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## Stingless bees (Hymenoptera: Apidae: Meliponini) of the Indian subcontinent: Diversity, taxonomy and current status of knowledge

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### Abstract

Eight named species of stingless bees are known from the Indian subcontinent: *Lepidotrigona arcifera* (Cockerell), *Lisotrigona cacciae* (Nurse), *Lisotrigona mohandasi* Jobiraj & Narendran, *Tetragonula* aff. *laeviceps* (Smith), *Tetragonula bengalensis* (Cameron), *Tetragonula gressitti* (Sakagami), *Tetragonula iridipennis* (Smith), *Tetragonula praeterita* (Walker), and *Tetragonula ruficornis* (Smith). Lectotypes are newly designated for *T. bengalensis* and *T. ruficornis*. Keys, comparative notes, and illustrations for species identification are provided. The distribution of stingless bees throughout the Indian subcontinent are summarized and concluding that they are found in most parts of the Indian subcontinent, except at higher elevation or the drier interior regions. Additional collections and studies are urgently needed to clearly define the species limits of the complex “*iridipennis*” species group.

**Key words:** *Tetragonula*, *Lisotrigona*, *Lepidotrigona*, *Trigona*, *Melipona*, India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, taxonomy, potential distribution

### Introduction

This is an account of the specimens upon which the eight specific names of stingless bees from the Indian subcontinent are based, as well as references to what has been published about the distribution and biology of the stingless bees of that region. With this information, and after additional collecting of specimens and nest data, it will be possible to prepare a complete revision of the Indian stingless bee fauna even though most of the relevant type specimens are in museums far from India.

Bee-keeping involving several species of native honey bees (*Apis* spp) is a very important enterprise with a long tradition in the Indian subcontinent (including the countries India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan) (Batra 1977, Engel 1999). Less known is the fact that stingless bees have also been kept for centuries in India, Sri Lanka and Nepal (Crane 1999, Kumar *et al.* 2012). As in other regions where stingless bees occur, colonies have been kept in tree logs, wooden boxes, and clay pots for harvesting small quantities of highly prized medicinal honey, and also for the wax and propolis, produced and gathered by the bees and used for its household and curative properties (Crane 1999). While the medicinal properties of the honey are little explored for the Indian subcontinent when compared to that of the Neotropical species (Rodríguez-Malaver *et al.* 2009, Choudhari *et al.* 2012, Surendra *et al.* 2012), the botanical origin of the honey has been explored (Phadke 1968, Joshi *et al.* 1998), as have the plants visited by the bees (e.g., Ramanujam *et al.* 1993, Viraktamath *et al.* 1999, Devanesan *et al.* 2002, Danaraddi 2007, Danaraddi *et al.* 2011). In fact, most research on stingless bees from the Indian subcontinent has focused on their role as crop and native flora pollinators (e.g., Raju *et al.* 2000, Raju *et al.* 2009a). Earlier studies of stingless bees have also dealt with worker communication (Lindauer 1956, Lindauer & Kerr 1958, 1960), taxonomy and morphology (George 1934, Sakagami 1978, Jobiraj & Narendran 2004, Danaraddi *et al.* 2012), as well as their nesting biology (Danaraddi *et al.* 2009).

Recent accounts report five named species of stingless bees from the Indian subcontinent (Sakagami *et al.* 1990, Jobiraj & Narendran 2004) and presumably several unnamed species that remains to be described (Sakagami *et al.* 1990, Rasmussen & Cameron 2007, 2010). Additional species from the Indian subcontinent are here removed