The Nearctic species of *Saotis* Förster, 1869 (Hymenoptera: Ichneumonidae: Ctenopelmatinae)

Неарктические виды рода *Saotis* Förster, 1869 (Hymenoptera: Ichneumonidae: Ctenopelmatinae)

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Sixteen North American species of the genus *Saotis* Förster, 1869 are reviewed. Most of them have Holarctic distribution. Four new species of this genus are described: *S. erythropleura* **sp. nov.**, *S. rufigaster* **sp. nov.**, *S. tinctor* **sp. nov.** and *S. truncator* **sp. nov.** The Nearctic subspecies of four Holarctic species are described and redescribed: *S. brevispina lissor* **subsp. nov.**, *S. granulator albator* **subsp. nov.**, *S. renovata rufipes* **subsp. nov.** and *S. pygidiator nearctor* Kasparyan, 2009. A key to the Nearctic species of *Saotis* is given. The status of the European *Iskarus* Kolarov, 1987 as a monotypic subgenus of the genus *Saotis* is justified due to peculiarities in structure of its ovipositor.

Ревизованы шестнадцать североамериканских видов рода *Saotis*; большинство из них – голарктические. Описаны четыре новых вида: *Saotis erythropleura* **sp. nov.**, *S. rufigaster* **sp. nov.**, *S. tinctor* **sp. nov.** и *S. truncator* **sp. nov.** Также описаны и переописаны неарктические подвиды четырех голарктических видов: *S. brevispina lissor* **subsp. nov.**, *S. granulator albator* **subsp. nov.**, *S. renovata rufipes* **subsp. nov.** и *S. pygidiator nearctor* Kasparyan, 2009. Составлен ключ для неарктических видов рода *Saotis*. Подтвержден статус *Iskarus* Kolarov, 1987 как европейского монотипического подрода *Saotis* на основании особенностей строения яйцеклада.

Key words: Holarctic, Nearctic, ichneumon-flies, Hymenoptera, Ichneumonidae, Ctenopelmatinae, *Saotis*, new species, new subspecies

Ключевые слова: Голарктика, Неарктика, настоящие наездники, Hymenoptera, Ichneumonidae, Ctenopelmatinae, *Saotis*, новые виды, новые подвиды

INTRODUCTION

Saotis Förster is a moderately large Holarctic genus containing about 25 species (Yu & Horstmann, 1997; Kasparyan & Kopelke, 2010). Most of the species are connected trophically with gall-forming sawflies of the genera *Pontania* Costa, 1859 and *Phyllocolpa* Benson, 1960 (Tenthredinidae, Nematinae) on Salix L. (Salicaceae). Palaearctic fauna of the genus that includes 21 species classified in 12 species groups was recently reviewed and keyed, and original data on 29 species of hosts of *Saotis* were given (Kasparyan & Kopelke, 2010). Only two species, *Saotis mellipes* (Provancher, 1874) and *S. clypeata* Ashmead, 1902, were described from North America. One Nearctic subspecies of a Holarctic species, *S. pygidiator nearctor* Kasparyan, 2009, has been described recently. Three species, *S. granulator* Kasparyan & Kopelke, 2010, *S. morleyi* Fitton, 1976, and *S. subarctor* Kasparyan & Kopelke, 2010 are recorded for America in the revision of the Palaearctic *Saotis* fauna (Kasparyan & Kopelke, 2010). Four new species of *Saotis* are described in this paper: *S. erythropleura* **sp. nov.**, *S. rufigaster*

sp. nov., *S. tinctor* **sp. nov.** and *S. truncator* **sp. nov.** Seven Holarctic species are recorded in North America for the first time; three of them are represented by new geographical forms (*S. brevispina lissor* **subsp. nov.**, *S. granulator albator* **subsp. nov.** and *S. renovata rufipes* **subsp. nov.**).

MATERIAL AND METHODS

The paper is based on specimens from Zoological Institute of the Russian Academy of Sciences (St. Petersburg, Russia; ZIN). Additional material was borrowed from the American Entomological Institute (Gainesville, Florida, USA, curator D. Wahl; AEI), the Canadian National Collection (Ottawa, curator A. Bennett; CNC), the National Museum of Natural History (Washington, USA, curator R. Carlson; NMNH). Type specimens were also examined from Museums of Lund University (Sweden, curator R. Danielsson; Mus. Lund), the Forschungsinstitut Senckenberg (Frankfurt-am-Main, Germany, curator J.-P. Kopelke; SMF), the Natural History Museum (London, UK, curator G. Broad; BNHM, National Museums of Scotland (Edinburgh, UK, curator M. Shaw, NMS), collection of R. Hinz in Zoologische Sammlung des Bayerischen Staates (Munich, Germany, curators E. Diller, S. Schmidt; Mus. Munich), collections of R. Jussila in Turku University (Finland; Mus. Turku), and W. Hellén in Zoological Museum in Helsinki (Finland, curator A. Albrecht; Mus. Helsinki).

The basic morphometric characters and their abbreviations used in the descriptions of species groups, species and in the key are listed below: *i.fl* – index flagellaris, ratio of length of first and second flagellomeres combined to eye height (longitudinal diameter); *i.gen* – index genalis, ratio of minimum length of malar space ("gena") to basal width of mandibles; *i.terg* – index tergalis, ratio of length of first metasomal tergite to its maximum width; *i.nrv* – index nervellaris, ratio of length of lower (posterior) section of hind wing nervellus to its entire length; *i.fem* – index femoralis, ratio of length to width of hind femur (in lateral view); *i.tars* – ratio of lengths of segments of hind tarsus. Most important apomorphies are given in *italics*, the names of American species in species group descriptions are given in **boldface** font.

TAXONOMY

Order **HYMENOPTERA**

Family **ICHNEUMONIDAE**

Subfamily CTENOPELMATINAE

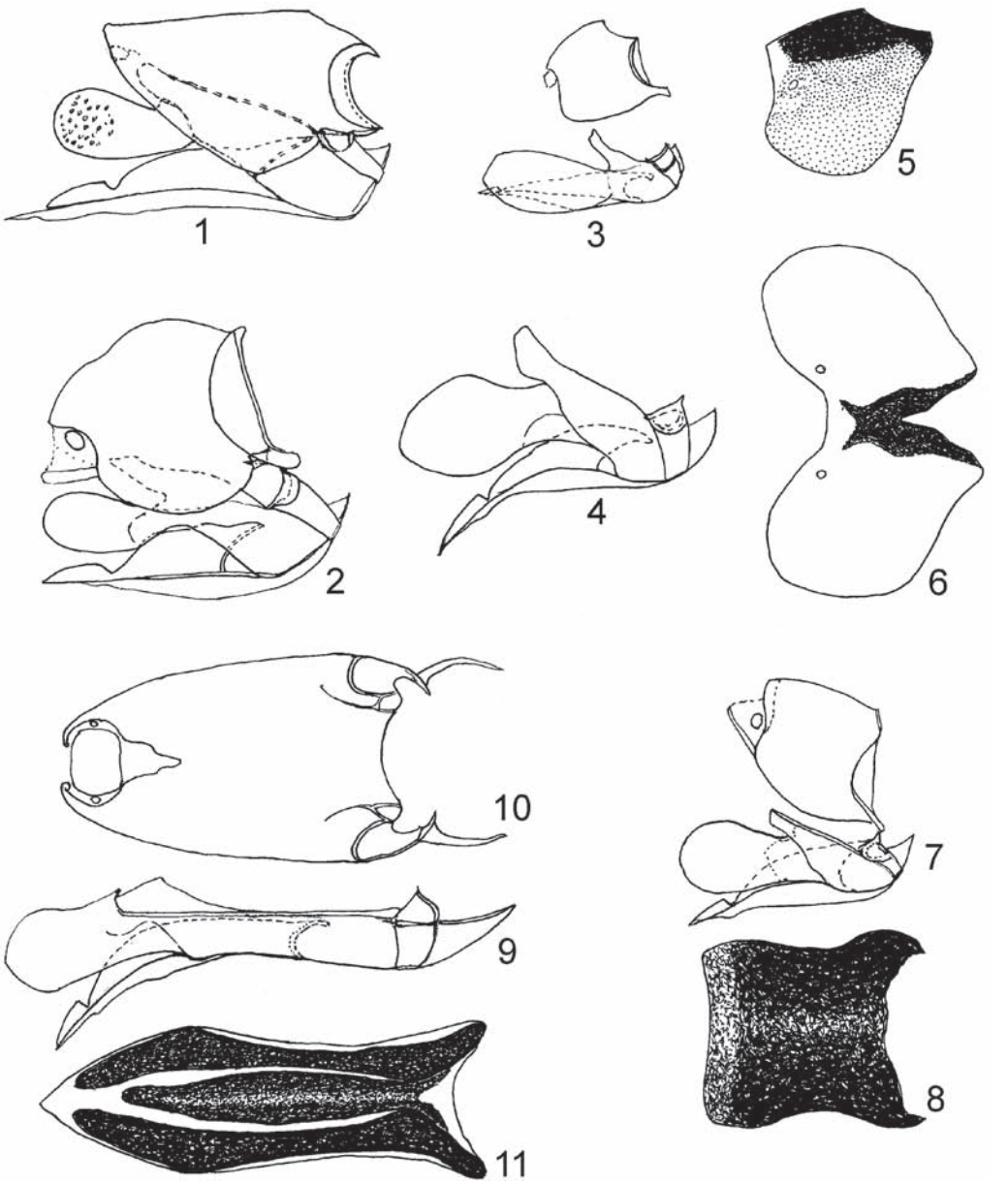
Genus ***Saotis*** Förster, 1869

Type species *Mesoleius* (*Saotis*) *brevispina* Thomson, 1883, designated by Viereck, 1914.

Saotis: Dalla Torre, 1902: 272 (catalogue, bibliogr.); Schmiedeknecht, 1914: 2807–2820 (key, descriptions of species); Townes, 1970 (description of genus); Yu & Horstmann, 1997: 436–437 (catalogue, bibliogr.); Kasparyan & Shaw, 2003: 351–355 (key; =*Iskarus*); Kasparyan & Khalaim, 2007: 547–551 (key); Kasparyan & Kopelke, 2010: 234–265 (review of 20 Palaearctic species).

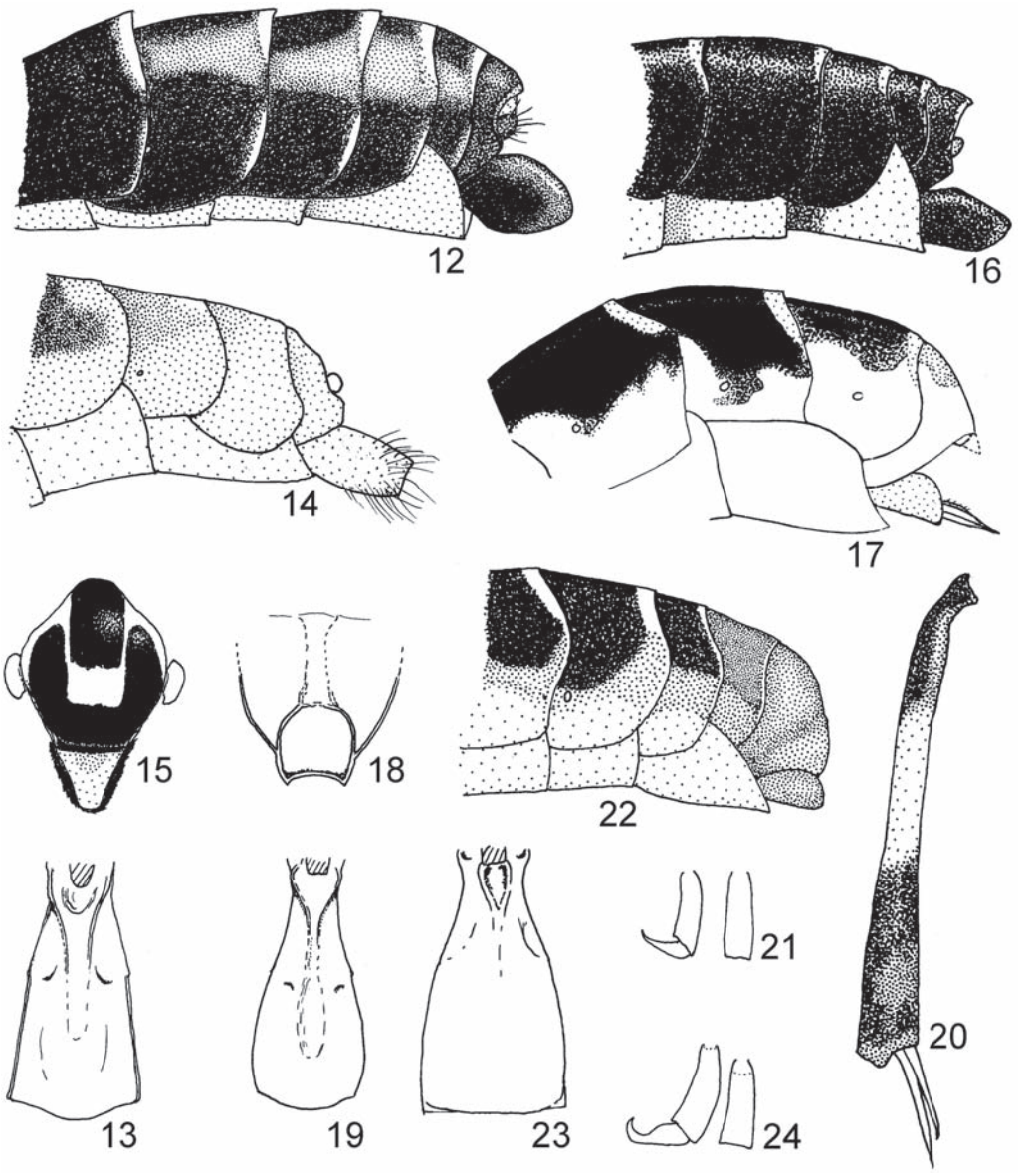
Iskarus Kolarov, 1987: 70; type species *Iskarus seleuciformis* Kolarov, 1987 (= *Saotis mirabilis* Schmiedeknecht, 1914).

