

Discussion

During the last two decades, new trends in pest control were directed towards the minimum application of chemical pesticides. This is obviously due to the serious hazards and damage to humans, animals and plants as well, and the environmental pollution of air, water and soil. This, coupled with the high prices of pesticides and loss of their properties due to the continuous development of resistant strains of pests.

At present most research studies in the field of pest control are depending on the application of pesticides of plant origin.

e.g. Schumutterer *et al*., 1995 and Stoll, 2000). This is due to the ease of preparation and application of these compounds and their safety and harmless effects on non target organisms.

In the same line, the present study was carried out to investigate the insecticidal effects of the aqueous extracts of two common plants naturally grown in Sudan, e.g., Neem and Argel, against termite species affecting buildings in Sharjah state, UAE. A standard insecticide, Fortune E.C 500, was also applied for comparison.

The experiments continued for four weeks and the results of the different treatments shown in tables 1-12, and in the comprehensive tables 13-16, and in figures 1-4, showed that the standard insecticide was effective up to the end of the experiments. The two plant extracts were also effective. The efficiency of Neem aqueous extract was very high up to the end of the experiment, and was almost comparable to that of the standard insecticide. Argel extract remains effective for two weeks, however, its efficiency dropped gradually after 2 weeks and lost its effect by the end of treatments.

Concerning the application of botanicals for pest control in the UAE, the literature review showed that some botanical extracts (e.g, Azadirachtin and jojoba oil) were evaluated for the control of the red palm weevil *Rhynchophorus ferrugineus* (Olivier) (Bream *et al*, 2001).

No record was found on the application of botanicals for termite control in the UAE. In comparison, a number of termite control trials were carried out with botanical extracts in other countries.

In Germany, Blaske and Hertel (2001) examined the insecticidal activity of 4 plant extracts against 4 species of subterranean termites { *Reticulitermes santonensis*, *R.virginicus*, *Coptotermes formosanus*, and *Schedorhinotermes intermedius*}. In choice experiments, the results showed that filter papers treated with extracts had significantly repellent effect on all species of termites. The results of choice experiments revealed toxic properties of all extracts tested .(against one species of termites (*R. santonensis*

In Pakistan, Badshah *et al* (2004) applied plant extracts of AK(*Calotropes procera*) against 2 species of termites (*Heterotermes indicola* and *Coptotermes heimi*). Their results indicated that the toxic effects of flowers extracts caused more mortality of the termite species than the leaves .extracts

In Sudan, Ajab (2005) used Neem seed kernel powder and boric acid in field and laboratory tests as preservatives of wood against dry wood termites. His results showed that, the two compounds significantly reduced termite attack and weight loss in test wood. In addition, the botanical extracts kept the treated blocks free .from termite attack

Also, in Sudan , Sidahmed *et. al* (2009) applied aqueous extracts of Argel (*Solenostemma argel*) against cotton soil termite *Microtermes thoracales* in laboratory experiments. Their results showed that, all concentrations of the argel aqueous extracts caused high mortality of the termites. No significant differences were found between the highest concentration of Argel extract and that of .the Standard insecticide Morisban 4

The results of the present study, and of those made in other countries, clearly indicated that, there is a wide range for future applications of different plant extracts against subterranean termites in different countries and in Sharjah Emirate and in the UAE as well. Their main advantages are that, they are safe and easy to apply and, more, almost of no costs comparable to .the chemical pesticides currently in use