Addition to the aphid fauna of Byelorussia (Homoptera: Aphidoidea) with detailed description of sexuales of *Semiaphis anthrisci* (Kaltenbach, 1843)

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For the first time, *Therioaphis luteola* (Börner, 1949), *Aphis chloris* Koch, 1854, *Aphis craccae* Linnaeus, 1758, *Aphis galiiscabri* Schrank, 1801, *Aphis newtoni* Theobald, 1927, *Aphis thalictri* Koch, 1854, *Aphis* (*Bursaphis*) *epilobiaria* Theobald, 1927, *Brachycaudus* (*Appelia*) *tragopoginis* (Kaltenbach, 1843), *Brachycaudus (Brachycaudina) aconiti* (Mordvilko, 1928), *Dysaphis hirsutissima* (Börner, 1940), *Acaudinum centaureae* (Koch, 1854), *Hydaphias molluginis* Börner, 1939, *Semiaphis anthrisci* (Kaltenbach, 1843), *Uroleucon* (*Lambersius*) *erigeronense* (Thomas, 1878) and *Uroleucon* (*Uromelan*) *campanulae* (Kaltenbach, 1843) are recorded from Byelorussia. The detailed description of oviparous female and male of *S. anthrisci* are given.

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At present the aphid fauna of Eastern Europe is relatively well known, which is not the case for that of Byelorussia. Until now aphidological research in Byelorussia was focused on dendrocolous aphids (Buga, 2001), species composition of herbaceous aphids however remains little known. Therefore any registrations may add information about the aphid fauna of this region of Eastern Europe and verify geographic distribution of some species in the whole of Europe. This article is based on the material collected in 1998, 2002-2007 by S.V. Buga and N.V. Leshchinskaya in Central and Northern Byelorussia.

All measurements (always in μm), number of hairs, rhinaria, etc., and indexes are presented by extreme variants and in brackets by arithmetical mean, for example 172-209 (194). Microscope slides are stored in collections of the Zoological Institute of RAS (St. Petersburg) and Byelorussian State University. In the description of hitherto unknown morphs oviparous female is examined in more detail and for male differences from oviparous female are specified only.

Abbreviations: al. – alate viviparous female, apt. – apterous viviparous female, RWS – railway station.

Superfamily **APHIDOIDEA**

Family **DREPANOSIPHIDAE**

Therioaphis luteola (Börner, 1949). *Grodno Prov.*: al., Smorgon Distr., near Soly RWS, mixed forest, 24.VI.2006, *Trifolium* sp., on lower side of leaves (N.V. Leshchinskaya); *Minsk Prov.*: al., Molodechno Distr., near Radoshkovichi RWS, 05.VII.2006, *Trifolium* sp., on lower side of leaves (N.V. Leshchinskaya).

Family **APHIDIDAE**

Tribe **Aphidini**

Subtribe **Aphidina**

Aphis chloris Koch, 1854. *Grodno Prov.*: al., Smorgon Distr., near Soly RWS, pine forest, 24.VI.2006, *Hypericum* sp., on stem (N.V. Leshchinskaya).

Aphis craccae Linnaeus, 1758. *Grodno Prov.*: apt., Smorgon Distr., near Soly RWS, ruderal vegetation, 24.VI.2006, *Galium* sp. (accidentally) (N.V. Leshchinskaya).

Aphis galiiscabri Schrank, 1801. *Grodno Prov.*: apt., Smorgon Distr., near Soly RWS, ruderal vegetation, 24.VI.2006, *Galium* sp., on stem (N.V. Leshchinskaya).

Aphis newtoni Theobald, 1927. *Grodno Prov.*: al., Smorgon Distr., near Soly RWS, on coast of storage lake, 25.VI.2006, *Iris* sp., on leaves (N.V. Leshchinskaya).

Aphis thalictri Koch, 1854. *Minsk Prov.*: apt., Minsk Distr., near vill. Zabolot'e, floodplain meadow, 24.VI.1998, *Thalictrum flavum* L., on inflorescences (S.V. Buga).

