**Colour methods.**

Reflectance of the skin was measured using spectrophotometry (Avantes, Avasoft spectrophotometer, AvaSpec-2048-USB2-UA-50, range 250-1000 nm) with a deuterium-halogen light source and fitted with a fibre-optic probe (probe diameter 1.3 mm). The probe, which was mounted within a metal holder to ensure reading at a constant distance from the surface, was always placed perpendicular to the skin of the animals. All measurements were expressed in relation to a white reference tile (WS2; Avantes). Four points on the body of each animal were sampled: One mid-dorsally on the head directly posterior to the eyes, one on the center of the dewlap and a central point on both flanks. These points were chosen to reflect the overall coloration of the animals' body. Reflectance spectra were calculated automatically by the software (AvaSpec75USB2).

Each of our reflectance spectra originally comprised 690 data points (0.59 nm reflectance intervals from 300 to 700 nm). Reflectance data were grouped into 10 nm bins resulting in mean values for 40 bins ranging from 300 to 700 nm. Principal component analysis (PCA) was used to reduce the number of variables for the reflectance data. Additionally, six commonly used reflectance indices were calculated from the reflectance spectra and these were then correlated with the principal component scores received from the principal component analyses of the four points measured (Griggio et al., 2009): mean brightness (the mean percentage of reflectance from 300 to 700 nm), UV chroma ($R_{300\text{-}400}/R_{300\text{-}700}$), blue chroma ($R_{400\text{-}475}/R_{300\text{-}700}$), green chroma ($R_{475\text{-}550}/R_{300\text{-}700}$), yellow chroma ($R_{550\text{-}625}/R_{300\text{-}700}$) and red chroma ($R_{625\text{-}700}/R_{300\text{-}700}$) (Endler, 1990; Montgomerie, 2006). In analyses of spectral data one of the PC's inevitably represents brightness variation and other PCs represent color variation (Cuthill et al., 1999). A PCA was run for the three points on the body (head, flanks and dewlap). The reflectance data obtained from the left and right flank were averaged. Components with eigenvalues > 1.5 were retained and one-way repeated measures ANOVAs were carried out on the component scores to test for statistical differences between treatments.

**Colour results**

In all three body parts measured, the second principal component (Eigenvalue = 26.63, 22.19% of variance explained) correlated positively with reflectance at almost all wavelengths (table 3, appendix) and the scores were positively correlated with the mean brightness colour chroma (Pearson correlation: heads 0.712, flanks 0.623 and dewlap 0.437). The second principal axis can therefore be considered a 'brightness' axis. The brightness of the head, flank and dewlap colours exhibited significant variation among treatments (fig. 1 appendix, $F_{2,58} = 22.02$, $P < 0.001$), the change in brightness was similar between sexes (sex*treatment-effect: $F_{2,58} = 0.46$, $P = 0.64$), but males did have an overall higher brightness than females (sex-effect: $F_{1,29} = 7.14$, $P < 0.05$). Brightness was lower in the "acclimatisation" period compared to the "small cage" (post-hoc, $P < 0.001$) and the "large cage" treatments ($P < 0.001$). Brightness did not differ between the "small cage" and "large cage" treatment ($P = 1$).

The first principal component (Eigenvalue = 35.03, 29.19% of variance explained) correlated positively with reflectances at almost all wavelengths for the flanks and the dewlap (table 3, appendix), indicating that the second component represents colour variation in the flanks and dewlap. The colouration of the flanks and dewlap exhibited significant variation among treatments (fig. 1B, C, appendix $F_{1.49,43.12} = 7.12$, $P < 0.01$). The scores for PC1 were found to be lower in the "acclimatisation" period compared to the "small cage" ($P < 0.001$) and "large cage" ($P < 0.05$)

treatments. The scores did not differ between the “small cage” and “large cage” treatments (P = 0.83). the changes in colouration were similar between sexes (sex*treatment-effect: $F_{1.49,43.12} = 3.04$, $P = 0.07$), but males did have lower scores than females (sex-effect: $F_{1,29} = 7.14$, $P < 0.05$). When these scores are correlated to the previously mentioned colour chromas, we find that they are negatively correlated with the green (-0.243) and yellow (-0.279) chromas for the flanks and with the UV-chroma (-0.274) for the dewlap. This indicates that the flanks reflected more green and yellow in the “acclimatisation” period, while the dewlap reflected more UV.

