

DIAGNOSIS OF THE *COENOSIA MOLLICULA*-GROUP
(DIPTERA: MUSCIDAE), WITH DESCRIPTIONS OF
FIVE NEW SPECIES FROM CHINA

XUE, WANQI and WANG, PING

Institute of Entomology, Shenyang Normal University
Shenyang 110034, P. R. China, E-mail: xwqfly@sina.com

The *Coenosia mollicula*-group from China is studied, and five new species are described: *Coenosia albifronta* Xue et Wang sp. n., *Coenosia adrohalter* Xue et Wang sp. n., *Coenosia decisetata* Xue et Wang sp. n., *Coenosia latiaedeaga* Xue et Wang sp. n. and *Coenosia nigriceps* Xue et Wang sp. n. A key for the identification of males of the 16 Chinese species are given.

Key words: China, Diptera, Muscidae, *Coenosia mollicula*-group, new species.

INTRODUCTION

MEIGEN (1826) described the genus *Coenosia* for 28 species, and *Musca tigrina* Fabricius, 1775 was subsequently designated as the type species. *Coenosia* is a species-rich genus in the Muscidae (Diptera). HENNIG (1961) revised the Palaearctic species of *Coenosia* and divided the genus into *tigrina*-group, *albatella*-group, *tricolor*-group, *intermedia*-group and *pumila*-group; the *pumila*-group has been divided into *pumila*-subgroup, *perpusilla*-subgroup, *mollicula*-subgroup and *lineatipes*-subgroup; according to PONT (1986), *C. lineatipes* is a junior synonym of *C. albicornis*. On the basis of free part of cerci bent forwards in profile, distal part not enlarged in posterior view, middle part or preapical part of surstyli bent backwards in profile, in this paper we integrate the *mollicula*-subgroup and *albicornis*-subgroup into *mollicula*-group. Sixteen Chinese species of the *Coenosia mollicula*-group are included, including five new species described herein.

MATERIAL AND METHODS

The morphological terminology follows that of McALPINE (1981). Absolute measurements for the body length are given in millimetres. The type specimens of the five new species are deposited in the Institute of Entomology, Shenyang Normal University, China.

Abbreviations are as follows: *fr* = frontal setae; *acr* = acrostichal setae; *dc* = dorsocentral setae; *pra* = prealar setae; *ial* = intra-alar setae; *av* = anteroventral setae; *ad* = anterodorsal setae; *pd* = posterodorsal setae; *p_v* = posteroventral setae; *a* = anterior setae; *d* = dorsal setae; *p* = posterior setae; r-m = radial-medial crossvein; M = media vein; R₄₊₅ = branch of radius.

DIAGNOSIS OF *COENOSIA MOLLICULA*-GROUP
(Figs 1–3)

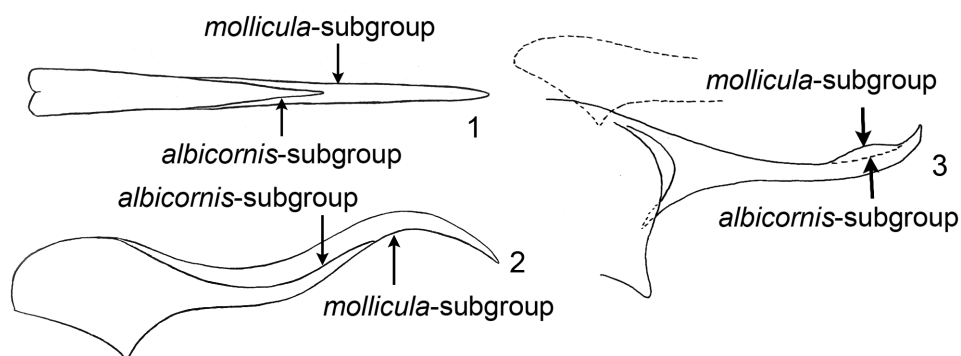
In the known species, *av* and *ad* on hind tibia not paratactic; anterior lower margin of postpedicel without conical process, at most as a right angle; abdomen with spots (except *C. nigriceps* sp. n.); presutural *dc* 1 (except *C. ansymmetrocerca*); costa reaching the tip of M (except *C. albifronta* sp. n.); a majority of lower calypters longer than upper calypters; free part of cerci bent forwards in profile, distal part not enlarged in posterior view, middle part or preapical part of surstyli bent backwards in profile; the group has been divided into two subgroups: *C. mollicula*-subgroup and *C. albicornis*-subgroup.

KEY TO SUBGROUPS (MALES)

- 1 Cerci especially long and thin in posterior view, free part of cerci at least twice the height of epandrium *C. mollicula*-subgroup
- Cerci short and wide in posterior view, free part of cerci and surstyli at most 1.5 times the height of epandrium *C. albicornis*-subgroup

KEY TO SPECIES OF *COENOSIA MOLLICULA*-GROUP (MALES)

- 1 *Dc* 2+3 *C. ansymmetrocerca* Xue et Feng, 2000
- *Dc* 1+3 2
- 2 Abdomen without spots ***C. nigriceps*** Xue et Wang, sp. n.
- Abdomen with distinct spots 3



Figs 1–3. *Coenosia mollicula*-group model showing of male terminalia: 1 = cerci in posterior view, 2 = cerci in profile, 3 = surstyli in profile.

3	Lower calypter small	4
–	Lower calypter subequal in length to upper calypter or longer than upper calypter	6
4	Femora completely yellow	5
–	Femora with black or black-brown colour	
	C. albifronta Xue et Wang, sp. n.	
5	Tergite 1+2 without spots, <i>ial</i> 0+2	C. deciseta Xue et Wang, sp. n.
–	Tergite 1+2 with a pair of light orange to orange spots, <i>ial</i> 0+1	
	C. latiaedeaga Xue et Wang, sp. n.	
6	Lower calypter not projecting, subequal in length to upper calypter	7
–	Lower calypter projecting, longer than upper calypter	9
7	Femora complete yellow	<i>C. mollicula</i> (Fallén, 1825)
–	Mid and hind femora black-brown or only apical 1/3–1/2 of mid and hind femora with black colour	8
8	Mid and hind femora black-brown	<i>C. ancylocerca</i> Xue, Wang et Zhang, 2006
–	Only apical 1/3–1/2 of mid and hind femora with black colour	
	<i>C. octopunctata</i> (Zetterstedt, 1838)	
9	Antenna black or only basal half of postpedicel yellow	11
–	Antenna complete orange-yellow	10
10	Basal 1/6–1/4 of mid femur yellow	<i>C. flavimixta</i> Feng et Xue, 1998
–	At least basal 2/3 of mid femur yellow	<i>C. unguiligentilis</i> Xue, Yang et Feng, 2000
11	Legs entirely black	<i>C. yulongXueshanensis</i> Xue, 2005
–	Legs not entirely black, at least femora or tibiae with yellow colour in basal part	12
12	Most of mid and hind femora yellow	13
–	Mid and hind femora black or at least apical 1/4 with black-brown colour	14
13	Frontal triangle reaching anterior margin of frons; trochanters yellow; abdomen conical	<i>C. conica</i> Cui et Li, 1996

- Frontal triangle reaching middle part of frons; trochanters black; abdomen oviform *C. brevicauda* Pont, 2005
- 14 Mid and hind femora black; knob of haltere large, as long as broad, knob about half length of haltere **C. adrohalter** Xue et Wang, sp. n.
- At least basal 1/4 of mid and hind femora yellow; knob of haltere normal, at most 1/3 of length of haltere 15
- 15 Apical 2/3 of fore femur black-brown on dorsal surface, at least basal 3/4 of mid and hind femora yellow *C. striolata* Hennig, 1961
- Most of fore femur yellow, sometimes with small black-brown annuli, at most basal 1/3 of mid and hind femora yellow *C. albicornis* Meigen, 1826

DESCRIPTIONS OF NEW SPECIES

Coenosia adrohalter Xue et Wang, sp. n. (Figs 4–8)

Holotype: male, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 8. vii. 2009, collected by Shuai Wang.

