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Adamon, a New Subgenus of the Genus *Nomada* Scopoli from Japan (Hymenoptera, Apidae)*

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Abstract. A new subgenus *Adamon* is proposed to include two Japanese species, *Nomada koikensis* Tsuneki, 1973 and *Nomada arasiana* Tsuneki, 1973. The new subgenus is very characteristic in having the male antennae 12-segmented. This is unusual for the bees. The male description of *N. koikensis* is presented. Key to the species of the subgenus is given.

Key words: taxonomy, Hymenoptera, Apidae, *Nomada*, new subgenus, 12-segmented male antennae.

Adamon, a new subgenus of the genus *Nomada* Scopoli is proposed to include *Nomada koikensis* Tsuneki, 1973 and *Nomada arasiana* Tsuneki, 1973. Both are Japanese species. The new subgenus is very characteristic in having the male antennae 12-segmented. This is unusual for the bees except for the Old World genus *Pasites* Jurine.

Alexander (1994) examined the genus *Nomada* Scopoli on a world wide basis and proposed 17 species groups in the genus as an informal cladistic classification based on his cladistic analysis. After that Alexander & Schwarz (1994) published a catalog of the species of *Nomada* in the world and classified them to the species groups. According to their catalog, *N. koikensis* and *N. arasiana* are included in the *roberjeotiana* group. We agree with them except the male antennal character of the two species.

Adamon, a new subgenus of *Nomada* Scopoli

Description.

Small species, 5-6 mm; body of female black or blackish brown including antennae

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and legs, without yellow marking except for a few tergal ivory markings; labrum wider than long; mandible simple, narrowly rounded; preoccipital ridge angulate; postocciput distinctly recessed below level of postgenal bridge; base of proboscideal fossa rounded; malar space closed posteriorly; median portion of pronotal collar sharply carinate with a distinct median notch; lateral portion of pronotal collar carinate along crest of curve; lateral ridge of pronotum distinctly indicated above, very weakly so below; anterior margin of pronotum rounded; neck of pronotum with a slightly drawn-up lip; metapleuron without protuberance above; ridge above propodeal spiracle present; scutellum evenly convex in profile; propodeal enclosure finely shagreened basally and medially, nearly smooth and shiny apically; lateral margin of propodeal enclosure without distinct ridge; procoxa without spinose process; procoxa without lateral carina on outer face; metasomal terga weakly

