

Carabid Ground beetles

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Why in news?

Recent studies have identified carabid ground beetles as potential bioindicators for tracking soil microplastics.

- Carabid ground beetles are **insect species** belongs to the insect order Coleoptera.
- **Family** - Carabidae, one of the largest insect families, with approximately 40,000 species worldwide.
- **Habitats** - Carabids live in a diverse **range of terrestrial environments** - from forests and grasslands to agricultural fields and urban areas.
- They are often found under logs, rocks, leaf litter, and in soil cracks, especially in moist locations.
- **Appearance** - They are recognized by their long legs and shiny black or brown elytra (wing covers), which are decorated with ridges and may be fused together along the midline.
- **Size** - Adult beetles can range greatly in size, from as small as 2 mm to over 35 mm long.
- **Adaptations** - They are known for their long, powerful legs, which allow them to run rapidly after prey.
- Some species are flightless due to fused elytra.
- **Defense mechanism** - When threatened, many species emit a **pungent, chemical-based odor** from abdominal glands to deter predators.
- **Feeding habits** - These **nocturnal** hunters have broad feeding habits, eating not only other insects but also seeds of plants (including weeds).
- **Diet** - Their diet includes common garden and crop pests such as snails, slugs, caterpillars, aphids, mites, and fly maggots.
- Unfortunately, their diet has also begun to include microplastics.
- **Ecological importance** - They play a vital part of many ecosystems, and a key role in biological pest control, improving soil health, and acting as

bioindicators for environmental health.



Quick Fact

Recent Scientific Findings

- **2025 pilot study** - A key pilot study conducted in Italy provided the evidence of microplastic ingestion by carabid beetles.
- It involved setting ***pitfall traps*** at sites with varying levels of human activity.
- **Method** - Researchers dissected the guts of the trapped carabid beetles and used *optical microscopy and infrared spectroscopy* to identify and characterize ingested microplastics.
- **Results** - They carried microplastic fragments, mostly *polyester and silicone*, ranging from 0.1 to 1 mm in size and often no larger than a grain of sand.
- The highest rate of ingestion occurred at the site with the ***highest level of human tourism***, confirming that carabids can reflect localized pollution.
- **Implications** - Carabid beetles can be integrated into bio-monitoring programs as a *cost-effective way* to assess the extent of microplastic contamination in a location.
- It offering a valuable tool for future large-scale environmental monitoring programs.

References

1. [The Hindu | Carabid beetles as potential bioindicators](#)
2. [Britannica | Ground Beetles](#)
3. [eOrganic | Ground Beetles](#)



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