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Xu, Huan-Li

Department of Entomology, College of Agronomy and Biotechnology, China Agricultural University

Tadauchi, Osamu

Laboratory of Entomology, Division of Zoology & Entomology, Department of Applied Genetics and Pest Management, Faculty of Agriculture, Kyushu University

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A Revision of the Subgenus *Plastandrena* of the Genus *Andrena* of Eastern Asia (Hymenoptera: Apoidea: Andrenidae)

XU Huan-li* and Osamu TADAUCHI

Laboratory of Entomology, Division of Zoology & Entomology, Department of Applied Genetics and Pest Management, Faculty of Agriculture, Kyushu University,
Fukuoka 812–8581, Japan

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The subgenus *Plastandrena* of the genus *Andrena* from eastern Asia is revised and six species are recognized. *Andrena* (*Plastandrena*) *fukaii* Cockerell is recognized as a new synonym of *A. japonica* Smith, and *A. (Plastandrena) eversmanni* Radoszkowski, *A. (Plastandrena) magnipunctata* Kim et Kim and *A. (Plastandrena) transbaicalica* Popov are recorded from China for the first time. A key to East Asian species of *Plastandrena* is given.

INTRODUCTION

The subgenus *Plastandrena* was erected by Hedicke in 1933. It is distinctly separated from the other subgenera by having the propodeal enclosure coarsely wrinkled, usually with a transverse carina posteriorly, and it also has the hind tibial spur widened and curved at the base. It is similar to the subgenus *Trachandrena* Roberston in having the coarsely sculptured propodeal enclosure and the black clypeus in male. However, it is different from *Trachandrena* which has the strongly narrowed facial fovea in the lower half and the broad inner space near the compound eyes, the normal hind tibial spur, and the sixth sternum flattened apically in male. Popov (1949) synonymized *Schizandrena* Hedicke with *Plastandrena* and he (1958) gave a key to 28 Eurasian species and subspecies in this subgenus. In Europe, Warncke (1968) synonymized two subgenera *Glyphandrena* Hedicke and *Mitsukuriella* Hirashima et LaBerge with *Plastandrena*. He included six species in this subgenus. In eastern Asia, Yasumatsu (1941) listed six species, *A. bimaculata mondaensis* Friese, *A. carbonaria* (L.), *A. eversmanni* Radoszkowski, *A. fukaii* Cockerell, *A. japonica* (Smith) and *A. mongolica* Morawitz from Mongolia and Japan. Hirashima (1957) described a new species *A. (Plastandrena) astragalina* from Japan. Hirashima and LaBerge (1965) erected a new subgenus *Mitsukuriella* based on *A. japonica*. Wu (1965) recorded *A. carbonaria* from China and (1982) recorded *A. (Plastandrena) ferghanica* (= *A. mongolica*) and described a new species *A. (Plastandrena) himalayaensis* (= *A. (Andrena) himalayaensis*) from Tibet, China. In Russian Far East Osytsnjuk (1995) gave a key to three species in this subgenus, *A. (Plastandrena) dzynnanica*, *A. (Plastandrena) carbonaria* and *A. (Plastandrena) transbaicalica*. Tadauchi and Matsumura (2007) described one new species from Nepal and Tadauchi (2008) recorded five species from

Central Asia. The Holarctic *Plastandrena* is represented by 26 species in Palaearctic region and six species in Nearctic region (Gusenleitner & Schwarz, 2002). In this study, we examined species deposited in the Institute of Zoology, Academia Sinica and the Entomological Laboratory, Kyushu University, and recognized six species of *Plastandrena* from eastern Asia. We synonymized *A. fukaii* Cockerell with *A. japonica* (Smith) and recorded *A. eversmanni* Radoszkowski, *A. magnipunctata* Kim et Kim and *A. transbaicalica* Popov from China for the first time. Two species of *A. (Plastandrena) eoa* Popov from north China and *A. (Plastandrena) dzynnanica* Popov from east Turkestan are excluded from this study because we have no materials at hands. A key to East Asian species of *Plastandrena* is given. Specimens were borrowed from the Institute of Zoology, Academia Sinica (Beijing) and the Entomological Laboratory, Kyushu University (Fukuoka).

Subgenus *Plastandrena* Hedicke

Plastandrena Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 217–218; Hirashima, 1952, Mushi, 24 (10): 63; Popov, 1958, Horae Soc. Ent. Union. Sovet., 46: 127; LaBerge, 1964, Univ. Nebraska St. Mus. Bull., 4: 297–298; Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307): 55–56; LaBerge, 1969, Trans. Amer. ent. Soc., 95: 2–3. Type species: *Melitta tibialis* Kirby, 1802, by original designation.

