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FIFTEEN YEARS OF *BLATTA ORIENTALIS* INFESTATION CONTROL IN THE CITY OF ZURICH, SWITZERLAND

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Abstract The oriental cockroach occurs in many blocks of buildings with old basic structures in the city of Zurich. Several visits of the Urban Pest Advisory Service (UPAS) in the sewers and bait tests during the last 15 years have shown that the oriental cockroach can occur there locally. In our encountered cases inner courtyard structures seem to be important for the occurrence of these cockroaches. In the last 15 years the UPAS achieved successful eradications of the oriental cockroaches in some houseblocks and significant reductions in others. If the monitoring of suspected houseblocks shows activity of cockroaches on sticky traps the UPAS enforces all concerned house owners to have the cockroaches professionally controlled. These houseblocks are monitored yearly during the warm season until no more infestations are found. The UPAS ensures the cooperation of all involved parties to eradicate the cockroaches. Eradication of the oriental cockroach needs persistence and can take more than five years of coordinated control measures. The eradication is important for the urban hygiene and only possible with a common effort of all parties involved.

Key words Monitoring, cockroach control, urban hygiene, oriental cockroach

INTRODUCTION

The main goal of the Urban Pest Advisory Service of the City of Zurich (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. The main duties are described in detail in Landau et al., 2008. Based on the "Cantonal Decree on Public and Residential hygiene" (Kanton Zürich, 1967), the municipality can enforce the control of pests of public health importance like cockroaches and impose the resulting costs on the owner of the building.

In temperate climate oriental cockroaches, *Blatta orientalis* (L.) (Blattodea: Blattidae), often live outside the houses during the warm season and even seem to be able to overwinter in hiding places (Le Patourel, 1993). These can be behind house ornamentals like marble blocks glued to the face of buildings, in wall cracks, under disintegrating concrete coverings of inner courtyards, etc. But they can also hide in the vegetation of a back yard, in soil with small bushes, or untidy places, and can stay in some distance to the house front. According to Thoms &

Robinson, 1987 oriental cockroaches tend to stay in their harborages and mainly move around with higher temperatures and increasing population density. If pest control companies (PCCs) have problems to eliminate an infestation of the oriental cockroach in houses belonging to a block of houses they often contact the UPAS to check if there is an infestation in the neighboring houses. All *B. orientalis* reports of our Dynamics 365 database are visualized on a GIS map. Therefore we can easily check if we had reports of this pest in neighboring houses in the past. Since oriental cockroaches are known to live outside during the warm season (Le Patourel, 1993; Mallis, 2011), the UPAS started with the first case in 2010 to check not only all buildings but also the streets, the backyards and the sewer. The decision to invite all involved house owners to join in the coordinated control measures was mainly due to the experience with an oriental cockroach infestation in the region of Damme (Nordrhein-Westfalen, Germany) from 2004 to 2006 (Freise, 2005 and 2006, Landau et al. 2014).

MATERIALS AND METHODS

The UPAS takes up pest enquiries into a in Microsoft Dynamics 365 database. This was designed to support our official activities, with possibilities of reports and statistical evaluations (Brimblecombe et al., 2023). The database contains a specially designed list of all reported animals (including pests) from 1991 to 2025 and is connected to a Web-GIS programme to visualize the pest data, in this case the oriental cockroach, in the city of Zurich. From May to July in successive years the UPAS placed Catchmaster® insect monitors with a lure pill (Simplex, Killgerm) or AF® insect monitors (Killgerm) in the backyards and sometimes also in front of the houses (Figure 1). The traps were checked after one to three days, were marked on a plan and the UPAS then contacted the house owners. They were informed about the significance of the infestation and asked to treat their houses and backyard by a professional pest control company. Furthermore, they had to have the houses ground level and cellar checked with monitoring traps. From 2010 to 2018 the courtyards were treated by spraying with suspension of Cislin® CS (deltramethrin 25g/l). Since 2019 the companies mainly use different cockroach bait gels that are applied in plastic AF® monitoring traps (Killgerm) along the buildings. Since 2012 the UPAS undertook three inspections of accessible sewage systems in the city and did baiting trials at the top of manholes with different cockroach bait gels.

Figure 1. Trap catch of oriental cockroaches outside houseblock O.

Figure 3. Aerial view of houseblock O.

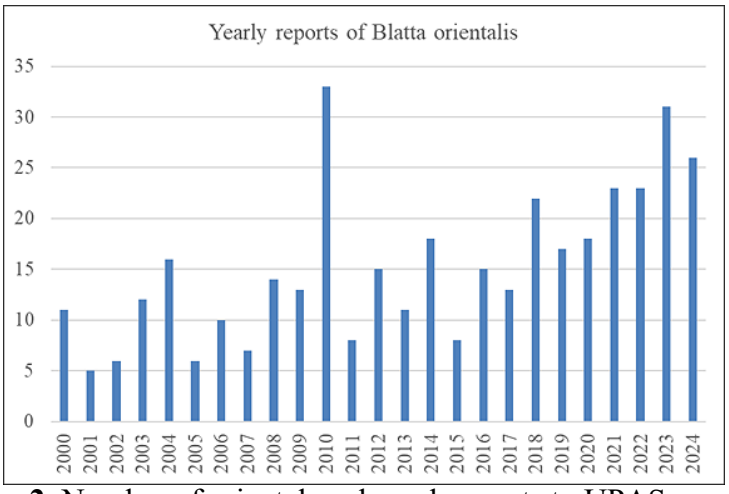

Figure 2. Number of oriental cockroach reports to UPAS

RESULTS

Since the first coordinated control action of oriental cockroaches in 2010, the UPAS has taken up 24 surveys of houseblocks with succeeding control actions (Table 1 and 2). The yearly oriental cockroach reports varied between five and 15 reports per year between 2000 and 2017 except for the year 2010 when the UPAS started the first coordinated control project (Figure 2). Since 2018 there is a trend of increasing reports varying between 15 and 30 per year.

