vores, is more. Recent discovery of volatile terpenes of plants that attract natural enemies, with progressive technology through bioengineering, may perhaps go a long way in harmonizing the full potential of biological control.

Incorporation of molecular techniques in ecological field studies has also shown the phenotypic effect of silencing genes. For instance, a reduction in volatile emission can also result from the effects of silencing genes affecting the attraction of natural enemies. This has been adequately demonstrated, enabling better assessment of function of a gene under field conditions[9,10]. Modifications of existing secondary pathways for defence by altering the level of expression of endogenous genes or inserting foreign genes from wild species, results in the augmentation or modification of phenolic production[11]. While information transfer between infested and uninfested plants is known, the possibility that plant roots release an elicitor that can induce the production of plant volatiles in another plant, has also been explored[12].

Identifying many more elicitors in different injured crop plants, as well as recent advances in microarray techniques could provide a more comprehensive view of gene expression patterns.

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Lymphatic filariasis eradication programme

The eight sister states in the Northeast, i.e. Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalya and Sikkim, have a tropical climate with luxuriant moist and deciduous rainforest. This environmental condition is ideal for breeding mosquitoes, leading to epidemics like malaria, lymphatic filariasis (LF), Japanese encephalitis and other mosquito-borne diseases. Low socio-economic conditions, difficult terrain, limited health facilities coupled with poor surface communication specially during long monsoon periods, pose major challenges in providing health services.

LF caused by nematode parasites *Wuchereria bancrofti* and *Brugia malayi*, is one of the leading causes of permanent and long-term disability in humans. Mosquito vectors, mainly *Culex quinquefasciatus* and swamp-breeding species of *Mansonioides* transmit LF in the country. India alone accounts for 40% of global burden of this disease. About 450 million people in more than 18 states/union territories of India and belonging to about 257 districts are at risk of infection.

Assam contributes more than 94 lakh people who are at risk of filarial infection; 360,000 microfilarial carriers and 90,000 diseased persons to the national pool[1]. There is an increase of 10,000 microfilarial carriers during a period of one year. Both forms of LF (*W. bancrofti* and *B. malayi*) have been reported from Assam in earlier surveys[2]. Filarial survey conducted amongst labourers working in tea gardens and local population endorsed the earlier findings that high microfilaria and disease rates in tea labourers were recorded compared to local indigenous population[3]. However, Raina *et al.*[4] has reported a decline in *B. malayi* infection from the southern part of Assam. Regarding chemotherapeutic studies, literature retrieval revealed only one reference of drug trials against bancroftian filariasis using diethylcarbamazine (DEC) alone in a tea garden setting[5]. Thus the tea worker community is not only the main sufferer from LF, it is also responsible for transmission and propagation of filarial infection.

Most of the tea labourers whose ancestors originally migrated from high filarial endemic states like Orissa, Andhra Pradesh, Bengal, Bihar, Kerala and Uttar Pradesh during pre-independence era to work as labourers in various tea estates, are still living in densely populated labour lines within the tea gardens or in close vicinity of tea factories and remain isolated from other indigenous population. Now they are dispersing in all the possible tea-growing areas instead of living in isolation and confining themselves to the existing old tea estates, because of the fact that tea leaf plucking and processing requires skilled workers and the existing workforce in Assam is being recruited in all newly created gardens across other states. In other words, along with tea workers, LF is now reaching newer niches. Further, *Cx quinquefasciatus*, the main vector of LF, is ubiquitous.

Studies conducted in Pondicherry, Shertallai and elsewhere in the country had shown that man-days loss due to filarial fever, acute attack and chronic clinical manifestation is huge and exerts significant impact on the socio-economic condition at both state and national levels. In the tea garden set up of Assam and Tripura, where tea output is directly related to work output, man-days loss due to filarial fever, acute attack and clinical manifestation must be enormous.

Researchers have found that single annual regimen of DEC at the dose of 6 mg per kg body weight, if given as mass therapy alone or in combination with albendazole

(> 85% drug intake coverage), to eligible population consistently for a period of 4–6 years (fecund period of filaria worm) is sufficient to control/block the transmission cycle of LF. These findings prompted the World Health Organization to identify LF as one of the six major tropical diseases potentially eradicable and planned to eliminate LF globally by 2020. Till date more than 32 out of 83 endemic countries are in the eradication programme globally. India has also joined hands with WHO and accordingly LF eradication programme in India was started in Andhra Pradesh, Tamil Nadu, Bihar, Uttar Pradesh, West Bengal, Kerala and Orissa.