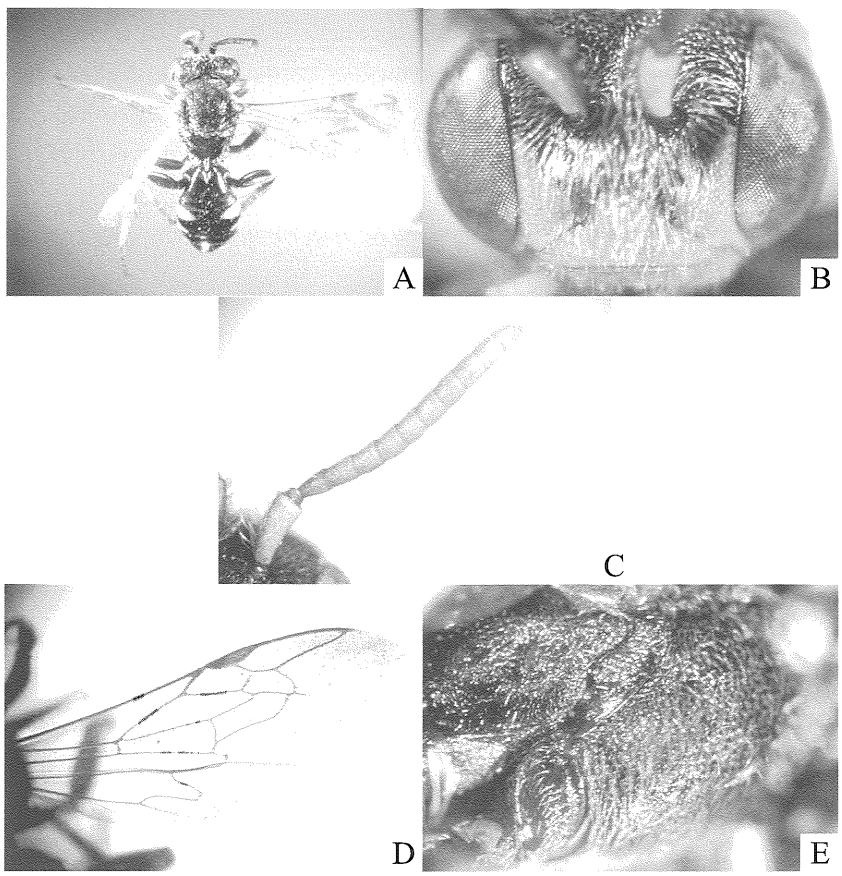

Fig. 1: A -E. *Nomada* (*Adamon*) *koikensi*, male. A: general habitus; B: head in frontal view; C: antennae; D: wings; E: lateral view of the thorax.

tessellate with weak punctures, posterior margin of metasomal terga smooth to very weakly tessellate with very sparse, weak punctures; fore wings with two submarginal cells in *koikensis*, 3 in *arasiana*; vein 1st *r-m* of fore wing absent or present; vein *Rs* of fore wing complete; apex of marginal cell pointed.

Female: 1st flagellar segment longer than broad and about as long as the next segment; paraocular ridge absent; outer face of hind tibia without short, thorn-like setae; metasomal tergum 5 (T5) with prepygidial fimbria posteriorly; pygidial plate large, triangular, narrowly rounded apically; hind tibia with distal setae short, stout, spinose.

Male: Antennae 12-segmented; 1st flagellar segment longer than broad and as long as the second; scape cylindrical, not conspicuously enlarged, but wider than flagellum; anterior articulation of mandible with a distinct flange; head without frontal ridge; front tarsi with long, brush-like setae; front femur not conspicuously enlarged; base of hind femur not excavated ventrally without flocculus; metasomal sternum 6 (S6) with subgenital brush long, erect, recurved apically; apex of S6 moderately produced medially, apex of projection broadly rounded; metasomal sterna without subapical setal fringes; pygidial plate without apical notch; S7 with apodemes relatively short, disc of sternum subtriangular, apical margin broadly rounded; S8 with median process dorsoventrally compressed, short and broad, apex broadly rounded; lateral profile of S8 straight; median process of S8 with stiff, stout, spinose setae; shape of gonostylus cylindrical, long, narrow, apex rounded but not expanded; inner basal shelf on gonostylus absent; gonostylus with sparse, simple setae; basoventral lobe of gonostylus absent; setal tuft at base of gonostylus absent; gonobase reduced in size; penis valves without ventral hook, without inner ridge, with outer lateral ridge, sharply carinate, roughly triangular in cross section, not flattened dorsally, expanded basoventrally; apex of penis valve acute; gonocoxite with invagination dorsally; inner dorsal lobe of gonocoxite present.

Type species: *Nomada koikensis* Tsuneki, 1973.

Included species: *Nomada arasiana* Tsuneki, 1973.

Etymology: *Adamon* is an anagram of *Nomada*.

Gender: Feminine.

Nomada (*Adamon*) *koikensis* Tsuneki, 1973

(Fig. 1: A - E, Fig. 2: A-E)

Nomada koikensis Tsuneki, 1973, Etizenia, (66) (I): 46 [female, Japan].

According to Tsuneki (1974), he was able to examine 15 female and 3 male specimens of this species just after his original description. However, he did not give description of the male. So we describe the male in the present paper.

Description (new to science).

Male. Body: 4.5-5.5 mm.