The third principal component (Eigenvalue = 19.6, 16.3% of variance explained) correlated positively with reflectances between 500 and 650 nm for the head, indicating that the third component represents colour variation in the heads. Also here did the colouration show significant variation among the treatments (fig. 1A appendix, $F_{2,58} = 5.24$, $P < 0.01$). The scores for PC3 were found to be higher in the “acclimatisation” period compared to the “small cage” treatment ($P < 0.01$) and higher but not significant compared to the “large cage” ($P = 0.06$) treatment. The scores did not differ between the “small cage” and “large cage” treatments (P=1). the changes in colouration differed between sexes (sex*treatment-effect: $F_{2,58} = 4.45$, $P < 0.05$), and males had lower scores than females (sex-effect: $F_{1,29} = 21.91$, $P < 0.001$). When these scores are correlated to the previously mentioned colour chromas, we find that they are positively correlated with the green (0.342) and yellow (0.354) chromas. This indicates that the heads also reflected more green and yellow in the “acclimation” period.

Table 3. Component matrix colour analysis.

| Head | PC1 | PC2 | PC3 | Flanks | PC1 | PC2 | PC3 | Dewlap | PC1 | PC2 | PC3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H300-310 | -0.113 | 0.703 | 0.023 | F300-310 | 0.557 | 0.433 | -0.346 | D300-310 | -0.111 | 0.68 | 0.071 |
| H310-320 | -0.082 | 0.718 | -0.042 | F310-320 | 0.632 | 0.4 | -0.35 | D310-320 | -0.123 | 0.683 | 0.035 |
| H320-330 | -0.108 | 0.8 | -0.077 | F320-330 | 0.804 | 0.182 | -0.381 | D320-330 | -0.204 | 0.687 | -0.128 |
| H330-340 | -0.129 | 0.865 | -0.113 | F330-340 | 0.847 | 0.081 | -0.357 | D330-340 | 0.037 | 0.755 | -0.024 |
| H340-350 | -0.135 | 0.866 | -0.113 | F340-350 | 0.861 | 0.065 | -0.34 | D340-350 | 0.214 | 0.752 | 0.086 |
| H350-360 | -0.132 | 0.866 | -0.107 | F350-360 | 0.862 | 0.067 | -0.338 | D350-360 | 0.25 | 0.749 | 0.124 |
| H360-370 | -0.158 | 0.867 | -0.086 | F360-370 | 0.864 | 0.068 | -0.337 | D360-370 | 0.266 | 0.739 | 0.17 |
| H370-380 | -0.165 | 0.874 | -0.081 | F370-380 | 0.864 | 0.072 | -0.338 | D370-380 | 0.297 | 0.725 | 0.222 |
| H380-390 | -0.177 | 0.877 | -0.066 | F380-390 | 0.867 | 0.079 | -0.339 | D380-390 | 0.333 | 0.695 | 0.31 |
| H390-400 | -0.194 | 0.888 | -0.049 | F390-400 | 0.873 | 0.089 | -0.339 | D390-400 | 0.389 | 0.644 | 0.409 |
| H400-410 | -0.192 | 0.91 | -0.05 | F400-410 | 0.881 | 0.107 | -0.343 | D400-410 | 0.451 | 0.565 | 0.502 |
| H410-420 | -0.199 | 0.931 | -0.049 | F410-420 | 0.887 | 0.128 | -0.354 | D410-420 | 0.501 | 0.465 | 0.588 |
| H420-430 | -0.215 | 0.931 | -0.054 | F420-430 | 0.892 | 0.147 | -0.362 | D420-430 | 0.537 | 0.372 | 0.638 |
| H430-440 | -0.252 | 0.915 | -0.039 | F430-440 | 0.896 | 0.158 | -0.366 | D430-440 | 0.539 | 0.303 | 0.684 |
