



Brazilian Velvet Ant

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Why in News?

A study in the *Beilstein Journal of Nanotechnology* revealed that the **Brazilian velvet ant (Traumatotilla bifurca)** has "ultrablack" body parts.

- These parts absorb over 99.5% of visible light, making them nearly invisible. The discovery highlights unique **biological nanostructures** with potential applications in technology.

What are the Key Facts About Brazilian Velvet Ant?

- **Taxonomy:** Velvet ants are not "ants," they are a species of **wasp** from the family **Mutillidae**.
 - Velvet belongs to the **Hymenoptera order**, which also includes **bees and other wasps**.
 - Some species, such as **Traumatotilla bifurca (Brazilian velvet ant)**, display **distinct black and white markings**, making them visually striking in **tropical savanna and dry shrub deserts**.
- **Ultrablack Property:** Female velvet ants display an ultrablack color which was first observed in **Traumatotilla bifurca**, which absorbs nearly all visible light.
 - The unique color comes from **special microstructures in the exoskeleton** that trap light. Ultrablack pigmentation helps with **camouflage, temperature control, and attracting mates**.
- **Males vs. Females:** **Only female velvet ants display ultrablack coloration**, while males have similar black markings but reflect more light.
- **Role in Ecosystem:** Serves as a pollinator and contributes to maintaining ecological balance.
- **Evolutionary Significance:** The ultrablack property highlights convergent evolution, where unrelated species develop similar traits.
 - This adaptation is also observed in **birds-of-paradise** and **deep-sea fish**, aiding in camouflage and survival.
- **Potential Scientific Applications:** The ultrablack property reveals insights into nanostructures and inspires advancements in [stealth technology](#) and [solar panel efficiency](#).

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Note:

- Ants, though small in size, have colonized nearly **every landmass on Earth**. Their total biomass is expected to surpass that of birds and mammals combined.
 - **Biomass, in ecological context**, refers to the **total mass of living organisms, including plants and animals**, within a given area or volume of a habitat.
- Ants are **eusocial insects** with highly **organized colonies** that demonstrate significant cooperation and division of labor.
- According to the [World Economic Forum](#), Ants use **feedback (responses to actions)** to regulate **foraging** (searching for food), conserving energy and resources. This **principle of minimizing waste** can enhance efficiency in systems like energy use or data management.
 - Additionally, Ants operate without **central control**, proving that complex tasks can be managed through simple interactions.
- A study published in *Proceedings of the National Academy of Sciences* demonstrated that ants, particularly **longhorn crazy ants (Paratrechina longicornis)** excel in collective problem-solving by coordinating efforts without verbal communication.
 - According to the study **Ants outperformed humans** in an experiment involving carrying a **T-shaped object** through obstacles.