RESULTS

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Study of lip prints on the six topographical areas of the lips of all members of the thirty families revealed the following:

Area A:

It was found that the pattern type of the lip prints present on area A in all members of the thirty families were only four types. These pattern types were II_b, III, IV and V and their frequency among the members of these families were 17.99%, 20.14%, 61.15% and 0.72% respectively (Table 1).

Table 2, shows the inheritance of lip patterns on area A,

1) Association of the parental phenotypes IV and III occured only in fourteen families out of the thirty and the majority of their offspring were found to have pattern type IV (97.37%), while the remainder have pattern type III (2.63%).
2) Parental phenotypes IV and II_b were present in three families on area A and this gave six offspring with pattern type IV (66.67%) and three with pattern type II_b (33.33%).
3) One family was found with the parents having pattern type IV and V on area A and produced two offspring , all having the pattern type IV on the same area.

4) Four families with the parents having the pattern type II_b and III and all of their offspring (10) have one identical pattern type only (II_b).

5) In eight families, both parents were of the same phenotype. They were five families with the phenotype IV, two families with the phenotype III (Fig.4) and one family with the phenotype II_b. These families produced offspring with phenotypes similar to those of the parents (100%), (Fig.4)

Area B:

The pattern types of lip prints present on area B in all members of the thirty families included six pattern types, type I_a, I_b, II_b, III, IV and V. Their frequency among the members of these families were 3.6%, 50.3%, 30.32%, 25.90%, 34.53% and 0.72% respectively (Table 1).

Table 3 shows the patterns on area B :

1) Both parental phenotypes IV and III were found in association in nine families and all the offspring of these families have pattern type IV (Fig.5)

2) Parental phenotypes II_b and III were in association in seven families and all of their offspring showed only the pattern type II_b.

3) The parental phenotypes IV and II_b were found in association in two families and they produced six children, four of them with phenotype II_b (66.6%), one with the phenotype III (16.7%) and the last one with the phenotype IV (16.7%).

4) Other associations of parental phenotypes IV, I_b and V were reported in three families. Parental phenotypes IV and I_b were in two families (Fig.3), where three of their offspring of the phenotype IV (60%) and two of the phenotype I_b (40%). The parental phenotypes IV and V were in one family and all of their offspring were of the phenotype IV.

5) The combination of parental phenotypes II_b and I_b were present in three families with all their offspring (eight in number) having the pattern type II_b (Fig.4)

6) It is also clear that when both parents have identical phenotypes, all of their offspring also have the same phenotype. These families were four with parental phenotype III (Fig. 7), one with phenotype I_a and the last family with phenotype IV.

Area C:

It was found that the pattern types of lip prints seen on area C among all members of the thirty families were only three types, pattern type II_b, III and IV. Their frequency among all the members of these families were 12.23%, 18.71% and 69.06% respectively (Table 1).

Its patterns of inheritance is shown in Table 4:

1) Association of the two parental phenotypes IV and III was seen in sixteen families and this resulted in the production of offpsing with two different phenotypes, 90.90% of them with the phenotype IV and 9.1% with the phenotype III.

2) The parental phenotype II_b was found in association with parental phenotype III in three families and it leaded to the production of eight offspring , all of them with the phenotype II_b.

3) Identical parental phenotypes were present in eleven families, two with parental phenotypes III (Fig.4) and nine with parental phenotype IV and all the offspring they produced have the same phenotypes similar to their parents.

Area D:

Three different pattern types of lip prints were present on area D in all members of the thirty families. They were pattern II_b, III and IV. The pattern type II_b was present in 6.47% of all individuals while the pattern type III in 33.81% and the pattern type IV in 59.72% of them (Table 1).

Table 5 shows:

1) Association of parental phenotypes III and IV was seen in fourteen families. The offspring produced were found to have two different phenotypes. They were the phenotype IV in 83.33% and the phenotype III in 16.67%.

