

New species and new records of the subgenus *Amiota* s. str. Loew (Diptera: Drosophilidae) from North America, East Asia and Oceania

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Résumé – Description et distribution géographique des espèces du sous-genre *Amiota* (Diptera: Drosophilidae) d'Amérique du Nord, de l'Asie de l'Est et de l'Océanie. – Vingt espèces dont cinq nouvelles été analysées et décrites: *A. leucostoma* Loew, *A. minor* (Malloch), *A. subtusradiata quadrata* Takada & Toda et *A. communis* Steyskal n. sp. d'Amérique; *A. aquilotaurusata* Takada *et al.*, *A. delta* Takada *et al.*, *A. dentata* Okada, *A. elongata* Okada, *A. flagellata* Okada, *A. kamui* Chen & Toda, *A. palpifera* Okada, *A. spinata* Chen & Toda, *A. subfurcata* Okada, *A. angulisternita* Chen & Liu, n. sp. et *A. kitamurai* Chen & Liu, n. sp. de Chine; *A. bifurcata* Chen; n. sp. et *A. vulnerabla* Chen & Zhang, n. sp. du Hokkaido et du Kyushu, au Japon et *A. sinuata* Okada, *A. kimurai* Chen & Toda et *A. nagatai* Okada de Papouasie Nouvelle Guinée.

Abstract – Fifteen known and five new species of the subgenus *Amiota* (s. str.) from North America, East Asia and Oceania were surveyed and described: *A. leucostoma* Loew, *A. minor* (Malloch), *A. subtusradiata quadrata* Takada & Toda and *A. communis* Chen & Steyskal, n. sp. from North America; *A. aquilotaurusata* Takada *et al.*, *A. delta* Takada *et al.*, *A. dentata* Okada, *A. elongata* Okada, *A. flagellata* Okada, *A. kamui* Chen & Toda, *A. palpifera* Okada, *A. spinata* Chen & Toda, *A. subfurcata* Okada, *A. angulisternita* Chen & Liu, n. sp. and *A. kitamura* Chen & Liu, n. sp. from Liaoning and Taiwan, China; *bifurcata* Chen, n. sp. and *A. vulnerabla* Chen & Zhang, n. sp. each from Hokkaido and Kyushu, Japan, *A. sinuata* Okada, *A. kimurai* Chen & Toda and *A. nagatai* Okada from Papua New Guinea.

The genus *Amiota* Loew, 1862 was regarded as a subgenus by Wheeler (1952). Up to the present, a total of 6 subgenera are put in the genus *Amiota*, i. e. *Amiota*; *Apsiphortica* Okada, 1971; *Erima* Kertész, 1899; *Paraphortica* Duda, 1934; *Phortica* Schiner, 1862; *Sinophthalmus* Coquillett, 1904. Chen & Toda (2001) revised the Asian and European species and established 7 species-groups based on phylogenetic analysis in the subgenus *Amiota*. The flies of subgenus *Amiota* widely distribute in the World except the Neotropical Region, mostly from East Asia (Chen & Toda 2001). Although North America has a longer study history of this subgenus since Loew (1862), only 14 species were described so far (Wheeler 1952, 1981), and the phylogenetic relationships and structure of male terminalia

of most members are unknown. Four species of the subgenus *Amiota* from northern America are very similar to some eastern Asian species, which shows that northern American species maybe come from eastern Asia in the original radiation. In Liaoning Province, Northeast China, 2 new species and 9 new records of *Amiota* (s. str.) are closely related to the species fauna of neighboring regions, e. g. Jilin Province of China, Far East of Russia and Hokkaido of Japan (Toda *et al.* 1996; Chen & Toda 2001). In the Australian Region, 3 new records of *Amiota* (s. str.) show faunal characteristics common to the Australian and Oriental Regions.

The examined specimens are deposited in the following institutions: National Science Museum, Tokyo, Japan (NSMT); Department of Entomology, South China Agriculture University, China (SCAU); Systematic Entomology, The Hokkaido University Museum, Hokkaido University, Sapporo, Japan (SEHU).

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Subgenus *Amiota* (s. str.) Loew

Amiota Loew, 1862: 229. Type-species: *Amiota leucostoma* Loew, 1862.
Amiota (s. str.): Wheeler 1952: 166; Okada 1960: 89, 1968: 303, 1971: 82;
 Máca 1980: 328; Máca & Lin 1993: 1; Chen & Toda 2001: 1517.

Diagnosis – Face, postpronotal lobe and wing base each with distinctly milky white spot; clypeus dark brown to black; aedeagal apodeme broad, dorso-ventrally flattened; a few anterior sensilla of medial cibarial short, somewhat peg-like (Chen & Toda 2001).

Description – Eyes dark reddish brown. Ocellar triangle dark brown to black. Frontal vitta brownish orange to dark brown, slightly pollinose, with a few minute, interfrontal setulae. Anterior reclinate orbital slightly shorter than other orbitals. Pedicel and first flagellomere almost grayish yellow; arista plumose, without terminal fork. Face brown. Palpus larger in female than in male, grayish yellow, with several stout setae on lateral margin. Vibrissa prominent; other orals small. Gena and postgena brown to brownish black. Occiput glossy black.

Thorax slightly glossy, usually dark brown to black, except for a small number of species with yellow thorax. Postpronotal seta 1. Acrostichal setulae in ca. 12 irregular rows. Prescutellar setae present (absent only in *sinuata* species-group). Scutellum unicolourous. Basal scutellar setae divergent; apical ones cruciate.

