

SCIENTIFIC NOTE: *ASTRAPTES TALUS* IN JAMAICA, WEST INDIES (HESPERIIDAE: EUDAMINAE)

Thomas Turner,¹ Vaughan Turland,² and Dionne Newell³

¹12 Kingfishers Cove, Safety Harbor, FL 34695; ²Birdlife Jamaica, Content Property, Santa Cruz P.O., Jamaica;

³Natural History Division, Institute of Jamaica, Kingston, Jamaica

Abstract - The occurrence, distribution and notes on the biology of *Astraptus talus* (Cramer) in Jamaica are discussed. *Mucuna pruriens* (L) DC (Fabaceae) is recorded as a local native larval food plant.

Key words: Jamaica, early collecting records, Eudaminae, Fabaceae, *Mucuna*, immature stages, parishes, distribution

The writing of *Jamaica and its Butterflies* began in the early nineteen sixties, but publication did not occur until some ten years later in 1972. At that time authors Brown and Heineman were aware of a publication by R. C. Williams (1927) that noted that *Astraptus talus* (Cramer, 1777) was present in Jamaica. They also noted that this species had been recorded from Cuba, Hispaniola, Puerto Rico, in the Greater Antilles and St. Vincent in the Lesser Antilles as well as “on the mainland where it ranges from Mexico to Brazil”. They also commented “there is no recent, well authenticated material available” to support this species’ presence in Jamaica.

Unknown to those authors at that time was the capture of a male *A. talus* on April 25, 1953 and a female on December 19, 1955 by Christopher McConnell at Watermount, St. Catherine Parish. In April 1969 another female was collected by Jennifer Hopwood on a window screen at Worthy Park, St. Catherine Parish, about 10 km northwest of Watermount. These three specimens were eventually deposited in the senior author’s collection. The original handwritten labels have been retained, newer labels have been added. Damage to thorax and abdomens on the Watermount specimens was repaired using Plasticene.

In June 1979, the senior author was called to a residence near Constant Spring, Kingston & St. Andrew Parish about 30 km southeast of Watermount, to determine what could be done to control caterpillars destroying an imported *Mucuna* vine similar in appearance to *Mucuna bennetti* F.Muell. (Fabaceae). Eggs, as well as caterpillars, which were shredding and rolling leaves, were collected. From these, pupae and adult *A. talus* were obtained. Specimens were retained in the senior author’s collection and voucher specimens were deposited at the Institute of Jamaica (IOJ), Kingston, and the McGuire Center for Lepidoptera and Biodiversity (MGCL), Florida Museum of Natural History, University of Florida, Gainesville.

A brief description of the immature stages was included (page 190) in the *Butterflies of the West Indies and South Florida* by Smith, Miller and Miller (1994). Additional notes are now included.

In the March 2007 edition of *Birdlife Jamaica*, Executive Member Vaughan Turland noted that he had seen and photographed *A. talus* at Content Property 5 km west of Santa Cruz, St. Elizabeth Parish. He subsequently observed this species at White Hill, 3 km west of Maggotty, St. Elizabeth Parish and at the Jamaica Public Service Hydro Electric Plant (Maggotty Hydro) 3 km southeast of Maggotty. These are the

first records of this insect in western Jamaica.

Junior author Dionne Newell collected voucher specimens from Maggotty Hydro on March 9 and 19, 2007 and March 5, 2008 and another specimen at Ginger Hall near Troja, St. Catherine Parish on January 27, 2009. The latter location is about 25 km northeast of Watermount. Meanwhile, Jan van den Broek positively identified this distinctive species on Long Mountain south of the University of the West Indies, Mona Campus, 4 km southeast of Constant Spring, Kingston and St. Andrew Parish in December 2006. Records are summarized in Table 1 and Figure 4.

NOTES ON THE IMMATURE STAGES

Larval food plants (Figs. 1A, B): In addition to the introduced *Mucuna bennetti* (Fig. 1A), the second author observed oviposition on a vine identified as *Mucuna pruriens* (L) D. C. (Fig. 1B), at both Content Property and at White Hill. The plant is locally known as “pod cowitch” for the urticaceous hairs which blow off the mature seed pods. This is the first record of a native larval food plant in Jamaica for this butterfly.