2) Another association of parental phenotype II_b with parental phenotype III was also seen in three families and their offspring showed the two different phenotypes II_b and III. The first represented 85.71% while the second represented 14.29% of the offspring (Fig. 8)

3) Identical parental phenotype association was seen in thirteen families, eight with both parents having the phenotype IV and five with the parents having the phenotype III (Fig. 4). Such association resulted in the production of offspring , all of them having phenotypes similar to their parents.

Area E:

It was found that the pattern types of lip prints seen on area E in all members of the thirty families were of six types. They included pattern types I_a (48.92%), I_b (0.72%) II_a (2.88%), II_b(7.91%), III (15.83%) and IV (23.74%), (Table 1).

Table 6 clearly shows:

1) The most common association of parental phenotype was between phenotypes I_a and III (Fig. 8) and was found in eleven families with twenty seven offspring . It was noticed that 96.3% of these offspring had a phenotype I_a, while only 3.7% had the phenotype III.

2) It was also found that in four families, the phenotypes of the parents were the combination of I_a and IV and they produced children of the phenotypes I_a (64.29%), IV (28.57%) and III (7.14%).

3) When the parental phenotypes I_a and II_a were present in three families, they produced offspring with the phenotype I_a only in all of them.

4) But when the parental phenotypes were I_a and II_b, their children presented only the phenotype II_b (100%).

5) It was also found that when the parental phenotypes were the association of the type IV with one of the types I_b, II_a and III, all the produced offsprings had the phenotype IV only. (Figs.5,6 & 7).

6) Another association of the phenotypes III and II_b produced offspring with the phenotype II_b only.

7) Identical parental phenotype association was seen in only three families on area E. One family has the phenotype I_a in both parents, another family with the parental phenotype IV, and the third family with the parental phenotype III. All these three families produced offspring having the same phenotype like their parents.

Area F:

The only pattern types seen on area F among all members of the thirty families were pattern types III and IV. Their frequency distribution among the members of these families were 35.25% and 64.75% respectively (Table 1).

Table 7 illustrates the inheritance of pattern types of lip prints on area F among the thirty families:

1) The most common association of parental phenotype was between the phenotype IV and the phenotype III. It was found in sixteen families and resulted in the production of forty one offspring . The majority of

them have the phenotype IV (82.93%), while the remainder have the phenotype III (17.07%).

2) Identical parental phenotype associations were seen in fourteen families, in eight of them the parents have the phenotype IV and all their offspring showed the same phenotype IV whereas in the other six families, both parents have the phenotype III (Fig. 4) and they produced fifteen offspring with the same phenotype similar to their parents.

Table 1: Frequency of pattern types on the various topographical areas of the lips.

Topographical areas of the lips	Pattern types														Total	
	I_a		I_b		II_a		II_b		III		IV		V			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	-	-	-	-	-	-	25	17.99	28	20.19	85	61.15	1	0.72	139	100
B	5	3.60	7	5.03	-	-	42	30.22	36	25.90	48	34.53	1	0.72	139	100
C	-	-	-	-	-	-	17	12.23	26	18.71	96	69.06	-	-	139	100
D	-	-	-	-	-	-	9	6.47	47	33.81	83	59.72	-	-	139	100
E	68	48.92	1	0.72	4	2.88	11	7.91	22	15.83	33	23.74	-	-	139	100
F	-	-	-		-	-	-	-	49	35.25	90	64.75	-	-	139	100

Table 2: Inheritance of lip patterns on Area A.

Parental phenotype	Number of families	Number of offspring	Offspring phenotype						Total	
			II_b		III		IV			
			No.	%	No.	%	No.	%	No.	%
IV x III	14	38	-	-	1	2.63	37	97.37	38	100
IV x IV	5	12	-	-	-	-	12	100	12	100
IV x II_b	3	9	3	33.33	-	-	6	66.67	9	100
IV x V	1	2	-	-	-	-	2	100	2	100
III x III	2	5	-	-	5	100	-	-	5	100
II_b x III	4	10	10	100	-	-	-	-	10	100
II_b x II_b	1	3	3	100	-	-	-	-	3	100
Total	30	79	16	20.25	6	7.60	57	72.15	79	100

Table 3: Inheritance of lip patterns on Area B.

