

Swarming Locusts



In many parts of the US, what we call “locusts” are actually cicadas—that plug-shaped insect that sings in the trees.

But especially in Africa and the Middle East, “locusts” are large *grasshoppers* occurring in massive swarms that can devour crops across the region.

These grasshoppers have undergone a strange metamorphosis.

In normal times, they’re a shy, solitary desert hopper. Heat and drought control their numbers, and they’re not a threat to agriculture.

But every few decades—when heavy rains span several seasons—vastly more eggs hatch, and the population explodes.

So many insects in close contact causes serotonin to flood their brains, and profound changes occur.

The juveniles band together in nomadic hordes, crawling across the landscape looking for food. They grow larger than normal, faster, and even change color.

Adults grow larger wings and jaws and take to the sky, forming swarms of billions, devastating the vegetation in their path. These swarms can span a thousand square miles and fly 80 miles in a day.

Aerial pesticide spraying can reduce their numbers but has problems of its own: contaminating crops and water.

The insects are edible and considered a delicacy, and make excellent cattle fodder. But there are so many that eating them makes little difference.

Eventually, dry conditions return and the swarms die. The eggs that hatch will again become the peaceful desert grasshopper... until the next unusually wet spell.

Locusts threaten fragile food security in Africa. This villager makes a futile attempt to scare them off.

Credit: Baz Ratner / Reuters

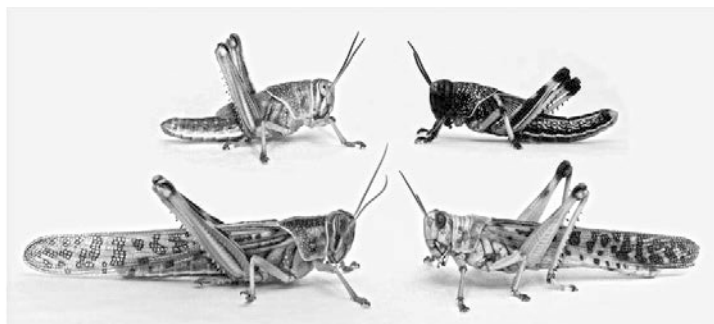


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Background: Swarming Locusts

Synopsis: In late 2019 and early 2020, swarms of locusts developed in East Africa, the result of a series of unusually wet spells in the region. What are locusts and why do they swarm?

- Unusually wet weather in 2018 and 2019 resulted in an explosion of desert locusts in the East African countries of Kenya, Ethiopia, and Somalia.
 - An Indian Ocean cyclone hit the Arabian Peninsula in mid-2018, creating perfect conditions for the insects to lay their eggs, which hatch in moist soil.
 - Normally the desert heat would kill them off, but a second monsoon struck the same area in late 2018, enabling a population explosion that spread into Yemen, then eventually across the Gulf of Aden into East Africa. The war in Yemen prevented mitigation efforts.
 - Then a third cyclone hit Ethiopia and Somalia in December 2019, and the locusts made their way to Kenya.
- Kenya has not faced a plague of locusts in the last 70 years; Ethiopia and Somalia have not seen one in the last 25 years.
 - The recent rains produced the best crops the Horn of Africa had seen in decades—until the locusts arrived. Some farmers have already lost 90% of their crops destined for both humans and livestock.
 - These countries are already vulnerable to hunger. Some 12 million people in the region face high levels of food insecurity because of recent droughts and flooding. Swarming locusts could affect an additional 20 million people.
 - Sometimes the clouds of insects turn the sky dark as villagers clang pots and pans and shake jars filled with pebbles to prevent the insects from landing and consuming their crops or laying eggs in the soil. The insects completely cover tree branches.
- Swarms have also been spotted across Africa in Djibouti, Eritrea, Uganda, Tanzania, and southern Sudan; in Middle Eastern countries Bahrain, Kuwait, Qatar, Iran, and Pakistan; and in India.
 - The rainy season, expected in March, will produce more vegetation, resulting in new breeding that could increase the population of locusts by 400–500 times, right at the time that farmers typically plant their crops. Less planting would increase food insecurity issues in the region.
 - The dry season typically begins in June, and that may be the best bet for halting their expansion.
- “Locust” is the name we use for some species of short-horned grasshoppers of the family *Acrididae* when they enter the swarming phase of their life cycles.
 - Normally solitary, these short-horned grasshoppers (*Schistocerca*) are typically not a threat to agriculture. Adults may grow up to 3 inches (7.5 cm) in length.



Juvenile (top) and adult (bottom) phases of the desert locust. You can see the dramatic color change between the solitary (left) and gregarious or swarming (right) phases of these insects.

