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# Improvement of individual camouflage through background choice in ground-nesting birds

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## **Supplementary information: Additional discussion**

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#### **Matching of Different Camouflage Features**

Match to any given background can be achieved by resembling a number of background features, including colour, luminance, and pattern. Our results concerning substrate choice by the plovers and coursers and nightjars suggest that pattern matching was the primary camouflage metric used to select nest sites, as opposed to colour or luminance matching (Table 1). In a few cases we found that eggs were better matched to a different potential patch than the chosen one. However, this only occurred for luminance, and we suggest that this is likely a by-product of birds prioritizing the pattern match of their eggs to the background. Bird egg maculation affects both pattern and luminance, meaning there is likely to be a trade-off in matching one over the other, and our data suggest that pattern matching was prioritized over luminance. Indeed, our past work shows that pattern matching is a key predictor of nest survival. In the case of the nightjars, nest survival is likely to be strongly affected by adult plumage camouflage in addition to egg camouflage because, unlike plovers and coursers, nightjars sit tight on their eggs until a predator comes very close. Correspondingly, we found that nightjars selected backgrounds on a larger spatial scale (several m) that improved colour camouflage for their plumage but not their eggs. Conversely, nightjars selected backgrounds at a fine scale (a few cm) that improved the colour camouflage of their eggs but not their plumage, consistent with the eggs being revealed only at short distances.

#### **Nest Modification in Plovers and Coursers**

Some of the plover and courser species in our study make modest modifications ('scrapes') to their nest area, potentially influencing camouflage match to the nest site irrespective of microhabitat selection. This is, however, highly unlikely to have affected the majority of our findings: first, the nightjars and Temminck's coursers do not undertake any nest modification, meaning that this could not have contributed to those results at any spatial scale for these species. Second, we re-ran our analysis for the conspecific comparisons and for the intermediate scale (patch choice at a scale of several meters) for plovers and coursers while excluding data from the immediate nest area, and found the results unchanged (see main paper Methods). Therefore, at most, nest modification could only have influenced the results for certain plover and courser species at the finest (cm) scale. Since many other ground-nesting birds undertake nest modifications, often much more substantial than the species here, this is a potentially important area for future work as it offers an additional way that birds could improve egg camouflage through other behaviours.