



Persian J. Acarol., 2021, Vol. 10, No. 4, pp. 403–450.
<https://doi.org/10.22073/pja.v10i4.67440>
Journal homepage: <http://www.biotaxa.org/pja>



Article

World distribution and habitat scope of Ameroseiidae (Acari: Mesostigmata)

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ABSTRACT

The mite family Ameroseiidae with 138 valid species is presently classified in the superfamily Ascoidea of the order Mesostigmata. Seventy-two species have been described based on type specimens and no report has been done since then, while the other 66 species have been frequently reported from around the world. The objective of this study is to provide information about distribution and habitat of the latter group, which are listed in twelve genera: *Ameroseius* (21 species), *Kleemannia* (15), *Neocypholaelaps* (8), *Epicriopsis* (7), *Hattena* and *Sertitympanum* (4 each), *Ameroseiella* (2), *Afrocypholaelaps*, *Asperolaelaps*, *Brontispalaelaps*, *Pseudoameroseius* and *Sinoseius* (1 each).

KEY WORDS: Ascoidea; catalogue; distribution; Parasitiformes; taxonomy.

PAPER INFO.: Received: 4 March 2021, Accepted: 12 June 2021, Published: 15 October 2021

INTRODUCTION

The mite family Ameroseiidae is presently classified in the superfamily Ascoidea of the order Mesostigmata, suborder Monogynaspida, cohort Gamasina, subcohort Dermanyssiae (Lindquist *et al.* 2009). Ameroseiids are known from all continents except Antarctica. Mites of four genera (*Afrocypholaelaps*, *Asperolaelaps*, *Brontispalaelaps*, and *Hattena*) are exclusive tropical fauna members. These mites are a free-living group that live in a large variety of habitats, such as soil, litter, organic matter, stored food, or dust, often in association with fungi, plants, insects, birds and mammals. Some ameroseiid mites are nectar- and pollen-feeders, from various flowers and flower-visiting animals, including bees and wasps (Hymenoptera, Apoidea), butterflies (Lepidoptera), and birds (Evans 1963; Allred 1970; Elsen 1972a, b, 1973; Castilho *et al.* 2015; Klimov *et al.* 2016). Predation has been suggested (Halliday 1997) but not conclusively confirmed (Lindquist *et al.* 2009). However, a few species have been mentioned as potentially useful for controlling pathogenic fungi (Moustafa and El-Hady 2006). Only a single species has been cited as potentially harmful to bees and - coconut plants (Haq 2001); given the uniqueness of those observations, the real impact of those mites on bees or coconut production should be further evaluated.

According to Maśán (2017), Ameroseiidae includes 12 genera: *Afrocypholaelaps* Elsen, 1972 (1 species), *Ameroseiella* Bregetova, 1977 (2 species), *Ameroseius* Berlese, 1904 (50 species), *Asperolaelaps* Womersley, 1956 (2 species), *Brontispalaelaps* Womersley, 1956 (2 species),

How to cite: Khalili-Moghadam, A. & Saboori, A. (2021) World dispersal and habitat scope of Ameroseiidae (Acari: Mesostigmata). *Persian Journal of Acarology*, 10(4): 403–450.

Epicriopsis Berlese, 1916 (10 species), *Hattena* Domrow, 1963 (10 species), *Kleemannia* Oudemans, 1930 (28 species), *Neocypholaelaps* Vitzthum, 1942 (22 species), *Pseudoameroseius* Maśán, 2017 (1 species), *Sertitympanum* Elsen & Whitaker, 1985 (8 species) and *Sinoseius* Bai & Gu, 1995 (2 species), totalizing 138 valid species. This study aims to present the distribution and habitat knowledge of some ameroseiid species (66 species) that have been reported more than once in the world.

MATERIALS AND METHODS

This study was elaborated based on information available in the world literature, evaluating conflicting concepts about generic placement or species synonymies. The information on reported species and their habitats or hosts was received from the papers published up to November 2020 worldwide. Furthermore, ameroseiid species available at the Department of Plant Protection in Shahrekord University were examined, and their distribution was added to the results. Genera and species are listed alphabetically in this study. For each species, sampling information, including locality, microhabitat, or host, has been mentioned. Out of 138 ameroseiid species, distribution and habitats information of 66 species is given in this study. Information of remaining species (72 species) reported only once in the world (type specimens) is available in Maśán (2017). Locations placed far away from their continental part (Canary Islands, Azores Archipelago, Hawaii) were considered the main locality, with related countries in the parenthesis. We can only confirm the taxa's identification validity that has been reported or described by the authors of this paper. For other taxa, we are not responsible for the validity of identification.

RESULTS

Distribution and habitats of Ameroseiidae

Family Ameroseiidae Evans, 1961

Ameroseiidae Evans (in Hughes, 1961: 244).

Type genus: *Ameroseius* Berlese, 1904, by inference.

For diagnosis of the family, see Maśán (2017).

Genus *Afrocypholaelaps* Elsen, 1972

Afrocypholaelaps Elsen, 1972b: 159. **Type species:** *Neocypholaelaps africana* Evans, 1963, by original designation.

For diagnosis of the genus, see Maśán (2017).

Afrocypholaelaps africanus (Evans, 1963)

Neocypholaelaps africana Evans, 1963: 224.

Neocypholaelaps lindquisti Prasad, 1968: 130. Synonymy by Maśán (2017: 16).

Afrocypholaelaps ranomafanaensis Haitlinger, 1987b: 531. Synonymy by Maśán (2017: 16).

Afrocypholaelaps analicullus Ho, Ma, Wang & Severinghaus, 2010: 88. Synonymy by Maśán (2017: 16).

Afrocypholaelaps africanus. — Maśán 2017: 16.

More information about the synonyms of this species are available in Maśán (2017: 16).

Distribution and habitats – **Angola**, on an African stingless bee [(*Meliponula bocandei* (Spinola)] (reported as *Trigona tomentosa*) (Hymenoptera: Apidae) (Evans 1963); **Australia**, State of Queensland, on flowers of *Aegiceras corniculatum* (L.) Blanco (Ericales: Myrsinaceae) and on *Apis mellifera* L. (Hymenoptera: Apiade) (Seeman and Walter 1995; Halliday 1997; Walter *et al.* 2002; Di Palma *et al.* 2017); **China**, Shanghai, on honey bees (Luo *et al.* 2010); Taiwan, on *Apis merlifera* (Ho *et al.* 2010); **Democratic Republic of Congo**, on *Chlorion ciliatum* (Hymenoptera: Sphecidae) (Elsen 1972b); **Hawaii (United States of America)**, on *Achaea janata* L. (Lepidoptera: Noctuidae), on Hawaiian bees and Ohia trees (*Metrosideros polymorpha* Gaudich.) (Myrtales: Myrtaceae) (Prasad 1968, Daly and Coville 1982; Tenorio *et al.* 1985; Goff 1987; Sabina *et al.* 2001); **Hong Kong**, on *Delias agalia* (L.) (Lepidoptera: Pieridae) (Treat 1975); **India**, State of Tamil Nadu, on honey bee, and on mangrove flowers (Ramanan and Ghai 1984); Jammu and Kashmir, on honey bee (Putatunda *et al.* 2001); **Madagascar**, on unidentified butterfly (Lepidoptera) (Haitlinger 1987b); **Papua New Guinea**, on little red lory (*Charmosyna pulchella* Gray) (Psittaciformes: Psittacidae), on *Apis mellifera* (Clinch 1979; Domrow 1979); **Turkey**, on honey bee (Selçuk and Aydin 2013); **Vietnam**, on butterflies and scarabaeid beetles (Haitlinger 1987a); **Europe** (country not mentioned), on honey bees (*Apis* spp.) (De Jong *et al.* 1982).

Genus *Ameroseiella* Bregetova, 1977

Ameroseiella Bregetova, 1977: 167. **Type species:** *Ameroseius apodius* Karg, 1971a (syn.: *A. macrochelae* Westerboer, 1963), by original designation.

For diagnosis of the genus see Maśán (2017).

Ameroseiella macrochelae (Westerboer, 1963)

Ameroseius macrochelae Westerboer (in Westerboer & Bernhard 1963: 501).

Ameroseius apodius Karg, 1971a: 226. Synonymy by Maśán (2017: 20).

Ameroseiella macrochelae. — Maśán 2017: 20.

More information about the synonyms of this species are available in Maśán (2017: 20).

Distribution and habitats – **Finland**, from mink, farm waste and compost (Huhta 2016); **France**, from compost (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Germany**, from compost soil (Karg 1971a; 1993); **Ireland**, unspecified substrate (Evans and Till 1979); **Poland**, from nests of the white-tailed sea eagle *Haliaeetus albicilla* L. (Accipitriformes: Accipitridae) (Gwiazdowicz *et al.* 2006), nests of birds (Błoszyk *et al.* 2009; 2011); **Russia**, Moscow, Novosibirsk Oblast and Rostov Oblast, from soil and litter (Bregetova 1977); **Slovakia**, from nest of *Passer domesticus* L. (Passeriformes: Passeridae), *Haliaeetus albicilla* L. (Accipitriformes: Accipitridae) and *Passer montanus* (Passeriformes: Passeridae) (Maśán 2017); **United Kingdom**, unspecified substrate (Evans and Till 1979); **Europe** (country not mentioned), from nest of birds (Aves, Columbiformes: Columbidae) and nests of hoopoe (*Upupa epops* L.) (Bucerotiformes: Upupidae) (Sixl 1975; Křištofik *et al.* 2013).

Ameroseiella stepposa Bregetova, 1977

Ameroseiella stepposa Bregetova, 1977: 167.

Ameroseiella stepposa. — Maśán 2017: 21.

Distribution and habitats – **Kazakhstan**, from nests of common vole *Microtus arvalis* Pallas (Rodentia: Cricetidae) (Bregetova 1977); **Russia**, Western Siberia region, from nests of narrow-

skulled vole *Microtus gregalis* Pallas (Rodentia: Cricetidae) (Malkova and Bogdanov 2004; Vinarskaya *et al.* 2016).

Genus *Ameroseius* Berlese, 1904

Ameroseius Berlese, 1904: 258. **Type species:** *Seius echinatus* C. L. Koch, 1839 (syn.: *Acarus corbicula* Sowerby, 1806), by original designation. Synonymy by Vitzthum (1942).

Cornubia Turk, 1943: 858. **Type species:** *Cornubia ornata* Turk, 1943 (syn.: *Acarus corbicula* Sowerby, 1806), by original designation. Synonymy by Turk (1953).

Ameroseius. — Evans 1963: 230.

For diagnosis of the genus see Mašán (2017).

***Ameroseius aegypticus* El-Badry, Nasr & Hafez, 1979**

Ameroseius aegypticus El-Badry, Nasr & Hafez, 1979: 2.

Ameroseius aegypticus. — Zaher 1986: 401; Narita *et al.* 2015: 395; Mašán 2017: 26.

Distribution and habitats – Egypt, from decayed debris under wild-sage (*Lantana camara* L.) (Lamiales: Verbenaceae), water weeds and barley grain (El-Badry *et al.* 1979; Nasr *et al.* 2011; El-Sayed Gad *et al.* 2020).

Published material from Iran – Chaharmahal va Bakhtiari Province, Shahrekord, Saman, Farokhshahr, Boldaji and Choghakhor, from soil and decaying wood; **Esfahan Province**, Esfahan, from soil; **Guilan Province**, from stored rice, rice dust and debris (Roodbar), soil in olive orchards, (Sangar), rice hulls,; Sangar, Eslamabad (Shaqaji) Village, from woodchips, from soil, stored products, debris, plant foliage, leaves, wood, and manure; **Kerman Province**, Kerman, from cow manure and sheep manure; **Khorasan Razavi Province**, Kashmar, from soil of vineyards; **Khuzestan Province**, Izeh, from soil; **Mazandaran Province**, in honey bee hives; **Khuzestan and Golestan Provinces**, from soil, debris, soil of ants nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Note – In all above references, this species has been reported as *Sertitympanum aegypticus*.

***Ameroseius callosus* Mašán, 1998**

Ameroseius callosus Mašán, 1998: 648.

