

# Crested Auklet Perfume

The bird in my fingers squirms, trying to escape the cage my hands form around its body. When I look up I see part of a huge seabird colony, perched in the steep slope of an ancient glacial cirque. Blue sky and ocean form the background for black rocks on which hundreds of little black birds with orange bills perform their social dance. Still holding the bird for banding, I suddenly feel something crawl across my forehead. A tick.

Ticks are the unwelcome inhabitants of the colony. Whether they outnumber the Crested Auklets or not, I cannot tell. The seabird, though, in contrast to me, is equipped with a weapon against the ectoparasite: a citric odor. This perfume, unique to the Crested Auklet, was the reason why Hector Douglas, a doctoral student at the University of Alaska at Fairbanks, and two field assistants journeyed to Big Koniuji Island, a weather-beaten, remote Alaskan island located in the Shumigans off the Aleutian chain. There he hoped to find further proof that the perfume was not only an ectoparasite repellent, but also a courtship pheromone and signal of mate quality. If so, the auklet would be one of the first birds known to produce a pheromone-like odor for mate attraction.

Big Koniuji Island, part of the Aleutian Islands National Wildlife Refuge, is one of many islands in Alaska where the Crested Auklet nests in the summer. The rocky slopes of the island with crevices in between big boulders make the location a perfect place for this oceanic bird

to raise its young. The female lays only one egg in a crevice. There the chick hatches in a little more than a month and grows up on a diet of plankton that the parents deliver by storing it in pouches under their tongues. Once the little ones fledge after about four weeks, the adults leave the land for

the open ocean, where they spend the winter. The Crested Auklets had probably already reached Big Koniuji Island for the breeding season in May 2002 when Douglas, Aidan MacCormick (a Scottish ornithologist), and I were still several



Adult Crested Auklet. St. Paul Island, Alaska; July 2003. © E. J. Peiker.

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hundred miles away from the study site. The equipment needed for Douglas's research was squeezed into a fancy new trailer and included everything from a steel frying pan to a fragile vitreous apparatus needed to analyze the birds' odors. The trailer had to make its way from Fair-

banks out to the tiny, remote island in the Aleutians, by car, ferry, and fishing boat, along with an inflatable boat, a generator, fuel, a freezer, and several propane tanks.

Several obstacles along the way made the journey to Big Koniuji an adventure by itself. A broken bumper and tow coupling almost ended the field trip before the excursion even reached Homer, a town on Kachemak Bay on the southwestern side of the Kenai Peninsula with ferry service to the islands of the Aleutian chain. A storm on the way out from Popof Island to Big Koniuji by fishing boat not only made us nauseous but also made it difficult to get the equipment and ourselves on the island's shore. John Galvin, the fisherman who took us out with his little fishing boat, could not stop teasing us as he dropped us off with our equipment in the rain and fog in the middle of nowhere. "So this is home for three months!" he laughed. Then he waved, turned his boat, and motored off into the fog.

On shore, we soon realized that our "new home" would be more challenging to live in and work on than expected. The narrow beach was framed by the Big Koniuji Bay on the northern side and by a steep curved mountain cirque of boulders and rocks on the southern side, forming the narrow island into a shape like a banana. The first hike up to the colony gave us an idea of the struggles lying ahead. The rocks where we would be working with the birds were slippery from moss and moisture, and they were 800 feet above sea level—a steep, strenuous hike away from our campsite near the shore.

If they were not in their crevices or out on the water feeding, the Crested Auklets were sitting on the mossy landing rocks, performing social and mating dances. These black, nine-inch-tall creatures wear a special outfit during breeding season. Both males and females have a white plume



"So this is home for three months!" Big Koniuji Island, Alaska; May 2002. © Anke Hirth.



trailing from behind their white eyes to the back of their head, and a bright orange bill. In addition, a crest of feathers graces their heads and curls forward, giving them a cheeky appearance. The black-webbed feet are set far back on the body, making the bird a perfect swimmer and diver. On land, however, these auklets are clumsy—tumbling and rolling about the large boulders, perfuming the whole colony with their citrus-like odor.

The greatest challenge would be to catch the birds. Different from other colonies where the crevices were accessible, the nests on Big Koniuji rested beneath large boulders, so that Douglas was not able to reach down to the nests to catch the birds.

