Scientific Papers. Series B, Horticulture. Vol. LXIII, No. 2, 2019
Print ISSN 2285-5653, CD-ROM ISSN 2285-5661, Online ISSN 2286-1580, ISSN-L 2285-5653

OBSERVATIONS RELATED THE LONG-EARED OWL (*ASIO OTUS* L.) FEEDING IN TOW HORTICULTURAL ECOSYSTEMS

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Abstract

Long-eared Owls (Asio otus L.) are very important in the ecosystem because they control rodent populations that especially in anthropogenic ecosystems are very often harmful. In this context, the study of the ecology and ethology of this night raptor species in anthropogenic habitats is an important task. The present paper includes observations made in winter agglomerations (roost) of Long-eared Owl in two horticultural ecosystems: a periurban private garden in Ilfov County and an urban green space, between apartment buildings in Bucharest. Birds pellets were analysed in order to determine the pray composition. The Long-eared Owls feeding were significantly influenced by the horticultural ecosystem. In the pellets collected from the green space in Bucharest, 94% were rodents, the Brown Rat (Rattus norvegicus) being predominant, by 59%, then the House Mouse (Mus musculus) by 32%, both species being considered as pests. In the pellets collected from Ilfov County, the House Mouse (Mus musculus) has the largest share, by 58%, followed by the Brown Rat by 30%. Useful information regarding the favourite prey of this night predator.

Key words*: periurban ecosystems, urban ecosystems, rodents, roost, night raptors.*

INTRODUCTION

The Romanian Biodiversity Directorate draws attention to the fact that populations of Long-eared Owl (*Asio otus* L.) in the country are threatened by habitat alteration and loss, use of long-standing pesticides, poaching, loss and deterioration of breeding and roosting birds that also shelter specimens from other parts of Europe (Petrovici, 2015).

According to Theodor Mebs and Wolfgang Scherzinger, from 19237 of preys found in pellets, were identified rodents - 95%, birds - almost 5% and a small number of insectivorous mammals (Mebs & Scherzinger, 2006).

Luminița Laiu observed that Long-eared Owls from Amara, Ialomita county, Romania, on over one year were fed with the following mammals: *Crocidura suaveolens* P. 2.14%; *Microtus arvalis* P. 41.03%; *Apodemus sylvaticus* L. 4,27%; *Apodemus agrarius* P. 0.43%; *Mus musculus* L. 50.85%; *Fringilla coelebs* L. 0.43%; *Passer domesticus* L. 0.85%. It also stands up that in Bucharest, Long-eared Owl consume also *Rattus rattus* L. and *Rattus norvegicus* B. (Laiu, 2010).

As shown, Long-eared Owl controls small rodents populations (Pirovano et al., 2000) Hadjisterkotis (2003), Balčiauskienė et al. (2006), Dupal and Chernyshov (2013), most of them producing significant damages to horticultural, agricultural or even households crops. It is necessary to know the behavior of this night predator, but also the threats from different ecosystems, especially those anthropic.

METHODS AND MATERIALS

For this study it was used the qualitative method (Papadopol & Petrescu, 2006; Laiu, 2010) to prey identification from pellets. It was collected 317 samples from two horticultural ecosystems.

The first horticultural ecosystem in the study was the roosting birds on Făurei Street in Bucharest. Practically the Long-eared Owls gathered in the trees in the green space between the blocks (Figure 1). The colony consisted of 17 birds of *Asio otus* L. According to the inhabitants, the birds gather in the area for at least 5 winters. Most of the specimens are sheltered in Lime Trees *(Tilia platyphyllos* S.) and some of them used as shelted Thuja *(Thuja orientalis* L.), Black Poplar *(Populus nigra* L.) and Spruce *(Picea abies* L.).

