LIVING WORLD

Journal of The Trinidad and Tobago Field Naturalists' Club

2021

THE TRINIDAD AND TOBAGO FIELD NATURALISTS' CLUB

The Trinidad and Tobago Field Naturalists' Club was founded on 10 July, 1891. Its name was incorporated by an Act of Parliament (Act 17 of 1991). The objects of the Club are to bring together persons interested in the study of natural history, the diffusion of knowledge thereof and the conservation of nature.
Monthly meetings are held at St. Mary's College on the second Thursday of every month except December.
Membership is open to all persons of at least fifteen years of age who subscribe to the objects of the Club.

Mission Statement
To foster education and knowledge of natural history and to encourage and promote activities that lead to the appreciation, preservation and conservation of our natural heritage.

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Editorial

This year has been another challenging year for many, and as such we are especially grateful to our editorial team for their contributions, and also to those who have generously given their time and expertise to review submissions. On top of everything else, serious technical issues with our server meant that we were forced to re-upload our entire archive of journal articles. This was no mean feat and would not have been possible without the dedication and perseverance of Kris Sookdeo and Deosaran Maharaj, who ensured that we have a fully open access online archive once again. We apologise to anyone who struggled to access material from the website earlier in 2021; we sincerely hope that we are now back on track.

The 2021 issue of Living World comprises a Guest Editorial, two Research Papers, five Nature Notes and one Report. The Research Papers are dominated by papers on Lepidoptera and strongly supported by observations made by non-specialists. The first is an account of the Notodontidae of Trinidad & Tobago by Matthew Cock. This is a major family of moths with 156 species present in T&T and 61 are new records for Trinidad. Our second paper, also by Matthew, provides an account of 45 new lepidopterans for Tobago.

Our Nature Notes are varied and, as usual, serve as a reminder of how much more there is still to discover about local biodiversity - even through chance observations. Saifudeen Muhammad and Mike Rutherford describe the first instances of a two-headed snake hatchling in Trinidad, coincidentally a species named in honour of one of the authors. Gervonne Barran and Milena Mechkarska describe an instance of a Tropical Wolf Spider preying upon a Trinidadian Stream Frog in Tamana Caves. This follows three notes published in Living World in 2015 describing other prey items of this spider. Our 2014 issue included a research article describing the first observations of anvil-use by Trinidad Motmots in Tobago to open gastropod shells. In the current issue Rainer Deo presents evidence of motmots using an anvil to prey upon and dismember a Manicou Crab. Hukaymah Ali, Rainer Deo and Mike Rutherford provide the first records of the terrestrial nemertean *Geonemertes pelaensis* for Trinidad. This is a species that some of us have probably mistaken for a free-living planarian and proves the value of not taking all observations for granted. Finally we have an account of a Hawksbill Turtle nesting during the day in northeast Trinidad by Shirley-Ann Ramphal, Samantha Ramnarine, Renata Ramoutar, Lanya Fanovich and Ryan S. Mohammed.

From the report of the Trinidad and Tobago Bird Status and Distribution Committee, we learn that 95 records of rare birds were submitted to the committee during 2020, representing 48 species. The Capped Heron was added to the official list of birds of Trinidad and Tobago, and Zone-tailed Hawk and Crested Caracara were found in Tobago for the first time.

We are grateful to Michelle Cazabon-Mannette for contributing a Guest Editorial highlighting the impact of the COVID-19 pandemic on conservation of marine turtles in Trinidad & Tobago. It is clear that any impacts of the pandemic on wildlife cannot be considered in isolation, and this insightful piece places the current threats to turtles locally in an historical, social and ecological context.

Amy Deacon,
Graham White

Cover Photograph

This year's cover shows a "rufous morph" female Hook-billed Kite photographed by Kevin Foster along Coora Rd, Siparia on 26 July 2020. Adult male birds tend to have the rufous coloring replaced by gray. This species is an extremely uncommon resident in Trinidad and is seen here feeding on its preferred diet of land snails. Its deeply hooked bill is an adaptation for extracting snails from their shells.

Guest Editorial

The impact of the COVID-19 pandemic on the conservation of sea turtles in Trinidad and Tobago

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A history of sea turtle conservation in T&T

Five species of sea turtles can be found in Trinidad and Tobago; all are listed as globally Threatened (Vulnerable, Endangered or Critically Endangered) by the IUCN and all have been designated as Environmentally Sensitive Species (ESS) under national legislation[1]. However it is important to remember that we have a history and culture of harvesting turtles for meat, eggs and shell, with a seasonal legal fishery that persisted until 2011, alongside annual illegal take during the closed season on land and at sea. Despite the closure of the fishery in 2011 and the subsequent strengthened legal protection of these species as ESS since 2014 (which carries a maximum penalty of TT$100,000 and two years' imprisonment for taking, possession or trade of sea turtles and other activities likely to cause harm), poaching persists annually on nesting beaches and at sea.

Sea turtle conservation efforts began locally in 1965, with the initiation of the first formal sea turtle nesting monitoring programme by Peter Bacon of The University of the West Indies, with the participation of the Trinidad and Tobago Field Naturalists' Club. Many other individuals, NGOs and staff of the Forestry Division have been involved over the years. Bacon (1973) estimated that 30% of turtles nesting at Matura Beach and 100% of turtles nesting near villages on the north coast of Trinidad were killed in 1970. In 1989, the Wildlife Section of the Forestry Division developed a co-management partnership with rural communities, resulting in several Community Based Organisations (CBOs) emerging over the years to share the responsibility for sea turtle conservation and provide what some might deem an "essential service" – patrolling the nesting beaches to ensure the safety of nesting females, eggs and hatchlings, and collecting valuable data to enable monitoring of the turtle nesting populations. With the declaration of Matura and Fishing Pond beaches as Prohibited Areas and the initiation of comprehensive community-based patrol programmes, the poaching of leatherbacks at Matura was reduced to zero by 1993 (Forestry Division *et al.* 2010).

In Tobago, beach patrols in 1982 revealed high levels of poaching and the leatherback population declined precipitously (Forestry Division *et al.* 2010). Regular beach patrols starting in 2000 significantly reduced poaching at Grand Courland Bay, with poaching becoming largely restricted to more remote beaches (Forestry Division *et al.* 2010).

In addition to the major reduction in poaching at nesting beaches that can be directly attributed to the consistent patrol efforts of the various CBOs, the community involvement has allowed for daily collection of data that would have been impossible otherwise (Forestry Division *et al.* 2010).

Trinidad has been considered a pioneer in the development of successful co-management arrangements, and the first such initiative at Matura has been recognized internationally and served as a model for similar initiatives elsewhere (Brautigam and Eckert 2006). As the community-based programmes have developed, new capacity has been built for entrepreneurial activity and the communities have been empowered (Brautigam and Eckert 2006, Forestry Division *et al.* 2010). Many of these groups started with a core team of dedicated volunteers patrolling the beaches without pay, but over the years they have been compensated for their efforts through a combination of government stipends, donations from the private sector, and income generated by tours and other programmes such as reforestation. In Matura and Grande Riviere in particular, turtle tours have become a thriving business, with each beach attracting some 10,000 -15,000 visitors annually, who not only participate in tours, but also support other community-operated businesses. This generates TT$200,000 - TT$300,000 annually, for each community.

Since 2011, sea turtle monitoring and conservation within Trinidad and Tobago has been primarily undertaken by some 28 CBOs under the umbrella of the Turtle Village Trust (TVT) and through the financial support of the Green Fund, Atlantic and BHP Billiton and in partnership with the relevant government agencies.

Poaching – a persistent threat

Prior to the closure of the seasonal fishery in 2011, it was well known that sea turtles were routinely harvested illegally on nesting beaches and at sea during the closed season (Forestry Division *et al.* 2010), with meat readily available at community celebrations such as "Harvest"

1 Legal Notices No. 88, 89, 90, 91 and 92 of 2014 under the ESS Rules, 2001 of the Environmental Management Act, Chapter 35:05, 2000.

or "Fishermen's Fete" often during the closed season, particularly in Tobago (Eckert and Herron 1998, Forestry Division *et al.* 2010).

The species typically targeted on land is now the hawksbill turtle (Fig. 1). This species is far less abundant than the leatherbacks on our beaches, but it can be regularly observed and is more widely distributed along the coasts of Trinidad and Tobago. Hawksbill meat is preferred over that of leatherbacks and their smaller size means that butchering the animal is an easier process. Nesting hawksbills (typically weighing between 100-175 lbs) can even be quickly moved off the beach by a group of poachers for slaughter and butchering elsewhere, as I have observed myself in Tobago, leaving little evidence behind. Walker *et al.* (2015) compiled available hawksbill nesting data over a period of eight years (2005 –-2012) across 55 beaches in Tobago, and documented 112 nesting hawksbill poaching events at 15 nesting beaches. This is likely a significant underestimate, given the low survey effort at many of these beaches over this time period.

Despite the strengthened legal protection of these species as ESSs since 2014 and the efforts of the CBOs, poaching of sea turtles continues annually both at sea and on nesting beaches, as can be confirmed by the CBOs, the government authorities, and many concerned citizens. Turtle remains

Fig. 1. A hawksbill turtle cruises over a reef at Speyside, Tobago. Photo Ryan P. Mannette. May 2014.

are often found especially at remote beaches, nets are placed close to shore to target sea turtles foraging along the coast, and turtles can be observed being landed by fishing boats or being removed from nesting beaches. While turtle meat may no longer be offered as openly as in the past, environmentalists Aljoscha Wothke of Environmental Research Institute Charlotteville (ERIC) and Pat Turpin of Man of War Cottages and the new Tobago Alliance for Resilient Communities, have both reported that poaching in Tobago is still an annual occurrence with a minority of people who engage and support it. Mark Gibson of the Nurture Nature Campaign also suggests that turtle meat is still relatively easy to source, and the cooked meat is openly offered at "harvest" in Tobago.

The COVID-19 pandemic

The World Health Organization announced that the COVID-19 outbreak was characterized as a global pandemic on 11 March 2020. The pandemic has led to an unprecedented significant reduction in human movement. With many countries closing borders international travel was significantly reduced, and most countries experienced various government restrictions at a national level. Logically then, associated anthropogenic threats such as emissions of pollutants including greenhouse gases declined. Various positive spin-offs for the environment have been experienced as a result, as documented by Bates *et al.* (2021), including reduced pollution, and wildlife "rebounding" in various places in response to reduced human activity. While these positive impacts have received widespread media coverage, less publicized have been the detrimental effects of the pandemic such as disruption of conservation management and research efforts, challenges to enforcement of wildlife laws, reduced conservation budgets, and economic insecurity leading to increased unregulated and illegal hunting and fishing (Bates *et al.* 2021).

The pandemic saw the implementation of regulations which restricted the activities of the various sea turtle conservation groups in Trinidad and Tobago and elsewhere around the region. The first confirmed case of COVID-19 in Trinidad and Tobago was reported on 12 March 2020, and the government took swift action via the implementation of new Public Health Regulations under the Public Health Ordinance Ch. 12 No. 4. Schools were quickly closed. Borders were closed effective midnight 22 March 2020. "Non-essential workers" were required to stay at home beginning 30 March 2020. Since then, restrictions have changed frequently and have included the closure of beaches from 6pm to 6am; complete closure of beaches; closure of restaurants, cinemas, gyms, places of worship; group size restrictions for public gatherings; and the implementation of a curfew under a State of Emergency for a six-month period between 16 May

and 16 November 2021. Borders remained closed to non-nationals until 17 July 2021.

The leatherback nesting season runs from March to August annually, and this is the period that most CBOs conduct their nightly patrols. Some CBOs extend their efforts later into September to record hawksbill nesting and/or to conduct day patrols for the protection of hatchlings emerging from their nests. In 2020, beaches were closed completely for the period 31 March through 20 June (80 days), and 16 August to 29 August (14 days), while beaches were opened for the period 21 June through 15 August (56 days). From 30 August through 24 October, a subtle change was made to the regulations which specified that "it is an offence for any person to be found at or in any beach, bay, river, stream, pond, spring or similar body of water, including the waters around any island off the coast of Trinidad or Tobago, or any public pool *for recreational purposes".* As the primary nesting season is from 1 March through 31 August, the beaches were closed for 51% of the nesting season (94 days of 184 days). Frequent changes were made to the regulations over this time period, and little notice was given, so there was little time to anticipate and plan for patrols when beaches opened, and no way to anticipate how long the beaches would remain open. Approvals to conduct patrols on the nesting beaches despite the beach closures were made available to some groups, but reportedly late in the season. Coupled with this, the CBOs found themselves with little to no funds to support their patrols and monitoring efforts; the Green Fund grant that TVT had acquired and used to pay stipends for patrols and data collection over several years had expired. Tours were also not possible for most of the season, between beach closures and restrictions in group size, which meant a significant loss of income for Nature Seekers and Grande Riviere Nature Tour Guides Association (GRNTGA). While some groups indicated that they did not conduct any patrols or data collection after the closure of beaches on 31 March, some groups indicated they were able to get unofficial permission from officers at their local Police Station to be on the beach and largely operated with limited numbers voluntarily or with much reduced stipends.

On 7 February 2021, access to beaches was limited to between the hours of 6am to 6pm under the Public Health [2019 Novel Coronavirus (2019-n CoV)] (No. 4) Regulations, 2021. With the nesting season approaching and no exemptions forthcoming for the CBOs to conduct their patrols of sea turtle nesting beaches, there was an outcry from the various CBOs and other environmental stakeholders as well as the general public. Appeals were made directly to the Minister of Health by Nature Seekers, Fishermen and Friends of the Sea, Council of Presidents of the Environment and the Environmental Management Authority at least. An online petition garnered 9,296 signatures. The appeal was successful in getting the attention of the Minister of Health and on 18 March 2021 it was announced that the CBOs would receive an exemption. Patrols, data collection and tours with restricted group size were possible as a result, but it took some time to roll out and little flexibility was given as exemptions were provided to each group for specific beaches. Save Our Sea turtles (SOS) Tobago for example regularly patrols three beaches in Grand Courland Bay, but would have also been able to do checks at other beaches had the exemption given them more freedom of movement. Limited funding for personnel was made available to most groups via Forestry Division and sponsorship from Atlantic, so groups operated at reduced capacity and/or personnel received a reduced stipend.

On 14 April, beaches were once again closed for the purposes of recreation so tours were no longer possible, and this regulation remained in effect until 19 December 2021. On 16 May 2021 a State of Emergency was declared (The Emergency Powers Regulations, 2021), and an overnight curfew was in effect, which remained in place throughout the rest of the nesting season, though the hours varied a little. The CBOs then required curfew passes for their personnel to legally conduct their nightly patrols. This caused an interruption for some of the groups while waiting to receive curfew passes from the Commissioner of Police. Curfew passes were provided in the name of specific individuals, and each group received passes for a limited number of individuals, which further restricted their ability to cover the beaches. Most groups were able to operate patrols and data collection at their beaches for most of the season in 2021, however with limited funds and staff, resulting in lower coverage than normal.

Resulting impact of the pandemic on sea turtle conservation in T&T

The primary effect of the various COVID-19 regulations and the curfew under the State of Emergency coupled with limited funding, was to disrupt and reduce the presence of these CBOs on the beaches to conduct their essential service for sea turtle conservation. The knock-on effects include the loss of valuable monitoring data and increased poaching. If it were not for the dedication of the members of these CBOs, who in some cases worked for a reduced wage or in some cases for no wage, the effect may have been even worse.

Monitoring and data collection at some of our nesting beaches has been conducted consistently since the 1990s or early 2000s. Over time the monitoring of sea turtle beaches and associated tagging of turtles has led to the identification of the nesting season, an improved understanding of nesting frequency and patterns of sea turtles including movements between nesting beaches, and allows for the detection of population trends. Further, nesting beach patrols provide

the opportunity to conduct research in a multitude of areas including hatch success and genetic studies. Important international collaborations have also allowed for research on the offshore habitat use and migration routes of leatherbacks. Long term annual data collection allows for the close monitoring of the leatherback nesting population in particular, and detection of any changes or trends. Such monitoring is especially important at this time, since the North West Atlantic Leatherback population to which our leatherbacks belong, is currently in decline and has been listed as Endangered by the IUCN, while the global status remains as Vulnerable. The decline has been principally driven by an exponential decline in French Guiana, but the data suggests declines across many other sites and a small decline in Trinidad also (Northwest Atlantic Leatherback Working Group 2018). Considering that Trinidad hosts the largest remaining leatherback rookery in the region (Northwest Atlantic Leatherback Working Group 2018), we play a significant role in conserving this sub-population and any local decline is of international concern.

Poaching is difficult to quantify due to the clandestine nature of event, especially given the growing practice of removing live nesting turtles from the beach, leaving little evidence behind. Furthermore with the inconsistent and low patrol coverage of many of the nesting beaches in 2020 and 2021, chances are higher that poaching could go undetected. Angela Ramsey (Wildlife Biologist, Division of Food Production, Forestry & Fisheries, Tobago) confirmed poaching of hawksbills is an annual occurrence on nesting beaches in Tobago, and highlighted the arrest of one individual for poaching of a hawksbill in 2020. She noted an increase in the number of turtle remains detected at some locations in 2020/2021, yet suggested it was difficult to confirm an overall increase in poaching due to the low patrol effort and lack of data. However, reports from the turtle CBOs and other local environmentalists suggest that a significant increase in poaching did occur in 2020 and 2021, especially in Tobago. Concerned environmentalists Aljoscha Wothke of Environmental Research Institute Charlotteville (ERIC) and Pat Turpin of Man of War Cottages and the new Tobago Alliance for Resilient Communities, have both reported that there was a significant increase in poaching events observed in northeast Tobago in 2020 and 2021 reported to them by concerned villagers. SOS was also able to note about five poaching events in 2020 within Grand Courland Bay based on random day checks of the beaches, and two in 2021 (when patrol efforts resumed but with reduced coverage). SOS typically record no poaching events within Grand Courland Bay when they achieve regular nightly coverage, so this represents a significant increase and is likely an underestimate due to their limited coverage in 2020/2021.

In Trinidad, Nature Seekers and GRNTGA didn't report a significant rise in poaching, though there was one possible hawksbill nest lost to poachers at Matura. Similarly the Wildlife Section (Forestry Division) indicated they received no reports of poaching on nesting beaches in Trinidad in 2020 or 2021. However, the Las Cuevas Eco Friendly Association did report nine poaching events in 2021 (three leatherbacks and six hawksbills). They indicated this is the first record of poaching at this beach since they began patrols in 2004. It is perhaps unsurprising that poaching didn't occur at Grande Riviere and Matura, given that these communities have become reliant on turtle tourism and recognize the value of the sea turtles. I was unable to contact any of the smaller groups that patrol other beaches in Trinidad that I might expect to be more vulnerable to increased poaching when patrol coverage was reduced.

We must remember that poaching of sea turtles has never been completely eradicated and has been recorded annually prior to the pandemic. There is still a portion of the population that engages in this illegal activity regardless of the risk. It is possible that these same individuals saw the lack of patrols in 2020 and 2021 as an opportunity to increase their efforts with reduced risk and took full advantage of the situation. There are many people experiencing economic hardship as a result of the pandemic and may be seeking out new sources of food and income, and this may be an additional driver of the increased poaching observed. This is perhaps especially the case in Tobago where many persons rely on the tourism industry which has come to a virtual standstill as a result of border and beach closures. Indeed Pat Turpin indicated that there was as an overall increase in poaching of other species on land in Tobago as well as sea turtles.

What can we learn from this experience?

CBOs have made great strides when it comes to sea turtle conservation efforts at our nesting beaches over the last 30 years and we are internationally recognized for our efforts. However, these last two years have been particularly challenging and the CBOs need support to continue their vital work. The Game Wardens in both islands are limited by numbers and resources and the government has come to rely on the CBOs for their role in patrolling our nesting beaches. Yet they cannot be expected to continue this demanding work, walking great distances on sandy beaches at night, without remuneration and basic supplies required (batteries, headlights etc.).

Trinidad and Tobago is not the only country that has experienced negative impacts to sea turtle conservation efforts as a result of the pandemic, and sustainability is an issue that sea turtle conservation organisations continue to struggle with internationally. Many rely on grants from external funding sources and some rely on volunteer tourism as a human resource. With the disruption of international

travel and the economic downturn, many organisations are facing very uncertain times. While it is certainly a worthwhile goal to strive towards developing a self-sustaining sea turtle conservation programme, we may need to accept that this is simply not possible. Sea turtle tourism may be the best available option to help support the patrols and data collection, but is simply not feasible on most beaches (due to accessibility, low numbers of turtles, risk of disturbance etc.). Furthermore, the pandemic effects in 2020 and 2021 show us that tourism is subject to many external factors and may be disrupted from time to time.

Trinidad & Tobago is in a unique position with the existence of the Green Fund, a national grant facility operationalised in 2008, capitalised by the Green Fund Levy, which is pegged at 0.3 percent of the gross sales or receipts of companies operating in the country. Turtle Village Trust was able to access nearly TT$30 million from the Green Fund for the National Sea Turtle Conservation Project which ran from 2013 through 2018 and allowed for a significant increase in nesting beach patrol coverage. However, the Green Fund has been severely underutilized to this point, with some TT$7billion accumulated and only an estimated TT$392 million disbursed towards the financing of 27 environmental initiatives as at September 2020. The Green Fund has been repeatedly criticized by members of civil society for its onerous application process and lengthy review process; even after project approval, there can be lengthy delays before the disbursement of funds. A commitment, of say TT$5 million per year, towards the continuation of the National Sea Turtle Conservation Project would be an effective and worthwhile use of the Green Fund towards one of its focal areas – conservation of the environment – and towards meeting T&T's many international commitments towards the conservation of sea turtles.

How you can help

As full financial support for the 2022 nesting season is looking unlikely, I urge you to consider making a contribution to support the essential work of these dedicated organisations

Nature Seekers: www.natureseekers.org
Las Cuevas Eco Friendly Association: https://www.facebook.com/Las-cuevas-eco-friendly-association-302082766647810
Save Our Sea Turtles (SOS) Tobago: http://sos-tobago.org/how-you-can-help/donate

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The prominent moths (Lepidoptera, Notodontidae) of Trinidad & Tobago

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ABSTRACT

An illustrated and annotated catalogue is presented of 156 species of Notodontidae confirmed to occur in Trinidad & Tobago. Of these, 61 are new records for Trinidad. Four additional records are considered questionable, needing confirmation. Images of 67 species of living adults and three species of caterpillars are included. Very little has been recorded regarding food plants and early stages of Notodontidae in Trinidad, but what is known is reported.

Key words: DNA barcodes, checklist, distribution, food plants, iNaturalist, inventory, new records

INTRODUCTION

Notodontidae is a family in the Noctuoidea, the largest superfamily of the Lepidoptera with about 50,000 currently recognized species worldwide, of which Notodontidae comprise 4,401 species in 640 genera, when last catalogued globally (Schintlmeister 2013). Of these, 2033 species in 128 genera are reported from the Americas (Miller 2009, Becker 2014). Here, I treat 156 species in 70 genera currently known from Trinidad & Tobago, or about 7.5% of the total American Notodontidae fauna. Of these, 67 are new records for Trinidad. There are a further four species recorded which seem doubtful records and are not included in the totals just given.

In this work, I follow the convention that Trinidad & Tobago refers to the country, whereas Trinidad and Tobago refer explicitly to the two islands, but not any of the offshore islands which are referred to separately. The two main islands of Trinidad and Tobago provide a zoogeographical contrast in terms of size and distance from the mainland (Starr 2009). Trinidad has an area of 4,768 km^2; the south-west peninsula is 11km from Venezuela and while the north-west peninsula is 20km from the mainland, the widest gap is 11.5 km, thanks to the intervening Bocas Islands. Tobago, on the other hand, has an area of about 300km^2, and is separated from Trinidad by 36km, and from the mainland by about 125km. They are both continental islands and Trinidad's Northern Range and Tobago's Main Ridge are extensions of Venezuela's coastal range. Trinidad was probably last joined to the mainland 10,000 years ago, and Tobago 14,000 years ago. This combination of land area, distance from the mainland, and time since the land masses were last joined, means that Trinidad's biodiversity is a subset of that of the mainland, and in turn, Tobago biodiversity is almost entirely a subset of Trinidad's.

Documentation of the Lepidoptera of Trinidad has steadily increased our knowledge of the species of Notodontidae found here. Wilson (1894) included no Notodontidae in his list of Trinidad butterflies and moths. Kaye (1901) reported eight species in his provisional list of moths of Trinidad, Kaye and Lamont (1927) increased this to 69 species (including two Dioptinae) in their catalogue of moths of Trinidad, and Lamont and Callan (1950) added 18, making 85 in total. In Cock (2003), I indicated that I knew of 149 species (but did not list them) and estimated that there could be as many as 200 species to be found. There has been little collecting since I published this in 2003. The moth fauna of Tobago was first reported in Cock (2017a), when I included 19 species of Notodontidae, two of which are not known from Trinidad. Here I treat 156 species (including the two reported from Tobago but not Trinidad). Of these, 21 are known from single specimens and 11 from just two records; this is considered a clear indication of a significant number of additional species yet to be found and recorded from an area (Colwell and Coddington 1994).

There is no easy way to distinguish Notodontidae from other families of Noctuoidea. The distinguishing features include aspects of the venation, internal structures such as the tympanum, and the male genitalia (Holloway et al. 1987, Scoble 1995). The family is often referred to as prominent moths, referring to a tuft or hump on the dorsum of the forewings which when at rest sticks up as a prominence (most figures of living moths, e.g. Figs. 7, 17, 42, 113). However, some Notodontidae lack this feature (e.g. Figs 50, 111), and such protuberances are found in diverse other groups of moths (Fig. 1). Notodontidae shows great diversity in wing pattern and shape, as can be seen in the Trinidad fauna. The abdomen is normally longer than the hindwings (e.g. Figs. 7, 44, 109), but this is true in other groups, e.g. Lasiocampidae (Fig. 1). With experience, and using the figures provided here, it should be possible to recognize most Trinidad Notodontidae. Examples of Trinidad species of other families that might be mistaken for Notodontidae because of superficial similarity are shown in Fig. 1. Some genera of larger species, such as *Crinodes, Antaea, Hapigia* and *Nystalea* bear a superficial resemblance to some Sphingidae (Cock 2018), but in life, the notodontid resting position with the wings held at a sharp angle above the abdomen,

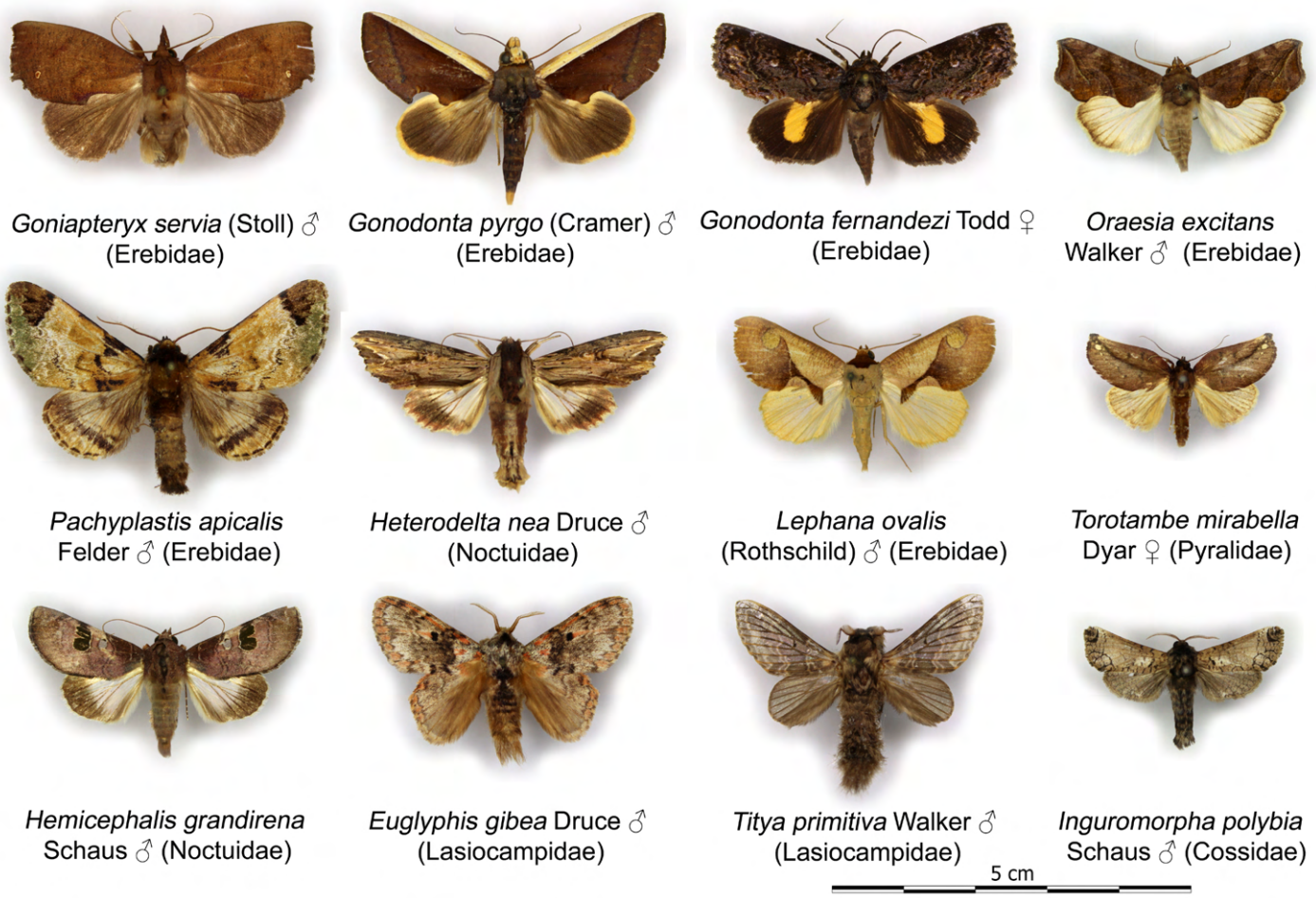

Fig. 1. Some Trinidad moths that might be mistaken for Notodontidae. Note that *Gonodonta fernandezi*, *G. pyrgo*, *Heterodelta nea* and *Torotambe mirabella* are new records for Trinidad.

will normally separate them from most sphingids which generally hold their wings flatter and at a shallower angle.

