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CATALOGUE OF MESOSTIGMATID MITES OF IRAN. PART 4: PARASITIDAE, VEIGAIIDAE AND ZERCONIDAE

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ABSTRACT — A catalogue of Parasitidae, Veigaiidae and Zerconidae (Acari: Mesostigmata) families from Iran is presented. Based on information from published studies, the following taxa are known to inhabit the various parts of this country: 10 genera and 21 determined species of Parasitidae, 2 genera and 4 determined species of Veigaiidae and 2 genera and 1 identified species of Zerconidae.

KEYWORDS — catalogue; Acari; Mesostigmata; Parasitidae; Veigaiidae; Zerconidae

INTRODUCTION

The mites of the family Parasitidae form one of the dominant components of the hemiedaphic fauna of temperate soils and of temporary accumulations of organic debris. They are free-living and predatory, feeding on the eggs and immature stages of other soil-inhabiting microarthropods and nematodes (Evans and Till, 1979). Its two constituent subfamilies, the Parasitinae and Pergamasinae, have been treated as separate families in some work (Woolley, 1988). Systematists have disagreed on the number of genera, subgenera, and species represented in the family. For example, parasitids are classified into relatively few genera by some authors (Micherdzinski, 1969; Tichomirov, 1969), but into considerably more by others (Athias-Henriot 1965, 1967a,b,c, 1968, 1969, 1971, 1972a,b, 1977, 1979a,b,c,d, 1980, 1982a,b; Evans and Till, 1979). The Iranian mite fauna of the family Parasitidae comprises representatives of both subfamilies.

The family Veigaiidae is well-defined, morphologically homogeneous, and has a stable and generally-accepted genus-level classification (Masan *et al*., 2008). This family contains three described genera: *Cyrthydrolaelaps* Berlese, *Gamasolaelaps* Berlese and *Veigaia* Oudemans (Krantz and Walter, 2009). Only two of the known genera have been recorded in Iran, namely *Veigaia* and *Gamasolaelaps*, with most of the recorded species in the genus *Veigaia*. Species of the genus *Veigaia* are free-living and are mostly associated with soil, decomposed litter, leaf mould, plant parts, mammalian nests etc. This genus is estimated to include around 70 species world-wide (Bhattacharyya, 2006). In Iran, five species of genus *Veigaia,* as well as two unknown species (*Veigaia* sp.), have been reported to date.

Members of the family Zerconidae are widely prevalent in the Holarctic region and are repre-

sented by 35 genera and more than 300 species. They are all free-living predators, occurring mostly in moss and leaf litter, and constitute an important part of the soil fauna (Ujvari, 2008). The Iranian fauna of Zerconidae is currently unknown. The only mentioned species from Iran is *Prozercon cf. traegardhi* (Halbert), which was reported from the Hamedan province (Kamali *et al.*, 2001).

The purpose of this paper is to summarize previous works and complete these records with new distributional data in order to provide a complete catalogue of the mentioned mite families in the different microhabitats of Iran. This is the fourth part of our catalogue of Iranian mesostigmatid mites. In three previous works, we dealt with other mesostigmatid families as follows: Ascidae (part 1), Blattisociidae (part 2) and Ameroseiidae (part 3) (Nemati *et al.* 2012a,b; Nemati *et al.*, 2013).

Materials and methods

The information on recorded species and their habitats or hosts were obtained from previous records in the literature about the mite fauna of Iran. In addition, new records and new distributional data of previously recorded species were provided following the procedures outlined below.

Materials were collected sporadically from different microhabitats and different parts of Iran. The soil mesofauna was extracted from the samples with Berlese funnels. The specimens were collected in beakers of 75 % ethanol, and then fixed on permanent slides in Hoyer's medium. The list of species was sorted by genera in each family, and includes sampling information (date of collection, locality, microhabitat or host). For some localities, only the name of province was presented.

Except for newly recorded taxa and previously published by authors of this paper, we can not confirm the identification of the reported species.

Results and discussion

Based available published studies a total of 10 genera and 21 determined species of Parasitidae, 2 genera and 4 determined species of Veigaiidae and 2 genera and 1 identified species of Zerconidae, are known to inhabit the various parts of Iran. Some undetermined species in various genera are also present.

Family Parasitidae Oudemans, 1901

Genus *Amblygamasus* Berlese, 1903

Jalaeian *et al.* (2004) reported an undetermined species of this genus from soil of fruit orchards, Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m).

Genus *Eugamasus* Berlese, 1893

Two unidentified species of this genus were recorded from the Khuzestan province (31°19′22"N, 48°40′50"E, H: 16 m) in honey bee hives (Mosaddegh, 1997; Ostovan and Mosaddegh, 1999) and from soil from Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al.*, 2004).

