



## Subfamily Alysiinae Leach, 1815 (Hymenoptera: Braconidae) from Iran: new records and updated list

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**ABSTRACT.** The subfamily Alysiinae (Hymenoptera, Braconidae) is one of the most peculiar and diverse endoparasitoids of the family Braconidae. A sampling survey was done in different parts of Iran, mainly in South, Central and South Eastern provinces. Fifteen species are recorded for the first time from Iran. They were belonging to tribe Alysiini (*Dinotrema amparoe* Peris-Felipo, 2013; *D. borzhomii* Tobias, 2004; *D. dimorpha* (Fischer, 1976); *D. perlustrandum* (Fischer, 1973); *D. sinecarinum* (Fischer, 1993); *D. tauricum* (Telenga, 1935); *Orthostigma longicorne* Konigsmann, 1969; *Phaenocarpa bicolor* (Foerster, 1863); *P. carinthiaca* Fischer, 1975 and *Synaldis maxima* Fischer, 1972) and Dacnusiini (*Chorebus melanophytobiae* Griffiths, 1968; *C. thusa* (Nixon, 1937); *Dacnusa areolaris* (Nees, 1811); *D. aquilegiae* Marshall, 1896 and *D. metula* (Nixon, 1954)). List of Iranian Alysiinae including 108 species is also presented.

**Key words:** Alysiinae, updated list, new records, Iran.

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### Introduction

The subfamily Alysiinae is one of the most peculiar and diverse endoparasitoid subfamilies of the family Braconidae (Yu *et al.* 2012). Morphologically, the two tribes are mainly separated by the presence (Alysiini) or absence (Dacnusiini) of the fore wing vein r-m (Yu *et al.* 2012; Peris-Felipo *et al.* 2014). Alysiini are parasitoids of a wide range of Diptera-Cyclorhapha while Dacnusiini are exclusively specialized on leaf and stem miners of the families

Agromyzidae, Ephydriidae and Chloropidae (Belokobylskij 2005; Fischer & Beyarslan 2012; Peris-Felipo *et al.* 2014).

Recently, the number of Alysiinae known from Iran has reached to 93 species (Gadallah *et al.* 2015, Farahani *et al.* 2016, Peris-Felipo *et al.* 2016, and Yari *et al.* 2016). In the present paper, new records and an updated list of Alysiinae from Iran are provided.

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## Material and methods

Specimens were collected using Malaise traps in different provinces of Iran during 2009–2013. They were dropped directly into ethyl alcohol (75%) for subsequent studies. The criteria indicated by Tobias (1986), Fischer (1990, 1993), van Achterberg (1993), Sharkey & Wharton (1997), and Peris-Felipo *et al.* (2014) were used for identification of new records. Classification and distribution follows Yu *et al.* (2012) and Peris-Felipo *et al.* 2014. New records of species are marked by an asterisk (\*).

The material examined is deposited in the Department of Plant Protection at University of Zabol (Iran; DPPZ), Entomological Collection at University of Valencia (Spain; ENV), and Department of Entomology of Tarbiat Modares University (Tehran, Iran; TMUC). An updated list of all recorded Alysiinae species from different parts of Iran (Fig. 1) is presented.

## Results

A total of 108 species belonging to 18 genera, *Adelurola* Strand, 1928, *Alloea* Haliday, 1833, *Alysia* Latreille, 1804, *Angelovia* Zaykov, 1980, *Aphaereta* Foerster, 1863, *Aristelix* Nixon, 1943, *Aspilota* Foerster, 1863, *Chorebus* Haliday, 1833, *Coelinidea* Viereck, 1913, *Coloneura* Foerster, 1863, *Dacnusa* Haliday, 1833, *Dinotrema* Foerster, 1863, *Idiasta* Foerster, 1863, *Orthostigma* Ratzeburg, 1844, *Phaenocarpa* Foerster, 1863, *Protodacnusa* Griffiths, 1964, *Pseudopezomachus* Mantero, 1905 and *Synaldis* Foerster, 1863 are recorded and catalogued for Iran. New records with material examined and distribution are provided below. Finally, a checklist of Iranian species of Alysiinae is given.

