

# A preliminary key to the European species of the genus *Saotis* Förster, 1869, with a list of British species (Ichneumonidae: Ctenopelmatinae: Mesoleiini)

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An illustrated key to the European species of *Saotis* described by Thomson, Schmiedeknecht and Morley, is given. A new synonym is proposed: *Saotis mirabilis* Schmiedeknecht, 1914 (type examined) = *Iskarus seleuciformis* Kolarov, 1987, **syn. n.** The material of *Saotis* (collected in Britain) kept at the National Museums of Scotland and the Natural History Museum, London, is listed.

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## Introduction

During visits to Lund in 1993 and 1997, the senior author examined type specimens of all species described by C.G. Thomson that are currently placed in the genus *Saotis* (cf. Yu & Horstmann, 1997), and prepared illustrations to many of them. This comprises the majority of the European species of the genus. During the senior author's visit to Edinburgh in 2002, it was possible to examine the British and European specimens of *Saotis* held by the National Museums of Scotland (NMS) and the Natural History Museum, London (BMNH), and to prepare a preliminary key to the European species presented here.

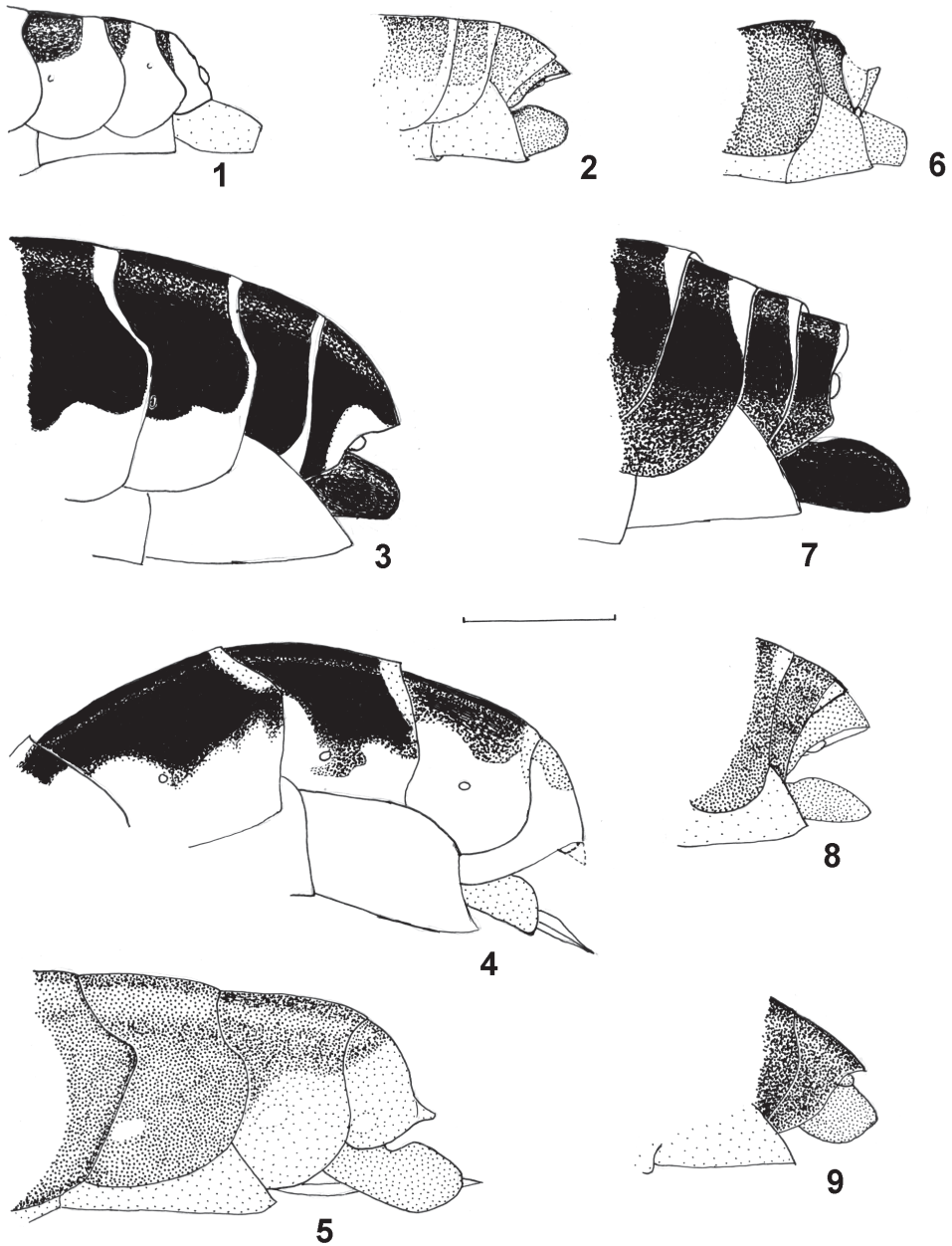
A new synonym is proposed: *Saotis mirabilis* Schmiedeknecht, 1914 (type from the Berlin Museum is examined) = *Iskarus seleuciformis* Kolarov, 1987, **syn. n.**; *Saotis* Förster, 1869 = *Iskarus* Kolarov, 1987, **syn. n.** Although *S. mirabilis* is a relatively large, brightly coloured species with more elongate abdomen than in other species of *Saotis*, these distinctions are insufficient for the warrant recognition of the genus *Iskarus* Kolarov, 1987 (possibly, it can be considered as a subgenus in the genus *Saotis*).

