

Lambers, 1966, *Liosomaphis berberidis* (Kaltenbach, 1843), *Liosomaphis himalayensis* A.N. Basu, 1964, *Liosomaphis ornate* Miyazaki, 1971, *Macrosiphum euphorbiae* (Thomas, 1878), *Myzus persicae* (Sulzer, 1776), and *Rhopalosiphum rufiabdominale* Sasaki, 1899 (Hodjat 1993, Blackman & Eastop 2006, Holman 2009, Blackman & Eastop 2015). So far, only three aphid species were reported from *Berberis* in Iran including *Amegosiphon platicaudum*, *Aphis pomi* and *Liosomaphis berberidis* (Hodjat 1993, Rezwani 2004). In the course of studies of aphid fauna of Iran since 2006, *Liosomaphis atra* was collected on *Berberis integerrima*, which is here a new record for aphid fauna of Iran. In this paper the morphological and biological characteristics of aphid species living on *Berberis* in Iran are presented and an identification key is provided.

***Amegosiphon platicaudum* (Narzikulov, 1953)  
(Aphidinae: Macrosiphini)**

This species was also described as *Elbourzaphis behboudii* by Remaudière and Davatchi in 1959. Individuals of this species have rather elongate body and long appendages, 1.63–2.7 mm long. Body color, in alive specimens, pale green to yellowish with an irregular red spinal stripe. Antennal tubercles well-developed, broadly divergent. Siphunculi slightly and uniformly swollen over most of length which narrowing at base and apex, with spinulose imbrications. Cauda tongue-shaped with 11–27 rather short hairs. Based on the specimens collected in this study, apterous viviparous females and oviparous females with 1–4 and 1–6 secondary rhinaria on the third antennal segment, respectively. Alate males with 0–1 secondary rhinaria on the base of antennal segment VI. In oviparae, antennal segment IV 0.55–0.68 times shorter than antennal segment III; Hind tibia 0.74–0.89 times shorter than body length; cauda with 16–24 hairs. Alatae males with 13–15 hairs on their cauda; antennal segment IV is 0.67–0.74 times shorter than antennal segment III; and hind tibia 0.78–0.88 times shorter than body length.

Some considerable morphological differences were found between the specimens that have been described by Remaudière and Davatchi (1959) and the specimens collected from Kerman province in this study (Table 1). In apterous viviparous females the ratio between ultimate rostral segment and second segment of hind tarsus, and the number of hairs on cauda were different between the two specimens (Table 1). In apterous oviparous females the ratio between length of processus ter-

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**Aphids Living on *Berberis* in Iran: New record of *Liosomaphis atra* Hille Ris Lambers, 1966 (Hem.: Aphididae)**

*Berberis* (Berberidaceae) is a large genus of deciduous and evergreen shrubs growing throughout the temperate and subtropical regions of the world. The European barberry, *Berberis vulgaris*, is the most well-known species which is common in Europe, North Africa, the Middle East, and central Asia. *Berberis* spp. grow in the wild and produce crops rich in vitamin C. Nowadays, Iran is the country in which edible berries are used the most frequently. *Berberis* spp. like other plants are infested by a number of aphids. There are more than 18 aphid species living on *Berberis* spp. in the world including *Amegosiphon platicaudum* (Narzikulov, 1953), *Aphis aurantii* Boyer de Fonscolombe, 1841, *Aphis berberidorum* Ortego & Mier Durante, 1997, *Aphis citricidus* (Kirkaldy, 1907), *Aphis nasturtii* Kaltenbach, 1843, *Aphis odinae* (van der Goot, 1917), *Aphis patagonica* Blanchard, 1944, *Aphis pomi* De Geer, 1773, *Aphis spiraeicola* Patch, 1914, *Aulacorthum solani* (Kaltenbach, 1843), *Berberidaphis lydiae* (Narzikulov, 1957), *Liosomaphis atra* Hille Ris

**Table 1.** Morphological differences between *Amegosiphon platicaudum* specimens described by Remaudière & Davatchi (1959) and the specimens collected in the current study.

Morph	Characters	Biometric data described in Remaudière & Davatchi (1959)	Biometric data of collected specimens in the current study
Apterous viviparae	Body length	1.97–2.36	1.63–2.32
	ANTIV/ANTIII	0.64–0.80	0.59–0.72
	PT/ANTVib	1.82–2.50	1.89–2.52
	URS/2HT	0.55–0.61	0.63–0.71
	HTib/Body length	0.70–0.85	0.71–0.88
	SIPH/Body length	0.12–0.15	0.11–0.15
	SIPH/CAU	1.03–1.26	1.04–1.27
	ANTIII/SIPH	1.86–2.47	2.21–2.79
Apterous oviparae	Body length	1.97–2.42	1.76–2.37
	PT/ANTVib	2.26–2.55	1.96–2.19
	URS/2HT	0.58–0.64	0.63–0.73
	SIPH/Body length	0.13–0.15	0.12–0.14
	SIPH/CAU	1.50–1.61	1.27–1.56
	ANTIII/SIPH	1.79–2.0	2.29–2.76
Alate males	Body length	2.0–2.04	1.76–1.85
	PT/ANTVib	2.7–2.73	2.0–2.3
	URS/2HT	0.55–0.59	0.53–0.63
	SIPH/Body length	0.11	0.09
	SIPH/CAU	1.17–1.44	1.0–1.07
	ANTIII/SIPH	2.65–2.95	3.75–4.0
	Rhin. on ANTIII	15–17	17–18
	Rhin. on ANTIV	11–17	8–12
Rhin. on ANTV	4–9	12–16	

