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A Revision of the Subgenus *Notandrena* of the Genus *Andrena* from Eastern Asia (Hymenoptera, Andrenidae)

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Abstract. The subgenus *Notandrena* of the genus *Andrena* of eastern Asia is revised, and two species including a new species, *Andrena* (*Notandrena*) *auriculata*, are recognized. *A. (Notandrena) nitidiuscula* Schenck is recorded from China and Mongolia for the first time. Key to east Asian species is presented.

Key words: taxonomy, Hymenoptera, Andrenidae, *Andrena*, *Notandrena*, revision, eastern Asia, new species

Introductioin

The small subgenus *Notandrena* is represented by two species in North America (LaBerge, 1986) and 11 species in Eurasia (Warncke, 1968). In this subgenus, Warncke (1974) described two new species from Morocco and Algeria, respectively; Warncke (1975) and Gusenleitner (2000) added one new species from Turkey, respectively. In eastern Asia, Hirashima (1964) recorded *A. (Notandrena) nitidiuscula* and described two Japanese species, *A. amamiensis* and *A. richardsi* related to this subgenus. Osytsnjuk (1995) recorded *A. (Notandrena) nitidiuscula* from Russian Far East. Tadauchi (1988) assigned *A. richardsi* to the subgenus *Leucandrena*; Gusenleitner and Schwarz (2002) included 14 species in this subgenus in the Palaearctic Region, and put *A. amamiensis* into the subgenus *Calomelissa* Hirashima et LaBerge. In the course of studying East Asian *Andrena*, we find two species including one new species of this subgenus from China, *A. richardsi* Hirashima should be transferred into the other subgenus in future paper. The holotype will be preserved in the Institute of Zoology, Academia Sinica, Beijing and paratypes will be in the above institute and the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka.

Subgenus *Notandrena* Pérez

Notandrena Pérez, 1890, Act. Soc. Linn. Bordeaux, 10:

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173; Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 216; Hirashima, 1965, J. Fac. Agr. Kyushu Univ., 13: 478-479; Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307): 91-92; LaBerge, 1986, Trans. Amer. Ent. Soc., 111: 474-476; Gusenleitner & Schwarz, 2002, Entomofauna, suppl., 12: 39-40. Type species: *Andrena nitidiuscula* Schenck, 1853, by designation of Hedicke, 1933.

Diagnosis. Small bees; facial quadrangle as long as broad or elongate; facial fovea narrow, separated from inner margin of eye by broad space; subgenal coronet present; malar space short; genal area rounded; pronotum with distinct humeral angle and ridge; propodeal enclosure well defined, large, rugulose basally; propodeal corbícula moderately developed, dorsal fringes well arranged; tibial spurs normal; three submarginal cells present; metasomal terga finely punctate, with apical hair bands. Male head large; clypeus black or yellow; genal area broad, carinate posteriorly; sterna with short, complete subapical fimbriae.

Key to species of the subgenus *Notandrena* in eastern Asia

Female

1. Process of labrum entire; clypeus largely and densely punctate apicomediaally; propodeal enclosure irregularly rugulose at basal half *auriculata* n. sp.

- Process of labrum emarginate apically; clypeus minutely and sparsely punctate; propodeal enclosure slightly rugulose basally *nitidiuscula* Schenck

Male

- 1. Vertex flat in frontal view; genal area ear-like with reflected angle posterobasally; apical margin of clypeus not reflected *auriculata* n. sp.
- Vertex not flat in frontal view; genal area rounded; apical margin of clypeus reflected *nitidiuscula* Schenck

1. *Andrena (Notandrena) auriculata* n. sp. (Figs.1:A-E; 2:A-E)

Female. BL 7.5-8.5 mm, WL 6.5-7.5 mm (n=9).

Color. Flagellum reddish brown beneath; mandible with apical half reddened; wing membranes subhyaline,

moderately brown, veins and pterostigma yellowish brown; tibial spurs yellow; posterior depressions of metasomal terga dark reddish brown.

