# Appendix S1: Notes on the measurement of ant traits for the GLAD

In order to maintain consistency among trait data, we recommend that contributors provide data using the protocols in the following pages. We provide a list of traits used in the database and priority for measurement and diagrams of the measurements requested. However, we also accept data collected in other ways if appropriate documentation is supplied.

We recommend that, if possible:

1. Six specimens are measured for monomorphic species (termed workers) and for majors (soldiers) and minors (workers) of dimorphic species and that ten specimens are measured for polymorphic species (workers)
2. Specimens are measured while dry –mounted
3. Data are entered on our standard Traits data entry sheets (see link)
4. Accompanying Source, Locality and Assemblage data are provided (see link to data sheets)

**Table S1.** List of standardised morphological traits and ecological and life history traits used in the GLAD and unit of measurement. Priority is assigned from 1 (high) to 3 (low), based on likely significance, effort to obtain and correlation with other traits.

| Trait | Measure | Unit | Priority | Figure |
|---|---|---|---|---|
| *Morphological traits* | | | | |
| Head width | Continuous | mm – measured across the eyes | 1 | S2a,b |
| Head length | Continuous | mm | 1 | S3a |
| Clypeus length | Continuous | mm | 2 | S3b |
| Mandible length | Continuous | mm | 1 | S4 |
| Femur length | Continuous | mm | 1 | S5 |
| Scape length | Continuous | mm | 2 | S6 |
| Weber's length | Continuous | mm | 2 | S7 |
| Pronotum width | Continuous | mm | 2 | S8 |
| Inter-ocular width | Continuous | mm | 1 | S9 |
| Max eye width | Continuous | mm | 1 | S10 |
| Whole body length | Continuous | mm | 3 | S11 |
| Sculpturing | Ordinal | 1 = cuticle appears completely smooth, often shiny;<br>2 = shallow wrinkles/pits;<br>3 = surface heavily textured with ridges, grooves or pits | 2 | S12 |
| Pilosity | Count | Number of hairs crossing mesosoma profile | 2 | S13 |
| Number of spines | Count | Number on mesosoma & petiole (separately) | 2 | S14 |
| Dominant colour | Categorical | Based on a colour wheel or RGB codes<br>Separately for head, mesosoma, gaster | 2 | S15a, b |
| Polymorphism | Categorical | 1 = monomorphic<br>2 = dimorphic<br>3 = polymorphic | 2 | - |
| *Life history traits* | | | | |
| Queen number | Categorical | 1 = monogyny<br>2 = polygyny | 3 | - |
| Worker number | Count | Number of workers | 3 | - |
| Colony type | Categorical | 1 = monodomous<br>2 = polydomous<br>3 = supercolony<br>4 = monodomous and polydomous | 3 | - |
| Colony founding | Categorical | 1 = dependent<br>2 = claustral independent<br>3 = non-claustral independent<br>4 = facultative dependent<br>5 = social parasite | 3 | - |
| *Ecological traits* | | | | |
| Nest site | Categorical | 1 = hypogaeic<br>2 = epigeic<br>3 = under stones<br>4 = dead wood<br>5 = arboreal<br>6 = litter<br>7 = woven leaves<br>8 = sand | 2 | - |
| Activity time | Categorical | 1 = diurnal<br>2 = nocturnal<br>3 = hypogaeic<br>4 = crepuscular | 2 | - |
| Diet | Categorical | 1 = generalist predator<br>2 = generalist<br>3 = seed harvester<br>4 = sugar feeder + generalist<br>5 = seed harvester + generalist<br>6 = specialist predator<br>7 = fungivore | 2 | - |