Aphis (Bursaphis) epilobiaria Theobald, 1927. *Vitebsk Prov.*: apt., Vitebsk, meadow in town park, 29.VII.2006, *Epilobium hirsutum* L., on stem (N.V. Leshchinskaya).

Tribe **Macrosiphini**

Subtribe **Anuraphidina**

Brachycaudus (Appelia) tragopogonis (Kaltenbach, 1843). *Grodno Prov.*: apt., al., Smorgon Distr., near Soly RWS, ruderal vegetation, 24.VI.2006, *Tragopogon* sp., on stem (N.V. Leshchinskaya).

Brachycaudus (Brachycaudina) aconiti (Mordvilko, 1928). *Vitebsk Prov.*: apt., Beshenkovichi Distr., Beshenkovichi, 30.VII.2007, *Delphinium elatum* L., on stem (S.V. Buga).

Dysaphis hirsutissima (Börner, 1940). *Vitebsk Prov.*: apt., Gorodok Distr., near vill. Marchenki, ruderal vegetation, 29.VIII.2002, *Anthriscus sylvestris* (L.) Hoffm., on root collar (S.V. Buga); *Vitebsk Prov.*: apt., Beshenkovichi Distr., Beshenkovichi, 30.VII.2007, *Anthriscus sylvestris* (L.) Hoffm., on root collar (S.V. Buga).

Subtribe **Liosomaphidina**

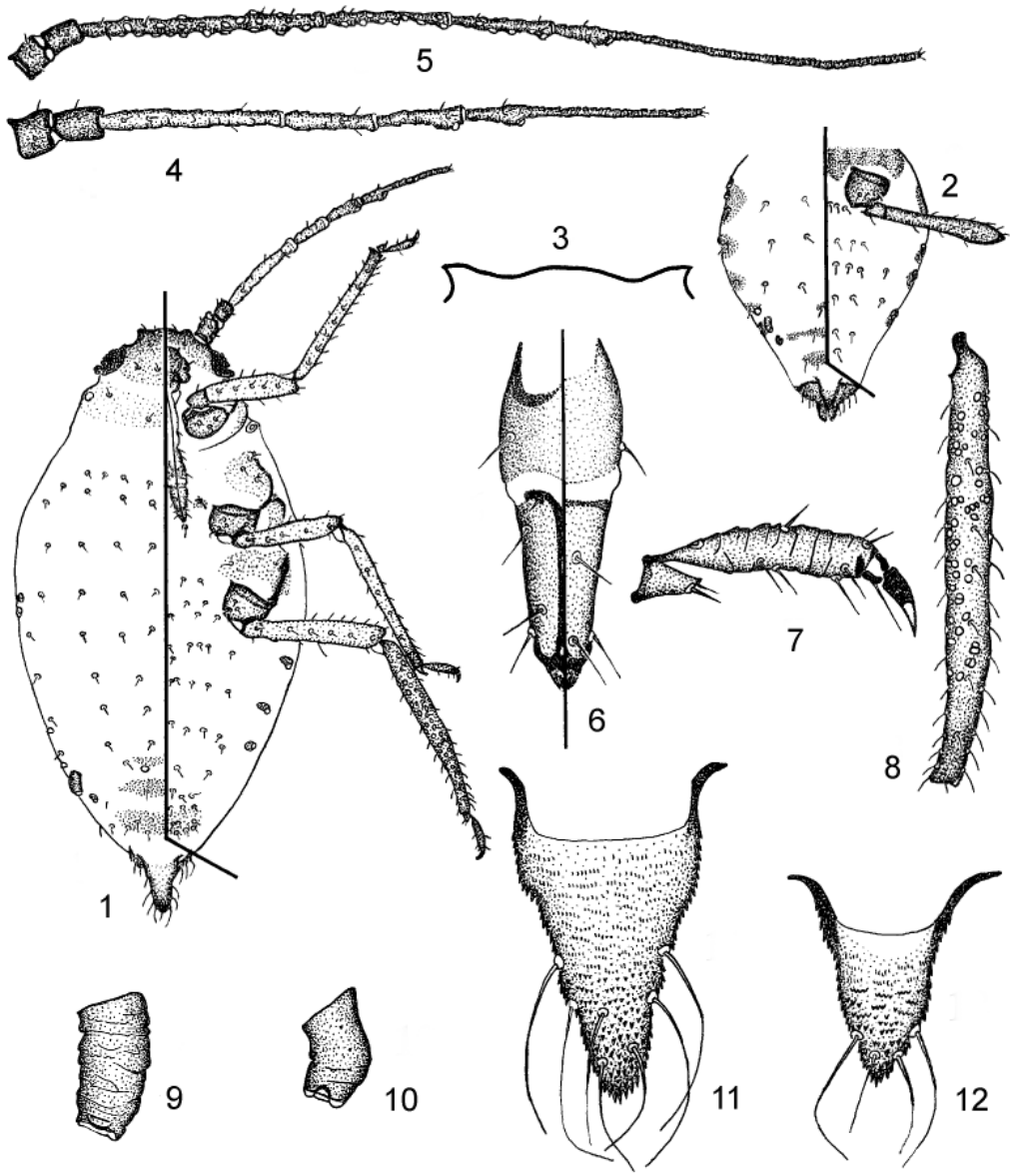
Hydaphias molluginis Börner, 1939. *Minsk Prov.*: al., Minsk Distr., near vill. Zabolot'e, meadow, 20.VI.2006, *Galium* sp., on stem (N.V. Leshchinskaya).

