

A revision of the genus *Argyra* from China (Diptera: Empidoidea: Dolichopodidae)

DING YANG¹*and TOYOHEI SAIGUSA²

¹Department of Entomology, China Agricultural University, Haidian, Beijing 100094, China; e-mail: dyangcau@yahoo.com.cn

²7-1-402, Baikoen 2-Chome, Chuo-ku, Fukuoka, 810-0035 Japan

Key words. Diptera, Dolichopodidae, *Argyra*, new species, China

Abstract. The species of the genus *Argyra* Macquart from China are revised. The following 3 species are new to science: *Argyra* (*Argyra*) *serrata* sp. n., *A. (A.) pallipilosa* sp. n., *A. (A.) nigripilosa* sp. n.

INTRODUCTION

Representatives of the genus *Argyra* Macquart, 1834 are characterized by the following features: occiput slightly concave medially, head closely connected with thorax, propleuron with 1 pale bristle on upper portion, and hind coxa with 2–6 strong or weak vertical outer bristles. Thirtytwo species are known from the Palaearctic Region (Negrobov, 1991; Grichanov & Shamshev, 1993) and 4 from the Oriental Region (Dyte, 1975; Yang & Grootaert, 1999). Three species were known to occur in China: *A. vanoyei* Parent, 1927, *A. arrogans* Takagi, 1960, *A. sinensis* Yang et Grootaert, 1999.

In the present paper the species of the genus *Argyra* from China are revised. Based on material collected by the second author in Yunnan in 1996 and Shaanxi in 1997, 4 species are added to the fauna of China. Three of these species are described as new to science and 1 is recorded from China for the first time. The types are in the insect collection of China Agricultural University (CAU), Kunming Institute of Zoology, Kunming (KIZ), and the Saigusa's collection of Kyushu University (SKU).

The following abbreviations are used: acr-acrostichal, ad-anterodorsal, apv-apicoventral, av-anteroventral, dc-dorsocentral, h-humeral, ih-inner humeral, LI-fore leg, LII-mid leg, LIII-hind leg, npl-notopleural, oc-ocellar, pd-posterodorsal, ph-posthumeral, psa-postalar, pv-posteroventral, pvt-postvertical, sa-supraalar, su-sutural, vt-vertical.

Genus *Argyra* Macquart, 1834

Argyra Macquart, 1834: 456.

Type species. *Musca diaphana* Fabricius, 1775 (subsequent designation by Rondani, 1856).

Leucostola Loew, 1857: 39.

Type species. *Dolichopus vestita* Wiedemann, 1817 (by monotypy).

Diagnosis. Body middle- to large-sized; thorax and abdomen usually with silvery gloss in males, abdomen usually with yellow patches in females. Head closely connected with thorax; vertex somewhat excavated, occiput slightly concave medially; face of male rather narrow (distinctly narrower than first flagellomere), but that of female rather wide and nearly parallel-sided; frons rather wide, somewhat narrowing anteriorly. Ocellar tubercle distinct with 2 long oc and 2 very short posterior hairs; 1 long vt (absent in male) and 1 short pvt. Antennal scape bare in subgenus *Leucostola* and with dorsal hairs in subgenus *Argyra*; first flagellomere short to elongated; arista dorsal to subapical, arista with indistinct hairs. Proboscis and palpus rather small. Six strong dc, uni- or biseriate acr (rarely quadriseriate), 1 h, 1 ph, 1 ih, 1 su, 2 npl, 2 sa, 1 psa; scutellum with 2–3 pairs of bristles. Propleuron with 1 pale bristle on upper portion and 1–2 pale or black bristles on lower portion. Hind coxa with 2–6 weak or strong vertical outer bristles. Mid and hind femora usually without preapical bristle. Wing with M1 usually weakly bent medially, R4+5 and M1 slightly convergent apically. Male genitalia: Surstylus on epandrium short or long, with dorsal and ventral lobes separated; hypandrium long, aedeagus distinctly long and projected apically.

