

Indo-Malayan Stingless Bees



Pictorial Identification guide and Composite
Algorithm

Compiled by Abu Hassan Jalil & Ibrahim Shuib

Based on: Key to Workers,
Stingless bee workshop notes (Debra Smith 2012)

Step 1 Cuticle Tessellation

dorsal view,
"tessellation" on
cuticle, yellow
scales

Genera:
Lepidotrigona

If NO
go to
Step 2



Lep. ventralis



Lep. latipes



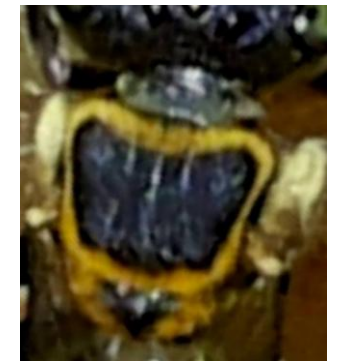
Lep. hoozana



Lep. doipaensis



Lep. cf. arcifera



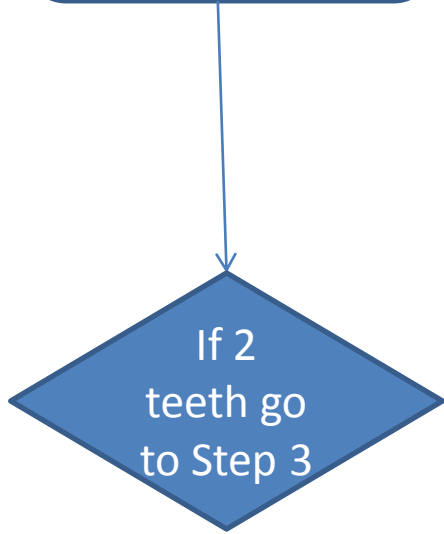
Lep. terminata

Step 2 Mandibles

Mandible with 1 tooth

Genera:

Heterotrigona



Heterotrigona erythrogastra - 1 tooth



Geniotrigona thoracica – 1st large, 2nd small denticle.



Lophotrigona canifrons - 2 moderate teeth



Tetrigona apicalis – 2 small (fine) teeth



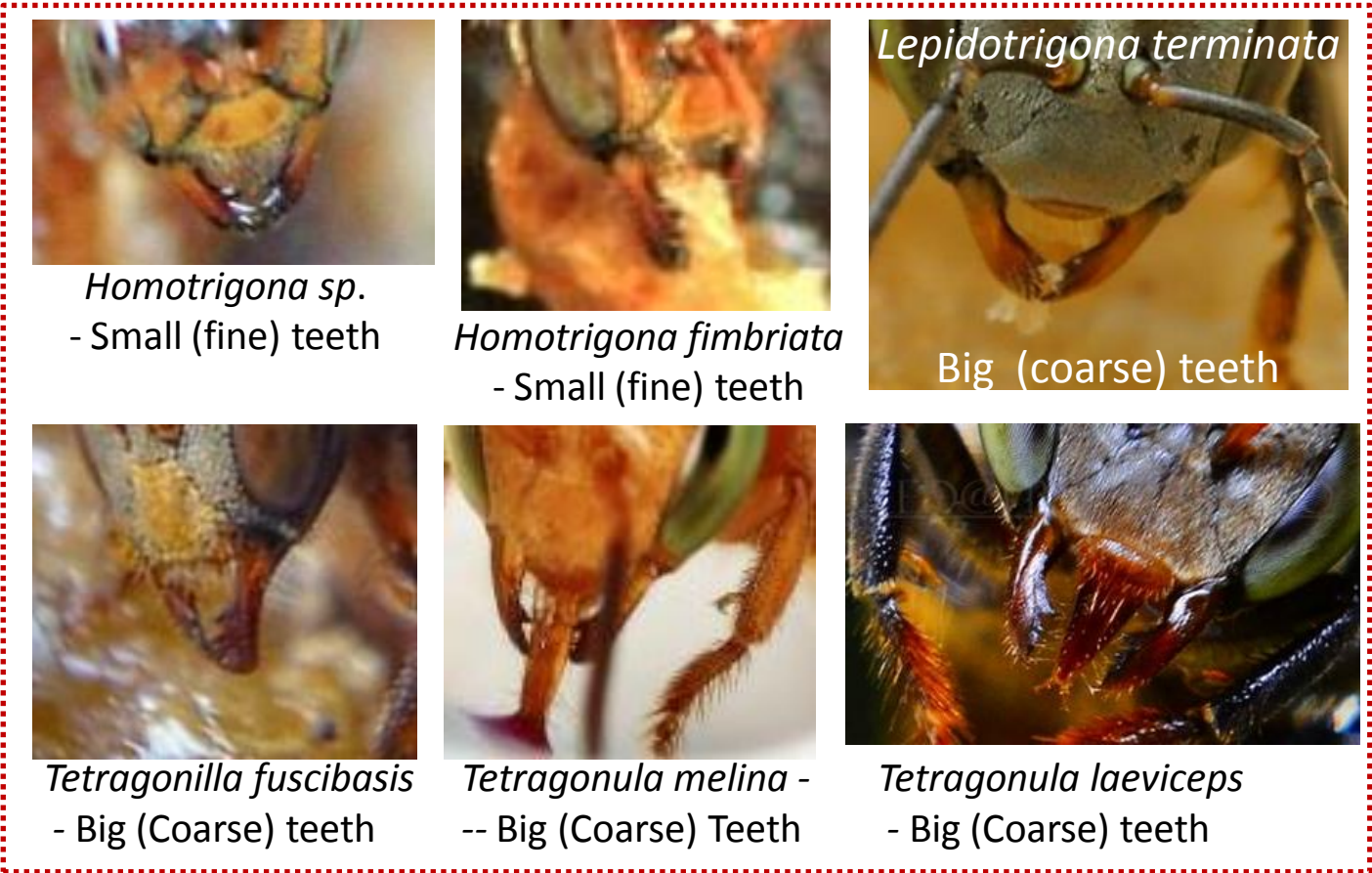
Tetragonilla atripes - 2 teeth – 1st halfway on mandible