Parental Phenotype	No.of families	No.of offspring	Offspring phenotype												Total	
			I_a		I_b		II_b		III		IV		V			
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
IV x III	9	24	-	-	-	-	-	-	-	-	24	100	-	-	24	100
IV x I_b	2	5	-	-	2	40	-	-	-	-	3	60	-	-	5	100
IV x V	1	2	-	-	-	-	-	-	-	-	2	100	-	-	2	100
IV x IV	1	2	-	-	-	-	-	-	-	-	2	100	-	-	2	100
IV x II_b	2	6	-	-	-	-	4	66.6	1	16.7	1	16.7	-	-	6	100
II_bx I_b	3	8	-	-	-	-	8	100	-	-	-	-	-	-	8	100
II_bx III	7	18	-	-	-	-	18	100	-	-	-	-	-	-	18	100
IIIxIII	4	11	-	-	-	-	-	-	11	100	-	-	-	-	11	100
I_a x I_a	1	3	3	100	-	-	-	-	-	-	-	-	-	-	3	100
Total	30	79	3	3.80	2	2.53	30	37.97	12	15.19	32	40.51	-	-	79	100

Table 4: Inheritance of lip patterns on Area C.

Parental phenotype	No. of families	No. of offspring	Offspring Phenotype						Total	
			II_b		III		IV			
			No.	%	No.	%	No.	%	No.	%
IV x III	16	44	-	-	4	9.10	40	90.9	44	100
IV x IV	9	22	-	-	-	-	22	100	22	100
II_b x III	3	8	8	100	-	-	-	-	8	100
III x III	2	5	-	-	5	100	-	-	5	100
Total	30	79	8	10.13	9	11.39	62	78.48	79	100

Table 5: Inheritance of lip patterns on Area "D"

Parental Phenotype	No. of families	No. of offspring	Offspring phenotype						Total	
			II_b		III		IV			
			No.	%	No.	%	No.	%	No.	%
IV x III	14	36	-	-	6	16.67	30	83.33	36	100
IV x IV	8	23	-	-	-	-	23	100	23	100
III x III	5	13	-	-	13	100	-	-	13	100
II_b x III	3	7	6	85.71	1	14.29	-	-	7	100
Total	30	79	6	7.59	20	25.32	53	67.09	79	100

Table 6: Inheritance of lip patterns on Area E .

Parental phenotype	No. of families	No. of offspring	Offspring phenotype								Total	
			I_a		II_b		III		IV			
			No.	%	No.	%	No.	%	No.	%	No.	%
I_a x III	11	27	26	96.30	-	-	1	3.70	-	-	24	100
I_a x IV	4	14	9	64.29	-	-	1	7.14	4	28.57	14	100
I_a x II_a	3	8	8	100	-	-	-	-	-	-	8	100
I_a x II_b	2	5	-	-	5	100	-	-	-	-	5	100
I_a x I_a	1	3	3	100	-	-	-	-	-	-	3	100
IV x I_b	1	3	-	-	-	-	-	-	3	100	3	100
IV x II_a	1	3	-	-	-	-	-	-	3	100	3	100
IV x III	4	9	-	-	-	-	-	-	9	100	9	100
IV x IV	1	2	-	-	-	-	-	-	2	100	2	100
III x III	1	2	-	-	-	-	2	100	-	-	2	100
II_b x III	1	3	-	-	3	100	-	-	-	-	3	100
Total	30	79	46	58.23	8	10.13	4	5.06	21	26.58	79	100

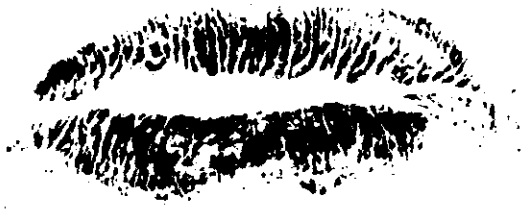
Table 7: Inheritance of lip patterns on Area F .

