

**Weather-related detection probability of *Lacerta agilis* Linnaeus, 1758 within the core
range in western Germany**

VIC F. CLEMENT¹, JULIA EDANACKAPARAMPIL¹, LISA M. SCHMITZ¹, RIEKE SCHLUCKEBIER¹,
DENNIS RÖDDER¹

¹ LIB, Museum Koenig, Bonn, Leibniz Institute for the Analysis of Biodiversity, Change
Adenauerallee 127, 53113 Bonn, Germany

Basic and Applied Herpetology 37 (2023) 75-94

SUPPLEMENTARY MATERIAL

Figure S1: Weather conditions during the sampling times for 2018 (A), 2019 (B) and 2020 (C). Temperature shows the distribution of values for maximum air temperature since the last measurement taken every 10 minutes. Relative humidity shows the humidity at the time of measuring, taken every 10 minutes. Windspeed shows the average windspeed since the last measurement taken every 10 minutes. Sunshine duration and precipitation duration are cumulative for the entire 24-hour day, as are number of findings.

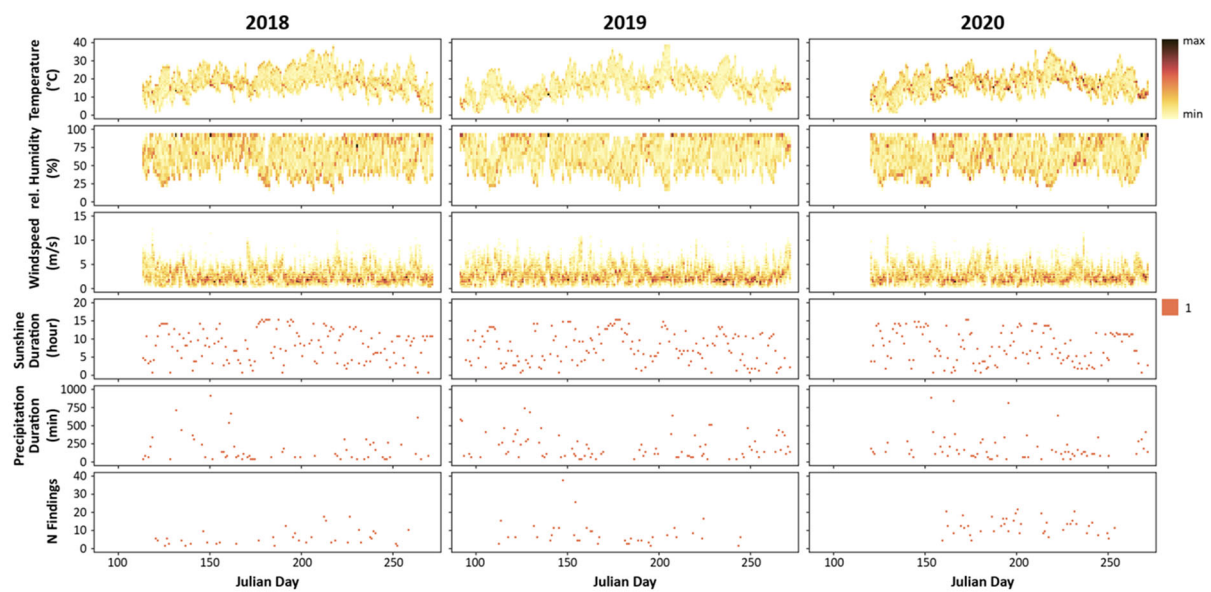


Table S1: Weather data. Available at [XX](#)

Table S2: Information on sampling points, time and date of sighting and duration of sampling intervals. Available at [XX](#)

Table S3: Complete results of the Bayesian models. Available at [XX](#)

Section S1: Results of the CART model with errors and alternative splits.