Step 3 Teeth or Denticles

Mandible with small (fine) to moderate teeth go to step 6

Genera: *Homotrigona* *Odontotrigona*
Lophotrigona *Tetrigona*

If big teeth go to Step 4



Homotrigona sp.
- Small (fine) teeth



Homotrigona fimbriata
- Small (fine) teeth



Lepidotrigona terminata
Big (coarse) teeth



Tetragonilla fuscibasis
- Big (Coarse) teeth



Tetragonula melina -
-- Big (Coarse) Teeth



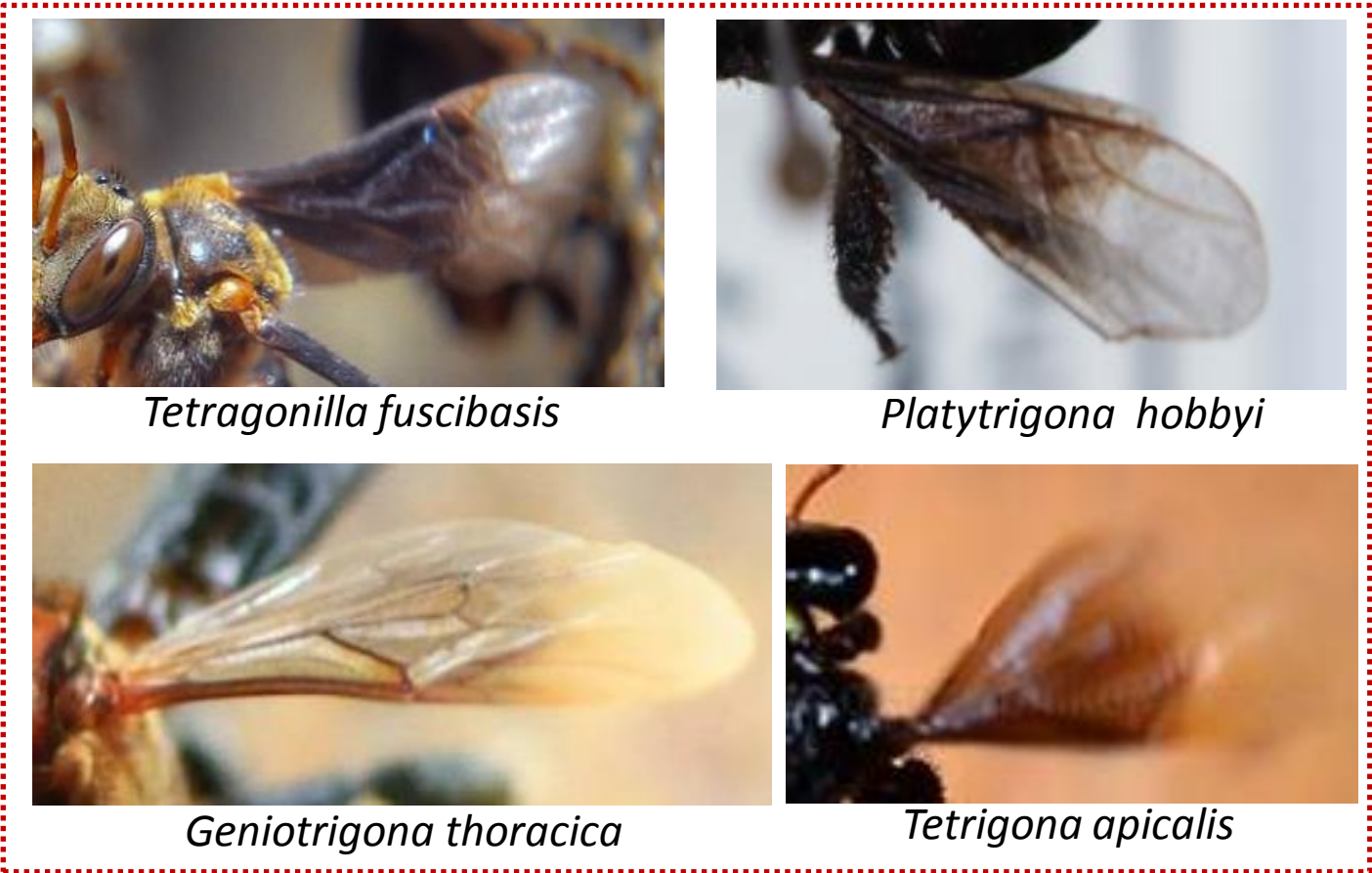
Tetragonula laeviceps
- Big (Coarse) teeth

Step 4 Wing Membrane

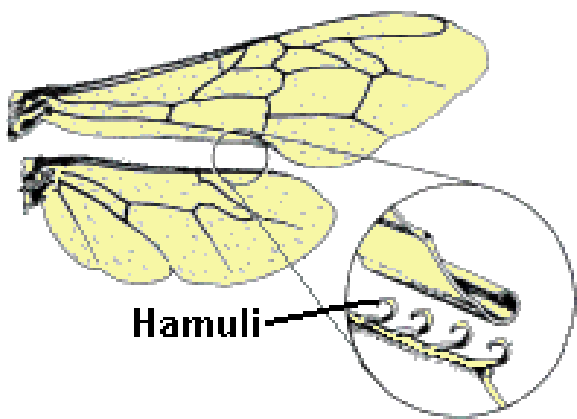
Wing Membrane
2 tone- Dark at base, clear or white at apex
Go to Step 6

If clear/
monotone
go to Step
5

- Genera:
- Tetragonilla*
 - Tetrigona*
 - Platytrigona*
 - Geniotrigona*

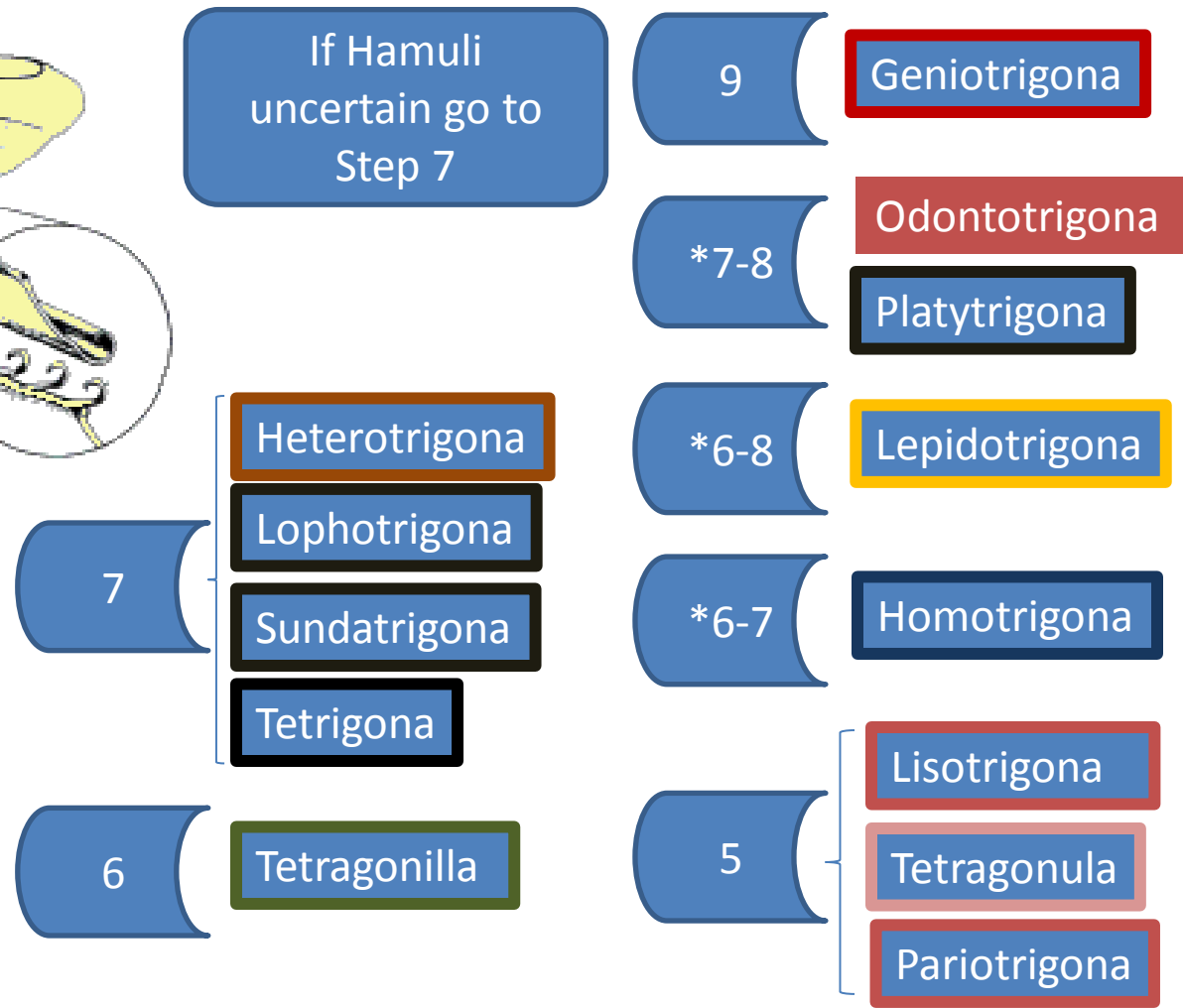


Step 5 Wing Hamuli



If Hamuli uncertain go to Step 7

*Some species may have asymmetrical # of hamuli having 6 or 7 on one wing while having 7 or 8 on other wing.



