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A comparative study of body composition among tribal inhabitants of Dooars in West Bengal

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Abstract
This study was carried out to know the relationship of body composition among tribal inhabitants of Dooars in West Bengal. For the present study two hundred and forty male ranging between 17 to 23 years from four different Tribes of Dooars, namely Bhutia, Mech, Rabha and Toto were selected as subjects. The subjects were selected randomly from the whole population of four different tribes. To find out the relation and relationship of selected body composition variables the mean and standard deviation were calculated. To find out the relationship least significance difference ANOVA post hoc test were applied at 0.05 level. However, the relationship of fat percentage with BMI was only found to be significant at 0.05 level.

Keywords: Body composition, dooars

Introduction
Indian tribal people play a key part in constructing the cultural heritage of India. They occupy a major part in the history of India as they are considered as the true habitants of India. The tribal people are scattered in different parts of India and they form a considerable number of the population of India. The traditional and cultural distinction of each tribal community has made them distinguishable from each other and their cultural and traditional heritage add colour and variation to the Indian culture as a whole and form a compact culture. Indian tribal people reside in approximately fifteen percent of the country`s area. They primarily live in various ecological and geo-climatic conditions ranging from plains, forests, hills and inaccessible areas that perhaps lie dotted in the panoramic Indian terrain.

We see these differences on the playing field, but they are apparent at the micro level as well. In the mitochondria of cells, the body's powerhouse, oxygen combines with the glucose released by Carbohydrates and, eventually, fats to produce sustained energy. When the body demands quick bursts, it breaks down carbohydrates quickly, if incompletely. At roughly 400 meters, about 40-50 seconds of running for a top athlete, or 100 meters in swimming, the body has depleted much of its anaerobic capacity. That is the point at which anaerobic athletes experience an accumulation of lactic acid, the waste product of the muscles. If physical activity continues past this bio-physiological divide, the body begins to process energy more deliberately. Scientists are definitive in their findings that athletes of West African ancestry are the most anaerobically efficient athletes, East African are the fittest aerobically, and whites fall in the middle. All seem to have certain natural anatomical advantages. Genetics role in athletic performance is a long debated subject. People of a certain race or genetic background seem to perform better ascertain sports than others. It is evolution that is likely responsible for genetics role in athletic performance. This would point to environment as a major factor, not just in short-term or single lifetime terms, but over many generations, for athletic performance. Part of a race or tribe that over many tens of thousands of years has to, out of necessity or need for survival, engage in certain regular behaviors then over time genetics are altered through the process of evolution to more efficiently perform these tasks of necessity. That's the theory anyway, it makes sense but is not entirely proven.

Dooars in Jalpaiguri district of West Bengal is a land of diverse ethnic communities, being a home to different tribal communities and immigrant people from neighboring states and countries; Dooars has a number of distinct languages and Dialects.

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This is also home to aborigines. Their ethnic identity, linguistic plurality, physical variations, food habits, rituals, mores, lineage, ethos all have drawn researchers, both at the national and international levels. Their origin, socio-cultural traits and religious beliefs are documented by anthropologists.

Material and Method

Participant: This study was carried out to compare the body composition among tribal inhabitants of Dooars in West Bengal. For the present study two hundred and forty male ranging between 17 to 23 years from four different Tribes of Dooars, namely Bhutia, Mech, Rabha and Toto were selected as subjects. The subjects were selected randomly from the whole population of four different tribes.

Ethical consideration and procedure In order to avoid ethical issues, all processes, including participant recruitment, research procedures, and methods, were confirmed by the institutional research ethics committee prior to the start of the study. After ethical approval, the parents of each subject were contacted and informed about the study. If they gave consent for the researchers to approach them then, they were asked to set aside 15 min at the beginning of a session. Before the start of test, verbal and written instructions were given.

Measurement of Body Composition: Body fat Percent was measured by the amount of fat in 100 kg. of body weight using digital electronic device. BMI was measured in weight in kilograms / height^2 in meters.