### Class Hexapoda Blainville, 1816

### Order Hymenoptera L., 1758

### Family Braconidae Nees, 1811

### Subfamily Alysiinae Leach, 1815

### Tribe Alysiini Leach, 1815

#### \**Dinotrema amparoe* Peris-Felipo, 2013

**Material examined:** 1 ♀, Iran, Hormozgan, Tezerj, 27°17'51.81"N 55°45'14.76"E, 867 m, 29.viii.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

#### \**Dinotrema borzhomii* Tobias, 2004

**Material examined:** 1 ♀, Iran, Kerman, Lalezar, 29°31'52.57"N 56°47'49.93"E, 2701 m, 22.vi.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Eastern Palaearctic.

#### \**Dinotrema dimorpha* (Fischer, 1976)

**Material examined:** 2 ♂♂, Iran, Hormozgan, Tezerj, 27°17'51.81"N 55°45'14.76"E, 877 m, 25.i.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

#### \**Dinotrema perlustrandum* (Fischer, 1973)

**Material examined:** 1 ♀, Iran, Sistan-& Baluchestan, Zahak, 30°54'07"N, 61°40'24"E, 491m, 23.viii.2009, swept on *Medicago sativa* L. (N. Khajeh leg) (ENV).

**Distribution:** Palaearctic.

#### \**Dinotrema sinecarinum* (Fischer, 1993)

**Material examined:** 1 ♂, Iran, Kerman, Delfard, 28°57'59.23"N, 57°38'34.71"E, 2066 m, 19.iv.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

#### \**Dinotrema tauricum* (Telenga, 1935)

**Material examined:** 1 ♀, Iran, Isfahan, Najafabad, 32°39'29.87"N 51°25'27.47"E, 1654 m, 6.vi.2012 (E. Nader leg.) (ENV).

**Distribution:** Palaearctic.

#### \**Orthostigma longicorne* Königsmann, 1969

**Material examined:** 1 ♂, Iran, Kerman, Lalezar, 29°31'52.57"N 56°47'49.93"E, 2701 m, 22.vi.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**\*Phaenocarpa (Phaenocarpa) bicolor**  
(Foerster, 1863)

**Material examined:** 1 ♀, 1 ♂, Iran, Kerman, Bardsir, 29°57'23.83"N 56°34'33.223"E, 2026m, 16.iv.2013, swept on *Medicago sativa* L. (M. Azad leg.) (DPPZ).

**Distribution:** Palaearctic.

**\*Phaenocarpa (Phaenocarpa) carinthiaca**  
Fischer, 1975

**Material examined:** 1 ♀, Iran, Kerman, Delfard, 28°57'59.23"N, 57°38'34.72"E, 2067 m, 30.vi.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**\*Synaldis maxima** Fischer, 1972

**Material examined:** 1 ♂, Iran, Kerman, Lalezar, 29°31'52.57"N 56°47'49.93"E, 2701 m, 22.vi.2013 (Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**Tribe Dacnusiini Foerster, 1863**

**\*Chorebus (Stiphocera) melanophytobiae**  
Griffiths, 1968

**Material examined:** 1 ♀, Iran, Kerman, Delfard, 28°57'59.23"N, 57°38'34.71"E, 2068 m, 1.vii.2013 (A. Ameri leg.) (TMUC); 1 ♀, 1 ♂, Iran, Fars, Jahrom, 28°29'23.07"N 53°31'20.12"E, 1105 m, 4.vi.2013 (A. Ameri leg.) (TMUC); 1 ♂, same locality but, 28°34'01.62"N 53°27'29.53"E, 1540 m, 22.iv.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**\*Chorebus (Chorebus) thusa** (Nixon, 1937)

**Material examined:** 1 ♂, Iran, Fars, Jahrom, 28°34'01.62"N 53°27'29.53"E, 1105 m, 10.i.2012 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Hormozgan, Abmah, 27°46'1.76"N 56°43'30.87"E, 643 m, 12.iv.2013 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Hormozgan, Bahne, 27°53'7.32"N 56°19'58.34"E, 1020 m, 4.xii.2012 (A. Ameri leg.) (TMUC); 1 ♀, 1 ♂, Iran, Hormozgan, Chelo, 27°10'30.39"N