Step 5a Wing Hamuli

Wing Hamuli 5
Go to Step 6a
check for hairbands

Genera with 6 hamuli :

Lepidotrigona

Tetragonilla

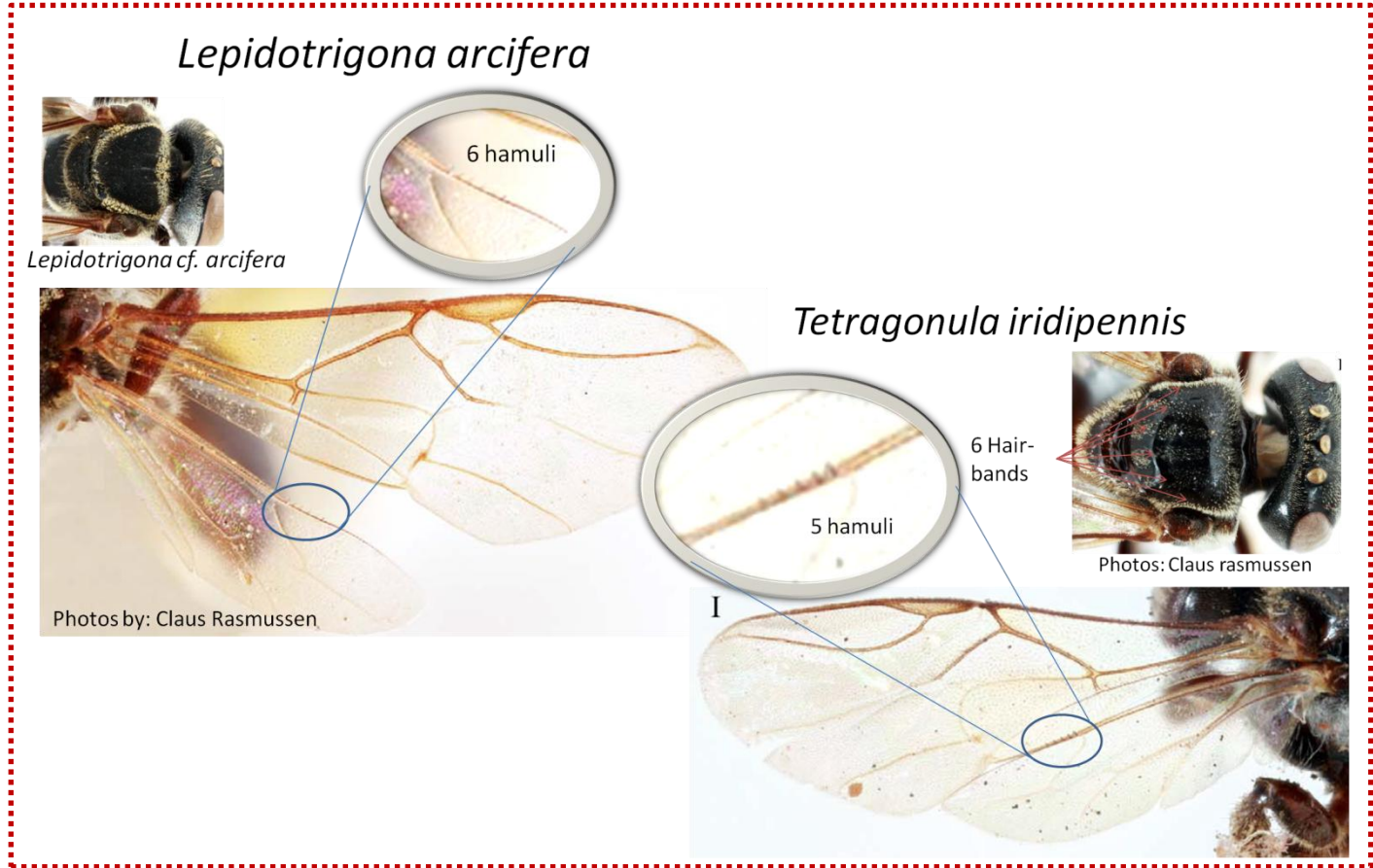
Homotrigona

Lisotrigona

Tetragonula

Pariotrigona

If uncertain
go to Step 7

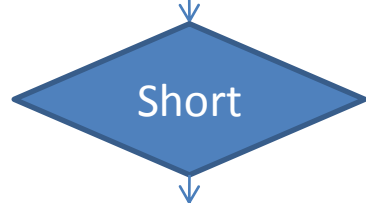


Step 6 Scutellum

Short scutellum or slightly over-roofing the metanotum
Go to Step 7

Genera with long or large overhanging scutellum :

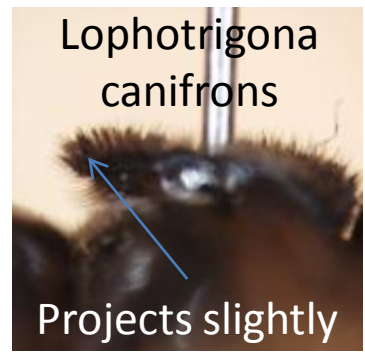
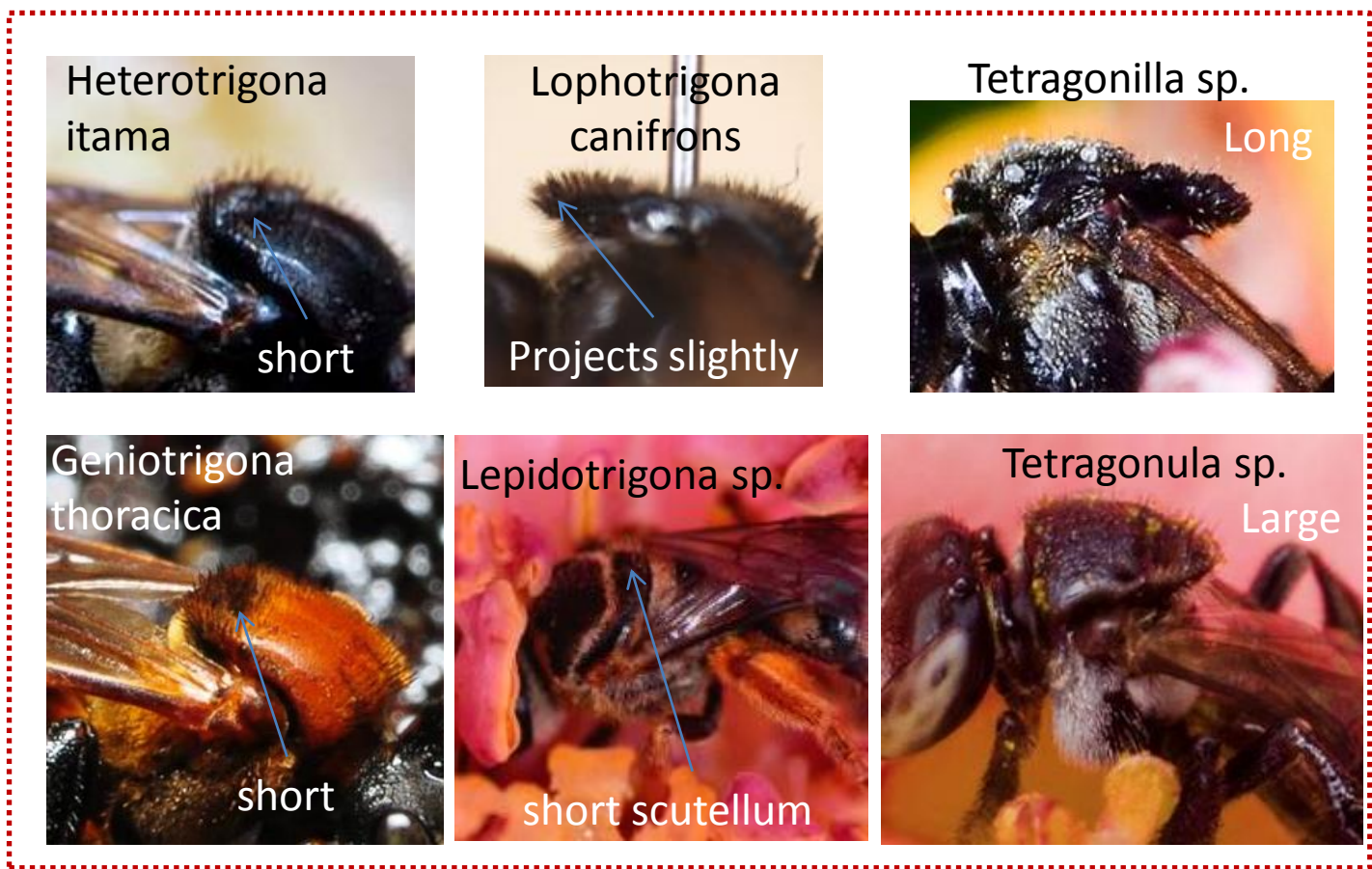
- go to Step 5
- Tetragonula
- Tetragonilla



