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CONTROL OF *BLATTA ORIENTALIS* (BLATTODEA: BLATTIDAE) IN ZURICH, SWITZERLAND

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Abstract The oriental cockroach (*Blatta orientalis)* occurs in several buildings of two different blocks in the city of Zürich. Pest control companies were unable to control the infestation, and reported cockroaches in the backyards of these blocks during the warmer periods of the year. The Urban Pest Advisory Service (UPAS) conducted an indoor cellar and outdoor backyard monitoring of the cockroaches in tenement block I (21 buildings) during the warm season, and outdoor backyard monitoring in tenement block II (7 buildings). The UPAS required the house owners to have professional pest control operators treat the problem, and the UPAS coordinated treatments to occur within a week. Monitoring the following spring showed that the treatment was successful; the infestation was reduced to the outside of one building in block I and to one outdoor spot in the backyard of block II. UPAS continues monitoring in both blocks. This demonstrates that coordinated pest control treatment can achieve reduction and possibly eradication of cockroach infestations.
Key words Monitoring, oriental cockroach control

INTRODUCTION

The main goal of the Urban Pest Advisory Service (UPAS) is to survey, control and eliminate health hazards posed by insects and rodents in the city of Zurich. It is the only non-commercial and official pest advisory service in Switzerland. Our main duties are described in Landau et al. (2008). Based on the 'cantonal decree on public and private living hygiene' (Kanton Zürich, 1967), we can enforce the control of pests of public health importance, and impose the costs of these measures upon the owners of infested buildings.

In 2009 an established pest control company reported to the UPAS that they could not eliminate an infestation of the oriental cockroach *Blatta orientalis* (L.) (Blattodea: Blattidae), and that there might be a vast infestation in the neighboring buildings. Research in our specifically designed SQL-database (Apel and Köhl, 2002) showed that oriental cockroaches had been reported before in this area: 1993 a house in the same tenement block was reported to be infested, and there was also a record from 1995 when cockroaches were seen in the backyard during the night. We found four further records between 2006 and 2008 when oriental cockroaches had been a problem both in- and outside. The whole block consists of 21 apartment buildings and includes a large backyard (Figure 1). Since oriental cockroaches are known to live outside during the warm season (Thoms and Robinson, 1986; Le Patourel, 1993; Mallis, 2011), we decided in 2010 to check not only all buildings but also the streets and the backyard. Our decision to force all involved house owners to join in the coordinated control measures was motivated by an experience that German colleagues made a few years earlier in the region of Damme (Nordrhein-Westfalen, Germany) in an area of more than 100 km^2 with oriental cockroaches walking in

the streets during daytime in the summer of 2004. This included parts of the city but also food industry plants and rural areas with pig farmers. When it became apparent that the control actions had to be paid by the house owners or the farmers, many of them cheated with the monitoring or even refused cooperation. Because the first control failed, the responsible authorities decreed a compulsory control that finally worked out when the area-wide control actions were coordinated (Freise, 2005, 2006).

In 2012, we performed a second coordinated control effort in another block (tenement block II) consisting of 7 buildings (Figure 2). The decision was taken because the pest control technician of one of the restaurants had seen oriental cockroaches in the back yard and because the food inspector was not satisfied with the results of the previous pest control actions in the restaurant. In our database we had already two buildings in that block with a record of oriental cockroaches in 2003 and 2011 (Figure 2).

MATERIALS AND METHODS

Tenement block I. The block consists of 21 apartment buildings, most of them built together, with 4 stories and one or two cellar levels. Most of the back yard is accessible by car. A former underground parking deck has been converted to a second-hand shop. There is no connection between any of the houses. In July 2010 UPAS placed Catchmaster® insect monitors with a lure pill (Agrisense Ltd) on the ground floor and in the cellars of all the houses. In the backyard and in front of the houses we placed clear AF® insect monitors with a sticky trap and lure pill and checked them one week later (Figure 1).

Tenement block II. This block consists of seven buildings (Figure 2). Three of the buildings feature large grocery stores on the ground floor, in two other buildings there are restaurants. The front of the buildings of the whole block is all paved sidewalks with no hiding possibilities for the cockroaches, so monitoring was restricted to the backyard. The outside was treated by spraying with suspension of Cislin® CS (deltramethrin 25g/l) or Ficam® W (bendiocarb 800 g/kg). At some places on the face of the buildings and in cracks Goliath® gel (fipronil 0.5 g/kg) was additionally applied.

