Chapter VIII
SUMMARY AND CONCLUSION

“Dental anthropology is defined as a study of people (and their close relatives) from the evidence provided by teeth” (Hillson, 1996). Dental anthropology is a subfield of physical anthropology under the broad discipline of anthropology which is concerned with the study of human teeth - one of the anatomical systems of man. One of the main themes of dental anthropology has been a study of variation in size and shape of the teeth, as recorded in casts of living mouths or seen in the skulls of archaeological and fossil collections. Dental anthropology studies the variation in size and shape of the teeth, the development of teeth in relation to age, their appearance in the mouth, and the processes of wear and other changes that occur once they are in place. It also includes the microscopic traces, preserved inside the tissues of the teeth, of the growth and ageing processes. Yet another area of interest is the study of dental diseases in relation to diet and other factors, and the most recent development is the study of the biochemistry of dental tissues (Hillson, 1996).

Dental anthropology is academically located within the human bone biology studies. Its main goal is to recognize attributes in the teeth form which can help us create bicultural dynamics of human populations, specially related to health–illness state, feeding habits and micro evolutionary transformations, related themselves to the ethno genesis of current and ancient times. In Dental anthropology, teeth are used to obtain
information on culture, health, diet, variability and evolutionary trends as well as eruption and dental pathologies in the past and modern populations.

The abundant published literature available on the Southeast Asian, East Asian and Pacific populations demonstrates the existence of similarities and dissimilarities in the distribution of frequencies of different dental characteristics among different populations which are as notable and significant as those that can be encountered in other biogenetic markers such as blood-groups and red cell enzymes, demographics, etc. that greatly render it possible to compare and classify populations. More such work is, however, necessary to substantiate these hypotheses.

Dental anthropology much like those of other subfields of anthropology can be applied to the welfare of the mankind in the areas of dental development, pathology, morphology, forensic deontology and odontometry. The area of dental development can be used in the application of tooth eruption times and calcification standards in the nationwide nutritional survey, in the diagnosis and treatment of children with growth disturbances, in solving a number of orthodontic problems including malocclusion, in the age estimation of skulls of unknown age, in the evaluation of racial differences and primate evolution, in the determination of personal identity or individuality of persons involved in different crimes-accidents-explosions etc. and tooth formation standards based on the study of crown and root development of teeth in clinical assessment of early or late dental maturity.

While the area of dental morphology is generally used in the understanding of biological history and racial classifications of human populations as also in micro-
evolutionary studies, it is necessary to assess the incidence of malocclusion cases in relation to a number of genetic and non-genetic factors to plan and gear up treatment needs. It is urgently needed to undertake carefully planned research investigations into the dental anthropology of the people to obtain and standardize the findings for application to different situations concerning their oral health, forensic and related problems in India in general and Northeast India in particular. Tooth morphology provides few clues as to age, sex, body size, elapsed time since death, etc., so its primary usage is in discerning the ethnic affiliation or race of an individual (Scott and Turner II, 2000).

In the area of dental pathology, dental caries and periodontal disease are the most common oral problems of man. In view of the alarming increase in the prevalence rates of these diseases in the human populations, it is of outmost importance to study these diseases in relation to different demographic, socio-economic, environmental and hereditary factors to delineate standards and levels of health for the public health planner to devise and extend preventive and treatment services to the well-being of one and all.

With this end in view we have undertaken a study on the dental anthropology of the Mizo of Aizawl, Mizoram with the following objectives:

1. To assess the eruption pattern of different types of teeth, both deciduous and permanent, their eruption age and order, in both boys and girls.

2. To record the various morphological patterns of teeth.

3. To assess the prevalence of dental pathology and impact of food habits, including chewing of betel nut, tobacco and smoking on dental health.
4. To find out the relationships of eruption pattern, dental pathology and frequency occurrence of various morphological traits with certain demographic and socio-economic variables such as age, sex, income and education.

The fieldwork for the present study was conducted among the Mizo of Aizawl town, Mizoram. The term ‘Mizo’ is a collective name for the people inhabiting Mizoram, possessing one language, same origin and a common way of life. The Mizos are racially belonging to the Mongoloid stock and linguistically belong to the Tibeto-Burman linguistic group. Etymologically, the word ‘Mizo’ means Hillman. The word is derived from two Mizo words ‘Mi’ and ‘Zo’, means man and hill respectively.

