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## The Emergence of COVID-19: A Multispecies Story

*Eben Kirksey*

Origin stories about COVID-19 have circulated widely. An exotic animal market, deep in the enigmatic East, spawned a new pandemic virus. Multiple species of bat and little scaly anteaters called pangolins have all been implicated in conventional accounts about the coronavirus outbreak. Outbreak narratives, about the wet animal market in Wuhan, reek of Orientalism. Media pundits, who have struggled to explain the sudden upheaval of the modern world, have reanimated old stereotypes about Asian people and exotic animals. The subjects of these multispecies stories, to reference Edward Said, share “in common an identity best described as lamently alien.”<sup>1</sup>

As medical doctors, virologists and epidemiologists publish new evidence, origin stories about exotic animals are starting to fall apart. Jon Cohen, a journalist who writes for *Science*, was among the first to challenge the wet market outbreak narrative. On Jan. 26, 2020, Cohen suggested that “the virus possibly spread silently between people in Wuhan — and perhaps elsewhere — before the cluster of cases from the city’s now-infamous Huanan Seafood Wholesale Market was discovered.”<sup>2</sup>

One key bit of evidence for this counter-narrative is buried in *The Lancet*, a world-renowned medical journal. The team of Chinese physicians who studied the initial COVID-19 patients found that the first reported cases did not involve contact with exotic animals. The very first patient with the disease — someone who never visited the market — began experiencing symptoms on Dec. 1, 2019. Nine days later, two other people who had no known contact with the market experienced the onset of symptoms. On that same day, Dec. 10, the first patient who had visited the Huanan Seafood Wholesale Market also became sick.<sup>3</sup>

When virologists began to study the DNA sequences of COVID-19, they found it was related to coronaviruses that infect bats. An initial study of viral genealogies found that COVID-19 was related to a virus that was collected from a horseshoe bat (*Rhinolophus affinis*). This common bat lives in caves and old buildings throughout mainland China. The viral sample that was the closest match to COVID-19 was collected in Yunnan, a province more than 1,000 miles away from Wuhan. In February, a widely cited article in *Nature* reported “a large number of SARS-related coronaviruses have been discovered in their natural reservoir host, bats.”<sup>4</sup>

Coronaviruses have been around for thousands, if not millions, of years. Different viral strains infect a variety of mammals — from pigs to camels to beluga whales — as well as a diversity of birds — from pigeons to chickens and pheasants.<sup>5</sup>

According to the Coronavirus Study Group, an international consortium of taxonomists who have been studying the viruses for decades, these infectious forms of life

are constantly mutating. Coronaviruses can jump quickly from species to species. The study group writes, “Few genome changes may attenuate a deadly virus or cause a host switch.”<sup>6</sup> The researchers recognize 49 species in the family *Coronaviridae*. The pandemic strain is recognized by this group as a member of an existing viral species: *Severe acute respiratory syndrome-related coronavirus*, or SARS-CoV. Officially, these taxonomists suggest that the proper name of COVID-19 should be SARS-CoV-2.

Celia Lowe, an anthropologist and specialist in the biodiversity of Southeast Asia, observes that the species concept breaks down when it is applied to viruses. Writing about influenza, she notes that many microbiologists regard viruses as “quasi-species.” Both influenza and corona are RNA viruses; consequently they have a higher mutation rate than DNA viruses, which have a “proof-reading ability” to find and repair damaged genetic material. “RNA viruses copy themselves unfaithfully,” writes Lowe, “making difficult the determination of any ‘original’ form as well as precise foreknowledge about future forms; the copy is unfaithful to the original.”<sup>7</sup> These viruses have unstable boundaries, so many biologists call them “mutant swarms” or “clouds.” Since swarms and clouds constantly change shape, perhaps researchers are warranted in using fuzzy language as they talk about COVID-19 and the SARS-CoV-2 quasi-species.

