



PAIN RATINGS OF SOLITARY WASPS

Sphecid wasps in general

Sceliphron caementarium (mud dauber wasp)

Large *Sphex* sp. (cricket hunter)

Sphecius grandis (cicada killer)

Scoliid and tiphiid wasps(white grub parasites)

Potter wasps (eumenids)

Velvet ants (Mutillidae)

Dasymutilla klugii

Spider wasps (Pompilidae)

Pepsis spp. (tarantula hawks)

0-1 If they can sting, it hurts little

1+ Minor sharp & burning pain

1 Minor, sharp pain

2- Moderate, sharp pain

1 Minor pain

0-1+ Minor burning pain

1-3 Usually short, intense burn,
sometimes long lasting

3 Very sharp, burning pain

1-4 Sharp, pure short-lived pain

4 Immediate, electrifying, pure,
intense, debilitating pain for 3 min



EC 0498-0006-25

STING-KILL®

SWABS



For
insect bites
and stings



QUICK • CONVENIENT • DISPOSABLE

Helps relieve the pain and itch
of insect bites and stings

5 SWABS
½ cc each

SEE BACK PANEL FOR FULL INSTRUCTIONS

PRESCRIPTION TREATMENT®

PT Quarterly

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SPECIAL REPORT:

Stinging Insects

An update on the latest
information about
stinging insect control.



Prescription Treatment
A Division of the American College of Allergy, Asthma & Immunology







Pepsis (tarantula hawks)



THE BIG BREAKTHROUGH??

(THE BEGINNING OF THE END)

April 1996 article in OUTSIDE MAGAZINE

By Richard Conniff



plus “**flare**” by Katie Arnold

THAT SMARTS!

Justin O. Schmidt's guide
to verminous hurt

Sweat bee: "Light and ephemeral, almost fruity. A tiny spark has singed a single hair on your arm." **Pain rating: 1**

Fire ant: "Sharp, sudden, mildly alarming. Like walking across a shag carpet and reaching for the light switch."

Pain rating: 1.2

Bull-horn acacia ant: "A rare, piercing, elevated sort of pain. Someone has fired a staple into your cheek."

Pain rating: 1.8

Bald faced hornet: "Rich, hearty, slightly crunchy. Similar to getting your hand mashed in a revolving door."

Pain rating: 2

Yellow jacket: "Hot and smoky, almost irreverent. Imagine W. C. Fields extinguishing a cigar on your tongue."

Pain rating: 2

Harvester ant: "Bold and unrelenting. Somebody is using a power drill to excavate your ingrown toenail."

Pain rating: 3

Southern paper wasp: "Caustic and burning, with a distinctly bitter after-taste. Like spilling a beaker of hydrochloric acid on a paper cut." **Pain rating: 3**

Pepsis wasp: "Blinding, fierce, shockingly electric. A running hair dryer has just been dropped into your bubble bath." **Pain rating: 4**

Bullet ant: "Pure, intense, brilliant pain. Like walking over flaming charcoal with a three-inch nail embedded in your heel." **Pain rating: 4+**

Rattlesnake: "Deep, penetrating agony. Unmistakably full-bodied. Analogous to shooting a hot slug into your arm." **Pain rating: well off the chart**

—Katie Arnold

1.0 Sweat bee: Light, ephemeral, almost fruity. A tiny spark has singed a single hair on your arm.

1.2 Fire ant: Sharp, sudden, mildly alarming. Like walking across a shag carpet & reaching for the light switch.

1.8 Bullhorn acacia ant: A rare, piercing, elevated sort of pain. Someone has fired a staple into your cheek.

2.0 Bald-faced hornet: Rich, hearty, slightly crunchy. Similar to getting your hand mashed in a revolving door.

2.0 Yellowjacket: Hot and smoky, almost irreverent. Imagine W. C. Fields extinguishing a cigar on your tongue.

2.x Honey bee and European hornet: Like a matchhead that flips off and burns on your skin.

3.0 Red harvester ant: Bold and unrelenting. Somebody is using a drill to excavate your ingrown toenail.

3.0 Paper wasp: Caustic & burning. Distinctly bitter aftertaste. Like spilling a beaker of hydrochloric acid on a paper cut.

4.0 Pepsis wasp: Blinding, fierce, shockingly electric. A running hair drier has been dropped into your bubble bath (if you get stung by one you might as well lie down and scream).

4.0+ Bullet ant: Pure, intense, brilliant pain. Like walking over flaming charcoal with a 3-inch rusty nail in your heel.

REALITY: WHAT'S THAT?