Parental phenotype	No. of families	No. of offspring	Offspring phenotype				Total	
			III		IV			
			No.	%	No.	%	No.	%
IV x III	16	41	7	17.07	34	82.93	41	100
IV x IV	8	23	-	-	23	100	23	100
III x III	6	15	15	100	-	-	15	100
Total	30	79	22	27.85	57	72.15	79	100

Fig.3: Lips of a family showing:

1) Pattern type IV on all areas of the upper lip and pattern type III on all areas of the lower lip of the father (A).
2) Pattern type III and Ia on the upper lip and pattern type IV on all areas of the lower lip of the mother (B).
3) All the offsprings have the pattern type IV on all areas of the upper and lower lips.(C,D & E).

A



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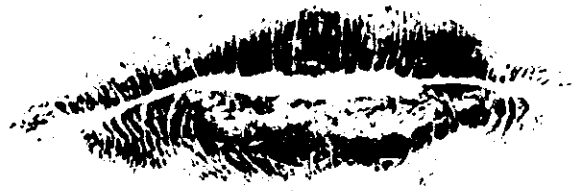

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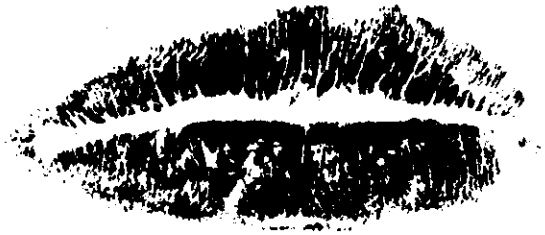


D

E

Fig.4: Lips of a family showing:

1) Pattern types III and Ia on the upper lip and pattern types III and Ia on the lower lip of the father (A).
2) Pattern types III and IIb on both the upper and lower lips of the mother (B).
3) All the offspring have (a) pattern type III on areas A,C,D and F (C,D&E),(b) Pattern type IIb on both areas B & E (C,D & E).

