

Notes and Comments

Arsenura and *Titaea* (Lepidoptera: Saturniidae: Arsenurinae): new records for the Cerrado of Northeast Brazil

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The Northeast region occupies 18.27% of the Brazilian territory with phytophysiognomies of the Amazon Forest, Atlantic Forest, Cerrado and Caatinga (exclusive to this region) biomes (Santos et al., 2020). About 46% of the native area of the Cerrado, one of the main biodiversity hotspots in the world, are converted to pasture or agricultural crops (Hofmann et al., 2021). The area protected of the Cerrado is only 2.2%, increasing the risk of species extinction, including those endemics to this biome (Ferro et al., 2010).

Arsenura and *Titaea* (Lepidoptera: Saturniidae: Arsenurinae) are exclusively Neotropical with 35 species described (Furtado, 1999; Camargo et al., 2011; Brechlin and Meister, 2013). Three species of the genus *Arsenura* (Camargo and Becker, 1999; Miranda et al., 2015; Brechlin and Meister, 2013) and three of *Titaea* (Lemaire, 1980; Camargo and Becker, 1999; Câmara et al., 2011) are reported for the Northeast region of Brazil. Two species of *Arsenura* and two of *Titaea* are reported for Maranhão state, Brazil (Câmara et al., 2011; Camargo and Becker, 1999; Brechlin and Meister, 2013). The number of species of these genera may be higher in this state, due to its size (2nd largest state in the northeast region) and its proximity to the Amazon biome, where more species are found. The objective was to report new records of moth species of the *Arsenura* and *Titaea* genera for the Maranhão state and the northeast region of Brazil in the Cerrado biome.

Species of the *Arsenura* and *Titaea* genera were collected in the Mirador State Park between the sources of the Itapecuru and Alpercatas rivers (06°10'S, 044°43'W and 06°42'S, 045°54'W) in the municipalities of Fernando Falcão, Formosa da Serra Negra and Mirador, Maranhão state, Brazil with a light trap using a white sheet (3×2 m) and a 250-watt mercury vapor (UV) lamp powered by a generator during waning and/or new moon nights between 6:00 P.M. and 6:00 A.M. from October 2006 to March 2012, in 122 nights. The vegetation of this park is of the Cerrado type with a sub-humid climate, annual rainfall of 1,200 to 1,400 mm and average maximum and minimum temperatures of 33°C and 19°C, respectively.

Individuals of *Arsenura* and *Titaea* were identified based on external and internal morphology, genitalia dissection and the literature (Lemaire, 1980) and deposited in the Zoological Collection of Maranhão (CZMA), located at Campus Caxias of the Universidade Estadual do Maranhão, Brazil. The validity of the scientific names of the host plants was verified (POWO, 2020)

Arsenura armida armida (Cramer, 1779), *Arsenura beebei* Fleming, 1945, *Arsenura sylla maranhensis* Brechlin & Meister, 2013, *Titaea tamerlan amazonensis* Lemaire, 1980 and *Titaea timur* (Fassl, 1915) were collected. *Arsenura beebei* is a new record for the Northeast and for the Cerrado biome and *T. tamerlan amazonensis* is a new record for the Maranhão state, Brazil.

Arsenura armida armida (Cramer, 1779) (Figure 1B)

Distribution: Argentina, Bolivia, Brazil (Amapá, Amazonas, Bahia, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Rio de Janeiro, Rio Grande do Sul, Rondônia, São Paulo and Santa Catarina states), Colombia, Ecuador, French Guiana, Guyana, Panama, Peru, Suriname and Venezuela (Lemaire, 1980; Marinoni et al., 1997; Camargo and Becker, 1999; Prestes et al., 2009; Siewert et al., 2010; Miranda et al., 2015; Santos et al., 2015; Molina-Nery et al., 2017; Albertoni et al., 2018; Bonatto et al., 2019; Mielke et al., 2020). Host plants: *Annona montana* Macfad, *Rollinia longifolia* A. St.-Hil (synonymy= *Annona dolabripetala*), *Rollinia membranacea* Triana & Planchon (synonymy= *Annona rensoniana*), *Rollinia mucosa* (Jacq) Baill (synonymy= *Annona mucosa*) (Annonaceae), *Bombacopsis quinata* Jacq (synonymy= *Bombax ceiba*) (Bombacaceae), *Acacia mearnsii* De Wild., *Erythrina fusca* Lour (Fabaceae) e *Bombax ceiba* L., *Ceiba insignis* (Kunth) Gibbs & Semir, *Ceiba pentandra* (L.) Gaertn, *Chorisia speciosa* A. St.-Hil (synonymy= *Ceiba speciosa*), *Guazuma tomentosa* Kunth (synonymy= *Guazuma ulmifolia*), *Guazuma ulmifolia* Lam, *Heliocarpus americanos* L., *Heliocarpus appendiculatus* Turcz., *Heliocarpus donnellsmithii* Rose ex Donn., *Luehea candida* Moç & Sessé ex DC, *Luehea divaricata* Mart., *Pachira aquatica*