A total of 69 localities in Aizawl town have been identified and listed out. Seven (7) localities were selected from the above 69 localities by adopting systematic sampling method and a house to house survey was conducted. The subjects were drawn only from the Mizo households for collecting data on dental anthropology.

Data were collected on eruption of the deciduous and permanent teeth, dental and oral pathology and dental morphology. All the educational background information of the parents as well as the subjects, their age, occupation, income of the family, the number of family members, food habits and dental care of the subjects was recorded with the help of interview schedule.
The findings of the present study may be briefly summarised as follows:

**Dental eruption**

1. The first deciduous tooth to erupt is the mandibular central incisor in boys, whereas in girls, the central incisor is erupted at the same time in both the jaws.

2. The deciduous teeth completed eruption at 37-42 months of age in both the sexes.

3. The first permanent tooth erupts at 5 years of age, in both boys and girls.

4. Except the third molar, all the permanent teeth completed eruption by 15 years of age, in both the sexes.

5. The third molar starts erupting at 14 years and 15 years of age in females and males respectively.

6. By 24 years of age, more than 50% of the third molars are found erupted in both the jaws and sexes.

7. The median age of eruption is lower in females except in the mandibular canine and first premolar and the maxillary central incisor and second molar, whereas, the maxillary first premolar is erupted at the same time in both the sexes.

8. The eruption of all the permanent teeth except the third molar takes place between the median ages 6.1 (±0.15) years to 12.1 (±0.10) years in males and 5.9 (±0.15 years to 12.2 (±0.20) years in females.
9. The order of eruption of the permanent teeth is as follows:

Male: $M_1 > I_1 > M_1^1 > I_1^1 > I_2 > I_2^1 > P_1 > P_1^1 > C_0 > P_2 > C_0^0 = P_2^2 > M_2^2 > M_3 > M_3^3$

Female: $M_1 = M_1^1 > I_1 > I_1^1 > I_2 > I_2^1 > P_1 > P_1^1 > C_0 > C_0^0 > P_2 > P_2^2 > M_2^2 > M_3 > M_3^3$

**Dental pathology**

10. Prevalence of dental caries was observed earliest at the age group of 13-18 months in both the sexes, where, only mild and moderate forms of caries were recorded.

11. The severe form of caries is first observed at 37-42 months and 43-48 months age groups, in males and females respectively.

12. In both the sexes, the frequency of caries affected found higher in posterior teeth than that of the anterior teeth.

13. Prevalence of dental caries is higher among the illiterates compared to the literate subjects.

14. Prevalence of dental caries is observed highest in the low income group among the Mizo.

15. Prevalence of caries is found to be less among the *kuhva* (betel nut and leaf with lime) chewers, compared to the non-chewers in both the sexes.
16. Difference between the smokers and non-smokers, and tobacco chewers and non-chewers are statistically insignificant in respect of the prevalence of dental caries.

17. The incidence of gingivitis decreases as the age increases till 16-20 years and then gradually increases.

18. No poor form of OHI (DI-S) is observed in the 16-30 years age group in both the sexes.

19. Prevalence of poor form of OHI (CI-S) decreased from 6-10 years to 21-25 years age group and from 6-10 years to 16-20 years age group in males and females respectively, and then again increases with the increase of age.

20. More than 70% of the subjects are under the score of Good (0.0-1.2) in both the sexes in respect of the prevalence of OHI-S.

21. Periodontal disease is observed higher among the non-chewers of *kuhva* (betel nut and leaf with lime) than the chewers and, the same is observed higher among the smokers than the non-smokers.

22. The prevalence of periodontal disease is observed higher in males than female subjects irrespective of the tobacco chewers and non-chewers. Out of 1631 individuals belonging to the tobacco chewers, 1005 (61.62%), and out of 3520 non-chewers, 1470 (41.76%) have periodontal disease.
23. Lowest prevalence of the OHI (CI-S) was found in males (9.32%) belong to the large families and the females (8.41%) belong to the medium families.

24. No significant differences were observed in the prevalence of OHI (DI-S) in respect of the family size.

25. Highest prevalence (21.94%) of the OHI (S) was observed among the individuals who belong to the large family size, followed by the small family size (21.25%) among the males and the same trend was observed in the females also. However, the differences in respect of family sizes are not significant.

26. Highest percentage of gingivitis in males is observed in large family size (18.46%) followed by the medium family size (18.42%) and lowest was recorded in the small family size. Same trend was observed in the females also. However, no significant difference was observed between the sexes.

