

## Control of the urban pigeon *Columba livia* population and the preservation of common swift *Apus apus* and bats *Chiroptera* during the restoration of the Ghirlandina tower in the city of Modena (Italy)

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### Abstract

The problem of the excessive abundance of the urban pigeon *Columba livia* population in the city of Modena has been solved thanks to the cooperation between the Modena Municipal authority and the Local Veterinary Service (AUSL). They have followed an integrated program that contains the following points: use of an oral veterinary licensed drug (Ovistop<sup>®</sup>, ACME, 1997-2002) in order to limit the pigeons fertility; use of architectural devices in order to limit the access of the pigeons in private and public structures, periodic monitoring of the colonies of pigeons and public information regarding the treatments and the integrated program. In the year 2008 Modena Municipality started the restoration of the Ghirlandina Tower. The above-mentioned authorities decided to exclude the pigeon population from the many scaffold holes existent on the tower. However, rather than completely remove all the scaffold holes to limit the pigeon reproduction, they decided to reduce the size of the scaffold holes, to allow access only to smaller animals, like Common swifts *Apus apus* and bats. In conclusion, the Modena Municipal Authority and the Local Veterinary Service have reached two important results: the first one was the effective reduction in the number of urban pigeons and the second one was the preservation of some animal species that are essential components of biodiversity in the city of Modena.

Keywords: bat, biodiversity, fertility control, Nicarbazine, pigeon, scaffold holes, swift

### Introduction

The Ghirlandina tower is the most important monument in the city of Modena. It is the bell tower of the Cathedral, standing at 89.35 m and it is part of the UNESCO World Heritage site. Its stone cover structure was badly damaged by atmospheric pollution and the daily corrosion caused by urban pigeons that have lived in the tower and to nest in its recesses for centuries. In addition to the pigeons, swifts and bats have always found a safe haven in the niches of the external walls without causing additional damages to the tower. At the beginning of the tower restoration, the Veterinary Service, that is part of the Department of Public Health, proposed to the Ghirlandina Scientific Committee an intervention in order to control the breeding population of pigeons and the consequential biological damage (1° target). At the same time, the veterinarians proposed to maintain favorable living conditions for the survival of the other species nesting in the same external walls used by the pigeons, such as swifts and bats, (2° target).

### Materials and methods

In order to reach the first target, to reduce the pigeon population, the pigeons in the most critical areas of the centre of Modena were treated with Nicarbazine that represents the best choice of treatments to reduce fertility of pigeons (Martelli et al., 1992; Gelati et al., 2000; Zucconi et al., 2003) thanks to its high versatility of use and its physical formulation that makes the drug unpalatable to most other avian species. The group of pigeons of the Dome (and Tower) and of other 6 most critical sites in central Modena, were administered with special maize grains (Ovistop<sup>®</sup>, ACME) each containing 800 ppm of Nicarbazine, attached to the grains by means of a patented process that prevents its release into the environment and it is delivered in doses of 8-10 g per pigeon per day. The Nicarbazine treatment was applied in different sites of the city, especially in the surrounding areas of the Ghirlandina in accordance with the following guidelines (Ferri et al., 2009). The choice of the colonies to be treated with Nicarbazine was based on the evaluation of their impact on urban hygiene. Therefore there was a preliminary identification followed by mapping of the sites and then finally a quantitative assessment of

the urban pigeons and their colonies was undertaken. At this point, the drug was administered to pigeons at regular intervals in selected locations. The drug was distributed at the dose of 6.4-8 mg of Nicarbazine per pigeon per day, 5 days a week, from mid March to mid October, thus covering the whole reproduction cycle of the urban pigeons. Since March 2008 each year the number of pigeons in the treated colonies has been estimated. (Table1). In addition, the public were given comprehensive information concerning the integrated programme by local newspapers, leaflets and internet sites.

**Tab. 1** Annual count of the pigeons in 6 sites treated with nicarbazine, in the center of the city of Modena, Italy; 2008-2011

site	Modena downtown pigeons abundance (in critical sites)			
	March 2008 n°	March 2009 n°	March 2010 n°	March 2011 n°
Porta S. Agostino	100	60	45	49
P.Redecocca	300	190	70	57
Rua Frati Minori	250	200	80	29
Rua Frati Minori	70	0	0	1
Piazza Grande	180	70	40	21
Piazza Matteotti	100	40	70	17
Piazza Pomposa	60	15	35	31
Total	1060	575	340	205

To reach the second target, the maintenance of acceptable living conditions for other species like swifts and bats, the height of the scaffold holes was reduced to 3,5 -5 cm by fixing a wedged piece of a brick to obtain a narrower entrance. Both this wedge and the reduction in the size of the hole (Figure 1) prevent the entrance of pigeons but allow access to swifts and bats. 200 scaffold holes of the medium and upper part of the tower were reduced in this way while a few scaffold holes in the lower part were closed with a steel net to prevent access to birds and to guarantee an adequate air circulation. In addition, prior to the restoration program, the Ghirlandina tower was used by Peregrine Falcons to roost. An artificial nest was erected on the north side of the top balcony of the tower in the hope of attracting Peregrines to nest, since these birds may help to keep the pigeon population under control.



**Fig. 1** A scaffold hole modified to be inaccessible for pigeons and allow swifts and bat enter; a wedged piece of brick is shown before the use in the hole

## Results and Discussion

The results obtained following the integrated program are summarized in the Table 1, showing the yearly trends of reduction of the pigeons in all the sites treated with Nicarbazine (Ovistop<sup>®</sup>, ACME). In the site 'Piazza Grande', Nicarbazine was given to pigeons while, since 2008, all the scaffold holes of the belltower Ghirladina were inaccessible to the pigeons due the impenetrable curtain that covers the

shelves because work in progress. In the remaining sites only Nicarbazine was given. Another aspect of the veterinary intervention has been the attention given to the need to effectively decrease the number of nesting sites used by the pigeons. To do that, it was reducing the shape and size of the entrance of the ancient niches to facilitate the access of swifts and bats. It will be possible for the swifts and bats to use the scaffold holes since the spring of 2012 (the tower is still undergoing renovation and is totally covered with an impenetrable sheet) but at Melegnano (Italy) it has been verified that the church bell tower (Lombardy), with the scaffold holes treated (Ferri and Ravizza) in the same way last winter, in 2011 seems already used by swifts. The restoration of ancient buildings and monuments needs great efforts by public authorities in order to limit the risks and damage caused by a combination of biological, physical and chemical factors. Biological damage caused by pigeons must be minimized. But on the other hand there is the need to keep at an acceptable level the presence of other insectivorous species in the urban and monumental habitats because those animals are an integral part of the city scenario.

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