Nearly all the Notodontidae exhibit the beginnings of a proboscis, but in most of the American forms it is not functional, reduced to a stunted, feeble thread (Seitz 1931-1932). An exception is the subfamily Hemiceratinae, the Trinidad members of which have a well-developed proboscis. I am not aware of any observations as to what the adult Hemiceratinae feed on, but they may well feed at flowers by night. Adults that cannot feed can have only a short adult life span, a matter of days at the most, and this will be dedicated to mating and egg-laying as rapidly as possible. Other families of moths with adults that do not feed, e.g. Saturniidae, Limacodidae, normally show little dispersal before oviposition, eggs are laid in batches, and the larvae are polyphagous, or at least broadly oligophagous, e.g. at the family level. It is not clear quite how true this will prove to be of Trinidad's Notodontidae as we learn more about them. This lifestyle is also likely to minimize dispersal before oviposition and hence reduce gene flow within a species, facilitating the evolution of geographically differentiated, very similar-looking species.

The eggs of Notodontidae are smooth (not ribbed), hemispherical or nearly spherical (Scoble 1995). The caterpillars are very diverse, and many have extreme structure and colouring (Scoble 1995, Janzen and Hallwachs 2021; Figs 2, 11, 93). What might be considered a typical caterpillar (since it is a widespread form) is shown as Fig. 2, but compare this with Figs. 11 and 93. As a generalisation,

Fig. 2. An example of a typical Notodontidae caterpillar; an unidentified species on pigeon pea, *Cajanus cajan*, P. Geerah. ©, with permission.

Notodontidae caterpillars are thought to be defoliators of trees (Seitz 1931-1932, Scoble 1995), but they also attack bushes (Fig. 2) and vines (Fig. 11), although they do not seem to normally feed on herbs. The extent to which members of the many different Trinidad species and genera may be specialised to feed on particular genera or families of tree food plants, as suggested by Seitz (1931-1932) can be indicated from an analysis of Janzen and Hallwachs' (2021) database, but this has not been attempted here. As yet, the early stages of very few Trinidad species have been documented, but those that are known to me are listed in Table 1. The following account includes the few reports of the early stages in Trinidad that are available. I have not attempted to compile information on the food plants and life histories of Trinidad species based on observations on the mainland, but the interested reader is referred to Janzen and Hallwach's (2020) database of Costa Rican caterpillars as an excellent starting point. Documenting the early stages of Trinidad Notodontidae deserves attention. They ought to be easy enough to rear using standard techniques, but there will be significant challenges to identify the tree food plants (so rarely in flower or fruit when one finds caterpillars on them) and obtaining an adequate supply of the food plant at ground level conveniently close to where the rearing is being carried out. The fact that many species have been recorded in a suburban area (Curepe / St. Augustine) suggests that food plants for these at least should be accessible, whereas the many species only known from forested areas will be more challenging.

Effectively all collecting of Notodontidae apart from Dioptinae in Trinidad has been based on the attraction of adults to light, especially light with a strong ultra-violet component. The number of specimens turned up by chance or reared from caterpillars is tiny by comparison. Dioptinae, in contrast, are day-fliers, and probably all specimens have been netted by butterfly collectors with an interest in moths.

Nomenclature and classification

The classification of Notodontidae used here follows Becker (2014). It builds on the classification developed by Miller (1991), modified in that *Hemiceras* (which Miller treated as *incertae sedis*, i.e. of uncertain placement) forms the core of the re-established subfamily Hemiceratinae, and *Truncaptera* (which Miller treated as *Lirimiris incertae sedis* based on his use of *T. truncata* (Herrich-Schäffer) as a species of *Lirimiris*) is placed in Dicranurinae (the true *Lirimiris* is placed in Heterocampinae). Note that Schintlmeister (2013) also recognized Disphraginae Thiaucourt, 1995, Rifarginae Thiaucourt, 1995 and Roseminae Forbes, 1939, all of which are included within Heterocampinae by Becker (2014). Accordingly, the Trinidad & Tobago Notodontidae fall into six subfamilies (Table 2), of which Heterocampinae and Nystaleinae dominate in terms of numbers of genera and species. In the treatment that follows, subfamilies, genera and species are presented in alphabetical order. This inevitably means that closely related genera may be widely separated, and this is partially addressed in the figures, where similar genera and species are placed together to some extent.

Identification

When working with pinned specimens in good condition, all of the Trinidad species can be identified by careful examination and comparison with the images provided here. Diagnostic features are pointed out in the text which should help separate similar species. Many naturalists are now taking photographs rather than specimens in support of their observations. With experience, images of living moths can also be readily identified, and I have included such images as are available to me to facilitate this. In the case of Notodontidae, the best diagnostic features are normally on the dorsal surface of the forewing, which makes image identification easier, than it is for some other groups of moths.

The available publications for the identification of

Table 1. The known food plants of Notodontidae based on observations in Trinidad (there is no information for Tobago). Any further information available is included under the species accounts.

Notodontidae species	Food plant(s)	Source
Crinodes insularis Rothschild	*Gouania* (Rhamnaceae)	Cock (2003) (Fig. 11)
Lyces ena (Boisduval)	*Passiflora* (Passifloraceae)	NHMUK collection
Rhuda focula (Stoll)	Unknown	R. Deo (Fig. 92)
Truncaptera meridionalis (Schaus)	Cocoa *Theobroma cacao* (Malvaceae)	UWIZM collection
Xylodonta imitans (Becker)	Yellow poui, *Tabebuia serratifolia*, black poui, *T. rufescens* and roble, *Platymiscium trinitatis* (Bignoniaceae)	Guppy (1911), Lamont and Callan (1950) and Laurence (1974) as *X. guarana* (Schaus)
Unknown	Pigeon pea, *Cajanus cajan* (Fabaceae)	P. Geerah (Fig. 2)

Table 2. Subfamilies of Notodontidae in Trinidad & Tobago. Numbers are based on accepted species only, excluding species requiring confirmation.

Subfamily	Number of genera	Number of species	Most species-rich genera (and number of species)
Dicranurinae Duponchel, [1845]	1	3	*Truncaptera* (3)
Dudusinae Matsumura, 1925	1	4	*Crinodes* (4)
Hemiceratinae Guenée, 1852	3	23	*Hemiceras* (21)
Heterocampinae Neumogen & Dyar, 1894	43	79	*Hapigia* (7), *Malocampa* (8), *Skaphita* (4)
Nystaleinae Forbes, 1948	18	45	*Bardaxima* (4), *Nystalea* (16)
Dioptinae Walker, 1862	2	2	
Total	70	156	

Neotropical Notodontidae are limited. Draudt's (1932-1934) treatment of the American Notodontidae is the only attempt at comprehensive coverage with illustrations and is a useful starting point, which should be used in conjunction with the two recent checklists (Schintlmeister 2013, Becker 2014). Miller (2009) monographed the subfamily Dioptinae. Some genera have been treated in recent papers, including *Bardaxima* (Becker 2021c), *Crinodes* (Schintlmeister 2016), *Ophitis* (Becker 2021d), *Moresa* (Schintlmeister 2016), *Rhuda* (Becker 2021a), *Rosema* (Schintlmeister 2016), and *Xylodonta* (Chacón *et al.* 2017, Becker 2021b), and A. Schintlmeister (pers. comm. 2021) is currently working on a major revision of the species-rich genus *Hemiceras*. Schintlmeister's (2016) illustrated catalogue of the types in the USNM is valuable, and many of his images are available on the USNM (2021) website.

The terminalia comprise genitalia and associated sternite and tergite of abdominal segment 8 (A8). They require dissection to see the full structure, but sometimes diagnostic features, particularly the structure of the A8 sternite can be examined by carefully brushing and scraping off the scales of the ventral abdomen tip (e.g. Appendix Fig. 15N). The structure of the male and female genitalia often provides good diagnostic features to distinguish species that otherwise have a similar appearance (habitus). I include figures of some 19 Notodontidae dissections in a supplementary Appendix, which demonstrate characters used and help define species that I have recognised but not been able to name. Ideally, such figures would be compared with those of type specimens, but many of the types have not been dissected and for those that have, few good figures are currently available. Fortunately, a significant proportion of types in the USNM have been dissected, and figures are available (Schintlmeister 2016, USNM 2021).

There is not a great deal of individual variation in the Notodontidae of Trinidad, but examples have been illustrated in a few cases, e.g. *Elymniotis longara* (Fig. 102), *Nystalea nyseus* (Fig. 107). Similarly, sexual dimorphism is usually restricted to the female being larger with broader wings, and sometimes darker or lighter in colour. In some cases, this difference is quite marked, e.g. *Skaphita* spp. (Fig. 41), *Strophocerus thermesia* (Fig. 105). In just a few cases the differences may be more marked due to different wing markings, e.g. *Hemipecteros otiosa* (Fig. 33), *Xylodonta scottmilleri* (Fig. 105). The males generally have bipectinate antennae (i.e. with two rows of fine projections each arranged like a comb, whereas females have simple antennae, and often this feature can be distinguished in images of living adults where the antennae are visible. However, some males have the antennae minimally bipectinate or simple, and some females have the antennae bipectinate, but more weakly so than the males.

DNA barcoding based on a defined section of the CO1 mitochondrial gene (Hebert *et al.* 2003) provides a tool that can be used to help clarify the status of different populations of taxa in the future, based on the increasing numbers of publicly available barcodes in BOLD (Barcode of Life Database, http://www.boldsystems.org/) and GenBank (http://www.ncbi.nlm.nih.gov/genbank). Barcode Index Numbers (BINs) have been introduced to provide a permanent numbering system for barcode clusters separated from others by at least 2% base pairs substituted, which in a high percentage of cases correspond to known taxonomic species and can also help flag species complexes or clusters needing taxonomic research (Ratnasingham and Hebert 2013, Miller *et al.* 2016). I checked all Trinidad genera of Notodontidae against BOLD in January 2020 and constructed BOLD TaxonID Trees using public barcodes in BOLD and the standard BOLD function for the genera thus far recognized from Trinidad. In most cases there were very few DNA barcodes from South America, but often a large sample from Costa Rica based on the work of Dan Janzen and Winnie Hallwachs' inventory programme. It was quite common to find that one phenotypic species in Costa Rica comprised more than one BIN in BOLD, and when barcodes were available from South America, they did not necessarily match those from Costa Rica and appeared as different BINs. This is an indication of changes that are going to come to our understanding of the

Neotropical Notodontidae and the names which should be applied to it. However, many of the Notodontidae recorded from Trinidad were described from the Guianas, with which the Trinidad Lepidoptera fauna has a high affinity (e.g. Cock and Robbins 2016), and so these names are likely to be reliable for Trinidad. On the other hand, many Notodontidae recorded from Trinidad, but described from further south, e.g. southern Brazil or Central America could well prove to be part of a species complex, for which the current name will not be applied to the Trinidad population in the future. The BOLD database does not have adequate coverage yet to resolve these questions, but there would be value to building up a library of DNA barcodes for the Trinidad & Tobago fauna, which in due course can help solve some of these, questions, resolve which species do occur in Trinidad & Tobago, and as the technology improves facilitate rapid identification in future. Sixteen Notodontidae taxa have been described from Trinidad, so characterising these taxa using DNA barcodes will be an important contribution, to stabilise and define the use of these names.

Layout of species entries

Under each species, the presentation follows a standardised sequence: The currently accepted name for that species, and subspecies where used. The author and year of publication for each name are included, in parentheses where the species or subspecies were originally described in a different genus. This is followed by references to the figures illustrating the species in this paper, and where known, the BIN in BOLD.

Immediately below this is the original descriptions, preceded by 'OD:', author and year of publication for the species is repeated, followed by the original combination, and the type locality (TL). The original publications of descriptions are not included in the references unless they are specifically referred to in the text; if needed, this information is available in Beccaloni *et al.* (2003) and Schintlmeister (2013). Below this, and preceded by 'TT:', are entries for this and any other names or combinations for this species that have appeared in the literature and refer explicitly to its presence in Trinidad or Tobago, i.e. these do not include generalised statements, e.g. that a particular species occurs throughout the Caribbean, or throughout the Neotropical Region. I have listed taxonomic papers where Trinidad or Tobago are included in the material examined section; I have doubtless missed some of these, but should have located and referred to all those papers dealing with Trinidad or Tobago specifically.

Historical notes. The key published records are presented, and in many cases, the location of specimens referred to in the original publications has been established, to confirm these early identifications. I also explain the source of my identification and use of the name. In preparing this account, I have checked all species in the NHMUK collection, although I did much of this last century and the curation has been further developed since then. I have also examined the main collection and type collection in USNM. In some cases, I have dissected the male terminalia of my specimens to compare with published or unpublished images.

Taxonomic issues. Here concerns regarding the identity of the species in Trinidad & Tobago are outlined, particularly where examination of the public barcodes in BOLD (www.boldsystems.org/) suggests greater diversity than is evident in the described species, or recent work has revealed some of this complexity. In some cases, I have dissected specimens to clarify whether odd specimens were variants of known Trinidad species or separate species.

Identification. Notes and pointers are provided to facilitate the identification of each species in Trinidad (or Tobago), paying particular attention to the features visible in images of live moths in the resting position. These diagnostic features are not intended to be used for the richer continental fauna of South America, where in many cases they will not be adequate. Comments on sexual dimorphism are also included here.

Biology in Trinidad. In this section, comments and illustrations regarding the life history and adult habits are restricted to observations from Trinidad & Tobago (unless specifically stated otherwise). Where nothing is known from Trinidad & Tobago, this section is omitted.

Status in Trinidad. This is a brief statement regarding the frequency with which each species has been encountered, where, and in what habitats, broadly categorized as forested or suburban. An appendix provides a listing of all records compiled from the sources listed below, following a standard format: locality, means of capture: sex of specimen if known (a '?' indicates uncertainty, e.g. in a photograph, or the sex was not noted at the time) date of capture (collector/photographer) [collection holding the specimen (if any), and any comments regarding curation or identification from the time I examined the collection]. 'MVL' is used to indicate captures made using a mercury vapour light with a strong ultra-violet component to attract the adults by night, whereas 'at light' normally refers to other lights, e.g. domestic lighting.

While I was resident in Trinidad, I sent a large number of specimens to the NHMUK for identification by CABI and NHMUK staff and retention in the NHMUK collection. For each morphospecies sent, I retained a duplicate specimen, and these pairs of duplicates were numbered sequentially TL-001, TL-002, etc. Hence for each TL- number there will normally be one duplicate in NHMUK (many are held in the accessions) and the other in either MJWC or UWIZM; these specimens are indicated by the TL- number which is given together with the holding collection in square brackets. I recorded the locality and date of capture of specimens sent

to NHMUK, but not the sex. Hence, in compiling this data here, I have often not located my specimens in NHMUK, and so many are listed with ? for the sex. In the case of Notodontidae, identifications were made at NHMUK by J.D. Holloway (Commonwealth Institute of Entomology, CABI) based on visual comparison with the NHMUK collection. I have revisited all these early identifications, and with the benefit of having examined types in the USNM have often improved on them; accordingly, I do not include Holloway's early identifications in the listing here.

In preparing this work, I consulted the following collections, either in person or from images shared by their staff (see acknowledgements):

EJS the private research collection of Ed J. Schmitt, USA (a small number of specimens but most have been DNA barcoded)

MJWC the private research collection of M.J.W. Cock, UK (records from all specimens and unpublished notes compiled and collated)

NHMUK Natural History Museum, London, UK, which contains much historical material collected by F. Birch, S.M. Klages, W.J. Kaye and others (the main sequence was checked and records included, but accessions were not reviewed)

NMS National Museum of Scotland, Edinburgh, UK, which includes part of the collections of Sir Norman Lamont and D.J. Stradling (records from both compiled and collated)

OUMNH Oxford University Museum of Natural History, which includes material collected by R.M. Farmborough and others (records from many, but perhaps not all, specimens from both the main sequence and accessions compiled and collated)

USNM National Museum of Natural History (formerly United States National Museum), Washington DC, USA (type material examined, but only selected species in the main collection)

UWIZM University of the West Indies Zoology Museum, St. Augustine, Trinidad & Tobago, which includes part of the collections of Sir Norman Lamont and D.J. Stradling as well as the former CABI collection containing material collected by the author, F.D. Bennett, R.E. Cruttwell (now McFadyen), R. Brown and T. Cassie, M. Morais and others (records from all specimens compiled and collated).

I have also examined images of live material from various contacts (see specimen listings and acknowledgements) as well as reviewing the records on iNaturalist (https://www.inaturalist.org/) and selected other websites.

Figures. The pinned specimens shown in the plates are shown life-size unless otherwise indicated; the specimens were collected by the author and are held in the author's collection except where otherwise stated. Specimen data is not given in the figure legends, but all images are cross-referenced in the Appendix listing if material. Whenever possible a male and female in dorsal view and at least one in ventral view are shown, and additional specimens may be shown to indicate variation. Images of living caterpillars and moths are attributed to the photographers. © in the figure legend refers to the photographer unless indicated otherwise.

NOTODONTIDAE OF TRINIDAD & TOBAGO

Family Notodontidae Stephens, 1829

Subfamily Dicranurinae Duponchel, [1845]

In Trinidad, this subfamily is represented by three large, distinctive species of *Truncaptera*.

Truncaptera Becker, 2014

Type species *Drymonia truncata*, Herrich-Schäffer, 1856.

Truncaptera meridionalis (Schaus, 1904)

Fig. 3. BIN: BOLD:AEF6262

OD: Schaus 1904: *Arhacia meridionalis*, TL Guyana.

TT: *Lirimiris meridionalis* (Schaus): Kaye and Lamont (1927)

Historical notes. Identified by comparison with the lectotype (USNM, ♂ Guyana) (USNM 2021). Kaye and Lamont (1927) recorded this species from Trinidad as *Lirimiris meridionalis*, referring to a specimen collected by W.J. Kaye, which I have located in NHMUK.

Taxonomic issues. A male from Arima Valley (Fig. 3, ♂2) is distinctly darker than the lectotype and the limited number of other Trinidad specimens that I have seen, but as it doesn't differ in markings it is treated here as reflecting individual variation.

All material in BOLD as *T. meridionalis* is from Costa Rica (BOLD:AAB5629). A Trinidad barcode is similar, but is in a separate BIN (BOLD: AEF6262), and may represent the true *T. meridionalis* given the type locality is Guyana.

Identification. Unlikely to be mistaken for any other Trinidad species (Fig. 3). The female is larger, and based on limited material, paler; the antennae are strongly bipectinate in both sexes (although not visible because of the angle of view for ♂1 in Fig. 3).

Biology in Trinidad. There is a specimen in the ICTA collection in UWIZM that is labelled as reared from cocoa. Since Kirkpatrick (1953) does not mention this species in his account of the Lepidoptera pests of Trinidad, this cannot be a common event.

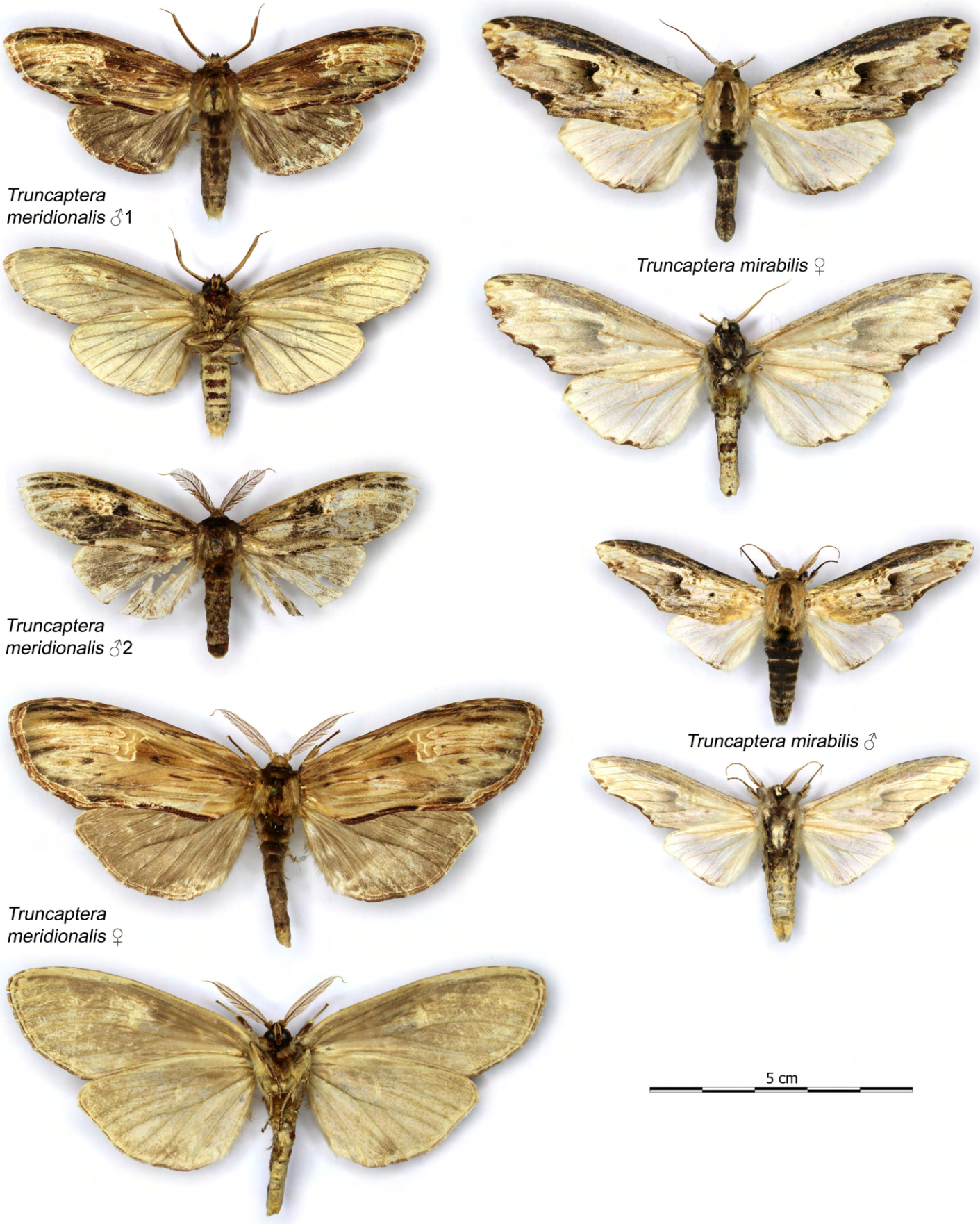

Fig. 3. Trinidad Notodontidae, Dicranurinae 1.

Status in Trinidad. An uncommon species, thus far only known from the forests of the Northern Range.

***Truncaptera mirabilis* (Rothschild, 1917)**
Fig. 3.
OD: Rothschild 1917: *Lirimiris mirabilis*, TL Peru.
Historical notes. This species has not previously been recorded from Trinidad. Identified by comparison with the type (♂ Peru, NHMUK) and NHMUK series.
Identification. Unlikely to be mistaken for any other Trinidad species (Fig. 3)
Status in Trinidad. An uncommon species in forested areas.

***Truncaptera pennipenis* (Thiaucourt, 1997)**
Fig. 4.
OD: Thiaucourt (1997): *Lirimiris pennipennis*, TL Mexico
TT: *Lirimiris truncata* (Herrich-Schäffer): Kaye and Lamont (1927) [misidentification]
Historical notes. Kaye and Lamont (1927) recorded this species as *Lirimiris truncata* from St. Ann's (W.J. Kaye); this specimen is in NHMUK. Thiaucourt (1997) revised the group of six species closely resembling *T. truncata* (Herrich-Schäffer) (TL believed to be Brazil). For the identification of this group, examination of the terminalia is necessary. Thiaucourt did not examine any material from Trinidad, but of the six known species, three might occur in Trinidad: *L. prava* (Thiaucourt) (TL Ecuador, widespread in Central and South America, including Venezuela but not the Amazon and Guianas), *T. inopinata* (Draudt) (TL Mexico, similar distribution to *T. prava*), and *T. pennipenis* (TL Mexico, widespread in the Neotropical region, including French Guiana). I dissected a Trinidad male and identified it as *T. pennipenis* by comparison with the figures in Thiaucourt (1997).
Taxonomic issues. I assume that only one species of this appearance occurs in Trinidad, but additional dissections would be needed to confirm this.
Identification. Unlikely to be mistaken for any other Trinidad species (Fig. 4). The female is larger and paler and has slightly shorter pectinations on the antennae.
Status in Trinidad. An uncommon species from forested areas with two records from suburban areas.

Subfamily Dudusinae Matsumura, 1925
***Crinodes* Herrich-Schäffer, 1855**

Type species *Phalaena bellatrix* Stoll, 1780. *Astylis* Boisduval appears in the Trinidad literature and elsewhere, but is a synonym. Males of *Crinodes* spp. are easily recognized by their large size and long tail tuft, projecting beyond the wings when at rest (Fig. 12). The large size of both sexes is comparable in size to species of *Antaea* and *Hapigia*, but *Crinodes* spp. lack the transverse markings of those genera.

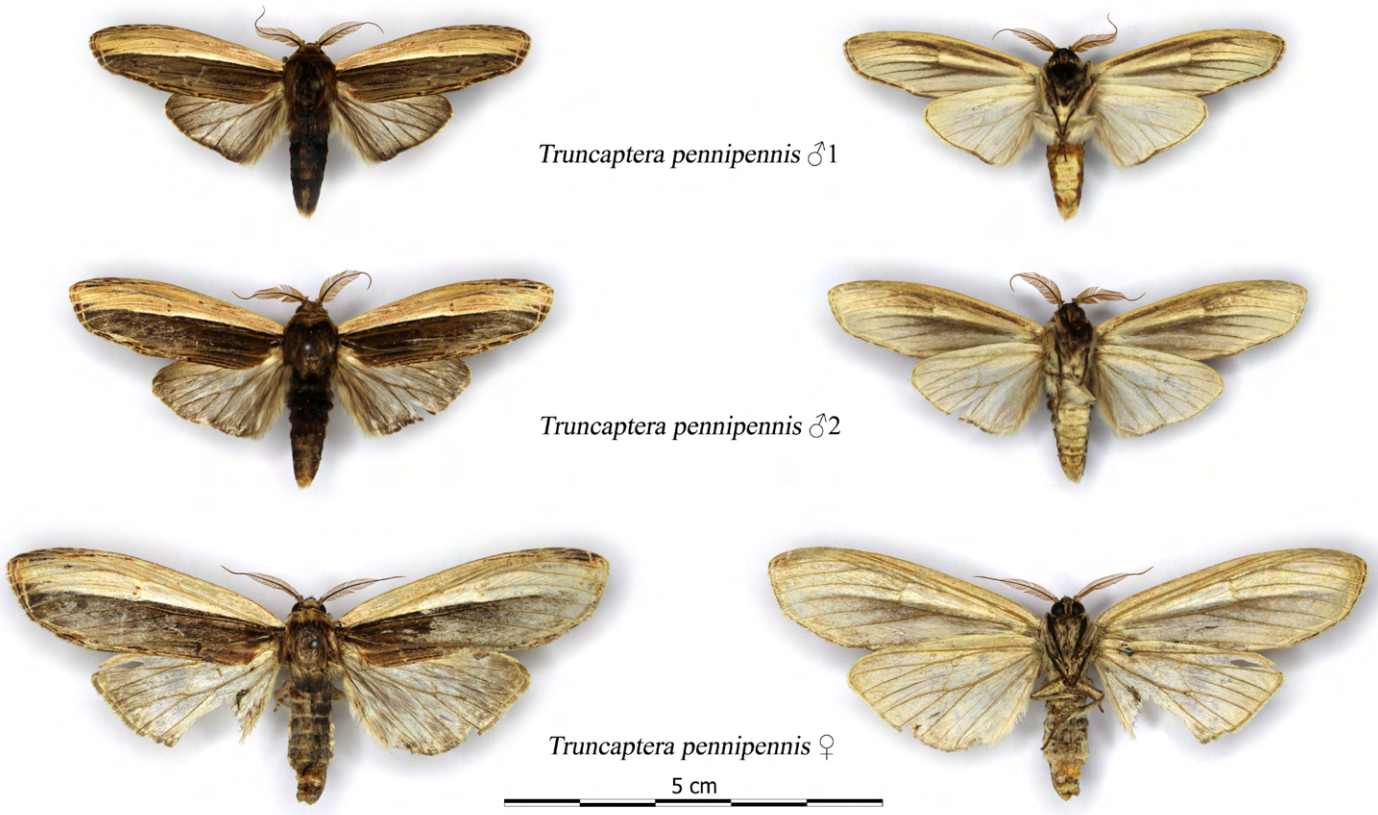

Fig. 4. Trinidad Notodontidae, Dicranurinae 2.