Genera with short scutellum:

- Geniotrigona
- Heterotrigona
- Lepidotrigona
- Sundatrigona

Projects slightly
go to Step 8



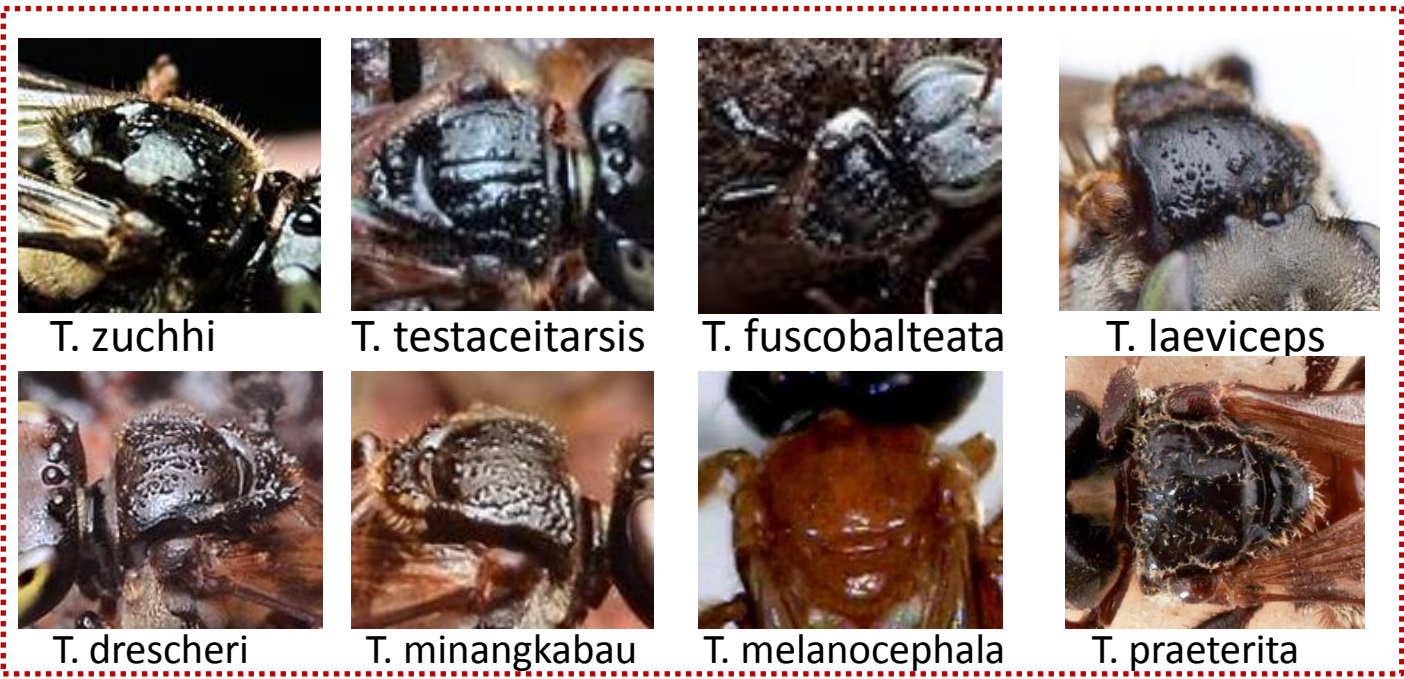
Step 6a Hair Bands

Hair bands on scutum

Genera with 6 hair bands on scutum:

Tetragonula

If No go to Step 10



Step 7 Malar space

About equal to dia. of 4th flagella Segment
Go To Step 8

Genera with very short or linear malar space

- Lisotrigona
- Tetragonula
- Tetragonilla

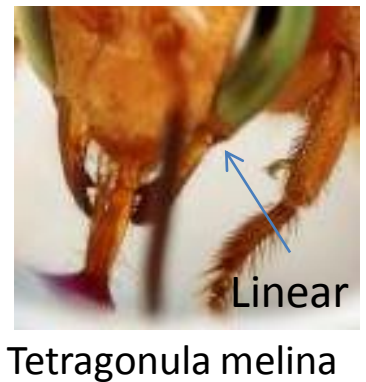
Check hair bands on scutum

Less than flagella width
go to Step 10

- Homotrigona
- Lepidotrigona

Larger than flagella width
go to Step 9

- Tetrigona
- Geniotrigona
- Pariotrigona
- Odontotrigona



Equal to flagellar width

- Platytrigona
- Sundatrigona
- Lophotrigona
- Heterotrigona

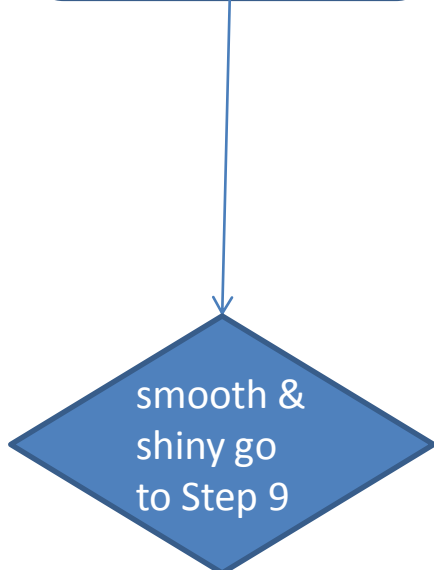


Step 8 Propodeum

Posterior median area with hairs

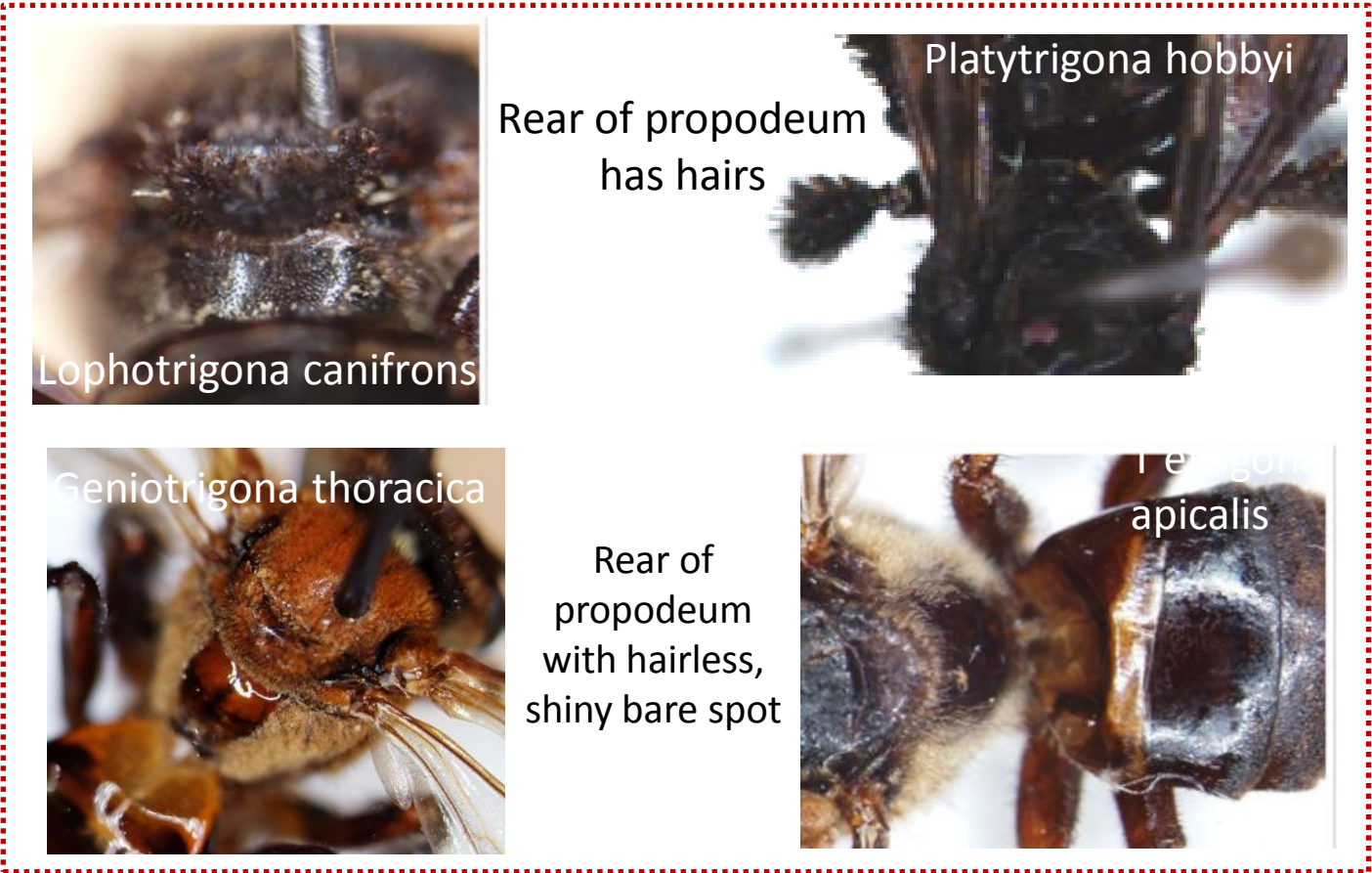
Genera with hairy rear propodeum

- Platytrigona
- Lophotrigona



Geniotrigona

Tetrigona



Rear of propodeum has hairs



Rear of propodeum with hairless, shiny bare spot

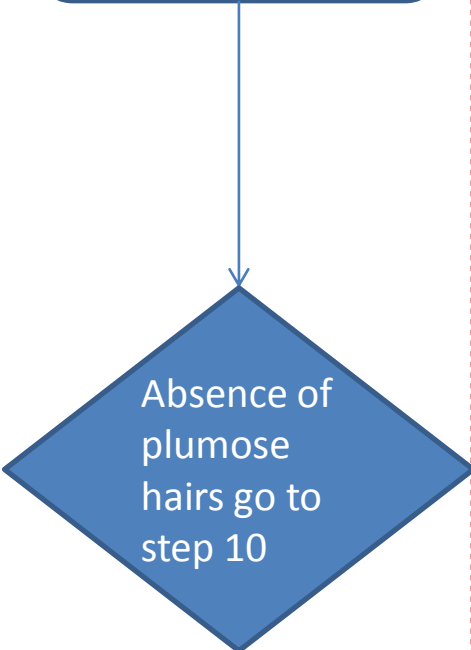


Step 9 Rear Tibia Hairs


- Pariotrigona
- Lisotrigona
- Lepidotrigona

Plumose hairs on hind tibia go to step 5


Genera with simple hairs




Hind tibia with plumose hairs on posterior rim



Tetrigona apicalis




Lepidotrigona terminata

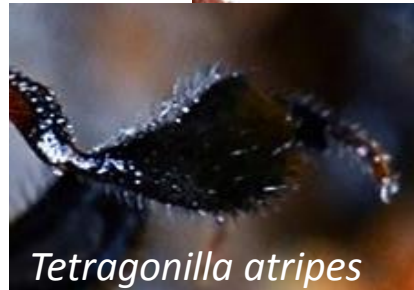


Lepidotrigona arcifera

Simple hairs on hind tibia



Geniotrigona thoracica



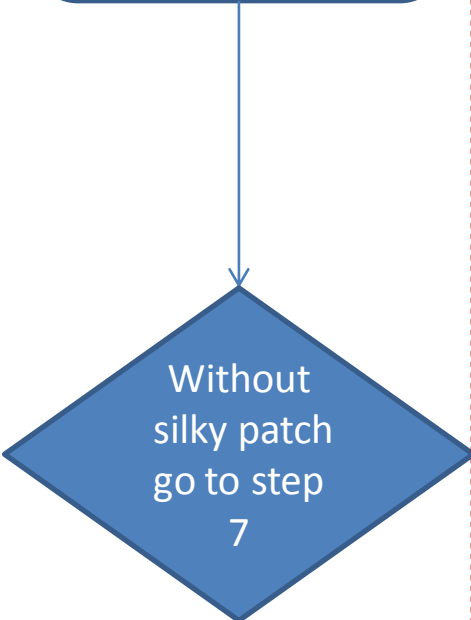
Tetragonilla atripes

Step 10 Hind Basitarsis


Sericeous patch on Inner face of hind basitarsis
go to step 5

Genera without sericeous *patch*


- Pariotrigona
- Lepidotrigona
- Homotrigona
- Lisotrigona



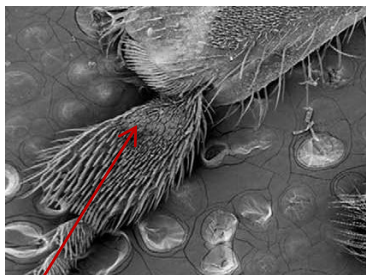
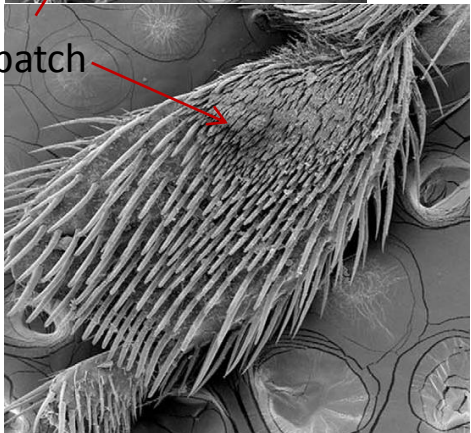
Tetrigona binghami