**i.e. The Actual Risk From
Stinging Insects**

BOTTOM LINES WITH STINGING INSECTS

- Death
- Potential to cause Death

CAUSES OF DEATH

- Toxic Envenomation
- Allergy (Type I Reaction)

TOXIC ENVENOMATIONS

Combination of lethality, amount venom per insect, and the number of insect stings

Plus

Patient factors

LETHALITY OF HONEY BEE VENOMS

	LD ₅₀ (mg/kg)	95% CI
European honey bee	2.8	2.0-4.1
Africanized honey bee	2.8	2.0-4.1
Cape honey bee	3.0	2.0-4.4

AMOUNT OF VENOM IN HONEY BEES

	n	Venom (μg)
European honey bee	121	148
Africanized honey bee	51	156
Cape honey bee	51	187

LETHAL CAPACITY

The lethal capacity (LC) of an insect venom is a measure of the maximum killing power of a sting by that insect.

$$\begin{aligned} \text{LC} &= \frac{\mu\text{g venom in the insect}}{\text{LD}_{50} \text{ in } \mu\text{g/g of the venom}} \\ &= \text{g of mammal receiving an LD}_{50} \text{ dose} \\ &\quad \text{from a single insect sting} \end{aligned}$$

LC of HONEY BEE VENOMS (g/sting)

European honey bee	53
Africanized honey bee	56
Cape honey bee	62

**WHAT ABOUT OTHER
STINGING INSECTS?**

LD₅₀ of INSECT VENOMS

	Species n	LD ₅₀
Honey bees	3	2.8
Yellowjackets	7	6.3
Paper wasps	7	3.2
Harvester ants	22	.6
Fire ants	n/a	large (?)
Bumble bees	3	12
Carpenter bees	3	25
Tarantula hawks	2	92
Velvet ants	1	65

LC of INSECT VENOMS (g/sting)

Honey bees	56
Yellowjackets	14
Paper wasps	59
Harvester ants	32
Fire ants	low (?)
Bumble bees	62
Carpenter bees	11
Tarantula hawks	25
Velvet ants	6

COLONY LC of STINGING INSECTS (kg/colony)

	Indiv./colony	Colony LC
Honey bees	15,000	840
Yellowjackets	3000	42
Paper wasps	50	3
Harvester ants	10,000	320
Fire ants	50,000	?
Bumble bees	300	19
Carpenter bees	1	.011
Tarantula hawks	1	.025
Velvet ants	1	.006

NUMBER of STINGS TO KILL A 110 lb PERSON (LD₅₀ Dose)

	Number of stings
Honey bees	890
Yellowjackets	3600
Paper wasps	850
Harvester ants	1550
Fire ants	n/a
Bumble bees	810
Carpenter bees	4500
Tarantula hawks	2000
Velvet ants	9200

RULE OF THUMB

Expected outcome of normal, healthy adult stung by honey bees and without medical intervention

6 Stings/lb	--	Survival
8 Stings/lb	--	50% chance of survival
10 Stings/lb	--	Death



CONCLUSIONS: ABILITY OF STINGING INSECTS TO CAUSE TOXIC DEATHS

- **Mainly a concern with Africanized honey bees**
- **Very rarely possible with yellowjackets or harvester ants**
- **Essentially not possible with other social insects**
- **Impossible with any solitary bees or wasps**

DEATH FROM ALLERGY

Can be caused by any species of stinging insect

Most commonly caused by yellowjackets, honey bees, and fire ants

Can be caused by a single sting; BUT frequency of hypersensitive reactions and their severity increases with number of stings

Usually, but not always, pt has history of a sting

Mixed toxic and allergic reactions might occur

KEY INDICATORS OF ALLERGIC DEATHS

1. Death usually occurs rapidly; 80% in < 1 hr. If death occurs days later, often involves cerebral reactions
2. Pt has elevated levels of specific IgE to venom of suspected stinging insect; IgG to stinging insect present, often low
3. Tryptase levels elevated

KEY: If possible obtain and freeze non hemolyzed blood for enzyme and IgE analyses

FREQUENCY OF ALLERGIC DEATHS

- 1. Nationwide, the rate stays around 40 per year**
- 2. About 19 from yellowjackets, 17 from honey bees, 3 from fire ants, and 1 from others**
- 3. About 3 million people, or 1% of population, are hypersensitive => death rate very low**

In contrast, only <1 person dies per year from toxic envenomations

IMPLIES: Allergic deaths about 80 times more common than toxic



CONCLUSIONS: DEATHS DUE TO ALLERGY

- **About 80 times as common as toxic deaths**
- **Usually caused by bees, wasps, and fire ants**
- **Tryptase will be elevated in blood**
- **Specific IgE will be present**