Viruses are transformed as they interact with the immune systems of animal hosts and ecological communities, and with the human institutions, infrastructures and behaviors that facilitate their spread. Lowe has described what she calls “multispecies

clouds,” or “collections of species transforming together in both ordinary and surprising ways.”<sup>8</sup> Applying these ideas to the current outbreak allows COVID-19 to be understood as a multispecies assemblage. The notion of “assemblage” foregrounds the interaction of political, economic and ecological forces that come together to shape forms of life.<sup>9</sup> Novel pandemic strains of coronavirus have assembled themselves with a series of small mutation events and the recombination of larger chunks of DNA, plus interactions with other life forms on macro and molecular levels.<sup>10</sup>

Michel Foucault famously argued against the quest to discover origins. Human history, like evolutionary history, contains many surprises — accidents, small deviations, mutations or errors — that give rise to new forms of life and power. Instead of searching for origins, Foucault suggested that scholars instead focus attention on the disruptive force of *entstehung*, or emergence.<sup>11</sup>

Viral genealogists who have closely studied the emergence of COVID-19 have not found a clear evolutionary tree sprouting from a single trunk. Instead, they have found a tangled web of relations, with jumping genes that defy human attempts to cordon off species from one another. One key paper in *Nature* found evidence that “genome fragments derived from multiple SARS-CoV related lineages” had recombined in multiple animal hosts, creating the conditions of possibility for the emergent pandemic.<sup>12</sup>

From a viral perspective, the boundaries of different animal species are inconsequential. What matters, as coronaviruses infect animals and humans, is the shape of a specific receptor on the outer membrane of our cells.

A certain coronavirus “spike” protein locks on to a receptor called ACE2, producing a fusion of the viral and host cell membranes. If there is a good fit between the spike and the receptor, the virus gets inside. A study conducted amid the pandemic concluded that some farm animals and cats have very similar ACE2 receptors when compared with the human receptor, “suggesting that the species barrier for virus transmission is small.”<sup>13</sup>

Working with synthetic cells designed to express receptors of different species, the authors of an article in *Nature* concluded that COVID-19 would not likely infect mice. But they found that receptors of other nonhuman species — including pigs and a lean nocturnal mammal called a civet — are susceptible.<sup>14</sup> Exotic animal smugglers use Asian palm civets to make a strange kind of coffee — where beans are eaten and defecated by civets, then collected by people with a taste for “coffee cherries.”

Stories about exotic animals grabbed more coronavirus headlines after South China Agricultural University in Guangzhou staged a press conference about pangolins on Feb. 7, 2020.<sup>15</sup> Researchers found coronavirus strains in pangolins that were related to COVID-19. The genetic sequences for the coronavirus spike — the protein that binds to ACE2 — were 85.5 percent to 92.4 percent similar when the pangolin coronavirus samples were compared with samples from humans.<sup>16</sup> Malayan pangolins are critically endangered animals found throughout Southeast Asia — from Indonesia to Vietnam and Cambodia. Most countries protect pangolins against hunting, but a lucrative trade on the black market continues to bring live animals into mainland China. Pangolin

scales are used in traditional Chinese medicine. Wealthy consumers, who pay exorbitant prices for fresh meat from endangered species, also eat pangolin.

The pangolins harboring coronavirus infections studied at South China Agricultural University were seized in antismuggling operations in southern China. University researchers published a paper in *Nature* that breathed new life into stories about the Huanan Seafood Wholesale Market — even though it was unclear if any live pangolins were being offered there for sale. They concluded that “surveillance of pangolins in the natural environment in China and Southeast Asia [is] clearly needed to understand their role in the emergence of coronaviruses and the risk of future zoonotic transmission.”<sup>17</sup> But Thom van Dooren quickly countered in *New Matilda* that it was people, not pangolins, who created the conditions for a pandemic. Van Dooren noted that with extended periods of human self-isolation, there is an opportunity to reflect on the “world that is being ushered in by our widespread failure to devise ways of living well in this broader community of life.”<sup>18</sup>

Pangolin pandemic stories do not stand up to critical or scientific scrutiny. Deep analysis of coronavirus DNA sequences, published in *Nature Medicine* on March 17, concludes that none of the bat or pangolin strains previously studied were “direct progenitors” of the highly infectious strain that suddenly began circulating among people. “The genetic data irrefutably show that SARS CoV-2 is not derived from any previously used virus backbone,” write Kristian G. Andersen and colleagues. Coronavirus diversity is “massively undersampled,” they add.<sup>19</sup> In other words,

early reports about pangolin and bat coronaviruses may have been simply an artifact of sampling. Scientists were looking for coronaviruses in exotic animals, and they found them.