Species of the genus may easily be distinguished by a strongly compressed abdomen of female and the ovipositor sheath short and broad (Figs 1–4, 12, 14, 16, 17, 28, 29, etc.). The body is about 4–6 mm long (up to 15 mm in *S. mirabilis*); fore wings are without areolet. This is a relatively small Holarctic genus with about twenty-five species, nineteen of them are described from Europe and one from Greenland. Nearctic fauna includes sixteen species, but most of them (eleven species) are Holarctic. Most of data on the hosts refer to gall-making nematine sawflies of the genera *Pontania* and *Phyllocolpa* (Tenthredinidae: Nematinae). One species, *S. albionis* Kasparyan, 2007, is reared in Finland from a larva of *Pontopristia amentorum* (Förster, 1854), a nematine habitant in catkins of Salix.



Figs 1–11. *Saotis*, ovipositor and pregenital segments of female. **1–5**, ovipositor and tergite 8, lateral view (**1**, *S. clypeata*; **2**, *S. tricolor*; **3**, *S. subarctor*; **4**, *S. pygidiator*, ovipositor only; **5**, *S. granulator granulator*); **6**, *S. subarctor*, tergite 7, lateral view; **7**, *S. brevispina lissor* **subsp. nov.**, tergite 7, dorsal view; **8**, *S. granulator*, sternite 6, ventral view; **9–11,** *S. mirabilis* (**9**, ovipositor, lateral view; **10**, tergite 8, dorsal view; **11**, sternite 6, ventral view).

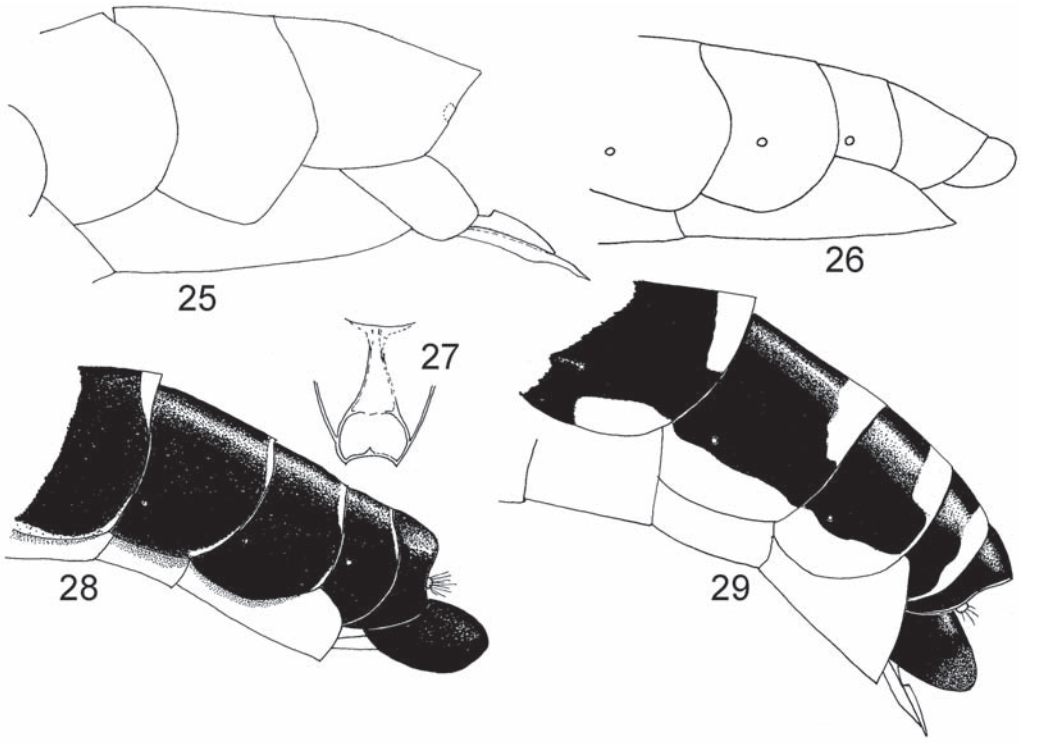
Structure of ovipositor (Figs 1–4, 7) is rather typical for the genus (except for *S. mirabilis*). The most noticeable peculiaritiy is a broad oval ovipositor sheath (third valva) which is only 1.5–2.0 as long as wide. Another noticeable structure is a long dorsoposterior apodema "Chitinlappen" (terminology of Oeser (1961)) of second valvifer. Similar



Figs 12–24. *Saotis*, female. **12**, **13**, *S. boreator*, holotype (**12**, apex of abdomen; **13**, tergite 1); **14**, *S. brevispina brevispina*, syntype, apex of abdomen; **15**, *S. brevispina lissor* **subsp. nov.**, mesonotum, dorsal view; **16**, *S. heteropus*, holotype, apex of abdomen; **17–21**, *S. morleyi* (**17**, apex of abdomen; **18**, dorsal areas of propodeum; **19**, tergite 1, dorsal view; **20**, hind tibia, colour pattern; **21**, tarsal segments 5 and 3); **22–24**, *S. tricolor* (**22**, apex of abdomen; **23**, tergite 1, dorsal view; **24**, tarsal segments 5 and 3).

structure is also present in *Mesoleius* s.l. and is considered plesiomorphic. There are more differences in the structure of pregenital segments (mainly in tergite 8 and sternite 6). Tergite 8 in *clypeata*- and *tricolor*-group has a peculiar shape (Figs 1, 2) and differs from that in other groups which have a more generalised shape of this tergite (Figs 3, 4, 7).

However, *S. mirabilis* possesses the tergite 8 depressed or of a different structure

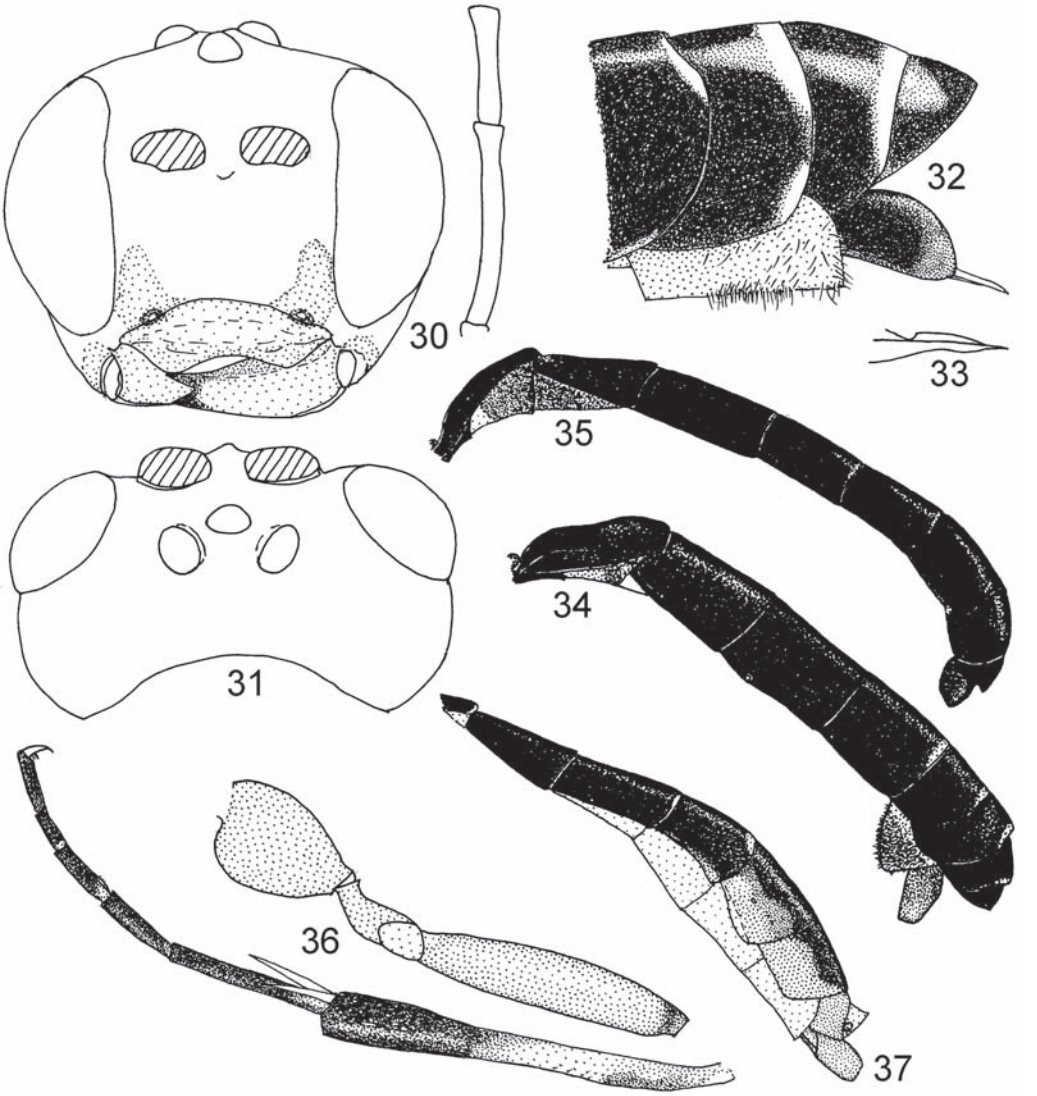


Figs 25–29. *Saotis*, female. **25**, *S. clypeata*; **26**, *S. albionis* (Finland, from *Pontopristia amentorum*); **27**, **28**, *S. erythropleura* **sp. nov.**; **29**, *S. tinctor* **sp. nov.** (**25**, **26**, **28**, **29**, apical part of abdomen; **27**, dorsal areas of propodeum).

(Fig. 9). In contrast to the congeners the dorsal apodema of second valvifer is completely absent, and the body is almost twice bigger. Therefore, I accept the subgenus *Iskarus* for the former *mirabilis* species group using a genus-group name proposed by Kolarov (1987), and the name for *S. mirabilis* is, accordingly, *Saotis* (*Iskarus*) *mirabilis* Schmiedeknecht, 1914. The subgenus includes the European species *S. mirabilis* only. This species differs from the congeners in having a *large size* (*length of the body is about 15 mm*) and a *very elongate abdomen* (the abdomen is 3 times as long as the head and the thorax combined); the tergites 3–8 with a very deep median notch on the hind margin; the *tergite 8 depressed,* and *the ovipositor sheath without a dorsal process*; a red mesothorax red. The host of the species is unknown.

Twelve groups of species were distinguished in the Palaearctic fauna (Kasparyan & Kopelke, 2010). Seven of them were found in North America: *brevispina-*, *tricolor-*, *renovata-*, *clypeata-* (*= hoeli-albionis*), *nigriscuta-*, *pygidiator-* and *granulator*-groups (all these groups are Holarctic). *Saotis truncator* **sp. nov.** is now assigned to a group of its own. Three other new Nearctic species of *Saotis* belong to the *nigriscuta* and *tricolor* species groups. *Saotis renovata* Morley, 1911 is considered here as a separate species group with the position immediately between *tricolor* and *clypeata* groups (earlier it was considered as a subgroup of the *tricolor*-group). Characteristics of these species groups are given below.

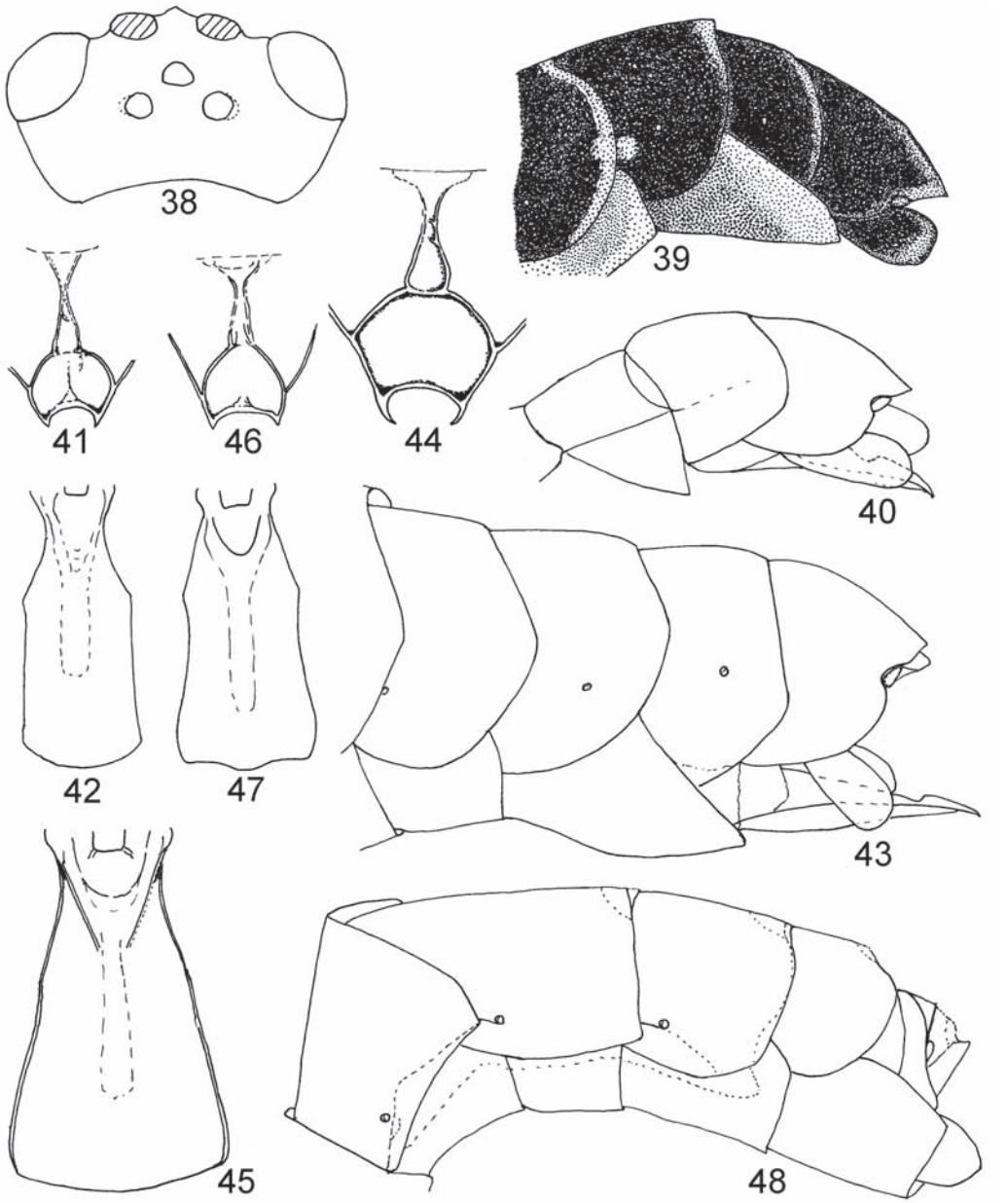
1. Species group *brevispina*: ***S. brevispina***, *S. varicoxa* (Thomson, 1894), ***S. subarctor***. *Epipleura of tergites 4 and 5*



Figs 30–37. *Saotis*, female. **30–33**, *S. pygidiator nearctor* (**30**, head anterior view and two basal flagellomeres; **31**, head, dorsal view; **32**, apex of abdomen; **33**, ovipositor); **34**, *S. pygidiator pygidiator*, abdomen; **35**, *S. granulator granulator*, abdomen; **36**, *S. granulator albator* **subsp. nov.**, hind leg; **37**, *S. subarctor*, abdomen.

separated by crease (in *S. brevispina* crease sometimes indistinct), *ovipositor sheath truncate at apex*, *yellow or reddish yellow* (Fig. 3, 14, 37). Antenna with 21–26 flagellomeres; *i.fl* 1.1–1.2; *i.gen* 0.4–0.5; lower margin of clypeus broadly convex and with small sharp flanges laterally; *i.fem* 4.3–5.0; *i.nrv* 0.05–0.22; *i.terg* 1.5–2.1; *tergite 7 with spiracles in its posterior 0.25* (Figs 6, 7); *yellow dorsolateral spots of scutellum or its yellow dorsolateral margins* (except for *S. subarctor*). Hosts: *S. subarctor* reared in Europe from three species of *Phyllocolpa*.