Color: Head blackish brown or nearly black, with ivory portions as follows: mandibles except apices, labrum, clypeus and malar space to lower portion of paraocular area (for detail see Fig. 1B). Antennae brown; scape ivory beneath, and flagellum yellowish brown beneath. Thorax black with linear mark on pronotum, tubercles, tegulae and 2 spots on scutellum pale yellow or ivory, but sometimes these are evanescent except tubercles. Abdomen shining, blackish brown with large lateral mark on 2nd tergum, smaller one on 3rd and transverse mark on 6th pale yellow or ivory; sometimes ivory lateral spots on 1st, 4th and 5th terga. Legs blackish brown, variegated with yellow.

Pilocity: Hairs on face below antennae silvery, more or less dense, decumbent; hairs on thorax short, not dense, whitish; propodeum almost bare; metasoma with hairs short,

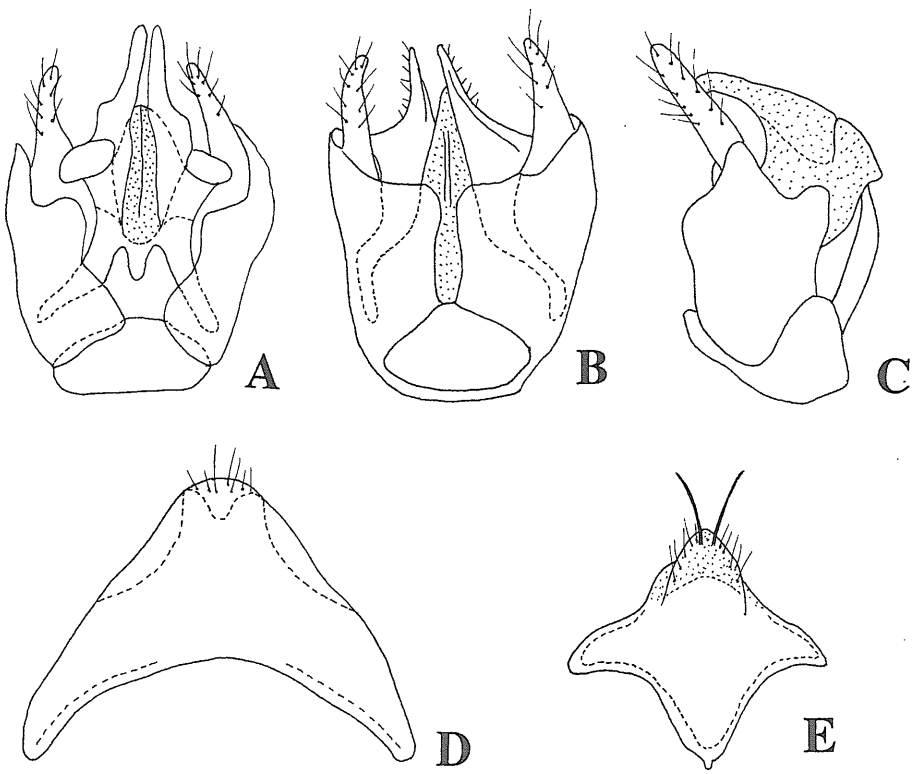

Fig. 2: A -E. *Nomada* (*Adamon*) *koikensis*, male genitalia and associated sterna. A: dorsal view of genitalia; B: ventral view of genitalia; C: lateral view of genitalia; D: sternum 7; E: sternum 8.

sparse, whitish; tuft of hairs on 6th sternum rather conspicuous, silvery.