*Saotis* is a highly specialized genus, parasitising species of *Pontania* O. Costa and *Phyllocolpa* Benson (Hymenoptera: Tenthredinidae) forming galls and leaf curls on *Salix* (Bridgman, 1887; Hinz, 1961; Koppelke, 1994).

The basic morphometric characters and their abbreviations used in this work are listed below: *i.fl.* – index flagellaris, ratio of length of 1st and 2nd flagellar segments combined to eye height (longitudinal diameter); *i.gen.* – index genalis, ratio of minimum length of malar space (“gena”) to basal width of mandible; *i.terg.* – index tergalis, ratio of length of 1st metasomal tergite to its maximum width.

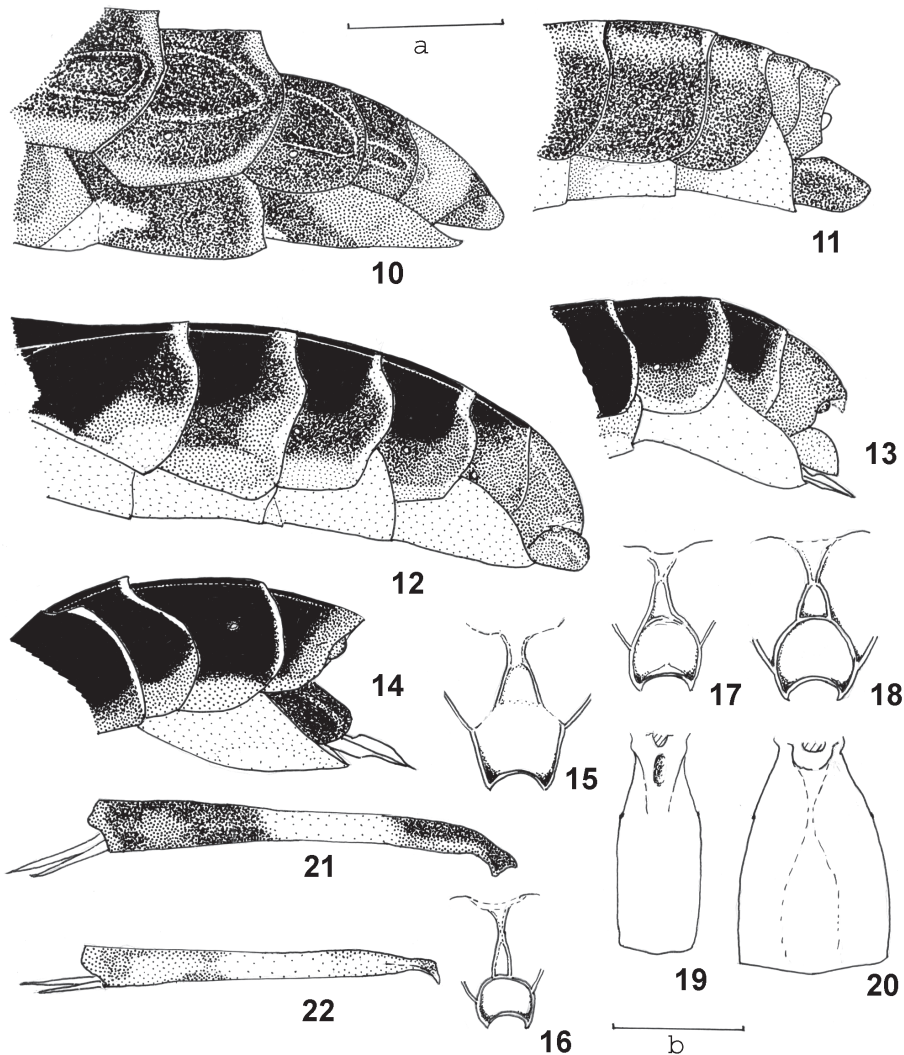
## A preliminary key to the European species of *Saotis* (females only)

