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The Palpebral Fissure in Somalia

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The morphology of the palpebral fissure in Somalia is studied in two samples of the population: 1236 adults and 471 school children. In both groups the presence of a slight Mongolian fold and obliquity of the rima was noted, which, by narrowing the fissure, makes the eye more suited to the climate of the country.

There is an interdependence between the characteristics under examination and sex. The presence of the slight Mongolian fold is reduced in Somalian students between the ages of 13 and 22.

1. Introduction

The form of the palpebral fissure, determined mainly by the palpebral folds, is considered in anthropology as an element of environmental adaption by selection (Spedini, 1963, 1966). The Mongolian fold was, in fact, related to a cold climate, and the external and medial folds to a hot, dry climate (Biasutti, in Parenti, 1959; Sergi, 1949; Omodeo, 1973). The sporadic but repeated reports of a Mongolian fold in various regions of Africa, in populations living in a hot environment and quite unconnected with the Mongolian populations, may point to an explanation of all the palpebral folds as a form of defence against extreme climates: cold, hot, dry or windy, so that the presence of the Mongolian fold in Africa may be seen as an example of the independent origin of variations (Seligman, 1924; Sera, 1946). The hereditary nature of these formations is also recognized (Olivier, 1967; Parenti, 1959; Fischer, in Aichel, 1933; Tao, 1935; Dunn, 1928; Corrain, 1971) and is often associated to hybridism: remembering the presence of the mongolian fold in the Khoisanids and in the Rehobots bastards (Fischer, 1913). Keith (in Chouke, 1929) states that this fold is represented in all races during fetal life: and so represents an ontogenetic factor. With the exception of the profound studies of the Bushmen-Hottentots (Fischer, in Aichel, 1933), authors have usually reported only the presence of this morphology in Africa (Puccioni, 1934; Seligman, 1924; Parenti, 1948; Puccioni, 1931). We therefore thought it interesting to intensify this research on the Somalian populations who live in a climate that is always hot and windy (Communauté Économique Européene, 1960*a*,*b*), in a semi-arid steppe, the Bush.

2. Methods and Materials

The 1707 sets of data were obtained during two anthropometric surveys, carried out by the author in Somalia in 1972 (Grassivaro, 1975) and in 1975. The first random sample of 1236 Somalis, 850 males and 386 females, was gathered: in Benadir, at Mogadish, at Afgoi, at Brava, (Parenti, 1947); in Upper Giuba, at Bur Acaba and at Baidoa (Figure 1).

The 471 schoolchildren of the second sample include 102 Somali males and 369 Somali females; they were interviewed in the Upper and Lower High Schools of the capital. They came from all parts of the country.

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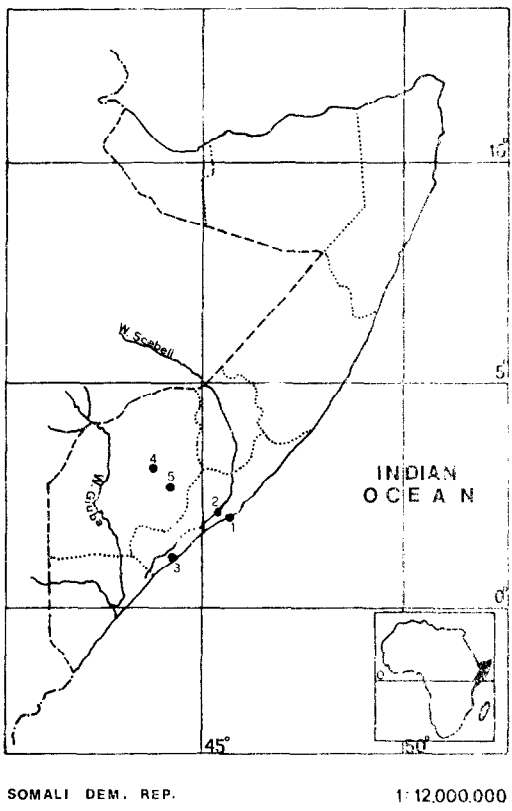

Figure 1. At present Somalia is divided into more regions, but we have kept to the division valid up to 1972 because the answers of the subjects were based on this division.

The places of recording, with their respective Somalian names, were the following: (1) Mogadish (Xamar), (2) Afgoi (Afgoye) and (3) Brava (Baraawa), in the Benadir region; (4) Baidoa (Baydhabo) and (5) Bur Acaba (Buur Hakaba), in the Upper Giuba region.

