

An abstract graphic featuring a dense cluster of colorful splatters and dots in shades of blue, purple, pink, red, orange, and yellow, resembling a bee or a cluster of cells, set against a white background.

# Massive Bee Attacks

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# Objectives: To talk about...

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A history of Arizona and massive bee attacks

Biology of Africanized or Killer Bees

What sort of public  
education is needed

# Marana, July 2022

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TUCSON, Ariz. (KOLD News 13) - Marana Police have identified the man who died after being attacked by bees last week.

The MPD says 29-year-old David Santiago was a landscaper working in the area of Thomas Arron Drive and Moore Road on July 29th when a swarm of bees appeared.

Police say he was attacked while trying to help get a juvenile to safety. The kid was able to make it inside a truck, but Santiago did not make it to his work truck and died from his injuries.





## Is this incident unusual for the past 30 years in Arizona?

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More people have died by bees than rattlesnake bites

More people have died by bees than scorpion stings

More people have died by bees than Chagas disease in Arizona

Time to allocate resources to address this problem



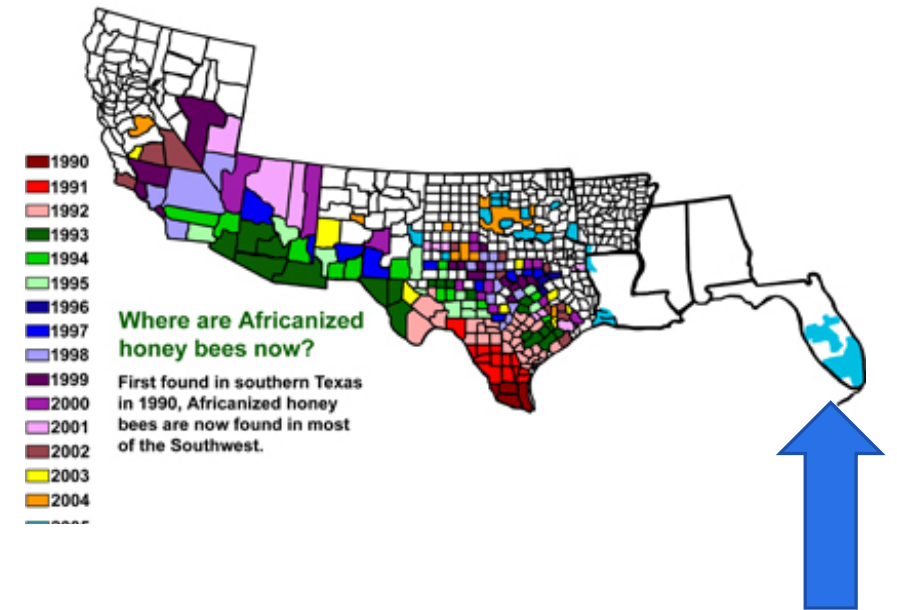
# When it began in the US-

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1990: Africanized bees in Hildago, Texas

1993: Africanized bees in Arizona followed by California and Nevada

**See:** Vetter RS, Visscher PK, Camazine S. Mass envenomations by honey bees and wasps. West J Med. 1999 Apr;170(4):223-7. PMID: 10344177; PMCID: PMC1305553.



# *Apis mellifera scutellata*=Africanized bees=Killer bees

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All wild honeybees in Arizona are the Africanized variety (escaped in Brazil in 1956)

Cannot survive cold winters, so not present in Northern Arizona

May have been assisted in their spread by *Varroa* mites killing European honeybees

Once disturbed, average of 29 minutes to settle down versus ~3 minutes for European honeybees

Their good features: Increased reproduction, swarming, foraging and resistance to disease

# Venom in the sting

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Venom is composed of mainly mellitin (50% by weight) and responsible for myocardial, kidney and other organ injury.

European honeybee sting contains 142 micrograms of venom vs. 94 micrograms venom for Africanized bees but the latter with more phospholipase A<sub>2</sub>

Human adults with 50-200 stings at risk for renal failure; 200-500 stings at risk for multiorgan failure; >500 stings are at risk for death

# Facts that may be important

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Formerly the concern involving bee stings was over allergy and anaphylaxis

Now the concern is over massive envenomation and toxic effects



# Changing gears: If these bees are so dangerous, What education is online concerning “killer bees”?

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Integrated Pest Control and Extension Service documents: a lot of information about biology and advice for beekeepers (Most informative were UGA and UA extension documents)

Confused and confusing “news” reports on attacks

Currently information generally tries to scare everyone rather than a selective message





Tsunambee: a 2017 thriller with 3  
out of 10 on the tomato scale

Also, a great cigar  
apparently!