Genus *Gamasodes* Oudemans, 1939

Jalaeian *et al.* (2004) reported a species of this genus as *Gamasodes* sp. from soil of fruit orchards, Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m).

Genus *Holoparasitus* Oudemans, 1936

Holoparasitus minimus (Holzmann, 1955)

Recorded in the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) in leaf compost (Kamali *et al.*, 2001).

Two species of this genus were reported as *Holoparasitus* sp. by Jalaeian *et al.* (2006) and Farshiani *et al.* (2010) from the orchards of Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) and the soil of *Eucalyptus camaldulensis* plants, respectively.

Genus *Leptogamasus* Tragardh, 1936

Leptogamasus bidens (Sellnick, 1950)

Recorded from Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) in soil (Pakyari *et al*., 2006).

Leptogamasus leruthi (Cooreman, 1951)

Recorded in the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from buttonwood, leaf compost and livestock manure (Kamali *et al*., 2001).

Genus *Neogamasus* Tichomirov, 1969

Neogamasus cervicornis (Van-Daele, 1975)

Recorded from Shiraz (29°37′32"N, 52°31′8"E, H: 1810 m) in orchard soil (Khezri *et al*., 2006).

New Records: Baghmalek (31°31′22"N, 49°53′8"E, H: 707m) (Khuzestan province), Ghaletol (31°37′55"N, 49°53′20"E, H: 885 m), Izeh (31°49′52"N, 49°52′9"E, H: 845 m), from soil, collected by A. Nemati in 2011 and 2012.

Jalaeian *et al.* (2004) reported an undetermined species of this genus from Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) in fruit orchard soils.

Neogamasus islandicus (Sellnick, 1940)

Recorded in Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from soil (Pakyari *et al*., 2006).

Genus *Parasitus* Latreille, 1795

Parasitus americanus (Berlese, 1905)

Recorded from Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) on alfalfa (Hatami, 1991; Modarres-Awal, 1997).

Parasitus cavernicolus (Tragardh, 1912)

Recorded from the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from bird nests (Kamali *et al*., 2001).

Parasitus coleoptratorum (Linnaeus, 1758)

Recorded from Gorgan (36°50′17"N, 54°25′39"E, H: 220 m) on Coleoptera (Bahrami *et al*., 2011); and from Bojnourd (37°28′39"N, 57°19′22"E, H: 1070 m) in farm soils, gardens and manure (Mahpikaran *et al*., 2012).

New Record: Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) in soil, coll., A. Nemati, 2011.

Parasitus concors (Oudemans and Voigts, 1904)

Recorded from the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) in livestock manure (Kamali *et al*., 2001).

Parasitus congener (Oudemans and Voigts, 1904)

Recorded from the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran from cattle carcasses and livestock manure (Kamali *et al*., 2001).

Parasitus consanguineus Oudemans and Voigts, 1904

Recorded in soils from Hamedan (34°45′24" N, 48°39′32"E, H: 1887 m) (Kanjani and Kamali, 2000), Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al*., 2004; Pakyari *et al*., 2006), Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Khalili-Moghadam *et al*., 2012) Gorgan (36°50′17"N, 54°25′39"E, H: 220 m) (Kazemi *et al*., 2011), Kerman (30°16′39"N, 57°3′53"E, H: 1763 m) (Masnavipour *et al*., 2011), Deh-Bakri (Bam region) (29°06′N, 58°21′E, H: 1060 m) (Mehrzad *et al*., 2012) and Kashan (33°54′16"N, 51°34΄33"E, H: 953 m) (Sekonji *et al*., 2011); from potato fields in Orumieh (37°32′59"N, 45°4′32"E, H: 1349 m) (Mosavi *et al*., 2004); from orchards in Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Jalaeian *et al*., 2006); from fruit trees in Kermanshah (34°18′51"N, 47°3′54"E) (Rijab area) (Babakfard *et al*., 2008); from bird nests in Chaharmahal Va Bakhtiyari and Esfahan provinces (Keivani *et al*., 2012); from Bojnourd (20°37′N, 50°57′E, H: 1210 m) in soils of farms, gardens and manure (Mahpikaran *et al*., 2012); in West Azarbaijan (37°32′59"N, 45°4′32"E, H: 1349 m), Khoy region, from the soil of sunflower field (Taher *et al*., 2012).