Oviposition and eggs (Figs. 2A, 2B, 2C): With host *M. bennetti*, eggs were laid on the leaf petioles and prominent leaflet veins of terminal shoots. No oviposition was observed on the lamina of the tripinnate leaves. As many as 38 eggs were deposited on a single petiole, with each spaced approximately 5 mm apart (Figs. 2A). On *M. pruriens*, which has smaller leaves, five to eight eggs were laid on the unfolding leaf petioles of terminal shoots (Fig. 2C). On both plants, eggs of differing ages were deposited on the same petiole as indicated by egg color changes from off-white to light brown and then dark brown before eclosion. Eclosion occurs between five and seven days after oviposition. Eggs are conical, tapered to the flattened micropyle, flattened where attached to the substrate. They are strongly ribbed both vertically and horizontally with 10 to 12 vertical ribs; the vertical ribs are stouter than horizontal ribs. The dark brown head capsule of the larva appears as a circular spot under the micropyle just prior to emergence. The larva consumes the micropylar area as it emerges, but most of the remaining chorion is not eaten. The chorion is not dorso-ventrally compressed prior to emergence as occurs with *Astraptus anaphus anausis* (Godman and Salvin, 1896) (Turner, unpublished). Oviposition has been observed in June and July in Kingston and St. Andrew Parish in the east and in three consecutive years between November and March in St. Elizabeth Parish, in the west of the island.

Larvae (Fig. 2D): Larvae are similarly colored in all five larval instars. They form tents by folding portions of leaf from the leaf margin or lamina or by leaf rolling. In the first two instars there may be several larvae on one leaflet, but then they disperse and remain solitary for the remaining instars, rolling leaves to form a shelter within which they remain concealed, then creating new larger shelters as they increase in size. The head is dark brown to black, slightly notched medially on the dorsum without lateral color spots (cf. *A. anaphus anausis*, the larvae of which have a prominent circular lateral orange spot on each side of the head) (Turner, unpublished). Ocelli are shining black, but the remainder of the head is duller with a fine white pile which extends onto the dark reddish brown thoracic and abdominal segments. The first thoracic segment bears a



Fig.1A. *Mucuna bennetti*.



Fig.2A. Eggs of differing ages and empty egg cases on *M.bennetti*.



Fig.2B. Empty egg cases and first instar larval leaf damage patterns on *M.bennetti*.



Fig.2D. Fifth Instar larva in opened leaf.



Fig.1B. *M. pruriens* flowers and maturing seedpods.



Fig.2C. Freshly laid eggs on petioles of *M.pruriens*.



Fig.2E. Pupa in exposed pupal nest. Dorsal aspect. Note absence of waxy bloom.



Fig.3A. Female ovipositing on *M. pruriens*. Content Property, January 26, 2009.

Fig.3B. Female at rest. Ventral aspect. Content Property, January 2, 2007.



Fig.3C. Female at rest. Dorsal aspect. Content Property, January 2, 2007.



Fig.3D. Male. Dorsal. Constant Spring, July 26, 1979.

Fig.3E. Male. Ventral. Constant Spring July 26, 1979.

Fig. 1-3 Life history of *Astraptes talus* in Jamaica.

black dorsal prothoracic shield and there are 10 to 11 conspicuous dull yellow transverse inter-segmental bands across the dorsum with the three thoracic and last two abdominal bands being narrower than the remaining bands. A narrow, slightly darker, mid-dorsal line is visible on the dark brown segments but is not visible under the yellow bands.

Those larvae reared on *M. bennetti* in captivity reached an average length of 38.0-42.0 mm (average 40mm) (n=21) and the resulting adults had an average wing length of 22.35 mm (n=15). This is smaller than wild caught adults which had wing lengths between 22.0-28.0mm (average 25.28 mm) (n=7), suggesting that larvae do grow larger in the wild.

The larvae live within a leaf shelter throughout development and prior to pupation create an elaborate nest comprised of several joined leaves in which the pupa rests. The larval stages in captivity last an average of 16-20 days (average 18 days) (n=21).

Pupae (Fig. 2E): Pupae are dark brown with a grey brown head and a pair of black raised "false eyespots" at the wing-base, with or without a blue gray waxy bloom. The anterior portion of the head is bluntly rounded and slightly narrower than the thorax. The abdomen widens to the third visible segment and then tapers gradually to the cremaster. There is a faint dark brown mid-dorsal line. The cremaster is well developed, approximately 3mm long and slightly curved ventrally. Pupae are attached firmly at the cremaster within the rolled silk lined leaf but have a weak thoracic girdle attaching each pupa to the leaf. This arrangement is also found in *A. fuligator* (Walch, 1775), but not in *A. anaphus* (Cramer, 1777), which is suspended within a well developed silken thoracic sling. (Turner, unpublished). The pupae are 28-30 mm long (average 28.6mm) (n=15).

Adults emerge from those pupae lacking a waxy bloom after 8-10 days (average 8.7) (n=15). It is possible that some pupae with the bloom may enter diapause as a mechanism for withstanding periods of drought as suggested by the absence of the adults during drier months of the year.