hind basitarsis with silky patch




Tetrigona peninsularis

Heterotrigona itama

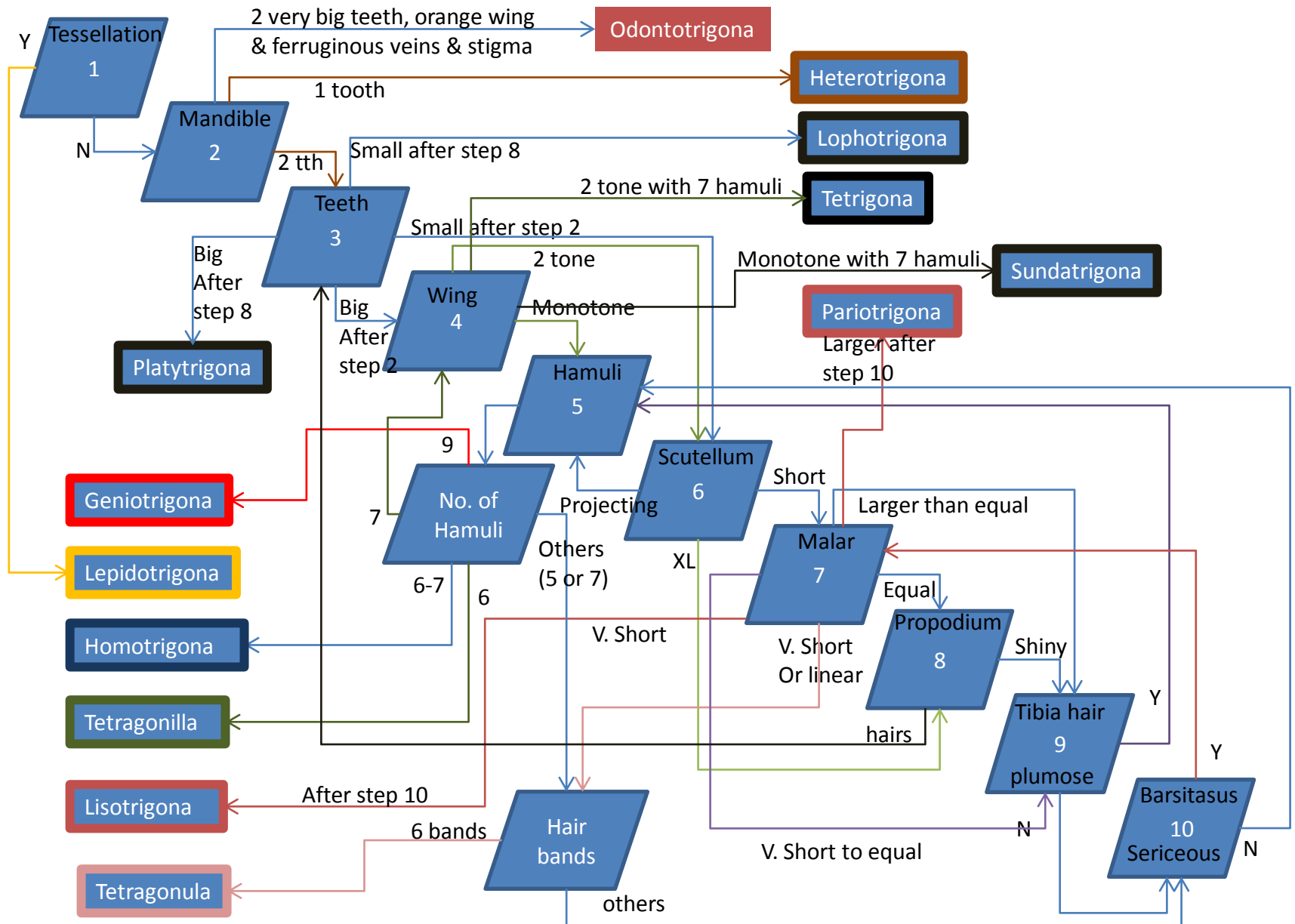
Lepidotrigona terminata



Lepidotrigona latipes

No sericeous patch on hind basitarsis

Indo-Malayan Meliponine Composite Identification Key Algorithm



Geniotrigona

Malar space very long, more than the twice diameter of antennal flagellum.

Hind basitarsus very wide, fully 2/3 as wide as the hind tibia. (Scutellum and propodeum short; scutellum not projecting over the propodeum.

Medium to large bees, body length 5-8 mm.)

Geniotrigona Moure 1961

Large woolly bees, body length usually 8 to 9 mm

Geniotrigona thoracica (Smith 1857)



Photo: Paimin Ponijan

The occipital region of the head is not raised, but there is a distinct median incision in the margin.



Reddish (castaneous) thorax and light colored wing tips.



Dark scutum with fulvous hairs on scutellum and clear wings



Photo: Morilee Mahar

Coxae, trochanters and femora rufous like the thorax, tibia and tarsi black;

Heterotrigona

The mandible with only one denticle or tooth at the inner edge of its apex. (Malar space very long, at least twice as long as the diameter of the antennal flagellum. The scutellum short, not salient. The erect hairs on the vertex, the mesonotum, scutellum, and mesopleura black. The hind basitarsi wide, about 2/3 the width of their tibiae.).....**Heterotrigona..Schwarz 1939**

Mesothorax distinctly dullish; scutellum hairy;**Heterotrigona itama (Cockerell 1918)**

Mesothorax extremely smooth and polished; scutellum bare;**Heterotrigona bakeri (Cockerell 1919)**

Wing membrane may have light orange tint. Abdomen / metasoma with at least some of the segments reddish..... **Heterotrigona erythrogastra (Cameron, 1902)**

Heterotrigona itama



Photo: Rosafandi Rosli

Hetreotrigona bakeri



Photo Acai Ibrahim

Heterotrigona erythrogastra



Photo: Abu Hassan

Homotrigona

The inner face of hind basitarsus without a basal sericeous area, instead with bristles from base to apex. (The malar space relatively short, about as long as the scape is wide. The hind tibiae are very wide, almost half as wide as the joint is long. The hind basitarsi are very narrow compared to the tibiae.) Body length 6 $\frac{3}{4}$ to 8 $\frac{3}{4}$ mm..... **Homotrigona Moure 1961**

The middle and hind tibiae and basitarsi black.....***Homotrigona fimbriata* (Smith 1857)**



Homotrigona fimbriata

Photos Hisyam Ismail

Lepidotrigona

Lepidotrigona ventralis



Photo: Deborah Smith

L ventralis hoozana



Photo: I Hsin Song

Lepidotrigona doipaensis



Photo: Azmi Awang Azmi

L. terminata



Photo: Syafeeq Ahmad

L. nitidiventris



Photo: Zestin Soh

L. palavanica

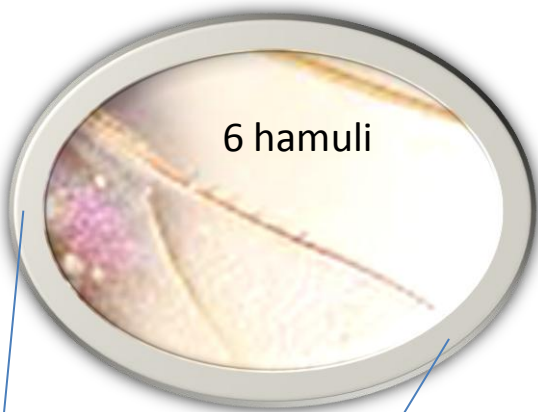


Photo: Zahari Deraman

Lepidotrigona (contd.)

