

Haemoglobin-C gene in India?

Mammalian haemoglobin (Hb) molecule is a conjugated protein consisting of four or five different peptide chains. These are designated as alpha (α), beta (β), gamma (γ) and delta (δ) with an alleged fifth type represented as epsilon (ϵ). Each chain has intimately but reversibly bound to it a molecule of the iron containing porphyrin ring called haem. Human haemoglobin contains two identical alpha chains; other two chains are either β , γ or δ . The various polypeptide chains, similar in the overall length, differ in the number and type of amino acid residues. The α -chain has 141 residues and β , γ and δ chains have 146 residues each.

In erythrocytes (red blood cells) of a normal adult human, two types of haemoglobin are found. The majority, about 97%, is normal adult haemoglobin (Hb-A), and a small fraction, of about 2.5% is haemoglobin A₂ (Hb-A₂); traces of haemoglobin F (Hb-F) are found predominantly in a foetus.

During human evolution, some mutations (substitution/deletion) that occurred resulted in a change in the molecular structure of genes responsible for haemoglobin synthesis. These genetic changes commonly occur in the natural selection process. Expression of abnormal or mutant genes either results in the formation of several abnormal haemoglobin variants (e.g. Hb-S, D, E, C, etc.) or decrease in the synthesis rate of globin chains (e.g. β -thalassaemia). Such genetic changes were mostly regional and race-specific. One of the β -globin chain Hb variants, Hb-C only occurs with a frequency com-

parable to that of Hb-S in a quite restricted area, west river Niger, in West Africa. The incidence of Hb-C gene in northern Ghana is about 20% (refs 1 and 2); there is also observed and reported 2% incidence in African Negroes³. It has been found in Morocco, occasionally in South Africa and rarely in white individuals⁴⁻⁶. That the incidence is so restricted suggests that the gene is of relatively recent origin⁷.

In India, the rarest Hb variant (Hb-C) has also been detected. The occurrence of this mutant gene was first observed in the Bohra-Muslims of southern Rajasthan in 1991 (ref. 8). The method adopted for its identification was electrophoresis. Later, this abnormal Hb was also detected in tribals and other ethnic groups of Rajasthan⁹⁻¹¹. In 2007, Kumar and his co-workers¹² identified and reported this mutant Hb gene in double heterozygous form (Hb-C/ β -thalassaemia) in a 22-year-old female patient and erroneously claimed that this is the first case of Hb-C in India. From India, another recent report on the evidence of Hb-C gene in the population of West Bengal is also available¹³. Hb-C thus is not restricted to native Africans but is also found in other geographical regions and diverse ethnic groups. Whether Hb-C gene has any correlation with falciparum malaria as found in case of sickle cell haemoglobin (Hb-S), more surveys are highly suggestive on its distribution in different geographical areas or ecosystems having different malaria endemicity. However, *in vitro* study is more suitable and reliable to find

out a correlation between Hb-C and falciparum malaria.

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Citedness of Indian science journals indexed by SCIE

Since independence India has developed a large infrastructure for science and technology (S&T) with the setting up of several academic institutions and national laboratories under the aegis of different scientific agencies. India also publishes more than 1000 science periodicals in different disciplines of S&T, which constitute an integral part of S&T infrastructure of the country. Of these, only a minuscule number (46) was indexed by the *Science Citation Index Expanded* (SCIE), a prestigious multidisciplinary

database published by Thomson Reuters (formerly Institute of Scientific Information) in 2006. Despite the criticism of Thompson Scientific regarding its inadequate coverage of science journals from scientifically peripheral countries¹ and in favour of specific publishers², there is an increasing pressure on journals around the world to be included in SCIE. The inclusion of a journal in SCIE database enhances the international presentation of scientific production of a country³ and also adds to the prestige of the journal.

These indexed journals were published by different publishers in different disciplines.