Abbreviations used in the table are as follows: ANTIII, ANTIV, ANTVib: antennal segments III, IV and base of antennal segment VI, respectively; PT: processus terminalis; URS: ultimate rostral segment; 2HT: second segment of hind tarsus; SIPH: siphunculus; CAU: Cauda; HTib: Hind leg tibiae length; Rhin.: rhinaria.

minalis and the base of antennal segment VI, ultimate rostral segment and second segment of hind tarsus, siphunculus and cauda, and third antennal segment and siphunculus were notably different (Table 1). In alate males, the ratio between the length of processus terminalis and the base of antennal segment VI, and third antennal segment and siphunculus were markedly different (Table 1). There was also a considerable difference between the numbers of secondary rhinaria on antennal segments (see Table 1).

*Amegosiphon platicaudum* is monoecious holocyclic on *Berberis* spp. infesting undersides of leaves. Sexual morphs occur in October and November (Remaudière & Davatchi 1959). This species was collected from Iran and Tajikistan (Remaudière & Davatchi 1959, Hodjat 1993, Blackman & Eastop 2006). In Iran, it was already collected in Tehran, Gatch-sar and Fasham (Alborz, altitude of 1600–2000 m), Shiraz, Kazeroun (Zagros, 1900 m), and Khorasan (Hodjat 1993, Rezwani 2004). In this study, it was collected from Kerman province (South-east of Iran) on *Berberis*

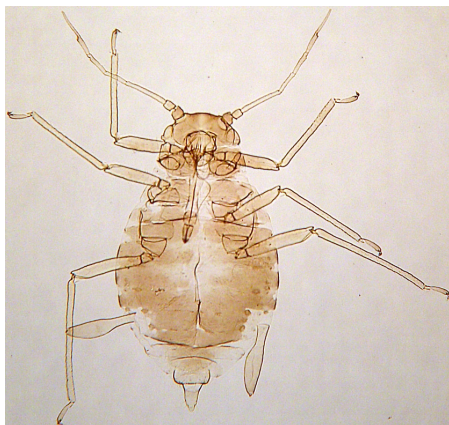
*integerrima* in Lalehzar (3020 m), 21 May 2006, Sar-cheshmeh (2553 m), 13 October 2006 and Chatrod (2201 m), 20 October 2006, M. Mehrparvar.

#### *Aphis pomi* De Geer, 1773 (Aphidinae: Aphidini)

This species is reported on *B. vulgaris* only in Iran by Hodjat (1993), however, this is doubtful and requires further confirmation. Apteratae are bright green with black siphunculi and dark cauda. Body 1.3–2.2 mm long. It lives in dense colonies on young growth of several genera of woody Rosaceae, causing slight leaf-curl (Blackman & Eastop 2000). This species is monoecious holocyclic. Distributed in Europe, North Africa, Asia (eastwards to India and Pakistan), and North America (Blackman & Eastop 2015).

#### *Liosomaphis atra* Hille Ris Lambers, 1966 (Aphidinae: Macrosiphini) (Fig. 1)

This species is reported for the first time from Iran. It was already collected on *Berberis* spp. from Afghanistan, Pakistan, India (Himachal Pradesh, Uttar Pradesh), Turkmenistan and China



**Figure 1.** Photograph of Apterous viviparous female of *Liosomaphis atra*.

(Raychaudhuri et al. 1980, Blackman & Eastop 2006, Holman 2009, Blackman & Eastop 2015). Apterous dark purplish brown, dirty greenish in centre of dorsal abdomen, with pale legs and antennae. Body length 1.3–1.8 mm. Ultimate rostral segment with two secondary hairs. Siphunculi darker on distal half. Alatae with a brown dorsal abdominal patch (Ghosh & Pramanik 1976). Dorsum usually with a complete dark shield. Middle anterior part of the abdominal shield often paler. Siphunculi 0.88–0.99 times shorter than head-width across eyes. Siphuncular base surrounded by a rather large membranous pale area. Rostrum relatively long so that it reaches to or past the coxae of the hind legs. Comparisons of biometric data of the specimens originally described by Hille Ris Lambers (1966) and specimens collected in the current study are given in the Table 2. Specimens in this study were collected on *Berberis integerrima* in Bondar-e-Chatroud (2550 m), Kerman province (South-east of Iran), 20 October 2006, M. Mehrparvar.

