

The effect of colour and distance on detectability in two aposematic insect species



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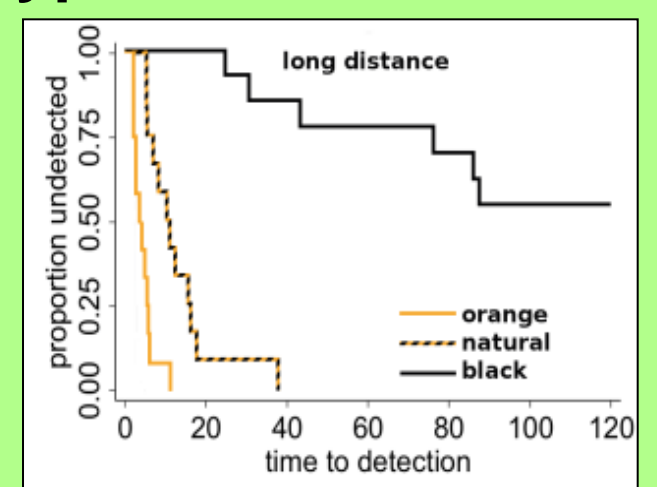
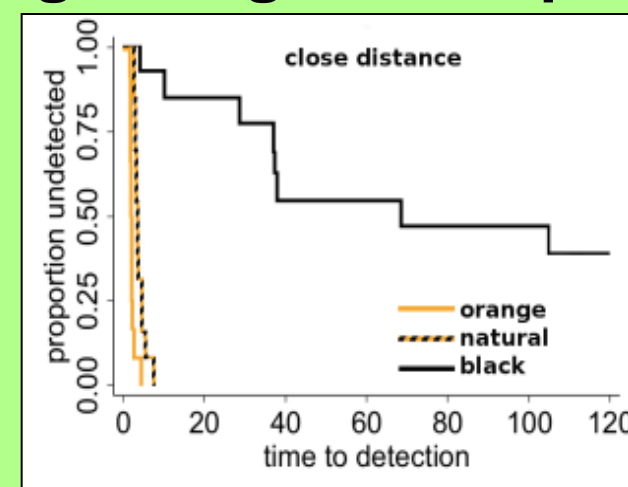
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There is a large variation in the appearance of protective coloration of prey animals. Some rely on extremely cryptic coloration, whereas others are highly conspicuous. Interestingly, in some aposematic, defended species, the function of coloration may actually switch with distance and be a combination of crypsis and warning signal.

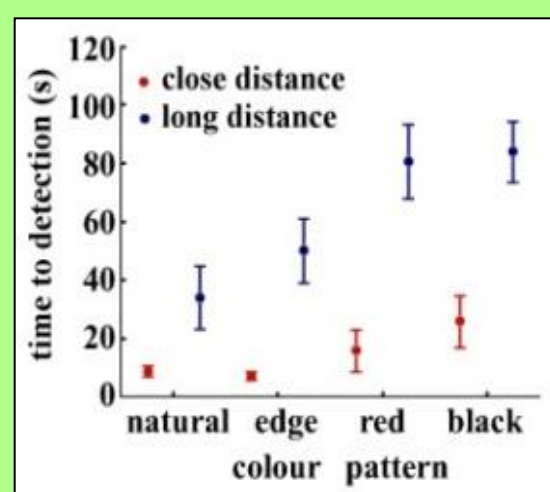
Apollo butterfly larva – *Parnassius apollo* ¹⁾



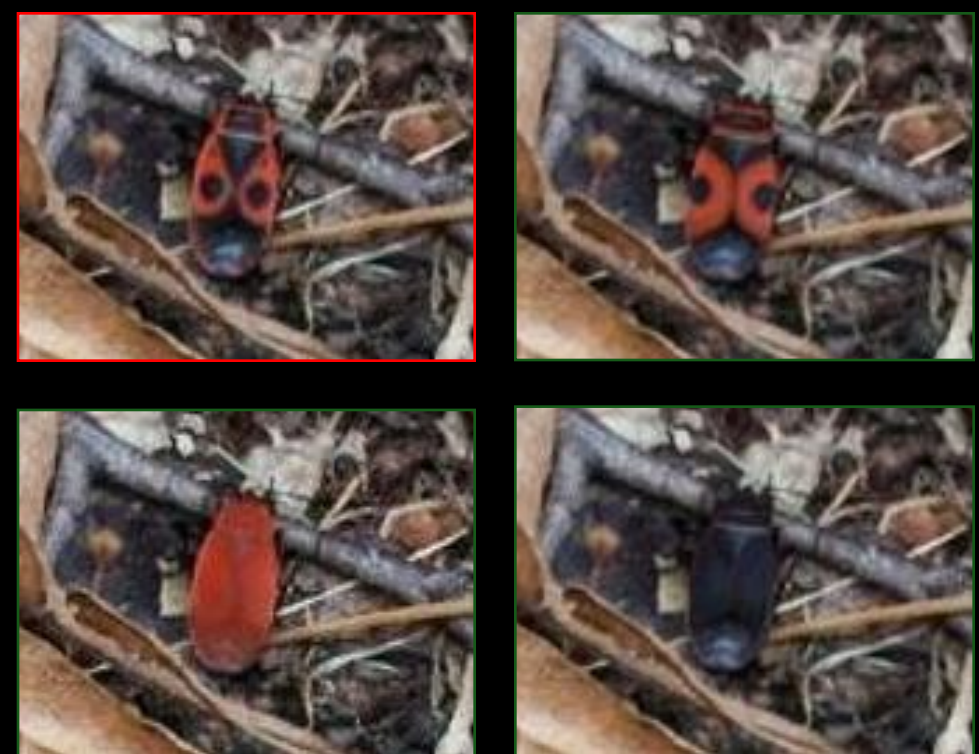
- Orange spots - signalling function.
- Natural larva not maximally conspicuous.
- A distance-dependent function: signalling close up, cryptic from a distance.



- Patterning *per se* important for detectability.
- Placement of the black elements important.
- Natural firebug highly conspicuous.
- No distance-dependent dual function.



Firebug – *Pyrrhocoris apterus* ²⁾



A human predator searching for an insect on a touch screen.
- time to detection recorded.....

Colour and distance affects detectability of the two aposematic species differently. They are both chemically defended against predators but the slow moving larva may benefit from avoiding predators and be cryptic at a distance, while the fast moving firebug benefit from an entirely signalling strategy.

1) Bohlin et al. (2008). The effect of signal appearance and distance on detection risk in an aposematic butterfly larva (*Parnassius apollo*). *Anim Behav*, 76: 577-584.

2) Bohlin et al. (2012). The detectability of the colour pattern in the aposematic firebug, *Pyrrhocoris apterus*: an image-based experiment with human "predators". *Biol J Linn Soc*, 104(4): 806-816.