Citation counts are important indicators of the frequency of its use by the current researchers and also reflect upon the impact of published work on the international community⁴. These counts indicate the total number of times each paper has been cited by all journals included in the SCIE database during a particular year. Citation analysis provides some degree of objectivity for assess-

Table 1. Journals with their publishers indexed by SCIE during 2006

Journal	Publisher	Percentage of cited papers
<i>Indian Journal of Medical Research</i> (M)	Indian Council of Medical Research	83
<i>Journal of Biosciences</i> (Q)	Indian Academy of Sciences	73
<i>Bulletin of Materials Science</i> (BI-M)	Indian Academy of Sciences	71
<i>Journal of Chemical Sciences</i> (BI-M)	Indian Academy of Sciences	71
<i>Journal of Environmental Biology</i> (HLY)	Private	71
<i>Journal of Postgraduate Medicine</i> (Q)	Private	71
<i>Neurology India</i> (Q)	Neurology Society of India	69
<i>Indian Pediatrics</i> (M)	Indian Academy of Pediatrics	64
<i>National Medical Journal of India</i> (BI-M)	All India Institute of Medical Sciences	63
<i>Current Science</i> (F)	Current Science Association	59
<i>Indian Journal of Chemistry, Section A</i>	NISCAIR (CSIR)*	58
<i>Allelopathy Journal</i> (HLY)	International Allelopathy Foundation	55
<i>Indian Journal of Biochemistry and Biophysics</i>	NISCAIR (CSIR)*	55
<i>Journal of Earth System Science</i> (BI-M)	Indian Academy of Sciences	53
<i>Journal of Genetics</i> (three issues/year)	Indian Academy of Sciences	50
<i>Journal of Astrophysics and Astronomy</i> (Q)	Indian Academy of Sciences	50
<i>Proceedings of Indian Academy of Sciences – Mathematical Sciences</i> (Q)	Indian Academy of Sciences	48
<i>Indian Journal of Chemistry</i> (M)	NISCAR (CSIR)*	47
<i>Pramana – Journal of Physics</i> (M)	Indian Academy of Sciences	47
<i>Indian Journal of Marine Sciences</i> (Q)	NISCAIR (CSIR)*	45
<i>Indian Journal of Chemical Technology</i> (BI-M)	NISCAIR (CSIR)*	44
<i>Indian Journal of Pure and Applied Physics</i> (M)	NISCAIR (CSIR)*	43
<i>Indian Journal of Heterocyclic Chemistry</i> (Q)	Private	42
<i>Journal of the Indian Chemical Society</i> (M)	Indian Chemical Society	40
<i>Journal of Plant Biochemistry and Biotechnology</i> (HLY)	Society of Plant Biochemistry and Biotechnology	39
<i>Bulletin of Electrochemistry</i> (Q)	Central Electrochemical Research Institute (CSIR)	37
<i>Journal of Applied Animal Research</i> (Q)	Private	34
<i>Journal of Camel Practice and Research</i> (HLY)	Private	34
<i>Journal of Scientific and Industrial Research</i>	NISCAIR (CSIR)*	34
<i>Asian Journal of Chemistry</i> (M)	Private	33
<i>Journal of the Geological Society of India</i> (M)	Geological Society of India	33
<i>Sadhana – Academy Proceedings in Engineering Sciences</i> (BI-M)	Indian Academy of Sciences	33
<i>Journal of Polymer Materials</i> (Q)	Private	32
<i>Indian Journal of Physics</i> (M)	Indian Association for the Cultivation of Science	27
<i>Journal of Food Science and Technology</i> (BI-M)	Association of Food Scientists and Technologists (India)	26
<i>Indian Journal of Pure and Applied Mathematics</i> (M)	Indian National Science Academy	25
<i>National Academy Science Letters – India</i> (BI-M)	National Academy of Sciences	23
<i>Defence Science Journal</i> (Q)	DESIDOC (DRDO)**	21
<i>Indian Journal of Engineering and Materials Sciences</i> (BI-M)	NISCAIR (CSIR)*	20
<i>Indian Journal of Agricultural Sciences</i> (M)	Indian Council of Agricultural Research	18
<i>Indian Journal of Animal Sciences</i> (M)	Indian Council of Agricultural Research	17
<i>Transactions of the Indian Institute of Metals</i> (BI-M)	Institute of Metals	15
<i>IETE Journal of Research</i> (BI-M)	The Institution of Electronics and Telecommunication Engineers	14
<i>Photonirvachak</i> (Q)	Indian Society of Remote Sensing	11
<i>IETE Technical Review</i>	The Institution of Electronics and Telecommunication Engineers	8
<i>Indian Veterinary Journal</i> (M)	Indian Veterinary Association	7

M, Monthly; Q, Quarterly; BI-M, Bi-monthly; HLY, Half yearly; F, Fortnightly.

