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優勝作品專輯

作品編號 **050019**

參展科別 **動物學**

作品名稱 **Territorial behaviour of the Eurasian Wren (Troglodytes troglodytes) during autumn migration and wintering in the urban environment of Hradec Králové, Czech Republic**

得獎獎項 **四等獎**

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關鍵詞 **Eurasian Wren, territorial behaviour, urban environment**

作者照片

Introduction

The Eurasian Wren (*Troglodytes troglodytes*) is a migratory bird but it occurs in the Czech republic also in winter. During the autumn migration and wintering, it is quite common in the urban environment. Even outside the breeding season, male wrens establish territories, which they defend strongly against conspecific intruders. They also react very well to the playback calls (Photo 1). Such territories may be formed for short time periods (a few days only) or they may be occupied by individual birds for the entire winter season[1., 2.]. The frequency of the formation and the time use of the territory is probably affected by the composition and structure of the biotope in question. In my research I was observing the frequency of the Eurasian Wren territories during the autumn and winter periods in the city of Hradec Králové and I paid close attention to the biotope preferences involved.

Part of my study was a description of the Eurasian Wren's territorial behaviour. I observed the birds' reactions to two different kinds of play backed calls - song and warning. The warning of Eurasian Wren is a very distinct call and other animal species may respond to it as it may provide them with information about potential enemies or imminent threats[3.].

Photo 1. The territories of Eurasian Wren are often formed near fences and linear shaped bush growths (photo author).

Methods

My observations were made in the city of Hradec Králové in the Czech Republic. I set up 10 observation points throughout the city centre. These represented different kinds of urban environments. All observation points were visited in one day, for a total of six times during the observation period from 31.10.2020 to 25.1. 2021. At each point I played the Eurasian Wren song and warning call; each for two minutes, from a speaker placed on the ground. The order in which the calls were played was changed regularly, so as not to bias the reaction of the birds by the sequence of the play backed calls.

Each observation point is described using the following set of variables, representing relative and absolute scale of the biotope structure.

Micro-space characteristic (within a limited area of 15 m^2 around the point), proportions [0-100 %]*:*

coverage of bushes, coverage of trees, lawn area.

Macro-space characteristics (within a wider area around the point), absolute size [m^2, m]*:*

total area of bush growth, line length of bush growth, isolation distance of bush growth to another [m].

Changes of the frequency of Eurasian Wren territories during the observation period (averaged for all observation points) were tested by a single linear regression. The average frequency at each point is presented in a bar chart. Single linear regression tests evaluated the effects of biotope variables upon the average frequency at the points. The association between the kind of a playback call and the kind of the wren vocal reaction was evaluated by Fisher's exact test.

Results and discussion

The frequency of the Eurasian Wren territories decreased during the observation period (Fig. 1). The decrease was probably affected by the ongoing migration in November and by the generally lower numbers of truly wintering individuals later in the season.

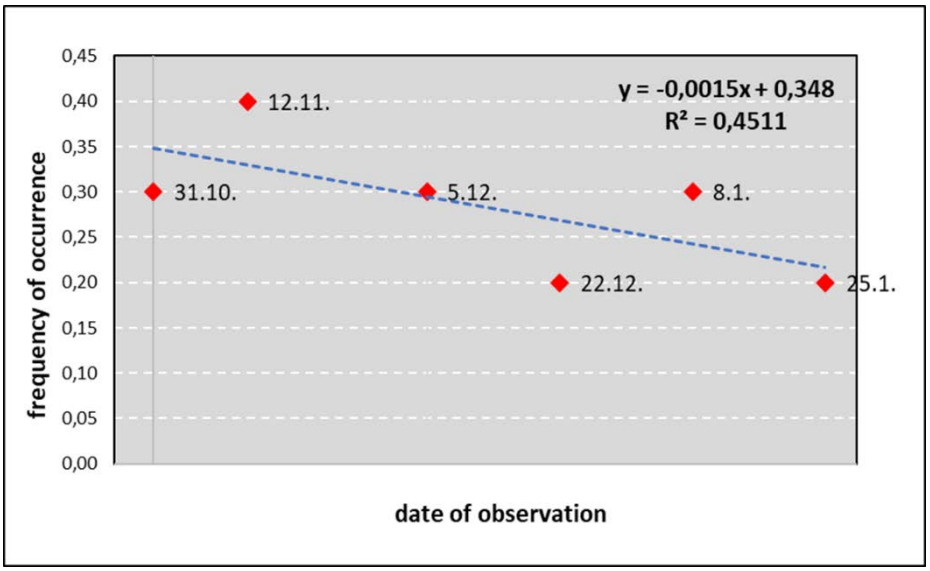

Figure 1. Frequency of detected Eurasian Wren territories during autumn and winter season (from 31.10. 2020 to 25.1. 2021). The dashed line represents the result of single linear regression.

