

Megachile bees (leafcutter and dauber bees) are true bees just like honey bees but do not make honey that people can harvest. Individuals live independently of the others (i.e. they are solitary) and only the females provide for their young ones. *Megachile* bees are not aggressive, have a mild sting that is much less painful than that of a honey bee, and is only used when they are handled.

Common Name (Language)

Leafcutter bees, dauber bees (English)

Scientific classification

Class: Insecta

Order: Hymenoptera

Family: Megachilidae

Subfamily: Megachilinae

Tribe: Megachilini

Genus: *Megachile* (Latreille, 1802)



Species in the genus

The genus *Megachile* is a group of solitary bees. *Megachile* is one of the largest genera of bees, with more than 1500 species found throughout the world. It is likely that more than 100 described *Megachile* species occur in East Africa (Rwanda, Burundi, Kenya, Tanzania and Uganda).

Species in East Africa

Six of the most common species that occur in East Africa are *Megachile accraensis*, *M. apiformis*, *M. eurymera*, *M. rufipes*, *M. rufiventris*, and *M. torrida*.

Description

Many *Megachile* bees have a greyish appearance due to the presence of pale hairs over a black cuticle. Pale bands of hair across the abdomen are common. The *Megachile* bees in East Africa vary from 9 – 22 mm in length. Females of most species have large mandibles (“jaws”) for cutting leaves and flowers that they use to build their nests. *Megachile* bees have no sticky pads (arolia) between their claws and therefore cannot climb smooth walls and glass

Economic / Ecological importance

All *Megachile* bees in East Africa are pollen-collecting bees. They have long tongues and can feed on deep or shallow flowers. However, *Megachile* bees are generally not recognised as bees by local people in East Africa – in Uganda they are often called ‘high speed flying flower beetles’ – and there is no knowledge of their nesting sites or foraging habits. Yet, their habit of quickly visiting wild and domesticated plant flowers makes them important pollinators. They increase agricultural productivity and assist in the conservation of the natural biological diversity in the Region.

Potential confusion with similar taxa

Some insect species, such as other bees, beetles and flies can be mistaken for *Megachile* bees. Many people confuse *Megachile* bees with honey bees. They can be easily distinguished by observing their behaviour. *Megachile* bees carry their pollen under the abdomen and cut leaves to form their nests and do not live in colonies as honey bees do. The bee genera *Ceratina* (small carpenter bees), *Xylocopa* (carpenter bees), and *Halictus* (sweat bees) can also be mistaken for *Megachile* bees but differ in that they carry their pollen in hairy brushes on their hind legs. Flies can be distinguished from *Megachile* bees as they have only two wings while bees have four wings. Some ground beetles and ladybeetles can also be confused with *Megachile* bees. Beetles have hardened fore-wings (elytra) while bees have four membranous wings.

Documented distribution in Kenya, Tanzania, Uganda

Megachile bees are found in most Districts / Regions of Kenya, Tanzania and Uganda.

Habitats

Megachile bees can be found in various habitats (land-uses) in East Africa such as grasslands, natural forests, marshlands, protected areas, farmlands, rangelands, woodlands, woodlots (forest plantations), along river edges (riparian areas) and in coastal areas.

Nesting

There are two nesting behaviours among *Megachile* bees. In the leafcutter bees, females neatly cut pieces of leaves or petals to build their nests, hence their common name. Most leafcutter bee species nest in sheltered locations in pre-existing natural cavities such as burrows, crevices and hollow twigs in any of the habitats listed above. The bees partition their nests with pieces of cut leaf which they typically construct a single long column of cells. The female lays an egg into each one of these cell that she provides with pollen and nectar for her growing larva. Daubers use mud instead of leaves, and also sometimes build exposed nests that look like a ball of mud on a twig.

Crops visited

Megachile bees are efficient pollinators of a variety of flowering crop species belonging to different plant families in East Africa. These include cucurbits, sunflower, eggplant, mango, avocado, watermelon, beans, coffee and cowpeas. Leafcutter bees are being domesticated in North America to pollinate alfalfa in open fields. No attempts have been made to domesticate leafcutter bees in East Africa.

Other plants visited

Megachile bees occurring in East Africa visit a range of wild plant species (trees, shrubs, herbs, weeds, lianas, grasses) in different habitats, especially plants with small greenish to whitish flowers. Some plants visited provide only building structures for the leafcutter bee nests.

Threats

In East Africa, *Megachile* bees and most other bee taxa are threatened by factors such as habitat degradation, agricultural intensification, the overuse of pesticides, collection of dry wood and pests and diseases. Farming practices that involve over-digging of soils in any type of habitat threaten populations of these bees since they often nest in underground burrows (some live in woodborer tunnels in wood). Natural enemies of *Megachile* bees (e.g. some parasitic wasps and bees) can threaten leafcutter bee populations when their numbers are already low.

Conservation and management practices

In the past little information on the usefulness of these bees to the lives of the people in East Africa has been gathered and there have been no scientific or farmer efforts to conserve them. However, information is now being sought and best practices for conservation and management of these bees in will be developed and utilised for improving crop productivity. Theoretically, bee conservation and management is inexpensive and adopted activities can also improve the aesthetic value of the landscape. Such practices involve setting land aside (e.g. a 1-metre strip) in the farmland to host all year round food resources for the bees, as well as safer sites for nesting, mating, resting and hiding from natural enemies. During flowering, farmers should manage pesticide usage carefully to avoid poisoning flower-visiting bees. Farmers should also minimise pesticide drift from the field to adjacent areas. Trampling by people and livestock and tilling should be managed to conserve the nesting sites of those species that nest in burrows. Leafcutters need a supply of plants from which to collect nesting material and daubers need a source of mud and resin. KARI (the Kenya Agricultural Research Institute) is developing protocols for mass rearing of different species of solitary bees. Any successful results from this research will be freely communicated to the public.

Legislation (national and international)

There is not yet any legislation in East Africa that explicitly addresses pollinators. However, there is scattered legislation for the protection of biodiversity particularly that covering environmental protection, protection of wildlife and heritage sites, protection of forests and natural resources such as water catchments. In addition, there are laws governing registration and commercialization of pest control products. These legislations, together with developments such as the Good Agricultural Practices (GAPs) codes, standards and regulations may help to protect bees albeit incidentally. Farmers should lobby their governments to develop Integrated Pest Management policies that would protect bees and other useful insects of importance in agriculture.

Sources of Further Information and Links

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Editors

Muo Kasina, Kenya Agricultural Research Institute (KARI) - Kenya; Théodore Munyuli, Busitema University - Uganda; Juma Lossini, Tropical Pesticides Research Institute (TPRI) – Tanzania; John Mauremootoo, BioNET-INTERNATIONAL Secretariat – UK; Connal Eardley, Plant Protection Research Institute (PPRI) – South Africa.

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Factsheet series

- 01 Pachyanthidium bees
- 02 Afranthidium bees
- 03 Allodapula bees
- 04 Ceratina bees
- 05 Anthophora bees
- 06 Tetraloniella bees
- 07 Macrogalea bees
- 08 Melitta bees
- 09 Hypotrigona bees
- 10 Liotrigona bees
- 11 Meliponula bees
- 12 Pseudapis bees
- 13 Nomia bees
- 14 Lipotriches bees
- 15 Amegila bees
- 16 Apis (Honey) bees**
- 17 Halictus bees
- 18 Lasioglossum bees
- 19 Megachile bees
- 20 Xylocopa bees