For each subject the predominant morphology of the palpebral fissure was recorded, making the following distinctions: presence of a Mongolian fold, however, slight, or of other folds; oblique axis of the rima palpebrarum. In cases of typical Mongolian eye (Olivier, 1960), other morphological characteristics were added with reference to race.

3. Results

Out of 1707 subjects observed, we found 15 cases of typical Mongolian eye in normal subjects with accentuated Mongolian fold, obliquity of the rima palpebrarum, adiposity of the upper eyelid and notable internal bipalpebral length; in these subjects, the flat or protruding cheek bones, the protruding or deep-set eyes, and the color of the skin ranging from light brown to very dark, indicate racial heterogeneity [Mongoloid (Chouke, 1929); Bushmen (Fischer, in Aichel, 1933)].

More frequently, a slight Mongolian or external fold was found. Lastly, we are able to confirm the existence in Somalia of a particular oblique rima (Parenti, 1948), which is present either alone or in 75% of the cases of Mongolian fold (Olivier, 1960; Gates, 1946).

We shall report our results separately for the two available samples, excluding the cases of typical Mongolian eye.

Sample of the adult population

Out of 1236 subjects observed: 29·9% presented an oblique axis of the rima, 19·9% a slight Mongolian fold and 13·6% an external fold. The frequency of the Mongolian fold

Table 1 **Sample of adult population and sample of school children: distribution according to form of palpebral fissure and sex**

Form of palpebral fissure	Adults* Male n	%	Female n	%	Σ n	%	Schoolchildren† Male n	%	Female n	%	Σ n	%
Normal	327	(38·5)	125	(32·4)	452	(36·6)	37	(36·3)	92	(24·9)	129	(27·4)
Oblique	225	(26·5)	145	(37·6)	370	(29·9)	36	(35·3)	177	(46·0)	213	(45·2)
Mongolian fold	163	(19·2)	83	(21·5)	246	(19·9)	29	(28·4)	108	(27·1)	129	(27·4)
Other folds	135	(15·0)	33	(8·5)	168	(13·6)						
Σ	850		386		1236		102		369		471	

* χ^2 (3 d.f.) = 24·91; significant at 5% level.
† χ^2 (2 d.f.) = 6·64; significant at 5% level.

does not distinguish the two sexes (21·5% and 19·2%) (Table 1); females presented greater obliquity: 37·6% against 26·5% of males, who have a greater percentage of external fold (15·8% and 8·5%) and the absence of specific folds (38·5% and 32·4%). On the whole, there is a significant relation between sex and forms of palpebral fissure: χ^2 (3 d.f.) = 24·91; significant at the 5% level.

Sample of school children

Out of 471 Somalian schoolchildren, 27·4% presented the Mongolian fold and 45·2% obliquity of the rima.

Here, too, the frequency of the Mongolian fold is almost equal in the two sexes, 28·4% and 27·1% (Table 1). Females are distinguished by a greater obliquity: 48·0% against 35·3%. χ^2 (2 d.f.) = 6·64; this confirms the interdependence of the two characteristics as judged by this statistical test.

The distinction according to age (Table 2) reveals a reduction of the Mongolian morphology as subjects grow older: the percentages, excluding the youngest subjects, are 33%, 28%, 26% and 11%. Obliquity was about 45%.

4. Discussion

The results of our research show that the population of Somalia is characterized by a narrow palpebral fissure, resulting from a slight Mongolian fold (in 20% of adults and 27% of school children) which rarely becomes complete, or by a particular obliquity of the rima palpebrarum (in 30% of adults and 45% of schoolchildren). This formation could be a form of defence against the hot, dry, windy climate of the country.

Table 2 **Sample of school children: distribution according to form of palpebral fissure and age**

Form of palpebral fissure	Age >13 n	%	14–15 n	%	16–17 n	%	18–19 n	%	<20 n	%	Σ
Normal	0		22	(20·8)	52	(29·3)	39	(30·0)	16	(36·4)	
Oblique	5	(71·4)	49	(46·2)	80	(43·4)	57	(43·8)	22	(50·0)	
Mongolian fold	2	(28·6)	35	(33·0)	52	(28·3)	34	(26·2)	6	(13·6)	
Σ	7		106		184		130		44		471

The presence of the Mongolian fold seems to involve the two sexes equally, while females appear to be characterized by a greater obliquity. This agrees with the literature (Routil, 1933).

The reduction of the Mongolian fold with age, which has been referred to several times in the literature (Aichel, 1933; Gates, 1948; Hilden, 1938), is also visible in Somali school children. This confirms the hypothesis that the presence of the shape of the Mongolian eye in adult age is a sign of arrested development (Metschnikoff, 1874).

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