Paratypes: 2 males, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 8. vii. 2009, collected by Shuchong Bai.

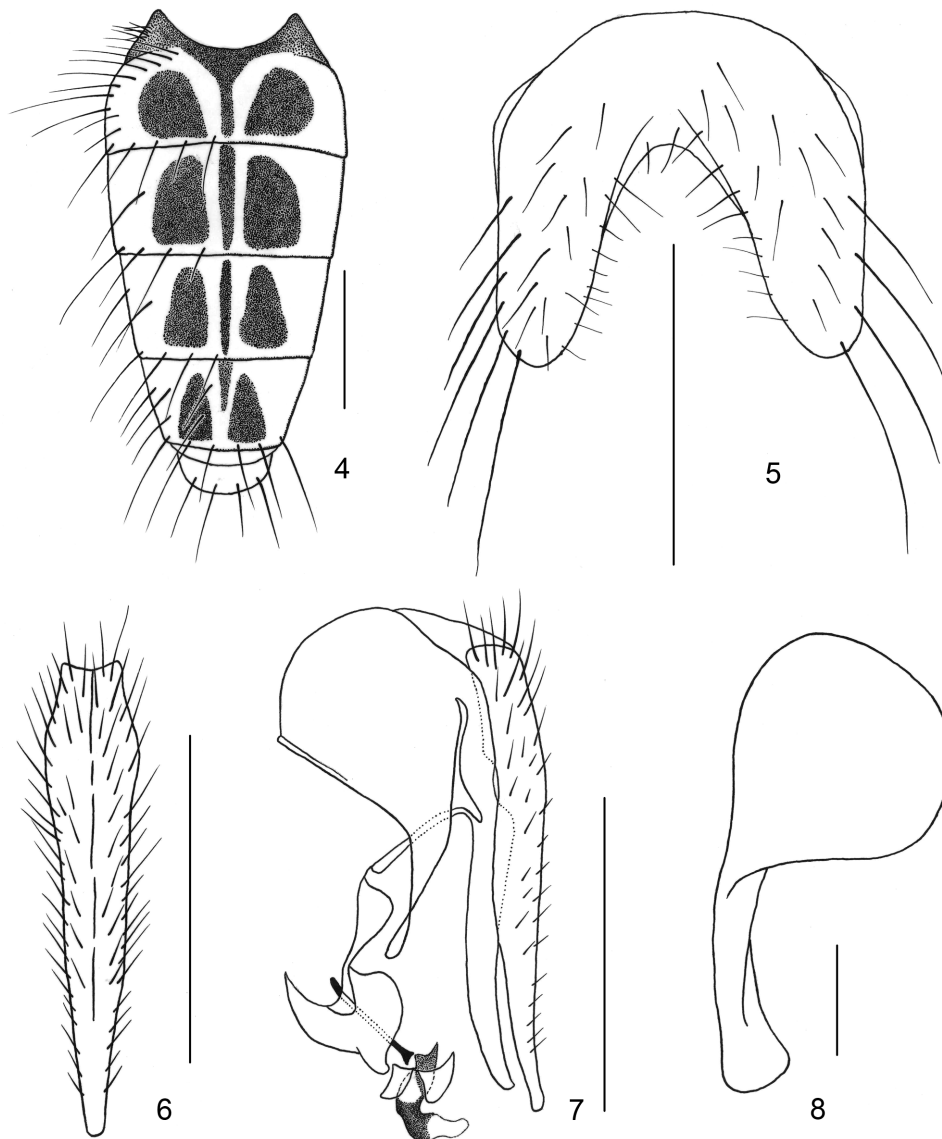
Male: Body length 3.6–3.8 mm.

Head: Eye bare, lower posterior margin not concave; frons about 0.38 of head in width; frontal vitta black, with orange-grey pruinosity, about 3.0 times as wide as fronto-orbital plate; frontal triangle with orange-grey pruinosity, reaching middle part of frons; lunule dark orange, with light grey pruinosity; ocellar seta shorter than width of frons; inner vertical seta about 3.0–3.5 times as long as outer vertical seta; 3 pairs of *fr*, middle pair short and small; orbital seta 1; fronto-orbital plate with orange-grey pruinosity; parafacial with silver pruinosity, parafacial at most equal to postpedicel width; antenna dark black; postpedicel about 3.2–3.5 times as long as broad, anterior lower margin as a right angle; arista entirely covered with short hairs, the longest hairs shorter than basal diameter of arista; epistoma not projecting; frontal angle situated in front of vibrissal angle; gena about 1/4 of eye in height; genal hairs, epicephalon hairs and postgenal hairs black; gena and occiput with green-grey pruinosity, epicephalon sparsely covered with hairs; prementum black and shining, about 3.0–3.2 times as long as broad; palpus black-brown, about 1.2 times as long as prementum; labellum about 1.3 times as long as width of prementum; oral disc with a tooth on posterior part, lateral part with 2 pairs of upcurved teeth.

Thorax: Black in ground colour, with green-grey pruinosity; scutum with orange-grey pruinosity; along the row of *acr* and the row of *dc* each with a brown vitta, median vitta reaching scutoscuteellar suture; 2 rows of *acr* as hairs; *dc* 1+3; posthumeral seta 1+0; *ial* 0+2; without *pra*; notopleuron bare; basal scutellar seta and apical scutellar seta large and long; lateral surface and ventral surface of scutellum bare; proepisternum and basisternum of prosternum concave in center; anepimeron, meron and katepimeron bare; proepisternal setae 2 (one of them short); upper proepimeral seta 1 (lower part with a downcurved hair);

anterior spiracle and posterior spiracle small, anterior spiracle yellow, posterior spiracle brown; katepisternal setae placed as an isosceles triangle.