Schizandrena Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 218. Type species: *Andrena aulica* Morawitz, 1876 = *Melitta bimaculata* Kirby, 1802, by original designation.

Mitsukuriella Hirashima et LaBerge, 1965, J. Fac. Agr., Kyushu Univ., 13: 472. Type species: *Nomia japonica* Smith, 1873, by original designation.

Mitsukuriapis Hirashima, LaBerge et Ikudome, 1994, Bull. Kagoshima Women's Junior College, 29: 6, new name for *Mitsukuriella* Hirashima et LaBerge 1965 (nec. *Mitsukuriella* Heding et Panning, 1954).

Glyphandrena Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 212. Type species: *Apis carbonaria* Linnaeus,

* Department of Entomology, College of Agronomy and Biotechnology, China Agricultural University, Beijing 100193, China

* Corresponding author (E-mail: hanabati@cau.edu.cn)

1767, by original designation.

Diagnosis: Moderate to large-sized bees; facial quadrange broader than long; integument metallic or not; clypeus black; pronotum without humeral angle and ridge; propodeal enclosure coarsely wrinkled with posterior carina or not; lateral area of propodeum usually rugulated; posterior spur of hind tibia broadened and abruptly bent near base; metasomal terga punctate with apical hair bands or not. Male clypeus black in Palearctic species, metasomal sterna with incomplete subapical fimbriae, sixth sternum with strong reflected lateral teeth.

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

Female

1. Metasomal terga without hair bands or with only lateral parts 2
 - Metasomal terga with hair bands 4
2. Integument with pure brown to black hairs except hind femoral and tibial scopa white *pilipes* (Fabricius)
 - Integument at least with pale hairs 3
3. Metasomal terga densely punctate, extremely reflected (1st generation), less reflected (2nd generation) apically; clypeus with median irregular impunctate space *japonica* (Smith)
 - Metasomal terga sparsely and weakly punctate, posterior depression flat; clypeus without median impunctate space *transbaicalica* Popov
4. Metasomal terga 1–4 with broad, decumbent white hair bands; propodeal enclosure weakly wrinkled with weak transverse posterior carina; [facial fovea white, head and thorax with abundant white hairs; clypeus closely punctate; process of labrum small, entire] *eversmanni* Radoszkowski
 - Metasomal terga with short yellow or white hair bands; propodeal enclosure strongly wrinkled with transverse posterior carina 5
5. Metasomal terga 1–3 red in part; terga with short, erect hairs and minute punctures; clypeus dulled with or without median raised impunctate line *mongolica* Morawitz
 - Metasomal terga black; terga with scanty hairs and moderate punctures; clypeus shiny without impunctate space *magnipunctata* Kim et Kim

Male

1. Metasomal terga without hair bands or with only lateral parts 2
 - Metasomal terga with hair bands 4
2. Head, propodeum and metasoma with pure brown to black hairs *pilipes* (Fabricius)
 - Head, propodeum and metasoma at least with pale hairs 3
3. Metasomal terga densely punctate, extremely reflected (1st generation), less reflected (2nd generation) apically; propodeal enclosure strongly wrinkled *japonica* (Smith)

- Metasomal terga sparsely and weakly punctate, posterior depression flat; propodeal enclosure weakly wrinkled *transbaicalica* Popov
- 4. Metasomal terga reddened in part 5
 - Metasomal terga black; [terga with scanty hairs and moderate punctures; clypeus shiny without impunctate space] *magnipunctata* Kim et Kim
- 5. Propodeal enclosure weakly wrinkled with weak transverse posterior carina; metasomal terga with dense minute punctures *eversmanni* Radoszkowski
 - Propodeal enclosure strongly wrinkled with transverse posterior carina; metasomal terga with sparse minute punctures *mongolica* Morawitz

1. *Andrena (Plastandrena) pilipes* (Fabricius)

Apis pilipes Fabricius, 1781, Spec. Insect., 1: 474 [female, Italy].

Andrena pilipes: Morawitz, 1880, Bull. Biol. Acad. Sci. St. Petersburg, 10: 479 [in list, Mongolia]; Schmiedeknecht, 1883, Apid. Europe., 1: 521–522 [female & male]; Nurse, 1904, J. Bombay nat. Hist. Soc., 15: 557 [in list, India].

Andrena (Plastandrena) pilipes: Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 594–597; Tadauchi, 2008, Esakia, (48): 5.

Andrena dolorosa Nurse, 1904, J. Bombay nat. Hist. Soc., 15: 563 [female, Pakistan].

Other synonymies: See Gusenleitner & Schwarz (2002).