New Records: Shahrekord (32°19′39"N, 50°51′35"E, H: 2206 m), Baghmalek (31°31′22"N, 49°53′8"E, H: 707 m) (Khuzestan province), Ghaletol (31°37′55"N, 49°53′20"E, H: 885 m), and Izeh (31°49′52"N, 49°52′9"E, H: 845 m) (Khuzestan province) in soil samples, coll., A. Nemati, 2011 and 2012.

Parasitus beta Oudemans and Voigts, 1904

Recorded in the provinces of Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from leaf compost and livestock manure (Kamali *et al.*, 2001); from Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) in soil (Pakyari *et al.*, 2006).

Kamali *et al*. (2001) and Pakyari *et al*. (2006) recorded this species as *P. eta* Oudemans and Voigts, 1904, while *P. eta* has been considered as a junior synonym of *P. beta* (Karg, 1993).

Parasitus fimetorum (Berlese, 1903)

Recorded in the provinces of Mazandaran (36°33′46"N, 53°3′15"E, H: 39 m), Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from ash, buttonwood, chicken manure, decaying, honey bee hives, leaf compost, livestock manure and bird nests (Mosaddegh, 1997; Kamali *et al.*, 2001); from soils in Ahwaz (31°19′22"N, 48°40′50"E, H: 16 m) (Baharloo *et al.*, 2006), Kerman (30°16′39"N, 57°3′53"E, H: 1763 m) (Masnavipour *et al.*, 2011), Orumieh (37°32′59"N, 45°4′32"E, H: 1349 m) (Rezaie *et al.*, 2011), and Deh-Bakri (Bam region) (29°06′N, 58°21′E, H: 1060 m) (Mehrzad *et al.*, 2012); from Khorasan Razavi (36°18′4"N, 59°35′24"E, H: 989 m) on gladiole corms and saffron (Baradaran Anaraki *et al.*, 2012); from Bojnourd (20°37′N, 50°57′E, H: 1210 m) in the soil of farms, gardens and manure (Mahpikaran *et al.*, 2012).

New Records: Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) , Shahrekord (32°19′39"N, 50°51′35"E, H: 2206 m), Baghmalek (31°31′22"N, 49°53′8"E, H: 707m) (Khuzestan province), Ghaletol (31°37′55"N, 49°53′20"E, H: 885 m), and Izeh (31°49′52"N, 49°52′9"E, H: 845 m) in soil samples, coll., A. Nemati, 2011 and 2012.

Parasitus hyalinus (Willmann, 1949)

Recorded in Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m), Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran provinces (35°42′2"N, 51°21′20"E, H: 1200 m) from alfalfa, a rat carcass, livestock manure, bird nests and pomegranates (Hatami, 1991; Modarres-Awal, 1997; Kamali *et al.*, 2001); from orchards in Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Jalaeian *et al.*, 2006); West Azarbaijan province (37°32′59"N, 45°4′32"E, H: 1349 m), and in the Salmas region (Alizadeh and Shirdel, 2012); from soils in Jiroft (28°40′41"N, 57°44′26"E, H: 682 m) (Balooch-shahryari *et al.*, 2012).

Parasitus insignis (Holzmann, 1955)

Recorded from livestock manure in Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al.*, 2001); from soil in Tehran (35°42′2"N, 51°21′20" E, H: 1200 m) (Pakyari *et al.*, 2006).

Parasitus mammillatus (Berlese, 1904)

Recorded in Fars (29°37′32"N, 52°31′8"E, H: 1810 m) and Hamedan (34°45′24"N, 48°39′32"E, H: 1887 m) from alfalfa, onion and *Trifolium* sp. (Kamali *et al.*, 2001); from soils in Hamedan (Khanjani and Kamali, 2000); from fruit trees in Kermanshah (34°18′51"N, 47°3′54"E), (Rijab area) (Babakfard *et al.*, 2008).

Parasitus mycophilus (Karg, 1971)

Recorded from Fars (29°37′32"N, 52°31′8"E, H: 1810 m), Hamedan (34°45′24"N, 48°39′32"E, H: 1887 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) on beans, rat carcasses, livestock, manure and stored onion (Kamali *et al.*, 2001); from Hamedan (34°45′24"N, 48°39′32"E, H: 1887 m) on bean only (Khanjani and Kamali, 2000); from soil in Marvdasht, (Soleimani *et al.*, 2011); in apple orchards of West Azarbaijan province (37°32′59"N, 45°4′32"E, H: 1349 m), Salmas region (Alizadeh and Shirdel, 2012).

Parasitus nolli (Karg, 1965)

Recorded from Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) on leaf compost, livestock, chicken, bird nests and pine (Kamali *et al.*, 2001); from Karaj (35°48′N, 50°59′E, H: 1384 m) in a fungal training bed (Arbabi and Baradaran, 2006).

