

## Systematic study of the genus *Antocha* recorded from Japan and its adjacent area (Diptera, Tipulidae)

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Abstract. Eighteen species of the genus *Antocha* from Japan and its adjacent area are studied based on about 1 800 specimens. Holotypes of all Japanese species including junior synonyms are included. Keys to subgenera and to species are given with figures. A character matrix and intrageneric groups are also given. *Antocha* (*Antocha*) *spicata* ALEXANDER, 1936 and *A.* (*A.*) *brevinervis* ALEXANDER, 1936 (nec. ALEXANDER, 1924) are synonymized under *A.* (*A.*) *brevinervis* ALEXANDER, 1924. *Antocha* (*Antocha*) *subdentifera* ALEXANDER, 1969 is synonymized under *A.* (*A.*) *dentifera* ALEXANDER, 1924. Females of the following 4 species are recorded and described for the first time: *Antocha* (*Proantocha*) *uyei*, *Antocha* (*Antocha*) *bidigitata*, *A.* (*A.*) *sagana*, *A.* (*A.*) *subconfluenta*. Female of *A.* (*A.*) *gracillima* is described for the first time.

Key words: *Antocha*, Tipulidae, Japan.

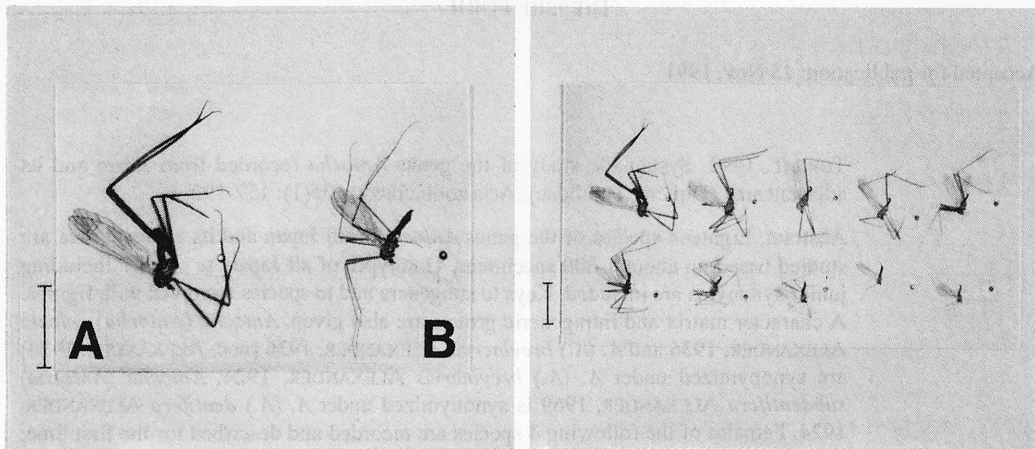
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*Antocha* OSTEN SACKEN, 1860 is a relatively large genus of small- to medium-sized crane flies, being found in all the zoogeographical regions. It belongs to the tribe Limoniini of the subfamily Limoniinae and is divided into three subgenera, *Antocha* OSTEN SACKEN, 1860, *Proantocha* ALEXANDER, 1919 and *Orimargula* MIK, 1883. Numerous species occur in eastern and southern Asia, but fewer representatives elsewhere. The genus *Antocha* is characterized by the following features of wing (Fig. 3): anal angle prominent; Sc close to R, Sc2 not evident; basal section of Rs usually straight, diverging from R1.

Until present, 18 species of the genus *Antocha* were recorded from Japan (Hokkaido, Honshu, Sikoku and Kyushu), North and South Korea and USSR far east (Amur obl., Primorskiy kray, Sakhalin and Kuril Isl.). Sixteen species of them belong to the subgenus *Antocha* and two species to *Proantocha*. In the present paper, key to subgenera based on the subgeneric definition in TORII (1991) is given.

All examined specimens without any indication about preservation method, such as "in ethanol" or "with permanent slide", have been pinned.

Except for those preserved as permanent slides, male and female terminalia were treated with hot 10% KOH, and observed in small dishes or as temporary glycerol slides, and preserved in glycerol in glass or polyethylene microtubes pinned with the specimens, or, in case of specimens in ethanol, preserved in ethanol in glass microtubes stored in vials with the specimens, but as exceptions, a holotype and most paratypes of *A. (A.) latistilus* and a holotype of *A. (A.) mitosanensis* have their male terminalia dissected and glued to paper mount pinned with the specimens. The morphological terminology follows ALEXANDER and BYERS (1981), MCALPINE (1981), SNODGRASS (1903, 1904) and TORII (1988, 1991).



Figs. 1 - 2. *Antocha (Proantocha) spinifer*: 1 A - male, B - female, Scale - 10 mm; 2 - size variation, scale - 10 mm.

Following abbreviations are used for indicating laboratories where specimens are preserved. DENMNHSI: Department of Entomology, National Museum of Natural History, Smithsonian Institution, U.S.A.; ELKU: Entomological Laboratory, Kyushu University. Specimens without indicated laboratories are in author's collection.

#### Genus *Antocha* OSTEN SACKEN, 1860

*Antocha* OSTEN SACKEN, 1860, Proc. Acad. nat. Sci. Philad., **1859** (for 1859): 219.

Type species, *Antocha saxicola* OSTEN SACKEN, 1860, l.c.: 219 (des. COQUILLET, 1910, Proc. U.S. nat. Mus., **37**: 508).

*Taphrophila* RONDANI, 1856, Dipt. Ital. Prodr. 1: 185. Type species, *Limnobia inusta* RONDANI, 1856, l.c.: 185, nec MEIGEN, 1818, Syst. Besch., 1: 135, designation by OSTEN SACKEN, 1888, Berl. Ent. Z., **31** (for 1887): 232; genus name based on insufficient and erroneous data.

#### Key to subgenera, male

1. Legs stout (Fig. 1-A), hindleg with opposable tubercles at tip of femur and base of tibia (Fig. 5-D) . . . . . subgenus *Proantocha*
- . Legs normal, hindleg without tubercles as above (Figs. 10-a, 12-a, etc.) . . . . . subgenus *Antocha*



## Key to subgenera, female

1. Ventral margin of cercus smooth (Figs. 10-d, 12-d, etc.) . . . . . subgenus *Antocha*
- . Ventral margin of cercus serrated (Figs. 6, 25-d, etc.) . . . . . 2
2. Sternite 8 with a pair of latero-caudal processes (Figs. 25-e, 31-c) . . . . . subgenus *Antocha*
- . Sternite 8 without processes as above (Figs. 7, 8-e) . . . . . subgenus *Proantocha*

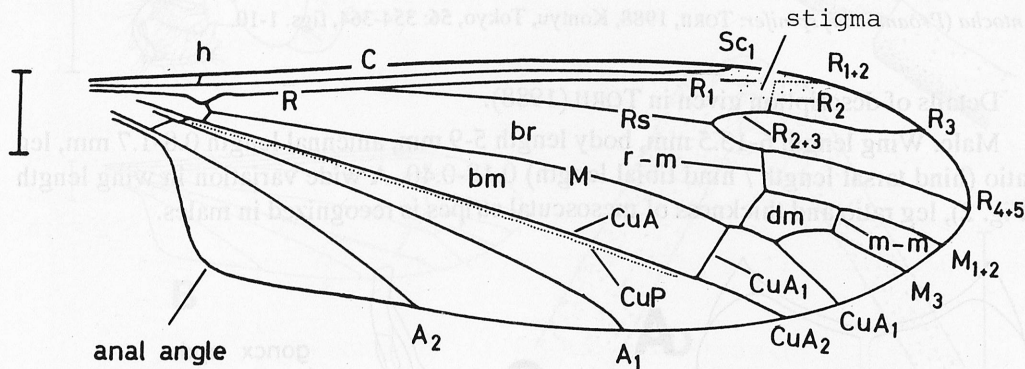


Fig. 3. *Antocha (Proantocha) spinifer*: male; wing; Scale - 1 mm.

Subgenus *Proantocha* ALEXANDER, 1919

*Antocha (Proantocha)* ALEXANDER, 1919, Annls. ent. Soc. Amer. 12: 330-331. Type species, *spinifer* ALEXANDER, 1919, l.c.: 331.

*Proantocha* ALEXANDER: ALEXANDER, Philipp. J. Sci. 35: 472 (1928).

## Key to species

1. General coloration of thorax yellowish brown or brown; male hindleg with tibia clavate at tip (Fig. 8-a); a tubercle at tip of male hind femur low and indistinct; male terminalia shown in Fig. 9 . . . . . *A. (P.) uyei*
- . General coloration of thorax pale brownish yellow; male hindleg with tibia not clavate at tip (Fig. 1-A); both of opposable tubercles at tip of male hind femur and base of tibia high and distinct (Fig. 5-D); male terminalia shown in Fig. 4 . . . . . *A. (P.) spinifer*

*Antocha (Proantocha) spinifer* ALEXANDER, 1919

[Japanese name: Usuba-gaganbo]

(Figs. 1-7)

*Antocha (Proantocha) spinifer* ALEXANDER, 1919, Annls. ent. Soc. Amer., 12: 331.

*Antocha (Proantocha) serricauda* ALEXANDER, 1924, Philipp. J. Sci., 24: 563-564, pl. 2, fig. 9. (male terminalia).

*Proantocha quadrivittata* ALEXANDER, 1932, Philipp. J. Sci., 49: 115, pl. 1, fig. 8 (wing).

*Antocha serricauda*: ESAKI, 1950, Ins. Japon., 2nd ed., p. 1519, fig. 4356.

*Antocha (Proantocha) serricauda*: ALEXANDER, 1954, Philipp. J. Sci., **82** (for 1953): 288, pl. 4, fig. 34. (female terminalia).

*Antocha (Proantocha) quadrivittata*: ISHIDA, 1957, Annual Rept. Iiyogo Agr. Coll., **6**: 146.

*Antocha (Proantocha) serricauda*: ISHIDA, 1957, Annual Rept. Iiyogo Agr. Coll., **6**: 146.

*Antocha (Proantocha) spinifer*: ISHIDA, 1957, Annual. Rept. Iiyogo Agr. Coll., **6**: 146.

*Antocha (Proantocha) serricauda*: TAKAHASHI, 1976, Icon. Ins. Japon. Col. nat. ed., 7th ed., **3**: 172, pl. 86, fig. 20.

*Antocha (Proantocha) spinifer*: TORII, 1988, Kontyu, Tokyo, **56**: 354-364, figs. 1-10.

Details of description given in TORII (1988).

Male. Wing length 6-13.5 mm, body length 5-9 mm, antennal length 0.8-1.7 mm, leg ratio (hind tarsal length / hind tibial length) 0.18-0.40. A wide variation in wing length (Fig. 2), leg ratio and thickness of mesoscutal stripes is recognized in males.

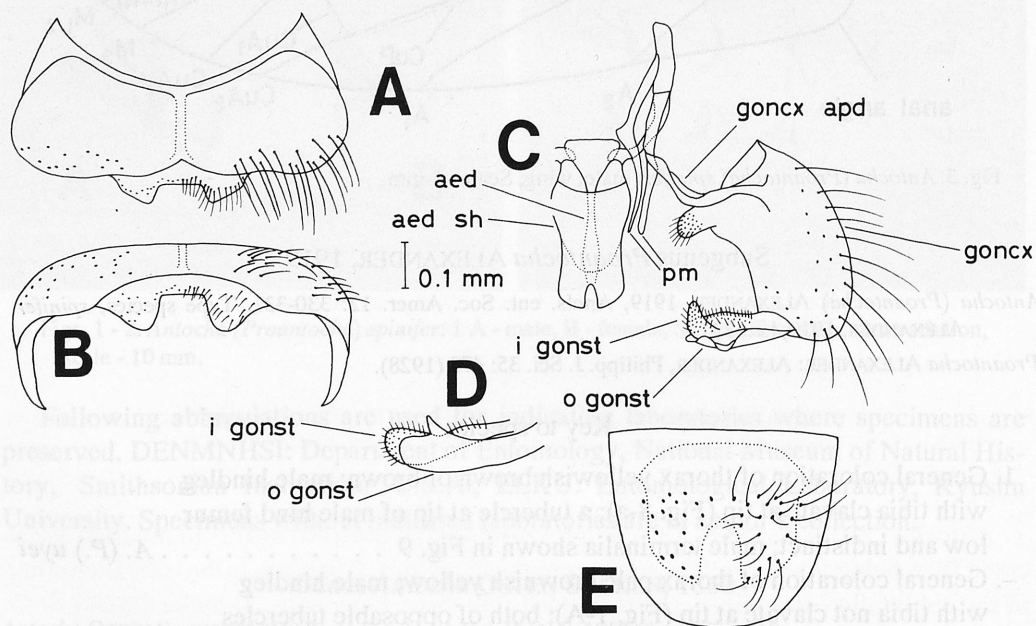


Fig. 4. Male terminalia of *Antocha (Proantocha) spinifer*: A, tergite 9, dorsal; B, same, posterior; C, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; D, gonostyli, posterior; E, sternite 9, ventral; aed, aedeagus; aed sh, aedeagal sheath; goncx, gonocoxite; goncx apd, gonocoxal apodeme; i gonst, inner gonostylus; o gonst, outer gonostylus; pm, paramere.

Males (Fig. 5-A) pale yellow or pale yellowish brown, slightly pruinose. Thorax generally pale brownish yellow; mesoscutum pale brownish yellow, usually with three indistinct broad darker stripes, but sometimes distinctly or barely indicated; the middle one ending before transverse suture. Legs with coxae and trochanters yellow; terminal tarsomeres brown or yellowish brown; remaining segments of legs brownish yellow; fore- and midleg stout, densely clothed with long setae; hindleg long and very stout, densely clothed with spinules or short spinous setae, armed with opposable pointed tubercles

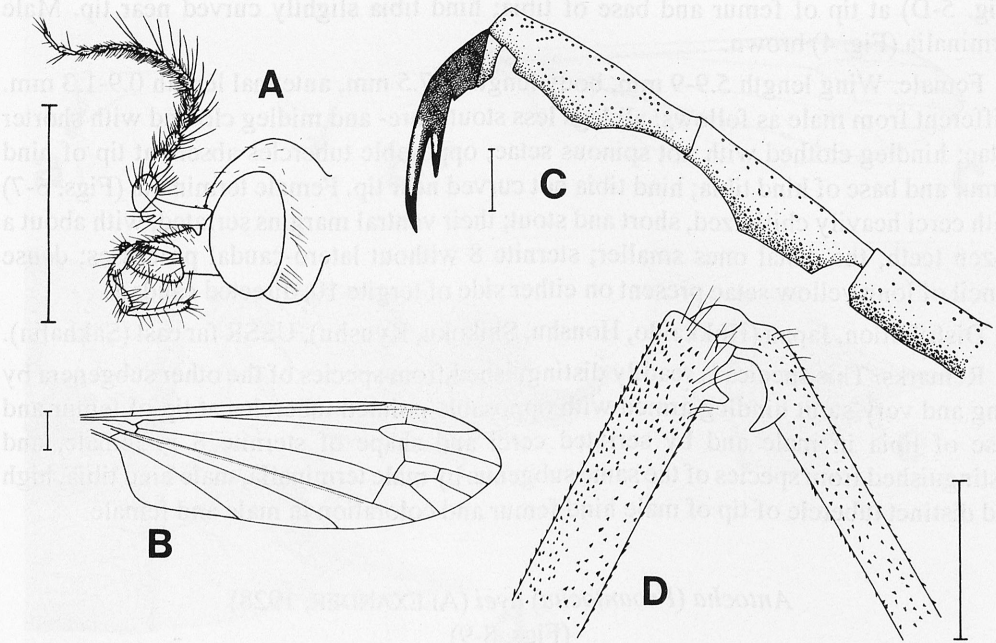
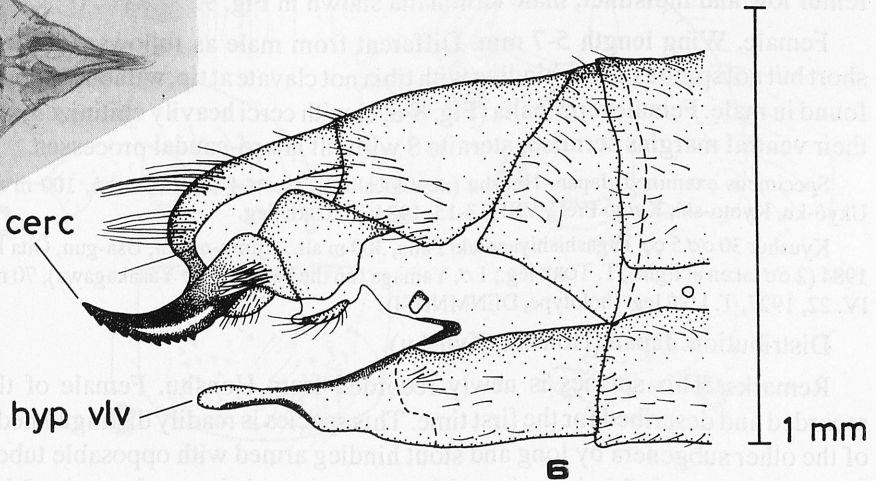
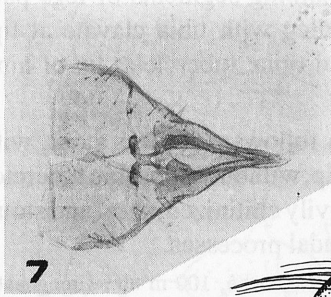


Fig. 5. *Antocha (Proantocha) spinifer*: male; A, head; B, wing; C, claw; D, femoro-tibial joint (hind leg); Scales, A, B, D, 1 mm; C, 0.1 mm.