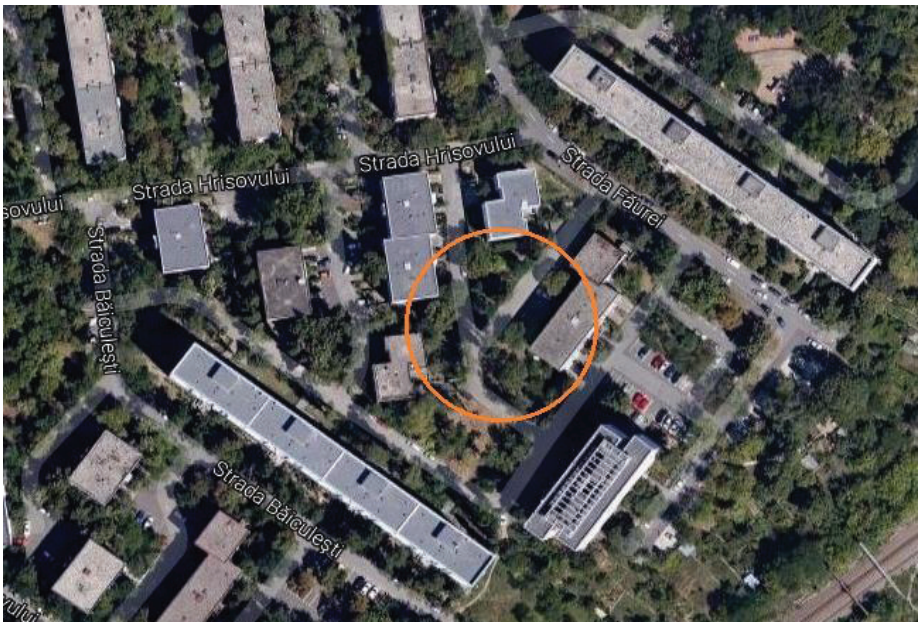

Figure 1. Localization of the Long-eared Owls roosting sites from Făurei Street in Bucharest (Google Maps)

More than 14 specimens of the colony are resting in lime trees, most likely because they are camouflaged with linden limestone inflorescences. From here, we took 150 pellets on January 19, 2016.

The second roosting of Long-eared Owls is in Moara Domnească village, Ilfov County, inside the Didactic Farm Moara Domnească (Figure 2). The farm has over 500 ha, having agricultural land, lake, orchard, arboretum nursery, farm domestic animals and green spaces.

A teacher living there for 29 years mentioned that in every winter between 3 and 15 long-eared owls gather.

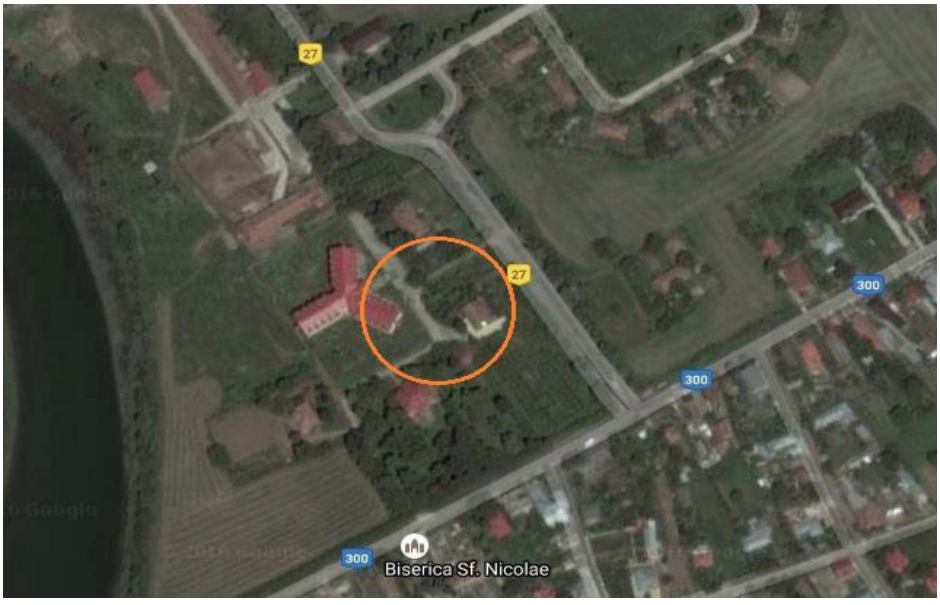

Figure 2. Localization of the Long-eared Owls roosting sites in Moara Domnească, Ilfov county (Google maps)

There were found 15 specimens of Long-eared Owl *(Asio otus* L.) in two plants 8-9 meters of Thuja *(Thuja orientalis* L.). We noticed that all the specimens were sheltering into the Thuja *(Thuja orientalis* L.), being the same place where they were hiding in the day time Magpies (*Pica pica* L.), which were aggressing them every time they were flying during the day. On February 10, 2016, they we picked up 167 pallets from this roosting birds.

