DARWIN DAY
2024
Art Contest
Digital Booklet
Wisconsin Evolution
J. F. Crow Institute for the Study of Evolution
Design: Ebony D. Taylor
Message From the Organizers

Capturing the Essence of Change: From One to Many, that’s why this year’s Darwin Day theme was "Variations." Participants depicted how a single concept, object, or element evolves into various forms, highlighting the beauty and diversity of variation in our world. We accepted a total of 16 submissions from Madison residents, undergraduates, graduate students, and university staff. Submissions were graded by a panel of anonymous judges based on artistic and scientific merit of the piece, as well as adherence to the contest prompt. The contest culminated in an art exhibition at UW-Madison on February 16th, 2024. We hope you will enjoy exploring the wonderful art that we had the privilege of featuring in our event.

- Darwin Day Organizing Team

About the Organizers

Ebony D. Taylor is a Masters student in the UW-Madison Entomology Department. She believes combing art and science leads to something spectacular; it did.

Dahn-young Dong is a PhD student in the UW-Madison Integrative Biology program.

Jassim Al-Oboudi is a PhD student in the UW-Madison Microbiology Doctoral Training Program

Myron Child is a PhD student in the UW-Madison Genetics program

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Disclaimer

All viewpoints presented here are the artists’ own
Each piece represents an animal or insect that undergoes a complete transformation from the infant to the adult. Very few beings go through a process such as this, which I think is fascinating. The ability to change one's body so extremely to be able to survive and adapt in a habitat that is completely different from the one at birth is an amazing aspect of the natural world. It shows how evolution, resilience, and adaptability are key to a being's survival. The animals I chose to highlight in this topic are the frog, the starfish, the dragonfly, and the butterfly, which are all separate works but also can be displayed as one cohesive work.
This Caenorhabditis elegans-based kaleidoscope captures a small but mighty contributor to our understanding of organismal biology, helping researchers to make sense of the genetic variation we observe in nature. While C. elegans is already beautiful in shape and form, here we have brought this organism alive in COLOR by introducing genetic variation through the expression of different fluorescent proteins in separate parts of the worm body. We can use these new colorful cells to illuminate how muscle (blue/red), neuron (green), intestinal (yellow), etc. cells respond to different drug treatments so we can better understand drug resistance and develop new disease treatment alternatives. We’ll keep working on the worm genetics, and in the meantime, please enjoy this multicolored worm kaleidoscope as a tribute to C. elegans for all the light it has helped shed on genetic variation!
One of the first concepts of evolution I learned was homology and homologous structures. This piece is inspired by homology by exploring a subsection of structural variation in animal skeletons. Within this piece are skeletons of a bird, bat, turtle, dolphin, and bony fish.
I wanted to capture the concept of Variation through my interpretation of the white and black Butterfly example used in all my biology courses to demonstrate natural selection. This was where white butterflies used to be dominant in a white tree forest and would blend into the white bark of the trees, however with the growing presence of pollution and industrialization, smog turned the trees darker. As a result, darker butterflies would survive better in their environment on the dark trees. In my piece, I wanted to show how the butterflies have had adapted to blend into the buildings and surroundings to avoid being eaten by birds. The butterflies that blend into the leaves and foliage were meant to represent the butterflies before human involvement. The butterflies in the smog cloud were supposed to represent the butterflies that had natural characteristics that allowed them to survive in that environment. The butterflies on the buildings were supposed to represent the shifting characteristics and blending of the past and present that allows for new variances in the species in result to human and industrial involvement.
My piece is a woodburning on a basswood plank, inspired by John Gould's illustrations of Darwin's finches, which Darwin collected on his voyage in the H. M. S. Beagle from the Galapagos. These illustrations show the variation of beaks across several closely related birds and suggests how their various forms related to their unique functions.
As beautiful as they look, the wings of the butterfly, one of nature’s greatest artworks, are an example of striking variation in nature. The variability in butterfly wings is a testament to the intricate dance between genetics and environmental influences. This diversity in coloration, patterns, and structure serves multiple purposes, from ensuring survival from their predators to facilitating successful reproduction. What's truly astonishing is that the intricate patterns and colors adorning butterfly wings are orchestrated by just two signals. Picture a butterfly wing as a canvas, with one signal delicately sketching details and outlines like a pencil (designing patterns and structure), while the other wields a paintbrush, infusing it with a kaleidoscope of colors. The collage of images featuring butterflies that I captured in their natural habitat accurately portrays the diverse range of variations among these enchanting creatures.
For my submission, I decided to make a 2D piece combining textiles and pens. "Beetle Bodies" showcases the diversity in beetle anatomy, a remarkable group of insects that display great biodiversity and evolutionary traits.
My art is showing the difference between flying birds, like hummingbirds and birds that do not fly, like penguins. When birds first settled in certain habitats where there was no predator threat they did not have to use their wings to fly away. Therefore, their wings became smaller and smaller and, over time changed function. For example, penguins adapted their wings to be able to swim in the oceans. Hummingbirds can hover at very fast speeds to drink plant nectar which is an evolutionary advantage over other birds. Humans came and hunted many flightless birds for food and game, and many have become extinct!