Key to species of *Argyra* from China

1. Antennal scape bare (subgenus *Leucostola*) 2
Antennal scape with dorsal hairs (subgenus *Argyra*) 3
2. Fore coxa with black hairs and bristles; mid tibia with 2 av; hypopygium with strong bristles. Zhejiang
..... *sinensis* Yang et Grootaert
- Fore coxa with yellow hairs and bristles; mid tibia without v; hypopygium without strong bristles. Shanghai
..... *vanoyei* Parent
3. Palpus yellow 4
Palpus black 6
4. Male fore tarsus modified with tarsomeres 2-4 shortened and thickened 5

* Temporary address: Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, 4-2-1 Ropponmatsu, Chuo-ku, Fukuoka, 810-8560 Japan.

- Male fore tarsus normal; only fore coxa with yellow hairs and bristles. Shaanxi *serrata* sp. n.
5. All coxae with yellow hairs and bristles; hind femur with dark brown tip; first flagellomere slightly long (2.5–3.0 times longer than wide). Yunnan *pallipilosa* sp. n.
- All coxae with black hairs and bristles; hind femur wholly yellow; first flagellomere slightly short (2.1 times longer than wide). Yunnan *nigripilosa* sp. n.
6. M1 with weak bend; squama with yellowish hairs. Zhejiang *arrogans* Takagi
- M1 with strong Z-bend; squama with black hairs. Yunnan .. *pseudosuperba* Hollis

***Argyra (Argyra) serrata*, sp. n.**

(Figs 1–3)

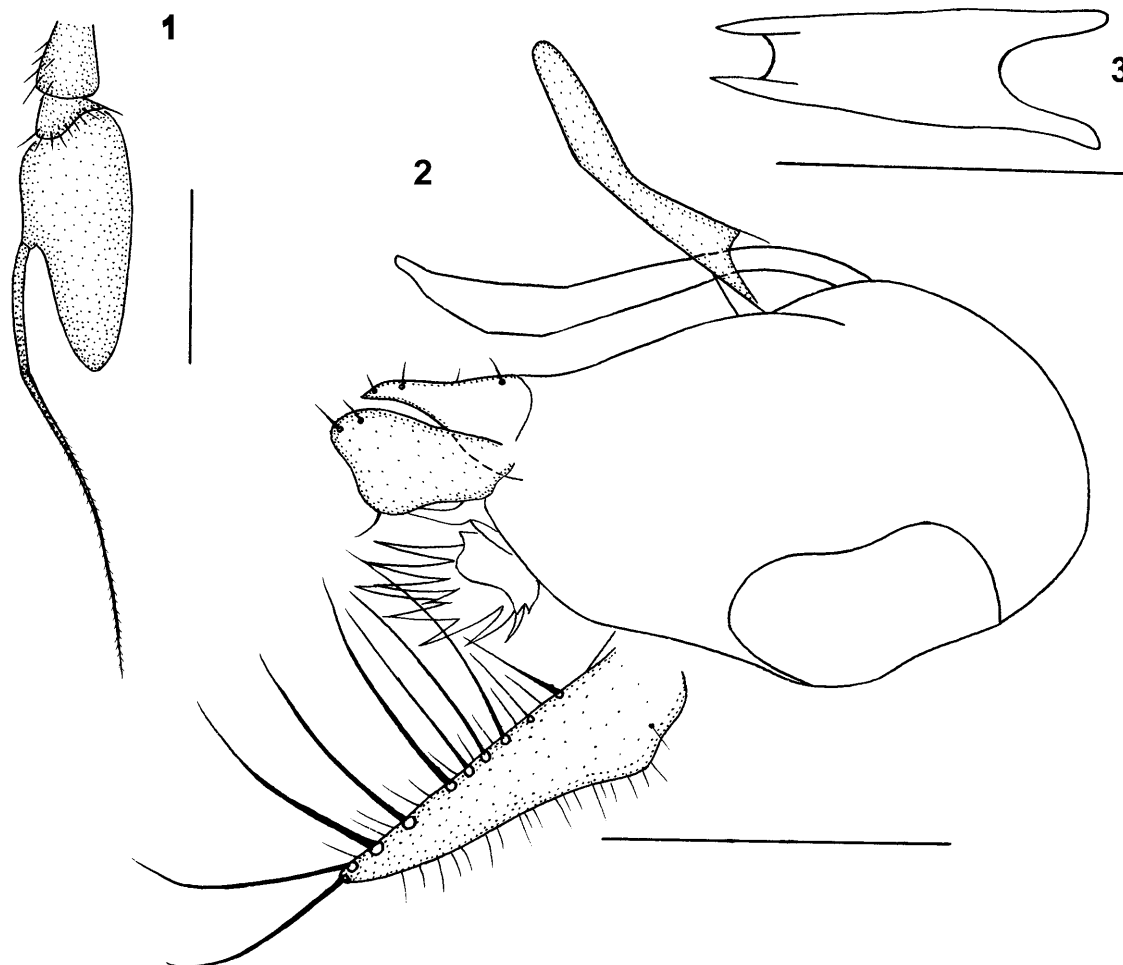
Diagnosis. Abdomen wholly metallic green. Palpus yellowish. First flagellomere rather large and distinctly elongated (2.4 times longer than wide); arista subdorsal. Fore coxa with yellow hairs and bristles; mid and hind coxae with black hairs and bristles.

