

## Hitherto unknown morphs of *Hyperomyzus (Neonasonovia) hieracii* (Burner, 1939) (Homoptera: Aphididae)

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The species *Hyperomyzus (Neonasonovia) hieracii* (Burner, 1939) is found in Russia for the first time. The first descriptions of fundatrix, male and oviparous females of this monoecious species are given.

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The very rare and poorly known species discussed in this paper was originally described by Burner (1939) as *Rhopalosiphoninus hieracii*. Later he (Burner, 1952) placed it in the genus *Hyperomyzella* H.R.L., but Stroyan (1957) emphasized that this species and *Hyperomyzus (Neonasonovia) picridis* (Burner & Blunck, 1916) form a morphological link between *Hyperomyzus* Burner and *Nasonovia* Mordv. and placed *H. hieracii* in the subgenus *Neonasonovia* of the genus *Hyperomyzus*.

To present day, only solitary finds of this species have been made in Germany and Austria (Burner, 1939, 1952; Burner & Franz, 1956), Great Britain (Stroyan, 1957; Shaw, 1964), Switzerland and Denmark (Heie, 1976, 1994). Ilharco (1979) collected aphids very similar to *H. (N.) hieracii* in Portugal, but was unable to attribute them to this species with confidence. There are published descriptions of apterous and alate viviparous females only. The life cycle of *H. hieracii* has been unknown until recently, but as early as 1952 Burner suggested that the species is monoecious on *Hieracium*.

A small colony including 6 fundatrix larvae has been found by A.V. Stekolshchikov on 18.VI.2004 in the southern part of the Lapland State Biosphere Nature Reserve (Murmansk Prov., Russia) in vicinity of Chuna Lake. It was situated on the underside of young leaves of *Hieracium* sp. (seemingly, *Hieracium vulgatum* Fries.). Aphids on the plant have been transferred to laboratory, where an adult fundatrix appeared on 2.VII.2004. Another colony (1 apterous virginopara female and 6 larvae) has been found at the

same place on a plant of the same species on 18.VII.2004. Under laboratory conditions, 2 oviparae females appeared on 3-6.VIII.2004.

In the aphidological collection of Institute of Entomology, Czech Academy of Sciences (Mesků Budějovice, Czech Republic), two slides from Dr. H.L.G. Stroyan collection are stored. Dr. Stroyan obtained one viviparous female and one apterous male of *H. hieracii* in laboratory condition in October 1958. Obviously an initial aphid colony has been collected in Tobermory (Scotland, Argyll, Isle of Mull) on 11.IX.1957 (Shaw, 1964). However, Dr. Stroyan did not publish any description of the male, oviparous female and life cycle of the species. Dr. J. Holman kindly put Dr. Stroyan's slides at our disposal for investigation. Now, we may give description of all previously unknown morphs and conclude that *H. hieracii* has a monoecious life cycle.

In the article, all measurements (always in  $\mu\text{m}$ ), number of hairs, rhinaria, etc., and indexes are presented by extreme variants and by arithmetical mean (in brackets). In case when samples differ strongly, minimum and maximum value of arithmetical mean are given in brackets, for example 607-802 (627-795).

### ***Hyperomyzus (Neonasonovia) hieracii*** (Burner, 1939) (Table, Figs 1-11).

*Material.* **Russia**, Murmansk Prov.: 1 fundatrix, sample no. 9285, the Lapland State Biosphere Reserve, near Chuna Lake, bank of river El'yavruay, on young leaves of *Hieracium* sp., then in culture, 2.VII.2004, A.V. Stekolshchikov; 2 oviparous females, sample no. 9358-3.VIII,

Table. Biometric data for fundatrix, male and oviparous females of *Hyperomyzus (Neonasonovia) hieracii* (Börner, 1939)

