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MODERN TRENDS OF PUBLIC HYGIENE INSECTOACARICIDES USE IN RUSSIA

BAKANOVA ELENA IVANOVNA AND ROSLAVTSEVA SVETLANA ALEXANDROVNA
Scientific Research Institute for Disinfectology of the Russian Federation Ministry of Health, Moscow

Abstract The article reviews insectoacaricidal formulations authorized for use in the Russian Federation during the period of 1992-2004, with a number of conclusions followed from the review. It recorded a stable interest to the containerized aerosols and emulsifiable concentrates, consistent growth of ecologically safe forms (various baits, sticky traps etc), and growing market demand to new target insectoacaricides.
Key Words Insectoacaricides, registration, formulations, target organisms

INTRODUCTION

Creation of a favorable condition for human vital activity in Russia is one of the most important tasks at the present day. It rests upon the law base (Federal law N52-FL adopted on 30 March 1999; Regulation about the state sanitary-epidemiological standardization, adopted on 24 July 2000 by Resolution N554 of the Russian Federation Government). Nowadays, synanthropic crawling and flying insects, mites and ticks represent one of the most important problems, since they can contaminate food with bacteria, transmit diseases and cause human allergies. Sanitary services implements the complex of measures to control urban pests in city buildings, houses, transport, country areas and water reservoirs to provide the human sanitary-epidemiological prosperity.

Insectoacaricides of various classes of chemical compounds (pyrethroids, organophosphates carbamates etc) can be applied to control the pest species. These chemicals are included in the composition of the insecticidal products as active ingredients. All the insecticidal products must be registered at the Ministry of Health of the Russian Federation. After the approval of the Ministry of Health insectoacaricides can be used according to the Instructions for use and the Label for each particular product.

There is a great variety of the insectoacaricidal formulations: containerized aerosols, readyto-use liquids in propellent free package, dustable powders, wettable powders, soluble powders, tablets and granules, emulsions and their concentrates (macro-, micro-, suspoemulsions, flowable and microencapsulated formulations), baits of all the kinds, bait stations, sticky traps, electric heaters with mosquito mats and liquid vaporizers, coils, crayons, gels, creams, lotions, shampoos etc. All the products registered and approved by the Ministry of Health of the Russian Federation as insectoacaricides during the period of 1992 - 2004 were analysed by two criteria: formulations and target organisms. The presented data characterize the share of each formulation in the total volume of products that have been registered yearly.

INSECTOACARICIDAL PRODUCTS AUTHORIZED FOR USE IN RUSSIA DURING 1992-2004

The analysis revealed that the biggest share of insectoacaticides authorized for use in Russia during 1992-2004 belongs to the following formulations: containerized aerosols and ready-to-use liquids in propellent free package (23%), emulsion and their concentrates (including all the variety of the forms) - 13%, baits of all the types and bait stations (12%), powders (including dustable, wettable and soluble powders, soluble tablets and granules) is 10%. The share of the electric heaters with mats and liquid vaporizers is 8%. (Figure 1). Below we will review the dynamics of each product formulation during the period 1992-2004.

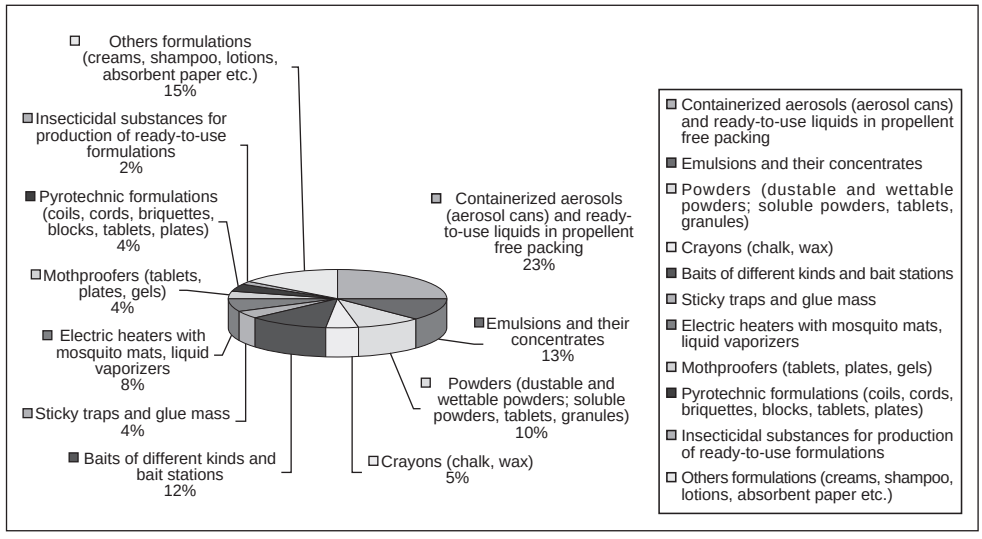

Figure 1. Assortment of products formulations authorized for use in Russia during 1992-2004

