

Scientific Note

Further records of phytoseiid (Acari: Mesostigmata: Phytoseiidae) species for Brazil

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Abstract. Phytoseiidae Berlese (Acari: Mesostigmata) is a family of predatory mites found mostly on the aerial plant parts. Several phytoseiid species are commercialized as biological control agents. Even though Brazil is the fifth country with the highest number of valid species, knowledge about the phytoseiid fauna in different Brazilian states is highly variable. The objective of this paper is to report unpublished records of phytoseiids on different Brazilian states. The list includes 20 species belonging to 13 genera. New records are reported for 11 states; the largest number of new records is reported for Santa Catarina (7), followed by Paraná (4).

Keywords: diversity, taxonomy, new records.

Species of the family Phytoseiidae Berlese (Acari: Mesostigmata) are found worldwide, primarily on the aerial plant parts, where they feed mostly on small arthropods, such as other mites and insects, although generalist species may also consume pollen, plant exudates and fungi (McMurtry et al. 2013). Due to their effectiveness as predators of agricultural pests, phytoseiids have been widely studied and several species are commercialized as biological control agents (McMurtry et al. 2013; 2015; Knapp et al. 2018).

Reports of phytoseiid species in Brazil have been published mostly in the last few decades (Moraes et al. 1986; 2004; Demite et al. 2021). Currently, approximately 230 valid species of this family have been reported from the country (Demitte et al. 2021). Even though Brazil is the fifth country with the highest number of valid species, the known distribution of phytoseiid species among different Brazilian states is highly uneven.

While examining phytoseiid mites deposited at the Acarological Collection of Departamento de Entomologia e Acarologia, ESALQ, Universidade de São Paulo (Piracicaba, São Paulo, Brazil), we became aware of several new records to a number of Brazilian states. These are here presented, by listing locality (federative units, municipality and, when available, the geographic coordinates), host plant, collection date, collector, specimens observed [female(s) and male(s)] and depository. Previous records are given only for Brazilian states, as reported in the Phytoseiidae Database (Demitte et al. 2014; 2021; <http://www.lea.esalq.usp.br/phytoseiidae/>); questionable records (i.e. *aff.* or *cf.*) were not considered.

Twenty phytoseiid species from a total of 11 states are mentioned. The highest number of new records is reported for Santa Catarina (7), followed by Paraná (4), receiving the highest number of records, followed by Bahia (2), Piauí (2), Rio Grande do Norte (2), Amazonas (1), Minas Gerais (1), Paraíba (1), Pernambuco (1), Rio de Janeiro (1) and Sergipe (1). The taxa are cited subsequently.

Amblyseinae

Amblydromalus rapax (De Leon, 1965a)

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Material examined: SANTA CATARINA – Garuva (26°01'S; 48°57'W), unidentified plant, 30-IV-2013, coll. P.R. Demite, 1 female.

Previous records: Rio Grande do Sul.

Amblyseius aerialis (Muma, 1955)

Material examined: PIAUÍ – Luís Correia, *Manihot esculenta* Crantz (Euphorbiaceae), 17-II-89, coll. A. Alencar, 1 female.

Previous records: Acre, Alagoas, Amapá, Amazonas, Bahia, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Sergipe, São Paulo and Tocantins.

Amblyseius chiapensis De Leon, 1961

Material examined: RIO DE JANEIRO – Duas Barras, *M. esculenta*, 05-III-92, coll. M.A. Tamai, 2 females.

Previous records: Acre, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Pernambuco, Rio Grande do Sul, Roraima, Santa Catarina, São Paulo and Tocantins.

Amblyseius impeltatus Denmark & Muma, 1973

Material examined: PERNAMBUCO – Igarassu, *Cocos nucifera* L. (Arecaceae), I-99, 1 female.

Previous records: Bahia, Rio de Janeiro and São Paulo.

Amblyseius operculatus De Leon, 1967

Material examined: AMAZONAS: Manaus, *Psidium guajava* L. (Myrtaceae), 18-IV-2008, coll. G.J.N. Vasconcelos, 1 female; Manaus, *Anacardium occidentale* L. (Anacardiaceae), 06-V-2008, same collector, 1 female. SANTA CATARINA – Garuva (26°01'S; 48°57'W), unidentified Myrtaceae, 03-IV-2013, coll. P.R. Demite, 1 female.

Previous records: Bahia, Ceará, Goiás, Mato Grosso, Minas Gerais, Paraíba, Pernambuco, Rio de Janeiro, Rio Grande do Sul and São Paulo.

Euseius mesembrinus (Dean, 1957)

Material examined: PARÁIBA – Taperoá, *M. esculenta*, 02-VIII-88, coll. A. Alencar, 1 female.

Previous records: Amazonas, Bahia, Ceará, Minas Gerais, Pernambuco, Rio de Janeiro, Rio Grande do Sul and São Paulo.

Iphiseiodes matatlanticae Mineiro, Castro & Moraes, 2011

Material examined: MINAS GERAIS – Prados, *Myrcia splendens* DC. (Myrtaceae), 21-VI-2012, coll. P.R. Demite, 3 females and 1 male; same collection data, except host *Myrcia tomentosa* Glaz. (Myrtaceae) and 11-XII-2012, 1 female; same collection data, except host *Calyptanthus clusiiifolia* O.Berg (Myrtaceae) and 21-VI-2012, 1 female.

Previous records: São Paulo.

Iphiseiodes moraesii Ferla & Silva, 2011

Material examined: SANTA CATARINA – Garuva (26°01'S; 48°57'W), unidentified Myrtaceae, 29-V-2012, coll. P.R. Demite, 2 females.

Previous records: Rio Grande do Sul.