RESULTS AND DISCUSSION

Tenement Block I

In spring 2010 the house owners of all involved buildings were informed by UPAS that a coordinated control action of the oriental cockroach in and outside the houses was planned in order to eradicate the local population. In July traps were placed both in- and outside, and the presence of cockroaches on the glue traps was checked a week later (Figure 1). The second-hand shop in the former underground garage in the middle of the backyard had no problems with cockroaches. We informed all house owners that we had found cockroaches everywhere and that they had to have a pest control company do the treatments. As the whole block was heavily infested, we had no difficulties convincing any of the house owners. In August the sewage water system in the streets was inspected by descending into the pipe and walking all the way through. All three sewer pipes were accessible: the narrowest pipe height was 90 cm. Since only 2 cockroaches were found in the whole length of 440 m sewage, we decided not to take control measures in the sewage system. In August the 5 involved companies started the treatments in the cellars of all the houses and the monitoring in all apartments. In September a coordinated control action outside took place. Before the treatment we discussed the control measures with the involved companies. Only in three houses apartments were infested (Figure 1), and there the gel method was used. In the corridors and cellars surfaces were sprayed, sometimes also gel was used. Some companies treated the drains in the floor with insecticidal varnish. Outside insecticide spray was applied for the lower face of the buildings, the paved and unpaved ground, and gel placements were put into cracks of the buildings.

The springs of 2011, 2012 and 2013 UPAS surveyed the buildings again by placing traps outside (Figure 3). Based on experience, knowledge of the geographical situation and control success, the UPAS could reduce the monitoring time. We needed 6 hours in 2011, we only took 2.5 hours in 2012 and 2 hours in 2013. Where necessary, the pest control companies did another treatment. We plan to conduct another monitoring as soon as the temperatures are high enough, probably in May 2014.

Tenement Block II

End of May 2012 we placed 15 clear AF® insect monitors with a sticky trap and lure pill along the buildings and checked them five days later. 12 of the 15 traps were positive with cockroaches sticking to them. One of the traps was empty and 2 others were missing (Figure 2). All house owners had already required the services of a pest control company for cockroach control, four buildings were permanently monitored. All buildings had a control action done within the last two years, with four involved companies. After the instruction by UPAS, control measures were undertaken in the middle of July 2012 within the houses and in the backyard.

At the beginning of August, 14 new traps were placed. Cockroaches were only found in a concrete framed flower bed (0.5 x 10 m) with low vegetation and one tree in the middle of the backyard (Figure 2). In September / October a second outdoor (and where necessary indoor) treatment was applied by the companies. Subsequent monitoring at the end of April 2013 showed that the traps at the same two spots in the plant bed had caught oriental cockroaches (Figure 4).

DISCUSSION

In temperate climates oriental cockroaches often live outside the houses during the warm season and even seem to be able to over-winter in hiding places (Thoms and Robinson, 1986; Le Patourel, 1993), such as behind marble blocks glued to the face of buildings, and in wall cracks. Cockroaches can also hide in the vegetation of a back yard, in soil with small bushes or untidy places, in some distance from the houses. In tenement block II the plant bed is 5 meters away of the nearest house and can act as a reservoir for the cockroaches at least during the warm season.

To eradicate cockroach populations in buildings and backyards with or without vegetation belonging to various house owners, the dimension of the infestation must be carefully identified. All possible refuges have to be identified and checked. This requires pest control technicians that have experience with the habits of oriental cockroaches, and all involved parties have to coordinate their control actions. It is a challenge for the authorities to persuade all the house owners that a professional is needed for the control. Some owners tried to convince us that they did not have any cockroaches, others thought that they would not require a control company and wanted to control the ‘roaches’ with own measures. The house owners have to be persuaded within short time because coordinated outside control measures (including second treatment after 8 to 10 weeks) have to be performed during the warm season and before night temperatures fall in autumn. Thoms and Robinson (1987) recommend treatments against populations of oriental cockroaches in May or June to be most effective, before the adult population peak.

A possible problem is the loss of time due to stubborn house owners who seek a legal dispute. The best solution is to explain and discuss the problem and appeal to the house owner’s responsibility to convince them that the cockroach problem can only be solved by working together.

The sewer system of tenement block I was not infested at the time of heavy infestation of the backyard and the buildings. UPAS had checked the sewer system on two other occasions without finding any infestation, making measures unnecessary. During the very high cockroach infestation in

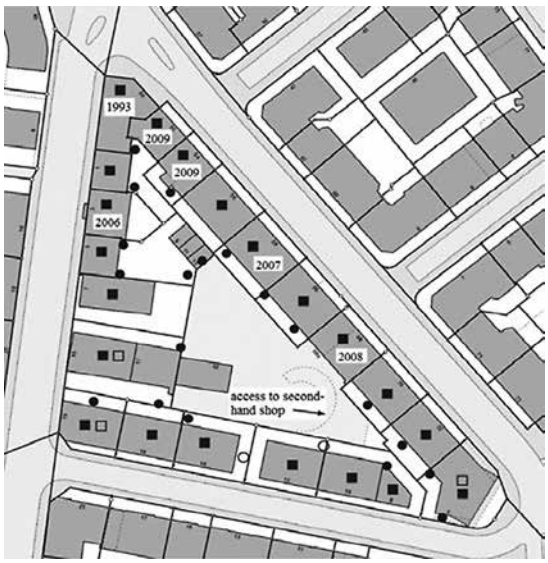

Figure 1. Tenement block I. Monitoring of B. orientalis in 2010. Years indicate when the UPAS received the first report of oriental cockroaches in the building. Traps: ■ = in basements; ◘ = in flats; ● = outdoor trap; ◘ = not trapped.