Parasitus numerus (Karg, 1965)

Recorded in soils of Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Khalili-Moghadam *et al.*, 2012).

Two species were reported as *Parasitus cf. fimetorum* Berlese and *P. cf. hyalinus* (Willmann) from soil in Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al.*, 2004). Bahrami *et al.* (2011) reported two species as *P. cf. copridis* and *P. cf. kempersi* from Coleoptera in Golestan province.

Some unnamed species of this genus were also recorded from Hamedan (34°45′24"N, 48°39′32"E, H: 1887 m), Mazandaran (36°33′46"N, 53°3′15"E, H: 39 m), Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from a series of different substrate types (elm, honey bee hive, leaf compost, liquorice-livestock manure, bird nests and pomegranate) (Mosaddegh, 1997; Kamali *et al.*, 2001), Dezful (32°22′13"N, 48°25′15"E, H: 126 m), citrus (Malekzadeh *et al.*, 2000); Zanjan (36°39′51"N, 48°29′8"E), soil (Rahmani and Zare, 2011) and from Larestan (35°44′24"N, 54°7′12"E, H: 1490 m), cotton and wheat fields (Khadempour *et al.*, 2012).

Genus *Poecilochirus* G. Canestrini and R. Canestrini, 1882

Poecilochirus carabi (G. and R. Canestrini, 1882)

Recorded in Zanjan (36°39′51"N, 48°29′8"E) from soil (Rahmani and Zare, 2011).

New Record: Shahrekord (32°19′39"N, 50°51′35"E, H: 2206 m) in soil samples, coll., A. Nemati, 2011.

Genus *Trachygamasus* Berlese, 1906

Trachygamasus gracilis (Karg, 1965)

Recorded from rat carcasses in Semnan (35°15′17"N, 53°51′03"E, H: 1117 m) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al.*, 2001).

One species of this genus, was recorded as *Trachygamasus* sp. in orchards in Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Jalaeian *et al.*, 2006).

Genus *Vulgarogamasus* Tichomirov, 1969

Some undetermined species were reported as *Vulgarogamasus* sp. from soil in East Azarbaijan (38° 4′ 36" N, 46° 17′ 5" E, H: 1386 m) (Kamali *et al.*, 2001) and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) (Kamali *et al.*, 2004). Other records come from green parts and soil of tea plant gardens in eastern parts of Gilan (37°17′15"N, 49°35′28"E, H: 100 m) (Nejadghanbar *et al.*, 2010) and soil in Kashmar (35°11′N, 58°27′E, H: 1215 m) (Salarzehi *et al.*, 2011).

Family Veigaiidae Oudemans, 1939

Genus *Gamasolaelaps* Berlese, 1904

An unidentified species of this genus was recorded from Ardebil (48°31′33"N, 37°37′08"E, H: 1500 m) in cotton field soil and was labelled as a species of *Gorirossia* Farrier, 1957 (Kamali *et al.*, 2001). However, this genus has been considered as a junior synonym of *Gamasolaelaps* (Bregetova, 1977).

Genus *Veigaia* Oudemans, 1905

Veigaia decurtata Athias-Henriot, 1961

Recorded in fruit orchard soil from Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m) (Jalaeian *et al.*, 2004).

Veigaia exigua (Berlese, 1916)

Recorded in Kerman (30°16′39"N, 57°3′53"E, H: 1763 m) in soil (Masnavipour *et al.*, 2011).

Veigaia nemorensis (Koch, 1839)

Recorded in Kermanshah (34°18′51"N, 47°3′54"E) (Rijab) from soil (Babakfard *et al.*, 2008); from Gachsaran (30°22′7"N, 50°48′24"E, H: 1279 m) (Kohgiloyeh Va Boir Ahmad province) in soils of rape seed and corn farms (Moradian *et al.*, 2011); from the Homayjan region (30°14′33"N, 51°59′22"E, H: 2184 m) (Sepidan county) and Fars province (29°37′32"N, 52°31′8"E, H: 1810 m) from soils under apple trees (Maneshi *et al.*, 2012).

New Records include reports from soil in Esfahan (32°39′37"N, 51°41′22"E, H:1608 m), Shahrekord (32°19′39"N, 50°51′35"E, H: 2206 m), Baghmalek (31°31′22"N, 49°53′8"E, H: 707 m)(Khuzestan

province), Ghaletol (31°37′55"N, 49°53′20"E, H: 885 m), and Izeh (31°49′52"N, 49°52′9"E, H: 845 m), coll., A. Nemati, 2011 and 2012.

