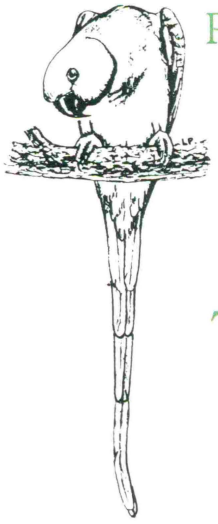

PSITTACULA SIGHTINGS

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What Color is That Green Bird?

Photo courtesy Lyrae Perry

From L. to R. – Graygreen, wild type normal green, Dark Factor Green.

I can't tell you how many times I have been asked "What does a graygreen look like?" or "Can you describe the color of the dark factor green?" I understand the question, but a clear and concise answer is not possible without a common reference point.

As an artist, I tend to think of color in terms of pigments – the actual paints I use everyday. However most people are not intimately familiar with the various pigments, and so I have had to be creative in choosing other examples in order to explain the various shades of green. Even those seem less than adequate to a person who is trying desperately to "connect" with my comparisons and envision the colors of the mutations.

For many years I wished for the opportunity to take comparison photographs of the various shades in all the mutations. Last August that wish came true. I had the pleasure of visiting Charles Collins in Baytown, Texas. I specifically set out to take comparison photos of nearly every color mutation of the Ring-necked Parakeets on his place and I came home with an exciting group of pictures.

The photo accompanying this column shows three green birds — three different shades of green. Using the wild type green Ring-necked Parakeet as our common reference (center bird), we can easily see the differences.

How is visual green produced? The visual color of green in most birds is not a simple, singular green pigment. Nor is it a mixture of yellow and blue pigments like you would find in a paint box. Instead, green is produced by a combination of the three elements listed below:

1. Melanins – black and/or brown pigment particles in the feathers
2. Carotenoids – yellow pigments in the feathers
3. Structural colors – microscopic bodies on the feathers that act like little prisms to scatter the light and reflect blue color back to our eyes.

The technical term for this scattering of light is Tyndall scattering. The microscopic structures on the feathers are called polygonal cells.

The microscopic prism-like bodies on the feathers – the polygonal cells, are colorless themselves, but require a dark background in order to reflect the blue. If the feathers have no other color in them except for the melanin pigments, then the bird will look blue. If however, the feathers have any yellow pigment in them, then the bird will look green.

How are the three different shades of green possible? Since all three birds are green, we know that they have both black (melanin) and yellow (carotenoid) pigments in the feathers. The variety of shades is due to a mutation gene that controls the shape of the microscopic prism-like bodies – the polygonal cells. If they are a squished or flattened in any direction to change the shape, the light passing through those cells will be a different color, or it may not reflect any at all.

In this case, since the polygonal

cells reflect different shades of blue light, we see a different shade of green on each of the three birds. If you were to take different shades of blue cellophane and hold them up to the light together with a yellow piece of cellophane, you would see different shades of green in much the same way.

Graygreen

The graygreen bird has almost no blue on it at all. This particular mutation color appears to have only black melanin and yellow pigment in the feathers. The polygonal cells are either not present on the feathers, or they are simply the wrong shape to reflect any significant amount of blue light. This is further shown to be true when a graygreen split blue (graygreen/blue) bird is crossed with a blue to produce a gray mutation.

Gray

The gray mutation is visually graygreen *and* a blue. The polygonal cells in the graygreen mutation don't reflect the blue light, so all that is left is the black melanin showing through the whitish keratin of the feathers, producing a visual gray. The gray is referred to as a "blue series bird" even though it is not visually blue, because it does not have any yellow pigments in the feathers.

Dark Factor Green

The dark factor green bird unfortunately does not photograph with complete accuracy. It looks a little like the graygreen, but that is again due to the polygonal cells. They are not the same shape as the polygonal cells on the feathers of the wild type green bird, and reflect a different shade of blue. The dark factor green bird is a deep emerald green and the polygonal cells are somewhat like those found on hummingbirds. You must view the bird with the light at just the right angle in order to see the true reflected color. Otherwise the body appears to be somewhat like the graygreen, especially in photographs.

Central Tail Feather Key

The central tail feathers of Ring-necked Parakeets are not only important indicators of a mutation, they are a key to proper identification. The dark factor green birds have brilliant cobalt blue central tail feathers, unique to this color mutation. The wild type green has a beautiful iridescent turquoise blue on the central tail feathers. Unfortunately the central tail feathers of the wild type green bird pictured are a bit broomed, but there is still enough for comparison. The central tail feathers of the graygreen Ring-necked Parakeet are dark grayish green.

Genetically these three greens are dominant in their inheritance mode. There is some question about the dark factor green however. It may fall in a special category of dominance called "incomplete dominance." Long term tracking and review of offspring and breeding records will provide the answer to that question some day.

In the meantime, keep your eyes open for any unusual greens. You never know, but you may be looking at a new mutation that when paired with a blue may show us a new shade.