

Smologies #6: WOLVES with Dr. Bridgett vonHoldt

Ologies Podcast

November 21, 2021

Oh hi, it's the French fry that fell under the driver's side seat and you can't decide if you want to eat it or not – Maybe? Ah, I don't know – Alie Ward, back with another episode of *Smologies*; small *Ologies*, get it? This is our sixth *Smologies* episode, and if you're looking for any of the previous *Smologies*, you'll find them in this feed or at AlieWard.com/Smologies. But what is a Smology? That's a great question. *Smologies* are quicker, kid and work and in-law and classroom-friendly edits of our full *Ologies* episodes and they clock in around 20 minutes. So all of the good stuff but with less of a commitment. It's perfect for those of you that are returning to the office and have a short commute. Maybe you're on a holiday road trip and you need something to keep the whole family occupied.

Speaking of holidays, November 23rd, this Tuesday, is Wolfenoot. What? You haven't heard of Wolfenoot? Really? Then you haven't listened to the longer, full version of *Lupinology*, so I'll summarize. It's a holiday started by a seven-year-old to celebrate canines and kindness. It's when the spirit of the wolf brings and hides small gifts around the house for everyone. And people who have had, or have, or are kind to dogs get better gifts than everyone else. You eat roasted meat or vegetables, and a cake decorated like a full moon. So, in 2019 I had a Wolfenoot party, and I hid gift-wrapped socks around the house. It was lit. It was the best. 10/10. [*howls*]

Today's episode is on *Lupinology*, the study of wolves. The word comes from the Latin *lupus*, meaning wolf. But if you ask a *Lupinologist* what their job title is, they will probably refer to themselves as a wolf biologist. But let's be honest, *Lupinologist* sounds way, way cooler; much more regal. Today's *Lupinologist* is an associate professor of evolutionary genomics and epigenetics at Princeton University, where she runs the vonHolt Lab of Ecology and Evolutionary Biology. She got her bachelor's degree in psychology from Eckerd University, her master's from NYU in biology, and got her PhD, making her a doctor, from the University of California Los Angeles in Ecology and Evolutionary Biology.

She guided us through the incredible world of wolves, including what makes a wolf a wolf, wolfie DNA, is there a connection between wolves and howling at the moon? The realities of pack dynamics, how they hunt, the idea of a lone wolf, and how dogs, coyotes, jackals, hyenas, and wolves are all related. So circle November 23rd, dream up a full moon cake, and prepare to celebrate Wolfenoot as we duck into the wolf's den and welcome wolf biologist and *Lupinologist*, Dr. Bridgett vonHoldt. And yes, that was my dog shaking her collar in this episode. She loves this episode!

Alie: What is a wolf? What's the difference between a wolf, and a coyote, and a big fox, and a domestic dog, genetically speaking?

Bridgett: Oh, okay. Genetically speaking. So, all of these animals are carnivores, Carnivora. That means that there's a defining feature to be a carnivore and this is usually talking about skeletal shape, cranial shape, and teeth morphology. So, to eat meat you have to have certain physiology, you have to have certain teeth structure to cut and shear that meat. There's usually some olfaction and some visual sense in terms of being a predator that has a meat-based diet.

Within Carnivora... We're going to focus on more of the canine-related families and species. Foxes, coyotes, dog-like species, they do have common ancestors, so they do arise from this ancestral

carnivore. The ecology that has shaped each of these lineages, their diet, their social nature, all of this variation is quite incredible. Wolves, broadly speaking, live across much of the northern parts of all of the continents. This is called a 'whole Arctic distribution'. We usually find them in temperate or much more higher latitudes. Coyotes are a North American-evolved canine species, so you only find coyotes in North America. Jackals are also the Eurasian version, basically; we don't have jackals that evolved in North America. They are both a little bit smaller, typically, than a gray wolf. They live in a very different type of ecology.

So, if we focus on North America which is the continent I'm a little better at, coyotes and wolves, though they both live on this continent, they do essentially segregate out based on habitat and the presence of the other. Coyotes don't typically live in a pack structure, although they have been known to form packs over the course of their evolution. Typically, coyotes mate as a pair and don't really form any larger groups than that.