Wings: Slightly hyaline, veins orange; basicosta dark brown; costal spine short and small; costa reaching the tip of M; R_{4+5} and M parallel; calypters yellowish; lower calypter



Figs 4–8. *Coenosia adrohalter* sp. n., male: 4 = dorsal view of abdomen, 5 = sternite 5 in ventral view, 6 = posterior view of cerci, 7 = terminalia in profile, 8 = halter. Scales: 0.5 mm for Figs 4–7, 0.1 mm for Fig. 8.

projecting, about 1.2 times as long as upper calypter; haltere yellow, knob of haltere large, as long as broad and about half length of haltere.

Legs: Basal 1/6 of tibiae, apical part of fore femur, fore trochanter and mid trochanter yellow, the remaining parts of legs dark black; femora with light grey pruinosity; fore tibia with 1 median *p*, 1 preapical *d*; mid femur without *av*, only 2–3 *av* setulae in basal part, as long as 1/3 of tibial diameter, 2–3 *pv* in basal 1/3, as long as tibial diameter, 1 preapical *a*; mid tibia with 1 supramedial *ad*, 1 *pd*; hind femur with 1 subbasal *av*, 1 submedial *av*, 1 preapical *av*, 1 subbasal *pv*, 1 supramedial *pv*; hind tibia with 1 submedial *av*, 1 median *ad*, 1 preapical *d*, without apical *pv*; tarsi longer than tibiae; claws longer than pulvilli, about 4/5 of fifth tarsomere in length.

Abdomen: Ground colour black, densely covered with green-grey pruinosity; long-conical in dorsal view; posterior marginal setae of each tergite weak, sparsely covered with hairs; tergites 1+2–5 each with dark brown median vitta and a pair of triangular spots; epandrium as a hemisphere; sternite 1 bare.

Female: Unknown.

Etymology: This species name refers to the enlarged distal part of the haltere.

Diagnosis: This species resembles *Coenosia brevicauda* Pont, 2005, but it differs by fronto-orbital plate with orange-grey pruinosity, along the row of *acr* and the row of *dc* each with a brown vitta, haltere yellow, knob of haltere large, as long as broad and about half length of haltere, fore trochanter and mid trochanter yellow, mid femur without *av*.

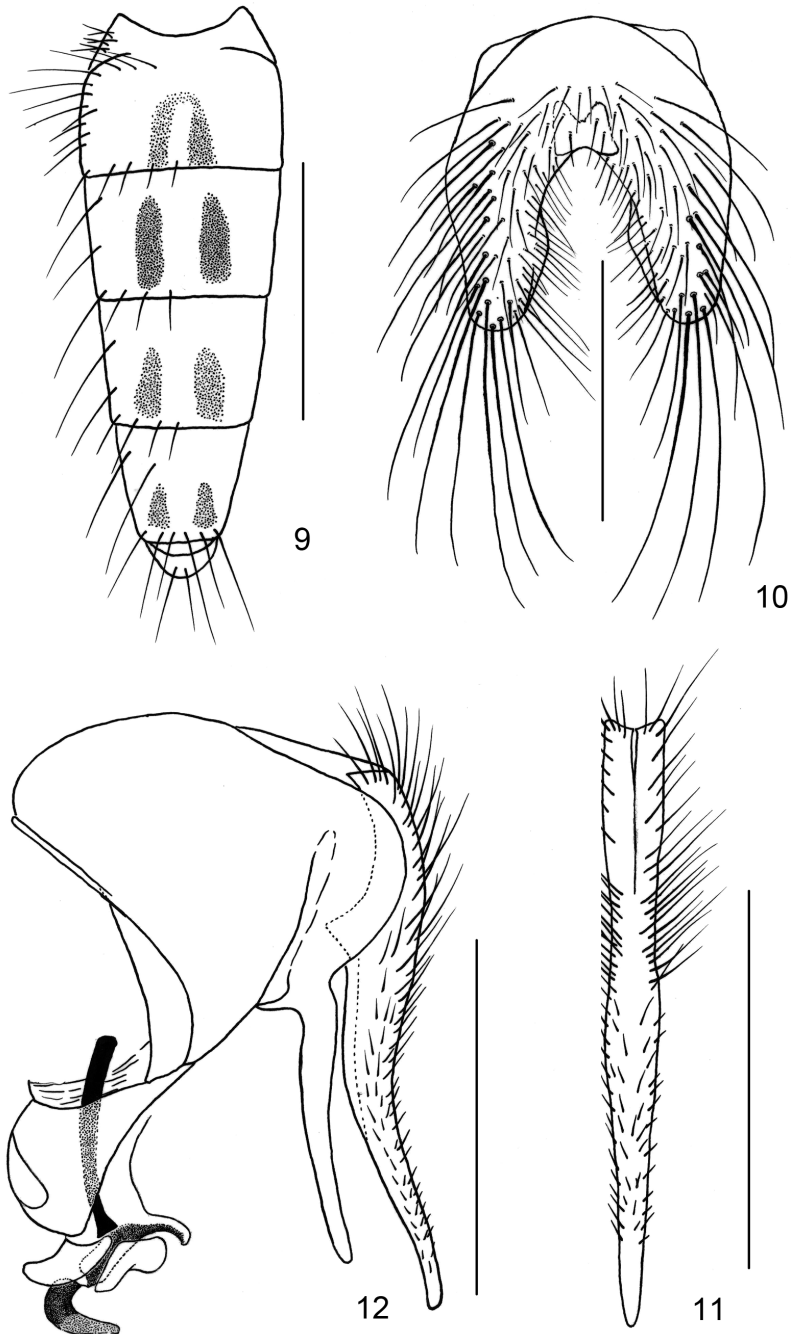
***Coenosia albifronta* Xue et Wang, sp. n.** (Figs 9–12)

Holotype: male, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 10. vii. 2009, collected by Shuai Wang.

Paratypes: 10 males, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 8. vii. 2009, collected by Shuchong Bai; 6 males, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 10. vii. 2009, collected by Wenxiu Dong; 23 females, China, Pianma town, Lushui county, Yunnan Province, 3153 m, 10. vii. 2009, collected by Shuchong Bai; 15 females, Same data as holotype.

Male: Body length 4.4–4.7 mm.

Head: Eye bare, lower posterior margin not concave; frons about 0.31–0.33 of head in width, frons densely covered with silver pruinosity; frontal vitta black, about 3.0–3.5 times as wide as fronto-orbital plate; frontal triangle with yellowish pruinosity, situated on upper 1/4 of frons; lunule light brown, with silver-white pruinosity; ocellar seta long and large, about 1.2 times as long as width of frons, subequal in length to longest *fr*; inner vertical seta about 3.0–3.5 times as long as outer vertical seta; 3 pairs of *fr*, the middle pair short and small; orbital seta 1; parafacial with silver-white pruinosity, about 2/3–4/5 of postpedicel width; antenna dark black; postpedicel about 2.5–3.0 times as long as broad (about 2.5 times as long as width of pedicel), anterior lower margin as a right angle; arista entirely covered with short hairs, the longest hairs shorter than basal diameter of arista; epistoma not projecting; frontal angle situated in front of vibrissal angle; gena about 1/4 of eye in height; genal hairs and postgenal hairs black, gena with light grey pruinosity,



Figs 9–12. *Coenosia albifronta* sp. n., male: 9 = dorsal view of abdomen, 10 = sternite 5 in ventral view, 11 = posterior view of cerci, 12 = terminalia in profile Scales: 0.5 mm for Figs 10–12, 1 mm for Fig. 9.

occiput with green-grey pruinosity; epicephalon sparsely covered with hairs; prementum black and shining, about 3.0 times as long as broad; palpus black-brown, subequal in length to prementum; labellum about 1.2 times as long as width of prementum; oral disc with knife-shaped teeth on posterior part.