Neoseiulus barkeri Hughes, 1948

Material examined: BAHIA – Piritiba, *Emilia sonchifolia* DC. (Asteraceae), 11-VIII-93, coll. W.M. Araújo, 2 females. Piritiba, “cipó-galego”, 10-XII-93, coll. M.A. Tamai, 1 female. PARANÁ – Castro, *Gerbera* sp. (Asteraceae), 25-IV-07, 1 female.

Previous records: Amazonas, Pernambuco, Piauí, São Paulo and Tocantins.

Neoseiulus fallacis (Garman, 1948)

Material examined: PARANÁ – Curitiba, *Vicia cracca* L. (Fabaceae), 08-IX-88, coll. L.A. Biasi, 9 females. SANTA CATARINA – São Joaquim, *Malus* sp. (Rosaceae), IV-85, coll. L. Gonzaga, 3 females.

Previous records: Rio Grande do Sul, São Paulo and Tocantins.

Neoseiulus idaeus Denmark & Muma, 1973

Material examined: RIO GRANDE DO NORTE – Portalegre, *Passiflora cincinnata* Mast. (Passifloraceae), 16-VI-89, coll. I.A. Almeida, 1 female; same collection data except host *Sida cordifolia* L. (Malvaceae), 1 female; same collection data except host “Comedeiro”, 1 female; same collection data except host “Roxinho”, 1 female. Riachuelo, *M. esculenta*, 21-III-89, coll. A. Alencar, 4 females; Macaíba, *M. esculenta*, 21-III-89, same collector, 14 females and 1 male; Mossoró, *M. esculenta*, 22-III-89, same collector, 8 females and 1 male. Areia Branca, *M. esculenta*, 14-VI-93, coll. W.M. Araujo, 1 female and 1 male.

Previous records: Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Paraíba, Pernambuco, Piauí, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina and São Paulo.

Paraphytoseius orientalis (Narayanan, Kaur & Ghai, 1960)

Material examined: RIO GRANDE DO NORTE – Location not mentioned (Probably Baía Formosa according to coordinates mentioned in the label: 6°28'S; 35°06'W), *Solanum paniculatum* L. (Solanaceae), 23-X-02, coll. I.P. Furtado, 7 females and 2 males.

Previous records: Acre, Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Paraíba, Pernambuco, Rio Grande do Sul, Santa Catarina, Sergipe and São Paulo.

Proprioseiopsis ovatus (Garman, 1958)

Material examined: PARANÁ – Londrina, *Phaseolus vulgaris* L. (Leguminosae), 25-VI-84, coll. S.M. Carvalho, 3 females.

Previous records: Alagoas, Amazonas, Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pernambuco, Piauí, Rio Grande do Sul, Roraima, São Paulo and Tocantins.

Ricoseius loxocheles (De Leon, 1965a)

Material examined: SANTA CATARINA – Guaruva (26°01'S; 48°57'W), unidentified Myrtaceae, 03-IV-2013, coll. P.R. Demite, 3 females.

Previous records: Bahia, Goiás, Mato Grosso, Minas Gerais, Roraima and São Paulo.

Typhlodromalus aripo De Leon, 1967

Material examined: SERGIPE – Santa Luzia, *M. esculenta*, 23-VI-90, coll. A.C. Luna, 1 female; Same collection data, except locality Propriá, 1 female.

Precious records: Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, São Paulo and Tocantins.

Typhlodromips corniformis Moraes, Barbosa & Castro, 2013

Material examined: SANTA CATARINA – Garuva (26°01'S; 48°57'W), unidentified Myrtaceae, 29-V-2012, coll. P.R. Demite, 2 females.

Previous records: São Paulo.

Phytoseiinae**Phytoseius averrhoae De Leon, 1965b**

Material examined: BAHIA – Piritiba, *Cassia* sp. (Caesalpiniaceae), 31-VIII-90, coll. A. Luna, 16 females.

Previous records: Rio Grande do Sul and São Paulo.

Typhlodrominae**Galendromus (Galendromus) annectens (De Leon, 1958)**

Material examined: PIAUÍ – “Coqueiro”, *M. esculenta*, 17-II-89, coll. A. Alencar, 1 female.

Remarks. Locality of collection in the label is referred as “Coqueiro - PI”, probably referring to Praia do Coqueiro (Coqueiro Beach) in the municipality of Luis Antonio.

Previous records: Acre, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Pernambuco, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina and São Paulo.

Metaseiulus (Metaseiulus) camelliae (Chant & Yoshida-Shaul, 1983)

Material examined: SANTA CATARINA – São Joaquim, *Malus* sp., 14-II-1984, coll. C.H.W. Flechtmann, 2 females.

Previous records: Rio Grande do Sul and São Paulo.

Metaseiulus (Metaseiulus) eiko (El-Banhawy, 1984)

Material examined: PARANÁ – Santa Tereza do Oeste (25°03'S; 53°36'W), *Solanum granulosoleprosum* Dunal (Solanaceae), 22-X-2004, coll. I.P. Furtado & L.V.F. Silva, 1 female.

Previous records: Minas Gerais, Rio Grande do Sul and São Paulo.

This study expands the number of phytoseiid species known from 11 Brazilian states. This increase in the diversity of mites in this family was expressive for the states of Santa Catarina (addition of 7 to a total of 18 species known until now in the state) and Paraná (addition of 4 to a total of 22 species known until now in the state). This study also reports the first record of *T. corniformis* after its original description from São Paulo state (Moraes et al. 2013); it is now reported from Santa Catarina state, both in the region of the Atlantic Forest.

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Figure 1. Brazilian States with new records of phytoseiid species.

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Authors' Contributions

MFCB analysed the material of the Acarological Collection of Departamento de Entomologia e Acarologia, ESALQ. MFCB and PRD prepared the manuscript. All authors revised the final version of the manuscript.

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