九州大学学術情報リポジトリ
Kyushu University Institutional Repository

Systematic and biological studies of the family Andrenidae of Japan (Hymenoptera, Apoidea) Part 2. Systematics, 6

Hirashima, Yoshihiro
Entomological Laboratory, Department of Agriculture, Kyushu University

https://doi.org/10.5109/22732

出版情報：九州大学大学院農学研究院紀要. 13 (3), pp.493-517, 1965-05. Kyushu University
バージョン：
権利関係：

KYUSHU UNIVERSITY

Journal of the Faculty of Agriculture, Kyushu University, Vol. 13, No. 3,
May 30, 1965

Systematic and biological studies of the family Andrenidae of Japan (Hymenoptera, Apoidea)
Part 2. Systematics, 6*

Yoshihiro HIRASHIMA

---

16. Subgenus *Poecilandrena* Hedicke

Poecilandrena Hedicke, 1933, Mitt. 2001. Mus. Berlin, 19: 218; Hirashima, 1952, Mushi, 24: 64.

Type-species: *Andrena labiata* Fabricius, 1781. (Original designation.)

Diagnosis: So far as the type species is concerned, the subgenus is recognizable by the robust and rather small size, the entire process of the labrum, the shiny integument, and the presence of very fine and dense punctures on the metasoma which is black and red. The female of this species is further distinct in having the propodeal corbicula not well developed, with dorsal fringe of rather scanty, not well arranged hairs, interior of corbicula with sparse, fine, simple hairs throughout, the trochanteral floccus perfect and dense, the tibia1 scopa compact with simple hairs, and the posterior spur of the hind tibia slightly widened and curved near the base. The male of this species is characterized by the yellow clypeus, and primarily by the aedeagus of the genitalia which is keeled medially.

Andrena fukuokensis Hirashima, the only representative of the subgenus in Japan, deviates slightly from *Andrena* ***labiata*** Fabricius in having the metasoma black and the vein 2nd transverse cubitus ending not usually but frequently more close to the pterostigma.

Description: Small to medium-sized species, integument " ganz oder ausgedehnt metallfarben oder aber Hinterleib ausgedehnt rotbraun," or black with legs partly ferruginous. Head moderate or rather large in male ; process of labrum entire; malar space obsolescent; inner margins of eyes subparallel or very slightly convergent below ; thorax with none of pubescence black ; propodeal enclosure well indicated, slightly to distinctly more coarsely sculptured than dorsal face of propodeum ; fore wings with three submarginal cells ; vein 2nd transverse cubitus occasionally ending close to pterostigma ; 1st metasomal tergum densely and finely punctate, especially so in female; 2nd and following terga with punctures becoming obsolescent toward apical terga ; posterior depressions of metasomal terga well indicated.

*Fe**male***: Facial fovea narrow, with upper end occupying less than one-half of

*Contribution Ser. 2, No. 218, Entomological Laboratory, Kyushu University.

distance between eye and post ocellus, separated from eye margin by a very narrow space; antennae short, swollen toward apical segments, with 3rd segment about equal to next two segments together; propodeal corbicula with dorsal fringe of not well arranged, rather short to moderately long hairs, without fringe of hairs anteriorly, interior with sparse, fine, simple hairs throughout; trochanteral floccus perfect; tibial scopa compact, composed of rather long, dense, primarily simple hairs; mid basitarsi scarcely expanded medially, subequal or slightly narrower than hind basitarsi; posterior spur of hind tibia slightly widened and curved near base or at least curved near base; posterior depressions of intermediate terga sparsely fringed with short appressed hairs.

Male: Clypeus and frequently lower paraocular areas yellow; mandibles moderate; antennae with 3rd segment as long as or slightly shorter than next two segments together; cheeks moderate or more or less well developed; genitalia with parapenial lobe rounded and hardly produced; aedeagus slender or slightly widened basally, strongly keeled medially.

(53) Andrena (Poecilandrena) fukuokensis Hirashima

Andrena (*Micrandrena*) ***fukuokensis*** Hirashima, 1952, Mushi, 23: 39, female and male.

Although this species was combined to the subgenus *Micrandrena* in my original paper, I now think that this species is best referred to the subgenus ***Poecilandrena.*** The presence of the very dense punctures (although fine) on the 1st metasomal tergum and the structure of the male genitalia deviate from those of *Micrandrena.* For *Poecilandrena,* the integument is "ganz oder ausgedehnt metallfarben oder aber Hinterleib ausgedehnt rotbraun" (Hedicke, 1933). So far as this character which was given in the original description of the subgenus is concerned, this species seems to deviate from species of that subgenus. I think, however, it is better to treat it in that group because, if the black metasoma of this species is ignored, it is structurally closely allied to *Andrena* ***labiata*** Fabricius, the type-species of the subgenus ***Poecilandrena.***

Since the description of this species I was able to examine only a few specimens from Honshu and Kyushu. All the specimens before me were taken in spring.

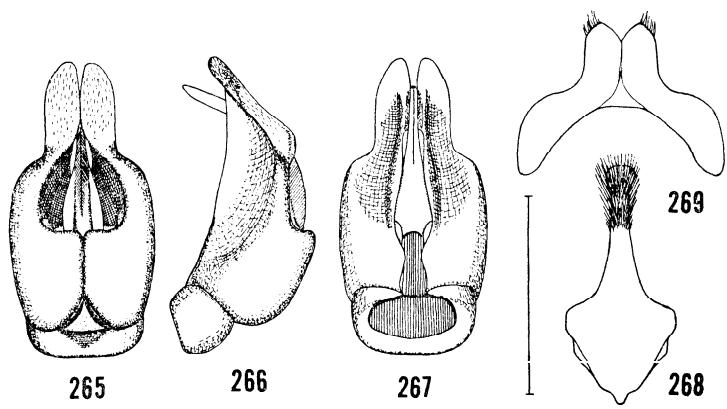
Female : Robust, length about or a little less than 8 mm.

Colour: Black; about or more than apical halves of mandibles reddened; bases of mandibles reddish; flagellum except basal two segments reddish or yellowish brown; wings yellowish subhyaline with distal margins a little darkened; veins and stigma pale yellowish brown; tegulae broadly pale yellowish brown transparent, brown anteriorly; legs piceous with hind tibiae and tarsi, mid tarsi and small segments of fore tarsi clear ferruginous, and frequently mid tibiae and fore basitarsi reddened; tibial spurs approximately concolorous with hind tibiae; posterior margins of metasomal terga rather broadly yellowish transparent.

Pubescence: Hairs on full body nearly concolorous, golden to bright fulvous, nowhere mixed with darker hairs; facial fovea bright, golden in some light; hairs on head rather short to short, those on clypeus more or less fine and sparse; hairs on mesoscutum rather short, dense but not conspicuous; hairs on posterior margins of mesoscutellum and metanotum longer and more conspicuous;

dorsal fringe of propodeal corbicula long, not well arranged; interior of corbicula with fine simple hairs; trochanteral floccus nearly perfect, dense ; femoral floccus dense; tibial scopa bright golden, compact, composed of moderately long, well arranged hairs ; metasoma scanty of hairs; cilia on terga becoming longer toward apical terga ; hairs on posterior margins of 2nd to 4th terga more dense than elsewhere, forming indistinct lateral (nearly complete on 4th) fringes ; caudal fimbria bright golden.

Structure: Head of moderate size, quite indistinctly narrower than thorax seen from above, somewhat rounded in front view ; mandibles moderately long, robust; malar space linear; process of labrum large, transverse, with apical margin nearly straight; clypeus more or less well convex, densely tessellate, weakly and rather sparsely punctate with a trace of median, longitudinal, broad, impunctate space ; clypeus slightly exceeding line running bases of eyes, its index about 1.8 : 0.8; facial quadrangle longer than broad (about 7 : 5.5); facial fovea rather narrow, separated from eye margin by a narrow space with upper end not well indicated; antennae* rather short, with 3rd segment as long as next two segments together; 4th segment distinctly broader than long, following segments becoming elongate and widened toward penultimate segment which is a little broader than long ; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is 1.4 : 1 : 3.3 : 4; cheeks a little broader than eyes seen in profile, rather convex, densely tessellate or nearly shagreened. Mesoscutum densely tessellate, with weak and rather close punctures which about as large as or a little smaller than those on clypeus; mesoscutellum more densely punctate than in mesoscutum; propodeum shagreened or nearly roughened; enclosure large, triangular, well indicated, interior coarsely wrinkled or rugose nearly all over; lateral face of propodeum reticulate ; mesopleuron shagreened with an indication of sparse roughened punctures, about as coarse as or a little less coarsely sculptured than propodeum. Wings with 2nd submarginal cell hardly narrowed above, receiving 1st recurrent vein about or before middle of



Figs X5-269. Genitalia and associated structures of male *Andrena* (*Poecilandrena fukuokensis* Hirashima. 265: dorsal view of genitalia, 266: lateral view of the same, 267: ventral view of the same, 268: 8th sternum, 269: 7th sternum.

cell; 2nd transverse cubitus close to pterostigma, ending two or three vein widths distant from it; basal vein interstitial with or distad of nervulus. Legs with mid basitarsi hardly dilated medially, indistinctly narrower than hind basitarsi. Metasoma broad ; 1st tergum microscopically tessellate, very densely punctate with punctures a little smaller than those on mesoscutum; posterior margin of 1st tergum narrowly impunctate ; 2nd tergum nearly as in 1st but posterior portion with punctures weaker and sparser; 3rd tergum less punctate with punctures much sparser than those on 1st; 4th tergum nearly impunctate ; posterior depressions of terga broad, not sharp but more or less well indicated.

Male : Length about or slightly less than 7 mm., occasionally larger.