KILLER BEES













'The panic, the fear'



Photos by Jeffry Scott, The Arizona Daily Star

Debrah Strait was attacked in Brewery Gulch and stung more than 200 times by the swarming bees

Bees sting 15 in Bisbee, kill dog in Tucson

**KILLER BEES
SWARMING**

**DO NOT WALK PAST
THIS POINT**

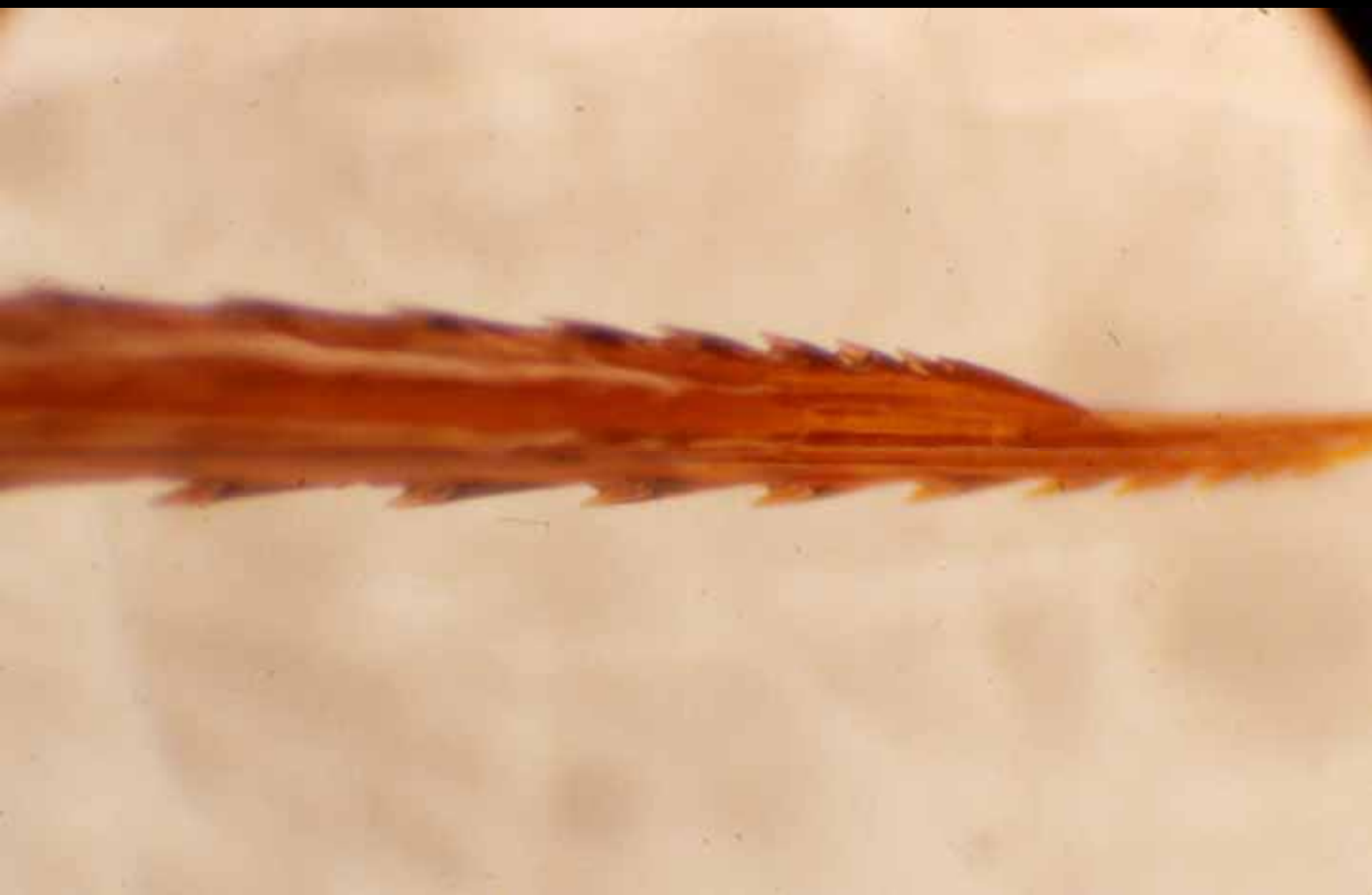
ROLL UP WINDOWS

ORDERS OF BISBEE POLICE











MYTHS and VOODOO

MYTHS and VOODOO



Insect Repellents
stop a bee attack



Final word – And hey, without stings our world would lose some of its beauty.





Picture Me Cute As Can Bee™