**Fig. S1**: Whole ant anatomy.

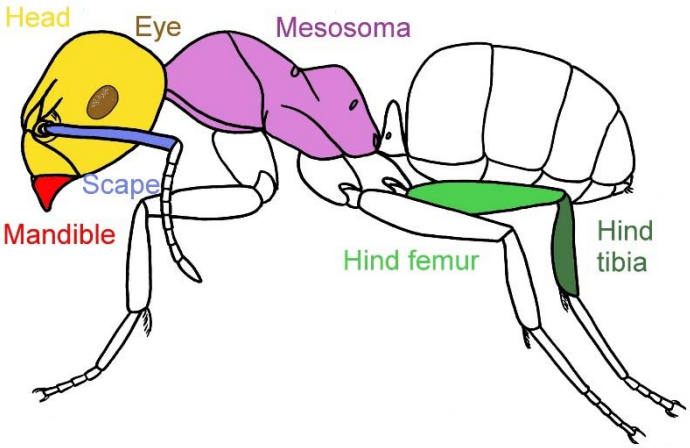
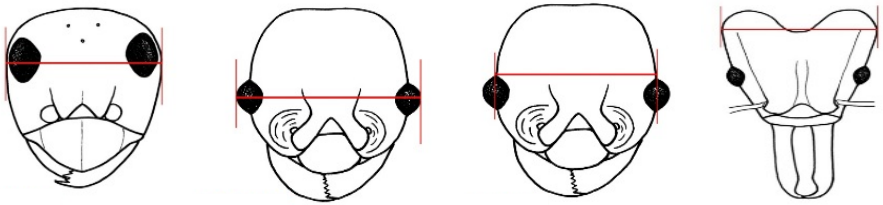



**Fig. S2:** Head width measures: head width across the eyes (a-b) are preferred.



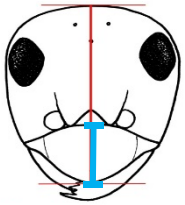
**a)** across eyes

**b)** across eyes / maximum

**c)** above eyes

**d)** maximum

**Fig. S3: a)** Head length (red line) and **b)** clypeus length (blue line).



Head length is the maximum longitudinal length from the most anterior part of the clypeus to the posterior cephalic margin, in full face view

**Fig S4:** Mandible length.

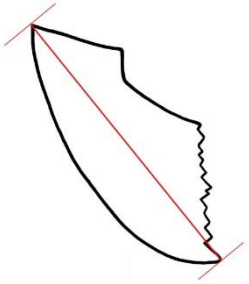


**Fig. S5:** Hind femur length.

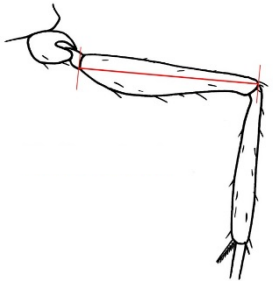


**Fig. S6:** Scape length

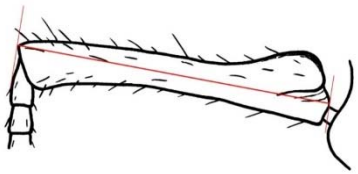


**Fig. S7:** Weber's length

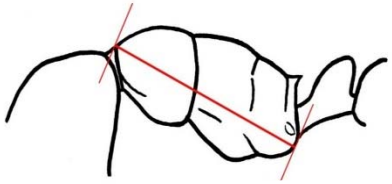


**Fig. S8:** Pronotum width

**Fig. S9:** Inter-ocular distance

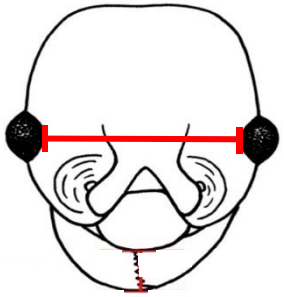


**Fig. S10:** Eye width

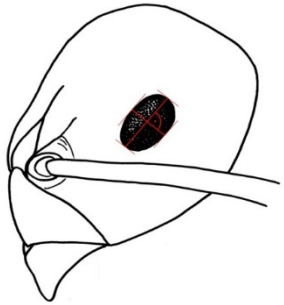
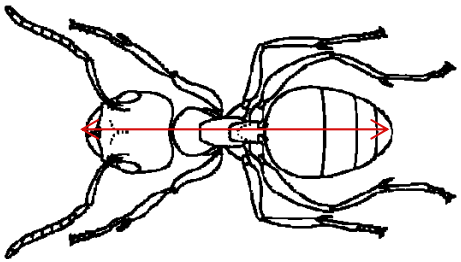


**Fig. S11:** Whole body length



Measured from tip of mandibles to tip of gaster, with the ant in an extended position.

