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## New record of Carpenter bees (Hymenoptera: Apidae: Xylocopinae) from Bhutan

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### ABSTRACT

A total of seven species under the genus *Xylocopa*, *Xylocopa (Platynopoda) latipes* (Drury), *Xylocopa (Platynopoda) magnifica* (Cockerell), *Xylocopa (Cyaneoderes) acutipennis* Smith, *Xylocopa (Ctenopoda) fenestrata* (Fabricius), *Xylocopa (Nyctomelitta) tranquebarica* (Fabricius), *Xylocopa (Orbitella) aestauns* Lepeletier and *Xylocopa (Zonohirsuta) collaris binghami* Cockerell, are recorded for the first time from Bhutan.

**Key Words:** *Xylocopa*, Carpenter bees, new record, Xylocopinae.

### INTRODUCTION

*Xylocopa* genus are commonly known as carpenter bees as it dwells in the woods, bamboos and even in the ground by making tunnels (Lucia, Gonzalez, & Abrahamovich 2015; Solomon Raju & Purnachandra Rao 2006). Belonging to the subfamily Xylocopinae, it is differentiated from other bees in having three sub-marginal cells with second sub-triangularly elongated, 6-jointed maxillary palpi, posterior tibiae densely pubescent, ocelli in a triangle and labrum only slightly exerted, not prominent (Bingham 1897). These are robust, large and hairy bees, and are encountered throughout the year, foraging on varieties of flowers both during the day and moonlit night (Solomon Raju & Purnachandra Rao 2006). It helps in pollinating variety of flowers (Giannini et al. 2015) however, some species are nuisance and intimidating to people. They produce loud buzzing sound when flying and nesting. They also drill numerous tunnels and as a result, weaken the nesting timber which may bring about collapsing of the structures (Lucia et al. 2015).

More than 450 species under genus *Xylocopa* were reported globally (Michener 2007). Despite conspicuously large size and its ecological and economic importance, no taxonomic study has been done on Carpenter bees in Bhutan. This paper reports seven species of *Xylocopa* from Bhutan as new record.

### MATERIAL AND METHODS

Only adult specimens were collected during the year 2014 – 2016 in Bhutan. Specimens were mounted dry and morphological examinations done with stereoscopic microscope (Olympus, Tokyo). Nikon D3300 with attached AF-S Micro Nikkor 40 mm macro lens was used for taking photographs, digital Vernier caliper nearest to 0.01 mm used for the measurements of body length, and Garmin eTrex 10 for recording geographical coordinates and elevation above sea level. Geographical coordinates were provided in decimal degrees, and elevations above sea level (Alt.)

provided in meters (m). Descriptions and keys provided by Bingham (1897), Bodlah et al. (2015), Guershon & Ionescu-Hirsch (2012), Hannan, Alqarni, Owayss, & Engel (2012), Maa (1938, 1970), Michener (2007), & Sharma, Kumar, & Gupta (2016) were used for taxonomic identification. The specimens were deposited in Zoology Museum, Sherubtse College, Bhutan.

### 1. *Xylocopa (Platynopoda) latipes* (Drury)

Fig.1: A & B

**Diagnosis:** Body with black or sooty-brown pubescence; length more than 30 mm; scutellum and postscutellum sharply marked off from the succeeding segments by a distinct ridge of varying height; inner orbits of eyes converging at the upper extremities; gastral tergum II-VI with very sparsely pubescent; anterior metatarsi greatly dilated; pubescence on outer surface of anterior metatarsi purely brownish yellow to yellowish white; wings with bluish tints; vein r-m complete; scape of antennae distinctly flattened and broad at apex; outer teeth of mandibles apically blunt; major apical spur of posterior tibiae apically weakly bifurcate. Length: 2 ♂: 32.56 – 33.31 mm.

**Materials examined:** Bangtar, Samdrup Jongkhar (91.6852°E, 27.8977°N, Alt. 258 m): 2 ♂ collected by Tshering Nidup & Phurpa Dorji on 19.vii.2015 along the highway to Dewathang.