Morph	Number of samples / specimens	Length of body	Length of antennae	Length of antennae / length of body	Hind femora		Head width across the compound eyes	Length of hind tibia	Last antennal segment		
					length	length / head width across the compound eyes			length of base	length of processus terminalis	length of processus terminalis / length of base
Fundatrix	1/1	1885	1796-1815	0.95-0.96	601-617	1.22-1.26	491	1057-1079	116-127	458-472	3.62-4.07
Male	1/1	1472	1821-1844	1.24-1.25	528-533	1.23-1.24	430	974-985	73	599-604	8.17-8.24
Oviparous females	2/3	1604-2010 (1634-2010)	1957-2383 (1993-2365)	1.17-1.22 (1.18-1.22)	579-716 (589-708)	1.35-1.37 (1.36)	424-445 (434)	1086-1299 (1091-1299)	102-116 (103-113)	607-802 (627-795)	5.57-7.73 (5.57-7.72)

Morph	length	Ultimate rostral segment			2nd segment of hind tarsus			Siphunculi		Length of cauda	Length of siphunculi/ length of cauda
		head width across the compound eyes	length/ length of 2nd segment of hind tarsus	length of base of last antennal segment	length	head width across the compound eyes	length/ length of base of last antennal segment	length	length/ width of siphunculi at half length		
Fundatrix	143	0.29	1.41-1.43	1.13-1.23	100-101	0.20-0.21	0.79-0.87	361-375	4.34-4.47	181	2.00-2.07
Male	120	0.28	1.32-1.36	1.64	89-91	0.21	1.21-1.24	281-283	3.61-3.70	124	2.27-2.29
Oviparous females	129-147 (138-147)	0.30-0.33 (0.32)	1.41-1.61 (1.43-1.56)	1.19-1.43 (1.22-1.42)	86-104 (89-102)	0.20	0.78-1.00 (0.79-0.99)	354-427 (358-421)	3.59-4.82 (3.84-4.82)	144-205 (145-205)	2.02-2.51 (2.02-2.46)

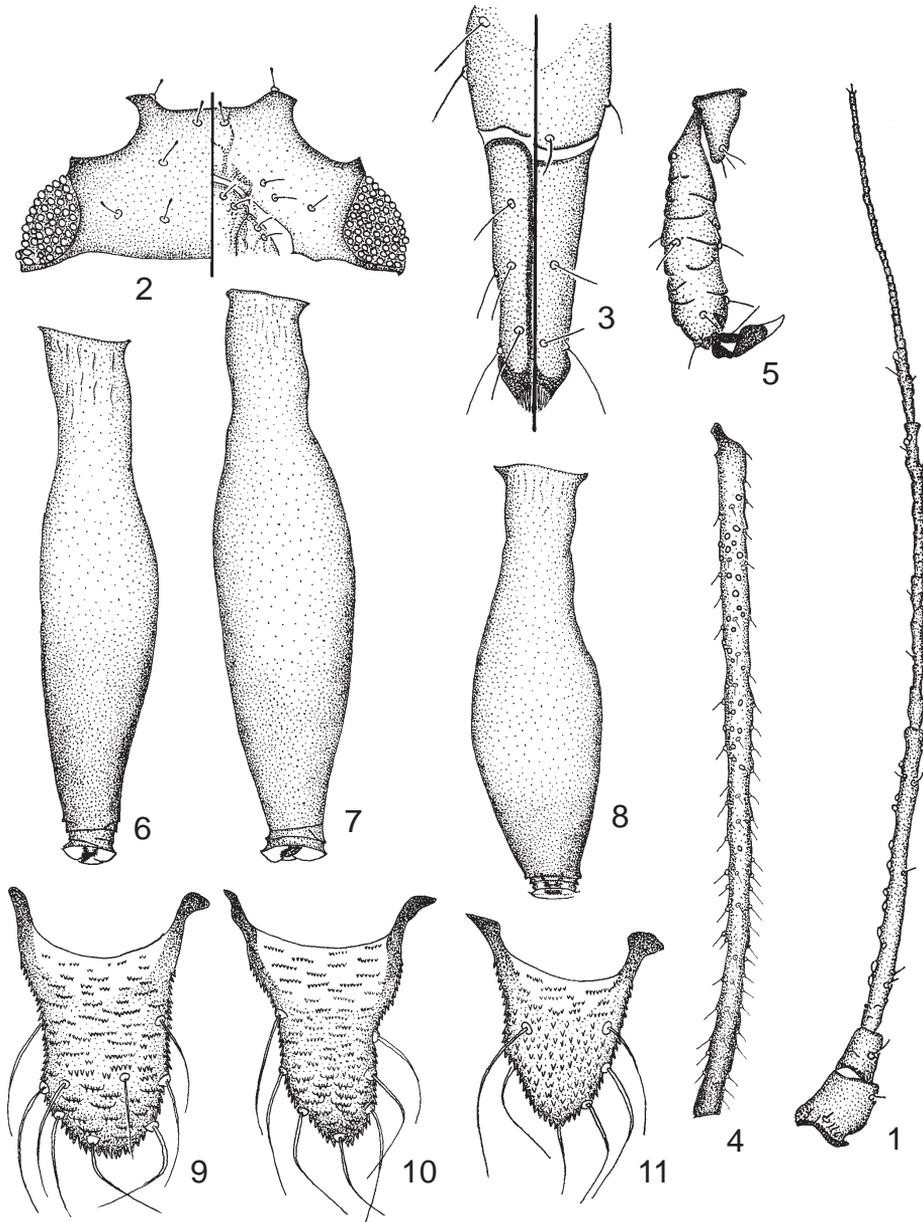
same place as in fundatrix, on pedicle of *Hieracium* sp., then in culture, 3-6.VIII.2004, A.V. Stekolshchikov. **Great Britain, Scotland:** 1 oviparous female and 1 apterous male, Argyll, Isle of Mull, Tobermory, near lighthouse, *Hieracium* sp., then in culture, 2.X.1957 (female) and 14.X.1957 (male), H.L.G. Stroyan.