Semiaphis anthrisci (Kaltenbach, 1843).
(Table, Figs 1-12)

Material. **Byelorussia**, *Minsk Prov.*, Minsk Distr.: apterous viviparous females and 1 oviparous females, no. 447-07, Sosny forestry, ruderal vegetation, 18.IX.2007, *Torilis japonica* (Houtt.) DC., then in culture, sample no. 4-07, 14 alatae males; sample no. 4-07, 12 oviparous females (N.V. Leshchinskaya).

Despite the fact that apterous and alatae females of this species was described by Kaltenbach as early as 1843, until now only short descriptions of 1 alate male were published by Ivanovskaja in 1974 and of oviparous females by Heikinheimo in 1997. Material obtained in Autumn 2007 allows us to make a detailed description of the sexuales.

Description. Oviparous female. Elongated-elliptic or elliptic, body 1.7-2.0 (1.9) times as long as wide. When alive, yellow green, antennae olive-coloured with dark apices, legs, siphunculi and cauda dirty olive-coloured. Cleared specimens with dark brown frons, with brown head (except of frons), 1st and 2nd antennal segments, 3rd and 4th rostral segments, coxae, trochanters, hind tibiae, apices of fore and middle tibiae, tarsi, siphunculi, anal and subgenital plates, cauda, peritremes on all abdominal segments, with light brown 5th and 6th antennal segments, femora, fore and middle tibiae (except for their apices), sclerites at bases of coxae, bands on abdominal tergites VII-VIII, with very light brown band on pronotum. Abdominal dorsum with light brown bands on abdominal tergites VII-VIII, peritremes on abdominal segments I-VII and, sometimes, with 2 sclerites on abdominal tergite VI. Surface of head, thorax and abdominal tergites I-V weakly wrinkled, almost smooth, of tergite VI with the rows of dentiform spinules; such spinules on tergites VII-VIII partially fused and forming scales; surface of ventral side of thorax wrinkled, of ventral side of abdomen with long rows of small dentiform spinules frequently forming strongly stretched cells. Hairs on dorsal surface of thorax and abdomen blunt or, rarely, pointed, on ventral surface pointed or, rarely, finely pointed; longest dorsal, marginal and ventral hairs on abdominal tergite III 15-20 (18), 13-18 (16) and 20-30 (26) μm long, 0.92-1.23 (1.07), 0.77-1.08 (0.98) and 1.33-1.85 (1.56) times as long as articular diameter of 3rd antennal segment, respectively; abdominal tergite III with 4-5 (4.1) dorsal hairs; tergite VI with 2 hairs between siphunculi; tergite VIII with 7-13 (10.8) long finely pointed hairs, 25-38 (32) μm long, 1.47-2.31 (1.92) times as long as articular diameter of 3rd antennal segment. Marginal tubercles always present on prothorax (always 2 tubercles), they present also on abdominal segment I in 54% of specimens (2 tubercles in 15% of specimens), on segment II in 46% of specimens (2 in 15%), on segment III in 54% of specimens (2 in 15%), on segment IV in 77% of specimens (2 in 31%), and on segment V in all specimens (always 2); marginal tubercles protuberant or strongly protuberant, semicircular or nipple-shaped, diameter of tubercles 0.7-2.4 times the height of tubercles. One spinal tubercle present on abdominal tergite VI in 15% of specimens and tergite VII in 8% of specimens. Head with epicranial coronal suture. Frontal tubercles well-marked; median tubercle surpassing the level of antennal tubercles. Occipital and frontal hairs blunt or, rarely, pointed; longest occipital and frontal hairs 13-18 (15) and 16-35 (24) μm long, 0.73-1.08 (0.91) and 0.93-