Containerized aerosols (aerosol cans). Share of containerized aerosol products steadily grew during the period of 1992-1996, and reached its maximum percentage 34.8%. Their share stayed at the highest level during 1994-1998, then it decreased sharply down to 12.3% in 1999. Share of aerosols started to grow again since 2000 and dominated over the rest of products in 2000-2004 (Figure 2). Ready-to-use liquids in propellent free package were not observed in the segment of insecticides in 1992-1993. This type of insecticidal products appeared in the Russian market in 1994, and since then the share of these products steadily grew until 1996, then experienced decline (Figure 2).

Emulsions and their concentrates. This group of products is the most stable in the Russian market of registered formulation. Its share stays at the high level during 12 years. The variety of microencapsulated emulsions is growing (Figure 2).

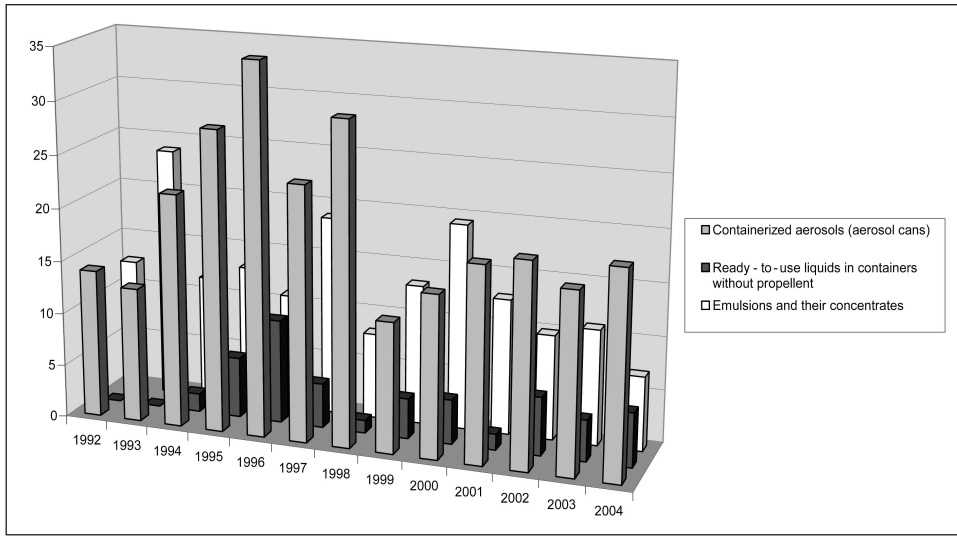

Figure 2. Share dynamics of each product formulations authorized for use in Russia during 1992-2004

Powders (dusts). These formulations have always kept significant share in the segment of registered formulations. This type of products took the highest share during 1992-1994, then its share started to decline (Figure 3). Wettable powders, soluble powders, soluble tablets and granules can be described with moderate but stable share (Figure 3). Crayons (chalk, wax). The peak of this type of products contemporized with its export from China in 1992. Then its share (26.6%) experienced a sharp drop (Figure 3).

