

Relationship Between Ridge Count and Pattern Intensity Index in Digital Dermatoglyphics Among the Wancho of Arunachal Pradesh, India

M.N. Dutta¹, S. Sengupta¹ and P.R. Goral²

1. Anthropology Department, Dibrugarh University, Dibrugarh 786 004, Assam, India

2. Anthropological Survey of India, Government of India, Calcutta 700 016, West Bengal, India

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ABSTRACT The relationship between pattern intensity index with total finger ridge count and absolute finger ridge counts has been investigated in Wancho, a Mongoloid population of Tirap district, Arunachal Pradesh, India. The results show a stronger linear relationship between pattern intensity index and the absolute finger ridge count than with total finger ridge count.

INTRODUCTION

Various investigators have tried to find relationship between various quantitative (metric) dermatoglyphic traits. Holt (1951) noted that the number of ridge counts on finger tips were highly correlated. Since Glanville and Huizinga's (1966) pioneering work on the relationship between pattern intensity index and total finger ridge count, similar such studies have been reported from different parts of the world. Basu and Namboodiri (1971), Barua (1975), Basu et al. (1978), Kshatriya et al. (1980) have noticed that a linear model give a good fit more particularly in males, while a reverse trend has been observed by Glanville and Huizinga (1966), Malhotra et al. (1979) and in case of female sample by Basu and Namboodiri (1971). Several investigators have also suggested a stronger association between the absolute finger ridge count and pattern intensity index than with total finger ridge count.

The present paper reports the finger dermatoglyphic data on the relationship between total finger ridge count (TFRC), absolute fin-

ger ridge count (AFRC) and pattern intensity index (PII) in Wancho, a Mongoloid population of Arunachal Pradesh.

The Wancho inhabit the south-western part of Tirap district, Arunachal Pradesh which adjoins the Konyak region of Nagaland in the north-eastern part of India. They are believed to be originated from Tangnu and Tsangnu, both in Tuensang district of Nagaland and they have marriage relation with Konyak Naga. The total population of Wancho was 28,642 (in 1971) and in them the number of males exceeds the females (965 females : 1000 males), which however records a substantial decrease from that of 1961 (995 : 1000). The society is organised under the Chief (*Wangham*) and each village has youth dormitory called *Morangs*.

The present sample were collected at random from different educational institutions of Longding sub-divisions of Tirap district, Arunachal Pradesh.

MATERIAL AND METHODS

Rolled finger prints were collected from 85 unrelated Wancho individuals (60 males and 25 females) by using common printers ink and the data were analysed by the methods suggested by Cummins and Midlo (1961). Ridge counting was done after Holt (1949). TFRC is the sum of the single counts on all the ten digits, while computing AFRC, sum of the two counts were taken into consideration, instead of the higher one as in TFRC.

Keeping in view the significant sex difference in earlier investigations, the sexes were treated separately in the present study. Test for equality between correlation coefficient in male and female sample was performed according to Fisher (1925). Linear regression of the form $a+bX$ were fitted to understand whether the regression obtained fitted to the data adequately.

RESULTS AND DISCUSSION

The mean value of PII, TFRC and AFRC with standard errors are shown in table 1. Though in general it is observed that TFRC and AFRC is higher among males, but the female Wancho shows just the opposite trend where values in all the characters is higher than male. In this regard, it may be relevant to be mentioned here that the mean value of TFRC in the Apatani (Jaswal et al., 1986) of Arunachal Pradesh; the Sonowal (Das, 1974), the Khamiyang (Das and Das, 1972) and the Ahom (Das and Banerjee, 1972) of Assam resembles with the later observation. In the present study, the females show less variation (3.2, 18.95, and 81.35 for PII, TFRC and AFRC respectively) than males. The significance test however do not suggest bisexual variation.

The findings of correlation coefficient and regression equation show a high (> 0.8) and significant correlations between the TFRC (5.0% level) and AFRC (at 1.0% level) with PII. In both sexes there is a higher correlation between AFRC and PII ($r=0.900$ in males and $r = 0.875$ in females) than between PII with

TFRC ($r = 0.827$ in males and $r = 0.801$ in females). The value for the difference between the sexes was higher in case of AFRC, PII ($Z = 0.4383$) than between TFRC and PII ($Z = 0.3187$). However, in both cases the value of Z is highly significant (at 1.0% level).

The F values show that in both sexes the linear model give a good fit. In both males and females, the linear relation is highly significant (at 1.0% level) for PII and TFRC in males ($F = 125.50$; d.f. = 1,58) and in females ($F = 41.17$; d.f. = 1,23) and also between PII and AFRC in male sample ($F = 247.26$; d.f. = 1,58) and in female sample ($F = 75.87$; d.f. = 1, 23).

The regression equations and with slope of the linearity for both males and females in case of PII versus TFRC (*i.e.*, $Y = -8.15 + 10.16 X$ and $Y = -0.35 + 9.67 X$) and in case of PII with AFRC (*i.e.*, $Y = -112.72 + 21.42 X$ and $Y = -122.47 + 22.02 X$) show sex differences.

The present finding is in agreement with the results reported by Basu and Namboodiri (1971), Barua (1975), Kshatriya et al. (1980), especially that the relationship between PII and TFRC is linear. Basu and Namboodiri (1971) found that linear regression of TFRC and PII accounted for 75.95 per cent of total variability in males and 68.95 per cent in females. On the other hand, linear regression of AFRC and PII accounted for 87.1 per cent of total variability in males and 83.9 per cent in females. Kshatriya et al. (1980) noted that the regression between TFRC and PII explains 65.84 per cent of total variation, while

Table 1 : Mean values (and standard error) of three finger dermatoglyphic traits among the Wancho

Trait	Male (N = 60) Mean $\pm$ S.E.	Female (N = 25) Mean $\pm$ S.E.	t-values	P lies between
Patter intensity Index	14.82 $\pm$ 0.45	15.80 $\pm$ 0.64	1.26	0.30>P>0.20
Total finger ridge count	142.47 $\pm$ 5.58	152.40 $\pm$ 7.79	1.04	0.30>P>0.20
Absolute finger ridge count	204.78 $\pm$ 10.82	225.36 $\pm$ 16.23	1.05	0.30>P>0.20

d.f. =83

the regression between AFRC and PII accounts for 86.30 per cent of total variation. The present results also confirm the earlier suggestions that compared to TFRC, AFRC shows stronger relationship with PII. Regression of AFRC accounted for a larger part of variation than of TFRC, in all the above mentioned studies, including the present one.

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