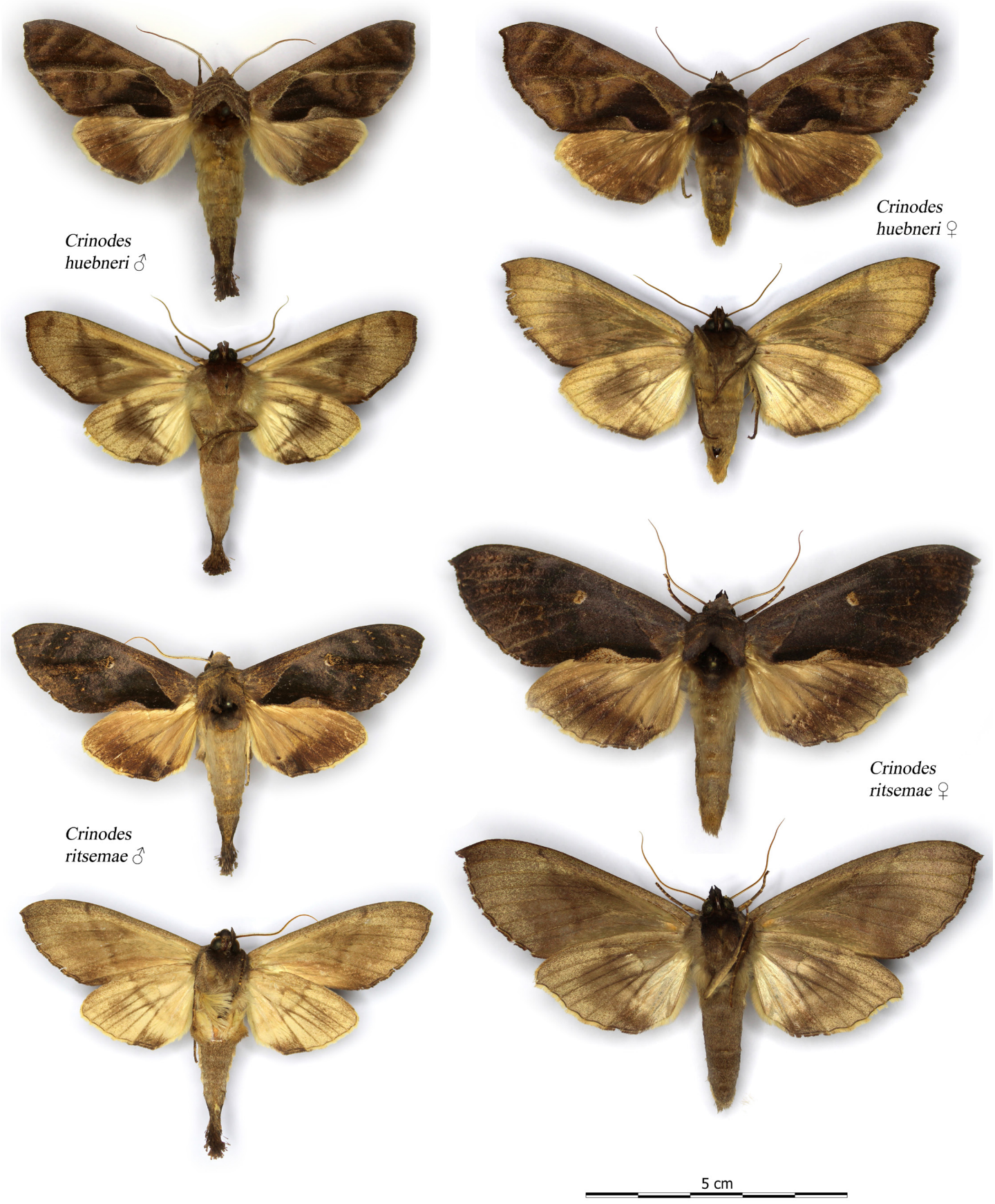

Fig. 5. Trinidad Notodontidae, Dudusinae 1.

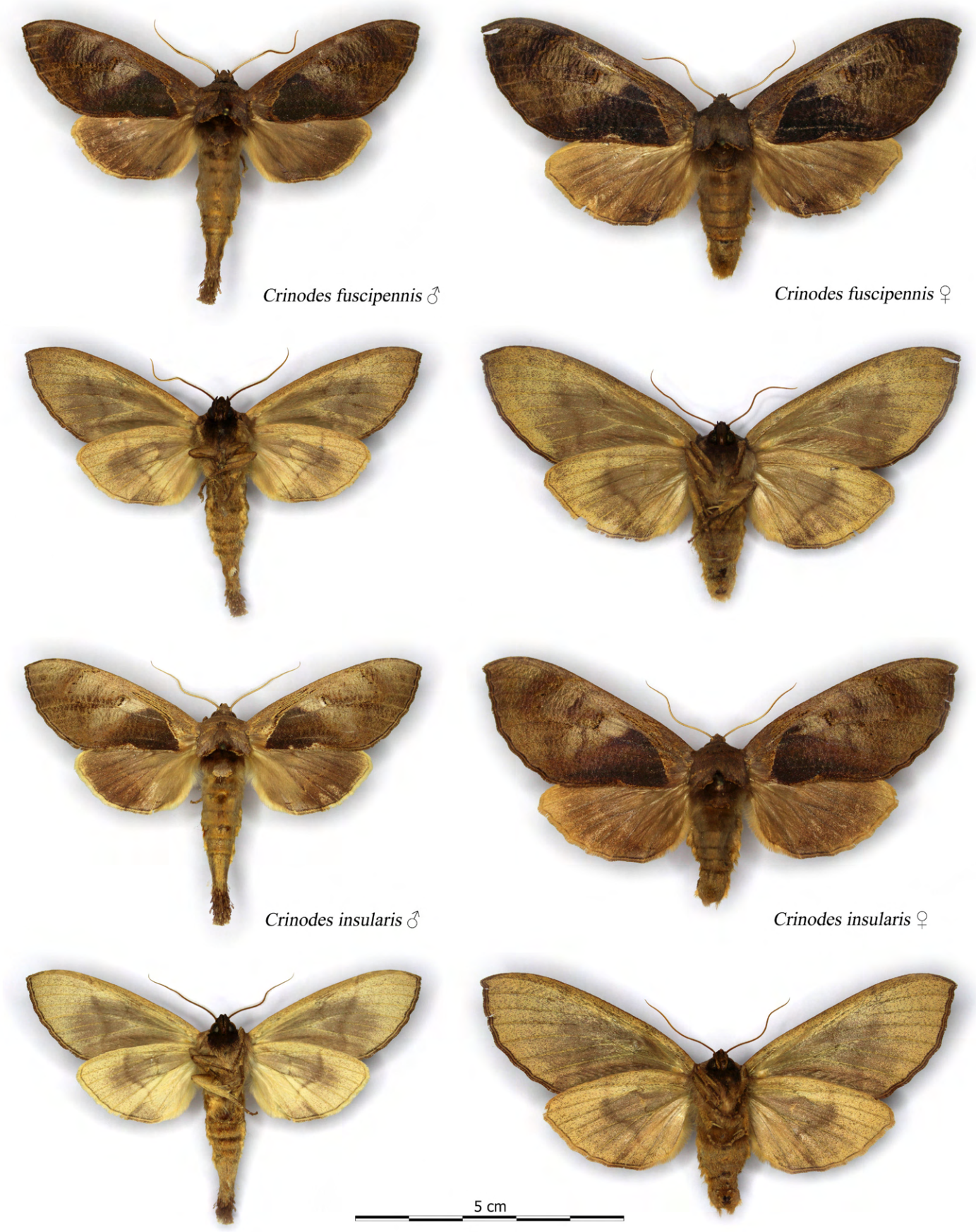

Fig. 6. Trinidad Notodontidae, Dudusinae 2.

***Crinodes huebneri* Schintlmeister, 2019**

Figs. 5, 7, 8. BIN: BOLD:AAA4399

OD: Schintlmeister 2019: *Crinodes huebneri*, TL French Guiana

TT: *Astylis besckei* (Hübner): Kaye and Lamont (1927)
Crinodes besckei (Hübner): Cock (2017a)
Crinodes huebneri Schintlmeister: Schintlmeister (2019) PTL

Historical notes. Recorded by Kaye and Lamont (1927) as *Astylis besckei* based on a W.J. Kaye specimen that has not been located. I had identified this species as *C. besckei* by comparison with the NHMUK series, but since then, Schintlmeister (2019) recognised that several similar species were combined under this name, and described *C. huebneri* which is widespread and common in Central and South America. Four males from Trinidad (Arima Valley, Simla) are included in the type series.

Fig. 7. Male *Crinodes huebneri*, Grand Riviere, 16.v.2015, K. Sookdeo. ©, with permission.

Fig. 8. Female *Crinodes huebneri*, Penal, 27.vi.2011, K. Sookdeo. ©, with permission.

Taxonomic issues. Public barcodes in BOLD (BOLD:AAA4399) as *C. besckei* are predominantly from Costa Rica, but include sequences from Mexico to Argentina. These are assumed to represent *C. huebneri*.

Identification. The reddish tint to the dorsal forewings and irregular transverse discal lines will distinguish *C. besckei* from the other members of the genus. Females are slightly larger, the forewing apex more falcate, and they lack the obvious tuft of scales at the end of the abdomen.

Status in Trinidad and Tobago. An occasional species found in both forested and suburban areas. It appears to be the commonest representative of the genus in Trinidad, and the only one found in Tobago (Cock 2017a).

Crinodes ritsemae Butler, 1878

Fig. 5, 9, 10. BIN: BOLD:AAA6120

OD: Butler 1878: *Crinodes ritsemae*, TL Brazil, Rio Madeira.

TT: *Astylis ritsemae* (Butler): Kaye and Lamont (1927)
Crinodes ritsemae Butler: Schintlmeister (2019, map 6)

Historical notes. Kaye and Lamont (1927) recorded this species from Trinidad as *Astylis ritsemae* based on a specimen collected by R.M. Farmborough (not located). Identified by comparison with the NHMUK series.

Taxonomic issues. Public barcodes in BOLD as *C. ritsemae* are predominantly from Costa Rica, but include sequences from French Guiana and Brazil (Para), suggesting that this is a single widespread species (BIN: BOLD:AAA6120).

Identification. This is the largest and darkest *Crinodes* species in Trinidad, with a contrasted pale cell spot and patch on the forewing dorsum. Females are larger than males, and lack the conspicuous tuft of scales at the end of the abdomen.

Status in Trinidad. An occasional species in both forested and suburban areas.

Fig. 9. Male *Crinodes ritsemae*, Arima Valley, Asa Wright Nature Centre, 11.v.2018, M.G. Rutherford (iNaturalist observation 12354865). ©, under CC-BY-NC license.

Fig. 10. Female *Crinodes ritsemae*, Grand Riviere, 16.v.2015, K. Sookdeo. ©, with permission.

Crinodes fuscipennis Rothschild, 1917
Fig. 6.
OD: Rothschild 1917: *Crinodes striolata fuscipennis*, TL South-East Peru.
TT: *Astylis striolata* (Schaus): Kaye and Lamont (1927) [misidentification]
Crinodes fuscipennis Rothschild: Schintlmeister (2019), Cock (2021)

Historical notes. *Crinodes striolata* Schaus was described from eastern Brazil (Pernambuco), but is considered to be restricted to eastern and southern Brazil, northern Argentina and Paraguay (Schintlmeister 2019). *Crinodes fuscipennis* and C. *insularis* Rothschild were considered to be subspecies of *C. striolata* (Becker 2014), but Schintlmeister (2019) raised *C. fuscipennis* to species status, giving its distribution as widespread in South America, including Trinidad, and made *insularis* a synonym. Cock (2021) explained why *C. insularis* should also be considered a separate valid species.

Crinodes fuscipennis has been recorded from Trinidad as *C. striolata* (Kaye and Lamont 1927), based on four specimens collected by W.J. Kaye from St. Ann's in the National Collection (now NHMUK). I identified this species from Schintlmeister (2019).

Taxonomic issues. See under *C. insularis* below.

Identification. *Crinodes striolata* is smaller than *C. ritsemae*, it lacks the pale discal spot of the dorsal forewing, and the discal and postdiscal area is striated with narrow dark lines. It is more similar to *C. insularis*, which follows and under which differences are presented.

Status in Trinidad. An occasional species in forested and suburban habitats. It flies together with the next.

***Crinodes insularis* Rothschild, 1917**
Figs. 6, 11, 12.
OD: Rothschild 1917: *Crinodes striolata insularis*, TL Trinidad.
TT: *Crinodes striolata insularis*: Rothschild: Rothschild (1917) TL, Cock (2003), Becker (2014)
Crinodes guatemalena insularis Rothschild: Schintlmeister (2013)
Crinodes fuscipennis Rothschild [part]: Schintlmeister (2019)
Crinodes insularis Rothschild: Cock (2021)

Historical notes. Rothschild (1917) described *insularis* from Trinidad as a subspecies of *C. striolata*, referring to ten specimens, at that time in the Tring Museum, which are now in NHMUK. Kaye and Lamont (1927) recorded *C. striolata* from Trinidad, but did not mention *C. insularis*, which at that time was an accepted subspecies of *C. striolata* from Trinidad. Schintlmeister (2019) made *C. insularis* a synonym of *C. fuscipennis*, but Cock (2021) raised it to a valid species. I identified this species by comparison with the type (NHMUK, ♂ Trinidad, photo), NHMUK series and Schintlmeister (2019).

Fig. 11. Caterpillars of *Crinodes insularis* on *Gouania* sp., Maracas Valley, 25.vi.1978 (M.J.W. Cock)

Fig. 12. Male *Crinodes insularis*, reared from larva on *Gouania* sp., Maracas Valley, 25.vi.1978 (M.J.W. Cock)

Taxonomic issues. Recently, Cock (2021) raised this taxon to species status based on the differences in markings and male genitalia.

Identification. Rothschild (1917) indicating that *C. insularis* differed from the nominate subspecies of *C. striolata* 'in being suffused with dark brownish cinnamon which gives it a washed-out appearance'. The wing markings of the two species are more or less identical in pattern, but in addition to the washed-out effect, the extent of the dark discal and postdiscal striations is reduced in *C. insularis*, and the pale basal area that extends along the costa is a much stronger contrast to the adjacent dark brown post basal area in *C. insularis*. Males are smaller than females, and the abdomen is longer with a tuft of narrow scales with spatulate tips.

Biology in Trinidad. Following Cock's (2003) publication of an image of a group of caterpillars on an unidentified vine (Fig. 11), the late Victor Quesnel (in lit. 18 February 2004) was able to confirm that he had seen the same caterpillar (documented with a photograph) on either *Gouania velutina* or *G. polygama* (Rhamnaceae) at Talparo, Trinidad. More recently, caterpillars observed by Mike G. Rutherford on the offshore island of Gaspar Grande were also thought to be feeding on a species of *Gouania* (https://www.inaturalist.org/observations/28833645). The caterpillars of *C. fuscipennis* are likely to be similar, so caterpillars of this appearance cannot be identified with certainty without rearing adults to check.

Status in Trinidad. An occasional species in both forested and suburban areas. Also recorded on Gaspar Grande.

Subfamily Hemiceratinae Guenée, 1852

Apela Walker, 1855

Type species *Apela divisa* Walker, 1855. Note that *Apella* [sic] *ovalis* (Rothschild) (Fig. 1), which was originally described as a species of *Apela*, has recently been transferred to *Lepela* in the Erebidae, Anobiinae (Cock 2021).

***Apela divisa* Walker, 1855**

Figs. 13, 17–19.

OD: Walker 1855: *Apela divisa*, TL [Trinidad].

TT: *Apela divisa* Walker: Kaye (1901), Kaye and Lamont (1927), Thiaucourt (1988b)

Historical notes. Walker (1855) described this South American species based on a female stated to be from Nepal. Kaye (1901) recorded it from Trinidad pointing out that 'Hampson has included this in his Moths of India vol. i, p.168, Walker having given N. India as the locality for the species'. Kaye and Lamont (1927) added additional records: 'Guaico, 18.iv.1915; Verdant Vale, 19.iv.1919, 31.xii.1921; Palmiste, 21.xii.1921 (N.L.). Tabaquite (F.W. Jackson) (F.W. Urich)', several of which are listed below. I identified this species by comparison with the type (NHMUK, ♀ Trinidad) and NHMUK series.

Taxonomic issues. *Apela* includes several very similar species best separated by their terminalia (Forbes 1939). In his treatment, Forbes was doubtful as to the identity of *A. divisa*, and so did not use this name. Thiaucourt (1988b) examined the holotype female in NHMUK, which is a female with no abdomen, actually from Trinidad rather than Nepal. He dissected males and females of phenotypically similar specimens from Trinidad to establish the true identity of *A. divisa*. At present, only *A. divisa* is recognized from Trinidad, but the possibility that other species of the genus could occur should not be ignored. For example, the individual shown alive in Fig. 16 is considerably paler than typical Trinidad specimens and would have been worth checking.

Identification. *Apela divisa* resembles some *Hemiceras* spp. (below), but males lack the hind wing stigma of *Hemiceras* spp., and the tuft on the dorsum of the forewing of *A. divisa* is much more pronounced and acute. Males and females both have simple antennae, and are not readily separated in life, but females have wider wings, are generally darker, and the dorsum hair tuft may be less pronounced.

Status in Trinidad. A fairly common and widespread species in diverse habitats.

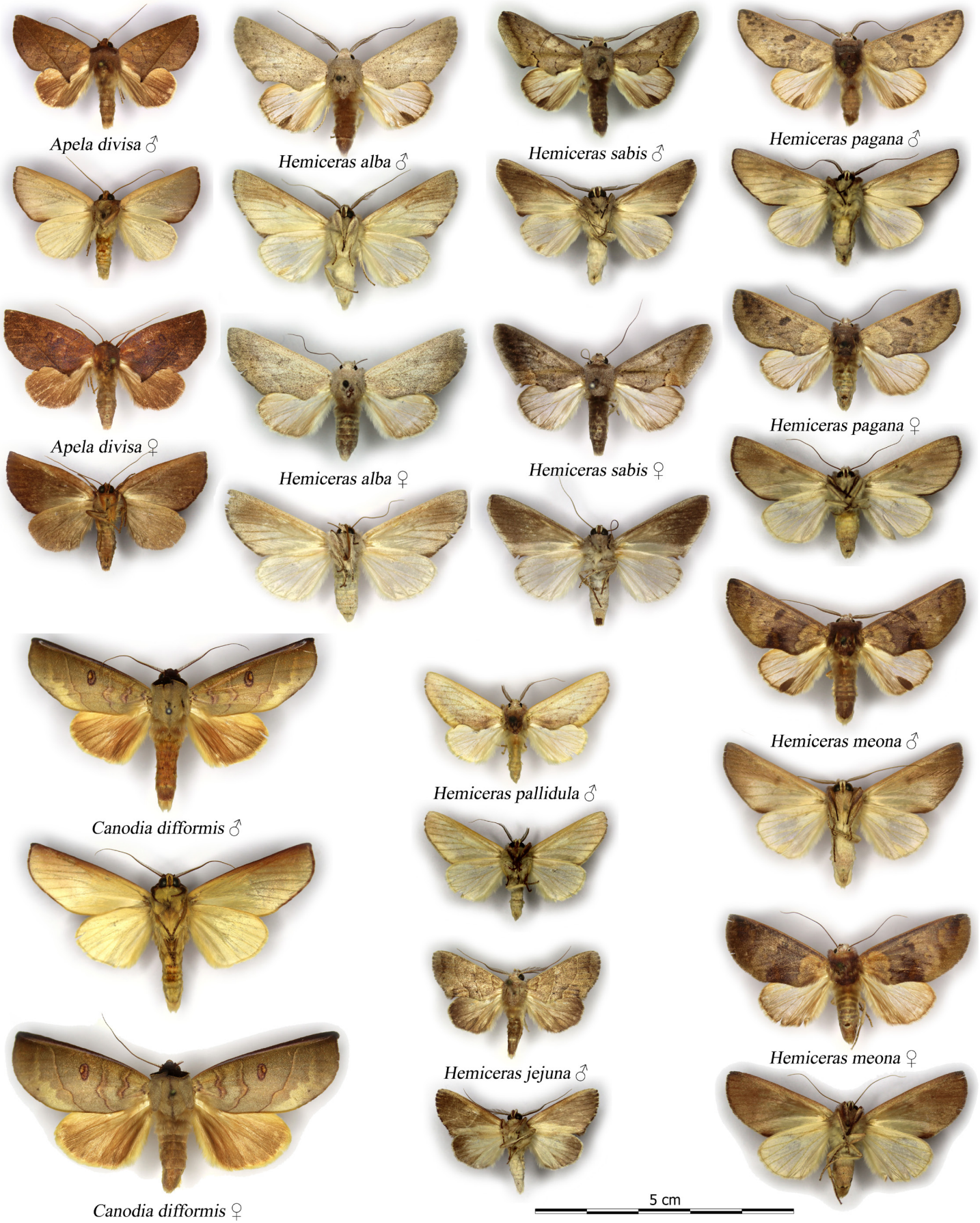

Fig. 13. Trinidad Notodontidae, Hemiceratinae 1.

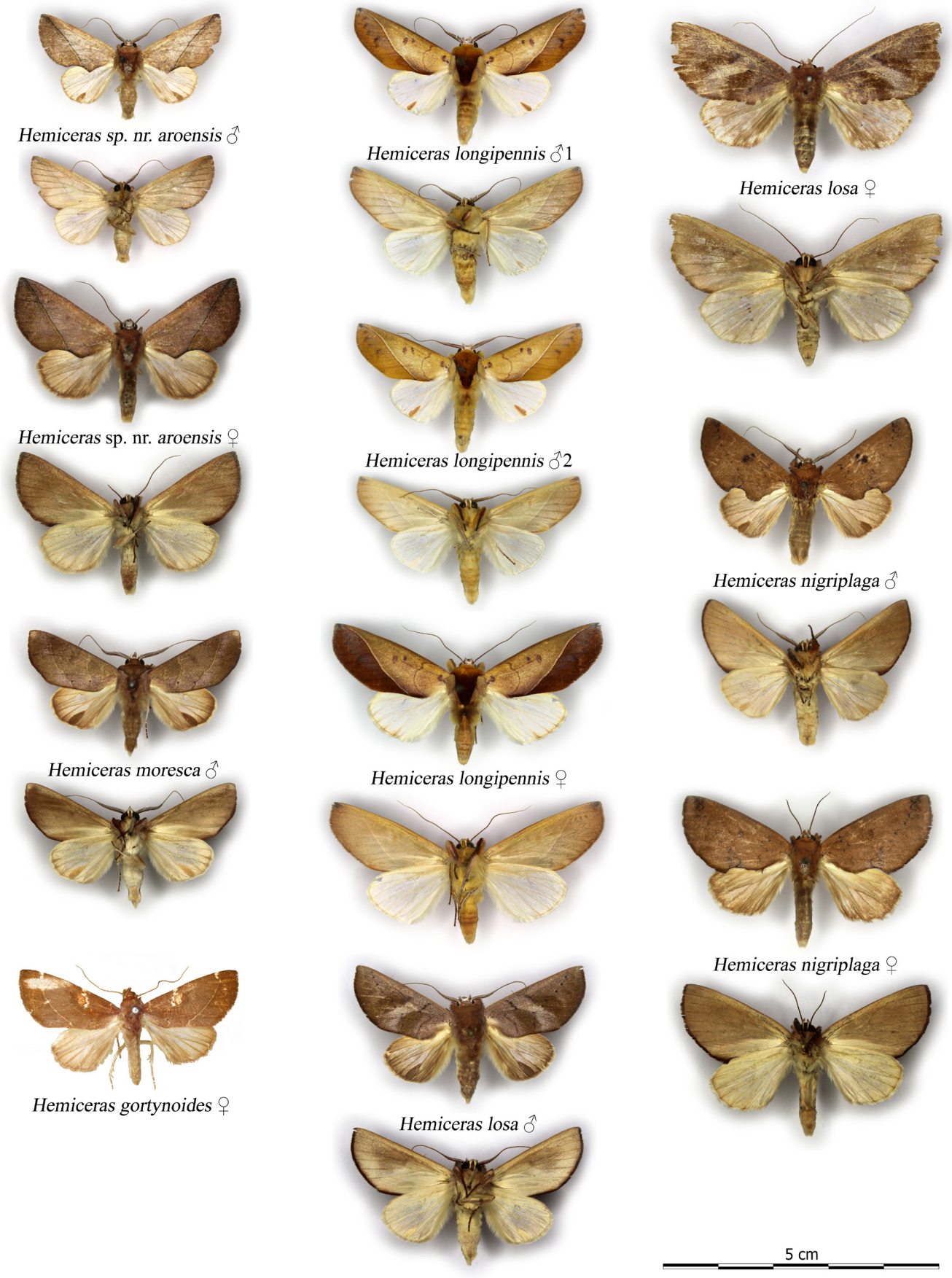

Fig. 14. Trinidad Notodontidae, Hemiceratinae 2. *Hemiceras gortynoides* ♀ is in OUMNH.

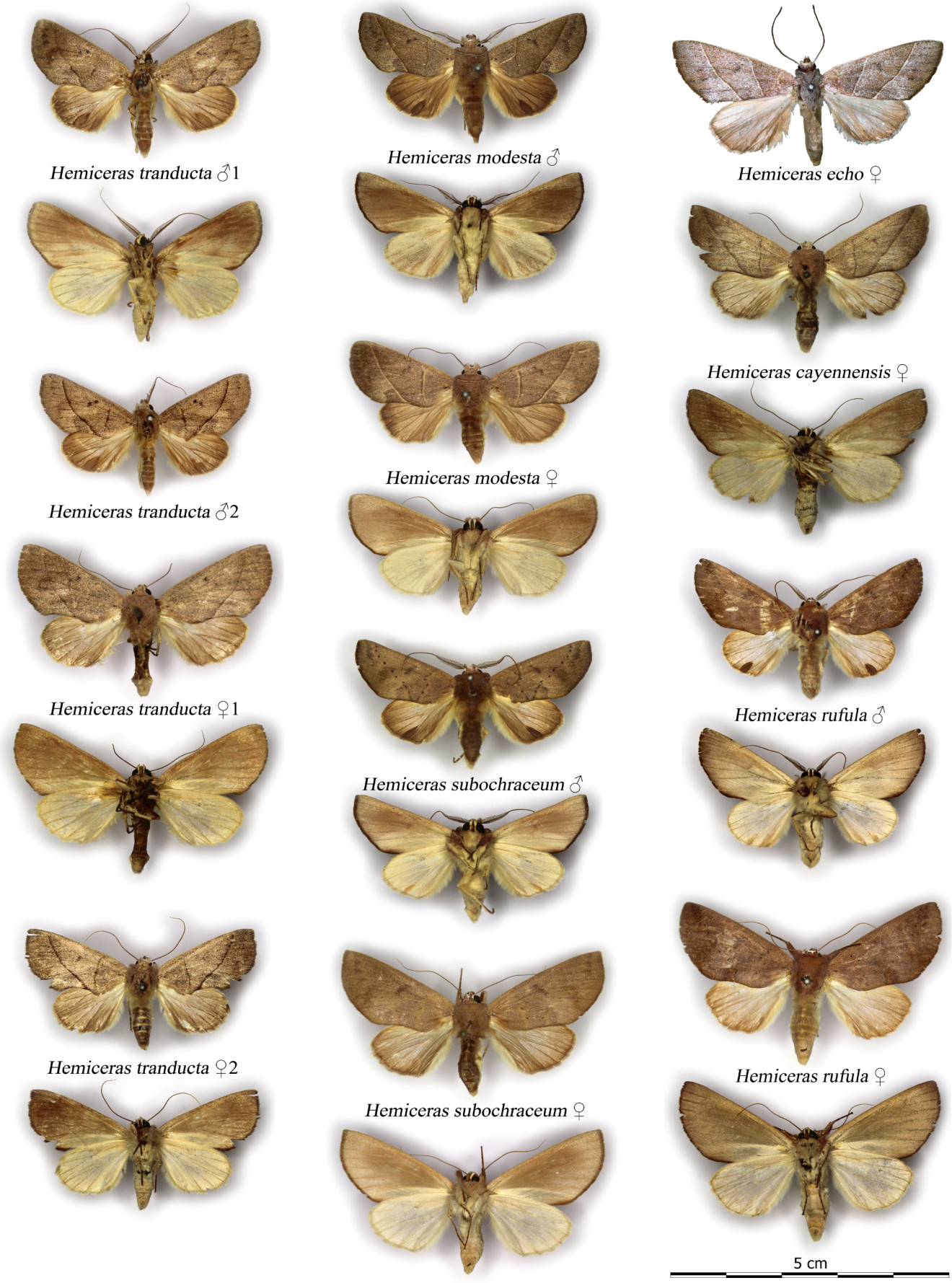

Fig. 15. Trinidad Notodontidae, Hemiceratinae 3. *Hemiceras echo* ♀ is in NHMUK; ©The Trustees NHMUK, made available under Creative Commons License 4.0 https://creativecommons.org/licenses/by/4.0/.