However, the picture from the NE region is different. Though studies on filariasis in Assam have indicated specific vulnerability of tea-garden workers who have ancestral link with filaria endemic states, except some scanty report from Assam there is no documented report on prevalence of LF from any other state in the NE region. Even Tripura which is the second largest tea-growing state in the NE region that employs significant proportion of the worker population in the tea industry, lacks documentation. Currently, the only Filaria Survey Unit (established in 1965) is operating from Directorate of Health Services, Guwahati. Further, there is no filaria clinic in the whole NE region. The existing survey unit has limitations and constraints in conducting thorough night-blood surveys.

High compliance in the intake of drug by eligible population and consistency of mass drug administration programme are the key factors behind the success of the LF control/elimination. Recently, the government of Assam for the first time launched mass DEC administration on 5 June 2004 in four of the 23 districts, namely Dibrugarh, Sibsagar, Nalbari and Kamrup. Though filaria eradication programme has begun in Assam, to make it a success in the NE region, strategic and meticulous planning is a must. Information about prevalence of LF is significantly lacking in this region. Also, the old method of night-blood survey for filariasis is cumbersome, painstaking and inconvenient to both the surveyor and subject and is difficult to perform due to obvious operational limitations. Rapid screening of children 2–14 years of age in a population for presence of filarial antigen by ICT (immuno-chromatographic test) which can be done at any time (during day or night), though uneconomical, may be practically feasible and a suitable substitute to the night-blood survey for this region.

Secondly, issues like earmarking of population, coverage level of mass therapy, consistency and monitoring of programmes for stipulated periods are some of the real challenges ahead for programmers and planners. LF eradication programme needs active help and support from all tea growers and big and small planters (ultimate beneficiaries), who can play a major role through their existing health care system. This will go a long way in the success of national LF eradication programme in this part of the country.

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Fish death in lakes

An incidence of mass-scale fish mortality in Bangalore was reported recently in the local newspaper as front-page headline[1]: 'Five tonnes of fish die in Ulsoor Lake. From being a clear, tranquil water body, the recently restored Ulsoor Lake has become a sea of dead fish'. Among the views expressed as the cause of this tragedy were[1–3]: (i) Chemicals flushed into the lake, following a cleaning of the BCC-owned Ulsoor swimming pool; (ii) lowered Biological Oxygen Demand; (BOD) level due to the approaching summer [BOD, expressed as mg O_2 per l, is the amount of dissolved oxygen needed to oxidize organic materials to carbon dioxide and water at a particular temperature and pressure. If there is a large quantity of organic waste, there will be a lot of bacteria working to decompose this waste. The greater the polluted organic waste, higher the BOD]; (iii) introduction into the lake, of a variety of fish known to be a prolific breeder to contain mosquitoes and (iv) death due to phosphorus load. A similar incidence of fish mortality in Bangalore had occurred in June–July 1995 in the Sankey Tank and Lalbagh Lake. These episodes have been reconciled with organic pollutants discharged into the lake. The purpose of this correspondence is to (i) inform that incidences of fish death are not unique to water bodies in Bangalore; (ii) review the available microbiological and biochemical explanations of fish death observed elsewhere, and (iii) apprise of a biological control of fish death proposed in the literature[4].

It is common knowledge that fishes in an aquarium live long if kept with photosynthetic aquatic plants such as *Hydrilla* or *Vallisneria*, or other plants under illumination and with air constantly bubbled into the water. The basis for this is a classic experiment by Joseph Priestley, who showed that a lone plant in a closed jar dies and a lone mouse in another closed jar dies, but when the plant and the mouse are together in the same jar, both live – experiments that led to the discovery of oxygen and photosynthesis. Animal life is dependent on photosynthesis. If the 'chemicals' discharged into the lake killed the suspended microscopic animals that are primary source of food of the fishes (zooplanktons), or if the lake was cleared of plants, it would have upset the 'ecosystem' and the fishes, like the mouse in Priestley's experiment, would die. Plants not only synthesize carbohydrate, but also do an