Changes in health status of the Soliga tribe at BRT due to modern interventions

The Soliga is an indigenous community of Biligiri Rangaswami Temple Wildlife Sanctuary (BRT; lat. 11°40′–12°09′N and long. 77°05′–77°1′E, altitude 600–1800 m asl), Karnataka, India. The tribe has a long history of curing most of its ailments using traditional medicine[1]. At high altitude regions as well as in most rural areas of our country, traditional healthcare system is the only accessible form of treatment for a majority of the people, both logistically as well as economically[2]. In such traditional healthcare systems, medicinal herbs are of vital importance as they are the major ingredients of local medicines. In the recent past, decrease in use of traditional medicines has been observed in many of the tribal communities in India, as they exhibit a preference to modern medicines[1,3]. Such a paradigm shift in the use of healthcare systems poses a number of questions. Is the decrease in the practice of traditional medicines responsible for a decrease in its use by the tribes? Does easy availability of modern medicines lead to its increased use in comparison to other traditional healthcare systems? Is the use of traditional medicines determined by the availability of medicinal herbs in different vegetation types? Could the availability of medicinal herbs in proximity to the tribal settlements, involving low opportunity cost of its collection determine the use of traditional medicines? All the above stated hypotheses were tested for the Soliga tribe of the BRT.

The Soliga population that settled in scrub, dry and moist deciduous, and low altitude Shola forest of the BRT, when appraised through semi-structured interviews, exhibited 75–95% usage of modern medicines (MM) compared to 5–40% use of traditional medicines (TM). The only exception to this trend was recorded in the Soliga tribe settled in the evergreen forests exhibiting 25% use of MM compared to 70% use of TM (Figure 1). One-way analysis of variance (ANOVA) exhibited significant difference in the use of traditional and modern medicines at $P < 0.05$ by the Soligas settled in the different vegetation types.

Since population demography of the villages differed widely, equal number of male and female Soligas were interviewed at each 'podu' (village) depending on its demographic strength. The sampled population of Devarhalli in scrub forest and Purani in dry deciduous forest stated slow remedy and dearth of traditional healers as the primary reasons for preferring MM over TM. Kanneri colony in the moist deciduous forest, which had 13–14 traditional healers, preferred MM over TM due to long duration of remedy for TM and proximity of modern medical facility to the podu. The population at the Kadigeri podu in low altitudinal Shola forests stated slow remedy by TM, dearth of traditional healers and unavailability of medicinal herbs as the reason for preferring MM. However, the Soliga tribe at Gombagallu podu in the evergreen forest of BRT preferred TM over MM. The plausible reasons stated for this were the presence of 3–4 traditional healers and lack of modern health facilities nearby.

The healthcare systems practiced at BRT were studied with reference to few selected ailments to understand their significance in improving the health status of the tribe. The alternative healthcare systems prevalent at BRT are allopathy at Vivekananda Girijna Kalyan Kendra (VGKK) and ayurveda at the Government Ayurvedic Health Unit. Consultation with the practitioners of alternative medicines and traditional Soliga healers indicated that MM has been greatly effective in treating and lowering the incidence of general diseases, infant mortality and sickle-cell anaemia. The contribution of allopathy was 100% in treatment of sickle-cell anaemia, which is inherent in the ethnic Soliga tribe. Ayurvedic medicines played a greater role in the treatment of some chronic diseases like jaundice and tuberculosis. However, in recent times the Soliga's indigenous system of medicine had negligible contribution to the treatment of both general and chronic diseases affecting the tribe. The increased incidence of general diseases among the tribe in the recent past could be attributed to the changes in their lifestyle. Their food habit has changed over the past few years from fibrous staple food, 'ragi' and other forest products, to food cooked in hydrogenated oil. The visible shift from agriculture and forest-based livelihoods in the younger generation (<40 years age) at all the podus is probably due to demographic pressures.

An investigation of the herbaceous vegetation was deemed necessary to test whether the availability of medicinal herbs in different vegetation types of the BRT resulted in the significant difference in use of healthcare systems among the tribe. A total of 100 sq. m was sampled to study the herbaceous vegetation by laying ten, 1 m × 1 m quadrats at 1 and 3 km from each podu across the five vegetation types of the BRT. A one-way ANOVA for difference in the density of medicinal and non-medicinal herbs across the five vegetation types was insignificant at $P < 0.05$ (Figure 2). Hence it can be stated here that the difference in the use of traditional healthcare systems by the Soligas settled in different vegetation zones was not dependent on the

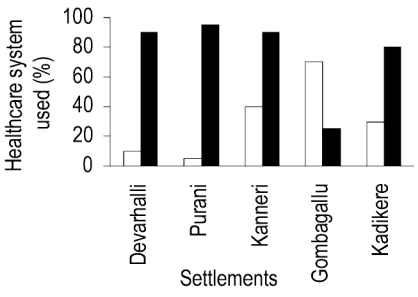

Figure 1. Percentage use of traditional (white bar) and modern (black bar) healthcare systems by the Soliga tribe settled in the different podus across the vegetation types of BRT.

