Colourful Chameleon Language

Written by Administrator Thursday, 06 February 2014 10:09 -

Colourful chameleon language, described in reports in ScienceDaily, ABC News in Science 11 December 2013 and *Biology Letters* doi: 10.1098/rsbl.2013.089. Chameleons are well known for their ability to rapidly change their skin colours, but contrary to popular belief, this cannot be solely for camouflage, as such colour changes often make them more conspicuous.

Russell Ligon and Kevin McGraw from Arizona State University studied the rapid changes in colours of male chameleons when they confronted one another. They reported their results as: "Males that achieved brighter stripe coloration were more likely to approach their opponent, and those that attained brighter head coloration were more likely to win fights; speed of head colour change was also an important predictor of contest outcome".

The researchers found the colour changes involved complex communication with different body regions conveying different information, and the rate of colour change, as well as the vividness of the colours, being an important part of the communication. Ligon and McGraw suggest this signalling helps avoid actual physical fights between mismatched opponents who are competing for territory and females. Ligon explained: "By using bright colour signals and drastically changing their physical appearance, the chameleons' bodies become almost like a billboard – the winner of a fight is often decided before they actually make physical contact. The winner is the one that causes its opponent to retreat. While sometimes they do engage in physical combat, these contests are very short – 5 to 15 seconds. More often than not, their colour displays end the contest before they even get started".

He also commented: "It's definitely a social signal. Most extreme changes in colour are to make chameleons more conspicuous rather than for camouflage".

ABC, ScienceDaily

Editorial Comment: It has been known for a long time the chameleon colour changes occur with many factors such as temperature, light, the presence of the opposite sex, and anger or fear, rather than being camouflage. This is an interesting example of how education and educators perpetuate myths in spite of observations proving them wrong. According to Karl Kruszelnicki, "The myth (of camouflage) first appeared in print around 240BC, when the Greek, Antigonus of Carystus, first mentioned it. But we have no idea exactly how he came to this conclusion. You see, a whole century earlier, the Greek thinker Aristotle got it right when he

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wrote that the chameleon's colour change could be related to fear". (See Great Moments in Science, 9 December 2008.)

We, the editors, suspect the myth has been preserved over the last century, because it suits the evolutionary world view of the struggle for existence and survival by aggression or hiding, in spite of scientific research showing the opposite. Consider chameleons from a Biblical perspective. In the beginning the world was very good, which meant no struggle or aggression. Chameleon colours would therefore have helped maintain body temperature, and served as a means of communication without any aggression at all. In a well-balanced ecology, animals could have had territory and attracted mates without any fighting at all. As the world degraded after the Fall of Man and Noah's flood, resources became scarier, animal behaviour degenerated, and some animals resorted to physical aggression to survive and compete for mates. The creature that used to change its colour purely for attraction, can now use its brains to choose to use this ability to break up its outline and become invisible or camouflaged. Natural selection? Yes. Evolution? No. (Ref. reptiles, pigmentation, communication)

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