

Mites (Arachnida: Acari) associated with hog plum trees (*Spondias mombin* L.) in the Brazilian Amazon.

Maria do Socorro Miranda de Sousa¹, Ezequiel da Glória de Deus², Jeferson Luiz de Carvalho Mineiro³, Ricardo Adaime⁵.

1. Engenheira Florestal, Mestranda em Desenvolvimento Regional, Universidade Federal do Amapá. E-mail: mariamseng@hotmail.com
2. Biólogo, Doutorando e Biodiversidade Tropical, Universidade Federal do Amapá. E-mail: egd_bio@hotmail.com
3. Biólogo, Doutor em Ciências. E-mail: jefmim@hotmail.com
4. Agrônomo, Doutor em Agronomia (Entomologia agrícola), Pesquisador A - Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA-AP). E-mail: ricardo.adaime@embrapa.br

ABSTRACT: This is the first survey of mites associated with hog plum trees in the state of Amapá, Brazilian Amazon. We collected 32 species of mites from 17 families. Among the phytophagous mites, *Davisella spondias* Reis & Navia (Diptilomiopidae) was the most abundant species. Among predator mites, the family Phytoseiidae presented the highest richness of species.

Key words: richness, predator mites, *Tenuipalpus uvae*, *Davisella spondias*.

RESUMO: Ácaros (Arachnida: Acari) associados ao taperebazeiro (*Spondias mombin* L.) na Amazônia Brasileira. Este é o primeiro levantamento de ácaros associados a *Spondias mombin* L. no Estado do Amapá, norte do Brasil. Foram coletadas 32 espécies de ácaros pertencentes a 17 famílias. Entre os fitófagos, *Davisella spondias* Reis & Navia (Diptilomiopidae) foi a espécie mais abundante. Entre os ácaros predadores, a família Phytoseiidae apresentou a maior riqueza de espécies.

Palavras-chave: riqueza, ácaros predadores, *Tenuipalpus uvae*, *Davisella spondias*.

The knowledge of diversity, taxonomy, phylogeny and distribution for most organisms is scarce in the Brazilian Amazon, especially for megadiverse taxa such as arthropods (SILVA et al., 2005). Regarding mites, records in the region are occasional and restricted to species of economic importance. In the Amapá State, located at the northern of Eastern Amazon, only two studies were carried out aiming to survey de mites diversity. In the first one, Mineiro et al. (2009) reported the mites occurrence in *Psidium guajava* L., *Theobroma grandiflorum* (Willd. Ex Spreng.) K. Schum, *Citrus sinensis* (L.) Osbeck, *Syzygium samarangense* Merr. & Perry, *Byrsonima crassifolia* (L.) Rich., *Pouteria caimito* (Ruiz & Pav.) Radlk., *Capsicum* sp., *Vigna unguiculata* (L.) Walp, and *Manihot esculenta* Crantz. In the second one, Deus et al. (2012) drew up a list of mites associated with rubber trees (*Hevea brasiliensis* Müll. Arg.).

The hog plum (*Spondias mombin* L.) is a fruit tree species native to the lowlands of Mexico, Central America and South America

(CROAT, 1974). In Brazil, it is found mainly in the North and Northeast. Its fruits are used in the preparation of fruit pulps, ice creams, nectars, jams and juices (SACRAMENTO; SOUZA, 2000). This work reports the results of the first survey of mites associated with hog plum trees in the state of Amapá, in the eastern Brazilian Amazon.

Two experimental areas were delimited in a property within the Matapi Agricultural Colony (00°36'13,3" N; 51°27'19,5" W), in the municipality of Porto Grande: Area 1 - commercial hog plum orchard (1.600 trees, four years old); and Area 2 - hog plum trees occurring spontaneously in a dry-land forest adjacent to the orchard. Samples of hog plum leaves were taken every two weeks between November 2010 and February 2011. A total of 70 samples were collected from Area 1 and 50 samples from Area 2. Each sample consisted of leaves collected from 10 trees at random (3 leaves/plant). The samples (packed in paper bags) were taken to the Laboratório de Entomologia at Embrapa Amapá, where the material was screened as per Mineiro et al.

(2009). The acarids were mounted in Hoyer's solution on permanent slides, for subsequent identification.

A total of 28.710 mites were collected: 18,208 from Area 1 and 10,502 from Area 2. Altogether, 32 species of mites from 17 families were identified. A total of 21 species of mites were collected from Area 1 and 29 species from Area 2 (Table 1). *Davisella spondias* Reis & Navia (Diptilomiopidae) was the most abundant species in both areas (93.9% of specimens from Area 1 and 91.3% from Area 2). This mite species was recently described by Reis & Navia (2010) and reported only in *S. mombin* in Northeastern Brazil. It is possible that *D. spondias* be monophagous, feeding only on this plant species, which could explain the high abundance of this mite. However, further studies are needed to corroborate this hypothesis. *Davisella spondias* was more abundant in the orchard, probably due to the availability of food resources and uniformity of the area. In both areas, Phytoseiidae was the family of predatory mites with the highest richness of species (eight species in Area 1; and 11 in Area 2). *Iphiseiodes zuluagai* Denmark & Muma was obtained in both areas

(82 specimens in Area 1 and 28 in Area 2). The availability of food resources enables an increase in the richness of phytoseiids mites. Specimens of *Tenuipalpus uvae* De Leon were collected in both areas, with greater abundance in Area 2. This species was reported for the first time in Brazil only recently, in the states of Amapá and Pernambuco (JLC Mineiro, personal communication). In Costa Rica, Salas and Ochoa (1986) reported *T. uvae* causing fine cracks on the epidermis of hog plum fruits (affecting their quality and commercial worth), as well as a uniform yellowing of the terminal leaves. Probably the population of *T. uvae* was bounded by *D. spondias*. However, the relationship between these mites species should be further investigated.