| H440-450 | -0.257 | 0.896 | -0.046 | F440-450 | 0.897 | 0.164 | -0.363 | D440-450 | 0.566 | 0.24 | 0.694 |
| H450-460 | -0.281 | 0.875 | -0.045 | F450-460 | 0.896 | 0.168 | -0.362 | D450-460 | 0.577 | 0.193 | 0.703 |
| H460-470 | -0.281 | 0.88 | -0.022 | F460-470 | 0.896 | 0.178 | -0.358 | D460-470 | 0.576 | 0.164 | 0.712 |
| H470-480 | -0.282 | 0.879 | -0.005 | F470-480 | 0.895 | 0.183 | -0.355 | D470-480 | 0.583 | 0.128 | 0.715 |
| H480-490 | -0.29 | 0.868 | 0.008 | F480-490 | 0.891 | 0.186 | -0.353 | D480-490 | 0.583 | 0.099 | 0.718 |
| H490-500 | -0.293 | 0.88 | 0.049 | F490-500 | 0.889 | 0.201 | -0.343 | D490-500 | 0.573 | 0.077 | 0.73 |
| H500-510 | -0.244 | 0.862 | 0.121 | F500-510 | 0.875 | 0.214 | -0.331 | D500-510 | 0.582 | 0.05 | 0.725 |
| H510-520 | -0.233 | 0.725 | 0.234 | F510-520 | 0.817 | 0.224 | -0.291 | D510-520 | 0.568 | 0.018 | 0.736 |
| H520-530 | -0.246 | 0.575 | 0.296 | F520-530 | 0.714 | 0.209 | -0.224 | D520-530 | 0.552 | -0.003 | 0.744 |
| H530-540 | -0.235 | 0.478 | 0.31 | F530-540 | 0.634 | 0.176 | -0.177 | D530-540 | 0.561 | -0.023 | 0.737 |
| H540-550 | -0.252 | 0.428 | 0.349 | F540-550 | 0.57 | 0.162 | -0.14 | D540-550 | 0.538 | -0.024 | 0.756 |
| H550-560 | -0.232 | 0.404 | 0.343 | F550-560 | 0.593 | 0.144 | -0.133 | D550-560 | 0.561 | -0.037 | 0.752 |
| H560-570 | -0.233 | 0.389 | 0.346 | F560-570 | 0.622 | 0.126 | -0.143 | D560-570 | 0.566 | -0.054 | 0.767 |
| H570-580 | -0.238 | 0.389 | 0.351 | F570-580 | 0.665 | 0.123 | -0.165 | D570-580 | 0.563 | -0.077 | 0.788 |
| H580-590 | -0.252 | 0.389 | 0.359 | F580-590 | 0.705 | 0.117 | -0.181 | D580-590 | 0.529 | -0.114 | 0.806 |
| H590-600 | -0.272 | 0.39 | 0.354 | F590-600 | 0.754 | 0.107 | -0.209 | D590-600 | 0.485 | -0.158 | 0.803 |
| H600-610 | -0.314 | 0.411 | 0.334 | F600-610 | 0.805 | 0.107 | -0.249 | D600-610 | 0.458 | -0.188 | 0.776 |
| H610-620 | -0.36 | 0.439 | 0.284 | F610-620 | 0.829 | 0.108 | -0.282 | D610-620 | 0.42 | -0.208 | 0.755 |
| H620-630 | -0.379 | 0.461 | 0.187 | F620-630 | 0.823 | 0.106 | -0.317 | D620-630 | 0.402 | -0.223 | 0.717 |
| H630-640 | -0.377 | 0.448 | 0.073 | F630-640 | 0.802 | 0.1 | -0.331 | D630-640 | 0.374 | -0.225 | 0.675 |
| H640-650 | -0.345 | 0.408 | -0.029 | F640-650 | 0.771 | 0.093 | -0.333 | D640-650 | 0.342 | -0.222 | 0.628 |
| H650-660 | -0.302 | 0.355 | -0.106 | F650-660 | 0.737 | 0.085 | -0.331 | D650-660 | 0.318 | -0.22 | 0.567 |
| H660-670 | -0.26 | 0.306 | -0.157 | F660-670 | 0.696 | 0.077 | -0.319 | D660-670 | 0.28 | -0.209 | 0.508 |
| H670-680 | -0.221 | 0.266 | -0.193 | F670-680 | 0.658 | 0.069 | -0.308 | D670-680 | 0.25 | -0.197 | 0.445 |
| H680-690 | -0.186 | 0.23 | -0.217 | F680-690 | 0.621 | 0.061 | -0.293 | D680-690 | 0.218 | -0.19 | 0.381 |
| H690-700 | -0.154 | 0.206 | -0.231 | F690-700 | 0.589 | 0.055 | -0.279 | D690-700 | 0.192 | -0.172 | 0.321 |