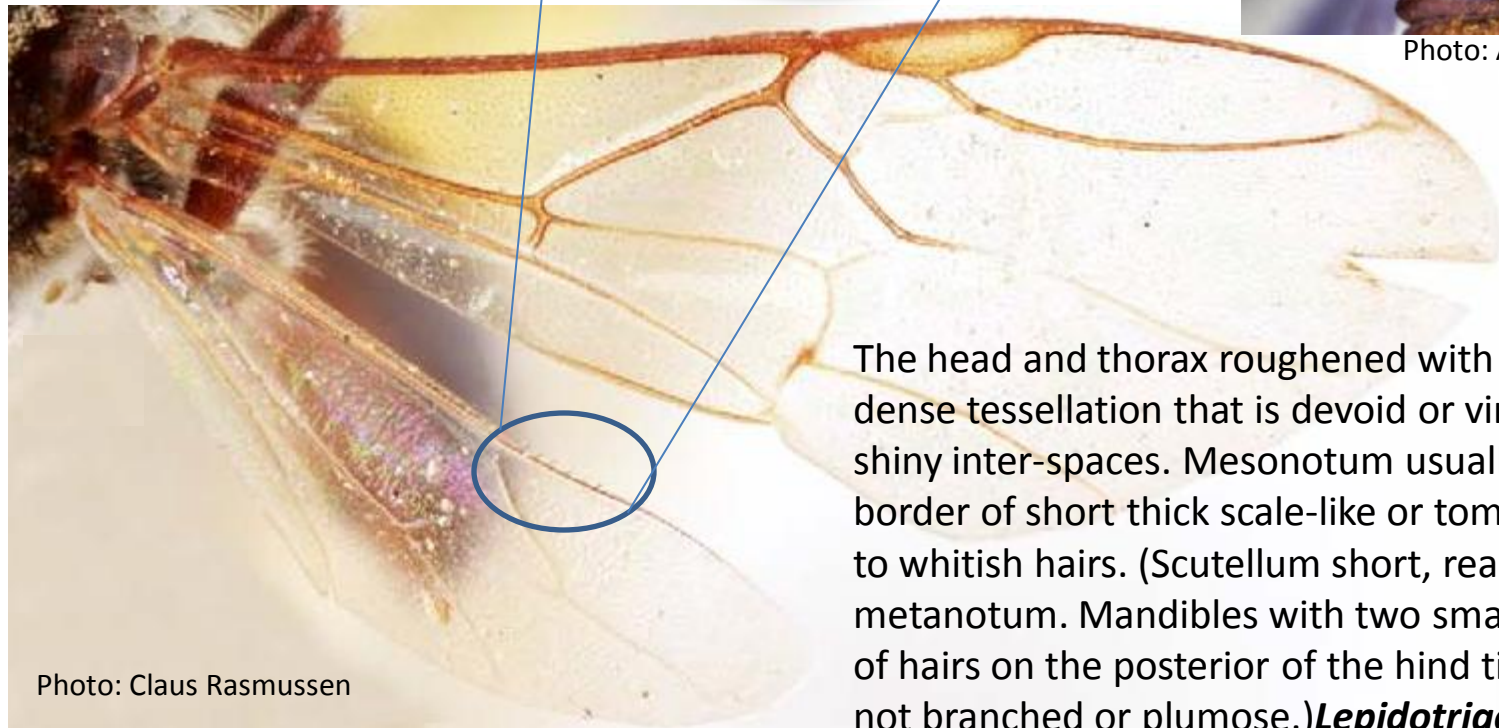


Lepidotrigona cf. arcifera



Lepidotrigona latipes

Photo: Azmand Rosland



The head and thorax roughened with an exceedingly dense tessellation that is devoid or virtually devoid of shiny inter-spaces. Mesonotum usually enclosed by a border of short thick scale-like or tomentose yellowish to whitish hairs. (Scutellum short, reaching back only to metanotum. Mandibles with two small teeth. The fringe of hairs on the posterior of the hind tibiae are simple, not branched or plumose.) ***Lepidotrigona* Schwarz 1939**

Photo: Claus Rasmussen

Lophotrigona canifrons



Photo: Ahmad Zaini



Photo: Abu Hassan

A woolly or moss-like pubescence usually rather thickly covering the head (especially upper half), thorax, and last two or three tergites of abdomen; pubescence on the head whitish; gena rounded, conspicuously wider than compound eye when viewed from the side; mandible with two strong teeth; scutellum distinctly triangular, extended beyond the metanotum and over the propodium. Wing membranes clear or lightly tinted throughout. Large, black bee. Length 5 to 8 ¼ mm.

***Lophotrigona* Moure 1961 *Lophotrigona canifrons* (Smith 1857)**

Lisotrigona

The malar space very short, the rim of the eye separated from the inner angle of the mandible by less than the width of the scape. **Lisotrigona Moure 1961**
(a) Clypeus entirely yellow; face with yellow markings; scutum black with thin yellow margins bordering tegulae; body length, ~4-4.2 m

.....**Lisotrigona carpenteri Engel 2000**

Lisotrigona carpenteri



Lisotrigona furva nest entrance

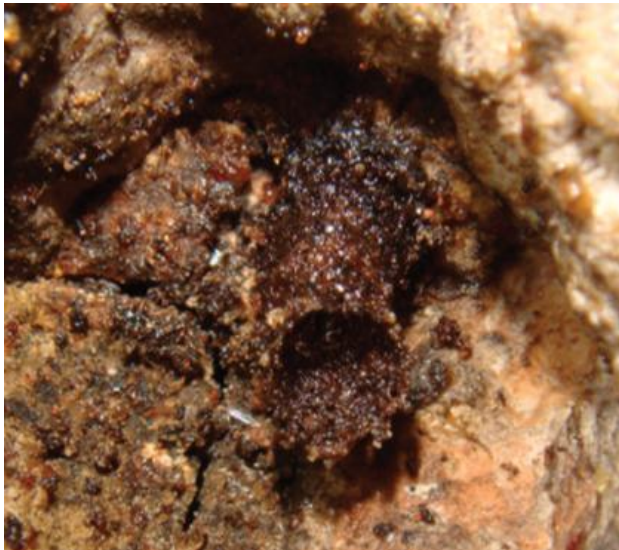


Photo by Dr. HANS BÄNZIGER

Tear drinking *Lisotrigona cacciae*

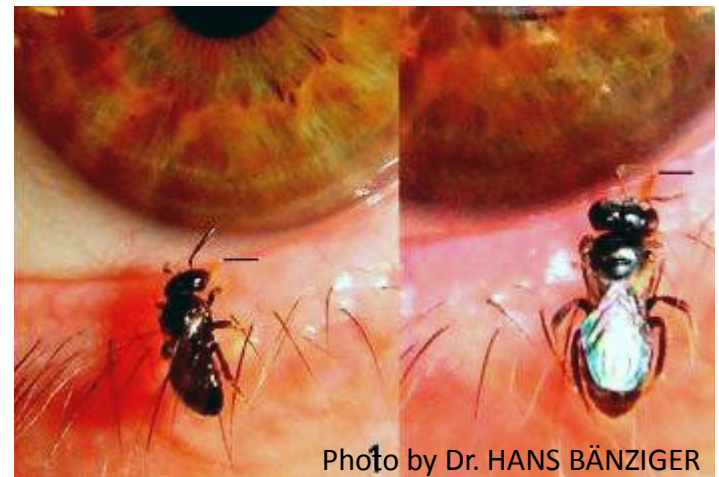


Photo by Dr. HANS BÄNZIGER

Odontotrigona haematoptera

The clypeus with fairly long, erect black hairs (perpendicular to clypeus, best seen when the head is viewed from the side) scattered over its entire surface in addition usually to appressed silvery hairs. (The mandible with two exceptionally large teeth, the innermost of the two rising from a level somewhat less than 1/2 of the distance toward the base of the mandible. Wings more or less suffused with orange, their veins and stigma a bright ferruginous. The malar space long, subequal in length to the width of the mandible at its base. The width of the hind tibiae moderate, about 1/3 of their length. Length 6 to 7 mm.)

***Odontotrigona* Moure 1961 *Odontotrigona haematoptera* (Cockerell 1919)**



Blood colored wings

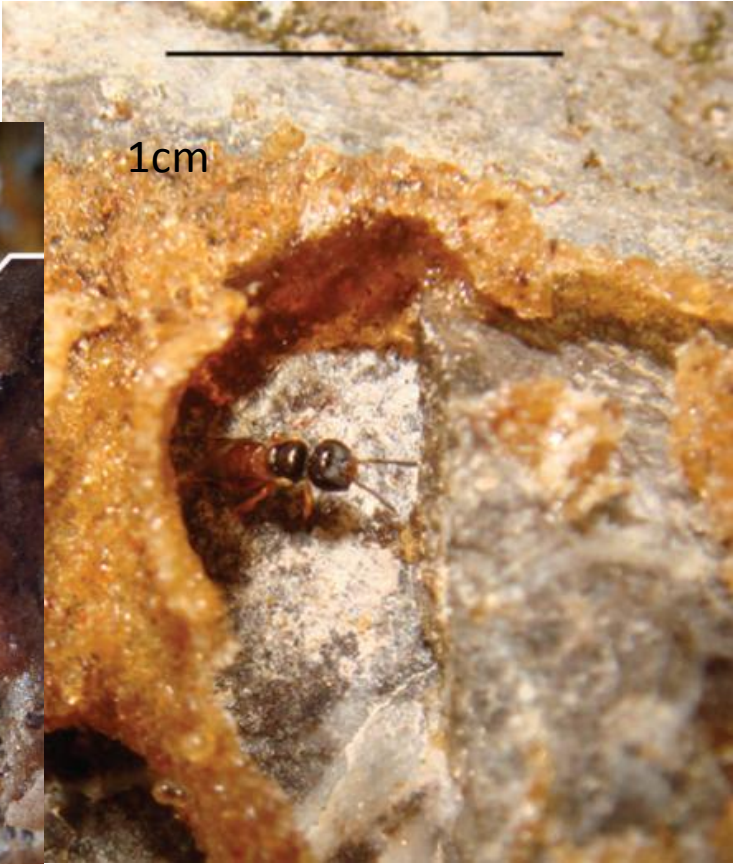


Pariotrigona

The malar space very long, about three times the width of the scape or twice the width of the flagellum, or almost 1/5 as long as eye. (Gonostylus of worker with setae but without minute hairs; see Fig. 13A in Schwarz 1939).