Wolves have a much larger group, they will predate on much larger species, and they competitively take larger prey, whereas coyote might come up and then try to steal whatever prey or carcass items are left from a wolf, and that's where conflict will usually happen. ["Hey! Leggo my Eggo!"] Wolves are known to kill coyote. Alternatively, coyotes can gang up and kill wolves, especially if it's injured, malnourished, or young. So, there is competition between those two species.

Aside: So wolves, coyotes, jackals, foxes, and dogs share a common ancestry diverging many millions of years ago. But this is Lupinology, not Jackalology, so back to wolves.

Alie: And how big is a wolf? What kind of dog size would you compare it to?

Bridgett: Well actually, Malamutes can be much larger than wolves.

Alie: Really?

Bridgett: Yeah, I've seen Malamutes get well over 120 pounds, and wolves can be very close to that size, but generally you can get them anywhere from 80 pounds upwards to 100-120. So, dogs can be larger than wolves, but also, we've bred them to be incredibly large, and maybe their diets have something to do with whether or not they're larger. But wolves are pretty substantial creatures.

Aside: Okay, so how many species of wolves are there all over the world? I had no idea, like a hundred species? I don't know. And I thought I'd get a clean answer, but holy moly is it herky-jerky and murky. So if you like drama you will love wolves, man! So, I rolled up my yellow sweater sleeves and I dug into find: Three. WHAT on Earth?!? Did you know this? Okay, first let's just beep, beep, back this puppy up.

So, the genus *Canis* includes jackals, coyotes, wolves, doggos, [*in Australian accent*] dingoes, and even the dire wolf, which has been extinct for roughly 10,000 years. Don't let George R.R. Martin pull any wool over your eyes. Dire wolf: two words, is a real animal and extinct. Direwolf: one word, *Game of Thrones* fiction. Okay, so the alive species of wolf on the planet include the African golden wolf, the Ethiopian wolf, and in North America and across Eurasia: *Canis lupus*. Now, America, studies have shown: we got one wolf *Canis lupus*; the gray wolf. Plus a bunch of subspecies. The timber wolf? That's a gray wolf. Arctic wolf? Gray wolf. Mexican Wolf? It's gray wolf. The extinct Oregonian brown wolf? That's a gray wolf. The buffalo wolf or loafer wolf which was hunted to extinction in 1926? That's also *Canis lupus*; a gray wolf.

There's also a red wolf in the Carolinas and here is where wolf experts throw down. There is a ton of debate that's gone on for decades and decades about if the smaller, ruddy wolf of the American Southeast is its own species and thus protected, or a hybrid of a gray wolf and a coyote and thus should be vulnerable to more hunting. As it stands in 2019, it's endangered, but it's protected, and

is considered its own species, but many scientists are like “Eerrghhh... it is though? A lot of DNA says it’s a hybrid.” So there you have it. Three-and-a-half-ish species of wolves. And in North America, the gray wolf is endemic, meaning it is native here. Now, let’s move on to how wolves relate to one another. Let’s talk family dynamics first.

Bridgett: So if we back up, we have this expectation that wolves travel in family groups, or at least groups of relatives, and the success of a particular individual is highly dependent upon having group members with it; pack members. Most of the livelihood of wolves depends upon multiple individuals coordinated in their social hunting and also cooperative raising of young and caring for each other. The goal was to identify some source populations in Canada and live capture a handful of individuals so we potentially maintain this pack cohesion where, upon release somewhere, these animals still maintain their group structure, still potentially had higher success as a group than you would find if you released one wolf somewhere on its own in the middle of a brand-new place.

Alie: How long do wolves live?

Bridgett: In captivity, they can live quite a while in this little posh, luxury element of being given food and safety. In Yellowstone, there’s usually a mortality rate at about four-and-a-half years. Two to four-and-a-half is an average lifespan depending upon, again, what’s the cause of mortality. There’s a lot of intraspecific mortality, which means that wolves kill other wolves. Whether it’s territorial disputes or some other event, wolves are absolutely known for having battles that end in the mortality of conspecifics.

