A watershed in termite control

R. N. Sharma

Synthetic organic pesticides constitute a sizeable component of the total toxicity load of the planetary environment. Persistence of these molecules in time substantially influences their distribution in the ecosphere. As a consequence, the most persistent among these, the chlorinated hydrocarbons have almost entirely been shelved. A glaring but unavoidable exception has been conditional permission for their use in the specific situations of building termite control[1]. However, many recent findings and perceptions[2-4] have led to their ban for termite control also. Heptachlor and chlordane are two insecticides banned for even building control in India recently. Aldrin, the most popular and persistent termiticide, has been stated for gradual phaseout[5]. A common property of these three most popular termiticides is high persistence ranging from 20 to 30 years.

Termites are highly developed social insects which are capable of causing enormous damage to human agriculture, buildings and commodities. Estimates of total cost of termite damage containment are 192,0000,000 US $ per annum globally, and 400,000,000 $ for India per annum[6].

The recent ban/phaseout on conventional termiticides in India is likely to leave a yawning chasm and in view of the tremendous economic potential, competition among various insecticides manufacturers to fill the gap is likely to be stiff. Care must be taken that the environmentally progressive ban on conventional termiticides must not be subverted into a promotional opportunity for newer ecologically unsound chemicals of other names or categories. Thus, classes of compounds other than chlorinated hydrocarbons may have residual activities lasting up to 15–20 years, and may have other undesirable properties besides being equally or more toxic[7]. In such cases, the new substituents will continue to have the disadvantages of the banned chemicals without their special merits for building termite control.

The ban was inevitable, and has not come soon enough, but it is better late than never, and welcome as it forces a fresh look and wholly biorational approach and action. The latter imperatives give precedence to environmental concerns over conventional requirements of the building industry. Thus, continuing toxicity of chemicals in the soil over several years poses manifold risks of soil, air and water (table) contamination at site as well as in locales far removed. Inherent in such unbridled radiation of toxic molecules are the whole gamut of their translocation through ecological chains and bioconcentration at all levels.

Certain rule of the thumb, unnegotiable guidelines therefore need to be enunciated for the choice of alternatives. For toxic chemicals, these can be: summary rejection for those persisting beyond five years, and temporary acceptance for 3–5 year active ones, till better substituents (1–2 years residual action) and strategies become available. Chemicals with higher than conventional water solubility or vapour pressures (volatilization potential) compared to conventional termiticides must also be rejected.

Creation of (chemical) barrier to prevent access of termites to cellulosic and other vulnerable structures has been the chief plank of termite damage containment in buildings. However, in view of the very serious environmental hazards, including those directly affecting man, it is now essential that new concepts, chemicals, formulations and strategies be developed for termite control in buildings. Thus, slow release formulations, replaceable or exploding cartridges in pre-provisioned access hatches leading to the foundation are two ideas which could reduce continuing and long-term toxicity of the soil. Even more desirable may be increasing deployment of non-toxic chemicals such as behaviour or development regulating molecules. Thus insect juvenile hormones or pesticides with latent or delayed toxicity could be used in combination with attractant chemicals to induce their carriage into the termite colonies by contaminated worker termites themselves. If suitable strategies can be devised, non-toxic chemicals such as feeding deterrents, antimetabolites, repellents and alarm pheromones can also be used to prevent termite damages.

Termite control in the building industry has reached a watershed and is presently without substantive mooring. The concept of maintaining a barrier of highly poisoned soil beneath buildings is inherently unscientific and hazardous since it assumes glibly that soil is an inert medium. In truth, the soil is a highly dynamic ecosystem with complex interwoven and interacting ramii into other connecting (aerial and aquatic) ecospheres. The vacuum created by the ban on the conventional termiticides has forced an intellectual and technological challenge which can be met only by revolutionary innovation in concepts, chemicals and techniques. Modern trends in architectural design and advances in construction technology should make it possible to evolve wholly new parameters and protocols incorporating environmental imperatives for preventing building termite damage.

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R. N. Sharma is in the National Chemical Laboratory, Pune 411 008, India