

The influence of equine facial dermatoglyphic profiles on English and Irish Thoroughbred (*Equus caballus*) flat racehorse performance ratings

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Introduction Relationships are established between dermatoglyph profiles and temperament, laterality and abnormal behaviour in multiple species. A further relationship between Thoroughbred dermatoglyph profiles and predisposition to exhibit non-ridden stereotypies has recently been demonstrated (Williams, 2009). The British Racing Industry exhibits high wastage of horses contributable to poor performance or injury (McGee, 2006). A non-invasive external indicator of performance could have substantial economic and welfare value. The study aimed to determine if facial dermatoglyph profiles (skin patterning: morphological or topographical parameters of trichoglyphs) would correlate to performance ratings for flat racing in Thoroughbred racehorses to establish their potential as indicators of performance.

Materials and methods The study population comprised English or Irish Thoroughbred horses (*Equus caballus*) (n=21) who were actively engaged in training for flat or National Hunt racing. All subjects included had attained racing post ratings (RPR) for flat racing in the UK and exhibited facial trichoglyphs. Horses presented with a mean age of 6.81 ± 3.28 years, range 3-11 years, variable colour and a gender distribution of 15 (71.43%) geldings and 6 (28.57%) mares. A facial dermatoglyph profile was produced for each horse utilising previously validated methods (Murphy & Arkins, 2008). Individual trichoglyphs (Figure 1) were photographed, by the same experimenter, using a 10.2 mega-pixel Canon 400D digital camera (Adobe Photoshop: version 9.2) to enable remote analysis. Trichoglyph location in respect of vertical and horizontal position was recorded; orientation was identified as clockwise, counter-clockwise or radial. RPR data for the individuals' flat racing performance were collated from the Racing Post website; career best rating was selected to represent optimal performance. RPR interpret confounding variables (weight, distance and handicap) to produce an acknowledged comparable performance rating. The mean RPR for the sample population was calculated (77.52 ± 25.12) and individual RPR were ranked as <average or >average for the purpose of analysis. A series of Kruskal Wallis and Spearman Rank Correlations were performed to identify relationships between facial trichoglyph orientation, trichoglyph location, and trichoglyph orientation and location with RPR for flat racing.

Results Statistical analysis exposed few significant relationships. Trichoglyph position exhibited a positive correlation to less than average RPR ($P=0.001$) in this population. A summary of the results obtained are presented in Table 1.

Table 1 Summary of results

	Spearman Rank Correlation	Kruskal-Wallis
Position: <average RPR	$P=0.001$	$P>0.05$
Position >average RPR	$P>0.05$	$P>0.05$
Orientation <average RPR	$P>0.05$	$P>0.05$
Orientation > average RPR	$P>0.05$	$P>0.05$
Position & Orientation <average RPT	$P>0.05$	$P>0.05$
Position & Orientation >average RPT	$P>0.05$	$P>0.05$

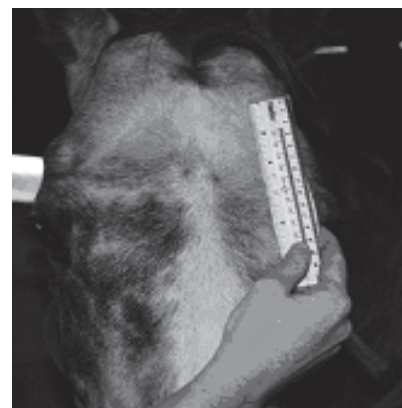


Figure 1 Facial trichoglyph

Conclusion Trichoglyph facial position appears to be a viable external indicator of phenotypic predisposition to poor performance levels in the English and Irish Thoroughbred engaged in flat racing. Further research within a wider population and with consideration to trichoglyph facial position, morphology, orientation and complete dermatoglyph profiles (whole body) is warranted.

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References

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