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NEW HOSTS OF *BACTROCERA CARAMBOLAE* (DIPTERA: TEPHRITIDAE) IN BRAZIL

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The carambola fruit fly (*Bactrocera carambolae* Drew & Hancock) (Diptera: Tephritidae), native to Indonesia, Malaysia and Thailand (White & Elson-Harris 1992), was first reported in South America in 1975 in Paramaribo, Suriname (Sauers-Muller 1991). *Bactrocera carambolae* was detected in French Guiana in 1989, and in 1996 in the state of Amapá, Brazil, where it is under strict official control (Godoy et al. 2011).

Bactrocera carambolae is a quarantine pest in Brazil, because its presence in production areas would cause the loss of major consumers markets worldwide. Unfortunately, little information is available about this pest's population dynamics, demographics, host range, and host preferences, but such data that are essential for the establishment of control measures. The current list of carambola fruit fly hosts in Brazil is mainly based on information from the center of origin of the species. The following hosts have been reported in Brazil: *Averrhoa carambola* L. (Oxalidaceae), *Malpighia emarginata* Sessé & Moc. ex DC. (Malpighiaceae), *Psidium guajava* L. (Myrtaceae), *Pouteria caimito* Radlk (Sapotaceae), *Rollinia mucosa* (Jacq.) Baill. (Annonaceae), and *Spondias mombin* L. (Anacardiaceae) (Silva et al. 2011a). This work aimed to record new hosts of *B. carambolae* in the state of Amapá, which is situated in the extreme north of the Brazilian Eastern Amazon.

Fruits were collected in 3 municipalities in Amapá: Santana (S 00° 02' 09" -W 51° 13' 31"), Mazagão (S 00° 06' 31" -W 51° 15' 45"), and Porto Grande (N 00° 36' 13" -W 51° 27' 10"), from Jan to Dec 2012. Samples were collected and processed (individual fruits) and adult insects were obtained according to Silva et al. (2011b).

Adult *B. carambolae* flies emerged from 9 plant species in 6 families. Six of those plant species are reported here for the first time as hosts of *B. carambolae* in Brazil (marked with a black circle in Table 1). In September 2010, using the grouped fruits method, we collected a sample of *Chrysobalanus icaco* L. (79 fruits, 286 g, 160 puparia) in Macapá (N 00° 48' 30" -W 50° 45' 23"), from which 106 *B. carambolae* adults were obtained. This is the first report of *B. carambolae* on this plant species. So, in this work we report 7 new hosts of *B. carambolae* in Brazil.

In Southeast Asia, the region of origin of *B. carambolae*, Allwood et al. (1999) reported the occurrence of the carambola fruit fly on 75 plant species from 26 families. In Suriname in South America, Sauers-Muller (2005) reported 20 hosts from 9 plant families. A total of 9 species were identified as hosts in this report, 5 [*Mangifera indica* (cv. 'Tommy Atkins'), *Syzygium malaccense* (L.) Merr. & L. M. Perry, *P. guajava*, *A. carambola*, and *Manilkara zapota* (L.) P. Royen] have also been reported by the aforementioned authors. However, this is the first report of *Capsicum chinense* Jacq. (Solanales: Solanaceae), *Chrysobalanus icaco* L. (Malpighiales: Chrysobalanaceae), *Eugenia stipitata* Mc Vaughe (Myrtales: Myrtaceae), and *Pouteria macrophylla* (Lam.) Eyma (Ericales: Sapotaceae) as hosts of *B. carambolae*.

The highest number of *B. carambolae* adults were obtained from *A. carambola* and *P. guajava*. These species have been reported in Southeast Asia and in Suriname as the primary hosts of *B. carambolae* (Allwood et al. 1999; Sauers-Muller 2005). In addition, we especially note the occurrence of *B. carambolae* on fruits of *E. stipitata* and *P. macrophylla*, which are native to the Amazon region. Although the fruits of these plant species were collected in areas altered by human activity, the carambola fruit fly is able to use species of the Amazon flora as alternative hosts. Therefore, new surveys should be conducted for a better understanding of host use by the exotic species *B. carambolae* in Brazil, encompassing both exotic and native plant species.

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TABLE 1. HOSTS OF *BACTROCERA CARAMBOLAE* IN THE STATE OF AMAPÁ, BRAZIL FROM JAN TO DEC 2012.