Pubescence. Hairs on head and thorax dense, yellowish to yellowish brown; those on clypeus 400µm; those on vertex 400µm; those on genal area 200-300µm; facial fovea brown. Hairs on mesoscutum 200-300µm, yellowish brown; those on scutellum 300-500µm; those on mesepisternum 400-500µm, yellowish; propodeal corbicula moderately developed, internal area with short, sparse simple hairs; trochanteral floccus imperfect, sparse, whitish; femoral floccus dense; tibial scopal hairs long, simple, yellow. Hairs on metasomal terga 1-2 scanty; those on terga 3-4 rather short, bright brown; terga 2-4 with short, white hair bands, broadly interrupted on tergum 2; caudal fimbria bright brown; sterna 2-5 with long, sparse, yellowish subapical fimbriae.

Structure. Head: HL/HW = 0.75. HW: MsW: MtW

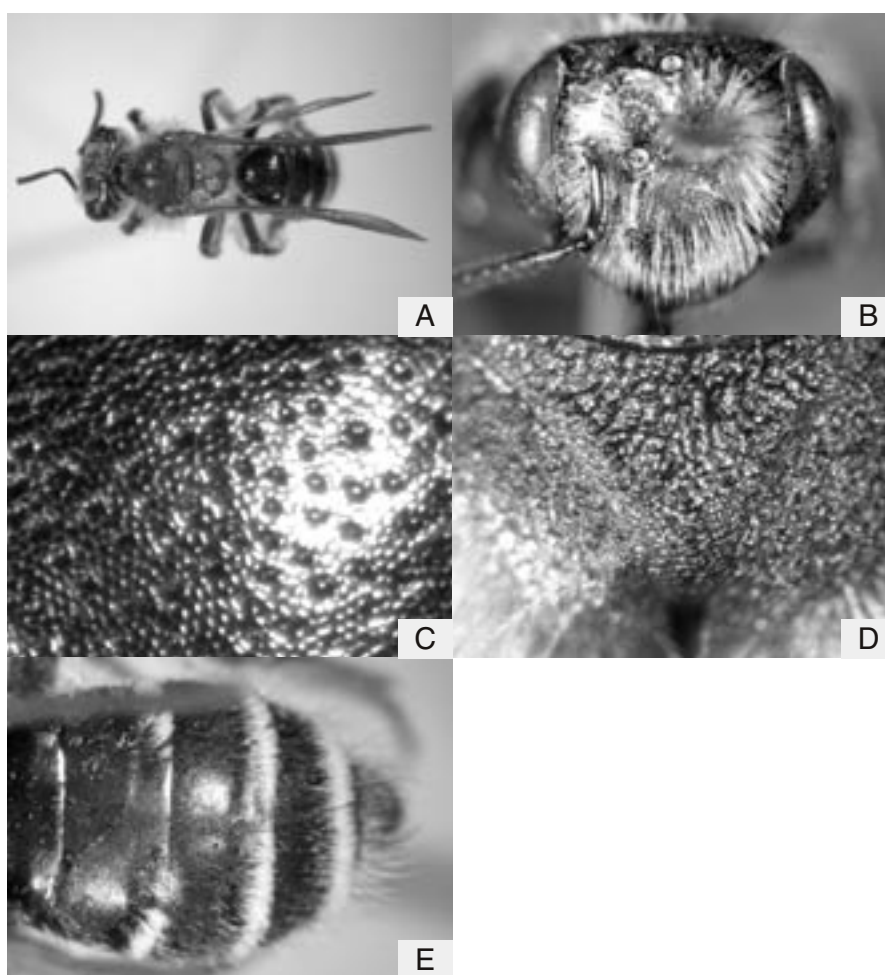


Fig. 1: A-E. *Andrena (Notandrena) auriculata* n. sp., female. A: general habitus; B: head in frontal view; C: mesoscutum; D: propodeum; E: metasomal terga.