Wing hyaline. Veins grayish yellow; crossveins clear. Basal medial-cubital crossvein present. Ventral surface of costal vein between R_{2+3} and R_{4+5} usually with more than 18 minute, peg-like spinules; such spinules more distinct and bigger in *apodemata*, *sinuate* and *nagatai* species-groups (spinules ca. 14–15) than in other groups. C_1 setae two, less differentiated. R_{2+3} slightly curved to costa at tip; R_{4+5} and M_1 converged distally. Halteres white.

Legs usually yellow, exceptionally dark brown in a few species. Apical seta present on mid tibia; preapical dorsal setae present on all tibiae. Fore femur with 2 or 3 irregular, posterior rows of setae. Mid tarsus with 1–2 (usually 1) row(s) of minute cuneiform setulae ventrally; hind tarsus with 1 row of such setulae. Fore and hind first tarsomeres each usually slightly shorter than remaining tarsomeres combined; mid first tarsomere as long as remainings combined; second tarsomere usually about twice as long as width.

Abdominal tergites glossy, usually brown to brownish black; first and second medially paler. Sternites pale grayish yellow; first small, lacking pubescence; second to sixth (?) or seventh (?) pubescent and setigerous.

Male terminalia. Epandrium with a number of setae near posterior to ventral margins; apodeme less-developed. Surstylus with a row of prensisetae on distal margin and several setae apically. Tenth sternite laterally fused to surstylus and with 1 pair of lobe-like processes, contiguous dorsally to cercus and ventrally to gonopod. Cercus separated from epandrium, entirely pubescent and setigerous. Membrane between epandrium and cercus pubescent. Hypandrium usually narrow and arcuate. Gonopods almost fused to each other, forming postero-medial plate, anteriorly forming vertical process, postero-laterally contiguous to posterior ends of hypandrium and antero-ventral corners of epandrium. Parameres usually basally contiguous to arms of aede-

gal apodeme. Aedeagus usually sclerotized and distinguishable from other structures; outer membrane less-developed; apodeme with 1 pair of arms.

Female terminalia. Seventh tergite usually separated mid-dorsally into lateral lobes. Eighth sternite (oviscapt) not bilobed. Pregenital lamella present posteriorly to eighth sternite, usually sclerotized, partly bilobed. Spermatheca dark brown, usually with numerous, minute, apically round, mold-like processes over outer surface; duct not introverted into capsule.

The above characters commonly seen in all species examined are not referred to in description of each species.

1. The *sinuata* species-group

(Chen & Toda 1998: 409, 2001: 1527)

Diagnosis – Prescutellar setae absent; hypandrium anteriorly connected with ventromedian part of paramere by articulating plate; parameres fused to each other basomedially; aedeagal apodeme slightly curved.

Included species: *bicolorata* Bock, 1989; *hernowoi* Chen & Toda, 1998; *javaensis* Chen & Toda, 1998; *pengi* Chen & Toda, 1998; *pontianakensis* Chen & Toda, 1998; *ratnae* Chen & Toda, 1998; *sinuata* Okada, 1968.

– *Amiota (Amiota) sinuata* Okada, 1968: 305; Chen & Toda 2001: 1528. Material examined: Papua New Guinea: Wau, 2 ♂♂, 1 ♀, 29.VIII, 10.IX, 15.IX.1977; Lae, 11 ♂♂, 27–29.IX.1977 (*T. Okada*) (NSMT).

Distribution – China (Guangdong, Hainan), Japan (Yakushima, Ryukyu Is.), Papua New Guinea (Lae, Wau).

2. The *nagatai* species-group

(Chen & Toda 2001: 1529)

Diagnosis – Costal vein with 14–15 distinct, peg-like spinules on ventral surface between R_{2+3} and R_{4+5} ; aedeagus separated into a pair of unbifurcated processes shorter than paramere.

Included species: *nagatai* Okada, 1971; *okinawana* Okada, 1971; *kimurai* Chen & Toda, 2001.

– *Amiota (Amiota) kimurai* Chen & Toda, 2001: 1529. Material examined: Papua New Guinea: Wau: 1 ♂, 8.IX.1977, 1 ♂, 7.X.1977 (*T. Okada*) (NSMT).

Distribution – Japan (Ryukyu Is.), Papua New Guinea (Wau).

– *Amiota (Amiota) okinawana* Okada, 1971: 86; Toda & Peng 1992: 202; Máca & Lin 1993: 2; Chen & Toda 2001: 1529. Material examined: Papua New Guinea: 1 ♂, Wau, 23.VIII.1977, around human eyes (*T. Okada*) (NSMT).

Distribution – China (Taiwan, Guangdong), Japan (Ryukyu Is.), Papua New Guinea (Wau).

3. The *basdeni* species-group

(Chen & Toda 2001: 1531)

Diagnosis – Surstylus with one to five aristate processes separated from or fused to each other on mesal surface; vertical lobe of gonopod with two sclerotized, basally fused M-shaped processes.

Included species: *basdeni* Fonseca, 1965; *clavata* Okada, 1971; *curvistyla* Okada, 1971; *elongata* Okada, 1971; *flagellata* Okada, 1971; *palpifera* Okada, 1971; *aristata* Chen & Toda, 2001; *macai* Chen & Toda, 2001; *angulisternita* Chen & Liu, n. sp.; *kitamurai* Chen & Liu, n. sp.