Family/Species	Origin of host	Collection date	Location	■Fruits (C/I)	♦ Weight (g)	Puparia (n)	*Infestation (P/f)	*Anastrepha* (n)	*B. carambolae* (n)
Anacardiaceae									
Mangifera indica●	India, Burma	Jan/2012	Porto Grande	3/1	772	22	22	0	11♂, 8♀
Malpighiaceae									
Malpighia emarginata	Tropical America	Jan/2012	Porto Grande	15/2	6.9	3	1.5	0	3♀
		Aug/2012	Porto Grande	15/2	9.8	2	1	0	1♂, 1♀
		Feb/2012	Santana	15/1	4.8	1	1	0	1♂
		Jun/2012	Santana	15/1	6.6	2	2	0	1♀
		Jul/2012	Santana	15/6	28.9	18	3	1	3♂, 6♀
		Aug/2012	Santana	15/3	17.4	6	2	0	2♂, 4♀
		Sep/2012	Santana	15/2	9.4	3	1.5	0	1♂, 2♀
Myrtaceae									
Eugenia stipitata●	West Amazon	Jan/2012	Porto Grande	10/5	605	60	12	12	8♂, 10♀
		Feb/2012	Porto Grande	10/8	944	222	27.75	41	38♂, 28♀
		Aug/2012	Porto Grande	10/3	391	60	20	22	4♂
Psidium guajava	Tropical America	Apr/2012	Mazagão	15/9	510	220	24.44	55	41♂, 39♀
		May/2012	Santana	10/3	181	27	9	8	1♂, 8♀
		Jun/2012	Santana	10/2	174	53	26.5	31	7♂, 3♀
		Oct/2012	Santana	10/2	269	41	20.5	6	2♂, 1♀
Syzygium malaccense●	Southeast Asia	Apr/2012	Mazagão	10/4	214	22	5.5	0	7♂, 9♀
		Sep/2012	Mazagão	15/6	263	40	6.66	0	12♂, 14♀
		Apr/2012	Porto Grande	10/3	287	23	7.66	0	9♂, 7♀
		Sep/2012	Santana	10/1	51	2	2	0	1♀
Oxalidaceae									
Averrhoa carambola	Southeast Asia	May/2012	Porto Grande	15/7	310	95	13.57	0	18♂, 20♀
		Jun/2012	Porto Grande	10/8	253	100	12.5	0	24♂, 21♀
		Jul/2012	Porto Grande	15/9	251	76	8.44	0	11♂, 19♀
		Sep/2012	Porto Grande	15/4	113	11	2.75	0	3♂, 3♀
		Nov/2012	Porto Grande	15/12	257	64	5.33	1	25♂, 17♀
		Dec/2012	Porto Grande	15/4	63	23	5.75	0	6♂, 8♀

■ number of fruits collected/number of fruits infested; ♦ mass of infested fruits; *infestation rate, calculated exclusively from infested fruits; P/f: puparia/fruit; ● first report as host of *B. carambolae* in Brazil.

TABLE 1. (CONTINUED) HOSTS OF *BACTROCERA CARAMBOLAE* IN THE STATE OF AMAPÁ, BRAZIL FROM JAN TO DEC 2012.

Family/Species	Origin of host	Collection date	Location	■Fruits (C/I)	◆ Weight (g)	Puparia (n)	*Infestation (P/f)	*Anastrepha* (n)	*B. carambolae* (n)
Sapotaceae									
Manilkara zapota●	Central America	Apr/2012	Porto Grande	15/1	117	1	1	0	1♂
		May/2012	Porto Grande	10/1	85	5	5	0	2♂
Pouteria macrophylla●	Amazon Forest	Jan/2012	Porto Grande	10/1	77	2	2	0	1♂, 1♀
		Feb/2012	Porto Grande	10/2	104	17	8.5	0	5♂, 9♀
		Nov/2012	Porto Grande	15/1	36	4	4	0	1♂, 1♀
		Dec/2012	Porto Grande	10/4	140	29	7.25	0	4♂, 8♀
Solanaceae									
Capsicum chinense●	South America	Feb/2012	Porto Grande	15/3	28	8	2.66	0	3♂, 3♀

■ number of fruits collected/number of fruits infested; ◆ mass of infested fruits; *infestation rate, calculated exclusively from infested fruits; P/f: puparia/fruit; ● first report as host of *B. carambolae* in Brazil.

SUMMARY

Seven plant species are reported for the first time as hosts of *Bactrocera carambolae* in Brazil. *Eugenia stipitata* and *Pouteria macrophylla*, native to the Amazon region, have already been reported as hosts of the carambola fruit fly. The largest number of specimens was obtained from fruits of *Averrhoa carambola* and *Psidium guajava*.

Key Words: carambola fruit fly, host plant, quarantine, Amazon

RESUMO

Sete espécies vegetais foram registradas pela primeira vez como hospedeiras de *Bactrocera carambolae* no Brasil. *Eugenia stipitata* e *Pouteria macrophylla*, nativas da região Amazônica, foram reportadas como hospedeiros da mosca-da-carambola. O maior número de espécimes foi obtido de frutos de *Averrhoa carambola* e *Psidium guajava*.

Palavras-Chave: mosca-da-carambola, plantas hospedeiras, quarentena, Amazônia

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