Colour: Black; clypeus entirely pale yellow ; occasionally lower portions of paraocular areas concolorous with clypeus ; mandibles reddened apically ; flagellum beneath reddish brown to yellowish brown ; wings very slightly smoky, distal margins a little more darkened; veins and stigma yellowish brown, tegulae pale yellowish brown transparent posteriorly, brown anteriorly; legs piceous with fore tarsi yellowish brown, mid tarsi and hind tibiae and tarsi more yellowish, a little paler than in female; mid tibiae reddened, narrowly yellowish brown anteriorly; metasoma partly piceous ; posterior margins of metasomal terga pale yellowish transparent.

Pubescence: Hairs on head and thorax rather short to more or less long, not dense, those on metasoma short, not conspicuous; hairs on clypeus downy apically, white ; hairs on head primarily white to slightly yellowish; hairs on thorax above pale to pale yellowish brown, darkest on mesoscutellum posteriorly, those on thorax below pale to white; cilia on metasomal terga nearly white or slightly yellowish ; hairs on posterior margins of metasomal terga slightly more dense than elsewhere ; posterior margins of 2nd and following sterna each with a complete fringe of more or less well arranged, suberect, bright, whitish hairs.

Structure : Head of moderate size, quite indistinctly broader than thorax seen from above, more or less circular in front view; mandibles more or less long, robust; malar space linear ; process of labrum transverse, slightly convex apically ; clypeus well convex, tessellate, weakly and more or less densely punctate; clypeus slightly exceeding line running bases of eyes, its index about 1.4 : 0.7; facial quadrangle longer than broad (about 5.8 : 4.4); antennae more or less long, with 3rd segment about one and one-half times as long as broad, shorter than next two segments together; 4th segment broader than long; 5th segment nearly as long as broad ; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is about 1.0 : 0.9 : 2.8 : 3.6; cheeks about as broad as eyes seen in profile, its outline rather distinctly convergent posteriorly seen from above, weakly nearly shagreened. Mesoscutum tessellate, weakly and sparsely punctate with punctures weaker than those on clypeus; scutellum tessellate or weakly nearly shagreened posteriorly, more weakly punctate than in mesoscutum ; propodeum nearly roughened ; enclosure weakly to more or less well indicated, large, broadly wrinkled, narrowly rugulose apically ; mesopleuron shagreened. Wings nearly as in female. Legs slender, without special modification. Metasoma shiny ; 1st tergum finely and closely punctate; 2nd tergum a little more sparsely punctate than in 1st; 3rd tergum with punctures much sparser and weaker than those on 2nd; 4th and 5th terga nearly impunctate; posterior depressions of terga not well indicated. Genitalia and subgenital sterna

as illustrated.

Distribution: Japan (Honshu and Myushu).

Specimens examined: from *Honshu*, 1 male, Amami, Osaka, 3. iv. 1937 (O.Y.); 2 females and 1 male, on *Brassica*, Yoshii, Okayama Pref., 27. iv. 1960 (R. Morimoto); from *Kyushu*: 2 males, Sasaguri, Prov. Chikuzen, 9. iv. 1951 (Y. Hirashima); 2 males and 1 female, Tachibanayama, 13. iv. 1951 (Y. Hirashima); 3 females, on flowers of *Brassica*, Fukuoka, 16. iv. 1951 (Y. Hirashima).

Flower record: *Brassica campestris* L.

17. Subgenus *Simandrena* Pérez

Simandrena Pérez, 1890, Act. Soc. Linn. Bordeaux, 44: 174 ; Cockerell, 1936, Pan-Pacific Ent., 12: 145; Hedicke, 1933, Mitt. 2001. Mus. Berlin, 19 : 218; Hirashima, 1952, Mushi, 24: 62.

Type-species: *Andrena propinqua* Schenck, *1853*. (By designation of Hedicke, 1933.)

Diagnosis: *Simandrena* is characterized by the highly developed propodeal corbicula in the female. The interior of the corbicula is free of hairs, the anterior margin with a complete fringe of hairs, and the dorsal margin with a long, dense, downwards curling fringe of hairs. The female of *Simandrena* is further distinct in having the hind tibia which is rather short, dilated subapically, with tibia1 scopa of unusually short, fine hairs. The propodeal enclosure is usually coarsely sculptured, more or less well to well indicated.

The subgenus is found in both the Old and New Worlds. According to Lanham (1949), *Platandrena* Viereck is a synonym of *Simandrena*. So far as my study goes, the subgenus is represented by two species in Japan.

(54) *Andrena* (*Simandrena*) *opacifovea* Wirashima

Andrena (*Simandrena*) *opacifovea* Hirashima, 1952, Mushi, 24 (7); 31, female and male.

Andrena opacifovea Uéda, 1954, Trans. Shikoku ent. Soc., 4 : 50.

This species is one the commonest *Andrena* which is associated with the flowers of *Brassica* in spring. It is a close relative of European *Andrena combinata* Christ, but is readily separated from the latter in having the clypeus much smoother, the mesoscutum much less tessellate, and the metasomal terga, especially the 1st and 2nd, distinctly less punctate. This species also related to the following species, *Andrena kerriae* sp. nov., but it is distinguished by the smoother clypeus, the less punctate metasoma and the less developed tibia1 scopa which is composed of much shorter hairs than in *kerriae*.

This species has been collected throughout Japan. It appears once a year, and associates with flowers of *Brassica*, *Euonymus*, etc.

Female: Length 9-11 mm.

Colour: Black ; mandibles reddened apically; flagellum brownish or reddish brown beneath; wings smoky with distal margins slightly darkened; veins and stigma yellowish brown ; tegulae reddish brown or more brownish; legs nearly black or piceous with tibiae and tarsi deep reddish brown; tibia1 spurs pale transparent.

Pubescence: Hairs on body rather short and scanty; hairs on head nearly pale or sometimes slightly yellowish except for sparse brownish hairs on frons and vertex ; facial fovea dull in front view, appears bright in some light, brownish above and silvery below; mesoscutum with short, sparse, pale ochraceous hairs and with much sparser, longer, erect ones above; hairs on thorax moderately long and dese, but not obscure integument, dull white without admixture of darker ones ; dorsal fringe of propodeal corbicula yellowish, quite long, well arranged; hairs on legs whitish to pale, except for yellowish hairs on inner sides of basitarsi ; trochanteral floccus imperfect, rather scanty ; tibia1 scopa scanty, composed of very short (on outer face) to slightly longer (on anterior margin) hairs ; metasoma scanty of hairs; posterior margins of 2nd to 4th terga with broad white hair bands, band of 2nd broadly, that of 3rd narrowly interrupted medially ;caudal fimbria yellowish, slightly brownish medially.

Structure: Head normal; process of labrum moderate in size, broadly rounded at apex; clypeus well convex, finely tessellate, with irregular punctures; 3rd antenna1 segment indistinctly shorter than 4th plus 5th; cheeks slightly rounded above.

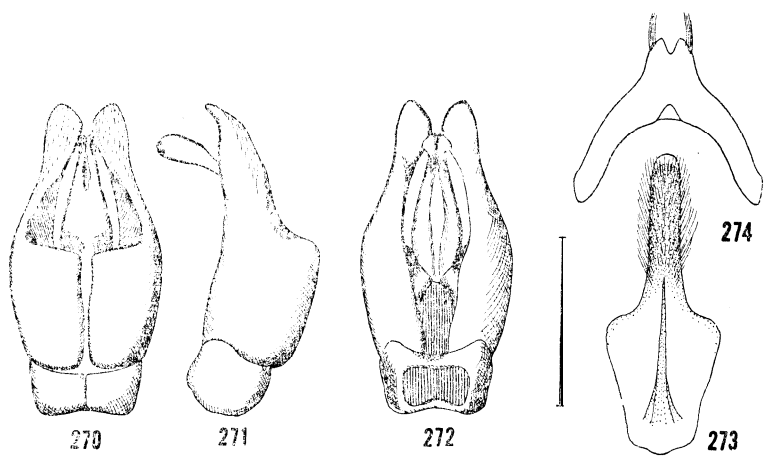
Mesoscutum tessellate, dull, with more or less strong punctures; propodeum subtriangular, strongly tapering posteriorly, coarsely sculptured, dull ; enclosure of propodeum triangular, well defined, distinctly wrinkled nearly all over; mesopleuron somewhat coarsely shagreened anteriorly, tessellate posteriorly. Legs with hind tibia not long, widened apically.

Metasoma finely tessellate all over, therefore weakly shiny; 1st tergum with very weak punctures ; 2nd and following terga with similar punctures slightly denser-

Male: Length 7-8 mm.

Colour: Mandibles reddened apically ; flagellum brown beneath; wings and tegulae nearly as in female; legs and metasoma sometimes piceous.

Pubescence: Head and thorax with long, more or less dense, dull hairs, those



Figs. 270–274. Genitalia and associated structures of male *Andrena* (*Simandrena*) *opacifovea* Hirashima. 270: dorsal view of genitalia, 271: lateral views of the same, 272 : ventral view of the same, 273: 8th sternum, 274: 7th sternum.

on clypeus white, on sides of face and frons blackish, on thorax above yellowish; metasoma scanty of hairs; hairs on 1st tergum white, longer than those on the following terga; no distinct hair hands.

Structure: Head moderate in size, transverse in front views; mandibles moderately long, more or less robust; malar space very narrow, almost linear medially; process of labrum transverse with apical margin nearly entire; clpyeus well convex medially, weakly tessellate, somewhat coarsely punctured with punctures subcontiguous to two puncture widths apart; clypeus slightly exceeding line running bases of eyes, its index about 1.7 : 1.1; facial quardrangle slightly longer than broad (about 6.7 : 5.7); antennae rather elongate with 3rd segment about as broad as long, shorter than 4th which is approximately as long as 5th; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance about 1.5 : 1.8 : 3.5 : 5.3; cheeks about as broad as or slightly narrower than eyes seen in profile, much receding, nearly shagreened posteriorly. Mesoscutum tessellate, with somewhat roughened punctures, or nearly roughened anteriorly; scutellum about as in mesoscutum; propodeum strongly coarsely sculptured; enclosure well indicated, large, densely irregularly and strongly wrinkled all over; mesopleuron almost roughened, dull. Wings as in female. Legs slender, as usual. Metasomal terga finely tessellate, shiny, with an indication of microscopical punctures; posterior depressions of terga not sharply indicated, impunctate. Genitalia and subgenital sterna as illustrated.