Male. Body length 2.8–3.7 mm, wing length 3.3–3.9 mm.

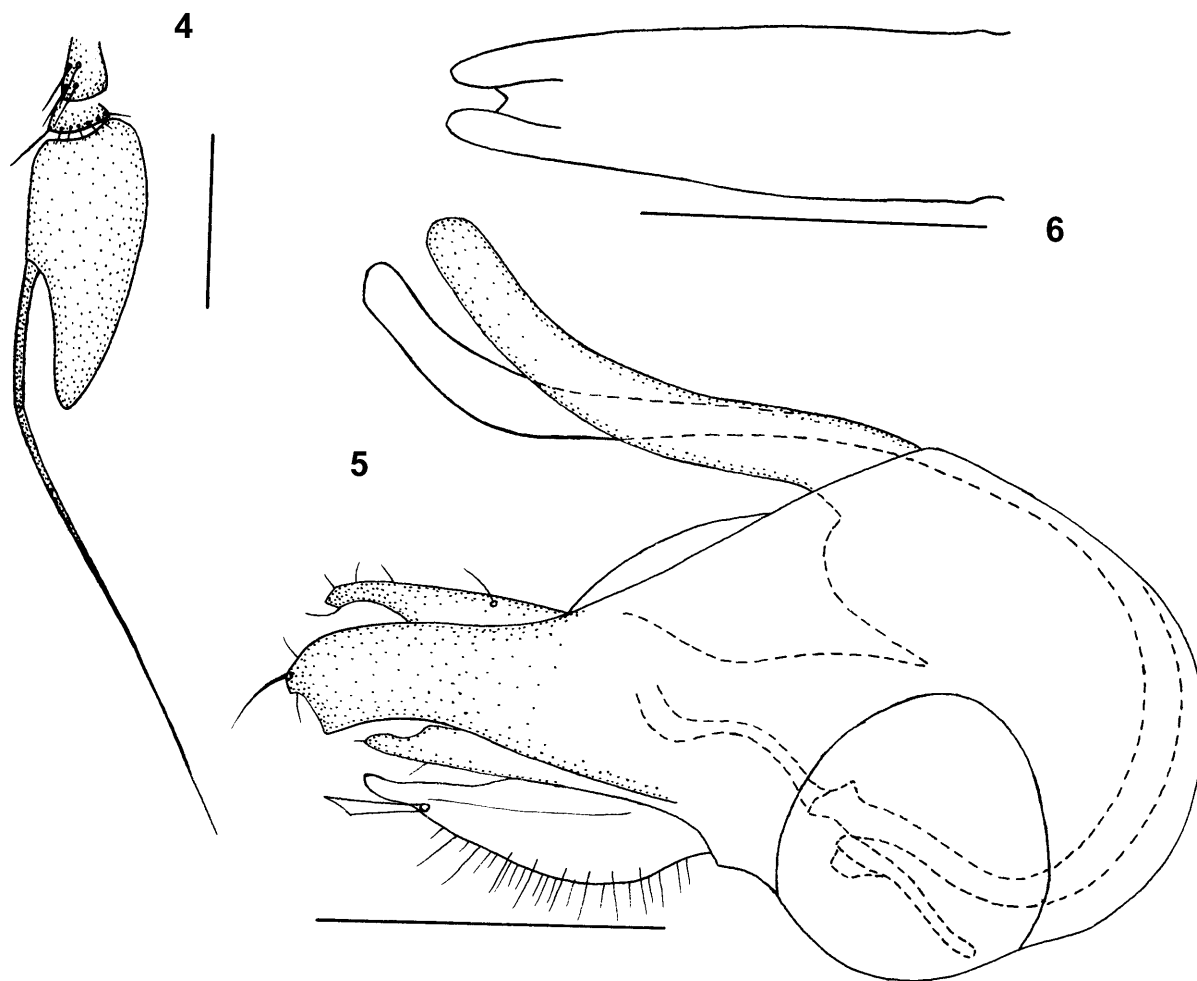
Head metallic green with pale grey powder; frons and face with dense silvery white powder. Hairs and bristles