2. Species group *tricolor*: easily distinguished *by strong curvature in profile of*



Figs 38–48. *Saotis*, female. **38–42**, *S. renovata rufipes* **subsp. nov. (38**, head, dorsal view; **39**, apex of abdomen, holotype; **40**, apex of abdomen, paratype; **41**, dorsal areas of propodeum; **42**, tergite 1, dorsal view**)**; **43–45**, *S. rufigaster* **sp. nov. (43**, apex of abdomen; **44**, dorsal areas of propodeum; **45**, tergite 1, dorsal view**)**; **46–48,** *S. truncator* **sp. nov. (46**, dorsal areas of propodeum; **47**, tergite 1, dorsal view; **48**, apex of abdomen**)**.

tergite 8 (Figs 2, 17, 22, 43); *antenna usually with 26 and more flagellomeres*.

2a. Subgroup *tricolor* s. str.: *S. bilineata* Gravenhorst, 1829, and Holarctic ***S. morleyi*** and ***S. tricolor*** Thomson, 1883. *Flagellum with (24)26–30 segments, malar space short* (*i.gen* 0.25–0.3). First flagellar segment only 4–5 times as long as its width at the middle; *i.fl* 0.9–1.07; hind femur rather thick (*i.fem* 3.9–4.4); hind tibia with distinct white ring in middle part and often tricoloured (Fig. 20); mesoscutum and tergites of abdomen shiny and almost smooth.

2b. Subgroup *rufigaster*: Only Nearctic ***S. rufigaster***, *entirely red abdomen* (unique feature for genus). *Flagellum with 29 segments*, malar space rather long (*i.gen* 0.5). First flagellar segment seven times as long as wide at middle; *i.fl* 1.12; *i.fem* 3.9. Legs (*including hind tibia*) almost uniformly *reddish rufous* with all trochantelli yellow; thorax black with scutellum reddish brown at apex. All tergites of abdomen shiny and almost smooth. Hosts: *S. morleyi* and *S. tricolor* reared in the Palaearctic from thirteen species of *Phyllocolpa*.

3. Palaearctic species group *nigriventris*: only Transpalaearctic *S. nigriventris*. Easily distinguished from congeners by presence of *numerous small hairs on tergites* of abdomen (including epipleura). Antenna with 22–24 flagellomeres; *i.fl* 0.9; malar space very short (*i.gen* 0.2–0.25); *i.fem* 4.4; areas of propodeum strongly obliterate; thorax completely black; ovipositor sheath from ochraceous to brownish, with deep dorsal notch at base. Hosts unknown.

4. Species group *renovata*: ***S. renovata***. Rather similar to *clypeata*-group but different in having tergite 8 more convex in profile (Figs 39, 40) with pygostyli distinctly separated; *tergite 1 rather long (i.terg 2.1–2.9) and without dorsolateral carinae*. Epipleura of tergite 3 not separated by crease. Antenna with 21–25 flagellomeres, *i.gen* about 0.4. Hosts: Palaearctic subspecies reared from 3 species of *Phyllocolpa*.

5. Species group *clypeata (= albionis-hoeli-group)*: European ***S. albionis***, ***S. hoeli*** Roman, 1933 (Greenland) and ***S. clypeata*** (Alaska). *Long projecting hypopygium* and *long usually strongly projecting and straight dorsally in profile tergites 7 and 8* (Figs 1, 36, 37); tergites 3–7 on hind margin with median notch; *pygostyli merged (immovably connected) with tergite 8*. Antenna usually with 22–23 flagellomeres; first flagellar segment about 4–5 times as long as its width at middle; *i.fl* 0.9–1.0; *i.gen* 0.33–0.45; *i.fem* about 4.7; *i.terg* 1.6–2.0; *i.nrv* 0.25–0.35; nervulus usually postfurcal; *tarsal claws with 1 or 2 teeth at base*. Thorax black or with weak yellow markings. Colouration of legs variable, hind tibiae either brownish (*S. hoeli*) or with whitish middle band, or whitish with fuscous apex (*S. albionis*). Hosts: *S. albionis* reared from *Pontopristia* Malaise, 1921 (larva living in catkins of Salix).

6. Nearctic species group *truncator*: **S. *truncator* sp. nov.** *Peculiar form of hypopygium* (Fig. 48) and presence of *crease on tergites 3–5 from base to spiracle*; 24 flagellomeres in holotype, head narrowed beyond the eyes, *i.fl* 1.1, *i.gen* 0.38, *i.nrv* 0.12, *i.fem* 5.0, *i.terg* 2.0; hind tarsal claw weakly upcurved at apex; mesoscutum and mesopleuron almost smooth. Hosts unknown.

7. Species group *nigriscuta*: Palaearctic *S. nigriscuta* (Thomson, 1888), Holarctic ***S. heteropus*** (Thomson, 1883), ***S. boreator*** Kasparyan & Kopelke, 2010, Nearctic ***S. eythropleura* sp. nov.** and ***S. tinctor* sp. nov.** *Ovipositor sheath wide and black* (Figs. 12, 39, 40), usually wider than hind femur. Antenna with 19–26 flagellomeres. First flagellar segment usually 7–8 times as long as wide at middle; *two basal flagellomeres always distinctly longer than maximum diameter of eye* (*i.fl* 1.15–1.33). Hosts: *Phyllocolpa*.

8. Species group *pygidiator*: ***S. pygidiator*** Kasparyan & Kopelke, 2009, a Holarctic species with four subspecies (including Nearctic ***S. pygidiator nearctor***). Similar to *nigriscuta*-group but different from it and the other species groups in having *hypopygium of female covered with dense erected hairs* (Figs 32, 34), temples broader and

swollen (Fig. 30), *nervulus usually interstitial*, *i.nrv* 0.1–0.25, and pterostigma usually pale (except for Transbaikalian subspecies). Antenna with 23–28 flagellomeres (23–25 in Nearctic subspecies); *i.fl* 1.25±0.1; *i.gen* about 0.4±0.1; *i.fem* 5.0±0.5; the biggest spur of hind tibia usually shorter than half of hind basitarsus; areola of propodeum is narrow (Fig. 40); *i.terg* 1.7–2.0; tergite 2 with very fine and smoothed granulation and with short and rather scarce hairs. Tergite 8 short and usually strongly retracted in abdomen; hypopygium with truncate hind margin and slightly concave medially; ovipositor sheath about 0.8 times as wide as hind femur. Mesoscutum usually with yellow anterolateral spots, scutellum black. Hosts: European *S. pygidiator pygidiator* reared from three species of *Pontania*.

9. Species group *granulator*: only Holarctic ***S. granulator***. Easily distinguished by *distinct granulation that evenly covers the body* (on tergites 4–8 the granulation is smoother). *Sternites more heavily sclerotised and usually without median fold*. Head not narrowed beyond eyes; malar space short, *i.gen* about 0.25; *i.fl* 0.8–1.0; antenna with 21–24 flagellomeres; mesoscutum and scutellum black; *i.nrv* 0.33; *i.terg* 1.7–1.8; *tergites 7 and 8 usually entirely projecting beyond hypopygium* (Fig. 39); *hypopygium with truncate hind margin and slightly concave medially* (Fig. 8). Hosts: reared in Europe from six species of *Pontania*.

10. Palaearctic species group *compressiuscula*: *S. compressiuscula* (Thomson, 1883) and *S. caucasica* Kasparyan, 2009. Very short cheeks (*i.gen* 0.2–0.25), antenna with 22–24 flagellomeres; *i.fl* 1.05–1.1; carinae of propodeum often very weak; nervulus interstitial or weakly postfurcal; *i.nrv* 0.1–0.28. Apical tergites of abdomen not modified, moderately compressed; ovipositor sheath rather broad. Hosts unknown.

11. Palaearctic species group *alpinator*: only *S. alpinator* **sp. nov.** Wide ovipositor sheath and rather weakly compressed abdomen similar to representatives of species group *nigriscuta* and partly to *compressiuscula* species group; different from both groups in having basal flagellomeres shorter (*i.fl* 0.9). Small insects with fore wing 3.5 mm long. Antenna with 22 flagellomeres; *i.gen* about 0.5; *i.nrv* 0.28; *i.fem* 4.6; *i.terg* 1.7. Scutellum black; coxae and trochanters I predominantly black. Pterostigma pale with brownish margins. Host: *Pontania*.

12. Palaearctic species group *longiventris*: only *S. longiventris*. *Strongly elongate abdomen*; *i.terg 2.7*. *Head strongly narrowed*; *i.gen* 0.33; *i.fl* 0.9; *nervulus interstitial*; ovipositor sheath as wide as hind femur; tergites completely black, without thin pale band on hind margin. Hosts: unknown.

13. Palaearctic species group *dorsata*: only *S. dorsata*. *Ovipositor sheath more narrow*, tergites 2 and 3 with distinct reddish-brown pattern. Mesoscutum and scutellum black, subtegular ridge with yellow stripe. Antenna with 22–26 flagellomeres; *i.fl* 0.9; *i.gen* 0.3; *i.fem* 3.9–4.2; *i.terg* 2.0–2.2; third segment of hind tarsus 1.1–1.2 times as long as fifth segment. Epipleura of tergites 4 and 5 sometimes separated by a weak crease. Hosts: unknown.

Review of the Nearctic species of *Saotis*

1. *Saotis albionis* Kasparyan, 2007 (in: Kasparyan & Khalaim, 2007) (Fig. 26)

Kasparyan & Shaw, 2003: 353–355, female (as *Saotis* sp. 2; key, fig., England); Kasparyan & Khalaim, 2007: 550, female [holotypus: female, England, Oxfordshire (NMS); description in key; fig.); Kasparyan & Kopelke, 2010: 247, 249 (key, fig., bibliogr., host).

Material. *Holotype*. **Great Britain**; 1 female. *Paratype*. **Russia**, *Yaroslavl Province*; 1 female; ZIN. **Finland**, "*Pontopristia suavis*"; 2 females, 1 male; Mus. Helsinki. **Canada**, *British Columbia*; 7 females; AEI. Same date as above, Stone Mt. Pk., 3800 ft; 16–20 July 1973; coll. H. & M. Townes; 1 female; AEI. Same date as above, Racing Riv., B. C., 2400 ft; 23 July 1973; coll. H. & M. Townes; AEI.

Diagnosis. *Saotis albionis* can be distinguished from the congeners by a large hy-

popygium, the tergites 7 and 8 strongly projecting and straight dorsally in profile (Figs. 26), and by a specific shape of the pygostyli. It is closely related to *S. clypeata* from North America (Alaska) and *S. hoeli* from Greenland, but differs from the both species in having the hind coxae and femora red, and the scutellum often with yellow apical spot.

Description. Female. In holotype fore wing 4.8 mm; flagellum 4.1 mm long (0.83 as long as fore wing), with 23 flagellomeres; the terminal segment of flagellum shorter than preceding segment; *i.fl* about 0.9; clypeus impressed along sharp lower margin; *i.gen* about 0.35; *i.nrv* 0.25–0.33; *i.fem* 4.5; *i.tars* in holotype 4.3:2.2:1.7:1.1:1.7 (third segment as long as fifth segment); tarsal claws with two rather high teeth at extreme base. Mesopleuron superficially granulate, almost smooth with fine punctures; metapleuron granulate. Tergite 1 broad on posterior margin; *i.terg* 1.5–1.8; tergite 2 almost entirely granulate; epipleura of tergites 2 and 3 separated by crease; tergites 3–7 smooth and almost unpubescent (bare), their hind margin moderately concave at middle and with narrow pale band. Thorax black, usually with yellow markings, at least hind corners of pronotum yellow; in holotype mesoscutum anteriorly with pair of yellow dots and scutellum with small yellow marking. Coxae, femora and trochanters predominantly red, hind trochanter I usually blackish, trochanters II yellow; hind tibia of holotype white in middle third (on ventral side white colouration expands almost to base of tibia), light greyish in basal 0.25 and brownish grey in apical 0.4; spurs white; hind tarsus greyish, with segments 1–4 whitish at extreme base. Sternites yellow.

Variabilty. In specimens from British Columbia fore wing 3.8–5.5 mm long, antenna with 21–24 flagellomeres; *i.fl* 0.93–1.07; *i.gen* about 0.4; *i.nrv* 0.17–0.33; *i.fem* 4.2–4.8; *i.tars* 4.3:2.0:1.6:1.0:1.8 (third segment usually a little shorter than fifth segment).

Host. The species is reared in Finland by E. Lindquist from nematine sawfly *Pontopristia amentorum* (larva in catkins of Salix).

2. *Saotis boreator* Kasparyan & Kopelke, 2010
(Figs 12, 13)

Kasparyan & Kopelke, 2010: 246, 251, female [key, description. *Holotype*: female, Norway, Finnmark, ex *Phyllocolpa nudipectus* (Vikberg, 1965) / Salix phylicifolia (leg. Kopelke) (SMF)]; 2009: 935, 939 (nomen nudum; host).

