Camouflage in motion- characteristic of *Sepia officinalis* camouflage during movement

Noam Josef [1,2] , Nadav Shashar [1]

1. Department of Life Sciences, Eilat Campus, Ben-Gurion University of the Negev, Beer Sheva, 84105, Israel

2. H. Steinitz Marine Biology Laboratory, Inter-university Institute for Marine Sciences, P.O.B. 469, Eilat 88103, Israel

In the visual system of many animals, Movement of a target attracts one's attention and allows rapid figure–ground segregation even when the texture of the target and background match perfectly [1,2,3,4]. Animals that rely on camouflage may minimize visible movement through strategies such as stealth and deceptive resemblance [5], but often this is not possible and many will decide to stay motionless as much as possible. Any camouflaging animal dealing with the question weather to run or stay motionless, obscure a premise: camouflage is harder while moving.

- How then do animals reduce the risk of predation as they move?

Cephalopod, particularly benthic species of cuttlefish and octopus, are masters of adaptive camouflage. These animals may change their body coloration and skin texture to match a given environment mostly by neurally controlled chromatophores [6]. It is long known that cephalopods change their appearance when they move, presumably to avoid detection during or after the movement. For example, octopus uses a combination of stealth and rapid chromatic and textural changes as they move, apparently to match the changing background [7] and cuttlefish showed context-dependent body pattern use during motion [8].

In our latest study we use the capacity for rapid pattern change in the cuttlefish *Sepia officinalis* to investigate the potential for motion camouflage by an animal that can alter its body pattern in less than a second [6]. We assessed changes in body intensity during movement over a periodic stimuli (uniform grey and black patterns), which is known to evoke color matching with respect to substrate intensity. On a more detailed aspect, we measured all motion properties of a given animal while sampling its body color, allowing us to reveal some of the tactics these animals use to keep as less conspicuous as possible while they are moving.

This study was carried out on non-endangered species under the supervision of the Israeli Nature Reserve Authority (Israeli Nature Reserve Authority permit #2010/37233). All necessary permits were obtained for the described field studies under the supervision of the Ben-Gurion University ethics committee under N.J.'s certification of authorization and in accordance with the recommendations in the guide for animal welfare, according to section 1 of the animal welfare law, 1994.

In addition to the main subject, we would like to present the video analysis code developed in the Matlab environment and the graphical presentation of our results.

We thank you in advance for giving us the opportunity to present our and learn others in our ever-growing field of behavioral sciences.

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