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| **Table S2.** Excluding species flagged as *incertae cedis* and/or without sequencing data does not influence relationship between longest λmax, shortest λmax or λmax range and coarse terrestrial habitat or coarse lineage. Analyses done without controlling for phylogeny. Significant comparisons in boldface. | | | | | | |
|  | *Before Excluding Data* | | | *After Excluding Data* | | |
|  | **SE** | **t** | **p** | **SE** | **t** | **p** |
| ***Longest*** | | | | | | |
| *Habitat* | **5.64** | **5.60** | **3.83\*10-8** | **5.72** | **5.65** | **3.00\*10-8** |
| *Lineage* | 4.23 | -1.02 | 0.309 | 4.33 | -0.377 | 0.706 |
| *Habitat \* Lineage* | 8.42 | -0.532 | 0.595 | 8.53 | -0.827 | 0.409 |
| ***Shortest*** | | | | | | |
| *Habitat* | **8.84** | **-2.01** | **4.48\*10-2** | **8.39** | **-2.02** | **4.37\*10-2** |
| *Lineage* | 6.29 | 1.96 | 0.0507 | 6.35 | 1.65 | 0.0990 |
| *Habitat \* Lineage* | **12.5** | **-3.06** | **2.34\*10‑3** | **12.5** | **-3.33** | **9.49\*10-4** |
| ***Range*** | | | | | | |
| *Habitat* | **10.1** | **4.77** | **2.51\*10-6** | **10.2** | **4.83** | **1.91\*10-6** |
| *Lineage* | **7.61** | **-2.18** | **2.95\*10-2** | 7.72 | -1.57 | 0.117 |
| *Habitat \* Lineage* | **15.2** | **2.23** | **2.61\*10-2** | **15.2** | **2.28** | **2.35\*10-2** |

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| **Table S3**. Canopy coverage does not affect longest λmax,shortest λmax, or range in λmax, when controlling for phylogeny. Closed refers to Forest + Intermediate canopy. | | | | | | |
| *Habitats Compared* | *λmax* | *SE* | *t-value* | *Lower Bound of Confidence Interval* | *Upper Bound of Confidence Interval* | *p-value* |
| *Open vs generalist* | Longest | 11.77 | 0.169 | -26.79 | 21.68 | 0.866 |
| *Closed vs generalist* | Longest | 13.17 | 0.280 | -17.07 | 26.37 | 0.780 |
| *Open vs closed* | Longest | 14.91 | 0.114 | -23.53 | 25.65 | 0.910 |
| *Open vs generalist* | Shortest | 21.24 | -1.322 | -71.53 | 3.459 | 0.190 |
| *Closed vs generalist* | Shortest | 24.58 | 0.769 | -23.31 | 60.74 | 0.445 |
| *Open vs closed* | Shortest | 26.22 | 1.792 | 2.371 | 81.74 | 0.077 |
| *Open vs generalist* | Range | 23.14 | 0.774 | -27.13 | 55.65 | 0.441 |
| *Closed vs generalist* | Range | 26.13 | -0.429 | -71.51 | 48.38 | 0.669 |
| *Open vs closed* | range | 29.20 | 0.998 | -76.28 | 21.32 | 0.322 |

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| **Table S4**. Sample size of combinations of independent variables in coarse habitat and coarse lineage analysis, before and after excluding species listed as *incertae cedis* and/or without sequencing data. | | | | |
|  | | **ntotal** | **nexcluded** | **nused\_in\_phylolm** |
| *Aquatic* | *Invertebrate* | 78 | 3 | 75 |
| *Vertebrate* | 273 | 26 | 247 |
| *Terrestrial* | *Invertebrate* | 43 | 1 | 42 |
| *Vertebrate* | 39 | 1 | 38 |

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| **Table S5**. Neither average, maximum, nor minimum depth influences longest, shortest, or range in λmax that a species can see. All analyses *sans* comparison between minimum depth and longest λmax performed with phylogenetic control. | | | | | | | |
| *Depth* | *λmax* | *λPagel* | *SE* | *t-value* | *Lower Bound of Confidence Interval* | *Upper Bound of Confidence Interval* | *p-value* |
| *Average* | Longest | 0.7042 | 0.018 | -0.2 | -0.0362 | 0.0359 | 0.8423 |
| Shortest | 0.8558 | 0.0136 | -0.2937 | -0.0207 | 0.0317 | 0.7698 |
| Range | 0.7633 | 0.0153 | -0.9437 | -0.0515 | 0.0158 | 0.3486 |
| *Maximum* | Longest | 0.6665 | 9.66\*10-3 | -9.51\*10-2 | -2.42\*10-2 | 0.0139 | 0.9245 |
| Shortest | 0.8596 | 7.30\*10-3 | 0.2934 | -0.0102 | 0.0139 | 0.7701 |
| Range | 0.7138 | 8.24\*10-2 | -0.9619 | -0.0252 | 0.0076 | 0.3394 |
| *Minimum* | Longest | 1\*10-7 | 0.0654 | 0.0342 | -0.1482 | 0.0148 | 0.9728 |
| Shortest | 0.0901 | 0.0508 | -0.033 | -0.0775 | 0.0949 | 0.9739 |
| Range | 0.4826 | 0.0565 | -0.14 | -0.1113 | 0.1127 | 0.8889 |