**Fig. S12:** Sculpturing (doesn't include spines; intermediate values allowed, e.g., 2.5)

**Category 1** - *Cuticle appears completely smooth, often shiny*

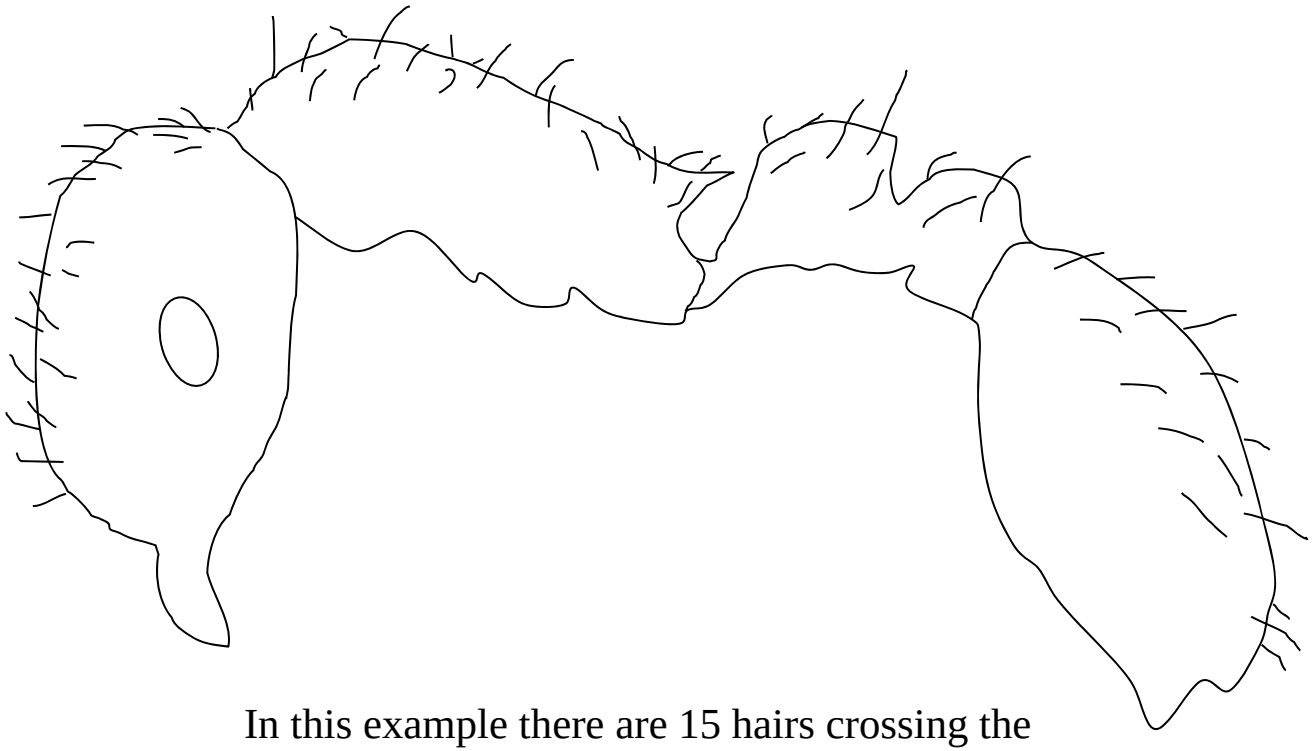


**Category 2 –** *Shallow wrinkles/ pits*



**Category 3** – *surface heavily textured with ridges, grooves or pits*


**Fig. S13:** Pilosity: count of all hairs that cross the border of the mesosoma of the ant in profile



In this example there are 15 hairs crossing the edge of the mesosoma profile.
(The 5 interior hairs are <u>not</u> counted)