Call:

```
rpart(formula = Species ~ rel_humidity_int + mean_wind_speed_int +  
  sunshine_duration_3h + max_temp_6h + precip_duration_24h,  
  data = pca.tree, method = "anova")  
n= 238
```

	CP	nsplit	rel error	xerror	xstd
1	0.06490276	0	1.0000000	1.011221	0.1646115
2	0.04869952	1	0.9350972	1.024799	0.1567676
3	0.02988345	3	0.8376982	1.061378	0.1632443
4	0.02373533	5	0.7779313	1.087653	0.1668668
5	0.01643948	6	0.7541960	1.106785	0.1656221
6	0.01011343	8	0.7213170	1.134243	0.1663088
7	0.01000000	9	0.7112036	1.163458	0.1673224

Variable importance

rel_humidity_int	sunshine_duration_3h	mean_wind_speed_int	precip_duration_24h	max_temp_6h
31	26	19	13	11

Node number 1: 238 observations, complexity param=0.06490276

mean=4.684874, MSE=17.87969

left son=2 (23 obs) right son=3 (215 obs)

Primary splits:

rel_humidity_int < 63.675 to the right, improve=0.064902760, (0 missing)

sunshine_duration_3h < 0.01097368 to the left, improve=0.059297110, (0 missing)

mean_wind_speed_int < 2.174107 to the right, improve=0.030177580, (0 missing)

max_temp_6h < 25.91216 to the right, improve=0.015264000, (0 missing)

precip_duration_24h < 3.486207 to the right, improve=0.007282954, (0 missing)

Surrogate splits:

precip_duration_24h < 4.265517 to the right, agree=0.916, adj=0.13, (0 split)

Node number 2: 23 observations

mean=1.391304, MSE=4.325142

Node number 3: 215 observations, complexity param=0.04869952

mean=5.037209, MSE=18.04513

left son=6 (174 obs) right son=7 (41 obs)

Primary splits:

mean_wind_speed_int < 2.174107 to the right, improve=0.027476880, (0 missing)

sunshine_duration_3h < 0.01097368 to the left, improve=0.026387590, (0 missing)

max_temp_6h < 25.91216 to the right, improve=0.025695190, (0 missing)

rel_humidity_int < 35.52917 to the right, improve=0.020518910, (0 missing)

precip_duration_24h < 2.568966 to the right, improve=0.007382531, (0 missing)

Surrogate splits:

precip_duration_24h < 3.486207 to the left, agree=0.823, adj=0.073, (0 split)

max_temp_6h < 11.25135 to the right, agree=0.814, adj=0.024, (0 split)

Node number 6: 174 observations, complexity param=0.02988345

mean=4.695402, MSE=12.59113

left son=12 (70 obs) right son=13 (104 obs)

Primary splits:

max_temp_6h < 21.14189 to the right, improve=0.04285845, (0 missing)

rel_humidity_int < 35.52917 to the right, improve=0.01581210, (0 missing)

sunshine_duration_3h < 0.01369298 to the left, improve=0.01402203, (0 missing)

mean_wind_speed_int < 3.49 to the right, improve=0.01191176, (0 missing)

precip_duration_24h < 0.003448276 to the left, improve=0.01175907, (0 missing)

Surrogate splits:

rel_humidity_int < 45.87619 to the left, agree=0.678, adj=0.200, (0 split)

sunshine_duration_3h < 0.1656579 to the right, agree=0.655, adj=0.143, (0 split)

precip_duration_24h < 0.003448276 to the left, agree=0.621, adj=0.057, (0 split)

mean_wind_speed_int < 2.20625 to the left, agree=0.603, adj=0.014, (0 split)

Node number 7: 41 observations, complexity param=0.04869952

mean=6.487805, MSE=38.59131

left son=14 (16 obs) right son=15 (25 obs)

Primary splits:

sunshine_duration_3h < 0.0865 to the left, improve=0.19457580, (0 missing)

mean_wind_speed_int < 1.75 to the left, improve=0.16781950, (0 missing)

precip_duration_24h < 0.6310345 to the right, improve=0.08315863, (0 missing)

rel_humidity_int < 52.20234 to the right, improve=0.05969091, (0 missing)

max_temp_6h < 20.93108 to the left, improve=0.03671477, (0 missing)

Surrogate splits:

precip_duration_24h < 0.006896552 to the right, agree=0.854, adj=0.625, (0 split)

mean_wind_speed_int < 1.72381 to the left, agree=0.805, adj=0.500, (0 split)

rel_humidity_int < 48.95 to the right, agree=0.780, adj=0.438, (0 split)

max_temp_6h < 14.08378 to the left, agree=0.683, adj=0.188, (0 split)