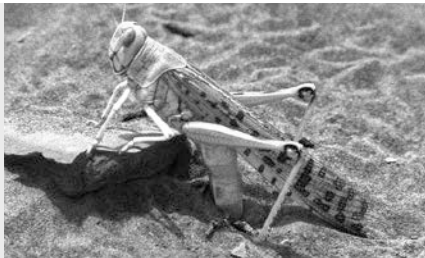
Credit: Patrício Simões, Swidbert Ott, Jeremy Niven, modified from M. Burrows, S. Rogers, and S. Ott.

References: Swarming Locusts

- Locusts | National Geographic
Worst Locust Swarms in Decades Hit East Africa | The Atlantic
Locusts Decimating Crops In East Africa | Time
Why Are Swarms of Locusts Wreaking Havoc in East Africa? | NPR
Locust Watch | UN Food and Agriculture Organization

Contributors: Juli Hennings, Harry Lynch

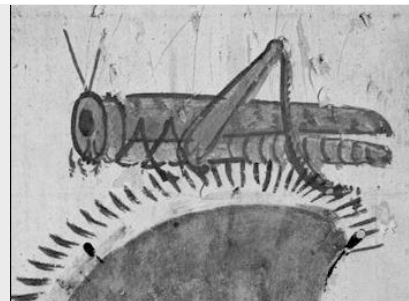
Background: Swarming Locusts



A desert locust (*Schistocerca gregaria*) laying eggs during the 1994 locust outbreak in Mauritania. Female locusts can lay up to 80 eggs at a time.

Credit: Christiaan Kooyman / Public domain

- However, under certain circumstances, they may dramatically change their behavior and morphology as they shift into the swarming phase of their life cycle, changing from grasshoppers into locusts.
 - Drought followed by wet weather and rapid vegetation growth causes eggs laid in moist soil in the arid region to hatch.
 - Overcrowding of the insects causes increased contact, and stimulation of the hind legs triggers a burst of serotonin in their brains that turns them “gregarious.” They eat more and become attracted to each other, breeding rapidly and swarming. The normally green grasshoppers even change colors, becoming gold and black.
 - They become nomadic, migrating as cohesive bands of ravenous nymphs on the ground, then as swarms of voracious adults in the air, decimating any vegetation in their path.
 - They can travel up to 80–95 mi (130–150 km) per day.
 - A large swarm might include billions of locusts over thousands of square miles at densities of up to 200 million locusts per square mile (80 million per square km).
 - The first bands to start swarming are known as “outbreaks,” and when these bands begin to merge, they are known as “upsurges.” When the full grasshopper population becomes integrated, the swarm becomes a “plague.”
- A swarm the size of Manhattan (23 mi² or 60 km²) can eat as much food each day as the entire population of the states of New York and California consumes daily.
 - An especially large swarm in northern Kenya measured 37 mi by 25 mi, or 925 mi² (60 km by 40 km, or 2400 km²). That is three times the area of New York City (303 mi² or 784 km²).
 - In January 2020, a locust swarm smashed into the engines, windshield, and nose of a passenger plane over Ethiopia, forcing it to make an emergency landing in Addis Ababa.
 - Aerial pesticide sprayed directly onto the locusts is the most effective way to control an outbreak, but continued spraying is needed to maintain control.
 - Kenya and Ethiopia each have only four planes that can spray the locusts.
 - It is difficult to spray in places like war-torn Somalia and Yemen.
 - People are worried about the impacts of the pesticide on their drinking water supply.
 - Biological methods have also shown promise, such as fungi that specifically target and kill only this the locust, but these usually take 7–14 days to work.



Locusts are mentioned in *The Iliad*, the Bible, and the Quran, and are featured in Egyptian tombs. This one is part of a hunt mural in the grave chamber of Horemhab, Ancient Egypt, circa 1422–1411 BC.

Credit: Maler der Grabkammer des Horemhab / Public domain

Background: Swarming Locusts



Locusts on skewers for sale in a Beijing market. These insects are a delicacy in the cuisine of many African, Middle Eastern, and Asian countries.

Credit: istoletv [CC BY (<https://creativecommons.org/licenses/by/2.0>)]

- Although doing so won't make much of a dent in East Africa's locust population, it is possible to eat locusts (unless they have been exposed to pesticide). They are high in protein and considered to be a delicacy in Africa, the Middle East, and Asia.
 - Most recipes call for removal of the head, wings, and front legs, with the abdomen and hind legs to be roasted or grilled over fire on skewers before consumption.
 - They are considered Halal, as it is recorded that the Islamic Prophet Mohammed ate them during a military raid. They are most popular during Ramadan.
 - According to the Bible, John the Baptist ate locusts with wild honey.
 - The Torah prohibits consumption of most insects but makes exception for red, yellow, spotted gray, and white locusts.
 - As fodder for cattle, they yield five times the protein and less greenhouse gas than typical feed.

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