



**Fig. S1 Reflectance spectra of the pollen samples.** Yellow-dyed alpha-cellulose was used in the unrewarded test of the differential conditioning experiment and strongly differed in colour from all pollen samples with colour distances of 4-6.6 RNL units [receptor-noise limited model of bee colour vision (Vorobyev, et al., 2001)].

| Stimulus                      | Chromatic                   | L-receptor |
|-------------------------------|-----------------------------|------------|
|                               | contrast to grey background |            |
| 90% pollen (training)         | 7.1                         | 1.8        |
| 100% pollen                   | 10.3                        | 1.8        |
| 80% pollen                    | 5.7                         | 2.7        |
| 70% pollen                    | 5.6                         | 3.0        |
| 60% pollen                    | 3.6                         | 3.5        |
| Yellow alpha-cellulose (test) | 10.1                        | 2.6        |
| Blue disc                     | 2.1                         | 2.9        |
| Green disc                    | 12.2                        | 3.1        |

**Table S1.** Differences in colour and brightness of the pollen samples and colour discs. Perception of achromatic brightness cues is mediated by the L-receptor in bees. The contrast has been calculated relative to the grey background using bumblebee photoreceptor sensitivities (Peitsch et al. 1992). Chromatic contrasts were quantified using the Receptor Noise Limited model of colour vision, also known as the Vorobyev-Osorio model (Vorobyev et al. 2001).