Oral Tori in the Ticuna Indians, Colombia

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This note describes the low frequency of mandibular and palatine tori among the Ticuna Indians, Colombia, South America. Tori are bony exostoses occurring along the palatal midline and on the lingual border of the mandible adjacent to the premolars. Tori may result from masticatory stress (and they are age-dependent, being most common and most developed in adults), but marked population differences imply a ponderable heritable component to trait expression. Palatine and mandibular tori are positively associated in their occurrence and exhibit familial predispositions.

Moorrees et al. (1952) noted that a minimum of three independent loci are needed to explain familial variations. Assuming a polygenic threshold model, I have used the pedigrees published by Suzuki and Sakai (1960) to estimate the heritability of liability ($h^2 \pm$ standard error) for mandibular torus at 0.81 ± 0.11 and palatine torus at 0.97 ± 0.10. These estimates used parent-offspring relationships (sexes pooled) and the method of Falconer (1965). These high h^2 values suggest that tori should be useful indicators of biologic affinity. Halffman et al. (1992) caution that expression of the genetic potential is alterable by the individual's degree of masticatory stress.

Material consisted of dental examinations and study models of 55 full-blooded Ticuna adults from the village of Arara, 30 km northwest of Leticia, Colombia. Trait identification followed the classification scheme of Hrdlicka (1940). Palatine torus was absent (0/55), and just one subject, a male, possessed a mandibular torus. This instance was a very slight, flattened torus that occurred bilaterally. This one case of mandibular torus yielded a frequency of 3.7% for males alone and 1.8% for sexes pooled (Table 1).

Figure 1 plots a collation of samples provided by Bernaba (1977) plus representative groups from Stieda (1891), Godlee (1909), and Woo (1950). Arctic peoples are characterized by high frequencies of both types of tori, while American Indians have appreciably lower frequencies. Indeed, there is almost no overlap between the Eskimo and Aleut samples ("Arctic") and the Amerindians. On the other hand, North and South American Indians appear to have similar trait distributions. Local variations with geographic and ethnic groups should not, however, be overlooked. A notable example concerns the disparate values of palatine torus reported for Peruvian skeletal series: 0.2% (Russell, 1900), 30.5% (Hrdlička, 1940), and 56.3% (Stieda, 1891). As suggested by Woo (1950), much of this variation probably is due to scoring differences among observers. The high heritability of liability estimates noted above points to the need for close attention to published standards such as those of Martin (1973) to maximize these traits' biologic and anthropological utility. Tori are directly observable and easily graded on skeletal material and the living alike, though care needs to be used in scoring dental casts since the site of the mandibular torus can be inferior to the basal limits captured by the casting technique.

TABLE 1. Incidence of tori in Ticuna Indians[1]

	Palatine Torus	Mandibular Torus
Males	0/27	1/27 (3.7%)
Females	0/28	0/28 (0.0%)
Total	0/55	1/55 (1.8%)

[1]individual counts

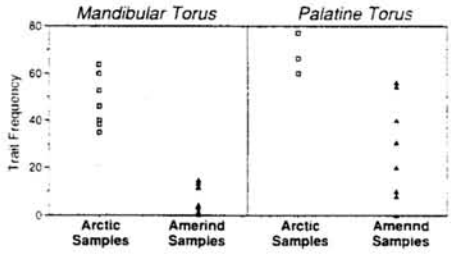

Fig. 1. Distributions of frequencies of palatine and mandibular tori in New World samples.

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