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Research Note

CIMEX LECTULARIUS L., 1758 (HEMIPTERA, CIMICIDAE): SENSITIVITY TO COMMERCIAL INSECTICIDES IN LABS

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Among the hemipterans of importance in Public Health the bedbugs are distinguished due to the discomfort brought to man because of hematophagic action or because of conveying pathogenetic agents to human health and well being. Two species of bedbugs are closely associated with man, *Cimex lectularius*, L., 1758 cosmopolitan and *Cimex hemipterus* (Fabricius, 1803) more restrict to the tropics (R. L. Usinger, 1966, *Monography of Cimicidae*. The Thomas Say Foundation, San Francisco, 585 p.).

Until the appearence of organochlorine insecticides the bedbug infestation were common and intense especially in places with great promiscuity and collective housing. Through campaigns of control of vectors of Yellow Fever, Dengue, Malaria and Chagas' disease the infestation by bedbugs was indirectly reduced. Because of such facts bedbugs were considered under control by the health authorities (WHO, 1982, VBC/82.841).

However a raise in bedbug infestation incidence has been observed (R. L. Nagem, 1985, *Rev. Bras. Entomol., 29:* 217-20; M. R. S. Negromonte et al., 1989, XII Cong. Entom./ II Encontro sobre Moscas-das-Frutas. B. H., MG, p. 481; F. King et al., 1989, *Parasitol. Today*, *5:* 100-1) due to negligence of government authority related to human health or resistance acquired to insecticides traditionally applied over the control of vectors of diseases, mainly organochlorines.

In order to give data to Public Health organs to control and fight these ectoparasite foci more efficiently, this work evaluated in laboratory the efficiency of six commercial insecticides to fight bedbugs, respectively, DDT, Lindane, Propoxur, Malathion, Deltamethrin and Permethrin.

Colonies of *C. lectularius* were reared and fed on domestic rabbits twice a week, after collecting in a district of Belo Horizonte, MG, where the previous infestation prevalence was determined as 7.26% (M. R. S. Negromonte et al., *loc. cit.*). In a first step, the mortality due to insecticide action on adult *C. lectularius* was evaluated, at 30 and 60 min exposure, and observed after 24, 48 and 72 h experiment. There was not any significant difference between the exposure time. The decreasing order of percentages for insect survival to each insecticide was practically the same after a 24 and 48 h exposure, except for Baygon and Permethrin, with alternate positions. Observations held after 72 h showed different sequences of insecticides.

The technique used to evaluate the association among the insecticides and to obtain subsides to prove possible crossed resistances among insecticides or groups of insecticides was one applied in Numerical Taxonomy (P. H. A. Sneath & R. R. Sokal, 1973, *Numerical Taxonomy*, Freeman & Co., San Francisco, 573 p.). The insecticides were compared in relation to 18 characters related to mortality percentage of *C. lectularius*, each one them codified in two character states, in decreasing order of survival.

The phenogram of association among the insecticides (Fig.) was constructed using the method U. P. G. M. A. (Unweighted pair group method analysis) from the data obtained. The associations that appeared on the phenogram could, consequently, provide data to show possible crossed resistance among insecticides

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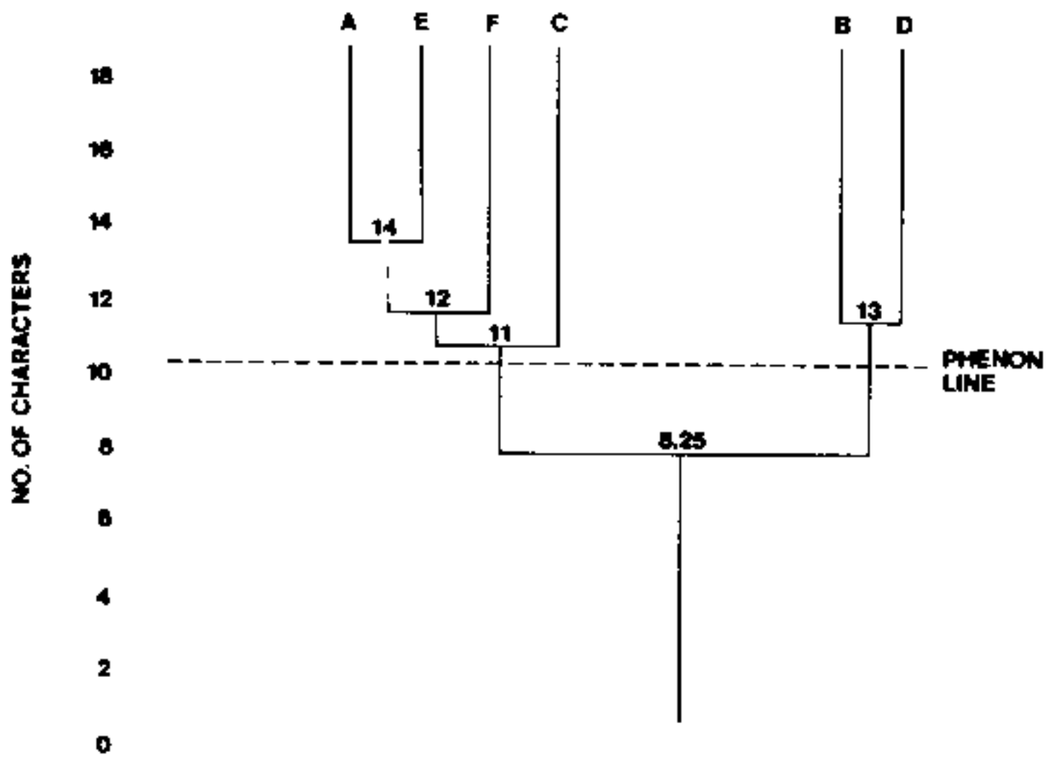

Association phenogram among some tested insecticides A = DDT; B = Lindane; C = Propoxur; D = Malathion; E = Deltamethrin; F = Permethrin.

or groups of insecticides. Two groups may be characterized according to efficacy: DDT/ Deltamethrin/Permethrin/Propoxur as oppost to Lindane/Malathion. The insecticides pyrethroid have the high knockdown effect in common with carbamate (Baygon), while the presence of chlorinated DDT in the same group could be revealing some resistance in the following order: pyrethroid (especially Deltamethrin) and carbamate.

Among the insecticides tested, phosphorated proved to be highly effective, according to notifications held by WHO in several geographical regions (WHO, 1982 VBC/82.857). The usage of an adequate dosage (2%) is relevant, since it was observed that reinfestation by bedbugs ocurred 30 days after pulverization with 1% Malathion (B. D. Varma et al., 1983, *J. Com. Dis., 15:* 126-8).

Concerning Permethrin, what should be recommended to improve its efficay would be to increase the concentration and the use of synergist (I. Yamamoto, 1970, *Ann. Rev. Entomol., 15:* 257-72). This is largely justified since the pyrethroid presents a large choice of advantages concerning the other insecticides.