Anaphylaxis due to Indian Black Ant Bite \textit{[Camponotus compressus]} and a Short Review of Literature

Sadananda Naik B*, Krishna Mohan Prabhu**, Jyothi CS***

\textbf{ABSTRACT}

Anaphylaxis and death have been reported due to bite by many species of ants such as fire ant, carpenter ant, black ant (sassum), etc. But anaphylaxis due to the bite of the Common Indian Black Ant (\textit{Camponotus compressus}) is unusual, and has rarely been reported.

We are reporting a case of anaphylaxis due to Indian black ant bite. Though the patient did not provide any previous history of a bite by this ant species, it could be presumed that he could have been bitten earlier.

This case report emphasizes the need for precautions against bites by this species of ant which is widely regarded as relatively harmless.

\textbf{Key Words:} Indian black ant; \textit{Camponotus compressus}; Ant bite; Anaphylaxis

\textbf{Introduction}

Stinging or biting ants are now recognized as being of considerable public health significance in both temperate and tropical regions. Many species of ants produce venoms that contain powerful allergens and these secretions can cause severe local and systemic reactions. Anaphylaxis and death have been reported due to many species of ants such as fire ants, carpenter ants, black ants (sassum), etc.\textsuperscript{1-3} But anaphylaxis due to the bite of the Common Indian Black Ant (\textit{Camponotus compressus}) is unusual, and rarely been reported.

\textbf{The Case:} A 30 year-old man was brought to the hospital with a history of sudden collapse while talking over the phone. He complained of giddiness, itching all over the body, and swelling of lips and tongue. He appeared breathless. On enquiry, the patient recalled killing a black ant after it had bitten him on the palm a few minutes earlier. The patient did not provide any history of known allergy to ant bites. Later the ant was identified as Common Indian Black Ant (\textit{Camponotus compressus}) by experts. This Indian black ant is known colloquially as “Kulpe”, an ant that is notorious for its painful bite in the coastal regions of India, where this case occurred.

On examination, the patient was fully conscious and sweating. His blood pressure was 70/50 mm Hg, pulse 110/minute, and respiratory rate 20/min. He had urticarial rash all over the body, and there was oedema of the lips and tongue. There was a small bite mark on the left palm with redness around it.

\textbf{Investigations:} Routine laboratory investigations revealed the following: Hb 14gm%; total leucocyte count 7700/cu mm; differential count - N68, L30, E2; RBS 128 mg%; and blood urea 30 mg%. Serum electrolytes, renal parameters, and liver function tests were normal. Urine examination did not reveal any abnormal findings. We could not perform skin tests with Indian black ant extract, as it was not available.

The patient was managed with IV normal saline, parenteral chlorpheneramine maleate, hydrocortisone,
adrenaline and nasal oxygen. He showed marked improvement in haemodynamic parameters in 4 to 6 hours and was discharged on the second day.

**Discussion**

The Common Indian Black Ant (*Camponotus compressus*) is a species of formicine ant found in Asia. It is the most common black ant found in India (Fig 1), and is one of the most abundant and best known species. Usually, bites by these ants produce moderate to severe local pain lasting for a few minutes, and may be associated with mild local swelling and erythema. But anaphylaxis due to its bite, as seen in our case is rare and not reported so far. Though our patient did not provide any previous history of bites by this ant species, it can be presumed that he could have been bitten earlier. Being a formicine ant, the Indian black ant produces cytotoxic venom that contains formic acid as the predominant venomous component, and it is present as a 60% aqueous solution. Free amino acids and small peptides are the other constituents of the venom which are responsible for allergic reactions. Formic acid is the most corrosive and cytotoxic of the fatty acids (pKa 3.75) and this leads to dermal necrosis when it comes in contact with the skin in large amounts. Formicine ants lacerate the skin with their mandibles before ejecting formic acid into the wound site. This particular action of these insects leads to severe irritation of the injured area. The high concentrations of formic acid generated by these ants can result in pulmonary irritation as well.

Ants belonging to the family Ponerinae which are seen in Central and South America are known for their severe sting. The bullet ant (*Paraponera clavula*) is one among them. These ants synthesize venom which are rich in a variety of enzymes, including phospholipase A, hyaluronidase, lipase, esterase, etc. Ants belonging to the genus Ecitoninae also have these enzymes in their venom. There are many studies on imported fire ants stings. In a study on adverse reactions to ant stings, Triplett found 50% of a total of 12,438 patients had local swelling, 15% systemic symptoms such as urticaria, and 76 (0.6%) were diagnosed as having anaphylactic reactions. Similarly, Lawrence et al reported 69 cases of anaphylaxis out of 1088 patients treated for imported fire ant stings. The overall incidence of anaphylaxis was found to be about 1% of the patients who were affected. In another study by Klotz JH et al, serious adverse reactions to a diverse array of ant species has been reported. But in none of these studies could we find any report of an Indian black ant bite.

Jack Jumper Ant (JJA; *Myrmecia pilosula* species complex) is responsible for a majority of ant bite anaphylaxis in Australia. Pilosulin3 (Myr p2) is the only major allergen, and [Ile(5)]pilosulin1 (Myr p1), pilosulin4.1 (Myr p3) are minor allergens. There are five more additional unnamed IgE-binding proteins. The bulldog ants of Australia constitute one of the most primitive subfamilies of ants. These aggressive ants of the genus Myrmecia are responsible for severe allergic reactions in a large number of patients. The venom of the families of these ants has been found to have histamine, hyaluronidase and some
other small molecular weight proteins which are responsible for the severe allergy and anaphylaxis.\(^5\)

Thus ant venoms are characterized by far greater structural diversity than other insects. A thorough knowledge of the ant venom and its toxicity will help the treating clinicians to improve the standard of care. The majority of ant bites are self-limiting events, which resolve in a few hours without specific treatment. However, prompt recognition and initiation of treatment is critical in successful management of anaphylactic reactions to ant bites. This case report emphasizes the need for precautions against bites by even relatively “harmless” species of ants.

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