

Sprig Tales Newsletter

The Secret of Feathers



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New Species Discovered in California

Once known as the Light-footed Clapper Rail, new DNA discoveries have shown that the bird is a species of its own, now known as the Ridgway's Rail. The DNA differences were discovered in late 2014 when scientists compared DNA from the Eastern Clapper rails and what is now known as the Ridgway's Rail. Sadly, the newly-found species is endangered due to major habitat loss.



Rinus Baak/USFWS

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Check it Out!

The Explorit Science Center in Davis, CA just launched their "Feathers of Our World" year long exhibit and workshop. You can learn everything about feathers: feather culture, art, science, technology and more, through a visit to the center or at one of their corresponding feather themed events, programs, classes, lectures or activities going on throughout the year. For more information, visit www.explorit.org



Feather Baskets

Many central California Native American tribes are famous for their expert basket making skills. Basket weavers collected hundreds of bird feathers to make feathered baskets for special occasions or gifts. They weaved the feathers of many bird species into complex and beautiful patterns. Meadowlark, mallard, American robin and California quail feathers were used for the yellow, black, red and green designs, respectively featured on the baskets below. A single basket can take weeks to complete! Can you spot the quail topknots weaved into the rims of each basket?



Joe Mabel



Bin im Garten

Why Birds' Feathers Shine



Jon Sullivan via PD Photo.org, / CC0-BY

What do hummingbirds, wood ducks and peacocks all have in common?

Shiny feathers! Many bird species have special feathers on their face and wings that shine like diamonds when the sun hits them just right. But how? Birds get their feather colors in two ways: pigment or air bubbles in the feathers. Pigment is the material in special cells of living things that absorbs light and causes color. Animals or plants of the same species can have different kinds pigment that make different colors. This explains why roses can end

up white or red colored, or why Labrador retrievers can be black or yellow.

Besides pigment, birds have another trick up their sleeve. If you look at the feathers under a microscope, you will see that they are not completely solid. The feather's pigment cells have tiny air bubbles in them like a honeycomb. These bubbles reflect light that is usually absorbed by the pigment, causing the light to shine back out from the feathers as a different color—this is what makes those special feathers look shiny or glossy. Shininess that is

caused by air bubbles instead of pigment is called **iridescence** (eer-eh-DESS-ints). The word iridescence comes from the Greek word for rainbow, *iris*. It is also the same word for the colorful part of your eye. Iridescent feathers appear to be different colors depending on the light. In the shade, iridescent feathers may appear brown or black, but in the light, they often take on brilliant shades of green, blue or purple.



Air bubbles in pigment (right – A= air) of the Black Inca hummingbird (left). Credit: Shawkey et al., 2009

Showing off and taking off

In nature, it is often the males who have iridescent feathers. They use their feathers in colorful displays that help them find a mate. It has been shown that the brighter the colors on a male, the healthier he looks and the more likely he is to find a mate.

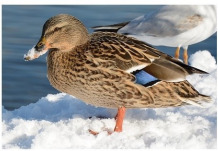
Some duck species, like the Northern Shoveler on the right, use bright patches on the speculum of the wing to startle predators as they fly away. The flashes of color also signal to other birds that it is time to split!



Dan Pancamo / CC BY-SA 2.0

Males with the brightest feathers are beautiful to both people and the female ducks of each species.

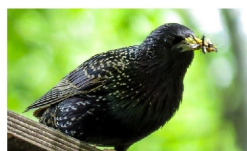
Match the iridescent feathers to the right bird species!



Mallard



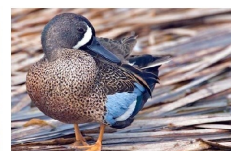
Wood Duck



European
Starling_____



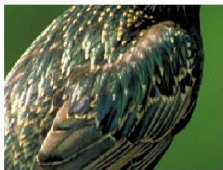
Yellow-billed
Magpie_____



Blue-winged
Teal_____



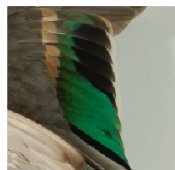
Green-winged
Teal_____



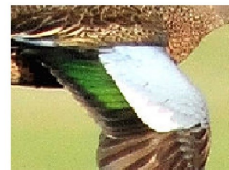
A



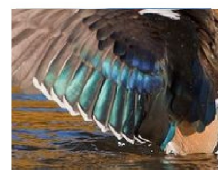
B



C



D



E



F

Answers on the last page

Are mallards really green?

Actually, no! Mallards get their green color through iridescence. Actually, most “green” birds are not really green at all. If you look at their feathers under a microscope, you will see that they have brown pigment! It is only because of the way that light reflects off of their feathers that we see them as green.

Feather Game photo credits (clockwise): Manfred Antranas Zimmer, JamesDeMers, Gerhard Gelliner, Bill Bouton / BY-SA 2.0, Alan D. Wilson via Nature'sPicsOnline/ CC BY-SA 3.0, Alan D. Wilson via Nature'sPicsOnline / BY-SA 2.5, Anna Ventura , PublicDomain-Images, Robert Olson / CC BY-NC-SA 2.0, Tom Koerner/USFWS, Marie Read / naturepl.com, Aaron Maizlish / CC BY-NC 2.0
Photo on opposite page by Jörg Groß / CC BY-SA 3.0



True Colors



What You'll Need

- ◇ Shredded flower petals (red- or purple-colored petals will work best)
- ◇ 1 mason jar
- ◇ Rubbing alcohol
- ◇ Plastic wrap
- ◇ 1 shallow bowl
- ◇ 1 coffee filter or absorbent paper towel (cut into 2-inch strips)

What color was your paper strip? The rubbing alcohol breaks down the petals (like sugar in water), causing pigment to bleed into the alcohol, then separated along the paper strip. Scientists use the same process, called Chromatography, with different chemicals to separate feather pigments and figure what a bird's true colors are.

Step 1. Place the shredded petals into the mason jar.

Step 2. Pour rubbing alcohol into the mason jar so that it just covers the petals.

Step 3. Wrap top of jar with plastic wrap.

Step 4. Fill the bowl with warm water and place the mason jar in the bowl. Wait (about 10 minutes) until the rubbing alcohol changes color inside the jar.

Step 5. Remove the plastic wrap and place one of the paper strips into the jar so that part of the strip is under alcohol.

Step 6. Watch as the alcohol is absorbed by the paper. Is the color of the paper the same as that of the petals?

Answers: Mallard = B, Wood Duck = E, European Starling = A, Yellow-billed Magpie = F, Blue-winged Teal = D, Green-winged Teal = C

For more information on our education programs or to get involved, contact Sabreena Britt, Education Coordinator at (916) 648-1406 Ext. 102 or sbritt@calwaterfowl.org

For more information and our calendar of events go to www.calwaterfowl.org