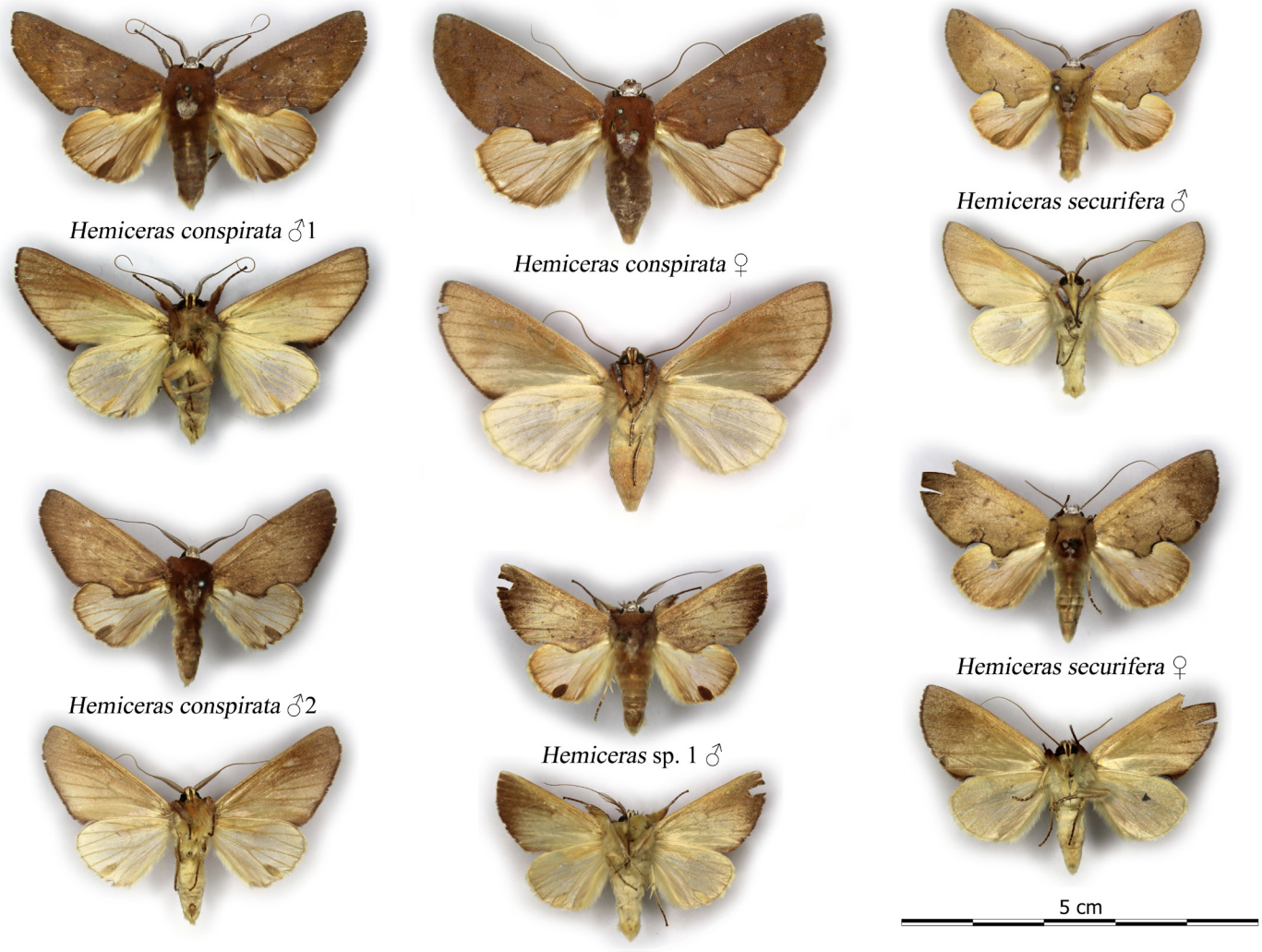

Fig. 16. Trinidad Notodontidae, Hemiceratinae 4.

Fig. 17. Living male(?) *Apela divisa*, Arima Valley, Asa Wright Nature Centre, 22.iii.2015, S. Nanz. ©, with permission.

Fig. 18. Female(?) *Apela divisa*, Arima Valley, Asa Wright Nature Centre, 21.ix.2013, K. Sookdeo. ©, with permission.

Fig. 19. Female(?) *Apela divisa* (?), Talparo, 30.iii.2014, K. Sookdeo. ©, with permission.

Canodia Guenée, 1852

Type species *Canodia carmelitoides* Guenée, 1852, TL Brazil.

***Canodia differmis* Herrich-Schäffer, 1854**

Fig. 13.

OD: Herrich-Schäffer 1854: *Canodia differmis*, TL Suriname.

TT: *Canodia differmis* Herrich-Schäffer: Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) listed a specimen in NHMUK collected by W.J. Kaye (as listed below). I identified this species by comparison with the NHMUK series.

Identification. This distinctive species should not be mistaken in Trinidad. The forewings are more elongate in males than females, and the antennae are narrowly bipectinate in the male and simple in the female.

Status in Trinidad. An uncommon species found in forested areas, so far only in northern Trinidad.

***Hemiceras* Guenée, 1852**

Type species *Hemiceras cadmia* Guenée, 1852, TL North America. This is a large and difficult genus with several species-complexes more or less understood. Currently, 23 species are recognized and treated below. Adults are shown in Figs 13–16, grouped to keep similar species together, rather than in the alphabetical sequence which follows. It seems likely that there will be misidentifications in my treatment, as well as additional species yet to be recognized or found. In Trinidad & Tobago, *Hemiceras* sp. males all have a stigma on the hindwing, not observed in any other Trinidad & Tobago genera. The antennae of males are strongly bipectinate in the basal half, whereas those of females are simple throughout. In most cases, the females are slightly larger, have broader more rounded wings and may be darker.

***Hemiceras alba* Walker, 1865 complex**

Figs. 13, 20.

OD: Walker 1865: *Hemiceras alba*, TL Honduras.

TT: *Hemiceras alba* Walker: Lamont and Callan (1950)

Historical notes. Lamont and Callan (1950) recorded this species based on a capture by Sir Norman Lamont at Palmiste, 9 December 1947. Probably this is the specimen in UWIZM labelled with the same date in 1937 (below), or a transcription error combining the two Palmiste specimens listed below. Identified by comparison with the type (NHMUK, ♂ Honduras) and NHMUK series.

Taxonomic issues. This species was described from Honduras, and there are public DNA barcodes in BOLD from Costa Rica only, which are likely to represent this species. It would be worthwhile to compare DNA barcodes from Trinidad and elsewhere in South America with these. A. Schintlmeister (pers. comm. 2021) advises that the name *H. alba* is a complex of undescribed species, differentiated by their genitalia, and as yet it is unclear exactly where the Trinidad population belongs.

Identification. This is the only Trinidad *Hemiceras* species with uniformly pale grey-white forewings and the two discal lines indicated principally by dots on the veins (Fig. 13).

Status in Trinidad. This is an uncommon species, with most records from suburban and disturbed areas.

Fig. 20. Male *Hemiceras alba*, Penal, 25.ix.2010, K. Sookdeo. ©, with permission.

***Hemiceras* sp. nr. aroensis Schaus, 1901**

Fig. 14, Appendix Fig. 1.

OD: Schaus 1901: *Hemiceras aroensis*, TL Venezuela, Aroa.

Historical notes. I have referred to this species as *H. aroensis* or *H.* near *aroensis*, following comparison with the lectotype (USNM, ♂ Venezuela) (Schintlmeister 2016, USNM 2021).

Taxonomic issues. Identified by comparison with the lectotype (♂ Venezuela USNM) (Schintlmeister 2016, USNM 2021), which is distinctly paler, and has slightly different male genitalia (Appendix Fig. 1) (A. Schintlmeister pers. comm. 2021). At present this is either an undescribed species or represents the unrecognised species *H. jacksoni* Kaye (below). *Hemiceras laurentina* Schaus, 1905 identified by comparison with the lectotype (USNM, ♂ French Guyana) (Schintlmeister 2016, USNM 2021) and H. *semililacea* Dognin, 1923 identified by comparison with the holotype (USNM, ♂ Brazil, Amazonas) (Schintlmeister 2016) are similar, but in both these species the discal line is reflexed at the dorsum.

Identification. The rather uniform dorsal forewing, with a single, solid, straight line from the dorsum tuft to the apex is distinctive in Trinidad. The dorsal forewing of the male is slightly paler basal to the straight line.

Status in Trinidad. An uncommon species from forested areas of the north of Trinidad.

***Hemiceras cayennensis* Schaus, 1905**
Fig. 15, Appendix Fig. 2.
OD: Schaus 1905: *Hemiceras cayennensis*, TL French Guiana.
Historical notes. Only a single female specimen of this species is known to me (Fig. 15). It appears to be a new record for Trinidad, although the identification needs confirmation.
Taxonomic issues. I have provisionally identified this as *H. cayennensis* Schaus, 1905 by comparison with the lectotype (USNM, ♂ French Guiana (Schintlmeister 2016, USNM 2021). The male lectotype is paler than the Trinidad female and the dorsum is completely straight. However, the female paralectotype illustrated by Schintlmeister (2016) is a good match to the Trinidad specimen. It also resembles some species of the *H. lissa* complex (Thiaucourt 1994), but the female genitalia (Appendix Fig. 2) do not resemble those illustrated by Thiaucourt for this complex. Without a Trinidad male to match, and until the type material is dissected, I hesitate to be categorical about this identification. Apart from slight differences in the female genitalia, A. Schintlmeister (pers. comm. 2021) agrees with this identification but points out *H. cayennensis* is likely to be a synonym of *H. indigna* Schaus, 1905 (TL French Guiana) (Schintlmeister 2016, USNM 2021).
Identification. Note the minimal bulge on the dorsum, uniform dorsal forewing ground colour, shading darker distally, and clear straight discal lines
Status in Trinidad. One record from the Arima Valley.

***Hemiceras conspirata* Schaus, 1905**
Fig. 16, Appendix Fig. 3. BIN: BOLD:AAM9309
OD: Schaus 1905: *Hemiceras conspirata*, TL Omoi, British Guiana, Venezuela, southern Brazil.
TT: *Hemiceras conspirata* Schaus: Cock (2017a)
Historical notes. A new record for Trinidad.
Taxonomic issues. Comparison with the lectotype (USNM, ♂ Guyana) (Schintlmeister 2016) suggests this identity, but Trinidad material has the ♂ hindwing stigma more elongate, although within the range of variation of the NHMUK and USNM series. *Hemiceras conspirata* appears in BOLD in two BINs: BOLD:AAA4232 with many examples from Costa Rica, and the closely similar BOLD:AAM9309 with material from southern Brazil and Trinidad. The latter should represent the true *H. conspirata* as it was described from Guyana (lectotype), Venezuela and southern Brazil.
Identification. This is one of the largest Trinidad *Hemiceras* species (Fig. 16). The pale head and pale dorsal patch of the metathorax, uniform chestnut brown wings and punctate cross lines should facilitate identification of this species in Trinidad. The female has the dorsal forewing costa narrowly white, but this feature is largely obscured in the male. A worn male specimen (Fig. 16 ♂2) for which the identification was confirmed by dissection (Appendix Fig. 3), lacked the chestnut tint to the dorsal forewing, the costa was not pale, the transverse lines were almost obscured, and the hindwing stigma appeared broader and did not extend as far basally.
Status in Trinidad and Tobago. An occasional species in forested and suburban areas.

***Hemiceras echo* Dyar, 1908**
Fig. 15.
OD: Dyar 1908: *Hemiceras echo*, TL British Guiana
TT: *Hemiceras indistans* Guenée: Kaye and Lamont (1927) [misidentification]
Historical notes. Kaye and Lamont (1927) included this species as *H. indistans* Guenée in their catalogue, based on a specimen from Port-of-Spain (3 March 1910) in NHMUK. I have examined this specimen in the NHMUK series of *H. indistans* (Fig. 15). The specimen data does not include a collector, and I have not seen this type of label or date of collection from Trinidad before, so that its authenticity may be open to question. *Hemiceras indistans* was described from South Brazil, and its known range does not extend to northern South America, where it is replaced by *H. echo* Dyar (lectotype USNM, ♂ Guyana, designated by Thiaucourt (2008a)) and *H. beata* Schaus (Thiaucourt 2008a). Based on the appearance of the specimen, Thiaucourt's (2008a) figures, and photos of the lectotype (Schintlmeister 2016, USNM 2021), the Trinidad specimen in NHMUK is *H. echo*. Although Schintlmeister (2013) followed Thiaucourt (2008a) in treating *H. echo* as a valid species. Becker (2014) listed it as a synonym of *H. indistans.* Since this change was not designated as a stat. rev., I am assuming it represents an oversight, and here I follow the treatment of Thiaucourt (2008a).
Identification. This species is similar to *H. modesta* and *H. tranducta* and others in Fig. 15. My photograph taken in the NHMUK some years ago is not necessarily colour-accurate and was taken under different lighting conditions to others in the plate, but this species is grey in colour compared to the other pale to medium brown species. The even transverse lines of the dorsal forewing, well separated at the dorsum, and the almost straight dorsum will also help to recognize this species.
Status in Trinidad. Only known from the original specimen (Fig. 15); confirmation of this as a Trinidad species is needed.

***Hemiceras gortynoides* Schaus, 1905**
Fig. 14.
OD: Schaus 1905: *Hemiceras gortynoides*, TL Guyana.
TT: *Hemiceras gortynoides* Schaus: Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) recorded *H. gortynoides* from Trinidad based on a specimen from Caigual (Agnes Lickfold). This specimen is in OUMNH (Fig. 14), and has Kaye and Lamont's determination label. I confirmed this identification by comparison with the lectotype (USNM, ♂

Guyana) (Schintlmeister 2016, USNM 2021) and NHMUK series.

Identification. This is one of the more distinctive Trinidad *Hemiceras* spp., due to the reddish dorsal forewing ground colour, white costal sections of the transverse lines and the white patch distal to the prediscal line in the cell.

Status in Trinidad. The original specimen from Caigual remains the only record of this species from Trinidad.

***Hemiceras jacksoni* Kaye, 1925**

OD: Kaye 1925: *Himiceras* [sic] *jacksoni*, TL Trinidad.

TT: *Hemiceras jacksoni* Kaye: Kaye (1925) TL, Draudt (1932-1934)

Historical notes. Kaye (1925) described this species from Trinidad, stating that the type from Manzanilla (F.W. Jackson) is in coll. Lamont. Other type species designated by Kaye have been found in NMS, derived from Lamont's collection, but not this one (Bland 2010). Neither has the type been located in NHMUK. Curiously, the species is omitted from Kaye and Lamont's (1927) catalogue two years later.

Identification. Kaye's (1925) description reads: 'Head, thorax and palpi reddish mixed with grey. Fore-wing reddish with a slight purplish suffusion. An indistinct orbicular stigma within the cell and a still more indistinct discoidal spot. Inner margin broadly pinkish grey and a very broad submarginal band pinkish grey, but very undecided except near costa. A double post-median line edging the submarginal band. Outer margin slightly darker and shading off towards apex and towards tornus. Hind-wing pearly with a pinkish tinge shading to red on outer margin. Fore-wing beneath pinkish with the inner margin broadly cream-coloured. Hind-wing below cream-coloured with the extremities of the veins pinkish. Abdomen beneath cream-coloured the last segment darker. Exp. 48 mm.' Kaye does not mention a hindwing stigma, so presumably this is based on a female. Could it be an accidental synonym of another Trinidad species? Kaye (1901) recorded only one species of *Hemiceras* from Trinidad (*H. modesta*), while Kaye and Lamont (1927) added five species based on specimens that they had seen: *H. deornata* (as *H. nubilata*), *H. gortynoides*, *H. indistans*, *H. pagana*, *H. sabis*, and *H. tranducta*. The description of *H. jacksoni* does not match any of these. Of the other species recorded here, only *H.* sp. nr. *aroensis* (Fig. 14) (above) seems to bear any similarity to this description. If they are synonyms, *H. aroensis* would be the senior name. Until a type can be located, *H. jacksoni* is treated as an unrecognised species.

***Hemiceras jejuna* Schaus, 1905**

Fig. 13, Appendix Fig. 4.

OD: Schaus 1905: *Hemiceras jejuna*, TL Trinidad.

TT: *Hemiceras jejuna* Schaus: Schaus (1905) TL, Kaye and Lamont (1927), Draudt (1932-1934)

Historical notes. Schaus (1905) described this species from Trinidad. I have examined the lectotype (USNM, ♀ Trinidad, dissected) (Schintlmeister 2016, USNM 2021), which is a female. Kaye and Lamont (1927) included this species based on Schaus' type locality, but added no new records.

Identification. Two specimens in coll. Lamont [UWIZM] as *Hemiceras jejuna* are misidentified: ♀ *Heorta perplexa* Schaus and ♂ *Gabara insulsa* Dognin (Erebidae). *Hemiceras jejuna* is not difficult to recognize due to the three clear transverse lines, only otherwise seen in *H. moresca* (Fig. 14) which is a much darker species, and *H. echo* (Fig. 15), which is a larger, grey species. The female has the forewing dorsum almost straight. As this rare species was described from Trinidad, the male terminalia are shown in Appendix Fig. 4.

Status in Trinidad. A rare species, I have only seen two specimens apart from the lectotype.

***Hemiceras longipennis* Schaus, 1905**

Fig. 14.

OD: Schaus 1905: *Hemiceras longipennis*, TL Guyana.

Historical notes. A new record from Trinidad, identified by comparison with the lectotype (USNM, ♂ Guyana) (Schintlmeister 2016, USNM 2021).

Identification. This species cannot be mistaken for any other in Trinidad. The colours are slightly variable, and females are darker than males.

Status in Trinidad. This species is common in Curepe / St. Augustine, but curiously I have no records from anywhere else in Trinidad.

***Hemiceras losa* Druce, 1890**

Fig. 14. BIN: BOLD:AAN6799

OD: Druce 1890: *Hemiceras losa*, TL Trinidad

TT: *Hemiceras losa* Druce: Druce (1890) TL

Historical notes. Druce (1890) described this species from Trinidad, and also mentions a specimen from Panama. I have examined the male Trinidad type in NHMUK.

Taxonomic issues. A Trinidad specimen in MJWC was successfully barcoded; the sequence does not match material from Costa Rica in BOLD identified as *H. losa* (BOLD:AAA5861), but it does match BIN: BOLD:AAN6799, with material from the mouth of the Amazon to Colombia and Peru.

Identification. This species can most readily be recognized by the lilac band on the dorsal forewing from about one-third on the costa to the tornus.

Status in Trinidad. An uncommon but widespread species in Trinidad, apparently more common in forest areas than suburban ones.

***Hemiceras meona* (Cramer, 1781)**
Figs. 13, 21.
OD: Cramer 1781: *Phal[aena] Bomb[yx] meona*, TL Suriname.
TT: *Hemiceras meona* (Cramer): Cock (2017a)
Historical notes. This newly recorded Trinidad species was identified by comparison with the NHMUK series and Thiaucourt (2008a).
Identification. The markings of the dorsal forewing are very similar to those of *H. pagana*, but that species is grey-brown (Fig. 13), whereas *H. meona* is two shades of brown (Fig. 13). In *H. meona* the area between the prediscal line and the postdiscal line is darker brown, particularly adjacent to the prediscal line and near the dorsum.
Status in Trinidad. An occasional species of both forest and suburban habitats.

Fig. 21. Female *Hemiceras meona*, Arima Valley, Asa Wright Nature Centre, 6.iii.2007, S. Daniel (iNaturalist observation 69947561). ©, with permission.

Hemiceras modesta Butler, 1879
Figs. 15, 22, Appendix Figs. 5, 6.
OD: Butler 1879: *Hemiceras modesta*, TL Amazonas.
TT: *Hemiceras modesta* Butler: Kaye (1901), Kaye and Lamont (1927)
Historical notes. Kaye (1901) and Kaye and Lamont (1927) listed this species on the basis of a specimen taken by W.J. Kaye at Tabaquite. We know from Kaye (1901) that at this time he had only collected in Trinidad in May and June 1898, so this specimen must have been collected then. I would expect it to be in NHMUK, but I have not found it there. However, there is material in MJWC, UWIZM and NMS which I have identified as this species by comparison with the type (♂ Amazons) and NHMUK series.
Taxonomic issues. BOLD contains public DNA barcodes of material from Costa Rica (many) and Peru (1) identified as this species, which are grouped in five different BINS. Clearly there is greater cryptic diversity than currently apparent, and not only might Trinidad material not represent the true *H. modesta*, but also there could easily be more than one species of this appearance in Trinidad. Hence, male and female terminalia are shown for Trinidad specimens (Appendix Figs. 5, 6). Life history information and DNA barcodes from Trinidad would be helpful to clarify this complex.
Identification. This species is similar to *H. echo*, *H. tranducta* and *H. deornata* (Fig. 15). The dorsal forewing and hindwing are a darker brown than most of these species, the prediscal and postdiscal lines are darker dark brown, and pale basally to the former and distally to the latter, and the dorsum is sinuous. Apart from being grey-brown, *H. echo* has a basal transverse line, the prediscal line is pale distally rather than basally, and the dorsum is flat. In *H. tranducta*, the ground colour is a paler brown, the prediscal line is hardly apparent, the post discal line is barely edged with white, and a bulge just before half on the dorsum is more pronounced.
Status in Trinidad. An occasional and widespread species mainly recorded from forested areas.

Fig. 22. Male *Hemiceras modesta,* Asa Wright Nature Centre, 24.iii.2015, S. Nanz. ©, with permission.

Hemiceras moresca Schaus, 1904
Fig. 14.
OD: Schaus 1904: *Hemiceras moresca*, TL Guyana.
Historical notes. A new record for Trinidad, identified by comparison with the lectotype (USNM, ♀ Guyana) (Schintlmeister 2016, USNM 2021).
Identification. The dorsal forewing of this species is a uniform rich brown, with the prediscal and postdiscal lines narrowly marked in pale brown, with a dark brown border

basally on the postdiscal line, a dot on vein 1 (2A) on the distal border of the prediscal line and the basal border of the postdiscal line, and a small pale patch at the apex, also present ventrally.

Status in Trinidad. A rare species primarily recorded from forests of the Northern Range.

***Hemiceras nigriplaga* Schaus, 1905**

Fig. 14, 23.

OD: Schaus 1905: *Hemiceras nigriplaga*, TL French Guiana.

Historical notes. This species has not been recorded from Trinidad hitherto. My identification was made by comparison with the lectotype (USNM, ♂ French Guiana) (Schintlmeister 2016, USNM 2021) and USNM series.

Taxonomic issues. Trinidad specimens are similar to the lectotype, but the dorsal forewing has a more chestnut tone to it, and the hindwing stigma of the male lectotype is more elongate, although Trinidad males fall within the range of variation of the USNM series.

Identification. This species is a uniform chestnut brown, with the prediscal and postdiscal dark lines undulating, and a more or less prominent dark double discal spot; the dorsum is strongly hooked (Figs. 14, 23).

Status in Trinidad. An uncommon species only recorded from the forests of the Northern Range.

Fig. 23. Male *Hemiceras nigriplaga*, Asa Wright Nature Centre, 23.iii.2015, S. Nanz. ©, with permission.

Hemiceras pagana Schaus, 1901

Fig. 13, Appendix Fig. 7.

OD: Schaus 1901: *Hemiceras pagana*, Paraguay.

TT: *Hemiceras pagana* Schaus: Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded *H. pagana* based on three specimens from Palmiste (vii.1915, 23 December 1916, 3 February 1919, N. Lamont); two of these were located in NMS. I identified this species by comparison with the lectotype (USNM, ♂ Paraguay) (Schintlmeister 2016); the type is slightly paler, but a reasonable match.

Taxonomic issues. Thiaucourt (2008a) treated the *Hemiceras meona* group of spp. that includes *H. pagana* and *H. meona*. He reported the brown species, *H. meona* (above), as widespread throughout tropical South America, but he did not record any of the other members of the group as occurring in the northern Amazon basin or the Guianas, and only one species, *H. anapoima* Thiaucourt, 2008 in Venezuela (La Guaira, north of Caracas). I dissected a Trinidad male (Appendix Fig. 7) and compared it to Thiaucourt's (2008a) diagnostic descriptions and figures. Comparison is not straightforward as the structures are complex and Thiaucourt's figures are from slide-mounted material. For example, the dorsal recurved projections visible in lateral view (Appendix Fig. 7C) are not visible in Thiaucourt's preparations. However, based on the position and size of the apical dorsal projection on the left valve, the bilobed basal dorsal projections on both valves and the curvature of the penis, the Trinidad terminalia come closest to *H. pagana* and *H. anapoima*. However, Thiaucourt characterises the dorsal forewing of *H. pagana* as very pale (in the case of the type I would characterise this as pale grey-brown), whereas that of *H. anapoima* is yellow brown. In addition, *H. pagana* is larger – male wingspan 37–45 compared to 35–38 mm. Further, his plate of pinned specimens shows that in *H. pagana* the discal spot is clear and contrasting, whereas it is not evident in *H. anapoima.* Trinidad specimens are pale grey-brown, the male wingspan is 37–44 mm and the discal spot matches that of *H. pagana*. Accordingly, I provisionally treat this species as *H. pagana*, despite Thiaucourt (2008a) having only seen material from southern Brazil and adjacent countries. It may prove to be undescribed, and DNA barcodes are needed to compare Trinidad material with *H. pagana* from Paraguay.

Identification. This is a distinctive pale *Hemiceras* species with a noticeable dark discal spot, which can be compared with the grey/pale species *H. alba*, *H. pallidula* and *H. sabis* (Fig. 13). It also resembles *H. meona* (Fig. 13) in wing shape and markings, but is two shades of brown, whereas *H. pagana* is grey-brown (Fig. 13).

Status in Trinidad. An occasional species primarily recorded from disturbed and suburban areas.

***Hemiceras pallidula* Guenée, 1852**

Fig. 13, 24.

OD: Guenée 1852: *Hemiceras pallidula*, TL Nouvelle Fribourg, Brésil.

TT: *Hemiceras pallidula* Guenée: Cock (2017a)

Historical notes. Cock (2017a) recorded this species from

Tobago, noting that it was not known from Trinidad. It was identified by comparison with the NHMUK series.

Taxonomic issues. The only public DNA barcodes in BOLD are from Costa Rica, but they appear in two closely related BINs: BOLD:ACL5066, and BOLD:AAA6651. There are no public DNA barcodes available to interpret the situation in South America at present.

Identification. This is a distinctive pale yellow-brown *Hemiceras* species, which can be compared with *H. alba*, *H. pagana* and *H. sabis* (Fig. 13), although they lack the yellow tone.

Status in Tobago. Although not known from Trinidad, there are several records from the forests of northern and eastern Tobago.

Fig. 24. Male *Hemiceras pallidula*, Tobago, Englishman's Bay, 29.i.2020, M. Kelly. ©, with permission.

Hemiceras sp. not ***rufula*** Dognin, 1923
Fig. 15, Appendix Fig. 8.
OD: Dognin 1923: *Hemiceras rufula*, TL Amazonas.
TT: *Hemiceras rufula* Dognin: Cock (2017a) [misidentification]

Historical notes. Cock (2017a) recorded this species from Tobago as *H. rufula* indicating that it is also present in Trinidad. It was identified by comparison with the 'type' of the form *H. rufula* f. *vinosa* Dognin (USNM, ♀ [Brazil], Amazonas). I have re-examined the type material of *H. rufula* and f. *vinosa* illustrated by Schintlmeister (2016), and conclude that although similar, the Trinidad material is unlikely to be conspecific, e.g. Trinidad specimens have a distinct white line between the antennae bases. *Hemiceras quebra* Schaus, 1901 (USNM, lectotype ♂, Venezuela, Aroa) illustrated by Schintlmeister (2016) is close, and the dorsal hindwing is a better match to Trinidad material. In the absence of a better match, and dissected type material to compare, I leave this unresolved, but include a figure of the male terminalia (Appendix Fig. 8) to facilitate future identification. A. Schintlmeister (pers. comm. 2021) also considers this not to be *H. rufula*, but was unable to suggest what it is.

Identification. This is an obscurely marked species, with prediscal and postdiscal lines barely indicated by dark dots on the veins. In this is resembles *H. deornata* (above), but the dorsal forewings of that species are not as red, they lack the distinct chestnut patch on the dorsum beyong the postdiscal line seen in some *H. rufula* (or near), the ventral forewing termen is narrowly darkened, the dorsal hindwing is darker and the male stigma is distinctly longer.

Status in Trinidad and Tobago. A rare species in Trinidad from lowland forest and suburban areas, with one record from forest in northern Tobago (Cock 2017a).

***Hemiceras sabis* Guenée, 1862**
Fig. 13. BIN: BOLD:AAM9303
OD: Guenée 1862: *Hemiceras sabis*, TL Brazil.
TT: *Hemiceras sabis* Guenée: Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded a specimen from Government House, Port-of-Spain (22 October 1917, N. Lamont), which is now in NMS. I identified this species by comparison with the NHMUK series and type of *H. ania* Druce (NHMUK, ♂ Ecuador), a synonym (Becker 2014).

Taxonomic issues. A. Schintlmeister (pers. comm.) commented that my images of Trinidad specimens are unusually dark, and may be indicative of greater taxonomic complexity than currently recognised. Most of the public DNA barcodes in BOLD as *H. sabis* are from Costa Rica and form BIN BOLD:AAA6376. However, there is a Trinidad specimen in BOLD, which together with material from French Guiana to Ecuador, forms BIN BOLD:AAM9303, close to, but distinct from, the Costa Rican sequences in BOLD:AAA6376. Given the type locality of *H. sabis* is Brazil, BOLD:AAM9303 is more likely to be the true *H. sabis*.

Identification. This is a distinctive grey *Hemiceras* species, which can be compared with *H. alba*, *H. pagana* and *H. pallidula* (Fig. 13).

Status in Trinidad. An occasional species, mainly found in forested areas.

***Hemiceras securifera* Thiaucourt, 2015**
Fig. 16, Appendix Fig. 9.
OD: Thiaucourt 2015 *Hemiceras securifera*, TL French Guiana.

Historical notes. This species is newly recorded from Trinidad. It was identified from Thiaucourt (2015) and confirmed by a comparison of the male terminalia.

Taxonomic issues. The male terminalia are generally a good match to those illustrated by Thiaucourt (2015, fig. 84). The distal borders of the diagnostic socii (Appendix Fig.

9G) are rounded (viking axe-head = securiform), but not as smoothly as those shown by Thiaucourt. I interpret this as individual or local variation, but this conclusion should be tested by comparison of DNA barcodes.

Identification. This species is pale brown, with the area between the prediscal and postdiscal lines slightly paler; the transverse lines are irregular, the postdiscal marked by a series of dots towards the apex; an obscure discal spot; the dorsum strongly hooked.

Status in Trinidad. A rare species, found in forested areas.

***Hemiceras subochraceum* Walker, 1867**

Fig. 15, 25.

OD: Walker 1867: *Hemiceras subochraceum*, TL Bogota.