Since the auklets nested out of reach of our hands, we

set up mist nets and noose carpets on the colony. This way, we could catch the birds on their return to the crevices from their daily morning feeding at sea. The noose carpets are fishing nets, tapped with loops of fishing line that tighten around a bird's foot as soon as it steps into it. The mist nets consist of fine webbing, which is invisible to the birds and entangles them when they fly into it. To our surprise,



Visitors to Crested Auklet nesting colonies are sure to discern a distinctive citric aroma, which may play a role in everything from ectoparasite protection to mate selection. *Big Koniujji Island, Alaska; May 2002. © Anke Hirth.*

some birds shot right through the mist nets, leaving them behind, torn and ripped. So every morning we crawled around the slimy rocks of the colony, to set up the noose carpets—and covering ourselves with ticks while the birds were out on the water feeding.

Tick collection became our hobby while we were waiting for the birds to return from the bay. Eventually, Douglas would need them for a parasite experiment to test the bird-perfume's repellent effect on ticks. So we collected into vials as many of the unpleasant creatures as we could find on or in our clothes. Every once in a while one of us would strip clothes like layers of an onion to stop the familiar, but loathsome, tickling of a tick on bare skin. Once, during this activity, Aidan found the pocket of his pants filled with crawling ticks. The top of the vial—filled with a three-day collection of ticks—had fallen off.

The birds that we caught in the noose carpets after those dreadful morning waits were subjected to an array of procedures. After we had taken blood from, measured, weighed, and banded a bird, we set it in the “volatile chamber”, the most important and fragile apparatus in the study. The auklet was placed in the darkened chamber and simply had to wait for thirty minutes for a vacuum machine to pull

an air stream through the chamber into the volatile trap. This trap, a slender two-inch-long tube filled with polymers, fixed the chemical components of the auk-odor and allowed Douglas to measure the chemical aldehyde production of individual birds which, according to his hypothesis, should differ from bird to bird in chemical potency.

From previous studies on the auklet, Douglas already knew about the aldehydes present in the bird's odor. He brought some of the chemicals with him to the island to imitate the perfume of the Crested Auklet for a repellency trial. For the test, he set up a heated drum on a rotating record player simulating an artificial host. As attachment sites for the ticks, he placed filter papers (with small amounts of aldehydes dissolved in ethanol) on top of the drum. Then he set one tick at a time on a metal rod that was placed perpendicular to the filter paper. All of the aldehydes turned out to be repellent, as the ticks either did not attach to the filter paper or fell off the drum after a few

seconds. “Oops, I just lost another one,” Douglas kept saying as the experiment proceeded and the ticks kept disappearing somewhere around the setup, leaving us worrying which of us they might select as their next host.

In the evenings I usually disappeared to the beach for a cold bath in the ocean to wash off the unwelcome guests on my skin. The ticks, which do not appear in the interior of Alaska, are quite able to survive in the milder climates associated with islands such as St. Lawrence and the Pribilofs, where the auklets nest in the summer. The unpleasant arachnid hatches from an egg following a dormant state and lives as a nymph until obtaining its first blood meal from a bird. It develops into an adult, doubles or triples in size, and seeks another blood meal, this one for egg production. Whether the blood comes from birds or humans, unfortunately, does not seem to matter to the parasite.

Not only does the auklet perfume successfully repel the unwelcome parasites, but it also seems to play an important role in mate selection. During breeding season, young birds as well as older adults participate in social and mating ritual behaviors that take place on the rocks and boulders of the colony. When two partners meet, they bury their bills in each other's neck feathers. During this “ruff-sniff” behavior

(described by Dr. Ian Jones), according to Douglas's theory, they smell the mate's odor and evaluate the mate on the basis of chemical potency. A potential partner might be more attractive if it produces more aldehydes, since the chemical-cocktail repels ectoparasites. Parasite-resistant mates are less likely to transmit parasites to mates and offspring and therefore signal fitness benefits.

Following chemical analysis, the collected samples reveal—as the odor conserved in the polymer tube of the volatile chamber—the chemical potency of individual birds. The different amounts of aldehydes secreted by individuals might correlate with measurements of mate quality, such as the size of the bird and its ornamental plumes. In that case, Douglas would be one step closer to proving the theory that the perfume plays a role in mate selection.



*After Douglas clips off some feathers I let go of the bird I held in the cage of my fingers. Loudly complaining, the bird disappears between some rocks. Suddenly, his crested head pops up again in front of us, surveying us with his white eyes before he takes off to the open water. Hands finally free, I reach to my forehead and snip off the tick. I am not sure who feels more relieved: the bird to be freed by me or me to be freed from the tick.*

Crested Auklet pair. St. Paul Island, Alaska; July 1998. © Rick & Nora Bowers.