Veigaia planicola (Belese, 1892)

Recorded in Esfahan (32°39′37"N, 51°41′22"E, H: 1608 m), Kermanshah (34°18′51"N, 47°3′54"E) (Rijab), and Tehran (35°42′2"N, 51°21′20"E, H: 1200 m) from soil (Babakfard *et al.*, 2008; Jalaeian *et al.*, 2004; Kamali *et al.*, 2004); from Salmas region (West Azarbaijan province) in apple orchard soil (Alizadeh and Shirdel, 2012).

New Record from soil in Shahrekord (32°19′39"N, 50°51′35"E, H: 2206 m), coll., A. Nemati, 2011 and 2012.

Kamali *et al.* (2001) reported *V. serrata* Willmann, 1936 from soils in E. Azarbaijan (38°4′36"N, 46°17′5"E, H: 1386 m), but this species has been considered as a junior synonym of *V. planicola*.

Two unidentified species of this genus were recorded from cow manure in Kerman (30°16′39"N, 57°3′53"E, H: 1763 m) (Arjomandi *et al.*, 2011) and from cotton field soil in Ardebil (48°31′33"N, 37°37′08"E, H: 1500 m) (Kamali *et al.*, 2001).

Family Zerconidae Berlese, 1892

Genus *Prozercon* Sellnick, 1943

Prozercon cf. traegardhi (Halbert, 1923)

Recorded from Hamedan (34°45′24"N, 48°39′32"E, H: 1887 m), on *Astragalus* sp. (Kamali *et al.*, 2001).

Genus *Zercon* Koch, 1836

Zercon berlesei Sellnick, 1958

Recorded from soil in Lordegan (31°30′30"N, 50°49′39"E, H: 1594 m) and Baghmalek (31°31′22"N, 49°53′8"E, H: 707 m) (Khuzestan province), coll., A. Nemati, 2012. This is the first record of this genus and species from Iran.

Conclusion

Iran is a large country with varied climatic and geographic conditions. Detailed studies of the various aspects of mesostigmatid mite biology and distribution in different habitats are therefore needed to obtain a better understanding of their general zoogeography, biology and ecology. Our current records are still incomplete and the work presented here should therefore be extended to obtain better information on particular species

References

Alizadeh S., Shirdel D. 2012 — Some mesostigmatic mites (Acari: Mesostigmata) in apple orchards of Salmas region, West Azarbaijan Province, Iran — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S., Abdollahi T. (eds): Proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 497.

Arbabi M., Baradaran P. 2006 — An investigation on abundance population of *Parasitus nolli* (Karg) (Mesostigmata: Parasitidae) on oyster mushroom cultivation in Karaj region — In: Manzari Sh. (ed): Proceedings of the 17th Iranian Plant Protection Congress, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Vol. I. p. 206.

Arjomandi E., Kazemi Sh., Afshari A. 2011 — Coprophilous mesostigmatic mites (Acari) in Kerman region, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 5.

Athias-Henriot C. 1965 — Particularites biogeographiques des *Pergamasus quisquiliarum* palearctique (Mesostigmata, Parasitidae) — Acarologia, 7: 624-631.

Athias-Henriot C. 1967a — Observations sur les *Pergamasus* II. Sous-genre *Pergamasus* Berlese, 1904 (Acariens, Anactinotriches, Parasitidae) — Acarologia, 9: 669-761.

Athias-Henriot C. 1967b — Observations sur les *Pergamasus* III. sous-genre *Amblygamasus* Berlese, 1903 (Acariens, Anactinotriches, Parasitidae) — Acarologia, 9: 762-800.

Athias-Henriot C. 1967c — Observations sur les *Pergamasus* I. Sous-genre *Paragamasus* Hull, 1918 (Acariens, Anactinotriches, Parasitidae) — Mem. Mus. Natl. Hist. Nat. 49 A: 1-198.

Athias-Henriot C. 1968 — Observations sur les *Pergamasus* 5. Additions et corrections aux *Paragamasus* dEurope temperee, principalment occidentale (Acariens Anactinotriches, Parasitidae) — Bsci Bourgogne, 25: 175-228.

Athias-Henriot C. 1969 — *Psilogamasus hurlbutti*, n. g., n. sp., gamaside nouveau de Tanzanie (Acariens Anactinotriches, Parasitidae) —. Ann. Soc. Entomol. France, 5: 439-449.

Athias-Henriot C. 1971 — *Paragamasus* (*Tanygamasus*) *probsti* (Oudemans) (systematique, geographie), aves quelques mises au point synonymiques (Arachnides, Gamasides tocospermiques, Parasitidae) — Zool. Med., 45: 167-179.