**Distribution:** Bhutan (Samdrup Jongkhar), Myanmar, Malaya, Singapore, Sumatra, Borneo, China, Siam, Java, Amboina, Philippines, India, Vietnam (Ashmead 1904; Bingham 1897; Long, Hue, Hoa, & Phong 2012; Maa 1938)

**Remarks:** New record for Bhutan.

### 2. *Xylocopa (Platynopoda) magnifica* (Cockerell)

Fig.1: C – F

**Diagnosis:** Similar to *X. latipes* in body size and color; body with black or sooty-brown pubescence; length more than 30 mm; male: inner orbits of eyes converging at the upper extremities; gastral tergum II-VI with very sparsely pubescent; anterior metatarsi greatly dilated; scape of antennae distinctly flattened and broad at apex; outer teeth of mandibles apically pointed; major apical spur of posterior tibiae simple; female: wings apically with strong golden iridescence. Length: 1 ♀: 30 mm; 1 ♂: 28.75 mm.

**Materials examined:** Gyelpoishing, Mongar (90.1400°E, 27.0066°N, Alt. 565 m): 1 ♂ collected by Tshering Nidup, Thinley Gyeltshen & Phurpa Dorji on 17.vi.2015 near Dam area; Nangkor, Pema Gatshel (27.02111°N, 90.34583°E, Alt. 1434 m): 1 ♀ collected by Tshering Nidup & Tshewang Dendup on 12.vii.2015 nearby village.

**Distribution:** Bhutan (Mongar, Pema Gatshel), India (Maa 1938)

**Remarks:** New record for Bhutan

### 3. *Xylocopa (Cyaneoderes) acutipennis* Smith

Fig. 2

**Diagnosis:** Body with black or sooty-brown pubescence; scutellum and postscutellum sharply marked off from the succeeding segments by a distinct ridge of varying height; male: inner orbits of eyes converging at the upper extremities; anterior metatarsi not dilated; clypeus apically with a sharp median emargination; posterior femora ventrally with a spine-like strong projection; female: upper orbital distance is less than the lower; gastral tergite I thickly pubescent; postgenae very sparsely punctate; dorsum of thorax with black hairs. Length: 1 ♀: 25.25 mm; 1 ♂: 24.06 mm.

**Materials examined:** Nangkor, Pema Gatshel (27.02111°N, 90.34583°E, Alt. 1434 m): 1 ♂ collected by Tshering Nidup & Tshewang Dendup on 12.vii.2015 near by the village; Sipsoo, Samtse (27.0425°N, 88.88639°E): 1 ♀ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 13.v.2015 along the high way.

**Distribution:** Bhutan (Samtse, Pema Gatshel), India, Nepal, Myanmar, Tenasserim (Bingham 1897; Maa 1938)

**Remarks:** New record for Bhutan.

### 4. *Xylocopa (Orbitella) aestauns* Lapeletier

Fig. 3

**Diagnosis:** Scutellum sharply marked off from postscutellum by a distinct ridge of varying height, its posterior portion projecting over postscutellum which lies at a much lower level; male: median line of posterior femora ventrally with a spine-like process at the base which is little blunt apically; female: supraclypeal region and clypeus more or less distinctly elevated near their junction; thorax dorsally covered with yellow hairs; postscutellum with a patch of yellow hairs medially; postgenae with a few whitish hairs; anterior tibiae with a few yellow hairs on outer surface. Length: 1 ♂ 20.58 mm; 2 ♀: 21.48 -22.54 mm