TT: *Hemiceras nubilata* Schaus: Kaye and Lamont (1927) [misidentification]

Hemiceras deornata (Walker): Cock (2017a) [misidentification]

Historical notes. Kaye and Lamont (1927) recorded *Hemiceras nubilata* Schaus from Trinidad referring to a specimen from Caigual (4 September 1917, Agnes Lickfold). There is a female specimen collected by Lickfold in OUMNH which I assume represents Kaye and Lamont's record; it is labelled as *H. nubilata* Schaus by Kaye and Lamont (misspelt as *H. imbilata* according to my notes), but it is dated 11 October 1917. I matched the Lickfold specimen with material in MJWC. This is not *H. nubilata* based on a comparison with the lectotype (USNM, ♀ Venezuela) (Schintlmeister 2016, USNM 2021). It is close to *H. deornata* (Walker, 1865) from a comparison with the types (NHMUK, ♂, ♀ Bogota, Colombia) and NHMUK series, and I used this name for my list of Tobago moths (Cock 2017a). However, A. Schintlmeister (pers. comm. 2021) considered this likely to be *H. subochraceum* Walker, 1867 (TL Colombia, Bogota) and there is a dissected male from Tobago in USNM which supports this view.

Identification. The dorsal forewing is obscurely marked, particularly in worn specimens and the female. The male (Fig. 15) has an irregular prediscal line and a slightly sinuous postdiscal line. Both lines are primarily indicated by dark dots on the veins, but the prediscal line and the postdiscal line towards the dorsum have the dots joined with a thin dark line; there is a dark oblique spot at the end of the cell ending at a dark dot in line towards the costa. In the female (Fig. 15) the dots on the veins are only partially present, and there is no dark line joining them, and the dark dot towards the costa merges with the oblique spot at the end of the cell. It superficially resembles *H. modesta*, *H. tranducta* etc. (Fig. 15), but in these species the prediscal and postdiscal lines are solid without the dark dots on the veins. It can also be compared with *H.* not *rufula*, which is also obscurely marked, but that species is redder, often with a distinct chestnut patch on the dorsum beyond the postdiscal line, the ventral forewing termen is more diffusely darkened, the dorsal hindwing is paler and the male stigma is distinctly shorter.

Status in Trinidad and Tobago. An occasional species found in both forest and suburban areas.

Fig. 25. Female (?) *Hemiceras subochraceum*, Penal, 9.vi.2010, K. Sookdeo. ©, with permission.

Hemiceras tranducta (Walker, 1857)

Figs. 15, 26, Appendix Figs. 10, 11.

OD: Walker 1857: *Ecregma tranducta*, TL Venezuela.

TT: *Hemiceras transducta* [sic] Walker: Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded this species from Trinidad, referring to a specimen in NHMUK. I was unable to locate this specimen, but I have identified material in MJWC as this species by comparison with the type (NHMUK, ♀ Venezuela) and NHMUK series. There is a Lamont specimen in NMS as this species, but I identified it as *H. modesta*.

Taxonomic issues. Public DNA barcodes in BOLD are from Costa Rica and French Guiana (one), and appear in two BINs. BIN BOLD:AAA2786 includes the French Guiana sequence and so may represent may represent *H. tranducta*,

given the Venezuela type locality.

Identification. This is one of several similar species in Trinidad (Fig. 15). It can be distinguished by the paler ground colour (compared to *H. modesta* and *H. deornata*), and the combination of: the solid, continuously curved post discal line with a trace of an outer white border; the weak prediscal line; the two discal lines meeting the dorsum close together, the postdiscal being at or just beyond the distal margin of a modest bulge on the dorsum; the obscure dark submarginal veins in the apical half of the margin; and the two obscure dark spots at the end of the cell at an oblique angle. In some specimens (Fig. 15 ♂2, ♀2, both confirmed by dissection; Appendix Figs. 10, 11) the ground colour is more even, the prediscal line stronger, and the two discal lines more or less meet at the bulge on the dorsum.

Status in Trinidad. An occasional species, mostly found in forested areas, but also recorded from a suburban area (Curepe).

Fig. 26. Male *Hemiceras tranducta*, South Oropouche, 5.ix.2021, T.P. Maharaj (iNaturalist observation 93810428). ©, under CC-BY-BC license.

Hemiceras sp. 1

Fig. 16, Appendix Fig. 12.

Historical notes. This species does not match any of the other *Hemiceras* spp. treated, and I was unable to match it in the collections of NHMUK and USNM. This may have been because the specimen is not in very good condition, making the markings obscure.

Taxonomic issues. In the hope of facilitating the identification of this species in the future, figures of the male terminalia are included (Appendix Fig. 12). The dorsal projection suggests it may be related to what I refer to as *H.* not *rufula*.

Identification. The colouring is similar to that of *H.* not *rufula*, but the discal lines are reduced to dark dots on the veins, the forewing dorsum is much smoother, and the terminalia are completely different.

Status in Trinidad. Just one record from Curepe.

Subfamily Heterocampinae Neumogen and Dyar, 1894

Heterocampinae is the most diverse and species-rich Notodontidae subfamily in Trinidad & Tobago, with 79 species in 43 genera (Table 2). Figs. 27-41 show pinned specimens of almost all species found in Trinidad & Tobago. When using these figures for identification, the user should note that *Cecrita paramaribena* and *Rhuda tuisa* do not appear, as the only records are photographs of live adults (Figs. 48-49, 94).

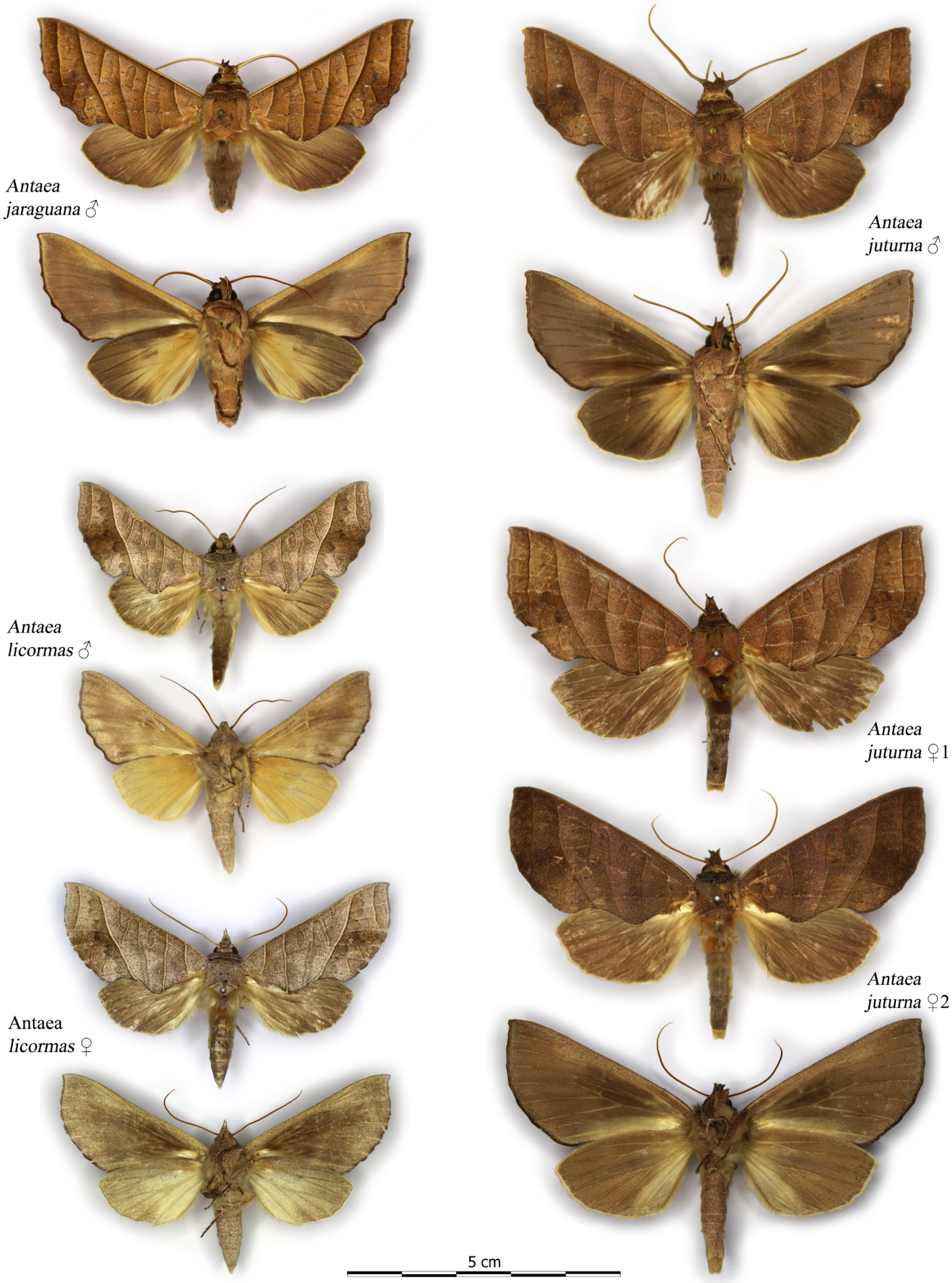

Fig. 27. Trinidad Notodontidae, Heterocampinae 1.

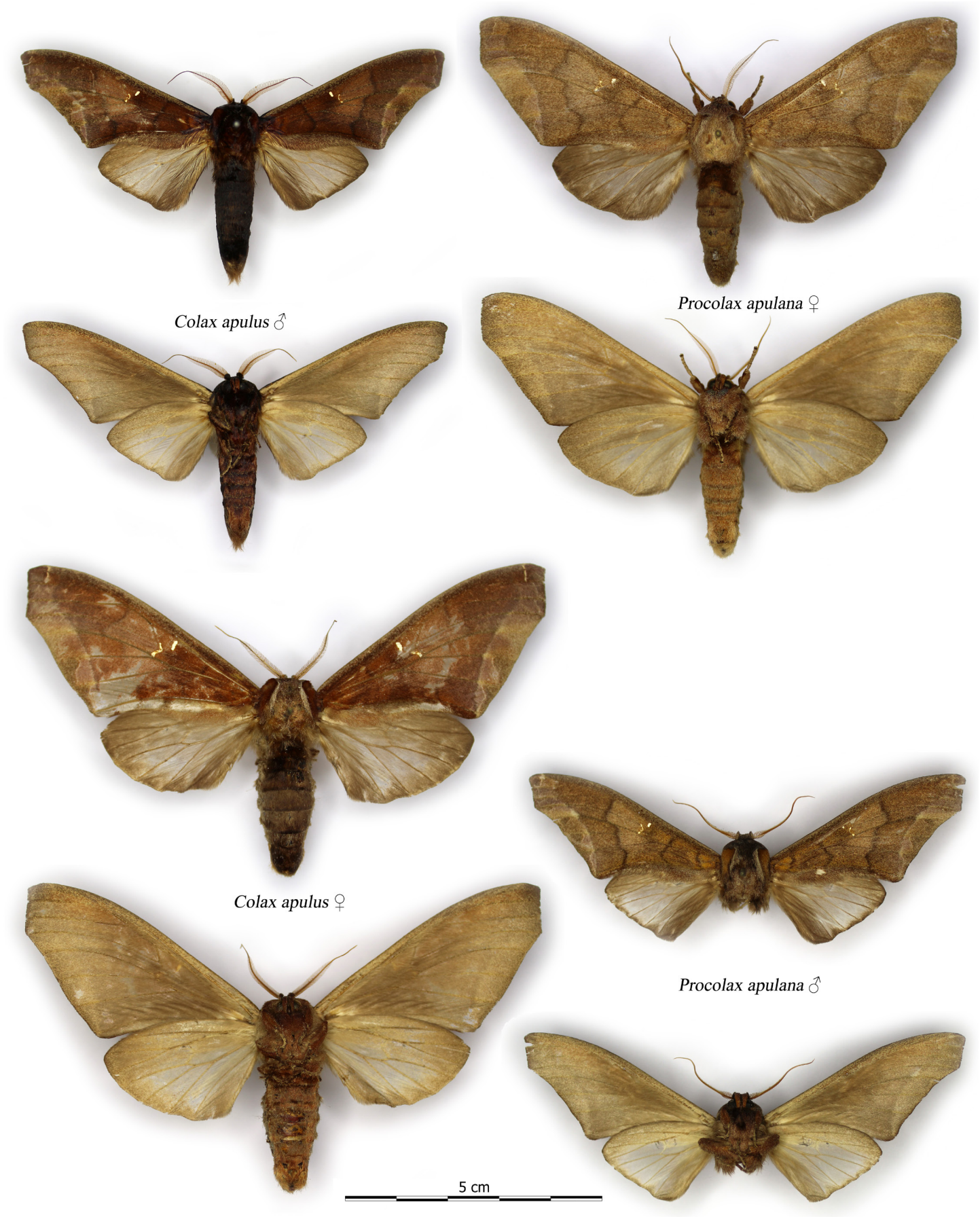

Fig. 28. Trinidad Notodontidae, Heterocampinae 2.

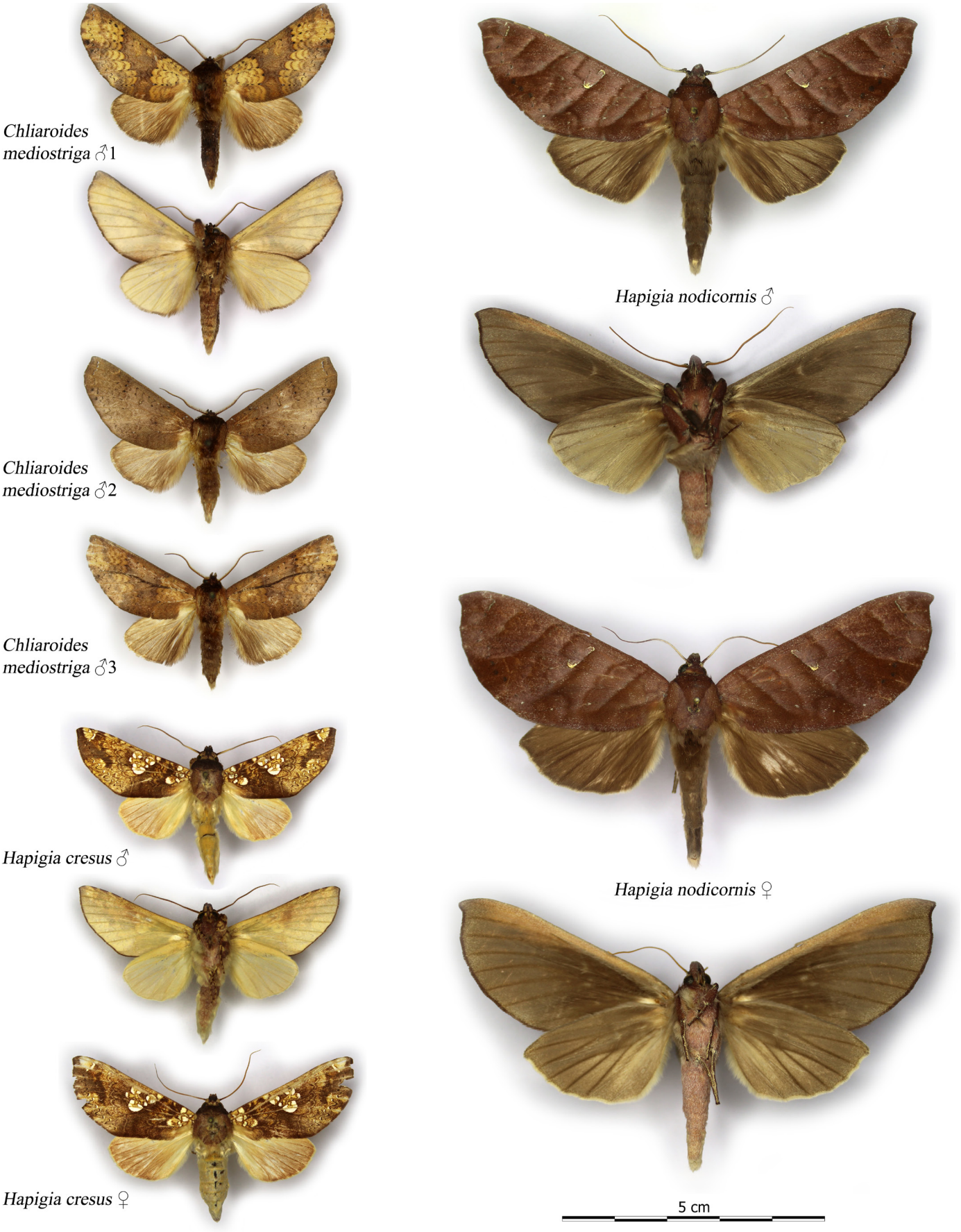

Fig. 29. Trinidad Notodontidae, Heterocampinae 3.

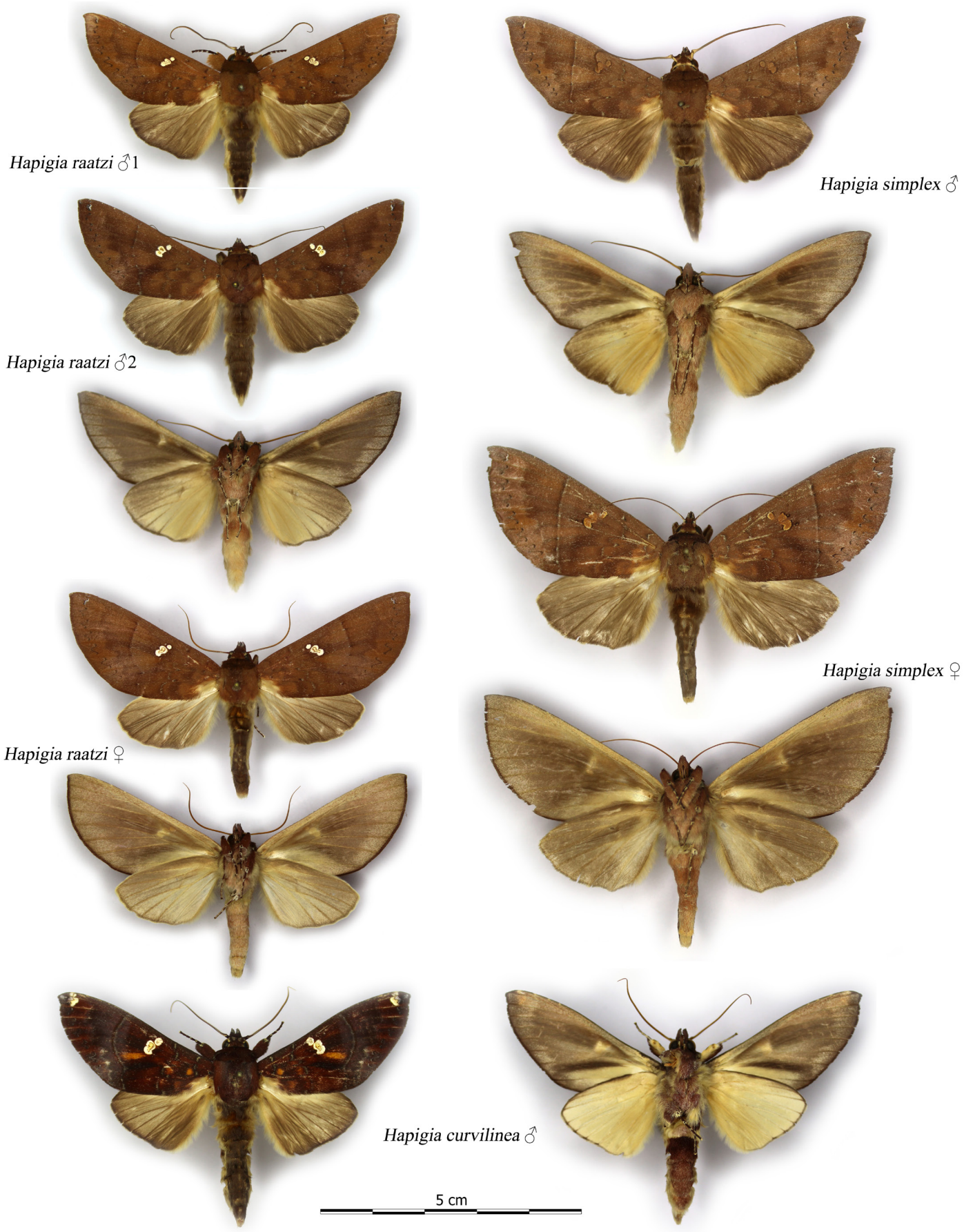

Fig. 30. Trinidad Notodontidae, Heterocampinae 4.

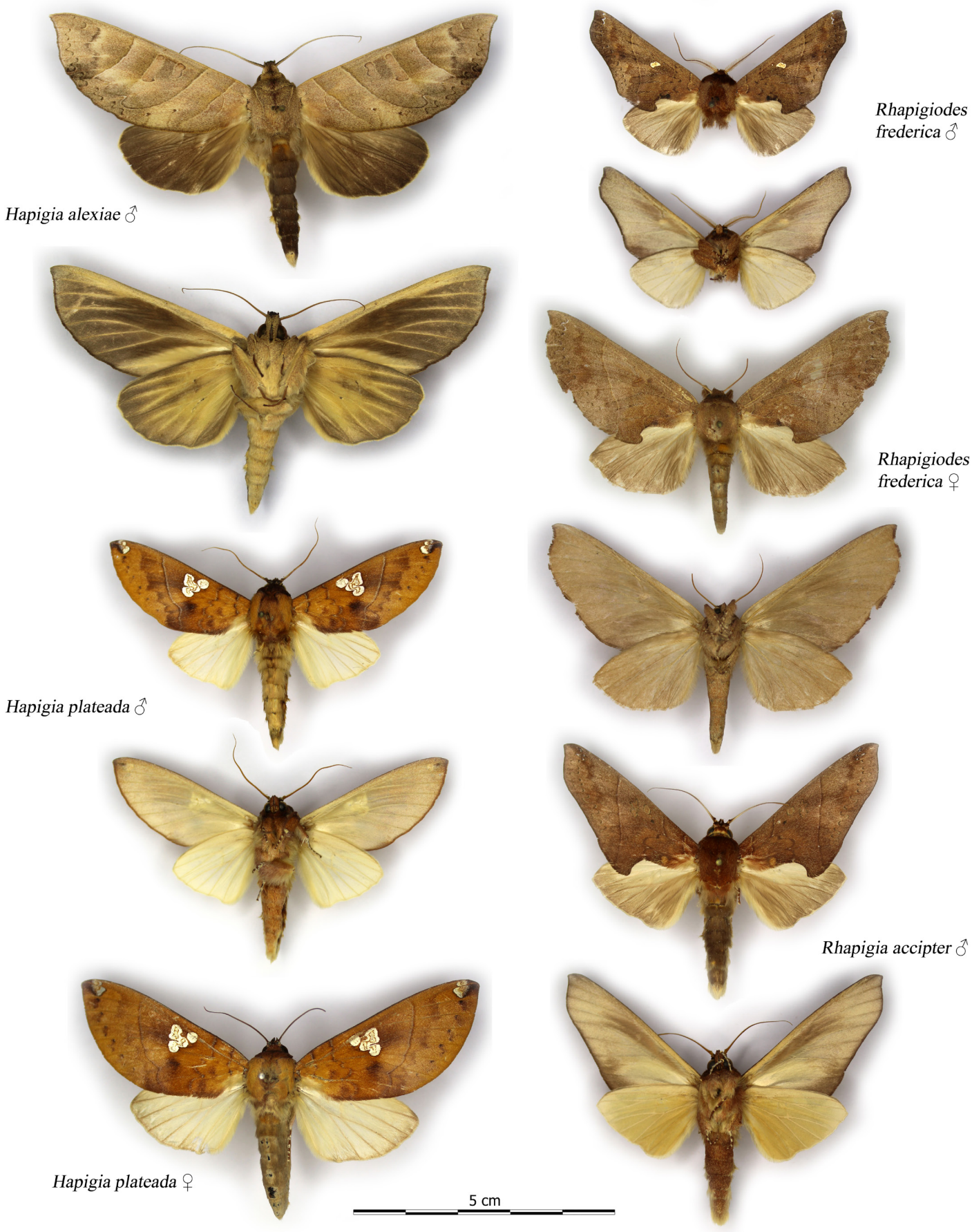

Fig. 31. Trinidad Notodontidae, Heterocampinae 5.

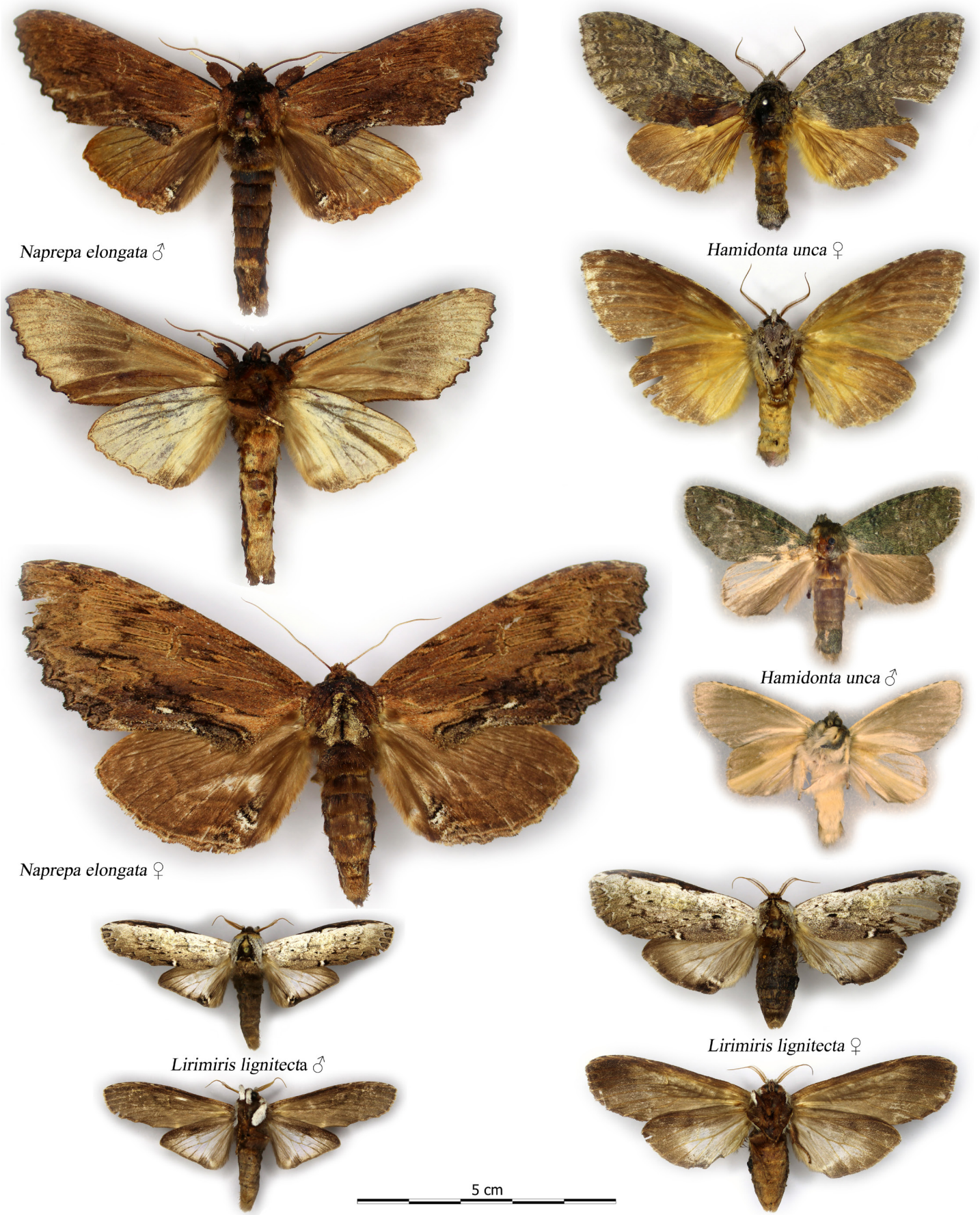

Fig. 32. Trinidad Notodontidae, Heterocampinae 6. *Hamidonta unca* ♂ is in USNM.