Athias-Henriot C. 1972a — Especes françaises du sous-genre *Leptogamasus* s.s., (Arachnida, Gamasida, Parasitidae: genre *Leptogamasus*) — Ann. Soc. Entomol. France, 8: 189-204.

Athias-Henriot C. 1972b — Sur la systématique et la geographie de la lignée truncus du sous-genre *Anidogamasus* Athias, 1970 (genre *Paragamasus* Hull, 1918) — B. Mus. Nat. Hist. Nat. Paris, 27: 317-325.

Athias-Henriot C. 1977 — *Neogamasus franzi* n. sp., Parasitidae nouveau du Nepal (Parsitiformes, Gamasides) — Int. J. Acarol., 3: 123-128. doi:10.1080/01647957708683089

Athias-Henriot C. 1979a — Sur le genre E*ugamasus* Berlese, 1892 (Parasitiformes, Parasitidae).1: Redefinition. Descriptions des petites espèces — Acarologia, 20: 3-18.

Athias-Henriot C. 1979b — *Neogamasus speculiger* n. sp. (Parasitiformes, Parasitidae), from a horticultural substrate near Antwerp, with definition of *Dyoneogamasus* n. subg. — Biol. Jaarboek, 47: 38-43.

Athias-Henriot C. 1979c — *Carpaidion cingulatum* n. g., n. sp., Parasitidae nouveau du Perou (Parasitiformes) — Int. J. Acarol., 5: 175-180. doi:10.1080/01647957908683146

Athias-Henriot C. 1979d — A contribution to the knowledge of the family Parasitidae of the fauna of the Ukrainian USSR — Zool. Zh., 58: 1148-1156.

Athias-Henriot C. 1980 — *Dicrogamasus* n. g., type *Eugamasus theodori* Costa, 1961 (Parasitiformes, Parasitidae) — Rev. Suisse Zool., 87 (2): 461-466.

Athias-Henriot C. 1982a — *Schizosthetus* n. g. (type *Eugamasus lyriformis* Mc Gr. and Farr., 1969) avec deux especes nouvelles (Parasitiformes, Parasitidae) — Acarologia, 23: 207-214.

Athias-Henriot C. 1982b — Sur le genre monotypique *Parasitus* Latr. (Parasitiformes, Parasitidae). Diagnose, definition, distribution — Rev. Suisse Zool., 89 (1): 3-6.

Babakfard A., Khanjani M., Pourmirza A.A., Mirab-Balou M., Zahedi-Keyvan M. 2008 — Study on Acari fauna (Acari: Mesostigmata) of fruit trees of Rijab area (Kermanshah province) — In: Manzari Sh. (ed): Proceedings of the 18th Iranian Plant Protection Congress, Faculty of Agriculture, University of Bu-Ali Sina, Hamedan, Vol. I. p. 269.

Baharloo M., Shishebor P., Mossadegh M.S., Khanjani M., Ueckermann E. 2006 — Investigation on the fauna of mesostigmata mites of Ahvaz region — In: Manzari Sh. (ed): Proceedings of the 17th Iranian Plant Protection Congress, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Vol. I. p. 191.

Bahrami F., Arbabi M., Vafaei R., Kazemi Sh. 2011 — Mesostigmatic mites associated with Coleoptera and biodiversity calculation of these mites phoretic on dung beetles in Golestan Province (North of Iran) — Middle-East J. Sci. Res., 9 (3): 345-366.

Balooch shahryari N., Hajizadeh J., Asadi M. 2012 — Fauna of edaphic mesostigmatic mites (Acari: Mesostigmata) in Jiroft city — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S. Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 518.

Baradaran Anaraki P., Arbabi M., Joharchi O., Rahimi H., Hoseini-Nia A. 2012 — Identification of the mites associated with the corm of gladiole and saffron in Khorasan Razavi and Markazi provinces, Iran — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S. Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 516.

Bhattacharyya A.K. 2006 — Two new species of *Veigaia* Oudemans (Acari: Veigaiidae) from India — Zootaxa, 1329: 29-37.

Evans G.O., Till W.M. 1979 — Mesostigmatic mites of Britain and Ireland (Chelicerata: Acari- Parasitiformes), an introduction to their external morphology and classification — Trans Zool. Soc. Lond., 35: 139-270.

Farshiani E., Arbabi M., Zaree F. 2010 — Study of *Eucalyptus camaldulensis* Dohn., soil mite fauna in south and north part of Iran — In: Manzari Sh. (ed): Proceedings of the 19th Iranian Plant Protection Congress, Iranian Research Institute of Plant Protection, Tehran, Vol. I., p. 410.

