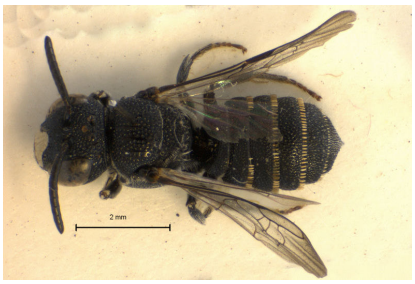
Ceratina bees are insects just like honey bees but they do not make honey. They do not make honey and for long people have perceived them as just insects and not bees. This factsheet intends to provide information about these bees so that the public familiarize themselves with these. The public should also be aware that honey bees are some of bees and there are other kind of bees, like these described here, that do not make honey but are important for other aspects of human wellbeing. *Ceratina* bees are not aggressive but can sting when squeezed e.g. with hand or when trapped n the clothing and a friction occurs. The intensity of the sting is not documented but may not be as painful as that of a honey bee. Please enjoy reading and enlighten other people of these different bees.

Scientific Classification

Kingdom: Animal
Phylum: Arthropoda
Class: Insecta
Order: Hymenoptera
Family: Apidae
Subfamily: Xylocopinae
Tribe: Ceratini
Genus: *Ceratina* Latreille, 1802



Species in the Genus

Ceratina is a genus that comprises of about 350 species distributed throughout the world. *Ceratina* bees (small carpenter bees) are closely related to the more familiar ("large") carpenter bees (*Xylocopa* species).

Representative Species in East Africa

More than 20 species have been recorded in different habitats in East Africa - Rwanda, Burundi, Kenya, Tanzania and Uganda (Eardley & Urban 2010) though a comprehensive list of *Ceratina* species for the Region has not yet been produced. Three of the most common species of *Ceratina* bees in East Africa are *Ceratina lineola*, *Ceratina lunata, and Ceratina rufigastra.*

Description

Ceratina bees are not well known by local people (including farmers) and scientists in East Africa. *Ceratina* bees are usually dark, shining, even metallic bees, with relatively little body hair and a weak pollen carrying structure (scopa) on the hind tibia (second leg segment). Most species have some yellow markings, mostly only on the face but also often elsewhere on the body. In Uganda, it is easy to identify some *Ceratina* bee species by their size and colour such by which they can be characterised as "blue shining", "black shining", etc.

Economic / Ecological importance

These bees are important pollinators of crops and plants. In so doing, they enhance productivity of crops, which in turn provides farmers with more income from commodity sales. In addition, farmers have enough to eat, both quantity and quality wise. Ecologically, they pollinate shrubs and plants and ensure their reproductive success. Some of the shrubs are important in erosion control and are source of food to animals and wildlife. Their presence is a good indicator of ecosystem

Similar Taxa/Possible Causes of Confusion

Some insect species can be confused with the larger *Ceratina* bees: These include species that are frequently seen on flowering plants during peak blooming periods such as leafcutter and dauber bees (*Megachile* bees), halictine bees and small beetles (Coleoptera species). Female *Ceratina* bees can be distinguished from *Megachile* bees by the fact that they carry pollen on the hind legs whereas *Megachile* bees carry pollen under the abdomen. *Ceratina* bees can be distinguished from halictine bees by their mouthparts (*Ceratina* bees have a long glossa – "tongue") and their hind wings (which have a tiny jugal lobe – posterior area of wing). Beetles have hardened fore-wings (elytra) while bees have four membranous wings. Smaller *Ceratina* bees can be confused with *Allodapula* bees (also sometimes known as small carpenter bees). *Ceratina* bees are mostly well sclerotized ("armoured") and robust, whereas *Allodapula* bees are weakly sclerotized and fragile looking.

Documented Distribution in Kenya, Tanzania, Uganda

Ceratina bees are found in most Districts/Regions of Uganda, Kenya and Tanzania (Eardley and Daly 2007; Eardley, Gikungu and Schwarz 2009).

Habitats

Ceratina bees can be found in various habitats (land-uses) in East Africa such as grasslands, natural forests, wetlands, marshlands, open habitats, protected areas, farmlands, rangelands, woodlands, woodlots (forest plantations), riparian areas.

Nesting Sites

Most *Ceratina* bee species are solitary bees that make nests in dead wood, stems, or pith. However, a number are subsocial, with mothers caring for their larvae, and in a few cases where multiple females are found in a single nest, daughters or sisters may form very small, weakly eusocial colonies (where one bee forages and the other remains in the nest and lays eggs). Most species occurring in East Africa nest in self-made tunnels in woody materials on the ground, in the soil and in walls of abandoned houses or in the soil. A few species are exceptional among these bees in that they are parthenogenetic, i.e. they reproduce without males (Michener 2007).

Crops Visited

Most *Ceratina* bee species in East Africa collect nectar and pollen from various flowering crop species belonging to different plant families (are polylectic) while a few visit a narrower range of plants (are oligolectic). These bees are efficient pollinators of crops such as beans, cowpeas, simsim (sesame), apples and coffee.

Other Plants Visited

In East Africa, *Ceratina* bees visit various plant species, notably those in the Fabaceae, Malvaceae, Rubiaceae and Asteraceae families. In East Africa, *Ceratina* are wild bees (not yet domesticated but with potential for being domesticated as efficient pollinators of many crops - “ceratiniculture”) that visit various wild plant species (trees, shrubs, herbs, weeds, lianas) found in different habitats. These bees preferably visit plant species with small yellow, white, green, milk-cream and purple coloured flowers.

Threats

In East Africa, *Ceratina* bees and most other bee taxa are threatened by factors such as habitat degradation, agricultural intensification and misuse of pesticides. Information about the effects of their pests and diseases is lacking though these play important ecological role in regulation of population dynamics of species. Wood collection can affect nesting sites of wood-nesting species. The lack of knowledge about these bees and their economic importance by the farmers is far the most serious threat to their existence. This is because conservation and management practices implemented at farm level depend to a large extent upon the value that farmers attach to the bees.

Conservation and Management Practices

Little information exists on the usefulness of these bees to the lives of the people in East Africa. However, information is now being sought and best practices for conservation and management of these bees 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. Wood collection should be managed to conserve nesting sites wood-nesting species and trampling by people and livestock and tilling should be managed to conserve the nesting sites of soil-nesting species. 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. In addition, KARI is collaborating with other stakeholders to ensure in situ conservation and management of bees for pollination purposes. Much of the

work of conserving native bees will be underpinned by raising public awareness of the importance of these species.

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, laws governing registration and use of plant protection products also indirectly play a major role in the protection of pollinators. Such legislation, 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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