Specimens examined. China: Xinjiang Uygur Autn. Region: 1 female, Alatai, 930 m, 14. viii. 1960 (S–y. Wang); 2 females, Yiwu, 21. vi. 1979 (S–f. Wang). Gansu Province: Wuwei: 1 female and 5 males, 28. iv. 1996 (S. Ikudome); 4 males (H–l. Xu); 2 females and 1 male (O. Tadauchi). 30. iv. 1996; 19 females and 2 males (H–l. Xu), 17 females and 3 males (O. Tadauchi); 13 females and 4 males (S. Ikudome), 10–11. viii. 1996; Lingtao: 1 female and 2 males (H–l. Xu); 2 females (S. Ikudome), Daban, 17. viii. 1996. Qinghai Province: Ledu: 2 females (H–l. Xu); 1 female (S. Ikudome), 16. viii. 1996. Beijing: 3 females, 1938 (K. Tsuneki). Inner Mongolia: 1 female, Apaka, 22. viii. 1939 (K. Tsuneki). Mongolia: Ostgobi aimak: 1 female, 20 km So v. Cojren, 1,200 m, 1. vii. 1963 (Z. Kaszab).

Remarks. This species has two generations a year. It can be recognized by the vestiture wholly blackish to black except the white hind femoral and tibial scopal hairs in female.

Distribution. China: (Qinghai, Xinjiang, Gansu, Inner Mongolia, Beijing); Mongolia; Pakistan; Central Asia; Europe; North Africa.

Floral associations. China: *Potentilla* sp., *Brassica campestris*, *Allium tuberosum*.

2. *Andrena (Plastandrena) japonica* (Smith)

Nomia japonica Smith, 1873, Trans. Ent. Soc. London, 1873: 201 [female, Japan].

Andrena japonica: Meado–Waldo, 1916, Ann. Mag. nat. Hist., (8)17: 462; Yasumatsu, 1941, Peking nat. Hist.

Bull., 15: 277 [in list].

Andrena mitsukurii Cockerell, 1913, Ann. Mag. nat. Hist., (8)11: 186 [male, Japan]; Yasumatsu, 1941, Peking nat. Hist. Bull., 15: 278 [in list].

Andrena (Glyphandrena) mitsukurii: Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 213.

Andrena (Mitsukuriella) japonica: Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 472–476; Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 96, 116 [female & male, in key]; Kim and Kim, 1983, Kor. J. Ent., 13: 6 [Korea]; Tadauchi, 1989, Check List Jap. Insects, 684.

Andrena fukaii Cockerell, 1914, Ann. Mag. nat. Hist., (8)13: 279 [female, Japan]; Yasumatsu, Peking nat. Hist. Bull., 15: 276. **New synonymy**

Andrena (Glyphandrena) fukaii: Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 213.

Andrena (Mitsukuriella) fukaii: Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 476–478; Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 96, 116 [female & male, in key].

Andrena (Plastandrena) japonica: Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 378–379.

Specimens examined. A series of specimens in the Kyushu University are examined.

Remarks. This species has two generations a year. It is recognized by the metasomal terga coarsely punctate and unusually reflected apically in the 1st generation (summer form), but less reflected in the 2nd generation (spring form).

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu); Korea.

Floral association. See Hirashima (1965).

3. *Andrena (Plastandrena) transbaicalica* Popov

Andrena (Plastandrena) transbaicalica Popov, 1949, Ent. Rev. USSR., 30: 398 [female, Siberia]; Popov, 1958, Horae. Soc. Ent. Union. Soviet., 46: 135 [female in key]; Osytsnjuk, 1995, Key Insects Russian Far East, Vol. IV, part 1, 493, 518 [female & male, in key, Russian Far East]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 772–773.

Andrena (Plastandrena) astragalina Hirashima, 1957, Mushi, 30: 51 [female & male, Japan]; 1965, J. Fac. Agr., Kyushu. Univ., 13: 488; Hirashima, 1966, J. Fac. Agr., Kyushu. Univ., 14: 96, 104, 116 [female & male, in key]. Tadauchi and Lee, 1992, Esakia, (32): 56 [Korea].

Other synonymies. See Gusenleitner & Schwarz (2002).

Specimens examined. China: Heilongjiang Province: 1 female and 4 males, Jingpo Lake, Mudanjiang, 23–24. v. 1993 (O. Tadauchi).

Remarks. This species is similar to *Andrena tibialis* (Kirby) in having sparse punctures on metasomal terga, but it differs by the entire process of labrum and the metasomal terga with scanty hairs in female.

Distribution. China (new record, Heilongjiang Prov.);

Japan (Hokkaido, Honshu, Kyushu); Korea (central Korea); Russia (middle Siberia, Far East area).

Floral association. China: *Taraxacum* sp.