*NISCAIR (CSIR), National Institute of Science Communication and Information Resources (Council of Scientific and Industrial Research); **DESIDOC (DRDO), Defence Scientific Information and Documentation Centre (Defence Research and Development Organization).

ment exercises of research quality or impact, the underlying rationale being that an article or journal that is cited by many researchers has made a significant contribution to science⁵. The present cor-

respondence reports the citation pattern of 5317 articles and reviews published in the 46 Indian science journals in 2006 and cited during January 2006–June 2009. Of these, 3943 were domestic papers, 1183

foreign contributions and the remaining 191 were collaborative papers. Of the 5317 papers, 39% were cited one or more times during January 2006–June 2009 and 61% remained uncited. However, the

pattern of citations varied from journal to journal, as shown in Table 1. A majority of these papers were cited between 1 and 5 times and only about 3% papers were cited six or more times. The proportion of cited domestic and foreign papers was almost the same (38% and 40%). However, collaborative papers had higher citations than domestic and foreign papers (55%).

Possible reasons for fewer citations of Indian science periodicals may be either due to the low prestige of the journal or the relative irrelevance of the work, which was not connected to mainstream science. Another possibility might be that the work being published in these journals is getting cited in domestic journals which are not indexed by SCIE. In addition, other factors responsible for poor citations might be the poor circula-

tion, low frequency of publication and non-availability of these journals in the Open Access mode. However, Open Access, full-text information systems are rapidly being developed in India. In order to enhance the visibility and citations of Indian science journals, journal editors need to create conducive conditions to attract quality papers from India and abroad. Also, there is a need to constitute editorial boards which are international in character and to appoint professional marketing agencies to increase the circulation of the journals. All these will help in enhancing the citations of Indian science journals.

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Kannimara teak: an extant forest genetic resource

The Kannimara teak is the largest teak tree (48.5 m height, 6.57 m girth) in the country, aged about 450–500 years. It is a precious asset standing in the Parambikulam Wildlife Sanctuary, Kerala (10°23'00"N, 76°42'30"E; Figure 1). The tree is healthy, it flowers and fruits annually and the seeds develop into viable seedlings. During the colonial era such giant teak trees were selectively harvested for ship-building. By the late 18th century most teak genetic resources got

depleted in the wild and man-made plantations were initiated. Trees akin to Kannimara teak are still found as museum exhibits in different parts of our country. Incidentally, the Gass Forest Museum (GFM) at Coimbatore, the oldest museum in the country, has a tree cross-section harvested during 1904. It is interesting to trace how Kannimara teak escaped the selective harvest forest management practice of the British Raj. Historically, the tree belongs to Kongu Nadu (presently

Coimbatore region) that worshipped the 'Saptha Kanniyar' (the seven virgin guardian angels). This practice is still prevalent among the people of Coimbatore region and its neighbouring districts. During the British era, forest-dwellers of Parambikulam believed that the Kannimara teak was an abode of the seven angels. This sentiment was respected by the then rulers and the tree became extant. Perhaps in terms of forest genetics it is still a resource of many founder alleles related to productivity and various other characteristics. The Government of India recognized the tree with 'Mahvriksha Puraskar' (Great Tree) award in 1994. The United Nations is making preparations to celebrate the year 2011 as the 'International Year of Forests' (www.un.org). This reminds us that it is time for us also to appreciate our precious forest resources.

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Figure 1. a, View of the Kannimara teak. b, Volunteers measuring the girth of the tree.