The frequency of territories detected at the individual observation points differed greatly (Fig. 2). While at one point it was observed five times out of the six controls, at three points it was not detected at all. I suppose this was affected by differences in the biotope structure (Tab. 1). All observation points included bushes. However, it was evident that the presence of trees positively affected the formation of such territories. In contrast to that, the wrens didn't occur that much in grassy areas as these likely do not provide good hiding places and enough food. Furthermore, the territories were not established in the bush growth isolated in space from areas of other bush growth.

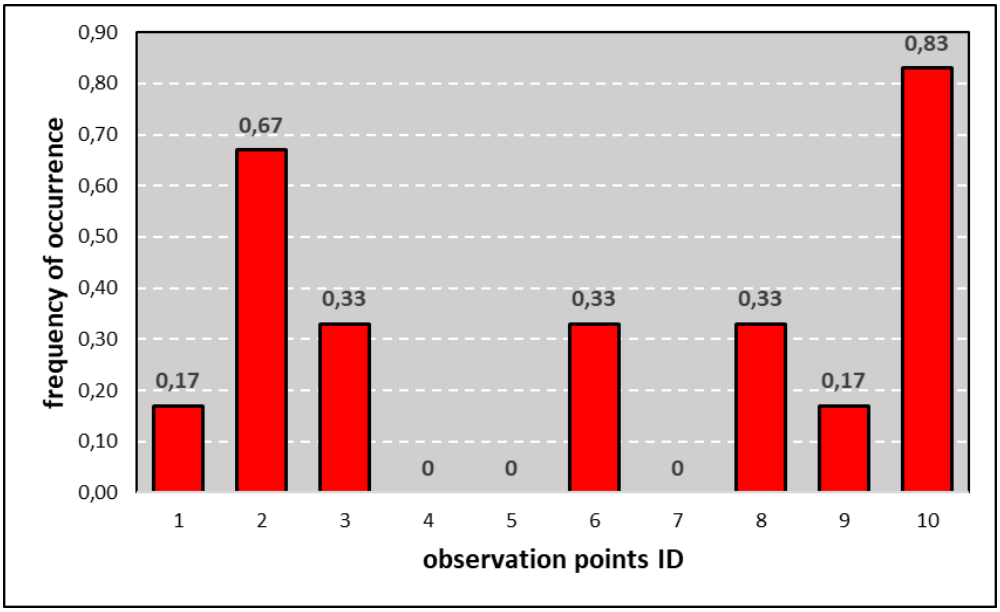

Figure 2. Frequency of detected Eurasian Wren territories on the individual observation points in the city of Hradec Králové.

Table 1. The effect of the biotope characteristics on the frequency of Eurasian Wren territories tested by single linear regression analyses. The table includes the results of the individual test of each effect. The test results where $R^2 > 0.2$ are marked in bold.

Tested effect	slope (b_1)	coefficient of determination (R^2)
Proportion of		
bushes	0.0014	0.0183
trees	**0.0076**	**0.4111**
lawns	**-0.0062**	**0.4236**
Absolute size of		
bush area	-0.0666	0.0680
bush line length	-0.0193	0.0113
isolation	**-0.0637**	**0.2369**

The territorial behaviour of Eurasian Wren included the following components: silent arrival to the speaker (24%), arrival and singing (29%), arrival and warning (29%), arrival, singing and warning (18%). It seemed that different played back calls triggered different reactions (Fig. 3). I noticed that individuals of seven other bird species responded to the playback of wren songs and warning calls (Fig. 4). The Great Tit (Parus major) tended to respond even more often than the Eurasian Wren, probably as it is one of the most common bird species here in the Czech Republic.