Figs. 6 - 7. Female terminalia of *Antocha (Proantocha) spinifer*: 6 - right lateral (cerc - cercus, hyp vlv - hypogynial valvae); 7 - female sternite 8 and hypogynial valves - ventral.



(Fig. 5-D) at tip of femur and base of tibia; hind tibia slightly curved near tip. Male terminalia (Fig. 4) brown.

Female. Wing length 5.9-9 mm, body length 4-7.5 mm, antennal length 0.9-1.3 mm. Different from male as follows: all legs less stout; fore- and midleg clothed with shorter setae; hindleg clothed with not spinous setae; opposable tubercles absent at tip of hind femur and base of hind tibia; hind tibia not curved near tip. Female terminalia (Figs. 6-7) with cerci heavily chitinized, short and stout; their ventral margins serrated, with about a dozen teeth; the distal ones smaller; sternite 8 without latero-caudal processes; dense pencil of long yellow setae present on either side of tergite 10, directed caudad.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), USSR far east (Sakhalin).

Remarks. This species is readily distinguished from species of the other subgenera by long and very stout hindleg armed with opposable pointed tubercles at tip of femur and base of tibia in male and by serrated cerci and shape of sternite 8 in female, and distinguished from species of the same subgenus by male terminalia, male hind tibia, high and distinct tubercle of tip of male hind femur and coloration in male and female.

*Antocha (Proantocha) uyei* (ALEXANDER, 1928)  
(Figs. 8-9)

*Proantocha uyei* ALEXANDER, 1928, PHILIPP. J. Sci., 35: 472-474.

*Antocha (Proantocha) uyei*: ISHIDA, 1957, Annual Rept. Hyogo Agr. Coll., 6: 146.

Male. Wing length 5-11 mm. A wide variation in male wing length is recognized. Head usually brownish grey; thorax yellowish brown in ground color; mesoscutum mostly brown; legs with coxae and trochanters pale yellow; remaining segments of legs pale brown or brown; legs bearing short spinuous setae; hindleg with tibia clavate at tip, possessing opposable tubercles at tip of femur and base of tibia; tubercle at tip of hind femur low and indistinct; male terminalia shown in Fig. 9.

Female. Wing length 5-7 mm. Different from male as follows: legs less stout, with short but not spinous setae; hindleg with tibia not clavate at tip, without opposable tubercles found in male. Female terminalia (Fig. 8-d, e) with cerci heavily chitinized, short and stout; their ventral margins serrated; sternite 8 without latero-caudal processes.

Specimens examined. Japan. Honshu (new locality): 71 ♂♂ 4 ♀♀, Takaochô, 100 m alt., Umegahata, Ukyô-ku, Kyoto-shi, Kyoto Pref., VIII. 13-15. 1984, T. TORII leg.

Kyushu: 30 ♂♂ 5 ♀♀, Higashishiyantaki Falls, 300 m alt., Ajimu-machi, Usa-gun, Ôita Pref., VIII. 9-11. 1984 (2 ♂♂ taken at light), T. TORII leg.; 1 ♂, Yamaga (on the banks of the Yasakagawa), 70 m alt., Ôita Pref., IV. 22, 1927, T. UYE leg. (holotype, DENMNHSI).

Distribution. Japan (Honshu, Kyushu).

Remarks. This species is newly recorded from Honshu. Female of this species is recorded and described for the first time. This species is readily distinguished from species of the other subgenera by long and stout hindleg armed with opposable tubercles at tip of femur and base of tibia in male and by serrated cerci shape of sternite 8 in female, and distinguished from species of the same subgenus by male terminalia, male hind tibia, low and indistinct tubercle at tip of male hind femur and coloration in male and female.



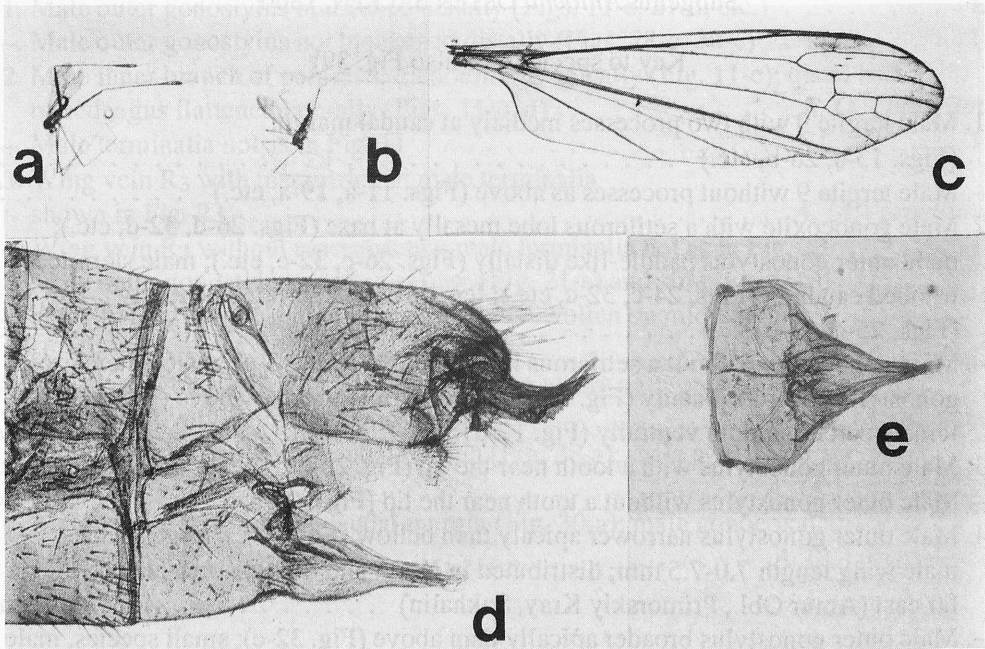


Fig. 8. *Antocha (Proantocha) uyei*: a, male; b, female; c, wing; d, female terminalia, left lateral; e, female sternite 8 and hypogynial vaeves, ventral.

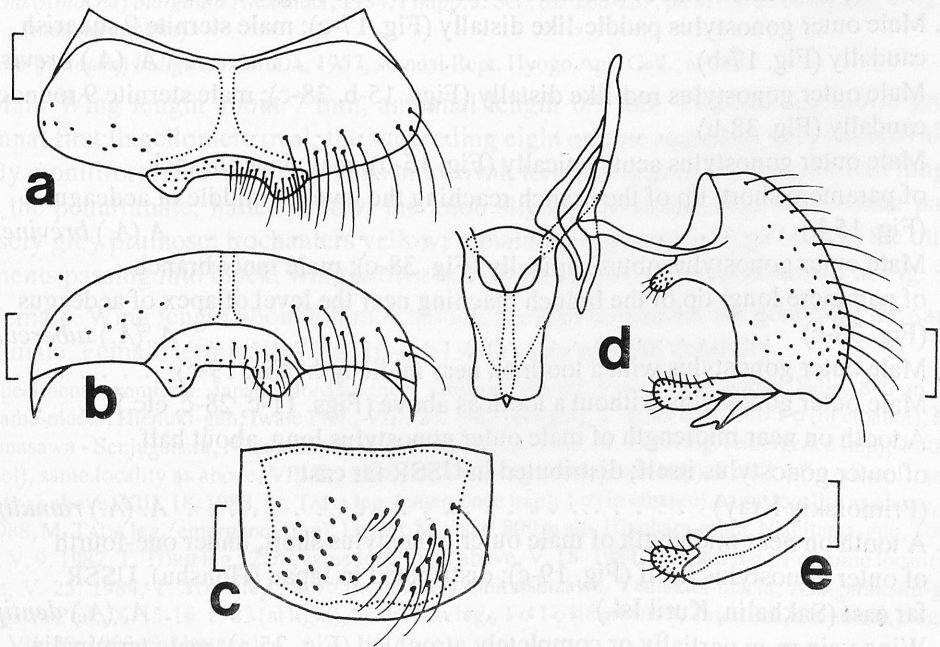


Fig. 9. Male terminalia of *Antocha (Proantocha) uyei*: a, tergite 9, dorsal; b, same, posterior; c, sternite 9, ventral; d, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; e, gonostyli, posterior; Scales, all 0.1 mm.

Subgenus *Antocha* OSTEN SACKEN, 1860

## Key to species (see also Fig. 39)

1. Male tergite 9 with two processes medially at caudal margin (Figs. 13-a, 26-b, etc.) . . . . . 2
- Male tergite 9 without processes as above (Figs. 11-a, 19-a, etc.) . . . . . 5
2. Male gonocoxite with a setiferous lobe mesally at base (Figs. 26-d, 32-d, etc.); male outer gonostylus paddle-like distally (Figs. 26-e, 32-e, etc.); male sternite 9 trilobed caudally (Figs. 24-c, 32-c, etc.); female cercus serrated ventrally (Figs. 25-d, 31-b) . . . . . 3
- Male gonocoxite without a setiferous lobe as above (Fig. 13-c); male outer gonostylus rod-like distally (Fig. 13-c); male sternite 9 not as above (Fig. 13-b); female cercus smooth ventrally (Fig. 12-d) . . . . . *A. (A.) bifida*
3. Male outer gonostylus with a tooth near the tip (Fig. 26-e) . . . . . *A. (A.) latistilus*
- Male outer gonostylus without a tooth near the tip (Figs. 24-e, 32-e) . . . . . 4
4. Male outer gonostylus narrower apically than below (Fig. 24-e); large species, male wing length 7.0-7.5 mm; distributed in North and South Korea and USSR far east (Amur Obl., Primorskiy Kray, Sakhalin) . . . . . *A. (A.) integra*
- Male outer gonostylus broader apically than above (Fig. 32-e); small species, male wing length 4.3-5.7 mm; distributed in Japan (Honshu, Kyushu) . . . . . *A. (A.) sagana*
5. Male gonocoxite with a setiferous lobe mesally at base (Figs. 15-b, 17-c, etc.) . . . . . 6
- Male gonocoxite without a setiferous lobe as above (Fig. 11-c, 19-c, etc.) . . . . . 8
6. Male outer gonostylus paddle-like distally (Fig. 17-c); male sternite 9 squarish caudally (Fig. 17-b) . . . . . *A. (A.) brevistyla*
- Male outer gonostylus rod-like distally (Figs. 15-b, 38-c); male sternite 9 rounded caudally (Fig. 38-b) . . . . . 7
7. Male outer gonostylus acute apically (Fig. 15-b); male inner branch of paramere short; tip of the branch reaching the level of middle of aedeagus (Fig. 15-b) . . . . . *A. (A.) brevinervis*
- Male outer gonostylus obtuse apically (Fig. 38-c); male inner branch of paramere long; tip of the branch reaching near the level of apex of aedeagus (Fig. 38-c) . . . . . *A. (A.) tuberculata*
8. Male outer gonostylus with a tooth on near midlength (Fig. 19-c) . . . . . 9
- Male outer gonostylus without a tooth as above (Figs. 11-c, 28-c, etc.) . . . . . 10
9. A tooth on near midlength of male outer gonostylus long, about half of outer gonostylus itself; distributed in USSR far east (Primorskiy Kray) . . . . . *A. (A.) ramulifera*
- A tooth on near midlength of male outer gonostylus short, under one-fourth of outer gonostylus itself (Fig. 19-c); distributed in Japan (Honshu), USSR far east (Sakhalin, Kuril Isl.) . . . . . *A. (A.) dentifera*
10. Wing vein m-m partially or completely atrophied (Fig. 35-a); male terminalia shown in Fig. 36 . . . . . *A. (A.) subconfluenta*
- Wing vein m-m present (Figs. 10-c, 27, etc.); male terminalia different from in Fig. 36 . . . . . 11

11. Male outer gonostylus blackened distally (Figs. 11-c, 21-d, etc.) . . . . . 12  
 –. Male outer gonostylus not blackened distally (Figs. 28-c, 30-c) . . . . . 15
12. Male inner branch of paramere dichotomous apically (Fig. 11-c); distal half of aedeagus flattened laterally (Figs. 11-c, d) . . . . . *A. (A.) bidigitata*  
 –. Male terminalia not as in Fig. 11 . . . . . 13
13. Wing vein R<sub>3</sub> with macrotrichia; male terminalia shown in Fig. 23 . . . . . *A. (A.) gracillima*  
 –. Wing vein R<sub>3</sub> without macrotrichia; male terminalia not as in Fig. 23 . . . . . 14
14. Male outer gonostylus swollen at base (Fig. 21-e) and simply pointed apically (Fig. 21-d); male inner gonostylus swollen on midlength (Fig. 21-d) . . . . . *A. (A.) dilatata*  
 –. Male both gonostyli (Fig. 34-c) not swollen at any part; outer gonostylus with a relatively obtuse subapical point . . . . . *A. (A.) satsuma*
15. Male tergite 9 convex at caudal margin (Fig. 28-a); male gonocoxal apodeme with a flange (Fig. 28-c) . . . . . *A. (A.) mitosanensis*  
 –. Male tergite 9 straight at caudal margin (Fig. 30-a); male gonocoxal apodeme without flange (Fig. 30-c) . . . . . *A. (A.) platyphallus*

*Antocha (Antocha) bidigitata* ALEXANDER, 1954

(Figs. 10 - 11)

*Antocha (Antocha) bidigitata* Alexander, 1954, Philpp. J. Sci., 82: 288-289, pl. 3, fig. 23 (wing); pl. 4, fig. 35 (male terminalia).

*Antocha (Antocha) bidigitata*: ISHIDA, 1957, Annual Rept. Hyogo Agr. Coll., 6: 146.