Coronaviruses probably did not make a sudden leap from pangolins to humans. Leading microbiologists now speculate about “many prior zoonotic events” where viruses were passed back and forth between humans and multiple animal species.<sup>20</sup> This alternate theory suggests that domestic companion animals, such as dogs and cats, or farm animals that live in industrial conditions, including pigs and cows, may have played an important role in the emergence of the viral pandemic.

Following the original 2002 SARS outbreak in China, a group of influential biologists sampled coronaviruses in chickens, cats, dogs, pigs, cattle and ducks. They were testing specifically for SARS-CoV, part of the same viral quasi-species as the current pandemic, SARS-CoV-2. The research team took samples from 242 animals and found that two pigs tested positive for SARS antibodies. To date, no comprehensive surveys of SARS-CoV-2 infections in common domestic animals have been published.<sup>21</sup>

An earlier coronavirus epidemic swept North American hog farms in 2013. This outbreak went largely unnoticed by the public, since this viral strain was innocuous for humans but deadly for pigs. Writing in *Cultural Anthropology*, Alex Blanchette described how the virus quickly became ubiquitous — on the floors of Midwestern convenience stores and in domestic household spaces. Workers were asked to follow strict biosecurity protocol that even governed

family life at home, as microscopic particles of hog saliva, blood, feces, semen or barn bacteria made their way through human worlds. Initial reports suggest that COVID-19 is circulating among workers on industrial farms, but no one has published a systematic study of the virus in industrial pigs.

As I write, stories about coronavirus in cats are just starting to circulate. A domestic cat in Belgium experienced respiratory issues, nausea and diarrhea after apparently contracting coronavirus from its owner. Laboratory analysis of the cat’s feces and vomit revealed high levels of COVID-19 genetic material.<sup>22</sup> A tiger at the Bronx Zoo was diagnosed with coronavirus in early April. An experimental study in China showed that cats can transmit COVID-19 among themselves, while a survey of feral cats in Wuhan found that many of them had antibodies to the virus.<sup>23</sup>

Epidemiologists have warned the public not to demonize cats and other animals as viral vectors or reservoirs. Right now animals that live with us as domestic companions, and others that are destined to become meat in our industrial food supply chain, are in vulnerable situations as a result of the pandemic. In an era of social distancing, it might be easy to turn away from other animals. For some species, such as cats, it might be best — for us and for them — to keep our distance. But establishing new boundaries, even with tact and care, may be just as difficult with companion animals as it is with family and friends.

Humans seem to be main carriers of COVID-19. We have certainly transmitted this emergent disease around the world at a dizzying pace via airplanes and global supply chains. It is important to recognize that

our habits continue to impinge upon other forms of life. Rather than react to multispecies stories about coronavirus with biophobia — a fear of other creatures — it is possible to respond with a sense of biophilia, or love for other forms of life.

Many animals probably are not susceptible to COVID-19. Insects — including dragonflies, bumblebees and butterflies — have a very different biological makeup than the mammals and birds that are known coronavirus carriers. If one desires to be close to an animal in this time of social distancing, perhaps a pet beetle or an ant farm is a better option than a new cat or dog. Close encounters with insects could produce opportunities for interspecies empathy. Radical declines in insects have taken place recently, with populations falling by 75 percent in some parts of Europe over just 27 years.<sup>24</sup> Widespread use of pesticides, habitat destruction and pandemic diseases spread by global commerce have all contributed to these losses. As the global economy comes to a halt to protect humanity, there is an important opportunity to reflect on how business as usual impacts other forms of life. As we learn new practices of self-care — as we experiment with new strategies for coping with social isolation — we could also learn to better care for other vulnerable species.

The emergence of COVID-19 also presents an opportunity to transform the industrial food system — not just because pigs might be viral breeding grounds. Coronavirus has suddenly upended planetary multispecies relations. Endangered animals such as pangolins, and industrial animals such as pigs, were already suffering before the pandemic. Now there

is an opportunity to establish a new normal. Humans have the opportunity to reconfigure the very conditions of life on earth.