A

B

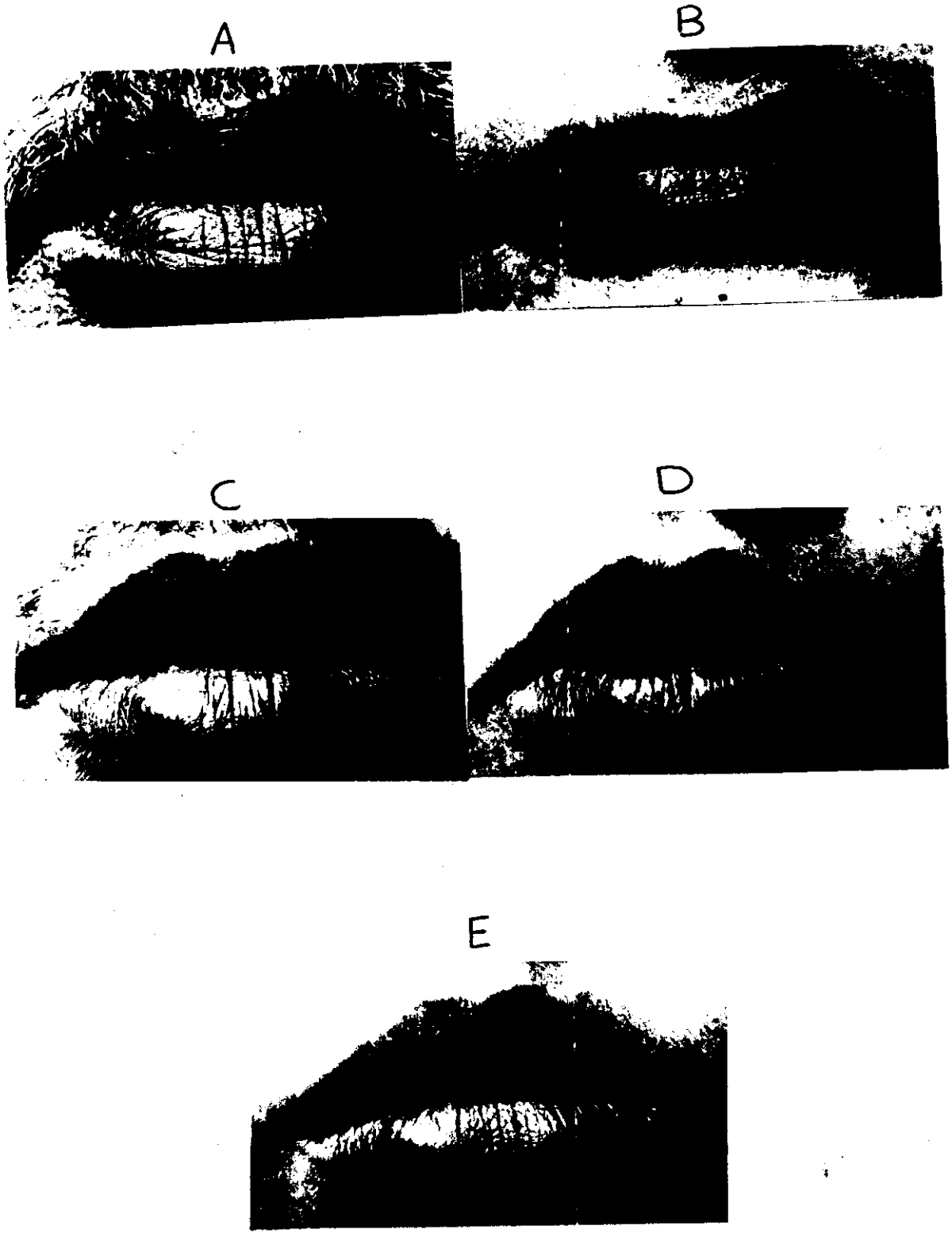
C

D

E

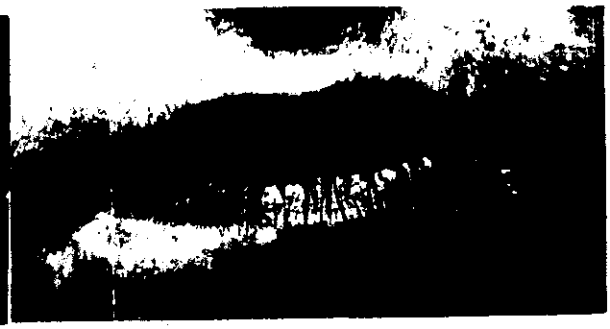
Fig.5: Lips of a family showing:

1) Pattern type IV on all areas of both upper and lower lips of the father (A).
2) Pattern type III on the upper lip and pattern types III and Ib on the lower lip of the mother (B).
3) All the offspring have the pattern type IV on all areas of both upper and lower lips.(C,D & E).


A
B
C
D
E

A

B



C

D

E

Fig.7: Lips of a family showing:

1) Pattern types IV and III on the upper lip and pattern type III on all areas of the lower lip of the father (A).
2) Pattern type III on the upper lip and pattern type IV on the lower lip of the mother (B).
3) All the offspring have pattern type IV on areas A,C,D,E and F (C & D).