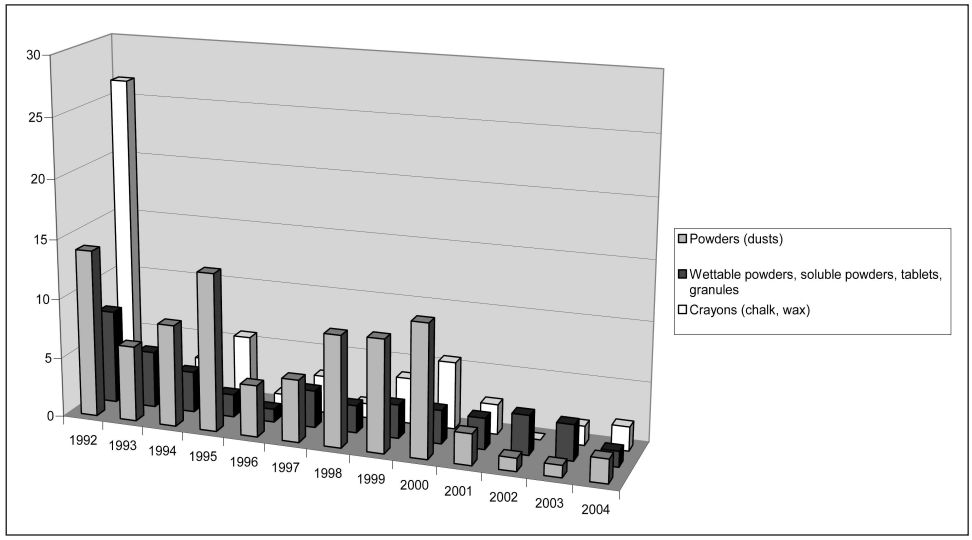

Figure 3. Share dynamics of each product formulations authorized for use in Russia during 1992-2004

Baits and Bait Stations. Their share was stable at the level of 5-7% till 2000, but it can be observed a slight decline in 2001, 2002, 2004 (Figure 4). Baits of all types (liquids, powders, granules, briquettes, plates, tablets, gels, pastes etc). The interest to baits has sharply grown since 1996, and this formulations enjoy high share till present. Baits share has increased from 1.% to 14-16% of registered formulations during the period of tracking (Figure 4).

Sticky traps (sticky boxes, ribbons, plates and glue mass). This type of products being attractive by its safety for people and environment will always be used for household pest control. In 2002 these products share reached the highest level of 9.9% having 13-year history in the Russian market (Figure 4).

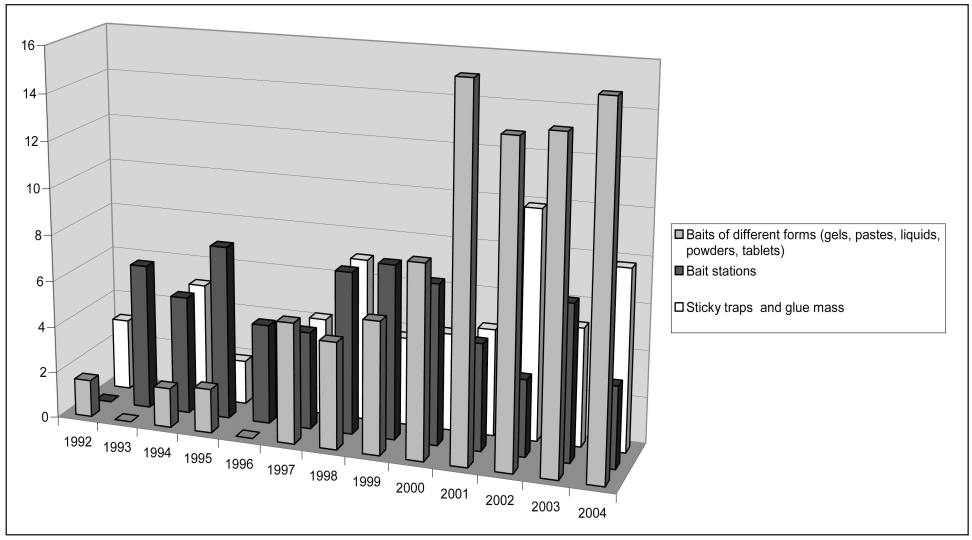

Figure 4. Share dynamics of each product formulations authorized for use in Russia during 1992-2004

Pyrotechnic formulations (coils, cords, briquettes, blocks, tablets, plates). These forms occupy 2-4% of the insecticides segment. Its share reached the highest level of 8.5% in 1994, then it started to decline (Figure 5). Electric heaters with mosquito mats, liquid and gel vaporizers. Share of these formulations increased in 2 times during the period of the last 5 years (Figure 5).

Mothproofers (tablets, plates, gels etc). These insecticidal products occupy the stable market share of 3-6% (Figure 5).

Ready-to-Use. Insecticidal substances for production of ready-to-use formulations are to be obligatory registered since 1999. Currently these products occupy insignificant share (3-4%) of the formulations segment, but this form of products has a strong potential in the Russian market (Figure 5).