**Most complete data regarding massive attacks in US in following 3-year study:**

Rahimian R, Shirazi FM, Schmidt JO, Klotz SA. Honeybee Stings in the Era of Killer Bees: Anaphylaxis and Toxic Envenomation. Am J Med. 2020 May;133(5):621-626. doi: 10.1016/j.amjmed.2019.10.028. Epub 2019 Nov 9. PMID: 31715166.

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3-year study (2017-19) reports to Arizona Poison and Drug Control Center, Tucson

Number of Stings	*Number of Victims/Percent
1 sting	251 (81%)
2-10 stings	42
11-49 stings	4
50-100 stings**	7
101-500 stings**	5
>501 stings**	1 (950 stings)

**Only death in the study was a 35-year-old man with one sting, died of anaphylaxis (~60/yr in US)**







# Lessons learned from Massive Sting attack Victims

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Survival was 100%

Only 50% were hospitalized!

50% were allowed to go home from ER before toxic effects could be measured

Toxic effects (renal injury, rhabdomyolysis, **biphasic anaphylaxis**, cardiac) may take 24-48 hours to become evident

Victims with concurrent illnesses may have toxic effects from lesser number of stings

# Comments about study patients

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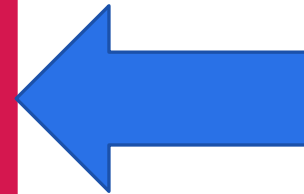
13 with massive attacks (>50 stings)

7 hospitalized (1 ICU, 6 non-ICU)

>300 visits to ER for stings (remember, not including Phoenix/Maricopa)

One person with 47 stings was hospitalized for weeks for dialysis (highlighting “at risk persons”)

The annual economic health costs for Arizona are quite high if Maricopa County data were included





# What are some lesser known clinical effects of massive bee attacks

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Bees can be found

- in eyelids

- nose

- bronchi

- intestines (esophagus, stomach, found in feces)

- skin folds

Bronchoscopy and endoscopy are frequently required



# Deaths from Bee Attacks in Arizona

October 1995	Outside home	Female/88
2004	Climbing	Male
September 2011	Working on home	Male/65
May 2013	Climbing	Male
October 2012	Climbing	Male/19
October 2014	Gardening	Male/32
May 2016	Hiking; 1000 stings	Male/23
July 2017	Working on road	Male
August 2017	Landscaping	Male
April 2019	Trying to remove bees from couch	Male/51
August 2019	Working on road	Male/73

# Continued

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Date	Circumstances	Age/Sex
July 2022	Attacked by swarming bees	29/Male
August 2023	Ran into swarming bees	50s/Male
August 2023	Landscaper; Peoria, AZ	83/Male

# Results of study of bee stings in AZ

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Outcome of sting	Individuals (Number of Stings)
Death	1 (1 sting)
Major effect, Poisoning Severity Score*	3 in ICU (1, 120, 300 stings)
Moderate effect, Poisoning Severity Score*	32 (6 hospitalized with 35, 50, 200, 300, 950 stings; number unknown for 1)
Minor effect, Poisoning Severity Score*	110
Not followed (managed on-site)*	140
Unable to follow and unknown	35

# Stings/person; Arizona 3 years

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# Lessons learned from deaths

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Thirteen of fourteen deaths were men

Four were climbing or hiking

Four occurred at home (several were foolish attempts to remove bees from homesite)

Three were working on backhoes or tractors (noise?)





# Things we concluded must be done by Emergency Rooms:

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In ERs: Physicians/nurses need to test for toxic effects; labs are needed after the stings for 24-48 hours

Anyone with over 50 stings should be hospitalized and observed for biphasic anaphylaxis and toxic clinical effects

# Who needs to be targeted for education about massive bee attacks:

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Hikers and climbers

Landscapers

Heavy equipment operators

Homeowners

Questions?