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| **Table S6.** Excluding species flagged as *incertae cedis* and/or without sequencing data does not influence relationship between longest λmax, shortest λmax or λmax range and canopy cover. Analyses performed without controlling for phylogeny; included for the sake of completeness. | | | | | | | |
| *Dependent variable* | *Before Excluding Data* | | | *After Excluding Data* | | |
| **χ2** | **df** | **p** | **χ2** | **df** | **p** |
| *Longest λmax* | 4.9986 | 2 | 0.08214 | 4.7425 | 2 | 0.09336 |
| *Shortest λmax* | 4.3746 | 2 | 0.1122 | 3.5176 | 2 | 0.1723 |
| *λmax Range* | 1.1827 | 2 | 0.5536 | 0.89993 | 2 | 0.6376 |

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| **Table S7.** Sample size of animals living in each habitat in terrestrial animal analysis, before and after excluding species listed as *incertae cedis* and/or without sequencing data. | | | |
|  | **ntotal** | **nexcluded** | **nused\_in\_phylolm** |
| *Forest + Intermediate* | 15 | 1 | 14 |
| *Generalist* | 32 | 0 | 32 |
| *Open Specialist* | 22 | 0 | 22 |

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| **Table S8.** Excluding species that were *incertae cedis* and/or without sequencing data did not influence the relationship between habitat greenness and longest or shortest λmax, but did influence the relationship between habitat greenness and λmax range. Analyses performed without controlling for phylogeny; included for the sake of completeness. | | | | | | | |
| *Dependent variable* | *Kruskal-Wallis,*  *Before Excluding Data* | | | *Kruskal-Wallis,*  *After Excluding Data* | | |
| **χ2** | **df** | **p** | **χ2** | **df** | **p** |
| *Longest λmax* | 52.736 | 3 | 2.087\*10-11 | 68.819 | 3 | 7.64\*10-15 |
| *Shortest λmax* | 41.553 | 3 | 4.993\*10-9 | 58.296 | 3 | 1.359\*10-12 |
| *λmax Range* | 7.3515 | 3 | 0.0615 | **8.5126** | **3** | **0.03652** |

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| **Table S9.** Steel-Dwass post-hoc tests, following Kruskal-Wallis, examining the effect of habitat greenness on mean visual pigment sensitivities, prior to excluding species that were *incertae cedis* and/or without sequencing data. Analyses performed without controlling for phylogeny; included for the sake of completeness. | | | | | | |
|  | *Coastal* | *Forest + Intermediate* | *Freshwater* | *Open Terrestrial* | *Mean (nm)* | *SD (nm)* |
| **Longest** |  |  |  |  |  |  |
| *Coastal* | -- | **8\*10-7** | 0.93 | **8.1\*10-6** | 353.68 | 118.23 |
| *Forest + Intermediate* | **-7.46** | -- | **1.1\*10-5** | 0.20 | 547.54 | 17.16 |
| *Freshwater* | -0.855 | **-6.74** | -- | **4.8\*10-7** | 327.15 | 95.62 |
| *Open Terrestrial* | **-6.83** | -2.80 | **-7.59** | -- | 534.09 | 49.09 |
| **Shortest** |  |  |  |  |  |  |
| *Coastal* | -- | **3.9\*10-5** | 0.77 | **4.5\*10-4** | 309.58 | 109.38 |
| *Forest + Intermediate* | **-6.37** | -- | **7.3\*10-6** | 0.16 | 476.02 | 68.99 |
| *Freshwater* | -1.37 | **-6.86** | -- | **1.2\*10-5** | 269.10 | 67.79 |
| *Open Terrestrial* | **-5.59** | -2.96 | **-6.72** | -- | 423.45 | 82.06 |

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| **Table S10.** Sample size of animals living in each habitat in habitat greenness analysis, before and after excluding species listed as *incertae cedis* and/or without sequencing data. | | | |
|  | **ntotal** | **ndropped** | **nused\_in\_phylolm** |
| *Coastal* | 53 | 13 | 40 |
| *Forest + Intermediate* | 15 | 1 | 14 |
| *Freshwater* | 24 | 1 | 23 |
| *Open Terrestrial* | 22 | 0 | 22 |