Distribution: Japan (Hokkaido, Honshu, Shikoku and Kyushu).

Specimens examined: A long series of specimens have been examined. Out of them, only the following specimens from Shikoku are recorded here: 1 male and 3 females, on the flowers of *Brassica campestris*, Tokushima City, 11. iv. 4960 (T. Kobayashi).

Flower records: *Brassica campestris* L., *Euonymus alata* Sieb. var. *subtriflorus* Franch. et Sav., and *Stellaria media* Cly. for the females and males.

(55) *Andrena* (*Simandrena*) *kerriae* sp. nov.

This species is close to the preceding species, *Andrena opacifovea* Hirashi ma, but is readily separated from that species in having the clypeus more tessellate, the metasoma, especially the 1st metasomal tergum, much more densely and more distinctly punctate, the tibia1 scopa composed of longer hairs, and the presence of the fulvous hairs on the thorax. This species resembles *Andrena combinata* (Christ) more closely rather than it does to *opacifovea*. So far as the female is concerned, *kerriae* is distinguished from *combinata* in having the clypeus with a median, longitudinal, impunctate space, the mesoscutum smooth and shiny posteriorly, the scutellum smooth and more punctate, the propodeum shorter with the enclosure less strongly and more closely wrinkled, and the tibia1 scopa composed of longer hairs.

Unfortunately this species is known only from the female. Specimens before me have been collected in April and May, on the flowers of *Brassica*, *Salix*, *Prunus* and *Kerria*.

Female: Length about or slightly over 9 mm.

Colour: Black ; mandibles reddened apically; flagellum brown beneath ; tegulae brown, a little paler posteriorly ; wings subhyaline with distal margins a little

darkened; veins and stigma brownish ; posterior margins of metasomal terga brownish subtransparent.

Pubescence: Hairs on head whitish, not specially dense, slightly yellowish on cheeks and occiput; hairs on thorax above pale fulvous, not mixed with darker ones; hairs on mesoscutum rather scanty medially, not long ; dorsal fringle of propodeal corbicula distinctly yellowish, well arranged ; trochanteral floccus imperfect, rather scanty ; tibia1 scopa as in the preceding species, composed of short, pale hairs ; 2nd to 4th terga each with a broad, dense, white band, that of 2nd broadly interrupted, and that of 3rd narrowed medially; caudal fimbria large, golden.

Structure: Head nearly normal ; clypeus strongly convex, tessellate with close punctures; clypeus with a longitudinal impunctate space ; facial quadrangle a little longer than broad (about 8 : 7); antennae with 3rd segment equal to 4th plus 5th; cheeks receding.

Mesoscutum slightly shiny medially, with irregular punctures a little stronger than in *opacifovea* ; scutellum flat, densely punctate; propodeum shorter and broader than in *opacifovea*, coarsely sculptured enclosure large, well defined, distinctly wrinkled all over. Legs with mid basitarsi slender; hind tibia short, widened apically. Metasomal terga, including 1st, densely punctured with punctures much more evident than in *opacifovea*.

Variation: Some specimens differ from the majority of them in having the clypeus more smooth, therefore more shiny, slightly more strongly punctate, with or without an indication of median, longitudinal, impunctate space; the mesoscutum sparsely punctate; the enclosure of propodeum rugose, not wrinkled; the metasoma more shiny with punctures slightly sparser, and caudal fimbria brownish. Because of the shortage of the sufficient material, I cannot determine at the present time whether or not these variations are interspecific. However, it seems probable that they may eventually be separated from *kerriae*.

Distribution: Japan (Hokkaido, Honshu and Kyushu).

Type-material: Holotype female and 1 paratopotype female, on the flowers of *Kerria japonica*, San jiro Utsukushigahara, Nagano, 7. v. 1961 (Y. Hirashima); 3 paratype females, Chuo Rinkan, Yamato, Koza, Kanagawa, 17. iv. 1958 (R. Ishikawa); paratype female, same data as above; 4 paratype females, on the flowers of *Prunus armeniaca* L. var. *ansu* Maxim. and on *Brassica campestris* L. respectively, Mori, Koshoku City, Nagano Pref., 19-20. iv. 1961 (Y. Maeta); 2 paratype females, on the flowers of *Salix* spp., Campus, Shinshu University, Nagano, 12. iv. 1961 (Y. Maeta); paratype female, on the flower of *Brassica*, Makizono, Kagoshima, 11. iv. 1959 (Y. Hirashima); paratype female, Sapporo, Hokkaido, 3. vi. 1955 (K. Kami jo).

Flower records: As recorded above, females of this species have been collected on *Kerria japonica* DC., *Prunus armeniaca* L. var. *ansu* Maxim., *Salix* spp. and *Brassica campestris* L.

18. Subgenus *Stenomelissa* Hirashima et LaBerge, nov.

στενος, narrow and μέλισσα bee

Type-species : *Andrena halictoides* Smith, 1869.

Diagnosis : This new subgenus is easily recognizable by the combination of

characters such as the protuberant clypeus, the elongate malar space, the elongate maxillary and labial palpi, and the large process of labrum in both sexes, the well developed tibia1 scopa which is composed of long branched hairs in the female, and the yellow clypeus and the uncinate apical segments of the antennae in the male. This subgenus seems to be related to *Iomelissa* of the New World. *Stenomelissa* is, however, readily separated from *Iomelissa* by the elongate malar space and the absence of the dense tergal hair bands. *Stenomelissa* is perhaps more closely allied to *Conandrena* of the New World. It has a protuberant clypeus as in *Conandrena*, but the malar space is longer than in any species of *Conandrena*. **Also,** *Stenomelissa* has a well-marked pronotal humeral angle (weak in *Conandrena*), highly plumose hairs of tibia1 scopa (simple to weakly plumose in *Conandrena*), modified last male flagellar segment (normal in *Conandrena*), a declivous propodeum without well-marked dorsal surface in both sexes (well-marked dorsal surface in *Conandrena*).

The subgenus is composed of a single species, *Andrena halictoides*, which occurs in Japan (Honshu and Kyushu and probably in Shikoku) and collects pallen from the flowers of *Lonicera*.

Description: Medium-sized, more or less slender species; integument black; legs and occasionally metasoma partly piceous. Head elongate, facial quadrangle much longer than broad; clypeus protuberant ; malar space elongate, approximately as long as base of mandible; labial palpi elongate, subequal to long maxillary palpi in length; inner margins of eyes subparallel or slightly converging above. Propodeum granulate, not roughened, with propodeal enclosure more or less well indicated, finely sculptured; mesopleuron densely tessellate or nearly granulate, impunctate ; wings with three submarginal cells; 2nd submarginal cell receiving 1st recurrent vein near end of cell; basal vein distad of nervulus. Metasoma elongate ; 1st metasomal tergum nearly smooth and impunctate; 2nd and following terga finely tessellate basally, scattered with microscopical fine punctures; posterior depressions of terga more or less broad, poorly indicated.

Female: Clypeus produced, considerably exceeding below a line across bases of eyes; facial fovea long, rather narrow, deep and sharply indicated; process of labrum large, semicircular; antennae with 3rd segment slightly longer than 4th plus 5th. Thorax with none of pubescence black. Propodeal corbicula with dorsal fringe of long, branched, not well-arranged hairs ; interior of corbicula with sparse, branched hairs anteriorly and dorsally ; trochanteral floccus perfect, long and dense; femoral floccus composed of long, dense branched hairs; tibia1 scopa well developed, composed of long, dense branched hairs. Mid basitarsi slender, scarcely expanded medially, a little narrower than hind basitarsi ; posterior spur of hind tibia normal. Posterior margins of 2nd to 4th metasomal terga with sparse hair fringes.

Male: Clypeus yellow ; mandibles rather long, robust, with sharp falciform apices; process of labrum transverse, convex ; head variable in shape, much elongate to quadrate; antennae with 3rd segment about twice as long as broad, 4th about as long as broad, 5th and following segments one and one-half times as long as broad; apical segment of antennae uncinate. Metasoma especially slender, without tergal hair fringes. Genitalia elongate, with parapenial lobes elongate, rounded apically ; paramere elongate and expanded apically, with inner edges sharply indicated ; aedeagus rather small, deeply excavated laterally.

(56) Andrena (Stenomelissa) halictoides Smith

Andrena halictoides Smith, 1869, Entomologist, *4: 205,* female; Dalla Torre, 1896, Cat. Hym., 10: 129; Cockerell, 1913, Ann. Nag. Nat. Hist., (8)11: 1954 ; Yasumatsu, 1941, Pecking Nat. Hist. Bull., 15: 276.

Halictus halictoides Sandhouse, 1943, Proc. U.S. Nat. Mus., 92: 576.

This is a quite interesting species and the recognition of it is very easy owing to its distinguished characters.

The majority of the specimens before me have been collected in May. Thus, it seems probable that this species appears in late spring and passes a generation per year.

Synonymy: Sandhouse (1943, p. 576) stated, on the comment of *Nesohalictus* Crawford, that " The genotype *(Halictus (Nesohalictus) robii* Crawford, 1810) is a synonym of (*Andrena*) *Halictus halictoides* (F. Smith), 1869, according to Bliithgen, Mittl. Deut. Ent. Ges., vol. 1, p. 75, 1930." According to my opinion, however, it is not the case and it is obvious that it is of her misunderstanding.

Blüthgen's comment is as follows:

"341. *H. Biroi* Friese 1909 (vgl. oben Nr. 290) = *halictoides* (Smith) 1859 ♀. Die im Museum zu Oxford befindliche Type des letzteren lag mir vor. Vgl. auch oben N. 201."

