Monarchs use their straw-like tongue (proboscis) for sipping nectar and water

Brunswick Wildlife
Monarch Migration: Catch you on the flip flop!

North America's most famous butterfly, the Monarch, recently began the flip side of its migration miracle. The east-of-the-Rockies population, after overwintering in Mexico, is moving north.

Remember back to one of those sunny October mornings along our barrier islands when hundreds of brilliantly colored jewels flapped across the dunes and into the cerulean sky. Butterflies including Cloudless Sulphurs, Common Buckeyes, and Gulf Fritillaries seem to provide an escort for the "rock star" Monarch.

As truckers would say (and probably still do) in the salad days of CB radio…"catch you on the flip lop"…meaning they would talk again when passing on the return trip. Our spring Monarchs will, however, not be on the flip flop. They will be offspring of those that migrated south last fall.

The Monarch, a member of the milkweed subfamily of Brushfoots, ranges across the country and into Southern Canada. There are two major populations, divided by the Rocky Mountains. There are also two non-migratory populations in south Florida and south Texas that breed all year.

Monarch larvae feed on milkweeds and adults feed on the nectar of milkweeds and other flowering plants. About one hundred species of milkweed grow in North America and approximately twenty-five are preferred Monarch hosts.

Chemicals from milkweeds make Monarch caterpillars and adults very distasteful or poisonous to predators, including causing diarrhea and vomiting. Remarkably, birds learn after one try not to eat Monarchs!

While Monarchs west of the Rockies migrate to coastal California to overwinter, millions from the eastern side migrate, via flyways that merge over Central Texas, to the Sierra Madre Mountains to thirteen small patches of pines and oyamel firs spread over five mountains. California has approximately forty overwintering colonies, including well-known sites at Muir Beach, Santa Cruz, and Pacific Cove. This story, however, is about our eastern population.

Scientists thought the eastern population migrated but the Monarch's winter grounds were a longtime mystery. In 1937, Toronto zoologists Fred and Nora Urquhart began attaching tiny adhesive tags (that do not harm the insect) to the hindwing of Monarchs. After mapping recapture sites for years, the Urquharts were able to trace Monarch flyways and, in January 1975, an associate discovered millions at one of the winter sites.

Since then scientists believed that the two geographically distinct Monarch populations did not mix during migration. Recently, six Monarchs tagged in southern Arizona seem to have disproved this theory according to the Southwest Monarch Study. Three of the Monarchs were recovered in California while the other three were found in winter colonies in Mexico. So the mystery continues to unfold.

Monarchs use air currents and thermals to travel up to 100 miles a day to cover what for some individuals may be a 3,000 mile trip…a journey that takes approximately two months.

The miracle? No individual makes the round trip so southbound migrants reach their winter home…a small area…at a place they have never been.

Those migrating do not reproduce and they spend the winter as adults in "reproductive diapause". They are not capable of reproduction until the following spring and will then breed as they start north.

Diapause is a dormant state, with specific trigger and release conditions, which allows an insect to survive unfavorable conditions such as extreme temperatures, drought, and/or reduced food availability. By species, butterflies diapause in a life cycle stage…as egg, larva, pupa, or adult like the Monarch.

Evolution selected where the eastern population would spend the winter. The advantage went to those that landed in cold storage for the time when no food was available while those that stayed in a warmer environment with little food would have exhausted their energy supplies much earlier and perished.

Monarch's winter grounds are between 9,500 and 11,000 feet in altitude. Their preferred sites are cool and have high relative humidity and little wind. At one colony for example, the temperature usually ranges from 42 degrees F to 59 degrees F and Monarchs there spend most of the winter in torpor.

Their winter environment, therefore, allows them to maintain a low body temperature and an energy balance while at rest for three months will virtually no food. On average, a butterfly's fat reserves are such that they should last about 90 days at 59 degrees F.

During occasional cold spells, with ice and snow storms, many butterflies die; however, since they are stacked in layers on top of each other on thickly coated trees, enough heat is conserved to save most of the butterflies.

Evolution sets diapause for predictable environmental conditions. In February, as the days lengthen, Monarchs will become reproductively active. A length of day (called the photoperiod) of 11.3 hours is the trigger chosen by evolution. Once this photoperiod is reached, warming temperatures will trigger a mating responsive throughout each colony and they are off.

Monarchs then move north and east, stopping to breed where they find newly emerging milkweed plants. They respond to the scent of milkweed, a cue for laying their eggs on plants that will become larval food supplies.

In turn, their young disperse farther north, breeding as they go. Four generations follow, as generation after generation pushes northward, so that by summer's end they have repopulated their entire range.

The first generation is the offspring of wintering Monarchs and they reach north to Texas and the Gulf States. The second generation pushes to the northern United States, the third generation into Canada, and the last brood of summer, the fourth generation, becomes the new "truckers" that will head south to Mexico this fall.

Interested in learning more? A website covering the Monarch's life cycle, protection, and migration may be found at: http://www.fs.fed.us/monarchbutterfly.

Also, their northern migration is tracked by Journey North, an Annenberg Media website, the premiere "citizen science" project for kids. Anyone, however, may track the migration of the Monarch and report sightings by visiting this website: http://www.learner.org/jnorth.

As of March 28, sightings of adults had been reported on Journey North across Texas north to Oklahoma, Arkansas, and Mississippi. First eggs have been found in several Texas locations plus in Mississippi, Arizona, and Florida. They are on the way!

John Ennis

Cardiac glycosides from milkweeds accumulate in caterpillars and adult Monarchs, making them distasteful or poisonous to predators. In birds, these chemicals cause diarrhea and vomiting. Remarkably, birds learn after one try not to eat Monarchs!

The last larval instar eventually "pupates". After splitting its exoskeleton, it attaches itself to the underside of as leaf by a cremaster and silk pad, forming the chrysalis from which the adult will emerge