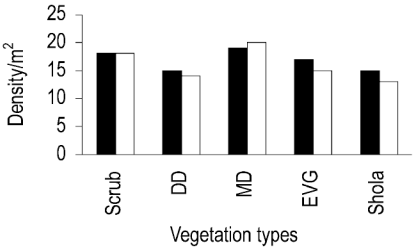

Figure 2. Density (plants/sq. m) of medicinal (black bar) and non-medicinal (white bar) herbs in the five vegetation types of BRT, namely Scrub, Dry deciduous (DD), Moist deciduous (MD), Evergreen (EVG) and low altitude Shola.

availability of medicinal herbs, as hypothesized. The density of medicinal herbs in proximity (1 km) to the villages as well as at distal sites (3 km) was found to be insignificant at $P < 0.05$ by one-way ANOVA. Hence, the decrease in the use of TM is not related to the higher cost of collection of medicinal herbs at distant sites from the podus. The use of MM was rather dependent on factors such as proximity of the podus to the hospitals, clinics, availability of mobile health clinics, etc.

In most vegetation types in the BRT, there was considerable decrease in the practice of TM by the younger generation of Soligas (below 40 years of age). There was a corresponding low inheritance of traditional medicinal knowledge (TMK) among the inhabitants of the podus. The only exception to this trend was observed in Gombagallu, situated in the evergreen forest. TM was practised by the younger generation of this population due to lack of alternative healthcare facilities closeby. About 95% of the inhabitants of Purani podu in the dry deciduous forest had no information on TMK of the Soligas. The death of a torch-bearer of TM resulted in higher loss of their TMK in some podus. These podus had no information on snake-bite antidote, the most primitive TMK of any tribal settlement. However, a one sample *t*-test at $P = 0.001$, showed that the decrease in practice of TM by the younger (<40 yr) generation Soligas compared to the adults (≥40 yr) was not significantly different across the sampled podus.

There was evidence of more information on the use of medicinal plants stored in the herbarium at VGKK and in the documentation by Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, compared to the knowledge among the inhabitants of the different podus. Efforts for conservation of medicinal plants by the Soligas were found to be low compared to other artificial conservatory systems. The increased intake of MM and the lack of much interaction of the younger generation Soligas with the forest resulted in deterioration and stagnation in the evolution of TMK.

The present study shows that the health status of the Soliga tribe has improved over the years due to the treatment of hereditary diseases by modern interventions. This has also led to increased preference of the tribe MM due to its easy availability and faster duration of remedy. On the other hand, the decreased dependence of the tribe on TM can be attributed to its longer duration of healing and low practice rather than the unavailability of medicinal herbs, as is often believed. The rapid decrease in the use of TM may lead to loss of immunity and the rich cultural heritage of the Soliga tribe in the near future.

On the global front, the World Health Organization[4] has initiated efforts for the conservation of TMK through its documentation. In its efforts for conserving TMK of the Soligas, VGKK has opened a herbal unit at BRT, which produces herbal medicines based on the tribal formulations for Soliga patients. The VGKK and ATREE station at BRT have developed agro-ecosystems, provided market channels for agricultural and non-timber forest products, monitoring of the natural ecosystems for sustainable development of the vegetation and people of the BRT. Unfortunately, such efforts do not seem to go hand in hand with the conservation of the rich, unique TMK of the Soliga tribes by themselves. Today, this is a common trend in most of the tribal populations of India due to their easy access to MM. However, further research is necessary to assess the impact of MM on the health status of the Soliga tribe at BRT. A pertinent question that remains to be answered is whether modern healthcare systems that come as a part of developmental packages, are more suitable than traditional healthcare systems for such ethnic tribes across India.

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ACKNOWLEDGEMENTS. We thank the staff at ATREE, Bangalore especially Drs K. S. Bawa, T. Ganesh, Ganesan, Arvind and Vanraj. We are grateful to Dr Sudershan, Founder, VGKK for the co-operation extended. We thank the doctors at VGKK Health Centre, the Government Ayurvedic Centre, traditional Soliga healers and the people of BRT. We also thank Dr D. Adhikari, North Eastern Regional Institute of Science and Technology, Arunachal Pradesh and the anonymous referees for their valuable comments.

Received 25 April 2006; revised accepted 13 March 2007

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