

Biodiversity Record: The rare solitary bee, *Lipotriches goniognatha*, and its host plants at Kranji

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Subjects: Angle-jawed austral-nomia, *Lipotriches (Austronomia) goniognatha* (Insecta: Hymenoptera: Halictidae);
Sedge, *Cyperus aromaticus* (Angiospermae: Poales: Cyperaceae);
Sedge, *Fimbristylis cf. umbellaris* (Angiospermae: Poales: Cyperaceae).

Subjects identified by: Zestin W.W. Soh and John S. Ascher (bee); Ho Boon Chuan and Phan Thi Thanh Nha (plants).

Location, date and time: Singapore Island, Kranji Coastal Nature Park, Junior Wetland; on three days — 4 June 2023 at 1047 hrs, 9 June 2023 at 1020 hrs and 11 June 2023 at 0900–1050 hrs.

Habitat: Marshy, freshwater pond situated near coastal mangrove forest.

Observers: Kam Yung Soh (4 June), Zestin W.W. Soh (9 June), Zestin W.W. Soh and Yu Jun Lim (11 June).

Observations: There are three separate observations —

- 1) A male bee of about 7 mm total length, readily identifiable by the enlarged hind femora, was found resting on a plant on 4 June 2023 and recorded on iNaturalist (<https://www.inaturalist.org/observations/165457463>).
- 2) On 9 June 2023, two female bees were observed foraging for pollen from the inflorescences of two species of sedge (Cyperaceae), *Fimbristylis cf. umbellaris* and *Cyperus aromaticus*, growing along the trail (Fig. 1B–D). The bees foraged by sonicating and causing the release of pollen (Fig. 1D). A visual check for *Lipotriches goniognatha* was also carried out at flowering plants typically visited by native halictid bees (e.g., *Leea rubra*, *Melastoma malabathricum* and *Premna serratifolia*), but this species was not found visiting them.
- 3) On 11 June 2023, two male bees were observed resting on plants near the water's edge (Fig. 1A). At least three female bees were also observed foraging from *Fimbristylis cf. umbellaris* and *Cyperus aromaticus*.

Remarks: Following the above-mentioned field observations of this species, we were also able to establish that an earlier sighting of a female *Lipotriches* from the same location recorded on iNaturalist on 14 January 2023 was also *Lipotriches goniognatha* (<https://www.inaturalist.org/observations/146532370>). The bee was photographed visiting water snowflake (*Nymphoides indica*), but the images do not show clearly if it was foraging for pollen or drinking nectar.

Lipotriches (Austronomia) goniognatha (Cockerell, 1919) is a native solitary bee rarely observed in Singapore, with only two country records known to precede 2023 (Soh & Ascher, 2020; Ascher et al., 2022). *Nomia pachypoda* Cockerell (1920), a junior synonym, was described based on a male specimen collected by Charles Fuller Baker in 1918 (Pauly, 2009). A male specimen was subsequently recorded at Kranji in 2009 by a malaise trapping project investigating the insect diversity of mangroves (Grootaert & Puniamoorthy, 2014; Yeo et al., 2021). Given the paucity of recent records, it is heartening to re-observe this species and confirm its persistence in Kranji after 11 years. Indeed the presence of this bee species and other nationally rare taxa at Kranji Coastal Nature Park and Sungei Buloh Wetland Reserve underscore the biodiversity conservation value of these areas (Wan et al., 2021; Loh et al., 2022).

Little is currently known about the biology and pollen hosts of *Lipotriches goniognatha*, and in consideration of its small size and inconspicuous colouration, the species was assessed to be 'Data Deficient' in a national conservation status assessment of bees by Ascher et al. (2022). The newly documented foraging from wetland-associated plants and its presence at a freshwater wetland habitat in Kranji Coastal Nature Park suggest that this species is associated with this

habitat type. Targeted surveys of similar wetland habitats across Singapore may help clarify the extent of its local distribution and shed light on its conservation status.