Material. *Holotype* and *paratype*. **Norway**, *Finnmark*; 2 females; SMF. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 ft; 18 July 1973; coll. H.& M. Townes; 1 female; AEI. **Finland**; 1 female; Mus. Turku.

Diagnosis. *Saotis boreator* belongs to the *nigriscuta* species group for it has a broad black ovipositor sheath and rather slender basal flagellomeres; it especially close to *S. heteropus* but the coxae, trochanters and hind femora of *S. boreator* are red (predominantly black in *S. heteropus*), the clypeus is flat, the tergite 1 is wider at the apex, and the flagellum has 19–21 segments (22–24-segmented in *S. heteropus*, 22–26-segmented in *S. tinctor* **sp. nov.**, and usually 25–27-segmented in *S. nigriscuta*).

Host. In Europe, it was reared from *Phyllocolpa nudipectus* (Vikberg, 1965).

3. *Saotis brevispina* (Thomson, 1883)
(Figs 7, 14, 15)

Thomson, 1883: 934, female, male [*Mesoleius* (*Saotus*); syntypi examinavi: 8 females, Sweden, "Lund" (Mus. Lund)], 1895: 2018 (*Saotus*); Dalla Torre, 1902: 275 (*Saotis*; bibliogr.); Schmiedeknecht, 1914: 2814 (key, description); Perkins, 1962: 450; Fitton, 1982: 55 (type); Kasparyan & Shaw, 2003: 352, 353 (key, fig.); Kasparyan & Khalaim, 2007: 548 (key, fig.); Kasparyan & Kopelke, 2010: 239–252(key, fig., bibliogr.).

Diagnosis. *Saotis brevispina* belongs to the species group *brevispina* which also includes the Holarctic *S. subarctor* and the European *S. varicoxa*. This group can be easily recognised by a combination of characters which includes a crease epipleura of the tergites 4(5–6) with yellowish ovipositor sheath truncate at the apex (Figs 14, 37). *Saotis*

brevispina differs from other species of the subgroup in having the flagellum of antenna longer than the fore wing (in other species of the group the flagellum is 0.85–1.0 as long as the fore wing) and in having yellow central spots on the mesoscutum. *Saotis brevispina* further differs from *S. subarctor* in having yellow basolateral spots on the scutellum (or scutellum almost entirely yellow) and anterolateral yellow spots on the mesoscutum (which can be expanded along the notauli to the central spot; Fig. 15), yellow fore and middle coxae and trochanters, and usually light reddish hind coxae and femora. The European population of *S. brevispina* also differs from the both species in having the lower half of the mesopleuron distinctly and rather densely punctate. In the Nearctic population, described here as a new subspecies, the mesopleuron usually has very fine hardly discernible punctures.

3a. *Saotis brevispina lissor* subsp. nov.

Holotype. **USA**, *California*, Hesperia NO San Bernardino, Mojave Desert, on Salix near dam; 24 May 1988; female; coll. D. Kasparyan; ZIN.

Paratypes. Same data as above; 7 females; ZIN. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 and 4200 ft; 19, 23 July 1973; coll. H. & M. Townes; 2 females; AEI.

Diagnosis. *Saotis brevispina lissor* differs from the European subspecies in having the mesopleuron and tergites 2–3 almost polished, usually without any distinct punctures or granulation, the epipleurae of the tergites 4–5 (–6) separated by a crease (in the European population only the epipleura of the tergite 4 are usually separated). The specimens of *S. brevispina lissor* with fore wing length 3–4 mm have 20–22-segmentes flagellum while specimens of *S. brevispina brevispina* with fore wing length 4 mm possess the flagellum with at least 23 segments. *Saotis brevispina lissor* differs from *S. subarctor* in yellow colouration of the lateral margins of the scutellum and epimeron, in large anterolateral yellow spots on the mesoscutum, yellow fore and middle coxae and trochanters.

Description. *Female*. Fore wing 3.0–4.3 mm, body 4.0–6.0 mm long. Antenna with 20–24 flagellomeres; flagellum about 1.05 as long as fore wing; first flagellar segment about 1.6 times as long as second segment; *i.fl* 1.1–1.2; *i.gen* 0.4–0.5. Head narrowed behind eyes. Clypeus evenly weakly convex, with lower edge at the middle obtuse and laterally with narrow sharp flanges. Mesoscutum smooth and shiny, covered with very fine and short hairs. Mesopleuron almost polished, in lower half with fine, moderately dense hairs; metapleuron almost smooth, evenly covered with fine hairs. Propodeum with areas, pleural and lateral carinae distinct, areola rather narrow. *I.fem* 4.3–4.5, *i.tars* 4.3:2.2:1.7:1.0:1.7. *I.nrv* 0.2–0.3. Tergite 1 distinctly granulate, very strongly tapered to base (at its hind margin three times as wide as at base); *i.terg.* about 1.5; tergites 2 and 3 about as long as wide in base; tergite 2 shiny and finely granulated, tergite 3 almost smooth with hardly discernible granulation. Tergites 4–8 very strongly compressed, shiny, sometimes tergites 4–7 on hind margin with median membranous concavity. Epipleura of tergites 2–4 (5–6) separated by crease. Ovipositor sheath truncate at apex.

Body black with yellow markings. In holotype flagellum brownish (darker above), scape yellow ventrally in apical 0.6, pedicel ventrally with yellow apical margin; malar space and cheeks (the part of temple below the eye), clypeus, mandibles, collar, lower and hind corners of pronotum, tegulae, subtegular ridge, apex of epimeron, a broad longitudinal band in lower part of mesopleuron, transverse band just behind prepectal carina on mesosternum (mesosternum brownish), large anterolateral spots on mesoscutum which extend backward along notauli as thin lines and merge in a central spot, scutellum dorsally entirely to hind margin, and postscutellum yellow (Fig. 15). Fore and middle coxae and all trochanters yellow; fore and middle legs beyond trochanters pale rufous with whitish yellow dorsal line on femora and with tarsi

partly brownish. Hind coxa light red with yellow apex (0.3); hind femur red; hind tibia dark brown in apical 0.4 and dirty yellowish in basal 0.6 (with ventral side paler); hind tarsi brownish.

Hind margins of tergites and all epipleura whitish yellow; tergites 6 and 7 (except for dorsal pale brown spot) and longitudinal fold of sternites; tergite 8 and ovipositor sheath entirely yellowish. Holotype very light-coloured. Specimens from Canada considerably darker: cheeks, lower corners of pronotum, mesopleuron completely black, central yellow spot on mesoscutum small, scutellum only in basolateral corners yellow; hind coxa and hind trochanter I blackish, hind tibia predominantly blackish with dirty rufous lower side in basal half.

Host. There are unverified records on parasitism of the European *S. brevispina brevispina* in *Pontania viminalis* (Linnaeus, 1759) and *Phyllocolpa leucapsis* (Tischbein, 1846) (Fulmek, 1968). Data on its parasitism in *Pontania* (= *Phyllocolpa*) *purpureae* (Cameron, 1884) on S. purpurea (Bridgman, 1887) should be refered to Saotis renovata.

4. *Saotis clypeata* (Ashmead, 1902) (Fig. 25)

Ashmead, 1902: 168, female (*Exolytus*; holotype: "Cat. No 5570, U.S. Nat. Museum. From Popof Island [Alaska], July 11"); Townes, 1945 (*Saotis*); 1951: 335; Carlson, 1979: 602.

Material. **USA**, *Alaska*, Cape Thompson; 29 July 1961; coll. R. Madge; 2 females; CNC. Photos of the *holotype* and a paratype, prepared by A. Reschikov, were examined . The paratype, to our opinion, does not belong to this species but to a species from the *brevispina* species group, probably *S. subarctor*.

Diagnosis. *Saotis clypeata* is distinguished by a long projecting hypopygium and the tergites 7 and 8 long and almost straight dorsally (Figs. 36), the tergites 3–7 have a median notch on their hind margin, the pygostyli are merged with the tergite 8.

Sternites predominantly yellow on median fold, sternites 4 and 5 with lateral brownish spots widened posteriorly and confluent on hind margin of sternite. Antenna usually with 22–23 flagellomeres; *i.fl* 0.9–1.0; *i.gen* 0.33–0.45; *i.fem* 4.7–5.0; *i.terg* about 1.8; *i.nrv* 0.33; nervulus moderately postfurcal; tarsal claws at base with 1–2 teeth.

Notes on the holotype. Photos of the holotype have been examined. Parts lost as follows: head, left wings, fore right leg, both middle legs, left hind leg partly, hind tarsomeres 2–5. Hind femur brownish red, hind tibia pale rufous in basal 0.7 and reddish in apical 0.3; tergites 3–7 with dorsal pale mark on hind margin before median emargination; longitudinal fold of sternites yellow, lateral brown spots on sternite 5 confluent on its hind margin.

Original description (Ashmead, 1902: 168). "*Female*. Length 6 mm. Polished black, with the clypeus, mandibles, except teeth, palpi at base, tegulae, a spot in front of it, the apices of front and middle coxae, all trochanters, except more or less of the first joint *above*, tibial spurs and the ventral fold of abdomen, ivory or yellowish-white; rest of legs pale ferruginous or yellowish, the middle femora basally brownish, the middle and hind coxae and the hind femora mostly black. Antenna 24-jointed, the flagellum ferruginous. Wings hyaline, the stigma and costal vein brownish, the internal veins paler, the areolet open, without a vestige of the second transverse cubitus. Abdomen very long, compressed more than twice longer than the head and thorax united, the petiole feebly coriaceous with the spiracles placed before its middle."

Remarks. *Saotis clypeata* is very close to *S. hoeli* and *S. albionis*. The both latter species may represent a subspecies or colour morphs (dark – *S. hoeli*, and light – *S. albionis*) of *S. clypeata*.

5. *Saotis erythropleura* sp. nov. (Figs 27, 28)

Material. *Holotype*. **USA**, *California*, NW San Francisco, nr Muir-Wood, a stream with Salix; 17 May 1988; coll. D. Kasparyan; female; ZIN.

Diagnosis. *Saotis erythropleura* belongs to the *nigriscuta* species group which differs

in having a broad ovipositor sheath (Fig. 28) and elongate basal flagellomeres (*i.fl* 1.1–1.35). The new species can be distinguished from the congeners by a combination of the following characters: mesopleuron red, clypeus without median convexity above its lower margin, flagellum 24-segmented (in holotype) and slightly shorter (0.95) than fore wing, *i.fl* 1.1, *i.gen* 0.3, *i.fem* 4.5, coxae and hind femora light reddish, hind tibia without distinct white band in its middle 0.33.

Description. Female (holotype). Fore wing 4.5 mm. Antenna with 24 flagellomeres; flagellum slightly shorter (0.95) than fore wing; flagellomeres 1 and 2 respectively about seven and four times as long as wide at the middle; *i.fl* about 1.1. Head roundly narrowed behind the eyes, the temple in middle part about 1.2 as long as eye in lateral view; *i.gen* about 0.3. Clypeus weakly convex, above lower margin impressed, lower margin sharp and in the middle part arcuated upward. Mesoscutum centrally with fine superficial granulation, on lateral lobes smooth and shiny with very fine sparse punctures. Mesopleuron smooth and shiny with very fine punctures in anterior 0.4. Metapleuron shiny with smoothed granulation. Propodeum with distinct dorsal areas, areola rather wide, basal area obliterated (Fig. 27); *i.ar.ap* 0.38; pleural and lateral longitudinal carinae present. Nervulus strongly postfurcal, distad of basal vein about 0.5 of its length; *i.nrv* 0.15; *i.fem* 4.5; *i.tars* 4.3:2.1:1.7:1:1.6; tarsal claws without distinct teeth in base. Tergites 1 and 2(3) distinctly granulate; *i.terg* 1.75; tergite 1 rather evenly tapered from hind margin to base; its dorsal and dorsolateral carinae obliterated. Tergite 3 very finely and superficially granulate, shiny; subsequent tergites shiny, almost smooth with hardly discernible granulation. Epipleura of tergites 2 and 3 completely separated by crease; epipleura of subsequent tergites not separated. Tergites (3)4–8 moderately compressed; hind edge of tergites 4–7 with median emargination, tergite 8 not enlarged. Sternite 6 (hypopygium) truncate at apex. Ovipositor sheath broad (Fig. 28), about as wide as lateral width of hind femur.

Antenna with flagellum brownish; scape, pedicel, and dorsal side of about eight basal flagellomeres blackish. Head black; clypeus, mandibles and palpi whitish, the ultimate segment of palpi brownish. Thorax black; mesopleuron and mesosternum red (except for black speculum and subtegular ridge); hind corners of pronotum, tegulae and anterolateral spots on mesoscutum whitish yellow; mesoscutum in posterior 0.5 with large subquadrate reddish brown median spot and with a pair of lateral reddish brown markings; scutellum completely reddish dorsally. Legs pale reddish with apex of fore coxa and all trochanters (except for hind trochanter I) light yellow.

Hind tibia blackish in apical third, greyish dorsally (with dorsolateral spot-like expansion before base), and dirty whitish ventrally and laterally in basal two thirds; hind spurs whitish; hind tarsus blackish with extreme base of segments 1–3 pale. Pterostigma brownish, paler in basal 0.2. Tergites black with thin whitish band on hind margin of dorsum of tergites 3–7 and on hind margin of their epipleura. Sternites light yellow. Ovipositor sheath blackish (Fig. 28).

Male unknown.

6. ***Saotis granulator*** Kasparyan & Kopelke, 2010
(Figs 5, 8, 35)

Kasparyan & Kopelke, 2010: 243, 247, 254, female, male [key, description, hosts, distribution: Scandinavia, Russia, Canada. *Holotype*: Norway, female, Norge/*Nordland*, Polarkreis, M[oi] Rana, ex *Pontania glabrifrons* Benson (leg. Kopelke) (SMF)]; 2009: 936, 937, 939 (nom. nudum, hosts).

Diagnosis. Saotis granulator may be distinquished from the congeners by a combination of the following characters: almost evenly granulate thorax, very short malar space, obliterated areas of propodeum, by elongate abdomen of female with tergites

7 and 8 far projecting beyond the hypopygium (Fig. 35) and all sternites brown and usually without median fold. Fore wing 3.5–5 mm; flagellum 21–24-segmented, 0.84–0.92 as long as fore wing; *i.fl* 0.8–1.1 (in Nearctic subspecies 1.02–1.1); *i.gen* 0.23–0.27; pleural carinae of propodeum sometimes complete. Body always covered with dense distinct granulation, mat. In the European population mesoscutum, scutellum, hind coxae almost always black; hind tibia light rufous, usually slightly greyish brown on dorsal side and at apex.

