

# Pest control in Albania: an example of collaboration in technical and scientific development in public health

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## Summary

In September 2007, a severe cockroach (*Blattella germanica*) infestation was reported on the premises of the Scutari Regional Hospital. The hospital was infested by cockroaches despite regular insecticide treatment by local pest control officers. The failure of treatment required a careful evaluation of the problem. It also created the opportunity for a more complete analysis of pest control in Albania.

## Keywords

*Aedes albopictus*, Albania, Cooperation, Control, Cockroach, Integrated pest management, Pest, Public health.

## Introduction

Pest control is a branch of biological sciences which embraces a number of different disciplines (medicine, veterinary medicine, biology, agricultural science, etc.) (1). The control of cockroaches (*Blattella germanica*) and other pests, such as tiger mosquitoes (*Aedes albopictus*), common mosquitoes (*Culex* spp., *Aedes* spp.), sand flies (*Phlebotomus* spp.), fleas (Siphonaptera), lice (*Pediculus humanus*), ticks (Ixodidae), rodents (*Rattus norvegicus*, *Rattus rattus*, *Mus domesticus*), etc., can be tackled with rational methods (integrated pest management: IPM), which provide a positive contribution to the environment and public health (2, 5). However, this process is not

automatic and the involvement of experts and planning of long-term projects are essential to ensure that the new theoretical concepts are consolidated and transformed into established routine practice (7).

This study involved the following steps:

- identification of the main cockroach control methods in Albania
- reduction of discomfort caused by the heavy infestation of cockroaches in the hospital (Table I; Figs 1, 2, 3, 4 and 5)

Table I  
Benefits of pesticide application with insecticide bait (gel formulation)

Benefits
Minimum environmental pollution and impact
No risk of acute intoxication through incorrect application
Minimal equipment needed (kit: delivery gun, extension lead, gel cartridge, torch, if necessary)
No need for post-treatment cleaning
Can be used risk-free in protected areas (hospitals, kitchens, canteens, prisons, schools, food industry, private homes)
Easy to use (e.g. in electrical panels, incubators)
Elimination of chronic cockroach infestation through primary and secondary poisoning

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- creation of conditions to alert users (public hygiene services) to the proposed new pest control method and its beneficiaries (hospitals)
- identification of priorities of integrated pest control in Albania.

Cockroaches, as well as provoking an instinctive disgust, are also considered a public health problem (1, 6).



Figure 1  
*Blattella germanica* in the drawers of hospital patients



Figure 2  
Hundreds of cockroaches and egg cases (ootheca) behind the fridge and cookers in the kitchens



Figure 3  
Cockroaches and egg cases (detail of Figure 2)



Figure 4  
Infested electrical control panel after application of insecticide gel



Figure 5  
Application in the electrical control panel

## Materials and methods

An individualised survey of pest control officers was conducted to identify the



techniques currently in use to control cockroaches in hospitals. Various inspections were performed at the Scutari Hospital (Fig. 6) in order to understand the location and intensity of this infestation, the species of cockroach present and the human/pest relationship.



Figure 6  
Scutari Hospital

As the hospital is an extremely sensitive environment (Figs 7, 8, 9 and 10) in which the use of traditional insecticides (sprays, aerosols, powders) may create a risk to the health of both patients and staff, it was decided that an edible gel insecticide should be used (Figs 11 and 12), with an extremely low environmental impact, but which is effective against cockroaches (10). The active ingredients identified were those already present in Albania, namely: imidacloprid 2.15%, fipronil 0.05%. The technique chosen has been in use in Europe for several years.

The pesticide was applied by three people: two Italian specialists and one Albanian, trained on-the-spot with a short theoretical and practical course. The number of treatments and the application method were those used when faced with a severe infestation, namely: three applications 10-15 days apart.

Training was conducted through meetings with staff from the local Public Health Department (Figs 13, 14, 15 and 16) during the application of treatment. The World Health Organization (WHO) office in Albania was contacted in order to alert the medical staff.