on head black; middle and lower postocular bristles (including ventral hairs) yellow. Ocellar tubercle distinct, with 2 long strong oc and 2 very short posterior hairs. Antenna (Fig. 1) black; scape with black dorsal hairs; first flagellomere rather large and distinctly elongated (2.4 times longer than wide), somewhat acute apically; arista subdorsal, black, with basal segment 0.45 times as long as apical segment. Proboscis black with black hairs; palpus yellowish with dense white pollen, and with yellow hairs and 1 yellow apical bristle.

Thorax metallic green with pale grey powder; mesonotum and scutellum brilliant metallic green, pleuron with dense powder. Hairs and bristles on thorax black; 6 strong dc, 6–7 irregularly paired acr (two rows somewhat close); 1 long h and 2 very short humeral hairs, 1 long ph, 1 long ih, 1 short su, 2 long npl, 2 sa (anterior sa slightly short), 1 long psa; scutellum with 2 pairs of bristles, outer pair short and as long as 1/2 of inner pair. Propleuron with 1 yellow bristle on upper portion, 1 short yellow hair and 1 yellow bristle on lower portion. Legs yellow; mid coxa or mid and hind coxae basally tinged with brown; tarsi from tip of tarsomere 1 onward brownish yellow to brown. Hairs and bristles on legs black; fore coxa with yellow hairs and bristles (1 anterior



Figs 1–3: *Argyra (Argyra) serrata*, sp. n. (male). 1 – antenna, lateral view; 2 – genitalia, lateral view; 3 – hypandrium, ventral view. Scale 0.25 mm.



Figs 4–6: *Argyra (Argyra) pallipilosa*, sp. n. (male). 4 – antenna, lateral view; 5 – genitalia, lateral view; 6 – hypandrium, ventral view. Scale 0.25 mm.

bristle near apex and 5 thick and thin apical bristles), mid coxa with 2 anterior bristles, hind coxa with 1 long and 1 distinctly short outer bristles. Mid femur with 1 preapical bristle. Fore femur with long postero-ventral hairs (which are yellow but apically black). Fore tibia with 3 ad, 2 pd and long posteroventral hairs, apically with 2 bristles; mid tibia with 3 ad, 2 pd, 2 av and 1–2 pv, apically with 4 bristles; hind tibia with 3 ad, 5 pd, 1 av and 3 pv, apically with 5 bristles. Relative lengths of tibia and 5 tarsomeres LI 2.2 : 1.5 : 0.65 : 0.55 : 0.45 : 0.4; LII 2.8 : 1.8 : 0.75 : 0.55 : 0.4 : 0.3; LIII 4.0 : 1.2 : 1.3 : 0.7 : 0.5 : 0.3. Wings slightly greyish; veins blackish, M1 weakly bent medially, R4+5 and M1 weakly convergent apically; CuAx ratio 0.45. Squama yellow with brown margin, with yellowish hairs. Halter yellow.

Abdomen metallic green with thin grey powder except tergum 1 with dense powder. Hairs and bristles on abdomen black; terga 1–3 with yellow hairs laterally. Sternum 8 with 2 bristles. Male genitalia (Figs 2–3): Surstylus on epandrium with dorsal lobe rather wide apically, and ventral lobe acute apically; cercus long finger-like, somewhat acute apically; hypandrium long and

slightly bent medially; aedeagus thick and curved apically.

Female. Unknown.

Holotype. Male, Shaanxi: Fuping, Dadianzi (1650–1800 m), 5 km N of Donghetai, 1997. VI. 26, T. Saigusa (CAU). Paratype: 1 male, same data as holotype (SKU).

Distribution. China (Shaanxi).

Etymology. The specific name refers to the serrate apical genital process.