Ameroseius callosus. — Mašán 2017: 29.

Distribution and habitats – Latvia, from *Fomitopsis pinicola* (Sw.) P. Karst (Polyporales: Fomitopsidaceae) on dry *Pinus sylvestris* L. (Pinales: Pinaceae), from *Fomes fomentarius* (L.) Fr. (Polyporales: Polyporaceae) on *Betula pendula* Roth (Fagales: Betulaceae) (Salmane 2007a; Salmane and Brumelis 2010; Salmane 2011); **Slovakia**, from wood-destroying fungi on fruiting body of willow bracket fungus (*Phellinus igniarius* (L.) Quél. (Hymenochaetales: Hymenochaetaceae), from wood-destroying fungus *Trametes* sp. (Polyporales: Polyporaceae), wood-destroying fungus (*Phellinus* sp.) growing on old walnut tree (*Juglans regia* L.) (Fagales: Juglandaceae) (Mašán 1998, 2017).

***Ameroseius corbiculus* (Sowerby, 1806)**

Acarus corbicula Sowerby, 1806: Tab. 66/14.

Seius hirsutus C. L. Koch, 1839: Fasc. 24/12. Synonymy by Vitzthum (1942).

Seius echinatus C. L. Koch, 1839: Fasc. 24/13. Synonymy by Vitzthum (1942).

Cornubia ornata Turk, 1943: 859. Synonymy by Turk (1953).

Ameroseius crassisetosus Ye & Ma, 1993: 86. Synonymy by Mašán (2017: 31).

Ameroseius qinghaiensis Li & Yang, 2000: 65. Synonymy by Mašán (2017: 31). Synonymy with *Ameroseius crassisetosus* Ye & Ma, 1993 by Ma (2006).

Ameroseius norvegicus Narita, Abduch & Moraes, in Narita *et al.* 2015: 391. Synonymy by Mašán (2017: 31).

Ameroseiella corbiculus. — Mašán 2017: 30.

More information about the synonyms of this species are available in Mašán (2017: 30).

Distribution and habitats – **Austria**, from soil (Westerboer and Bernhard 1963); **Bulgaria**, on small mammals (Koyumdjieva and Yaneva 1980); **Canada**, Québec Province, from soil (Marshall 1963); **China**, Qinghai Province, in humus; Xinjiang Region, on wood mouse [*Apodemus sylvaticus* (L.)] (Rodentia: Muridae) (Ye and Ma 1993; Li and Yang 2000; Ma 2006; Ma 2008); **Finland**, from soil, composts and seashore debris (Huhta *et al.* 1979; Huhta *et al.* 2010; Huhta *et al.* 2012; Huhta 2016); **France**, from soil (de Groot *et al.* 2016); **Germany**, from old cow manure, rotted thistle herb, rotting weeds and soil (Koch 1839; Westerboer and Bernhard 1963; Buryr and Hartmann 1992); **Hungary**, from pine litter and soil (Kandil 1981; Komlowszky 1987; Salmane and Kontschán 2005; Kontschán 2007; Kontschán *et al.* 2015a); **Ireland**, moss (Westerboer and Bernhard 1963); **Kazakhstan**, from soil (Joharchi *et al.* 2020); **Latvia**, from rotting wood, soil, inland, coastal meadows, bogs and Bracket fungi, (Salmane 1999; 2001; 2005b; 2007b; Salmane and Brumelis 2010); **Netherlands**, from dung, roots, soil and leaves (Schelvis 1991; Messelink and Holstein-Saj 2006); New Zealand, (Schmölzer 1998); **Norway**, from litter in a strawberry field (Narita *et al.* 2015); **Poland**, from litter, insect, on white-tailed sea eagle *Haliaeetus albicilla* (L.) (Accipitriformes: Accipitridae), small mammals and nests of the harvest mouse [*Micromys minutus* (Pallas)] (Rodentia: Muridae) (Haitlinger 1981; Gwiazdowicz and Klemm 2004; Gwiazdowicz *et al.* 2006; Haitlinger and Łupicki 2012; Skorupski *et al.* 2013; Haitlinger 2015; Krawczyk *et al.* 2015); **Russia**, (different regions such as Altai, Transbaikalia and Omskaya), from different substrate such as litter, soil, and on micromammal (Bregetova 1977; Davydova *et al.* 1980; Petrova 1982; Davydova and Nikolsky 1986; Khomjakov 1988; Marchenko 2002; Malkova and Bogdanov 2004; Marchenko 2009; Marchenko, 2012; Tatyana and Nadezhda, 2015; Vinarskaya *et al.*, 2016; Poletayeva and Kleusova, 2016); **Slovakia**, from nest of small mammal, leaf litter and soil detritus, wood-destroying fungus *Trametes* sp. (Polyporales: Polyporaceae), nest of *Sylvia atricapilla* L. (Passeriformes: Sylviidae), soil and detritus from ant-hill of *Formica* sp. (Hymenoptera: Formicidae), nest of *Motacilla cinerea* (Tunstall) (Passeriformes: Motacillidae), under bark, stones and pieces of wood, fish-ponds, nest of *Circus aeruginosus* (L.) (Accipitriformes: Accipitridae), nest of *Aythya ferina* (L.) (Anseriformes: Anatidae), nest of *Emberiza schoeniclus* L. (Passeriformes: Fringillidae), nest of *Clethrionomys glareolus* (Schreber) (Rodentia: Cricetidae), from leaf litter and soil detritus, burrow entry of *Spermophilus citellus* (L.) (Rodentia: Sciuridae), rotting leaves and vegetation rests, straw and miscellaneous organic detritus, old and drier dung, nest of *Motacilla flava* L. (Mašán 2017); **Sweden**, from soil (Lundqvist 1998); **United Kingdom**, from mollusc ctenidium moss [*Ctenidium molluscum* (Hedw.) Mitt.] (reported as *Hypnum molluscum*) (Hypnales: Hypnaceae) (Sowerby 1806), on dead leaves, moss, soil and humus (Evans 1958; Westerboer and Bernhard 1963; Southwood and Emden 1967), on yew (*Taxus baccata* L.) (Pinales: Taxaceae) (Turk 1953; Skorupski and Luxton 1998); **United States of America**, State of Oregon, Marion County, from soil (Neese 2004); **Turkey**, from *Corylus avellana* L. (Fagales: Betulaceae) (Cobanoglu & Özman 2002; Çakmak *et al.* 2011). **Asia** (country not mentioned), from cultivated soils on meadows, litter, moss, wood debris, rodent's nests, rotting plant remains, under stacks, old manure, heavy and light soils (Bregetova 1977); **Europe** (country not mentioned), from cultivated soils on meadows, litter, moss, wood debris, rodent's nests, rotting plant remains, under stacks, old manure, heavy and light soils (Karg 1971a;

Bregetova 1977; Madej 1990; Madej and Tomczok 1990; Madej and Kudla 1990; Karg 1993; Madej and Grec 1994; Buryń 2008; Dirilgen *et al.* 2016).

Published material from Iran – East Azarbaijan Province, from soil of orchards; **Chaharmahal va Bakhtiari Province**, associated with *Agricales* sp., Shahrekord, Boldaji, Choghakhor, from soil and decaying wood; **Golestan Province**, Gorgan, from leaf; **Guilan Province**, Rostam Abad, Ganjeh, Roodbar and Manjil, from soil in olive orchards; **North Khorasan Province**, associated with the nests of *Tapinoma* sp. (Hymenoptera: Formicidae); **Tehran Province**, Tehran City, Police Park, from soil (Kazemi and Rajaei 2013; Nemati *et al.* 2018); **West Azarbaijan Province**, from soil in apple orchard (Kavianpour *et al.* 2018); **Zanjan Province**, from soil, rotten wood, fungi, litter and dung; **Esfahan and Khuzestan Provinces**, region not mentioned, from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Ameroseius corniculus Karg, 1971

Ameroseius corniculus Karg, 1971a: 233.

Ameroseius corniculus. — Bregetova 1977: 163; Karg 1993: 231; Kontschán 2007: 101; Kazemi & Rajaei 2013: 65; Nemati *et al.* 2013: 19; Mašán 2017: 34.

Ameroseius (Ameroseius) corniculus. — Hajizadeh *et al.* 2013b: 150.

Distribution and habitats – Bulgaria, on great tit (*Parus major* L.) (Passeriformes: Paridae), (Davidova *et al.* 2019; Davidova and Vasilev 2020); **Germany**, from humus (Karg 1971a; 1993); **Hungary**, from soil and leaf litter (Salmane and Kontschán 2006; Kontschán 2007); **Poland**, from wood decay and nests of the harvest mouse [*Micromys minutus* (Pallas)] (Rodentia: Muridae) (Gwiazdowicz *et al.* 2011; Krawczyk *et al.* 2015); **Russia**, Caucasus region, from humus, litter and wood debris (Bregetova 1977); **Slovakia**, under bark, stones and pieces of wood, from leaf litter and soil and wood detritus, decaying plant remnants, wood-destroying fungi, moss (Mašán 2017); **Ukraine**, from humus, litter and wood debris (Bregetova 1977).

Published material from Iran – Fars Province, Shiraz, from soil of orchards; **Zanjan Province**, from soil, rotten wood, fungi, litter and dung (Kazemi and Rajaei 2013).

Ameroseius denticulatus Gu & Guo, 1997

Ameroseius denticulatus Gu & Guo, 1997: 137.

Ameroseius denticulatus. — Mašán 2017: 37.

Distribution and habitats – China, Yunnan Province, on Yunnan red-backed vole [*Eothenomys miletus* (Thomas)] (Rodentia: Cricetidae) (Gu and Guo 1997; Luo *et al.* 2007).

Ameroseius fungicola Mašán, 1998

Ameroseius fungiculis Mašán, 1998: 645.

Ameroseius fungiculis. — Kazemi & Rajaei 2013: 65.

Ameroseius (Ameroseius) fungiculis. — Hajizadeh *et al.* 2013b: 150.

Ameroseius fungicola. — Mašán 2017: 37.

Distribution and habitats – Latvia, from Bracket fungi (Salmane 2007a; Salmane and Spungis 2008; Salmane and Brumelis 2010; Salmane 2011); **Russia**, Republic of Komi, from bracket fungi, soil and sphagnum pine (Makarova 2004, 2009, 2011); **Slovakia**, on fruiting body of willow bracket fungus, *Phellinus igniarius* (Hymenochaetales: Hymenochaetaceae) and different wood-destroying fungus (Mašán 1998, 2017).

Published material from Iran – Alborz Province, Eshtehard, from compost and mushroom (Kheradmand *et al.* 2007).

Ameroseius furcatus Karg, 1971

Ameroseius furcatus Karg, 1971a: 231.

Ameroseius pseudofurcatus Livshits & Mitrofanov, 1975: 462. Synonymy by Mašán (2017: 38).

Ameroseius furcatus. — Bregetova 1977: 158; Karg 1993: 228; Hajizadeh *et al.* 2013a: 68; Mašán 2017: 38.

Distribution and habitats – **China**, Fujian Province, from soil (Lin *et al.* 2009); **Germany**, in tussocks of grass with roots (Karg 1971a; 1993); **Norway**, from soil and tree hollows (Slomian *et al.* 2005); **Poland**, from leaf litter (Błaszak *et al.* 2000; Barczyk and Madej 2014); **Russia**, Siberia region, from litter and soil (Bregetova 1977; Marchenko 2012); **Slovakia**, from pine forest, soil and detritus from ant-hill of *Formica* sp. (Hymenoptera: Formicidae), from moss and tinder from decaying ash stump (Mašán 2017); **Ukraine**, in leaf litter under common hazel (*Corylus avellana* L.) (Fagales: Betulaceae) from a park (Livshitz and Mitrofanov 1975); **United Kingdom**, on yew (*Taxus baccata* L.) (Pinales: Taxaceae) (Skorupski & Luxton 1998); **Uzbekistan**, from soil (Khmraev 2003).