– *Amiota (Amiota) elongata* Okada, 1971: 86 [*Amiota (Amiota) alboguttata*, forma *elongata* Okada, 1960: 95]; Chen & Toda 2001: 1532. Material examined: China: 121 ♂♂, Guanmenshan, 27-29.VII.2002, ex. tree trunks and around human eyes (*N. Kitamura, G.-C. Liu, H.-W. Chen*).

Distribution – Russia (Amur Region, Khabarovsk Region, Ussuri Region), China (Jilin, Liaoning), Korea, Japan (Hokkaido, Honshu).

– *Amiota (Amiota) flagellata* Okada, 1971: 88; Chen & Toda 2001: 1533. Material examined: China: 8 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex. tree trunks and around human eyes (*N. Kitamura, G.-C. Liu*).

Distribution – China (Jilin, Liaoning), Korea, Japan (Hokkaido, Honshu).

– *Amiota (Amiota) palpifera* Okada, 1971: 89; Chen & Toda 2001: 1533. Material examined: China: 6 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex. tree trunks and around human eyes (*G.-C. Liu, H.-W. Chen*).

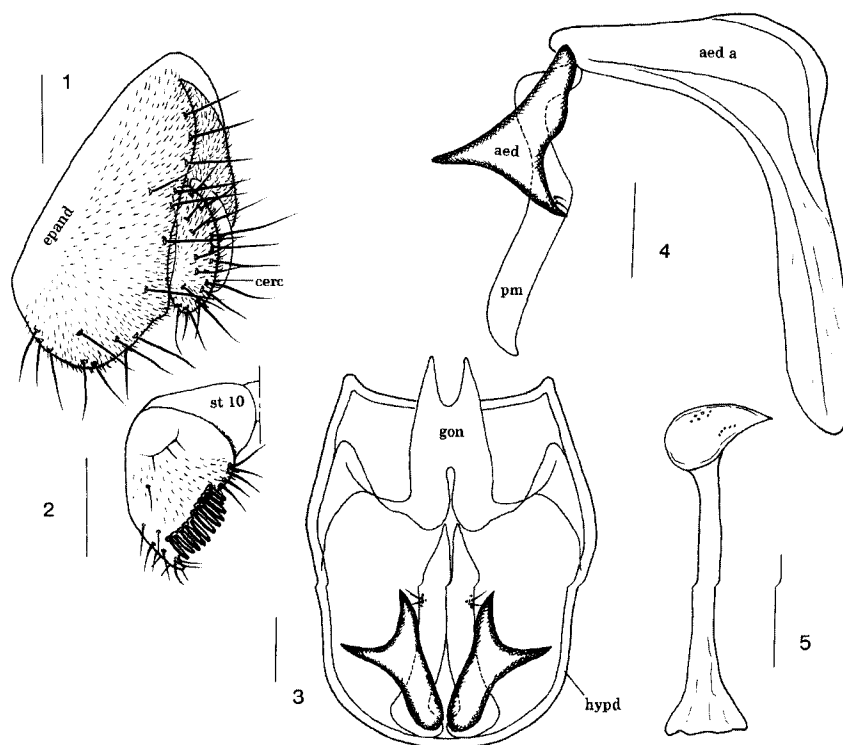
Distribution – Russia (Amur Region, Khabarovsk Region, Ussuri Region), China (Jilin, Liaoning), Japan (Honshu).

Amiota (Amiota) angulisternita

Chen & Liu, n. sp.

(figs. 1-5)

Type material – **Holotype** ♂, CHINA: Guanmenshan, Liaoning, 27-29.VII.2002, 520 m, around human eyes (*G.-C. Liu*) (SCAU). – **Paratypes**: CHINA: 17 ♂♂, same data as the holotype (*N. Kitamura, G.-C. Liu,*



Figures 1-5

& Liu

Amiota (Amiota) angulisternita Chen, n. sp. ♂. – 1, epandrium (epand) and cercus (cerc) (lateral view). – 2, surstylus (sur) and tenth sternite (st 10) (ventral view). – 3, paramere (pm), aedeagus (aed), hypandrium (hypd) and gonopod (gon) (ventral view). – 4, paramere, aedeagus and aedeagal apodeme (aed a) (lateral view). – 5, ejaculatory apodeme (scale-line = 0.1 mm).

H.-W. Chen) (SCAU, SEHU); 1 ♂, Rhoshan, Taiwan, 24.VIII.1974 (*N. Watanabe*) (NSMT).

