

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

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

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The subgenus *Micrandrena* of the genus *Andrena* from eastern Asia is revised and twelve species are recognized. *Andrena* (*Micrandrena*) *kaguya* Hirashima, *A.* (*Micrandrena*) *komachi* Hirashima, *A.* (*Micrandrena*) *munakatai* Tadauchi, *A.* (*Micrandrena*) *semirugosa* Cockerell, *A.* (*Micrandrena*) *sublevigata* Hirashima, *A.* (*Micrandrena*) *subopaca* Nylander are recorded from China for the first time.

INTRODUCTION

The subgenus *Micrandrena* was erected by W. H. Ashmead in 1899. It is distinctly separated from the other subgenera by the tiny body size, tessellated or polished metasomal terga. It is characterized in having the vein first transverse cubitus ending close to the pterostigma. Ribble (1968) revised 19 species of North American *Micrandrena*. In Europe, Warncke (1968) included 34 species in this subgenus. In eastern Asia, Yasumatsu (1941) listed 1 species, *A. subopaca* Nylander from Japan. Hirashima (1957, 1965, 1966) described 5 new species in this subgenus from Japan. Tadauchi (1985) revised the 11 Japanese species of *Micrandrena*. Wu (1965) recorded *A. minutula* from China, and she also (1982, 1992) recorded *A. parvula* (= *A. minutula*) from Tibet. In Russian Far East, Osytsnjuk (1995) gave a key to 6 species including 1 new species in this subgenus. The Holarctic *Micrandrena* is represented by 86 species in the Palaearctic region and 21 species in the 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 12 species of *Micrandrena* from eastern Asia. 9 species, *A.* (*Micrandrena*) *hikosana* Hirashima, *A.* (*Micrandrena*) *hirashimai* Tadauchi, *A.* (*Micrandrena*) *hanedai* Tadauchi, *A.* (*Micrandrena*) *kaguya* Hirashima, *A.* (*Micrandrena*) *komachi* Hirashima, *A.* (*Micrandrena*) *munakatai* Tadauchi, *A.* (*Micrandrena*) *semirugosa* Cockerell, *A.* (*Micrandrena*) *sublevigata* Hirashima, *A.* (*Micrandrena*) *subopaca* Nylander are recorded from China for the first time. Specimens were borrowed from the Institute of Zoology, Academia Sinica (Beijing) and the Entomological Laboratory, Kyushu University (Fukuoka).

Subgenus *Micrandrena* Ashmead

Micrandrena Ashmead, 1899, Trans. Amer. ent. Soc., 26: 89; Lanham, 1949, Univ. California Pub. Ent., 8: 208–209 (in part); Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 461; LaBerge, 1964, Bull. Univ. Nebraska St. Mus., 4: 301–302; Ribble, 1968, Bull. Univ. Nebraska St. Mus., 8: 237; Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307): 54–55; Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 59; Tadauchi, 1985b, J. Fac. Agr., Kyushu Univ., 30: 77. Type species: *Andrena pacifica* Ashmead, 1899 = *Andrena melanochoa* Cockerell, 1889, by original designation.

Andrenella Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 210. Type species: *Melitta minutula* Kirby, 1802, by original designation.

Diagnosis: Small-sized bees; facial quadrangle broader than long or quadrate; facial fovea narrow; clypeus black; subgenal coronet present; malar space linear; genal area usually broader than eye; pronotum without humeral angle and ridge; propodeal enclosure large, coarsely to finely sculptured; three submarginal cells present, the first transverse cubital vein ending very close to pterostigma (within 2 to 3 vein widths or closer); propodeal corbicula poorly developed; tibial scopal hairs long, simple; tibial spurs normal; metasomal terga usually impunctate or punctate basally. Male with sterna without subapical fimbriae.

1. *Andrena* (*Micrandrena*) *chirisana* Tadauchi

Andrena (*Micrandrena*) *chirisana* Tadauchi, 1992, Esakia, (32): 53–54 [female, Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 173.

Type material examined: Holotype female (Kyushu Univ.), Sam Jeon Li, Ma Cheong Meon, Hamyang Gun, Kyon Sang Nam Do, 11. v. 1991 (O. Tadauchi).

Distribution: Korea (southern Korea).

Floral association: Not available.