Published material from Iran – East Azarbaijan Province, Arasbaran Forests, from soil and plant debris; Arasbaran Forests, Vaygan and Kalaleh, from soil and plant debris; **Guilan Province**, Damash and Rudbar, from soil and leaf litter; **Chaharmahal va Bakhtiari**, Esfahan, **Khuzestan**, and **Golestan Provinces**, region not mentioned, from soil, debris, soil of ants nests and fungi (Nemati *et al.* 2018).

Ameroseius gabonensis Elsen, 1973

Ameroseius gabonensis Elsen, 1973: 753.

Ameroseius gabonensis. — Narita *et al.* 2015: 396; Mašán 2017: 40.

Distribution and habitats – **Cameroon**, on the dorsal side of the thorax of *Doryllus depilis* Emery (Hymenoptera: Formicidae) (Elsen 1973); **Democratic Republic of Congo**, on base of elytra of *Ancylonotus tribulus* (Fabricius) (Coleoptera: Cermbycidae) (Elsen 1973); **Gabon**, on abdomen and wings of *Crocisa meripes* (Vachal) (Hymenoptera: Apidae) (Elsen 1973).

Ameroseius georgei (Turk, 1943)

Cornubia georgii (sic) Turk, 1943: 859 (nom. n. pro *Epicrius canestrinii* Haller, 1881 sensu George, 1906). Incorrect synonymy with *Ameroseius corbiculus* (Sowerby, 1806) by Turk 1953.

Ameroseius georgei. — Turk 1953: 12.

Ameroseius imparsetosus Westerboer (in Westerboer & Bernhard, 1963: 514). Synonymy by Mašán (2017: 40).

Ameroseius georgei. — Mašán 2017: 40.

More information about the synonyms of this species are available in Mašán (2017: 40).

Distribution and habitats – **Bulgaria**, unspecified substrate (Koyumdjieva 1986); **United Kingdom**, unspecified substrate (Turk 1943); **Finland**, on fungus on dead wood (Huhta 2016); **Hungary**, from leaf litter (Kontschán 2007); **Latvia**, unspecified substrate (from moss, rotten bark of fallen oaks and beech trees under bark, fungi on the bark of trees and rodents (Bregetova 1977; Salmane 2005b; Salmane and Brumelis 2010; Salmane 2011); **Russia**, (region not mentioned),

unspecified substrate (from moss, rotten bark of fallen oaks and beech trees under bark, fungi on the bark of trees and rodents (Bregetova 1977); **Romania**, from soil (Kontschán *et al.* 2007); **Slovakia**, on wood-destroying fungus *Trametes* sp. (Polyporales: Polyporaceae), on *Meripilus giganteus* (Pers.) P. Karst. (Polyporales: Meripilaceae) growing at base of old oak, on unidentified wood-decaying fungi, from leaf litter and soil detritus (Mašán 2017); **Spain**, from moss and bark of fallen and standing old oaks (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Ukraine**, Trans Carpathia, unspecified substrate (from moss, rotten bark of fallen oaks and beech trees under bark, fungi on the bark of trees and rodents (Bregetova 1977).

Ameroseius lehtineni Huhta & Karg, 2010

Ameroseius lehtineni Huhta & Karg 2010: 337.

Ameroseius lehtineni. —Mašán 2017: 44.

Distribution and habitats – **Finland**, from old pile of sawdust under barn and on fungus on dead wood (Huhta and Karg 2010; Huhta 2016).

Ameroseius lidiae Bregetova, 1977

Ameroseius lidiae Bregetova, 1977: 161.

More information about the synonyms of this species are available in Mašán (2017: 44).

Distribution and habitats – **China**, Taiwan, from soil, (Ho *et al.* 2010); **Hungary**, from soil (Salmane and Kontschán 2005); **Kazakhstan**, unspecified substrate (Chelebiev 1988); **Moldavia**, unspecified substrate (from hollows of trees, nests of rodents and insects and on the animals themselves) (Bregetova 1977); **Russia**, (region not metioned), unspecified substrate (from hollows of trees, nests of rodents and insects and on the animals themselves) (Bregetova 1977); **Siberia**, from *Microtus gregalis* Pallas (Rodentia: Cricetidae) (Malkova and Bogdanov 2004); **Barents Sea region**, unspecified substrate (Makarova 2013); **Omskaya Oblast**, from Micromammalia (Vinarskaya *et al.* 2016); **Saudi Arabia**, from *Ocimum basilicum* L. (Lamiales: Lamiaceae) and grasses (Alatawi *et al.* 2018); **Slovakia**, from leaf litter, soil detritus and nests of several birds [*Serinus serinus* L., *Cygnus olor* (Gmelin), *Turdus philomelos* Brehm, *Aythya ferina* L., *Fulica atra* (L.), *Circus aeruginosus* L.], (Mašán 2017); **Spain**, from soil and litter (Moraza and Pena 2005; Oromí and García 2009); **Syria**, from ground litter (Barbar 2016); **Tadjikistan**, unspecified substrate (from hollows of trees, nests of rodents and insects and on the animals themselves) (Bregetova 1977); **Ukraine**, unspecified substrate (from hollows of trees, nests of rodents and insects and on the animals themselves) (Bregetova 1977); **Uzbekistan**, from soils under different crops (rice, cotton, apple and grapes) (Khamraev 2003);

Published material from Iran – **Alborz Province**, Karaj and Shahriar on *Scolytus amygdale* Guerin-Meneville (Coleoptera: Scolytidae); **Chaharmahal va Bakhtiari Province**, associated with *Agricales* sp., Ben, Hafshejan, Farokhshahr, Dezak, Shahrekord and Saman, from soil and rotting wood; **Fars Province**, Jahrom, Kazerun, from soil of citrus orchards, debris, stored foods; **Guilan Province**, Somesara, on raspberry shrubs (*Rubus* spp.), Ganjeh, from soil in Olive orchards; **Hamedan Province**, from soil; **Esfahan Province**, Foolad Mobarakeh, from soil; **Kerman Province**, Sirjan, Kerman and Baft, from poultry manure soil and manure; **West Azarbaijan Province**, Miandoab, from soil of apple orchards; **Zanjan Province**, from soil, rotten wood, fungi, litter and dung; **Khuzestan and Golestan Provinces**, region not mentioned, from soil, debris, soil of ant's nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

***Ameroseius longitrichus* Hirschmann, 1963**

Ameroseius longitrichus Hirschmann (in Westerboer & Bernhard, 1963: 530).

More information about the synonyms of this species are available in Maśán (2017: 46).

Distribution and habitats – **China**, Henan Province, from hole in a tree (Ma and Lin 2006); **Finland**, from dead wood, aspen stump and polypore fungus on dead wood (Huhta *et al.* 2012; Huhta, 2016); **Germany**, in wood detritus of spruces and firs, and in galleries of various scolytine bark beetles (Westerboer and Bernhard 1963; Karg, 1971a; 1993); **Latvia**, from wood bracket fungi and Scolytid beetles (Salmane 2005a, b; 2007b; Salmane and Telnov 2009; Salmane and Brumelis 2010; Salmane 2011); **Norway**, on *Hylotrupes bajalus* (L.) (Coleoptera: Cerambycidae) (Gwiazdowicz and Gulvik 2007); **Poland**, from rotten wood, leaf litter, wood decay and nest of bird (Kaczmarek and Michalski 1988; Gwiazdowicz and Klemt 2004; Gwiazdowicz *et al.* 2006; Gwiazdowicz *et al.* 2011; Madej *et al.* 2011); **Russia**, Leningrad Oblast, unspecified substrate (from under bark of trees, in tunnels of bark beetles and larvae of weevil, litter and debris) (Bregetova 1977); **Slovakia**, from bird nest and forests including several trees (*Pinus sylvestris* L., *Robinia pseudoacacia* L., *Betula* sp., *Quercetum cerris* L., *Fagion sylvaticae* Luquet, *Aceri* sp., *Fagetum* sp., *Fraxinus* sp., *Salici* sp., *Populetum* sp.), from sandy soil and wood detritus from colony of *Formica* sp. (Hymenoptera: Formicidae), under bark of old pines and poplar trunks, fallen and dead birches, leaf litter and soil detritus, under stones and pieces of wood, wood-destroying fungus (Maśán 2017); **Turkey**, on bark beetle (Coleoptera: Scolytidae) (Karaman 2006); **United States of America**, State of Idaho and Louisiana, on insects (Moser and Roton 1971; Furniss *et al.* 1972; Moser 1975; Blackwell *et al.* 1988).

***Ameroseius magnisetosus* (Ishikawa, 1972)**

Kleemannia magnisetosa Ishikawa, 1972: 99.

Ameroseius magnisetosus. — Maśán 2017: 47.

More information about the synonyms of this species are available in Maśán (2017: 47).

Distribution and habitats – **China**, Taiwan, from soil (Ho *et al.* 2010); **Japan**, from litter (Ishikawa 1972); **Russia**, Magadan Oblast, from liter and nests of rodents (Bregetova 1977).

***Ameroseius matsudai* Ishikawa, 1977**

Ameroseius matsudai Ishikawa, 1977: 182.

Ameroseius matsudai. — Ho *et al.* 2010: 91; Maśán 2017: 48.

Distribution and habitats – **China**, Taiwan, from soil (Ho *et al.* 2010); **Japan**, on Japanese pine sawyer (*Monochamus alternatus* Hope) (Coleoptera: Cerambycidae) (Ishikawa 1977).

***Ameroseius proteae* Ryke, 1964**

Ameroseius proteae Ryke, 1964: 344.

Ameroseius proteae. — Maśán 2017: 49.

Distribution and habitats – **South Africa**, on dry flower of sugarbush, *Protea repens* (L.) (reported as *Protea mellifera*) (Proteales: Proteaceae) (Ryke 1964; Roets 2006; Roets *et al.* 2007; Roets *et al.* 2011).

***Ameroseius sculptilis* Berlese, 1916**

Ameroseius sculptilis Berlese, 1916a: 47.

Ameroseius pulcher Westerboer (in Westerboer & Bernhard, 1963: 505). Synonymy by Bregetova (1977).

Ameroseius sculptilis. — Mašán, 2017: 51.

More information about the synonyms of this species are available in Mašán (2017: 51).

Distribution and habitats – **Bulgaria**, unspecified substrate (Koyumdjieva 1986); **Germany**, from rotting grass (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Italy**, from moss (Berlese 1916a); **Japan**, associated with insect (Ishikawa 1972; Ishikawa, 2012); **Norway**, on *Ips ypographus* (L.) (Coleoptera: Scolytidae) (Gwiazdowicz *et al.* 2012); **Russia**, Bashkiria, Crimea, Black Sea coast of Caucasus region, unspecified substrate (from rotting grass, moss, nests of rodents) (Bregetova 1977); **Slovakia**, from fish-ponds, shore reed stand (*Phragmites*), from nest of *Circus aeruginosus* L. (Accipitriformes: Accipitridae) (Mašán 2017); **Ukraine**, unspecified substrate (from rotting grass, moss, nests of rodents) (Bregetova 1977).

Published material from Iran – **Guilan Province**, Somesara, on raspberry shrubs (*Rubus* spp.) (Tajmiri and Hajizadeh 2013).

***Ameroseius taoerhensis* Ma, 1995**

Ameroseius taoerhensis Ma, 1995: 93.

Ameroseius taoerhensis. — Ma 2002: 309; Mašán 2017: 53.

Distribution and habitats – **China**, Jilin Province, under decomposed bark of pine tree (Ma 1995; 2000; 2002); **South Korea**, from imported goods (Ma and Cu 2002).

***Ameroseius ulmi* Hirschmann, 1963**

Ameroseius ulmi Hirschmann (in Westerboer & Bernhard, 1963: 498).

More information about the synonyms of this species are available in Mašán (2017: 53).

Distribution and habitats – **China**, Xizang Autonomous Region, from bark of tree (Ma and Lin, 2016); **Germany**, in gallery of bark beetle [*Scolytus scolytus* (Fabricius)] (Coleoptera: Curculionidae) in elm tree (*Ulmus* sp.) (Westerboer and Bernhard 1963; Karg 1971a; Bregetova 1977; Karg 1993); **Latvia**, wood, bracket fungi, insect and soil (Salmane 2005a, b, 2007b; Salmane and Brumelis 2010); **Poland**, from insect and decaying bodies of *Ceriporus squamosus* (Huds.) Quél. (Polyporales: Polyporaceae) (Haitlinger 2008; Teodorowicz and Gwiazdowicz 2020); **Slovakia**, on wood-destroying fungus (*Trametes* sp.), under bark, stones, pieces of wood and soil detritus (Mašán 2017); **Ukraine**, on bark beetles (Khaustov 2001).

