

BRIEF COMMUNICATIONS

**Red Cell G-6-PD and Sick Cell Haemoglobin Among
Four Nomadic Isolates of Andhra Pradesh**

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ABSTRACT The incidence of G-6-PD deficiency and Sick Cell trait among the *Suvvi*, *Badda*, *Uppu* and *Kunchapuri* endogamous nomadic groups of an Andhra Tribe - Yerukala is reported. Relatively higher values of G-6-PD and Hb^{AS} were noticed for the Kunchi and the Suvvi, respectively. The results though supports malarial-selection hypotheses, yet the role of natural selection depends upon the original possession of concerned gene in one's gene pool.

The biological adaptation in the form of selective advantage for red cell G-6-PD enzyme (E.C. 1.1.1.49) deficiency and heterozygotic Sick Cell Haemoglobin (Hb^{AS}) in endemic malaria among the human populations is demonstrated. This has prompted many investigations of different populations of the world, mostly sedentary. However, nomadism coupling with such an aspect generates enthusiasm to fathom bio-cultural interaction with ecology. The present paper reports, the frequency distribution of G-6-PD enzyme deficiency and sickle cell haemoglobin among the four endogamous groups of Yerukala, viz., *Suvvi Yerukala* (SY), *Badda Yerukala* (BY), *Uppu Yerukala* (UY) and *Kunchi* or *Kunchapuri Yerukala* (KY).

The first two groups are semi-nomads, large in number and mainly distributed in Guntur and Anantapur districts, respectively. Traditionally they are date-palm and bamboo basket makers. The latter two groups are true nomads and small in number. The UY are salt-traders on donkeys chiefly inhabiting Nellore district while the KY are Weaver's Brush Makers and found sparsely in almost all the districts of Andhra Pradesh. Hierarchically, the KY ranks low status. However, all of them speak particular dialect known

as 'Yerukala Bhasha' or 'Kurratha', a conglomeration of Telugu, Tamil and Canarese. Their womenfolk are experts in saying or fortune telling. Pig rearing is their secondary occupation.

MATERIALS AND METHODS

Blood samples, belonging to four nomadic groups—SY, BY, UY and KY, were collected in ACD solution from 72 villages of Guntur, Nellore and Anantapur districts of Andhra Pradesh. The sample includes unrelated individuals selected by Multistage Random Sampling procedure. Sample size for each system differs due to field and technical constraints. Samples were analysed in the field for erythrocyte G-6-PD enzyme deficiency using BCB Dye Screening Procedure of Motulsky and Campbell-Kraut (1961) and for Sick Cell Haemoglobin types with Rapid Slide Technique using reducing agents (Daland and Castle, 1948; Dacie and Lewis, 1975) and Qualitative Solubility Test (Dacie and Lewis, 1975) using buffers. Doubtful cases were repeated and confirmed by electrophoresis in the laboratory. Gene frequencies were calculated after Balakrishnan (1988). Information pertaining to Malaria in the studied areas was

gathered from Medical and Health departments of the districts concerned. Only male samples considered for G-6-PD while for Sickie Cell Haemoglobin, both sexes were treated in the analysis.

RESULTS AND DISCUSSION

The G-6-PD enzyme deficiency is pronounced in the KY (4.48%) followed by the SY (3.97%), BY (2.46%) and UY (1.49%). The sickle cell haemoglobin, that occurs in heterozygous form -Hb^{AS}, is found to be higher in the SY (3.11%) and absent in the UY (Table 1). The other groups show almost equal values. A close perusal of the data on endemicity of malaria in the area of their operation (Guntur and Anantapur districts) reveal the selective advantage of both G-6-PD deficiency and Hb^{AS} for the KY and SY groups. However, the role of genetic drift in shaping the differential frequencies of these traits among the four nomadic isolates is not to be ignored, in view of their population size. Nevertheless, their nature and degree of nomadism, exposure to malarial environment though strengthen the possible role of Natural Selection. Yet the possession of particular gene originally in the gene pool of a population and its expressivity towards the environment is equally important when one considers Negi's (1968) contention for Hb^{AS}.

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Table 1: G-6-PD deficiency and Hb^{AS} among the Yerukala groups

Sl. No.	Group	Phenotype(%)		Gene Frequencies $\pm$ S.E.	
		G-6-PD Deficiency (Males Only)	Sickle Cell Hb ^{AS} (M+F)	g	Hb ^S
1.	Savvi Yerukala (SY)	3.97 (126)	3.11 (187)	0.0397 $\pm$ 0.0155 $\pm$	0.0174 0.0063
2.	Badda Yerukala (BY)	2.46 (122)	1.55 (190)	0.0246 $\pm$ 0.0140	0.0078 $\pm$ 0.0045
3.	Uppu Yerukala (UY)	1.49 (67)	0.00 (120)	0.0149 $\pm$ 0.0148	
4.	Kunchapuri Yerukala (KY)	4.48 (67)	1.85 (106)	0.0448 $\pm$ 0.0253	0.0093 $\pm$ 0.0065

* Figures in the paranthesis indicate total sample size.
M= Male, F= Female

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