

Morphological Characters of Foot Among The Lepcha of Kalimpong, West Bengal

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ABSTRACT This note reports the frequency distribution of digital formulae and other morphological characters of foot among the Lepcha of Kalimpong sub-division, West Bengal.

INTRODUCTION

Foot is an important part of the body, which not only bears weight of the body but also an essential organ for locomotion. Foot has undergone several significant changes through evolutionary processes due to the assumption of erect posture. Environment is also an important factor which can bring about changes in shape and size of foot. Unfortunately, in India, not many researchers till date have shown much interest in studying various morphological characters of human foot from an anthropological point of view.

In the present study an attempt has been made to investigate some morphological characters of foot, like relative length of first and second toes and a few anthropometric traits like length, breadth and hallux divergence angle of foot among the Lepcha, a scheduled tribe of West Bengal. They are having Mongoloid affinities and speak Rong language, which belongs to the Tibeto-Burman family. They also identify themselves as Rongpa, meaning inhabitants (pa) of the valley (rong). The religious beliefs of the Lepcha may be classified into three categories, a) Animism, b) Buddhism, and c) Christianity.

MATERIAL AND METHOD

Data used in the present study were obtained from 90 unrelated Lepchas (45 males, 45 females) of Ngassey village in Kalimpong sub-division of Darjeeling district, West Bengal.

The techniques of collecting contour tracings of foot, followed in the present work, conform in general to those, described by Sarkar (1958). The relative lengths of first and second toes was determined by measuring the length from pterion to acropodion. Following three fold classification of Minami (1952), digital types of the Lepcha have been divided into tibial or type T (1>2), fibular or type F (2>1) and type 0 (1=2).

RESULTS AND DISCUSSION

The prevalence of type T, more particularly in males, and complete absence of type 0 in both sexes of the Lepcha is a remarkable feature (Table 1). However, no significant difference exists in foot types between sexes ($\chi^2 = 1.658$, d.f. = 1, >0.05). Data from other populations of North East India (Table 1) show that the tibial (T) type overwhelmingly predominates in all populations, and it is closely followed by fibular (F) type. The exception is limited only to the male Mikir and female Khasi (Das and Uzir, 1961), among which type 0 changes its sequential position with F type. The frequency of type T is relatively higher among the Boro Kachari, but it occurs in lesser frequency among the Turung. The test of significance reveals that so far as relative length of digits is concerned, the Lepcha in no way resemble the other Mongoloid population of the region.

In male, the Turung have got the highest foot length, while the Khasi, studied by Das and Uzir (1961), show the lowest value. In females, the highest mean value of foot length is noticed among the Ao Naga. Considerable differences are noticed among these populations in respect of foot length. However, variation observed in between male Lepcha and Khasi, and female Lepcha and Rabha, Khasi is not

Table 1 : Types of digital formulae

Population	No. tested	Digital Formulae			Chi-square with Lepcha	Reference
		T	F	O		
Male						
Lepcha	45	73.30	26.70	-	-	Present Study
Mikir	120	80.47	8.75	10.83	25.58*	Das & Das, 1968
Ahom	50	88.00	8.00	4.00	14.66*	Nath, 1976
Kachari	50	82.00	15.00	3.00	6.31*	Nath, 1976
Pati Rabha	100	70.50	15.50	14.00	16.76*	Das & Uzir, 1959
Rangdani Rabha	100	66.50	16.50	17.00	18.99*	Das & Uzir, 1959
Maitori Rabha	100	72.00	17.50	10.50	12.03*	Das & Uzir, 1959
Khamiyang	46	79.34	15.21	5.43	7.97*	Dutta, 1974
Turung	52	62.50	26.92	10.57	10.36*	Dutta, 1974
Mishing	60	83.33	11.67	5.00	11.55*	Sengupta & Chetry, 1997
Boro Kachari	34	88.24	5.88	5.88	15.82*	Sengupta & Chetry, 1997
Ao Naga	137	74.09	17.88	8.03	9.84*	Nath & Das, 1994
Nishi	50	72.00	20.00	8.00	8.12*	Dutta & Bhowmik, 1991
Khasi	134	88.88	7.45	3.73	25.48*	Das, 1980
Khasi	56	87.50	7.14	5.35	18.07*	Das & Uzir, 1961
Female						
Lepcha	45	64.40	35.60	-	-	Present study
Mikir	100	82.50	13.30	3.10	21.07*	Das & Das, 1968
Ahom	50	76.00	17.00	7.00	13.53*	Nath, 1976
Kachari	50	87.00	7.00	6.00	27.38*	Nath, 1976
Pati Rabha	100	72.00	20.00	8.00	13.76*	Das & Uzir, 1959
Rangdani Rabha	100	74.50	19.50	6.00	12.82*	Das & Uzir, 1959
Maitori Rabha	100	71.50	15.50	13.00	23.64*	Das & Uzir, 1959
Khamiyang	49	76.53	15.30	8.16	16.01*	Dutta, 1974
Turung	45	68.88	17.77	13.33	17.47*	Dutta, 1974
Mishing	26	88.46	7.69	3.85	16.16*	Sengupta & Chetry, 1997
Boro Kachari	38	93.42	-	6.58	37.42*	Sengupta & Chetry, 1997
Ao Naga	49	76.53	16.33	7.17	14.20*	Nath & Das, 1994
Nishi	50	73.00	17.00	10.00	15.83*	Dutta & Bhowmik, 1991
Khasi	100	79.50	13.00	7.50	24.42*	Das, 1980
Khasi	62	76.60	8.10	15.30	34.96*	Das & Uzir, 1961