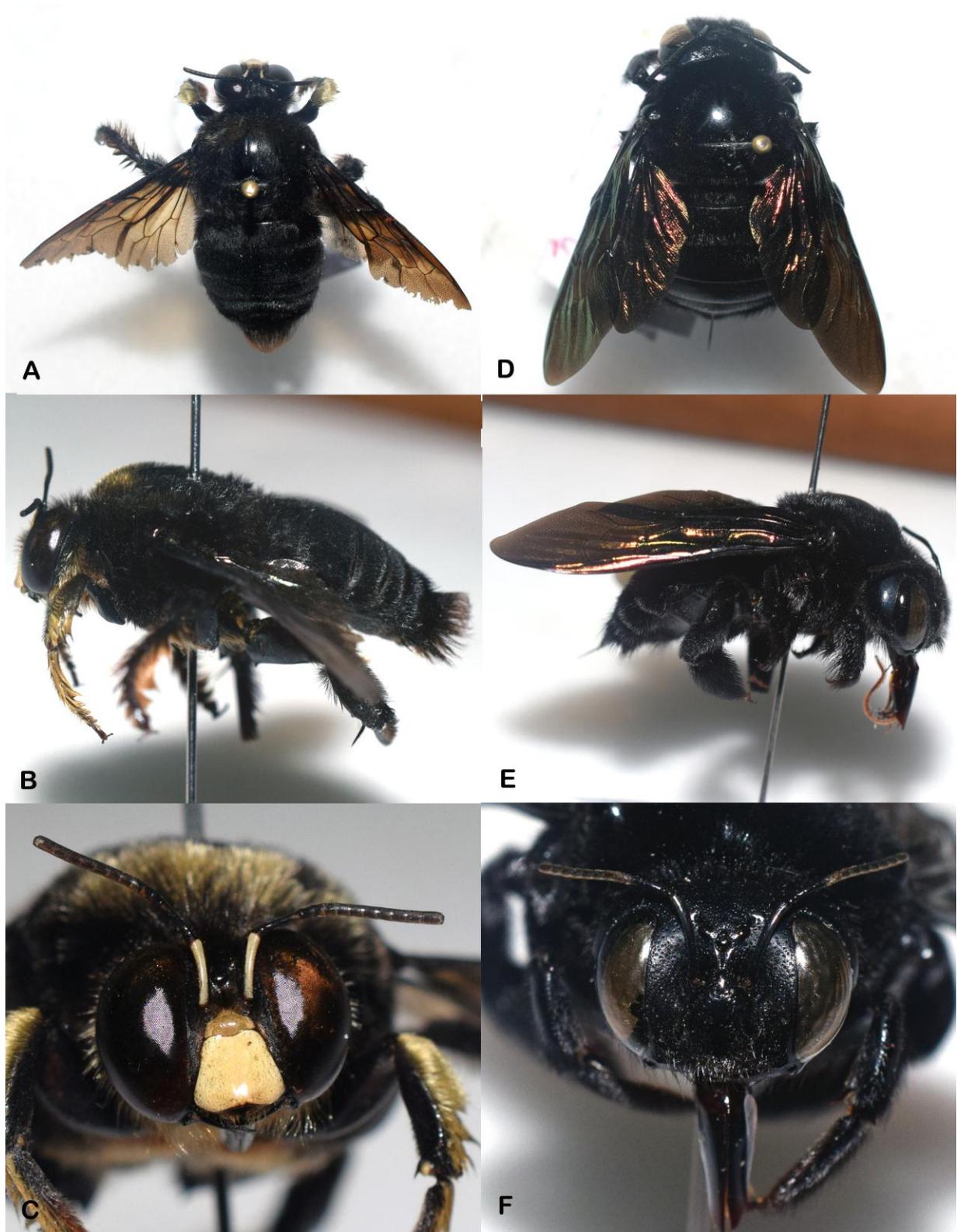
**Materials examined:** Nganglam; Pema Gatshel (91.2494°E, 26.8355°N, Alt. 133 m): 2 ♀ & 1 ♂ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 11.v.2015 from the Nganglam Lake near Nganglam Primary School.