Thorax: Black in ground colour, with green-grey pruinosity; scutum with orange-grey pruinosity; along the row of *acr* and the row of *dc* each with a brown vitta, median vitta reaching scutoscuteellar suture; 1–2 irregular rows of *acr* as hairs; *dc* 1+3; posthumeral seta 1+0; *ial* 0+2; without *pra*; notopleuron bare; basal scutellar seta and apical scutellar seta large and long; lateral surface and ventral surface of scutellum bare; proepisternum and basisternum of prosternum concave in center; anepimeron, meron and katepimeron bare; proepisternal setae 2 (one of them short); upper proepimeral seta 1 (lower part with a downcurved hair); anterior spiracle and posterior spiracle small, light brown; katepisternal setae placed as an isosceles triangle.

Wings: Slightly hyaline; veins brown; basicosta dark black, costal spine long and large, longer than r-m; costa reaching R_{4+5} or slightly beyond; R_{4+5} and M straight, parallel; calypters light yellow; lower calypter short and small, about 2/5 of upper calypter in length; haltere light yellow.

Legs: Femora and tibiae with green-grey pruinosity, trochanters, basal 1/5 and apical 1/7 of tibiae, and apical 1/9 of femora orange-yellow, the remaining parts of legs black-brown; fore tibia with 1 median *p*, long and large, about half of tibia in length, 1 preapical *d*; mid femur with 4 *av* in basal half, as long as tibial diameter; *pv* surface with 3–4 setae in basal half, 1 preapical *a*, long and large; mid tibia with 1 submedial *ad*, about 1/3 of tibia in length, 1 median *pd*, long and large; hind femur with 1 subbasal *av*, 1 submedial *av*, 1 preapical *av*, sometimes with 1 short and small median *av* and 1 short and small apical *av*, 1–2 setiform *pv* in basal, supramedial *pv* long and large, about 1.2 times as long as tibial diameter; hind tibia with 1 preapical *av*, 1 median *ad*, about 2/5 of tibia in length, preapical *d* long and large, 1 supramedial *d*, 1 supramedial *pd*, about 1/3 of tibia in length, without apical *pv*; apical part of tarsi not widened; fore tarsus and mid tarsus longer than tibiae; hind tarsus at most equal to tibia in length; claws longer than pulvilli, about 3/5 of fifth tarsomere in length.

Abdomen: Ground colour black; long-conical in dorsal view, curved in profile, densely covered with blue-grey pruinosity; tergite 3 and tergite 4 with a pair of dark brown spots (outline of spots mostly indistinct); sometimes spots of tergite 1+2 and tergite 5 indistinct; tergites 3–5 with a pair of distal setae and 1–2 pairs of lateral setae; hairs short; epandrium projecting backward as a hemisphere; tergite 6 and sternite 1 bare; surstyli shorter than cerci; distal part of cerci bent backwards in profile, narrow in posterior view.

Female: Body length 4.2–5.5 mm; frontal vitta with orange-grey pruinosity; frontal triangle reaching upper 3/5 of frons to anterior margin; fronto-orbital plate, parafacial and gena with green-grey pruinosity; lunule without distinct pruinosity; sometimes upper half of fronto-orbital plate with orange-grey pruinosity; parafacial about 1/2–2/3 of postpedicel width; abdomen oviform, without spots; other characters as male.

Etymology: This species name refers to the male frontal vitta with silver-white pruinosity.

Diagnosis: This species resembles *Coenosia ancyllocerca* Xue, Wang et Zhang, 2006, but it differs by the antenna dark black, postpedicel about 2.5–

3.0 times as long as broad, anterior lower margin as right angle, arista entirely covered with short hairs, the longest hairs shorter than basal diameter of arista, gena about 1/4 of eye in height, palpus black-brown, subequal in length to prementum, *ial* 0+2, costal spine long and large, costa reaching R_{4+5} or slightly beyond, lower calypter short and small, about 2/5 of upper calypter in length.

Coenosia deciseta Xue et Wang, sp. n.
(Figs 13–22)

Holotype: male, China, Mt. Liupan, Ningxia Province, 1500–1700 m, 22. vi. 2008, collected by Mingfu Wang.

Paratypes: male, China, Mt. Liupan, Ningxia Province, 2500–2700 m, 22. vi. 2008, collected by Mingfu Wang; 2 females, same data as holotype; male, China, Longde County, Ningxia Province, 2150 m, 26. vi. 2008, collected by Mingfu Wang.

Male: Body length 3.4–3.6 mm.

Head: Eye bare, lower posterior margin not concave; frons about 0.36 of head in width; frontal vitta black, with black pruinosity, about 2.5 times as wide as fronto-orbital plate; frontal triangle with light orange pruinosity, close to anterior part of frons; ocellar seta long and large, as long as width of frons; inner vertical seta about 3.0 times as long as outer vertical seta; 3 pairs of *fr*, the middle pair weak; orbital seta 1; fronto-orbital plate and parafacial with grey-white pruinosity; parafacial about half of postpedicel width; most of postpedicel yellow, distal part brown; anterior apical margin of pedicel orange, with light grey pruinosity; postpedicel about 3.2 times as long as broad; arista entirely covered with short hairs, the longest hairs as long as basal diameter of arista; epistoma not projecting; frontal angle situated in front of vibrissal angle; gena about 1/7 of eye in height; genal hairs and postgenal hairs black, occiput with green-grey pruinosity, epicephalon with hairs; prementum black and shining, about 3.0 times as long as broad; palpus light yellow, subequal in length to prementum; labellum about 1.3 times as long as width of prementum; lateral part of labellum with 2 pairs of teeth, oral disc with a wide tooth on posterior part.

Thorax: Black in ground colour, with green-grey pruinosity; scutum with orange-grey pruinosity; along the row of *dc* and the row of *ial* with 4 dark brown vittae, outer vittae indistinct, inner vittae not reaching scutoscuteellar suture; 1 irregular row of presutural acrostichal setae as short hairs; *dc* 1+3, *ial* 0+2, without *pra*; notopleuron bare; basal scutellar seta and apical seta large and strong, lateral surface and ventral surface of scutellum bare; proepisternum and basisternum of prosternum concave in center; anepimeron, meron and katepimeron bare; proepisternal seta 1; proepimeral seta 1; without distinct anterior anepisternal seta; anterior spiracle and posterior spiracle small, brown; katepisternal setae placed as an isosceles triangle.

Wings: Slightly hyaline, veins brown; basicosta light yellow; costal spine short and small; costa reaching the tip of *M*; R_{4+5} and *M* straight, parallel; calypters yellowish; lower calypter short and small, about 3/5 of upper calypter in length; haltere yellowish.