1. Mesothorax predominantly red; metasoma much longer than head and thorax combined. – Flagellum with 27-33 segments ..... **S. mirabilis** Schmiedeknecht, 1914 (= *Iskarus seleuciformis* Kolarov, 1987, **syn. n.**)  
– Mesothorax predominantly black; metasoma not so long ..... 2
2. Epipleura of tergites 5-6 white ..... 3  
– Epipleura of apical tergites black, brown or rufous .. 8
3. Scutellum black; flagellum with 22-24 segments. – Tergites 6-8 predominantly black dorsally (with white band on hind margin); ovipositor sheath light brown (Fig. 2); metasoma moderately compressed. Syntypes: fore wing 3-5 mm long; head wide; *i.fl.* 1.1, 1st flagellar segment about 5 times as long as wide (in other species usually shorter); malar space short, *i.gen.* 0.25; clypeus widely impressed along lower margin, convex above impression; propodeal areas very indistinct; *i.terg.* 1.8; fore and middle coxae and all trochanters yellow (hind trochanter I darkened dorsally); hind coxa reddish or brownish; hind tibia yellowish white, weakly darkened at base and at apical 0.3 ..... **S. compressiuscula** (Thomson)



**Figs 1-9.** *Saotis*, apical metasomal segments of female. 1, *S. brevispina* (Thomson); 2, *S. compressiuscula* (Thomson); 3, *S. bilineata* (Gravenhorst) (syntype of *S. emarginata* (Thomson)); 4, *Saotis* sp. 1 (possibly, var. of *S. liopleuris* (Thomson)); 5, *S. nigriventris* (Thomson); 6, *S. varicoxa* (Thomson); 7, *S. nigriscuta* (Thomson) (holotype); 8, *S. dorsata* (Thomson); 9, *S. longiventris* (Thomson). Scale 0.5 mm.