***Liosomaphis berberidis* (Kaltenbach, 1843)**  
(Aphidinae: Macrosiphini)

*Liosomaphis turanica* Narzikulov 1960

Apterous with two color forms, yellow to yellow-green, or pinkish to orange-red, usually occur as a mixture in colonies. Body 1.1–2.3 mm long covered slightly with wax-powder. Alatae with dark head, thorax, and antennae, but with little or no dark dorsal abdominal pigmentation. This species lives on undersides of leaves of *Berberis* and *Mahonia*, throughout Europe, east to India, and introduced to North America, Australia and New Zea-

**Table 2.** Comparisons of biometric data of *Liosomaphis atra* specimens originally described by Hille Ris Lambers (1966) and specimens collected in the current study.

Morph	Characters	Specimens described by Hille Ris Lambers (1966)	Specimens collected in the current study
Apterous	Body length	1.3–1.6	1.4–1.8
viviparae	PT/ANTVIb	1.18–1.56	1.15–1.36
	URS/2HT	0.90	0.83–0.92
	SIPH/Body length	0.20–0.22	0.21–0.25
	SIPH/CAU	1.83–2.13	2.03–2.34
	No. hairs on CAU	5	5–6

Abbreviations used in the table are as follows: ANTVIb: base of antennal segment VI; PT: processus terminalis; URS: ultimate rostral segment; 2HT: second segment of hind tarsus; SIPH: siphunculus; CAU: Cauda.

land (Blackman & Eastop 2006, Blackman 2010, Blackman & Eastop 2015).

Antennal tubercles weakly developed, median tubercle well developed. Antennae 0.4–0.5 times shorter than body length. Processus terminalis 0.8–1.4 times the base of antennal segment VI. Third antennal segment of apterae without secondary rhinaria. Rostrum reaching just past middle coxae. Ultimate rostral segment bearing two accessory hairs, and 0.7–0.8 times shorter than second segment of hind tarsus. Siphunculi markedly swollen on distal half, 1.8–2.3 times longer than cauda, and 0.19–0.25 times shorter than body length. Cauda bearing 5–6 hairs. Alatae with secondary rhinaria on the third (19–31), fourth (4–10), and fifth (1–6) antennal segments. Antennae in alates 0.7–0.8 times shorter than body length. Processus terminalis 0.9–1.1 times the base of antennal segment VI. Oviparae 1.85–2.1 mm long. Antennae 0.51–0.58 times shorter than body length. Siphunculi 2.14–2.30 times longer than cauda.

This species was collected in Iran from Tehran, Alborz mountains (2200 m) and Birjand (Hodjat 1993, Rezwani 2004). In this study, specimens were collected on *Berberis integerrima* from Rayen (2535 m), Kerman province (South-east of Iran), 5 May 2006, and Sarcheshmeh (2575 m), Kerman province (South-east of Iran), 25 May 2007, M. Mehrparvar.

**Materials Examined.** All specimens collected in this study are deposited in the Aphid Collection of Aphidology Research Group, Institute of Science and High Technology and Environmental Sci-

ences, Graduate University of Advanced Technology, Kerman, Iran.

### Key to the apterous viviparous aphid species living on *Berberis* spp. in Iran

- 1– Siphunculi tapering, not swollen; Siphunculi and cauda dark; Marginal tubercles present on abdominal tergites 2–4; Cauda with 10–19 hairs (rarely less than 13); Ultimate rostral segment more than 120  $\mu\text{m}$ .....*Aphis pomi*  
 – Siphunculi swollen, with maximum width of swollen part broader than base; Siphunculi and cauda pale; Marginal tubercles absent on abdominal tergites 2–4; Cauda with 5–27 hairs.....2  
 2– Siphunculi markedly clavate (Fig. 1), and lacking imbrication except near apex; Antennal tubercles weakly developed; Cauda with 5–6 hairs.....3  
 – Siphunculi slightly and uniformly swollen over most of length, narrowing at base and apex, with spinulose imbrication; Antennal tubercles well-developed; Cauda with 11–27 hairs.....  
 .....*Amegosiphon platicaudum*  
 3– Dorsum sclerotic, usually with a complete dark shield; Processus terminalis 1.15–1.56 times longer than the base of antennal segment VI.....  
 .....*Liosomaphis atra*  
 – Dorsal abdomen pale; Processus terminalis 0.8–1.4 times as long as the base of antennal segment VI.....*Liosomaphis berberidis*

The biodiversity and aphid fauna of Iran has not been extensively studied and there is no complete information on this important group of insects. It is expected that more aphid species are present in Iran so that with more extensive investigations the number of species will increase in the future.

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