

Some Genetic Traits in Solomon Island Populations

IV. MID-PHALANGEAL HAIR

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ABSTRACT Among 425 Lau and 467 Baegu of northern Malaita, there were no tribal differences in mid-phalangeal hair. The trait was present more often in males than in females, and after puberty than before it. Age differences were more marked for males than for females. Among 168 men 20 years of age and older in both tribes, the frequency of mid-phalangeal hair was 58.3%; among 189 women of similar age, 34.4%. These frequencies were at or just below those reported for Caucasian samples, just above that for Japanese, and considerably above those for Negroes and American Indians. Analysis of family data did not confirm the hypothesis that the absence of mid-phalangeal hair is recessive to its presence.

Since Danforth's ('21) pioneering paper, mid-phalangeal hair has interested physical anthropologists as a presumably genetic trait, differing in frequency from one population to another and said to show patterns of transmission within families. Recently Washburn ('68) has suggested that because the trait is under "special genetic control" it may reflect a partial adaptation to knuckle-walking by our remote ancestors. Present-day gorillas and chimpanzees rest the middle phalanges of their three middle fingers on the ground in walking. The genetic basis of mid-phalangeal hair is far from established, however, for both technical and biological reasons (Garn, '51; Saldanha and Guinsburg, '61), and its evolutionary significance is far from clear.

We report here data on the distribution and inheritance of mid-phalangeal hair among two Solomon Island populations, the Lau and Baegu of Malaita Island. Although the trait was also rated by the same observer among the Nasioi of Bougainville and the Kwaio of Malaita, technical shortcomings invalidated the results.

METHODS

The presence or absence of hair on the middle phalanx was recorded by one of us (A.D.) for each digit of each hand. Observations were made in natural daylight (augmented by flashlight when indoors) against a white background, but

without magnification. This technique underestimates the amount of hair, missing some rudimentary hairs and all follicles lacking hair at the time of examination.

RESULTS AND COMMENT

By age and sex categories the Lau and Baegu did not differ significantly in the percentage of persons with mid-phalangeal hair, except for a higher frequency in Baegu girls between 10 and 20 years of age. The two groups were therefore combined for further analysis.

Among both Lau and Baegu, mid-phalangeal hair was more frequent in males than in females, and after puberty than before it (table 1 and separate calculations, not shown here, of frequencies before and after age 15). The age differences were more marked among males than among females. All three of these age-sex relationships have been generally reported (Saldanha and Guinsburg, '61; Giles et al., '68).

The distribution of mid-phalangeal hair by digits followed the usual formula, $4 > 3 > 5 > 2$.

Comparison among populations should be age- and sex-specific, but such distinctions appear in few published studies. According to the compilation of Saldanha and Guinsburg ('61), augmented by our own search of the subsequent literature, the Lau and Baegu percentage with mid-phalangeal hair fell at the lower end of

TABLE 1

Mid-phalangeal hair in two Solomon Island populations, Lau and Baegu

Digital combinations	Sex	Age (years)							Totals
		0-10	11-20	21-30	31-40	41-50	51-60	60+	
0-0 ¹	M	60	22	6	6	16	5	7	122
	F	69	28	16	13	13	9	5	153
4-4	M	1	4	1					6
	F		1	1					2
3,4-3,4	M	9	1	1	4	7	1		23
	F	3	4		2	3			12
3,4,5-3,4,5	M			2	1	1	2		6
	F		2		1		1		4
4-0	M	3	1		2	2	2	2	12
	F	2	1	1		5			9
3,4-4	M	2	1	1	1				5
	F	1	4	1	4				10
3,4-3,4,5	M	2	2	1	1		1	1	8
	F	1	2			2			5
Others	M	6	6	6	7	5	5	2	37
	F	6	6	6	6	5	2	1	32
Totals	M	83	37	18	22	31	16	12	219
	F	82	48	25	26	28	12	6	227
Percentage 0-0 ¹	M	72.3	59.5	33.3	27.3	51.6	31.2	58.3	55.7
	F	84.1	58.3	64.0	50.0	46.4	75.0	83.3	67.4

¹ No hair on any digit of either hand.

the Caucasian range, which in turn is higher than the ranges reported for Negroid and Mongoloid groups. Of the 168 combined Lau and Baegu adult males (aged 20 years and over), 58.3% had mid-phalangeal hair. This may be compared to none among Andaman Islanders (Büchi and Roy, '55), 1% among Eskimos (146 subjects, of whom roughly 2/5 were males, Sewall, '39), 16.3% to 28% among American Negroes (Danforth, '21; Setty, '66), 25.6% for Ethiopians of all ages (Bat-Miriam, '62), 20.9% for Yucatan Mexicans (Giles et al., '68), 27.7% for Shinnecock and Penobscot Indians from Maine, 33.6% for Ghorkas of Nepal (Parmar, '68), 44.3% for Japanese, 40-50% for various groups of Hindus (Dutta, '66; Basu, '67), 52.3% for Egyptians, 62-71% for Near Eastern peoples, and 60-80% for various Europeans. For references to reports summarized but not cited here, see Saldanha and Guinsburg ('61).