Remarks. The new species is somewhat similar to *Argyra (Argyra) skuffini* Negrobov, 1965 from Russia in having the rather large and elongated first flagellomere, but may be separated from the latter by having a subdorsal arista and male cercus with long bristles on ventral margin. In *skuffini*, the arista is subapical, and the male cercus has no long bristles (Negrobov, 1965). It can be easily separated from *Argyra (Argyra) arrogans* Takagi and its related species from Asia by its long first flagellomere with subdorsal arista, yellow palpus and abdomen without yellow spots (Takagi, 1960; Hollis, 1964).

***Argyra (Argyra) pallipilosa*, sp. n.**

(Figs 4–6)

Diagnosis. Abdomen wholly metallic green. Palpus yellow. First flagellomere 2.5–3.0 times longer than wide; arista subdorsal. Hind femur with dark brown tip. All coxae with yellow hairs and bristles. Fore tarsomeres 2–4 distinctly shortened and thickened.

Male. Body length 4.4–5.1 mm, wing length 3.9–4.3 mm.

Head metallic green with pale grey powder; frons and face with dense silvery white powder, face rather narrow (distinctly narrower than first flagellomere). Hairs and bristles on head black; middle and lower postocular bristles (including ventral hairs) yellow. Ocellar tubercle distinct, with 2 long strong oc and 2 very short posterior hairs. Antenna (Fig. 4) black; scape with black dorsal hairs; first flagellomere distinctly elongated (2.5–3.0 times longer than wide), somewhat acute apically; arista subdorsal, black, with basal segment 0.3 times as long as apical segment. Proboscis black with black hairs; palpus yellow, white powdery, with 2 long black hairs and 1 black apical bristle.

Thorax metallic green with pale grey powder; pleuron with dense powder, mesonotum and scutellum brilliant metallic green. Hairs and bristles on thorax black; 6 strong dc, 3 irregularly paired acr (two rows somewhat close); 1 long h and 2 distinct humeral hairs, 1 long ph, 1 long ih, 1 slightly short su, 2 long npl, 2 sa (anterior sa short), 1 long psa; scutellum with 2 pairs of bristles, outer pair short and as long as 1/2 of inner pair. Propleuron with 1 yellow bristle on upper portion, 1 short yellow hair and 1 long blackish bristle on lower portion. Legs yellow; fore coxa yellow, mid and hind coxae (except narrow apex) black; tip of hind femur dark brown; tarsi from tip of tarsomere 1 onward brown to dark brown. Hairs and bristles on legs black; all coxae with yellow hairs and bristles, fore coxa with 2 anterior bristles near apex and 5–6 thick or thin apical bristles, mid coxa with 2 anterior bristles, hind coxa with 1 long and 1 distinctly short outer bristles. Fore femur (except apex), mid femur (except apical half) and hind coxa basally with yellow ventral hairs; fore femur with long yellow hairs on posterior surface except apex which bears long black hairs on posterior surface. Fore tibia with 1 ad and 2 pd, apically with 2 bristles; mid tibia with 3 ad, 2 pd and 2 av, apically with 4 bristles; hind tibia with 1 ad, 6 pd and 2 short av, apically with 4 bristles. Fore tarsomeres 2–4 distinctly shortened and thickened; tarsomere 2 with distinct ventral hairs, tarsomeres 3–4 with very short thin pubescence. Relative lengths of tibia and 5 tarsomeres LI 2.9 : 1.7 : 0.45 : 0.4 : 0.25 : 0.25; LII 3.6 : 2.4 : 1.0 : 0.65 : 0.4 : 0.3; LIII 5.0 : 1.7 : 1.65 : 0.9 : 0.5 : 0.25. Wings distinctly tinged greyish brown; veins blackish, M1 slightly bent medially, R4+5 and M1 weakly convergent apically; CuAx ratio 0.5. Squama brownish yellow with dark brown margin, with yellowish hairs. Halter yellow.

Abdomen metallic green with thin grey powder except tergum 1 and base of tergum 2 with dense powder. Hairs and bristles on abdomen black; terga 1–4 with yellow hairs laterally. Sternum 8 with 2 bristles. Male genitalia (Figs 5–6): Surstylus on epandrium with wide dorsal lobe

bearing weak incision apically, and narrow ventral lobe somewhat acute apically; cercus with finger-like sclerotized apical process; hypandrium long and slightly bent, with narrow apical incision; aedeagus curved apically.

Female. Unknown.

