

Cinque, C., Moray Williams, N., Bencini, C. and Cozzolino, R.2021. Adverse weather conditions reduce food availability and increase glucocorticoid metabolite levels in barn swallow nestlings. – Wildlife Biology 2021: wlb.00747

Appendix 1

Pilot study

Percentage frequency distribution of dropping excretion during the day

In order to calculate the percentage frequency distribution of dropping excretion by adults and nestlings, the day was subdivided into three periods: 'Morning', from 5:00 to 13:00; 'Afternoon', from 13:00 to 20:00; 'Night', from 20:00 to 4:00. The analysis of the photos recorded by camera traps (Capture, Cuddeback Digital, USA) showed that droppings found under nests occupied by brooding adults were mainly excreted during the night instead, nestlings older than six days excreted most of the droppings during the afternoon and the night.

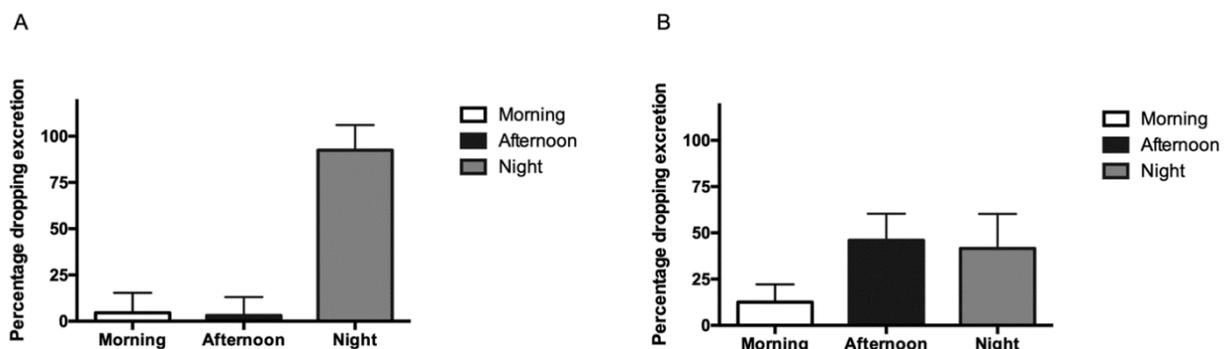


Figure A1. (A) Mean (\pm SD) percentage of the number of droppings excreted during the day by adult barn swallows; (B) Mean (\pm SD) percentage of the number of droppings excreted during the day by nestling barn swallows.

Wet and dry barn swallow droppings

Based on the tests made during the pilot study (Fig. A3–A4), we believe that the main difference between wet and dry droppings was the content of water, most probably due to different time of excretion – i.e. wet droppings were excreted closer to sample collection time compared to dry droppings.

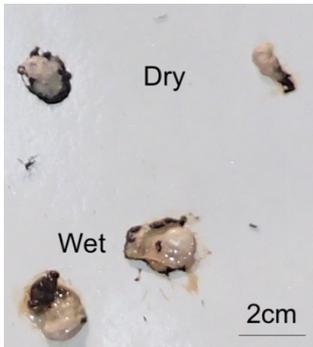


Figure A2. Visual differences between wet and dry droppings under the same barn swallow nest.