It is clear that Sandhouse simply believed what Bliithgen cited as "*halictoides* (Smith) 1859" as an *Andrena*, and she made an error in consequence of this idea. In No. 201 of his *Weitere Synonyme* which appears in the fourth paper of *Beiträge zur Synonymie der Bienengattung* Halictus *Latr.*, Bliithgen (1925) stated that "*Nomia halictoides* Sm. ist gleichfalls ein *Halictus.*" Therefore, what Bliithgen cited as "*halictoides* (Smith) 1859 " have to consider as *Nomia halictoides* Smith, 1859. The latter species is, however, considered to be published in 1858. Blüthgen's opinion is summarized from his paper published from 1925 to 1930 that *Halictus biroi* Friese, 1909, *Haticlus (Nesohalictus) robii* Crawford, 197.0, and *Halictus carinatifrons* Strand, 1910, are synonyms of *(Nonzia) Halictus halictoides* (Smith, 1858), and not of *Andrena halictoides* Smith, 1869.

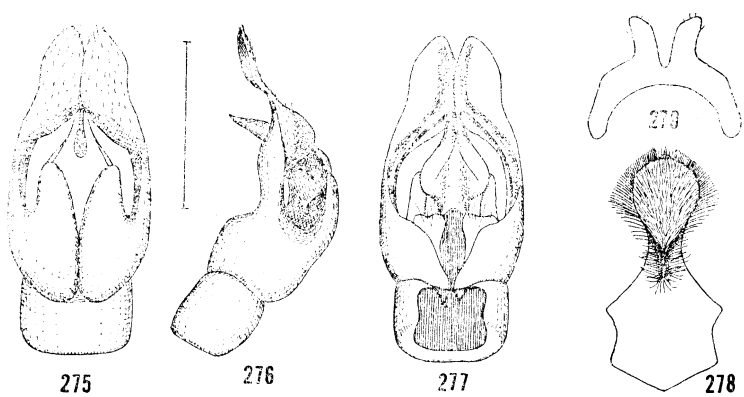
Female: Slender, length 10—12 mm.

Colour: Black ; mandibles reddened apically; malar space often obscurely reddened ; flagellum beneath reddish brown ; wings slightly dusky, veins and stigma nearly pale brown; tegulae broadly pale yellowish brown transparent ; legs piceous, small segments of tarsi nearly reddish brown; tibia1 spurs pale yellowish brown ; metasoma occasionally piceous, posterior margins of terga broadly pale transparent.

Pubescence: Hairs on head and thorax rather short to more or less long, not specially dense, those on abdomen scanty; hairs on head nearly uniformly dull white except for those on vertex and frons laterally slightly brownish; facial fovea brown, glistening in some light; hairs on mesoscutum, scutellum and metanotum uniform in colour, rather variable, primarily pale yellowish brown, sometimes more paler or more brownish; hairs on mesoscutum rather short, looking rather shorn ; hairs on propodeum and sides of thorax long, nearly dull white; propodeal corbicula not well developed, with dorsal fringe of rather loose hairs; hairs on outer faces of tibiae and tarsi of fore and mid legs glistening brown; trochanteral and femoral floccus white, composed of long, well branched hairs respectively, the former perfect; tibia1 scopa sooty brown or nearly fuscous,

becoming whitish anteriorly, with hairs on anterior margin nearly silver white; tibia1 scopa quite well developed, composed of long, dense, well branched hairs; hairs on outer and inner faces of hind basitarsi brown or deep reddish brown; metasoma scanty of hairs; cilia on 2nd to 4th terga pale or very slightly brownish; posterior margins of 2nd and 3rd terga with indistinct lateral fringes of sparse, whitish hairs ; similar and sparser hairs present on posterior margin of 4th tergum ; caudal fimbria glistening yellowish brown.

Structure: Head considerably elongate, longer than broad seen in front; mandibles long, well decussate, moderately robust; malar space elongate, a little shorter than or about equal to basal width of mandibles, nearly smooth and strongly shiny; process of labrum very large, semicircular; clypeus protuberant, much exceeding line running bases of eyes, its index about 0.8 : 2.8 to 0.4 : 3.2; clypeus smooth or nearly so, broadly impunctate or very sparsely punctate medially, weakly punctate laterally ; subantennal and supraclypeal areas well convex ; antennae rather long, with 3rd segment a little longer than 4th plus 5th; 4th indistinctly broader than long, 5th about as long as wide; facial fovea long, deep, narrowed above with upper end occupying about one-half of distance between eye and post ocellus; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is 1.7 : 1.5 : 3.2 : 4.3; cheeks about as broad as eyes seen in profile, rounded above, receding below, nearly smooth and quite feebly punctate near eyes, feebly rugulose posteriorly and beneath. Mesoscutum tessellate, distinctly so anteriorly, weakly and not densely punctate, weakly shiny ; anterior part of scutellum shiny, not tessellate or feebly so ; sparsely punctate ; dorsal face of propodeum densely tessellate, not roughened, weakly to rather well shiny; enclosure ill defined, more finely tessellate than outside, narrowly rugulose basally ; mesopleuron sculptured nearly as in dorsal face of propodeum. Wings with 2nd submarginal cell receiving 1st recurrent vein near end of cell; basal vein much distad of nervulus. Legs with mid basitarsi scarcely expanded medially, slenderer than hind basitarsi; hind tibiae slender, scarcely widened apically. Metasomal terga shiny; 1st tergum smooth and nearly impunctate ; 2nd and following terga nearly smooth or feebly tessellate, sparsely



Figs. 2X-279. Genitalia and associated structures of male *Andrena* (*Stenomelissa*) *halictoides* Smith. 275: dorsal view of genitalia, 276 : lateral view of the same, 277: ventral view of the same, 278: 8th sternum, 279: 7th sternum.

to moderately densely, very weakly punctate; posterior depressions of 2nd to 4th terga broad, more or less distinctly marked.

Male: Slender, length 8.540 mm.

Colour: Black ; clypeus yellow ; lower paraocular areas occasionally with yellow markings ; mandibles reddened apically ; flagellum reddish brown beneath ; wings, includings veins and stigma, nearly as in female or a little paler; tegulae pale yellowish brown transparent or more yellowish, slightly darker anteriorly; legs piceous to reddish brown, tarsi brownish ; metasomal terga nearly piceous, with posterior margins broadly pale yellowish brown subhyaline or more paler.

Pubescence: Hairs on head and thorax rather long to long, rather sparse, those on metasomal terga rather short to short, sparse; hairs on full body nearly uniform in colour, nearly dull yellowish gray, without admixture of brown hairs except for cilia on apical metasomal terga occasionally slightly brownish; metasomal terga without hair fringes on posterior margins.

Structure: Head greatly variable in size (see under *Polymorphism*); head frequently as long as broad seen in front; mandibles long, robust to quite robust, simple with sharp apices; malar space about equal to or slighty shorter than basal width of mandible, smooth and shiny; process of labrum large, transverse, nearly flat or slightly convex, with apical margin entire; clypeus protuberant, much produced, nearly smooth, sparsely and weakly punctate; antennae elongate with 3rd segment about twice as long as broad, 4th nearly quadrate, 5th about one and one-half time as long as broad and subequal to each following segment in length, ultimate segment uncinate ; facial fovea deeply impressed with inner edge not distinct; cheeks variable, usually broader than eyes seen in profile, receding to considerably well developed. Mesoscutum tessellate, nearly smooth and shiny posteriorly, weakly and sparsely punctate; scutellum slightly convex, tessellate with anterior part shiny; propodeum densely tessellate, nearly roughened, dull; enclosure ill defined, more finely tessellate than dorsal face of propodeum, rather shiny, narrowly nearly rugulose basally ; mesopleuron densely tessellate, not roughened. Wings nearly as in female. Legs slender; hind basitarsi slightly curved downward ; apices of tibiae each with an outwardly projecting spine, middle one of which is longest. Metasomal terga shiny, nearly smooth, with very fine, moderately close punctures; 6th metasomal sternum deeply triangulary emarginate ; ultimate sternum largely exposed throughout that emargination. Genitalia and subgenital sterna as illustrated.

Polymoryhism: It is of great interest as well as of importance to recognize this species that the head of the male vary greately both in the size and shape. Usually the head is broader than the thorax, but occasionally it is small and about as broad as or, on the contrary, quite massive and exceedingly broader than the thorax. In the latter case, the dead is quadrate in front view and monster-like, then the clypeus neither protuberant nor much produced. The malar space is usually elongate. The cheeks also vary greatly; frequently they are receding beneath, but sometimes they develop very well, becoming more and more convex, and are measured more than twice as broad as the eyes seen in profile. The ocelloccipital and ocellocular distance also elongate at the same time in consequence of the development of the head. The pronotum also varies in the shape accompanied with the enlargement of the head; it becomes thicker and the postero-lateral tubercles develop more and more robust.

Thus, the appearance of the head as well as the shape of the pronotum of somespecimens in the lesser development is very different from those of the monsterlike ones.

Specimens examined: from *Honshu*: 1 male, Toyotama, Tokyo, 1948 (R. Ishikawa); 1 female, Egota, Tokyo, 4. iv. 1249 (R. Ishikawa); 1 male, same locality as above, 4. iv. 1950 (R. Ishikawa): from *Kyushu*: 1 male, Mt. Hikosan, Prov. Buzen, Kyushu, 1,000 m., 19. iv. 1935 (K. Yasumatsu); 3 males and 1 female, same locality as above, 6-11. v. 1951 (Y. Hirashima); 4 males and 17 females, on the flowers of *Lonicera gracilipes* var. *glandulosa*, same locality as above, 11-13. v. 1952 (Y. Hirashima).

Distribution: Japan (Honshu, Kyushu).

Flower record: As recorded above, I have collected a series of males and females on *Lonicera gracilipes* var. *glandulosa* Maximowicz, the flowers of which are elongate and tuberant. It seems probable that the elongate head as well as the mouth parts of this species is best suitable to sucking the nectar from the tuberant flowers of *Lonicera*. This species is probably monolectic or at least oligolectic in nature.