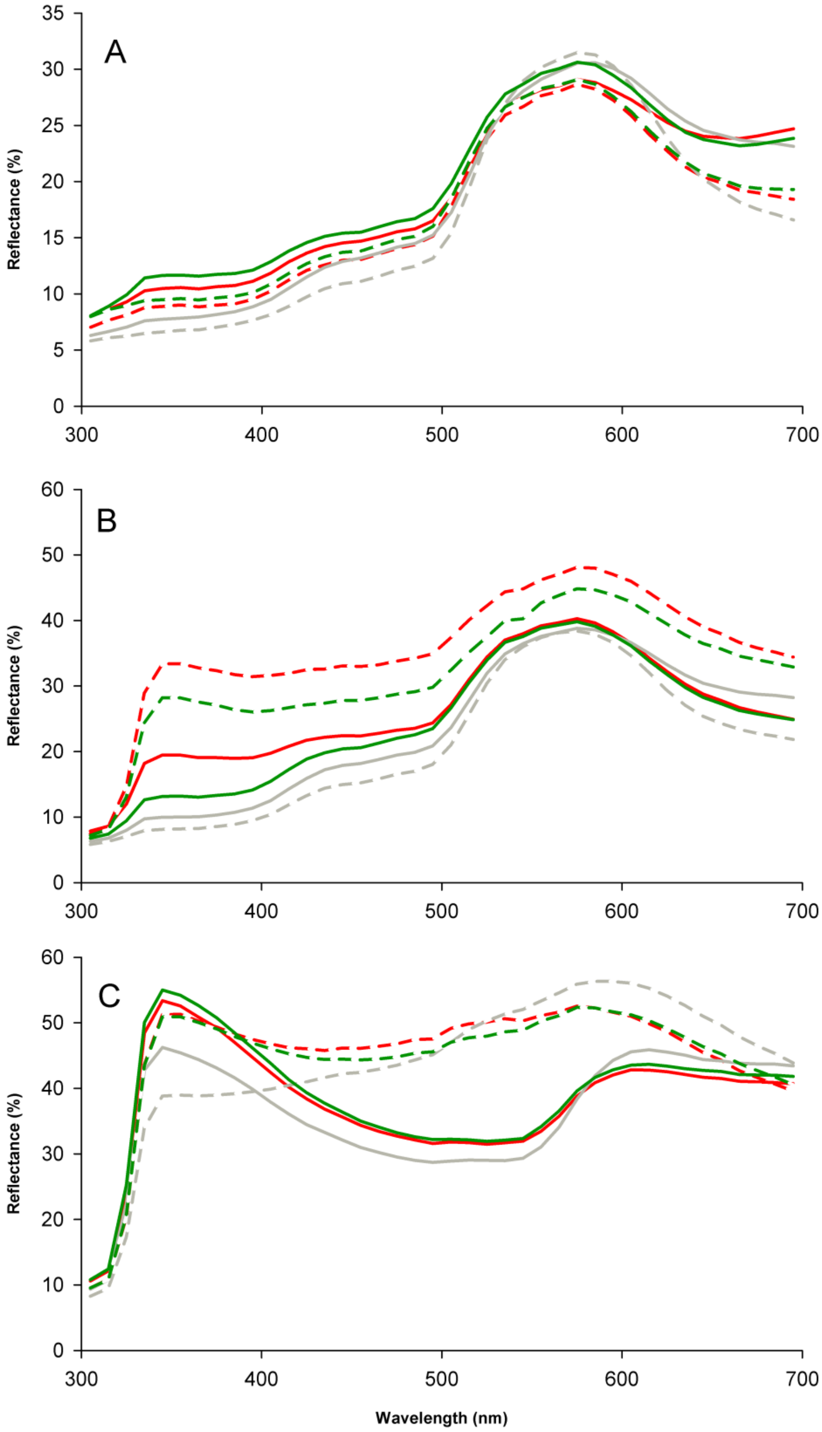


Figure 1. Average reflection of the skin of the head (A), the flanks (B) and the dewlap (C) of *Anolis carolinensis* lizards in the "acclimatisation" period (grey lines), the small cage (red lines) and the large cage treatments (green lines). Values for males (full lines) and females (dashed lines) are shown separately