

A snake of a different color: physiological color change in Arizona black rattlesnakes

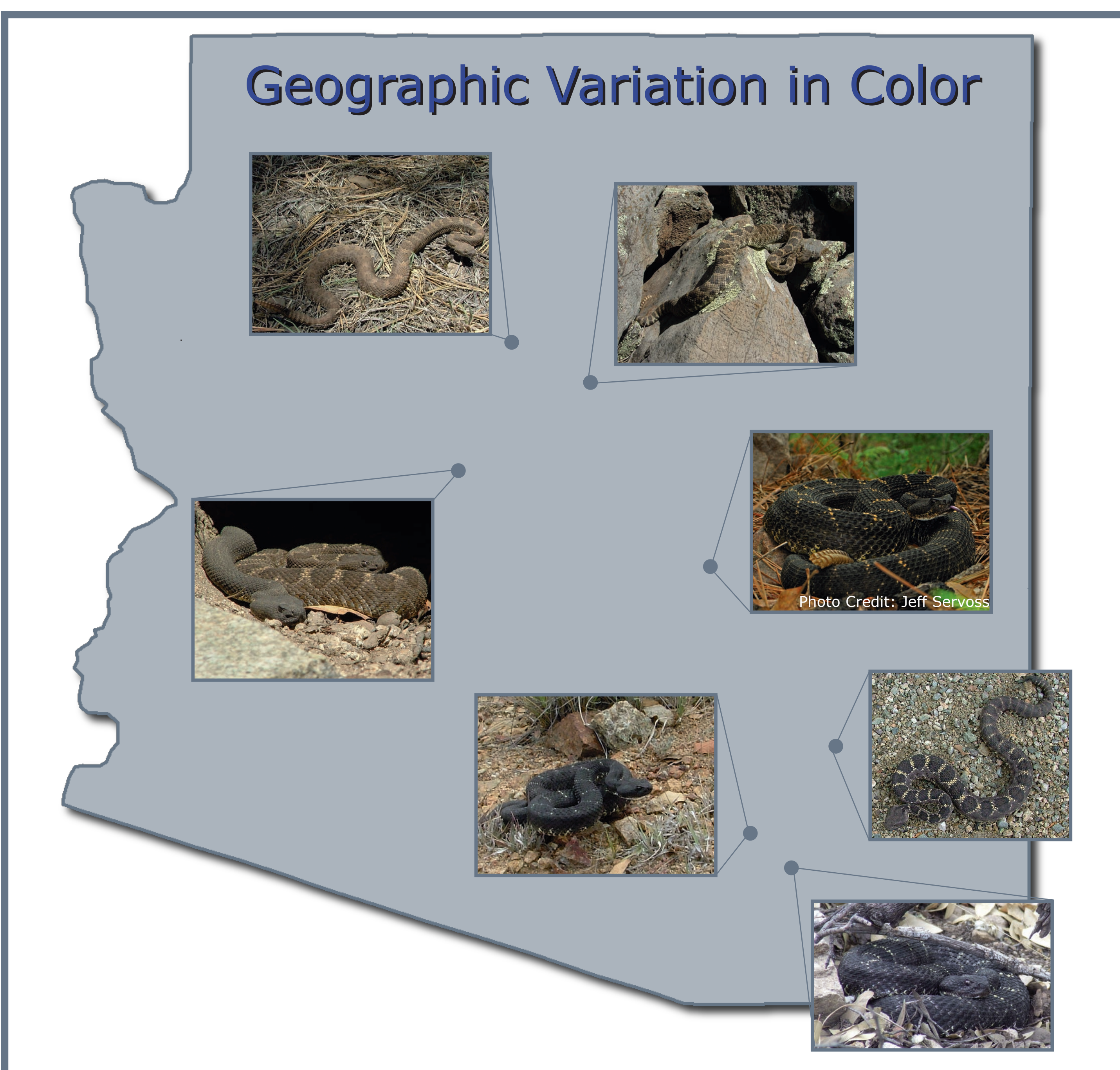
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A Colorful Snake

Arizona black rattlesnakes (*Crotalus cerberus*) show striking variation in color among populations (geographic variation), within populations, and even within individuals. Adults are less patterned than juveniles (morphological color change) and some adults can rapidly change color (physiological color change).