**Fundatrix.** Elliptic. Colour when alive dark brown, shining; apices of femora grey; antennae (except bases), apices of tibiae and tarsi black; siphunculi dark grey; cauda pale. Cleared specimens with dark brown antennae, apices of femora, bases and apices of tibiae and tarsi, brown head, 3rd and 4th rostral segments, legs, arms of mesosternal furca, bands on segments of thorax, abdominal shield, bands on abdominal tergites V-VIII, marginal maculae, peritremes, ante- and postsiphuncular sclerites, siphunculi, subgenital and anal plate and cauda. Dorsal surface of thorax with broad bands on all segments. Abdominal dorsum with large shield on tergites I-IV, bands on tergites V-VIII, large marginal sclerites on tergites I-IV, ante- and postsiphuncular sclerites and peritremes. Surface of head, thorax and abdominal tergites I-VI weakly wrinkled, almost smooth, of abdominal tergites VII and of postsiphuncular sclerites with rows of small, pointed spinules, which are partially fused and forming scales on tergites VIII; surface of ventral side of thorax and abdominal sternites I-V smooth, of abdominal sternites VI-VII with long rows of small pointed spinules. Hairs on dorsal surface of thorax and abdomen weakly capitate or blunt, on ventral surface of thorax and abdomen pointed or finely pointed; longest dorsal, marginal and ventral hairs on abdominal tergite III 24, 27 and 40 long, 1.00, 1.11 and 1.67 times as long as articular diameter of 3rd antennal segment, respectively; abdominal tergite III with 8 dorsal hairs; tergite VI with 4 hairs between siphunculi; tergite VIII with 7 hairs, longest hair 54 long, 2.22 times as long as articular diameter of 3rd antennal segment. Marginal and spinal tubercles absent. Head without epicranial coronal suture. Antennal tubercles not high, diverging, their surface smooth; median tubercle weakly developed; frons moderately concave; ratio of depth of sinus to distance between bases of antennae 0.06. Occipital and frontal hairs weakly capitate, longest occipital and frontal hairs 30 and 27 long, 1.22 and 1.11 times as long as articular diameter of 3rd antennal segment, respectively. Antennae 6-segmented, 3rd antennal segment with 8-9 secondary rhinaria situated in row all over posterior margin of segment, 4th segment with 0-1, 5th segment without rhinaria. Surface of 1st-2nd antennal segments weakly wrinkled, of 3rd segment smooth with small scales at base of segment, of 4th segment weakly imbricated, of 5-6th segments imbricated. Hairs on antennae weakly capitate, on 5-6th segments pointed; longest hair on