57°1'9.79"E, 16 m, 23.xi.2012 & 22.i.2013 (A. Ameri leg.) (TMUC); 1 ♀, Iran, Hormozgan, Goleshvar, 27°58'30.57"N 56°59'53.55"E, 14 m, 29.iii.2011 (A. Ameri leg.) (TMUC); 2 ♂♂, Iran, Hormozgan, Rahbari, 27°27'2.67"N 57°8'54.22"E, 213 m, 25.iii.2011 & 1.iv.2013 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Hormozgan, Ramkan, 26°52'25.27"N 56°1'7.33"E, 34 m, 17.iv.2013 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Hormozgan, Tezerj, 27°17'51.81"N 55°45'14.76"E, 867 m, 8.iv.2013 (A. Ameri leg.) (TMUC); 2 ♂♂, Iran, Hormozgan, Zakin, 27°28'53"N 56°18'27"E, 632–687 m, 3.ii & 7.v.2013 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Kerman, Lalezar, 29°31'52"N 56°47'49"E, 2701 m, 25.vi.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**\*Dacnusa (Dacnusa) areolaris** (Nees, 1811)

**Material examined:** 3 ♀♀, 4 ♂♂, Iran, Hormozgan, Bahne, 27°53'7.32"N 56°19'58.34"E, 1021 m, 12.iv.2013 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Hormozgan, Tezerj, 27°17'51.81"N 55°45'14.76"E, 879 m, 25.i.2012 (A. Ameri leg.) (TMUC); 1 ♀, Iran, Kerman, Delfard, 28°57'59.23"N 57°38'34.71"E, 2067 m, 1.vii.2013 (A. Ameri leg.) (TMUC); 1 ♀, 1 ♂, Iran, Kerman, Lalezar, 29°31'52.57"N, 56°47'49.93"E, 2700 m, 27.vi.2013 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

**\*Dacnusa (Pachysema) aquilegiae** Marshall, 1896

**Material examined:** 1 ♀, Iran, Fars, Dejh, 30°55'42.46"N 52°43'46.85"E, 2100 m, 10.vii.2012 (A. Ameri leg.) (TMUC); 1 ♂, Iran, Kerman, Lalezar, 29°31'52.57"N 56°47'49.93"E, 2700 m, 27.vi.2013 (A. Ameri leg.) (TMUC); 2 ♀♀, 1 ♂, Iran, Hormozgan, Tezerj, 27°17'51.81"N 55°45'14.76"E, 880 m, 25.i.2012 (A. Ameri leg.) (TMUC); 5 ♀♀, 6 ♂♂, Iran, Hormozgan, Zakin, 27°28'53.23"N 56°18'27.03"E, 682 m, 11.v., 6.vii & 10.xi.2012 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

