

LIVING WORLD

Journal of the Trinidad and Tobago
Field Naturalists' Club

admin@ttfnc.org

ISSN 1029-3299



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Polar, P., Cock, M.J., Seales, T.L. 2011. Painful Encounters with Caterpillars of *Megalopyge lanata* (Stoll), (Lepidoptera: Megalopygidae) in Tobago, Trinidad and Tobago, West Indies. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2011, 01-05.

Painful Encounters with Caterpillars of *Megalopyge lanata* (Stoll), (Lepidoptera: Megalopygidae) in Tobago, Trinidad and Tobago, West Indies

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ABSTRACT

Shinney is a colloquial term used to describe a hairy caterpillar in Trinidad and Tobago. There have been at least four instances in 2010 in which people were envenomated by shinneys in the Bon Accord region of Tobago. We have identified the species as *Megalopyge lanata* (Stoll) (Megalopygidae), which has been reported in the literature from Trinidad, but only noted in unpublished data from Tobago. The moths are likely to be originating from the mangroves around the Bon Accord Lagoon, which is a protected area (Ramsar site) and have repeatedly appeared on tropical almond trees at the Pigeon Point Beach Facility and hence are a concern to the local tourism industry. We discuss the current management practices and appropriate future actions that should be both effective and environmentally sensitive.

Key words: Erucism, moth, Pigeon Point, shinney, *Terminalia catappa*.

INTRODUCTION

The Dictionary of the English/Creole of Trinidad and Tobago describes a shinney, shinney worm, shinney makak, or chenille as any caterpillar covered with hairs, which are stiff and very irritating (Winer 2009). Shinneys are found in several families of Lepidoptera, but are especially prevalent in the Megalopygidae.

Most Lepidoptera are harmless to humans. The irritating effect caused by certain adult moths is called lepidopterism while encounters with the immature stages are called erucism (Wirtz 1984). Caterpillars which introduce venom through the offensive use of poisonous setae are known as *phanerotoxic* while those which produce volatile or repellent emanations released onto the integument or projected through an emission tube are known as *cryptotoxic* (Wirtz 1984). The setae on these caterpillars act as a defence mechanism against natural predators and human contact is often accidental (Cardoso and Junior 2005).

Several Lepidoptera families have species with caterpillars possessing urticating properties including: Arctiidae, Bombycidae, Limacididae, Eupterotidae, Lymantriidae, Megalopygidae, Noctuidae, Notodontidae and Saturniidae (Wirtz 1984). However, the phenomenon is mainly associated with three families of moths: Megalopygidae, Saturniidae and Arctiidae (Cardoso and

Junior 2005). The most important genera of the Megalopygidae family in this respect are *Podalia* and *Megalopyge* (Cardoso and Junior 2005). Setae in caterpillars of the Megalopygidae are thin and plentiful often over the whole body. This usually allows them to be distinguished from the Saturniidae, which have setae, based on scoli, looking like small pine trees (Cardoso and Junior 2005; Cock 2008, 2009; Polar *et al.* 2010). In most cases symptoms are intense pain and local edema (fluid accumulation below skin) and erythema (redness of skin) which are not proportional to the observed pain (Cardoso and Junior 2005).

OBSERVATIONS

Occurrence of shinneys and moths

Adults, pupae and larvae were observed on several occasions in 2009 and 2010 on many of the tropical almond trees (*Terminalia catappa*, Combretaceae) at the Pigeon Point Beach Facility area, a popular tourist destination, and in the mangrove surrounding the facility. The moths were described as 3-4 inches wide with round tipped wings, brown with a fleshy abdomen and they laid eggs on a range of surfaces about the facility.

The first reported sighting recorded by the Tobago House of Assembly was in September 2009 (pupae). Other sightings occurred on October 2009 (pupae), De-

ember 2009 (moths), March 2010 (caterpillars), September 2010 (final instar caterpillars and pupa) and October 2010 (adults). This indicates a fairly regular reoccurrence of moths.

Description of envenomations

We have described the symptoms of envenomations to assist in diagnosis where the causative agent has not been identified. On 13 January 2010, James, a local male Caucasian, 33 years of age, 1.94 meters tall and approximately 95 kg was walking barefooted in the mangrove between the Bon Accord slipway and Pigeon Point in Tobago when he stood on an ivory coloured, hairy shinney and was stung on the arch of his left foot. He immediately began to experience symptoms of burning in the area of the sting, gradually getting more intense over 45 minutes. He felt the toxin travel up the lymphatic system of his left leg to the nodes in the groin and later a red line appeared up the leg. Within an hour and a half of being stung, his left foot was swollen and he was limping. He was treated at the Calder Hall Medical Center where doctors were not familiar with what had stung him. He was given a cortisone injection for the pain and a five-day course of broad spectrum antibiotics for possible infection. He also took a five-day course of high dosage antihistamines. His symptoms persisted for three days, especially the effect of the toxin in the upper thigh, but he made a full recovery.

