New tools and methods

Optimizing urban rodent control strategies: predictive approach and risk assessment – the contribution of SECU-RAT

Sage, Mickaël[1,2*]; Riehling, Philippe[1]; Hoffmann, Julien[1]

[1] SECU-RAT & Faune INNOV' R&D, Besançon, France
[2] Faune INNOV' R&D, Besançon, France
* m.sage@secu-rat.fr

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Rodents pose a significant problem to society (e.g. zoonoses, severe property damage, food loss). Urban environment favours high population densities, especially of brown rats (*Rattus norvegicus*). Increasingly high infestation levels are observed, in particular where there is a high human presence (e.g. urban parks, along riverbanks, where birds are fed, on picnic spots). Rodent population control is mainly based on the use of rodenticides in bait boxes and trapping. However, due to high food availability and the presence of attractive habitats in these areas, rat population control is particularly difficult and often ineffective. After decades of rodent control, they continue to persist in cities around the globe and a new approach is needed. Placing traps or rodenticides close to rat burrows, habitats, or food sources is essential, but the discretion requirement, bait box degradation risk, and children and non-target species safety are major issues linked to these practices. Public bins are of major concern because they offer food to rats, but also because they fit into the urban outdoor environment and are often placed near rat habitats such as flowerbeds, bushes, etc.

SECU-RAT addresses two major challenges: (i) ensuring the highly effective and secure deployment of rodenticide baits and trap in the areas exactly where they are most needed in an urban outdoor environment: under public bins; (ii) offering a new comprehensive and integrative tool for decision support in the monitoring and control of rodents in urban environments.

Resulting from academic research, our work aims to develop an innovative approach for more effective management of rodent populations addressing health, material, economic, environmental, and ethical concerns. Based on a range of sensors for detecting the presence and trapping of rodents, our decision-making tool enables the population to be monitored in real-time, data analysis, automated reports and alerts, high-stakes areas mapping, identifying and anticipating health issues for risk assessment, optimized decision-making, effectiveness tracking of interventions.

Our approach based on the superimposition of different GIS layers will be presented: favourable habitats (e.g. sewer system, green spaces), available food resources (e.g. litter bins, composters, food shops), rat "densities" measured with SECU-RAT, and human activities at risk (e.g. human density, children's play areas, restaurant terraces). This new comprehensive tool represents a significant advancement in sustainably mitigating the impact of rodents in urban areas. It combines advanced technology with integrated management under the One Health approach promoting a healthier and safer environment.