Published material from Iran – **Khuzestan Province**, Ahwaz, from soil; **Chaharmahal va Bakhtiari**, **Esfahan** and **Golestan Provinces**, region not mentioned, from soil, debris, soil of ants nests and fungi (Nemati *et al.* 2018).

***Ameroseius variolarius* Ishikawa, 1972**

Ameroseius variolarius Ishikawa, 1972: 101.

Ameroseius variolarius. — Mašán 2017: 54.

Distribution and habitats – Japan, from fungi, plants, soil and litter (Ishikawa 1972; Nakamura *et al.* 2006; Karasawa *et al.* 2008; Ishikawa 2012).

***Ameroseius vietnamensis* Micherdzinski, 1965**

Ameroseius (sic) *vietnamensis* Micherdziński, 1965: 17.

Ameroseius (sic) *vietnamensis*. — Micherdziński 1965: 21.

Ameroseius vietnamensis. — Ho *et al.* 2010: 91; Ma & Lin 2013: 84; Maśán 2017: 54.

Distribution and habitats – China, Sichuan Province, from leaf litter (Ma and Lin 2013); **Vietnam**, from mould in a rocky cavity, leaf litter, dry and moist moss soil, (Micherdzinski 1965; Ho *et al.* 2010).

***Ameroseius womersleyi*, Maśán, 2017**

Ameroseius ornatus Womersley, 1956a: 547. Junior secondary homonym by Maśán (2017: 54)

Ameroseius womersleyi Maśán, 2017: 54.

More information about the synonyms of this species are available in Maśán (2017: 54).

Distribution and habitats – Australia, State of Tasmania, on strawberry plants (Womersley 1956a; Halliday 1997); **South Africa**, on *Protea obtusifolia* H. Buek ex. Meisn (Proteales: Proteaceae) (Theron 2011).

Published material from Iran – Fars Province, Estahban, from soil, leaves, litter, bark and saffron bulb; **Kerman Province**, Rafsanjan, from soil of fruit groves (Kazemi and Rajaei 2013).

Note – This species had been reported mistakenly from Iran by mentioned authors. Therefore, we removed it from Iranian mite fauna.

Genus *Asperolaelaps* Womersley, 1956

Asperolaelaps Womersley, 1956a: 534. **Type species:** *Asperolaelaps rotundus* Womersley, 1956, by original designation.

For diagnosis of the genus see Maśán (2017).

***Asperolaelaps rotundus* Womersley, 1956**

Asperolaelaps rotundus Womersley, 1956a: 534.

Neocypholaelaps rotundus. — Domrow 1979: 104; Halliday 1997: 197; Beaulieu *et al.* 2010: 6; Moraes and Narita 2010: 42; Narita, *et al.* 2011: 62; Narita *et al.* 2013a: 11; Hajizadeh *et al.* 2013b: 150; Nemati *et al.* 2013: 21.

Sertitympanum rotundus. — Kazemi & Rajaei 2013: 67.

Asperolaelaps rotundus. — Maśán 2017: 57.

Distribution and habitats – Australia, State of Queensland, on cards, from leaf litter and soil (Womersley 1956a; Halliday 1997; Beaulieu *et al.* 2010).

Published material from Iran – Tehran Province, Varamin, Mohammad Abad, Asgar Abad, Moein Abad, Pouinak, Jalil Abad, Ghalesin, Pishva Roadway, from soil of crop fields (pomegranate, grape vine, eggplant, cucumber, wheat, tomato, lettuce and alfalfa) (Kheradpir and Pakyari 2011).

Note – This species was recorded as *Sertitympanum rotundus* (Womersley, 1956) in Kazemi and Rajaei 2013 and *Neocypholaelaps rotundus* (Womersley, 1956) in Hajizadeh *et al.* 2013 and Nemati *et al.* 2013, but we believe that identifications are incorrect. So, we removed them from Iranian mite fauna.

Genus *Brontispalaelaps* Womersley, 1956

Brontispalaelaps Womersley, 1956a: 533. **Type species:** *Brontispalaelaps leveri* Womersley, 1956, by original designation.

Brontispalaelaps. — Evans 1963: 229; Maśán 2017: 57.

For diagnosis of the genus see Maśán (2017).

Brontispalaelaps leveri Womersley, 1956

Brontispalaelaps leveri Womersley, 1956a: 533.

Brontispalaelaps leveri. — Silva *et al.* 2014: 710; Maśán 2017: 58.

Distribution and habitats – **Papua New Guinea**, on coconut leaf beetle (*Brontispa longissima* Gestro) (reported as *Brontispa froggatti*) (Coleoptera: Chrysomelidae) (Womersley 1956a); **Solomon Islands**, on coconut leaf beetle (*Brontispa longissima*) (reported as *Brontispa froggatti*) (Womersley 1956a); **Thailand**, on coconut leaf beetle (*Brontispa longissima*) (Silva *et al.* 2014).

Genus *Epicriopsis* Berlese, 1916

Epicriopsis Berlese, 1916a: 34. **Type species:** *Gamasus horridus* Kramer, 1876, by original designation.

Epicriopsis. — Evans 1963: 229; Karg 1971a: 223; Bregetova 1977: 167; Karg 1993: 220; Maśán 2017: 59.

For diagnosis of the genus see Maśán (2017).

Epicriopsis atuberculatus Narita & Moraes, 2016

Epicriopsis atuberculatus Narita & Moraes, 2016: 478.

Epicriopsis atuberculatus. — Maśán 2017: 61.

Distribution and habitats – **Brazil**, State of Minas Gerais, on leaves of macaúba palm [*Acrocomia aculeata* (Jacq. Lodd.)] (Arecales: Arecaceae) (Narita and Moraes 2016); **Colombia**, on leaves of coffee plants and *Matisia cordata* Humb. and Bompl. (Malvales: Malvaceae) (Narita and Moraes 2016); **Peru**, on leaves of avocado plants (Narita and Moraes 2016).

Epicriopsis horridus (Kramer, 1876)

Gamasus horridus Kramer, 1876: 82.

Epicrius mollis. — Haller 1881: 190; Berlese 1887a: 40/9; Oudemans 1903: 87; George 1906: 265; Turk 1943: 856.

Hypoaspis mollis. — Oudemans 1903: 87, and Oudemans 1904: 84; Turk 1943: 856.

Epicriopsis horrida. — Berlese 1916a: 48.

Epicriopsis berlesei Oudemans, 1939a: 198 (new name for *Epicrius mollis* sensu Berlese, 1887).
Synonymy by Karg (1971a, 1971b).

Epicriopsis horridus. — Mašán 2017: 61.

More information about the synonyms of this species are available in Mašán (2017: 61).

Distribution and habitats – **Finland**, from sawdust and soil (Huhta *et al.* 2012; Huhta 2016); **Germany**, from litter (Kramer 1876), and soil (Glockemann and Larink 1991); **Hungary**, from soil, and on bamboo plantings (Salmane and Kontschán 2005; Kontschán *et al.* 2015b); **Ireland**, from soil (Arroyo *et al.* 2013); **Israel**, from litter (Costa 1966); **Italy**, from soil (Berlese 1916a); **Latvia**, from leaves and fungi (Salmane, 1999; 2001; 2005b; Petrova *et al.* 2004; Salmane and Brumelis 2010); **Moldavia**, from humus, rotting hay and moos (Bregetova 1977); **Norway**, from wet moss on bank of rill on border of C3a vegetation, and from soil (Gwiazdowicz and Gulvik 2005; Skorupski *et al.* 2009); **Poland**, from soil, rotten wood, leaf litter and soil under yew (*Taxus baccata* L.) (Pinales: Taxaceae) forest (Seniczak *et al.* 1999; Gwiazdowicz and Klemm 2004; Skorupski *et al.* 2013; Madej and Kozub, 2014; Kordonska, *et al.* 2019); **Russia**, Leningrad Oblast, Crimea and Caucasus region, from humus, rotting hay and moos (Bregetova 1977), Northern Taiga region, from soil and litter (Makarova 2009), Northeastern Altai, from soil (Marchenko 2012), Omskaya Oblast, micromammal (Vinarskaya *et al.* 2016); **Slovakia**, from soil, leaf litter, soil detritus, nest of different animals (Aves, Mammalia, Insecta), decaying herbaceous vegetation and decaying plant remnants, and moss (Mašán 2017); **Syria**, from soil and litter (Barbar 2018); **Ukraine**, Odessa Oblast, from mixed forests, humus, rotting hay and moos (Bregetova, 1977); **United Kingdom**, from soil (Southwood and Emden 1967; Evans and Till 1979); **Central Europe** (country not mentioned), from leaf litter (Buryń 2008).

Note – Type locality of *Epicriopsis berlesei* not specified (Germany, Borkum Island; Italy, San Remo; France, Sucy-en-Brie), in rotting leaves (Oudemans 1939a: 198 by Mašán 2017).

Published material from Iran – **East Azerbaijan Province**, Tabriz, from soil of orchards **Golestan Province**, Gorgan, from soil and litter; **Guilan Province**, Talesh, Shaft, Siahkal, Fuman and Rostamabad, from soil; **Lorestan Province**, Khorramabad and Bishe District, from soil under willow trees and oak forest; **Chaharmahal va Bakhtiari**, **Esfahan** and **Khuzestan Provinces**, region not mentioned, from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Epicriopsis mirabilis Willmann, 1956

Epicriopsis mirabilis Willmann, 1956: 218.

Epicriopsis rivus Karg, 1971a: 226. Synonym by Mašán (2017: 66).

Epicriopsis mirabilis. — Mašán 2017: 66.

More information about the synonyms of this species are available in Mašán (2017: 66).

Distribution and habitats – **Czech Republic**, from European white hellebore (*Veratrum album* L.) (Liliales: Melanthiaceae) and moss (*Sphagnum* sp., *Hypnum* sp.) (Willmann 1956); **Finland**, from sawdust (Huhta 2016); **Germany**, from leaf litter under beech tree (Karg 1971a; Buryń 2008); **Latvia**, from litter and mosses (Salmane 2006; Salmane and Brumelis 2010; Salmane 2011); **Poland**, from soil of humid pine-oak forest (Szymkowiak 1998; Madej *et al.* 2011); **Romania**, from soil (Manu 2012; Manu and Ion 2014); **Slovakia**, from soil, from moss and soil detritus (Mašán 2017).

Epicriopsis palustris Karg, 1971

Epicriopsis palustris Karg, 1971b: VI/3.

Epicriopsis langei Livshits & Mitrofanov, 1975: 464. Synonymy by Mašán (2017: 67).

Epicriopsis baloghi Kandil, 1978: 165. Synonymy by Mašán (2017: 67).

Epicriopsis palustris. — Mašán, 2017: 67.

More information about the synonyms of this species are available in Mašán (2017: 67).

Distribution and habitats – **Germany**, from leaf litter under hawthorn (*Crataegus* sp., Rosales: Rosaceae) (Karg 1971b); **Hungary**, unspecified substrate (Kandil 1978); **Latvia**, from mosses [*Hylocomium splendens* (Hedw.) Schimp, *Pleurosium schreberi* (Brid.) Mitt.] (Salmane 2006; Salmane and Brumelis 2010; Salmane 2011); **Romania**, from soil and litter (Călugăr 2018); **Ukraine**, from leaf litter (Livshitz and Mitrofanov, 1975); **Slovakia**, from wet leaf litter, soil detritus and moss (Mašán 2017); **Turkey**, from moss, litter and soil (Urhan *et al.* 2015; Kassen 2019); **United Kingdom**, from yew (*Taxus baccata*) (Pinales: Taxaceae) (Skorupsk and Luxton, 1998).