Aside: P.S. Some of the finest people on the planet don’t know what conspecific means and had to Google it just now. And it means *animals or plants belonging to the same species*.

Bridgett: But they are very social creatures, they maintain territories, and even though there is recognition of relatives, there are debates about ‘how do you acquire new territory’ or if you’re a disperser and you need to find a mate and you need to have a new home range because you’re going to have a litter, how do you acquire that new space and those resources to support that? Especially in a landscape, maybe, that’s saturated with other wolf populations already. This battle usually does result in a give-and-take of boundaries, there’s expansion or shrinking of home ranges, and then there’s usually conflict, either around resources or territory usage. There’s a lot of wolf drama.

Aside: Speaking of wolf drama, we have to talk about wolf packs. We have to. From memes allegedly identifying different roles within the pack, to the often-cited alpha males, people are obsessed with wolf pack dynamics.

Alie: What exactly is a pack dynamic like? Is there an alpha? Is there a beta? Do they take care of the elderly wolves if they make it that long? What is that little pod like?

Bridgett: It’s very complicated. The original description of wolf society and this lovely idea of altruism and cooperation, that is still maintained but it’s not necessarily that cookie cutter that every wolf pack is going to have that size and shape and dynamic. [*angelic choir plays in the background*] There are many packs that do enjoy this traditional idea of monogamous breeding pairs. They have annual litters of pups and maybe some of their older offspring will maintain membership in the pack to help care for the next generation of offspring, these packs do exist. [*record scratch*] There are, however, many other structures of packs where there could be a single male that breeds with as many females as he can. Most of the time, nearly all of the time, they’re all unrelated to him. So, there is an element of avoiding inbreeding and kin recognition, but there are lots of structures and variation to that pack structure.

Again, we would love to have this idea that wolves are just always going to care exclusively for their pack members. There is a lot of provisioning for everybody else in the pack, but there is still

this battle between “I want to reproduce, I want to be the dominant individual in the pack.” That battle can be very much shaped by age and resource availability, body size, maybe just personalities of individuals. There are wolves that might be far more bold and others that are far more shy. That will shape how they interact in a pack and what that means for their rank in that system.

Aside: Wolfey family pack drama confirmed. So many possibilities based on any number of factors. But what about the connection between the canine in the moonlit tundra and the one snoring on your lap?

Alie: When it comes to domestic dogs and wolves, I feel like everyone has this question. How far down the line are they? How different genetically are they, and how did we get hairless Chihuahuas out of a wolf? How did we domesticate that?

Bridgett: Yeah, dogs and wolves are really curious. They aren’t very different at all. This is a huge and important question for evolutionary biologists, in asking: how do we get such variation, when we look at dogs? How do we get that when we have these dog breeds that we know came from this basic cookie-cutter of a wolf? Wolves don’t vary that much. They might have different colors; they might have slightly shorter fur. Maybe thinner fur if they live in an arid desert environment, and a thicker coat if they’re more Arctic, but they’re not that different in size and shape as you get in dogs.

A lot of the work that’s been done to understand the genetics behind why dogs are so diverse shows that there are a lot of mutations that have happened over the course of their domestication. It can be very few that happen that disrupt genes very quickly and you get a brand-new appearance.

Aside: So they are just as similar as we expected, but domestication has had a huge impact on how dogs look, and act, and continue to evolve. Maybe in 10,000 years, puppy dogs will have even bigger eyes and fuzzier ears. In my opinion, don’t mess with perfection. They’re great the way they are.

Okay, we have some questions from listeners like you, but first, each week we donate to a cause of the ologist’s choosing. And Bridgett chose the Red Wolf Coalition at RedWolves.com, which teaches people about the value of red wolves to the ecosystem and to the people living in the restoration area. Bridgette says, “I continue to study red wolves and they currently need as much support as they can get from the public.” Making that donation possible are a few sponsors of Ologies, which I may talk about right now.

[Ad Break]

On to your Patreon questions. And as always, you brought it; and by “it,” I mean great questions.