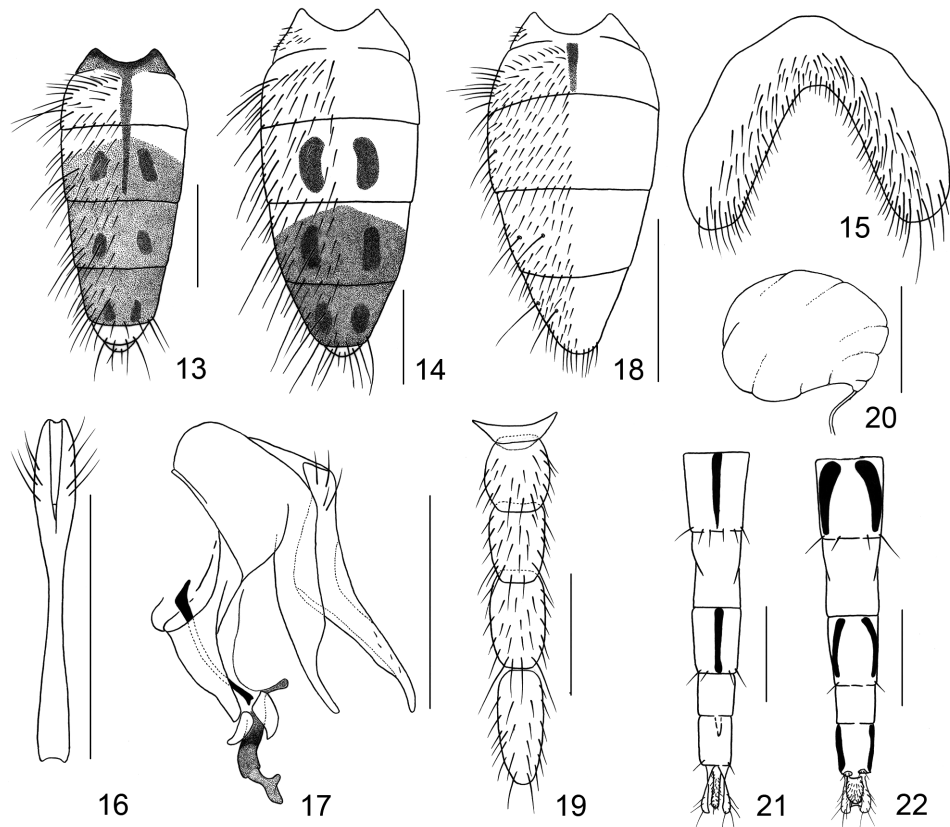
Legs: Tarsi orange, the remaining parts of legs yellow; fore tibia with 1 median *p*; mid femur with 1 (0) *av* in basal part, 2–3 anterior setulae and 2–3 *pv* in basal half, 2 preapical *pd*; mid tibia with 1 median *pd*; hind femur with 1 subbasal *av*, 1 submedial *av*, 1 preapical *av*, *pv* small in basal part, supramedial *pv* long and large, about 1.5 times as long as tibial

diameter; hind tibia with 1 submedial *av*, 1 median *ad*, about 2/7 of tibia in length, 1 preapical *d*, without apical *pv*; distal part of tarsi not widened; tarsi longer than tibiae; claws and pulvilli long, claws subequal in length to pulvilli, about 4/5 of fifth tarsomere in length.

Abdomen: Ground colour black; long-conical in dorsal view; tergite 1+2 yellow, anterior part and each side of tergite 3 (sometimes tergite 4) orange-yellow, remaining part dark black, with grey pruinosity; posterior margin of tergite 5 and terminalia yellow, tergite 3 with a pair of discal setae, tergite 4 and tergite 5 each with 2 pairs of discal setae, usually about 10 discal setae; tergites 3–5 each with a pair of dark black spots; sternite 1 bare; sternite 1, sternite 4 and sternite 5 orange-yellow.

Female: Body length 4.3–4.4 mm; distal 3/5 of antenna dark brown, mid tibia with 1 median *ad*, about 1/3 of tibia in length; claws longer than pulvilli, claws about 3/5 of fifth tarsomere in length; sternites yellow, tergites without spots; other characters as male.

Etymology: This species name refers to the abdomen with 10 distal setae.



Figs 13–22. *Coenosia deciseta* sp. n., male: 13 = dorsal view of abdomen, 14 = dorsal view of abdomen, 15 = sternite 5 in ventral view, 16 = posterior view of cerci, 17 = terminalia in profile. Female: 18 = dorsal view of abdomen, 19 = sternites 1–5 in ventral view, 20 = spermatheca, 21 = oviscapt in ventral view, 22 = oviscapt in dorsal view. Scales: 0.5 mm for Figs 13–17, 19, 21–22, 0.1 mm for Fig. 20, 1 mm for Fig. 18.

Diagnosis: This new species resembles *Coenosia conica* Cui et Li, 1996, but it differs by most of postpedicel yellow, distal part brown, arista entirely covered with short hairs, the longest hair as long as basal diameter of arista, palpus light yellow, along the row of *dc* and the row of *ial* with 4 dark brown vittae, lower calypter short and small, about 3/5 of upper calypter in length, fore tibia with 1 median *p*.

***Coenosia latiaedeaga* Xue et Wang, sp. n.**
(Figs 23–26)

Holotype: male, China, Mt. Emei, Sichuan Province, 2400–2690 m, 3. vi. 2009, collected by Mingfu Wang.