The Nearctic specimens are described here as a new subspecies.

Distribution. Europe (Norway, Sweden, Finland), Russia (Leningrad Province, North of Yakutia), Canada.

Hosts. In Europe, the species was reared by Kopelke from *Pontania glabrifrons* Benson, 1960, *P. hastatae* Vikberg, 1970, *P. nivalis* Vikberg, 1970, *P. norvegica* Kopelke, 1991, *P. varia* Kopelke, 1991, and *Pontania pedunculi* (Hartig, 1837).

6a. *Saotis granulator albator* subsp. nov. (Fig. 36)

Material. Holotype. **Canada**, *British Columbia*, Stone Mt. Pk., 3500 ft; 24 July 1973; coll. H. & M. Townes; female; AEI.

Paratypes. Same locality as in holotype, 3800 ft, 19 and 22 July 1973; coll. H. & M. Townes; 2 females; AEI.

Diagnosis. *Saotis granulator albator* differs from the Palaearctic subspecies *S. granulator granulator* in having all coxae light reddish, hind tibia with a small whitish dorsal spot at base (Fig. 36), number of flagellomeres smaller in specimens with similar body size, granulation of mesopleuron and tergites finer, areola of propodeum weak but distinct, and median concavity on hind margin of tergites (4)5 and 6 deeper.

Description. *Female*. Fore wing 4.3–5.3 mm, body 6.5 mm long. Antenna with 20–22 flagellomeres, *i.fl* 1.02–1.10 (in Palaearctic subspecies 0.8–1.0). Head almost not narrowed beyond the eyes. Clypeus convex in basal two thirds, with lower edge sharp and broadly concave. *I.gen* 0.25. Thorax mat and almost completely evenly and distinctly granulate. Mesopleuron in lower half with moderately dense hairs; speculum rather small, partly with fine granulation. Metapleuron densely and coarsely granulate. Propodeum with basal area and areola partly obliterated, apical area weakly bordered; pleural carinae absent. *I.fem* 5.0, *i.tars* 5.2:2.7:2.1:1.3:2.0. *I.nrv* 0.2–0.3. Tergites distinctly elongate, *i. terg* 1.8, tergites 2–4 about 1.5 as long as their width in base; tergites 7 and 8 projecting beyond the hypopygium almost on their entire length. All tergites are completely granulate, tergites 1 and 2 mat, subsequent tergites smoother and shining. Epipleura of tergites 2 and 3 are narrow and separated by crease. Tergites 4–6 on hind margin with median emargination. Sternites without median fold or with weak fold.

Body black. Antennae brownish with scape and pedicel blackish. Clypeus reddish brown; palpi, mandible, hind corners of pronotum, fore and hind tegulae yellow; both pairs of tegulae yellow; in two females scutellum partly reddish yellow dorsally. Legs light reddish, fore and mid coxae ventrally in apical 0.4, their trochanters I in apical half, and all trochantelli yellow; hind tibia at extreme base (0.1) with whitish dorsal spot, in basal 0.6 dull whitish or pale yellowish, fuscous dorsolaterally before base (0.2–0.3) and completely fuscous (greyish or brownish) at apex (0.35); spurs whitish yellow; hind tarsus brownish with extreme base of segments 1–3 pale. Pterostigma pale brownish with brown margins. Abdominal tergites black, bordered with pale dorsally on hind margins of tergites 4–6, epipleura of tergites 2 and 3 whitish yellow. Sternites brown (without pale median fold). Ovipositor sheath brownish black.

Male unknown.

7. *Saotis heteropus* (Thomson, 1883) (Fig. 16)

Thomson, 1883: 934, female [*Mesoleius* (*Saotus*); lectotypum examinavi, "Lpl" (Lapland) (Mus. Lund)]; Dalla Torre, 1902: 276 (*Sao-*

tis; bibliogr.); Schmiedeknecht, 1914: 2809, 2816 (key, description); Meyer, 1936: 295 (Russia); Jussila, 1965: 71 (Fig., Finland); 1984: 91; Fitton, 1982: 57 (lectotype); Kasparyan & Shaw, 2003: 354 (Fig., key); Kasparyan & Khalaim, 2007: 549, 550 (key, fig.). Kasparyan & Kopelke, 2010: 246, 255 (key, figs, bibliogr., distribution, host).

Material. **Canada**, *British Columbia*, Stone Mt. Pk.; coll. H. & M. Townes; 9 females; AEI. Same data as above, 3800 ft; 17–22 July 1973; 6 females. Same data as above, 4800 ft; 26 July 1973; 1 female. Same data as above, 5500 ft; 18, 22 July 1973; 2 females. **USA**, *Alaska*, Tangle Lakes; 9 Aug. 1973; coll. H. & M. Townes; 1 female; AEI. **Sweden**, *Lappland*; 1 female (lectotype) and 1 male; Mus. Lund. Same data as above, Kiruna; coll. R. Hinz; 2 females; Mus. Munich); Same data as above, Abisco; 13 July 1954; coll. J.E. and R.B. Benson; 1 female; BNHM. **Russia**, Polar Ural; coll. D. Kasparyan; 1 female; ZIN. Same data as above, *Yakutia*, delta of Lena River, ex *Phyllocolpa* sp. on Salix sp.; coll. A. Zinoviev; 2 females.

Diagnosis. *Saotis heteropus* belongs to the *nigriscuta* species group; most important characters of this group are such characters as a wide black ovipositor sheath (Fig. 16) and slender basal flagellomeres (*i.fl* 1.1–1.3). *Saotis heteropus* may be further distinguished from other species of the group by black colouration of hind femora, of mesoscutum, epipleura, basal part of sternites, coxae and trochanters, and by slender tergite 1 (*i.terg* about 2.1). In holotype (Lapland, Sweden) fore wing 4.8 mm, flagelli broken; *i.fl* 1.12; *i.gen* 0.4; *i.nrv* 0.25; nervulus weakly postfurcal; *i.fem* 5.0; *i.tars* 2.7:1.5:1.2:0.7:0.9 (second segment 1. 65 times as long as fifth one); *i.terg* 2.2. In specimens from Canada fore wing 4.0–4.8 mm; antenna with 21–23 flagellomeres, two basal flagellomeres a little longer (*i.fl* 1.15–1.35); in all specimens blackish brown lateral spots on sternites 4–6 confluent at base thus basal part of these sternites blackish; sternites 1–3 usually yellowish brown.

Host. *Phyllocolpa* sp.

8. ***Saotis hoeli*** Roman, 1933

Roman, 1933: 9 [*Holotype*: female, East Greenland (Zoologisk Museum, Sars gt. 1, Oslo, Norway)]; 1934: 609; Carlson, 1979: 602 (Nearctic); Kasparyan & Shaw, 2003: 354 (Figs., key); Kasparyan & Kopelke, 2010: 247, 256 (key, figs, bibliogr., distribution)

Material. **Greenland** (**Denmark**), "*hoeli* Roman det."; 1 female; BNHM. **E. Greenland**, Jamesonland; Aug. 1933; coll. D. Lack; 2 females; BNHM. "Nedre Midsommer Sö Greenland"; 8, 22 July 1966; males, females?; CNC. **Canada**, Ellesmere Isl., Hazen Camp, 81°49' N, 71°18' W; 11 Jully 1962; coll. R.B. Madge; 4 males; CNC. Same data as above; 15, 24 July 1962; 2 females. **Russia**, *Novaya Zemlya*; 1 female; ZIN [1 female (ZIN), recorded for Kamchatka (Kasparyan & Kopelke, 2010), may be it is a dark form of *S. renovata*].

Diagnosis. The darkest species of the genus: the body, coxae, trochanters, mid and hind femora are black; the hind tibiae are brownish (usually with a pale middle marking in other species of the group); palpi are brownish, clypeus reddish or yellowish brown, mandibles yellow. *I.terg* about 2.0.

Saotis mellipes (Provancher, 1874) (should be referred to *Anoncus*)

Provancher, 1874: 59, female, male [*Echthrus*; lectotype (design. Gahan, Rohwer, 1918: 31) (Quebeck, Université Laval); 1879: 258 (*Mesoleius*); Davis, 1897: 298; Gahan & Rohwer, 1918: 31 (lectotype); 1951: 335; Barron, 1975: 508; Carlson, 1979: 602.

According to Barron (1975), in Provancher's collection there are two females (Nos 413 and 413a); specimen 413 is lectotype and belongs to *Saotis* but it does not fit the description – "Gahan and Rohwer's designation of specimen 413 as type is not categorically rejected but is considered with some doubt in the interests of stability" (Barron, 1975: 509). Specimen 413a (labelled as paratype by Comeau, curator) is Mesoleiine, but not *Saotis*. It better fits the description as far as has the face whitish below, mesonotum partly rufous, and ovipositor sheath projecting (as in the description). Supposedly it belongs to *Anoncus*. I have studied the photo of specimen ("paratypes") of *Anoncus* sp. (cf. *gracilicornis* Holmgren) from Philadelphia Museum

compared by Townes (?) with specimens of *Echthrus mellipes* Provancher. Here I do not consider this species as *Saotis*.

9. *Saotis morleyi* Fitton, 1976
(Figs 17–21)

Fitton, 1976: 341, nom. nov. pro *Homocidus emarginatus* Morley, 1911, praeocc., non Thomson, 1883 [*Holotypus*: female, Scotland, Kincardineshire, Banchory (BNHM)]; Kasparyan & Kopelke, 2009: 935, 939 (hosts); 2010: 241, 249, 256 (= *albiventris*; key, diagnosis, distribution, hosts).

Saotis albiventris Kasparyan, 2007 (in: Kasparyan & Khalaim, 2007: 548–549), female, male [*Holotypus*: female, England, Oxfordshire, Dry Sandford Pit, 30 June–19 July 1990 (K. Porter) (NMS), key, description, figs., distribution: Great Britain, Sweden, Russia].

Material. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 ft; 13, 18 July 1973; coll. H. & M. Townes; 2 females; AEI. Same date as above, Racing Riv., B. C., 2400 ft; 23, 27 July 1973; coll. H. & M. Townes; 2 females. **Palaearctic Region** (22 females, 7 males): **Great Britain** (BNHM, NMS), **Switzerland**, **Germany**, **Norway** (SMF), **Sweden** (Mus. Lund), **Russia** (from Murmansk to Transbaikalia), **Mongolia** (ZIN).

Diagnosis. Female of this species may easily be recognised by the very light coloured and strongly compressed apex of abdomen (Fig. 17); tergite 8 convex in lateral view, ovipositor sheath light yellow. The characters typical of the species group *tricolor* – antenna with 27–29 flagellomeres, short malar space, and colouration of hind tibia (Fig. 20) – are also typical of this species, but it has tergite 1 slender (Fig. 19) and propodeal areas weaker (Fig. 18).

Hosts. In Europe, it was reared by Kopelke from *Phyllocolpa ischnocera* (Thomson, 1862), *Phyllocolpa leucapsis*, *Ph. plicaglauca* Kopelke, 2007, *Ph. plicalapponum* Kopelke, 2007, *Ph. scotaspis* (Förster, 1854), and *Ph. spirhelvetica* Kopelke, 2007.

10. *Saotis pygidiator* Kasparyan & Kopelke, 2009
(Figs 4, 30–34)

Kasparyan & Kopelke, 2009: 120 (in: Kasparyan, 2009) [*Holotype*: female, Austria, Steiermark, ex *Pontania varia* (SMF), description, key to subspecies]; Kasparyan & Kopelke, 2009: 936, 937, 939 (hosts); 2010: 244, 248, 258 (key, diagnosis, distribution, hosts).

Diagnosis. *Saotis pygidiator* resembles *S. nigriscuta* especially in having a rather broad ovipositor sheath, slender basal flagellomeres, and by some features of colouration but it differs from *S. nigriscuta* and the congeners in broad and swollen temples (Fig. 31), and erect, usually very dense and short pubescence of female's hypopygium (Fig. 34); nervulus interstitial or rarely weakly postfurcal; *i.nrv* 0.1–0.25; pterostigma often is pale.

Differences between the four subspecies are given in key below.

1. Flagellum slightly longer (1.02–1.1) than fore wing. Face entirely black. Flagellum darkened 2
– Flagellum slightly shorter (about 0.95) than fore wing. Face often with yellow spots near clypeal fovea. Flagellum almost uniformly yellowish rufous. Pterostigma pale brown . . .3
2. Coxae and trochanters I black. Antenna with 23–26 flagellomeres. Pterostigma pale brown with dark margins. West Palaearctic . . . . . ***S. pygidiator pygidiator***
– Coxae, trochanters and femora uniformly light red. Antenna with 26–28 flagellomeres. Pterostigma blackish brown with small basal white marking. Transbaikalia . . . . . ***S. pygidiator ivan*** Kasparyan, 2009
3. *I.gen* 0.4–0.5; second flagellar segment 4.5–4.8 times as long as broad centrally. Hind tibia almost uniformly yellowish rufous. North of Siberia . . . . . ***S. pygidiator arctor*** Kasparyan, 2009
– *i.gen* 0.27–0.33; second flagellar segment 5–6 times as long as broad centrally (Fig. 30). Hind tibia yellowish rufous with fuscous markings before base and apex. Nearctic Region . . . . . ***S. pygidiator nearctor***

10a. *Saotis pygidiator nearctor* Kasparyan, 2009
(Figs 30–33)

Material. *Holotype*: **USA**, *Alaska*, Paxon, Alaska; 10 Aug. 1973; coll. H. & M. Townes; female; AEI.

Paratypes. Same date as in holotype; 2 females. **Canada**, *British Columbia*, B.C., Racing

Riv. 2400 ft; 23 Aug. 1973; coll. H. & M. Townes; 1 female; AEI.

Saotis pygidiator nearctor differs from *S. pygidiator pygidiator* and from the most congeners by pale yellowish rufous flagellum and yellowish pterostigma, face near clypeal foveae may be with yellow markings, basal flagellomeres very slender (Fig. 30), *i.fl* 1.21–1.35. In these characters it closely resembles the North-Siberian subspecies *S. pygidiator arctor,* but *S. pygidiator nearctor* has shorter cheeks (*i.gen* 0.27–0.35), somewhat more slender hind femora (*i.fem* 5.1–5.6), and slightly darkened hind tibia (at base and at apex).