Published material from Iran – **Guilan Province**, Talesh, Fuman and Rostamabad, from soil; **Chaharmahal va Bakhtiari Province**, Saman, from litter; **East Azarbaijan Province**, Arasbaran Forests, from soil and plant debris (Arasbaran Forests, Garmanab), soil and plant debris; **Mazandaran Province**, Nowshahr, Ecological (Botanical) Garden of Nowshahr, from soil and litter (Kazemi and Rajaei 2013; Nemati *et al.* 2018); **West Azarbaijan Province**, from soil and litter (Kavianpour *et al.* 2018); **Zanjan Province**, from soil, rotten wood, fungi, litter and dung; **Esfahan, Khuzestan and Golestan Provinces**, region not mentioned, from debris (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Epicriopsis stellata Ishikawa, 1972

Epicriopsis stellata Ishikawa, 1972: 95.

Epicriopsis stellata. — Narita & Moraes 2016: 483; Mašán 2017: 69.

Distribution and habitats – **Japan**, Hokkaido, from haystacks in persimmon grove, from litter (Ishikawa 1972), Takaku and Sasaki 2007); **Russia**, Sakhalin Oblast (Shikotan Island), from litter (Marchenko 2002).

Epicriopsis suedus Karg, 1971

Epicriopsis suedus Karg, 1971a: 226.

Epicriopsis suedus. — Karg 1971b: VI/7; Bregetova 1977: 169; Kandil 1978: 171; Karg 1993: 224; Narita and Moraes 2016: 482; Mašán 2017: 69.

Distribution and habitats – **Belarus**, from birds nests (Efremova 2000); **Finland**, from peat bog (Huhta 2016); **Russia**, Sakhalin Oblast (Kunashir Island), from litter (Marchenko 2002); **Sweden**, from agricultural land (Karg 1971a).

Epicriopsis walteri Halliday, 1997

Epicriopsis walteri Halliday, 1997: 187.

Epicriopsis walteri. — Narita & Moraes 2016: 482; Mašán 2017: 70.

Distribution and habitats – **Australia**, State of Queensland, from rainforest leaf litter (Halliday 1997; Beaulieu *et al.* 2010).

Genus *Hattena* Domrow, 1963

Hattena Domrow, 1963: 202. Type species: *Hattena erosa* Domrow, 1963, by monotypy.

Edbarellus Manson, 1974: 115. Type species: *Edbarellus tonganus* Manson, 1974, by original designation. Synonymy by Halliday (1997).

For diagnosis of the genus see Mařán (2017).

***Hattena cometis* Domrow, 1979**

Hattena cometis Domrow, 1979: 109.

More information about the synonyms of this species are available in Mařán (2017: 73).

Distribution and habitats – **Australia**, State of Queensland, from beak and nostrils of yellow honeyeater, *Meliphaga flava* (Gould) (Passeriformes: Meliphagidae) and on graceful honeyeater, *M. gracilis* (Gould); New South Wales, from eastern spinebill, *Acanthorhynchus tenuirostris* (Latham) (Passeriformes: Meliphagidae) (Domrow 1979); State of Queensland, from river mangrove flowers [*Aegiceras corniculatum* (L.) Blanco] (Ericales: Primulaceae) (Seeman and Walter 1995); State of Queensland, from flowers of *Aegiceras corniculatum*, *Castanospermum australe* A. Cunn. Ex Mudie (Fabales: Fabaceae), *Dendrophthoe vitellina* (F. Muell.) Tiegh. (Santalales: Loranthaceae), *Erythrina variegata* L. (Fabales: Fabaceae), *Aloe* sp. (Asparagales: Asphodelaceae) and *Amyema* sp. (Santalales: Loranthaceae) (Seeman 1996); State of New South Wales, in flowers of *Castanospermum australe*; State of Queensland, in aloe flowers under pines; in flower of *Erythrina* in flower of mistletoe (Halliday 1997).

***Hattena floricola* Halliday, 1997**

Hattena floricola Halliday, 1997: 190.

Hattena floricola. — Faraji & Cornejo 2006: 291; Scoble & Clarke 2006; Mařán 2017: 74.

Distribution and habitats – **Australia**, State of Victoria, on flowers of mountain correa (*Correa lawrenceana* Hook) (Sapindales: Rutaceae) (Halliday 1997; Scoble and Clarke 2006).

***Hattena panopla* Domrow, 1966**

Hattena panopla Domrow, 1966: 208.

More information about the synonyms of this species are available in Mařán (2017: 74).

Distribution and habitats – **Australia**, State of Queensland, from nostrils of brown honeyeater (*Lichmera indistincta* Vigors and Horsfield) (reported as *Gliciphila indistincta*) (Passeriformes: Meliphagidae), nostrils of white-throated honeyeater, *Melithreptus albogularis* Gould (Passeriformes: Meliphagidae), bird and flower (Domrow 1966; Domrow 1979; Fain and Lukoschus 1979; Noske 1993; Seeman 1996; Halliday 1997); **Malaysia**, on flower (Noske 1993).

***Hattena tongana* Manson, 1974**

Edbarellus tonganus Manson, 1974: 116.

Hattena tonganus. — Klimov *et al.* 2016.

Hattena tongana. — Halliday 1997: 188; Mařán 2017: 75.

Distribution and habitats – **Tonga**, in a hive of honey bee (*Apis mellifera* L.) (Hymenoptera: Apidae) (Manson 1974); **Europe** (country not mentioned), on honey bees (*Apis* spp.) (De Jong *et al.* 1982).

Genus *Kleemannia* Oudemans, 1930

Kleemannia Oudemans, 1930: 135. **Type species:** *Zercon pavidus* C. L. Koch, 1839, by original designation.

Primoseius Womersley, 1956b: 116. **Type species:** *Zercoseius macauleyi* Hughes, 1948 (syn.: *Seiulus plumosus* Oudemans, 1902), by original designation. Synonymy by Hughes (1961).

Kleemannia. — Evans 1963: 229.

not *Zercoseius* Berlese, 1916a: 33. **Type species:** *Seius spathuliger* Leonardi, 1899, by original designation. Incorrect synonymy by Oudemans (1939b).

For diagnosis of the genus see Maśán (2017).

Kleemannia curvata (Gu, Wang & Bai, 1989)

Ameroseius curvatus Gu, Wang & Bai, 1989: 48.

Kleemannia curvata. — Maśán 2017: 81.

Distribution and habitats – **China**, Ningxia Autonomous Region, on midday gerbil (*Meriones meridianus* Pallas) (Rodentia: Muridae) and from soil (Gu *et al.* 1989; Yan *et al.* 1999; Ma 2000).

Kleemannia delicata (Berlese, 1918)

Ameroseius delicatus Berlese, 1918: 144.

Lasioseius (*Lasioseius*) *gracilis* Halbert, 1923: 369. Synonymy by Maśán (2017: 81)

Ameroseius stramenis Karg, 1976: 538. Synonymy by Maśán (2017: 81).

Kleemannia delicata. — Maśán 2017: 81.

More information about the synonyms of this species are available in Maśán (2017: 81).

Distribution and habitats – **Chile**, from humid leaf litter (Karg 1976); **Germany**, from decaying hay of *Cornus sanguinea* L. (Solanales: Convolvulaceae) (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Ireland**, on sprouting potatoes (Halbert 1923; Westerboer and Bernhard 1963; Karg 1971a; 1993); **Italy**, from hay (Berlese 1918); **Kyrgyzstan**, on mammals (Fedorova 2018); **Latvia**, from soil, on insect, from inland meadows and bracket fungi (Salmane 1999, 2005a, b; Salmane and Brumelis 2010; Salmane 2011); **Netherlands**, from manure (Schelvis 2007); **Poland**, from wood decay and on insect (Gwiazdowicz *et al.* 2011; Haitlinger and Łupicki 2012); **Russia**, Crimea, from rotting foliage, moss, on *Cornus* sp., nests of rodent (Bregetova 1977); **Slovakia**, on decaying potatoes with soil-sand substrate (Maśán 2017); **Spain**, on birds (Muñiz and Bretón 1994; Muñiz 1996).

Published material from Iran – **Khorasan Razavi Province**, Mashhad, from stored food products; **North East of Iran**, region not mentioned, from stored food products (Nemati *et al.* 2018).

Kleemannia elegans (Bernhard, 1963)

Ameroseius elegans Bernhard (in Westerboer & Bernhard, 1963: 483).

Ameroseius elegans. — Karg 1971a: 233; Bregetova 1977: 158; Karg 1993: 230.

Kleemannia elegans. — Maśán 2017: 85.

Distribution and habitats – **Germany**, from a heap of weed plants (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Poland**, from nests of rodents (Haitlinger 1987c; Gwiazdowicz *et al.* 2005); **Russia**, Voronezh Oblast, from litter (Bregetova 1977).

***Kleemannia guyimengi* (Ma, 1997)**

Ameroseius guyimengi Ma, 1997: 140.

Ameroseius chinensis Khalili-Moghadam & Saboori, 2016: 546 (nom. n. pro *Ameroseius qinghaiensis* Ma, 2008). Synonymy by Mašán (2017: 85)

Kleemannia guyimengi. — Mašán 2017: 85.

More information about the synonyms of this species are available in Mašán (2017: 85).

Distribution and habitats – **China**, Jilin Province, on house mouse [*Mus musculus* (L.)] (Rodentia: Muridae); Qinghai Province, on brown rat [*Rattus norvegicus* (Berkenhout)] (Rodentia: Muridae) (Ma 1997, 2008).

***Kleemannia insignis* (Bernhard, 1963)**

Ameroseius insignis Bernhard (in Westerboer & Bernhard, 1963: 487).

Ameroseius marginalis Fan & Li, 1993: 17. Synonymy by Mašán (2017: 86)

Ameroseius sichanensis (sic) Fan & Li, 1993: 18, 20. Synonymy by Mašán (2017: 86)

Kleemannia insignis. — Mašán 2017: 86.

More information about the synonyms of this species are available in Mašán (2017: 86).

Distribution and habitats – **China**, Sichuan Province, from bean stick and on jelly ear fungus, *Auricularia auricula-judae* (Bull.) J.Schröt. (Auriculariales: Auriculariaceae) (Fan and Li 1993); **Germany**, from horse dung, rabbit dung, rotting leaves of northern water hemlock, *Cicuta virosa* L. (Apiales: Apiaceae) and manure and hay stacks (Westerboer and Bernhard 1963; Karg 1971a; 1993); **Latvia**, from soil and coastal meadows (Salmane 1999; Salmane 2001; Salmane and Brumelis 2010); **Poland**, from wood decay (Gwiazdowicz *et al.* 2011); **Netherlands**, from dung of domestic animals (Schelvis 1991); **Romania**, from soil (Nae *et al.* 2004-2005); **Slovakia**, from nest of *Passer montanus* (L.) (Passeriformes: Passeridae), artificial nest box and straw litter (Mašán 2017); **Ukraine**, from manure, wet straw chaff, under ha stacks, rotting leaves and debris in tree-hollows (Bregetova 1977);.

Published material from Iran – East Azerbaijan Province, Tabriz, from soil of orchards; **Fars Province**, Marvdasht, from apple bark beetles; **Guilan Province**, from soil, stored products, debris, plant foliage, leaves, wood, and manure (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

***Kleemannia kosi* El-Badry, Nasr & Hafez, 1979**

Kleemannia (sic) *kosi* El-Badry, Nasr & Hafez, 1979: 5.

Kleemannia Kosi (sic). — Mohamed *et al.* 1985: 99.

Kleemannia kosi. — Mohamed *et al.* 1985: 98; Zaher 1986: 402; Mašán 2017: 86.

Distribution and habitats – **Egypt**, from debris under orange tree, *Citrus sinenses* (L.) Osbeck (Sapindales: Rutaceae), from rice grain, maize grain, onion and garlic (El-Badry *et al.* 1979; Metwally *et al.* 2016; El-Sayed Gad *et al.* 2020).

***Kleemannia nova* Nasr & Abou-Awad, 1986**

Kleemannia nova Nasr & Abou-Awad, 1986: 75.

Ameroseius (*Kleemannia*) *novus*. — Hajizadeh *et al.* 2013b: 150.

Ameroseius nova. — Kazemi & Rajaei 2013: 65.