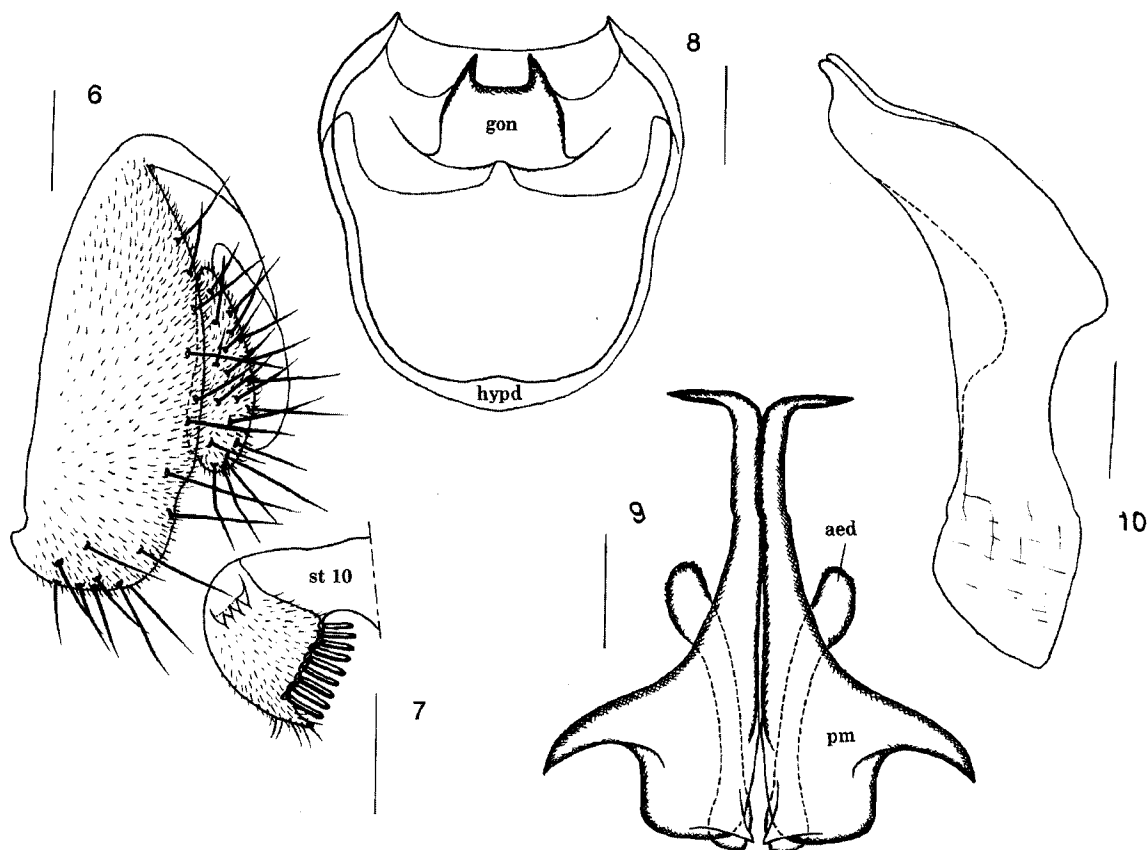
Diagnosis – Paramere unsclerotized, lacking pubescent; aedeagus strongly sclerotized, distally with 2 pointed processes; vertical lobe of gonopod with 2 unsclerotized basally fused M-shaped processes.

Description – *Male terminalia*. Epandrium constricted heavily (about 1/2 width of mid-dorsal), with ca. 20 setae near posterior to ventral margins. Surstylus medially pubescent, basally with 2-3 aristate processes fused to each other and forming palm-like lobe on outer surface, finger-like process at postero-ventral corner, ca. 9 long prenisetae on distal margin, and a few stout, spine-like setae on inner margin. Paramere articulated with aedeagus at base, submedially with 4-5 sensilla. Aedeagus separated into 2 triangular-like, strongly sclerotized processes; outer membrane high and erected basally. Aedeagal apodeme broad and large. Ejaculatory apodeme: apical plate with ca. 5-6 pits on each lateral margin; stalk thick, extremely long.

Measurements. BL (body length) = 3.00 mm in the holotype (range in 5 ♂ paratypes: 2.87-3.14); ThL (thorax length)

= 1.20 mm (1.10-1.30); WL (wing length) = 2.60 mm (2.50-2.60); WW (wing width) = 1.00 mm (1.10).

Indices. arb (dorsal branches/ventral branches of arista) = 4-5/4 (4-5/3-4), avd (longest ventral branch/longest dorsal branch of arista in length) = 0.90 (0.85-0.95), adf (longest dorsal branch of arista/width of first flagellomere) = 1.20, flw (length/width of first flagellomere) = 1.30 (1.20-1.30), FW/HW (frontal width/head width) = 0.30 (0.30), ch/o (maximum width of gena/maximum diameter of eye) = 0.07 (0.06-0.07), prorb (proclinate orbital/posterior reclinate orbital in length) = 1.00 (1.00), rcorb (anterior reclinate orbital/posterior reclinate orbital in length) = 0.80 (0.75-0.85), vb (subvibrissal/vibrissa in length) = 0.40 (0.35-0.40), dcl (anterior dorsocentral/posterior dorsocentral in length) = 0.55 (0.55-0.60), presctl (prescutellar/posterior dorsocentral in length) = 0.65 (0.60-0.70), sctl (basal scutellar/apical scutellar in length) = 1.10 (1.00-1.10), sterno (anterior katapisternal/posterior katapisternal in length) = 0.85 (0.80-0.90), orbito (distance between proclinate and posterior reclinate orbitals/distance between inner vertical and posterior reclinate orbital) = 1.60 (1.50-1.70), dcp (length distance between ipsilateral dorsocentrals/cross distance between anterior dorsocentrals) = 0.25 (0.25), sctlp (distance between ipsilateral scutel-



Figures 6-10 ♂ *Liu*
Amiota (Amiota) kitamurae Chen, n. sp. ♂. – 6, epandrium and cercus (lateral view). – 7, surstylus and tenth sternite (ventral view). – 8, hypandrium and gonopod (ventral view). – 9, paramere and aedeagus (lateral view). – 10, aedeagal apodeme (lateral view) (scale-line = 0.1 mm).

lars/cross distance between apical scutellars) = 1.10 (1.10-1.20), C (2nd costal section between subcostal break and R_{2+3} /3rd costal section between R_{2+3} and R_{4+5}) = 1.57 (1.45-1.64), 4c (3rd costal section between R_{2+3} and R_{4+5}/M_1 between r-m and dm-cu) = 1.74 (1.61-1.87), 4v (M_1 between dm-cu and wing margin/ M_1 between r-m and dm-cu) = 2.39 (2.31-2.46), 5x (CuA_1 between dm-cu and wing margin/dm-cu between M_1 and CuA_1) = 1.15 (1.10-1.23), ac (3rd costal section between R_{2+3} and R_{4+5} /distance between distal ends of R_{4+5} and M_1) = 4.00 (3.88-4.21), M (CuA_1 between dm-cu and wing margin/ M_1 between r-m and dm-cu) = 0.65 (0.58-0.73), C3F (length of heavy setation in 3rd costal section/(length of heavy setation in 3rd costal section + length of light setation in 3rd costal section)) = 0.70 (0.56-0.79).