Description. Female (holotype). Fore wing 5.5 mm, flagellum 5.1 mm long. Antenna with twenty-five flagellomeres; *i.fl* 1.26; first and second flagellomeres 9.0 and 5.0 as long as wide at the middle respectively. Head weakly narrowed, temples swollen (Fig. 31), but slightly convergent beyond the eyes to occipital carina; minimal distance from eye to occipital carina in upper part of temple 0.8 as long as minimum diameter of eye. *I.gen* 0.31. Clypeus convex in basal 0.6 with more than ten strong setae in lower half of this convexity. Nervulus weakly postfurcal, nervellus intercepted at lower 0.12. *I.fem* 5.6, *i.tars* 5.5:2.7:2.1:1.3:1.7; longest spur of hind tibia as long as segment 2 of hind tarsus. First abdominal tergite mat, distinctly granulate; *i.terg* 2.0; dorsal carinae of first tergite extend almost to middle of tergite; dorsolateral carina present but very weak beyond the spiracles. Tergites 2–4 of subequal length, each tergite about 1.3 times as long as wide at base. Tergite 2 distinctly granulate, except for hind margin, subsequent tergites shiny, with very fine granulation. Hairs on dorsal surface of tergites 2–5 very scarce and short, subsequent tergites rather uniformly pubescent. Tergites 3–7 moderately compressed. Hypopygium in apical half covered with dense and short erect hairs; its apex truncate, but without membranous concavity at the middle (Fig. 32).

Antenna yellowish rufous ventrally and slightly brownish dorsally; base of scape and dorsal surface of pedicel and scape completely blackish. Head and thorax black, with markings on face between clypeal fovea and eye (Fig. 30) (these marks very weak in one paratype), clypeus, mandible, palpi, weak spot on gena just beyond the mandible, anterior edge of collar, hind corner of pronotum, a pair of large anterolateral spots on mesoscutum, tegulae and apex of epimeron yellow. Fore and middle legs pale reddish; coxae with blackish dorsal longitudinal band widened at base; trochanters I reddish brown dorsally; all trochanters II yellow. Hind coxa blackish, slightly reddish ventrally at apex; hind trochanter I blackish with apical margin yellowish; hind femur red; hind tibia almost uniformly pale rufous, with small fuscous dorsal spot before base and with apical third entirely reddish rufous; hind spurs and hind tarsus uniformly dull rufous. Pterostigma pale yellowish rufous. Abdominal tergites black; tergites 2–7 dorsally with yellow band on hind margin which is rather wide on tergites 3–7, epipleura of these tergites also yellowish on margins. Hypopygium completely yellow (Fig. 32).

Male unknown.

Variability. Fore wing 4.0–5.5 mm, flagellum about 0.95 times as long as fore wing. Antenna with 23–25 flagellomeres; *i.fl* 1.21–1.35; second flagellar segment 5–6 times as long as wide at the middle. Head weakly narrowed or not narrowed, temples swollen. *I.gen* 0.27–0.38. Nervulus interstitial to weakly postfurcal; *i.nrv* 0.1–0.3; *i.fem* 5.1–5.6; *i. terg* 1.75–2.0.

Distribution. Subarctic zone of Canada and Alaska.

11. *Saotis renovata* (Morley, 1911)

Morley, 1911: 169, male [*Mesoleius*; lectotypum examinavi: male, England, Worcester (BNHM)]; Schmiedeknecht, 1914: 2808, 2812 (*Saotis*; key, description); Fitton, 1976: 341 (designation of lectotype); Kasparyan & Shaw, 2003: 355 (lectotype, male); Kasparyan & Kopelke, 2009: 935, 939 (host); 2010: 247, 249, 260 (female, key, diagnosis, hosts).

Saotis morleyi: Kasparyan & Shaw, 2003: 353, 354 (misidentification, female, key, Figs.); Kasparyan & Khalaim, 2007: 550, (female, key, distribution Britain, Sweden, Russia).

Material. **Great Britain**; 3 females; NMS. **Norway**; 1 female, 2 males; SMF. **Germany**; 1 female; Mus. Munich. **Sweden**; 1 female; BNHM. **Poland**; 1 female; ZIN. **Russia**, Vladivostok; 1 female; ZIN. **North America**; 2 females; AEI.

Diagnosis. *Saotis renovata* can easily be distinguished by its strongly elongate tergite 1 (*i.terg* 2.3–2.9) (Fig. 42), by epipleura of tergite 3 which are not separate by a crease, and by rather long and less convex dorsum of tergite 8 (Figs 39, 40). *Saotis renovata* was considered in species group *tricolor* since has *i.fl* 0.95–1.05, first flagellomere 4–5 times as long as its width at the middle, hind femora rather thick (*i.fem* 3.9–4.5), and hind tibia usually with white ring at the middle part. However it differs from other species of *tricolor*-group (besides of structural features of tergites 1, 3 and 8) in having the number of flagellomeres of antenna only 21–25 (26–30 in *tricolor*-group), malar space longer (*i.gen* about 0.4). Most of these characters are same as in *hoeli* group of species, thus *S. renovata* has intermediate position between *tricolor*- and *clypeata*-groups and distinguished here as a separate species group. *Saotis renovata* can be separated from species of *clypeata*-group by slender tergite 1, and by distinctly separated pygostyli of tergite 8 (compare Figs 25 and 40).

Variability in females. Fore wing 3.5–5.0 mm; antenna with 21–25(26) flagellomeres.

Hosts. The species was reared in Europe from several species of *Phyllocolpa* (Kasparyan & Kopelke, 2009, 2010): *Phyllocolpa anomalpotera* (Förster, 1854), [2 males perhaps of this species from *Phyllocolpa nudipectus*], *Phyllocolpa* sp. on Salix udensis. Type (as noted by Morley, 1911: 169) has been reared from *Phyllocolpa* ["*Nematus*"] *purpurea*.

Distribution. Holarctic Region. In Nearctic Region the species is represented by a new subspecies.

11a. *Saotis renovata rufipes* subsp. nov. (Figs 38–42)

Material. *Holotype*. **Canada**, *British Columbia*, Stone Mt. Pk., B. C., 5500 ft; 23 Aug. 1973; coll. H. & M. Townes; female; AEI.

Paratype. Same data as above, 2400 ft; 16 July 1973; female.

Diagnosis. *Saotis renovata rufipes* differs from the Palaearctic subspecies *S. renovata renovata* in combination of reddish coxae with entirely black thorax (in *S. renovata renovata* coxa usually black, or if reddish then mesoscutum with anterolateral yellow spots); hind basitarsus about 0.9 as long as tergite 8 on dorsum (in *S. renovata renovata* hind basitarsus 1.2–1.4 as long as tergite 8).

Description. *Female* (holotype). Fore wing 3.8 mm, flagellum 3.5 mm long. Antenna with 23 flagellomeres, *i.fl* 0.97. Head strongly narrowed beyond the eyes. Clypeus evenly convex, its lower edge sharp and broadly concave at the middle. *I.gen* about 0.4. Mesoscutum on central lobe mat, with fine dense granulation, on lateral lobes smoother, shiny with discernible punctures. Mesopleuron below subtegular ridge almost smooth and shiny, at lower half with fine moderately dense setiferous punctures. Metapleuron densely granulate. Propodeum with distinct dorsal areas, areola rather narrow; dorsolateral areas almost smooth, pleural area scabrous; pleural and lateral carinae distinct. *I.fem* 4.2, *i.tars* 3:1.6:1.2:0.8:1.3. Nervulus strongly postfurcal; *i.nrv* about 0.33. Tergites distinctly elongate, *i.terg* 2.4, epipleura of tergite 3 narrow and not separated by crease; tergites 7 and 8 almost entirely projecting (Figs. 39, 40); tergite 8 rather long on dorsum, 1.15 as long as hind basitarsus. Abdomen beyond the middle of tergite 2 strongly compressed. Tergite 2 granulate and mat in basal part, smoother to apex; subsequent tergites almost smooth and shining with scarce hairs. Tergites (5)6–7 on hind margin with median emargination. Sternite 6 (hypopygium) long and at apex projecting (Figs 39, 40).

Antennae blackish-brown. Head black; clypeus, mandibles and palpi light yellow.

Thorax black, hind corners of pronotum and all tegulae yellow. Legs reddish rufous; fore and mid coxae pale yellow ventrally; all trochanters yellow, except that hind trochanter I is reddish brown. Hind tibia in the middle 0.3 dull whitish yellow, its base (0.37) and apex (0.33) brownish rufous, spurs pale rufous; hind tarsus pale brownish-rufous. Pterostigma uniformly pale brownish. Abdominal tergite 1 black, tergites 2–8 blackish brown, tergites (5)6 and 7 hardly bordered with pale on hind margins. Sternites 1–5 yellow with lateral brownish sclerites; hypopygium brownish, its apical half yellowish brown. Ovipositor sheath brownish.

Variability. In paratype hind tibia almost uniformly reddish.

Male unknown.

12. Saotis *rufigaster* sp. nov.

(Figs 43–45)

Material. Holotype. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 ft; 18 July1973; H. & M. Townes; female; AEI.

Diagnosis. Saotis rufigaster may be distinguished from the congeners by almost completely reddish abdomen. New species belongs to *tricolor* species group in having tergite 8 convex dorsally in profile (Fig. 43), flagellum 29-segmented (usually not more than twenty six flagellomeres in other groups), and hind femora thickened. It differs from most other species of *tricolor*-group (except for *S. renovatus*) besides colouration of abdomen, by malar space longer, thorax completely black and hind tibia predominantly rufous (without white middle ring).

Description. Female (holotype). Fore wing 4.8 mm, body 6.0, flagellum 5.3 mm long (flagellum 1.1 times as long as fore wing). Antenna with twenty-nine flagellomeres; flagellomeres 1 and 2 respectively about 7.0 and 3.8 as long as their width at the middle; *i.fl* 1.1. Head strongly narrowed beyond the eyes; temple mat and with distinct granulation, at the middle about as long as eye in profile. Clypeus weakly convex, with lower margin sharp and concave at the middle. *I.gen* about 0.45. Mesoscutum on median lobe mat, with weak granulation; its lateral lobes almost smooth, with discernible fine punctures. Mesopleuron with large granulation, under subtegular ridge almost smooth; speculum polished. Metapleuron mat, with granulation smaller but coarser. Propodeum with basal area partly obliterated, areola rather broad, apical area large (Fig. 44); lateral and pleural carinae present. *I.fem* 3.9, *i.tars* 4.5:2.0:1.6:1.0:1.6. Nervulus postfurcal; *i.nrv* about 0.3. Tergite 1 (Fig. 45) with dorsal carinae moderately short, dorsolateral carinae distinct to hind margin; *i.terg* 1.6; tergite 2 about as long as wide at base; tergites 5–7 with wide median emargination on hind margin; tergites 7 and 8 almost entirely projecting, tergite 8 convex dorsally in lateral view (Fig. 43). All tergites are shiny, smooth (except for hardly granulated tergite 2 and epipleura), with rather scarce fine hairs. Epipleura of tergite 2 very narrow, light yellow and separated by crease; epipleura of tergite 3 and of subsequent tergites not separated. Hypopygium large, its apex projecting (Fig. 43). Ovipositor sheath moderately wide, about 0.5 times as wide as hind femur.

Head and thorax black, abdomen reddish brown, legs reddish rufous. Antennae with flagellum brownish dorsally, reddish brown ventrally; scape and pedicel blackish. Clypeus, mandibles, palpi, and tegulae yellow. Hind corners of pronotum reddish yellow; scutellum reddish brown at apex. Legs almost uniformly reddish rufous with all trochanters II (trochantelli) yellow. Pterostigma uniformly dark brown with small pale marking at base. Abdominal tergites and ovipositor sheath reddish brown; tergite 1 infuscate at base and laterally. Sternites pale rufous, sternites 1–3 predominantly yellow.

Male unknown.

13. *Saotis subarctor* Kasparyan & Kopelke, 2010
(Figs 3, 6, 37)

Kasparyan & Kopelke, 2010: 242, 249, 260, female, male [key, description, hosts, distribution: Scandinavia, North of Yakutia, Canada). *Holotype*: Russia, *Murmansk Province*, Kirovsk, Yuksporrjokk stream; 31 July 1974; coll. D. Kasparyan; female; ZIN]; Kasparyan & Kopelke, 2009: 935, 939 (nom. nudum; hosts).

Material. Paratypes. **Norway**; 4 females, 4 males; SMF. **Finland**; 1 male; SMF. **Russia**; 2 females; ZIN. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 ft; 17, 20 July 1973; H. & M. Townes; 3 females; AEI. Same data as above, 4200 ft; 23 July 1973; 1 male. **Canada**, *Quebeck*, Payne Bay; 18, 21 July 1958; coll. E.E. MacDougall; 5 females; CNC. Same data as above; 27 July 1958; coll. W.R.M. Mason; 1 female.

Diagnosis. Saotis subarctor may easily be distinguished from the congeners by a combination of the separated by crease epipleura of tergites 4(5–6) and yellow colouration of the ovipositor sheath (Fig. 37) with entirely black thorax, coxae and all trochanters I.

Distribution. Holarctic Region, subarctic zone.

Hosts. In Europe the species was reared by Kopelke from *Phyllocolpa acutiserra* Lindquist, 1948, *Ph. nudipectus*, and *Ph. plicaphylicifolia* Kopelke, 2007.

14. *Saotis tinctor* sp. nov.
(Fig. 29)

Material. Holotype. **Canada**, *British Columbia*, Stone Mt. Pk., 3800 ft; 14 July 1973; coll. H. & M. Townes; female; AEI.

Paratypes. Same data as in holotype; 17, 20, 24 July 1973; 4 females. Same locality as above, 5500 ft; 22 July 1973; 1 female. Same locality, 4200 ft; 23 July 1973; 1 female. Same locality, 3500 ft; 25 Luly 1973; 1 female. **USA**, *Alaska*, Thompson Pass; 15, 16 Aug. 1973; coll. H. & M. Townes; 4 females; AEI.

Diagnosis. Saotis tinctor belongs to *nigriscuta* species group; it closely resembles structurally Palaearctic species *S. nigriscuta* Thoms. but differs from this species and other species of group in having epipleura of tergites 4–7 predominantly yellowish white or with yellow spot in hind corner and tergites 4–7 dorsally with a broad apical yellowish band (Fig. 29); hypopygium completely light yellow (hypopygium with blackish base in *S. heteropus* and *S. boreator*).