**Fig. S14:** Spines: TOTAL number of spines on alitrunk and petiole/s.


0 petiolar;
0 alitrunk = 0 spines


0 petiolar;
0 alitrunk = 0 spines


0 petiolar;
2 alitrunk = 2 spines


0 petiolar;
2 alitrunk = 2 spines


2 petiolar; 2 alitrunk
= 4 spines

2 petiolar; 6 alitrunk
= 8 spines

**Fig. S15a:** Dominant colours – use colours from 16a and/or 16b (head/mesosoma/gaster).


12/12/1


4/4/11


9/11/1


8/8/8


5/6/5

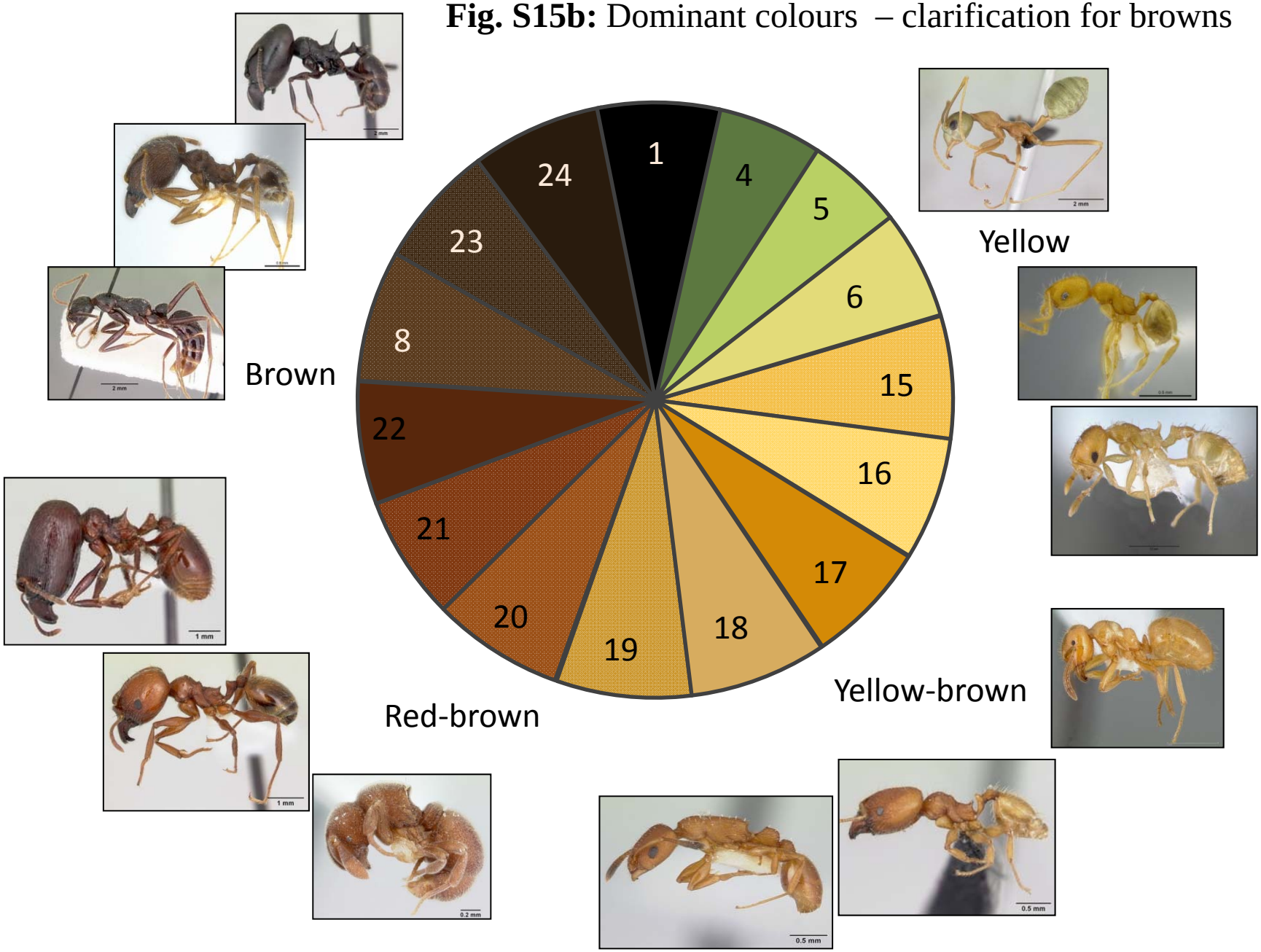

7/7/1



1/1/1


3/3/3

**Fig. S15b:** Dominant colours – clarification for browns



## Notes on colour

*In some cases, you may not be happy with the range of colours supplied by us. Please feel free to provide the red green blue (RGB) values from your computer in the notes column if that is the case. Please also note any confusion about colour when it is produced by hairs or other oddities.*

### Monitor calibration

*If you feel that you need to calibrate your monitor to evaluate colours, please see:*
*http://www.wikihow.com/Calibrate-Your-Monitor*
*Most computers running Windows will have Adobe Gamma, or they can download QuickGamma for free (it is all provided and explained on the site).*

### Metallic, iridescent and hair-derived colour

*To keep things relatively simple, we are not including any measure of whether an ant is metallic or iridescent or whether its colour is derived from hairs. However, we request that colours are evaluated on dry specimens as hair-based colours could be missed on wet specimens.*

## Acknowledgements

All line drawings are by Melanie Tista, except S11 and S13, which were contributed by Elena Angulo. All photographic ant images were extracted from AntWeb.