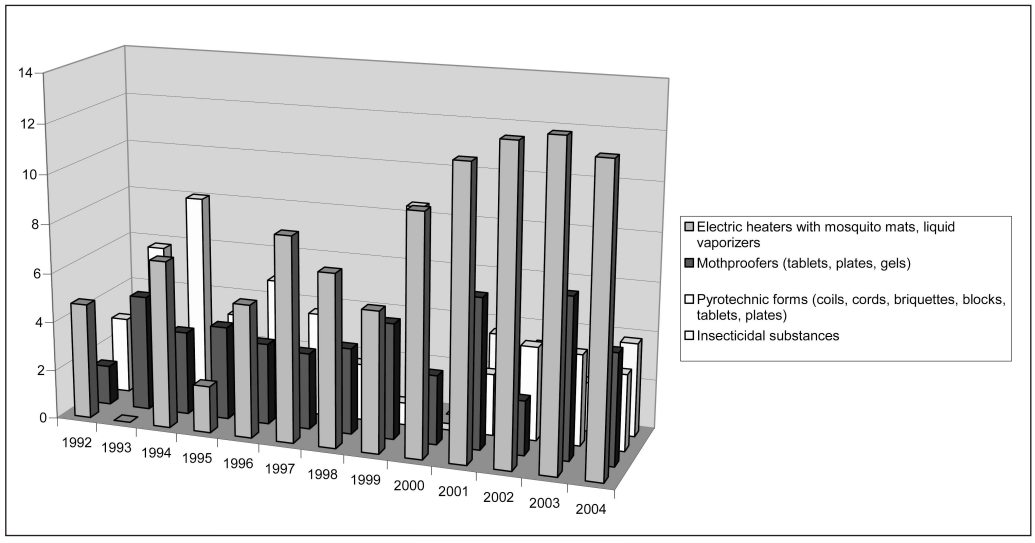

Figure 5. Share dynamics of each product formulations authorized for use in Russia during 1992-2004

Most of the produced insectoacaricides control the following important urban pests such as houseflies, German, Oriental and American cockroaches, ants, mosquitoes, bedbugs, fleas, head-and bodylice, mites and ticks. For the last three years the amount of repellents and acaricides grew rapidly and there appeared new products controlling target organisms such as house dust mites, ticks including *Dermacentor, Haemaphysalis* and *Hyalomma,* yellowjackets. Cases of undesirable contacts of people with yellowjackets on the territory of European part of Russia have become much more frequent recently. Mass development of countryside garden plots by population of European part of Russia and fractional deforestation have led to the increase of people stung by these insects. All these facts explain why yellowjackets and hornets as the objects of medical disinsection have been included into the list of the arthropods for which control methods on the territory of the Russian Federation should be developed.

Synthetic pyrethroids are still leading among the insectoacaricides of various chemical classes. Based on the recent data, allethrin, tetramethrin, permethrin, alphamethrin and cypermethrin are in the most popular demand in the sphere of public health in the Russian Federation. Organophosphates have strong positions as well. For example, malathion, phenitrothion, diazinon are broadly used in emulsifiable concentrates; diazinon, azamethiphos, chlorpyrifos are used in baites. Propoxur (emulsifiable concentrates and powders) and methomyl (baites for houseflies) are the most popular among carbamates. During the last decade new compounds have appeared: aminohydrazones (hydramethylnon), phenylpyrazoles (fipronil), neonicotinoids etc. Modes of action of such compounds have their own specific features. These compounds are broadly used in various types of baits due to enteric type of action.

CONCLUSION

This analysis shows that a number of ecologically safe formulations (different kinds of baits and bait stations, sticky traps and glue mass) has grown significantly over the past 5 years (2000-2004). At the same time the share of the concentrated forms used as a water solutions, and applied by spraying has dropped, especially that of powders. However, such formulations as containerized aerosols, emulsions, wettable powders do not loose their significance. Over the last few years it can be observed growth of segment of such products as microencapsulated emulsions, electric heaters with mosquito mats, liquid vaporizers, mothproofers, etc. This analysis shows that for the last few years, the interest to the formulations with low health and environmental risks has risen significantly. Spectrum of target organisms as well as variety of active ingredients based on various classes of chemical compounds has widened during the period of tracking.