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Impact of fluoride on intelligence of some school going children in Barkagaon, Hazaribag, Jharkhand, India

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Water is of paramount importance for the existence, development and sustenance of life. Water at any place also plays a vital role in health, wealth and prosperity of people living there. Over millions of people in the world have no access to safe drinking water. Groundwater is one of the major sources of drinking water but geogenic contaminants including fluoride have affected groundwater in more than 200 districts of 20 states of India. Fluoride is one of the most important elements for calcification of bones and teeth where as excess intake (<1.5 mg/lit.) may affect skeletal, non skeletal and dental fluorosis which has direct bearing on Intelligence Quotient (I.Q.). Fluoride content in the collected water samples from five tribal dominated pockets of Barkagaon, Hazaribag, Jharkhand, India showed that the water samples contain fluoride above the permissible limit in all the seasons (July 2011 - June 2013). The highest average concentration of fluoride was recorded in Potanga basti (3.86 +/- 0.8 mg/lit.) and lowest in Garsulla basti (1.99 +/- 0.8 mg/lit.). Dental fluorosis and Intelligence Quotient of 567 school children (06-14yrs.) were respectively evaluated by Dean's Index and Raven's coloured progressive matrices which indicated that almost 87% children were suffering from dental fluorosis where as 73% were having extremely low to low average I.Q. Parallely socio-economic status of the school children was recorded with the help of questionnaire to draw a meaningful result. It is thus clear that the dental fluorosis and I.Q. among children have direct relationship on fluoride concentration in drinking water. Probably the higher fluoride concentration in the study pockets is due to geogenic contamination and injudicious exploitation of nature. Conclusion is that the affected children in endemic area of fluorosis are at risk for impaired development of intelligence.

Biography

D N Sadhu is Associate Professor, Department of Zoology, Vinoba Bhawe University, Hazaribag, Jharkhand, India. He has more than 37 years of experience in extensive teaching and research in Post graduate and Under graduate levels in the prestigious St. Columba's college, Hazaribag and in the Department of Zoology, Vinoba Bhawe University, where he served the Dept., as Head of the Department for more than two years. He is the recipient of Gold Medals from Zoological Society of India, Madhavi Shyam Educational Trust, Ranchi and Environmental Society, Haridwar, besides getting National Merit Scholarship at UG and PG levels. His subjects of specialization are "Environmental Biology, Fish Toxicology and Endocrinology". He has successfully guided nine research scholars for PhD degree in different fields of his interest, while more than 50 full length research papers have been published in peer reviewed national and international journals of repute. He is also an active member of the Editorial boards of five prestigious research journals of national and international repute; is a life member of 10 academic societies of India and abroad, active member of the wild life board, Jharkhand and member of advisory board of Ramakrishna Mission. He has two UG and PG level books to his credit as author and co-author and the latest contributions in these publications will help students, researchers, teachers and scientists as a reference material.

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