CM levels of non-dehydrated wet and dry droppings

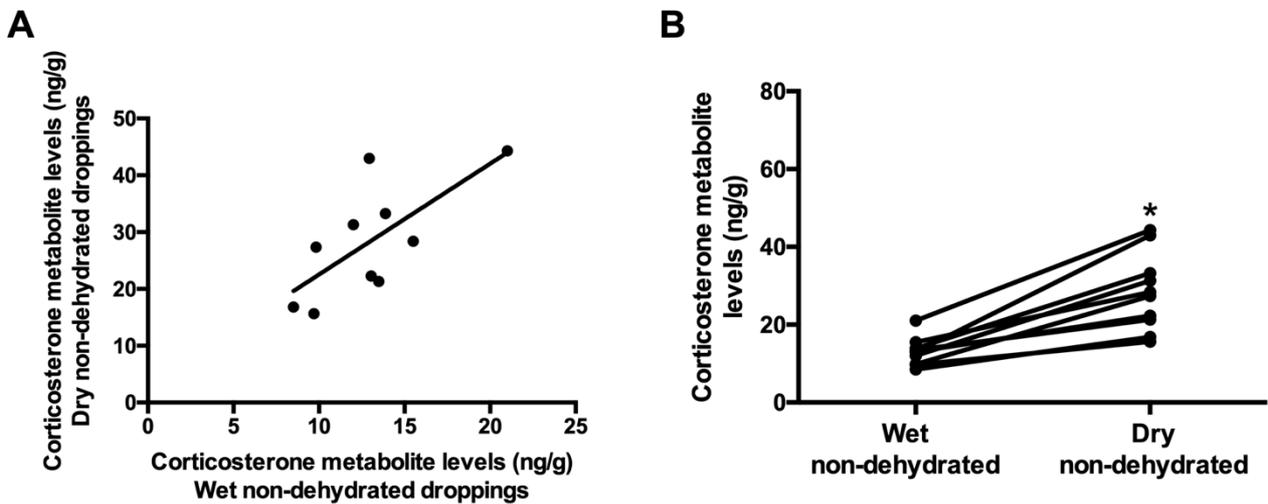


Figure A3. (A) CM levels simple regression between non-dehydrated wet and dry droppings; (B) CM levels in non-dehydrated wet and dry droppings, * $p < 0.05$ versus wet non-dehydrated droppings, paired t-test.

CM levels of dehydrated wet and dry droppings

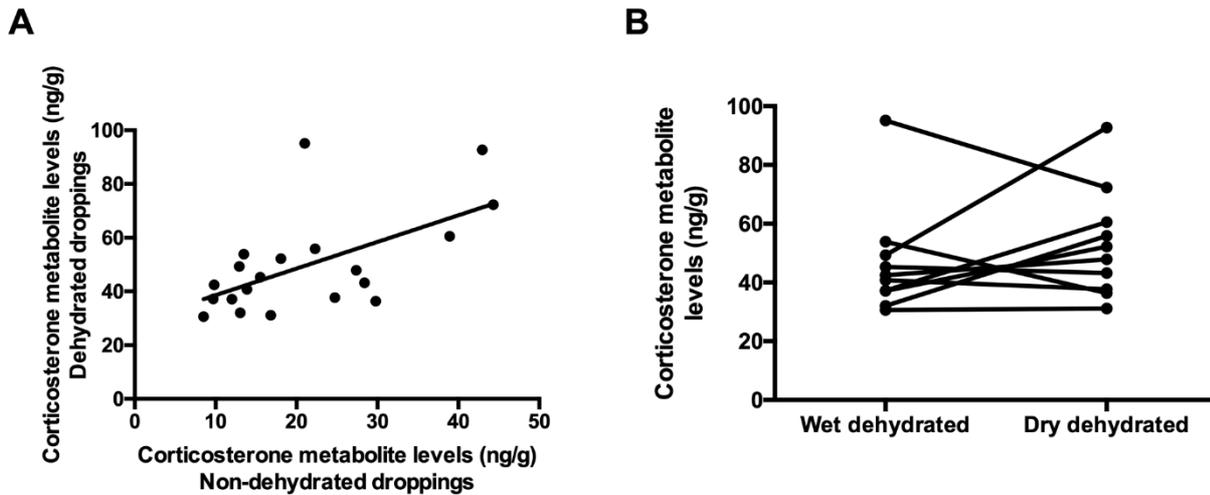


Figure A4. (A) CM levels simple regression between non-dehydrated and dehydrated wet and dry droppings; (B) CM levels in dehydrated wet and dry droppings, paired t-test.

Visual differences among droppings of barn swallows of different age

We found that droppings from medium and late aged nestlings and adults differed in consistency, shape and dimension. Droppings from medium aged nestlings were rounded and showed a dominant proportion of white-colored uric acid. Late aged nestling droppings were darker than droppings from medium aged nestlings and had a shape similar to those of adults but were thinner. We found relatively few adult droppings on the sheets. Adult droppings were longer and wider than droppings of late aged nestlings. Adults spend very short time at the nest during the day, usually do not brood the nestlings after they are able to thermoregulate and often roost close to the nest, not in it (Jones 1987; Jenni-Eiermann et al. 2008; personal observations). Consequently, adult's droppings that were found on the sheets were mostly situated apart from those deposited by the nestlings.