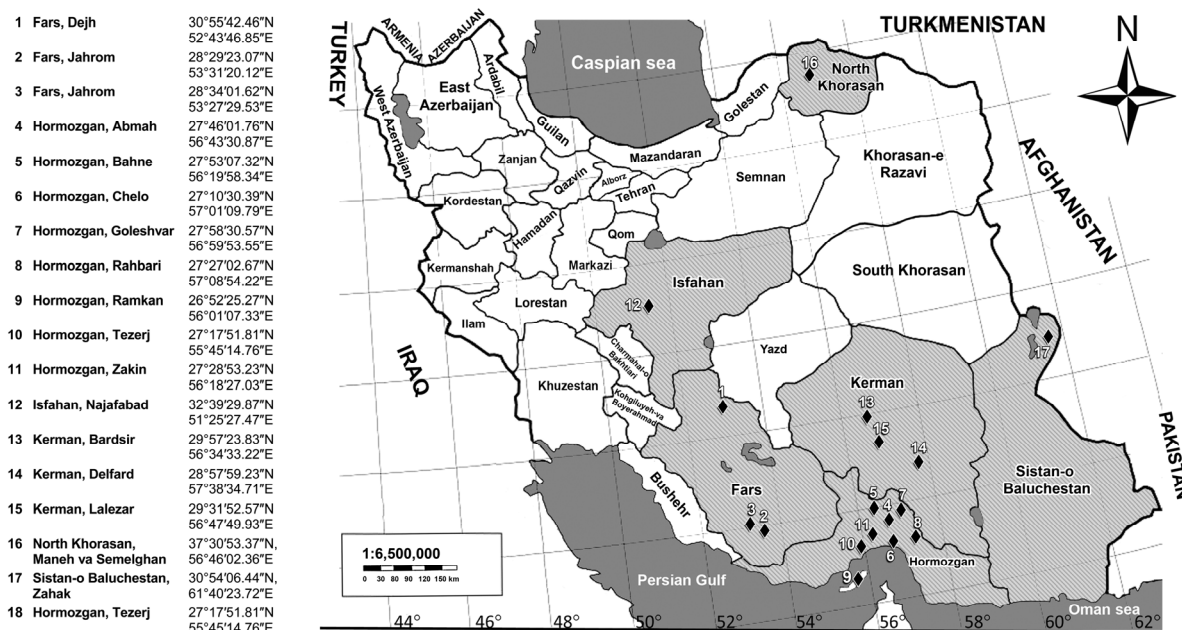


Figure 1. Province distribution of alysiine records in Iran.

\**Dacnusa (Pachysema) metula* (Nixon, 1954)

**Material examined:** 2 ♀♀, Iran, Hormozgan, Zakin, 27°28'53.23"N 56°18'27.03"E, 685 m, 24.v & 10.xi.2012 (A. Ameri leg.) (TMUC).

**Distribution:** Palaearctic.

#### Updated list of Iranian Alysiinae species Tribe Alysiini Leach, 1815

- Adelurola amplidens* (Fischer, 1966)
- Alloea contracta* (Haliday, 1833)
- Alysia (Anarcha) rufidens* Nees, 1834
- Angelovia elipsocubitalis* Zaykov, 1980
- Aphaereta difficilis* Nixon, 1939
- Aphaereta minuta* (Nees, 1811)
- Aspilota alfalfae* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
- Aspilota delicata* Fischer, 1973
- Aspilota flagimilis* Fischer, 1996
- Aspilota insolita* (Tobias, 1962)
- Aspilota isfahanensis* Peris-Felipo, 2016
- Aspilota latitemporata* Fischer, 1976
- Aspilota nidicola* Hedqvist, 1972
- Dinotrema amoenidens* (Fischer, 1973)
- Dinotrema amparoae* Peris-Felipo, 2013\*
- Dinotrema borzhomii* Tobias, 2004\*
- Dinotrema concinnum* (Haliday, 1838)
- Dinotrema contracticorne* (Fischer, 1974)
- Dinotrema cratocera* (Thomson, 1895)
- Dinotrema dimorpha* (Fischer, 1976)\*
- Dinotrema intermissum* (Fischer, 1974)
- Dinotrema perlustrandum* (Fischer, 1973)\*
- Dinotrema significarium* (Fischer, 1973)
- Dinotrema sinecarinum* (Fischer, 1993)\*
- Dinotrema tauricum* (Telenga, 1935)\*
- Idiasta (Idiasta) picticornis* (Ruthe, 1854)
- Orthostigma beyarslani* Fischer, 1995
- Orthostigma laticeps* (Thomson, 1895)
- Orthostigma longicorne* Königsmann, 1969\*
- Orthostigma maculipes* (Haliday, 1838)
- Phaenocarpa (Phaenocarpa) bicolor* (Foerster, 1863)\*
- Phaenocarpa (Phaenocarpa) brevipalpis* (Thomson, 1895)
- Phaenocarpa (Phaenocarpa) carinthiaca* Fischer, 1975\*

34. *Phaenocarpa (Phaenocarpa) ruficeps* (Nees, 1812)
35. *Pseudopezomachus cursitans* (Ferrière, 1930)
36. *Pseudopezomachus masii* Nixon, 1940
37. *Synaldis concolor* (Nees, 1812)
38. *Synaldis distracta* (Nees, 1834)
39. *Synaldis maxima* Fischer, 1972\*
40. *Synaldis megastigma* Fischer, 1967
41. *Synaldis ultima* Fischer, 1970

