**Title**

Katarzyna Wojczulanis-Jakubas1, Marcelo Araya-Salas2

1Department of Vertebrate Ecology and Zoology, University of Gdansk, Gdansk, Poland; biokwj@univ.gda.pl

2Laboratory of Ornithology, Cornell University, Ithaca, NY, USA. 2Escuela de Biología, Universidad de Costa Rica, San Pedro, San José, Costa Rica

**Abstract**

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**Introduction**

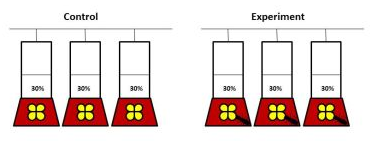
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**Material and methods**

*Fieldwork.* We carried out the study at the area of one of LBH leks in La Selva Biological Station, Costa Rica (10 o23’ N, 84o10’ W) between May and June 2015. Owing to another project on LBH being carried out the same time, local birds were already individually marked [Fig. 1; foam tags of unique colour combinations, attached to bird back and breast with nontoxic eyelash glue, see Araya-Salas et al. 2018 for details] and habituated to use feeders. Of the XX birds marked at the study lek (XX territorials and XX floaters or females), 12 individuals regularly used feeders utilized in the present study (located at XX distance from the closest lek border) and so were tested in the experiment.

**Fig. 1** Long billed hermit (LBH) marked with a foam tag of unique color-combination. Photo credit: XXXX

We used three one-flower feeders for the experimental set up, arranging them in a line, separated by ca 10 cm distance from each other (Fig. 2). The experiment consisted of two phases – control and experimental, both performed at the same day, with the control being directly followed by the experimental phase. The experimental phase started at the moment when all the focal individuals have been recorded at the feeder for the control conditions, and lasted until all of them visited the feeder again in the experimental conditions. Since focal individuals visited feeders regularly, appearing at the site on average XX times per hour, we were able to complete the two phases within ca XX hours. During both phases of the experiment the three feeders were filled up with ~ 30% sugar-water and birds were allowed to forage on the nectar spontaneously, while their behaviour at feeders site were recorded by human observer and a commercial camera (XX). The only difference between the control and experimental phase were a threat model attached to feeders during the experimental phase. For the threat model, we used specimens of the bull-headed ant (XXX; found dead in the forest). Although the ant is not a predator of hummingbirds (including LBH), the ant-bird encounter imposes potential danger for the bird in the form of being bitten. Indeed, an average birds response was as an expected for a potential treat (see results). We performed total of four complete experimental sessions (control and experiment) within ca two weeks.



**Fig. 2**. Feeders set up

To quantify the birds behaviour (the same at both control and experimental phase) we examined several parameters (see Supplement materials) and selected those which represented the three behavioural traits such as exploration, risk-avoidance and arousal, and exhibited the highest inter-individual variation. As a proxy for **explorative behaviour** we utilized a **standardized number of feeders** - totalnumber of various feeders (i.e. 1-3 feeders) used during the visit divided by the total duration of the foraging event. The foraging event was the total time between the onset and end of the foraging at given visit that included both foraging time as well as all the time breaks related to physiological need to interrupt the foraging from a single feeder and change of the feeder. As a proxy for **risk-avoidance** we utilized **latency to approach the feeder** – duration of time interval (in seconds) between appearance in the feeder area (i.e. hovering in front of the feeder) and onset of the foraging. For both the parameters, we assumed that the higher their value is the stronger is the examined behaviour exhibited by an individual. We quantified the two parameters using CowLog softwer (XXX).

For **arousal** we utilized tracker software in which…

(hereafter, arousal) - amount/range of movements around the feeder. Calculated as coeficent of variance of the value established for each video frame basaed on the equation: sqrt((xj - xi)2 + (yj - yi)2), where xi,j and yi,j are cartesian coordinates of the bird position in the focal i and previous j video frame. The higher value, the higher arousal. A proxy for behavioural coping with stressful situation.

**Foraging efficiency**

*Data analysis.*

**Results**

**Discussion**

**Acknowledgments**

Beth, Judith