Given the richness of species found in association with hog plum trees in this preliminary survey conducted in the state of Amapá – and abundance of *D. spondias* and the presence of *T. uvae*, a harmful species –, we suggest the completion of additional, more deeply systematized surveys, both in areas where hog plum is spontaneously found and in cultivated orchards.

Table 1. Mite species collected on hog plum trees in Porto Grande, Amapá (November 2010 to February 2011).

Species	Area 1	Area 2
ORDER MESOSTIGMATA		
☒Ascidae		
<i>Asca</i> sp.		11
☒Blattisociidae		
<i>Lasioseius</i> sp.		2
☒Melicharidae		
<i>Proctolaelaps bickleyi</i> (Bram, 1956)	1	
☒Phytoseiidae		
<i>Amblyseius</i> sp.	26	25
<i>Amblyseius perditus</i> Chant & Baker (1965)	1	10
<i>Amblydromalus</i> sp.	1	26
<i>Euseius alatus</i> De Leon (1966)		1
<i>Euseius</i> sp.		1
<i>Iphiseiodes</i> sp.	130	42
<i>Iphiseiodes zuluagai</i> Denmark & Muma (1972)	82	28
<i>Neoseiulus</i> sp.	2	1

<i>Phytoscutus</i> sp.	3	13
<i>Proprioseiopsis</i> sp.	25	16
<i>Typhlodromips</i> sp.		2

ORDER SARCOPTIFORMES**Suborder Oribatida****★Galumnidae**

sp.1		1
------	--	---

★Oripodidae

<i>Oripoda</i> sp.		1
--------------------	--	---

★Phthiracaridae

sp.1		1
------	--	---

Astigmatina Group**★Acaridae**

<i>Tyrophagus putrescentiae</i> (Schrank, 1781)	2	4
hipopus - not identified	7	83

★Histiotomatidae

sp.1	1	
------	---	--

ORDER TROMBIDIFORMES**Suborder Prostigmata****☒Cunaxidae**

<i>Armascirus</i> sp.	8	1
-----------------------	---	---

▣Diptilomiopidae

<i>Davisella spondias</i> Reis & Navia (2010)	17,105	9,593
---	--------	-------

★Echimyopodidae

<i>Blomia</i> sp.	643	355
-------------------	-----	-----

★Eupodidae

<i>Eupodes</i> sp.		1
--------------------	--	---

★Iolinidae

<i>Parapronematus acaciae</i> Baker (1965)	16	1
--	----	---

☒Stigmaeidae

<i>Agistemus</i> sp.	56	25
----------------------	----	----

Zetzellia sp.

1

***Tarsonemidae**

<i>Fungitarsonemus</i> sp.	23	13
----------------------------	----	----

Tarsonemus sp.

18

▣Tenuipalpidae

<i>Brevipalpus phoenicis</i> (Geijskes, 1939)		1
---	--	---

<i>Tenuipalpus uvae</i> De Leon (1962)	41	233
--	----	-----

<i>Tenuipalpus</i> sp.	17	10
------------------------	----	----

Total	18,208	10,502
--------------	---------------	---------------

☒ predators; ▣ phytophagous; * fungivorous; ★ generalists.

Acknowledgments

To Mr. S. Kubota for allowing access to the study site. To the Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq for the grants (post-doctoral fellowship to J.L.C. Mineiro, Research Productivity Fellowship to R. Adaime, Human Resource Stability Fellowship to E.G. Deus, and Undergraduate Research Fellowship to M.S.M. Sousa).

References

- DEUS, E. G.; SOUZA, M. S. M.; MINEIRO, J. L. C.; ADAIME, R.; SANTOS, R. S. Mites (Arachnida: Acari) collected on rubber trees *Hevea brasiliensis* (Willd. ex A.Juss.) Müll.Arg. in Santana, Amapá State, Brazil. **Brazilian Journal of Biology**, v. 72, n. 4, p. 915-918, 2012.
- CROAT, T. B. A reconsideration of *Spondias mombin* L. (Anacardiaceae). **Missouri Botanical Garden Annals**, v. 61, n. 2, p. 483-490, 1974.
- MINEIRO, J. L. C.; SILVA, W. R.; SILVA, R. A. Ácaros em fruteiras e outras plantas no Estado de Amapá. **Biota Neotropica**, v. 9, n. 2, p. 103-106, 2009.
- REIS, A. C.; GONDIM JUNIOR, M. G. C.; NAVIA, D.; FLECHTMANN, C. H. W. Eriophyoid mites (Acari: Prostigmata: Eriophyoidea) from fruit trees in Northeastern Brazil - a new genus, three new species and a redescription. **Zootaxa**, v. 2694, p. 43-53, 2010.
- SACRAMENTO, C. K.; SOUZA, F. X. **Cajá** (*Spondias mombin* L.). FUNEP, Jaboticabal, 42p. (Série Frutas Nativas, n. 4), 2000.
- SALAS, L. A.; OCHOA, R. El género *Tenuipalpus* Donn. en Costa Rica (Acari: Tenuipalpidae). **Agronomía Costarricense**, v. 10, n. 1-2, p. 207-210, 1986.
- SILVA, J. M. C.; RYLANDS, A. B.; FONSECA, G. A. B. O destino das áreas de endemismo da Amazônia. **Megadiversidade**, v.1, n. 1, p. 124-131, 2005.