* Significant $P < 0.05$

significant.

The Lepcha show the minimum foot breadth, and the Khasi the maximum value among these populations. This holds good for both sexes. The Lepchas differ significantly from the other Mongoloid populations in respect of this trait (Table 2).

The mean hallux divergence angle is significantly higher in Lepcha males than in the Lepcha females (t value - 9.80, d.f. = 120, >0.05). The t test result shows that the Lepcha differ significantly from several other populations. The exception is noticed that between the Lepcha male and Rabha, Ahom, Mikir and Khasi (Das, 1980) and Lepcha female and Ahom, Kachari as there is no significant difference in this trait.

From the above discussion it appears that in respect of relative length of toes and other metric characters of foot, the Lepcha (both male and female) differ from the other Mongoloid populations of the region. The study also reveals that these morphological characters of foot cannot perhaps be used for taxonomical classification of ethnic groups, though they may be well used in study of population variation.

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Table 2 : Anthropometric characters of foot

Population	No. tested	Foot length Mean±S.E.	Foot breadth Mean±S.E.	Hallux divergence angle Mean±S.E.	Reference
Male					
Lepcha	45	22.99±0.07	9.03±0.05	6.84±0.04	Present Study
Rabha	300	23.97±0.07	9.97±0.05	6.73±0.06	Das & Uzir, 1959
Khamiyang	46	24.26	9.85	6.60	Dutta, 1974
Turung	52	24.70	10.13	6.80	Dutta, 1974
Ahom	50	23.99±0.10	10.20±0.25	6.90±0.05	Nath, 1976
Kachari	50	24.22±0.06	10.22±0.04	6.40±0.16	Nath, 1976
Mikir	120	24.43±0.10	10.14±0.04	6.90±0.10	Das & Das, 1968
Ao Naga	137	23.88±0.09	9.77±0.04	6.26±0.06	Nath & Das, 1994
Abor	42	24.10			Kemp, 1915
Khasi	104	22.81±0.09	10.24±0.04	6.54±0.03	Das, 1980
Khasi	56	23.58±0.11	10.07±0.06	7.00±0.10	Das & Uzir, 1961
Female					
Lepcha	45	22.11±0.06	8.09±0.03	6.35±0.03	Present Study
Rabha	300	22.02±0.07	8.74±0.03	6.59±0.06	Das & Uzir, 1959
Khamiyang	49	22.35	9.00	6.80	Dutta, 1974
Turung	45	22.57	9.20	5.80	Dutta, 1974
Ahom	50	22.54±0.13	9.19±0.05	6.40±0.17	Nath, 1976
Kachari	50	22.52±0.05	9.16±0.07	6.30±0.17	Nath, 1976
Mikir	100	22.63±0.11	9.22±0.05	7.01±0.13	Das & Das, 1968
Ao Naga	49	23.34±0.44	9.21±0.05	6.02±0.12	Nath & Das, 1994
Abor	10	22.80			Kemp, 1915
Khasi	100	22.24±0.09	9.36±0.04	6.97±0.08	Das, 1980
Khasi	62	21.95±0.11	9.37±0.05	7.01±0.11	Das & Uzir, 1961

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