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Function of Color^{1,2}

- Camouflage
- Communication
- Thermoregulation
- Protection



1. S. Clusella Trullas, J.H. van Wyk, J.R. Spotila, J. Therm. Biol., 32, 235 (2007).
2. D. Stuart-Fox, A. Moussalli, Phil. Trans. R. Soc. B, 364, 463 (2009).

Why Change Color?^{1,2}

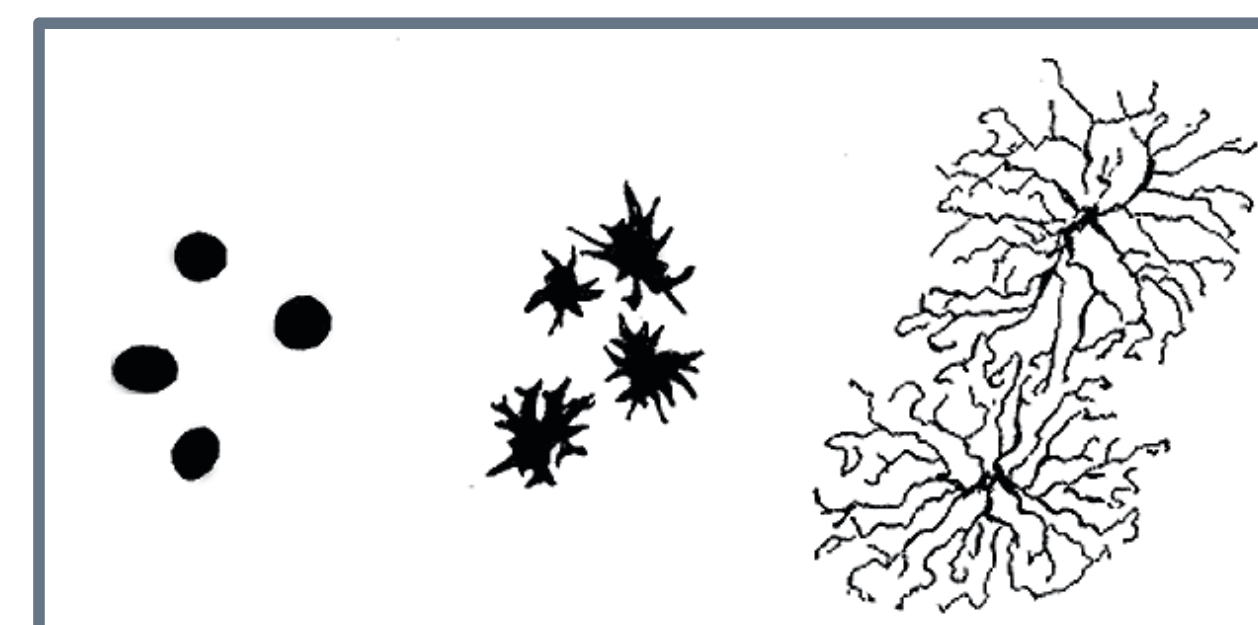
- Variable environment
- Trade-offs among color functions
- Physiological trade-offs

Morphological Color Change²

Gradual change due to changes in number or quality of chromatophores



Physiological color change due to melanin movement within dermal melanophores.