### Tribe Dacnusiini Foerster, 1863

42. *Aristelix persica* Peris-Felipo, 2015
43. *Chorebus (Chorebus) affinis* (Nees, 1812)
44. *Chorebus (Stiphrocera) anasellus* (Stelfox, 1951)
45. *Chorebus (Stiphrocera) aphantus* (Marshall, 1895)
46. *Chorebus (Phaenolexis) ares* (Nixon, 1944)
47. *Chorebus (Stiphrocera) asphodeli* Griffiths, 1968
48. *Chorebus (Chorebus) axillaris* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
49. *Chorebus (Stiphrocera) baeticus* Griffiths, 1967
50. *Chorebus (Phaenolexis) bathyzonus* (Marshall, 1895)
51. *Chorebus (Phaenolexis) caesariatus* Griffiths, 1967
52. *Chorebus (Phaenolexis) compressiventris* (Telenga, 1935)
53. *Chorebus (Stiphrocera) cubocephalus* (Telenga, 1935)
54. *Chorebus (Stiphrocera) diremtus* (Nees, 1834)
55. *Chorebus (Phaenolexis) femoratus* (Tobias, 1962)
56. *Chorebus (Stiphrocera) flavipes* (Goureau, 1851)
57. *Chorebus (Phaenolexis) fuscipennis* (Nixon, 1937)
58. *Chorebus (Phaenolexis) gedanensis* (Ratzeburg, 1852)
59. *Chorebus (Chorebus) gracilipes* (Thomson, 1895)
60. *Chorebus (Chorebus) groschkei* Griffiths, 1967
61. *Chorebus (Phaenolexis) heringianus* Griffiths, 1967
62. *Chorebus (Phaenolexis) iridis* Griffiths, 1968
63. *Chorebus (Stiphrocera) lar* (Morley, 1924)
64. *Chorebus (Phaenolexis) leptogaster* (Haliday, 1839)
65. *Chorebus (Chorebus) longiarticulis* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
66. *Chorebus (Stiphrocera) melanophytobiae* Griffiths, 1968\*
67. *Chorebus (Stiphrocera) merellus* (Nixon, 1937)
68. *Chorebus (Stiphrocera) misellus* (Marshall, 1895)
69. *Chorebus (Chorebus) mucronatus* (Telenga, 1935)
70. *Chorebus (Chorebus) nigridiremtus* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
71. *Chorebus (Chorebus) nigriscapousus* (Nixon, 1949)
72. *Chorebus (Chorebus) nixonii* Burghelle, 1959
73. *Chorebus (Phaenolexis) ornatus* (Telenga, 1935)
74. *Chorebus (Chorebus) paroungula* (Thomson, 1895)
75. *Chorebus (Phaenolexis) posticus* (Haliday, 1839)
76. *Chorebus (Chorebus) properesam* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
77. *Chorebus (Stiphrocera) pseudomisellus* Griffiths, 1968
78. *Chorebus (Chorebus) ruficollis* (Stelfox, 1957)
79. *Chorebus (Chorebus) scabiosae* Griffiths, 1967
80. *Chorebus (Chorebus) solstitialis* (Stelfox, 1951)
81. *Chorebus (Stiphrocera) spenceri* Griffiths, 1964
82. *Chorebus (Chorebus) stilifer* Griffiths, 1968
83. *Chorebus (Phaenolexis) tamsi* (Nixon, 1944)
84. *Chorebus (Chorebus) thusa* (Nixon, 1937)\*
85. *Chorebus (Stiphrocera) tumidus* (Tobias, 1966)

86. *Chorebus (Chorebus) uliginosus* (Haliday, 1839)
87. *Chorebus (Stiphrocera) venustus* (Tobias, 1962)
88. *Chorebus (Chorebus) zarghanensis* Fischer, Lashkari Bod, Rakhshani & Talebi, 2011
89. *Coelinidea elegans* (Curtis, 1829)
90. *Coelinidea gracilis* (Curtis, 1829)
91. *Coloneura dice* (Nixon, 1943)
92. *Dacnusa (Aphanta) hospita* (Foerster, 1863)
93. *Dacnusa (Aphanta) sasakawai* Takada, 1977
94. *Dacnusa (Dacnusa) areolaris* (Nees, 1811)\*
95. *Dacnusa (Dacnusa) confinis* Ruthe, 1859
96. *Dacnusa (Dacnusa) gentianae* Griffiths, 1967
97. *Dacnusa (Dacnusa) pubescens* (Curtis, 1826)
98. *Dacnusa (Pachysema) abdita* (Haliday, 1839)
99. *Dacnusa (Pachysema) alpestris* Griffiths, 1967
100. *Dacnusa (Pachysema) aquilegiae* Marshall, 1896\*
101. *Dacnusa (Pachysema) aterrima* Thomson, 1895
102. *Dacnusa (Pachysema) clematidis* Griffiths, 1967
103. *Dacnusa (Pachysema) evadne* Nixon, 1937
104. *Dacnusa (Pachysema) metula* (Nixon, 1954)\*
105. *Dacnusa (Pachysema) monticola* (Foerster, 1863)
106. *Dacnusa (Pachysema) sibirica* Telenga, 1935
107. *Protodacnusa aridula* (Thomson, 1895)
108. *Protodacnusa litoralis* Griffiths, 1964