Analysis and interpretation of data the statistical analysis and interpretation of data pertaining to the score of Body composition have been presented below. One way analysis of variance was used to find out whether there are significant differences among the tribes of Bhutia, Mech, Rabha, Toto on selected Body composition variables Whether F value was found to be significant, LSD test was used as post-hoc test to determine which of the pointed mean different significantly. The level of significance was set at 0.05 level.

Table 1: Fat Percentage (%): Mean and SD of Body Composition of Tribal inhabitants of Dooars in West Bengal

Tribe	N	Mean (%)	SD	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Boundary	Upper Boundary		
Bhutia	60	12.65	3.79	.48	11.67	13.63	4.60	25.90
Mech	60	11.03	3.83	.49	10.04	12.02	5.50	20.00
Rabha	60	9.71	4.04	.52	8.66	10.75	4.60	20.80
Toto	60	11.56	3.97	.51	10.53	12.58	5.30	20.60
Total	240	11.24	4.02	.26	10.72	11.75	4.60	25.90

Table 01 shows the mean and standard deviation of the Body composition (Fat Percentage) of the tribal inhabitants of Dooars in North Bengal in which tribes such as Bhutia, Mech, Rabha and Toto of 60 subjects each tribes respectively are considered. The table 01 further reveals the mean and standard deviation of the four tribes in selected Body composition (Fat percentage) are as follows: Fat Percentage: Bhutia (M, 12.65; SD, 3.79), Mech (M, 11.03; SD, 3.83), Rabha (M, 9.71; SD, 4.04) and Toto (M, 11.56; SD, 3.97) respectively.

Table 2: ANOVA of Body composition (Fat Percentage in %) of Tribal inhabitants of Dooars in West Bengal

	Sum of Squares	df	Mean Square	F
Between Groups	268.621	3	89.540	5.853
Within Groups	3610.677	236	15.299	
Total	3879.298	239		

*Significant at 0.05 Level. With df 3 and 239 are 2.64

The above table 02 shows the ANOVA (calculated by IBM, SPSS 20 version) for Body composition (Fat Percentage) among of the tribal inhabitants of Dooars i.e. Bhutia, Mech, Rabha and Toto are as follows: The following obtained 'F' value's for Fat was 5.835. As the obtained 'F' values is greater than the table value of 2.64 with df 3 and 239 required for significance at 0.05 levels. The result of the study shows significant among the tribal groups of Dooars on Fat Percentage. Since the obtained F-ratio is significant on Fat percentage among the four groups. So LSD Post Hoc test was applied to study the significance difference between the paired means of the various groups on Fat percentage and the results are presented in table-03.

Table 3: Paired Mean Differences among the group of Bhutia, Mech, Rabha and Toto tribal inhabitants of Dooars in West Bengal on Fat Percentage (%)

Bhutia	Mech	Rabha	Toto	Mean Difference	Critical Difference
12.65	11.03			1.62*	
12.65		9.71		2.94*	
12.65			11.56	1.09	
	11.03	9.71		1.32	1.40
	11.03		11.56	0.52	
		9.71	11.56	-1.84*	

*The mean difference is significant at 0.05 level.

The table 03 shows the mean difference between Bhutia, Mech, Rabha and Toto tribes for Body composition where the significant differences are mentioned as follows: Fat percentage was found significant between Bhutia and Mech with mean difference 1.61, Bhutia and Rabha, with mean difference 2.94, Rabha and Toto with mean difference 1.84, against the required critical difference of 1.40 at 0.05 level of confidence. Whereas, there is no significance difference between Mech with Toto and Rabha groups.

Table 4: BMI (kg/m^2): Mean and SD of Body Composition of Tribal inhabitants of Dooars in West Bengal

Tribe	N	Mean (%)	SD	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Boundary	Upper Boundary		
Bhutia	60	20.15	2.24	.29	19.57	20.73	16.50	28.00
Mech	60	20.39	2.11	.27	19.84	20.94	14.10	25.10
Rabha	60	20.09	2.00	.25	19.57	20.60	14.10	26.70
Toto	60	20.78	1.88	.24	20.30	21.27	16.70	26.30
Total	240	20.35	2.07	.13	20.09	20.62	14.10	28.00

Table 04 shows the mean and standard deviation of the Body composition (BMI) of the tribal inhabitants of Dooars in which tribes such as Bhutia, Mech, Rabha and Toto of 60 subjects each tribes respectively are considered. The table 04 further reveals the mean and standard deviation of the four tribes in selected Body composition (BMI) are as follows: BMI: Bhutia (BMI: Bhutia (M, 20.15; SD, 2.24), Mech (M, 20.39; SD, 2.11), Rabha (M, 20.09; SD, 2.00) and Toto (M, 20.78; SD, 1.88) respectively.

