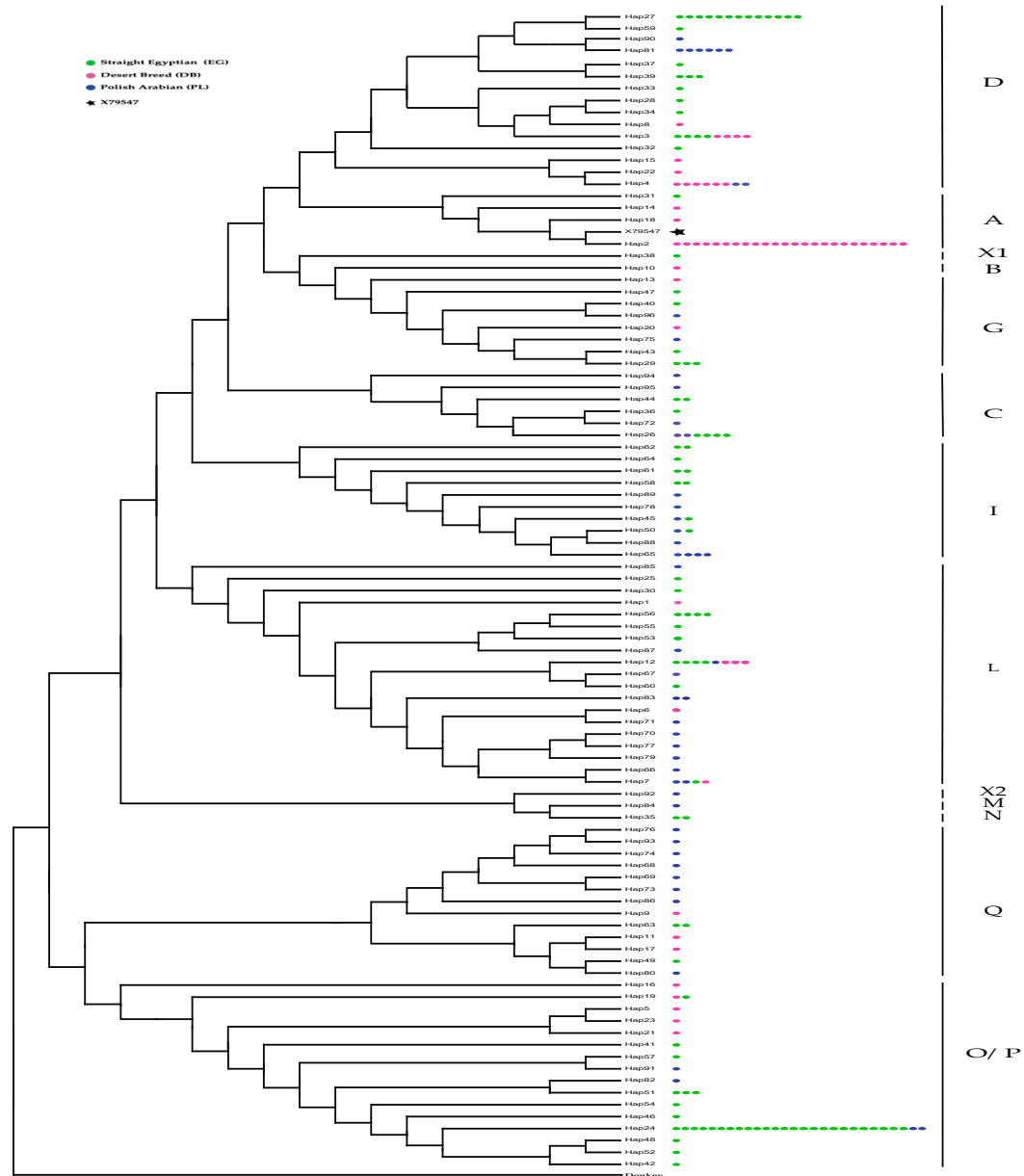
db : desert breed

<sup>1</sup> : Information from studbooks

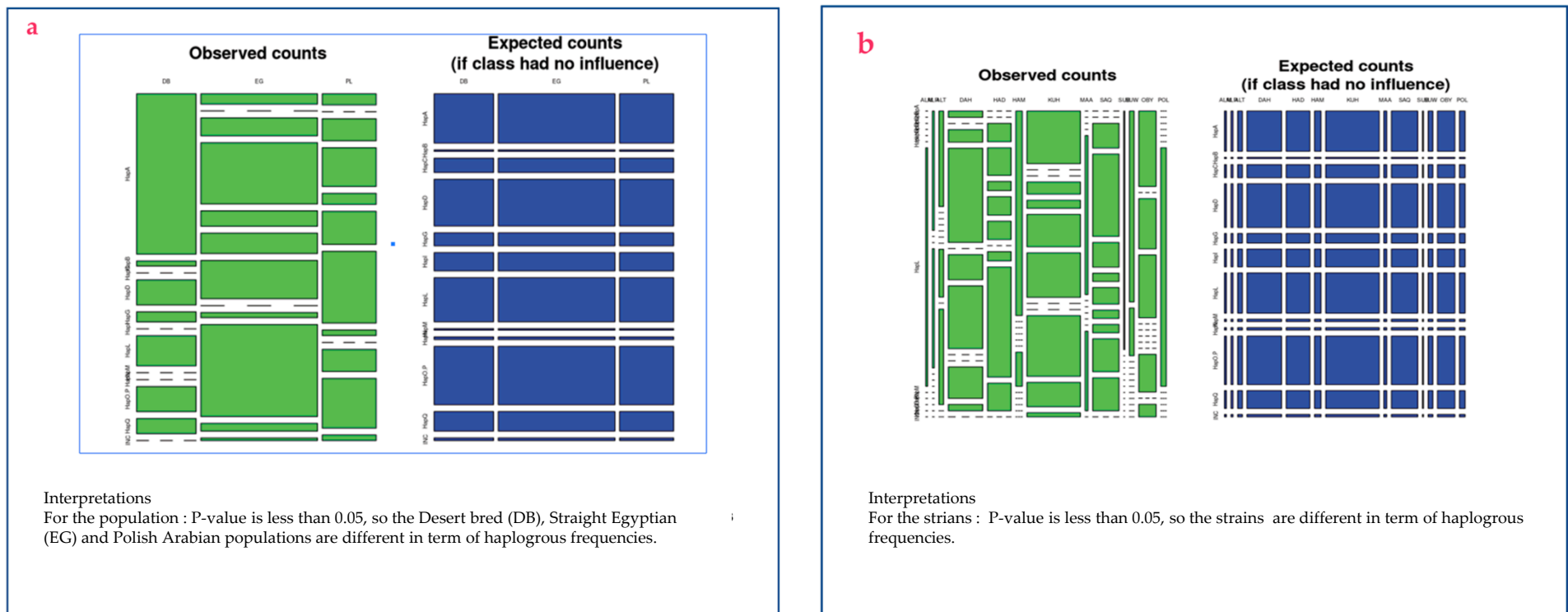
<sup>2</sup> : Strains reported by Skorkowski (1972)

Supplementary Table S2. Arabian horse haplotype sequences of mtDNA D-loop hypervariable region compared to the reference sequence GenBank X79547. Haplotypes are listed according to an order suggested by a neighbor-joining algorithm using MEGA X. Black spot indicate concordance with the X79547 sequence.