Male Wing length about 7 mm, antennal length 0.9 mm. General coloration grey; antennal first flagellomere oval; the succeeding eight or nine segments very short oval to nearly moniliform; the outer segments more oval; terminal segment about one-half longer than the penultimate; halter yellow; the knob slightly darkened; legs with coxae pale, sparsely grey pruinose; trochanters yellow; remaining segments of legs brown; the outer segments passing into black; wing shown in Fig. 10-c; male terminalia shown in Fig. 11.

Female. Wing length about 8 mm. Characters except terminalia are generally the same as in male. Female terminalia (Fig. 10-d, e) with cerci smooth ventrally.

Specimens examined. Japan. Honshu (new locality); 40 ♂♂ 3 ♀♀, Fenukinotaki Falls, 840 m alt., Ôhazama-machi, Hienuki-gun, Iwate Pref., VIII. 20. 1983 (at light), T. TORII leg.; 5 ♂♂ 1 ♀ (in ethanol), Riv. Toyamasawa - Senjugahara, Nikkô-shi, Tochigi Pref., VI. 23. 1988, M. TADA leg. (emergence trap); 4 ♂♂ (in ethanol), same locality as above, VII. 21. 1988, M. TADA leg. (emergence trap); 8 ♂♂ 1 ♀ (in ethanol), same locality as above, VIII. 18. 1988, M. TADA leg. (emergence trap); 1 ♂ (in ethanol), same locality as above, IX. 21. 1988, M. TADA leg. (emergence trap); 1 ♂, Mt. Mitôsan, 800 m alt., Hinohara-mura, Nishitama-gun, Tokyo Pref., V. 9. 1982, T. TORII leg.; 2 ♂♂, same locality as above, V. 18. 1984, T. TORII leg.; 1 ♂, same locality as above, V. 25. 1984, T. TORII leg.; 6 ♂♂ (in ethanol), Shiraishizawa, Yamakita-machi, Ashigarakami-gun, Kanagawa Pref., X. 15-16. 1983 (at light), S. UCHIDA leg.; 1 ♂ 1 ♀ (in ethanol), Tateshina, Chino-shi, Nagano Pref., VII. 20. 1983, S. UCHIDA leg.

Shikoku: 1 ♂ (pinned specimen and permanent slide), Omogokei, Ehime Pref., V. 10. 1952, KUSUNOKI leg. (holotype, DENMNHSI).

Kyushu (new locality): 3 ♂♂ 1 ♀, Naidaijin, Irido (= Kumamoto Pref.), VII. 29. 1952, TAKEYA & HIRASHIMA leg. (ELKU).



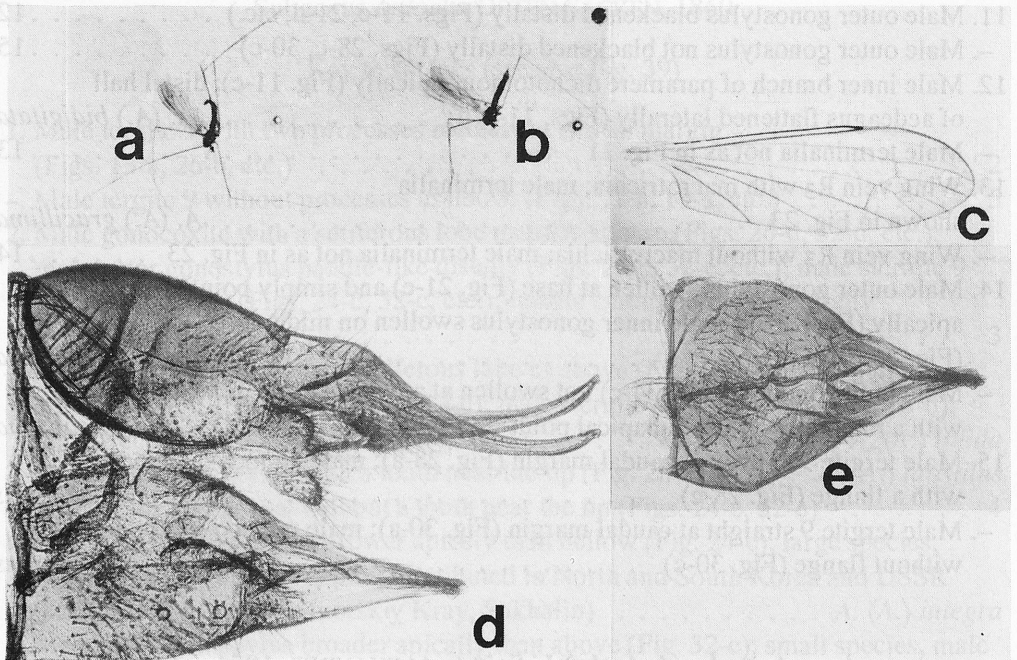


Fig. 10. *Antocha (Antocha) bidigitata*: a, male; b, female; c, wing; d, female terminalia, left lateral; e, female sternite 8 and hypogynial valves, ventral.

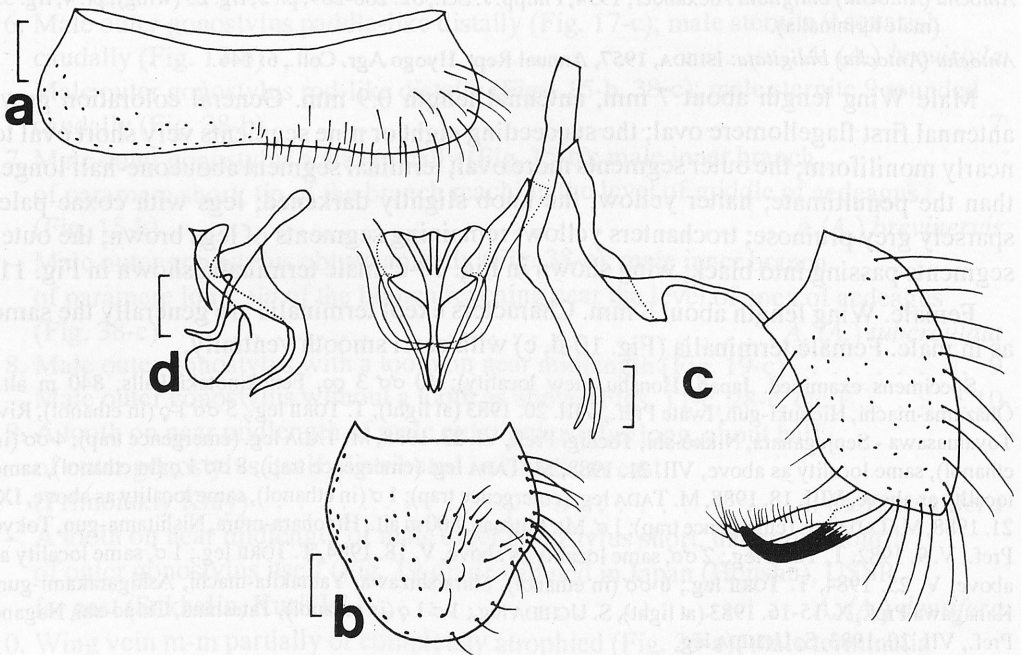


Fig. 11. Male terminalia of *Antocha (Antocha) bidigitata*: a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; d, aedeagus and aedeagal sheath, left lateral; Scales, all 0.1 mm.



Distribution. Japan (Honshu, Shikoku, Kyushu).

Remarks. This species is newly recorded from Honshu and Kyushu. Female of this species is recorded and described for the first time. This species is readily distinguished from all the other congeners by following characters in male terminalia: tip of inner branch of paramere dichotomous; distal part of aedeagus flattened laterally.

*Antocha (Antocha) bifida* ALEXANDER, 1924

(Figs. 12-13)

*Antocha (Antocha) bifida* ALEXANDER, 1924, Philipp. J. Sci., 24: 563, 564-566, pl. 2, fig. 10 (male terminalia).

*Antocha pallida* LACKSCHEWITZ, 1964, Ent. Obozr., 43: 716, fig. 9 (wing, male terminalia).

*Antocha (Antocha) bifida*: ISHIDA, 1957, Annual Rept. Iiyogo Agr. Coll., 6: 146.

Male. Wing length 5.3-7.0 mm. Head grey; distal flagellomeres oval; terminal segments about the same length as penultimate; general coloration of thorax ochereous; pleura reddish brown; halter with stem pale; knob slightly darkened; legs with coxae and trochanters yellow to yellowish brown; wing shown in Fig. 12-c; macrotrichiae present on C, R<sub>1</sub>, R<sub>1+2</sub>, distal half to three-quarters of distal section of R<sub>4+5</sub>, distal section of M<sub>1+2</sub>, distal section of M<sub>3</sub>, extreme tip only to almost all of distal section of CuA<sub>1</sub>, and on wing margin; R<sub>3</sub> without macrotrichia; male terminalia shown in Fig. 13.

Female. Wing length 5.0-6.7 mm. Characters except for the terminalia not different from male. Female terminalia (Fig. 12-d, e) with cerci smooth ventrally.

Specimens examined. Japan. Hokkaido: 1 ♂, Jozankei, VIII. 19. 1922, T. ESAKI leg. (holotype, DENMNIISI).

Honshu: 8 ♂♂, Shiraiwa, 220 m alt., Ôhazama-machi, Hienuki-gun, Iwate Pref., VIII. 14-15. 1983 (at light), T. TORII leg.; 1 ♂, Taimagura, 480 m alt., Kawai-mura, Shimohei-gun, Iwate Pref., VIII. 16. 1983 (at light), T. TORII leg.; 3 ♂♂, Ochiai-Take, Ôhazama-machi, Hienuki-gun, Iwate Pref., VIII. 15. 1983 (at light), T. TORII leg.; 6 ♂♂, Myôjin-Tokusa, Kawai-mura, Shimohei-gun, Iwate Pref., VIII. 16-17. 1983 (at light), T. TORII leg.; 1 ♂ (in ethanol), Hiisudori, Iwaizumi-chô, Shimohei-gun, Iwate Pref., VIII. 17. 1983, S. Uchida leg.; 1 ♂ (in ethanol), Mineral Spring Asahi-kôsen, Asahi-machi, Nishimurayama-gun, Yamagata Pref., VIII. 2. 1983, S. UCHIDA leg.; 4 ♂♂, Nishiyama, Yanaitsu-machi, Kawanuma-gun, Fukushima Pref., VII. 20-26. 1983, K. ISHIZUKA leg.; 4 ♂♂ (in ethanol), Riv. Toyamasawa - Senjugahara, Nikkô-shi, Tochigi Pref., VII. 21. 1988, M. TADA leg. (emergence trap); 2 ♂♂ (in ethanol), same locality as above, X. 19. 1988, M. TADA leg. (emergence trap); 1 ♂, Mt. Takaosan, Hachiôji, Tokyo Pref., IV. 11. 1982, T. TORII leg.; 1 ♂, same locality as above, IV. 18. 1982, T. TORII leg.; 17 ♂♂, same locality as above, V. 19. 1982, T. TORII leg.; 1 ♂, Shiromaru-Unasawa, 330 m alt., Okutama-machi, Nishitama-gun, Tokyo Pref., V. 3. 1982, T. TORII leg.; 39 ♂♂ 36 ♀♀, Jûrigi, Itsukaichi-machi, Nishitama-gun, Tokyo Pref., VIII. 4. 1982 (at light), T. TORII leg.; 1 ♂ (in ethanol), Nagae, Hayama-machi, Miura-gun, Kanagawa Pref., III. 30. 1983, S. UCHIDA leg., 1 ♂, Aone, Tsukui-machi, Tsukui-gun, Kanagawa Pref., IV. 30. 1984, M. AMANO leg.; 1 ♂, Itoigawa-shi, Niigata Pref., VIII. 13. 1982, T. TORII & S. UCHIDA leg.; 5 ♂♂ (in ethanol), Sano (Riv. Kanogawa), Amagi-yugashima-machi, Shizuoka Pref., III. 11. 1984, S. UCHIDA leg.

Shikoku: 1 ♂, Omogo, Iyo (= Ehime Pref.), VII. 14. 1952, S. Miyamoto leg. (ELKU).

Kyushu: 19 ♂♂ 18 ♀♀ (1 ♂ 1 ♀ taken in copula, 2 ♀♀ parasited by Acari), Inugatake, Buzen (Fukoka Pref. & Ôita Pref.), VII. 13-15. 1938, Hori, KAWAHARA & YASUMATSU leg. (ELKU); 2 ♂♂, Kirishima, Osumi (Kagoshima Pref.), VII. 17. 1933, Hori & FUJINO leg. (ELKU).

South Korea (new locality): 1 ♂ (in ethanol), Odaesanjang, Odaesan, Pyongchang-gun, Kangwon-do, VI. 9. 1983, S. UCHIDA leg.

Taiwan: 1 ♂ (in ethanol), near Puli, Nanshanchi, IV. 8. 1982, S. UCHIDA leg.

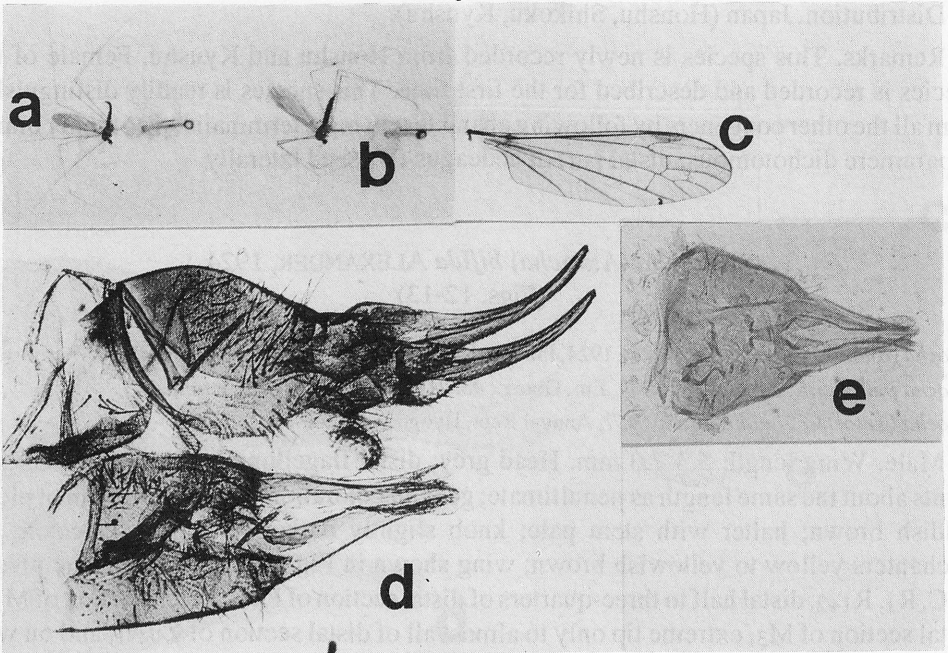


Fig. 12. *Antocha (Antocha) bifida*: a, male; b, female; c, wing; d, female terminalia, left lateral; e, female sternite 8 and hypogynial valves, ventral.