Alie: Bathbunny Art and Anakin Janiak both asked about lone wolves: Are there any theories about why some wolves become loners?

Bridgett: There are certainly many times in a wolf’s life where they will absolutely choose to venture out on their own. That could be the random sighting that you’re catching a wolf in mid-dispersal, or there’s also perhaps this – I don’t know how commonly it’s known – but that wolf packs only exist as packs seasonally. [“No way!”] In winter, when prey is usually a little more vigilant, snow is on the ground, food for prey species like elk or Caribou is harder to find. They are usually more vigilant against predators because they’re more vulnerable on snow surfaces, if it’s packed snow and their long legs get stuck in it. They’re quite vulnerable. So wolves really do well in the winter

when they pack up. And in the warm months, when there's much more food resources, they're often not in packs.

So, you might see wolves on their own because they're just out, hanging out, doing their wolfie thing. They rendezvous with each other periodically, but wolves are often – for a good half of the year in temperate zones – on their own. Lone wolves absolutely exist, they might be out in pairs, hanging out with their favorite buddy. Often, they're not always that close in touch with each other.

Aside: But the notion of an alpha male as we think of them in concrete terms, like a CEO overseeing a terrified team of subordinates, is a myth. Canine ethologist David Mech, who's studied wolf behavior for decades, has disavowed some of his previous notions of alphas because they were based on captive wolf packs of unrelated wolfies. In the wild, most packs are just families of a pop, and ma, and their pups, and maybe a few other families and their kiddos, maybe an unrelated straggler or two. Mech did report seeing some dominance behaviors and in his 2010 paper titled: "Prolonged intensive dominance behavior between gray wolves, *Canis lupus*," he describes a time he witnessed what his team thinks was a dad wolf straddling and harassing what may have been his son. Kind of like a test before the son took off for his own territory.

Science means always asking new questions, and collecting more information, and then learning new things by analyzing it. And the myth of the alpha male is simply that. But let's go back to more of your questions, specifically about wolf and dog genetics.

Alie: Sarah Greer asked: My neighbor claims her dog is half wolf and that her dog is the offspring of a domestic canine who mated with a wolf. Is this biologically possible or is she just trying to make her dogs seem more cool?

Bridgett: Both, both are probably true. The first one is certainly true. Dogs and wolves can absolutely reproduce, no question about it. The feasibility of her dog, or her dog's parent, coming across a wolf. I don't know if this is a captive environment, if someone's breeding dog-wolf hybrids, which is highly possible, or if they live somewhere rural enough where a wolf is running around and decided to reproduce. Both are possible, an offspring in that cross is absolutely viable.

Alie: Got it. A ton of people, Natalie Mastick, Lauren Dean, Kristina Weaver, Andrea Levinson, Amelia Heins, Matthew Thomas Hill, John Sansone, Stephanie Malek, Anna Thompson, Jodi Kendall, Lucy Keegan, and Samantha G all had questions: Do wolves care about the moon? Do they howl at the moon? Do they like the moon? Does the moon affect their behavior? What is it with wolves and the moon?

Bridgett: Yeah, I see why that's a question. Wolves howl all the time regardless of what the moon is doing. So, a full moon will give more light at night, and although most wolves are not actually hunting in the middle of the night, the dawn and dusk times will have perhaps more light than normal, which might make hunting or movement a little more interesting, and maybe there's more activity. So, maybe there's more howling because there's more action, but this is just me speculating. I don't know of anything that ever talks about having to, basically, control for if there's moonlight or not on understanding a wolf behavior.

Aside: So, mystical wolf moon connections are flimflam, but wolves' communication devices, AKA songs sung from their boopable snouts, have a range of up to 10 miles, and it helps get the pack back together or intimidate others not in their clique. Essentially, they're saying, "I'm lonely," or, "Get away from me, you scare me, and I hate you."

Alie: And what about encounters? Sadie Neuman, Mariko Shinn, Kerri, Isabelle B. Holper, and a few people asked: What should I do if I see a wolf when I'm hiking or backpacking?