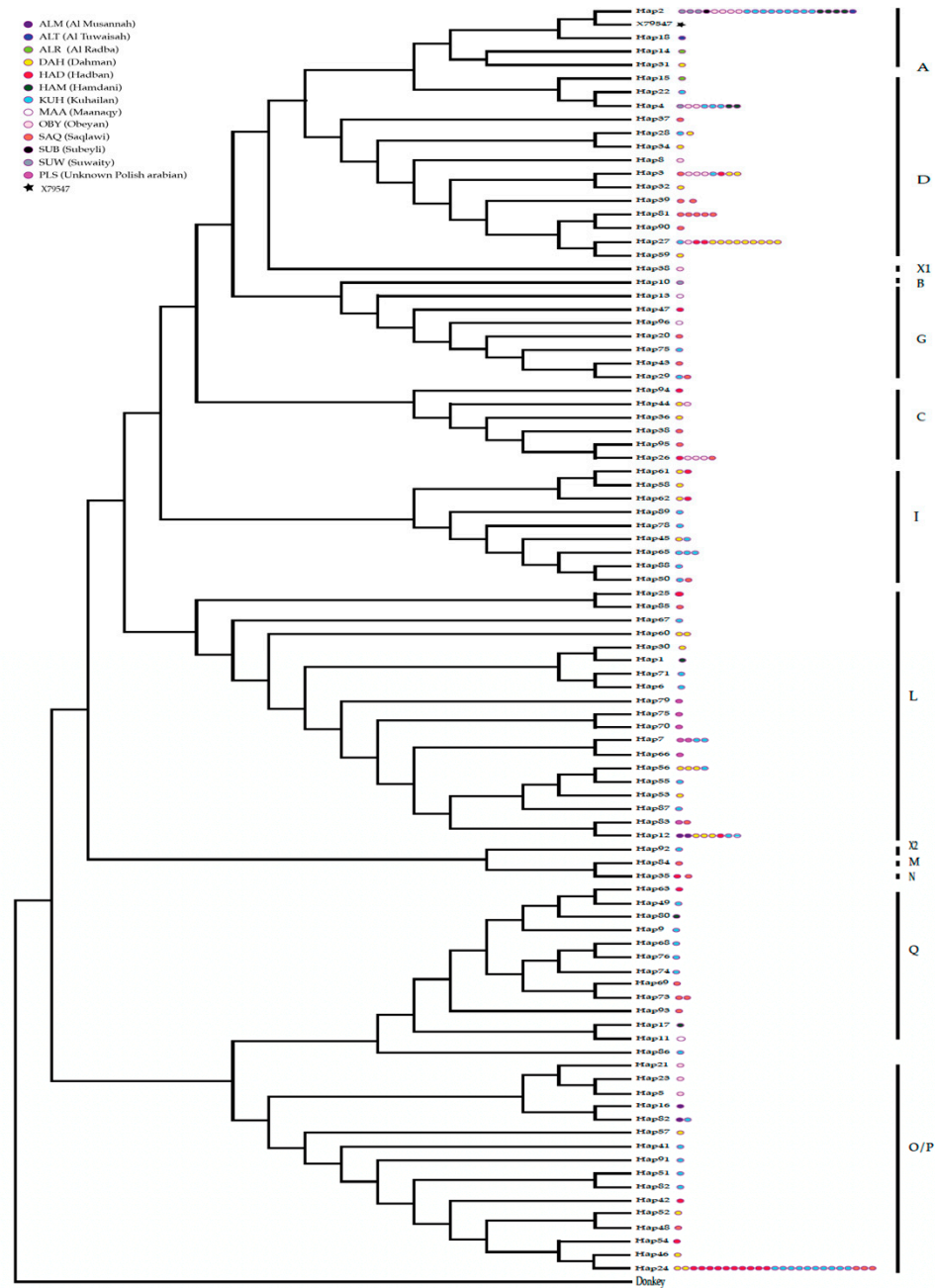
[illegible]



**Supplementary Figure S2 :** Consensus Neighbor-joining tree of 96 mtDNA haplotypes found in arabian horse populations . The tree was drawn based upon 1000 bootstrap replicates and the values were all below 50. The reference donkey sequence nc 0017788 was used as an out-group. The individuals with each haplotype are represented by colored circles depending on population. Populations details are represented in Table 1.