Female Unknown.

Relationship – This species resembles *A. (A.) palpifera* in having the unsclerotized paramere, but is distinguishable from it by the paramere lacking pubescent and aedeagus distally with 2 pointed (in *palpifera*: the paramere entirely densely pubescent and aedeagus apically pointed).

Distribution – China (Liaoning).

Etymology – In reference to the angular aedeagus.

Amiota (Amiota) kitamurai Chen & Liu, n. sp.
(figs. 6-10)

Type material – **Holotype** ♂, CHINA: Guanmenshan, Liaoning, 27.VII.2002, around human eyes (*N. Kitamura*) (SCAU). **Paratypes**: 10 ♂♂, same data as the holotype (*N. Kitamura, G. -C. Liu, H. -W. Chen*) (SCAU, SEHU).

Diagnosis – Paramere and aedeagus strongly sclerotized; paramere lacking sensilla, basally with 1 strong, triangular, pointed process, apically expanded.

Description – *Male terminalia*. Epandrium constricted heavily (about 1/2 width of mid-dorsal), with ca. 17-18 setae near posterior to ventral margins. Surstylus nearly entirely pubescent, subbasally with 4 aristate processes fused to each other and forming palm-like lobe on outer surface, finger-like process at postero-ventral corner, ca. 9 long prensisetae on distal margin, and a few stout, spine-like setae on inner surface. Anterior portion of hypandrium slightly broadened at middle. Vertical lobe of gonopod with 2 sclerotized basally fused M-shaped processes. Paramere articulated with aedeagus basally, somewhat expanded apically. Aedeagus separated into 2 curved rod-like processes; outer membrane high and erected basally. Ejaculatory apodeme: apical plate with ca. 5 pits on each lateral margin; stalk thick, extremely long.

Measurements: BL = 3.00 mm in holotype (5 ♂♂ paratypes: 2.86-3.20); ThL = 1.20 mm (1.17-1.34); WL = 2.40 mm (2.30-2.47); WW = 1.20 mm (1.17-1.27).

Indices: arb = 4/3 (4/2-3), avd = 0.83 (0.80-0.91), adf = 1.30 (1.20-1.30), flw = 1.50 (1.50-1.60), FW/HW = 0.35 (0.35), ch/o = 0.06 (0.06), prorb = 1.00 (0.95-1.00), rcorb = 0.80 (0.75-0.80), vb = 0.35 (0.35-0.40), dcl = 0.55 (0.55-0.60), presctl = 0.75 (0.70-0.80), sctl = 1.10 (1.10-1.20), sterno = 0.85 (0.90-1.00), orbito = 1.40 (1.30-1.40), dcp = 0.25 (0.25), scltp = 1.10 (1.10-1.20), C = 1.91 (1.85-1.89), 4c = 1.42 (1.40-1.49), 4v = 2.29 (2.11-2.35), 5x = 1.17 (1.10-1.30), ac = 3.40 (3.00-3.67), M = 0.58 (0.55-0.65), C3F = 0.56 (0.54-0.63).

Female. Unknown.

Relationship – This species very resembles *A. (A.) clavata* Okada from Japan in having the strongly sclerotized paramere and aedeagus, but is distinguishable from it by the paramere basally with strong, triangular, pointed process (absent in *clavata*).

Distribution – China (Liaoning).

Etymology – Patronym, in honor of Mr. N. Kitamura of Tokyo Metropolitan University, Japan.

4. The *taurusata* species-group

(Chen & Toda 2001: 1536)

Diagnosis – Hind femur with small, lobe-like flap basoventrally; hind tibia apicodorsally much extended like flap; hind first tarsomere expanded dorsally; fourth tergite laterally broadened and protruded more than others.

Included species: *aquilotaurusata* Takada, Beppu & Toda, 1979; *sacculipes* Máca & Lin, 1993; *taurusata* Takada, Beppu & Toda, 1979; *vulnerabla* Chen & Zhang, n. sp.

– *Amiota (Amiota) aquilotaurusata* Takada, Beppu & Toda, 1979: 110; Chen & Toda 2001: 1536. Material examined: China: 3 ♂, Guanmenshan, Liaoning, 29.VII.2002, ex tree trunk (*H. -W. Chen*).

Distribution – Russia (Ussuri Region), China (Heilongjiang, Liaoning, Beijing), Japan (Hokkaido).

Amiota (Amiota) vulnerabla Chen & Zhang, n. sp.
(figs. 11-14)

Type material – **Holotype** ♂, JAPAN: Tomochi, Kumamoto, Kyushu, 17.VIII.2002, around human eyes (*H. -W. Chen*) (SCAU).

Diagnosis – Paramere membranous on anterior half, sclerotized on posterior half, subbasally with ca. 3 sensilla, subapically with 1 pointed process; aedeagus sclerotized, apically pointed.

Description – Leg yellow; hind femur basally with 1 small lobe-like flap.