Figs 1-12. *Semiaphis anthrisci*. **1,** body of oviparous female; **2**, abdomen of male; **3**, front of oviparous female; **4-5**, antenna (4, of oviparous female; 5, of male); **6**, ultimate segment of rostrum of oviparous female; **7**, hind tarsus of oviparous female; **8**, hind tibia of oviparous female; **9-10,** siphunculi (9, of oviparous female; 10, of male); **11-12,** cauda (11, of oviparous female; 12, of male).

2.15 (1.43) times as long as articular diameter of 3rd antennal segment, respectively. Antennae 6-segmented in 84% of specimens, one (in 8% of specimens) or both antennae (in 8% of specimens) 5-segmented due to more or less complete fusing of 3rd and 4th segments, without secondary rhinaria. Hairs on antennae blunt or pointed; longest hair on 3rd segment 10-16 (13) μm long, 0.57-0.73 (0.78) times as long as articular diameter of the segment; basal part of 6th antennal segment with 3 hairs, longest hair 0.73-1.27 (0.93) times as long as articular diameter of basal part of the segment. Rostrum reaching mesothorax or metathorax. Ultimate rostral segment elongate wedge-shaped, blunt, with slightly concave sides, 1.85-2.16 (2.02) times as long as its basal width, with 2 accessory hairs. Hind femora and hind tibiae 0.20-0.22 (0.21) and 0.33-0.36 (0.34) times as long as body,

Table. Biometric data for sexuales of *Semiaphis anthrisci* (Kaltenbach, 1843).

Morph			Oviparous females	Males
Number of samples/ specimens			2/13	1/14
Length of body			1411-1619 (1538)	1135-1585 (1387)
Length of antennae			784-856 (815)	1249-1606 (1394)
Length of antennae / length of body			1.77-2.02 (1.89)	0.96-1.14 (1.04)
Hind femura	length		284-355 (320)	335-445 (411)
	length / head width across the compound eyes		0.83-1.00 (0.90)	1.05-1.28 (1.15)
Head width across the compound eyes			353-370 (360)	320-359 (342)
Number of marginal tubercles			5-10 (7.1)	2-7 (4.4)
6th antennal segment	length of base		68-76 (72)	73-99 (88)
	length of processus terminalis		172-209 (194)	344-526 (406)
	length of processsus terminalis / length of base		2.52-2.89 (2.68)	3.73-5.33 (4.63)
Ultimate rostral segment	lenght		91-104 (98)	89-104 (96)
	length /	head width across the compound eyes	0.25-0.29 (0.27)	0.27-0.29 (0.28)
		length of 2nd segment of hind tarsus	0.88-1.05 (0.93)	0.84-0.98 (0.90)
		length of base of 6th antennal segment	1.20-1.52 (1.36)	0.94-1.36 (1.10)
2nd segment of hind tarsus	lenght		99-114 (106)	99-114 (106)
	length /	head width across the compound eyes	0.27-0.32 (0.30)	0.30-0.31 (0.31)
		length of base of 6th antennal segment	1.30-1.63 (1.47)	1.06-1.48 (1.21)
Siphunculi	length		58-81 (70)	38-51 (46)
	length / width of siphunculi at half length		1.69-2.29 (1.89)	1.43-1.82 (1.71)
Length of cauda			137-162 (148)	78-106 (96)
Length of siphunculi / length of cauda			0.41-0.57 (0.48)	0.38-0.59 (0.48)