Supplementary Figure S3 : Chi-2 test results of haplogroups among both populations (a) and strains (b)



Supplementary Figure S4 . Consensus Neighbor-joining tree of the 93 mitochondrial haplotypes found in Arabian horses strains. The reference sequence GenBank X79547. The reference donkey sequence nc 0017788 was used as an out-group. The individuals with each haplotype are represented by colored circles depending on strains. The tree was drawn based upon 1000 bootstrap replicates and the values were all below 50.

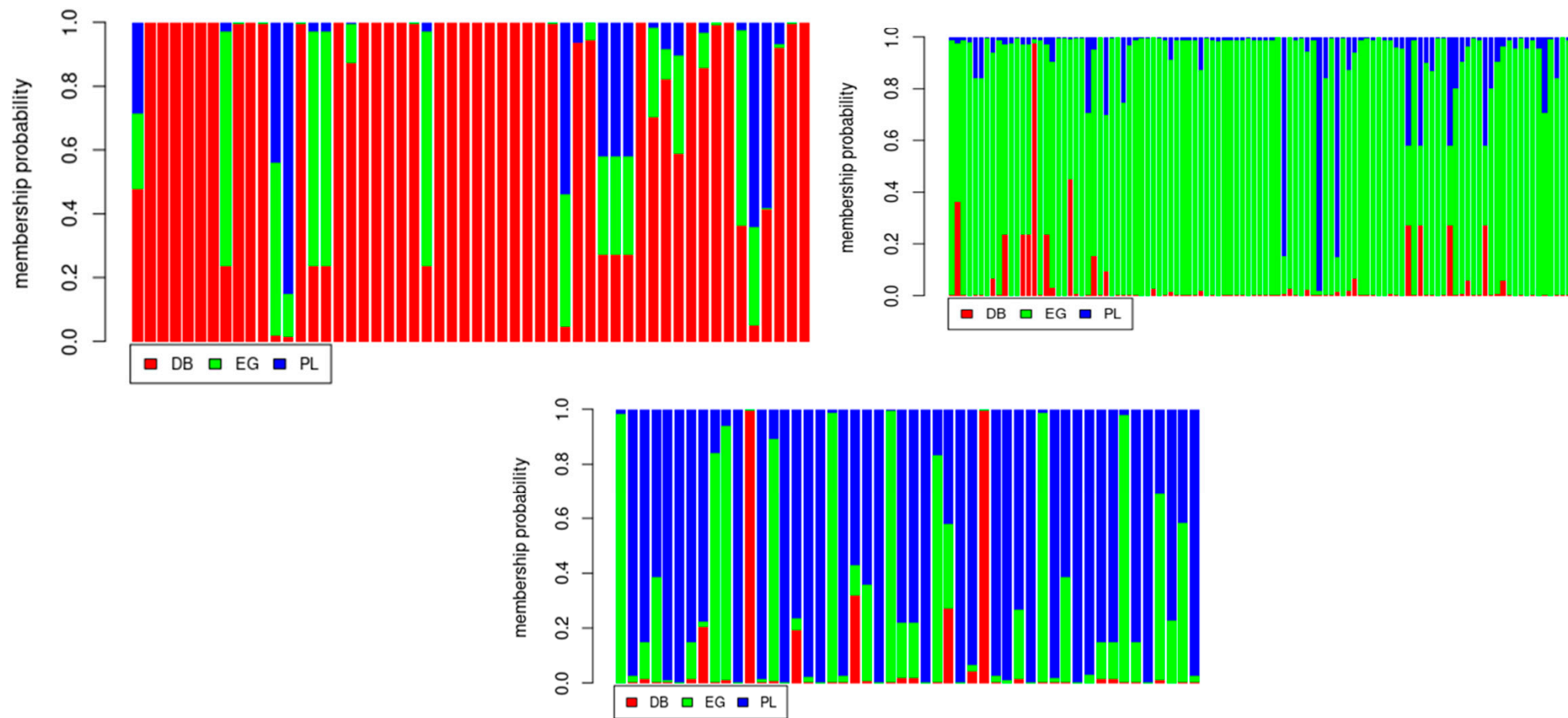


Figure S5: Probability of membership for each individual in the studied populations. Each column is representative of one individual and each population is shown by a separate color.