Hatami B. 1991 — A report of two species and four genera of mites (Acari) from alfaalf fields in Esfahan province. — In: Proceeding of 10th Iranian Plant Protection Congress, Shahid Bahonar Univ., Kerman, p.86.

Jalaeian M., Saboori A.R., Seyedoleslami H. 2004 — Introduction of some genera and species of mesostigmatic mites to the fauna of Iran. — In: Proceeding of 16th Iranian Plant Protection Congress, University of Tabriz, Vol. 1, p. 254.

Jalaeian M., Saboori A., Seyedoleslami H. 2006 — Introduction of some families, genera and species of mesostigmata mites (Acari: Mesostigmata) from Isfahan province — In: Manzari Sh. (ed) Proceedings of the 17th Iranian Plant Protection Congress, Campus

of Agriculture and Natural Resources, University of Tehran, Karaj, Vol. I., p.183.

Kamali K., Ostovan H., Atamehr A. 2001 — A catalog of mites and ticks (Acari) of Iran — Islamic Azad University Scientific Publication Center. 192 pp.

Kamali M., Kamali K., Jafari K.h., Ueckermann E. 2004 — Edaphic mites of order Mesostigmata collected from Shahid Beheshti University Campus — In: Proceeding of 16th Iranian Plant Protection Congress, University of Tabriz, Vol. 1, p. 262.

Kanjani M., Kamali K. 2000 — A study of fauna clover (*Triflium* sp.) in Hamedan — In: Proceeding of 14th Iranian Plant Protection Congress. Isfahan University of Technology, Iran. p. 234.

Kazemi Sh., Arjomandi E., Katooli A. 2011 — Mesostigmatic mites (Acari: Mesostigmata) of Gorgan, Iran — In: Kazemi Sh., Saboori A. (eds) Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 30.

Keivani F., Nemati A., Nematollahi M., Riahi E. 2012 — Some mites of Mesostigmata in birds' nests in Chaharmahal Va Bakhtiyari and Esfahan — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S., Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 420.

Khadempour F., Ostovan H., Haghani M., Farzaneh M. 2012 — The faunistic survey of Mesostigmatic mites (Acari: Mesostigmata) in cotton and wheat fields in Larestan region — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S. Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 427.

Khalili-Moghadam A., Riahi E., Nemati A., Abotalebian R., Motahari S., Mardani A. 2012 — The fauna of some edaphic Mesostigmata (Acari) in Esfahan — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S. Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 460.

Khanjani M., Kamali K. 2000 — Mites (Acari) associated with beans (*Phaseolus volgaris* L.) in Hamedan province — In: Proceeding of 14th Iranian Plant Protection Congress. Isfahan University of Technology, Iran. p. 246.

Khezri A., Ostovan H., Kamali K., Al-Mansuor H. 2006 — Some edaphic mites from Iran — In: Manzari Sh. (ed): Proceedings of the 17th Iranian Plant Protection Congress, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Vol. I. p.192.

Krantz G.W., Walter D.E. 2009 — A Manual of Acarology — 3th edition. Texas Tech University Press, Lubbock, USA. 807 pp.

Mahpikaran M., Kazemi Sh., Bahrami F. 2012 — Edaphic mesostigmatic mites (Acari: Mesostigmata) of Bojnourd region — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S. Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 473.

Malekzadeh M., Arbabi M., Shakerzadeh A. 2000 — Studies on fauna of citrus mites in Dezful area — In: Proceeding of 14th Iranian Plant Protection Congress. Isfahan University of Technology, Iran. p. 265.

Maneshi S., Ostovan H., Soleimani M. 2012 — Mesostigmatic mites (Acari:Mesostigmata) associated with apple trees in Sepidan-Homayjan region — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S., Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 519.

Masan P., Fenda P., Mihal I. 2008 — New edaphic of the genus *Veigaia* from Bulgaria, with a key to the European species (Acari, Mesostigmata, Veigaiidae) — Zootaxa, 1897: 1-19.

Masnavipour M., Kazemi Sh., Latifi M., Ziaaddini M. 2011 — Edaphic mesostigmatic mites (Acari: Mesostigmata) fauna of north-western Kerman province, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 41.

Mehrzad N., Kazemi Sh., Masnavipour M. 2012 — Soil-inhabiting Mesostigmata (Acari) in Bam region, Kerman province — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S., Abdollahi T. (eds): proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 471.

Micherdzinski W. 1969 — Die familie Parasitidae Oudemans, 1901 (Acarina, Mesostigmata) — Panstwowe Wydawnictwo Naukowe, Krakow. 590 pp.