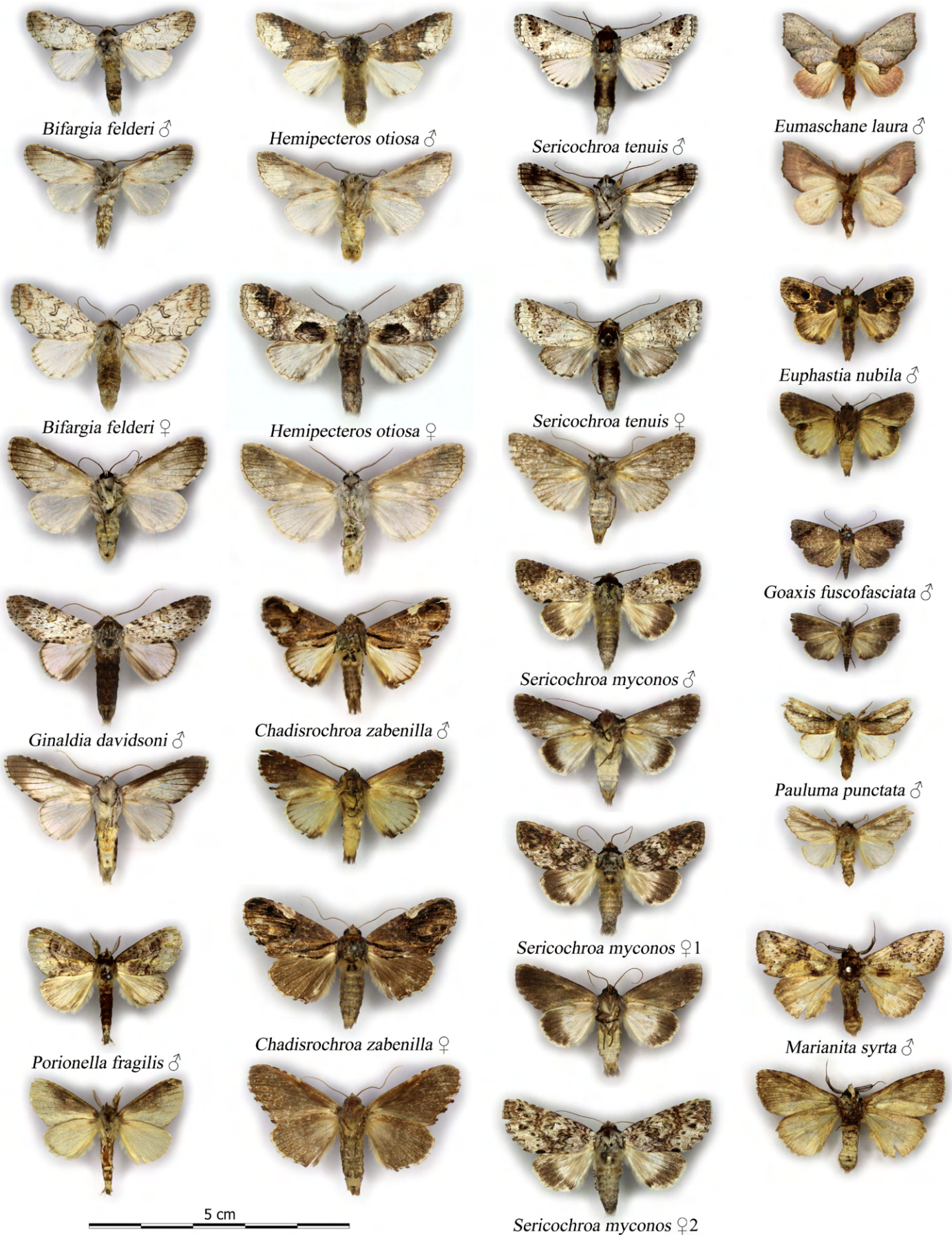

Fig. 33. Trinidad Notodontidae, Heterocampinae 7.

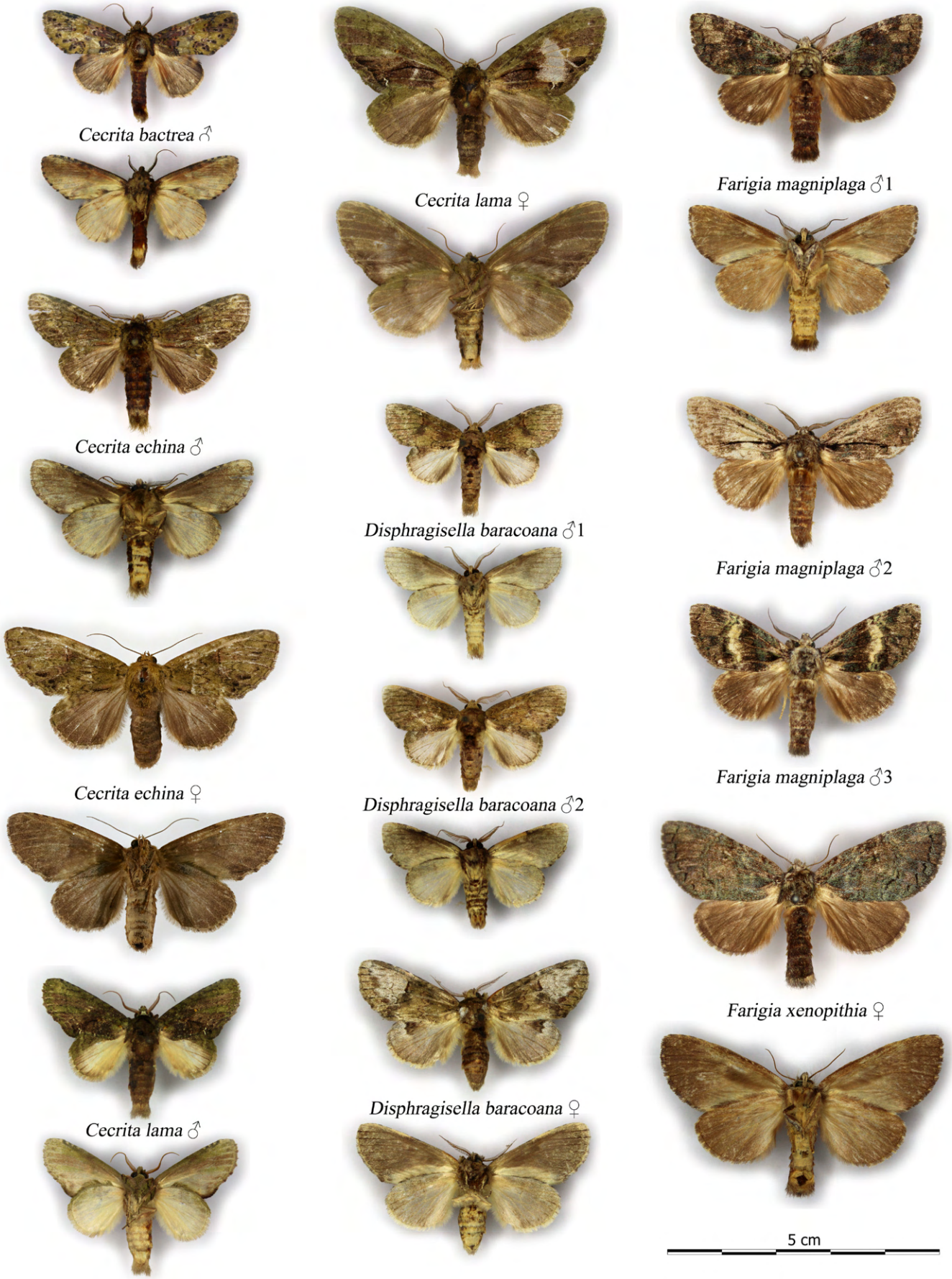

Fig. 34. Trinidad Notodontidae, Heterocampinae 8. *Cecrita echina* ♀ in NMS; photographed by A. Whiffen, © NMS.

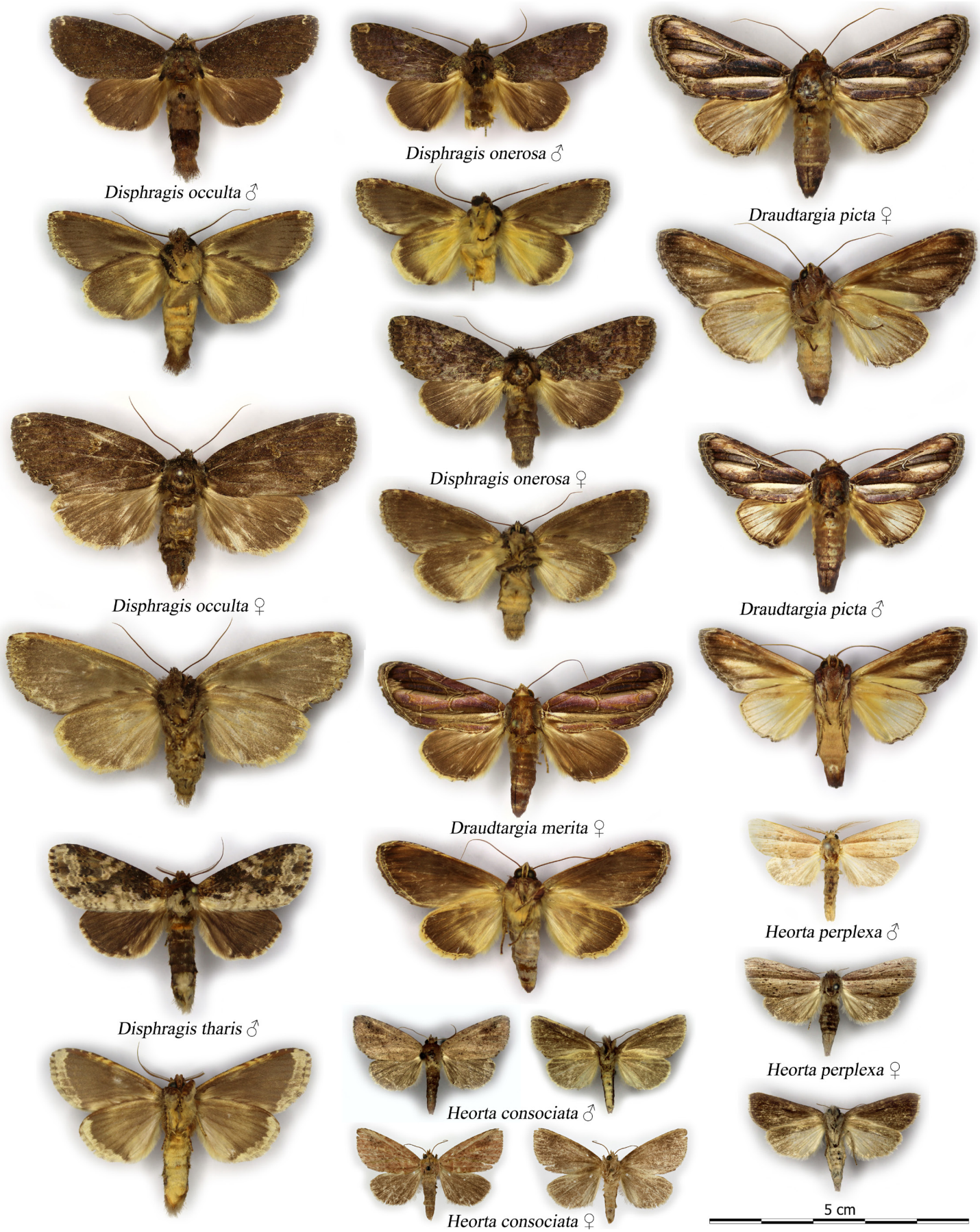

Fig. 35. Trinidad Notodontidae, Heterocampinae 9. *Heorta consociata* ♀ in NMS; photographed by A. Whiffen, © NMS.

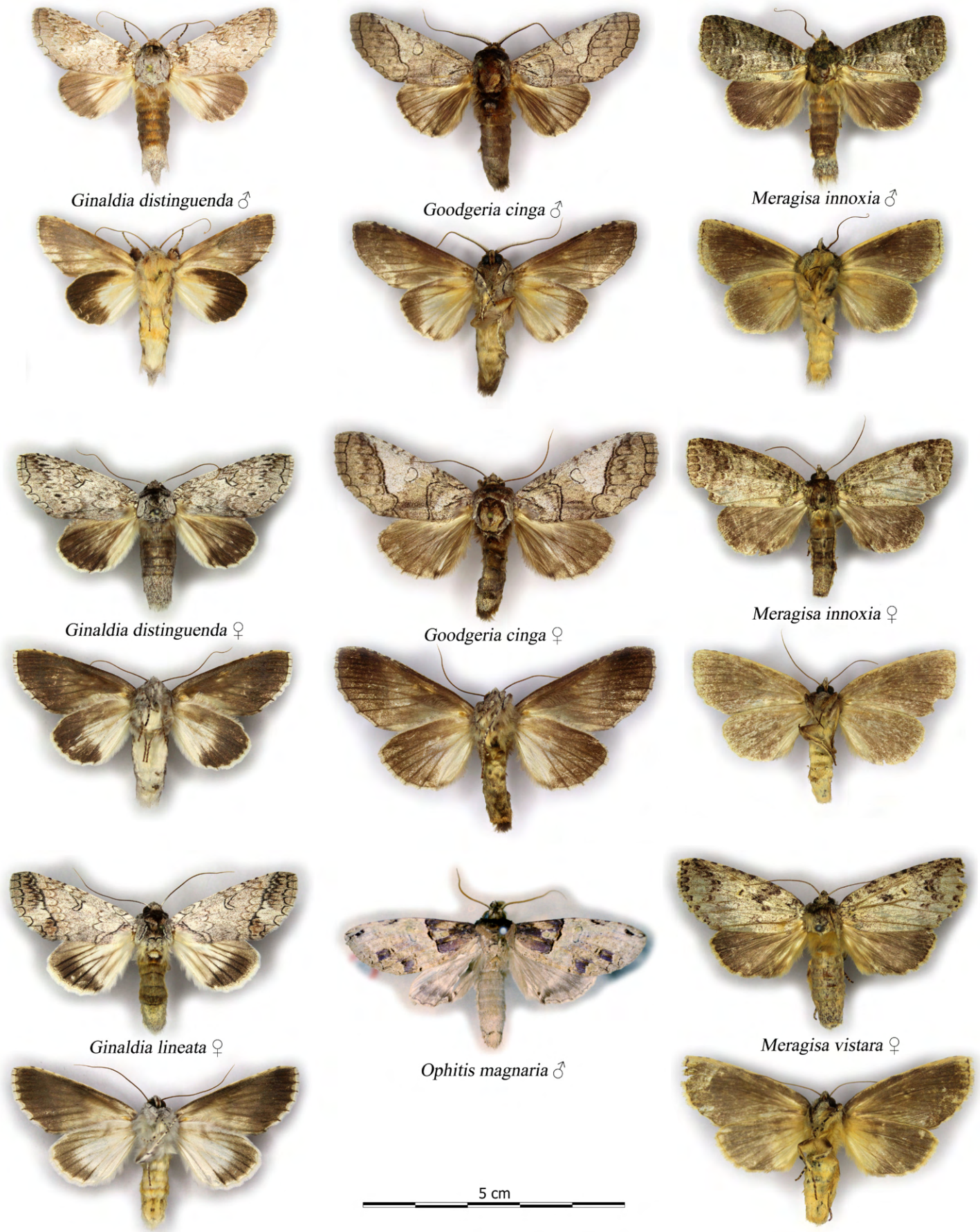

Fig. 36. Trinidad Notodontidae, Heterocampinae 10. *Ophitis magnaria* ♂ is in NHMUK; ©The Trustees NHMUK, made available under Creative Commons License 4.0 https://creativecommons.org/licenses/by/4.0/.

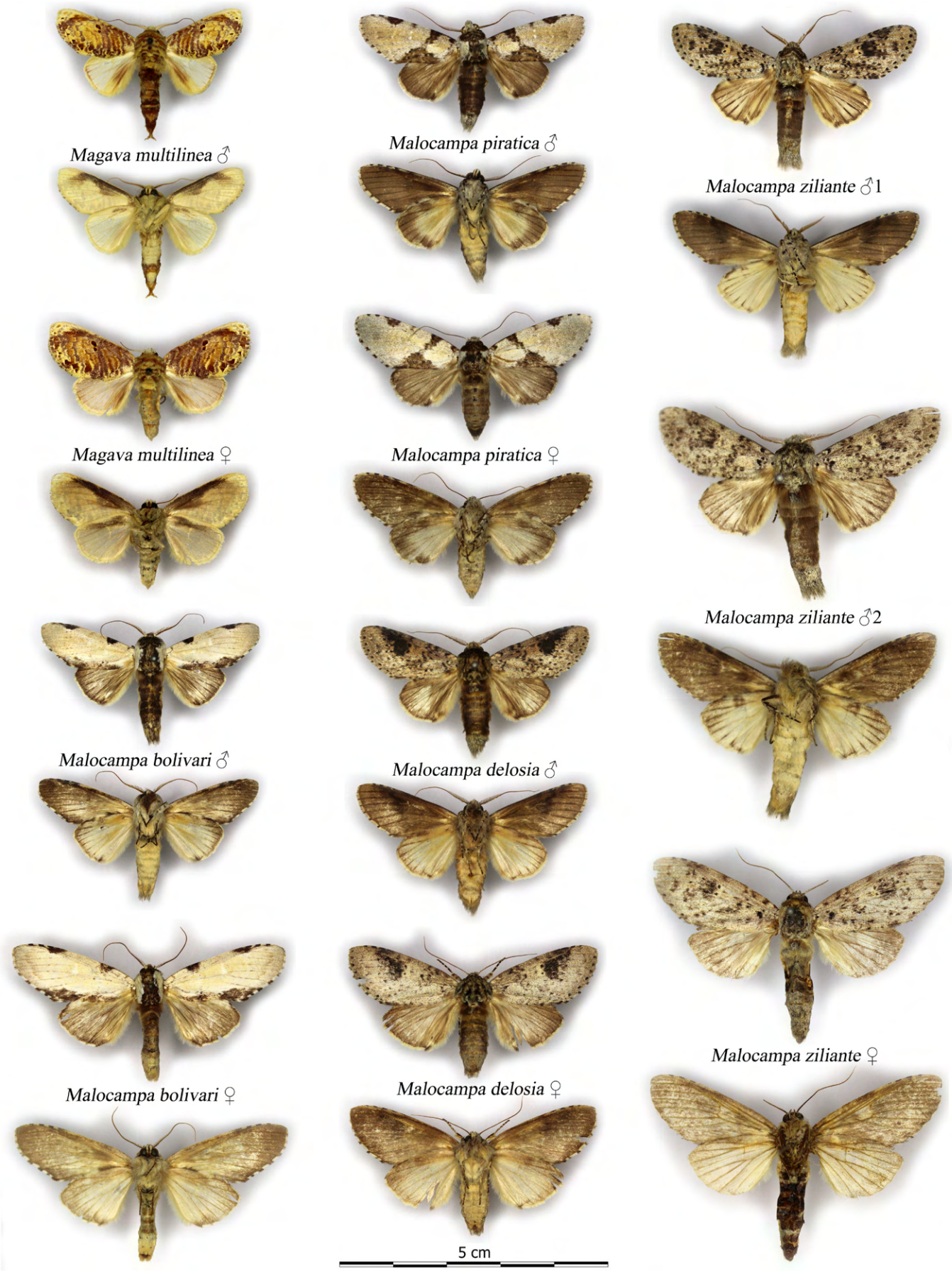

Fig. 37. Trinidad Notodontidae, Heterocampinae 11.

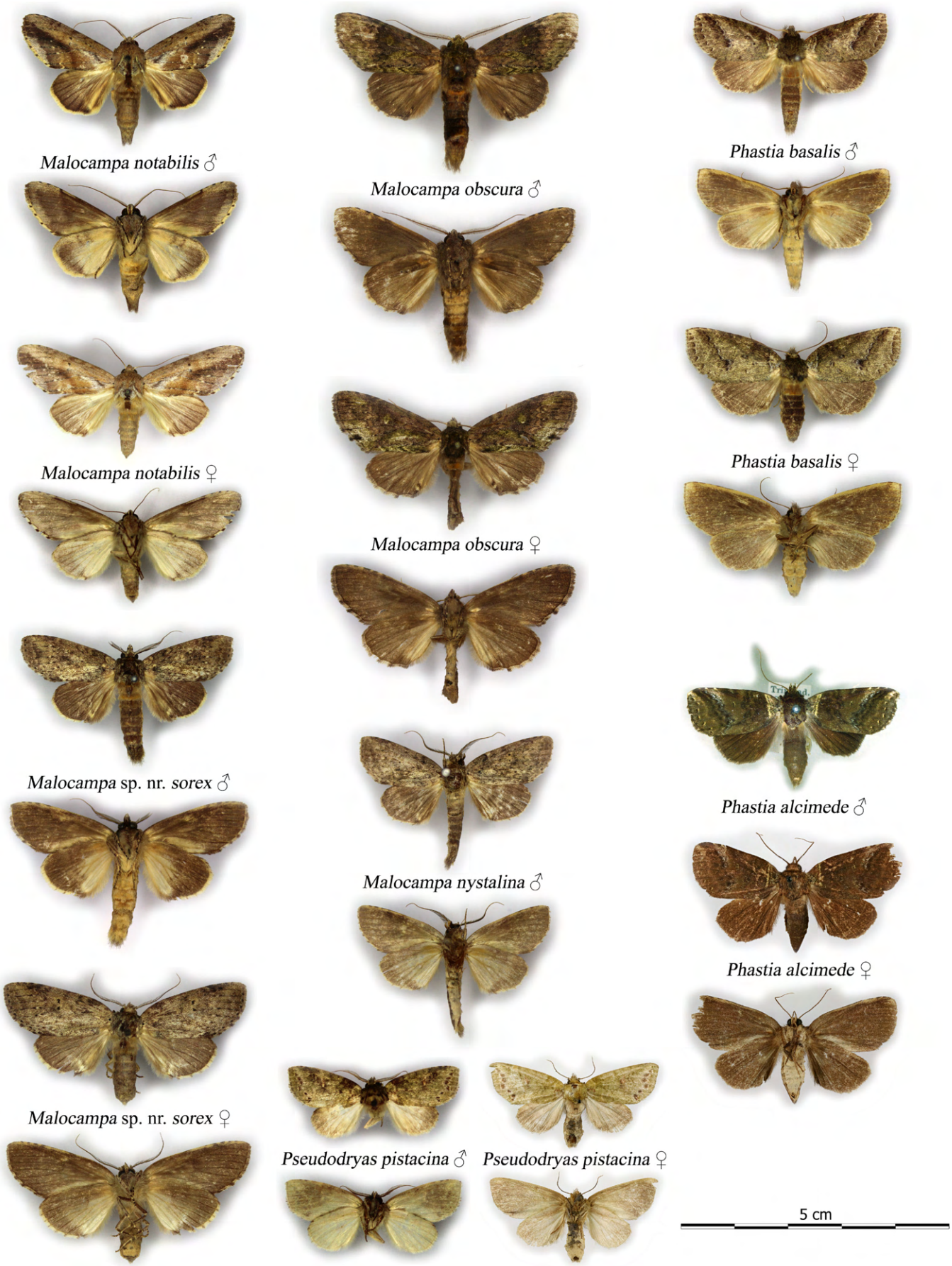

Fig. 38. Trinidad Notodontidae, Heterocampinae 12. *Phastia alcimede* ♂ is in NHMUK; ©The Trustees NHMUK, made available under Creative Commons License 4.0 https://creativecommons.org/licenses/by/4.0/. *Phastia alcimede* ♀ and *Pseudodryas pistacina* ♀ are in NMS; photographed by A. Whiffen, © NMS.

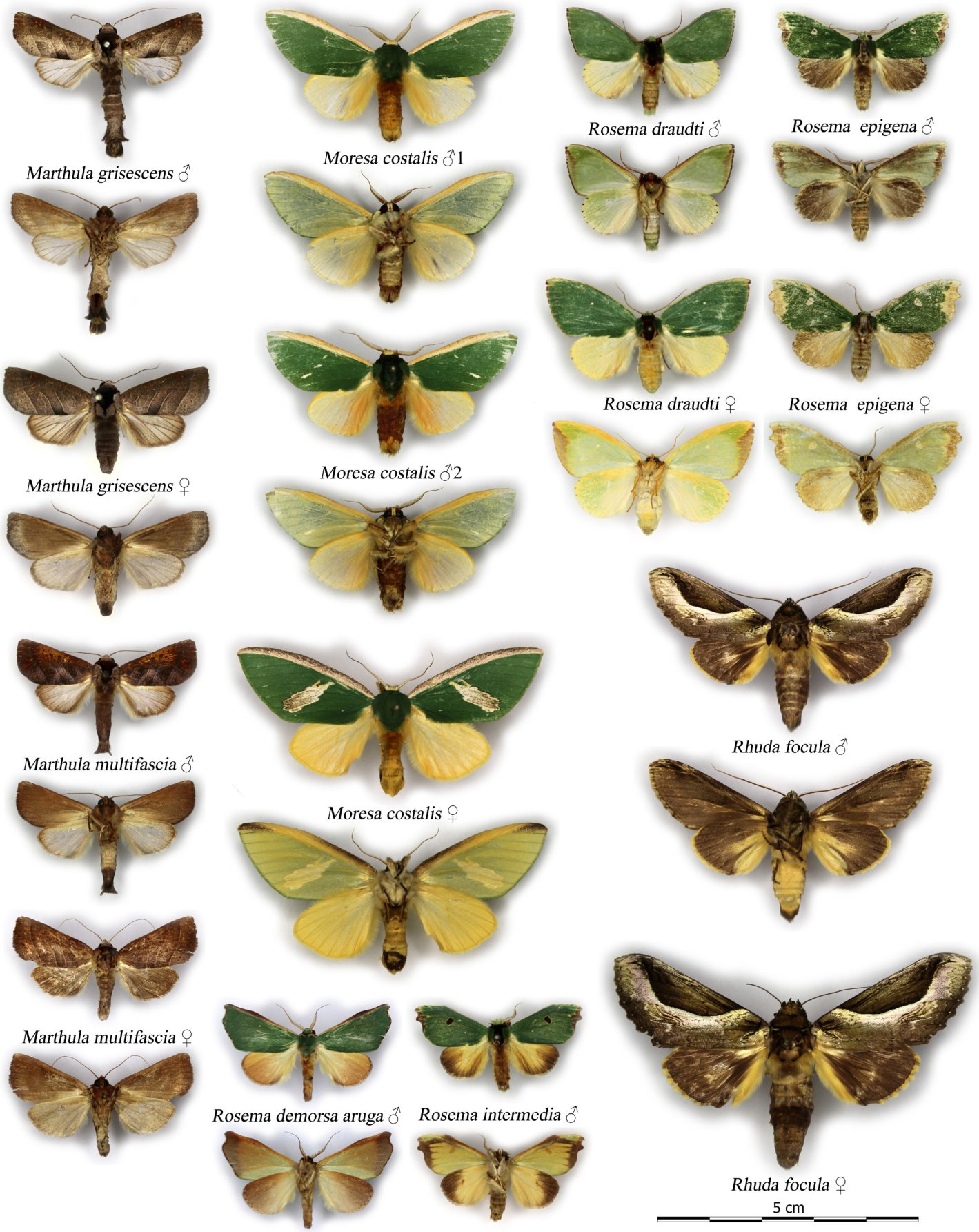

Fig. 39. Trinidad Notodontidae, Heterocampinae 13.

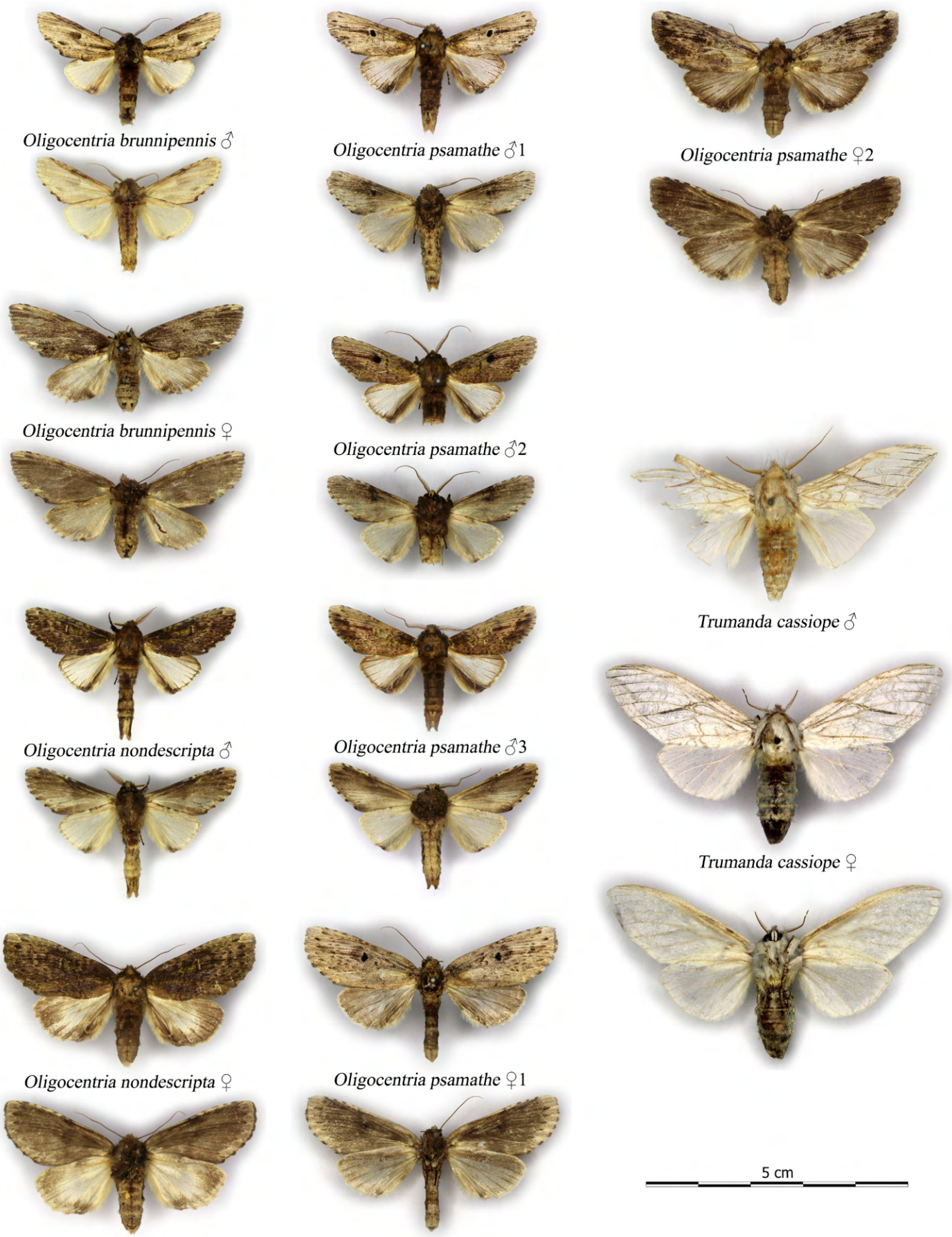

Fig. 40. Trinidad Notodontidae, Heterocampinae 14.