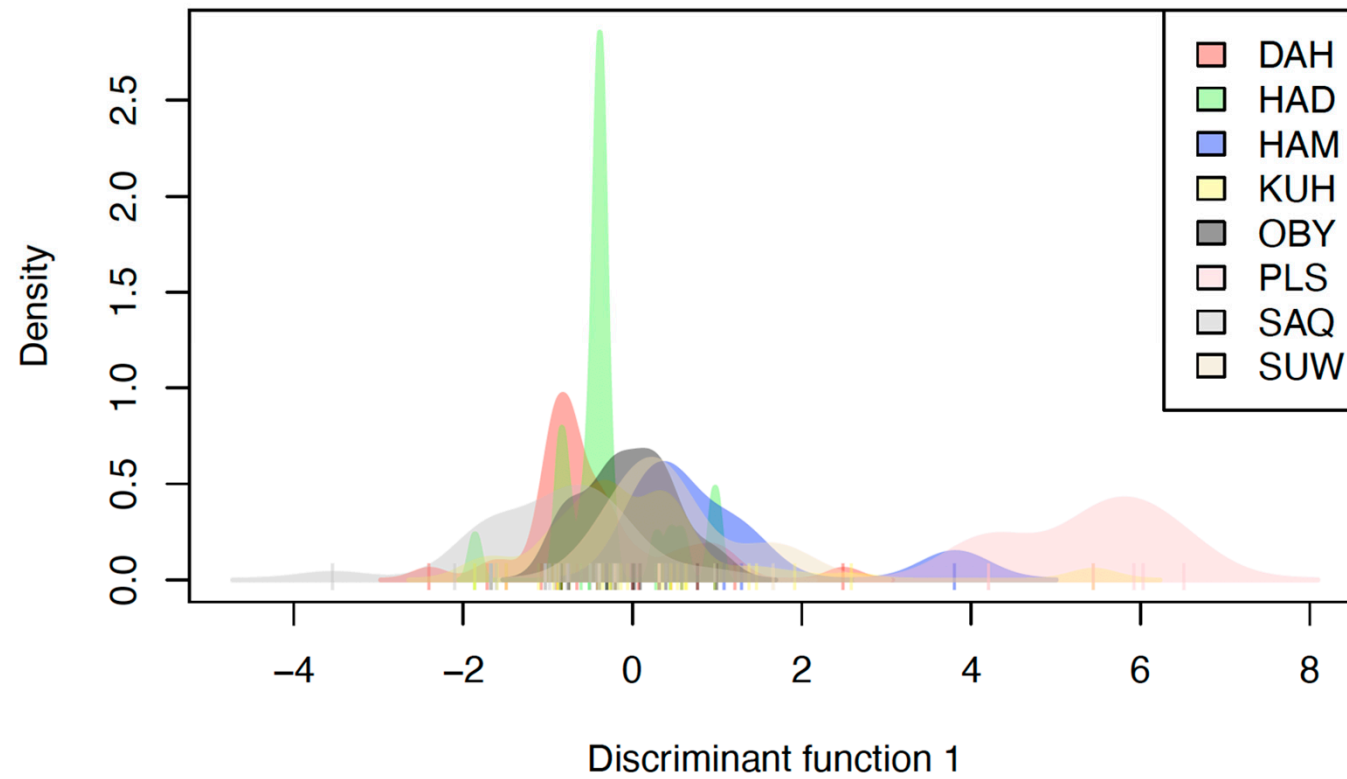


Figure S6: Density plot of Arabian horse strain individuals based on first discriminant function.