WESTERN AUSTRALIAN museum

Information Sheet

Discovery of the 'megamouth bee' - *Leioproctus* sp.

Male of the new species

This remarkable solitary native bee was discovered in December 2010 when the Museum's Curator of Insects, Dr Terry Houston, and Museum volunteer, Mr Otto Mueller, went looking for a gazetted rare and endangered bee species in bushland at Forrestdale, only about 20 kilometres from Perth CBD. While scouring the bushland for that species (unsuccessfully as it turned out) a chance observation by Mr Mueller of an insect entering a hole in the ground led to discovery of the new species.

Similar in size to honeybees, both sexes of the new species are distinguished by being black with a partial covering of white hair and having the tip of the abdomen bright orange-red. The head is rounded and appears disproportionately large, particularly in males which also possess much enlarged, fierce-looking jaws.

Following the initial capture, further specimens (females) loaded with pollen were observed entering burrows in the ground and other individuals (large-headed males) were seen cruising around close to the ground. This was clearly a nesting aggregation and, surprisingly, it was situated in an area subject to inundation during winter.

Facial views of male (above) and female (below).

Subsequent observations over the following week brought to light some unusual behaviour among males and a likely explanation of their large head size. Each burrow in which a female was busy constructing brood cells was occupied also by a male which stationed itself just below the burrow entrance looking upward. The male permitted the female to come and go but repelled other males. This burrow

guarding behaviour is something not recorded previously for a solitary bee species. Males of solitary bees usually spend all their active hours flying around the preferred forage flowers or over the nesting areas and can potentially mate with many females. Large-headed males are known for a few other kinds of bees but, in these cases, the bees nest communally and securing access to multiple females is the name of the game. 'Megamouth' males each have access to only one female. Perhaps each male mates with his nest companion repeatedly thus ensuring that it is his sperm that fertilizes each and every egg she lays in the nest. Also, he may deter parasitic insects from entering the burrow, thus ensuring a greater survival rate for his progeny.

Head of male with jaws extended

As an authority on Australian native bees, Dr Houston was stunned by the discovery of this species. He has worked at the Western Australian Museum for 32 years and has collected extensively in the Perth region and beyond. Discovering such a handsome species with such novel male behaviour in close proximity to a large metropolis is what makes this such a remarkable find. How could such a striking species have escaped detection for so long? Four factors may have contributed. First, pollen samples taken from females and brood cells matched the pollens of nearby tall paperbark tea-trees (*Melaleuca* species) and spearwood (*Kunzea glabrescens*). The flowers of these plants are borne high on the crowns of the trees, so females foraging on them would remain mostly out of the reach and gaze of entomologists. Second, these plants tend to occur in isolated pockets of damp land. Third, they flower only for a limited period in late spring and early summer. Fourth, the bee's burrow entrances are extremely inconspicuous (those of other solitary bees are usually surmounted by a conspicuous 'tumulus', a volcano-shaped mound of excavated soil).

The Perth region has a large native bee fauna, at least 50 species being known. Evidently more may yet be discovered. Most of them depend on the native flora and some are very specialized, gathering pollen and nectar from just one to a few closely related kinds of plants. If our bushlands disappear, the bees will disappear with them. The bushland where the 'megamouth' species was found forms part of 'Jandakot Regional Park' but this does not guarantee its survival. For Dr Houston it would be a tragedy to see this bushland developed for housing or other uses, particularly as it is not yet known if the new bee survives elsewhere or if the Forrestdale bushland is its last refuge.

In collaboration with bee taxonomist Dr Glynn Maynard, Dr Houston is preparing a scientific paper in which the new species will be named and described and its habits outlined. The new species belongs to the large and diverse genus *Leioproctus* in the short-tongued bee family Colletidae but it cannot be assigned to any of the existing subgenera and may require a new subgenus to be created for it. Dr Houston proposes that the species name will honour Otto Mueller whose keen eye spotted the first specimen.

Author: TFH. 18 January 2011