

Leaves, fruit, shadows, and lighting in Kibale Forest

Tom Troscianko, C. Alejandro Parraga, U. Leonards, R. Baddeley, D.J. Tolhurst

To what extent does colour vision match the properties of natural scenes? Chromatic mechanisms are relatively more sensitive to low spatial frequencies than luminance mechanisms. Perhaps this reflects some general property of natural scenes, but empirical evidence argues against this. However, since there is separate evidence that colour vision evolved for frugivory, we asked whether the properties of scenes of fruit and foliage differ from those of general scenes. The results suggested that such scenes are indeed optimally signalled by primate spatiochromatic vision, but only for the red - green system (Parraga et al, 2002 *Current Biology* 12 483 - 487). What about the yellow - blue system? Its spatial properties are similar to that of the red - green system. However, we have found no spatial optimisation for foliage encoding. The problem with this system is that shadows are bluer than highlights, and are therefore not removed from dappled scenes. The only situation in which there is evidence of spatial optimality is when patches of blue sky are visible through the leaf canopy. Thus, spatial encoding by the yellow - blue system may be optimised for distinguishing between foliage and sky, or perhaps for an entirely different, yet undiscovered, class of tasks.

[Supported by BBSRC.]