**Distribution:** Bhutan (Pema Gatshel); India; Sri Lanka, Tenasserim, Myanmar, Ceylon, Malaya, Sumatra, Andaman, Saudi Arabia, United Arab Emirates, Philippine, Vietnam (Ashmead 1904; Bingham 1897; Hannan et al. 2012; Long et al. 2012; Maa 1938; Soh & Ngiam 2013; Wijesekara 2001)

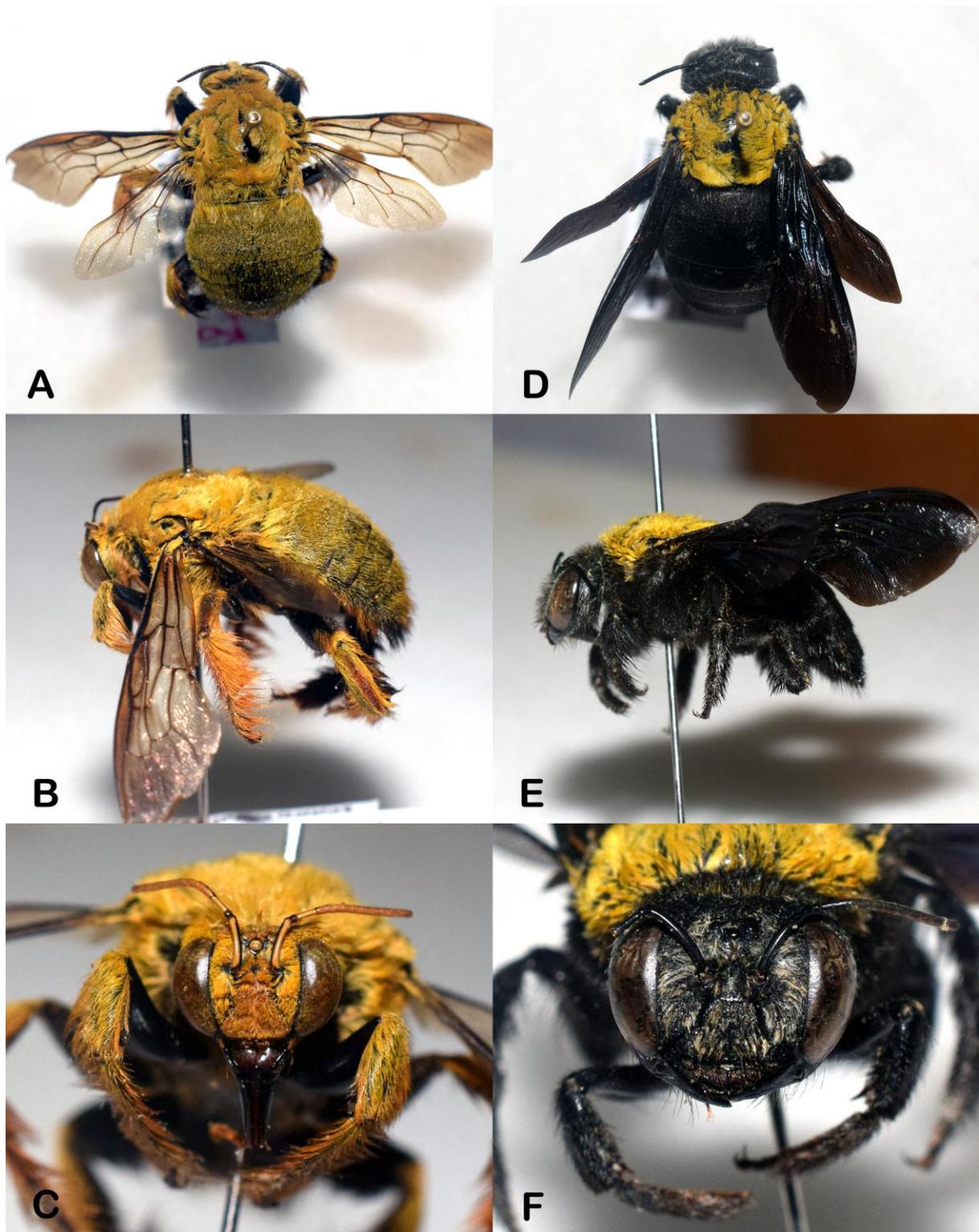
**Remarks:** New record for Bhutan.



**Fig. 1.** A & B. Lateral and frontal views of *Xylocopa latipes* male; C & D. Lateral and frontal views of *X. magnifica* male; E & F. Lateral & frontal views of *X. magnifica* female.