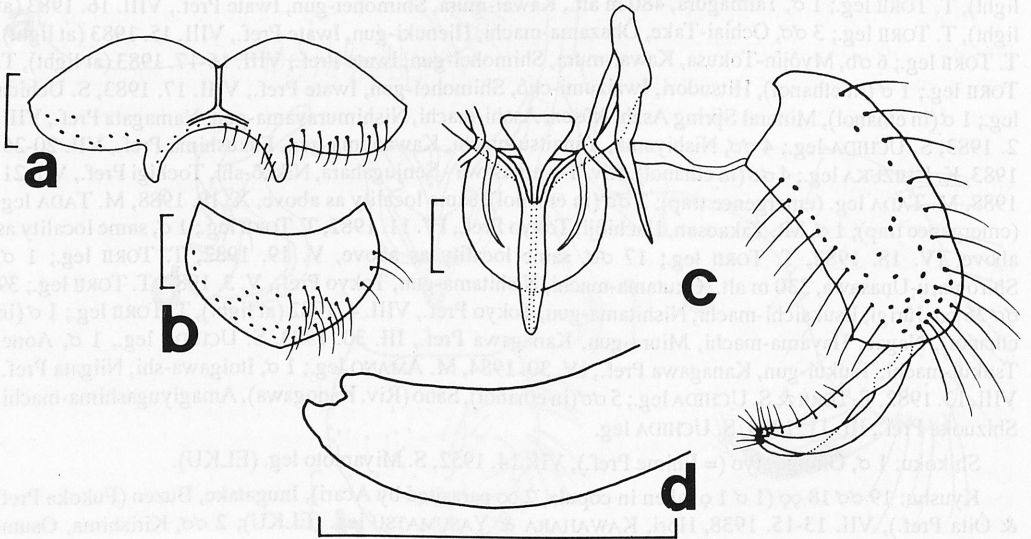


Fig. 13. Male terminalia of *Antocha (Antocha) bifida*: a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm.

Distribution: Japan (Hokkaido, Honshu, Shikoku, Kyushu), North Korea, South Korea, USSR (south Siberia from Altai to Primorskiy Kray and Kuril Isl.), China (as far south as Guangdong), Taiwan, Philippines.

Remarks. This species is newly recorded from South Korea. This species is readily distinguished from *Antocha (Antocha) javanensis* ALEXANDER, 1915 (Taiwan, Java, Malaya) by having macrotrichia on vein distal section of CuA<sub>1</sub> and lacking on R<sub>3</sub>. In some cases, grey individuals are found, as in common in the genus *Antocha*.

*Antocha (Antocha) brevinervis* ALEXANDER, 1924

(Figs. 14 - 15, 40)

*Antocha (Antocha) brevinervis* ALEXANDER, 1924, Philipp. J. Sci., 24: 563, 567, pl. 2, fig. 12 (male terminalia), holotype male, Jôzankei, Hokkaido, Japan.

*Antocha (Antocha) brevinervis* ALEXANDER, 1936 (nec ALEXANDER, 1924), Philipp. J. Sci., 59: 238, 239, holotype male, Sapporo, Hokkaido, Japan, syn. nov.

*Antocha (Antocha) spicata* ALEXANDER, 1936, Philipp. J. Sci., 59: 238-239, pl. 1, fig. 10 (wing); pl. 2, fig. 29 (male terminalia), holotype male, Kibune, Kyoto Pref., Japan, syn. nov.

*Antocha (Antocha) brevinervis* ALEXANDER, 1924: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

*Antocha (Antocha) spicata*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 148.

Male. Wing length 4-6.5 mm, body length about 3.5-5 mm. Head brown to dark brown, slightly pruinose; rostrum short, brown to dark brown; compound eye black; antenna with the scape brown; the pedicel and flagellomeres darker brown; flagellum with 14 segments; each flagellomere subglobular to very short-oval; the outer segments slightly elongate; labellum brown; palpus brown to dark brown.

Thorax almost uniformly brown to dark brown, pruinose; mesoscutal stripes not evident; halter with stem's base pale; remainder of halter infuscated; legs with the coxae and trochanters brown; remaining segments of legs uniformly darkened; wing (Fig. 14) tinged with grey; the prearcular field paling to white; stigma quite indistinct or lacking; veins brown. Venation: Sc short; Sc<sub>1</sub> ending about two-thirds to three-fourths the length of the basal section of Rs; R<sub>2</sub> indistinct in the stigmal area, at or beyond opposite r-m; r-m at about one-third the length of cell dm; basal section of CuA<sub>1</sub> before the fork of M; cell dm present; its length about twice as long as wide or a little longer. Macrotrichia present on C, R<sub>1</sub>, R<sub>1+2</sub>, distal two-thirds of distal section of M<sub>1+2</sub>, sometimes distal three-fifths of distal section of M<sub>3</sub>, and on wing margin.

Abdomen, including terminalia, uniformly dark brown. Male terminalia (Fig. 15, 40) with the tergite 9 simple, bearing long setae, emarginate medially in frontal margin; gonocoxite with setae except lateral portion, bearing a setiferous lobe mesally at base; aedeagal sheath well developed; inner branch of paramere slender; tip acute, at about the level of middle of aedeagus; outer branch of paramere short; tip obtuse; outer gonostylus glabrous, simple, a trifle more pointed than inner one apically; inner gonostylus setiferous, simple, and generally similar in the shape to outer one.

Female. Wing length 4.8 mm, body length 5 mm. Characters except for terminalia are generally the same as in male.



Specimen examined. Japan. Hokkaido: 1 ♂ (permanent slide only), Sapporo, VI. 25. 1921, S. KUWAYAMA leg. (paratype of *A. (A.) brevinervis* ALEXANDER, 1924 and holotype of *A. (A.) brevinervis* ALEXANDER, 1936, DENMNIISI); 1 ♂, Jôzankei, Ishikari, VIII. 19. 1922, T. ESAKI leg. (holotype of *A. (A.) brevinervis* ALEXANDER, 1924 and paratype of *A. (A.) spicata*, DENMNIISI).

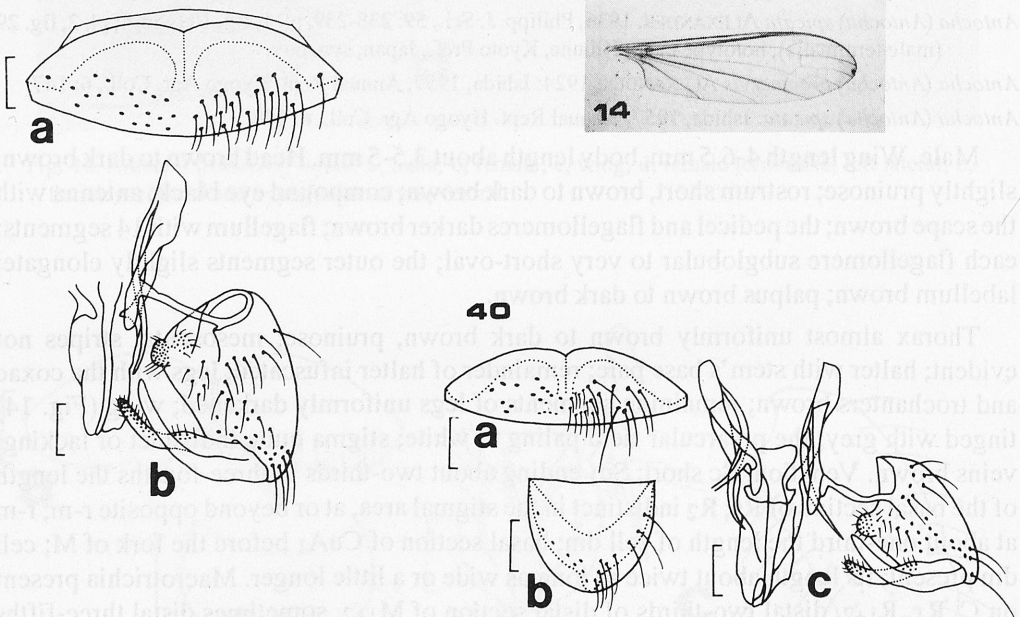
Honshu: 1 ♂, Jûrigi, 200 m alt., Itsukaichi-machi, Nishitama-gun, Tokyo Pref., VIII. 4. 1982 (at lighth), T. TORII leg.; 1 ♂ (once in ethanol, now dried, and with permanent slide), Kibune, Kyoto Pref., X. 11. 1934, M. TOKUNAGA leg. (holotype of *A. (A.) spicata*, DENMNIISI).

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

Remarks. This species is readily distinguished from all the other congeners by the characters of male terminalia.

In the original description of *Antocha (Antocha) brevinervis* ALEXANDER, 1924 he designated following type series: holotype, ♂, Jôzankei, Ishikari, Hokkaido, VIII. 19. 1922, T. ESAKI leg.; allotype 1 ♀; paratype 1 ♂; paratypes, Lake of Akan, Hokkaido, IX. 4. 1922, T. ESAKI leg.; 1 ♂, Sapporo, Hokkaido, VI. 25. 1921, S. KUWAYAMA leg.,

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Figs. 14 - 15, 40. *Antocha (Antocha) brevinervis* ALEXANDER, 1924: 14 - wing (holotype of *A. (A.) brevinervis* ALEXANDER, 1936); 15 - male terminalia (holotype of *A. (A.) brevinervis* ALEXANDER, 1936) - a, tergite 9, dorsal; b, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm; 40 - male terminalia (holotype of *A. spicata*); a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm.

and he mentioned that the specimens from Jôzankei including holotype are very small but undoubtedly referred to this species and that this species is distributed in Hokkaido.

In the original description of *Antocha (Antocha) spicata* ALEXANDER, 1936 a paratype of *A. (A.) brevinervis* ALEXANDER, 1924 from Sapporo (a large specimen) was redesignated a "true" holotype of *A. (A.) brevinervis*, and the original holotype of *A. (A.)*



*brevinervis* ALEXANDER, 1924 from Jôzankei (a small specimen) was redesignated a paratype of *A. (A.) spicata*, and He mentioned that *A. (A.) brevinervis* and *A. (A.) spicata* resemble each other, the former being a large species from Hokkaido and the latter small species from Hokkaido, Honshu and Kyushu, and he described following type series of *A. (A.) spicata*: holotype, ♂ (in ethanol), Kibune, Kyoto Pref., Honshu, X. 11. 1934, M. TOKUNAGA leg.; paratypes, 1 ♂, Date, Iburi, Hokkaido, IX. 4. 1923, S. KUWAYAMA leg.; 1 ♂, Jôzankei, Ishikari, Hokkaido, VIII. 19. 1922, T. ESAKI leg.; 1 ♂, Takaharu, Hiuga, Kyushu, XI. 1. 1923, T. ESAKI leg.

The present author recognizes as follows:

- (1) The holotype change in ALEXANDER (1936) is invalid, therefore *A. (A.) brevinervis* ALEXANDER, 1924 is a small species with an original holotype from Jôzankei.
- (2) According to (1), *A. (A.) spicata* ALEXANDER, 1936, a small species, is a junior synonym of *A. (A.) brevinervis* ALEXANDER, 1924.
- (3) *A. (A.) brevinervis* ALEXANDER, 1936 with a holotype from Sapporo, a large species, is a junior homonym of *A. (A.) brevinervis* ALEXANDER, 1924.
- (4) *A. (A.) brevinervis* ALEXANDER, 1924 is distributed in Hokkaido, Honshu, Shikoku and Kyushu (including the distribution area of *A. (A.) spicata*), and *A. (A.) brevinervis* ALEXANDER, 1936 (nec. ALEXANDER, 1924) is distributed in Hokkaido.
- (5) *A. (A.) brevinervis* ALEXANDER, 1936 is synonymized under *A. (A.) brevinervis* ALEXANDER, 1924 because they cannot be distinguished from each other definitely, differences concern only quantitative characters, without qualitative differences, such as in Figs. 15, 40. A wide variation of quantitative characters generally is observed in species of this genus.

### *Antocha (Antocha) brevistyla* ALEXANDER, 1924

(Figs. 16-17)

*Antocha (Antocha) brevistyla* ALEXANDER, 1924 Philipp. J. Sci., **24**: 563, 567-568, pl. 2, fig. 11 (male terminalia).

*Antocha (Antocha) brevistyla* ALEXANDER: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., **6**: 147.

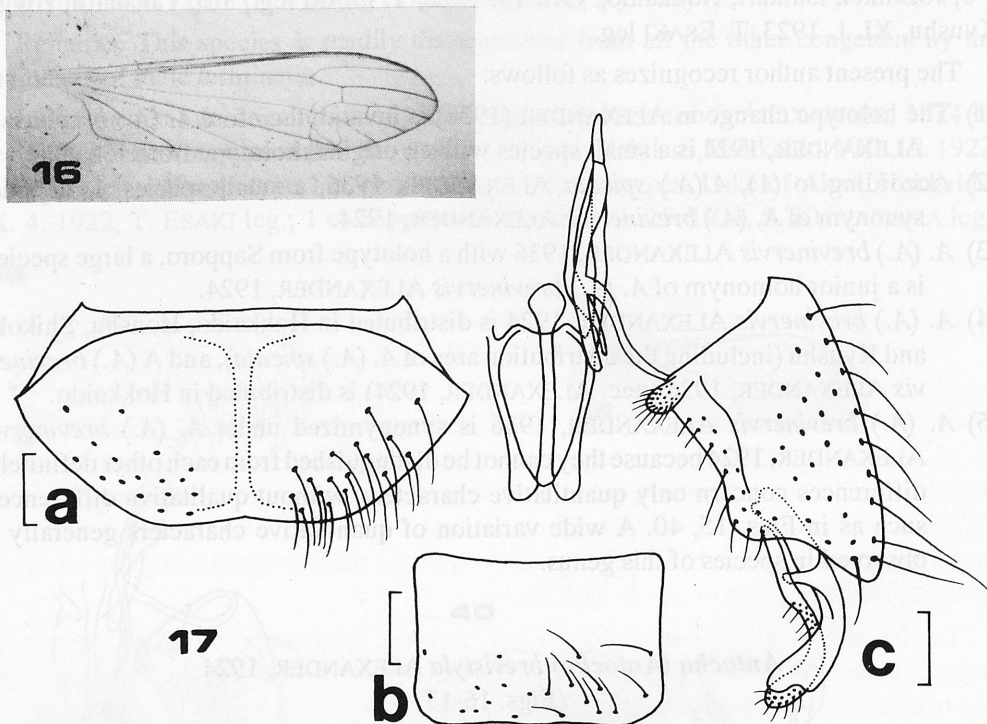
Male. Wing length about 7.2 mm, body length about 5.3 mm. Head dark, silvery grey pruinose on anterior part of vertex; rostrum ochreous; antenna dark brown throughout; palpus black; pronotum ochreous, broadly dark brown medially; presutural area of mesonotum reddish brown, darker brown medially; lateral stripe obliterated; postsutural area of mesoscutum and scutellum pale brown; postnotum pale brown, darker caudally; pleura pale, but katapisternum infuscated; halter pale; knob infuscated; legs with coxae pale; knob infuscated; legs with coxae pale but darkened in the outer faces; trochanters pale, dark brown apically; remaining segments of legs dark brownish black; the femoral bases a little paler; wing shown in Fig. 16; abdominal tergites obscure brownish yellow, with indications of a darker median stripe; sternites obscure yellow, darkened in the lateral margins; male terminalia shown in Fig. 17.

Female unknown.

Specimen examined. Japan. Hokkaido: 1 ♂ (pinned specimen with only left wing and one leg, and permanent slide), Sapporo, VIII. 17. 1922, T. ESAKI leg. (holotype, DENMNIISI).

Distribution. Japan (Hokkaido), USSR far east (Kuril Isl.).

Remarks. *Antocha (Antocha) brevistyla* is readily told from all other regional species of the genus by the structure of the male terminalia, especially of the gonostyli.



Figs. 16 - 17. *Antocha (Antocha) brevistyla*: 16 - wing; 17 - male terminalia; a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm.

*Antocha (Antocha) dentifera* ALEXANDER, 1924.  
(Figs. 18-19, 41)

*Antocha (Antocha) dentifera* ALEXANDER, 1924, Annls. ent. Soc. Amer., 17: 63, holotype ♂, Mt. Takaosan, Tokyo Pref., Honshu, Japan.

*Antocha (Antocha) subdentifera* ALEXANDER, 1969, Trans. Shikoku ent. Soc., 10(2): 34, 35-36, fig. 4 (male terminalia), holotype ♂, Kurokawa, Niigata Pref., Honshu, Japan, syn. nov.