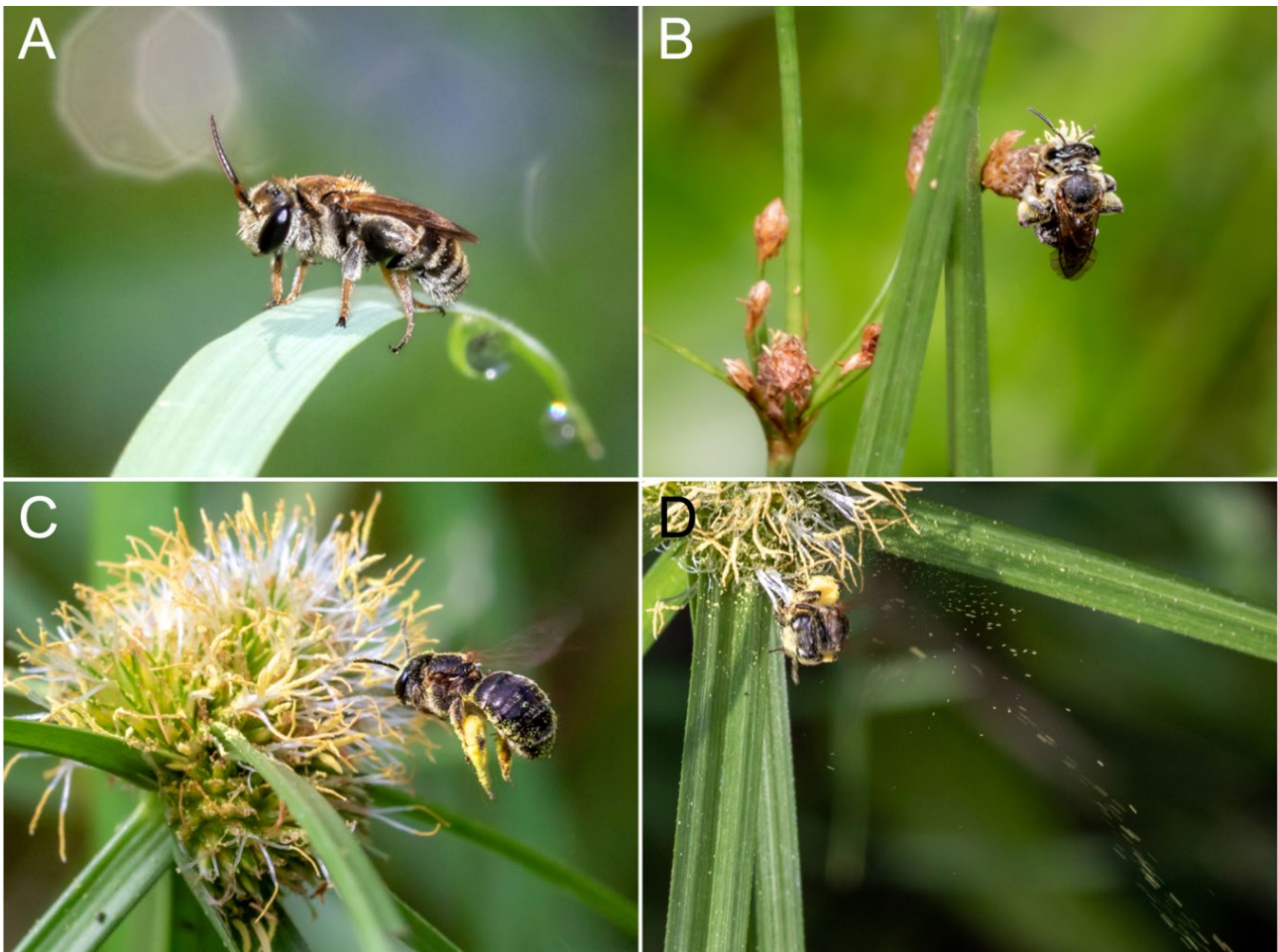


Fig. 1. Male and female *Lipotriches goniognatha* at Kranji Coastal Nature Park. (A) A male bee at rest on a leaf on 11 June 2023. (B) Female bee collecting pollen from *Fimbristylis* cf. *umbellaris* on 9 June 2023. (C & D) Female bees collecting pollen from *Cyperus aromaticus* on 9 June 2023. (Photographs: Zestin W. W. Soh).

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