Species and preys were identified based on the determination keys from the following: Barbu and Popescu (1999), Macdonald and Barrett, (2007), Humphries et al. (2007), Mullarney et al. (2009).

That materials used for the pellets determination were: metallic ruler, electronic caliper Dexter, magnifying glass, tweezers, gloves and ethanol, and the identification of pray from pellets was based on skulls, mandibles and jaws (Figure 3).

Figure 3. Ruler measurement for prey identification

RESULTS AND DISCUSSIONS

From the first location, on Făurei Street (Figure 1), from Bucharest, we collected 150 pellets and we were able to identify the prays in 64 cases; the remaining 86 of them did not contain identifiable elements.

In the 64 cases we identified 100 prays (Figure 4) as follows:

- Rodents: 3% Black Rat (*Rattus rattus* L.), 59% Grey Rat (*Rattus norvegicus* B.), 32% Domestic Mouse (*Mus musculus* L.). A total of 94% rodents.
- Insectivorous mammals: 4% Bicolored Shrew (*Crocidura leucodon* H.). In total 4% insectivorous mammals.
- Granivorous birds: 2% European Greenfinch (*Chloris chloris* L.). In total 2% of granivorous birds.

There have been pellets with two or three skulls or mandible, giving a large number of prays identified in the 64 pellets.

We noticed that the birds were placed in a quiet area, behind the blocks, near the garbage can (Figure 5), a source of food for the Black Rat (*Rattus rattus* L.), the Grey Rat (*Rattus norvegicus* B.) and Domestic Mouse (*Mus musculus* L.).

Unfortunately, at only 300 meters, on the main road, exaggerated maintenance prunning were made on trees in the green space.

These exaggerated shortening of branches, carried out during the roosting period of long-eared owls, are extremely dangerous because they can scare the birds that are nesting in these trees.

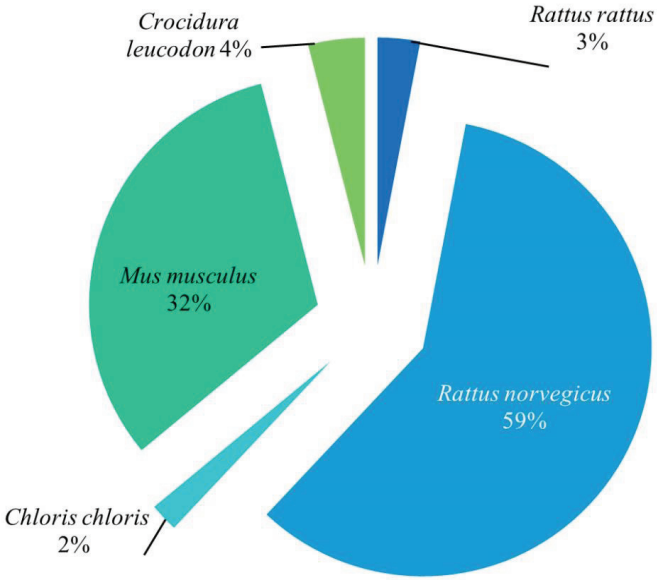

Figure 4. The preys identified in pellets. Făurei Street, Bucharest

Figure 5. The garbage dump between the blocks on Făurei street near the agglomeration of long-eared owl

From the second location, from the Didactic Farm Moara Domnească (Figure 2), Ilfov County, we collected 167 pellets and we were able to identify the preys in 70 pellets; of the other 97 of them we could not identify the preys, due of lack of identification elements.

In the 70 pellets we identified 84 prays (Figure 6) as follows:

- Rodents: 1% Hazel Dormouse (*Muscardinus avellanarius* L.), 30% Gray Rat (*Rattus norvegicus* B.), 58% Domestic Mouse (*Mus musculus* L.). Total: 89% rodents.