A

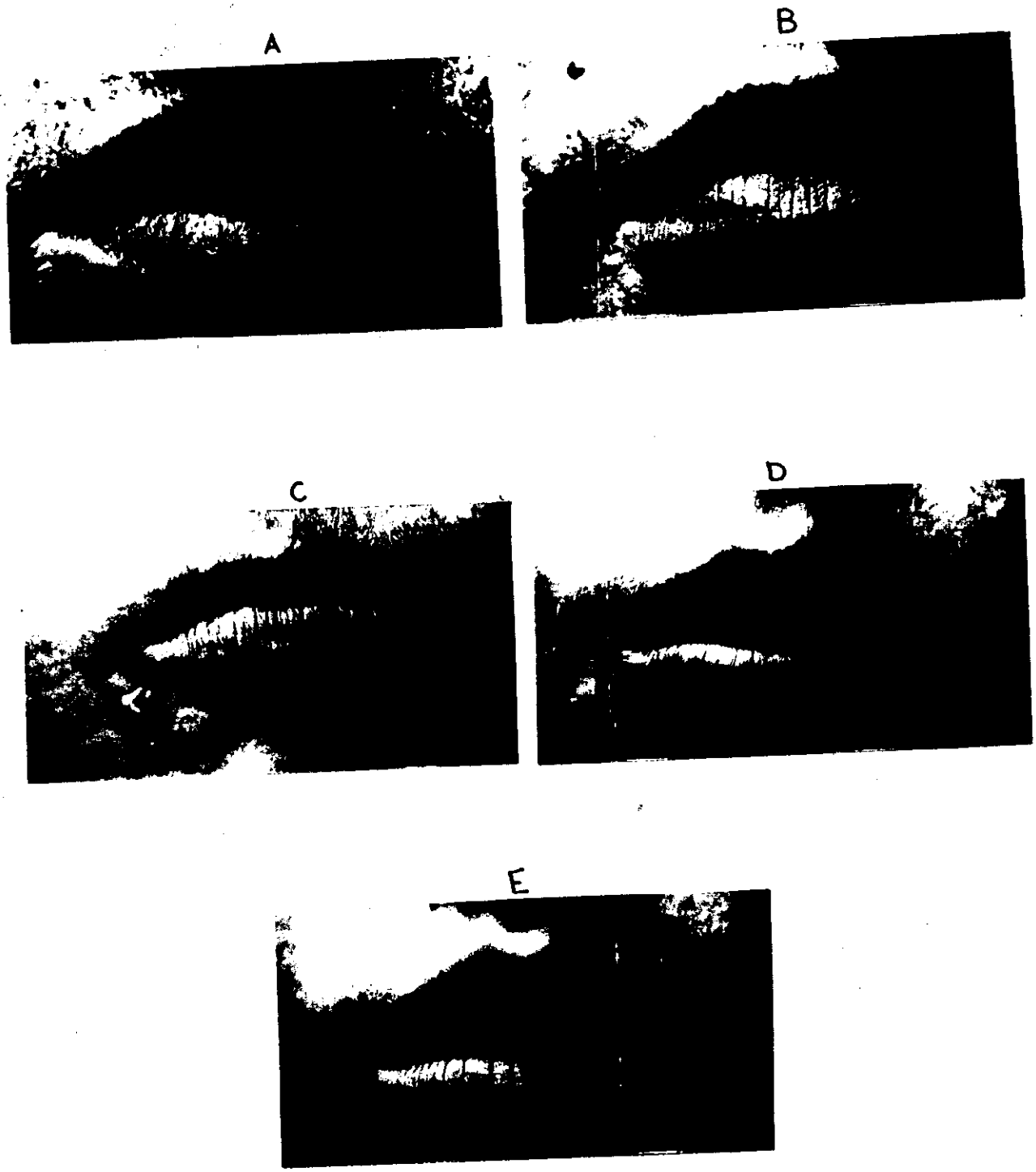
B

C

D

Fig.8: Lips of a family showing:

1) Pattern types III and IIb on the upper lip and pattern type III on the lower lip of the father(A).
2) Pattern type IIb on the upper lip and pattern types IIb, Ia and III on the lower lip of the mother (B).
3) All the offsprings have pattern type IIb on the upper lip. On the lower lip, they all have pattern types IIb and III on area D, pattern type Ia on area E and pattern type III on area F.(C,D & E).


A
B
C
D
E