Question on the existence of the sibling species: I keep several male specimens collected in May from the various localities in Honshu, which differ from those recorded above in having the head quadrate but not so massive, the clypeus more convex, the malar space shorter, the lower paraocular areas always decorated with larger yellow markings, and the genitalia with the paramere less elongate. So far as they are concerned, it seems probable to me that they may represent a different species, but I hesitate to describe it at the present time.

19. Subgenus *Taeniandrena* Hedicke

Taeniandrena Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19 : 219; Niemelä, 1949, Ann. ent. Penn., 15 : 101; Lanham, 1949, Univ. Calif. Pub. Ent., 8 : 215; Hirashima, 1952, Mushi, 24 : 63.

Diagnosis: The subgenus is characterized by the process of labrum which is short, transverse, occasionally nearly triangular, narrowly and deeply bilobed apically, with irregular rugae over the surface. This character is best recognized in the female. The head is broad and thin, with the clypeus broadly flat and scarcely convex in lateral view. The punctures on the clypeus rather elongate. The subgenus is also easily recognized by the metasoma which is oval, densely tessellate-punctured or only densely tessellate, with conspicuous appressed hair bands on the posterior margins of the intermediate terga.

The subgenus is primarily found in the Old World. *Andrena wilkella* (Kirby), which occurs in Europe, is found also in the United States. It is said, however, that it is an introduced species. So far as the present paper is concerned, the subgenus is represented by only a single species, *Andrena yezoensis* sp. nov., in Japan.

Description: Medium-sized, robust species, integument black, legs usually partly brownish to ferruginous. Head broad, thin; process of labrum short, strongly narrowing toward apex where deeply bilobed, usually with irregular rugae over surface; clypeus only slightly convex or broadly flat, tessellate, with elongate punctures in female; malar space obsolescent; eyes long, with inner

margins subparallel ; thorax without black pubescence ; propodeum rounded, enclosure of propodeum not sharply indicated, not much coarsely sculptured than dorsal face of propodeum; fore wings with three submarginal cells; metasoma, especially in female, oval, densely tessellate-punctate or tessellate, with posterior depressions poorly indicated.

Female: Facial fovea wide, rather long, not sharply defined, hardly separated from eye margin by a punctate space; 3rd antenna1 segment as long as or longer than 4th plus 5th; dorsal fringe of propodeal corbicula short, rather scanty to compact; interior of corbicula with long, coarse, simple hairs, the majority of which are concentrated on anterior half, no fringe of hairs anteriorly; trochanteral floccus imperfect to nearly perfect, scanty to moderately dense; tibia1 scopa compact; mid basitarsi scarcely widened medially, subequal to or narrower than hind basitarsi; posterior spur of hind tibiae slightly curved near base ; metasomal terga with conspicuous appressed hair bands.

Male: Clypeus black ; mandibles moderate ; 3rd antenna1 segment at least longer than broad, as long as or shorter than, or occasionally longer than 4th; intermediate segments of flagellum usually longer than broad, slightly to distinctly convex anteriorly ; cheeks receding ; legs without special modification ; genitalia with parapenial lobe slightly to distinctly produced, more or less acute, paramere expanded apically with sharp inner edges, redeagus usually swollen basally, sides not excavated.

(57) Andrena (Taeniandrena) ezoensis sp. nov.

This species is a close relative of *Andrenaovatula* (Kirby) of Europe. Female of this species is only separable from that of the latter in having the hair band on the 3rd metasomal tergum narrowed or rarely interrupted medially, the antenna1 segments relatively longer, the mesoscutum more tessellate and punctate, the propodeum more strongly roughened and the tibiae and tarsi of the hind legs at most reddish brown, not clear ferruginous as in *ovatula*. The male of this species is distinguished from that of *ovatula* in having the clypeus more shiny and slightly more produced below, the 3rd antenna1 segment a little longer than broad while it is as long as broad in *ovatula*, and the intermediate flagellar segments slightly more convex in front. This species is also close to European *Andrena gelriae* Van der Vecht. The female of *ezoensis* is distinguished from that of *gelriae* in having the clypeus more strongly punctate, the mesoscutum more sparsely punctate, and the legs darker, and the male is separated in having the intermediate metasomal terga hardly constricted basally and the posterior depressions of the metasomal terga more weakly indicated. The pubescence of the body of *ezoensis* is much paler than in *gelriae*.

This species occurs in Hokkaido where it is one of the commonest *Andrena* which flys in summer. A few specimens have been collected in the mountainous region of Honshu.

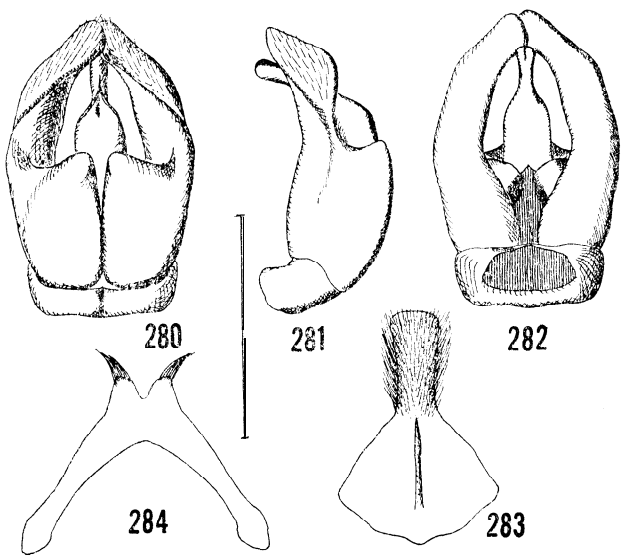
Female: Length 9.5—11 mm.

Colour: Black ; mandibles reddened apically ; flagellum beneath deep reddish brown; wings subhyaline with distal margins but little darkened; veins and stigma yellowish brown ; tegulae reddish brown subhyaline posteriorly, darkened anteriorly ; legs piceous with hind tibiae and tarsi reddish brown; tibia1 spurs

yellowish brown ; metasom.a occasionally obscure piceous basally, with posterior margins of terga narrowly brownish subhyaline.

Pubescence : Hairs on head rather short to short, rather fine, primarily white, slightly yellowish on frons and vertex; facial fovea slightly brownish above, not conspicuous ; hairs on thorax short, not specially dense, dull and pale yellowish brown on mesoscutum, scutellum and metanotum, pale or whitish on the rest of thorax; dorsal fringe of propodeal corbicula not well developed, composed of short, rather scanty, whitish hairs ; interior of corbicula with coarse, simple, silvery hairs anteriorly ; hairs on mesopleuron slightly longer than those on mesoscutum, not obscure integument; legs without brownish hairs ; trochanteral floccus nearly perfect, somewhat dense, white; femoral floccus long, dense, silver white; tibia1 scopa compact, composed of moderately long, dense, slightly coarse, simple hairs; tibia1 scopa silver white, or sometimes yellowish posteriorly, occasionally narrowly brownish above basally ; metasoma scanty of hairs with discs of 1st and 2nd terga bare; cilia on 3rd and 4th terga brownish; caudal fimbria brownish medially; posterior margin of 2nd tergum with lateral, those of 3rd and 4th terga with complete bands of short, appressed, snow-white hairs; band of 3rd tergum narrowed or rarely interrupted medially; similar hair fringe presents on posterior margin of 1st tergum laterally.

Structure: Head a little broader than thorax seen from above, rather thin, somewhat round in front view; mandibles moderately long and robust; malar space very narrow, nearly obsolescent; process of labrum short, subtriangular, rugose, emarginate or bispinose apically; clypeus broadly flat, tessellate, dull, coarsely rugoso-punctate with an indication of median, longitudinal, raised, impunctate space ; punctures on clypeus slightly stronger than in *ovatula*; clypeus



Figs. 280–284. Genitalia and associated structures of male *Andrena* (*Taeniandrena*) *ezoensis* Hirashima. 280 : dorsal view of genitalia, 281 : lateral view of the same, 282: ventral view of the same, 283: 8th sternum, 284: 7th sternum.

slightly exceeding line running bases of eyes, its index about 2 : 1.5; facial quadrangle longer than broad (about 9 : 7.5); lower paraocular areas rugoso-punctate, shiny; facial fovea more or less long and broad, not sharply indicated ; antennae with 3rd segment shorter than 4th plus 5th; penultimate segment of antennae longer than broad while it is about as long as broad in *ovatula*; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance about 1.6 : 2.5 : 3.5 : 5.5; cheeks slightly narrower than eyes seen in profile, much receding, rounded posteriorly, a little more coarsely sculptured than in *ovatula*. Mesoscutum tessellate, dull, densely punctate with punctures much weaker than those on clypeus; scutellum shiny anteriorly, irregularly punctate; metanotum usually flat dorsally, not normally convex as in *ovatula*; propodeum dull, coarsely sculptured with indication of roughened punctures ; enclosure poorly defined, rugose basally, granulate apically ; propodeum including enclosure usually a little more coarsely sculptured than in *ovatula*; mesopleuron coarsely sculptured with more or less sparse, roughened punctures, dull. Wings with 2nd submarginal cell receiving 1st recurrent vein about middle or before middle of cell; basal vein basad of nervulus. Legs with mid basitarsi slender, subequal to hind basitarsi in width; posterior spurs of hind tibiae slightly curved near base. Metasoma oval; 1st tergum much broader than long, densely tessellate, with an indication of sparse, very weak punctures; 2nd and following terga densely tessellate, densely punctate with punctures about as strong as in *ovatula*; posterior depressions of 2nd and following terga narrow, weakly indicated medially.

Male: Length 8-9 mm.

Colour: Black; mandibles piceous or more reddened apically ; flagellum reddish brown ; wings slightly yellowish subhyaline, with distal margins a little darkened ; veins and stigma yellowish brown; tegulae brownish subhyaline posteriorly, darkened anteriorly; legs black with small segments of tarsi brownish or occasionally further hind basitarsi obscurely so; posterior margins of metasomal terga narrowly brownish subhyaline.