The combined Lau and Baegu adult females (N = 189), 34.4% of whom had

mid-phalangeal hair, were below all Caucasian females recorded (41.7 to 73.6%), slightly below the Japanese and Aleut frequencies (39-42%), but well above those for Maine Indians (20.9%), Mexicans from Yucatan (9.9%), American Negroes (9.7%), Eskimos (around 1%), and Andaman Islanders (none).

Unfortunately data on adults from Southeast Asia, other than India and Nepal, and from Oceania are lacking.

The increased frequency of mid-phalangeal hair, as of body hair in general, clearly distinguishes these Melanesians from African Negroids. The same is true for various other traits — serologic (Barnicot, '64; Damon, in press), craniometric (Howells, '73), and histologic (Szabo et al., '69; Hrdy, '71), as well as for some of the traits noted in the present series of papers — namely, lighter hair color, less Negroid and more variable facial features, and lower frequency of longer first toes.

As for the presumed mode of inheritance, Danforth ('21) suggested that the absence

of mid-phalangeal hair might be due to a recessive gene or genes. Genetic analysis of sib and family data by Bernstein and Burks ('42) and Bernstein ('49) was said to support the hypothesis, but exceptions were noted in their American series and also in family data from Japan, where 69 matings of parents without the trait produced eight children with it (Matsunaga, '56). Single exceptions have been reported from Indian (Chopra, '53) and from Sweden (Beckman and Böök, '59). The Swedish material also contained "a significant deficiency of individuals with mid-digital hair" born to two parents with the trait; we attribute this to the extreme youth of the children, whose ages ranged from 1.5 to 4.5 years. Older children would probably have contributed more "positive" offspring to "negative" parents.

The Solomon Islanders likewise show exceptions, in the form of children with mid-phalangeal hair born to parents without it. Eight Lau families in which both spouses lacked the trait produced 28 offspring, of whom six (21%), in four families, had mid-phalangeal hair. The nine Baegu families with both parents lacking the trait produced 36 offspring, of whom eight (22%), in four families, had it. The percentages of "positive" offspring from "negative" matings might be expected to increase as all children reach puberty. This was indeed the case; table 2 shows the mid-phalangeal hair of offspring aged 15 years and above from the four mating types. Of eight Lau families where both spouses lacked the trait, five families pro-

duced ten "adult" offspring (aged 15 years and older), of whom six (60%), in four families, had mid-phalangeal hair. Of the nine negative Baegu matings, seven produced 14 "adult" offspring, of whom five (36%), in four families, had mid-phalangeal hair. Blood typing with ABO and Rh systems showed no exclusions, so that illegitimacy or adoption cannot explain these discrepancies. While mid-phalangeal hair might have been missed in some of the parents, observational error is unlikely to have occurred in as many as eight of the 17 families. Our data therefore do not confirm the simple hypothesis that absence of mid-phalangeal hair is a recessive trait.

In fact, table 2 shows similar percentages of mid-phalangeal hair among offspring from the four types of parental mating, further evidence against any such simple genetic hypothesis. Also apparent in table 2 is the absence of assortative mating.

CONCLUSIONS

Mid-phalangeal hair varies with age, sex, and population, in rough correspondence with the amount of total body hair. Like hair elsewhere on the body, it is under hormonal influence. Beyond the genetic basis of population differences in the amount of total body hair, the existence — let alone the nature — of any "special genetic control" (Washburn, '68) for mid-phalangeal hair is uncertain. Among the Lau and Baegu of the Solomon Islands, the absence of mid-phalangeal hair was not a recessive trait.

TABLE 2

Mid-phalangeal hair in Solomon Islanders — phenotypes of parents and offspring

Parents		No. of matings ¹	Offspring (aged 15 years and older)			
Father	Mother		Hair	No hair	Total	Per cent with hair
Hair × Hair		19	6	10	16	37.5
Hair × No hair		33	11	14	25	44.0
No hair × Hair		19	6	7	13	46.2
No hair × No hair		17	11	13	24	45.8
Totals		88	34	44	78	43.6

¹ Producing offspring of any age.

	χ^2	d.f.	p ≤
Assortative mating	1.67	1	0.20
Heterogeneity of offspring	0.42	3	0.95

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