3rd segment 27-30 long, 1.11-1.22 times as long as articular diameter of segment; longest hair on basal part of 6th antennal segment 1.00-1.17 times as long as articular diameter of basal part of segment. Secondary rhinaria elliptical or almost rounded, projecting, with sclerotized rim and more or less convex membrane. Rostrum reaching abdominal segment II. Ultimate rostral segment with 8 long accessory hairs. Legs strong; hind femora and hind tibiae 0.32-0.33 and 0.56-0.57 times as long as body, respectively; inner side of coxae with rows of small spinules sometimes partially fused and forming scales; trochanters, femora, tibiae and outer sides of hind coxae smooth; 2nd tarsal segments imbricated. Hairs on legs blunt or pointed, rarely weakly capitate or finely pointed; ventral hair on hind trochanter 0.60 times as long as basal diameter of hind femur; longest dorsal, ventral and dorso-apical hairs on hind femur 22-27, 27 and 22-24 long, respectively; longest dorsal hair on hind tibia 1.25-1.50 times as long as mid-diameter of the latter. First tarsal segments with 3,3,3 hairs. 2nd segment of hind tarsus 4.11-4.69 times as long as its maximum width. Siphunculi distinctly swollen (diameter of the swollen part near apex 1.67-1.68 times the smallest diameter of the basal half), with distinct flanges, surface of siphunculi smooth, weakly wrinkled at base. Subgenital plate oval, with 5 pointed hairs on anterior half and 12 hairs along hind margin. Hairs on anal plate finely pointed. Cauda finger-shaped, with 9 finely pointed hairs.

**Measurements.** Body – 1885 ♀ 1046, antennae – 1815: III – 512, IV – 264, V – 251, VI – 116+472; hind trochanter+femur – 679, hind tibia – 1057, siphunculus – 361 ♀ 81; cauda – 181 ♀ 121 (at base) ♀ 108 (before base).

**Male.** Apterous, alatiform. Elongate-elliptic. Colour when alive unknown. Cleared specimens with dark brown head, antennae, 3rd and 4th rostral segments, mesothorax, apices of femora, bases and apices of tibiae and tarsi, with brown pronotum and metathorax, legs, bands on abdominal segments I-IV and VII-VIII, sclerites on tergites V-VI, marginal maculae, peritremes, ante- and postsiphuncular sclerites, siphunculi, anal plate and cauda. Abdominal dorsum with large separate bands on tergites I-IV, two sclerites on tergites V and VI, bands on tergites VII-VIII, large marginal sclerites on tergites I-IV and VII, ante- and postsiphuncular sclerites and peritremes. Surface of head, thorax and abdominal tergites I-VI weakly wrinkled, almost smooth, of abdominal tergites VII and of postsiphuncular sclerites with rows of small, pointed spinules, which are on tergites VIII partially fused and forming short scales; surface of ventral side of thorax smooth, of abdomen with long rows of small pointed spinules. Hairs on dorsal surface of thorax and abdomen



**Figs 1–11.** *Hyperomyzus (Neonasonovia) hieracii*. 1, antenna of fundatrix; 2, head of oviparous female; 3, ultimate segment of rostrum; 4, hind tibia of oviparous female; 5, hind tarsus of oviparous female; 6–8, siphunculi (6, of fundatrix; 7, of male; 8, of oviparous female); 9–11, cauda (9, of fundatrix; 10, of male; 11, of oviparous female).