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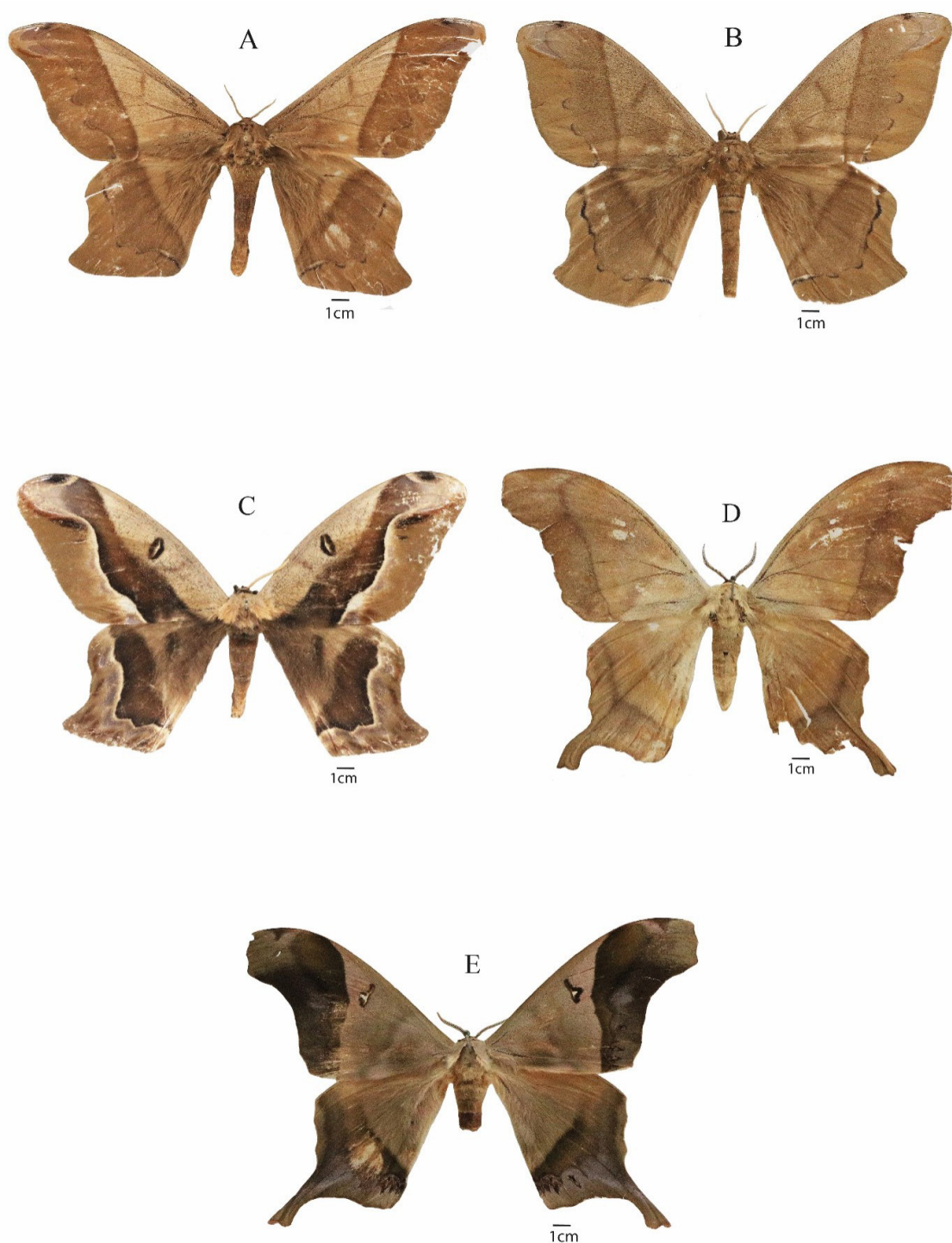


Figure 1. Adults of *Arsenura beebei* (A), *Arsenura armida armida* (B), *Arsenura sylva maranhensis* (C), *Titaea tamerlan amazonensis* (D) and *Titaea timur* (E) (Lepidoptera: Saturniidae: Arsenurinae) collected in the Mirador State Park, Maranhão, Brazil, with a light trap.

Aubl, *Pachira quinata* (Jacq) W. Alverson (synonymy= *Bombax ceiba*), *Pseudobombax ellipticum* (Kunth) Dugand, *Sterculia excelsa* Mart. and *Theobroma cacao* L. (Malvaceae) (Stone, 1991; Diniz et al., 2001; Kowalczyk et al., 2012;

Molina-Nery et al., 2017; Mejia et al., 2020). Registration: Brazil– Maranhão, Mirador State Park, Geraldina Base, light trap, 19-20.xii.2006, F. Limeira-de-Oliveira, 6 specimens; idem 11-15.xi.2007, J.C. Silva, 2 specimens; idem 17-21.

ii.2007, F. Limeira-de-Oliveira & J.C. Silva, 3 specimens; idem 05-08.i.2008, J.C. Silva & M.J. Almeida-Holanda, 1 specimen; idem 08-13.iii.2008, F. Limeira-de-Oliveira & J.C. Silva, 5 specimens; idem 27.x-01.xi.2008, F. Limeira-de-Oliveira, 1 specimen; idem Cágados Base, 26.xi-03.xii.2011, A. A. Santos, T. M. A. Lima & F. Limeira-de-Oliveira, 2 specimens.