- Scutellum with a yellow spot; flagellum with 25-29 segments . . . . . 4
- 4. Tergites 6-8 predominantly white (with a black dorsal spot at base); ovipositor sheath yellow, usually tapered at apex (Fig. 1); flagellum usually with 25-26 segments; hind tibia reddish brown, but dirty white on posterior side in basal 0.6. – Syntypes: malar space rather long, *i.gen.* 0.4; *i.terg.* 1.5; mesoscutum with yellow central and anterolateral spots; scutellum dorsally (except for black median spot at base) and postscutellum yellow; fore and middle coxae and trochanters yellow; propodeum with distinct areola and apical area . . . . . **S. brevispina** (Thomson)
- Tergites 6-8 predominantly black dorsally, with a rather narrow white band on hind margin; ovipositor sheath not as above (Figs 3, 4); flagellum with 26-29 segments; hind tibia with wide dark ring in basal 0.3 (Fig. 21), sometimes tricolourous: black and reddish at base and apex and with a white median ring . . . . . 5
- 5. Flagellum usually with 29 segments . . . . . 6
- Flagellum with 26-27 segments . . . . . 7
- 6. Mesosternum red and separated from black mesopleurum by a yellow longitudinal band. – Syntypes of *S. emarginata*: flagellum with 29 segments, *i.gen.* about 0.33 (in male, 0.1); face with two yellow spots below antennal sockets and yellow marks above clypeus, on malar space and on cheeks; mesoscutum with two yellow anterolateral spots; hind tibia tricolourous, its hind apical margin shining and projecting; hind spurs brownish; tergites black with white epipleura (Fig. 3) . . . . . **S. bilineata** (Gravenhorst, 1829) (= *S. emarginata* Thomson, 1883)
- Mesosternum black, mesopleura black or sometimes brownish in lower parts. – Flagellum with 29 segments. The syntypes (3 ♀, 1 ♂) are very similar to those of *S. emarginata* (possibly they are only a form of *S. bilineata*), but the face is darker and more distinctly shagreened, malar space usually black, hind tibia darker (usually bicolourous), with hind apical margin not shining and not projecting, *i.terg.* 1.6, ovipositor sheath yellow or light brown . . . . . **S. tricolor** (Thomson)
- 7. Ovipositor sheath light brown . . . . . **S. liopleuris** (Thomson)
- Ovipositor sheath yellow (Fig. 4). – *i.terg.* 2.2; *i.gen.* 0.28 . . . . . **Saotis** sp. 1 (NMS; possibly var. of *S. liopleuris*)
- 8. Tergites very densely covered with short hairs; malar space rather short, *i.gen.* 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 (Fig. 5). Holotype: 23/24 flagellar segments; clypeus impressed along lower margin; black to brown, with the following parts white: clypeus, mandibles, hind corner of pronotum, tegulae, fore and middle trochanter II; all coxae and hind trochanter black; hind tibia whitish, weakly fuscous at extreme base and brownish at apical 0.35; mesopleura granulate; epipleura of tergite 3 (except at base) and tergites 4-8 not separated by a crease . . . . . **S. nigriventris** (Thomson)
- Tergites with hairs much sparser and longer; malar space usually longer; coxae red or black; thorax entirely black or with yellow marks . . . . . 9
- 9. Scutellum with a pair of yellow basolateral spots. *i.gen.* 0.45; metasoma beyond apical part of tergite 1 smooth and almost polished; hind tibia darkened dorsally, dirty whitish to dirty rufous at middle 0.5 ventrally. – Lectotype: 24 flagellar segments; mesoscutum with anterolateral yellow spots; fore and middle coxae and trochanters white to yellow; hind coxa and hind trochanter blackish brown (in other specimens, sometimes red); sternites white; epipleura rusty rufous; fore and middle tibia rufous, darkened dorsally at the middle. Metasomal tergites (3)4-7 with a white spot on hind margin dorsally (this spot angulate anteriorly); ovipositor sheath from yellowish brown (in type) to rufous-yellow, tapered apically (Fig. 6). . . . . **S. varicoxa** (Thomson)
- Scutellum entirely black or with one yellow spot dorsally. Some other characters not as above . . . . . 10
- 10. Coxae and trochanters predominantly reddish; thorax usually with yellow spots (at least, hind corners of pronotum yellow) . . . . . 11
- All coxae and trochanters black; thorax black with only tegulae white . . . . . 15
- 11. Mesoscutum black; scutellum black, sometimes reddish brown at apex; *i.terg.* 2-2.7. – Legs light red, hind tibia whitish, slightly reddish at base and reddish brown at about apical 0.27 . . . . . 12
- Mesoscutum with anterolateral yellow spots; scutellum with a yellow dorsal spot (but black in *S. nigriscuta*); if sometimes mesoscutal spots indistinct (in *Saotis* sp. 2) then 1st metasomal tergite wider (*i.terg.* 1.6) . . . . . 13
- 12. Metasomal tergite 2 at apical part and median longitudinal band on tergite 3 reddish brown; first tergite about 2.2 times as long as wide; sternites 1-4 reddish yellow, sternites 5-6 rufous; ovipositor sheath rather narrow (Fig. 8). – Holotype: fore wing 4.2 mm; flagellum with 26 segments (other specimens sometimes with 24 segments); *i.fl.* 0.9; 1st flagellar segment 4 times as long as wide; *i.gen.* 0.3 (0.25-0.33); clypeus widely convex on lower margin; tergites black, apical 0.33 of tergite 2 and wide longitudinal median mark on tergite 3 brownish red; epipleura of tergites 2-3(-5) separated by a crease; ovipositor sheath brownish (Fig. 8) . . . . . **S. dorsata** (Thomson)
- Metasomal tergites 2 and 3 black dorsally; tergites 1-3 (in holotype) 2.7, 2.4 and 2.0 times as long as apical width of tergite 1, respectively; sternites fuscous, hypopygium reddish yellow; ovipositor sheath rather wide and light brownish (Fig. 9). – Holotype: antennae broken; face black with a pair of small yellow spots distal to clypeal foveae; *i.gen.* 0.33 . . . . . **S. longiventris** (Thomson)
- 13. Scutellum black; lower margin of clypeus with median convexity; flagellum with 26-27 segments; ovipositor sheath very wide, blackish (Fig. 7); dorsal areas of propodeum indistinct. – Holotype: fore wing 4.9 mm; flagellum with 26 segments; propodeal carinae very weak, vestigial; hind margin on dorsum of tergites 3-7 white; sternites 3-6 yellowish white (Fig. 7) . . . . . **S. nigriscuta** (Thomson)
- Scutellum with a dorsal yellow spot; clypeus with sharp lower margin, usually arcuate (concave) at the middle; flagellum with 23-25 segments; ovipositor sheath not so large (Figs 12-14); dorsal areas of propodeum distinct (Figs 17, 18) . . . . . 14
- 14. First tergite 2.2-2.9 as long as wide (Fig. 19); flagellum with 24-25 segments; tergite 2 polished at apical 0.3; ovipositor sheath light brown to brown (Figs 12, 13) . . . . . **S. morleyi** Fitton
- First tergite 1.6 times as long as wide (Fig. 20); flagellum with 23 segments; tergite 2 entirely granulate; ovipositor sheath larger and darker (Fig. 14) . . . . . **Saotis** sp. 2 (NMS)