Kleemannia nova. — Mašán 2017: 90.

Distribution and habitats – **Egypt**, from manure (Nasr and Abu-Awad 1986); **Morocco**, on *Trox* sp. (Coleoptera: Scarabaeidae) (Philips 2009); **Peru**, on avocado plant leaves (Marticorena and Berrio 2014).

Published material from Iran – **Fars Province**, Jahrom, from soil of citrus groves; **Chaharmahal va Bakhtiari**, Esfahan, **Khuzestan and Golestan Provinces**, region not mentioned, from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Kleemannia parplumosa Nasr & Abou-Awad, 1986

Kleemannia parplumosus Nasr & Abou-Awad, 1986: 76.

Ameroseius (Kleemannia) parplumosus. — Hajizadeh *et al.* 2013b: 150.

Ameroseius parplumosus. — Narita *et al.* 2013a: 2325; Kazemi & Rajaei 2013: 66; Nemati *et al.* 2013: 19; Khalili-Moghadam & Saboori 2016: 544.

Kleemannia parplumosa. — Mašán 2017: 90.

Distribution and habitats – **Egypt**, from manure (Nasr and Abou-Awad 1986); **Saudi Arabia**, from different plants (Poales: Poaceae) and soil debris, under date palms (Alatawi *et al.* 2018).

Published material from Iran – **Fars Province**, Jahrom, from soil of citrus groves; **Guilan Province**, from soil, stored products, debris, plant foliage, leaves, wood, and manure, **Khorasan Razavi Province**, Mashhad, from soil; **Zanjan Province**, from soil, rotten wood, fungi, litter and dung (Zare *et al.* 2012); **Chaharmahal va Bakhtiari**, Esfahan, **Khuzestan and Golestan Provinces** (region not mentioned), from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Kleemannia pavidus (C. L. Koch, 1839)

Zercon pavidus C. L. Koch, 1839: Fasc. 23: 15.

Ameroseius lanceosetis Livshits & Mitrofanov, 1975: 462. Synonymy by Mašán (2017: 91).

Kleemannia pavidus. — Evans & Till 1979: 230; Mašán 2017: 91.

More information about the synonyms of this species are available in Mašán (2017: 91).

Distribution and habitats – **China**, Xinjiang Autonomous Region, on *Rattus norvegicus* Berkenhout (Rodentia: Muridae) (Ma 1996; Ye *et al.* 2000); **Germany**, in houses, stables, from manure, hay and straw and meadows (Koch 1839; Westerboer and Bernhard 1963; Rack 1970; Karg 1971a; Bregetova 1977; Buryin and Hartmann 1992; Karg 1993); **Hungary**, on grapevine (Szabó *et al.* 2009; Szabó *et al.* 2010); **Kazakhstan**, unspecified substrate (Chelebiev 1988); **Kyrgyzstan**, on *Meriones tamariscinus* Pallas (Rodentia: Muridae) (Fedorova and Kharadov 2013; Fedorova 2018); **Netherlands**, from house dust (Oudemans 1930; Westerboer and Bernhard 1963; Bregetova 1977; Karg 1971; 1993); **Russia**, (region not mentioned), unspecified substrate (from garbage pits, rotting garbage, under hay and straw in pig sties, house dust, house mouse) (Bregetova, 1977); **Slovakia**, from nests of birds, fresh cadaver of *Clethrionomys glareolus* Schreber (Rodentia: Cricetidae) (Mašán 2017); **Armenia**, unspecified substrate (from garbage pits, rotting garbage, under hay and straw in pig sties, house dust, house mouse) (Bregetova 1977); **Ukraine**, from grain storage house (Bregetova 1977), from litter and rot of trees hollows (Livshitz and Mitrofanov 1975); **United Kingdom**, from soil (Davis 1963); **Central Asia** (country not mentioned), in garbage pits, rotting garbage (Bregetova 1977);

Published material from Iran – **Guilan Province**, Somesara, on raspberry shrubs (*Rubus* spp.); Sangar, Esfahan; Shaft, Jirdeh, from rice hulls soil, stored products, debris, plant foliage, leaves, wood, and manure; **Kerman Province**, Sekonj, from poultry manure; **North East of Iran** (region

not mentioned), from stored food products; **Chaharmahal va Bakhtiari, Esfahan, Khuzestan and Gulestan Provinces** (region not mentioned), from soil, debris, soil of ants' nests and fungi (Nemati *et al.* 2018).

***Kleemannia pinicola* Ishikawa, 1972**

Kleemannia pinicola Ishikawa, 1972: 97.

Ameroseius pinicola. — Bregetova 1977: 158; Gu *et al.* 1989: 46.

Kleemannia pinicola. — Maśán 2017: 93.

Distribution and habitats – **China**, Ningxia Autonomous Region, from *Mus pahari* Thomas (Rodentia: Muridae) (Gu *et al.* 1989); **Japan**, from humus (Ishikawa 1972; 2012); **Russia**, Sakhalin Oblast, from humus and nest of rodent (Bregetova 1977; Marchenko 2002).

***Kleemannia plumea* Oudemans, 1930**

Seiulus plumosus. — Oudemans 1902: 17.

Kleemannia plumea Oudemans, 1930: 139.

Ameroseius tauricus Livshits & Mitrofanov, 1975: 462. Synonymy by Bregetova (1977).

Kleemannia plumea. — Maśán 2017: 93.

More information about the synonyms of this species are available in Maśán (2017: 93).

Distribution and habitats – **Azores Archipelago (Portugal)**, from soil (Borges *et al.* 2010); **Belarus**, Brest, unspecified substrate (from litter, hollows of trees, nest of ant and rodent) (Bregetova 1977); **Finland**, from decaying ash log (Huhta 2016); **Germany**, Lower Saxony (Ehrnsberger and Btaszak 1999); **Latvia**, from beach sand (Salmane 2005a; Salmane and Brumelis 2010); **Moldavia**, from litter, hollows of trees, nest of ant and rodent (Bregetova 1977); **Netherlands**, on red squirrel (*Sciurus vulgaris* L.) (Rodentia: Sciuridae) (Oudemans 1930); **Poland**, from leaf litter, hollows of trees and wood decay (Błaszak *et al.* 2000; Gwiazdowicz 2010; Kaczmarek *et al.* 2011; Gwiazdowicz *et al.* 2011); **Russia**, Tataria, unspecified substrate (from litter, hollows of trees, nest of ant and rodent) (Bregetova 1977); **Slovakia**, from soil, leaf litter, soil detritus and nests of bird (Maśán 2017); **Ukraine**, unspecified substrate (from litter, hollows of trees, nest of ant and rodent) (Bregetova 1977), from litter, from hollow in an oak (*Quercus* sp.), wood detritus, and nest of ants and rodents (Livshitz and Mitrofanov 1975); **Western Europe** (country not mentioned) (Bregetova 1977).

Published material from Iran – **Kerman Province**, Jiroft, from soil; **Chaharmahal va Bakhtiari, Esfahan, Khuzestan and Golestan Provinces** (region not mentioned), from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

***Kleemannia plumigera* Oudemans, 1930**

Kleemannia plumigera Oudemans, 1930: 140.

Zercozeius Gracei Hughes, 1948: 149. Synonymy by Evans (1954), and Hughes (1961).

Kleemannia plumigera. — Hughes 1976: 336; Maśán 2017: 94.

Ameroseius gilarovi Petrova (in Petrova & Koshchanova, 1986: 31). Synonymy by Maśán (2017: 94).

More information about the synonyms of this species are available in Maśán (2017: 94).

Distribution and habitats – **Austria**, from grass (Wissuwa *et al.* 2012); **Azores Archipelago (Portugal)**, from soil (Borges *et al.* 2010); **Brazil**, State of Pernambuco, from stored food (Souza *et al.* 2005), chicken nests (Faleiro *et al.* 2015); **China**, (region not mentioned), from stored products

(Chao-Peng 1984); **Denmark**, Faroe Islands, from stored hay (Hallas and Solberg 1989); **Egypt**, from rice and maize grain (El-Sayed Gad *et al.* 2020); **France**, from house dust, laying hen houses (Brady 1970; Araujo-Fontaine *et al.* 1972); **Germany**, in a building (Rack 1970; Karg 1971a; 1993); **India**, State of Haryana, from house dust (Kumud *et al.* 1989); **Latvia**, from wood (Salmane and Brumelis 2010; Salmane 2011); **Malta**, from silo and flourmill (Pfliegler *et al.* 2017); **Mexico**, from nest of *Neotoma mexicana* Baird (Rodentia: Cricetidae) (Villegas-Guzmán *et al.* 2004); **Netherlands**, from common eelgrass, *Zostera marina* L. (Alismatales: Zosteraceae) (Oudemans 1930); **Peru**, on *Zophobas opacus* (Sahlberg) (Coleoptera: Tenebrionidae) (Morote and Bardales 2004); **Philippines**, Isabel province, rice and rice litter (Corpuz-Raros and Raros 1999); **Poland**, on small mammals and from stored products (Haitlinger 1978c; Chmielewski 1990; Barczyk and Madej 2014); **Romania**, from soil (Manu 2010; Manu and Onete 2016); **Slovakia**, from soil, rotten wood and nests of *Mus spicilegus* Petényi (Rodentia: Muridae), from soil detritus with sawdust and humus, bottom of cave, organic detritus, moss on rocky walls in cave entrance, fragments of rock with guano and wood detritus, (Mašán 2017); **China**, Taiwan, from stored grains (Tjying 1970); **Turkey**, from stored products, on bell pepper (*Capsicum annuum* L.), eggplant (*Solanum melongena* L.), and nightshade plants (Solanales: Solanaceae) (Genç and Özar 1986; Çobanoğlu and Özman 2002; Çakmak *et al.* 2011; Çobanoğlu and Kumral 2014; 2016; Kumral and Çobanoğlu 2015; Kumral and Çobanoğlu 2016); **United Kingdom**, in damp cracks in stone walls and in siftings of oats (Turk 1953), from nests of birds (Fain *et al.* 1991); **United States of America**, State of Massachusetts, on pyralid moth (Treat 1975); **Uzbekistan**, from field with cotton plants (*Gossypium* sp.) (Malvales: Malvaceae), from soil substrate (Petrova and Koroleva 1986; Khmraev 2003).

Published material from Iran – Alborz Province, Mallard, Shahryar, Mohammad Shahr, from compost and mushroom, from stored products (Kazemi and Rajaei 2013).

Kleemannia plumosa (Oudemans, 1902)

Seiulus plumosus Oudemans, 1902: 17 (in part).

Ameroseius dubitatus Berlese, 1918: 143. Synonymy by Mašán (2017: 96).

Zercoseius Macauleyi Hughes, 1948: 146. Synonymy by Evans (1954), and Hughes (1961).

Lasioseius (Zercoseius) macauleyi. — Womersley 1956b: 116.

Kleemannia plumosa. — Mašán, 2017: 97.

More information about the synonyms of this species are available in Mašán (2017: 96–97).