Adults (Figs. 3A, B, C, D, E): Adults have now been collected or observed in most months of the year with the exception of May and between August and October.

Our observations confirm that this species normally occupies the forest canopy, in agreement with Schwartz (1987), and Smith *et al.* (1994), but descends to nectar on flowering plants and to oviposit on lower growing *Mucuna pruriens* vines at the edge of forested localities. Taking nectar has been observed on *Bidens pilosa* var. *radiata* Sch. Bip., *Lantana camara* L. and a plant similar to *Pachyrhizus tuberosus* (Lam) Spreng in fields adjacent to forest between the hours of 10:00 and 15:30. Oviposition has been observed between 11:00 and 14:00 in St. Elizabeth Parish and as early as 10:00 in Kingston and St. Andrew Parish.

Schwartz (1989), from observations in the Dominican Republic, inferred that *A. talus* might be univoltine. We record two extended periods of reproduction, one in July-August, with evidence that this period starts in June, and again between November and March.

Voucher specimens: Two additional males and two females have been deposited at the McGuire Center for Lepidoptera and Biodiversity (MGCL), Florida Museum of Natural History, University of Florida, Gainesville from the senior author's collection. Four specimens, two males and two females, from western Jamaica have been added to the IOJ collection, Kingston, Jamaica (Table 1. AT1 - AT4).

DISCUSSION

Brief descriptions of the larval food plants and immature stages of *A. talus* have been noted by several authors. Sepp (1841) illustrated the larva and pupa (as *lucidator*) from

Surinam and gave the larval food plant as *Paullinia* L. (1753) (Sapindaceae), a genus represented by two widespread species in Jamaica. Riley (1975), referring to Sepps' illustrations, noted that "the caterpillar is black, the segments divided by a thin transverse dirty yellow line; head grey, with a median black stripe; prolegs red." Bates (1935a) in Cuba noted the larval food plant as *Guarea* Allam. ex. L. (1771), (Meliaceae). The species noted was *trichilioides*, which is related to *G. swartzii* DC. (1824), a plant that is widespread in Jamaica.

Restating previous descriptions of the larva in Cuba, Hernandez (2004) notes that the larval head is dark red, almost black, a red prothorax with a transverse black line (presumably the black pro-thoracic shield) and red prolegs, which differs from Jamaican material where these structures are black, black edged posteriorly with pink, and dull black, respectively. Hernandez notes that the body is black with the segments divided by thin transverse dirty yellow bands and a dark median line. He records *Canavalia ensiformis* (L.) DC. (Fabaceae) and two species of *Stizolobium* syn. *Mucuna deeringianum* (Bort) Merr., and *M. pruriens* as food plants in Cuba. These three plant species are also found in Jamaica.

Miller *et al.* (2007, p.197) record the larval food plant in Costa Rica as *Mucuna* and illustrate a jet black larva with black head and ten bright yellow inter-segmental bands. Agostini *et al.* (2006) in Brazil record species of *Mucuna* as larval food plants. There appear to be minor differences in larval coloration from location to location, the significance of which still has to be determined.

Each reproductive period follows a month of high rainfall: May and October. Scientific Research Council (1963) rainfall records for Jamaica show these are the islands' wettest months. These months follow the much drier months of April and September. After the rains the larval food plants put on new flushes of growth, which appear necessary for oviposition. It is also of interest that mature seedpod formation occurs at the end of each breeding period in August and between November and March. Adams, (1972) and Agostini *et al.* (2006) note that the icterine bird *Cacicus haemorrhous* (L.) nectars on *Mucuna japira* Adans. and preys on caterpillars and pupae of *A. talus* found on that plant in southeastern Brazil. In Jamaica there are three species of cuckoos and an icterine which are predominantly insectivorous and which forage in habitats where *A. talus* occurs. Hairs shed from the dried pods of *Mucuna pruriens* through mechanical disturbance or strong winds are a known irritant to primates. Whether these serve as a deterrent to foraging birds or not needs investigation.