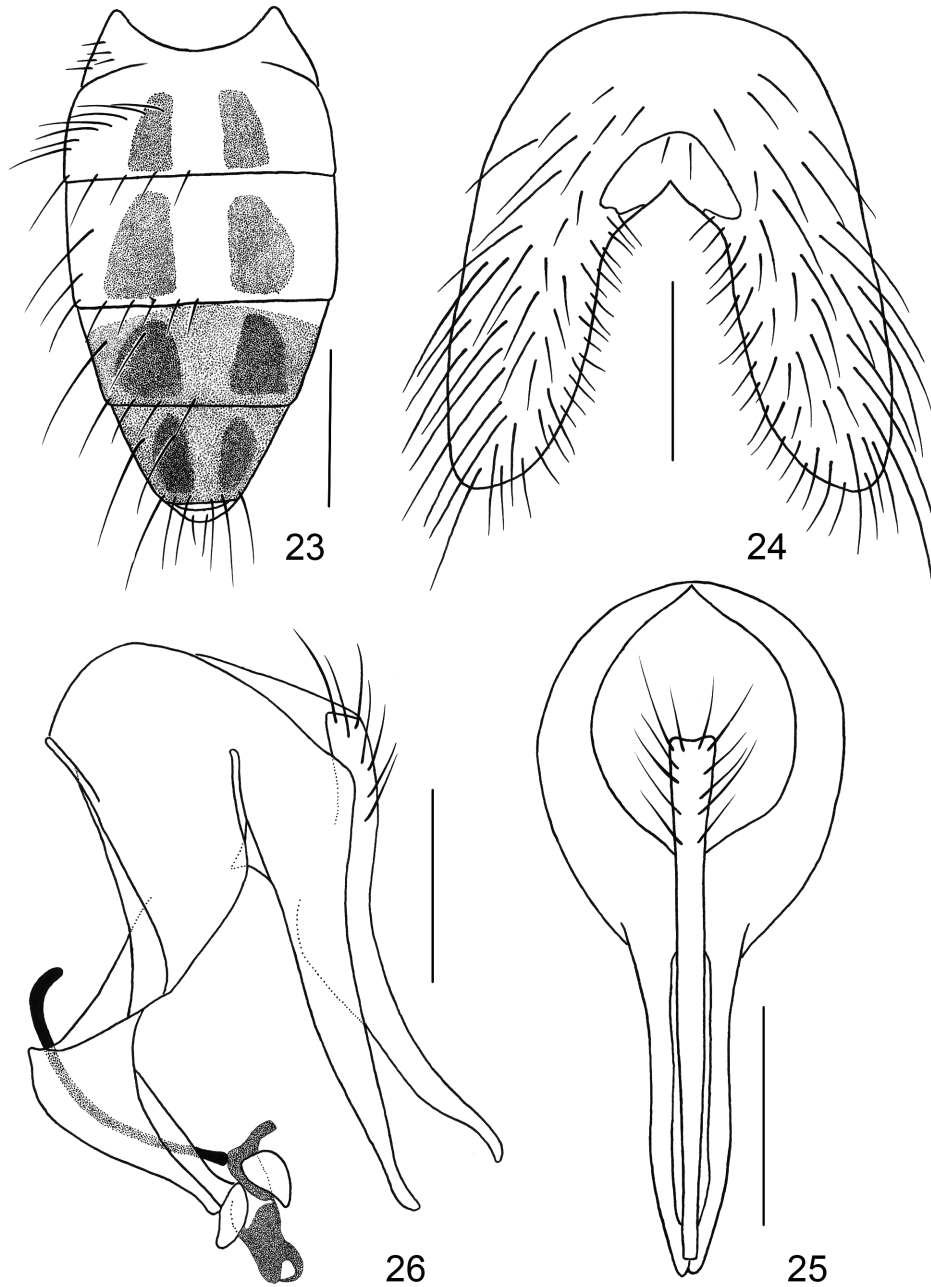
Male: Body length 3.0–3.2 mm.

Head: Eye bare, lower posterior margin not concave; frons about 0.28–0.30 of head in width; frons sparsely covered with light grey pruinosity; frontal vitta black, about 3.0 times as wide as fronto-orbital plate; frontal triangle with grey-yellow pruinosity, situated on upper 1/3 of frons; lunule dark brown, sparsely covered with grey pruinosity; ocellar seta short, as long as 4/5 of frons width; inner vertical seta about twice as long as outer vertical seta; 3 pairs of *fr*, the middle pair short and small; orbital seta 1; parafacial with light grey pruinosity; parafacial about 2/5–1/2 of postpedicel width; distal margin of pedicel and postpedicel yellow, postpedicel about 3.0–3.5 times as long as broad, anterior lower margin as a right angle, first and second parts of arista yellow; arista entirely covered with short hairs, the longest hairs about 1.2 times as long as basal diameter of arista; epistoma not projecting; frontal angle situated in front of vibrissal angle; gena about 1/7 of eye in height; genal hairs, epicephalon hairs and postgenal hairs black; gena with light grey pruinosity; occiput with green-grey pruinosity; prementum black and shining, about 3.0 times as long as broad; palpus orange-yellow, subequal in length to prementum; labellum about 1.2 times as long as width of prementum.

Thorax: Black in ground colour, with green-grey pruinosity; along the row of *dc* with a pair of dark brown vittae, reaching scutoscuteellar suture; 1–2 irregular rows of *acr* as hairs; *dc* 1+3, posthumeral seta 1+0, *ial* 0+1, without *pra*; notopleuron bare; basal scutellar seta and apical seta large and strong; lateral surface and ventral surface of scutellum bare; proepisternum and basisternum of prosternum concave in center; anepimeron, meron and katepimeron all bare; proepisternal seta 1; upper proepimeral seta 1; without anterior anepisternal seta; anterior spiracle and posterior spiracle small, orange-yellow; katepisternal setae placed as an isosceles triangle.

Wings: Hyaline, veins brown; basicosta yellow; costal spine distinct; costa reaching the tip of M; R_{4+5} and M straight, parallel; calypters yellowish; lower calypter slightly shorter than upper calypter; haltere yellowish.

Legs: Yellow, fore tibia with 1 median *p*, 1 preapical *d*; mid femur with 2–3 *av* in basal 1/3, 4 *a* and 3 *pv* in basal half, 1 preapical *a*; mid tibia with 1 submedial *ad*, without *pd* and *pv*; hind femur with 1 subbasal *av*, 1 submedial *av*, 1 preapical *av*, 1 supramedial *pv*, long and large, about 1.2 times as long as tibial diameter, 1 subbasal *pv*, 1 preapical *pv*; hind tibia with 1 submedial *av*, 1 median *ad*, 1 preapical *d*, without *pd*, without apical *pv*; apical part of tarsi not widened; tarsi longer than tibiae; claws subequal in length to pulvilli, about 3/5 of fifth tarsomere in length.



Figs 23–26. *Coenosia latiaedeaga* sp. n., male: 23 = dorsal view of abdomen, 24 = sternite 5 in ventral view, 25 = posterior view of cerci, 26 = terminalia in profile. Scales: 0.5 mm for Figs 23, 25, 0.2 mm for Figs 24, 26.

Abdomen: Oviform in dorsal view; abdominal segments 1+2–3 yellow, tergites 1+2 and 3 each with a pair of light orange to orange spots; latero-ventral surface of tergite 4, latero-ventral surface and posterior margin of tergite 5 yellow, most of dorsal surface dark black, with grey pruinosity, each with a pair of black brown spots; posterior marginal setae of each tergite weak; tergite 3 with a pair of lateral setae; tergites 4 and 5 each with two pairs of lateral setae; sternite 1 bare; abdominal syntergosternite 7+8 dark brown; terminalia yellow; distal part of sternite 5 reaching basal part of cerci.

Female: Unknown.

Etymology: This species name refers to the male aedeagus which is strong and broad.

Diagnosis: This species resembles *Coenosia conica* Cui et Li, 1996, but it differs by distal margin of pedicel and postpedicel yellow, anterior lower margin of postpedicel as a right angle, arista entirely covered with short hairs, the longest hair about 1.2 times as long as basal diameter of arista, palpus orange-yellow, *ial* 0+1, lower calypter slightly shorter than upper calypter, fore tibia with 1 median *p*.