*Antocha (Antocha) dentifera*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male. Wing length about 3.5-6.5 mm, body length about 3.2-5 mm. A wide variation of quantitative characters recognized. Head brownish grey, with setae sparsely; rostrum with setae; compound eye black; antenna brown, with setae; flagellomeres 14 in number, oval; labellum pale brown, with setae; palpus brown, with setae.

Thorax mostly brown; presutural area of mesoscutum chiefly brown, grey in lateral border; halter with stem pale; knob brown; legs with coxae and trochanters testaceous; remaining segments of legs brown; wing (Fig. 18) greyish subhyaline, whitened in prearcular field; stigma scarcely indicated; veins pale brown; macrotrichia present on C, R<sub>1</sub>, R<sub>1+2</sub>, distal half of distal section of R<sub>4+5</sub> sparsely, distal section of M<sub>1+2</sub> sparsely, and on wing margin. Venation: Sc<sub>1</sub> ending just before the level of fork of Rs; R<sub>2</sub> very faint to virtually atrophied in the stigmal area; r-m before midlength of cell dm; cell dm, its length about twice as long as wide; basal section of CuA<sub>1</sub> joining M at about half its own length before fork of M.

Abdomen brown in ground color. Male terminalia (Fig. 19, 41) with tergite 9 bearing setae sparsely on the posterior half, gonocoxite with setae; aedeagal sheath well developed; inner branch of paramere long and slender, sinuous; its tip acute, directed sublaterally; outer branch of paramere sinuous; its tip about the level of middle of aedeagus; outer gonostylus glabrous, with a tooth at about midlength, obliquely truncated apically; inner gonostylus setiferous, stouter than outer one.

Female. 30 ♂♂ 4 ♀♀ collected from the southern Kuril Isl., but without morphological description of female (SAVCHENKO and KRIVOLUTSKAYA 1976).

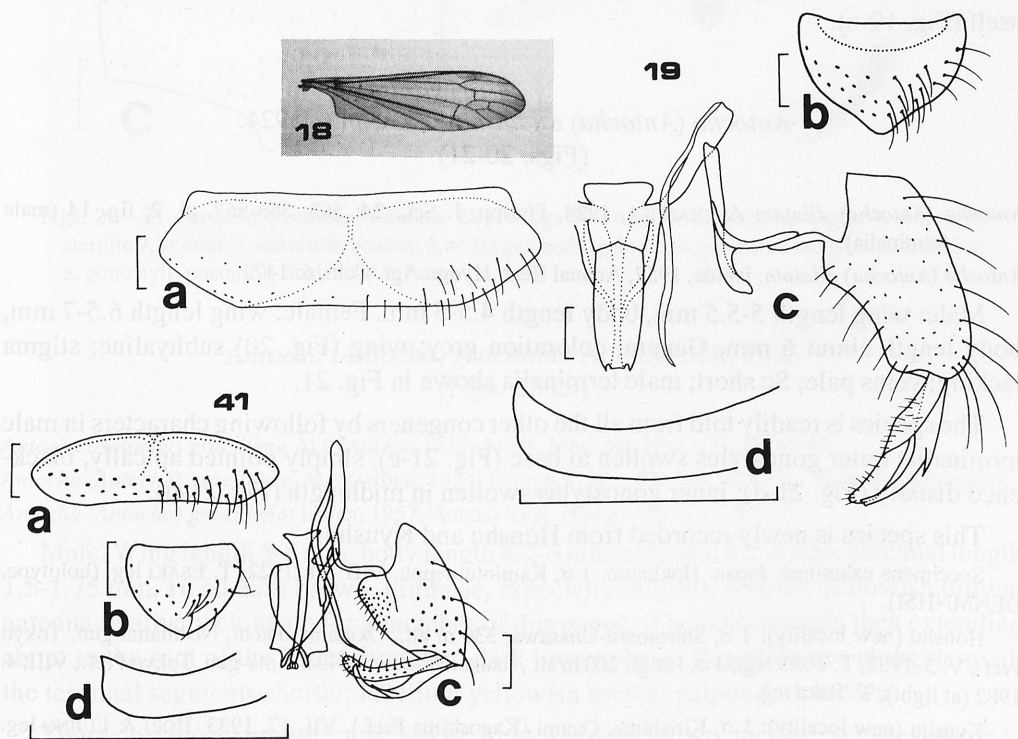


Fig. 18 - 19, 41. *Antocha (Antocha) dentifera*: 18 - wing; 19 - male terminalia; a, tergite 9, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm; 41 - male terminalia (holotype of *A. (A.) subdentifera*); a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm.



Specimens examined. Japan. Honshu: 1 ♂, Fuenukinotaki Falls, 840 m alt., Ôhazama-machi, Hienuki-gun, Iwate Pref., VIII. 20. 1983 (at light), T. TORII leg.; 1 ♂ (pinned specimen and permanent slide), Mt. Takaosan, 300-600 m alt., Musashi-no-kuni (Tokyo Pref.), V. 7. 1922, T. ESAKI leg. (holotype of *A. (A.) dentifera*, DENMNHSI); 2 ♂♂, Mt. Takaosan, Hachiôji, Tokyo Pref., IV. 11. 1982, T. TORII leg.; 2 ♂♂, same locality as above, IV. 14. 1982, T. TORII leg.; 1 ♂, Shiromaru-Unasawa, 330 m alt., Okutama-machi, Nishitama-gun, Tokyo Pref., V. 3. 1982, T. TORII leg.; 2 ♂♂, Yokote, Hidaka-machi, Iruma-gun, Saitama Pref., VII. 8. 1982, T. TORII leg.; 1 ♂ (pinned specimen and permanent slide), Kurokawa, Echigo (= Niigata Pref.), IX. 20. 1954, K. BABA leg. (holotype *A. (A.) subdentifera*, DENMNHSI).

Distribution. Japan (Honshu), USSR far east (Sakhalin, Kuril Isl.).

Remarks. *A. (A.) subdentifera* ALEXANDER, 1969 distributed in Japan (Honshu), USSR far east (Sakhalin, Kuril Isl.) cannot be told from *A. (A.) dentifera* ALEXANDER, 1924 distributed in Japan (Honshu) definitely because the two species are different from each other mainly in quantitative characters, and differences in holotypic permanent slides of the two species are considered to be artefact. And a wide variation of quantitative characters generally exists in species of this genus. Therefore, *A. (A.) subdentifera* is synonymized under *A. (A.) dentifera*.

*A. (A.) dentifera* is told from *A. (A.) ramulifera* SAVCHENKO, 1983 distributed in the USSR far east (Primorsky Kray) by having a following character in male terminalia: a tooth on near midlength of outer gonostylus short, under one-fourth of outer gonostylus itself (Fig. 19-c).

*Antocha (Antocha) dilatata* ALEXANDER, 1924.  
(Figs. 20-21)

*Antocha (Antocha) dilatata* ALEXANDER, 1924, Philipp. J. Sci., 24: 563, 566-567, pl. 2, fig. 14 (male terminalia).

*Antocha (Antocha) dilatata*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male: wing length 5-5.5 mm, body length 4.5-5 mm. Female: wing length 6.5-7 mm, body length about 6 mm. General coloration grey; wing (Fig. 20) subhyaline; stigma lacking; veins pale; Sc short; male terminalia shown in Fig. 21.

The species is readily told from all the other congeners by following characters in male terminalia: outer gonostylus swollen at base (Fig. 21-e), simply pointed apically, blackened distally (Fig. 21-d); inner gonostylus swollen in midlength (Fig. 21-d).

This species is newly recorded from Honshu and Kyushu.

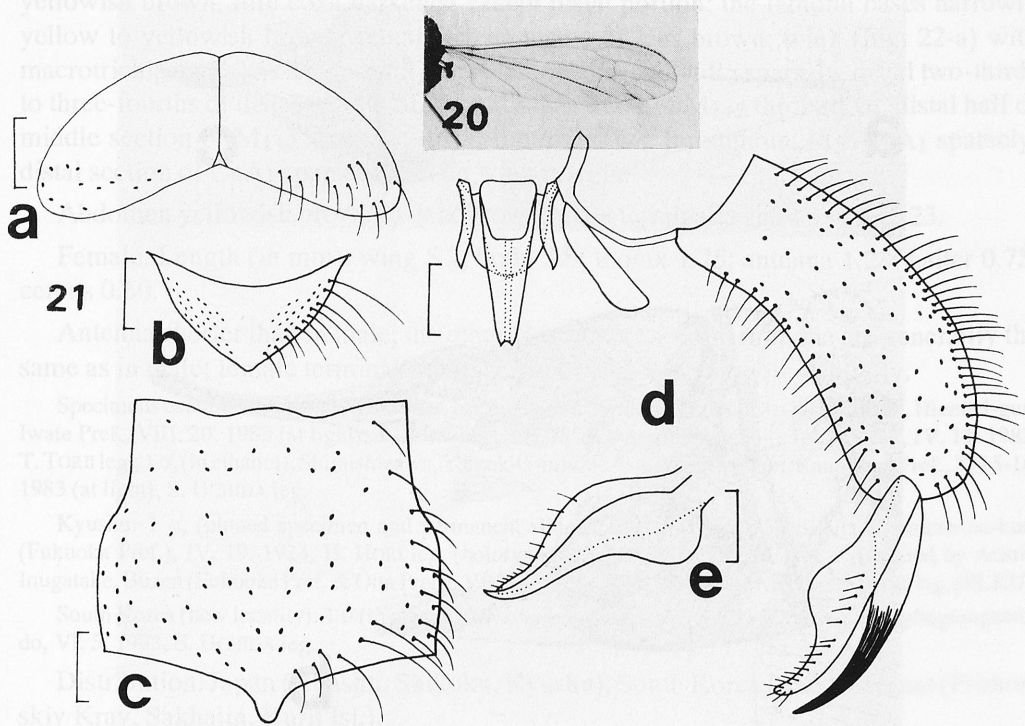
Specimens examined. Japan. Hokkaido: 1 ♂, Kamiotoineppu, VIII. 24. 1922, T. ESAKI leg. (holotype, DENMNHSI).

Honshu (new locality): 1 ♂, Shiromaru-Unasawa, 330 m alt., Okutama-machi, Nishitama-gun, Tokyo Pref., V. 3. 1982, T. TORII leg.; 1 ♂, Jûrigi, 200 m alt., Itsukaichi-machi, Nishitama-gun, Tokyo Pref., VIII. 4. 1982 (at light), T. TORII leg.

Kyushu (new locality): 1 ♂, Kirishima, Osumi (Kagoshima Pref.), VII. 17. 1933, HORI & FUJINO leg. (ELKU).

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), USSR far east (Primorskiy Kray).





Figs. 20 - 21. *Antocha (Antocha) dilatata*: 20 - wing; 21 - male terminalia; a, tergite 9, dorsal; b, sternite 9, ventral; c, sternite 8, ventral; d, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; e, gonostyli, posterior; Scales, all 0.1 mm.

*Antocha (Antocha) gracillima* ALEXANDER, 1925  
(Figs. 22-23)

*Antocha (Antocha) gracillima* ALEXANDER, 1925, Annls. Mag. nat. Hist., (9), 15: 67-68.

*Antocha (Antocha) gracillima*: ALEXANDER, 1954, Philipp. J. Sci., 82: 289, pl. 4, fig. 36 (male terminalia).

*Antocha (Antocha) gracillima*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male. Wing length 5-8 mm, body length 4.2-6 mm, antennal 4.2-6 mm, antennal length 1.5-1.75 mm. Head dark brown, pruinose, especially in front; rostrum yellowish brown; antenna relatively elongate for a member of this genus, if bent backwards then extending about to the root of the halter, brown to dark brown; basal flagellomeres elongate-oval; the terminal segments shorter; labellum yellowish brown; palpus dark brown.

Thorax pruinose; pronotum yellowish brown to dark brown; mesoprescutum brown to dark brown, slightly paler laterally; presutural area of mesoscutum yellowish brown striped; the middle stripe lengthened into and filling most area of the mesoprescutum anteriorly; postsutural area of mesoscutum brown to dark brown, paler laterally; scutellum and mediotergite brown to dark brown; laterotergite yellowish brown to dark brown; halter

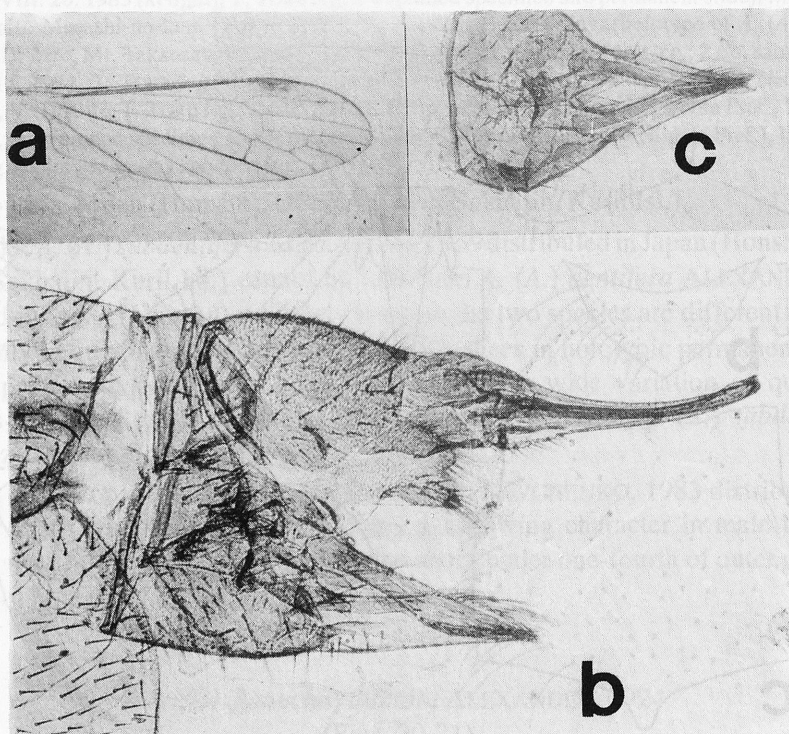


Fig. 22. *Antocha (Antocha) gracillima*: a, wing; b, female terminalia, left lateral; c, female sternite 8 and hypogynial valves, ventral.

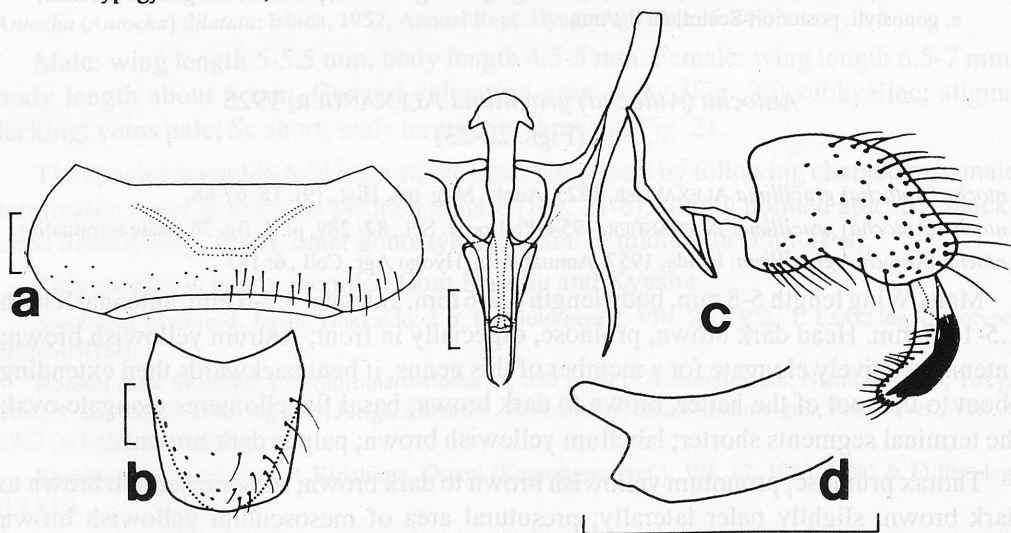


Fig. 23. Male terminalia of *Antocha (Antocha) gracillima*: a, tergite 9, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm.

with stem pale and setose; the knob infuscated; legs with coxae and trochanters yellow to yellowish brown; fore coxa darkened except distal portion; the femoral bases narrowly yellow to yellowish brown; remaining segments of legs brown; wing (Fig. 22-a) with macrotrichia on C, R<sub>1</sub>, R<sub>1+2</sub>, distal one-third to almost all of R<sub>3</sub> sparsely, distal two-thirds to three-fourths of distal section of R<sub>4+5</sub>, distal section of M<sub>1+2</sub> throughout, distal half of middle section of M<sub>1+2</sub> sparsely, distal section of M<sub>3</sub> throughout, M<sub>3</sub>+CuA<sub>1</sub> sparsely, distal section of CuA<sub>1</sub> sparsely, and on wing margin.