= 2.8: 2.7: 2.8. Vertex flat, shagreened by dense tessellation. OOD: POD: OCD = 0.6: 0.3: 0.2. FL1 = FL2+3, FL2 = FL3 which are as broad as long. Eyes with inner margins paralleled. Facial fovea narrow, separated from eye by broad space, extending to below a line at lower margins of antennal fossae, FVL = 1.0 mm, FVW = 0.3 mm. Supraclypeal area roughened by coarse punctation. Face above antennal fossae with fine longitudinal rugulae and weak interrugal PP, shagreening surface. Facial quadrangle quadrate (about 1.9: 1.9). Clypeus convex medially, apical margin slightly reflexed, surface densely tessellate with PP ϕ 40 μ m, IS < 0.5, with smaller PP basally and laterally, CPL = 0.8 mm. Process of labrum short, trapezoidal, entire apically. Labrum apical to process flat, without cristae. Lower paraocular area finely tessellate, weakly shiny with crowded minute PP, IS < 0.5. Malar space linear. Genal area broader than eye, GW:

EW = 0.7: 0.6, weakly carinate posteriorly, surface finely tessellate, narrowly shiny with obscure PP. Mesosoma: Pronotum with humeral angle and ridge, surface reticularly shagreened. Mesoscutum finely tessellate, narrowly shiny with PP ϕ 10-20 μ m, IS < 1. Scutellum finely tessellate with scattered minute PP. Propodeal enclosure weakly rugulose basally, granulate apically and laterally; dorsal face of propodeum densely tessellate, not roughened. Mesepisternum densely tessellate, shagreened. Vein 1st m-cu meeting second submarginal cell at middle of cell. Metasoma: Metasomal terga finely tessellate, weakly shiny. Tergum 1 with sparse microscopic PP, IS = 1-3; terga 2-4 with rounded minute PP ϕ 10 μ m, IS < 0.5; posterior depressions of terga not well indicated; pygidial plate V-shaped with rounded apex, internal area with weak raised triangular area. Sterna 2-5 weakly tessellate, impunctate at basal halves, finely punctate at apical halves.