## Notes

1. Edward W. Said, *Orientalism* (New York: Vintage Books, 1979), 207.
2. Jon Cohen, “Wuhan Seafood Market May Not Be Source of Novel Virus Spreading Globally,” *Science*, January 26, 2020. <https://www.sciencemag.org/news/2020/01/wuhan-seafood-market-may-not-be-source-novel-virus-spreading-globally>.
3. Chaolin Huang et al., “Clinical Features of Patients Infected with 2019 Novel Coronavirus in Wuhan, China.” *The Lancet* 395, no. 10223 (2020): 497–506. [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5).
4. Peng Zhou et al. “A Pneumonia Outbreak Associated with a New Coronavirus of Probable Bat Origin.” *Nature* 579, no. 7798 (2020): 270–73. <https://doi.org/10.1038/s41586-020-2012-7>.
5. Raoul de Groot et al., “Revision of the Family Coronaviridae” (proposal to the ICTV Executive Committee, 2008.085-126V). <https://talk.ictvonline.org/ictv/proposals/2008.085-122V.v4.Coronaviridae.pdf>.
6. Alexander E. Gorbalenya et al., “Severe Acute Respiratory Syndrome-Related Coronavirus: The Species and Its Viruses – A Statement of the Coronavirus Study Group,” *bioRxiv*, February 11, 2020. <https://doi.org/10.1101/2020.02.07.937862>.
7. Celia Lowe, “Viral Clouds: Becoming H5n1 in Indonesia.” *Cultural Anthropology* 25 (2010): 625.
8. Lowe, “Viral Clouds,” 626.
9. Anna Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton, NJ: Princeton University Press, 2015), 23.



10. Jiumeng Sun et al., "COVID-19: Epidemiology, Evolution, and Cross-Disciplinary Perspectives," *Trends in Molecular Medicine* 26, no. 5 (2020): 483–95. <https://doi.org/10.1016/j.molmed.2020.02.008>.

11. Michel Foucault, "Nietzsche, Genealogy, History," in *Language, Counter-Memory, Practice*, ed. Donald F. Bouchard (Ithaca, NY: Cornell University Press, 1977), 146.

12. Tommy Tsan-Yuk Lam et al., "Identifying SARS-CoV-2 Related Coronaviruses in Malayan Pangolins." *Nature* (2020). <https://doi.org/10.1038/s41586-020-2169-0>.

13. Sun et al., "COVID-19."

14. Zhou et al., "A Pneumonia Outbreak."

15. David Cyranoski, "Mystery Deepens over Animal Source of Coronavirus." *Nature* 579, no. 7797 (2020): 18–19. <https://doi.org/10.1038/d41586-020-00548-w>.

16. Tommy Lam et al., "Identifying SARS-CoV-2 Related Coronaviruses in Malayan Pangolins." *Nature* (2020). <https://doi.org/10.1038/s41586-020-2169-0>.

17. Lam et al., "Identifying SARS-CoV-2 Related Coronaviruses."

18. Thom van Dooren, "Pangolins and Pandemics: The Real Source of This Crisis Is Human, not Animal," *New Matilda*, March 22, 2020. [https://newmatilda.com/2020/03/22/pangolins-and-pandemics-the-real-source-of-this-crisis-is-human-not-animal/?amp\\_markup=1](https://newmatilda.com/2020/03/22/pangolins-and-pandemics-the-real-source-of-this-crisis-is-human-not-animal/?amp_markup=1).

19. Kristian G. Andersen et al., "The Proximal

Origin of SARS-CoV-2." *Nature Medicine* (2020). <https://doi.org/10.1038/s41591-020-0820-9>.

20. Andersen et al., "The Proximal Origin."

21. Weijun Chen et al., "SARS-Associated Coronavirus Transmitted from Human to Pig." *Emerging Infectious Diseases* 11, no. 3 (2005): 446–48. <https://doi.org/10.3201/eid1103.040824>.

22. Helen Thompson, "A Cat Appears to Have Caught the Coronavirus, but It's Complicated," *Science News*, March 31, 2020. <https://www.sciencenews.org/article/cats-animals-pets-coronavirus-covid19>.

23. James Gorman, "A Bronx Zoo Tiger Is Sick With Coronavirus. Your Cats Are Probably OK," *The New York Times*. April 6, 2020. <https://www.nytimes.com/2020/04/06/science/tiger-cats-coronavirus.html>.

24. Douglas Main, "Why Insect Populations Are Plummeting — and Why It Matters." *National Geographic*, February 14, 2019. <https://www.nationalgeographic.com/animals/2019/02/why-insect-populations-are-plummeting-and-why-it-matters/>.

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