Node number 12: 70 observations

mean=3.8, MSE=7.274286

Node number 13: 104 observations, complexity param=0.02988345

mean=5.298077, MSE=15.26692

left son=26 (95 obs) right son=27 (9 obs)

Primary splits:

rel_humidity_int < 35.52917 to the right, improve=0.10104380, (0 missing)

max_temp_6h < 20.83514 to the left, improve=0.05987520, (0 missing)

sunshine_duration_3h < 0.01142105 to the left, improve=0.04845186, (0 missing)

mean_wind_speed_int < 3.821591 to the right, improve=0.02006089, (0 missing)

precip_duration_24h < 2.568966 to the right, improve=0.01093660, (0 missing)

Node number 14: 16 observations

mean=3.0625, MSE=3.433594

Node number 15: 25 observations, complexity param=0.02373533

mean=8.68, MSE=48.7776

left son=30 (9 obs) right son=31 (16 obs)

Primary splits:

mean_wind_speed_int < 1.805556 to the left, improve=0.08282695, (0 missing)
max_temp_6h < 23.22568 to the right, improve=0.03080675, (0 missing)
rel_humidity_int < 39.91111 to the left, improve=0.01760462, (0 missing)
sunshine_duration_3h < 0.1599211 to the right, improve=0.01104749, (0 missing)

Surrogate splits:

sunshine_duration_3h < 0.1634474 to the left, agree=0.80, adj=0.444, (0 split)
max_temp_6h < 19.62838 to the left, agree=0.72, adj=0.222, (0 split)
rel_humidity_int < 44.52143 to the right, agree=0.68, adj=0.111, (0 split)

Node number 26: 95 observations, complexity param=0.01643948

mean=4.915789, MSE=12.68765

left son=52 (12 obs) right son=53 (83 obs)

Primary splits:

sunshine_duration_3h < 0.01142105 to the left, improve=0.045540840, (0 missing)
max_temp_6h < 16.17838 to the left, improve=0.035044950, (0 missing)
rel_humidity_int < 51.9487 to the right, improve=0.027624440, (0 missing)
mean_wind_speed_int < 3.8525 to the right, improve=0.021437550, (0 missing)
precip_duration_24h < 0.5068966 to the left, improve=0.008500535, (0 missing)

Surrogate splits:

precip_duration_24h < 3.282759 to the right, agree=0.884, adj=0.083, (0 split)

Node number 27: 9 observations

mean=9.333333, MSE=24.66667

Node number 30: 9 observations

mean=6, MSE=15.33333

Node number 31: 16 observations

mean=10.1875, MSE=61.27734

Node number 52: 12 observations

mean=2.916667, MSE=5.243056

Node number 53: 83 observations, complexity param=0.01643948

mean=5.204819, MSE=13.10263

left son=106 (71 obs) right son=107 (12 obs)

Primary splits:

sunshine_duration_3h < 0.03771053 to the right, improve=0.07817840, (0 missing)
rel_humidity_int < 51.97727 to the right, improve=0.03904708, (0 missing)
mean_wind_speed_int < 3.821591 to the right, improve=0.03442652, (0 missing)
max_temp_6h < 16.17838 to the left, improve=0.03288963, (0 missing)
precip_duration_24h < 2.568966 to the right, improve=0.01517618, (0 missing)

Node number 106: 71 observations, complexity param=0.01011343

mean=4.788732, MSE=10.61734

left son=212 (64 obs) right son=213 (7 obs)

Primary splits:

max_temp_6h < 20.57162 to the left, improve=0.05709018, (0 missing)
mean_wind_speed_int < 3.461429 to the right, improve=0.04439311, (0 missing)
sunshine_duration_3h < 0.07986842 to the left, improve=0.02327315, (0 missing)

rel_humidity_int < 50.33 to the right, improve=0.02023827, (0 missing)
precip_duration_24h < 0.5724138 to the left, improve=0.01006022, (0 missing)

Node number 107: 12 observations
mean=7.666667, MSE=20.72222

Node number 212: 64 observations
mean=4.53125, MSE=8.311523

Node number 213: 7 observations
mean=7.142857, MSE=25.55102