Holotype. Male, Yunnan: Yunlong, Zhichang (2400 m), 1996. VI. 7, T. Saigusa (KIZ). Paratype: 1 male, Yunnan: Yunlong, 3 km NNW of Zhichang (2500–2600 m), 1996. VI. 5, T. Saigusa (SKU).

Distribution. China (Yunnan).

Etymology. The specific name refers to the pale hairs and bristles on coxae.

Remarks. The three new species of the subgenus *Argyra* (*Argyra*) described in the present paper are more closely related to *Argyra* (*Argyra*) *skuffini* Negrobov in having an elongated first flagellomere, but differ from the latter in having subdorsal arista. Among them, *Argyra* (*Argyra*) *pallipilosa* is a sister species of *Argyra* (*Argyra*) *nigripilosa* as it has a modified fore tarsus and cercus, but is easily separated from the latter by the yellow hairs and bristles on the coxae, hind femur with dark brown tip, and the first flagellomere long (2.5–3.0 times longer than wide).

Argyra (*Argyra*) *nigripilosa*, sp. n.

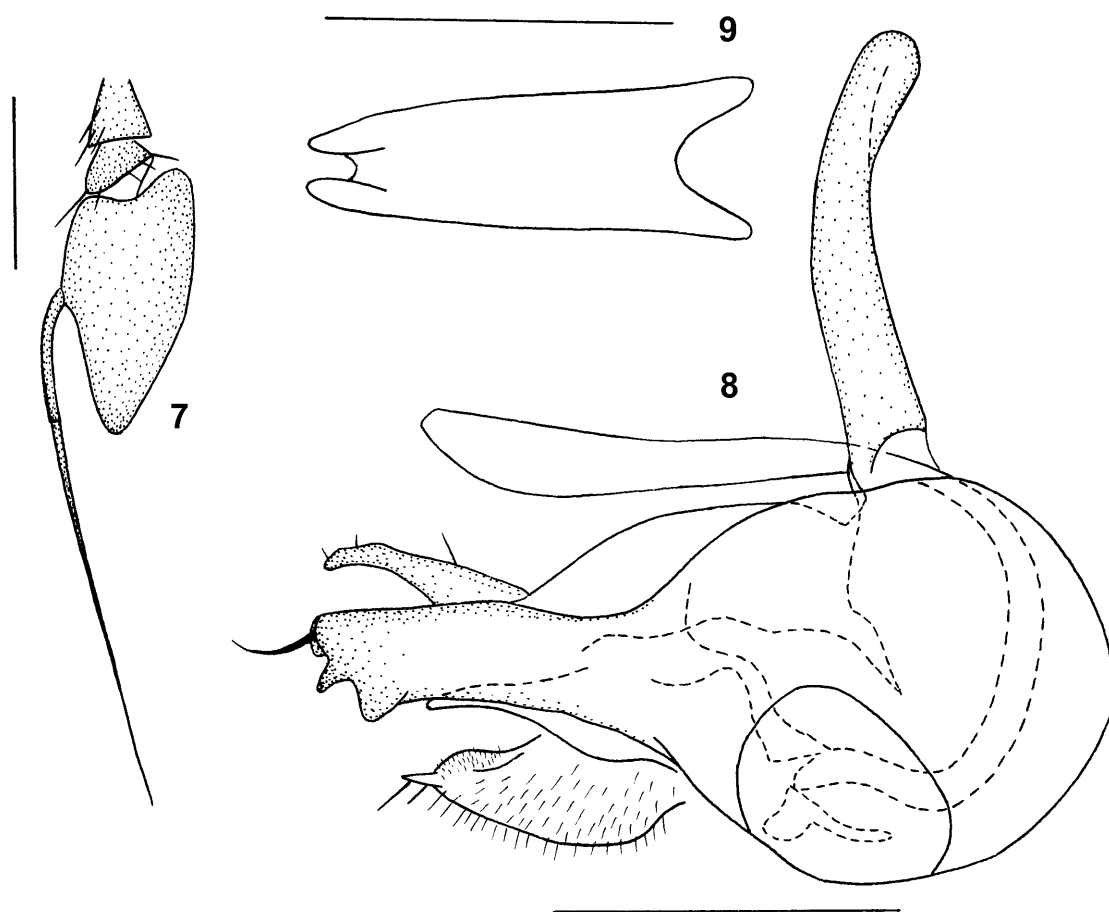
(Figs 7–9)

Diagnosis. Abdomen wholly metallic green. Palpus yellow. First flagellomere 2.1 times longer than wide; arista subdorsal. All coxae with black hairs and bristles. Fore tarsomeres 2–4 distinctly shortened and thickened.