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2. *Andrena (Micrandrena) falsificissima* Hirashima

Andrena (Micrandrena) falsificissima Hirashima; 1966, J. Fac. Agr. Kyushu Univ., 14: 92–93 [female, Japan]; Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 60–62 [male, Japan]; Osytsnjuk, 1995, Key Insects Russian Far East, Vol. IV, Part 1, 498, 518–519 [female & male, in key]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 262.

Type material examined: Holotype female (Kyushu Univ.), Sugadaira, 1,200–1,500 m, Shinshu, Honshu, Japan, 30. viii. 1963 (Y. Hirashima).

Distribution: Japan (Hokkaido, Honshu); Russia (Far East area).

Floral association: *Angelica ursina*, *Aralia cordata*.

3. *Andrena (Micrandrena) hanedai* Tadauchi

Andrena (Micrandrena) hanedai Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 73–76 [female & male, Japan]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 333–334.

Specimens examined: Holotype female (Type No. 2510, Kyushu Univ.), Shimouchinami, Ohno, Fukui Pref., Japan, 25. viii. 1974 (Y. Haneda). Other material: China: Beijing: 1 female, 20. viii. 1985 (Y–s. Shi). Hebei Province: Xiaowutaishan: 6 females, Beitai, 1,800–2,400 m, 14–16. viii. 1964 (Y–h. Han); 2 females, Tatou, 1,200 m, 15. viii. 1964 (Y–h. Han); 2 females, 20. viii. 1964 (C–g. Wang). Jilin Province: 1 female, Baihe, Changbaishan, 6. viii. 1981 (Y–r. Wu). Hubei Province: 1 female, Shenglongjia, 1,800 m, 4. viii. 1981 (Y–h. Han).

Distribution: China (new record, Beijing, Hebei, Jilin, Hubei Provs.); Japan (Hokkaido, Honshu).

Floral association: Not available in China.

4. *Andrena (Micrandrena) hikosana* Hirashima

Andrena (Micrandrena) hikosana Hirashima, 1957, Mushi, 30: 53 [female, Japan]; Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 461 [female & male]; Kim and Kim, 1983, Kor. J. Ent., 13: 7 [Korea]; Tadauchi, 1985a,b, J. Fac. Agr., Kyushu Univ., 30: 60, 88, 90; Tadauchi and Lee, 1992, Esakia, (32): 52. Osytsnjuk, 1995, Key Insects Russian Far East, Vol. IV, Part 1, 495, 498, 519 [female & male, in key]. Tadauchi *et al.*, 1997, Esakia, (37): 194 [Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 343–344.

Specimens examined: Holotype female (Kyushu Univ.), Hikosan, Fukuoka Pref., Kyushu, Japan, 9. v. 1951 (Y. Hirashima). Other material: China: Shanghai (O. Piel): 4 females, 24. iv. 1930; 1 female, 30. vi. 1930. Zhejiang Province (O. Piel): Chusan (now is Zhoushan Is.), 1 female, 24. iv. 1931; 1 female, 27. iv. 1931; 1 male, 2. v. 1931. Fujian Province: 1 female, Xingchun, 740–910 m, Chongan County, 25. v. 1960 (Y–r. Zhang).

Distribution: China (new record, Shanghai, Zhejiang, Fujian Provs.); Japan (Hokkaido, Honshu, Sado Is., Shikoku, Kyushu, Tsushima Is.); Korea (southern and central Korea).

Floral association: *Brassica campestris*.

5. *Andrena (Micrandrena) hirashimai* Tadauchi

Andrena (Micrandrena) hirashimai Tadauchi, 1985b, J. Fac. Agr., Kyushu Univ., 30: 86–88 [female & male, Japan]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 346–347.

Specimens examined: Holotype female (Type No. 2511, Kyushu Univ.), Shinmuna, Amami–Oshima, Japan, 22. iii. 1973 (O. Tadauchi). Other material: China: Zhejiang Province: 1 female, Chusan, 27. iv. 1931 (O. Piel). Fujian Province: Xinchun, 740–1,150 m, Chongan County: 4 females, 21. v. 1960 (Y. Zuo); 1 female, 6. vi. 1960 (Y. Zuo); 3 females, 25. v. 1960 (C–l. Ma). Taiwan: 1 female, Mt. Huanshan, Taizhong, 1. vi. 1971 (K. Kanmiya); 1 female, Mt. Nantoushan, Sungkang, 31. v. 1965 (T. Shirôzu).