Table 5: ANOVA of Body composition (Fat Percentage in %) of Tribal inhabitants of Dooars in West Bengal

	Sum of Squares	df	Mean Square	F
Between Groups	17.840	3	5.947	1.389
Within Groups	1010.343	236	4.281	
Total	1028.183	239		

*Significant at 0.05 Level. With df 3 and 239 are 2.64

The above table 05 shows the ANOVA (calculated by IBM, SPSS 20 version) for Body composition (BMI) among of the tribal inhabitants of Dooars i.e. Bhutia, Mech, Rabha and Toto are as follows: The following obtained 'F' value's for BMI was 1.389. As the obtained 'F' values is smaller than the table value of 2.64 with df 3 and 239 required for significance at 0.05 levels. The result of the study shows insignificant among the tribal groups of Dooars on BMI.

Discussion
Fat percentage was found significant between Bhutia - Mech, Bhutia - Rabha and Toto - Rabha. Bhutia's were higher in body fat percentage due to daily intake of high amount fat and protein content in food habits as well as they stay in high altitude area were temperature remains low round the year. To maintain body temperature Bhutia tribe consumes more content of fat and protein daily food. The mean score of BMI in Toto tribe clearly indicates better than Rabha, which means Toto's were greater in fat percentage than Rabha at 0.05 level of significance. The above findings are in consonance with the studies conducted by Bandyopadhyay and Chatttopadhyay (1981) [2]. Bogin and Vean (1981) [3], Chillon et al. (2011) [6], Yamauchi and Umezaki (2005) [5], Adamo et al. (2001) [1], Insignificant results were noted among other tribes.
Body mass index (BMI) was found insignificant between Mech –Toto, Mech - Rabha, Toto –Rabha and Rabha – Bhutia. One end belongs to the lower socioeconomic groups living in rural and remote areas However, difference is observed within the group too due to individual variation (genetic factors) and exposure to different environmental condition. The above results also line with the studies conducted by Davis et al. (2007) [4].

Conclusion
On the basis of the result drawn with the mentioned methodology the following conclusions were soughed out:- There was a Significant result has been found in Fat percentage between Bhutia – Mech, Bhutia - Rabha and Toto – Rabha. Insignificance difference was found between Bhutia – Toto, Mech – Rabha and Mech -Toto. The conclusion of this research work may also be aware the tribal individuals while performing or training any sports activity.

References
1. Adamo SA, Jensen M, Yonger M. Changes in lifetime immunocompetence in male and female gryllus texensis. Tradeoffs between immunity and reproduction. 2001; 62:417-425.
2. Bandyopadhyay B, Chattopadhyay H. Body fat in urban and rural male college students of eastern India. American Journal of Physical Anthropology. 1981; 54:119-122.
3. Bogin BA, Mac Vean RB. Body composition and Nutritional status of urban Guatemalan children of high and low socio economic class. American Journal of Physical Anthropology. 1981; 55:543-551.
4. Davis MM, Gance–Cleveland B, Hassink S, Johnson R, Paradis G, Rosnicow K. Recommendations for prevention of childhood obesity. Pediatrics. 2007-2329E; 120:5229-5253 doi 10.1542/peds
5. Yamauchi T, Umezaki M. Rural-urban migration and changing physical activity among Papua New Guinea highlanders from the prospective of energy expenditure and time use. Environmental science. 2005; 12(3):155-166.
6. Palma Chillon, Kelly Evenson R, Amber Vaughan, Dianne Ward S. A systematic review of interventions for promoting active transportation to school. Online Journal of The International Journal of behavioral nutrition and physical activity. 2011; 14(8):10. Doi:10.1186/1479-5868-8-10.