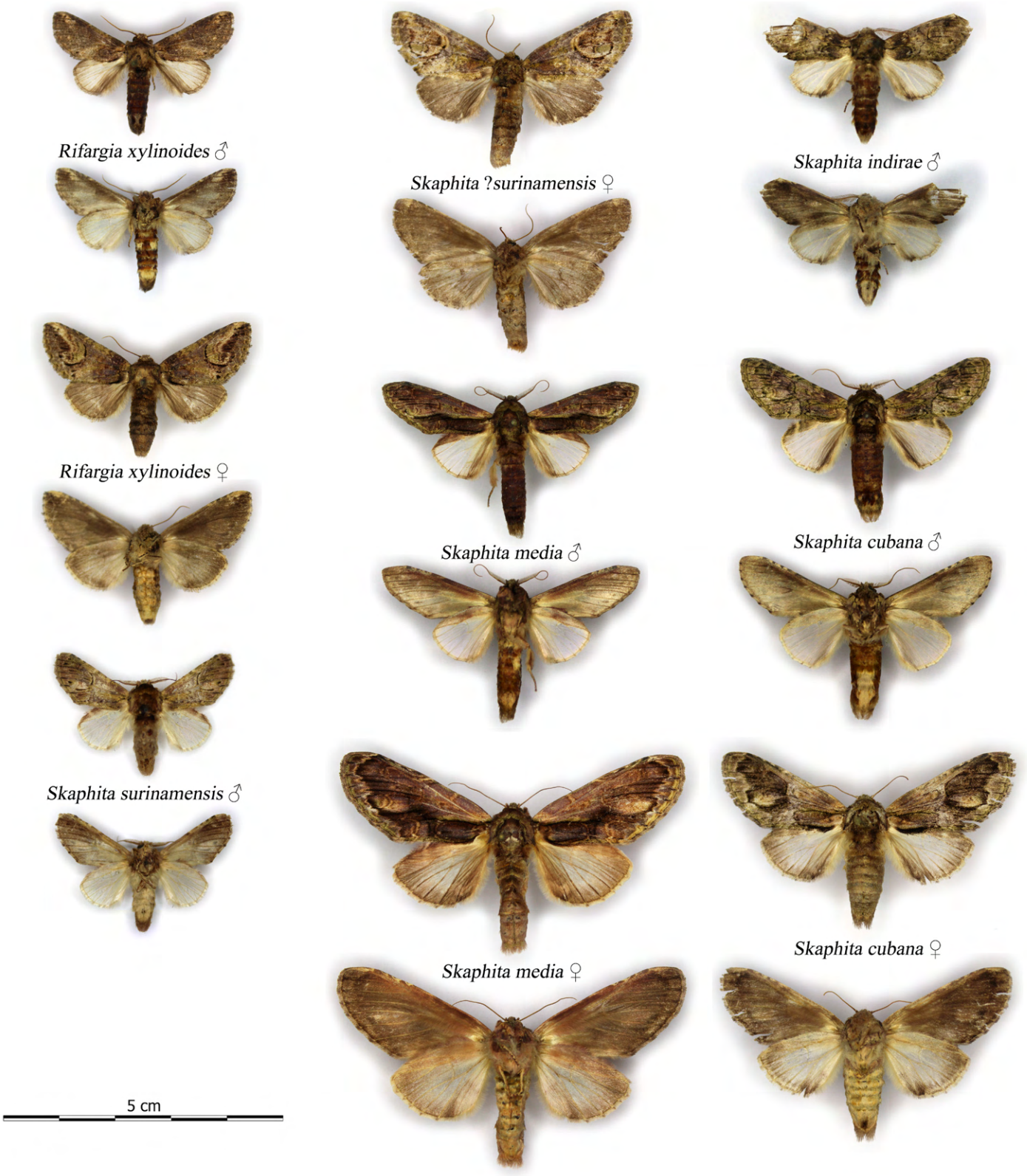

Fig. 41. Trinidad Notodontidae, Heterocampinae 15.

***Antaea* Hübner 1823**

Type species *Phalaena juturna* Cramer, 1777, TL Suriname.

***Antaea jaraguana* Franclemont, 1942 (in Forbes, 1942)**

Figs. 27, 42. BIN: BOLD:ADG3906

OD: Franclemont 1942: *Antaea jaraguana*, TL Brazil, Santa Catharina.

Historical notes. This is a new record for Trinidad. Identification was by comparison with the USNM series and with the diagnostics and male terminalia figures in Forbes (1942).

Taxonomic issues. Of the known species of *Antaea*, this matches *A. jaraguana* best. However, I see minor differences in the male terminalia, suggesting it may prove to be a distinct species. It is not *A. fernandesi* Thiaucourt, lacking the strong lateral tooth on the aedeagus shown by that species (Thiaucourt 1978), and a DNA barcode from Trinidad confirms that it is not *A. lichyi* Franclemont.

Identification. This species is distinctly paler and pinker than *A. juturna*, which is browner (Fig. 27). The markings are otherwise very similar. I have not seen the female from Trinidad, but expect it to differ from the male in the same way as for *A. juturna*.

Status in Trinidad. A rare species, so far only known from the higher parts of the Northern Range.

Fig. 42. Male *Antaea jaraguana*, Morne Bleu, Textel Installation, at light, 29.xii.2013, K. Sookdeo. ©, with permission.

Antaea juturna (Cramer, 1778)

Figs. 27, 43.

OD: Cramer 1778: *Phal*[*aena*] *Noct*[*ua*] *juturna*, TL Suriname.

TT: *Antaea juturna* (Cramer): Forbes (1942), Lamont and Callan (1950)

Historical notes. Lamont and Callan (1950) recorded this species from Trinidad referring to a specimen captured at Verdant Vale, 29 November1947 by Sir Norman Lamont. I believe this is the specimen in UWIZM labelled from Arima, 29 November 1937 – Lamont sometimes referred to captures in the Arima Valley as from Arima, and the error in the decade is easily made. I identified this species by comparison with the NHMUK series.

Taxonomic issues. Just one public barcode from Brazil (Para) in BOLD.

Identification. See comments under last species.

Status in Trinidad. A fairly common species in forested areas, especially in the Northern Range.

Fig. 43. Male *Antaea juturna*, Arima Valley, Asa Wright Centre, 23.iii.2015, S. Nanz. ©, with permission.

Antaea licormas (Cramer, 1775)

Fig. 27.

OD: Cramer 1775: *Phal*[*aena*] *Noct*[*ua*] *licormas*, TL Suriname.

TT: *Antaea licormas* (Cramer): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded this species from Trinidad, citing a specimen captured by Sir Norman Lamont at Palmiste, in 1913. I have noted that Lamont did not start labelling his specimens until 1915, so that in most cases specimens dated earlier than this in Kaye and Lamont (1927) are represented by unlabelled specimens in his collection, in this case a female in NMS. I identified this species by comparison with the NHMUK series.

Taxonomic issues. Schintlmeister (2013) remarks that Cramer's original figure of this species does not agree with the species currently treated as *A. licormas*. Certainly, the figure in Cramer (1775-1776, plate 74E) is too contrasting,

but the markings do agree with *licormas* as treated here, so I suggest there is no need to consider a change in nomenclature.
Identification. The dorsal forewing markings are very similar to the other two *Antaea* spp. treated here but the ground colour is a distinctive very pale brown. The sexes show little difference apart from those of the antennae and wing shape, but the female is darker ventrally.
Status in Trinidad. An occasional species, most commonly encountered in suburban situations.

***Bifargia* Becker, 2014**
Type species *Rifargia felderi* Schaus, 1901, TL Peru.

***Bifargia felderi* (Schaus, 1901)**
Figs. 33, 44.
OD: Schaus 1901: *Rifargia felderi*, TL Peru.
Druce 1904: *Heterocampa longula*, TL Peru [synonym].
TT: *Rifargia longula* (Druce): Kaye and Lamont (1927) [synonym]
Rifargia felderi Schaus: Kaye and Lamont (1927)
Bifargia felderi (Schaus): Cock (2017a)
Historical notes. Schaus (1901) and Druce (1904) independently described this species, the former from a Peru, and the later apparently from Peru, but his type specimen is from Caparo, Trinidad (Schintlmeister 2013). It is not clear whether Druce's type locality published or the specimen labelled as type is in error. Schaus (1928) incorrectly treated *longula* as a synonym of *Ginaldia cassandra* Schaus (Thiaucourt 1980). Although Schintlmeister (2013) treated all three species as valid, Becker (2014) synonymized *felderi* and *longula* in his new genus *Bifargia* – correctly in my view. Dissection of a male from Tobago supported this view.

Kaye and Lamont (1927) recorded both *felderi* and *longula* from Trinidad, the former based on specimens from Palmiste (October 1921, F.H. Stent) and without locality (1922, F.W. Jackson; W.J. Kaye), and the later without comment, perhaps based on Druce's type specimen. There are specimens in NMS from Lamont's collection from Palmiste, October 1921 but not attributed to Stent. Jackson and Kaye's specimens are in NHMUK. I examined the lectotype of *B. felderi* (USNM, ♂ Peru, dissected) (Schintlmeister 2016, USNM 2021) and type of *B. longula* (NHMUK, ♀ Trinidad) in making this identification.
Identification. There are several small grey/white notodontids in Trinidad (Fig. 33), but *B. felderi* can be recognized by a comparison of the markings of the dorsal forewing, e.g. note the clear white ground colour and sharply contrasting discal lines and spot. Sexes similar apart from the antennae and wing shape.
Status in Trinidad and Tobago. This is a common and widespread species in forested, disturbed and suburban situations.

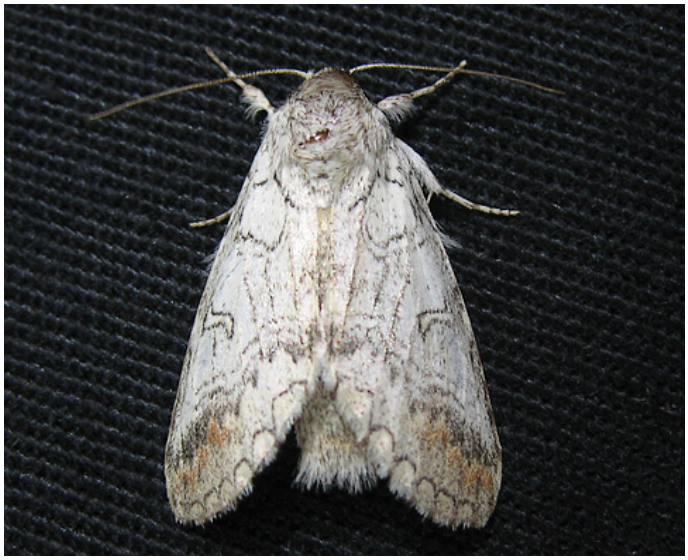

Fig. 44. Female *Bifargia felderi*, Penal, 7.vii.2010, K. Sookdeo. ©, with permission.

***Cecrita* Walker, 1855**
Type species *Cecrita guttivitta* Walker, 1855, TL Canada.

***Cecrita bactrea* (Schaus, 1905)**
Figs. 34, 45.
OD: Schaus, 1905: *Heterocampa bactrea*, TL French Guiana.
TT: *Disphragis bactrea* (Schaus): Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) recorded this

Fig. 45. Male *Cecrita bactrea*, Asa Wright Nature Centre, 20.iii.2015, S. Nanz. ©, with permission.

species from San Fernando (January 1922, N. Lamont); the specimen is in NMS. My identification is based on a comparison with the lectotype (USNM, ♂ French Guiana) (Schintlmeister 2016, USNM 2021).

Identification. This is one of several medium-small species with the dorsal forewing predominantly mottled dull green (Fig. 34). Note on the dorsal forewing, the dark basal area, the clear brighter green discal area, the dark patch on the costa before the apex, the row of submarginal spots, and on the dorsal hindwing the rusty brown dorsum. I have not seen the female from Trinidad.

Status in Trinidad. An occasional species predominantly found in forested areas.

Cecrita echina (Schaus, 1905)

Figs. 34, 46, 47.

OD: Schaus 1906: *Heterocampa echina*, TL St. Jean, Maroni River, French Guiana.

TT: *Disphragis proba* Schaus: Kaye and Lamont (1927) [misidentification]

Cecrita echina (Schaus): Cock (2017a)

Historical notes. Kaye and Lamont (1927) reported specimens of *Disphragis proba* from Palmiste (5 July 1917, N. Lamont), and without locality (F.W. Jackson). I have not located the latter, but I have found the former in NMS, complete with Lamont's name label, although curated as *D. vestona* (Schaus). I note that four further specimens in Lamont's collection in UWIZM as *D. proba* are female *Oligocentria nondescripta* (Kaye). The curation of Lamont's specimen in NMS as *D. vestona* probably reflects the treatment in Draudt (1932-1934) and Schintlmeister (2013) where *proba* is considered a synonym of *D. vestona.* In contrast, Becker (2014) treats both species as valid and places them in *Cecrita*. Working with my material (which I consider the same as Lamont's specimen) I compared the type of *Heterocampa proba* (USNM, ♂ Costa Rica) (Schintlmeister 2016) and found this not to be an exact match, e.g. the type lacks the red tints of Trinidad material. I failed to locate the type of *H. vestona* (TL Mexico) in USNM for comparison, but Schintlmeister (2016) illustrates the female lectotype, which appears to be a separate species. However, I was able to compare the lectotype of *H. echina* Schaus (USNM, ♂ French Guiana) (Schintlmeister 2016, USNM 2021) and found it a good match. Becker (2014) placed *echina* in *Cecrita*, and so I use this name for Trinidad material.

Taxonomic issues. Given the number of similar species, it would be desirable to compare dissections (or DNA barcodes) of Trinidad material with the lectotype.

Identification. This is not a distinctive species, and surely caused problems for the early collectors – in addition to Lamont's misidentification of *O. nondescripta* as this species, Kaye and Lamont misidentified a female specimen as *Pseudodryas pistacina* (Schaus) (= *Phastia maricolor* (Kaye)) in OUMNH. Enlarged figures are provided (Fig. 46). As well as the other medium-small mottled green species in Fig. 34, it should be compared with the female of *O. nondescripta* (Fig. 40), *P. pistacina* (Fig. 38) and *Malocampa obscura* (Schaus) (Fig. 38). Dorsal forewing

Fig. 46. Male and female *Cecrita echina* (enlarged from Fig. 34). Female in NMS; photographed by A. Whiffen, © NMS.

Fig. 47. Female *Cecrita echina*, Grand Riviere, 16.v.2015, K. Sookdeo. ©, with permission.

features to consider include the submarginal dark markings, narrow discal spot, reddish tint around the discal spot and the basal part of the wing, especially on the dorsum, indistinct white spot on dorsum near tornus; other features to consider includethe pectinations of the male antennae which extend for about two-thirds of the antenna, simple female antennae, the uniformly dark dorsal hindwing with markings to match the forewing on the costa, and the darker margins of the ventral wings.

Status in Trinidad and Tobago. An uncommon species, mostly from forested areas.

***Cecrita lama* (Schaus, 1905)**

Fig. 34.

OD: Schaus 1905: *Heterocampa lama*, TL French Guiana.

TT: *Disphragis lama* (Schaus): Kaye and Lamont (1927)

Historical notes. This species was recorded from Guaico (18 April 1915, N. Lamont) by Kaye and Lamont (1927); Lamont's specimen is a male in NMS. I identified this species by comparison with the type (USNM, ♂ French Guiana).

Identification. One of several medium-small mottled green notodontids in Trinidad (Fig. 34). The dark green areas are principally on the dorsal forewing costa, margin and a streak from base to margin through the middle of the wing, and the dorsal hindwing costa. A short, narrow, angled white line on the dorsum just before the tornus is distinctive, as is the yellowing tone to the dorsal hindwing in the male. The forewing dorsum is sinuous, especially in the male. The male has bipectinate antennae to about half way, whereas those of the female are simple; the female is significantly larger.

Status in Trinidad. An uncommon but widespread species in Trinidad's forests.

***Cecrita paramaribena* (Schaus, 1905)**

Figs. 48, 49.

OD: Schaus 1905: *Malocampa paramaribena*, TL Suriname (Paramaribo).

Historical notes. Kris Sookdeo photographed a female of this species at Caroni Swamp, and Tarran Maharaj photographed one near South Oropouche. I identified them by comparison with the type of a synonym, *Malocampa lupana* Dognin (USNM, ♀ French Guiana) as illustrated by Schintlmeister (2016) and USNM (2021). These are the only Trinidad records.

Identification. This is a sexually dimorphic species. The male was described from Suriname, and is illustrated by Schintlmeister (2016). It has the dorsal forewings pale grey-brown with dark blackish brown markings: a basal band across the basal third of the wing, but not extending to the base, and a subapical rectangular patch on the costa. It superficially resembles *Ophitis magnaria* (Fig. 36), but is considerably smaller (40 mm wingspan vs. 56 mm) and the distal dark markings differ. The female was described twice, as *Malocampa lupana* Dognin, 1908 and as *Psilacron maculosa* Dognin, 1911, both from French Guiana and illustrated by Schintlmeister (2016) and USNM (2021). The holotype of *M. lupana* is a reasonable match to Sookdeo's photo, whereas the holotype of *M. maculosa* has the pattern overlaid with the colouring of the male; clearly there is some variation. The female should be recognised by the dark streak in space 2 (Cu_2-2A), the dark spot beyond it in space 3 (Cu_1-Cu_2), and the arrangement of lines and shading, particularly the shape of the submarginal border between the darker postdiscal area and the paler margin below apex.

Status in Trinidad. Just two photographic records from Caroni Swamp and South Oropouche.

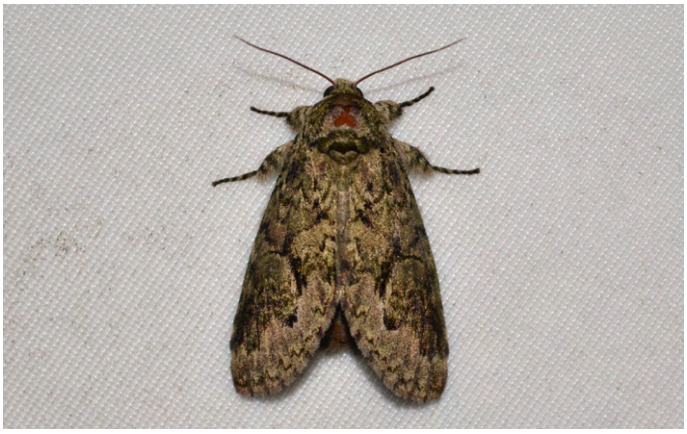

Fig. 48. Female *Cecrita paramaribena*, Caroni Swamp, 25.ii.2014, K. Sookdeo. ©, with permission.

Fig. 49. Female *Cecrita paramaribena*, South Oropouche, 9.viii.2021, T.P. Maharaj. ©, with permission.

***Chadisrochroa* Thiaucourt, 1997**

Type species: *Chadisra zabena* Schaus, 1901, TL Mexico. Species now placed in *Chadisrochroa* were previously included in the Old World genus *Chadisra* Walker, 1862.

***Chadisrochroa zabenilla* (Dognin, 1901)**

Fig. 33.

OD: Dognin, 1901: *Chadisra zabenilla*, TL Paraguay.

Historical notes. This is a new record for Trinidad. I identified it by comparison with the type (USNM, ♂ Paraguay) and NHMUK series.
Identification. This species can be recognized by the white notch on the costa at about two-thirds on the dorsal forewing, and the pair of black streaks across the basal area and dorsum. The male antennae are weakly bipectinate, whereas those of the female are simple. The female is also larger with more rounded wings.
Status in Trinidad. A rather rare species found in forests of the Northern Range.

***Chliaroides* Thiaucourt, 1995**

Type species: *Chliora* [sic] *mediostriga* Rothschild, 1917, TL Guyana.

***Chliaroides mediostriga* (Rothschild, 1917)**
Fig. 29.
OD: Rothschild 1917: *Chliora* [sic] *mediostriga*, TL Guyana.
Historical notes. Not previously recorded from Trinidad. I identified this species based on the plate in Rothschild (1917) and the NHMUK series.
Identification. This is a variable species, in colour and markings. Only one Trinidad specimen that I have seen has the dark medial streak for which Rothschild named it (Fig. 29, ♂3), others are distinctively mottled in brown and yellow brown (Fig. 29, ♂1), or almost plain brown (Fig. 29, ♂2). The relatively large size helps distinguish this species, which because of the wing shape and colouring can be compared with some *Hapigia* spp., particularly *H. cresus* (Fig. 29). I have not seen the female from Trinidad.
Status in Trinidad. An occasional species, mainly from forested areas of northern Trinidad, but also found in suburban areas.

***Colax* Hübner, 1819**

Type species *Phalaena apulus* Cramer, 1776, TL Suriname.

***Colax apulus* (Cramer, 1776)**
Figs. 28, 50, 51.
OD: Cramer 1776: *Phal[aena] Noct[ua] apulus*, TL Suriname, NTL French Guiana.
Historical notes. Thiaucourt (2004) recognized this species as occurring through the Guiana-Amazon area, so it is no surprise to now record it from Trinidad. I identified it as this species from Draudt (1932-1934) and Thiaucourt (2004).
Taxonomic issues. In BOLD, there are many DNA barcodes of *C. apulus* from Costa Rica in BOLD:AAB6594, and a single specimen from Brazil (Parana) in BOLD:AAP4041. Since *C. apulus* was described from Suriname, and the neotype is from French Guiana (Thiaucourt 2004), it is more likely to match the specimen from Brazil than those from Costa Rica (or differ from both). However, material from Trinidad can be expected to match that from French Guiana and Suriname, so the use of this name should be safe.
Identification. This large, brown species with truncate forewings can only be confused with *Procolax apulana* Schaus (Fig. 28). Although the markings of the two species are very similar, both sexes of *C. apulus* are consistently darker than the corresponding sex of *P. apulana*. Note also that the antennae of male *C. apulus* are strongly bipectinate for about three-quarters of their length, whereas those of male *P. apulana* are only obviously bipectinate at the base.

Fig. 50. Male *Colax apulus*, Grand Riviere, 16.v.2015 K. Sookdeo. ©, with permission.

Fig. 51. Female *Colax apulus*, Arima Valley, Simla, 28.viii.2016, M.G. Rutherford (iNaturalist observation 12413925]. ©, under CC-BY-NC license.

Females of both species have bipectinate antennae. Sexual dimorphism is quite strong in *C. apulus*, the females are significantly larger and paler, and are grey on the dorsal thorax.

Status in Trinidad. An uncommon species from the forests of the Northern Range.

Disphragis Hübner, 1820

Type species *Phalaena tharis* Stoll, 1782, TL Suriname.

***Disphragis occulta* (Schaus, 1905)**

Figs. 35, 52.

OD: Schaus 1905: *Rifargia occulta*, TL French Guiana.

TT: *Rifargia occulata* [sic] Schaus: Lamont and Callan (1950)

Disphragis occulta (Schaus): Cock (2017a)

Historical notes. Lamont and Callan's (1950) record of this species is of a specimen collected by Sir Norman Lamont at St. Patricks, Arima, 21 April 1938. I assume this is the specimen in NMS labelled Arima, 2 April 1938. My identification is based on a comparison with the type (USNM, ♀ French Guyana).

Taxonomic issues. There is a specimen from Trinidad which has been sequenced. It is the only member of BOLD:ACN8759, and there are no other public sequences in BOLD identified as *D. occulta*.

Identification. This medium-large species has the dorsal forewings rather uniformly dark brown, with the trace of a white spot at the apex, and an indication of a pale spot at the end of the cell. *Disphragis onerosa* (Schaus) is similar, but the dorsal forewing is more variegated, with the basal area differentiated by a pale line, a strong apical spot, and the ventral hindwing is more extensively yellow, especially ventrally (Fig. 35). *Lusura plorabilis* Schaus is comparable in size and also quite uniformly dark blackish brown, but it has an irregular pale spot at mid costa on the dorsal forewing (Fig. 104). Females of *D. occulta* are significantly larger than males and slightly paler.

Status in Trinidad and Tobago. An uncommon species in forested areas of northern Trinidad, and also reported from Tobago (Cock 2017a).

Disphragis onerosa (Schaus, 1905)

Figs. 35, 53.

OD: Schaus 1905: *Rifargia onerosa*, TL French Guiana.

Historical notes. This species has not previously been reported from Trinidad. It was identified by comparison with the type (USNM, ♂ French Guiana).

Taxonomic issues. DNA barcodes in BOLD are only from Costa Rica, but fall into two BINs (BOLD:AAC5431, BOLD:AAE3056), indicating there seems be at least one additional cryptic species under this name. Given that the type locality is French Guiana, this suggests Trinidad material can reasonably be treated as *D. onerosa* until we know more.

Identification. See comments under *D. occulta* above.

Status in Trinidad. Like the last, this is an uncommon species of the forests of northern Trinidad, but it has not been reported from Tobago.

Fig. 52. Male *Disphragis occulta*, Grand Tacarib, 29.viii.2015, K. Sookdeo. ©, with permission.

Fig. 53. Male *Disphragis onerosa*, Asa Wright Nature Centre, 23.iii.2015, S. Nanz. ©, with permission.

Disphragis tharis (Stoll, 1780)
Fig. 35.
OD: Stoll 1780: *Phal*[*aena*] *Noct*[*ua*] *tharis*, TL Suriname.
Historical notes. This is a new record for Trinidad, identified by comparison with the NHMUK series. I have also compared it with the type of *Heterocampa laeca* Schaus (USNM, ♀ Rio Janeiro), which is a synonym.
Taxonomic issues. Public barcodes in BOLD identified as this species appear in three BINS: BOLD:ACL4114 from Costa Rica (Limon), BOLD:AAM8272 from Brazil (Parana), and BOLD:AAB6166 from Costa Rica. Nevertheless, the type locality of Suriname indicates this name is likely to be correct for Trinidad material.
Identification. The dorsal forewing pattern of grey and dark brown should be distinctive in the Trinidad fauna. The pale margins to both ventral wings are a useful additional character. I do not know the female from Trinidad.
Status in Trinidad. An uncommon species from forested areas of Trinidad.

Disphragisella **Thiaucourt, 2003**

Type species *Heterocampa delira* Schaus, 1905, TL French Guiana.

Disphragisella baracoana **(Schaus, 1904)**
Figs. 34, 54.
OD: Schaus 1904: *Heterocampa baracoana*, TL Cuba.
TT: *Heterocampa epona* Schaus: Kaye (1901) [misidentification]
Boriza eglossa Kaye: Kaye (1925) TL, Draudt (1932-1934), Kaye and Lamont (1927) [synonym]
Disphragis epona (Schaus): Kaye and Lamont (1927) [misidentification]
Historical notes. This is a variable, sexually dimorphic species, which has caused some confusion in the literature. My treatment is based on examination of the types of *Heterocampa baracoana* Schaus (USNM, ♀ Cuba), *H. habilis* Schaus, 1905 (type USNM, ♂ French Guiana) a synonym (Schaus 1928), *H. foliata* Schaus (USNM, ♂ French Guiana) a synonym (Becker 2014) and *Boriza eglossa* Kaye (NHMUK, ♂ Trinidad) also a synonym (Becker 2014). Becker (2014) makes two other species synonyms, which indicates the confusion this species has caused.

Kaye (1901) recorded *Heterocampa epona* Schaus referring to a specimen in W.M. Schaus' collection collected by W.E. Broadway. Schaus' collection is now in USNM, but I could not locate the Broadway specimen there – it is not curated as *H. epona*, or as any of the other associated species discussed here. Kaye and Lamont (1927) expanded the entry for *Disphragis epona*, noting that there was only one specimen in 'The National Collection' (NHMUK). There is a Trinidad specimen in NHMUK curated as *D. epona*; in my view it is female *Disphragiella baracoana*. I have examined the type of *Disphragiella epona* (USNM, ♀ Peru); it is similar to *D. baracoana*, but has a slightly different texture to the dorsal forewing markings, and the white patch of the dorsal forewing remains within the submarginal line, whereas in *D. baracoana* it extends to the margin at the apex. I do not recognize *D. epona* as a Trinidad species. Kaye (1925) described *B. eglossa* Kaye from Trinidad; as noted above I have examined the type (NHMUK ♂) and it is a synonym of *D. baracoana*, as confirmed by Becker (2014).
Taxonomic issues. BOLD currently only contains public barcodes of this species from Costa Rica; these fall within two BINS (BOLD:ACE3907 and BOLD:AAA5397) indicating that the situation in central America at least is more complex than currently considered.
Identification. This is not a distinctive species in the male; in addition to several medium-small mottled green species (Fig. 34), *D. baracoana* should be compared with female *Oligocentria nondescripta* (Fig. 40), *Malocampa obscura* (Fig. 38), *Phastia basalis* Walker and *Pseudodryas pistacina* (Schaus) (Fig. 38). Males and females need to be considered separately, and the variability particularly with regard to the darker transverse discal bar of the male (Fig. 34) should be taken into consideration. Useful characters include the aforementioned dark bar when present, the forewing shape, the brown tint to the basal area of the dorsal forewing, the green and brown markings of the costa of the dorsal hindwing, and the antennae strongly bipectinate for most of their length in both sexes. The white patches, post-discal on the dorsal forewing, distal costa of dorsal hindwing, and on thorax above base of forewing should make females easier to recognize.
Status in Trinidad. A common and widespread species in forested and disturbed situations.

Fig. 54. Male *Disphragis baracoana,* Penal, 28.ii.2014, K. Sookdeo. ©, with permission.

Draudtargia Thiaucourt, 1995

Type species: *Rifargia picta* Schaus, 1905, TL Guyana.

***Draudtargia merita* Schaus, 1905**

Fig. 35, 55.

OD: Schaus 1905: *Rifargia merita*; TL Guyana.

Historical notes. This species has not previously been recorded from Trinidad. It was identified by comparison with the type (USNM, ♂ Guyana); the type is less red than Trinidad females, but the markings are a good match.

