

CERUMEN POLYMORPHISM IN THE THREE MAJOR ETHNIC GROUPS OF MALAYSIA

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Summary Cerumen types were determined in 406 Malays, 362 Chinese and 381 Indians living in Peninsular Malaysia. The gene frequencies obtained for the allele for dry cerumen are Malays = 0.600 ± 0.028 , Chinese = 0.840 ± 0.020 and Indians = 0.652 ± 0.028 . A significant association was found between cerumen types and axillary odour in all three races.

INTRODUCTION

Cerumen or earwax is the wax like secretion found in the external meatus of the ear. Phenotypically, human cerumen is wet (sticky) or dry. It is controlled by a pair of autosomal alleles in which the allele for the wet type (*W*) is dominant to that for the dry type (*w*). The homozygous (*WW*) and the heterozygous (*Ww*) wet cerumen types are phenotypically indistinguishable (Matsunaga, 1962).

Malays represent 53 percent, Chinese 35 percent and Indians 11 percent of the Peninsular Malaysian population of about 11 million. Together they comprise about 90 percent of the total Malaysian population (Malaysia Official Yearbook, 1975). Malays form the largest indigenous group in Malaysia whereas Chinese and Indians are mostly the descendants of immigrants originating from South China and South India respectively who migrated to Peninsular Malaysia mainly beginning from the early 19th century until the middle of the 20th century (Ryan, 1962).

In this paper, we report the results of the first large scale study on cerumen phenotypes in these three major ethnic groups of Malaysia. The association between cerumen types and axillary odour was also investigated in these ethnic groups.

MATERIALS AND METHODS

The population surveyed was a random sample of people from the Federal Territory of Kuala Lumpur and the Serdang and Klang Valley districts of Selangor state in Peninsular Malaysia. A total of 1149 volunteers were typed for cerumen

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phenotypes by otological examination following the procedure of Matsunaga (1962). The presence or absence of axillary odour was scored by interviewing the subjects prior to inspection of their ear canals.

RESULTS AND DISCUSSION

Table 1 summarizes the phenotypic and the gene frequencies for cerumen types in the three major races of Malaysia. Ambiguous are those that could not be typed either as wet or dry. Included among ambiguous are those in whom the cerumen looked wet but could not be classified definitely because of environmental factors such as dirt and humidity and also those in whom what appeared to be dry cerumen was observed in one ear and wet in the other. In the calculation of gene frequencies, the ambiguous were excluded, because they could not be typed conclusively.

Malays have the lowest gene frequency for the dry cerumen allele compared to Chinese and Indians from Malaysia. The gene frequency of w in Malays is 0.600, close to the 0.519 obtained by Petrakis *et al.* (1971) in a small survey of 78 Malays from Kuala Lumpur. The Chinese have the highest gene frequency for the dry allele when compared to Malaysian Malays and Indians. The gene frequency of w in Malaysian Chinese (0.840) is similar to that of 0.860 listed for Southern Chinese in Matsunaga (1962). This clearly reflects the Southern Chinese origin of Malaysian Chinese. However, in Malaysian Indians, the gene frequency

Table 1. Phenotypic and gene frequencies for cerumen types in Malaysians.

Race	Cerumen types: Number and phenotypic frequencies (%)				Gene frequencies		Standard error
	Wet	Dry	Ambiguous	Total	Wet (W)	Dry (w)	
Malays	258 (63.55%)	145 (35.71%)	3 (0.74%)	406	0.400	0.600	0.024
Chinese	106 (29.28%)	253 (69.89%)	3 (0.84%)	362	0.160	0.840	0.019
Indians	216 (56.69%)	160 (41.99%)	5 (1.31%)	381	0.348	0.652	0.024

Table 2. Cerumen types and axillary odour in the three major ethnic groups of Malaysia (Percentages of those with and without axillary odour within each of the cerumen types are also given).

Race	Cerumen types				χ^2 1d.f.	P
	Wet		Dry			
	With odour	Without odour	With odour	Without odour		
Malays	159 (61.63%)	99 (38.37%)	10 (6.9%)	135 (93.10%)	112	<0.001
Chinese	81 (76.42%)	25 (23.58%)	10 (3.95%)	243 (96.05%)	203	<0.001
Indians	101 (46.76%)	115 (53.24%)	15 (9.38%)	145 (90.62%)	58	<0.001
Total	341 (58.79%)	239 (41.21%)	35 (6.27%)	523 (93.73%)	352	<0.001

for the dry allele that we found (0.652) was different from that of 0.478 obtained by Petrakis *et al.* (1971) in 48 non-tribal Indian students attending University College, London. This difference may be because the students, who were said to have come from all parts of India, might have contained a predominance of North Indians, whereas Malaysian Indians are mostly descendants of South Indian immigrants. The frequency of *w* in tribal Indians from North India was about 0.35 (Petrakis *et al.*, 1971).

An association between cerumen types and axillary odour had been reported among Japanese and Formosans by several Japanese workers in the past. A high proportion of those with wet cerumen also had axillary odour (Matsunaga, 1962). To determine if such an association also existed in Malays, Chinese and Indians of Malaysia, contingency chi-square tests were performed. The results, presented in Table 2, showed that there was indeed an association between the two in all the three races tested as well as in the pooled data. From the data, it could be observed that those having dry cerumen were less likely to have axillary odour while those with wet cerumen were more likely to have the odour.

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