### Discussion

In the present study, a total of 108 Alysiniinae species are catalogued from Iran (41 species belonging to Alysini and 67 belonging to Dacnusiini). Fifteen species are recorded for the first time: *Idiasta picticornis* (Ruthe, 1854), *Orthostigma latinerve* (Petersen, 1956), *Chorebus anasellus* (Stelfox, 1951), *Chorebus melanophytobiae* Griffiths, 1968, *Chorebus*

*thusa* (Nixon, 1937), *Dacnusa areolaris* (Nees, 1811), *Dacnusa aquilegiae* Marshall, 1896, *Dacnusa metula* (Nixon, 1954), *Dinotrema amparoe* Peris-Felipo, 2013, *Dinotrema borzhomii* Tobias, 2004, *Dinotrema dimorpha* (Fischer, 1976), *Dinotrema perlustrandum* (Fischer, 1973), *Dinotrema sinecarinum* (Fischer, 1993), *Dinotrema tauricum* (Telenga, 1935), *Orthostigma longicorne* Königsmann, 1969, *Phaenocarpa bicolor* (Foerster, 1863), *Phaenocarpa carinthiaca* Fischer, 1975, and *Synaldis maxima* Fischer, 1972.

This number of species is higher than the number in adjacent countries such as Azerbaijan (107), Turkey (36), Armenia (26), Turkmenistan (10), Afghanistan (10), and Pakistan (1) (Yu *et al.* 2012). Comparison of the distribution of the new species recorded for Iran shows that Hormozgan with nine records was the province with the largest increase followed by Kerman and Fars with three (Fig. 1). Further investigations both on the fauna composition and the host associations of the Iranian Alysiniinae are necessary to provide a basis for biological control of the dipterous pests in agricultural and urban ecosystems.

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## زیرخانواده (Hymenoptera: Braconidae) Alysiinae Leach, 1815 در ایران: گزارش‌های جدید و فهرست به‌روز شده گونه‌ها

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**چکیده:** زیرخانواده آلیزینه یکی از گروه‌های متنوع و ناشناخته از زنبورهای پارازیتوبیید داخلی متعلق به خانواده براکونیده (Braconidae) محسوب می‌شود. نمونه‌برداری در مناطق مختلف ایران عمدتاً در نواحی جنوبی، جنوب شرق و مرکز انجام شد. پانزده گونه برای اولین بار از ایران گزارش شدند. این گونه‌های متعلق به هر دو قبیله Alysiini؛ *D. borzhomii* Tobias, 2004؛ *Dinotrema amparoae* Peris-Felipo, 2013؛ *D. perlustrandum* (Fischer, 1973)؛ *D. dimorpha* (Fischer, 1976) *orthostigma*؛ *D. tauricum* (Telenga, 1935)؛ *D. sinecarinum* (Fischer, 1993)؛ *Phaenocarpa bicolor* (Foerster, 1863)؛ *longicorne* Konigsmann, 1969 و *Synaldis maxima* Fischer, 1972 و *P. carinthiaca* Fischer, 1975 و *C. thusa* (Nixon)؛ *Chorebus melanophytobiae* Griffiths, 1968) Dacnusi و *D. aquilegiae* Marshall, 1896؛ *Dacnusa areolaris* (Nees, 1811)؛ 1937 و *D. metula* (Nixon, 1954) بودند. فهرست کل گونه‌های زیرخانواده Alysiinae ایران مشتمل بر ۱۰۸ گونه نیز ارایه شده است.

**واژگان کلیدی:** Alysiinae، لیست به‌روز شده، گزارش جدید، ایران.