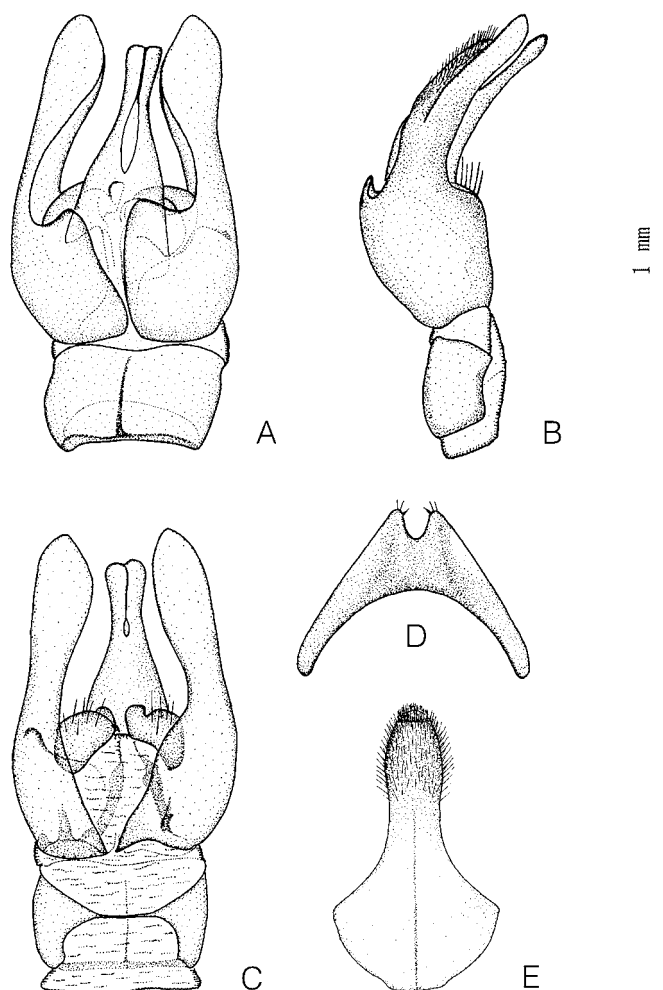


Fig. 2.: A-E. *Andrena (Notandrena) auriculata* n. sp., male. Genital capsule and subgenital sterna. A: dorsal view of genital capsule; B: lateral view of the same; C: ventral view of the same; D: metasomal sternum 7; E: metasomal sternum 8.

Male. BL 6.5-7.5 mm, WL 5.5-6.0 mm (n=4).

Color. Flagellum reddish brown beneath; clypeus yellowish white except two spots below tentorial pits; mandible with apical third reddened; wing membranes subhyaline, moderately brown, veins and pterostigma reddish brown; tibial spurs yellowish; posterior depressions of metasomal terga yellowish brown.

Pubescence. Hairs on head sparse, yellowish except clypeus with dense whitish hairs (500µm); those on vertex 400-500µm; those on genal area 200µm; those on mesoscutum 400-500µm, sparse, pale yellow; those on posterior margin of scutellum and metanotum long and dense; propodeum and mesepisternum with sparse, whitish hairs. Hairs on metasomal terga short, whitish to bright brown; terga 2-4 without pale hair bands; sternum 2 with long sparse hairs, sterna 2-5 with short, dense whitish subapical fimbriae.

Structure. Head: HL/ HW = 0.70. HW: MsW: MtW = 2.2: 1.6: 1.7. Vertex flat, finely tessellate, dull shiny. OOD: POD: OCD = 0.5: 0.2: 0.2. FL1 = FL2+3, FL2 slightly shorter than FL3. Eyes with inner margins subparallel. Supraclypeal area and face above antennal fossae sculptured as in female. Facial quadrangle broader than long (about 1.5: 1.3). Clypeus nearly flattened, smooth and shiny, surface scattered shallow, minute PP, IS = 2-3 or more, denser at lateral angle, CPL = 0.6 mm. Process of labrum as in female, but smaller. Mandibles long, decussate. Lower paraocular area smooth and shiny with minute PP, IS = 2. Malar space linear. Genal area enlarged, distinctly carinate posteriorly with angle basally, GW: EW = 0.7: 0.5, surface smooth and shiny with obscure PP. Mesosoma: Pronotum with distinct humeral angle and ridge, surface densely tessellate. Mesoscutum finely tessellate, narrowly shiny with microscopic PP, IS = 1-1.5. Scutellum weakly tessellate, broadly shiny with scattered minute PP. Propodeum densely tessellate with dorsal enclosure rugulose basally. Mesepisternum densely tessellate, shagreened. Venation as in female. Metasoma: Metasomal tergum 1 smooth and shiny with scattered microscopic PP; terga 2-5 weakly tessellate, broadly shiny, impunctate apically, weakly punctate at basal two-thirds with microscopic PP, IS = 1; posterior depressions of terga well indicated. Sterna 2-5 weakly tessellate, shiny with scattered minute PP.

Type material. Holotype female, Tianpingshan, 1,350 m, Sanzi County, Hunan Province, China, 12. viii. 1988 (L-l. Yang); Paratypes: Same locality and collector as the holotype: 3 females and 2 males, 12. viii. 1988; 2 females and 1 male, 13. viii. 1988; 3 females, 15. viii. 1988. Hubei Province: 1 male, Shenglongjia, 1,800 m, 4. viii. 1981 (Y-h. Han).