Male terminalia. Epandrium not constricted mid-dorsally, with ca. 17-19 setae along posterior to ventral margins. Surstylus lacking pubescent, distally with several setae, without finger-like process at postero-ventral corner, ca. 6 prensisetae on distal margin. Anterior portion of hypandrium slightly broadened at middle. Vertical lobe of gonopod weakly sclerotized, broad and large. Outer membrane of aedeagus undeveloped. Aedeagal apodeme long.

Measurements. BL = 2.97 mm; ThL = 1.25 mm; WL = 2.47 mm; WW = 1.10 mm.

Indices. arb = 5/3-4, avd = 0.90, adf = 1.30, flw = 1.50, FW/HW = 0.30, ch/o = 0.06, prorb = 1.00, rcorb = 0.65, vb = 0.35, dcl = 0.55, presctl = 0.70, sctl = 1.10, sterno = 0.90, orbito = 1.90, dcp = 0.25, sctlp = 1.20, C = 1.70, 4c = 1.62, 4v = 2.50, 5x = 1.63, ac = 4.50, M = 0.80, C3F = 0.70.

Female. Unknown.

Relationship – This species is similar to *A. (A.) sacculipes* Máca & Lin, 1993 from Taiwan in hind femur basally with 1 small lobe-like flap, but can be distinguished from it by the yellow legs and paramere membranous on anterior half (legs brown and paramere sclerotized in *sacculipes*).

Distribution – Japan (Kyushu).

Etymology – In reference to the paramere with membranous part.

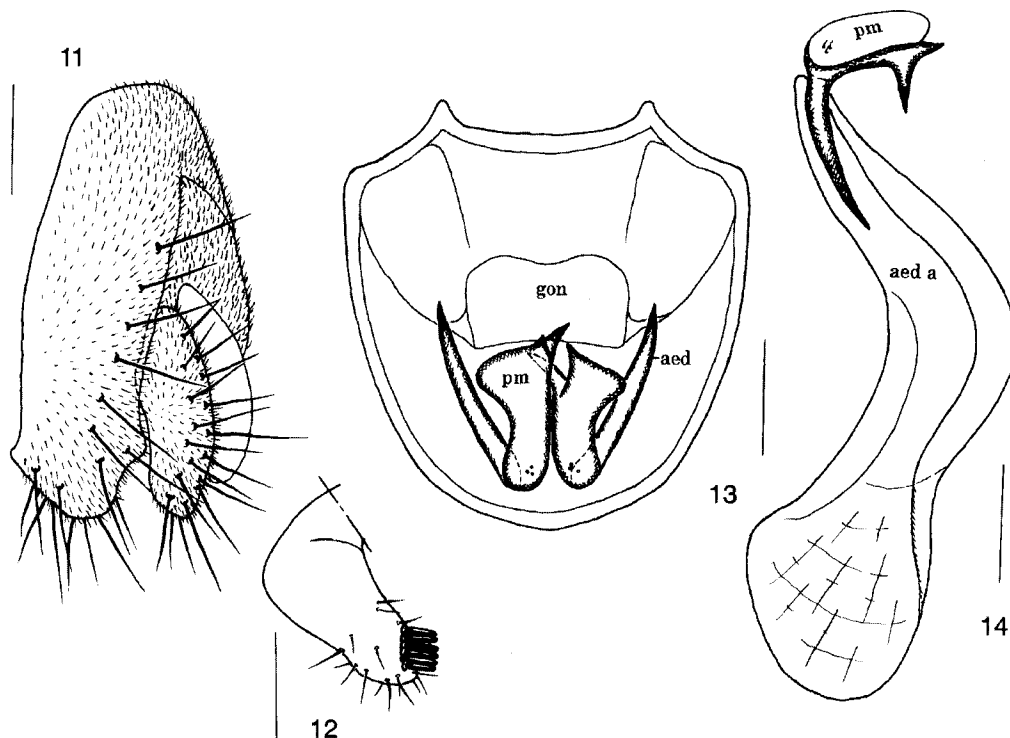
5. The *alboguttata* species-group

(Chen & Toda 2001: 1537)

Diagnosis – Hind tibia ventrally with a row of long setae; hind second to fifth tarsomeres broadened: second shorter than 1.5 times of width.

Included species: *albilabris* (Roth, 1860); *alboguttata* (Wahlberg, 1838); *delta* Takada, Beppu & Toda, 1979; *dispina* Okada, 1960; *eos* Sidorenko, 1989; *falcilis* Takada, Beppu & Toda, 1979; *forficula* Takada, Beppu & Toda, 1979; *lanceolata* Okada, 1971; *sigma* Okada, 1971; *subtusradiata* Duda, 1934; *todayi* Sidorenko, 1989; *trifurcata* Okada, 1968; *cuii* Chen & Toda, 2001; *nuerbachii* Chen & Toda, 2001; *spinata* Chen & Toda, 2001; *watabei* Chen & Toda, 2001; *bifurcata* Chen, n. sp., *communis* Chen & Steyskal, n. sp.

– *Amiota (Amiota) delta* Takada, Beppu & Toda, 1979: 108; Chen & Toda 2001: 1538. Material examined:



Figures 11-14

Amiota (Amiota) vulnerabla Chen & Zhang, n. sp. ♂. – 11, epandrium and cercus (lateral view). – 12, surstylus and tenth sternite (ventral view). – 13, paramere, aedeagus, hypandrium and gonopod (ventral view). – 14, paramere, aedeagus and aedeagal apodeme (lateral view) (scale-line = 0.1 mm).

CHINA: 2 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex tree trunks (H.-W. Chen).