Structure: *Head*: HW : HL = 4.5 : 3.6; HW : MsW : MtW = 4.5 : 4.0 : 3.8; vertex rounded in frontal view, shiny and smooth, with large, close, distinct punctures (PP), ø 30-50 μ, IS= 0.2; flagellar segments FL1-10 L and F2 W = 1.2 : 1.2 : 1.1 : 1.1 : 1.0 : 1.1 : 1.1 : 1.1 : 1.2 : 1.9 : 0.9; interantennal tubercle moderately high; supraclypeus moderately raised, rugoso-punctate; clypeus flat, smooth and shiny with PP weak and sparse, ø 20 μ, IS= 1-2; paraocular area and vertex smooth and shiny; mesoscutum smooth and shiny with large, dense, distinct PP, ø 30-40 μ, IS= 0.2; mandibles simple and pointed at apex; eye with inner margins slightly convergent below; genal area distinctly narrower than eye, EW : GW = 3.0 : 1.7. *Mesosoma*: Mesoscutum smooth and shiny with distinct, close PP, ø 30-40 μ, IS=0.2-0.4, scutellum medially slightly depressed longitudinally, with larger and more roughened PP; propodeal enclosure weakly rugose at basal 1/5, nearly smooth and very shining at apical 4/5; lateral field of propodeum roughened above, nearly smooth and shiny below, with PP along lateral margin of propodeal enclosure. *Metasoma*: T1 smooth and shiny with fine, sparse PP medially, weakly tessellate posteriorly; T2-5 weakly tessellate with sparse, weak PP, ø 20 μ, IS= 1-1.5.

Specimens examined: 3 females and 16 males, Sugadaira, Shinshu (= Nagano Pref.), 1300-1500m, 30. viii. 1963 (Y. Hirashima); 1 male, Koike, Fukui, 22. viii. 1966 (Y. Haneda); 1 female, Akausagi-yama, Ohono City, Fukui Pref., 1. ix. 1981 (Y. Haneda).

Distribution: Japan (central Honshu).

Nomada (*Adamon*) *arasiana* Tsuneki, 1973

(Fig. 3: A - E)

Nomada arasiana Tsuneki, 1973, Etizenia, (66) (I): 44 [female & male, Japan].

The male of this species is similar to that of *koikensis*, but is more robust. It is separated from *koikensis* by the key given below.

The female of *arasiana* is similar to that of *Nomada galloisi* Yasumatsu et Hirashima, and only separable by the marking of the scutellum (yellow in *galloisi*, ferruginous in *arasiana*).

Specimens examined: 1 female, Karuizawa, Nagano Pref., 18. viii. 1949 (R. Ishikawa); 1 female, Mt. Norikura, 1500m, Nagano Pref., 9. viii. 1954 (H. Nagase); 1 female, Mt. Norikura, 1500m, Nagano Pref., 9. viii. 1954 (H. Nagase); 1 female, Chugu-onsen, Honshu, 8-10. viii. 1961 (I. Togashi); 1 female, Ohono City, Fukui Pref., 28. vii. 1965 (Y. Haneda); 1 female, Jukkoku-toge, Gunma Pref., Honshu, 28. viii. 1973 (T. Nambu); 2 males, Ohono City, Fukui Pref., 1. viii. 1964 (Y. Haneda); 1 male, Asashi, Ohono City, Fukui Pref., 28. viii. 1965 (Y. Haneda); 1 male, Ohono City, Fukui Pref., 25. viii. 1976 (Y. Haneda).

Distribution: Japan (central Honshu).

Key to the species of *Nomada* (*Adamon*)

1. Female 2
- Male 3
2. Small species, less than 7 mm in length; fore wings with 3 submarginal cell as usual; body black, without red or yellow markings except tubercles, tegulae, scutellum and metanotum ferruginous and lateral mark on 2nd tergum, small lateral spot on 3rd tergum and interrupted or nearly interrupted apical band of 5th tergum ivory; mandibles, labrum and apical portion of clypeus nearly ferruginous; antennae pale yellowish brown beneath, reddish brown above; 3rd antennal