Abdomen yellowish brown to dark brown; male terminalia shown in Fig. 23.

Female. Length (in mm): wing 5.2; body 3.8; thorax 1.25; antenna 1.28; halter 0.75; cercus 0.60.

Antenna shorter than in male; the other characters except terminalia are generally the same as in male; female terminalia (Fig. 22-b, c) with cerci smooth ventrally.

Specimens examined. Japan. Honshu: 1 ♂, Fuenukinotaki Falls, 840 m alt., Ôhazama-machi, Hienuki-gun, Iwate Pref., VIII. 20. 1983 (at light), T. TORII leg.; 1 ♂, Mt. Takaosan, Hachiôji, Tokyo Pref., IV. 11. 1982, T. TORII leg.; 1 ♂, (in ethanol), Shiraishizawa, Yamakita-machi, Ashigarakami-gun, Kanagawa Pref., X. 15-16. 1983 (at light), S. UCHIDA leg.

Kyushu: 1 ♂, (pinned specimen and permanent slide), Mt. Wakasugi, 750 m alt., Chikuzen-no-kuni (Fukuoka Pref.), IV. 19. 1924, H. HORI leg. (holotype, DENMNHSI); 2 ♂♂, 1 ♀ (1 ♂ parasited by Acari), Inugatake, Buzen (Fukuoka Pref. & Ôita Pref.), VII. 13. 1938, HORI, KAWAHARA & YASUMATSU leg. (ELKU).

South Korea (new locality): 1 ♂ (in ethanol), Sesokpyongjon, Chiri-san, Hamyang-gun, Kyôngsangnam-do, VI. 5. 1983, S. UCHIDA leg.

Distribution. Japan (Honshu, Shikoku, Kyushu), South Korea, USSR far east (Primorskiy Kray, Sakhalin, Kuril Isl.).

Remarks. This species is newly recorded from South Korea.

Female of this species is described for the first time.

This species is readily distinguished from all regional species of the genus by relatively long antennae, abundant distribution of wing-veins macrotrichia, and characters of male terminalia.

*Antocha (Antocha) integra* ALEXANDER, 1940  
(Fig. 24)

*Antocha (Antocha) integra* ALEXANDER, 1940, Philipp. J. Sci., 71: 43-44, pl. 1, fig. 3 (wing, erratum); pl. 2, fig. 28 (male terminalia).

Male. Length (in mm): wing 7.0-7.5; body 5.2-6.4; thorax 1.4-1.7; antenna 1.3-1.4; halter 0.93-1.0; aedeagus 0.26. General coloration of head brown; antenna brown; flagellomeres 14 in number, oval or long oval; distal segments longer.

Thorax yellow in ground color; halter with stem pale and setose; knob a little darkened, with a few setae on the basal part; legs with coxae and trochanters pale yellow, but an anterior side of fore and mid coxa tinged with brown; femora brown to dark brown, with pale yellow basal parts; remaining segments of legs brown to dark brown; wings subhyaline; veins brown. Venation: Sc<sub>1</sub> ending shortly beyond four-fifths the length of basal section of Rs; R<sub>2</sub> indistinct in stigmal area, shortly before opposite r-m; r-m at or shortly



basal to one-third the length of cell dm; cell dm long, about 2.5 times as long as wide; basal section of CuA<sub>1</sub> about two-fifths its own length basal to fork of fork of M. Macrotrichia present on C, R<sub>1</sub>, R<sub>1+2</sub>, distal four-fifths of distal section of distal section of R<sub>4+5</sub>, distal two-thirds of distal section of M<sub>1+2</sub>, and on wing margin; a few macrotrichia present on near the tip of distal section of M<sub>3</sub>.

Male terminalia shown in Fig. 24.

Female. Unknown.

Specimens examined. South Korea (new locality): 16 ♂♂ (in ethanol), Samjong, Kayasan, Hapchon-gun, Kyongsangnam-do, V. 25-26. 1983, S. UCHIDA leg.

Distribution. North Korea, South Korea, USSR far east (Amur Obl., Primorskyi Kray, Sakhalin).

Remarks. This species is newly recorded from South Korea.

The species is readily distinguished from *Antocha* (*Antocha*) *latistilus* (Japan: Honshu) by absent of a tooth near the tip of male outer gonostylus and from *A. (A.) sagana* (Japan: Honshu, Kyushu) by the outline of distal part of male outer gonostylus and larger body size.

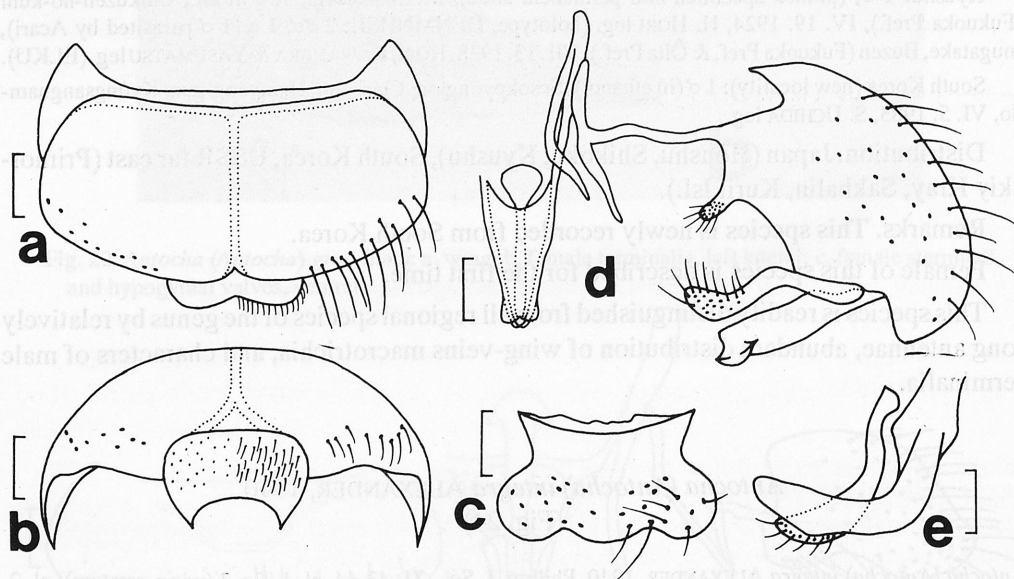


Fig. 24. Male terminalia of *Antocha* (*Antocha*) *integra*: a, tergite 9, dorsal; b, same, posterior; c, sternite 9, ventral; d, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; e, gonostyli, posterior; Scales, all 0.1 mm.

*Antocha* (*Antocha*) *latistilus* TORII, 1991  
(Figs. 25-26)

*Antocha* (*Antocha*) *latistilus* TORII, 1991, Jap. J. Ent., **59**, figs. 1-9 (in press).

Male. Length (in mm): wing 5.0-6.7; body 4.0-5.7; head 0.40-0.53; thorax 1.3-1.8; antenna 1.2-1.5; halter 0.70-0.93; aedeagus 0.23-0.28.

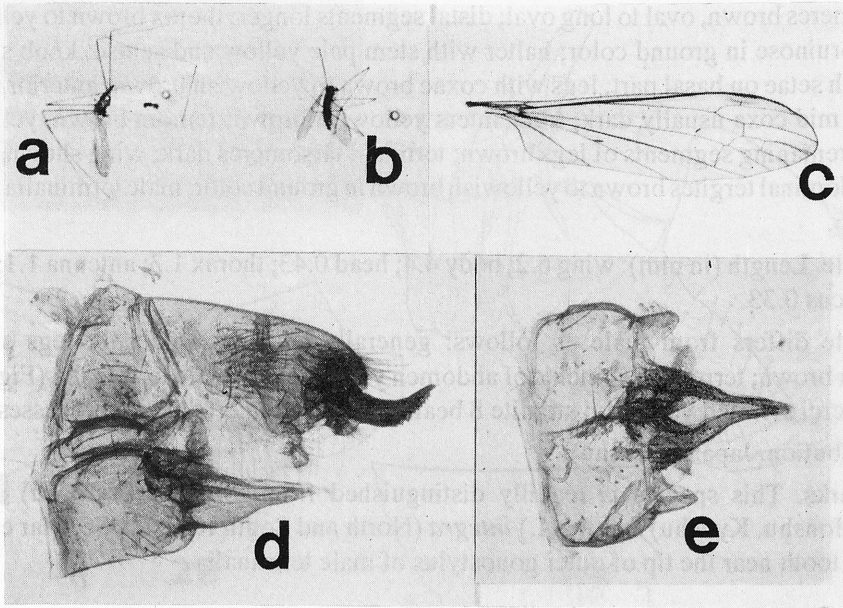


Fig. 25. *Antocha (Antocha) latistilus*: a, male; b, female; c, wing; d, female terminalia, left lateral; e, female sternite 8 and hypogynial valves, ventral.

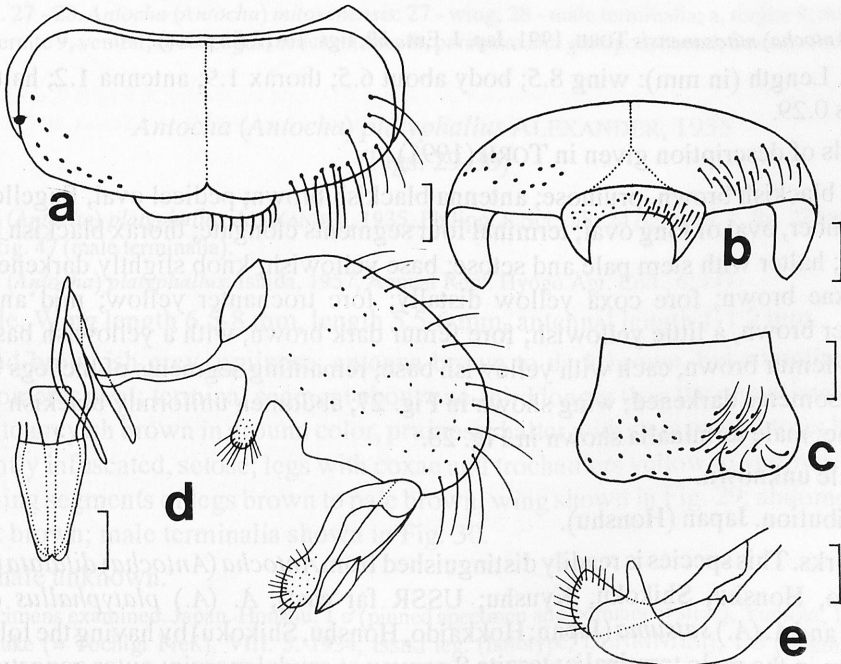


Fig. 26. Male terminalia of *Antocha (Antocha) latistilus*: a, tergite 9, dorsal; b, same, posterior; c, sternite 9, ventral; d, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; e, gonostyli, posterior; Scales, all 0.1 mm.

Details of description grey, pruinose; antenna with scape yellow; pedicel brown; flagellomeres brown, oval to long oval; distal segments longer; thorax brown to yellowish brown, pruinose in ground color; halter with stem pale yellow and setose; knob slightly dark, with setae on basal part; legs with coxae brown to yellowish brown; anterior side of fore and mid coxa usually dark; trochanters yellowish brown; femora brown, yellowish basally; remaining segments of legs brown; terminal tarsomeres dark; wing shown in Fig. 25-c; abdominal tergites brown to yellowish brown in ground color; male terminalia shown in Fig. 26.

Female. Length (in mm): wing 6.2; body 4.4; head 0.43; thorax 1.3; antenna 1.1; halter 0.70; cercus 0.33.

Female differs from male as follows: generally smaller, especially legs shorter; abdomen brown; terminal segments of abdomen yellowish. Female terminalia (Fig. 25-d, e) with cerci serrated ventrally; sternite 8 bearing a pair of latero-caudal processes.

Distribution. Japan (Honshu).

Remarks. This species is readily distinguished from *Antocha* (*Antocha*) *sagana* (Japan: Honshu, Kyushu) and *A. (A.) integra* (North and South Korea, USSR far east) by having a tooth near the tip of outer gonostylus of male terminalia.

*Antocha* (*Antocha*) *mitosanensis* TORII, 1991  
(Figs. 27-28)

*Antocha* (*Antocha*) *mitosanensis* TORII, 1991, Jap. J. Ent., **59**, figs. 10-13 (in press).

Male. Length (in mm): wing 8.5; body about 6.5; thorax 1.9; antenna 1.2; halter 1.0; aedeagus 0.29.

Details of description given in TORII (1991).

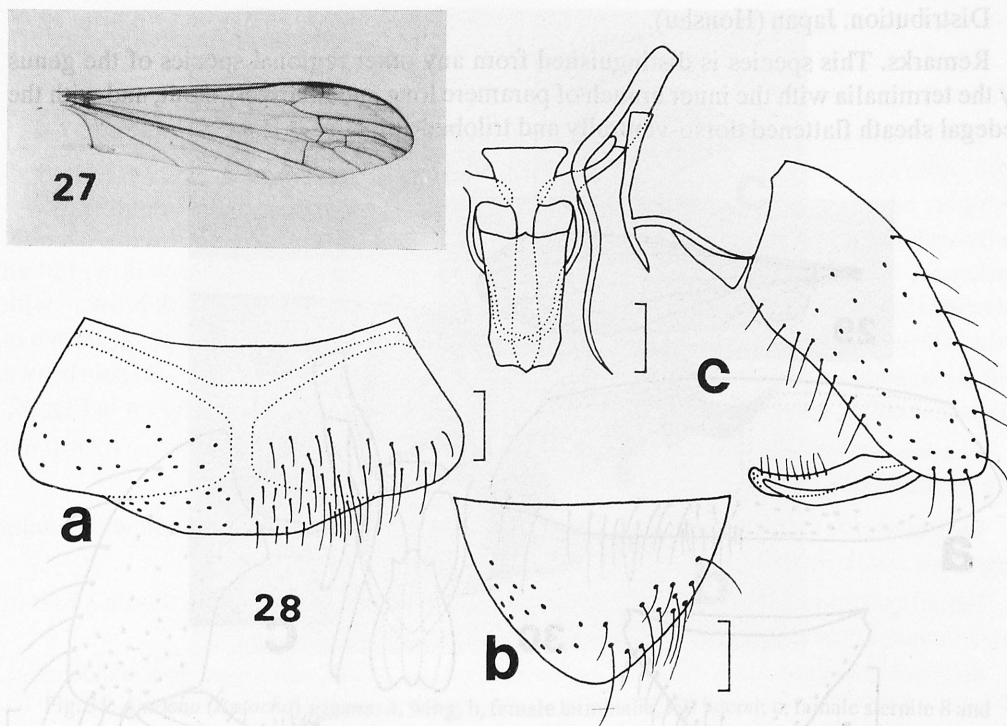
Head blackish brown, pruinose; antenna blackish brown; pedicel oval, flagellomeres 14 in number, oval or long oval; terminal four segments elongate; thorax blackish brown, pruinose; halter with stem pale and setose; base yellowish; knob slightly darkened; legs with coxae brown; fore coxa yellow distally; fore trochanter yellow; mid and hind trochanter brown, a little yellowish; fore femur dark brown, with a yellowish base; mid and hind femur brown, each with yellowish base; remaining segments of the legs brown; distal tarsomeres darkened; wing shown in Fig. 27; abdomen uniformly blackish brown, with setae; male terminalia shown in Fig. 28.