respectively. Hairs on legs pointed or blunt; ventral hair on hind trochanter 0.53-0.81 (0.68) times as long as basal diameter of hind femur; longest dorsal, ventral and dorso-apical hairs on hind femur 16-20 (19), 23-33 (27) and 13-18 (14) μm long, respectively; longest dorsal hair on hind tibia 30-48 (37) μm long, 0.52-0.83 (0.66) times as long as mid-diameter of the latter. Hind tibia with 92-183 (140.9) rounded or oval pheromone plates. Chaetotaxy of first tarsal segments 3, 3, 3 in 33% of specimens, in 59% of specimens one hind tarsus and in 8% both hind tarsi with 2 hairs. 2nd segment of hind tarsus 4.11-5.00 (4.55) times as long as its maximum width, with 2 dorsal and 1-3 (1.9) ventral hairs in addition to the three apical pair. Peritremes on abdominal sternites I and II separated by a distance lesser than diameter of peritreme. Siphunculi cylindrical, imbricate, without flange, curved inwards distally, 1.50-2.55 (1.86) times as long as their basal width, 0.04-0.05 times as long as body and 0.21-0.36 (0.30) times as long as 3rd antennal segment. Subgenital plate oval, with 10-15 (12.9) hairs on anterior half and 18-24 (20.3) pointed or finely pointed hairs along hind margin. Hairs on anal plate finely pointed. Cauda triangular or elongated-triangular, 1.15-1.50 (1.32) times as long as its basal width, with 7-11 (9.3) long finely pointed hairs.

Measurements. Body 1568 × 787; antennae 845: III 235 × 24, IV 119, V 101, VI 71+202; hind femur 325; hind tibia 528; siphunculus 71 × 37; cauda 149 × 116 (at base) × 96 (before base).