27. In both males and females, the percentage of periodontal diseases is recorded highest in the low income group followed by middle income group.

28. The percentage of individuals having OHI (DI-S) is highest in the lower income group (12.95% in males; 13.22% in females) and lowest in high income group (7.41% in males; 8.29% in females).

29. Females show less prevalence OHI (CI-S) than their male counterpart. In both the sexes, the prevalence of OHI (CI-S) found highest among the individuals belonging to the low income group (male 10.70%; female 10.51%) followed by
the middle income group (9.93% in males; 9.56% in females) and lowest in the high income group (male- 7.89%; females- 7.32%).

30. The prevalence of OHI (S) found to be highest in the low income group followed by middle income group and lowest in the high income group in both the sexes. When compared between the males and females, males show slightly higher prevalence of OHI (S) in all the income groups than the females.

31. The percentage of gingivitis decreases as the income level increases. There is no significant difference observed between males and females in respect of the prevalence of gingivitis.

**Dental Morphology**

32. No supernumerary teeth are observed in the deciduous teeth as well as in the permanent dentition up to 10 years of age in both the sexes.

33. The highest frequency of supernumerary teeth is observed at 16-20 years and 21-25 years age groups in males (3.69%) and females (3.65%) respectively.

34. The incidence of carabelli’s anomaly is found highest among 4 years age group in boys (14.06%) and girls (12.28%). However, this trait does not follow any specific pattern regarding its distribution.
35. The occurrence of carabelli's anomaly is slightly higher in males (8.59%) compared to their female counterpart (7.48%).

36. The incidence of shovelling in both the jaws is found to be slightly higher in females than in males.

37. The occurrence of diastema is higher in the lower age group in both the boys and girls.

38. In respect of the deciduous dentition, the incidence of diastema is recorded higher in both the jaws of the boys than that of the girls.

39. The incidence of crowding in the deciduous teeth is comparatively low in both the sexes.

40. The frequency of crowding in the permanent teeth is found to be higher in the anterior teeth compared to the posterior teeth in both the jaws and sexes.

41. No incidence of cingulum is found below 1 year of age and 12-14 years of age in boys and girls. The highest frequency of cingulum is recorded at 5 years and 6 years of age in the girls and boys respectively.

42. In all the quadrants of both the jaws, the incidence of cingulum in the permanent teeth is found to be higher in the central incisor than that of the lateral incisor in both the sexes.

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43. The incidence of occlusion is recorded as 52.39% over-bite, 47.24% normal-bite and 0.37% under-bite among the males; whereas in females, the incidence of occlusion is 54.01% over-bite, 45.77% normal bite and 0.22% under-bite.

CONCLUDING REMARKS

The present study was conducted to examine the dental eruption, dental and oral pathology and dental morphology among the Mizo of Aizawl town, Mizoram. Medial incisor is the earliest deciduous tooth to erupt in the lower jaw of both the sexes. Deciduous tooth have completed their eruption at 37-42 months of age in both the sexes. The first permanent tooth to emerge is the mandibular first molar and the last to erupt is the maxillary second molar (excepting, M3) in both the boys and girls. By 15 years of age, all the teeth except the third molar have completed their eruption. Except the mandibular canine and first premolar and maxillary medial incisor and second molar, all the teeth in female erupt earlier than their male counterpart. A comparative study of emergence of permanent teeth (excluding ,M3) among some Indian populations by jaw and sex shows that in all the populations, the mandibular first premolar erupts earlier than their maxillary counterpart; however, the eruption takes place at the same time among females also.
The occurrence of dental caries was observed earliest at of 13-18 months age in both the sexes, where, only mild and moderate forms of caries were recorded. The frequency of caries affected teeth is higher in the posterior teeth than the anterior teeth in both males and females. In both the sexes of the Mizo of Aizawl town, the prevalence of caries appears in low frequency among the *kuhva* (betel nut and leaf with lime) chewers, compared to that of the non-chewers.

The present study reveals that the chewing of *Kuhva* to certain extent protects the teeth from the dental caries and periodontal diseases in the present population. However, smoking and tobacco chewing show negative effect in the dental health. The prevalence of the OHI (CI-S), OHI (DI-S) is also affected by certain socio-economic factors like the family size, literacy, income etc. High income, small family size and high education are negatively associated with the dental and the oral diseases.