James reported that another male, Simon (Caucasian from St. Lucia, in his 20s, very fit) was also stung when he leaned back against a chair on which a similar shinney was walking. Simon also experienced immediate and quite severe pain along the lymphatic system, travelling into the armpit and arm. Simon self-administered painkillers and what he believed to be an anti-inflammatory herbal treatment but did not go to hospital.

A local biologist, RJ, also described having a painful encounter with a shinney in the Bon Accord area in April 2010. She recounted that she was in pain for one night while on painkillers and antihistamines. RJ reported that she had never encountered the particular organism and has been working in the Bon Accord Lagoon since 1996. She also reported that a fisherwoman was admitted to the hospital as a result of an encounter with a shinney.

Anecdotal evidence from Pigeon Point indicates that these shinneys are known to local residents with one person remembering their existence over thirty years ago. Accounts are vague and effects have also been described as "scratching of the skin". It is not possible to say whether the effects of the envenomations were different or simply reflected the response or tolerance of the individuals. Regardless, the species is of public health importance and a

greater understanding of the organism is required.

Identification and previous encounters

Photographs of the shinneys (Figs. 1A, 1B) were identified by MJWC as *Megalopyge lanata* (Stoll) (Megalopygidae). Provisional identification was made from Merian (1705, plate 19) and Sepp (1830, plate 12), and confirmed from Janzen and Hallwachs (2010) which includes photographs of caterpillars from Costa Rica. Unlike most Megalopygidae, in *M. lanata* the setae are in dorsolateral and lateral clumps on each segment of the thorax and abdomen of the caterpillar, and thus superficially more similar to the Saturniidae. A reared female moth was photographed and provisionally confirmed as *M. lanata*, but it was in too poor condition to make a definitive identification. Accordingly, photographs of an adult male and female (Figs. 1C, 1D) from previous collections in Trinidad are provided. Photos of eggs (Fig. 1E) and cocoons (Figs. 1F, 1G) at Pigeon Point are also provided.

Megalopyge lanata is known from previous collections in Trinidad. It was reported from Trinidad by Kaye and Lamont (1927) based on pupae collected on *Andira inermis* (Fabaceae), and caterpillars collected on *Tecoma* sp. (Bignoniaceae) at Pointe Baleine, Gasparee (Gaspar Grande), a small offshore island between Trinidad and Venezuela. Lamont's specimens from *A. inermis* have not been located, but a reared male and female from Gasparee are in the National Museums of Scotland, and there is a similar specimen in the Lamont collection at The University of the West Indies, St. Augustine, which confirm Kaye and Lamont's identification. MJWC (unpublished data) also has records from Fyzabad (R.M. Farmborough), Palmiste (N. Lamont), Pointe à Pierre (R.M. Farmborough), Curepe/St. Augustine (F.D. Bennett, R.E. Cruttwell, D.J. Stradling, M.J.W. Cock), Morne Bleu Textel Installation (M.J.W. Cock). Laurence (2000) refers to this species as "flannelworm or hairy caterpillar".

The moths of Tobago have not been documented. However, it is known to occur there, as MJWC (unpublished data) has a record from Marden House, near Scarborough, at MV light by R. Forrester, 15.i.1982.

In Trinidad, *M. lanata* is an occasional pest of avocado (*Persea americana*, Lauraceae) (Worth 1967; Laurence 2000) and coffee (*Coffea* spp., Rubiaceae) (Laurence 2000). There are records from other food plants elsewhere in the Neotropics, e.g. *Citrus* spp. (Rutaceae) in Surinam (Sepp 1830), *Byrsonima crassifolia* (Malpighiaceae), *Swietenia macrophylla* (Meliaceae), *Roupala montana* (Proteaceae) and *Rhizophora mangle* (Rhizophoraceae) in Costa Rica (Janzen and Hallwachs 2010), and *Conocarpus erectus* (Combretaceae) and *La-*