Description. Female (holotype). Fore wing 5.6 mm, flagellum 5.4 mm long (slightly shorter than fore wing). Antenna with 26 flagellomeres; flagellomeres 1 and 2 accordingly about 8.5 and 4.8 as long as their width at midlength; *i.fl* 1.32. Head weakly narrowed beyond the eyes; temple mat and with distinct granulation, just beyond the eyes subparallel, at the middle about as long as eye in profile. Clypeus convex, with median swelling above lower margin; the lower margin with lateral sharp lobes and arcuated upward in median part; *i.gen* about 0.4. Mesoscutum on median lobe mat with weak granulation; on lateral lobes almost smooth, shiny, with very fine punctures. Mesopleuron smooth, shiny, with fine inconspicuous punctures in anterior 0.4 and below the middle, and with small central granulate area; speculum polished. Metapleuron shiny, with smoothed fine granulation. Propodeum variably smooth, without granulation; basal area partly obliterated, areola rather weak and narrow, apical area rather short, *i.ar.ap* 0.37; lateral and pleural carinae present. Nervulus postfurcal, distad of basal vein about 0.33 of its length; *i.nrv* about 0.22; *i.fem* 5.8, *i.tars* 5.5:2.9:2.1:1.2:1.8 (second segment 1.6 times as long as fifth segment); tarsal claws with 1 thin and high tooth at base. Tergite 1 rather evenly tapered from hind margin to base; *i.terg* 1.78; dorsal carinae distinct about to spiracle level; dorsolateral carina variably long. Tergite 1 in basal 0.7 distinctly granulate; tergite 2 and apical third of tergite 1 shiny, with smoothed granulation; subsequent tergites shiny and almost smooth with hardly discernible granulation. Hairs on dorsum of tergites fine, rather short, moderately sparse, distances between bases of hairs about as long as hairs. Tergite 2 about as long as wide at base; epipleura tergites 2 and 3 completely separated by crease; epipleura of subsequent tergites not sepa-

rated. Tergites 3–8 moderately compressed; hind edge of apical tergites without distinct median emargination; tergites 7 and 8 not enlarged (Fig. 29). Hypopygium large, its apex slightly projecting (Fig. 29). Ovipositor sheath wide, about as wide as hind femur. Apex of upper valve beyond the nodus rather thin and short, about 0.7 times as long as third segment of hind tarsus.

Antenna with scape, pedicel and first flagellomere (except for its extreme base and apex) blackish, flagellum reddish brown ventrally, blackish brown dorsally, with completely darkened five apical segments. Head black, clypeus and mandibles light yellow; palpi whitish, two apical segments of maxillary palpi brownish. Thorax black with hind corners of pronotum, tegulae, one pair of anterolateral spots on mesoscutum, apex of epimeron whitish yellow. Fore coxa and all trochanters II yellow; fore and middle trochanters I yellow with brown base, hind trochanter I predominantly blackish-brown. Mid and hind coxae, and femora reddish; fore and mid tibiae rufous, mid tibia fuscous dorsally; fore and mid tarsi brownish. Hind tibia dirty whitish in basal 0.6, blackish in apical 0.3 and in dorsal 0.35 at base; hind spurs and hind tarsus blackish-brown, tarsal segments 1–4 pale at extreme base. Pterostigma uniformly brown with small yellow marking at extreme base. Tergites blackish; tergite 2 with thin pale line on hind margin; tergites 3–7 with a broad dorsal apical band which interrupted laterally; epipleura of tergites 2 and 3 pale brownish; epipleura of tergites 4–7 predominantly white (Fig. 29); tergite 8 blackish, slightly pale on hind margin. Sternites 2 and 3 yellowish with light brownish tinge; sternites 4–6 completely light yellow on longitudinal fold. Ovipositor sheath blackish with apex brownish-black.

Variability. Fore wing 4.2–5.7 mm; 22–26 flagellomeres; *i.fl* 1.2–1.33; *i.fem* 5.0–6.0. Mesoscutum always with anterolateral yellow spots. Scutellum black. Hypopygium and longitudinal fold on tergites 1–5 entirely light yellow. Hind coxa and hind femora usually red, but in two females blackish; in this specimens epipleura also darkened but on tergites 5 and 6 whitish in their hind corners and hypopygium yellow to base.

Male unknown.

15. *Saotis tricolor* (Thomson, 1883) (Figs 2, 22–24)

Thomson, 1883: 933, female [*Mesoleius* (*Saotus*); syntypi examinavi: 3 females, Sweden, "L-d" (=Lund) (Mus. Lund)]; 1894: 2019 (*Saotus*); Dalla Torre, 1902: 276 (*Saotis*; bibliogr.); Schmiedeknecht, 1914: 2809, 2815 (key, description); Fitton, 1982: 59 (syntypes); Kasparyan & Shaw, 2003: 352, 353 (key, fig); Kasparyan & Khalaim, 2007: 548, 549 (=*liopleuris*; key, fig.); Kasparyan & Kopelke, 2009: 935, 939 (hosts); 2010: 241, 247, 249, 262 (key, figs, diagnosis, hosts).

Saotis liopleuris Thomson, 1888: 1263, female [*Mesoleius* (*Saotus*); lectotypum (labelled Hinz 1962) examinavi: female, Sweden, "Pål" (=Skåne, Pålsjö) (Mus. Lund)]; 1894: 2018 ("*liosternus*", lapsus); Dalla Torre, 1902: 276 (*Saotis*); Schmiedeknecht, 1914: 2809, 2815 (key, description); Meyer, 1936: 295 (Russia); Fitton, 1982: 57 (designation of lectotype); Kasparyan & Shaw, 2003: 353 (key).

Material. **Canada**, *British Columbia*, Stone Mt. Pk., B. C.; coll. H. & M. Townes, 3800 ft; 17 July 1973; 1 female; AEI. Same data as above, 5500 ft; 22 July 1973; 1 female. **USA**, *California*, N San Francisco, near Muir-Wood, valley of stream with Salix; 17 May 1988; coll. D. Kasparyan; 2 females; ZIN. **Norway**; 4 females, 2 males; SMF. **Germany**; 2 females; SMF. **Austria**; 13 females, 6 males; SMF. **Belorussia**;1 female; ZIN. **Russia**; 4 females; ZIN.

Diagnosis. *Saotis tricolor* differs from closely related *S. bilineata* and *S. morleyi* in brownish colouration of tergites 7 and 8 (including epipleura) (Fig. 22). It can be distinguished from *S. renovata* by strongly swollen in profile tergite 8, by short malar space (*i.gen* about 0.25), by large number of flagellomeres (usually 27–30), by strongly hooked at apex tarsal claws (Fig. 24), and tergite 1 robuster (*i.terg* about 1.6) (Fig. 23). The constant and typical of species elements of colouration are: brownish two last metasomal tergites (tergites 7 and 8, Fig.

22), a broad white middle ring on hind tibia (as in *S. morleyi*, Fig. 20), and red hind coxa and hind femur.

Variability of colouration. Face entirely black or with small yellowish markings. Thorax usually with yellow large anterolateral spots on mesoscutum, with yellow spot on scutellum (its hind margin always black), on postscutellum, and sometimes (in specimens from California and Russian Far East) on subtegular ridge. However in specimens from Canada and South of Siberia thorax is almost entirely black, without yellow markings. The specimens from California differ sharply in having mesopleura (except for black speculum), metapleura and basal half of propodeum red.

Hosts. The species is reared in Europe by J.-P. Kopelke from *Phyllocolpa anomalpotera*, *Ph. ischnocera*, *Ph. plicadaphnoides* Kopelke, 2007, *Ph. nudipectus*, *Ph. oblita* (Serville, 1823), *Ph. polita* (Zaddach, 1883); in Russia reared from *Phyllocolpa* sp. on Salix miyabeana; in Germany reared (Hinz, 1961 as *Saotis liopleuris*) from *Phyllocolpa leucosticta* (Hartig, 1837).

16. *Saotis truncator* sp. nov.
(Figs 46–48)

Material. Holotype. **USA**, *Alaska*, Thompson Pass; 15 July 1973; coll. H. & M. Townes; female; AEI.

Paratypes. Same data as in holotype; 1 male. **USA**, *Alaska*, Tsaina R.; 17 Aug. 1973; coll. H. & M. Townes; 1 female; AEI. **Canada**, *British Columbia*, Stone Mt. Pk., 420 ft; 23 July 1973; coll. H. & M. Townes; 1 male; AEI.

Diagnosis. Saotis truncator may easily be distinguished from the congeners by the hypopygium widely truncate at apex (Fig. 48, to compare with Figs 39, 43).

Description. Female (holotype). Fore wing 4.4 mm, body 5.5 mm, flagellum 4.4 mm long. Antenna with twenty-four flagellomeres; flagellomeres 1 and 2 accordingly 6.5 and 3.2 as long as their width at the middle; *i.fl* 1.1. Head distinctly narrowed beyond the eyes, temple at the middle about as long as eye in profile. Clypeus evenly and weakly convex, at apex obtuse, with lower edge sharp and almost straight. *I.gen* 0.38. Mesoscutum with very fine pubescence and granulation, weakly shiny. Mesopleuron shiny and almost polished, in lower half with moderately dense fine hairs, and with small spot of weak granulation at centre (before mesopleural pit). Metapleuron mat, superficially granulate. Propodeum (Fig. 46) with basal area partly obliterated, areola, apical area, lateral and pleural carinae present. *I.fem* 5.0, *i.tars* 3.8:1.9:1.5:1.0:1.5. Nervulus moderately postfurcal; *i.nrv* about 0.12. Tergite 1 (Fig. 47) with dorsal and dorsolateral carinae obliterated; *i.terg* 2.0; tergites 2 and 3 about as long as wide in base; tergites 5–8 with median emargination on hind margin; tergites 7 and 8 retracted (Fig. 48). All tergites are shiny, smooth (except for hardly granulated tergite 2), with rather scarce fine hairs. Tergites 4–8 strongly compressed. Epipleura of tergites 2 and 3 are narrow, light yellow and separated by crease (or in tergite 3 may be not separated; epipleura of tergites 4 and 5 sometimes can be separated by a weak fold). Hypopygium large and widely truncated at apex (Fig. 48). Ovipositor sheath rather wide, about 0.9 times as wide as hind femur (in paratype ovipositor sheath entirely retracted into hypopygium).

Head and thorax black. Antennae blackish with scape and pedicel yellowish rufous ventrally. Clypeus, mandibles, palpi, crescent spot just beyond mandible, hind corners of pronotum, anterolateral spot on mesoscutum, fore tegulae, subtegular ridge, apical 0.4 of epimeron, and hind tegulae yellow. Fore and mid coxae yellowish at apex with fuscous markings at basal half; trochanters yellow, hind trochanter I blackish with yellow apical margin. Fore and mid legs beyond the trochanters predominantly reddish rufous with the last segment of tarsi brownish. Hind coxae blackish, hind femur brownish red, hind tibia blackish in apical 0.4, brownish dorsally, pale at basal 0.6 ventrally and also at the middle later-

ally; spurs pale rufous; hind tarsus greyish-brown with extreme base of segments 1–3 paler. Pterostigma uniformly brown with dark brown margins. Abdominal tergites 1–3 black, tergite 2 in apical 0.5 and tergite 3 in apical 0.35 brown with pale hind margin; tergites 4–7 shiny brown with median triangle yellow spot on hind margin (Fig. 48), and sometimes with yellow markings on epipleura. Sternites broadly yellow on median fold with lateral brownish spots. Ovipositor sheath blackish brown.

Variability in females. Paratype similar to holotype, but ovipositor sheath is almost entirely retracted inside the hypopygium.

Description. Male. Similar to female but genae shorter (*i.gen* about 0.25); flagellomeres 1 and 2 more slender (*i.fl* 1.2), respectively 7.5 and 4 times as long as their width at the middle, without rinariae ventrally; *i.fem* 5.4. Face, lateral margins of frons in lower 0.35, clypeus and mandibles, scape ventrally completely and small ventral spot on pedicel, malar space and cheeks beyond the mandibles to lower margin of eye light yellow. Thorax black with front edge of collar, hind corners of pronotum, anterolateral spots on mesoscutum, spot on subtegular ridge, markings on prepectus and in anterior part of mesosternum, apex of epimeron, sometimes in hind lower corner of mesopleuron yellow. Fore and mid coxae, apical part of hind coxa and all trochanters (except for blackish hind trochanter I) yellow; hind coxae in basal 0.7 and extreme base of fore and mid coxae blackish. Fore and mid femora and tibiae rufous, posterior surface of femora slightly brownish at base. All tarsi brownish. Hind femora brownish black. Hind tibia fuscous (greyish brown) dorsally and in apical 0.35, dull pale ventrally in basal 0.65. Tergites 1 and 2 black, subsequent tergites blackish brown; hind edge of tergite 2, triangular spot at base and at apex of tergite 3 and similar but smaller spots on tergite 4 reddish yellow; tergites 6–8 on hind margin with triangular median yellow spot. Epipleura and sternites yellow; parameres brown.