Left: full aggregation = light color
Center: intermediate
Right: full dispersal = dark color

Physiological Color Change²

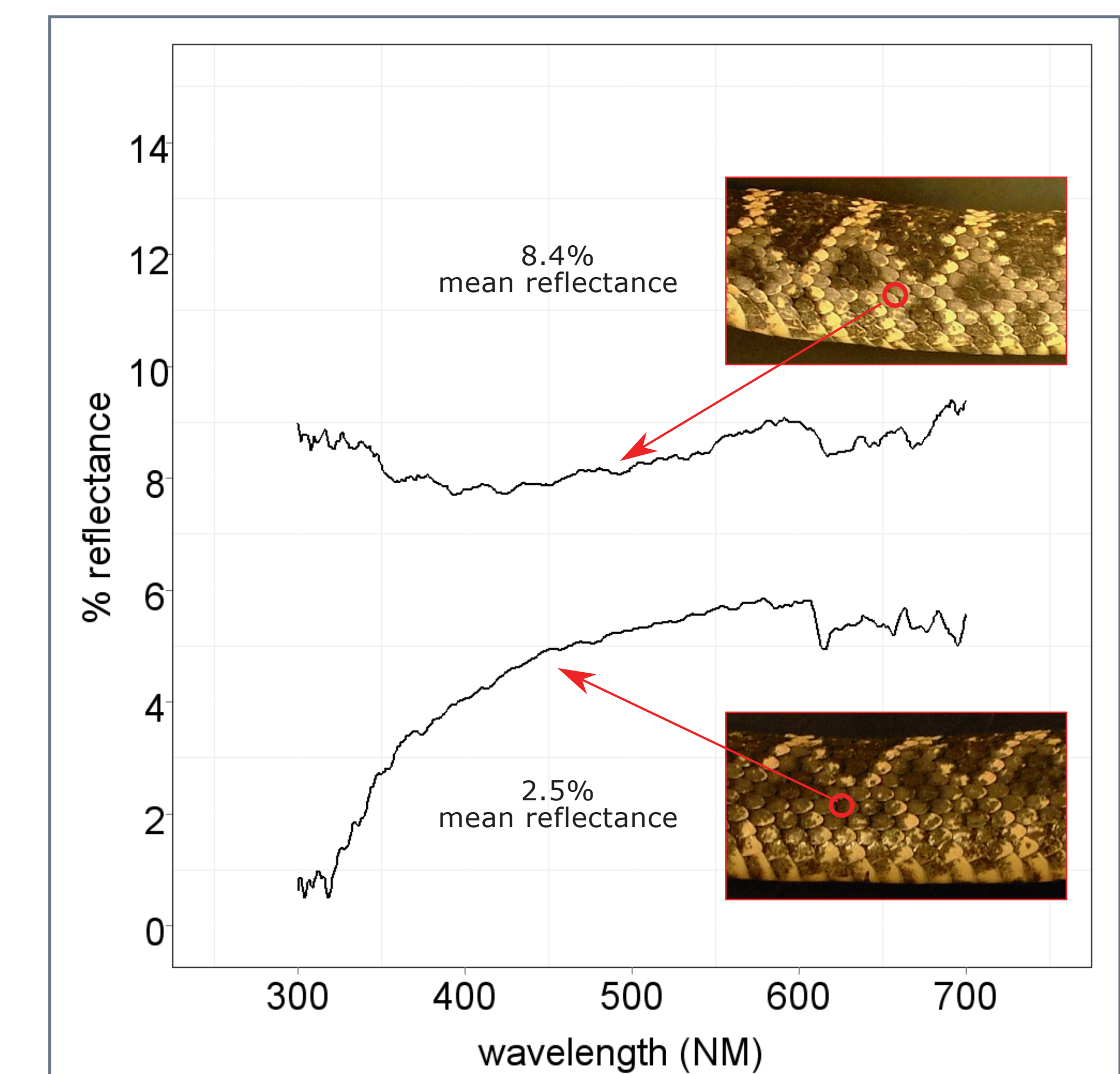
Rapid change due to movement of organelles within chromatophores

09/17/2008 (right)



09/18/2008 (left)

Crotalus cerberus #205, Santa Catalina Mountains; photos taken ~24 hours apart.



Spectral curves from *Crotalus cerberus* #111 taken approximately 24 hours apart with an Ocean Optics spectrometer.