blunt, on ventral surface of thorax and abdomen pointed or, rarely, blunt; longest dorsal, marginal and ventral hairs on abdominal tergite III 27, 25 and 30 long, 0.95, 0.91 and 1.09 times as long as articular diameter of 3rd antennal segment, respectively; abdominal tergite III with 4 dorsal hairs; tergite VI with 3 hairs between siphuncu-

li; tergite VIII with 5 hairs, longest hair 40 long, 1.45 times as long as articular diameter of 3rd antennal segment. One marginal tubercle present on each abdominal segment II and III. Spinal tubercles absent. Head without epicranial coronal suture. Antennal tubercles low, diverging; surface of antennal tubercles smooth; median tubercle

weakly developed; frons moderately concave; ratio of depth of sinus to distance between bases of antennae 0.05. Occipital and frontal hairs blunt; longest occipital and frontal hairs 33 and 25 long, 1.18 and 0.91 times as long as articular diameter of 3rd antennal segment, respectively. Antennae 6-segmented; 3rd antennal segment with 13-15 secondary rhinaria situated in row all over posterior margin of segment, 4th segment with 4-5, 5th segment with 3 rhinaria. Surface of 1st-2nd antennal segments weakly wrinkled, of 3rd-4th segments smooth with small scales at base of 3rd segment, of 5th segment and base of 6th segment weakly imbricated, surface of process terminalis imbricated. Hairs on antennae blunt; longest hair on 3rd segment 18-20 long, 0.64-0.73 times as long as articular diameter of segment; longest hair on basal part of 6th antennal segment 0.79-1.00 times as long as articular diameter of basal part of segment. Secondary rhinaria elliptical or almost rounded, projecting, with sclerotized rim and convex membrane. Rostrum reaching abdominal segment I. Ultimate rostral segment with 8 long accessory hairs. Legs strong, hind femora and hind tibiae 0.36 and 0.66-0.67 times as long as body, respectively; inner sides of hind coxae with rows of small spinules sometimes partially fused and forming scales; outer sides of hind coxae, trochanters, femora and tibiae smooth; 2nd tarsal segments imbricated. Hairs on legs pointed or, rarely, blunt; ventral hair on hind trochanter 0.47-0.52 times as long as basal diameter of hind femur; longest dorsal, ventral and dorso-apical hairs on hind femur 20-23, 23-25 and 20 long, respectively; longest dorsal hair on hind tibia 1.00-1.07 times as long as mid-diameter of the latter. First tarsal segments with 3,3,3 hairs. 2nd segment of hind tarsus 3.50-4.00 times as long as its maximum width. Siphunculi distinctly swollen (diameter of the swollen part near apex 1.88-2.06 times the smallest diameter of the basal half), with distinct flanges, surface of siphunculi smooth, weakly wrinkled at base. Hairs on anal plate finely pointed. Cauda elongate-triangular, with 6 finely pointed hairs.

Measurements. Body – 1472 ♀ 609, antennae – 1844: III – 521, IV – 263, V – 223, VI – 73+599; hind trochanter+femur – 628, hind tibia – 974, siphunculus – 283 ♀ 78; cauda – 124 ♀ 111 (at base) ♀ 94 (before base).

*Oviparous female.* Elliptic. Colour when alive dark brown, shining; antennae, femora (except bases), apices of tibiae and tarsi black; siphunculi and cauda dark brown. Cleared specimens with dark brown antennae, apices of femora, bases and apices of tibiae and tarsi, brown head, 3rd and 4th rostral segments, legs, arms of mesosternal furca, bands on segments of thorax, abdominal shield, bands and sclerites on abdominal