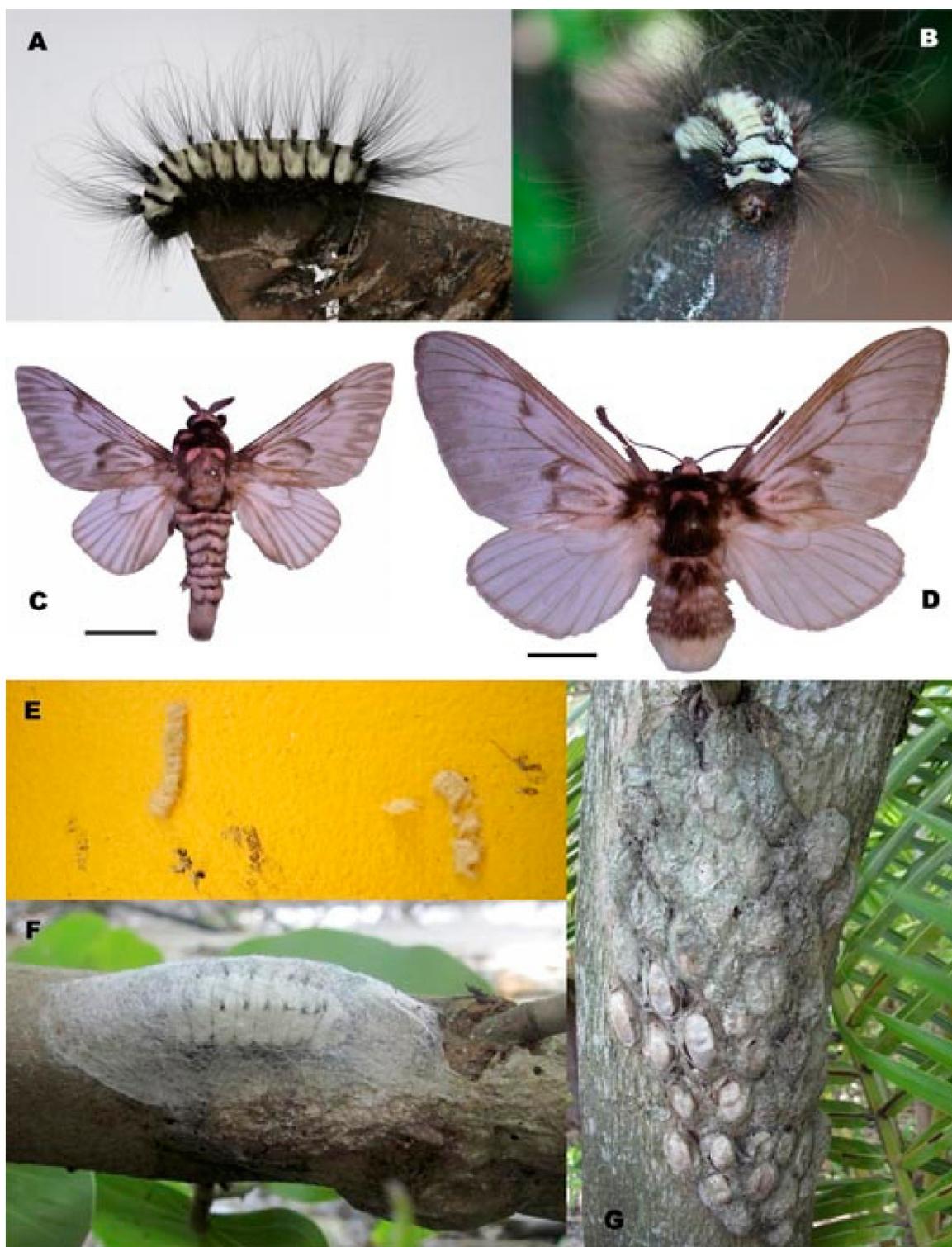


Fig. 1. Biology of *Megalopyge lanata*. **A**, mature caterpillar, lateral view, Pigeon Point, Tobago, 23 January, 2010 (Dawn Glaisher); **B**, mature caterpillar, anterior view, Pigeon Point, Tobago, 3 November, 2010 (Perry Polar); **C**, adult male, captured at light, Morne Bleu Textel Installation, Trinidad, 4 February, 1979, M.J.W. Cock (in collection M.J.W. Cock); **D**, adult female, captured at light, Morne Bleu Textel Installation, Trinidad, 10 November, 1978, M.J.W. Cock (in collection M.J.W. Cock); **E**, two groups of eggs laid on a wall in short rows and covered in setae from the apex of the female abdomen, Pigeon Point, Tobago, 3 November, 2010 (Perry Polar); **F**, caterpillar constructing its cocoon at the edge of a group of cocoons on a branch of tropical almond tree, Pigeon Point, Tobago, 3 November, 2010 (Perry Polar); **G**, a group of cocoons on the trunk of a tropical almond tree (the lower cocoons are abraded, and it can be seen that the inner papery layer is visible, most showing the slit where the adult moth has emerged), Pigeon Point, Tobago, 3 November, 2010 (Perry Polar).

gerstroemia indica (= *speciosa*) (Lythraceae), as well as *T. catappa* in Panama (Aiello 2011). Thus, this is a very polyphagous species. The known food plants and records of adults indicate that although it may be more frequently encountered at the coast, it probably occurs throughout Trinidad and Tobago.