Pubescence: Hairs on head somewhat long, more or less dense, primarily white or slightly yellowish on frons and vertex; hairs on clypeus becoming shorter toward apex ; hairs on thorax more or less long and dense but not obscure integument, slightly yellowish brown above, whitish below; head and thorax without admixture of brownish hairs; hairs on legs white except for pale ferruginous hairs on inner sides of tarsi; metasoma covered with short fine hairs, those on 1st and 2nd metasomal terga white, and those on 3rd to 5th terga brownish; posterior margin of 2nd tergum with lateral, those of 3rd to 5th terga each with a complete band of short, more or less loose, white hairs; band of 3rd usually narrowed or rarely interrupted medially; similar hairs present on posterior margin of 1st tergum laterally; posterior margins of 2nd to 5th metasomal sterna each with a complete fring of curled, silvery hairs.

Structure: Head a little broader than thorax seen from above, more or less round in front view; mandibles moderately long, somewhat slender ; malar space very narrow; process of labrum short, nearly bispinose apically ; clypeus more or less broadly nearly flat, strongly and densely rugoso-punctate, with or without an indication of median, longitudinal, impunctate space; punctures on clypeus slightly stronger than in *ovatula*; clypeus rather well exceeding line running bases of eyes, its index about 1.7 : 1.4; facial quadrangle longer than broad (about

8.2 : 6.5); antennae elongate with 3rd segment slightly longer than broad, slightly shorter than 4th which is about one and one-half times as long as broad and subequal to following segments in length; 5th and following segments convex in front ; frons and upper paraocular areas longitudinally striate-punctate, the latter deeply concave ; vertex nearly roughened ; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance about **1.5** : 2.3 : 3.5 : 5.3; cheeks about as broad as or a little narrower than eyes in lateral view, much receding. Mesoscutum densely tessellate, dull, rather densely punctate wite punctures slightly roughened anteriorly, more or less shallow ; scutellum nearly flat, shiny anteriorly, irregularly punctate ; propodeum coarsely sculptured, dull; enclosure poorly indicated, coarsely sculptured, or rugose basally, nearly granulate apically ; mesopleuron more coarsely sculptured than propodeum. Wings nearly as in female. Legs slender, as usual. Metasoma oblong, slightly shiny; 1st tergum tessellate with an indication of weak and sparse punctures; 2nd and following terga tessellate, more densely and distinctly punctate; posterior depressions of terga narrow, very poorly indicated. Genitalia and subgenital sterna as illustrated.

Distribution: Japan (Hokkaido and Honshu).

Type material : Holotype male, allotopotype female and 15 paratopotypes (9 males and 6 females), on the flowers of white clover, Ikeda, Tokachi, Hokkaido, 14-16. vii, 1953 (Y. Hirashima); 6 paratype females, Nishiashoro, Tokachi, Hokkaido, 9. viii. 1933 (Y. Hirashima); paratype female, Kawakami, near Honbetsu, Tokachi, Hokkaido, 17–57. vii. 1953 (Y. Hirashima); 3 paratype males, on the flowers of white clover and *Dasyphora fruticosa*, Botanical Garden, Sapporo, Hokkaido, 27. vi. 1958 (Y. Hirashima); paratype male, Mt. Apoi-nupuri, Hidaka, Hokkaido, 2. vii. 1958 (Y. Hirashima); paratype female, Karuizawa, Honshu, 30. vii. 1949 (R. Ishikawa); paratype female, same locality as above, 21. viii. 1949 (R. Ishikawa); paratype female, same locality as above, 25. viii. 1951 (Ishikawa and Maruyama).

Flower records: As recorded above, this species has been commonly collected on *Trifolium repens* L. and *Dasyphora fruticosa* Rydb.

20. Subgenus ***Trachandrena*** Robertson

Trachandrena Robertson, 1902, Trans. Amer. Ent. Soc., 28 : 187 ; Cockerell, 1929, Ann. Ent. Soc. Amer., 22 : 754; Hedicke, 1933, Mitt. Zool. Mus. Berlin, 19: 220 ; Lanham, 1949, Univ. Calif. Pub. Ent., 8 : 216 ; Hirashima, 1952, Mushi, 24 : 61; Popov, 1958, Horae Soc. Ent. Univ, Soviet., 46: 153.

SC *raptcrops is* Viereck, 1922, Occ. Papers Boston Soc. Nat. Hist., 5 : 42; Lanham 1949, Univ. Calif. Pub. Ent., 8: 216.

Type-species: *Andrena rugosa* Robertson, 1891.

Diagnosis: The subgenus is easily recognized by the enclosure of the propodeum which is rugose and transversely carinate posteriorly. It is further distinct in having the strong punctures on the mesoscutum, the coarsely sculptured mesopleuron and propodeum, and the considerably well indicated posterior margins of the metasoma. The females of *Trachandrena* are further distinct by the characters such as the facial fovea widely separated from the eye margin, the propodeal corbicula not specially well developed with sparse, fine and simple hairs on interior, the posterior spurs of the hind tibia neither widened nor

curved near the base, etc. The male is further characterized by the acute, strongly produced parapenial lobes and the modified parameres of the genitalia.

So far as known, the subgenus is essentially American. It is represented by more than 70 species in the United States. On the contrary, it is represented by only five species in the Old World (Popov, 1958). Of these, *Andrena haemorrhoa* Fabricius and *Andrena foveopunctata* Alfken have been recorded from Japan. Distribution of the latter is constricted only to Japan.

According to Lanham (1949), *Scrapteropsis* is a synonym of *Trachandrena*.

Description: Medium-sized to small species, integument black in our species; legs black or reddened. Head moderate in size; process of labrum nearly flat in female, entire or slightly emarginate apically; malar space almost obsolescent; inner margins of eyes subparallel; facial quadrangle longer than broad; thorax without black pubescence; enclosure of propodeum rugose, transversely carinate posteriorly; dorsal face of propodeum as well as mesopleuron coarsely sculptured; mesoscutum considerably strongly punctate; fore wings with three submarginal cells; metasoma with posterior margins of intermediate terga conspicuously well indicated, especially so in female.

Female: Facial fovea well indicated, separated from eye margin by a wide shiny space; 3rd antenna1 segment shorter than 4th plus 5th; dorsal fringe of propodeal corbicula not specially well developed, with dorsal fringe of long, not specially dense hairs; interior of corbicula with sparse, fine, simple hairs throughout; trochanteral floccus imperfect, rather scanty (nearly to quite perfect, rather scanty in American species); tibia1 scopa compact; posterior spur of hind tibia normal; metasomal terga without hair fringes posterior spur of hind tibia normal; metasomal terga without hair fringes posteriorly.

Male: Clypeus black; mandibles moderate or falciform; 3rd antenna1 segment as long as broad and shorter than 4th; cheeks rather well to well developed, not sharply angulate behind; genitalia with parapenial lobe acute and strongly produced; paramere with apical half curved inward and apical portion expanded; aedeagus slender or expanded basally with sides excavated.

(58) *Andrena* (*Trachandrena*) *foveopunctata* Alfken

Andrena foveopunctata Alfken, 1932, Mitt. Deut. Ent. Gesell., 3 : 119, female; Yasumatsu, 1941, Peking Nat. Hist. Bull., 15: 276.

Andrena (*Trachandrena*) *foveopunctata* Hedicke, Mitt. Zool. Mus. Berlin, 19 : 220; Hirashima, 1952, Mushi, 23: 38, female and male.

This is a rather small and robust species. The recognition of it is very easy owing primarily to the mesoscutum which is foveolate-punctate. The metasoma of the female is also characteristic, namely, the posterior depressions of the second to fourth terga are considerably broad, nearly smooth and impunctate. None of the related species is known to me.

So far as the present data are concerned, this species appears once a year. It flys in April and May, and primarily found on the flowers of *Brassica* in Honshu and Kyushu.

Female: Robust, length about or slightly over 8 mm.

Colour: Black; mandibles reddened apically; flagellum reddish brown beneath; wings very slightly brownish, nearly hyaline, with distal margins a little more

darkened ; veins and stigma brownish; tegulae brownish subhyaline posteriorly, deep brown or blackish anteriorly; legs nearly black or piceous, tarsi brownish or obscure reddish brown; tibia1 spurs pale yellowish brown; metasoma occasionally partly reddened; posterior margins of metasomal terga reddish brown.

Pubescence: Hairs on head and thorax rather short and scanty, those on metasoma especially scanty ; hairs on head uniformly white; facial fovea very slightly brownish above, whitish below; hairs on thorax above very pale yellowish brown to pale, those on thorax below whitish; propodeum with dorsal fringe of rather scanty, more or less long, branched hairs; interior of corbicula hairy throughout; trochanteral floccus imperfect, scanty, white ; femoral floccus silver white; tibia1 scopa large, compact, composed of well arranged, somewhat coarse hairs; tibia1 scopa silver white, narrowly brown above basally ; hairs on metasoma primarily confined to periphery; posterior margins of 2nd to 4th terga with fringe-like, very sparse, snow white hairs laterally; caudal fimbria bright, brownish, covered with long shiny white hairs.