Medium aged nestlings
Adult

Late aged nestlings



Figure A5. Barn swallow droppings at different ages.

Table A1. Mean, minimum and maximum values of weather parameters recorded during the sampling period

	Mean	Minimum	Maximum
Delta maximum temperature	-1,48	-9,50	3,40
Maximum temperature (°C)	24,47	13,00	36,60
% Humidity	63,19	39,10	83,90
Wind speed (Km/h)	5,21	0,30	14,80
Precipitation (mm)	1,41	0,00	9,60
Atmospheric pressure (hPa)	1010,96	1000,30	1020,50
Day length (min)	894,14	822,00	924,00

Insect abundance per counting day

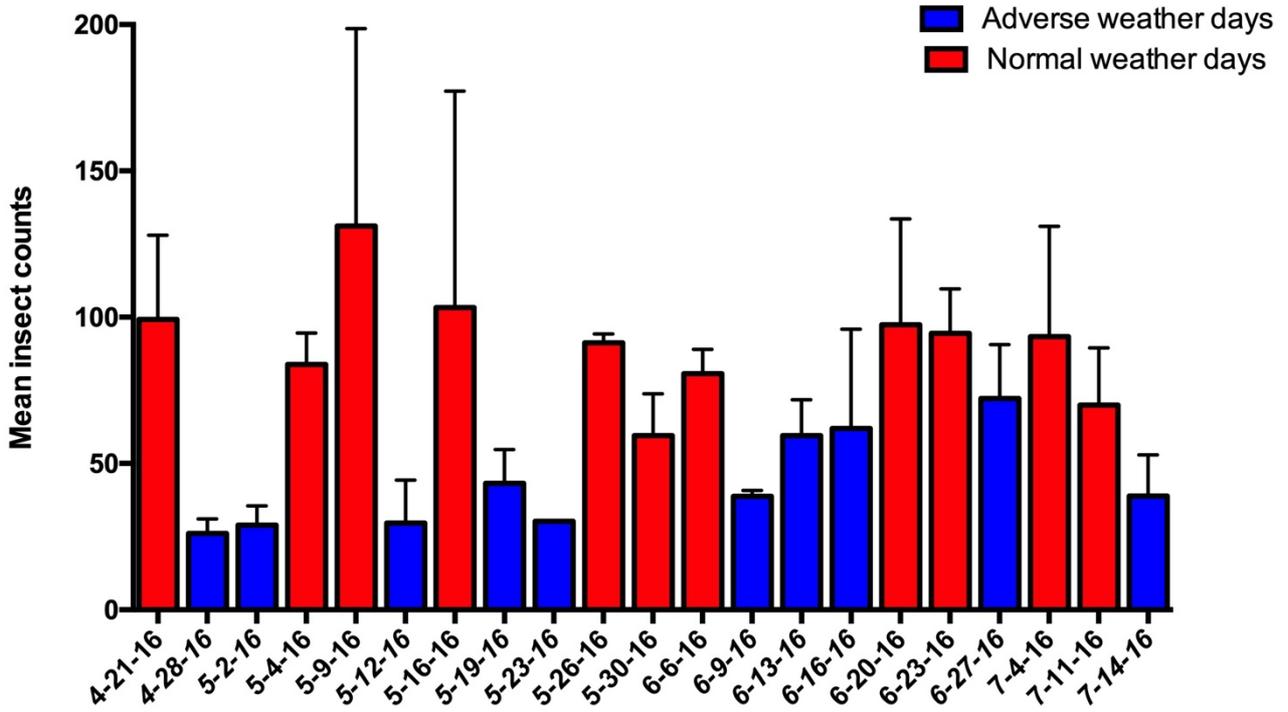


Figure A6. Insect abundance (mean \pm SD) per each counting day during normal (red bar plot) and adverse weather conditions (blue bar plot).