Tadpoles undergo vast transformation during their development, from the egg form to free-swimming tadpoles. During this rapid transformation, tadpoles are especially sensitive to environmental cues which can alter their developmental trajectories. For example, tadpoles will undergo faster development in response to pond drying conditions in order to avoid desiccation. While some tadpoles develop over the course of the spring and summer from egg to tadpole to frog, green frogs have a longer developmental period. In this painting, I depicted the developmental process that green frogs undergo, starting as eggs in late summer. Green frogs typically develop throughout the winter and metamorphose into adult frogs during the following spring or summer. Early environmental conditions can significantly alter how and when green frogs undergo development, creating variation in metamorphosis between populations of green frogs across different habitats.
Yeast are some of the most amazing organisms on this planet. They grow and contribute to biodiversity in all kinds of environments. From our day-to-day bread and beer to the most extreme places, from the Arctic to the Amazon jungle. In this picture, a small selection of 15 different yeast can be seen, each of them beautiful in a different way.
This submission showcases the amazing variation in the aposematic signal of the Dyeing poison frog, *Dendrobates tinctorius*. Aposematism, a term referring to a bright warning signal in an animal, is an evolutionary trait that diverse animals have evolved to communicate their toxicity to predators. In the Dyeing poison frog, we can see the vibrant yellow signal that is characteristic of the species, but has an impressive amount of individual-level variation. Naturally occurring throughout the Eastern Guyanese Shield, diverse populations of these beautiful frogs can be distinguished by their size, color, and pattern diversity. Throughout my doctorate I studied a population from a hypothesized hybridization-zone where we see differences in arm/leg color and dorsal patterning across both sexes. Pictured here is a small subset of poison frogs I’ve caught across multiple field seasons at Les Nouragues Field Station in French Guiana.
Fungal imagery appeals to me because of the associations with decay, growth and rebirth from decay or detritus, variation of form between the seen and unseen, contrast between the destructive and constructive powers of different fungi, and the historical mythos surrounding mushrooms. As a fungal biologist, these themes also intertwine with my research and my exploration of fungi at a microscopic, mechanistic scale, and I feel that fungi are fantastic examples of the "endless forms most beautiful and most wonderful" that evolution has brought about: they can cause rapid, painful death, alter neural networks to create powerful hallucinogenic experiences, nourish us, decay and absorb waste, and provide artistic and narrative inspiration (as they have with this piece). Each face of this piece displays a different figure sprouting a different cap, shifting and changing as you travel around the jar, while maintaining the same basic form.
Sometimes beauty lies within what you cannot see…. however, you may be able to appreciate it if you look close enough (or zoom in enough under the microscope). Cyanobacteria are the photosynthetic bacteria responsible for the Great Oxidation Event on Earth which had a huge impact on the evolution and variation of all living organisms. They are the first aerobic (with oxygen) life that evolved at least 2 billion years ago, replacing the predominating anaerobic (without oxygen) life. Cyanobacteria have since become the most diverse phylum of Prokaryotes (bacteria) inhabiting many diverse environmental niches such as terrestrial, freshwater, and marine. This art piece represents the variation among 3 different genera (types) of Cyanobacteria from our very own Lake Mendota in Madison, WI. This is a quick peak under the microscope of the morphological variation in the nearly 150 genera encoding around 2,000 different species of Cyanobacteria. Seen represented here are Gloeotrichia, Aphanizomenon, and Dolichospernum.
I visualize the differences in land cover characteristics, such as impervious (buildings, roads, and artificial structures), woody dominated vegetation (trees and shrubland), and non-woody vegetation (grassland and cropland), which I captured from satellite data. In the picture, I summarized this information as RGB image: in red, I display the gradient from 0-100% in for impervious, 0-100% green for woody vegetation, and 0-100% blue for non-woody vegetation; and leaving black for bare soil, snow, and water surfaces, because these do not contain vegetation or impervious. The illustration shows the variation of man and environment and how they coexist together and yet are very different and variable in the landscape and therefore shape the landscape differently.
In "Harmony of Variation," I employed both graphite and colored pencil to celebrate the diverse beauty inherent in nature. I've chosen to highlight select orchid genera—such as Phalaenopsis, Cattleya, Cymbidium, Cypripedium and Angraecum sesquipedale (Darwin orchid)—to showcase their remarkable diversity. My focus has been on capturing the intricate details of their floral morphology, which display significant variation across genera. The diverse shapes and colors of their labellum, column, petal, and sepal serve as intricate strategies for attracting specific pollinators, highlighting the coevolutionary relationship between orchids and their pollinators. This rich variation within the orchid family serves as a testament to the ongoing interplay between creation and adaptation in the natural world. In parallel to my exploration of the orchid family, I introduced a contrasting yet complementary element to the composition—a human hand holding an amplifier. It serves as a homage to the spirit of exploration and curiosity embodied by Charles Darwin. Much like Darwin's insatiable curiosity that propelled him to unravel the mysteries of natural selection, the hand symbolizes our innate desire to explore the world around us. Just as orchids display their varied forms to attract specific pollinators, the hand with the amplifier becomes a symbol of our species' adaptability and creativity, driven by an ever-curious mind.
Pollinators are incredibly important to maintaining plant diversity around the world, and bumble bees such as the one painted in this piece are instrumental to bringing our prairies and gardens to life. There is a huge biodiversity of bees; over 400 species of bee in Wisconsin, from tiny sweatbees to this large, fuzzy, familiar garden visitor. I was inspired to do this painting after learning that bumble bees may soon be listed as endangered.
This Concludes the 2\textsuperscript{nd} Annual Wisconsin Evolution Darwin Day Art Competition...

see you for the 3\textsuperscript{rd}!