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A Study on Stinging Insects in the Churu Region, Rajasthan (India)

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Abstract – The present study was undertaken in the Churu region of Rajasthan which is part of the Thar Desert. Churu is situated in the north of Rajasthan. This research provides special information about the stinging insects of this region. Stinging insects are belonging to the order Hymenoptera of class Insecta of the Arthropoda phylum. The researcher reported some of the stinging insects in the study area such as - honey bee, bumble bee, carpenter bee, yellow jacket wasp, hornet wasp, potter wasp, hunting wasp and paper wasps, etc. For the study of stinging insects, a sweep net was used for the collection of insects and laboratory work was also done by the researcher to study their venomous sting.

Keywords - Sting, insects, venom, pain, wasps, bees, Churu, Rajasthan, India.

Introduction – Stinging insects are belonging to the order Hymenoptera of class Insecta of the Arthropoda phylum. Stinging insects are taxonomically divided into three groups – Ants, Bees and Wasps. In these insects, only the female bears a venomous sting. The allergic reaction is occurred in the majority by the sting of these insects. These insects delivered painful stings. In Hymenopterans the venomous sting is evolved with their egg depositing apparatus. Hymenopterans venom contains highly potential allergic compounds such as – Melittin present in bee stings and also contains low molecular weight compounds such as – Histamine. All allergens are species specific. Stinging insect venom has a variety of important biological activities such as – organ toxicity, inducing pain, allergic reactions, redness, swelling, etc.

Mostly insect venoms can induce pain that is used for defense purposes against predators because it might be lethal or toxic to potential predators. Generally, insects are not stung but if someone trying to handle or catch them or if they feel threatened by their hive then they are stung for defending themselves. They can sting once or multiple-time or repeatedly. In this research researcher trying to collect, identify and observe the current status of stinging insects found in the study area.

Objectives of the Study-

1. To identify the current status of stinging insects found in the study area.
2. To enhance the knowledge about the stinging reaction of insects.
3. To know the stinging behavior of insects.

Study Area- Rajasthan is the largest state in India by area. It is situated in the northern direction. Geographically it covers 10.4% of the total geographical area of India. It contains most of the wide and unwelcoming Great Indian Desert or the Thar Desert. Churu is a region of Rajasthan which is known as the gateway of the Thar Desert. Churu is located in the north of Rajasthan. A great temperature variation can be seen in this region. In winter the minimum temperature ranges below 0°C whereas in summer the maximum temperature can be seen when it crosses 50°C. There are no rivers and lakes in this area so the vegetation of this area is dependent on rainfall. A very low rainfall occurs in this region. The maximum rainfall occurs in the monsoon season or July month. Scarcity of water and food, dry winds (also known as “loo”), seasonal variation in temperature, sandy soil, desert, etc. are some of the salient features of this desert area.

Method and Material – This study was carried out in the Churu region of Rajasthan monthly from April 2022 to July 2022.

The stinging insect fauna from the study area was collected during a field visit. A sweep insect net was used to capture these insects. Fieldwork, survey method, direct observation, photography, etc. were used for studying sting insects. Laboratory work is also done by the researcher for studying stinging nature and the venomous sting of these insects.

Result and Discussion-

Following stinging insects are observed in the study area:

Table- 01

S.N.	Common Name	Scientific Name
1.	Honey Bee	<i>Apis dorsata</i>
2.	Carpenter Bee	<i>Xylocopa letipes</i>
3.	Bumble Bee	<i>Bombus</i>
4.	Paper Wasp	<i>Polistes dominula</i>
5.	Hornet Wasp	<i>Vespa Linnaeus</i>
6.	Yellow jacket Wasp	<i>Vespula</i>
7.	Potter Wasp	<i>Eumenes</i>
8.	Hunting Wasp	<i>Ammophila sabulosa</i>

Bees: Bees that are away from their hive for collecting nectar are usually rare or not stinging but these are stinging when catch them by roughly handed. Bees actively sting when they assume danger in their hive or nest. The sting of a bee cause wound and pain in the skin and also punctured it. The venom of bees differs in composition and has chemical variations. In the stinging process of a bee, the venom apparatus and stinger remain in the skin and it releases venom continuously. When a bee is stinging, it releases more than 140 micron gm. venom. In repeated stings, the toxin can cause severe illness.