Female unknown.

Distribution. Japan (Honshu).

Remarks. This species is readily distinguished from *Antocha* (*Antocha*) *dilatata* (Japan: Hokkaido, Honshu, Shikoku, Kyushu; USSR far east), *A. (A.) platyphallus* (Japan: Honshu) and *A. (A.) satsuma* (Japan: Hokkaido, Honshu, Shikoku) by having the following characters in the male terminalia: tergite 9 convex at caudal margin; outer gonostylus not blackened; gonocoxal apodeme with a flange.





Figs. 27 - 28. *Antocha (Antocha) mitosanensis*: 27 - wing; 28 - male terminalia; a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm.

*Antocha (Antocha) platyphallus* ALEXANDER, 1935

(Figs. 29-30)

*Antocha (Antocha) platyphallus* ALEXANDER, 1935, Philipp. J. Sci., 58: 247-248, pl. 1, fig. 22 (wing); pl. 4, fig. 47 (male terminalia).

*Antocha (Antocha) platyphallus*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male. Wing length 6.5-8 mm, length 5.5-6 mm, antennal length 1-1.2 mm.

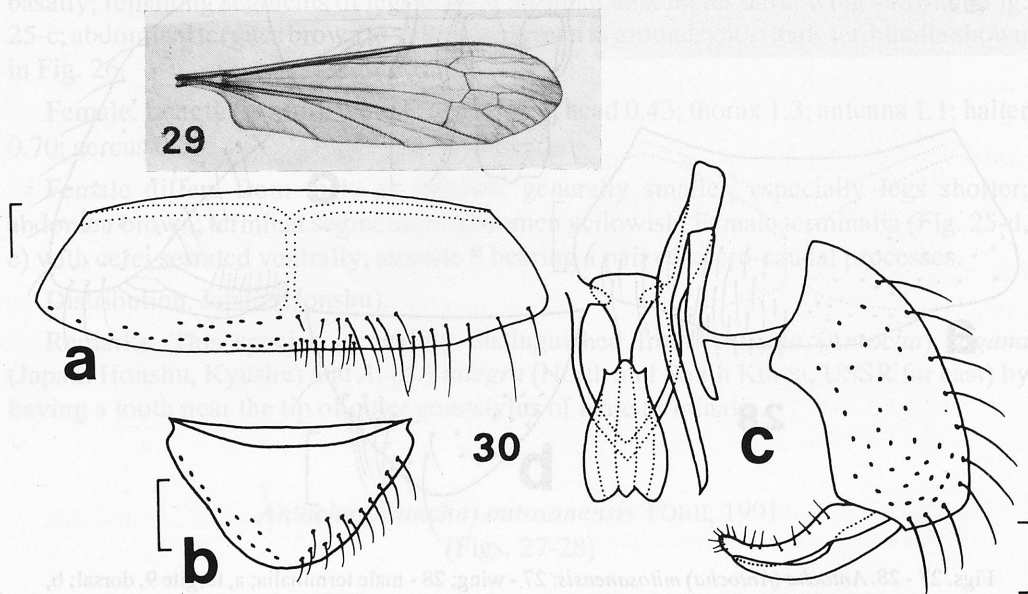
Head brownish grey, pruinose; antenna brown to dark brown, but sometimes paler; flagellomeres oval; terminal segment about one-third longer than the penultimate; thorax brown to greyish brown in ground color, pruinose; halter with stem pale, setose; knob pale or slightly infuscated, setose; legs with coxae and trochanters yellow to yellowish brown; remaining segments of legs brown to pale brown; wing shown in Fig. 29; abdomen brown to dark brown; male terminalia shown in Fig. 30.

Female unknown.

Specimens examined. Japan. Honshu: 1 ♂ (pinned specimen and permanent slide), Yumoto, 1500 m alt., Shimotsuke (= Tochigi Pref.), VIII. 5. 1934, ISSIKI leg. (holotype, DENMNHISI); 1 ♂ (in ethanol), Riv. Toyamasawa - Senjugahara, Nikkô-shi, Tochigi Pref., VI. 23. 1988, M. TADA leg. (emergence trap); 1 ♂ (in ethanol), same locality as above, VIII. 18. 1988, M. TADA leg. (emergence trap); 1 ♂, Mt. Mitôsan, ca 800 m alt., Hinohara-mura, Nishitama-gun, Tokyo Pref., V. 9. 1982, T. TORII leg.; 3 ♂♂ the same locality as above, V. 18. 1984, T. TORII leg.

Distribution. Japan (Honshu).

Remarks. This species is distinguished from any other regional species of the genus by the terminalia with the inner branch of paramere long and relatively stout, and with the aedeagal sheath flattened dorso-ventrally and trilobed apically.



Figs. 29 - 30. *Antocha (Antocha) platyphallus*: 29 - wing; 30 - male terminalia; a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm.

*Antocha (Antocha) ramulifera* SAVCHENKO, 1983.

*Antocha (Antocha) ramulifera* SAVCHENKO, 1983, The Limoniidae of the south Primorye region: 107-108, fig. 40 (wing, male & female terminalia).

This species resembles *Antocha (Antocha) dentifera* in male terminalia with outer gonostylus bearing a tooth at about its midlength (like in Fig. 19-c), and resembles *A. (A.) subconfluenta* in female terminalia with cerci bearing ventro-apical angles (like in Fig. 35-b). In male, this species is readily told from *A. (A.) dentifera* by having a larger tooth on outer gonostylus of male terminalia. In female, this species is distinguished from *A. (A.) subconfluenta* by wing with vein m-m complete.

Distribution. USSR far east (Primorskiy Kray).

*Antocha (Antocha) sagana* ALEXANDER, 1932  
(Figs. 31-32)

*Antocha sagana* ALEXANDER, 1932, Philipp. J. Sci., 49: 116, pl. 1, fig. 9 (wing); pl. 2, fig. 35 (male terminalia).

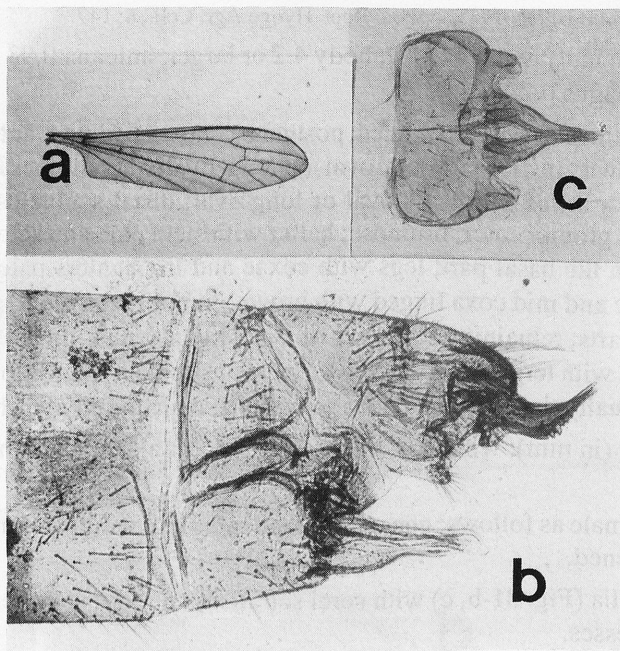


Fig. 31. *Antocha (Antocha) sagana*: a, wing; b, female terminalia, left lateral; c, female sternite 8 and hypogynial valves, ventral.

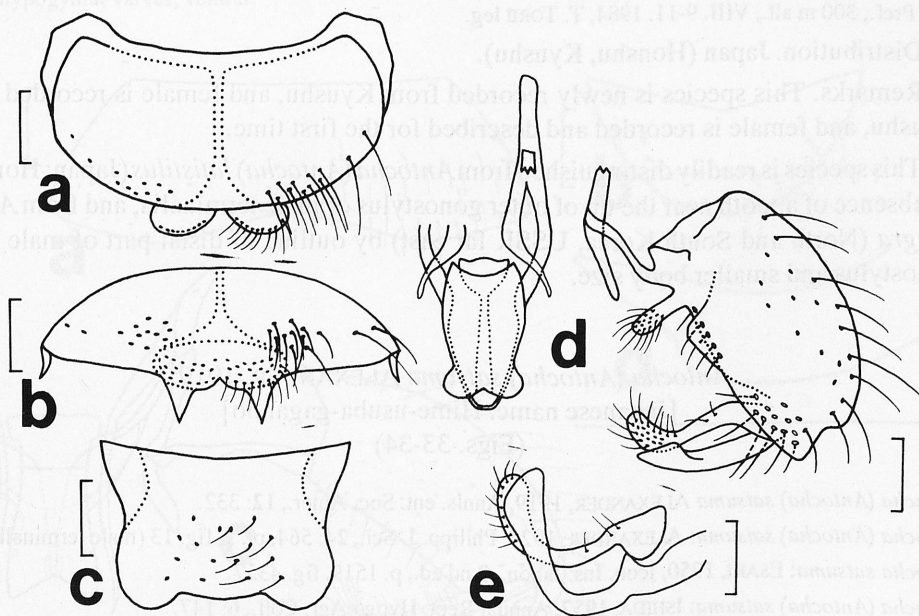


Fig. 32. Male terminalia of *Antocha (Antocha) sagana*: a, tergite 9, dorsal; b, same, posterior; c, sternite 9, ventral; d, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; e, gonostyli, posterior; Scales, all 0.1 mm.



*Antocha (Antocha) sagana*: Ishida, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male. Length (in mm): wing 4.3-5.7; body 4.2 or larger; antenna 0.93 or larger; halter 0.58 or larger; aedeagus 0.22 or larger.

Head brown, pruinose; vertex darkened; postgena yellowish brown; antenna with scape pale yellowish brown; pedicel brown, oval or long oval; flagellomeres brown, 14 in number; basal six or seven segments oval or long oval; distal segments longer; thorax yellowish brown in ground color, pruinose; halter with stem pale and setose; knob a little darkened, setose on the basal part; legs with coxae and trochanters pale yellow; but an anterior side of fore and mid coxa tinged with brown; femora brown to dark brown, with pale yellow basal parts; remaining segments of legs brown to dark brown; wing shown in Fig. 31-a; abdomen with tergites pale yellow to brown; sternites pale yellow to pale brown in ground color, usually darkened on caudal segments; male terminalia shown in Fig. 32.

Female. Length (in mm): wing 4.0-4.8; body 3.9-5.2; antenna 0.90; halter 0.58-0.63; cercus 0.25-0.28.

Different from male as follows: general coloration of legs paler; abdomen with caudal segments not darkened.

Female terminalia (Fig. 31-b, c) with cerci serrated ventrally; sternite 8 with a pair of latero-caudal processes.

Specimens examined. Japan. Honshu: 1 ♂ (once in ethanol, now dried, and with permanent slide), Saga, 150 m alt., Kyoto Pref., IV. 15. 1928, M. TOKUNAGA leg. (holotype, DENMNIISI); 10 ♂♂, 4 ♀♀, Takao-chô, Umegahata, Ukyô-ku, Kyoto-shi, Kyoto Pref., 100 m alt., VIII. 13-15. 1984, T. TORII leg.

Kyushu (new locality): 6 ♂♂, 4 ♀♀ (1 ♀ taken at light), Higashishiyantaki Falls, Ajimu-machi, Usa-gun, Ôita Pref., 300 m alt., VIII. 9-11. 1984, T. TORII leg.

Distribution. Japan (Honshu, Kyushu).

Remarks. This species is newly recorded from Kyushu, and female is recorded from Kyushu, and female is recorded and described for the first time.

This species is readily distinguished from *Antocha (Antocha) latistilus* (Japan: Honshu) by absence of a tooth near the tip of outer gonostylus of male terminalia, and from *A. (A.) integra* (North and South Korea, USSR far east) by outline of distal part of male outer gonostylus and smaller body size.

*Antocha (Antocha) satsuma* ALEXANDER, 1919.

[Japanese name: Hime-usuba-gaganbo]

(Figs. 33-34)

*Antocha (Antocha) satsuma* ALEXANDER, 1919, Annls. ent. Soc. Amer., 12: 332.

*Antocha (Antocha) satsuma*: ALEXANDER, 1924, Philipp. J. Sci., 24: 564, pl. 2, fig. 13 (male terminalia).

*Antocha satsuma*: ESAKI, 1950, Icon. Ins. Japon., 2 nd ed., p. 1519, fig. 4357.

*Antocha (Antocha) satsuma*: ISHIDA, 1957, Annual Rept. Hyogo Agr. Coll., 6: 147.

Male. Wing length 7.3-7.6 mm, body length 5.3-5.5 mm. Head rusty brown; antenna brown, with basal flagellomeres a little paler; thorax grey in ground color; halter pale yellow; legs with coxae pale; trochanters dull yellow; femora pale brown, more yellowish

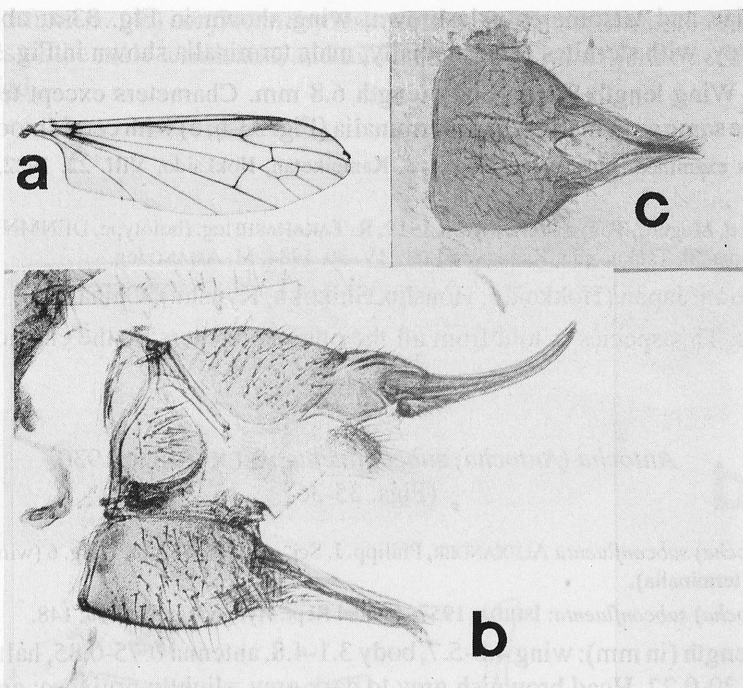


Fig. 33. *Antocha (Antocha) satsuma*: a, wing; b, female terminalia, left lateral; c, female sternite 8 and hypogynial valves, ventral.