tergites V-VIII, marginal maculae, peritremes, ante- and postsiphuncular sclerites, siphunculi, subgenital and anal plates and cauda. Dorsal surface of thorax with broad bands on all segments. Abdominal dorsum with large shield on tergites I-IV, two sclerites on tergites V and VI, short bands on tergites VII and VIII, large marginal sclerites on tergites I-IV, ante- and postsiphuncular sclerites and peritremes. Surface of head, thorax and abdominal tergites I-VI weakly wrinkled, almost smooth, of abdominal tergites VII and of postsiphuncular sclerites with rows of small, pointed spinules, which are on tergites VIII partially fused; surface of ventral side of thorax smooth, of abdomen with long rows of small pointed spinules. Hairs on dorsal surface of thorax and abdomen weakly capitate, capitate or blunt, on ventral surface of thorax and abdomen pointed or finely pointed; longest dorsal, marginal and ventral hairs on abdominal tergite III 30-33 (32), 33-38 (34-38) and 35-40 (35-39) long, 1.00-1.37 (1.05-1.33), 1.25-1.40 (1.31-1.38) and 1.17-1.60 (1.22-1.59) times as long as articular diameter of 3rd antennal segment, respectively; abdominal tergite III with 6-7 (6.7) dorsal hairs; tergite VI with 4 hairs between siphunculi; tergite VIII with 7-9 (8.0) hairs, longest hairs 40-46 (43) long, 1.42-1.89 (1.48-1.75) times as long as articular diameter of 3rd antennal segment. One specimen has one marginal tubercle on abdominal segment IV. Spinal tubercles absent. Head without epicranial coronal suture. Antennal tubercles not high, diverging; surface of antennal tubercles smooth; median tubercle weakly developed; frons moderately concave; ratio of depth of sinus to distance between bases of antennae 0.08-0.09 (0.08). Occipital and frontal hairs blunt; longest occipital and frontal hairs 28-38 (33-35) and 25-30 (25-28) long, 1.10-1.58 (1.22-1.34) and 0.83-1.26 (0.87-1.16) times as long as articular diameter of 3rd antennal segment, respectively. Antennae 6-segmented, 3rd antennal segment with 10-18 (10.0-17.0) secondary rhinaria situated in row all over posterior margin of segment, 4th segment with 0-4 (0.5-4.0), 5th segment without rhinaria. Surface of 1st-2nd antennal segments weakly wrinkled, of 3rd segment smooth with small scales at base of segment, of 4th segment weakly imbricated, of 5-6th segments imbricated. Hairs on antennae blunt; longest hair on 3rd segment 23-28 (23-27) long, 0.75-1.10 (0.78-1.08) times as long as articular diameter of the segment; longest hair on basal part of 6th antennal segment 1.00-1.14 (1.03-1.14) times as long as articular diameter of basal part of the segment. Secondary rhinaria elliptical or almost rounded, projecting, with sclerotized rim and more or less convex membrane. Rostrum reaching abdominal segments I-II. Ul-

time rostral segment 1.93-2.64 (1.93-2.48) times as long as its basal width, with 8 long accessory hairs. Legs strong, hind femora and hind tibiae 0.35-0.36 (0.36) and 0.65-0.68 (0.66) times as long as body, respectively; inner side of coxae with rows of small spinules sometimes partially fused and forming scales; trochanters, femora, tibiae and outer side of hind coxae smooth; 2nd tarsal segments imbricated. Hairs on legs blunt or pointed; ventral hair on hind trochanter 0.48-0.61 (0.51-0.57) times as long as basal diameter of hind femur; longest dorsal, ventral and dorso-apical hairs on hind femur 25-28 (26), 25-28 (27) and 15-23 (18-21) long, respectively; longest dorsal hair on hind tibia 1.06-1.25 (1.16) times as long as mid-diameter of the latter. Hind tibia with 32-56 (34.5-52.5) rounded pheromone plates. First tarsal segments with 3,3,3 hairs. 2nd segment of hind tarsus 3.78-4.56 (3.89-4.56) times as long as its maximum width. Siphunculi distinctly swollen (diameter of the swollen part near apex 1.75-1.95 (1.88) times the smallest diameter of the basal half), with distinct flanges; surface of siphunculi smooth, of base of siphunculi weakly wrinkled. Subgenital plate oval, with weak constriction along medial line, with 6-11 (8.0-11.0) pointed hairs on anterior half and 12-23 (13.0-23.0) hairs along hind margin. Hairs on anal plate finely pointed. Cauda finger-shaped, slightly narrowed to apex, almost elongate-triangular, with 7-8 (7.3) finely pointed hairs.

Measurements. Body – 1665 ♀ 883, antennae – 2029: III – 523, IV – 307, V – 255, VI – 116+647; hind trochanter+femur – 701, hind tibia – 1096, siphunculus – 354 ♀ 99; cauda – 147 ♀ 129 (at base) ♀ 96 (before base).

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