This README file details the eight data files uploaded that contain data used in this paper. Each column of data is defined listing the variable name and what it signifies. All files are in SPSS format.

**S1 File. Body color for additional pale ant species with enlarged eyes.** Body color was measured as brightness (B) using the color window in Adobe Photoshop based on photographs from Antweb ([www.antweb.org](http://www.antweb.org)) for individuals from three additional genera that included *Dorymyrmex* and *Iridomyrmex* (subfamilyDolichoderinae)and *Temnothorax* (subfamily Myrmicinae). The first three columns define the individual that was measured; the next seven columns give data.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species\_subspecies** – gives the species/subspecies of each examined individual.

Column 3: **ANTWEB.ID** – lists the persistent identifier on Antweb ([www.antweb.org](http://www.antweb.org)) that links the measured worker with its high-resolution photo.

Column 4: **B\_lightness\_Head** – lists the measured Brightness value (B) for the head of that individual using the color window (HSB value) in Adobe Photoshop.

Column 5: **B\_lightness\_Mesosoma** - lists the measured Brightness value (B) for the mesosoma of that individual using the color window (HSB value in Adobe Photoshop.

Column 6: **B\_lightness\_Gaster** - lists the measured Brightness value (B) for the gaster of that individual using the color window (HSB value) in Adobe Photoshop.

Column 7: **Mean\_lightness** – gives the mean brightness value (B) for each worker as averaged across the head, mesosoma, and gaster.

**Column 8**: **Mesosoma\_length** – mesosoma length (in mm) of the individual (=Weber’s length) which is an index of body size.

Column 9: **Eye\_area** – area of left eye (in mm2) measured in full lateral view.

Column 10: **Ratio\_eyesize** – this variable is a measure of relative eye size, measured as the ratio eye area/mesosoma length (column 9/column 10).

(SPSS)

**S2 File. Body color for species in our four focal genera.** Body color was measured as brightness (B) using the color window in Adobe Photoshop based on photographs from Antweb ([www.antweb.org](http://www.antweb.org)) for individuals from our four focal ant genera (*Myrmecocystus, Aphaenogaster, Temnothorax, Veromessor*). The first three columns define the individual that was measured; the next four columns give data; the last three columns summarize the data for each species. Cells with a value of “999” in columns 8-10 represent “Not applicable” as these are empty cells with no associated data.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **ANTWEB.ID** – lists the persistent identifier on Antweb ([www.antweb.org](http://www.antweb.org)) that links the measured worker with its high-resolution photo.

Column 4: **B\_lightness\_Head** – lists the measured Brightness value (B) for the head of that individual using the color window (HSB value) in Adobe Photoshop.

Column 5: **B\_lightness\_Mesosoma** - lists the measured Brightness value (B) for the mesosoma of that individual using the color window (HSB value in Adobe Photoshop.

Column 6: **B\_lightness\_Gaster** - lists the measured Brightness value (B) for the gaster of that individual using the color window (HSB value) in Adobe Photoshop.

Column 7: **Mean\_lightness** – gives the mean brightness value (B) for each worker as averaged across the head, mesosoma, and gaster.

Column 8: **Species\_coding** – this column lists all of the species on which we measured brightness.

Column 9: **Species\_mean\_brightness** – the mean brightness value (B) averaged across and measured workers for that species.

Column 10: **Color\_category** – lists the color category of each species. Species were categorized as pale or dark; pale species had an overall mean brightness value >70; dark species had an overall mean brightness value < 70.

(SPSS)

**S3 File.** **Eye morphology data for the six species of *Myrmecocystus***. Eye, ocellus, and body size measurements for workers of the species of *Myrmecocystus* that were examined in this study. The first three columns define the individual that was measured; the next nine columns give data. Cells with missing data are listed as “999”. Data not collected for these individuals and are listed as “-111”

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** – lists the accession number and pin location for the individual the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **anterior\_ocellus** – the diameter of the anterior ocellus (μm) for each individual.

Column 5: **area\_tran** - transformed variable of anterior\_ocellus (column 4) for statistical purposes. Transformed as area\_tran = ln (1000 \* (anterior\_ocellus +1).

Column 6: **eyeareaMM2** – eye area for each worker (in mm2).

Column 7: **ommatidiaNumber** – the number of ommatidia or eye facets counted for each worker.

Column 8: **ln(number)** - transformed variable of ommatidiaNumber (column 9) for statistical purposes. Transformed as logeyetran = ln (1000 \* eyearea).

Column 9: **OmmatidiaDiameter** – mean diameter (in μm) for four adjoining lateral eye facets.

Column 10: **lntran\_diameter** - - transformed variable of ommatidiaNumber (column 9) for statistical purposes. Transformed as logeyetran = ln (1000 \* eyearea).

Column 11: **Mesosoma\_length** – Mesosoma length (in mm) of the individual (=Weber’s length) which is an index of body size. Mesosoma length was used as a covariate in the statistical models as an index of body size.

(SPSS)

**S4 File. Eye morphology data for the four species of *Aphaenogaster***. Eye and body size measurements for workers of the species of *Aphaenogaster* that were examined in this study. The first three columns define the individual that was measured; the next six columns give data.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** – lists the accession number and pin location for the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **eyeareaMM2** – eye area for each worker (in mm2).

Column 5: **area\_transform** – transformed variable of eyeareaMM2 (column 7) for statistical purposes. Transformed as area\_transform = lg10 (100 \*eyeareaMM2).
Column 6: **ommatidiaNumber** – the number of ommatidia or eye facets counted for each the eye of each worker.

Column 7: **number\_transform**- transformed variable of ommatidiaNumber (column 9) for statistical purposes. transformed as number\_transform = lg10 (ommatidiaNumber).

