

Colonial Spider's Venom Gland

Prelims: Current events of national and international importance | Environment

Why in News?

*Indian researchers have produced the first comprehensive molecular and functional profile of the venom gland of the colonial spider *Stegodyphus sarasinorum*, indicating anti-cancer drug potential.*

Key Highlights of the Study

- Researchers combined transcriptomics, proteomics, metabolomics and Confocal Raman spectroscopy to map the molecular composition and spatial distribution of biomolecules in the venom gland.
- **31 Protein Components** - Transcriptomic analysis identified 31 annotated protein components, including venom-associated and non-venom proteins.
- **32 Proteins Identified** - Proteomic analysis independently identified 32 proteins in the venom gland.
- **81 Metabolites** - UHPLC-Mass Spectrometry identified 81 metabolites, including amino acids, biogenic amines, nucleotides, nucleosides, quaternary amines and organic acids.
- **Anti-Cancer Potential** - Venom-gland extracts showed **dose-dependent cytotoxicity** against **Dalton's lymphoma ascites (DLA) cells** in laboratory experiments.
- **Antimicrobial Potential** - Certain venom peptides, including **U12 and U20 lycotoxins**, are of interest because of their ability to disrupt cellular membranes, making them potential templates for antimicrobial and anticancer research.
- **Hemocyanin Proteins** - The study also identified hemocyanin proteins, which have attracted interest because of their immune-modulating and potential cancer-immunotherapy relevance.
- **Antioxidant Activity** - The venom gland showed radical-scavenging activity in assays involving DPPH, ABTS, hydrogen peroxide and hydroxyl radicals, indicating potential antioxidant applications.

About *Stegodyphus sarasinorum*

- **Social Spider** - Unlike most spiders, which are solitary, *S. sarasinorum* lives in **large, permanent colonies** and cooperatively captures and feeds on prey.
- **Indian Cooperative Spider** - It is also known as the **Indian cooperative spider**.
- **Family** - **Eresidae**, commonly associated with velvet/social spiders.
- The World Spider Catalog recognises *S. sarasinorum* as an accepted species.
- **Distribution** - Its recorded distribution includes Pakistan, India, Sri Lanka, Nepal and Myanmar.
- **Habitat** - It occurs particularly in **dry, shrubby and seasonal habitats**, with communal silk nests often constructed on shrubs and trees.
- **Cooperative Behaviour** - Members of the colony cooperate in prey capture, feeding and brood care.



Reference

[The Hindu | Stegodyphus sarasinorum](#)