Distribution: China (new record, Zhejiang, Fujian, Taiwan Provs.); Japan (Amami–Oshima Is., Okinawa–Honto Is.).

Floral association: Not available.

6. *Andrena (Micrandrena) kaguya* Hirashima

Andrena (Micrandrena) kaguya Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 467 [female & male, Japan]; Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 95, 117 [female & male, in key]; Tadauchi, 1985b, J. Fac. Agr., Kyushu Univ., 30: 83–86. Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 380.

Specimens examined: Holotype male and allotype female (Kyushu Univ.), Fukuoka, Kyushu, Japan, 22. iii. 1952 (Y. Hirashima). Other material: China: Zhejiang Province: 1 female and 3 males, Tianmushan, 20–21. iv. 1996 (O. Tadauchi); 10 females, Hangzhou Botanical Garden, 22. iv. 1996 (O. Tadauchi); 6 females, 22. iv. 1996 (H–l. Xu).

Distribution: China (new record, Zhejiang Prov.); Japan (Hokkaido, Honshu, Sado Is., Shikoku, Kyushu).

Floral association: *Brassica campestris*, *Rubus hirsutus*.

7. *Andrena (Micrandrena) komachi* Hirashima

Andrena (Micrandrena) komachi Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 469 [female & male, Japan]; Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 94, 117 [female & male, in key]; Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 63–65; Tadauchi *et al.*, 1997, Esakia, (37): 194 [Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 390–391.

Specimens examined: Holotype male and allotype female (Kyushu Univ.), Tachibanayama, Fukuoka, Kyushu, Japan, 21. iv. 1951 (Y. Hirashima). Other material: China: Shanghai: 1 female, 8. v. 1920 (O. Piel); 1

female, 20. iv. 1930 (A. Savio). Zhejiang Province: 3 males, Tianmushan, Linan, 20–21. iv. 1996 (H.-I. Xu & O. Tadauchi); 2 females, Hangzhou Botanical Garden, 22. iv. 1996 (H.-I. Xu).

Distribution: China (new record, Shanghai, Zhejiang Prov.); Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima Is.); Korea (Cheju Is.).

Floral association: *Brassica campestris*, *Rubus hirsutus*.

8. *Andrena (Micrandrena) minutula* (Kirby)

Melitta minutula Kirby, 1802, Monogr. Apum. Angl., 2: 161 [female & male, England].

Andrena minutula Illiger, 1806, Mag. Insectenk., 5: 72; Dalla Torre, 1896, Cat. Hym., 10: 138; Perkins, 1914, Ent. Mag. London, 50: 75, 73 [female & male]; Stöckhert, 1930, Hym. Nord-und Mitteleurop., 905 [female], 952, 955 [male]; Stöckhert, 1933, Deut. ent. Zeitschr., 1932: 129; Stöckhert, 1954, Abh. Bayer. Akad. Wiss., neue Folge, (65): 27.

Andrena (Andrenella) minutula: Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 210.

Andrena (Micrandrena) minutula: Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307): 54; Tadauchi, 1985b, J. Fac. Agr., Kyushu Univ., 30: 77–80. Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 482–484.

Melitta parvula Kirby, 1882, Monogr. Apum. Angl., 2: 162–164 [female & male, England].

Andrena parvula: Schmiedeknecht, 1883, Apid. Europ. 1: 629–631; Wu, 1965, Econ. Insects Faun. China IX, Hym., Apoidea, 30 [female & male, China]; Wu, 1982, Insects Xizang, vol. 2. 385; Wu, 1992, Insects Hengduan Mts. Region, vol. 2, 1380.

Specimens examined: China: Beijing: 1 female, Badaling, 24. iv. 1973 (Y.-s. Shi). Jilin Province: 1 female, Baihe, Changbaishan, 6. viii. 1981 (Y.-r. Wu). Liaoning Province: 1 female, Gaolingzi, 5. viii. 1955.

Distribution: China (Beijing, Jilin, Liaoning Provs., Xizang Autn. Region); Japan (Hokkaido, Honshu, Shikoku, Kyushu); north and central Europe.

Floral association: Not available.

9. *Andrena (Micrandrena) munakatai* Tadauchi

Andrena (Micrandrena) munakatai Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 70–73 [female & male, Japan]; Tadauchi and Lee, 1992, Esakia, (32): 53 [Korea]; Tadauchi *et al.*, 1997, Esakia, (37): 195 [Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 502.