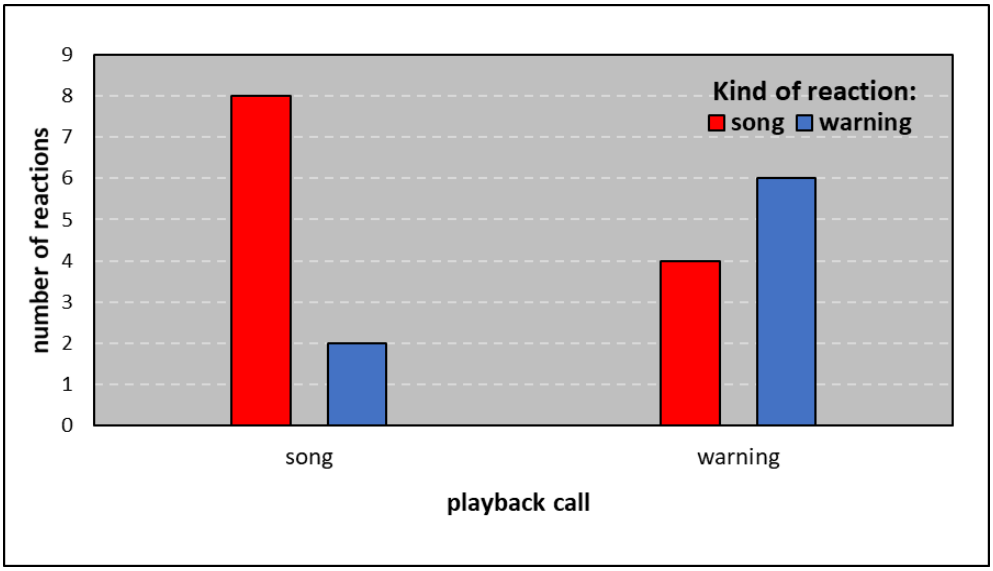

Figure 3. Vocal reactions of Eurasian Wren to the two kinds of playback calls - song and warning. The association between the playback and reaction to it was tested by the Fisher´s exact test (P=0.1698).

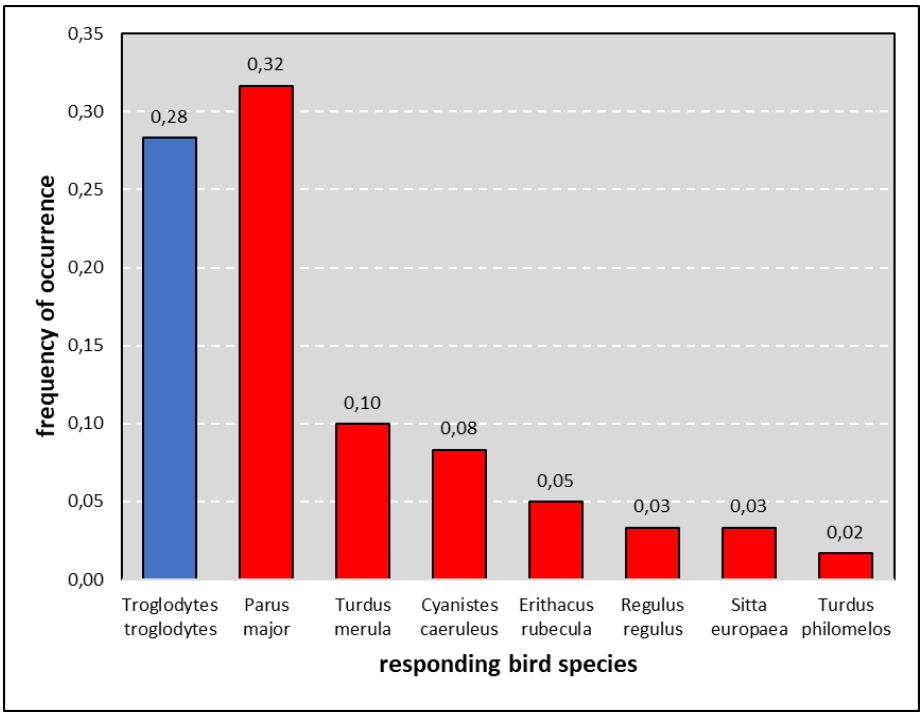

Figure 4. Frequency of different birds species detected to respond to playbacks of Eurasian Wrens (*Troglodytes troglodytes*) calls.

References

1. Amrheim V. & Erne N. 2006: Dawn singing reflects past territorial challenges in the winter wren. *Animal Behaviour* 71: 1075-1080.

2. Brejšková L. 2008: Winter occurrence and abundance of Wren (Troglodytes troglodytes) in Sušice region, Southwest Bohemia. *Sylvia* 44: 77-87. (in Czech with English summary)

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【評語】050019

This project studies the territorial behaviour of Eurasian Wren. The author set up 10 observation points in the city and scores the frequency of warning and territorial songs sung by the bird. Author also determines the frequency of other birds that react to the songs sung by the Eurasian Wren. Author reached the conclusion that Eurasian Wren prefers staying at the bush as opposed to other areas, and other species of birds also respond to the playback calls of Eurasian Wren.

This work is interesting, and systematically examines the behaviours of Eurasian birds. It also uses some statistical analysis, although the author did not adequately explain the principle behind the analysis. The author's enthusiam toward this study is obvious and can be applauded.