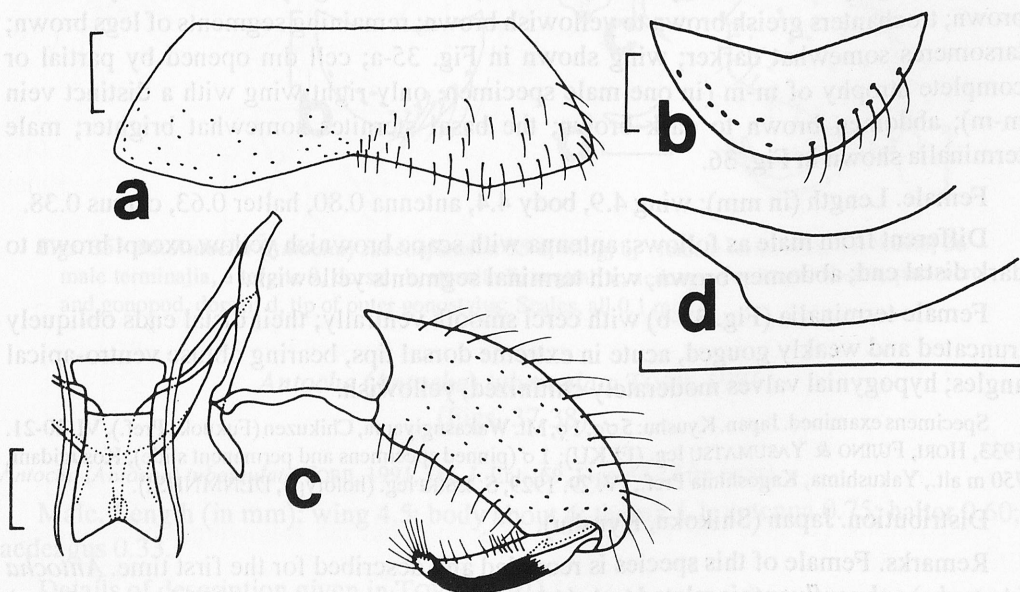


Fig. 34. Male terminalia of *Antocha (Antocha) satsuma*: a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm.

basally; tibiae and tarsomeres pale brown; wing shown in Fig. 33-a; abdomen dark brownish grey, with sternites paler medially; male terminalia shown in Fig. 34.

Female. Wing length 8 mm, body length 6.8 mm. Characters except terminalia are generally the same as in male; female terminalia (Fig. 33-b, c) with cerci smooth ventrally.

Specimens examined. Japan. Hokkaido: 1 ♂, Kamuikotan, Hokkaido, VIII. 22. 1922, T. ESAKI leg. (ELKU).

Honshu: 1 ♂, Meguro, Tokyo Pref., IV. 21. 1919, R. TAKAHASHI leg. (holotype, DENMNHISI); 3 ♂♂, 1 ♀, Aone, Tsukui-machi, Tsukui-gun, Kanagawa Pref., IV. 30. 1984, M. AMANO leg.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (?).

Remarks. This species is told from all the other congeners by the characters of male terminalia.

*Antocha (Antocha) subconfluenta* ALEXANDER, 1930.  
(Figs. 35-36)

*Antocha (Antocha) subconfluenta* ALEXANDER, Philipp. J. Sci., 42: 516-517, pl. 1, fig. 6 (wing); pl. 2, fig. 25 (male terminalia).

*Antocha (Antocha) subconfluenta*: ISHIDA, 1957, Annual Rept. Iiyogo Agr. Coll., 6: 148.

Male. Length (in mm): wing 4.0-5.7, body 3.1-4.8, antenna 0.75-0.85, halter 0.53-0.80, aedeagus 0.20-0.22. Head brownish grey to dark grey, slightly pruinose; antenna brown to dark brown throughout; flagellomeres 14 in number, oval to long oval; distal segments longer; thorax brown to dark grey in most area, slightly pruinose; halter with stem pale and setose, yellowish basally; the knob infuscated, with setae on the basal part; legs with coxae dark greyish brown to yellowish brown; trochantrals greyish brown to yellowish brown; trochanters greyish brown to yellowish brown; remaining segments of legs brown; tarsomeres somewhat darker; wing shown in Fig. 35-a; cell dm opened by partial or complete atrophy of m-m (in one male specimen, only right wing with a distinct vein m-m); abdomen brown to dark brown; the basal sternites somewhat brighter; male terminalia shown in Fig. 36.

Female. Length (in mm): wing 4.9, body 4.4, antenna 0.80, halter 0.63, cercus 0.38.

Different from male as follows: antenna with scape brownish yellow except brown to dark distal end; abdomen brown, with terminal segments yellowish.

Female terminalia (Fig. 35-b) with cerci smooth ventrally; their distal ends obliquely truncated and weakly gouged, acute in extreme dorsal tips, bearing obtuse ventro-apical angles; hypogynial valves moderately chitinized, yellowish.

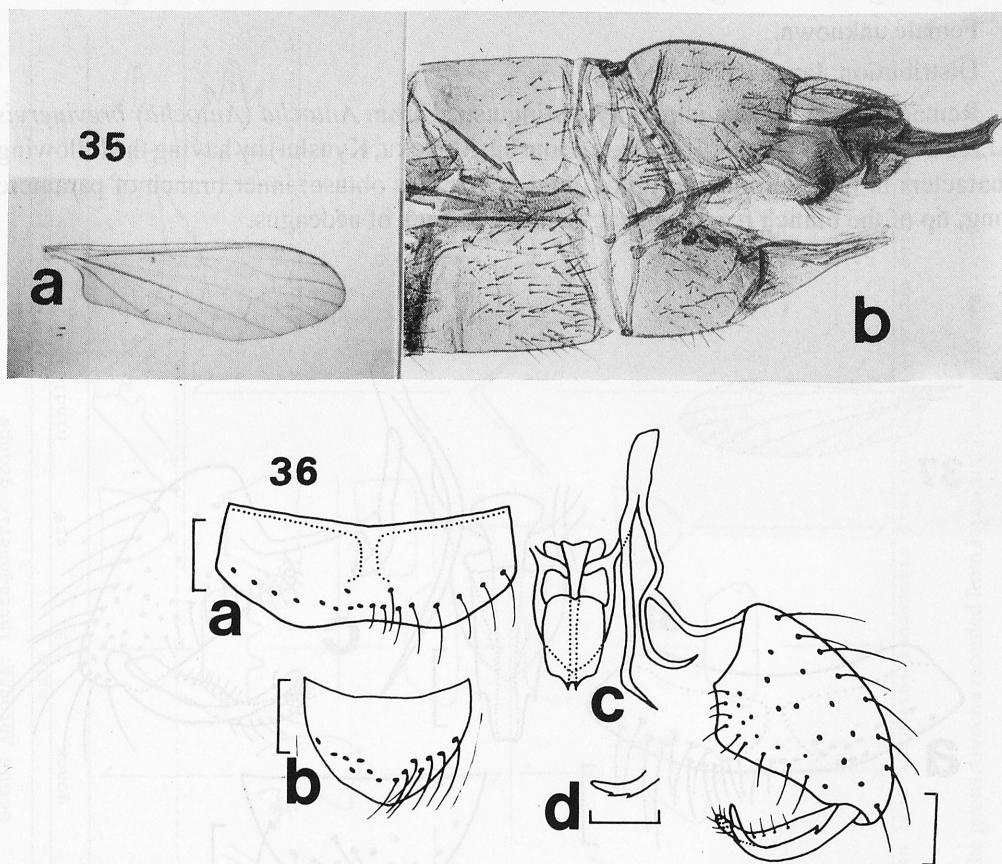
Specimens examined. Japan. Kyushu: 5 ♂♂, 1 ♀, Mt. Wakasugiyama, Chikuzen (Fukuoka Pref.), VI. 20-21. 1933, HORI, FUJINO & YASUMATSU leg. (ELKU); 1 ♂ (pinned specimens and permanent slide), Kosugidani, 750 m alt., Yakushima, Kagoshima Pref., IV. 29. 1929, S. ISSIKI leg. (holotype, DENMNHISI).

Distribution. Japan (Shikoku, Kyushu).

Remarks. Female of this species is recorded and described for the first time. *Antocha (Antocha) subconfluenta* is related to *A. (A.) confluenta* ALEXANDER, 1926 (eastern China) whose wing vein m-m is also atrophied, and related to *A. (A.) ramulifera* SAVCHENKO, 1983 (USSR far east) also having female cerci with ventro-apical angles. *A. (A.) subcon-*



*fluenta* is told from *A. (A.) confluenta* by less prominent wing anal angle, venation and in the structures of the male terminalia, and told from *A. (A.) ramulifera* by wing with vein m-m atrophied.



Figs. 35 - 36. *Antocha (Antocha) subconfluenta*: 35 a, wing, b, female terminalia, left lateral; 36 - male terminalia, a tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; d, tip of outer gonostylus; Scales, all 0.1 mm.

*Antocha (Antocha) tuberculata* TORII, 1991  
(Figs. 37-38)

*Antocha (Antocha) tuberculata* TORII, 1991, Jap. J. Ent., **59**, Figs. 14-17 (in press).

Male. Length (in mm): wing 4.5; body about 4; thorax 1.1; antenna 0.75; halter 0.60; aedeagus 0.33.

Details of description given in TORII (1991).

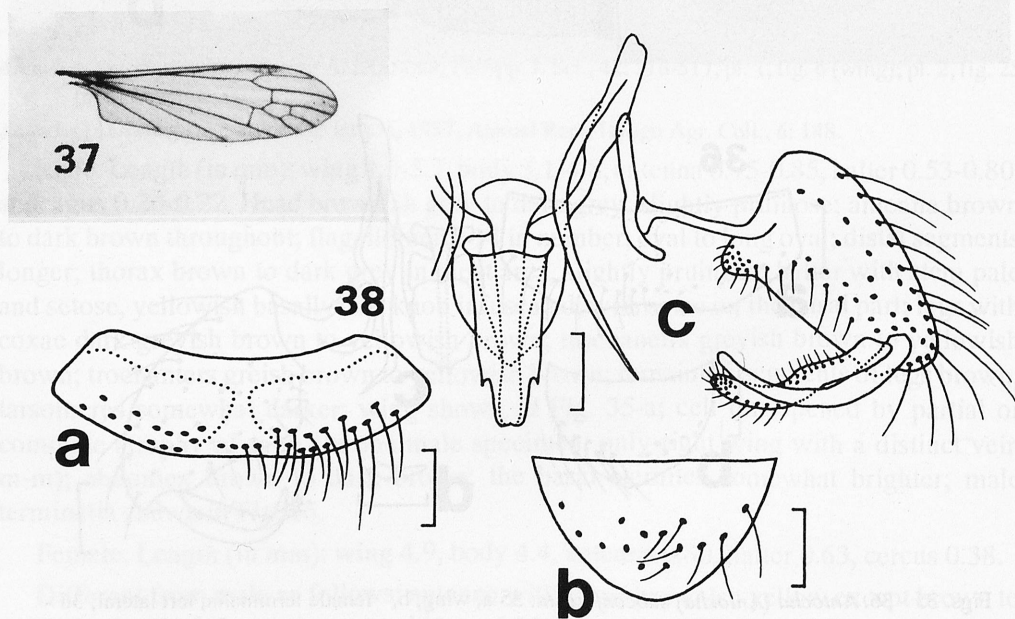
Head greyish brown, pruinose; antenna with scape brown; pedicel brown; oval; flagellomeres brown, 14 in number; each flagellomere oval or long oval; terminal

segments slightly elongate; thorax greyish brown or brown, pruinose in ground color; halter with stem pale yellowish brown and setose; knob darkened; legs lost except right foreleg; foreleg with coxa pale brown, and yellowish distally; trochanter pale yellowish brown; femur brown, except basal part pale yellowish brown; remaining segments of legs brown; wing shown in Fig. 37; abdomen brown; male terminalia shown in Fig. 38.

Female unknown.

Distribution. Japan (Shikoku).

Remarks. This species is readily distinguished from *Antocha* (*Antocha*) *brevinervis* ALEXANDER, 1924 (Japan: Hokkaido, Honshu, Shikoku, Kyushu) by having the following characters in male terminalia: tip of outer gonostylus obtuse; inner branch of paramere long; tip of the branch reaching near the level of apex of aedeagus.



Figs. 37 - 38. *Antocha* (*Antocha*) *tuberculata*: 37 - wing; 38 - male terminalia; a, tergite 9, dorsal; b, sternite 9, ventral; c, aedeagus, aedeagal sheath, paramere and gonopod, dorsal; Scales, all 0.1 mm.

#### Intrageneneric groups (Fig. 39)

ALEXANDER (1924b) and ISHIDA (1957) pointed out the following morphological differences between the two subgenera: [male] the subgenus *Proantocha* has opposable tubercles at tip of hind femur and base of hind tibia, but the subgenus *Antocha* does not have them; [female] ventral margin of cercus serrated in the subgenus *Proantocha*, but smooth in the subgenus *Antocha*.

Genus *Antocha*: intrageneric groups

	male		female	
	goncx	st9	hindleg	st8
<i>A. (P.) spinifer</i> <i>A. (P.) luyei</i>				
<i>A. (A.) latistylus</i> <i>A. (A.) sagana</i>				
<i>A. (A.) integra</i> (*)				
<i>A. (A.) brevistyla</i> (*)				
<i>A. (A.) tuberculata</i> (*) <i>A. (A.) brevinervis</i>				
<i>A. (A.) bifida</i>				
<i>A. (A.) subconfluenta</i> <i>A. (A.) ramulifera</i>				
<i>A. (A.) bidigitata</i> <i>A. (A.) gracillima</i> <i>A. (A.) satsuma</i>				
<i>A. (A.) dentifera</i> <i>A. (A.) dilatata</i>				
<i>A. (A.) platyphallus</i> (*) <i>A. (A.) mitosanensis</i> (*)				

(\*) female unknown broken line indicates subgeneric division with previous definition

Fig. 39. Key characters and character states of the genus *Antocha* recorded from Japan and its adjacent area.



However, I described *Antocha (Antocha) latistilus* TORII, 1991 which has serrated cerci in the female, but has no opposable tubercles on the hindleg in the male. And in the present paper, I described female of *A. (A.) sagana* for the first time, which has serrated cerci but conspecific male has no opposable tubercles on the hindleg. Therefore, the subgeneric definition by ALEXANDER (1924b) and ISHIDA (1957) seems not to be applied to some species. In the present paper, key to subgenera based on the subgeneric definition in TORII is given.

Following characters are studied for intra-generic grouping, and if it is possible, each character state is assumed to be apomorphic (apo.) or plesiomorphic (ple.) mainly based on outgroup comparison and method in Munroe (1974).

Male: tip of outer gonostylus ----- paddle-like (apo.) or rod-like (ple.); setiferous lobe at basal-mesal part of gonocoxite ----- present (apo.) or absent (ple.); a pair of processes at medio-caudal margin of tergite 9 ----- present (apo.) or absent (ple.); caudal half of sternite 9 ----- trilobed (apo.), round (ple.) or squarish; hindleg ----- long and very stout (apo.) or normal (ple.); dense spinules or short spinous setae of hindleg ----- developed (apo.) or absent (ple.); opposable pointed tubercles at tip of femur and base of tibia of hindleg ----- present (apo.) or absent (ple.).

Female: ventral margin of cercus ----- serrated (apo.) or smooth (ple.); ventro-apical angle of cercus ----- present (apo.) or absent (ple.); latero-caudal processes of sternite 8 ----- present (apo.) or absent (ple.).

By the above characters, the 18 species of the genus *Antocha* discussed here are classified into 7 intra-generic groups (Fig. 39).

Subgenus *Proantocha* is monophyletic, but subgenus *Antocha* is undoubtedly paraphyletic because of no synapomorphy, and should be divided into several monophyletic groups when more species are studied for a cladistical analysis of genus *Antocha*. In the present paper, subgenus *Antocha* as a paraphyletic group is temporarily accepted.

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