CHEMICAL COMPONENTS OF INSECT VENOMS

Insect venoms can vary significantly in their composition. They commonly contain a complex mix of proteins, peptides, and enzymes, as well as smaller molecular weight components. This graphic aims to give a broad overview of some of these components.

The circle surrounding each component is colour coded to indicate whether it is present in bee, wasp, hornet, or ant venom. Note that this represents a general overview, and venoms will vary from species to species.

Bee Venom

Wasp Venom

Hornet Venom

Ant Venom

MELITTIN
A peptide, and a major toxic component of bee venom. Can break up & kill cells.

APAMIN
Can pass through the blood-brain barrier, act on the central nervous system, and block ion channels.

PHOSPHOLIPASE A
An enzyme that breaks up cell membranes and destroys cells. Also a strong allergen.

PHOSPHOLIPASE B
An enzyme, with an effect similar to phospholipase A. These enzymes also help immobilise prey.

ALARM PHEROMONES
Signal and attract other nearby insects of the same species to take defensive action.

HYALURONIDASE
Splits carbohydrates from their complexes with proteins and breaks them down, allowing penetration of venom into tissue.

MCD PEPTIDE
Causes degranulation of mast cells, leading to release of inflammatory agent histamine.

WASP KININ
A peptide that forms a large portion of wasp venom. Its components have yet to be fully characterised.

HORNET KININ
A peptide that forms a large portion of hornet venom. Its components have yet to be fully characterised.

HISTAMINE
Can contribute to pain and itching. It is also one of the chemicals released during an allergic response.

SEROTONIN
Acts as an irritant and contributes towards the pain experienced as a result of the venom.

DOPAMINE
Present only in small amounts. Any effect is largely obscured by other components of venom.

ACETYLCHOLINE
Presence reportedly increases stimulation of pain nerves. Particularly high concentration in hornet stings.

NORADRENALINE
Causes constriction of blood vessels, resulting in reducing blood flow and increasing blood pressure.

FORMIC ACID
A major component of some ant venoms, particularly those that spray their venoms rather than sting.

PIPERIDINE ALKALOIDS
Class of compounds found in fire ant venom, and large contributors to the pain of fire ants' stings.

LETHAL DOSES OF VENOM

Honey Bee	2.8mg/kg
Yellowjacket	3.5mg/kg
Giant Hornet	4.6mg/kg
Harvester Ant	0.12mg/kg