Recently the potential of many microorganisms, especially fungus to control weeds in several crops has been reported. Some of them are listed here. *Alternaria cassiae* (Casst), *Cercospora rodmani* (ABG-5003), *Cercospora coccodes* (Velgo), *Collectotrichum orbicular*, *Fusarium aonifliral*, *Deleterious rhizobacteria* (DRB), *Pseudomonas* spp., *Agrobectarium*, *Xanthomonas* spp., *Ervinia herbicola*, *Pseudomonas syringae pv. Tagetis (*Pst), *Xanthommonas campaestris pv. Poannua*, (Xcp), *S. hygroscoplus* (Bialaphos).

Besides many advantages of bioherbicides, certain factors have been reported to limit the development of bioherbicides into commercial products. These include biological constraints (host variability, host range resistance mechanisms and interaction with other microorganisms that affect efficacy), environment constraints (epidemiology of bioherbicides dependent on optimum environmental conditions), technical constraints (mass production and formulations development of reliable and efficacious bioherbicide), and commercial limitations (market size, patent protection, secrecy and regulations).

The bioherbicides approach is gaining momentum. New bioherbicides will find place in irrigated lands, wastelands as well as in mimic parasite weeds or resistant weed control. Research on synergy test of pathogens and pesticides for inclusion in IPM, developmental technology, fungal toxins, and application of biotechnology, especially genetic engineering is required. However, bioherbicides should not be viewed as a total replacement to chemicals, but rather as complementary in integrated weed management systems.

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B. L. MENARIA

Indian Institute of Forest Management, Bhopal 462 003, India
e-mail: drmenaria@gmail.com

Prospects of filariasis elimination programme in India

Lymphatic filariasis (LF), a mosquito-transmitted disease caused by parasitic worms *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*, affects an estimated 120 million people throughout the tropics. In 1998, the World Health Organization had targeted the elimination of this disease and formulated a Global Programme on Elimination of Lymphatic Filariasis (GPELF). The basic features of this programme are Mass Drug Administration (MDA) with appropriate antifilarial drug and morbidity management. Under this programme, annually, on a particular day, the antifilarial drug diethyl carbamazine (DEC) is distributed to all inhabitants of filariasis endemic areas, excluding children below 2 years of age and pregnant women. Though this drug has limited effect on adult filarial worm, it clears microfilariae from the circulation of the affected hosts, thus preventing the mosquito from transmitting the infection. As the fecundity of the female filarial worm is expected to be about 5–6 years, continuation of MDA in these areas up to such period will certainly cut down the transmission of filarial infection to a low level. The effectiveness or success of LF elimination depends on the consumption of the drug by the affected population and intermediary evaluation of the programme.

In India, the filariasis prevalence data basically came from the State health delivery system, which are primarily morbidity data. The microfilariae data available are largely based on information received from the Filaria Control Units (FCU) and filaria clinics as well as limited sample surveys carried out over a number of years. The data, while confirming the widespread distribution of LF in India, have several limitations and cannot be used for estimating the disease burden, *mf* carrier rates or *mf* densities, which are required for planning and monitoring the impact of MDA. Though the morbidity data are indicative of filariasis situation in any area and indicate the gravity of the disease, it is more about past infection and is not an indicator of the present situation. In the absence of microfilariae and CFA data, it will be difficult to evaluate the success of the MDA, as there are no baseline data for comparison. In asymptomatic individuals filarial infection can be examined by detection of microfilariae (night blood smear examination or PCR) or by detecting Circulating Filarial Antigen (CFA). Though CFA detection (Og4C3 ELISA or ICT Card Test) is highly specific and sensitive, it indicates overall presence of filarial parasite. However, it does not differentiate between microfilaraemic and amicrofilaraemic antigen-positive individuals. The main aim of MDA is to remove microfilariae from blood and check transmission. In this context, the evaluation of LF elimination programme should continue with night-blood smear examination or by adopting PCR techniques (in night-blood sample).

While some states are able to achieve high compliance with MDA, others lag behind due to ineffective IEC and the inability to tap all the available resources. In order to attain a high level of IEC, the education system should be involved in all levels, i.e. from primary education to college level. This could be achieved by incorporating information about the disease in the study syllabus, conduction of camps, essay competitions, health 'melas', drawing competitions, etc. and to run these programmes continuously for the entire MDA period. Children should be given the responsibility to find out ways to teach their elders about filariasis. Each school should have a wall painting highlighting the importance of MDA and mosquitocidal activities depicting the life cycle of the filarial parasite. In the absence of vaccine, elimination of filariasis can only be possible once the programme becomes a mass movement.

DASARATHI DAS

Regional Medical Research Centre for Tribals,
Jabalpur 482 003, India
e-mail: drdas60@rediffmail.com