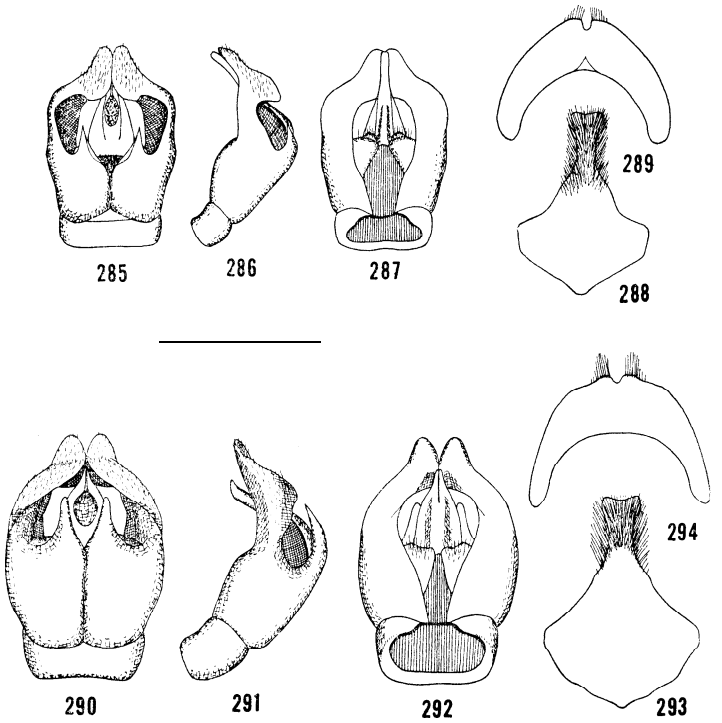
Structure: Head about as broad as thorax seen from above; mandibles moderately long, robust; malar space linear ; process of labrum rather small, nearly entire or slightly notched at tip; clypeus well convex, shiny, strongly and coarsely rugoso-punctate with punctures becoming coarser and sparser toward apex ; clypeus slightly exceeding line running bases of eyes, its index 1.7 : 1.2; facial quadrangle longer than broad (about 7.3 : 6.4); facial fovea deep, broadly separated from eye margin by a shiny space, constricted at middle ; antennae with 3rd segment a little more than one and one-half times as long as broad, slightly shorter than next two segments together; ratio of postocellar width to ocelloccipital distance to postocellar distance to ccellocular distance is 1.6 :1.3: 3 :4.3; frons strongly longitudinally striate-punctate ; vertex shiny, coarsely punctate above, with punctures becoming distinctly coarser and stronger beneath. Masoscutum foveolate-punctate, with punctures irregular in distribution, interspaces linear to several puncture widths apart, weakly tessellate; scutellum shiny, punctate nearly as in mesoscutum; propodeum roughened or strongly and irregularly wrinkled ; enclosure well indicated, defined by a carina posteriorly, interior of enclosure somewhat longitudinally carinate; mesopleuron quite strongly roughened, much coarsely sculptured than in propodeum. Wings with 2nd submarginal cell receiving 1st recurrrent vein beyond middle of cell; 3rd submarginal cell occasionally receiving 2nd recurrent vein close to end of cell; basal vein about interstitial with nervulus. Legs with mid basitarsi scarcely expanded medially, subequal to hind basitarsi in width. Metasomal terga nearly smooth and shiny ; 1st tergum scattered with weak punctures; 2nd to 4th terga transversely elevated basally, narrowly so medially and broadly so sublaterally; or in other expression, posterior depressions of 2nd to 4th terga well indicated, quite broad, narrowed sublaterally, nearly smooth and impunctate; basal. elevations of terga densely punctate ; intermediate sterna of metasoma strongly and quite closely rugoso-punctate with punctures considerably stronger than those on terga.

Male: Length about or slightly less than 8 mm.

Colour: Black ; mandibles reddened apically; flagellum brown beneath ; wings, including veins and stigma, a little paler than in female; tegulae brownish subhyaline posteriorly, deeper brown anteriorly ; legs piceous, small segments of tarsi brownish; metasoma partly piceous; posterior margins of metasomal terga brownish subhyaline.

Pubescence : Hairs on clypeus long, dense, downy, white; hairs on the rest of head slightly yellowish in fresh specimens; hairs on thorax somewhat abundant, very pale yellowish brown above, whitish below, not mixed with brown hairs; hairs on metasomal terga short, sparse, nearly white, those on apical terga slightly yellowish; apical margins of 2nd to 5th metasomal sterna with fringe-like, soft, branched, white hairs.

Structure: Head more or less large, slightly broader than thorax seen from above ; head transverse ; vertex well exceeding line running summits of eyes seen in front; mandibles long, slender, falciform, with sharp apices; malar space nearly linear; process of labrum transverse, slightly convex; clypeus only slightly convex, densely rugoso-punctate ; clypeus only slightly exceeding line running bases of eyes, its index about ***1.7 : 0.7***; facial quadrangle about as long as broad (about ***6.3 : 6)***; antennae somewhat long, with 3rd segment indistinctly longer than broad, slightly shorter than 4th which is indistinctly shorter than 5th; frons longitudinally striate and weakly punctate ; vertex coarsely rugoso-punctate ; ratio



Figs. 285-294. Genitalia and associated structures of male *Andrena* (*Trachandrena*). Figs. 285-289 : *foveopunctata* Alfken, 285 : dorsal view of genitalia, 286: lateral view of the same, 287: ventral view of the same, 288: 8th sternum, 289: 7th sternum. Figs. 290-294: *haemorrhoa japonibia* Hirashima, 290: dorsal view of genitalia, 291: lateral view of the same. 292: ventral view of the same, 293 : 8th sternum, 294: 7th sternum.

of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is 1.4 : 1.4 : 3.5 : 4.7; cheeks much broader than eyes, its outline elongate and slightly convergent posteriorly seen from above, somewhat coarsely rugoso-punctate all over. Mesoscutum strongly and densely rugoso-punctate, nearly dull ; scutellum well convex, punctate nearly as in mesoscutum, with interspaces smoother; propodeum strongly and coarsely wrinkled or coarsely sculptured ; enclosure well indicated, longitudinally carinate, bounded posteriorly ; mesopleuron strongly roughened or quite coarsely sculptured with indication of large punctures. Wings with 3rd submarginal cell occasionally receiving 2nd recurrent vein nearly at end of cell (nearly as in *Halecomelissa*). Legs slender, without special modification. Metasomal terga smooth and shiny; 1st tergum scattered with microscopical punctures ; 2nd and following terga weakly and sparsely, occasionally somewhat densely punctate ; posterior depressions of 2nd to 5th terga well indicated, about one-half as broad as tergum respectively, nearly impunctate ; metasomal sterna much more evidently punctate than in terga, with punctures relatively sparser than in female. Genitalia and subgenital sterna as illustrated.

Distribuition: Japan (Honshu and Kyushu).

Specimens examined: Following specimens other than those recorded in my previous paper were examined from Honshu: 1 male, Nara-park, Nara, 10. iv. 1952 (R. Ishikawa) ; 2 females, on the flowers of *Euonymus alata subtrifloris*, Tenryukyo, Nagano Pref., 8. v. 1961 (Y. Hirashima): from *Kyushu:* 4 females, on flowers of *Brassica campestris*, Shisui-mura, near Kikuchi-City, Prov. Higo, 22. iv. 1959 (Y. Hirashima).

Flower records: Females have been collected on the flowers of *Brassica campestris* L. and *Euonymus alata* Sieb. var. *subtrifloris* French. et Sav.

(59) *Andrena* (*Trachandrena*) *haemorrhoa japonibia* Hirashima

Andrena (*Trachandrena*) *haemorrhoa japonibia* Hirashima, 1957, Mushi, 30 : 53, female and male.

Since the description of this subspecies in 1957, I was able to examine a short series of female specimens from Hokkaido and a few from Kyushu. On the other hand, I received a short series of male and female specimens of the Polish *haemorrhoa* from Dr. W. J. Pulawski. The examination of them reveals that the Japanese subspecies *japonibia* is distinctly smaller than European *haemorrhoa*. Although it was ignored in the original description of *japonibia*, it may be an important diagnostic character that the interior of the propodeal corbicula of the female is quite strongly and irregularly carinate in *haemorrhoa* while it is only nearly rugose in *japonibia*. As a whole, the propodeum of *japonibia* is much less coarsely sculptured than in *haemorrhoa*. Thus, the Japanese form is easily distinguishable from the European one so far as the smaller size as well as the structure of the propodeum are concerned.

Female: Length about or less than 10 mm. (10—12 mm. in *haemorrhoa*).

Colour: Black ; mandibles reddened apically ; flagellum beneath brownish ; wings slightly yellowish subhyaline, veins and stigma yellowish brown or sometimes reddish ; tegulae yellowish brown transparent posteriorly, blackish anteriorly; legs with mid tarsi, and hind tibiae and tarsi ferruginous, and small segments

of fore tarsi reddened; tibial spurs yellowish ; posterior margins of metasomal terga weakly reddened.

Pubescence : Hairs on head and thorax rather short, more or less dense, those on metasoma scanty ; hairs on head white, very slightly yellowish on vertex; facial fovea whitish; hairs on mesoscutum, scutellum and metanotum fulvous, usually paler than in *haemorrhoa* ; dorsal fringe of propodeal corbicula pale, long, more or less well arranged; interior of corbicula with fine white hairs throughout; hairs on mesopleuron longer than those on mesoscutum, pale to whitish; trochanteral floccus imperfect, scanty, white ; femoral floccus silver white, not dense ; tibial scopa not specially large, compact, silvery or faintly yellowish; metasomal terga only hairly laterally; caudal fimbria golden.

Structure: Head a little narrower than thorax seen from above, rather rounded in front view ; mandibles moderately long, stout; malar space nearly linear; process of labrum with apical margin entire; clypeus well convex, shiny, strongly and densely rugoso-punctate, with a median, longitudinal, raised, impunctate line ; punctures on clypeus less coarser than in *haemorrhoa* ; clypeus slightly exceeding line running bases of eyes, its index about 2 : 1.3; facial quadrangle longer than broad (about 8.2 : 6.7); facial fovea separated from eye margin by a shiny space, with upper portion less impressed than in *haemorrhoa* ; vertex densely rugoso-punctate with punctures closer than in *haemorrhoa* ; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is 1.8 : 2 : 3 : 4.8; cheeks about as broad as or slightly broader than eyes seen in profile, not much receding, nearly rugoso-punctate. Mesoscutum strongly and coarsely rugoso-punctate, strongly roughened anteriorly ; scutellum punctate as in mesoscutum; propodeum outside enclosure coarsely sculptured with dense rugae which are evidently weaker than in *haemorrhoa* ; enclosure well indicated, carinate posteriorly, interior of enclosure principally longitudinally wrinkled ; lateral faces of propodeum tessellate, nearly rugose, much less coarsely sculptured than in *haemorrhoa* ; mesopleuron quite strongly roughened. Wings with 2nd submarginal cell receiving 1st recurrent vein near middle of cell; basal vein interstitial with nervulus or nearly so. Legs with mid basitarsi indistinctly expanded medially, subequal to hind basitarsi in width. Metasoma shiny with punctures weaker than in *haemorrhoa* ; 1st tergum somewhat densely punctate, with posterior portion longitudinally rugulose ; 2nd to 4th terga with basal portion densely punctate, especially so laterally, posterior depressions well indicated, broad, weakly punctate and frequently longitudinally rugulose ; intermediate sterna of metasoma densely rugoso-punctate.