Male. Alatae. Elongated-elliptic, body 2.3-2.8 (2.5) times as long as wide. When alive, dirty green, antennae dark, femora and tibiae dark olive-coloured with dark apices, siphunculi and cauda brown. Cleared specimens with dark brown head, thorax, antennae and legs (except for bases of femora), with brown 3rd and 4th rostral segments, sclerites, bands and peritremes on abdominal tergites I-VI, siphunculi, anal plate and cauda, with light brown proximal half of fore femora and bases of middle and hind femora. Abdominal dorsum with brown sclerites on abdominal tergites I-II, bands on abdominal tergites VI-VIII, marginal maculae and peritremes on abdominal segments I-VII; sclerites on abdominal tergite II occasionally grouped together in short band; band on tergite VI very short and sometimes divided into two large separate sclerites; sclerotized band and marginal maculae on tergite VII often fused. Surface of abdominal tergites I-V with hardly noticeable reticulation (contour of cells formed by sparse, large, strongly smoothed-out spinules), of tergite VI with the rows of dentiform spinules situated in form of cells, of marginal maculae with short rows of large dentiform spinules. Hairs on dorsal surface of thorax and abdomen pointed or, rarely, blunt, on ventral surface pointed or, rarely, finely pointed; longest dorsal, marginal and ventral hairs on abdominal tergite III 18-20 (18), 15-23 (17) and 20-30 (26) μm long, 0.93-1.23 (1.06), 0.86-1.29 (0.99) and 1.23-1.71 (1.50) times as long as articular diameter of 3rd antennal segment, respectively; tergite VIII with 2-5 (3.5) pointed hairs, 20-30 (25) μm long, 1.23-1.71 (1.43) times as long as articular diameter of 3rd antennal segment. Marginal tubercles present on prothorax in 93% of specimens (2 in 86% of specimens), on abdominal segment IV in 36% (2 tubercles in 7% of specimens), on segment V in 93% (2 in 79%) and one marginat tubercle present on segment I in 7% and on segment III in 29% of specimens. One spinal tubercle present on abdominal tergite VI in 21% of specimens. Head without traces of epicranial coronal suture. Median tubercle not surpassing the level of antennal tubercles. Occipital hairs pointed or blunt, frontal hairs pointed, blunt or, rarely, finely pointed; longest occipital and frontal hairs 13-20 (17) and 15-23 (20) μm long, 0. 77-1.17 (0.96) and 0.92-1.29 (1.12) times as long as articular diameter of 3rd antennal segment, respectively. Antennae 6-segmented, with secondary rhinaria. Secondary rhinaria 25-35 (28.7) on 3rd antennal segment, 7-12 (9.2) on 4th segment, 3-7 (4.7) on 5th segment, they rounded or oval, projecting or strongly projecting, with external contour 1.5-5.0 times as long as high. Hairs on antennae pointed or blunt; longest hair on 3rd segment 11-15 (14) μm long, 0.69-1.00 (0.83) times as long as articular diameter of the segment; longest hair on basal part of 6th antennal segment 0.67-1.50 (1.07) times as long as articular diameter of basal part of the segment. Rostrum reaching mesothorax. Ultimate rostral segment 1.92-2.29 (2.12) times as long as its basal width, with 3-4 (3.9) accessory hairs. Hind femora and hind tibiae 0.25-0.33 (0.30) and 0.47-0.60 (0.55) times as long as body, respectively. Hairs on legs pointed, rarely, blunt or finely pointed; ventral hair on hind trochanter 0.67-1.04 (0.82) times as long as basal diameter of hind femur; longest dorsal, ventral and dorso-apical hairs on hind femur 15-20 (17), 18-29 (24) and 13-15 (14) μm long, respectively; longest dorsal hair on hind tibia 23-30 (26) μm long, 0.83-1.20 (0.98) times as long as mid-diameter of the latter. Chaetotaxy of first tarsal segments 3,3,3 in 69% of specimens, in 23% of specimens one hind tarsus and in 8% both hind tarsi with 2 hairs. 2nd segment of hind tarsus 4.32-5.38 (4.88) times as long as its maximum width, with 2 dorsal and 1-4 (2.8) ventral hairs in addition to the three apical pair. Siphunculi 1.07-2.00 (1.55) times as long as their basal width, 0.03-0.04 times as long as body and 0.09-0.13 (0.11) times as long as 3rd antennal segment. Cauda triangular, 0.80-1.27 (1.04) times as long as its basal width, with 5-7 (6.2) hairs.

Measurements. Body 1324 × 601; fore wing 2071; antennae 1383: III 438 × 28, IV 207, V 157, VI 73+379; hind femur 792; hind tibia 436; siphunculus 46 × 23; cauda 96 × 96 (at base) × 63 (before base).

Subtribe **Macrosiphina**

Acaudinum centaureae (Koch, 1854). *Minsk*: apt., Central botany gardens of National academy of Science of Belarus, 25.VII.2006, *Centaurea* sp., on leaves (N.V. Leshchinskaya).

Uroleucon (Lambersius) erigeronense (Thomas, 1878). *Vitebsk Prov.*: apt., Lepel Distr., Lepel, ruderal vegetation, 21.VIII.2006, *Conyza canadensis* (L.) Cronq., on stem (N.V. Leshchinskaya).

Uroleucon (Uromelan) campanulae (Kaltenbach, 1843). *Minsk Prov.*: apt., Molodechno Distr., near vill. Udranka, dry meadow, 22.VI.2006, *Jasione montana* L., on steam near inflorescences (N.V. Leshchinskaya). – Blackman and Eastop (2006) accentuated that specimens from *Jasione* have longer siphunculi (1.01-1.14 times as long as cauda) than those from *Campanula* (0.72-0.98 times as long as cauda), suggesting that there may be two different species. Our specimens possess more longer siphunculi (1.28-1.39 (1.35) times as long as cauda) confirming the necessity of further investigation of *U. campanulae* group.

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