

Lecture :- GENETICS & THE ORIGIN OF HUMANKIND

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5'

1. Introduction

Reconstructing Human past

- a. Fossils (Paleontology)
- b. Artifacts (Archaeology)
- c. Ethnology (Anthropology)

Genetic approach similar to ethnology.
 Give information about :- Origin, heritage and time course - Based on comparison of genes.

Hominoids

Genetic changes

5

Trans 1 -

Trans 2.

Trans 3

Darwin's Hypothesis
Hominid Lineage

10'

2. Methodology

Variation of frequencies of A, B, O
in human population

Trans 4

Trans 5

Genetic Distance

Construction of Lineage trees (Coalescence).

Rooted and unrooted tree, 15 and 105
 with 4 gene frequencies (population) - 2×10^6 and
 3.4×10^6 with 10 populations.

(Mathematical methods)

Trans 6 - Mapping adding - Rh genes makes the meaning
 with 2000 population of genetic distance clear
 1000 gene frequency

Protein markers and DNA markers

Restriction mapping (fingerprinting)

DNA sequencing (SNIPS)

unlimited
typing.

Mitochondrial DNA - + Y-chromosome
(Adam + Eve)

Measuring Time

Physical Methods: ^{14}C ; K, Ar, Thermolum.

DNA as a clock

~ 40,000 yrs

Microsatellite DNA (CA) repeats

③ Origin and Migration :-

Trans ⑦

Correlating genetic distance
with Geographic distance - (Cavalli-Forsza)

Trans ⑧

Origin & Distribution of African pygmies.

Trans ⑨

Origin and spread of Homo-Sapiens

Times of expansion

2-way migrations

Unanswered questions

Routes?

5'

④

Languages and genes

Homology - Darwin's Prophecy

Trans ⑩

Language Tree & World distribution

Trans ⑪

Correlation between genetic and
linguistic "trees"

⑤ Humans in India

Paleolithic sites all over In (going to ~ 50,000 BP)

Sk Singh monumental work on the people of India (over 500 ethnic groups)

Language families

Indo-aryan (North)

Dravidian (South)

Austro-Asiatic (South, Gonds)

Sino-Tibetan (In the east)

Tram (12)

Tram (13) Parties Work -

(~ 2 markers haplotypes)

- 21 haplotypes among 31 groups
- Unity of the Indian population
- Divergent haplotypes in small ethnic groups

Antiquity of Linguistic groups

Austro-Asiatic - 50,000 BP

Sino-Tibetan 54,000 "

Dravidian 39,000 "

Indo-Aryan V. Recent

Comparison with West-African + Central African

⑥ Conclusions

1. Humankind is one species :-
2. Racial - differences largely non-genetic
more Intra-group variation than
variation between groups.

③. Apparent Differences - Skin colour
due to natural selection. (Black-skin
in hot sunny climate
Maintained in racial groups by
sexual selection.