Arsenura beebei Fleming, 1945 (Figure 1A)

Distribution: Brazil (Amapá), Guyana, French Guiana, Venezuela (Lemaire, 1980), and Trinidad and Tobago (Kelly and Cock, 2018). Host plants: *Cecropia peltata* L. (Urticaceae) (Kelly and Cock, 2018). New record for the Maranhão state and Northeast Brazil. Host plants: no information. Registration: Brazil– Maranhão, Mirador State Park, Geraldina Base, light trap, 17-21.ii.2007, F. Limeira-de-Oliveira & J.C. Silva, 1 specimen, idem 08-13.iii.2008, 6 specimens.

Arsenura sylla maranhensis Brechlin & Meister, 2013 (Figure 1C)

Distribution: Brazil (Maranhão), (Brechlin and Meister, 2013). Host plants: *Hirtella racemosa* Lam. (Chrysobalanaceae), *Luehea candida* Moç & Sessé ex DC (Malvaceae), *Calycophyllum candidissimum* (Valh) DC.) (Rubiaceae) (Mejia et al., 2020). Registration: Brazil–Maranhão, Mirador State Park, Geraldina Base, light trap, 20-24.xii.2006, J.C. Silva, 12 specimens; idem 11-15.xi.2007, J.C. Silva 7 specimens; idem 05-08.i.2008, J.C. Silva & M. J. Almeida-Holanda, 2 specimens; idem 22.ii-01.iii.2009, F. Limeira-de-Oliveira, 1 specimen; idem Cágados Base, 26.xi-03.xii.2011, 4 specimens.

Titaea tamerlan amazonensis Lemaire, 1980 (Figure 1D)

Distribution: Brazil (Amazonas, Bahia, Pará, Mato Grosso), Colombia, Ecuador, French Guyana, Guiana, Suriname, Peru (Lemaire, 1980, Miranda et al., 2015). New record for Maranhão. Host plants: *Bombax* L., *Brachychiton populneus* (Schott & Endl) R. Br., *Ceiba pentandra* (L.) Gaertn., *Chorisia speciosa* A.St.-Hil. (synonymy= *Ceiba speciosa*), *Goethalsia meiantha* (Donn. Sm.) Burret, *Pachira aquatica* Aubl., *Pachira quinata* (Jacq.) W.S. Alverson (synonymy= *Bombax ceiba*) e *Tilia platyphyllos* Scop. (Malvaceae) (Mejia et al., 2020). Registration: Brazil – Maranhão, Mirador State Park, Geraldina Base, light trap, 11-15.xi.2007, F. Limeira-de-Oliveira & J.C. Silva, 2 specimens; idem Maranhão, Mirador, Sítio Melancia, F. Limeira-de-Oliveira & J.C. Silva, 1 specimen.

Titaea timur (Fassl, 1915) (Figure 1E)

Distribution: Colombia, Brazil (Amazonas, Maranhão, Mato Grosso, Pará; Rondônia), Ecuador, Peru (Lemaire, 1980; Camargo and Schmidt, 2009; Câmara et al., 2011; Miranda et al., 2015). Record: Brazil – Maranhão, Mirador

State Park, Geraldina Base, light trap, Mosquito Base, 04-08.ii.2011, F. Limeira-de-Oliveira, 1 specimen.

The record of *A. beebei* in the Northeast expands the distribution of this species, previously recorded in the Amazon biome, northern Brazil (Lemaire, 1980) and Trinidad and Tobago (Kelly and Cock, 2018). This biome shares with the Cerrado in the Maranhão state and the proximity between them increases common species (Camargo, 2001). In addition, the heterogeneity of the Cerrado facilitates the adaptation of species from other biomes, such as those of Saturniidae recorded in the Amazon and Atlantic Forest (Braga and Diniz, 2015). The polyphagy of Saturniidae species and similar climatic variations also facilitate the simultaneous colonization of different Brazilian biomes by them (Camargo and Becker, 1999).

The records of *A. beebei* and *T. tamerlan amazonensis* as new for the Maranhão state increase the importance of studying species of these genera of Arsenurinae in this region. Knowledge of Saturniidae subfamilies, including Arsenurinae in the Northeast region is lower than that in the Southeast and South regions of Brazil (Mielke et al., 2020). The last records published of Saturniidae in the Cerrado of Maranhão were the description of *Paradaemonia balsasensis* Mielke & Furtado, 2005 and *Rhescyntis reducta* Camargo & Becker, 2001 (Becker and Camargo, 2001; Mielke and Furtado, 2005).

Arsenura beebei, as a new record for the Maranhão state, Northeast and the Cerrado biome of Brazil and *T. tamerlan amazonensis* for Maranhão, expand the knowledge on the fauna of these genera of the Arsenurinae in Brazil.

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