**Figs 10-22.** *Saotis*, female. **10, 15,** *S. hoeli* Roman; **11, 16, *S. heteropus* (Thomson); **12, 13, 17, 19, 22, *S. morleyi* Fitton (12, 19, 22, specimen from BMNH); **14, 18, 20, *Saotis* sp. 2; **21,** *Saotis* sp. 1 (possibly, var. of *S. liopleuris* (Thomson)). Apex of abdomen (10-14); dorsal areas of propodeum (15-18); 1st metasomal tergite (19, 20); hind tibia (21, 22). Scale 0.5 mm: a, Figs 10-14; b, Figs 15-22.******

- 15. Areola of propodeum narrow and distinctly separated from apical area (Fig.16); 3rd segment of hind tarsus about 1.3 times as long as 5th segment; tergites 3-7 black, with a yellowish dorsoapical spot; sternites pale brown, sternites 5 and 6 widely yellowish at apical part; ovipositor sheath wide and blackish (Fig. 11). Mandibles wide, brownish, slightly convex before teeth. . . . . ***S. heteropus*** (Thomson)
- Areola of propodeum wider and not separated from apical area (Fig.15); 3rd segment of hind tarsus about 1.0 times as long as 5th segment; shape and largely brownish colour pattern of metasomal segments as in Fig.10. – Greenland . . . . . ***S. hoeli*** Roman

**The annotated list of British species (on the materials from BMNH and NMS)**

***Saotis compressiuscula*** (Thomson, 1883). 1 ♀, *England*, Oxfordshire, Taynton Fen, SP233148, Malaise trap, 21.VI–26.VII.1991 (K. Porter) (NMS); 1 ♀, *England*, Devon, Newton Abbot, 10.VI.1941 (J.F. Perkins) (BMNH).

***Saotis morleyi*** Fitton, 1976. 1 ♀, *England*, Hampshire, Ashford Hill Meadow, SU561620, Malaise trap, 6-29.VI.1989 (K. Porter) (NMS); 1 ♀, *England*, Cambridgeshire, Chippenham Fen, TL650693, Malaise trap, 25.VI-9.VII.1985 (J. Field) (NMS). 1 ♀, *England*, “Leister”

(T.A. M[arshall]) (BMNH: incorrectly labelled as cotype of *Homocidus (Bassus) emarginatus* Morley).

*Saotis nigriscuta* (Thomson, 1888). 2 ♀, *England*, Oxfordshire, Dry Sandford Pit, SU468995, Malaise trap, 10.VIII-10.IX.1999 (K. Porter) (NMS).

*Saotis renovatus* (Morley, 1911). 1 ♂, [*England*, Worcestershire] Worcester, reared from *Phyllocolpa purpurea* (Cameron) (Hym.: Tenthredinidae), emerged 24.V.1886 ([J.E. Fletcher]) (BMNH: Lectotype of *Mesoleius renovatus* Morley, 1911, designated by Fitton, 1976). Bridgman (1887) doubtfully referred this specimen, or another male with identical data, to *brevispina* (Thomson).

*Saotis varicoxa* (Thomson, 1893). 1 ♀, *England*, Oxfordshire, Taynton Fen, SP233148, Malaise trap, 16.VI-17.VII.1989 (K. Porter) (NMS); 1 ♀, *Scotland*, Wester Ross, Beinn Eighe NNR, NH0064, Malaise trap, VIII.1989 (I. MacGowan) (NMS); 1 ♀, *England*, Hertfordshire, Boxmoor, 3.VIII.1938 (R.B. Benson) (BMNH); 1 ♀, *England*, Surrey, Kew, 19.VI.1979 (V.F. Eastop) (BMNH); 1 ♀, *England*, Cambridgeshire, Great Shelford, 22-28.VI.1979 (V.F. Eastop) (BMNH).

*Saotis* sp. 1 [possibly, var. of *liopleuris* (Thomson, 1888)]. 2 ♀, *England*, Oxfordshire, Dry Sandford Pit, SU468995, Malaise trap, 14-30.VI.1990 and 30.VI-19.VII.1990 (K. Porter) (NMS); 1 ♀, *Scotland*, Sutherland, Bettyhill, Skelpick, NC724560, Malaise trap, 3-9.VII.1982 (D. Horsfield) (NMS).

*Saotis* sp. 2. 1 ♀, *England*, Oxfordshire, Otmoor Rifle Range, SP573130, Malaise trap, 20.V-27.VI.1989 (K. Porter) (NMS).

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