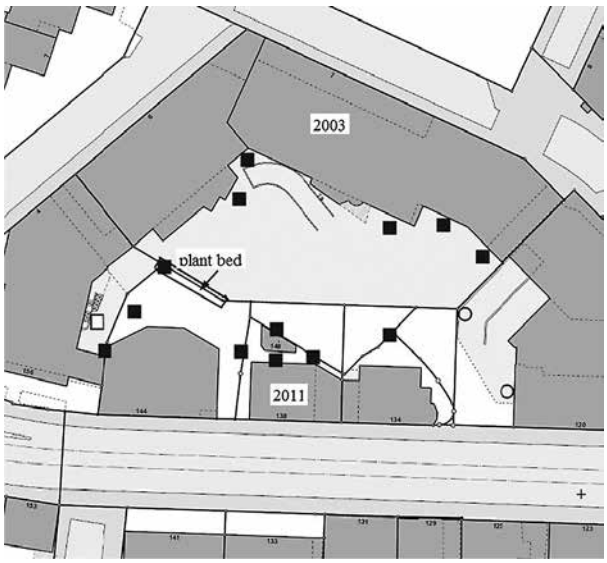

Figure 2. Tenement block II: Outdoor monitoring of B. orientalis in 2012. Block consists of 7 buildings, 3 grocery stores, 2 restaurants on ground floor. Traps: ■ = on trap; ◘ = not trapped; ◘ = trap missing.

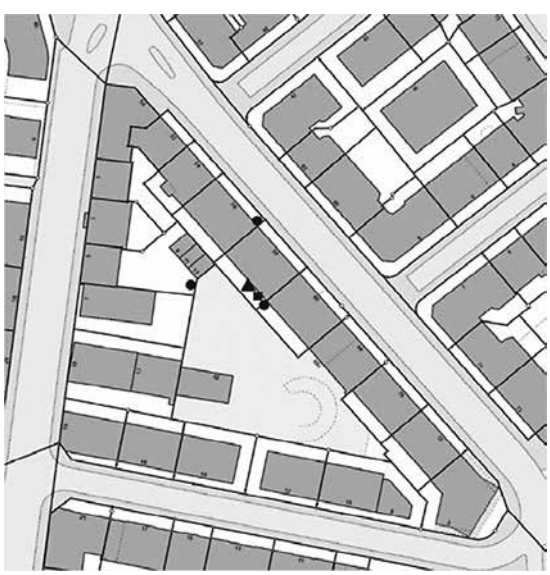

Figure 3. Tenement block I. Monitoring of B. orientalis in 2011- 2013. Traps: ● = 2011 trap catch; ■ = 2012 trap catch; ▲ = 2013 trap catch.

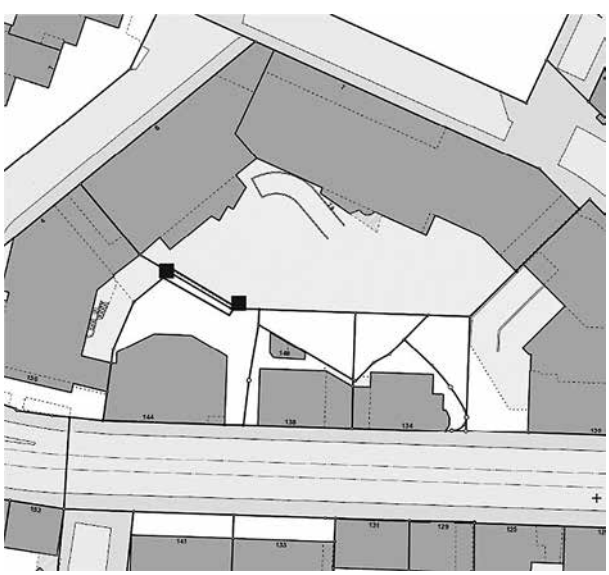

Figure 4. Tenement block II: Outdoor monitoring of B. orientalis in 2013. Traps: ■ = 2013 trap catch.

Damme (Germany) they were also present in the sewers and manholes were treated with insecticidal varnish (Freise, 2005). Therefore infestations of the sewer system should be considered in future cases. In both blocks a single source of cockroaches in unpaved ground could not be eradicated yet, so the monitoring and control measures will be carried on.

CONCLUSIONS

Altogether the strong reduction of the oriental cockroach in the backyards of both blocks has improved the situations substantially. In none of the buildings in block I cockroaches appeared after the first coordinated control action. Due to this success the UPAS started to have a closer look at other tenement blocks where oriental cockroaches have been seen outside in summer. At the moment we are involved in the control coordination of 4 different blocks of houses in Zurich.

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