Distribution – Russia (Ussuri Region), China (Jilin, Liaoning), Japan (Hokkaido, Honshu).

– *Amiota (Amiota) spinata* Chen & Toda, 2001: 1544. Material examined: CHINA: 6 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex tree trunks and human eyes (G.-C. Liu).

Distribution – China (Jilin, Liaoning).

– *Amiota (Amiota) subtusradiata quadrata* Takada & Toda, 1981: 2; Toda *et al.* 1996: 464. Material examined: USA: 2 ♂♂, Wayne County, Michigan, 15.VIII.1960 (G. Steyskal) (NSMT).

Distribution – Canada (Northwest Territories), USA (Michigan).

Amiota (Amiota) communis Chen & Steyskal, n. sp. (figs. 15-18)

Type material – **Holotype** ♂, USA: Wayne County, Michigan, 16.VI.1960 (G. Steyskal) (NSMT).

Paratypes, 4 ♂, same data as holotype.

Diagnosis – Paramere strong, distally with several pubescent and 2 sensilla, apically sclerotized, submedially with 1 slender process; aedeagus large, apically pointed, basally expanded; aedeagal apodeme apically with pubescent.

Description – **Male**. Hind tibia ventrally with a row of ca. 8-10 setae, which somewhat longer than tibial diameter.

Male terminalia. Epandrium entirely separated into 2 lateral lobes at mid-dorsal portion, with ca. 15-16 setae near posterior to ventral margins. Surstylus lacking pubescent, distally with several setae and ca. 8-10 prenisetae. Anterior portion of hypandrium entirely thin. Vertical lobe of gonopod weakly sclerotized, nearly round-shaped. Outer membrane of aedeagus undeveloped. aedeagal apodeme broad and large.

Measurements. BL = 2.86 mm (2.88 mm in paratype); ThL = 1.25 mm (1.20); WL = 2.60 mm (2.56); WW = 1.10 mm (1.05).

Indices. arb = 4-5/3-4, avd = 0.90, adf = 1.00, flw = 1.30, FW/HW = 0.35, ch/o = 0.06, pror = 1.00, rcorb = 0.70, vb = 0.35, dcl = 0.55, presctl = 0.65, sctl = 1.10, sterno = 0.90, orbito = 2.00, dcp = 0.25, sctlp = 1.20, C = 2.11, 4c = 1.50, 4v = 2.78, 5x = 1.30, ac = 4.50, M = 0.72, C3F = 0.56.

Female. Unknown.

Relationship – This species is similar to *A. (A.) spinata*, in the shaped paramere, but can be distinguished from it by the paramere submedially with 1 slender process and strong aedeagus (in *spinata*: paramere submedially without process and aedeagus small).

Remarks – The type specimens are deposited in National Science Museum, Tokyo with a given name

as the paratypes. No report about it was found in Wheeler (1981, 1986); flybase selected by Searches & Tools (<http://flybase.bio.indiana.edu/>); TaxoDros compiled by G. Bächili (<http://www.taxodros.unizh.ch/>) and Toda's data base (private communication), so they are described and appointed one of them as holotype in this paper.

Distribution – North America.

Amiota (Amiota) bifurcata Chen, n. sp. (figs. 19, 20)

Type material – **Holotype** ♂, JAPAN: Sapporo, 4.VIII.1996, ex banana trap (S. Tanabe) (SCAU).

Diagnosis – Paramere strong, subbasally with ca. 3 sensilla, apically with 1 curved, sclerotized process, subapically with 1 small projection; aedeagus deeply bifurcated.

Description – **Male**. Hind femur with 3-4 setae on postero-ventral surface, long as femoral diameter; hind tibia ventrally with a row of ca. 6-7 setae, long as tibial diameter.

Measurements. BL = 2.78 mm; ThL = 1.10 mm; WL = 2.20 mm; WW = 1.00 mm.

Indices. arb = 5/3-4, avd = 0.90, adf = 1.30, flw = 1.50, FW/HW = 0.30, ch/o = 0.06, pror = 1.00, rcorb = 0.65, vb = 0.45, dcl = 0.55, presctl = 0.70, sctl = 1.10, sterno = 0.90, orbito = 1.90, dcp = 0.25, sctlp = 1.20, C = 1.71, 4c = 1.75, 4v = 2.75, 5x = 1.30, ac = 4.37, M = 0.65, C3F = 0.57.

Female. Unknown.

Nota: This species' terminalia was broken except for the paramere and aedeagus by which we can distinguish it from the other species.

Relationship – This species is similar to *A. (A.) falcilis* Takada *et al.*, 1979 from Hokkaido, Japan in having the aedeagal shape, but can be distinguished from it by the paramere apically with 1 process (paramere apically with 2 long, curved processes and serrated margin between them in *falcilis*).

Etymology – In reference to the bifid aedeagus.

Distribution – Japan (Hokkaido).

6. The *rufescens* species-group (Chen & Toda 2001: 1547)

Diagnosis – Prenisetiae on surstylus long, pointed apically.

Included species: *rufescens* (Oldenberg, 1914); *stylopyga* Wakahama & Okada, 1958; *magniflava* Chen & Toda, 2001.

– *Amiota (Amiota) leucostoma* Loew, 1862: 230. Material examined: USA: 2 ♂♂, Wayne County, Michigan, 6,15.VIII.1960 (*G. Steyskal*) (NSMT). Distribution – North America.

