

Supplementary material for
The contribution of cornea and lens to the ocular media transmittance of birds

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In addition to this file, a second file `supplementary_material_OMT_birds_2021.xlsx` contains the original transmittance data for the ocular media, corneal and lenses of birds used in this analysis.

Supplementary tables

Table S1. The dependence of ocular media $\lambda_{T0.5}$ on axial length of the eye (N = 66 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	304.610	17.674	<0.0001	1	0.183	0.170
log10(axial.length)	46.711	12.535	0.0004			

Table S2. The dependence of ocular media $\lambda_{T0.5}$ on axial length of the eye and the type of visual system (VS or UVS SWS1 opsin), including owls with the VS birds, from which they likely descended (N = 66 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	299.242	17.703	<0.0001	1	0.217	0.193
log10(axial.length)	45.624	12.351	<0.0001			
visual.system v	9.597	5.791	0.102			

Table S3. The dependence of ocular media $\lambda_{T0.5}$ on axial length of the eye and the type of visual system (VS or UVS SWS1 opsin), excluding owls, which lack SWS1 opsin (N = 60 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	293.198	19.175	<0.0001	1	0.238	0.211
log10(axial.length)	51.048	13.704	<0.0001			
visual.system v	9.989	5.957	0.099			

Table S4. The relationship between cornea thickness and cornea transmittance ($\lambda_{T0.5}$) and type of visual system (VS or UVS).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	333.64	7.57	<0.0001	0.832	0.032	-0.046
cornea.thick	13.211	16.345	0.427	0.832		
visual.systemv	0.452	5.51	0.896	0.832		

Table S5. The relationship between lens thickness and lens transmittance ($\lambda_{T0.5}$) and type of visual system (VS or UVS).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	316.182	18.200	<0.0001	0.515	0.124	0.079
lens.thick	4.487	3.116	0.157			
visual.systemv	15.380	10.180	0.139			

Table S6. The dependence of ocular media $\lambda_{T0.5}$ on cornea $\lambda_{T0.5}$ (N = 40 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	288.84	53.357	<0.0001	1	0.056	0.031
cornea.trans	0.227	0.156	0.148			

Table S7. The dependence of ocular media $\lambda_{T0.5}$ on lens $\lambda_{T0.5}$ (N = 40 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	159.844	24.176	<0.0001	0.288	0.727	0.72
lens.trans	0.585	0.069	<0.0001			

Table S8. The dependence of ocular media $\lambda_{T0.5}$ on cornea and lens $\lambda_{T0.5}$ and visual system (N = 40 species).

variable	estimate	SE	p.value	lambda	r2	r2.adj
intercept	-9.605	36.091	0.792	0.025	0.882	0.869
cornea.trans	0.569	0.113	<0.0001			
lens.trans	0.538	0.045	<0.0001			
log10 (axial.length)	-7.127	7.991	0.379			

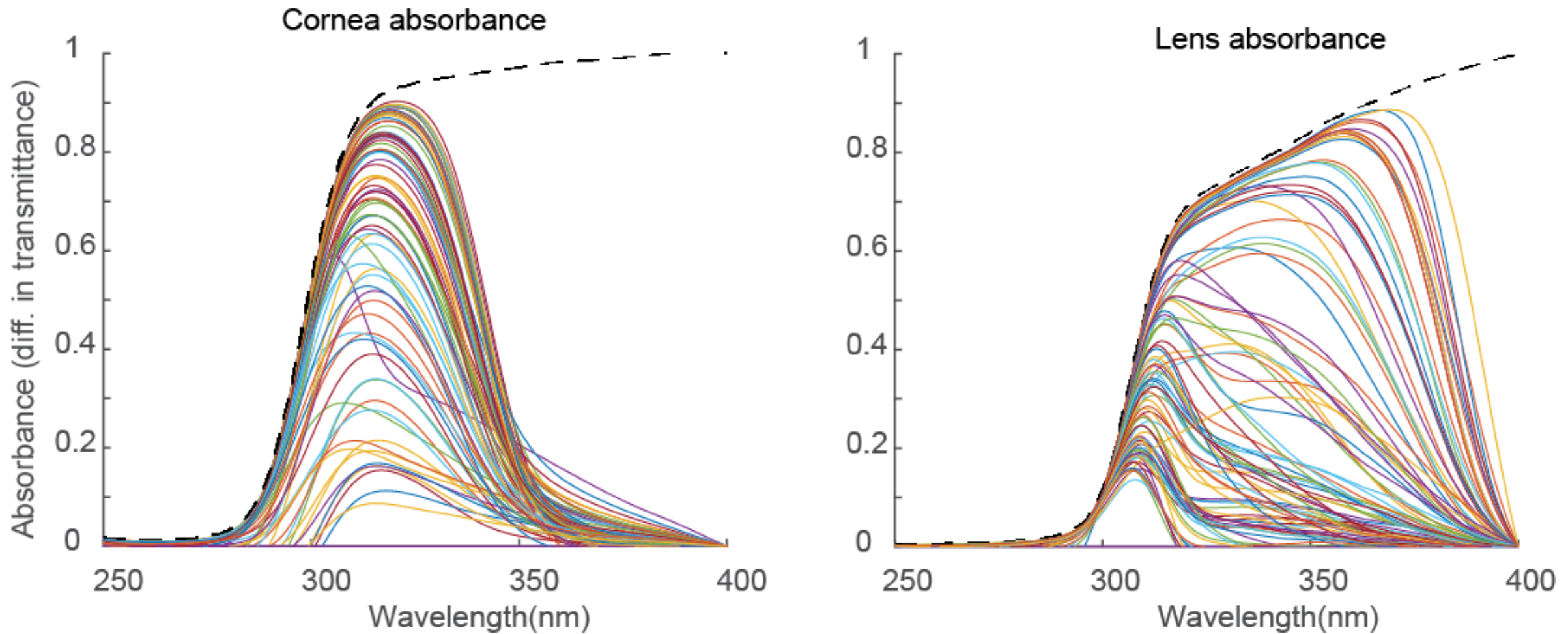


Figure S1. Difference spectra for all individual corneas and lenses compared to the most transmissive cornea and lens respectively. The dashed lines show the transmittance spectrum of the most transmissive cornea and lens respectively. The difference spectra show higher values where the individual transmittance spectra differ from the most transmissive spectrum. This could reveal the absorbance spectra of potential pigment molecules.