***Coenosia nigriceps* Xue et Wang, sp. n.**
(Figs 27–31)

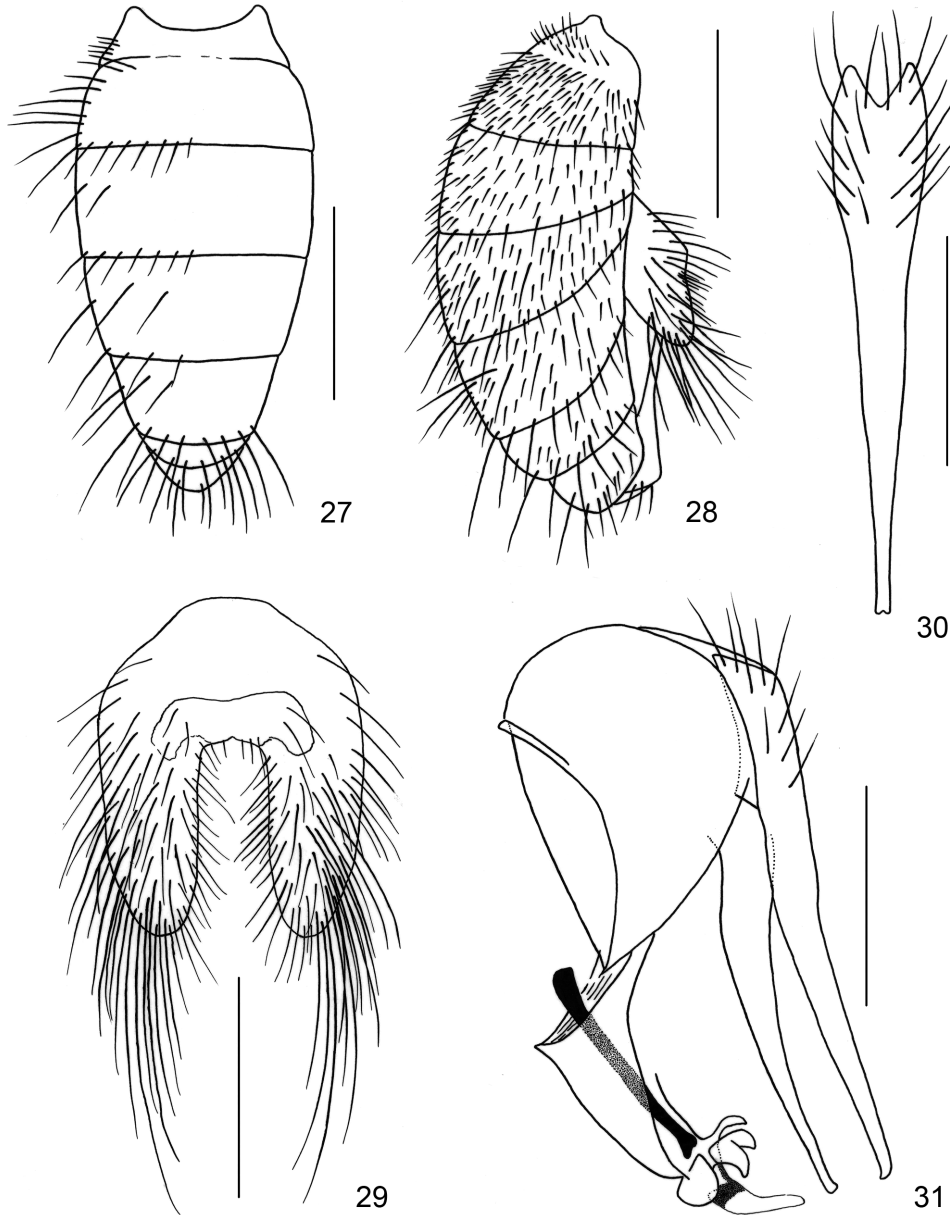
Holotype: China, Pianma town, Lushui county, Yunnan Province, 3153 m, 10. vii. 2009, collected by Wenxiu Dong.

Male: Body length 4.4–4.6 mm.

Head: Eye bare, lower posterior margin not concave; frons about half of head in width; frons and face black; lower margin of fronto-orbital plate, parafacial and gena with gold pruinosity; frontal vitta about 2.5 times as wide as fronto-orbital plate; frontal triangle reaching middle part of frons; lunule black brown, sparsely covered with grey pruinosity; ocellar seta short, as long as 4/5 of frons width; inner vertical seta about 5.0–6.0 times as long as outer vertical seta; 4 pairs of *fr*, the upper pair long and strong, lower pair short; orbital seta 1, slightly shorter than ocellar seta; parafacial at most equal to 2/5–1/2 of postpedicel width; antenna black; postpedicel about 2.5 times as long as broad, distal part of postpedicel rotundity; arista entirely covered with short hairs, the longest hairs subequal to basal diameter of arista; epistoma slightly projecting beyond frontal angle, frontal angle situated in front of vibrissal angle; gena about 1/3–2/5 of eye in height; genal hairs, epicephalon hairs and postgenal hairs black, occiput with green-grey pruinosity; prementum black and shining, about 3.5 times as long as broad; palpus black, at least equal to prementum length; labellum about 1.2 times as long as width of prementum.

Thorax: Ground colour black, lateral surface with green-grey pruinosity; anterior half of anepisternum with orange-grey pruinosity; scutum with orange-grey pruinosity; notopleuron with blue-grey pruinosity; scutellum black, lateral surface with blue-grey pruinosity; scutum with 3 black brown vittae, reaching posterior half of postscutum; 2 rows of *acr* as hairs; *dc* 1+3; posthumeral seta 1+0; *ial* 0+1; without *pra*; notopleuron bare; basal scutellar seta and apical scutellar seta large and long, lateral surface and ventral surface of scutellum bare; proepisternum and basisternum of prosternum concave in center;

anepimeron, meron and katepimeron bare; proepisternal setae 2; upper proepimeral setae 2; anterior anepisternal seta 1; anterior spiracle and posterior spiracle small, dark black; katepisternal setae placed as an isosceles triangle.



Figs 27–31. *Coenosia nigriceps* sp. n., male: 27 = dorsal view of abdomen, 28 = lateral view of abdomen, 29 = sternite 5 in ventral view, 30 = posterior view of cerci, 31 = terminalia in profile. Scales: 0.5 mm for Figs 29–31, 1 mm for Figs 27, 28.

Wings: Hyaline; veins brown; basicosta black, spinule row on costa distinct; costa reaching the tip of M; costal spine subequal in length to r-m; calypters yellowish; lower calypter short and strap-like, about 1/3 of upper calypter in length; haltere yellowish.

Legs: Black, fore tibia with 1 median *p*, long and large, about 2/5 of tibia in length; mid femur with a row of *av* and a row of *a* in basal 2/3, submedial *pv* long and large, about 1/5 of femur in length, median *pv* as long as femoral diameter, supramedial *pv* long, 1–2 short *pv* in basal part, 1 preapical *a*, slightly thin, 2 preapical *pd*; mid tibia with 1 median *ad*, long and large, 1 supramedial *pd*, longer than *ad*, about 1/3 of tibia in length, without *pv*; hind femur with *av* row in basal half, about 4–5, as long hairs, with *pv* row in basal 3/5, about 7–8, 4–5 in basal part as a fringe; hind tibia with 1 submedial *av*, 3 *ad*, 1 preapical *d*, 3 *pd*; apical part of tarsi not widened, fourth tarsomere shortened like a globe, tarsi shorter than tibiae; claws longer than pulvilli, about 5/6 of fifth tarsomere in length.