Following stinging bee species are observed in the study area:

1. **Honey bees** - These are social insects and live in colonies. In a honey bee colony, only the queen bee and worker bees are female so they bear a sting whereas the drone or male is stingless. Their stinger is the modification of ovipositor. The honey bee is the only insect of the order Hymenoptera which bears a barbed sting. They can sting with their barbed stinger to the other insects without losing themselves. Worker honey bees sting only once whereas female stings multiple when a person disturbs their nest or hive. Due to the sting of a honey bee allergic reactions, redness, swelling on the skin, etc. may occur by venom components.

2. **Carpenter bees** – These are solitary insects. In this species of bee, only female bees are stinging but the female is not aggressive. It is stinging when handling or touching them. The sting of the carpenter bee causes swelling, inflammation and allergic reaction in the skin.
3. **Bumble bees** – Generally bumble bees are very peaceful insects but these are stinging only when they feel a disturbance in their hive. These are social insects. In their hive queen and workers are female so they bear stingers whereas drones or males are stingless. Bumble bees do not have barbed stings so after stinging they do not detach their sting from the abdomen. It can sting more than one time. Its sting can cause itching, redness, and painful swelling on body parts with looser skin such as – eyelids etc.

Wasps: Wasps are known for their painful sting, so people are afraid of them. Sting is present only in female wasps. In the wasp colony, the queen and workers both are females so they bear stings on tip of the abdomen. The sting of a wasp is venomous. A wasp sting is painful but not dangerous. For one target, female wasps have the ability to sting more than once or multiple times because after they use their sting, it does not fall off. Wasps release 3 micron gm. venom. After stinging, it retracts its stinger from the skin. The sting of a wasp causes a local reaction on the skin such as itching, pain, swelling, redness, burning, etc.

Following stinging wasp species are observed in the study area:

1. **Paper wasps** – Paper wasp sting is not much dangerous but quite painful. These are stinging for defending themselves and protecting their nest when a person tries to trap them, press them against their skin, try to break their nest or colonies, etc. These are social wasps and live in colonies.
2. **Hornet wasps** – They have the ability to inflict a painful sting so these are known as a beneficial predator to control a variety of insect pests. These have a mild sting and cause minor symptoms such as - infection, allergic reaction, etc. These are also social but some of the species are solitary.
3. **Yellow jacket wasps** – They do not quickly to sting but they show aggressive behavior to defend their nest or colonies. They bear a painful sting. Each one has the capability to sting multiple times. They also sting repeatedly. Yellow jacket wasp lives in colonies or shows social behavior.

4. **Potter wasps** – They do not show aggression. Potter wasps also bear a painful sting on the tip of their abdomen and have the potential to deliver it. These are rarely attacks on humans. Mostly potter wasps are solitary but some of the isolated species show social behavior.
5. **Hunting wasps** – Hunting wasp usually stings insects in such a manner as to paralyze them but do not kill them. These are solitary insects.

Conclusion – The discussion in this study focuses on the sting insects found in the Churu region of Rajasthan. Insects including order Hymenoptera bears sting on the tip of their abdomen. Honey bee, carpenter bee, bumble bee, yellow jacket wasp, potter wasp, hunting wasp, hornet wasp, and paper wasp are some of the insects of order Hymenoptera which are included in stinging insects. Insects are stinging to defend themselves when they feel threatened or in danger in their hive and when someone trying to catch or handle them. Mostly females bear a stinger and their stings are venomous and painful whereas male hymenopterans do not have a sting. Due to the sting, there are local as well as systematic reactions occur. Local reactions occur around the area of the sting while systematic reaction occurs in the internal part of whole the body. Allergic reactions, itching, redness, swelling on loose skin body parts such as – eyelids, etc. are some of the instant reactions that occur just after being stung by insects.

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