Column 8: **OmmatidiaDiameter** – mean diameter (in μm) for four adjoining lateral eye facets.

Column 9: **MesosomaLength**- mesosoma length (in mm) of the individual (=Weber’s length). Mesosoma length is an index of body size, and was used as a covariate in the statistical models.

(SPSS)

**S5 File. Eye morphology data for the three species of *Temnothorax***. Eye and body size measurements for workers of of the species of *Temnothorax* that were examined in this study. The first three columns define the individual that was measured; the next eight columns give data.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** – lists the accession number and pin location for the individual the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **eyeareaMM2** – eye area for each worker (in mm2).

Column 5: **area\_tran** – transformed variable of eyeareaMM2 (column 4) for statistical purposes. Transformed as: sqrt (ln(eye area \* 1000).

Column 6: **ommatidiaNumber** – the number of ommatidia or eye facets counted for each worker.

Column 7: **ommatidiatran** - transformed variable of ommatidiaNumber (column 6) for statistical purposes. Transformed as: ommatidiatran = ln (ommatidiaNumber).

Column 8: **OmmatidiaDiameter -** mean diameter (in μm) for four adjoining lateral eye facets.

Column 9: **Mesosoma\_length** – mesosoma length (in mm) of the individual (=Weber’s length) which is an index of body size. Mesosoma length was used as a covariate in the statistical models as an index of body size.

Column 10: **area.ML** – this variable standardizes eye area based on body size (=Mesosoma length). Standardized as (eye area/mesosoma length).

Column 11: **ratio.transform** - transform of eye area/ML ratio for statistical purposes. Transformed as ratio.transform = ln ( 1000 \* area.ML).

(SPSS)

**S6 File. Eye morphology data for the 10 species of *Veromessor*** Eye and body size measurements for workers of the species of *Veromessor* that were examined in this study. The first three columns define the individual that was measured; the next four columns give data.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** – lists the accession number and pin location for the individual the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **eyeareaMM2** – eye area for each worker (in mm2).

Column 5: **ommatidiaNumber** – the number of ommatidia or eye facets counted for the eye of each worker.

Column 6: **OmmatidiaDiameter** – mean diameter (in μm) for four adjoining lateral eye facets.

Column 7: **Mesosoma\_length** – mesosoma length (in mm) of the individual (=Weber’s length) which is an index of body size. Mesosoma length was used as a covariate in the statistical models as an index of body size.

(SPSS)

**S7 File. Interommatidial angle, eye parameter, and visual field span data.** Interommatidial angle, eye parameter, and antero-postero visual field span data for one pale and dark species in each of our four focal genera (*Myrmecocystus, Aphaenogaster, Temnothorax, Veromessor*). Pale species are *M. navajo, A. megommata*, and *T.* BCA-5, and *V. lariversi*; dark species are *M. kennedyi, A. occidentalis, T. neomexicanus,* and *V. chicoensis.*

The first three columns define the individual that was measured; the next six columns give data, the next column defines activity period for each species (see below), and the last column is a constant for converting degrees to radians.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** – lists the accession number and pin location for the individual the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **Deltaphi** – interommatidial angle between eye facets (in degrees).

Column 5: **VFspan** – visual field span in degrees for antero -posterior visual field (in degrees).

Column 6: **eye\_parameter** – eye parameter calculated as the product of Δ*ϕ* in radians and *D* in μm. Calculated as (Deltaphi \* radians/degree \* facet diameter).

Column 7: **eye\_Psqrt** – transformed variable of eye\_parameter (Column 6) for statistical purposes. Transformed as ln (1000 \* eye\_parameter).

Column 8: **OmmatidiaDiameter**- mean diameter (in μm) for four adjoining lateral eye. facets.

Column 9: **Mesosoma\_length** – Mesosoma length (in mm) of the individual (=Weber’s length) which is an index of body size. Mesosoma length was used as a covariate in the statistical models as an index of body size.

Column 10: **ActivityTime** – activity time of species based on literature and other records. Each species was categorized as either diurnal or nocturnal.

Column 11: **radians** – radians is a constant for converting the ommatidial angle into radians. One degree = .0174533 radians.

(SPSS)

**S8 File. Regional variation in facet diameter for two species of *Myrmecocystus* and *Veromessor*.** Facet diameter for five regions of the eye (anterior, posterior, dorsal, ventral, lateral) for one pale and one dark species of *Myrmecocystus* and *Veromessor*. The anterior-posterior axis of the eye was a line from the mandible to the posterior corner of the head, and the five following eye regions (lateral, dorsal, ventral, posterior, anterior) were described relative to this line. Pale species are *M. navajo* and *V. lariversi*; dark species are *M. kennedyi* and *V. chicoensis*. The first four columns define the individual that was measured; the next five columns give data on facet diameter (in μm) for the five measured regions of the eye.

Column 1: **Genus** - lists the genus of each examined individual

Column 2: **Species** – gives the species of each examined individual

Column 3: **IDspecimen** - lists the accession number and pin location for the individual the measured individual in the Robert A. Johnson collection (RAJC), Tempe, AZ.

Column 4: **Individual** – assigns an unique number to each worker of each species.

Column 5: **Lateral** – mean diameter (in μm) of three facets on the lateral eye surface.

Column 6: **Dorsal** - mean diameter (in μm) of three facets on the dorsal eye surface.

Column 7: **Ventral** - mean diameter (in μm) of three facets on the ventral eye surface.

Column 8: **Posterior** - mean diameter (in μm) of three facets on the posterior eye surface.

Column 9: **Anterior** - mean diameter (in μm) of three facets on the anterior eye surface.

(SPSS)