Male. Body length 3.1–4.4 mm, wing length 3.3–3.9 mm.

Head metallic green with pale grey powder; frons and face with dense silvery white powder, face rather narrow (distinctly narrower than first flagellomere). Hairs and bristles on head black; middle and lower postocular bristles (including ventral hairs) yellow. Ocellar tubercle weakly raised, with 2 long strong oc and 2 very short posterior hairs. Antenna (Fig. 7) black; scape with black dorsal hairs; first flagellomere distinctly elongated (2.1 times longer than wide), somewhat acute apically; arista subdorsal, black, with basal segment 0.3 times as long as apical segment. Proboscis black with black hairs; palpus yellow, white pollinose, with 1 black distinct hair and 1 black apical bristle.

Thorax metallic green with pale grey powder; pleuron with dense powder, mesonotum and scutellum slightly brilliant metallic green with grey powder. Hairs and bristles on thorax black; 6 strong dc, 3–4 irregularly paired acr (two rows somewhat close); 1 long h and 1 distinct humeral hair, 1 long ph, 1 long ih, 1 short su, 2 long npl, 2 sa (anterior sa short), 1 long psa; scutellum with 2 pairs of normal bristles (outer pair short and as long as 1/3 of inner pair) and 1 pair of short apical hairs between them. Propleuron with 1 yellow bristle on upper portion, 1 short yellow hair and 1 black bristle on lower portion. Legs yellow; fore coxa yellow, mid and hind coxae (except narrow apex) blackish to black; tarsi from tip of tarsomere 1 onward brown to dark brown. Hairs and bristles



Figs 7–9: *Argyra (Argyra) nigripilosa*, sp.n. (male). 7 – antenna, lateral view; 8 – genitalia, lateral view, 9 – hypandrium, ventral view. Scale 0.25mm.

on legs black; all coxae with black hairs and bristles, fore coxa with 2 anterior bristles near apex and 4–5 thick or thin apical bristles, mid coxa with 2 anterior bristles, hind coxa with 1 long and 1 slightly short outer bristles. Femora without yellow ventral hairs. Fore tibia with 1 ad and 2 pd, apically with 2 bristles; mid tibia with 3 ad, 2 pd and 1 av, apically with 3–4 bristles; hind tibia with 2 ad, 5 pd and 2–3 av, apically with 3 bristles. Fore tarsomeres 2–4 distinctly shortened and thickened; tarsomere 2 with distinct ventral hairs, tarsomeres 3–4 with very short thin pubescence. Relative lengths of tibia and 5 tarsomeres LI 2.5 : 1.5 : 0.4 : 0.3 : 0.25 : 0.25; LII 3.2 : 2.1 : 0.8 : 0.6 : 0.35 : 0.25; LIII 4.5 : 1.3 : 1.35 : 0.85 : 0.5 : 0.3. Wings tinged greyish brown; veins blackish, M1 slightly bent medially, R4+5 and M1 weakly convergent apically; CuAx ratio 0.55. Squama yellow with dark brown margin, with yellowish hairs. Halter yellow.

Abdomen wholly metallic green with thin grey powder except tergum 1 and base of tergum 2 with dense powder. Hairs and bristles on abdomen black; only tergum 1 with yellow hairs laterally. Sternum 8 with 2 bristles. Male genitalia (Figs 8–9): Surstylus on epandrium with wide dorsal lobe bearing a finger-like apical process, and narrow ventral lobe somewhat acute apically; cercus with acute thin apical process; hypandrium long and slightly bent, with narrow apical incision; aedeagus thick apically.

Female. Unknown.

Holotype. Male, Yunnan: Luchun, 7–8 km E of Luchun (1900–2000 m), 1996. V. 31, T. Saigusa (KIZ). Paratype: 1 male, Yunnan: Yongping, Meihuapu (2300 m), 83 km from Xiaoguan, 1996. VI. 4, T. Saigusa (SKU).

Distribution. China (Yunnan).

Etymology. The specific name refers to the black hairs and bristles on coxae.