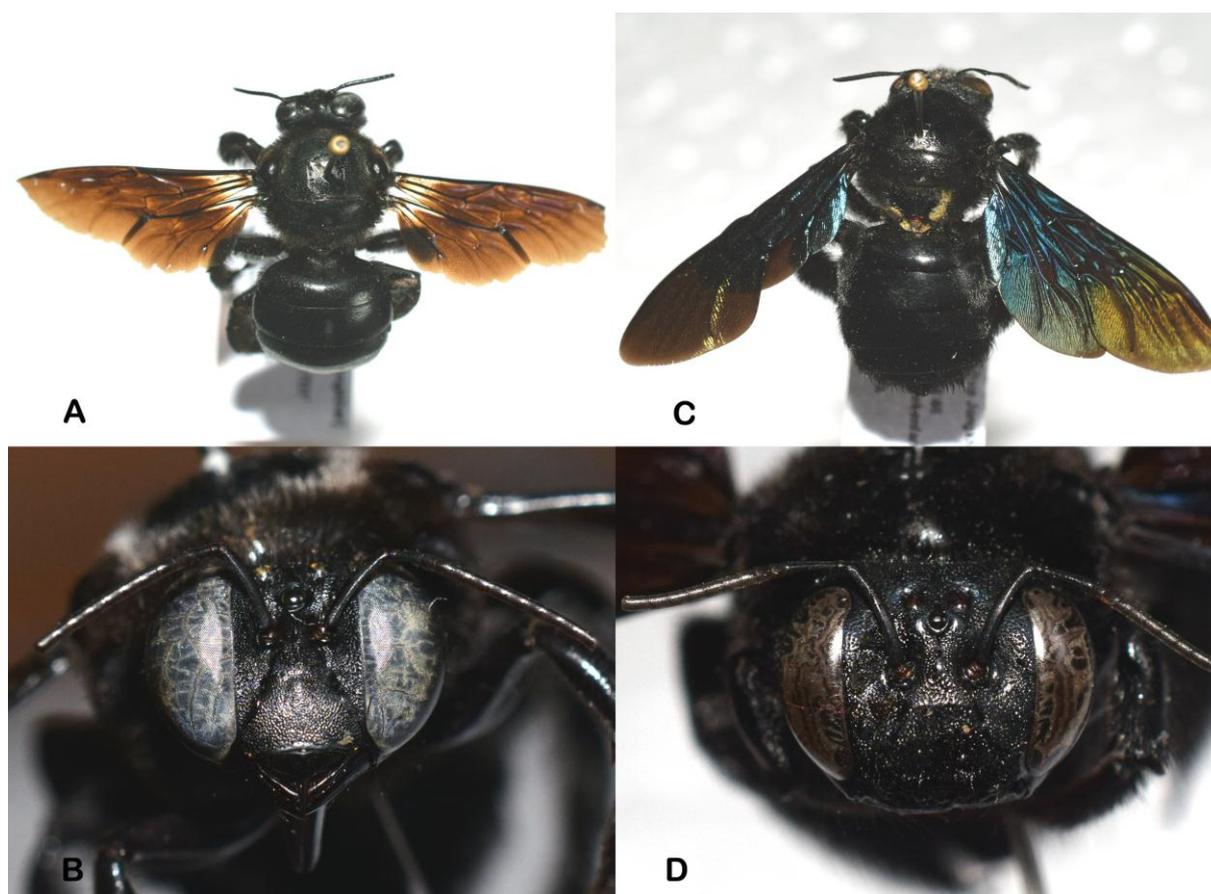
**Fig. 2.** *X. acutipennis*: A, B & C. Dorsal, lateral and frontal views of male; D, E & F. Dorsal, lateral & frontal views of female.



**Fig. 3.** *X. aestuans*: A, B & C. Dorsal, lateral and frontal views of male; D, E & F. Dorsal, lateral & frontal views of female.



**Fig. 4.** *X. collaris binghami*: A, B & C. Dorsal, lateral and frontal views of male; D, E & F. Dorsal, lateral & frontal views of female



**Fig. 5.** A & B. Dorsal and frontal views of *X. fenestrata* male; C & D. Dorsal and frontal views of *X. tranquebarica* female.