Modarres-Awal M. 1997 — List of agricultural pests and their natural enemies in Iran (revised edition) — Ferdowsi Univ. Pub., Mashhad, No.147, 429 pp.

Moradian H., Ostovan H., Haghani M. 2011 — Faunistic survey of edaphic Mesostigmatic mites (Acari: Mesostigmata) in rape seed and corn farms in Gachsaran — Iran. J. Entomol. Res., 3(1): 73-83.

Mosaddegh M.S. 1997 — Some mites of the honey bee *Apis mellifera* L. hives in Iran — J. Sci. Agric. Shahid Chamran Univ., Ahwaz, Iran, 19 (1, 2): 7-16.

Mosavi Sh., Ostvan H., Alidoosti H. 2004 — Study of the mite fauna of potato fields in Orumieh — In: 16th Iranian Plant Protection Congress. p. 263.

Nejadghanbar N., Arbabi M., Vafaei R. 2010 — Study tea garden fauna and determination abundance of species in eastern parts of Guilan province in Iran — In: Manzari Sh. (ed): Proceedings of the 19th Iranian Plant Protection Congress, Iranian Research Institute of Plant Protection, Tehran, Vol. I. p. 361.

Nemati A., Gwiazdowicz D.J., Riahi E., Mohseni M. 2012a — Catalogue of the Iranian mesostigmatid mites, part 1: family Ascidae. Intl. J. Agri. Crop Sci., 4(14): 1005-1011.

Nemati A., Riahi E., Mohseni M., Gwiazdowicz D.J. 2012b — Catalogue of the Iranian mesostigmatid mites, part 2: family Blattisociidae. Intl. J. Agri. Crop Sci., 4(14): 1415-1420.

Nemati A., Riahi E., Gwiazdowicz D.J., Kheradmand K. 2013 — A catalogue of mesostigmatid mites of Iran, part 3: family Ameroseiidae. Iranian J. Entomol. 3:18-23.

Ostovan H., Mosaddegh M.S. 1999 — Mites associated with honey bee (*Apis mellifera* L.) hives in Iran — In: 35th Int. Cong. Apicult. (Apimondia), Canada. p. 254.

Pakyari H., Ostovan H., Kamali K. 2006 — Specific diversity of family Parasitidae collected from Sorkheh Hesar Park of Tehran and new records of two species from Iran — In: Manzari Sh. (ed): Proceedings of the 17th Iranian Plant Protection Congress, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Vol. I. p. 193.

Rahmani H., Zare M. 2011 — Report of some edaphic mesostigmatic mites (Acari) from Iran and Zanjan province — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 47.

Rezaie P., Safaralizadeh M.H, Joharchi O., Behboodzadeh H., Ehramiyan N.S. 2011 — Mesostigmatic mites (Acari: Mesostigmata) fauna in Orumieh region, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 51.

Salarzehi S., Hajiqanbar H., Faraji F., Joharchi O., Noei J., Oliyai A. 2011 — Fauna of some Mesostigmata mites (Acari: Mesostigmata) in Kashmar region, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 56.

Sekonji A.H, Nemati A., Hatami M. 2011 — Some edaphic mites of Mesostigmata (Acari) from Kashan, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 52.

Soleimani M., Ostovan H., Joharchi O. 2011 — Mesostigmatic mites (Acari: Mesostigmata) in Marvdasht, Fars province, Iran — In: Kazemi Sh., Saboori A. (eds): Abstract and proceeding book of the First Persian Congress of Acarology, International Center for Science, High Technology & Environmental Sciences, Kerman, 2011, p. 17.

Taher H., Shirdel D., Atamehr A., Adldoost H. 2012 — Fauna of mesostigmatic mites (Acari: Mesostigmata) in sunflower fields of Khoy region, West Azarbaijan — In: Sarafrazi A., Asef M.R., Mozhdehi M., Mozhdehi M., Solhjouy-Fard S., Abdollahi T. (eds): Proceedings of the 20th Iranian plant protection congress. 20th Iranian Plant Protection Congress, Shiraz, Iran, Vol. I., p. 465.

Tichomirov SI. 1969 — Morphological and ecological structure of the genus *Parasitus* sensu Micherdzinski, 1966 (Gamasoidea, Parasitidae). II. Subgenera *Neogamasus* subgen. n., *Coleogamasus* subgen. n. — Zool. Zh. 48(10): 1467-1477.

Ujvari ZS. 2008 — Zerconid mites (Acari: Mesostigmata: Zerconidae) from Crete, Greece, with description of two new species — Opusc. Zool. Budapest, 39: 99-108

Woolley TA. 1988 — Acarology: Mites and human welfare — New York, John Wiley & Sons.

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