Distribution and habitats – Australia, State of South Australia, in bark scrapings, (Womersley 1956b; Bellati *et al.* 2003); State of Western Australia, from western chestnut native mouse, *Pseudomys nanus* (Gould) (Rodentia: Muridae) (Domrow 1974, 1979; Halliday 1997); from soil and litter, Humphreys *et al.* 2006); **Brazil**, State of Rio Grande do Sul, from nest of birds (Silva 2014); **China**, Anhui Province, from stored products and small mammals, mat materials in snake house (Chao-Peng 1984; Luo *et al.* 2007; Wang *et al.* 2018; Ye *et al.* 2019); Taiwan, from stored grains (Tjying 1970); **Egypt**, on figs and birds, orchard crops, rice grain and barley grain, associated with bird [*Passer domesticus niloticus* (Nicoll and Bonhote)], leaves of mango, fig and grapes, leaves and buds of mango orchards, debris of citrus; onion, maize and bread bean, organic manures, cow and sheep manures (El Badry *et al.* 1979; El-Halawany *et al.* 1990; Shoker *et al.* 2001; Mariam *et al.* 2016; Metwally *et al.* 2016; Osman *et al.* 2016; El-Husseini *et al.* 2018; Hussian *et al.* 2018; Halawa *et al.* 2019; Mohamed *et al.* 2019; El-Sayed Gad *et al.* 2020; Marei *et al.* 2020); **Germany**, in a building (Westerboer and Bernhard 1963; Rack 1970; Karg 1971a; 1993); **Greece**, from stored cotton plants seeds and related products (Athanasios *et al.* 2002); **India**, State of Haryana, from house dust (Kumud *et al.* 1989); **Israel**, from litter and manure (Costa 1966); **Italy**, on rotting leaves (Berlese 1904); **Japan**, from haystacks and manure (Ishikawa 1972; Bregetova 1977; Ishikawa 2012); **Malta**, from silo and flourmill (Pfliegler *et al.* 2017); **Mexico**, on dog and from nest of *Neotoma mexicana*

Baird (Rodentia: Cricetidae) (Quintero 1982; Villegas-Guzmán *et al.* 2004); **Netherlands**, on bat (*Myotis dasycneme* Boie) (reported as *Vespertilio dasycneme*) (Chiroptera: Vespertilionidae), from dung and manure (Oudemans 1902; 1930; Schelvis 1991; 2007); **Poland**, from pollen and stored products, from house dust, wood decay and on rodent (Chmielewski 1985; 1990; Solarz 1998; Haitlinger and Turek 2006; Gwiazdowicz *et al.* 2011; Barczyk and Madej 2014); **Russia**, Primorsky Krai (Vladivostok), house dust, (Zheleznova and Kholin 2004); Omsk, from micromammal (Vinarskaya *et al.* 2016); **Serbia**, from hen-houses (Tomanovic *et al.* 1977); **Slovakia**, from soil, dung-hill, manure, bird nests (Mašán 2017); **Spain**, on birds (Muniz and Bretón 1994; Muniz 1996); **Switzerland**, unspecified substrate (Westerboer and Bernhard 1963); **Turkey**, from stored products (Özer *et al.* 1986; 1989; Çobanoğlu and Özman 2002; Bayram and Çobanoğlu 2005; Çakmak *et al.* 2011); **United Kingdom**, in sifted oats and detritus from warehouse floors, stored products (Hughes 1948; 1961; 1976); **United States of America**, State of Ohio, from house dust (Yoshikawa and Bennett 1979); **Ukraine**, from manure, rotting plant remains, warehouse sweeping, pig sties, ha stacks, nest of ant, bumble bees and small mammals (Bregetova 1977); **Central Asia** and **Western Europe** (country not mentioned), haystacks (Bregetova, 1977).

Published material from Iran – Chaharmahal va Bakhtiari Province, Shahrekord, from soil; **Esfahan Province**, Khomeini Shahr, Najaf Abad, soil of fruit orchards; **Kerman Province**, Jiroft, from soil; **Khorasan Razavi Province**, Mashhad, from soil; **Khuzestan Province**, Ahvaz, from soil; **Sistan va Baluchestan Province**, Sistan Region, from stored product; **West Azerbaijan Province**, Urmia, from house dust and soil; Miandoab Plain, from foliage and soil of sugarbeet fields; Khoy, from soil of sunflower fields (Salmas), soil and plant debris of apple orchards (Khoy, Salmas, Boukan, Mahabad, Urmia, Gharehziaadin), dried fruits and nuts; **Zanjan Province**, from soil; **Golestan Provinces**, from soil, debris, soil of ants' nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

Kleemannia pseudoplumosa (Rack, 1972)

Primoseius macauleyi. — Womersley 1956b: 116.

Ameroseius pseudoplumosus Rack, 1972: 249.

Ameroseius eumorphus Bregetova, 1977: 153. Synonymy by Mašán (2017: 98).

Kleemannia potchefstroomensis Kruger & Loots, 1980: 1. Synonymy by Mašán (2017: 99).

Kleemannia pseudoplumosa. — Mašán, 2017: 97.

More information about the synonyms of this species are available in Mašán (2017: 98–99).

Distribution and habitats – Azerbaijan, under plants on a peat slope on rocks (Bregetova 1977); **Canary Islands (Spain)**, fungi, plants and terrestrial animals (Oromí and García 2009); **Czechoslovakia**, on small terrestrial mammals (Daniel 1988); **Germany**, in a building (Rack 1972); **Kyrgyzstan**, on *Meriones tamariscinus* Pallas (Rodentia: Muridae) and other mammals (Fedorova and Kharadov 2013; Fedorova 2018); **Latvia**, from soil and forests (Salmane 2005a; Salmane and Brumelis 2010; Salmane 2011); **Poland**, on *Mus musculus* L. (Rodentia: Muridae) (Haitlinger and Turek 2006); **Russia**, Murmansk Oblast (Kharlov Island) and Nakhichevan, unspecified substrate (under plant on a peat on rocks, in soil from rabbit warren, on woodlice) (Bregetova 1977); **Slovakia**, unspecified substrate (Mašán 2017); **South Africa**, from compost (Kruger and Loots 1980); **Saudi Arabia**, from soil, on different plants (Poales: Poaceae) under date palm groves, from leaf debris of *Conocarpus* sp. (Myrtales: Combretaceae), *Acacia* sp. (Fabales: Fabaceae) and *Citrus* sp. (Sapindales: Rutaceae) (Alatawi *et al.* 2018); **Uzbekistan**, unspecified substrate (under plant on a peat on rocks, in soil from rabbit warren, on woodlice) (Bregetova 1977; Khmraev 2003).

Published material from Iran – Chaharmahal va Bakhtiari Province, Shahrekord, Lordegan, from soil, litter; **Khuzestan Province**, Ahvaz, from soil of ant nest; **Guilan Province**, from soil, stored products, debris, plant foliage, leaves, wood and manure; **Kerman Province**, Kerman, from

cow manure, poultry manure and sheep manure; **North Khorasan Province**, from soil and manures; **Zanjan Province**, from soil, rotten wood, fungi, litter and dung; **Esfahan and Golestan Provinces**, from soil, debris, soil of ants nests and fungi (Kazemi and Rajaei 2013; Nemati *et al.* 2018).

***Kleemannia tenella* (Berlese, 1916)**

Ameroseius tenellus Berlese, 1916a: 47.

Ameroseius lanatus Solomon, 1969: 274. Synonymy by Mařán (2017: 101).

Ameroseius fimetorum Karg, 1971a: 230. Synonymy by Mařán (2017: 101).

Kleemannia tenella. —Mařán 2017: 101.

More information about the synonyms of this species are available in Mařán (2017: 101).

Distribution and habitats – **Georgia**, from warehouse refuse (Bregetova 1977); **Germany**, from compost soil of greenhouse (Karg 1971a; 1993); **Italy**, from moss; (Berlese 1916a); **Kazakhstan**, from litter (Bregetova 1977); **Moldavia**, under hay (Bregetova 1977); **Poland**, on small mammals and nests of rodent (Haitlinger 1978c; 2010); **Romania**, from soil, on small rodents [*Apodemus sylvaticus* L. (Muridae) and *Microtus arvalis* Pallas (Cricetidae)] (Solomon 1969; Honciuc and Manu 2010; Manu and Onete 2016; Manu *et al.* 2015; 2017); **Russia**, Leningrad Oblast, Gor'kiy, Tula Oblast, Rostov Oblast, Caucasus region, unspecified substrate (from litter, rodents nest, under hay, in warehouse refuse, in hen house) (Bregetova 1977), Western Siberia, on narrow-skulled vole *Microtus gregalis* (Rodentia: Cricetidae) Malkova and Bogdanov 2004); Republic of Tatarstan, from nests of birds and micromammal (Borisova 1977; Vinarskaya *et al.* 2016); **Slovakia**, from burrow entry of *Spermophilus citellus* (Rodentia: Sciuridae), on rotting leaves and vegetation rests (Mařán 2017); **Ukraine**, unspecified substrate (from litter, rodents nest, under hay, in warehouse refuse, in hen house) (Bregetova 1977), Kharkiv province, on *Sorex araneus* L. (Eulipotyphla: Soricidae) (Naglov *et al.* 2006); **United Kingdom**, unspecified substrate (Turk 1953)

Genus *Neocypholaelaps* Vitzthum, 1943

Cypholaelaps Berlese, 1918: 117 (preocc. by *Cypholaelaps* Berlese, 1916b: 166).

Neocypholaelaps Vitzthum, 1942: 763. Replacement name for *Cypholaelaps* Berlese, 1918: 117.

Type species: *Laelaps ampullula* Berlese, 1910, by original designation.

Indoseius Evans, 1955: 107. Type species: *Indoseius stridulans* Evans, 1955, by original designation. Synonymy by Evans (1963). Not *Indoseius* Ghai & Menon, 1969 (syn.: *Indoseiulus* Ehara, 1982, replacement name for *Indoseius* sensu Ghai & Menon, 1969).

Neocypholaelaps. — Evans 1963: 210; Karg 1993: 220; Moraes & Narita 2010: 38.

For diagnosis of the genus see Mařán (2017).

***Neocypholaelaps ampullula* (Berlese, 1910)**

Laelaps ampullula Berlese, 1910: 260.

Cypholaelaps ampullula. — Berlese 1918: 117; Vitzthum 1935: 69; Castagnoli & Pegazzano 1985: 15.

Neocypholaelaps ampullula. — Mařán 2017: 104.

More information about the synonyms of this species are available in Mařán (2017: 104).

Distribution and habitats – **Indonesia**, on Indian honeybee (*Apis cerana indica* Fabricius) (reported as *Apis indica*) (Hymenoptera: Apidae) (Berlese 1910); **Malaysia**, on inflorescences of coconut (Evans 1963); **Sri Lanka**, on inflorescences of *Cocos nucifera* L. (Arecaceae: Arecaceae) (Narita *et al.* 2011); **Thailand**, on inflorescences of *Cocos nucifera* (Silva *et al.* 2014; Oliveira 2015).

Europe (country not mentioned), honey bees (Jong *et al.* 1982).

***Neocypholaelaps ceylonicus* Narita & Moraes, 2011**

Neocypholaelaps ceylonicus Narita & Moraes (in Narita *et al.* 2011: 60).

Neocypholaelaps ceylonicus. — Silva *et al.* 2014: 714; Mašán 2017: 105.

Distribution and habitats – **Sri Lanka**, on inflorescences of *Erythrina* sp. (Fabales: Fabaceae), *Hibiscus* sp. (Malvales: Malvaceae) and *Cocos nucifera* L. (Arecales: Arecaceae) (Narita *et al.* 2011); **Thailand**, on leaflets, inflorescences and fruits of *Cocos nucifera* (Silva *et al.* 2014; Oliveira 2015).

***Neocypholaelaps cocos* Evans, 1963**

Neocypholaelaps cocos Evans, 1963: 221.

Neocypholaelaps cocos. — Baker & Delfinado-Baker 1985: 232; Halliday 1997: 197; Moraes & Narita 2010: 43; Narita *et al.* 2011: 62; Mašán 2017: 106.

Distribution and habitats – **Australia**, State of Queensland, on flower of a dwarf variety of coconut (Halliday 1997); **Solomon Islands**, on inflorescence of *Cocos nucifera* L. (Arecales: Arecaceae) (Evans 1963).

***Neocypholaelaps favus* Ishikawa, 1968**

Neocypholaelaps favus Ishikawa, 1968: 38.

Ameroseius bregetovae Livshits & Mitrofanov, 1975: 463. Synonymy by Mašán (2017: 106).

Neocypholaelaps favus. — Mašán 2017: 106.

More information about the synonyms of this species are available in Mašán (2017: 106).

Distribution and habitats – **Czech Republic**, in bee hives (Haragsim *et al.* 1978); **Denmark**, in hives of honey bee (Schousboe 1986); **Greece**, on honey bee (Emmanouel *et al.* 1983); **Hungary**, in bee hives of *Apis mellifera* L. (Hymenoptera: Apidae) (Kontschán *et al.* 2015c); **Japan**, on honey bee (*Apis mellifera* L.) (Hymenoptera: Apidae) (Ishikawa 1968; 1972; 2012; Okabe and Mkino 2008); **Ukraine**, from litter (Livshits and Mitrofanov 1975); **Slovakia**, in an apiary (Fend'a and Lukáš 2014); **Turkey**, on bee (Selçuk and Aydin 2013); **Europe** (country not mentioned), on honey bees (Jong *et al.* 1982).