Male: Length about 9 mm.

Colour: Black ; mandibles reddened apically ; flagellum beneath brown ; wings, including veins and stigma, a little paler than in female; tegulae brownish or brownish subhyaline posteriorly, blackish anteriorly ; legs with fore tarsi reddened, mid and hind tarsi ferruginous, and hind tibiae partly reddened (darker than in *haemorrhoa*); posterior margins of metasomal terga reddish brown to yellowish brown subhyaline.

Pubescence: Hairs on full body (including legs) nearly concolorous, yellowish (fulvous to pale fulvous in *haemorrhoa*), without admixture of brownish hairs on any portion ; hairs on head and thorax rather long and abundant, those on metasoma short and rather sparser; hairs on clypeus downy; hairs on posterior margins of 2nd to 4th metasomal terga forming an indistinct lateral fringe on

each tergum; posterior margins of 2nd to 5th metasomal sterna each with an obscure fringe of suberect branched hairs.

Structure: Head as broad as thorax seen from above; mandibles moderate in size, robust, not falciform as in *foveopunctata*; malar space indistinctly wider than in female, about one-seventh times as broad as base of mandible; process of labrum transverse, reflected at tip; clypeus well convex, shiny, strongly and rather coarsely rugoso-punctate, with punctures a little larger than in *haemorrhoa*; clypeus slightly exceeding line running bases of eyes, its index about 2 : 1.2; facial quadrangle longer than broad (about 8 : 6.6); antennae elongate with 3rd segment indistinctly longer than broad, much shorter than 4th which is about one-half times as long as broad and about as long as next segment; 4th to 12th segments of antennae slightly convex anteriorly; this is a little more pronounced than in *haemorrhoa*; frons nearly roughened; vertex coarsely rugoso-punctate, nearly roughened, at least with an indication of punctures; ratio of postocellar width to ocelloccipital distance to postocellar distance to ocellocular distance is 1.5 : 2.6 : 3.8 : 5; cheeks slightly narrower than large eyes seen in profile, receding, rugoso-punctate. Mesoscutum and scutellum quite densely and coarsely rugoso-punctate or roughened; propodeum strongly roughened; enclosure well indicated, at least weakly carinate posteriorly, interior primarily longitudinally wrinkled; mesopleuron quite coarsely sculptured with an indication of strong punctures. Wings nearly as in female. Legs slender, without special modification. Metasomal terga smooth and shiny; 1st tergum and basal portions of following terga more or less densely, somewhat evidently punctate, with punctures becoming denser and stronger laterally; posterior depressions of intermediate terga broad, rather well indicated, much more weakly punctate than the rest of each tergum; intermediate sterna coarsely punctate with punctures shallow, more evident than in *haemorrhoa*. Genitalia and subgenital sterna as illustrated.

Distribution: The nominate form is widespread in palaearctic region, and the present subspecies is restricted in Japan where it has been collected in Hokkaido, Honshu and Kyushu.

Specimens examined: from *Hokkaido*: 8 females, Ashorobuto, Ashoro-gun, 22-24. v. *1957* (M. Takahashi); 1 male, same locality as above, 13. vi. 1957 (M. Takahashi): from *Honshu*: 1 male, Sasayama, Prov. Tanba, 8. iv. 1958 (S. Taniguchi): from *Kyushu*: 1 female, on the flowers of *Brassica campestris*, Ichinohara, near Oguchi, Prov. Higo, 24. iv. 1959 (Y. Hirashima).

Flower records: Females have been collected on *Pachysandra terminalis* Sieb. et. Zucc. and *Brassica campestris* L. According to the European authors, the nominate form visits the flowers of *Salix*, *Taraxacum*, *Potentilla* and *Berberis*.

Parasite: *Nomada rificornis* L. (= *bifida* Thomson) is known as a parasite of the nominate in Europe.

UNDETERMINED SPECIES

Andrena consimilis Alfken

Anthrena consimilis Alfken, 1900, Ent. Nach., 26: 177, female; Yano, 1932, Icon. Ins. Jap., 1st ed.: 272, fig. 527.

It seems probable to me, as indicated before, that this species is conspecific

with *Andrena* ***sasakii*** Cockerell. The careful examination of the type specimen of *consimilis*, therefore, is desirable.

"♀. Nahe mit *Anthrena apicata* Smith verwandt, unterscheidet sich die vorliegende Art von ersterer durch das greisgelb behaarte Gesicht, den grober punktierten Clypeus, die weissen Fransen an den Hinterrändern der Hinterleibsringe (besonders an Segment 3 und 4), die braunrothe, seitlich hellere Endfranse und die anders gefärbte Bürste.

Kopf rund; Wangen kaum entwickelt ; Clypeus grob punktiert, die Punkte manchmal zu Runzeln zusammenfliessend, ohne glatte Mittellinie, aber in der Mitte mit schwach erhabener Längslinie; die übrigen Theile des Gesichtes, der Scheitel und die Schläfen viel schwächer punktiert als der Clypeus. Behaarung schmutzig gelb, vorn am Clypeus weisslich, am Scheitel bräunlichgelb. Fühler schwarz, Geissel unten pechbraun, 2. Glied derselben so lang wie die 3 folgenden zusammen.

Brust oben schmutzig braungelb, unten greisgelb behaart ; Mesonotum matt, sehr dicht und fein körnig punktiert, dazwischen mit wenigen grösseren Punkten besetzt; Schildchen etwas glänzender, zerstreut und ziemlich grob punktiert; Hinterschildchen lang behaart. Der herzförmige Raum des Mittelsegme'nts am Grunde runzelig gefurcht, am Ende fein körnig punktiert, die Hinterwand des Mittelsegments hat eine etwas stärkere Punktierung.

Hinterleib schwarz, mit sehr schwachem blauem Schimmer, den auch ***A.*** *apicata* besitzt, wenig glänzend, unter einer scharfen Lupe fein chagriniert erscheinend, dazwischen ziemlich dicht mit von hinten her schräg eingestochenen Punkten besetzt, aus denen Haare entspringen, die niedergedriickten Endränder feiner chagriniert, am äussersten Ende glatt und glänzend und schwach durchscheinend rötlichgelb gefärbt. Die Behaarung besteht vorn aus einigen dünnen, hellgrauen, abstehenden, am 3. und 4. Segmente in der Mitte aus kurzen anliegenden, rauchschwarzen Haaren ; das 2. Segment zeigt am Hinterrande seitlich, das 3. und 4. in ihrer ganzen Breite dünne, weissliche Fransen. Endfranse braun, seitlich mit greisen Haaren bedeckt. Bauch lang greis behaart.

Beine schwarz, Tarsen braun gefärbt. Hüftlocke und Schenkel schmutzig gelbbraun, unten greisgelb, Fersen innen bräunlich gelb behaart, Schienen sporne gelblich weiss.

Flügel ein wenig getriibt, Adern und Stigma braun, Vena ordinaria ein wenig vor der Gabel, riicklaufende Ader etwas hinter der Mitte in die zweite Cubitalzelle mündend. ♂ fehlt. Länge 13 mm. 1 Ex. „ 27. April 1899. Acer.""

Andrena praecociformis Cockerell

Andrena praecociformis Cockerell, 1911, Proc. U. S. Nat. Mus., 40: 243, male; Cockerell, 1913, Ann. Mag. nat. Hist., (8) 11: 190, male.

Although Prof. Yasumatsu has kindly examined the type specimens of ***praecociformis*** and made the figures for me, I could not determine this species. Dr. Krombein kindly wrote to me that ". . . . ..but upon comparing the two specimens I do not agree with Cockerell's opinion that they belong to the same species."

" Male.-Length 8 to 9 mm., black, with long white hair on head, thorax, and

legs, black at sides of face, upper part of cheeks behind, and a little on scutellum. In Schmiedeknecht's table of European species it runns to A. *parvula*, but it actually resembles A. *praecox* Scopoli, so much so that at first sight it seems to be the same. It differs from *praecox* by the rather smaller size; the cheeks, though broad, dullish except near the eye, and not angled behind (shiny and angled in ***praecox)*** ; the mandibles moderate, without the very long falciform apical tooth of *praecox*; the head above and cheeks with less black hair; the sides of thorax behind with hair all white ; the metathorax rougher; the hind margins of abdominal segments a little reddish, and with a tendency to thin marginal hair bands at sides. Mesothorax dull and rough; metathorax very dull and rough, the area ill defined, minutely granular, roughened basally, its apical angle acute ; tegulae very dark rufo-piteous; wings as in *praecox*, but stigma darker (variable); first r. n. joining the broad second s. m. about middle ; abdomen shining, without distinct punctures. Antenna1 joints 3 to 5 measured as follows in two specimens: the type, (3.) 374, (4) 255, (5.) 340 μ. Another, (3.) 323, (4) 306, (5) 340 μ. The latter specimen is the larger.

Habitat.—Japan, specimen numbered 166 and 54.

The Californian A. *knuthiana* Cockerell is also allied. A. *japonica* Alfken is also compared with *praecox*, but it is larger and evidently different.

Type. -Cat. No. 13530, U. S. N. M."