Bridgett: I would say it's not very different from bear gear. I would have bells and whistles on my shoes and backpack and blowing one of these survival whistles will just pretty much deter an animal who already doesn't really want to interact with you. ["*Okay byyyyye.*"] Having pepper spray is never a bad thing. I would just probably turn and walk the other way or back up. They're a little bit different... they're not quite like bears.

Usually, a wolf is already going to see you long before you've ever seen it. I would be surprised if you happened to surprise a wolf, although I'm sure it can happen. It's not anything I've ever worried about.

Aside: Solid advice that I hope you never have to use. If you love wolves as much as I do, I'm sure you're asking yourself, "What can we do to help these delightful, fluffy, loyal, smart creatures? Who do I call? Who do I write? I will protect them at all costs!"

Alie: A bunch of people wanted to know: What can we do to help the Wolfies? Dakota Harriman asked: How can we save them, especially red wolves?

Bridgett: Email! Email or send a letter to your congressman or congresswoman, your local government. I know that there are many agencies that are pro-red wolf or pro-gray wolf. NRDC, there are red wolf foundations in many locations. You can donate money; you can donate services.

Aside: There are plenty of really great organizations, some that even work with Indigenous folks to protect the gray wolf, which is a sacred animal to many cultures. So maybe look into a local one too.

Now, as we round the bend into the home stretch of the episode, you know I always want to know what makes our ologist get up in the morning.

Alie: And what about the best thing about your job? What do you love about what you do?

Bridgett: Oh my gosh! That I get to do this. I can't believe that this is a job! I mean, it's amazing. Every so often, you know, you have those rough days, and you think, "What else could I do?" Nothing! I would never want to do anything else. I can't imagine whatever a normal job would look like. I get to sit and research something that's invisible, right? We can't see DNA, we can't see evolution tangibly from 3 million years ago, and yet we press some buttons on our computer and some really lovely evolutionary theory, and we expose what our history looks like. We can understand more about something we can never possibly observe, and I think that's just so incredible.

So many cool things about wolves! Lupinology: truly fascinating. November 23rd, Wolfenoot. Celebrate it. So, these dog-sized icons of the outdoors are so amazing, their societies are so complex. So to recap what we learned: dogs descended from wolves; there are only three species of wolves (*Canis lupus*, the gray wolf, the African golden wolf, and the Ethiopian wolf) but plenty of subspecies that are still being debated; that there isn't a known correlation between the Moon and the howl; and that wolves really only travel in packs during the winter; the myth of the alpha male is just that, a myth; and yes, it's possible that your friend might have a dog-wolf hybrid.

To find out more about Dr. Bridgett vonHoldt, you can check out her website, which is Vonholdt.princeton.edu, where you can stay up to date on all of her current research. And if you liked this episode and want to listen to the full *Ologies* episode, complete with maybe some saucy language and a side of innuendo, you can find the entire adult-friendly *Ologies* catalog at AlieWard.com/Ologies, including a full Lupinology episode that this was cut from.

Thank you to biologist and Lupinologist Dr. Bridgett vonHoldt and thank you new Smologites! I'm so glad you're here. New episodes are out every two weeks or so for you, and there's a full list of credits for this episode at AlieWard.com/Smologies since we like to keep things short and small around here.

And if you listen to the end of the episode, you know I give you a piece of advice. This week, it's that I know making your bed doesn't sound very fun, but when you come home and your bed is made and it looks nice, you're like, "Ah, this is such a treat for myself!" So if you make your bed in the morning, think, "Ah, I'm doing this for myself later at night!" Don't think about doing it for your parents; think about having a nice made bed when you get home. It's such a treat. Anyway, I've been doing that since I was about 13. I make my bed every day. It's just nice when I get home. It's like, "Hey, thanks, me from this morning."

Anyway, until next time, Smologites. Berbye.

Transcribed by Emily White at TheWordary.com

Links to things we discussed:

[The full, uncut, NSFW Lupinology episode](#)

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A donation went to [Red Wolf Coalition](#)

[Canis genus](#)

[Grey wolf distribution via Wiki](#)

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[Mech's earlier work on wolf pack dynamics](#)

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