ACKNOWLEDGEMENTS

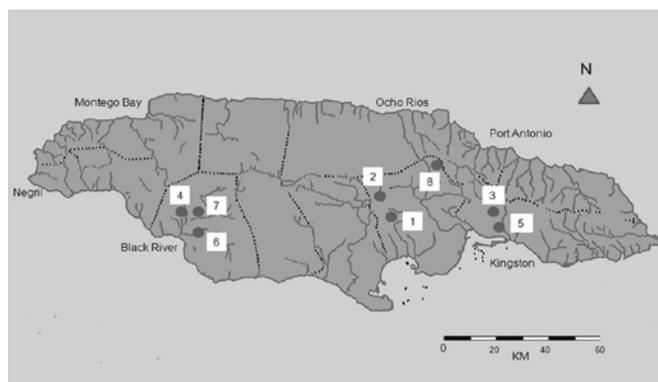
The authors would like to acknowledge the late George Austin (MGCL) and Andrew Warren as well as the anonymous reviewers who examined this publication and made suggestions for improvement. Also thanks to Christopher McConnell, David and Jennifer Hopwood, Jan van den Broek, Elizabeth Morrison for her assistance with field work and to Leonard Wright (IOJ) who assisted with field work and curation, and Keron Campbell (IOJ) for plant identifications.

Table 1. Distribution records for *Astrartes talus* (Cramer) in Jamaica.

Date	Map Ref	GPS	Place	Parish	Specimen	Sex
25 April 1953	1		Water Mount	St. Catherine	Author's collection	m
19 December 1955	1	-	Water Mount	St. Catherine	Author's collection	f
April 1969	2	-	Worthy Park	St. Catherine	Author's collection	f
June 1979	3	-	Constant Spring	Kingston & St. Andrew	All stages	-
18 December 2006	4	N18°09.348' W 77° 7.130'	White Hill, Maggotty	St. Elizabeth	Ovipositing	f
26 December 2006	5	-	Long Mountain, Mona Campus, UWI.	Kingston & St. Andrew	Sighted	-
November to March, 2007 - 2009	6	N18° 04.585' W77° 4.692'	Content Property, Santa Cruz	St. Elizabeth	>100 sightings; and ovipositing	f
10 March 2007	7	N18°08.379' 77°45.146'	JPS Hydro Station, Maggotty	St. Elizabeth	Sighted	-
9 March 2007	7	N18°08.379' 77°45.146'	JPS Hydro Station, Maggotty	St. Elizabeth	AT1	m
19 March 2007	7	N18°08.379' 77°45.146'	JPS Hydro Station, Maggotty	St. Elizabeth	AT2	m
5 March 2008	7	N18°08.379' 77°45.146'	JPS Hydro Station, Maggotty	St. Elizabeth	AT3	f
27 January 2009	8	N18°11'40.9" 76°56'00.5"	Ginger Hall, Troja	St. Catherine	AT4	f

REFERENCES CITED

- Adams, C.D.**
1972. *Flowering Plants of Jamaica*. The University Press, Glasgow, 848pp.
- Agostini, K., M. Sagina, I. Sagina**
2006. Bird Pollination of Explosive Flowers While Foraging for Nectar and Caterpillars. *Biotropica* 38(5):674-678.
- Bates, D. M.**
1935. The Butterflies of Cuba. *Bull. of the Mus. of Comp. Zool.* 78: 63-258.
- Brown, F. M. & B. Heineman**
1972. *Jamaica and its Butterflies*. Claxsey, London. pp. 346-371.
- Hebert, P. D. N., E. H. Penton, J. M. Burns, D. H. Janzen, and W. Hallwachs**
2004. Ten species in one: DNA barcoding reveals cryptic species in the neotropical skipper butterfly *Astrartes fulgerator*. *Proc. Natl. Acad. Sci.* 101: 14812-14817.
- Hernandez, L. R.**
2004. *Field Guide of Cuban – West Indies Butterflies*. Ediluz, Maracaibo, pp. 165-169.
- Miller, J., D.H. Janzen, & W. Hallwachs**
2007. *100 Butterflies and Moths: portraits from the tropical forests of Costa Rica*. Harvard University Press, Harvard, 256p. (pp. 197-198).
- Riley, N.D.**
1975. *Butterflies of the West Indies*. Collins, London, pp.164-165.
- Schwartz, A.**
1989. *The Butterflies of Hispaniola*. University of Florida Press, Gainesville. pp. 35-42.
- Sepp, J.**
1841. *Surinaamsche Vlinders*. J.C.Sepp en Zoon, Amsterdam. 1.p. 77, pl. 35.
- Smith, D. S., L. D. Miller, and J. Y. Miller**
1994. *Butterflies of the West Indies and South Florida*. Oxford University Press, Oxford, pp. 190-192, pl. 2.
- Turland, V. A.**
2007. *The Broadsheet*. Birdlife Jamaica, Dept. of Life Sciences, University of the West Indies, Mona, Kingston, Jamaica 85: 3.
- Williams, R. C.**
1927. Studies in the Neotropical Hesperioidea. *Trans. Amer. Ent. Soc.* 53: 261-292, pls. 24, 25, figs. 1-34.

Fig. 4. Distribution of *Astrartes talus* in Jamaica (see Table 1 for details).