Abdomen: Ground colour black; long-oviform in dorsal view, lateral surface with blue-grey pruinosity, each tergite with dark grey pruinosity in posterior part, without distinct lateral spots, densely covered with short hairs on dorsal surface, lateral surface and ventral surface sparsely covered with long hairs; discal setae distinct; sternite 1 bare, sternite 5 situated on middle part of abdomen, distinctly projecting, lateral lobe with a long fringe, surstyli and cerci slender, surstyli slightly shorter than cerci in distal part, apical hook of surstyli bent backwards, postgonite with membranous lobe.

Female: Unknown.

Etymology: This species name refers to the black male frons.

Diagnosis: This species resembles *Coenosia yulongxueshanensis* Xue, 2005, but it differs by 4 pairs of *fr*, frontal vitta about 2.5 times as wide as fronto-orbital plate, distal part of postpedicel rotundity, arista entirely covered with short hairs, the longest hairs subequal to basal diameter of arista, *ial* 0+1, scutum with 3 black brown vittae, proepisternal setae 2, lower calypter short and strap-like, about 1/3 of upper calypter in length, fore tibia with 1 median *p*, mid tibia with 1 median *ad*.

DISTRIBUTION OF THE CHINESE COENOSIA MOLLICULA-GROUP

- C. albicornis* Meigen, 1826 – China: Liaoning Prov.; Europe; Russia.
C. ancyllocerca Xue, Wang et Zhang, 2006 – China: Liaoning Prov., Xiuyan county.
C. ansymmetrocerca Xue et Feng, 2000 – China: Sichuan Prov., Mt. Erlang.
C. brevicauda Pont, 2005 – Armenia.
C. conica Cui et Li, 1996 – China: Liaoning Prov.
C. octopunctata (Zetterstedt, 1838) – China: Shanxi Prov.; Europe; Russia, Siberia, the Far East; Nearctic region.
C. striolata Hennig, 1961 – China: Xinjiang Uygur Autonomous Region; Russian Far East.
C. unguligentilis Xue, Yang et Feng, 2000 – China: Sichuan Prov., Yaan City.
C. yulongxueshanensis Xue, 2005 – China: Yunnan Prov., Mt. Yulong Snow.
C. flavimixta Feng et Xue, 1998 – China: Fujian Prov., Hainan Prov., Sichuan Prov., Zhejiang Prov.
C. mollicula (Fallén, 1825) – China: Heilongjiang Province, Jilin Province, Liaoning Province, Shanxi Province, Shaanxi Province, Sichuan Province, Inner Mongolia Autonomous Region, Xinjiang Uygur Autonomous Region; Europe; Turkey; Kazakhstan; Kyrgyzstan; Mongolia; Russia, including the east of Siberia, Ural mountains; Nearctic region.

- Coenosia adrohalter* Xue et Wang, sp. n. – China: Lushui county, Yunnan Prov.
Coenosia albifronta Xue et Wang, sp. n. – China: Lushui county, Yunnan Prov.
Coenosia deciseta Xue et Wang, sp. n. – China: Mt. Liupan, Ningxia Prov.; Longde County, Ningxia Prov.
Coenosia latiaedeaga Xue et Wang, sp. n. – China: Mt. Emei, Sichuan Prov.
Coenosia nigriceps Xue et Wang, sp. n. – China: Lushui county, Yunnan Prov.

*

Acknowledgements – This study was supported by the National Nature Science Foundation of China (No. 31172139), and the Foundation of Experimental center of Shenyang Normal University (No. SY200609). Thanks are also offered to Professor Ming Fu Wang, Shu Chong Bai, Shuai Wang and Wen Xiu Dong for providing the examined materials.

REFERENCES

- CUI, Y. S. & LI, L. Z. (1996) Four new species of *Coenosia* from northeastern China (Diptera: Muscidae). *Entomologia Sinica* **3**(3): 213–220.
- EVENHUIS, N. L. & PONT, A. C. (2012) *Coenosia* Meigen, 1826 and *Coenosiinae* Verrall, 1888 (Insecta, Diptera, Muscidae): proposed conservation of usage of the genus-group and family-group names. *Bulletin of Zoological Nomenclature* **69**: 271–275.
- FALLÉN, C. F. (1825) *Monographia Muscidum Sveciae*. Part IX et ultima. Berling, Lundae, 90 pp.
- FAN, Z. D. (1992) *Key to the common flies of China*. 2nd ed. Science Press, Beijing, pp. 386–390.
- FENG, Y. & XUE, W. Q. (1998) Three new species of the Calyptratae from Sichuan, China (Diptera: Calliphoridae, Muscidae). *Zoological Research* **19**(1): 77–82.
- HENNIG, W. (1961–1962) Muscidae. Pp. 518–620. In: LINDER, E. (ed.): *Die Fliegen der palaearktischen Region*, 63b. Stuttgart, Schweizerbart.
- MEIGEN, J. W. (1826) *Systematische beschreibung der bekannten europäischen zweiflügeligen Insekten*. Schulz, Hamm, 220 pp.
- PONT, A. C., WERNER, D. & KACHVORYAN, A. A. (2005) A preliminary list of the Fanniidae and Muscidae (Diptera) of Armenia. *Zoology in the Middle East* **36**: 73–86.
- PONT, A. C. (1986) Family Muscidae. Pp. 57–215. In: Soós, Á & PAPP, L. (eds): *Catalogue of Palaearctic Diptera*. Vol. 11. Akadémiai Kiadó, Budapest.
- XUE, W. Q., SONG, W. H. & ZHENG, L. J. (2005) Three new species of the genus *Coenosia* from Yunnan Province, China (Diptera: Muscidae). *Chinese Journal of Pest Control* **21**(2): 118–121.
- XUE, W. Q. & FENG, Y. (2000) Two new species of *Coenosia albicornis*-group from Sichuan China (Diptera: Muscidae). *Acta Zootaxonomica Sinica* **25**(4): 454–457.
- XUE, W. Q., WANG, R. R. & ZHANG, D. (2006) Three new species of the family Muscidae (Diptera) of Liaoning Province, China. *The Pan-Pacific Entomologist* **82**(3–4): 311–319.
- XUE, W. Q., YANG, M. & FEN, Y. (2000) Two new species of the *Coenosia albicornis* group from China (Diptera: Muscidae). *Acta Entomologica Sinica* **43**(4): 417–420.
- ZETTERSTEDT, J. W. (1838) Sectio tertia. Diptera. Dipterologis Scandinaviae amicis et popularibus carissimus. In: *Insecta Lapponica*. L. Voss, Lipsiae, 693 pp.

Revised version received October 14, 2013, accepted December 27, 2013, published June 4, 2014