Specimens examined: Holotype female (Type No. 2509, Kyushu Univ.), Shirikashinai, Kamedagun, Hokkaido, Japan, 17. v. 1964 (M. Munakata). Other material: China: Heilongjiang Province: Harbin: 2 females, 16. v. 1954; 1 male, 11. viii. 1955; 1 female, 6. vi. 1964; Jingpo Lake, Mudanjiang (O. Tadauchi): 7 females, 23. v. 1993; 2 females and 1 male, 24. v. 1993; 5 females, 26. v. 1993; 4 females, 27. v. 1993. Jilin Province: 2 females,

Baihe, Changbaishan, 30. v. 1993 (O. Tadauchi).

Distribution: China (new record, Heilongjiang, Jilin Provs.); Japan (Hokkaido, Honshu); Korea (southern Korea).

Floral association: *Taraxacum* sp.

10. *Andrena (Micrandrena) semirugosa brassicae* Hirashima

Andrena (Micrandrena) brassicae Hirashima, 1957, Mushi, 30: 52 [female & male, Japan]; Hirashima. 1965, J. Fac. Agr., Kyushu Univ., 13: 464 [redescription]; Hirashima. 1966, J. Fac. Agr., Kyushu Univ., 14: 95, 117 [female & male, in key]; Kim and Kim, 1983, Kor. J. Ent., 13: 7 [Korea]; Tadauchi, 1985a,b, J. Fac. Agr., Kyushu Univ., 30: 67, 89; Tadauchi and Lee, 1992, Esakia, (32): 53 [Korea].

Andrena (Micrandrena) semirugosa brassicae: Tadauchi and Xu, 1999, Esakia, (39): 14–15.

Specimens examined: Holotype male and allotype female of *A. brassicae* (Kyushu Univ.), Homansan, Prov. Chikuzen (=Fukuoka Pref.), Kyushu, Japan, 18. iii. 1951 (Y. Hirashima). Other material: China: Beijing: 3 females, 24. iv. 1962 (S.-m. Ge); 8 females, 14. vi. 1863 (S.-m. Ge); 2 females, 28. iv. 1964 (S.-m. Ge); 5 females, 6. vi. 1965 (y.-h. Han); 2 females, 9. v. 1985 (J.-g. Fan). Gansu Province: 1 male and 1 female, Lanzhou, 29–30. iv. 1955 (S.-j. Ma). Qinghai Province: 3 females, Guinan, 3,300–3,800 m, 28. v. 1957 (Y.-r. Zhang). Shannxi Province: 2 females, Huangling, 1,000–1,400 m, 4. vi. 1963 (J.-l. Mao). Shandong Province: 7 females, Taishan, Taian, 2–6. vi. 1973 (S.-f. Wang). Sichuan Province: Emeishan, 550–750 m, 2 females, 29. iii. 1957 (K.-r. Huang); 3 females, 4. iv. 1963 (J.-l. Mao).

Distribution: China (new record, Qinghai, Gansu, Shannxi, Beijing, Shandong, Sichuan Provs.); Japan (Hokkaido, Honshu, Sado Is., Shikoku, Kyushu, Tsushima Is., Yakushima Is.); Korea (southern and central Korea).

Floral association: See Tadauchi (1985).

11. *Andrena (Micrandrena) sublevigata* Hirashima

Andrena (Micrandrena) sublevigata Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 91–92 [female & male, Japan]. Tadauchi, 1985a, J. Fac. Agr., Kyushu Univ., 30: 65–67; Tadauchi and Lee, 1992, Esakia, (32): 52 [Korea]; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 725–726.

Specimens examined: Holotype female and allotype male (Kyushu Univ.), Fukuchiyama, Takeda, Honshu, Japan, 12. iv. 1963 (Y. Hirashima). Other material: China: Beijing: 1 female, 11. iv. 1950 (L.-y. Wang); 20 females, 23. iv. 1963 (S.-m. Ge); 4 females, 26. iv. 1974 (Y.-r. Wu); 2 females, 26. iv. 1974 (S.-f. Wang). Hebei Province.: 1 female, Xintai, 29. iv. 1963 (J.-l. Mao). Gansu Province: 2 females, Lanzhou, 30. iv. 1955 (S.-j. Ma). Shanghai: 2 females, 16. iv. 1931 (O. Piel); 2 females and 1 male, 20. iv. 1932 (A. Savio); 2 males, 31. iii. 1932 (O. Piel); 2 males, 23. iv. 1951. Jiangsu Province: 2 females, Zhenjiang, 3–7. iv. 1919 (O. Piel). Zhejiang Province: 1 female,

Mokanshan, 1. iv. 1936 (O. Piel). Hubei Province: 1 female, Longmenhe, 1,350 m, Xingshan, 16. vi. 1993 (J. Yao).

