Evaluation of CimeXa and ChinCheX against fed and unfed Cimex lectularius

Final Report Oct 2017 by Dr. Richard Naylor

Introduction

Since c.2000 the Common Bedbug (Cimex lectularius) has experienced a resurgence in urban centres all over the World. Widespread resistance to pyrethroid and carbamate insecticides is believed to be the main cause of the resurgence and is frequently responsible for treatment failures. Consequently new products are needed for the effective control of bedbugs.

One class of bedbug treatments that shows promise are the desiccant dusts, which include both the naturally derived "diatomaceous earth" and the synthetic equivalent "amorphous silica dioxide". Efficacy of these products varies considerably, with CimeXa (Rockwell Labs inc. U.S.) being one of the best commercially available products in this class.

The objective of this investigation was to evaluate a new product, ChinCheX, using CimeXa as a commercially available reference.

Products

ChinCheX - sample supplied by Frank Gullass.

CimeXa – commercially available product in the same class, which was used for comparison.

Insects

The products were evaluated against a laboratory reared population of bedbugs (Cimex lextularius) known as the "London Field Strain", which was collected in 2008 and has been maintained in culture by Richard Naylor since it was collected. This population has been widely used for product evaluations and is known to be moderately resistant to pyrethroid and carbamate insecticides at the time of testing.

Protocol

Both products were applied as a light dusting to a filter-paper substrate using a soft paintbrush. Exact dosing by weight was not possible due to the extremely light nature of both products, so the application was somewhat subjective. For both products the objective was to produce an even coating that was just visible across the entire treated surface.

Three replicates of ten mixed sex adult bedbugs were confined to each treated surface using upturned 90mm Petri dishes.

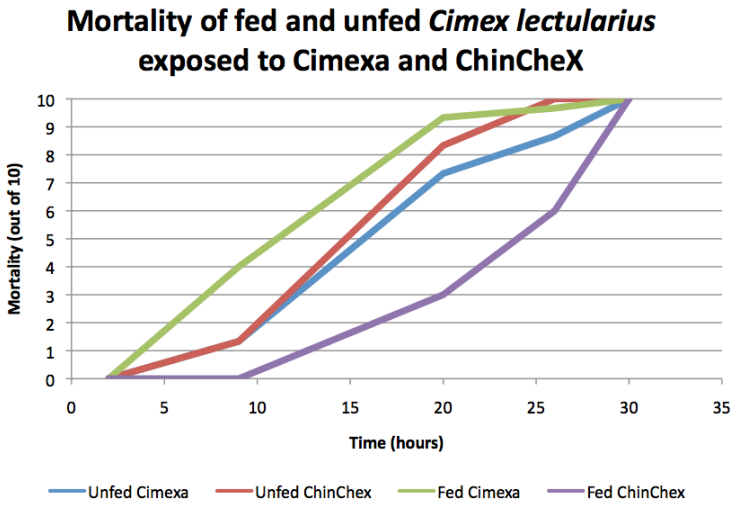
Bedbugs were confined to the treated surfaces for the duration of the trial.

Both products were evaluated against both fed and unfed bedbugs. The fed bedbugs were fed on human volunteers immediately prior to the trial.

Mortality was recorded at intervals and compared to a no-treatment control (just filter-paper), however, there was no mortality in either the fed or unfed control group for the duration of the trial.

Results

Both products achieved 100% mortality in under 30 hours. There was very little difference between CimeXa and ChinCheX in terms of the time it took to achieve 100% mortality. However, ChinCheX appeared to cause slightly more rapid mortality of unfed bedbugs, while CimeXa appeared to cause slightly mortality of fed bedbugs (see figure below). The reason for this difference is not know.



Conclusion

The results indicate that ChinCheX is extremely good for bedbug control. CimeXa, which was used for comparison, is already widely used for bedbug control, particularly in the US. In the countries where it is available, CimeXa is one of the most effective residual products on the market. The efficacy of ChinCheX is very similar to that of CimeXa, making it an equally valuable tool for bedbug control.