Climate change, breeding date and nestling diet

Burger, Claudia; Belskii, Eugen; Eeva, Tapio; Laaksonen, Toni; Maegi, Marko; Maend, Raivo; Qvarnstrom, Anna; Slagsvold, Tore; Veen, Thor; Visser, Marcel

Published in:
Journal of Animal Ecology

DOI:
10.1111/j.1365-2656.2012.01968.x

The following Supporting Information is available for this article online:

Table S1: Additional information on method of diet collection, number of food items per nest, percentage caterpillars in the diet, other important prey types and percentage of unidentified items for the different areas. NA's indicate that data on this feature was not available. 'Adult Lep.' is adult Lepidoptera.

Area	Sampling method	Number of food items per nest	Mean % Caterpillars per habitat	Other important prey types (in %)	% of unidentified items
Hoge Veluwe, NL	Videos	Range= 25-249, mean= 95.4	Oak: 34.7 Other: 23.3	NA	NA
Drenthe, NL	Photos	Range: 26-141, mean= 71.5	Oak: 37.5 Other: 28.9	Coleoptera: 18.4 Arachnida: 14.4	33
Öland, S	Videos	Range=7-123, mean= 35.9	Oak: 35.3 Other: 13.1	Winged insects: 52.5	NA
North Wales, UK	Videos	Range= 7-600, mean= 112.3	Oak: 40.4	NA	NA
Kilingi-Nõmme, EST	Videos	Range: 14-98, mean= 44.3	Other: 38.0	Coleoptera: 19.5, Adult Lep.: 9.0	34
Oslo, N	Videos	Range=7-40, mean=25.1	Other: 31.2	Diptera: 60 Arachnida: 8.0	NA
Harjavalta, FIN	Videos	Range=8-149, mean= 41.9	Other: 23.5	Adult Lep.: 20.0 Arachnida: 14.3	NA
Turku, FIN	Photos	Range= 49-262, mean= 116.9	Oak: 40.6 Other: 12.8	Adult Lep.: 16.9 Arachnida: 12.5	39
Revda, RUS	Neck-collars	Range= 7-91, mean= 22.7	Other: 10.6	Arachnida: 21 Diptera: 17	0

<u>*Appendix S1:* Analysis of seasonal changes in nestling diet in relation to timing of caterpillars in the environment:</u>

We analysed data on 67 nests from one area, Hoge Veluwe, Netherlands, of which we had information on the date of the caterpillar peak of oak trees (Visser, Holleman & Gienapp 2006), in order to confirm that a decline of caterpillars in the diet corresponds with an decline in the environment.

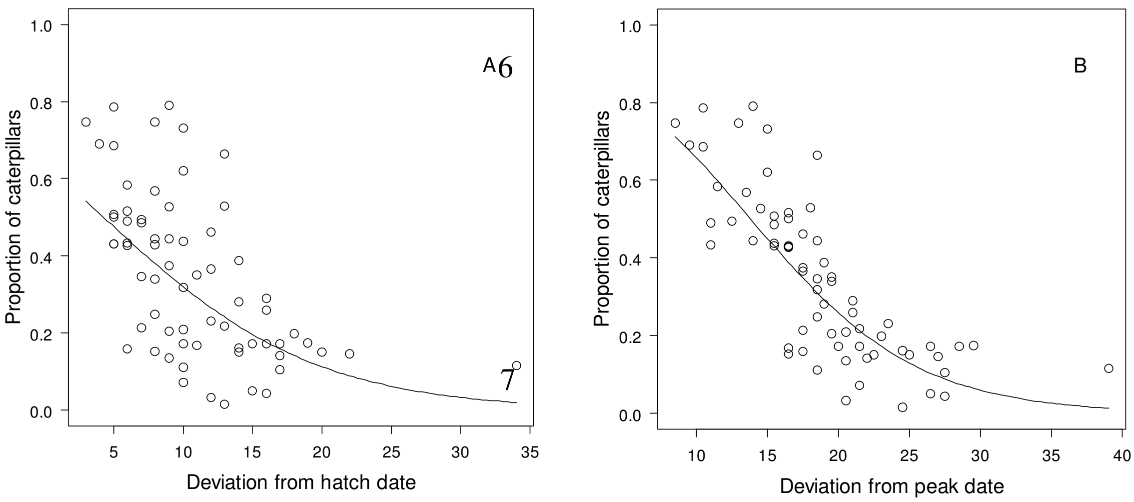
We compared two models with proportion of caterpillars in the diet as dependent (y) and either deviation (in days) from median hatching date (model 1) or deviation from the caterpillar peak (model 2) as covariates. We used function *lmer* (package *lme4*) in R (R Development Core Team 2010) with binomial error distribution and year as a random intercept (5 years were available).

Model 2 had a clearly lower AIC value (ΔAIC = 8.4), suggesting that proportions of caterpillars in the diet closely reflect timing of caterpillars in the environment.

Table S2: Model comparison using AIC, with proportion of caterpillars as dependent and deviations from either hatch date (model 1) or peak date (model2) as covariate.

Linear mixed models (lmer)	AIC
Model 1: y ~ Deviation from median hatch date, random= 1|year	497.2
Model 2: y ~ Deviation from peak date, random= 1|year	488.8

Figure S1: Relationship between proportion of caterpillars in the nestling diet and the deviation from median hatch date (in days, panel A) or the deviation from peak date of caterpillars (in days, panel B). Raw data points (per nest) and predicted curves from two GLM's are shown.



References:

R Development Core Team (2010) *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna. http://www.R-project.org.

Visser, M.E., Holleman, L.J.M., & Gienapp, P. (2006) Shifts in caterpillar biomass phenology due to climate change and its impact on the breeding biology of an insectivorous bird. *Oecologia*, **147**, 164-172.