Distribution: China (new record, Beijing, Hebei, Gansu, Hubei, Jiangsu, Zhejiang, Shanghai Provs.); Japan (Hokkaido, Honshu, Sado Is., Shikoku, Kyushu); Korea (southern Korea).

Floral association: China: *Brassica* sp.

12. *Andrena (Micrandrena) subopaca* Nylander

Andrena subopaca Nylander, 1848, Notis. Saellsk.

Fauna & Flor. Fenn. Forh., 1: 221 [female & male, Finland]; Perkins, 1914, Ent. Mag. London, 50: 73, 75; Alfken, 1929, Arkiv. Zoologi, 20A (16): 7; Stöckhert, 1930, Hym. Nord-und Mitteleurop., 905, 954; Stöckhert, 1933, Deut. ent. Zeitschr., 1932: 129; Yasumatsu, 1941, Peking nat. Hist. Bull., 15: 280; Stöckhert, 1954, Abh. Bayer. Akad. Wiss., neue Folge, (65): 27.

Andrena (Andrenella) subopaca: Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 210.

Andrena (Micrandrena) subopaca: Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307): 55; Tadauchi, 1985b, J. Fac. Agr., Kyushu Univ., 30: 80–83; Osytsnjuk, 1995, Key Insects Russian Far East, Vol. IV. Part 1, 499, 519; Gusenleitner & Schwarz, 2002, Entomofauna, (Suppl. 12): 730–731; Proshchalykin, 2006: Far East. Ent., (153): 8.

Specimens examined: China: Sichuan Province: 1 female, Maerkang, 3,200 m, 30. vi. 1961 (Z–f. Li). Yunnan Province: 1 female, Zhongdian, 3,200 m, 8. viii. 1981 (X–z. Zhang). Liaoning Province: 1 female, Kao–lin–tse (now is Gaolingzi), 16. vi. 1940.

Distribution: China (new record, Sichuan, Yunnan, Liaoning Provs.); Japan (Hokkaido, Honshu, Kyushu); north and central Europe; central Asia and Far East of Russia.

Floral association: Not available.