**5. *Xylocopa (Zonohirsuta) collaris binghami***  
Cockerell Fig. 4

**Diagnosis:** Male - Frontal carina abbreviated, not coming below the base of the clypeus; body black with following parts pale yellowish white: clypeus, sides of the face, front below the anterior ocellus, a broad line between the eyes over the vertex and scape of the antennae; pubescence on the vertex, pronotum, sides of the thorax anteriorly, front of the mesonotum, anterior legs and basal one or two gastral tergites ochraceous; wings subhyaline, lightly fuscous with purple effulgence. Female: head and abdomen very finely and closely punctate, less densely punctate on the disc of mesonotum and on scutellum; a distinct fine medial vertical carina from the apex of clypeus to between the base of the antennae, continued as a furrow to the anterior ocellus; body black with black pubescence except pronotum, sides of thorax anteriorly, front of mesonotum with erect dense white pubescence; wings dull fuscous with moderate purple effulgence. Length: 2♂: 17.97 mm; 1♀: 19.76 mm.  
**Materials examined:** Pangbang, Zhemgang (26.8435°N and 90.99297°E, Alt. 390 m): 2♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 15.iv.2016 from Klawagang stream. Bangtar, Samdrup Jongkhar (27.8977°N and 91.6852°E, Alt. 258 m): 1♀ collected by

Tshering Nidup & Phurpa Dorji on 19.vii.2015 along the highway to Dewathang.

**Distribution:** Bhutan (Samdrup Jongkhar, Zhemgang), India, Burma, Tenasserim, Ceylon, Malayan, Thailand, Tibet (Bingham 1897; Maa 1938)

**Remarks:** New record for Bhutan.

**6. *Xylocopa (Ctenopoda) fenestrata (Fabricius)***

Fig. 5: A & B

**Diagnosis:** Scutellum and postscutellum running gradually into the succeeding segments; median ocellus rounded; knee caps on posterior tibiae bifurcate; spiracular tubercles on gastral tergite III with teeth-like projection; epipygium apically with two pointed tooth-like projections; anterior and lateral portions of mesonotum and spiracular tubercles on II tergite with white hairs; outer surface of anterior metatarsi with sooty brown hairs. Length: 1♂: 21.35 mm.

**Materials examined:** Bangtar, Samdrup Jongkhar (91.6852°E, 27.8977°N, Alt. 258 m): 1♂ collected by Tshering Nidup & Phurpa Dorji on 19.vii.2015 along the highway to Dewathang.

**Distribution:** Bhutan (Samdrup Jongkhar), Nepal, India, Sri Lanka, Myanmar, Tenasserim, Ceylon, Celebes, Pakistan, Colombo, Persia, Mesopotamia, Mauritius, Madagastar, Andaman, Saudi Arabia,

Israel (Bingham 1897; Guershon & Ionescu-Hirsch 2012; Hannan et al. 2012; Maa 1938; Wijesekara 2001)

**Remarks:** New record for Bhutan

**7. *Xylocopa (Nyctomelitta) tranquebarica* (Fabricius)** (Fig. 5: C & D)

**Diagnosis:** Scutellum running gradually into postscutellum, only separated by a suture; posterior portion of scutellum never projecting over the postscutellum which is at almost same level; epipygium medially furrowed; knee-caps of posterior tibiae bifurcate; ocelli enlarged, median ocellus elliptical; clypeal suture S-shaped; inter-antennal distance a little longer than antenna-ocular distance. Length: 4♀: 23.14 - 24.95 mm.

**Materials examined:** Bangtar, Samdrup Jongkhar (91.6852°E, 27.8977°N, Alt. 258 m): 4♀ collected by Tshering Nidup & Phurpa Dorji on 19.vii.2015 along the highway to Dewathang.

**Distribution:** Bhutan (Samdrup Jongkhar), India, Myanmar, Ceylon, Tenasserim, Thailand (Burgett, Sukumaland, & Vorwohl 2005; Maa 1938; Wijesekara 2001)

**Remarks:** New record for Bhutan

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