***Neocypholaelaps indicus* Evans, 1963**

Neocypholaelaps indica Evans, 1963: 217.

Neocypholaelaps ewae Haitlinger, 1987a: 363. Synonymy by Mašán (2017: 109)

Neocypholaelaps indicus. — Mašán 2017: 108.

More information about the synonyms of this species are available in Mašán (2017: 109).

Distribution and habitats – **China**, Beijing, on honey bees (Luo *et al.* 2010); Fujian Province, on blossom of loquat, (Ma and Lin 2006), on *Apis cerana* Fabricius (Zheng *et al.* 2018); Fuzhou, on honey bees (*Apis mellifera* L. and *A. cerana*) (Hymenoptera: Apidae), (Fan and Jiang 2014; Deng *et al.* 2019); Henan Province, unspecified substrate, Lin *et al.* 2010; Yunnan Province, on *Apis cerana* (Ge *et al.* 2017); Taiwan, on honey bee (*Apis mellifera*) (Lo and Chao 1975; Ho *et al.* 2010); Region not mentioned, on *Apis mellifera* (Teng and Pan 1964); **Egypt**, on honey bee (*Apis mellifera*) (Abou Senna 1997); **Hong Kong**, on butterflies (Mo 1969; Treat 1975); **India**, State of Kerala, on honey

bees (Kshirsagar 1968; Percy *et al.* 1968; Ramanan and Ghai 1984; Abrol and Kakroo 1997; Hanumanthaswamy *et al.* 2009; Haq *et al.* 2010); Jammu and Kashmir, on honey bees (*Apis cerana*, *A. mellifera*, *A. dorsata* Fabricius and *A. florea* Fabricius), fruit crops (Apple) (Jyothi 1994; Abrol and Putatunda 1995; Putatunda and Abrol 2003; Athreya and Reddy 2011; Kotwal *et al.* 2013; Mattu and Devi 2016; Chandra and Mattu 2017); **Hungary**, in bee hives (Kontschán *et al.* 2015); **South Korea**, on honey bee (Woo and Lee 1993); **Nepal**, on honey bee (Baker and Delfinado 1976); **Pakistan**, on honey bee (Shafi 1986); **Russia**, Moscow, on honey bee (Grobov 1974); **Sri Lanka**, on honey bees (*Apis cerana*, *A. dorsata* and *A. florea*) (Koeniger and Koeniger 1983; Evans 1963); **Turkey**, on bee (Selçuk and Aydin 2013); **Asia** (country not mentioned), on honey bees (*Apis cerana*, *A. dorsata* and *A. florea*) (Chmielewski, 1997); **Europe** (country not mentioned), on honey bees (Jong *et al.* 1982).

***Neocypholaelaps novaehollandiae* Evans, 1963**

Neocypholaelaps novaehollandiae Evans, 1963: 223.

Neocypholaelaps novaehollandiae. — Maśán 2017: 111.

More information about the synonyms of this species are available in Maśán (2017: 111).

Distribution and habitats – **New Zealand**, on honey bee (*Apis mellifera* L.) (Hymenoptera: Apidae), heads of bellbirds [*Anthornis melanura* (Sparman)] (Passeriformes: Meliphagidae), on inflorescences of *Rhopalostylis sapida* H.Wendl. and Drude (Arecaceae: Arecaceae) (Evans, 1963; Gravatt, 1969; Kar *et al.* 2015); **Europe** (country not mentioned), on honey bees (Jong *et al.* 1982).

***Neocypholaelaps pradhani* Gupta, 1969**

Neocypholaelaps pradhani Gupta, 1969: 335.

Neocypholaelaps pradhani. — Gupta 1985: 327; Moraes & Narita 2010: 43; Maśán 2017: 111.

Distribution and habitats – **India**, State of Tamil Nadu, on flowers of apple tree [*Malus domestica* (Borkh.)] (reported as *Pyrus malus*, Rosales: Rosaceae) and fig trees (Gupta 1969; Singh *et al.* 2016).

***Neocypholaelaps stridulans* (Evans, 1955)**

Indoseius stridulans Evans, 1955: 107.

Sertitympanum stridulans. — Hallan 2005.

Neocypholaelaps stridulans. — Maśán 2017: 111.

More information about the synonyms of this species are available in Maśán (2017: 111).

Distribution and habitats – **India**, Upatte, on inflorescences of coconut (*Cocos nucifera* L.) (Arecaceae: Arecaceae) (Evans 1955); State of Kerala, on inflorescences of palm (*Areca catechu* L.) (Arecaceae: Arecaceae) and coconut (Evans 1963; Haq 2001); West Bengal, on inflorescences of coconut (Bhattacharyya 1971; Banerjee and Gupta 2011); **Indonesia**, on coconut flowers (Evans 1963); **Philippines**, on coconut (Evans 1963); **Malaysia**, on coconut flowers (Evans 1963).

Genus *Pseudoamerosei* Maśán, 2017

Pseudoamerosei Maśán, 2017: 113. **Type species:** *Amerosei michaelangeli* Moraza, 2006.

For diagnosis of the genus see Maśán (2017).

***Pseudoameroseius michaelangeli* (Moraza, 2006)**

Ameroseius michaelangeli Moraza, 2006: 163.

Pseudoameroseius michaelangeli. — Maśán 2017: 113.

Distribution and habitats – **Canary Islands (Spain)**, from soil and litter of *Cheirolophus burchardii* Susanna (reported as *Cheirolophus canariensis* subsp. *subexpinnatus*) (Asterales: Asteraceae) and *Euphorbia aphylla* Brouss. Ex. Willd. (Malpighiales: Euphorbiaceae) (Moraza 2006; Oromí and García 2009).

Genus *Sertitympanum* Elsen & Whitaker, 1985

Sertitympanum Elsen & Whitaker, 1985: 119. **Type species:** *Sertitympanum separationis* Elsen & Whitaker, 1985, by original designation.

For diagnosis of the genus see Maśán (2017).

***Sertitympanum contiguum* Elsen & Whitaker, 1985**

Sertitympanum contiguum Elsen & Whitaker, 1985: 122.

Sertitympanum contiguum. — Maśán 2017: 116.

Distribution and habitats – **Mexico**, on *Dipodomys nelsoni* Merriam (Rodentia: Heteromyidae) (Bassols *et al.* 1993); **United States of America**, State of Oregon, on *Dipodomys ordii* Woodhouse (Elsen and Whitaker 1985); State of California, on elephant-eared kangaroo rat [*Dipodomys elepantinus* (Grinnell)] and Santa Cruz kangaroo rat [*Dipodomys venustus* (Merriam)] (Thomas *et al.* 1991).

***Sertitympanum nodosum* (Sheals, 1962)**

Kleemannia nodosa Sheals, 1962: 99.

Kleemannia bassolsae Vargas & Polaco, 2001: 171.

Ameroseius bassolase (sic). — Kazemi & Rajaei 2013: 64; Khalili-Moghadam & Saboori 2014: 674.

Ameroseius (*Kleemannia*) *bassolsae*. — Hajizadeh *et al.* 2013b: 150.

Sertitympanum nodosum. — Maśán 2017: 117.

Distribution and habitats – **Argentina**, unspecified substrate (Sheals 1962); **Mexico**, on Nelson's kangaroo rat (*Dipodomys nelsoni* Merriam) (Rodentia: Heteromyidae) (Vargas and Polaco 2001).

***Sertitympanum separationis* Elsen & Whitaker, 1985**

Sertitympanum separationis Elsen & Whitaker, 1985: 119.

Sertitympanum separationis. — Elsen *et al.* 1992: 113; Maśán 2017: 119.

Distribution and habitats – **United States of America**, State of Indiana, on thirteen-lined ground squirrel [*Ictidomys tridecemlineatus* (Mitchill)] (reported as *Spermophilus tridecemlineatus*) (Rodentia: Sciuridae) (Elsen and Whitaker 1985; Elsen *et al.* 1992; Whitaker *et al.* 2007).

***Sertitympanum zaheri* (El-Badry, Nasr & Hafez, 1979)**

Klemania (sic) *zaheri* El-Badry, Nasr & Hafez, 1979: 8.

Kleemannia zaheri. — Zaher 1986: 405.

Sertitympanum zaheri. — Mašán 2017: 119.

Distribution and habitats – Egypt, from litter and debris of mandarin (El-Badry *et al.* 1979; Mariam *et al.* 2016).

Genus *Sinoseius* Bai & Gu, 1995

Sinoseius Bai & Gu (in Bai *et al.* 1995: 435). Type species: *Sinoseius lobatus* Bai, Gu & Fang, 1995, by original designation.

For diagnosis of the genus see Mašán (2017).

Sinoseius lobatus Bai, Gu & Fang, 1995

Sinoseius lobatus Bai, Gu & Fang, 1995: 436.

Sinoseius pinnatus Huhta & Karg, 2010: 335. Synonymy by Mašán (2017: 121).

Sinoseius pinnatus. — Fend'a & Lukáš 2014: 174.

Sinoseius lobatus. — Mašán 2017: 121.

Distribution and habitats – China, Ningxia Autonomous Region, on long-tailed dwarf hamster (*Cricetulus longicaudatus* Milne-Edwards) (Rodentia: Cricetidae) and Yunnan red-backed vole (*Eothenomys miletus* Thomas) (Rodentia: Cricetidae) (Bai *et al.* 1995; Peng *et al.* 2015); **Finland**, from bottom of straw shed and garden soil (Huhta and Karg 2010; Huhta 2016); **Slovakia**, from nest of *Sitta europaea* L. (Passeriformes: Sittidae) (Fend'a and Lukáš 2014).

ACKNOWLEDGEMENTS

This study has been financially supported by the research deputy of Shahrekord University under grant number 141/4279 which is greatly appreciated. We are grateful to Dr. Bruce Halliday (CSIRO Division of Entomology, Canberra, Australia) and Dr. Peter Mašán (Institute of Zoology, Slovak Academy of Sciences, Slovakia) for obtaining useful copies of some papers. We are endlessly thankful to João P. Z. Narita (Luiz de Queiroz College of Agriculture, University of Sao Paulo, Piracicaba, Brazil) and Dr. Alireza Nemati (Department of Plant Protection, Shahrekord University, Iran) for the helpful suggestions and comments on the manuscript.

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اطلاعات پراکنش جهانی و زیستگاه‌های کنه‌های خانواده Ameroseiidae (Acari: Mesostigmata)

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چکیده

کنه‌های خانواده Ameroseiidae با ۱۳۸ گونه معتبر در حال حاضر در بالاخانواده Ascoidea از راسته میان‌استیگمایان قرار دارند. هفتاد و دو گونه بر اساس نمونه‌های تایپ توصیف شده‌اند و پس از آن گزارش دیگری از آنها وجود ندارد در حالی که ۶۶ گونه بارها از سراسر جهان گزارش شده‌اند. هدف از این مطالعه ارایه کاتالوگ گونه‌های گروه آخر همراه با اطلاعات پراکنش و زیستگاه هر گونه است که در ۱۲ جنس فهرست شده‌اند: *Ameroseius* (۲۱ گونه)، *Kleemannia* (۱۵)، *Neocypholaelaps* (۸)، *Epicriopsis* (۷)، *Hattena* و *Sertitympanum* (هر کدام ۴)، *Ameroseiella* (۲)، *Afrocypholaelaps*، *Asperolaelaps*، *Brontispalaelaps*، *Pseudoameroseius* و *Sinoseius* (هر کدام ۱).

واژگان کلیدی: بالاخانواده Ascoidea؛ کاتالوگ؛ پراکنش؛ بالاراسته Parasitiformes؛ آرایه‌شناسی.

اطلاعات مقاله: تاریخ دریافت: ۱۳۹۹/۱۲/۱۴، تاریخ پذیرش: ۱۴۰۰/۳/۲۲، تاریخ چاپ: ۱۴۰۰/۷/۲۳