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REFERENCES

- Alfken, J. D. 1929 Entomologische Ergebnisse der schwedischen Kamtschatka-Expedition 1920–1922, Apidae, excl. genus *Bombus*. *Arkiv. Zoologi*, **20A**(16): 1–8
- Asmead, W. H. 1899 Classification of the bees, or the superfamily Apoidea. *Trans. Am. ent. Soc.*, **26**: 49–100
- Cockerell, T. D. A. 1924 Descriptions and records of bees. *Cl. Ann. Mag. Nat. Hist.*, **14**(9): 179–185
- Gusenleitner, F. and M. Schwarz 2002 Weltweite Checkliste der Bienen-gattung *Andrena* mit Bemerkungen und Ergänzungen zu paläarktischen Arten (Hymenoptera, Apidae, Andreninae, *Andrena*). *Entomofauna, Suppl.*, **12**: 1–1280 (In German)
- Hedicke, H. 1933 Beiträge zur Systematik der Gattung *Andrena* F. (Hym. Apid.). *Mitt. Zool. Mus. Berlin*, **19**: 199–220 (In German)
- Hirashima, Y. 1957 Descriptions and records of bees of the genus *Andrena* from Eastern Asia. 3. (Hymenoptera, Andrenidae). *Mushi*, **30**: 49–57
- Hirashima, Y. 1965 Systematic and biological studies of the family Andrenidae of Japan (Hymenoptera, Apoidea). Part 2. Systematics 5. *J. Fac. Agr., Kyushu Univ.*, **13**: 461–491
- Hirashima, Y. 1966 Systematic and biological studies of the family Andrenidae of Japan (Hymenoptera, Apoidea). Part 2. Systematics 7. *J. Fac. Agr., Kyushu Univ.*, **14**: 89–131
- Illiger, K. 1806 William Kirbys familien der Bienenartigen insekten mit Zusätzen, Nachweisungen und Bemerkungen. *Mag. Insectenk.*, **5**: 28–175
- Kim, M.-I. and C.-w. Kim 1983 On the 9 unrecorded Andrenidae from Korea (Hymenoptera: Apoidea). *Kor. J. Entomol.*, **13**(1): 5–9
- LaBerge, W. E. 1964 Prodnomus of American bees of the genus *Andrena* (Hymenoptera, Apoidea). *Bull. Univ. Nebraska St. Mus.*, **4**: 279–316
- Lanham, U. 1949 A subgeneric classification of the New World bees of the genus *Andrena*. *Univ. California Publ. Ent.*, **8**: 183–237
- Nylander, W. 1848 Adnotationes in expositionem monographi-cam speciebus Europae media. *Notis. Sällsk. Faun. Fl. fenn. Förh.*, **1**: 165–282
- Perkins, R. C. L. 1914 Synopsis of the British forms of the *Andrena minutula* group. *Ent. mon. Mag.*, **25**(2): 71–75
- Osytsnjuk, A. Z. 1977 Bees–Andrenidae, *Fauna Ukraini*, **12**(5): 1–328 (In Ukrainian)
- Osytsnjuk, A. Z. 1995 *Andrena*. In “Key to the Insects of Russian Far East in six volumes. vol. 4, Neuropteroidea, Mecoptera, Hymenoptera, Part 1”, ed. by P. A. Lehr, St. Petersburg, Nauka, pp. 489–527 (In Russian)
- Proshchalykin, M. Yu. and A. N. Kupianskaya 2006 The bees (Hymenoptera, Apoidea) of the northern part of the Russian Far East. *Far Eastern Ent.*, (153): 1–39
- Ribble, D. W. 1968 Revisions of two subgenera of *Andrena*: *Micrandrena* Ashmead and *Derandrena*, new subgenus (Hymenoptera: Apoidea). *Bull. Univ. Neb. St. Mus.*, **8**: 237–394
- Stöckhert, E. 1930 *Andrena* Fabr. In “Die Hymenopteren Nord-und Mitteleuropas” ed. by O. Schmiedeknecht, Gustav Fischer Jena, pp. 897–986 (in German)
- Tadauchi, O. 1985a Synopsis of *Andrena (Micrandrena)* of Japan (Hymenoptera, Andrenidae) Parts I. *J. Fac. Agr., Kyushu Univ.*, **30**: 59–76
- Tadauchi, O. 1985b Synopsis of *Andrena (Micrandrena)* of Japan (Hymenoptera, Andrenidae) Parts II. *J. Fac. Agr., Kyushu Univ.*, **30**: 77–94
- Tadauchi, O. 2006 The genus *Andrena* from Kazakhstan and Kyrgyzstan collected by the Kyushu University expedition (Hymenoptera, Andrenidae) (1). *Esakia*, (46): 1–19
- Tadauchi, O. and C.-e. Lee 1992 The family Andrenidae of Korea (Hymenoptera Apoidea) I. *Esakia*, (32): 47–58
- Tadauchi, O. and H.-I. Xu 1999 Subgeneric positions and redescrptions of Cockerell’s Siberian *Andrena* preserved in the British Museum (Natural History) (Hymenoptera, Andrenidae). *Esakia*, (39): 13–30
- Tadauchi, O., H.-I. Xu and J.-c. Paik 1997 The family Andrenidae of Korea (Hymenoptera, Apoidea) II. *Esakia*, (37): 187–202
- Warncke, K. 1968 Die Untergattungen der westpaläarktischen Bienen-gattung *Andrena* F. *Mem. Est. Mus. Zool. Univ. Coimbra*, (307): 1–111
- Wu, Y.-r. 1965 *Economic Insects Fauna of China IX, Hymenoptera, Apoidea*. Science Press, Beijing
- Wu Y.-r. 1982 Hymenoptera: Apoidea. In “Insects of Xizang”,

- Vol. II, ed. by F-s. Huang, Science Press, Beijing, pp. 379–426
- Wu Y-r. 1992 Hymenoptera: Apoidea. *In* “Insects of Hengduan Mountains Regions”, Vol. II, ed. by S-x. Chen, Science Press, Beijing, pp. 1378–1421