***Pariotrigona* Moure 1961.....**
...*Pariotrigona pendleburyi* (Schwarz 1939)*
(See Schwarz 1939, p. 132 for *Trigona (Hypotrigona) pendleburyi* variety *klossi* Schwarz 1939).

Pariotrigona klossi



Photos by Dr. HANS BÄNZIGER

Platytrigona

Platytrigona hobbyi

Without woolly white pubescence on the head; gena rounded, slightly broader than compound eye when viewed in profile; mandible with two small teeth, more basal tooth very wide, outer tooth small narrower ; scutellum not triangular; instead rounded, twice as broad as long, projecting beyond the metanotum only slightly. Basal half of wings dark or stained, apical half clear or whitish. Large, black bee.

***Platytrigona* Moure 1961**

.....***Platytrigona hobbyi* (Schwarz 1937)***



Photo by: Deborah Smith

Sundatrigona

The scutellum short, not extending over the propodeum Hind basitarsus with a large sericeous area occupying more than one third of inner face. Mandible with two small teeth. Malar area as long as diameter of the flagellum.....*Sundatrigona Inoue & Sakagami 1993*

Sundatrigona moorei



• [Discover Life's bee species guide and world checklist, Ascher and Pickering, 2014.](#)



Sundatrigona cf lieftincki



Photos by Benny Tan

Tetragonilla

The malar space vestigial, the base of the mandible separated from the rim of the eye by rather less than the width of the scape.

The scutellum is extended backward very emphatically, somewhat beyond the end of the propodeum when the insect is viewed from the side.

As a rule there are no erect black hairs growing more or less perpendicular to the clypeus along its apex.

The two teeth on the inner edge of the mandible of moderate development, their combined lateral extension about one- third the width of the edentate outer portion of the apex of the mandible.

The second or innermost tooth placed only a little basad of the first.

At least the median cell of forewing definitely stained.....***Tetragonilla Moure 1961***

T. atripes



T. fuscibasis



Tetragonilla colina



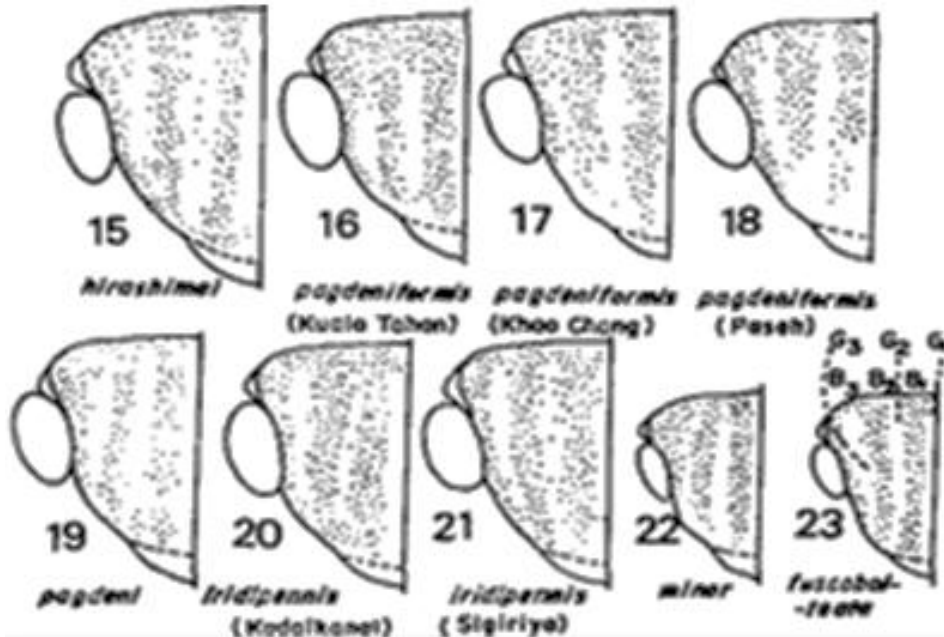
Photos: Ahmad Zaini

Tetragonula

The wing of rather uniform clarity throughout, without deepening of color in the basal half of the wing compared with the apical half (wings look clear, not brown at the base). (The erect hairs of the mesopleura and of the venter silvery to white. Small bees) ***Tetragonula* Moure 1961**

HAIRBANDS

Mostly to identify *Tetragonula* species



- On scutum
- (top of the thorax)
- 6 bands of hairs
- Separated by bare space
- NOT always easy to see



Redrawn from Sakagami 1978

Tetragonula (contd.)

T. Laeviceps



Azmand Rosland

T. biroi



Texter Taichao

T. pagdeni



Joe Teamworkshop

T. valdezi



Mohd Zulkarnain

T. zucchi



Acai Ibrahim

T. bengalensis



Claus rasmussen

T. sapiens



Suardi saide

T. minangkabau



Ahmad Zaini

T. fuscobalteata



Ahmad Zaini

T. melanocephala



Syafrizal Fachmy

T. melina



Syafrizal fachmy

T. testaceitarsis



Ahmad Zaini

Tetragonula iridipennis



5 hamuli

6 Hair-bands



Photos: Claus Rasmussen



I



T. iridipennis

The malar space well developed, longer than the scape is wide. The scutellum extended backward only slightly, not so far as the end of the propodeum. The apex of the clypeus with upright black hairs. The two inner teeth on the mandible very large, the second one placed distinctly more basad than the first, springing from a level somewhat less than one-half the distance to the base of the mandible. The contrast between the dark basal half and whitish apical half of the wing is strong. The hairs on the abdominal sternites black or blackish.....***Tetrigona Moure 1961***

Tetrigona

Tetrigona apicalis



Photo: Mambo Jumbo

Tetrigona binghami

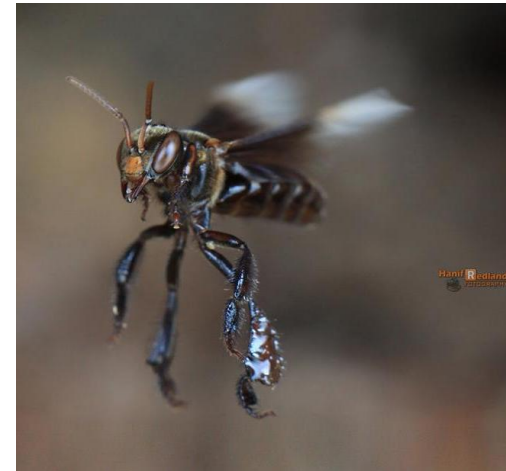


Photo: Hanif Redland

Tetrigona apicalis



Photo: Deborah Smith

Tetrigona melanoleuca



Photo: Ahmad Zaini

Tetrigona peninsularis



Photo: Abu Hassan

- Further study required

Peculiarities

1. Hetrotrigona with single denticle – forages lichen @ tree bark
Attempts bite on human skin
2. Apicalis with 2 small teeth – Hunts honeydew from Treehoppers
3. Tetragonula with 2 large teeth – doesn't bite human skin?
4. Lophotrigona with 2 moderate teeth – bites human skin and cuts human hair.
5. Lepidotrigona have largest clavate hind tibia but has occasional robbing characteristics. And does not store the most pollen.
6. Geniotrigona largest mandible - does not bite even when agitated



THANK YOU