- Insectivorous mammals: 3% Common Shrew (*Sorex araneus* L.), 2% Bicolored Shrew (*Crocidura leucodon* H.). In total: 5% insectivorous mammals.
- Insectivorous birds: 1% tit (*Parus* sp.). In total 1% insectivorous birds.
- Granivorous birds: 4% Sparrow (*Passer* sp.), 1% Goldfinch (*Carduelis carduelis* L.). A total of 5% of granivorous birds.

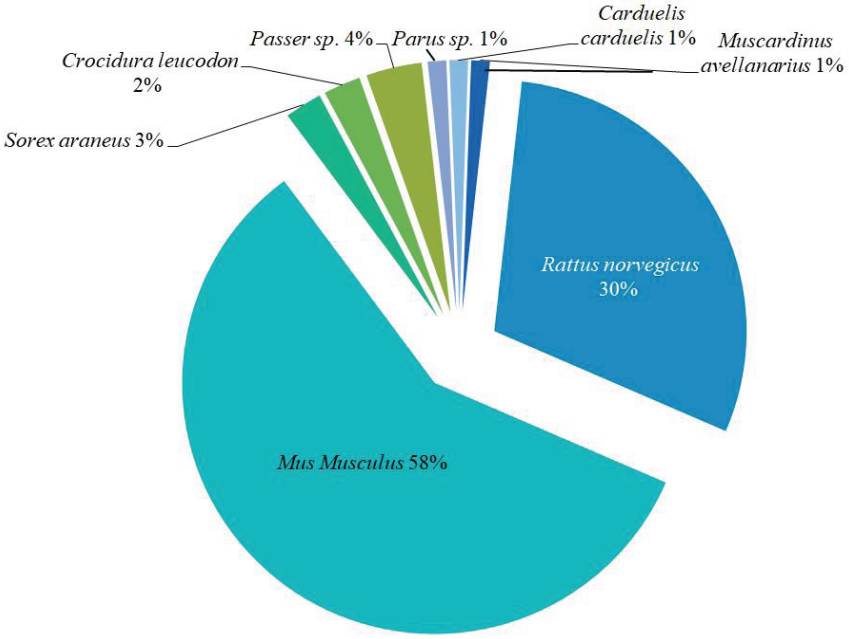

Figure 6. The preys identified in pellets. Moara Domnească, Ilfov County

CONCLUSIONS

Into the pallets collected from the green space from Bucharest, we identified 94% rodents, the biggest percentage being of Gray Rat (*Rattus norvegicus* B.) with 59% and Domestic Mouse (*Mus musculus* L.), with 32% - both rodent species being considered harmful.

We also identified three skulls of Black Rat (*Rattus rattus* L.), indigenous species, showing that this species it is still present in Bucharest, despite the competition he has with the Gray Rat (*Rattus norvegicus* B.), exotic and invasive species;

Into the pallets collected from the Didactic Farm Moara Domnească of the Ilfov county, the biggest percentage were on the Domestic Mouse (*Mus musculus* L.) with 58% and Gray Rat (*Rattus norvegicus* B.) by 30%.

The Long-eared Owls from the Didactic Farm Moara Domnească yard had a variety of seven species that were fed to those in Bucharest, with only five species - the diversity of food being affected probably by ecosystem.

Into the both locations, percentage of another mammalian and insectivorous birds percentage it is insignificant. We can appreciate that the Long-eared Owl (*Asio otus* L.) being a very helpful species into the control of rodent populations.

Roosting birds from the Făurei Street from Bucharest it is inside the city, 5 km from the periphery of Bucharest city. These testify that these species can do wintering colonies into big cities, between blocks, not just at the periphery or in small cities.

The long-eared owls from the cities can bring special services to the ecosystem through rodents consumption (mice and rats), but they are linked with the horticultural ecosystem quality.

For protection Long-eared Owl, we recommend administration of raticides with caution or even avoidance, maintenance of diversity, limitation

of disturbance into the roosting birds areas on winter, limit of heavy pruning and avoidance execution into the winter in the roosting long-eared owls areas.

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