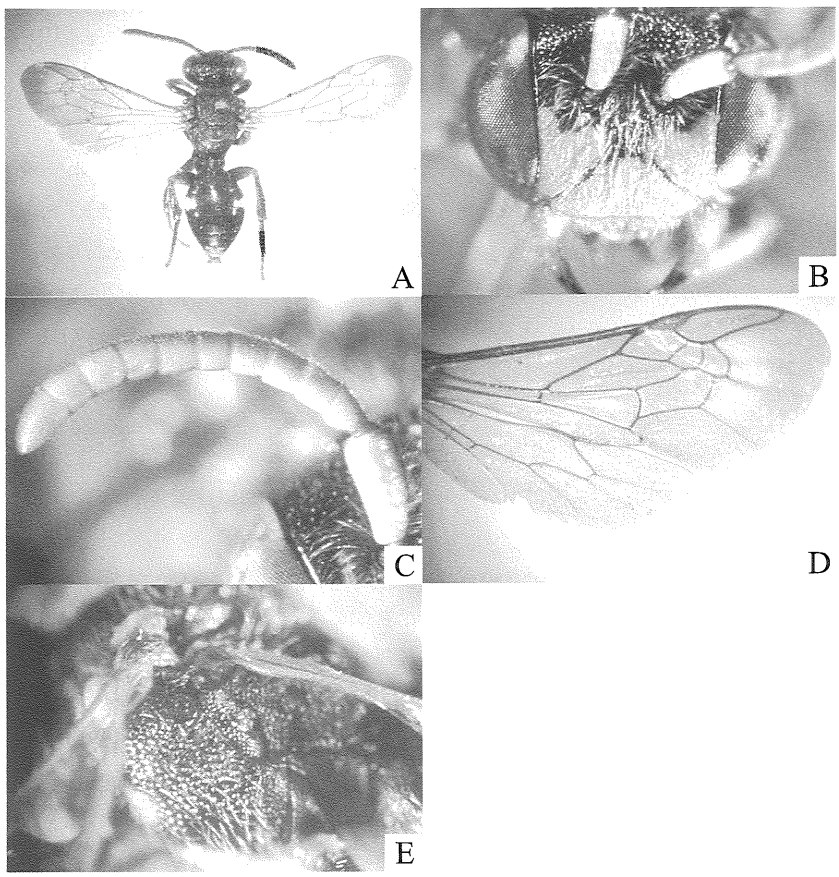

Fig. 3: A -E. *Nomada asasiana*. A: general habitus, female; B: head in frontal view, male; C: antenna, male; D: wings, male; E: lateral view of the thorax, male.

segment a little longer than broad, about as long as next segment; hairs on body very sparse, short; propodeum bare, nearly smooth, shining except enclosure and lateral faces; apex of hind tibia without special modification ..... *arasiana*

- Very similar to the above species, but smaller and slenderer; fore wings with 2 submarginal cells; tubercles and tegulae pale brown; scutellum and metanotum nearly black; propodeum and 1st tergum smoother and more shining; 3rd tergum without ivory marking ..... *koikensis*

3. Small species, more or less robust; antennae 12-segmented; fore wings with 3 submarginal cells as usual; head and thorax black with pale yellow or ivory markings as follows: mandibles except reddened apices, labrum, clypeus, malar space to lower portion of paraocular area, underside of scape and flagellum, interrupted band on pronotum, tubercles, tegulae and spot on anterior portion of mesopleuron; scutellum entirely black or with reddish or reddish-yellow marks. Legs brown, variegated with yellow; metasoma black or blackish brown; 1st tergum sometimes slightly reddened; lateral marks (various in size) on 1st to 5th terga and entire band on 6th ivory; 3rd antennal segment about as long as broad, about as long as next segment; ivory coloration of scape conspicuous ..... *arasiana*

- Very similar to the above, but smaller and less robust; fore wings with 2 submarginal cells; 3rd antennal segment relatively slightly longer than in *arasiana*; mesopleuron entirely black; scutellum black, with or without yellow marking ..... *koikensis*

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