Figure 7  
Crushed cockroaches by the fridge door



Figure 8  
Inspection and application in neonatology



Figure 9  
Equipment that could be affected by a cockroach infestation

## Results

Investigation of the products used in cockroach control in Albania revealed that



Figure 10  
Infested towel used as bait



Figure 12  
Complete kit (application gun, cartridges and needles)



Figure 11  
Preparation of the necessary materials



Figure 13  
Application of gel formulation

spray formulations were the predominant (if not the only) products currently in use. Although gel formulations have been present since 2000, they have not yet been found effective. The insecticide used to control these pests is a pyrethroid formulation (deltamethrin suspension concentrate 0.73%) applied with a manual pump. This insecticide was found to be in use throughout the hospital.

Cockroaches infested the entire hospital. There was a very close human/pest relationship. The situation was particularly serious in the canteen, in the paediatric department and in

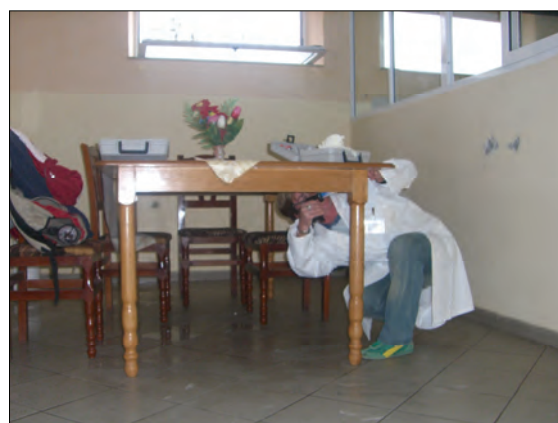


Figure 14  
Application of gel formulation





Figure 15  
Application of gel formulation



Figure 16  
Identification of cockroach passageways and consequent gel application

the neonatal department, where the insects could be seen at almost any time of day.

The non-invasive gel application technique was carried out even with infants present in the incubator room and during the preparation of meals in the canteen. Eight cartridges (35 g each) were used for the general treatment. It took 5 h to treat 18 rooms (20 m<sup>2</sup> per room on average) in the paediatric/neonatal section and

9 rooms in the kitchen area, including the bathrooms and dish-washing area (200 m<sup>2</sup>).

The gel insecticide dose was very high, in order to deal with the high number of cockroaches present. Although the label recommends a dose from 0.06 g/m<sup>2</sup> to 0.1 g/m<sup>2</sup> (2-3 drops/m<sup>2</sup>), in reality the dose can only be determined through practical experience (9). In this case, the gel was applied in both long lines (50-80 cm) and as numerous spots dotted in areas where cockroaches were active. The palatability of the gel bait was immediately recognised by the insects, which started eating it immediately after application. Dead cockroaches were observed approximately 10-12 h after the first treatment, up to the third application. No live insects were seen thereafter.

The cockroach treatment applied in this way was extremely effective, and resulted in complete eradication of the infestation. The results were clear to both hospital staff and patients. The initial scepticism over such a minimally invasive technique was overcome.

The local health service workers were impressed by the new technology, with younger workers particularly enthusiastic. The older workers were more sceptical than their younger colleagues.

This experience was presented to the the National Public Health Conference (2-3 June 2009) which received the support of WHO Albania. The audience particularly appreciated the historical comparison with pest control in Italy, which is very similar to the Albanian situation in many respects.

The mid- to long-term priorities with respect to public health were also identified (1, 5, 8, 11), as follows:

- analysis of the current status of public and private pest control services
- analysis of equipment used for pest control activities
- planning of trainer training programmes in health education and IPM for both the public and private sectors
- analysis of methods for self-assessment of the activities carried out.

For particularly important pests, aspects related to climate change were also considered when evaluating outbreaks. The European Centre for Disease Prevention and Control (ECDC) and Emilia Romagna health service guidelines were considered for *Aedes albopictus* (3, 12, 13). Health and hygiene issues connected with the presence of rodents and ticks are also included in local surveillance and control service planning (1, 4).

## Conclusions

The current scepticism over gel formulations expressed by both professionals (pest control officers) and those requiring their services coincides with experience in Italy (6, 10). Two years of work in the hospital and industrial food sector by a company with a vested interest in promoting a gel product, were necessary in Italy for this pest control technique to be perceived as an effective solution in sensitive environments. The supervisory role of both health control bodies and university research laboratories were important throughout this period.

The activity reported here can be considered as the first application and training in the use of a

gel formulation insecticide for cockroach control in a hospital in Albania.

The authors wish to stress the importance of establishing a multidisciplinary group that was able to develop the pest control sector according to the needs of the country.

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