4. *Andrena (Plastandrena) eversmanni* Radoszkowski

Andrena eversmanni Radoszkowski, 1868, Horae Soc. ent. Ross., 5: 74–75 [female & male, central Asia]; Schmiedeknecht, 1883, Apid. Europe., 1: 434, 475 [female & male]; Morawitz, 1890, Horae Soc. ent. Ross., 24: 357 [in list, Mongolia]; Yasumatsu, 1941, Peking nat. Hist. Bull., 15: 280 [in list].

Andrena (Plastandrena) eversmanni: Popov, 1958, Horae Soc. ent. Union. Soviet., 46: 131, 140 [female & male, in key]; Xu and Tadauchi, 1997, J. Fac. Agr., Kyushu Univ., 41: 172–175 [redescription]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 257–258; ; Tadauchi, 2008, Esakia, (48): 2–3.

Specimens examined. China: Gansu Province: Nanhu, Dunhuang, 7. v. 1996: 3 females and 2 males (H–I. Xu); 2 females and 2 males (O. Tadauchi); 5 females and 7 males (S. Ikudome). Mongolia: Bejanchongor Aimak, 2 females, 24–29. vi. 1967 (Z, Kaszab).

Remarks. This species is separated from the other members of *Plastandrena* by hairs on the body abundant, white, the facial fovea white, the mesoscutum and suctellum with subvelvety hairs and the metasomal terga with broad, decumbent hair bands in female.

Distribution. China (new record, Gansu Prov.); Mongolia; Central Asia.

Floral association. *Salix* sp.

5. *Andrena (Plastandrena) mongolica* Morawitz

Andrena mongolica Morawitz, 1880, Bull. Acad. Sci. St. Petersburg, 26: 360 [female, Mongolia]; Yasumatsu, 1941, Peking nat. Hist. Bull., 15: 278 [in list].

Andrena (Plastandrena) mongolica: Popov, 1949, Ent. Obozr., 30: 393 [female & male, Russia]; Popov, 1958, Horae Soc. ent. Union. Soviet., 46: 133, 141 [female & male, in key]. Xu and Tadauchi, 1997, J. Fac. Agr., Kyushu Univ., 41: 175–176 [redescription]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 490; ; Tadauchi, 2008, Esakia, (48): 3–5.

Andrena (Plastandrena) apiformis mongolica: Warncke, 1967, Eos, 43: 289.

Andrena (Plastandrena) ferghanica: Wu, 1982, Insects of Xizhang, P. 381[nec *A. mongolica* Morawitz, 1880].

Specimens examined. China: Xinjiang Uygur Autn. Region: 1 female, Shache, 26. v. 1955 (S–j. Ma); 1 female, Atushi, 1,350 m, 22. vi. 1987 (X–z. Zhang); 1 female, Aketao, 2950 m, 10. vii. 1989 (X–z. Zhang); 1 male, Hezhen, 1,300 m, 3. vi. 1959 (S–y. Wang). Gansu Province: 1 male, Xishuichi, Zhangye, 2. v. 1996 (H–I. Xu); 4 males, Jiuquan, 3. v. 1996 (S. Ikudome); 4 males (H–I. Xu); 2 females and 1 male (O. Tadauchi); 2 females and 1 male (S. Ikudome), Yumen, Jiayuguan, 4. v. 1996.

Remarks. Wu (1982) misidentified this species as *A. (Plastandrena) ferghanica* Morawitz from Tibet. This

species is similar to *Andrena cypricola* Mavromoutakis from Europe, but it can be easily separated from *cypricola* by the longer flag segmental 3, the coarsely punctate clypeus, the longer malar space and hair bands on the metasomal terga.

Distribution. China (Gansu, Xinjiang, Xizang Provs.); Mongolia; Russia; Central Asia.

Floral association. *Prunus* sp.

6. *Andrena (Plastandrena) magnipunctata* Kim et Kim

Andrena (Plastandrena) magnipunctata Kim et Kim, 1989, Kor. J. Ent., 19: 201–202 [female, Korea]; Tadauchi *et al.*, 1997, Esakia, (37): 195–196 [male, Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 452.

Specimens examined. China: Beijing: 1 female, 17. v. 1962 (S.-y. Wang); 2 females, 7–28. iv. 1964 (S.-m. Gee); 2 females, 4–20. v. 1964 (S.-m. Gee); 1 female, 26. iv. 1974 (S.-f. Wang); 1 female, 25. viii. 1981 (Q. Zhou). Heilongjiang Province: 2 females, Harbin, 10–20. viii. 1955; 1 female, Jingpo Lake, Mudanjiang, 26. v. 1993 (O. Tadauchi).

Remarks. This species is similar to *Andrena transbaicalica*, the female can be separated from that of *transbaicalica* by the metasomal terga with close punctures and white hair bands.

Distribution. China (new record, Beijing, Heilongjiang Prov.); Korea.

Floral association. Not available.

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