Remarks – This species is very similar to *A. (A.) stylopyga* Wakahama & Okada, 1958 from East Asia in having the long paramere, but can be distinguished from it by the aedeagus apically with 2 small, pointed processes (in *stylopyga*: aedeagus basally with 1 triangular process, apically pointed).

7. Ungrouped species

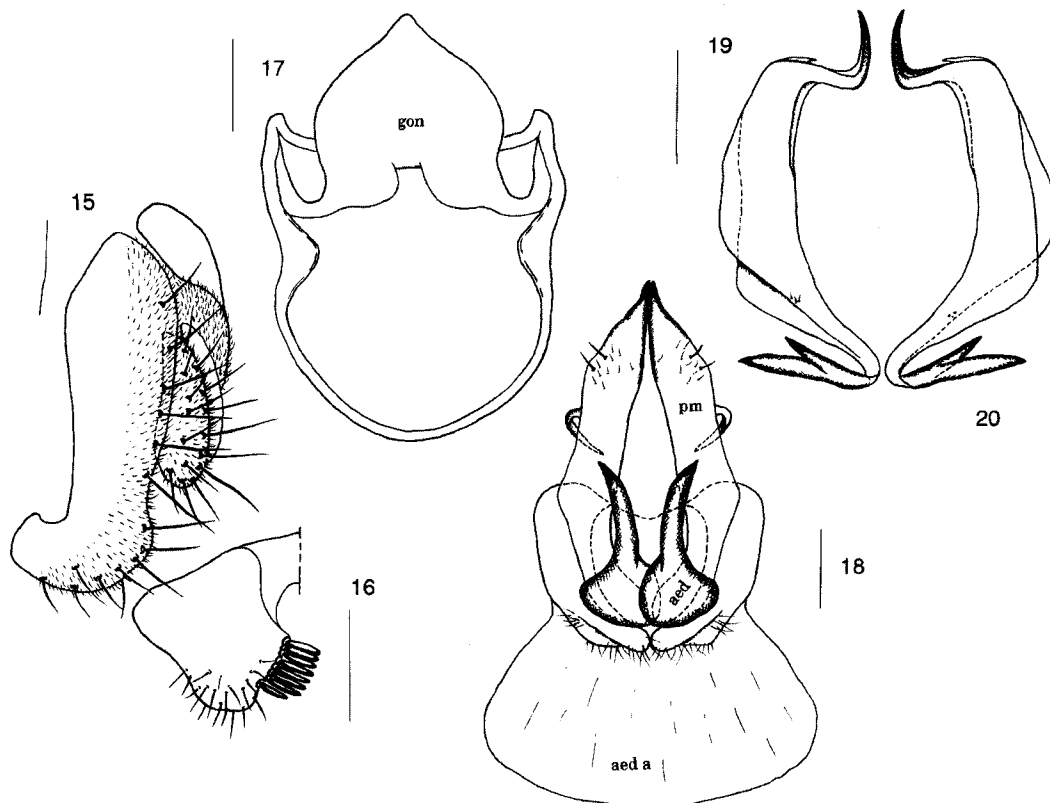
– *Amiota (Amiota) dentata* Okada, 1971: 87; Mácá & Lin 1993: 2. Material examined: CHINA: 6 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex tree trunks and around human eyes (*H.-W. Chen*). Distribution – China (Liaoning, Hubei, Taiwan), Japan (Hokkaido, Honshu).

– *Amiota (Amiota) kamui* Chen & Toda, 2001: 1551. Material examined: CHINA: 2 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex tree trunks (*H.-W. Chen*). Distribution – China (Liaoning), Japan (Hokkaido).

– *Amiota (Amiota) minor* (Malloch, 1921: 312); Wheeler & Takada 1971: 226. Material examined: USA: 4 ♂♂, Great Falls, Montana, 21.VII.1962 (*G. Steyskal*) (NSMT). Distribution – North America.

Remarks – This species is very similar to *A. (A.) furcata* Okada, 1971 from East Asia in having the mid tibia medio-ventrally with several erected setae, but can be distinguished from it by the hind femora basally with 4-5 postero-ventral setae that as long as femoral diameter; and surstylus with 6-7 prenisetae (hind femora basally without longer setae and surstylus with 11-12 prenisetae in *furcata*).

– *Amiota (Amiota) subfurcata* Okada, 1971: 85 [*Amiota (Amiota) alboguttata*, forma *furcata* Okada,



Figures 15-18

Amiota (Amiota) communis Chen & Steyskal, n. sp. ♂. – 15, epandrium and cercus (lateral view). – 16, surstylus and tenth sternite (ventral view). – 17, hypandrium and gonopod (ventral view). – 18, paramere, aedeagus and aedeagal apodeme (ventral view). – 19, 20, *Amiota (Amiota) bifurcata* Chen, n. sp. ♂. – 19, paramere and aedeagus (ventral view). – 20, ditto (dorsal view) (scale-line = 0.1 mm).

1960: 96 (part.)); Máca & Lin 1993: 2; Chen & Toda 2001: 1551. = *Amiota* (*Amiota*) *subfurcata* *Amiota* (*Amiota*) *pacifica* Sidorenko, 1989: 63 (synonymized by Sidorenko 1992: 260). Material examined: 39 ♂♂, Guanmenshan, Liaoning, 27-29.VII.2002, ex tree trunks and around human eyes (G.-C. Liu, H.-W. Chen). Distribution – Russia (Yakutia, Amur Region, Khabarovsk Region, Ussuri Region), China (Jilin, Liaoning, Beijing, Zhejiang, Sichuan, Taiwan), Japan (Hokkaido, Honshu, Kyushu).

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