Remarks. This species is similar to *Andrena nitidiuscula* Schenck, but the female can be separated from that of *nitidiuscula* by the larger and entire process of labrum and the more coarsely punctated clypeus. The male can be separated from that of *nitidiuscula* by the clypeus yellowish white, and the genal area distinctly carinated.

Distribution. China (Hunan, Hubei Provs.).

Floral record. Not available.

2. *Andrena (Notandrena) nitidiuscula* Schenck

Andrena nitidiuscula Schenck, 1853, Jahrb. Ver. Nat.

Nassau, 9: 132-133 [female & male, West Germany].

Andrena (Notandrena) nitidiuscula: Pérez, 1890, Act.

Soc. Linn. Bordeaux, 44: 173; Osytsnjuk, 1977,

Fauna Ukraini, 12 (5): 260-262. Hirashima, 1965, J.

Fac. Agr., Kyushu Univ., 13: 479-482 [redescription,

Japan]; Hirashima, 1966, J. Fac. Agr., Kyushu Univ.,

14: 111, 118 [female & male, in key]; Osytsnjuk,

1995, Key Insects Russian Far East, vol. iv, part 1,

512, 521 [female & male, in key]; Gusenleitner and

Schwarz, 2002, Entomofauna, 12(Suppl.), 536-538.

Andrena fulvicornis Schenck, 1853, Jahrb. Ver. Nat.

Nassau, 9: 134 [Germany].

Andrena lucens Imhoff, 1868, Mitt. Schweiz. Ent. Ges.,

2: 67-68 [female & male, Switzerland].

Andrena nigellata Pérez, 1895, Espec. Niuv. Mellif. Bar-

barie, 46 [male, Algeria].

Andrena gascheti Pérez, 1903, P. -verb. Soc. Linn. Bor-

deaux, 58: 89 [female & male, Italy].

Andrena petroselini Pérez, 1903, P. -verb. Soc. Linn.

Bordeaux, 58: 90 [female & male, France].

Andrena divergens Pérez, 1903, P. -verb. Soc. Linn.

Bordeaux, 58: 90-91 [female, Spain].

Andrena rostellata Pérez, 1903, P. -verb. Soc. Linn.

Bordeaux, 58: 90 [female & male, Algeria].

Andrena rubrosignata Saunders, 1908, Trans. Ent. Soc.

London, 2: 207 [male, Algeria].

Andrena lucens var. *algira* Friese, 1922, Konowia, 1:

211 [male, Tunisia].

Andrena franconica E. Stoeckert, 1922, Ent. Mitt., 11:

99-105 [female & male, Germany].

Description. See Hirashima (1965).

Specimens examined. China: Heilongjiang Province: 1 male, Harbin, 2. viii. 1954 (collector unknown). Jilin Province: 1 female, Baihe, 1. viii. 1981 (Y-r. Wu). Gansu Province: Mingle, 1 female and 1 male, 12. viii. 1996 (H-l. Xu); 1 female, 12. viii. 1996 (O. Tadauchi). Qinghai Province: Huangyuan, 15. viii. 1996 (O. Tadauchi). Mongolia: Central aimak: 1 female, 1,300 m, 13. vii.

1963; 2 females and 1 male, 1,390 m, 8. vii. 1963 (Z. Kaszab). Bulgan aimak: 1 female, 2,300 m, 23. vii. 1966 (Z. Kaszab). Chovsgol aimak: 1,150 m, 21. vii. 1968 (Z. Kaszab).

Remarks. This species is characterized by the female with process of labrum emarginate, transverse, the propodeal enclosure rugulose basally the metasomal terga nearly smooth and shiny, with microscopical punctures, and the male with clypeus strongly reflected apically.

Distribution: China (new record, Qinghai, Gansu, Heilongjiang, Jilin Provs.); Japan (Hokkaido, Honshu, Kyushu); Mongolia (new record, Bulgan, Chovsgol aimak); Europe, north Africa.

Floral associations: China: *Pedicularis* sp., *Brassica campestris*.

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