Remarks. This species is very similar to *Argyra (Argyra) pallipilosa* sp. n., but may be separated from the latter by the black hairs and bristles on all coxae, hind femur wholly yellow, and first flagellomere short (2.1 times longer than wide).

***Argyra (Argyra) pseudosuperba* Hollis, 1964**

Argyra pseudosuperba Hollis, 1964: 100.

Type locality. Nepal.

Specimens examined. 1 female, Yunnan: Luchun, 7–8 km E of Luchun (1900–2000 m), 1996. V. 31, T. Saigusa; 1 female, Yunnan: Pingbian, Daweishan (1800–2000 m), 1996. V. 24, T. Saigusa.

Distribution. China (Yunnan); India, Nepal.

Remarks. This species is recorded from China for the first time. It was originally described by Hollis (1964) on the basis of 2 females, its male is still unknown. It can be easily identified and distinguished from other species of

the genus by the following features: 4-seriate acr, mesonotum and scutellum with supplementary hairs on disc, scutellum with two pairs of strong bristles subequal in length, and M1 with a strong Z-bend.

ACKNOWLEDGEMENTS. The first author is indebted to Profs. H. Shima and O. Yata (Kyushu University, Fukuoka) for their generous help. The second author is very grateful to Prof. Jiang Xiong (Institute of Zoology, Kunming) for his various assistance during the survey of Yunnan in 1996 and Dr. Wenxia Zhang (Beijing University, Beijing) for her kind assistance during the survey of the Qinling Mountain in Shaanxi in 1997. Thanks are also due to two anonymous reviewers for their critical comments on the manuscript. The research was funded by the Japanese Society for the Promotion of Science via Post-doctoral Fellowships for Foreign Researchers to DY, a Grant-in-Aid for Field Research of the Monbusho International Science Research Program, Japan (No. 07041141) and the National Natural Science Foundation of China (No. 30070100). The present paper is contribution No. 78 from the Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University.

REFERENCES

- DYTE D.E. 1975: Family Dolichopodidae. In: Delfinado M.D. & Hardy D. E. (eds): *A catalog of the Diptera of the Oriental region* 2. The University Press of Hawaii, Honolulu, pp. 212–258.
- GRICHANOV I.Y. & SHAMSHEV I.V. 1993: *Argyra* (Leucostola) *negrobovi* sp. n. from the Far East of Russia (Diptera: Dolichopodidae). *Dipterol. Res.* **4**: 191–194.
- HOLLIS D. 1964: On the Diptera of Nepal (Stratiomyidae, Therevidae and Dolichopodidae). *Bul. Brit. Mus. (Nat. Hist.) Entomol.* **15**: 81–116.
- LOEW H. 1857: Neue Beiträge zur Kenntniss der Dipteren. Fünfter Beitrag. *Programm K. Realschule zu Meseritz* 1857: 1–56.
- MACQUART J. 1834: *Histoire naturelle des Insectes. Diptères* 1: 1–578. (In Roret N.E. (ed.): *Collection des suites à Buffon*, Paris.)
- NEGROBOV O.P. 1965: New and little-known Dolichopodidae (Diptera) in the fauna of the Soviet Union. *Entomol. Obozr.* **44**: 438–446. [in Russian]
- NEGROBOV O.P. 1991: Family Dolichopodidae. In: Soos A. & Papp L. (eds): *Catalogue of Palaearctic Diptera* 7. Akadémiai Kiadó, Budapest, pp. 11–139.
- PARENT O. 1927: Dolichopodides nouveaux de l'extrême orient paléarctique. *Encyclopedie Entomologique (B II) Diptera* 3: 111–149.
- RONDANI C. 1856: *Dipterologiae Italicae Prodromus. Genera Italica Ordinis Dipteriorum Ordinatum Disposita et Distincta et in Familias et Stripes Aggregata* 1. Parmae, 228 pp.
- TAKAGI S. 1960: Descriptions of two new species of *Argyra* occurring in Japan (Diptera: Dolichopodidae). *Insecta Matsu-murana* **23**: 121–125.
- YANG D. & GROOTAERT P. 1999: New and little known species of Dolichopodidae from China (V). *Bull. Inst. R. Sci. Nat. Belgique Entomol.* **69**: 215–232.

Received August 29, 2000; revised March 21, 2001; accepted August 17, 2001