Megalopyge lanata is known to occur widely in the Neotropics and previous encounters have been reported (Cardoso and Junior 2005; Anon 1964). What was almost certainly an encounter with *M. lanata* in Trinidad has been described by Worth (1967) who, along with a colleague, in order to test its toxicity deliberately touched a fat shinney, "whitish in colour, with a coating of sparse long hairs overlying tufts of shorter spines". This resulted in "a tremendous aching" that set in and extended up their arms to the shoulder indicating its venomous nature, and paralleling the observation reported above. Worth (1976) described a community of cocoons of this species at the base of an avocado tree in his garden in Port of Spain, a site that appeared to be used year after year given the tattered remnants of cocoons. In a single cocoon, the "outer spreading, low-lying case was woven loosely" while the interior was more firmly woven "shaped angularly, something like a Brazil nut" but with one end being "virtually unsealed" to allow for the emerging moth to emerge. A survey of the northernmost point at the Pigeon Point area in November 2010 revealed a collection of cocoons (Fig. 1G) at the base of the trunk of a tropical almond tree similar to that described by Worth. Worth (1967) suggested that this pupation site provided camouflage for the cocoons against the rugged bark of the avocado tree. The cocoons may be similarly camouflaged against the bark of tropical almond.

Management Options

The periodic appearance of the shinneys of *M. lanata* at Pigeon Point could pose a problem for the local tourist industry. After the first incident, the trees with shinneys were cordoned off to prevent people coming into contact with them. The shinneys were treated with detergent water, which was ineffective, although this treatment was found effective in killing the caterpillars of *Hylesia metabus* (Cramer) (Saturniidae), another moth with urticating properties in Trinidad (Polar *et al.* 2010). Dipel™, a biological pesticide based on *Bacillus thuringiensis* var. *kurstaki* reduced the number of shinneys; however, since the biological pesticide had to be ingested, the time taken for mortality meant the shinneys continued to pose a risk to people for up to seven days after application. Pestac/Fastac (Alpha-Cypermethrin) acts as a stomach poison and proved more effective because of its neurotoxic effect. This contact pesticide has since been used as a con-

trol measure on tropical almond trees when caterpillars are observed at the Pigeon Point Beach Facility. This intervention may be the most practical at this point in the current situation, but may disrupt the action of natural enemies leading to outbreaks of shinneys in the future.

Given that *R. mangle* is plentiful and *C. erectus* is present in the Bon Accord/Buccoo Bay Mangroves (Juman 2010), it is possible that these species may be providing a food source for *M. lanata* from where it makes its way a short distance to the tropical almond trees at the Pigeon Point facility. As the Bon Accord Lagoon is an environmentally sensitive area, spraying of chemical pesticides is not recommended but ecological studies should be conducted, particularly with respect to natural enemies of this species. If monitoring the tropical almond trees at Pigeon Point could detect the very young shinney caterpillars, *Bacillus thuringiensis* could then be applied; it should be more effective on young caterpillars and conserve the local natural enemies.

Sensitization of the Tobago Hotel and Tourism Association is also suggested so they can advise their members who deal with visitors to the island to alert them to the potential dangers of shinneys, and what the caterpillars look like so that they can be avoided if seen. For example, information signs or leaflets could be placed in hotel receptions. The emergency services and hospitals in Tobago should be aware of the species concerned and its potential impacts in the event that emergency treatment is required.

ACKNOWLEDGEMENTS

We would like to thank Ms. Dawn Glaisher for providing photos of caterpillars and an account of James and Simon's encounter as well as Dr. Rahanna Juman for her account. Thank you to Dr. Mark Shaw and Dr. Keith Bland who facilitated MJWC's access to the collection of the National Museums of Scotland and Mr. Raj Mahabir (The University of the West Indies (UWI), St. Augustine) who checked the Lamont collection at UWI for specimens of *M. lanata*.

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