

Morphometrical studies on the stingless bee, *Trigona iridipennis* Smith

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Morphometrical studies comprising of fifteen characters of *Trigona iridipennis* Smith from eight places of Karnataka were made during 2006-2007. It was found that the bees collected from different parts varied in the morphometrical parameters, but the variations were not significant. All the bees had five hamuli. These studies indicate the occurrence of *T. iridipennis* throughout Karnataka.

Key words : Morphometrical, Stingless bee, *Trigona iridipennis*

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INTRODUCTION

Stingless bees are taxonomically different from honey bees. The honey bees (Apinae), bumble bees (Bombinae) and stingless bees (Meliponinae) belong to the family Apidae. The species coming under Meliponinae are divided into two tribes Trigonini and Meliponini. All Asian and African stingless bee species belong to the tribe *Trigonini*. The various genera in this tribe include *Trigona*, *Plebeia*, *Tetragona* and *Nanotrigona*. The genus *Melipona* consists of about 40 species, medium to large sized bees all of which occur in Neotropics (Camargo *et al.*, 1988). *Trigona* is the largest and most widely distributed genus, which includes 130 species under ten sub-genera. The species found in Karnataka (Biesmeijer, 1993) Kerala (Mohan and Devanesan, 1999) and Tamil Nadu have been reported as *T. iridipennis* (Swaminathan, 2000). In order to understand the variation among the population of *T. iridipennis* in Karnataka, the morphometrical studies were made and the results are presented in this paper.

RESEARCH METHODOLOGY

In order to study morphometry of *T. iridipennis*, a sample

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of 20 stingless bees were collected from each of the following places *viz.*, Bangalore, Dharwad, Sirsi, Bijapur, Shimoga, Chitradurga, Raichur and Gulbarga. These bees were collected from foraging sources so as to represent the mean population of that place. Then the following morphometric parameters were recorded under the stereoscopic binocular microscope fixed with ocular micrometer in one of the eye pieces. These parameters included, length of body, width of head including eyes, width of thorax, width of abdomen, length of proboscis, length of forewing, length of femur, length of tibia, length of metatarsus, width of forewing, width of femur, width of tibia, width of metatarsus, inter ocellar distance and number of hamuli.

The morphometric data were subjected for statistical analysis (One- Way ANOVA method) to study the extent of variation in the population of *T. iridipennis* in Karnataka.

RESEARCH FINDINGS AND ANALYSIS

Various morphological parameters of *T. iridipennis* measured during the present investigations are presented in Table 1 and 2. Body length of worker bees collected from different places ranged from 3.93 mm from Shimoga to 4.12 mm

Table 1 : Morphometrics of the body of stingless bee, *Trigona iridipennis*

Sample source → Parameters ↓	Length of body (mm)	Width of head including eye (mm)	Width of thorax (mm)	Width of abdomen (mm)
Bangalore	4.10	1.52	1.61	1.51
Dharwad	4.07	1.59	1.61	1.47
Sirsi	3.98	1.53	1.50	1.40
Bijapur	3.98	1.53	1.52	1.39
Shimoga	3.93	1.56	1.44	1.34
Chitradurga	4.1	1.59	1.42	1.30
Raichur	4.07	1.61	1.4	1.32
Gulbarga	4.12	1.59	1.38	1.27
S.E. ±	0.88	0.39	0.61	0.63
C.D. (P=0.05)	NS	NS	NS	NS

NS=Non-significant

Table 2 : Morphometrics of body appendages of the stingless bee, *Trigona iridipennis*

Sample source → Parameters ↓	Length of proboscis (mm)	Length of forewing (mm)	Length of femur (mm)	Length of tibia (mm)	Length of metatarsus (mm)
Bangalore	1.30	3.54	0.90	1.32	0.46
Dharwad	1.35	3.78	0.93	1.39	0.48
Sirsi	1.33	3.65	0.9	1.39	0.46
Bijapur	1.37	3.59	0.86	1.34	0.47
Shimoga	1.34	3.62	0.89	1.35	0.50
Chitradurga	1.38	3.66	0.90	1.37	0.49
Raichur	1.41	3.69	0.92	1.33	0.49
Gulbarga	1.40	3.67	0.92	1.33	0.52
S.E. ±	0.23	0.77	0.38	0.34	0.24
C.D. (P=0.05)	NS	NS	NS	NS	NS

Table 2 (Contd....)

Sample source/ → Parameter ↓	Width of forewing (mm)	Width of femur (mm)	Width of tibia (mm)	Width of metatarsus (mm)	Inter ocellar distance (mm)	No. of hamuli
Bangalore	1.17	0.23	0.49	0.27	0.37	5
Dharwad	1.41	0.23	0.47	0.28	0.37	5
Sirsi	1.32	0.26	0.48	0.28	0.37	5
Bijapur	1.36	0.25	0.48	0.29	0.37	5
Shimoga	1.33	0.24	0.48	0.27	0.38	5
Chitradurga	1.37	0.26	0.47	0.29	0.38	5
Raichur	1.36	0.26	0.50	0.30	0.39	5
Gulbarga	1.34	0.23	0.49	0.31	0.39	5
S.E. ±	0.65	0.18	0.23	0.19	0.17	0.02
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS

NS=Non-significant

from Gulbarga. Body length of *T. iridipennis* in Karnataka was similar to the length of bees reported from Kerala (Devanesan *et al.*, 2003). The width of the head including eyes ranged from 1.52 (Bangalore) to 1.61 mm (Raichur). Similarly the width of thorax and abdomen varied from 1.38 (Gulbarga) to 1.61 mm (Bangalore and Dharwad) and 1.27 (Gulbarga) to 1.51 mm (Bangalore), respectively. The proboscis length of the bees collected from different places varied from

1.30 mm (Bangalore) to 1.41 mm (Raichur). Forewing length of worker bees ranged from 3.54 (Bangalore) to 3.78 mm (Dharwad). The width varied from 1.17 (Bangalore) to 1.37 mm (Chitradurga). The length of femur ranged from 0.86 (Bijapur) to 0.93 mm (Dharwad). Similarly the width of femur which ranged from 0.23 (Bangalore, Dharwad and Gulbarga) to 0.26 mm (Sirsi, Chitradurga). The length of tibia varied from 1.32 (Bangalore) to 1.39 mm (Dharwad, Sirsi) and the width varied

from 0.47 (Dharwad, Chitradurga) to 0.50 mm (Raichur). The length of metatarsus collected from different places ranged from 0.46 (Bangalore) to 0.52 mm (Gulbarga). Similarly the width of metatarsus varied from 0.27 (Bangalore, Shimoga) to 0.31 mm (Gulbarga). The inter ocellar distance which ranged from 0.37 (Bangalore) to 0.39 mm (Raichur and Gulbarga). However, these variations were non significant. All the bees collected from different places in Karnataka had five hamuli.

However, Kuberappa *et al.* (2005) have reported that the bees from hilly zones were bigger while from central dry zone were smaller. They attributed this variation to the diversity in floral resources available in these areas. In the present study, 5 hamuli were observed in all the bees collected from different parts of Karnataka, which also corroborate the findings of Devanesan *et al.* (2003) and Kuberappa *et al.* (2005).

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