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Damselfish go ultraviolet

They may look drab to us in daylight, but like so many ravers, damselfish take on a new look under black light. The tiny fish have distinctive, species-specific ultraviolet-reflective facial markings that can be used by other fish for identification.

Various animals have ultraviolet vision, but it was thought to be rather poor. Ultraviolet light waves are easily scattered in air and water, and animals that can see them generally have relatively few ultraviolet-sensitive light receptors in their eyes. But new research from Ulrike Siebeck (University of Queensland, Brisbane, Australia) and colleagues calls this assumption into question.

Siebeck's study used two species of damselfish (*Pomacentrus amboinensis* and *P. moluccensis*) that have different ultraviolet-reflective facial patterns. Damselfish defend their territories against intruders and typically respond more aggressively to intruders of their own species than to those of other species. When male fish were presented with two intruders (one of each species), they preferentially attacked the intruder of their own species. But when the fish were placed behind ultraviolet filters, this preference disappeared (*Curr. Biol*. published online 25 February 2010; doi:10.01016/j.cub.2009.12.047). The results show that damselfish use complex ultraviolet patterns for species recognition. Ultraviolet patterning and vision may allow the damselfish to communicate with one another while remaining undetected by predators.

Keeping up the diversity

About one-third of the more than 50 species of whiptail lizards (genus *Aspidoscelis*) reproduce by parthenogenesis, a type of asexual reproduction. The lizards arose from hybridization events between related sexual species, meaning they started off as genetically heterozygous animals. How they have maintained heterozygosity over many generations of asexual reproduction has puzzled scientists for years.

Now, researchers have shown that at least two parthenogenetic whiptail lizard species start meiosis with four sets of chromosomes, instead of the two sets used for sexual reproduction (*Nature* published online 21 February 2010; doi:10.1038/nature08818). As a result, mothers pass on their own two sets of chromosomes to offspring, thus maintaining genetic diversity.

Peter Baumann of the Stowers Institute for Medical Research (Kansas City, MO) and colleagues used photon microscopy to determine the amount of DNA present in the oocytes of asexual and sexual species of whiptail lizards. They found that the oocytes of the asexual species contained twice the amount of DNA as did those of the sexual species. Further analysis showed that the asexual lizards pair genetically identical sister chromosomes (instead of homologous chromosomes), preventing loss of genetic material during recombination.

Superior color vision

The light receptors in chickens' retinas are arranged in highly regular mosaics, according to a recently published study. This level of organization, which exceeds that found in the retinas of most mammals, helps chickens maximize their ability to see colors.

A team led by Joseph Corbo of the Washington University School of Medicine in St. Louis examined the distribution of cones, photoreceptors that are most sensitive in bright light, in 28 chicken retinas (*PLoS One* **5**, e8992; 2010). Chicken retinas contain five types of cones: double cones, which help detect motion, and green, red, blue and violet single cones, which help visualize color. When Corbo and his colleagues looked at a retina sample, the cones did not appear to be organized in any particular order. However, when they considered each of the five cone types separately, they found the distribution of each type of cone to be highly regular. Further analysis suggested that all five types of cones share a common mechanism for determining the magnitude of spacing between neighboring cone cells.

Corbo thinks a better understanding of the organization of light receptors in the bird might help researchers develop treatments for the genetic disorders that cause blindness in humans.