The houseblocks consist of a different amount of apartment houses and often have restaurants, stores or shops involved. There are houseblocks with five to 21 involved houses (Figure 3). Most of them are built together, have four to six floors and one or two cellar levels. The front of the houses of most blocks have paved sidewalks with no harborage possibilities for the cockroaches, so monitoring here was restricted to the backyard. There are two special cases where only one house was affected with a strong outside infestation. The affected houseblocks are mainly situated in the city-districts 3, 4 and 5, which are next to each other.

Table 1. Houseblocks where oriental cockroaches have been eliminated.

House-block	City district	Total houses / block	Houses with *B.orientalis* catches	No. of yearly control actions
A	3	22	22	10
B	3	10	5	2
C	4	7	7	7
D	4	10	10	4
E	4	13	7	2
F	5	1	1	3
G	5	18	3	2
H	5	7	1	1
I	10	7	6	2
K	12	11	4	1
Mean		10.6	6.6	3.4

Table 2. Houseblocks with continuing monitoring and control measures.

House-block	City district	Total houses / block	Houses with *B.orientalis* catches in the first monitoring year	last year's *B.orientalis* catches	No. of yearly control actions
L	3	13	11	2	4
M					
N	3	12	3	3	1
O	3	5	5	3	2
P	4	17	13	5	6
Q	4	9	8	2	3
R	5	15	3	2	2
S	5	14	3	4	1
T	5	16	6	6	1
U	8	14	14	4	7
Mean		12.8	7.3	3.4	3

The elimination of oriental cockroaches from courtyards or front gardens usually takes several years of control actions depending on the severity of the infestation. This means that the UPAS monitors these backyards every year until no more cockroaches are found or reported by the residents. Usually, the infestation is largely reduced after two to three years of control measures and control actions concentrate on one or few problematic houses. In ten of the 25 known infested sites the oriental cockroaches were eliminated by the repeated pest control actions (Table 1). The longest elimination action took ten seasons. Whereby in this case only two houses out of all were affected after three seasons. The shortest control action only took one season until eradication. Nine of the 24 sites need to be monitored next year and according to the trapping will need further control measures (Table 2). Three of the monitored sites have only one building where the oriental cockroaches were only found inside the house. This is managed by the pest control company involved. The monitoring of the inner courtyard showed no outside infestation, so no further monitoring by UPAS is needed. One of the sites had no courtyard infestation, but an infestation in the front of the house in a row of trees in soil beds. One of the sites was not surveyed after the last control action two years ago and no further cockroaches were reported. Here further monitoring will be necessary.

Overall, eleven sites will need rechecking in the coming season with probably more control actions and monitoring of the involved houses (Table 2). Only in one out of the three performed sewer inspections evidence of an oriental cockroach population was found.

DISCUSSION

In every concerned houseblock the UPAS evaluates the extent of the infestation with oriental cockroaches of the backyards with sticky traps. The UPAS coordinates the involved PCCs with their control actions. All control applications should be conducted simultaneously throughout the infested houseblock to avoid further dispersal. Pest control professionals that execute the

cockroach control need experience with the habits of oriental cockroaches so that all possible refuges are supplied with sufficient bait. Since the pest control operators apply longer lasting gel baits instead of insecticide spraying, there is a greater tolerance in time, but optimally the applications take place in the same week. The UPAS persuades the house owners that a professional is needed for the control and that the treatment has to begin within two weeks. The UPAS provides a fact sheet about coordinated cockroach control in houseblocks (UPAS, 2023).

Treatments should be done latest in July because a second treatment after 8 to 10 weeks for the hatching nymphs is necessary for good control results before night temperatures fall in autumn. The UPAS requires control reports of the company as proof for a completed treatment. A possible obstacle for a successful eradication is the loss of time due to a stubborn house owner, who seeks a juristic fight. The best way to combat this is to explain the problem and appeal to the owner's responsibility to convince them that the cockroach problem can only be solved by working together.

CONCLUSIONS

The UPAS proved that it is possible to eliminate big scale oriental cockroach infestations of courtyards or front gardens of house blocks if consequent and coordinated monitoring and control actions are undertaken. Altogether the strong reduction of the oriental cockroaches in the backyards of all blocks has improved the situations substantially after the first control action. Due to this success the UPAS keeps up taking closer looks at other blocks of houses with oriental cockroaches that have been seen outside in summer. Currently the UPAS is involved in the control coordination of at least nine different houseblocks in Zurich. In cities lwith old houses, eliminating oriental cockroaches will probably stay a longtime assignment of the UPAS.

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