Key to the Nearctic species of *Saotis*, females only

1. Apical part of hypopygium broadly truncate (Fig. 48). Fore wing 4.5 mm; 24 flagellomeres; head narrowed beyond eyes, *i.fl* 1.1, *i.gen* about 0.4, *i.nrv* 0.12, *i.fem* 5.0; *i.terg* 2.0 (Fig. 48); mesoscutum and mesopleuron almost smooth; tergites 3–5 usually with crease from base to spiracles. Thorax black with anterolateral spots on mesoscutum, subtegular ridge and apical part of epimeron yellow; abdomen blackish brown; hind coxa reddish brown, hind femur reddish, hind tibia greyish brown with pale ventral and median markings . . . . . 16. ***S. truncator* sp. nov.**
– Apical part of hypopygium different 2
2. Epipleura (lateral parts of tergites ventrad of spiracles) of tergites 4 and 5 usually separated by crease. Tergite 8 and ovipositor sheath ochraceous to light yellowish; ovipositor sheath truncate at apex (Figs 3, 14). Antenna with 20–24 flagellomeres; *i.fl* about 1.1; *i.gen* 0.4–0.6. Nervulus postfurcal; nervellus intercepted close to its lower end (*i.nrv* 0.1–0.23); *i.terg* 1.5–2.0. Hind tibia reddish brown, but in basal half sometimes dirty white to rufous ventro-posteriorly 3
– Epipleura of tergites 4 and 5 not separated by crease. Other characters not entirely as above 4
3. Scutellum dorsally (except for black median spot at base) and postscutellum yellow; mesoscutum with yellow central and anterolateral spots (Fig. 15); fore and mid coxae and trochanters yellow. Mesopleuron, metapleuron and tergite 3 almost smooth, shiny. Antenna usually with 23–24 flagellomeres; *i.fem* 4.3–4.5 . . . . . 3a. ***S. brevispina lissor* subsp. nov.**
– Thorax entirely black (except for white tegulae); coxae and all trochanters I black . . . . . 13. ***S. subarctor***
4. Abdomen reddish (except for base of tergite 1). Flagellum 29-segmented (in other species usually 20–26 flagellomeres, except for species of *tricolor*-group), hind femora thickened (*i.fem* about 3.9). Hind legs almost uniformly reddish . . . . . 2. ***S. rufigaster* sp. nov.**
– Abdomen predominantly black dorsally. Other characters not entirely as above 5
5. Epipleura of tergites 5–6 white or yellow 6

– Epipleura of tergites 5–6 black, brown or rufous, or only distally or at hind edge whitish 8

6. Dorsum of tergite 8 very strongly convex in lateral view (Figs 2, 17, 22). Malar space short, *i.gen* about 0.25–0.3. Antenna usually with (26)27–30 flagellomeres; first flagellar segment only 4–5 times as long as its width at middle; *i.fl* 0.9–1.07; hind femur rather thick (*i.fem* 3.9–4.4); hind tibia with distinct white ring in middle part and often tricoloured (Fig. 20); mesoscutum and tergites of abdomen shiny and almost smooth 7
– Tergite 8 weakly convex dorsally (Fig. 29). *I.gen* about 0.4. In holotype antenna with 26 flagellomeres; first flagellar segment about eight times as long as its width at middle; *i.fl* 1.32; hind femur slender (*i.fem* 5.8); ovipositor sheath wide, about as wide as hind femur; Mid and hind coxae, and femora reddish; hind tibia dirty whitish in basal 0.6, blackish in apical 0.3 and indorsal 0.35 at base, its spurs and hind tarsus blackish brown. Tergites 3–7 with a broad dorsal apical band which interrupted laterally (Fig. 29) . . . . . 14. ***S. tinctor*** **sp. nov.**

7. Tergites 7 and 8 almost entirely brownish; tergite 8 with superficial transverse impression beyond middle (Fig. 22). Tergite 1 about 1.6 times as long as wide (Fig. 23). *I.fl* 1.03–1.07. Hind tarsal claw strongly curved at apex (Fig. 24) . . . . . 15. ***S. tricolor***
– Tergites 7 and 8 white laterally, tergite 8 almost entirely white (except for dorsal spot at base) (Fig. 17). Tergite 1 about 2.0–2.3 times as long as wide (Fig. 19). *I.fl* 0.9–0.95. Hind tarsal claw slender (Fig. 21) . . . 9. ***S. morleyi***

8. Tergites very densely covered with short hairs. *I. gen.* about 0.2. All coxae brownish black; thorax entirely black. Tergites of metasoma black to brown, without white pattern; apical tergites (except dorsally), hypopygium and ovipositor usually ochraceous; hind margin of tergite 8 with median projection. *Holotype*: 23/24 flagellomeres; clypeus impressed along lower margin; body black to brown, with following parts white: clypeus, mandibles, hind corners of pronotum, tegulae, fore and mid trochanters II. All coxae and hind trochanters black; hind tibia whitish, weakly fuscous in extreme base and brownish in apical 0.35; mesopleuron granulate; epipleura of tergite 3 (except at base) and tergites 4–8 not separated by crease. Palaearctic species . . .[***S. nigriventris*** Thoms.]
– Tergites with hairs much sparser and longer; malar space usually longer; coxae red or black; thorax entirely black or with yellow marks 9

9. Thorax and tergites 1–4(5) mat, evenly covered with granulation. Malar space very short (*i.gen* about 0.2). Sternites brownish, without distinct longitudinal fold; hind edge of hypopygium truncate (Fig. 8); tergites 7 and 8 usually projecting beyond apex of hypopygium (Fig. 35). *I.terg* 1.7–1.8; tergites 2–4 subequal, about 1.5 as long as their width at base, almost not compressed; Head not narrowed, temples beyond eyes parallel. Mesoscutum, scutellum and abdominal tergites black (6. ***S. granulator***). Hind tibia at extreme base (0.1) with whitish dorsal spot (Fig. 36) (without this spot in *S. granulator granulator*). Antenna with 20–22 flagellomeres (21–24 in *S. granulator granulator*); *i.fl* 1.02–1.1 (0.8–1.0 in *S. granulator granulator*); nervulus postfurcal; *i.nrv* 0.2–0.3 (about 0.33 in *S. granulator granulator*). Propodeum with basal area and areola (these areas usually obliterated in *S. granulator granulator*); coxae and hind trochanter I reddish (blackish or sometimes reddish in *S. granulator granulator*); other trochanters predominantly yellow . . . . . 6a. ***S. granulator albator*** **subsp. nov.**
– Thorax and tergites 2–5 predominantly or partly polished, or without distinct granulation. Malar space longer, *i.gen* 0.27–0.50. Sternites usually yellowish, with distinct longitudinal fold; apex of hypopygium usually projecting backward; tergites 7 and 8 usually not projecting beyond apex of hypopygium (Figs 25, 26, 32, 39) 10

10. Hypopygium covered with dense erect hairs perpendicular on surface of sternite or slightly slanted by apices to its base (Fig. 32). Head not narrowed behind eyes, temples swollen (Fig. 31). *I.fl.* 1.25±0.1; first flagellar segment 1.4–1.6 times as long as segment 2. Flagellum 23–28-segmented, about as long as fore wing (±0.1). Mesoscutum with anterolateral yellow spots; scutellum black. Nervulus interstitial to slightly postfurcal; *i.nrv* 0.1–0.2; *i.terg* 1.7–2.0. Ovipositor sheath (Figs 4, 32) usually reddish brown, about 0.8 times as wide as lateral width of hind femur (10. ***S. pygidiator***). Flagellum slightly shorter (about 0.95) than fore wing and almost uniformly yellowish rufous. Pterostigma pale yellowish brown. Face often with yellow spots near cly-

peal fovea (Fig. 30). *I.gen* 0.27–0.33; second flagellar segment 5–6 times as long as wide at middle (Fig. 30). Hind tibia yellowish rufous with fuscous markings before base and at apex. Nearctic Region . . . . . 10a. ***S. pygidiator nearctor***

– Hairs on hypopygium sparse and slanted backward (to apex of sternite). Head usually slightly or distinctly narrowed. Other characters not entirely as above 11

11. First tergite 2.2–2.9 times as long as wide, its lateral margins beyond spiracles subparallel (Fig. 42), without dorsolateral carinae. Epipleura of tergite 3 not separated by crease. Flagellum with 21–25 segments; *i.gen* about 0.4; *i.fem* 3.9–4.4. Tergite 2 polished in apical third; apical tergites completely brownish, strongly compressed and rather strongly convex (Fig. 39); ovipositor sheath light brown to brown. Hind tibia often with whitish middle band, but sometimes dull rufous. *I.fl* 0.97 (11. ***S. renovata***). Hind coxae reddish, thorax entirely black (in *S. renovata renovata* coxae often black, if hind coxae red, then mesoscutum usually with yellow anterolateral spots); hind basitarsus about 0.9 as long as tergite 8 on dorsum (hind basitarsus 1.2–1.4 as long as tergite 8 in *S. renovata renovata*). Fore and mid coxae and trochanters yellow . . . . . .11a. ***S. renovata rufipes*** **subsp. nov.**

– First tergite about 1.6–2.1 times as long as wide, its lateral margins beyond spiracles usually divergent (Figs 13, 23) and usually bordered with carinae. Epipleura of tergite 3 usually separated by crease. Flagellum with 20–30 segments; *i.gen* about 0.25–0.45; nervulus postfurcal 12

12. Ovipositor sheath very wide (1.1–1.3 as wide as hind femur), black or dark brown (Figs 12, 16, 28, 29). First flagellomere about seven-eight times as long as wide at middle. Tergites 4–8 moderately compressed; hind edge of tergites without distinct median emargination; tergites 7 and 8 not enlarged, their visible part shorter than second segment of hind tarsus 13

– Ovipositor sheath not wider than hind femur and usually paler (brownish). First flagellomere about four–five times as long as wide at middle. Tergites 4–8 strongly compressed; hind edge of tergites 4–7 with median emargination; tergites 7 and 8 enlarged (Figs 1, 2, 22, 25, 26), their visible part is much longer than second segment of hind tarsus 6

13. Mesopleuron and mesosternum red (except for black speculum and subtegular ridge); scutellum completely reddish dorsally; mesoscutum with whitish yellow anterolateral spots and in posterior 0.5 with large subquadrate reddish brown spot; clypeus without median bulge above its lower margin, flagellum 24-segmented (in holotype) and slightly shorter (0.95) than fore wing, *i.fl* 1.1, *i.gen* 0.3, *i.fem* 4.5, coxae and hind femora light reddish, hind tibia without distinct white band in its middle third . . . . . 5. ***S. erythropleura*** **sp. nov.**

– Mesopleuron, mesosternum and scutellum completely black; anterolateral yellow spots on mesoscutum present or absent; mesoscutum in posterior 0.5 without reddish spot; clypeus often with median bulge above its lower margin 14

14. Mesoscutum with anterolateral yellow spot *and* hypopygium light yellow to base. Hind margin of tergites 4–7 with broad median yellow spot (Fig. 29). Hind tibial spurs brownish or blackish. Antenna with (22)23–26 flagellomeres; *i.fl* about 1.2–1.33 . . . . . .14. ***S. tinctor*** **sp. nov.**, var.

– Mesoscutum completely black or with yellow anterolateral spot and hypopygium blackish at base (Fig. 16). Hind margin of tergites 4–7 with narrow median yellow band (Figs 12, 16). Hind tibial spurs whitish or only at apex brownish. Antenna with 19–24 flagellomeres; *i.fl* 1.1–1.2 15

15. Hind femur black with brownish apex; all coxae and trochanters I black. Mesoscutum entirely black. Fore wing 4–5 mm long; antenna with 23–24 flagellomeres. Areola of propodeum very narrow and separated from apical area. Segment 3 of hind tarsus 1.2–1.3 times as long as segment 5. Thorax black with only tegulae white. *Lectotype*: fore wing 4.8 mm; antennae broken; *i.fl* 1.12; mandible brownish (in other studied specimens yellow); *i.gen* 0.35; nervulus weakly postfurcal; *i.nrv* 0.25; head with temples swollen; tergite 1 beyond spiracles with parallel margins; *i.terg* 2.1; trochanters II blackish at base; hind tibia in lectotype pale rufous with reddish apex (0.25) and fuscous in extreme base (0.05); tergites 3–7 black, with a dorsoapical yellowish spot and white apical margin; sternites pale brown, sternites 5 and 6 yellowish with fuscous basal part; ovipositor sheath wide and blackish (Fig. 16) . . . . . 7. ***S. heteropus***

– Hind femur red; coxae red, fuscous at base; trochanters yellow, hind trochanters I red; hind spurs white (in type). Mesoscutum with anterolateral yellow spot. *Holotype*: fore wing 3.7 mm; flagellum 21-segmented; *i.gen* about 0.4–0.5. Areola of propodeum absent or obliterated . . . . . 2. ***S. boreator***

16. *I.gen* about 0.25. Tergite 8 very strongly convex dorsally in profile and just beyond middle with light transverse impression; pygostyli distinctly separated from tergite (Fig. 2); apical tergites brownish, strongly compressed (Fig. 22). Flagellum usually with 26–30 segments (in small specimens with fore wing 3.5–4.0 mm may be 24–25 flagellomeres). Hind tarsal claws without teeth at base (Fig. 24). *I.fl* about 1.05; *i.fem* 4.0–4.4. Hind tibia in basal 0.3 with wide dark basal ring, usually tricolourous: white at middle, black with reddish at base and at apex (as in Fig. 20). Tergite 2 with very fine granulation, almost polished in apical third; epipleura of tergite 3 not separated by a crease. Segment 3 of hind tarsus usually slightly shorter than segment 5. *I.nrv* about 0.33 . . . . . 15. ***S. tricolor***

– *I.gen* about 0.35. Tergite 8 (and 7) strongly projecting and almost straight dorsally in profile; hypopygium very large; pygostyli merged with tergite 8. (Figs 1, 25, 26). Flagellum usually with 20–23 segments (rarely to 26 segments in *S. albionis*), shorter than fore wing or slightly longer. Hind tarsal claws with two teeth at base; *i.fl* 0.9–1.0; *i.fem.* about 4.5; *i.nrv* 0.25–0.33. Hosts: larvae of *Pontopristia* (Nematinae) in catkins of Salix (recorded only for *S. albionis*) . . . 17

17. Coxae, femora and trochanters predominantly reddish (trochantelli yellow); thorax usually with yellow spots (at least hind corners of pronotum yellow; in holotype mesonotum anteriorly with a pair of yellow dots and with small yellowish spot on scutellum). Sternites yellow; *i.terg* 1.5–1.7. *Holotype*: fore wing 4.8 mm, flagellum 4.1 mm long, 23-segmented; *i.fl* about 0.9; *i.fem* 4.5. Clypeus with impression before sharp lower margin. Mesopleuron with superficial granulation, almost smooth and with fine punctures; metapleuron granulate; *i.tars* 2.8:1.5:1.15:0.75:1.15 (segment 3 about as long as segment 5); *i.nrv* about 0.25. Tergites smooth behind posterior 0.3 of second tergite and almost hairless; tergites 3–7 on hind edges moderately concave and with narrow pale band. Hind tibia white at middle third (white colouration expands ventrally almost to base of tibia), light greyish in basal 0.25 and brownish grey in apical 0.4; spurs white, hind tarsus greyish, segments 1–4 whitish at extreme base . . . . . ***S. albionis***

– Coxae, femora and trochanters predominantly black; thorax black with only tegulae white. Sternites blackish brown 18

18. Hind tibia more or less uniformly brownish; *i.terg* about 2.0. Greenland and Arctic zone . . . . . 8. ***S. hoeli***

– Hind tibia reddish brown, paler in middle; *i.terg* about 1.7–1.8 Antenna usually with 22–23 flagellomeres; *i.fl* 0.9–1.0; *i.gen* 0.33–0.45 ; *i.fem* 4.7–5.0; *i.nrv* 0.33; nervulus moderately postfurcal; tarsal claws at base with 1 or 2 teeth . . . . . 4. ***S. clypeata***

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