Taxonomic issues. Public barcodes for *D. picta* in BOLD fall into three BINS: BOLD:AAL6853 from French Guiana and Brazil (Para) and BOLD:AAL1702 and ABY3649 both from Costa Rica. As *D. picta* was described from Guyana, the first of these should be representative of the true *D. picta* including Trinidad material.

Identification. The two Trinidad species of *Draudtargia* have a distinctive look to them due to the different coloured streaks and patterning of double dark lines with a paler centre on the dorsal forewings (Fig 35). *Draudtargia* is larger and paler, particularly due to the three longitudinal streaks on the dorsal forewings, whereas *D. picta* has a much stronger red-mauve tint to them. I have not seen the male of *D. picta* from Trinidad, but it differs from the female in a similar manner *D. merita* (Fig. 35).

Status in Trinidad. A rare species, from forested areas.

Fig. 55. *Draudtargia merita*, Talparo, 29.x.2020, L. Arneaud (iNaturalist observation 63798789). ©, under CC-BY-NC license.

Draudtargia picta (Schaus, 1904)

Fig. 35, 56.

OD: Schaus 1904: *Rifargia picta*; TL Guyana.

Historical notes. A new record for Trinidad, identified by comparison with the type (USNM, ♂ Guyana).

Taxonomic issues. There is one public barcode from Brazil (Para) and three from French Guiana in BOLD (BOLD:AAL6854), which given Guyana is the type locality suggests this name should be reliable for Trinidad material too.

Identification. See comments under *D. picta* above.

Status in Trinidad. An uncommon species found in forested areas.

Fig. 56. Female(?) *Draudtargia picta*, Upper Guanapo Valley, 15.xii.2018, R. Deo (iNaturalist observation 19058502). ©, with permission.

Eumaschane Schaus, 1905

Type species *Eumaschane laura* Schaus, 1905, TL French Guiana.

***Eumaschane laura* Schaus, 1905**

Figs. 33, 57.

OD: Schaus 1905: *Eumaschane laura*, TL French Guiana.

Historical notes. This is a new record for Trinidad. It was identified by comparison with the type (USNM, ♂ French Guiana) and NHMUK series; there are minor differences in colouring which are probably not significant.

Identification. This is a very distinctive small species, with a very strongly hooked forewing dorsum. In the live figure (Fig. 57), the hook of the dorsum is positioned beside the abdomen and bent downwards, but this may reflect an active individual ready to fly rather than the normal resting position. It is unlikely to be confused with any other Trinidad species. I have not seen the female from Trinidad.

Status in Trinidad. Rare; just two records from forests of the higher parts of the Northern Range.

Fig. 57. Male *Eumaschane laura*, Brasso Seco, 14.iii.2015, K. Sookdeo. ©, with permission.

Euphastia Dognin, 1911

Type species *Euphastia ophidera* Dognin, 1911, TL French Guiana, a synonym of *Rifargia nubila* Druce, 1901, TL Colombia.

***Euphastia nubila* (Druce, 1901)**

Figs. 33, 58.

OD: Druce 1901: *Rifargia nubila*, TL Colombia.

Historical notes. A new record for Trinidad. Identified by comparison with the type (NHMUK, ♂ Colombia, photo), the type of *E. ophidera* Dognin (a synonym, USNM), and NHMUK series.

Identification. Amongst Trinidad Notodontidae this is a distinctive small species with a basal black spot, and large and small discal black spots. However, it might easily be mistaken for a member of the Noctuidae, such as a species of *Drobeta* or *Parangitia*, and so enlarged images are included here to facilitate recognition (Fig. 58). I have not seen the female from Trinidad.

Status in Trinidad. An uncommon species from the forests of northern Trinidad.

Fig. 58. Male *Euphastia nubila* (enlarged from Fig. 33).

***Farigia* Schaus, 1901**

Type species *Heterocampa sagana* Druce, 1894, TL Mexico.

***Farigia magniplaga* Schaus, 1905**

Figs. 34, 59.

OD: Schaus (1905): *Farigia magniplaga*, TL French Guiana.
Druce (1911): *Farigia xenopithia*, TL Trinidad, synonym.

TT: *Farigia moresca* Schaus: Kaye and Lamont (1927) [misidentification]
Farigia xenopithia Druce: Druce (1911) TL, Draudt (1932-1934), Lamont and Callan (1950) [synonym]
Farigia xenopythia [sic] Druce: Becker (2014) [synonym]
Farigia magniplaga (Schaus): Cock (2021)

Historical notes. Druce (1911) described this species from Caparo, Trinidad, and a single male type from Cuparo (an alternative spelling of Caparo in material from the beginning of the last century) is in NHMUK. It resembles ♂1 in Fig. 34, but is paler. This record was subsequently repeated by other authors.

Kaye and Lamont (1927) appear to have overlooked Druce's description as they do not include *F. xenopithia*, but they do include *F. moresca* Schaus, 1910 (type USNM, Costa Rica), citing a specimen from St. Ann's in NHMUK. *Farigea moresca* is now treated as a synonym of *F. vecina* Schaus, 1901 (type USNM, ♀ Mexico) (Schaus 1928). I located the St. Ann's specimen in NHMUK, and considered it and other material from Trinidad to represent a single variable species, which at that time I identified as *F. xenopithia* by comparison with the type. Recently, Cock (2021) synonymised *F. xenopithia* with *F. magniplaga*, based on the male terminalia and the work of Thiaucourt (1988a).

Identification. Within the Trinidad fauna, this variable species is quite distinctive and can be recognised by the mostly mottled green dorsal forewing, which may or may

Fig. 59. Male *Farigia magniplaga*, Grand Tacarib, 29.viii.2015, K. Sookdeo. ©, with permission.

not have a discal band of white or a black streak from the base to the submarginal area, and the uniform brown dorsal hindwing and both ventral wings. The female is larger, with simple antennae. Individuals with relatively uniform mottled green colouring, such as the female in Fig. 34, bear some resemblance to the male of *Hamidonta unca* (Fig. 32), but note the unusual hindwing shape and the extensive yellow on the ventral surface of that species.

Status in Trinidad. An occasional species in forested areas.

***Ginaldia* Schaus, 1905**

Type species *Ginaldia davidsoni* Schaus, 1905, TL French Guiana.

***Ginaldia davidsoni* Schaus, 1905**

Fig. 33, 60.

OD: Schaus 1905: *Ginaldia davidsoni*, TL French Guiana.

Historical notes. A new record for Trinidad, identified by comparison with the type (USNM, ♂ French Guiana).

Identification. There are several small grey-white notodontids in Trinidad with which this species might be confused (Fig. 33). Of these, *Serichroa myconos* (Schaus) is the closest, but unlike *G. davidsoni*, it has a dark spot on the dorsum just before the tornus of the the dorsal forewing, a clearly defined brown double discal line, and it usually has the apex of darker; the hindwing dorsally and ventrally has a broad dark border. *Ginaldia davidsoni* might also be confused with some of the Trinidad *Malocampa* spp. such as *M. delosia* Schaus and *M. ziliante* (Stoll) (Fig. 37), but they are larger, the ground colour is grey rather than white, and the basal part of the antennae of the male are noticeably bipectinate, unlike the simple ones of *G. davidsoni*. I have not seen the female from Trinidad.

Status in Trinidad. A rare species in forested areas of northern Trinidad.

Fig. 60. Male *Ginaldia davidsoni*, Talparo, at light, 1.ix.2020, K. Sookdeo. ©, with permission.

Ginaldia distinguenda (Walker, 1856)

Fig. 36, 61.

OD: Walker 1856: *Acronycta distinguenda*, TL St. Domingo [Dominican Republic]

TT: *Rifargia distinguenda* (Walker): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded a specimen of this species from Palmiste (14 Septmber 1917, N. Lamont); this specimen, a female, is in NMS. Identified by comparison with the type (NHMUK, ♀ Dominican Republic) and NHMUK series.

Taxonomic issues. Public barcodes of *G. distinguenda* appear in three BINS in BOLD: BOLD:AAA6354 from Costa Rica and Mexico, BOLD:AAM8279 from Brazil (Para, Maranhao) and BOLD:AAU0305 from French Guiana. Given the type locality is in the Greater Antilles, it is not certain that this name can safely be applied to Trinidad material; it may be that *G. dubia* (Möschler), described from Suriname, and currently a synonym (Becker 2014), may be more appropriate for BOLD:AAU0305 and Trinidad material. For now, the established name is used.

Identification. One of several medium-sized grey notodontidae species in Trinidad (Fig. 36). *Ginaldia lineata* (Druce) (Fig. 33) is close, but it has a solid postdiscal line on the dorsal forewing. *Goodgeria cincta* (Schaus) is readily distinguished as it has a large contrasting pale area in the costal half of the discal area of the discal forewing (Fig. 36).

Status in Trinidad. A common and widespread species in forests and disturbed habitats.

Fig. 61. Male *Ginaldia distinguenda*, Penal, 8.x.2014, K. Sookdeo. ©, with permission.

Ginaldia lineata (Druce, 1887)

Fig. 36.

OD: Druce 1887: *Symmerista lineata*, TL Panama.

Historical notes. This is a new record from Trinidad. Identified by comparison with the NHMUK series.

Taxonomic issues. *Ginaldia lineata* from Costa Rica appear as two BINs in BOLD (BOLD:AAB3888 and BOLD:AAE7892); the implications for South American material are not clear.
Identification. Close to *G. distinguenda* (above), but the solid dark post-discal line of *G. lineata* should serve to distinguish this species. I have not seen the male from Trinidad.
Status in Trinidad. A rare species, only recorded from Morne Bleu Textel at this time.

***Goaxis* Schaus, 1901**

Type species *Goaxis singularis* Schaus, 1901, TL Brazil (Rio de Janeiro).

***Goaxis fuscofasciata* Dognin, 1916**

Fig. 33, 62.
OD: Dognin 1916: *Goaxis fuscofasciata*, TL French Guiana.
Historical notes. A new record for Trinidad, which I identified by comparison with the type (USNM, ♂ French Guiana).
Identification. This is the smallest notodontid recorded from Trinidad. As such it is easily separated from other species of this family, but could easily be mistaken for a noctuid or erebid. Fortunately, no noctuids or erebids closely resemble *G. fuscofasciata*, and the forewing shape and detailed markings should be adequate to recognize it (see enlarged Fig. 62).
Status in Trinidad. Just one Trinidad record, which was from Curepe.

Fig. 62. Male *Goaxis fuscofasciata* (enlarged from Fig. 33).

Goodgeria Thiaucourt, 2002

Type species *Blera apella* Schaus, 1892, TL Brazil (Rio de Janeiro).

***Goodgeria cinga* (Schaus, 1924)**

Fig. 36, 63.
OD: Schaus 1924: *Rifargia cinga*, TL Guyana.
Historical notes. Not previously recorded from Trinidad. Identified by comparison with the type (USNM, ♀ Guyana). I have previously misspelt this species as *einga*.
Taxonomic issues. *Goodgeria apella* (Schaus), identified from the type (USNM, ♂ Brazil, Rio Janeiro), is very similar and Trinidad material has been incorrectly identified as this species in the past. Schaus (1924) indicated that *G. cinga* can be differentiated by the straighter post-medial line – a character that seems more evident in the female than the male. I also note that the type of *G. cinga* and all Trinidad material has a brown dorsal thorax, whereas this area is grey in the type of *G. apella*. On the basis of these two characters I treat Trinidad material as *G. cinga*. In BOLD, *G. apella* from Para, Brazil, appears as BOLD:AAM8489, whereas a sample from French Guiana appears as BOLD: AAU5186, and a single sample of *G. cinga* from French Guiana appears as BOLD:AAU5229.
Identification. *Goodgeria cincta* is readily distinguished from other medium-large grey Trinidad notodontids (Fig. 36) as it has a large contrasting pale area in the costal half of the discal area of the dorsal forewing.
Status in Trinidad. An uncommon species mainly recorded only from the forests of the Northern Range.

Fig. 63. Male *Goodgeria cinga*, Talparo, at light, 16.xi.2020, K. Sookdeo. ©, with permission.

Hamidonta Dognin, 1911

Type species *Hamidonta unca* Dognin, 1911, TL French Guiana.

***Hamidonta unca* Dognin, 1911**

Fig. 32.
OD: Dognin 1911: *Hamidonta unca*, TL French Guiana.
Rothschild 1917: *Drugera muscosa*, TL Trinidad, [synonym (Schaus 1928)].
TT: *Drugera muscosa* Rothschild: Rothschild (1917) TL
Historical notes. Rothschild (1917) described *Drugera muscosa* Rothschild from Trinidad, but Schaus (1928) subsequently recognized that it is a synonym of *H. unca*. I

identified my Trinidad female by comparison with the male type of *H. unca* (USNM, ♂ French Guiana).

Identification. Although the mottled green forewing markings and plain dark hindwing are undistinguished, the large size of this species makes it distinctive in Trinidad (Fig. 32). Where no scale is available, e.g. images of living moths, a detailed comparison of the markings may be needed to separate this from other mottled green species (Figs. 35, 38). The female is considerably larger than the male.

Status in Trinidad. Just three Trinidad records, with no clear indication of habitat.

Hapigia Guenée, 1852

Type species *Hapigia nodicornis* Guenée, 1852, TL French Guiana. *Chliara* Walker, 1858 (type species *Phalaena cresus* Cramer, 1777) is a synonym; *Chiliara* is a misspelling in Schintlmeister (2013). There are many DNA barcodes for *Hapigia* spp. in BOLD. Multiple BINs are defined, giving the impression that eash of the following species is likely to be a species complex. As all the species treated below from Trinidad were described from the Guianas, it may well be that they are correctly named.

Hapigia alexiae Thiaucourt, 1974

Figs. 31, 64, 65.

OD: Thiaucourt 1974: *Hapigia alexiae*, TL French Guiana.

Historical notes. A new record for Trinidad, which I identified by comparison with the NHMUK series (in turn identified by P. Thiaucourt).

Identification. The dorsal forewing markings resemble those of *H. nodicornis* Guenée (Fig. 29) (below), but this a much paler species, and the yellow-rayed ventral surface is distinctive (Fig. 31). Fig. 65 probably is of a female, as the wings appear broader than for the male.

Status in Trinidad. An occasional species, widespread in forested areas of Trinidad.

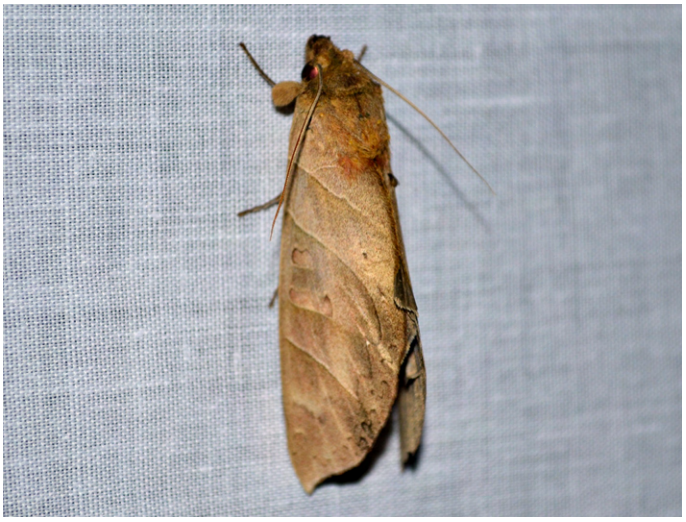

Fig. 64. Male *Hapigia alexiae*, Grand Tacarib, 29.viii.2015, K. Sookdeo. ©, with permission.

Fig. 65. Female *Hapigia alexiae*, Arima Valley, Asa Wright Nature Centre, 14.ii.2017, J. Muddeman. ©, with permission.

Hapigia cresus (Cramer, 1777)

Fig. 29, 66.

OD: Cramer 1777: *Phal[aena] Noct[ua] cresus*, TL [Suriname].

TT: *Chliara croesus* [sic] (Cramer): Kaye and Lamont (1927)
Hapigia cresus (Cramer): Cock (2017a)

Historical notes. Three records by Sir Norman Lamont from Palmiste (24 January 1917, 25 December 1920, 21 May 1921) form the basis for Kaye and Lamont's (1927) record of this species. Three female specimens in NMS represent these records. I identified this species by comparison with the NHMUK series.

Taxonomic issues. Schintlmeister (2013) notes that Cramer's figure (plate 142C) does not match the species currently known as *C. cresus*. At first sight he is right, but I note that the figure does not obviously match any other species, and that the markings do match *C. cresus*, except that the silver-white discal and basal spots are missing. If their absence

Fig. 66. Male(?) *Hapigia cresus*, Santa Cruz Valley, 25.iv.2021, rishi_zach (iNaturalist observation 75179618). ©, under CC-BY-NC license.

were attributable to an inadequacy in the hand colouring process, that would explain the apparent mis-match.
Identification. The dorsal forewing combination of yellow and brown colouring and silver-white discal and basal spots is distinctive. Sexes are similar, the female having slightly broader forewings.
Status in Trinidad and Tobago. A common species in disturbed and suburban habitats.

Hapigia curvilinea Schaus, 1904
Figs. 30, 67.
OD: Schaus 1904: *Hapigia curvilinea*, TL Guyana.
Historical notes. Not previously recorded from Trinidad. I identified this species by comparison with the type (USNM, ♂ Guyana,).
Identification. This dark reddish brown *Hapigia* species, with silver-white discal spots and a splash of orange below them is distinctive.
Status in Trinidad. An occasional species in the forests of northern Trinidad.

Fig. 67. Female(?) *Hapigia curvilinea*, Grand Tacarib, 30.viii.2014, K. Sookdeo. ©, with permission.

Hapigia nodicornis Guenée, 1852
Figs. 29, 68.
OD: Guenée 1852: *Hapigia nodicornis*, TL French Guiana.
Walker 1855: *Hapigia obliqua*, TL 'Madras' [South America] [a separate species]
TT: *Hapigia obliqua* Walker: Kaye (1901) [misidentification]
Hapigia nodicornis Guenée: Kaye and Lamont (1927)
Historical notes. Kaye (1901) misidentified this species as *H. obliqua* Walker (incorrect type locality Madras), referring to a specimen from Verdant Vale captured by his brother S. Kaye. This was corrected to *H. nodicornis* in Kaye and Lamont (1927). There is a specimen in NHMUK which may be the one referred to, but it is labelled W.J. Kaye (so perhaps this is a second specimen). My identification is based on the NHMUK series.
Taxonomic issues. Material in BOLD appears in two BINs BOLD:AAM8485 from Costa Rica (2) and Brazil (Maranhao 1 and Para 1) and BOLD:AAA8802 from Costa Rica (many). Provisionally, BOLD:AAM8485 may be taken as likely to represent the true *H. nodicornis* and the Trinidad population.
Identification. The large size, lilac-brown ground colour with a series of transverse lines and an elongate white-rimmed discal spot is distinctive. *Hapagia alexiae* (Fig. 31) is similarly marked but much paler. *Antaea* spp. (Fig. 27) also have a series of transverse lines but they are orientated differently. There is a female *Hemicerus losa* in coll. Lamont [UWIZM] as *Hapigia nodicornis*; although superficially similar, *H. losa* is a much smaller species. Sexes similar, but the female has browader wings.
Status in Trinidad. An occasional and widespread species in forsted areas, but also occurring in suburban areas.

Fig. 68. *Hapigia nodicornis*, Arima Valley, Asa Wright Nature Centre, 10.xii.2017, nancynorman (iNaturalist observation 9128021). ©, under CC-BY-NC license.

Hapigia plateada Schaus, 1904
Figs. 31, 69.
OD: Schaus 1904: *Hapigia plateada*, TL Guyana.
TT: *Hapigia plateada* Schaus: Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) recorded specimens from Esperance (30 October 1917, N. Lamont). St. Ann's (in NHMUK) and without locality (November 1920, W.J. Kaye). I have examined the first of these in NMS, the second in NHMUK, but not located the third (although it may be the specimen in NMS labelled November 1921 without locality). I confirmed this identification by comparison with the type (USNM, ♂ Guyana).
Identification. The rather uniform yellow brown ground colour of the dorsal forewing with a group silver-white discal spots is distinctive. The female is slightly larger with broader wings.
Status in Trinidad. A fairly common and widespread species, found in forested and suburban areas.

Fig. 69. Male *Hapigia plateada*, Arima Valley, Asa Wright Nature Centre, 23.xi.2009, P. Prior (iNaturalist observation 29758555). ©, under CC-BY-NC license.

Hapigia raatzi raatzi Möschler, 1883
Figs. 30, 70, 71.
OD: Möschler 1883: *Hapigia raatzi*, TL Suriname.
TT: *Hapigia ribbei* Druce: Kaye (1901) [misidentification]
Hapigia raatzi Möschler: Kaye and Lamont (1927)
Historical notes. Kaye (1901) recorded this species from Trinidad as *Hapigia ribbei* (Druce) referring to a specimen from Verdant Vale (S. Kaye). *Hapigia ribbei* is currently a valid species (Schintlmeister 2013) or a synonym of *H. simplex* (Becker 2014). Kaye and Lamont (1927) incorrectly treated *H. ribbei* as a synonym of *H. raatzi* and listed specimens from Verdant Vale (S. Kaye) and Guaico (18 April 1915, N. Lamont). The former is in NHMUK labelled 'Arima' and the latter is in NMS; both are what I treat here as *H. raatzi*, which I confirmed by comparison with the NHMUK series. Becker (2014) recognizes three subspecies, hence the use of the trinomial.

Fig. 70. Male *Hapigia raatzi*, Arima Valley, Asa Wright Nature Centre, 22.iii.2015, S. Nanz. ©, with permission.

Fig. 71. Female *Hapigia raatzi*, Arima Valley, Asa Wright Nature Centre, 7.xii.2018, C.D. Jones (iNaturalist observation 18886630). ©, under CC-BY-NC license.

Identification. See discussion under *H. simplex* which follows.
Status in Trinidad. A common species in forested areas.

Hapigia simplex Walker, 1865
Figs. 30, 72, 73.
OD: Walker 1865: *Hapigia simplex*, TL French Guiana.
Druce 1887: *Hapigia ribbei*, TL Panama [synonym (Becker 2014)]
TT: *Hapigia simplex* Walker: Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) recorded this species based on a specimen from Guaico (18 April 1915, N. Lamont), which is now in NMS. I confirmned this identification by comparison with the type (NHMUK, ♂ French Guiana) and NHMUK series.
Taxonomic issues. There are multiple BINs under this name in a cluster mostly identified as *H. simplex* in BOLD: BOLD:AAA6647 (Costa Rica), BOLD:ABZ0087 (Costa Rica), BOLD:AAI6859 (Costa Rica), BOLD:ACE5869 (Brazil, Para), BOLD:AAU5494 (French Guiana), BOLD:AAM8317 (Brazil, Para), and BOLD:AAM9306 (French Guiana as *Hapigia* sp.). *Hapigia ribbei* also appears in a separate cluster as multiple BINS: BOLD:AAE3217 (Costa Rica), BOLD:ADL9863 (Costa Rica), BOLD:AAD5626 (Costa Rica), BOLD:ACE6983 (Brazil, Maranhao and as *Hapigia* sp. from Brazil, Para and French Guiana) and two BINs in this cluster as *Hapigia* sp.: BOLD:ACE4527 (Brazil,

Parana), and BOLD:ACE6132 (Brazil, Maranhao). *Hapigia plateada* from Costa Rica (BOLD:AAD0544) also falls within this group. Clearly the taxonomy of *H. simplex* and *H. ribbei* is far more complicated than the current treatment.

The NHMUK series of *H. ribbei* has discal spots silvery white on the dorsal forewing, while those of *simplex* are close to the ground colour. The type of *H. ribbei* (NHMUK, ♀ Chiriqui) has an evenly curved, two-tone discal line on the dorsal forewing, differing in this from Trinidad material. Hence, I prefer *H. simplex* over *H. ribbei* as the more appropriate name for Trinidad material. However, until this group is revised the application of the name *H. simplex* to Trinidad material can only be considered provisional, although given the type locality of French Guiana, it may well prove to be correct.

Fig. 72. Male *Hapigia simplex*, Grand Riviere, 16.v.2015, K. Sookdeo. ©, with permission.

Fig. 73. Female *Hapigia simplex*, Matura, 7.xii.2019, R. Deo (iNaturalist observation 36441014). ©, permission requested.

Identification. Thus far, Trinidad specimens of this appearance with silvery white discal spots on the dorsal forewing are all *H. raatzi* (*H. ribbei* also has silver-white discal spots), whereas those with spots comparable to the ground colour are all *H. simplex*. This matches the curation of the NHMUK, but not the USNM, so this might be a variable character. In addition, I note differences in the three transverse, mostly dotted lines on the dorsal forewing: basal, prediscal and postdiscal. The prediscal line of *H. simplex* runs more distally towards the costa, and closer to the postdiscal line. The postdiscal line in *H. simplex*, is generally straight or very weakly and evenly curved, with a darker outer border; it turns slightly basally just above the dorsum. The postdiscal line of *H. raatzi* is angled between veins 3 and 4 (Cu_1 and M_3) and the lower section is angled inwards in space 1B (Cu_2-2A), and is less well defined by a dark distal border. *Rhapigiodes frederica* and *Rhapigia accipiter* (Fig. 31) are superficially similar, but immediately distinguished by the large distal hook on the forewing dorsum. The sexes are similar, but the female has broader forewings.

Status in Trinidad. A fairly common species in forested areas.

Hemipecteros Schaus, 1920

Type species *Hemipecteros arthemis* Schaus, 1920, TL Guyana.

***Hemipecteros otiosa* (Schaus, 1905)**

Fig. 33.

OD: Schaus 1905: *Heterocampa otiosa*, TL French Guiana.
Dognin 1914: *Chadisra peirreta*, TL Trinidad

TT: *Chadisra peirreta* (Dognin): Dognin (1914) TL, Draudt (1932-1934), Lamont and Callan (1950) [synonym (Becker 2014)]
Blera semialba (Druce): Kaye and Lamont (1927) [synonym (Becker 2014)]

Historical notes. This species was first recorded from Trinidad as *Blera semialba* (Druce), based on a W.J. Kaye specimen in NHMUK. This species is now considered a synonym of *H. otiosa* (Becker 2014), although when I first examined Kaye's specimen in NHMUK, it was still curated as *B. semialba*. Dognin (1914) inadvertently described it again as *Chadisra peirreta* from Trinidad., and Lamont and Callan (1950) therefore included it again under this name in their additions to the Trinidad catalogue. I examined the types of *Heterocampa otiosa* (USNM, ♂ French Guiana) and *Chadisra peirreta* Dognin (USNM, ♂ Trinidad) and considered them synonyms, as confirmed by Becker (2014).

The female, which I identified from Draudt (1932-1934) was described as *Malocampa mammerta* Schaus, but this too has been synonymized with *H. otiosa* by Becker (2014).
Identification. This is perhaps the most striking example of sexual dimorphism amongst Trinidad Notodontidae (Fig. 33). Compared with other small grey-white Heterocampinae in Trinidad, the male stands out because of the large dark discal area on the dorsal forewing, while the female has a distinctive large dark spot on the dorsum at one-third.
Status in Trinidad. This is an uncommon species, widespread in forested and disturbed habitats, but curiously there are no records from the Northerm Range.

***Heorta* Walker, 1858**

Type species *Heorta roseoalba* Walker, 1858, TL Brazil, Amazonas. *Talmeca* Schaus, 1905 (type species: *Talmeca perplexa* Schaus) is a synonym.

***Heorta consociata* (Schaus, 1905)**

Figs. 35, 74, 75.

OD: Schaus 1905: *Talmeca consociata*, TL French Guiana.
Schaus 1905: *Boriza povera*, TL Guyana [synonym].
Möschler 1833: *Talmenia arsilonchoides*, TL Suriname [separate species according to Becker (2014)]

TT: *Talmenia arsilonchoides* Möschler: Lamont and Callan (1950) [misidentification?]

Historical notes. There is a female from Palmiste (9 December 1931) in Sir Norman Lamont's collection in NMS identified incorrectly as *Talmenia arsilonchoides* Möschler (TL Suriname), which is included in Lamont and Callan's (1950) additions to the Trinidad catalogue. My identification was made by comparison with the type of *Boriza povera* Schaus (USNM, ♀ Guyana, a synonym).
Identification. The two small brown *Heorta* spp. recorded from Trinidad are unlikely to be mistaken for any other Trinidad Notodontidae (Fig. 35), although they might easily be confused with species of Erebidae or even Crambidae; accordingly enlarged images are also included (Figs. 74, 75).

Fig. 74. Male *Heorta consociata* (enlarged from Fig. 34).

Fig. 75. Female *Heorta consociata* (enlarged from Fig. 34). Specimen in NMS. Specimen in NMS; photographed by A. Whiffen, © NMS.

Heorta consociata can be distinguished from *H. perplexa* (Schaus) by the diffuse dark supapical patch, broader wings and in the male simple antennae. In contrast *H. perplexa* has a pale streak from base to mid termen, more sharply marked by a dark brown streak on the costal side, and in the male the antennae are clearly bipectinate. The difference in antennae raise the question as to whether these two species are truly congeneric. The male and female of *H. consociata* are very similar.
Status in Trinidad. A rare species in Trinidad, with just two records from Curepe and Palmiste.

Heorta perplexa (Schaus, 1905)

Figs. 35, 76, 77.

OD: Schaus 1905: *Talmeca perplexa*, TL French Guiana.

TT: *Heorta roseoalba* Walker: Kaye and Lamont (1927) [misidentification]
Talmeca perplexa Schaus: Schaus (1905), Draudt (1932-1934), Lamont and Callan (1950)

Historical notes. Kaye and Lamont (1927) recorded *Heorta roseoalba* (Walker) (TL, Brazil, Amazonas, Ega) from a specimen taken by Sir Norman Lamont at Palmiste; this specimen is now in NMS. Schaus (1905) included Trinidad in the type series and this record is repeated by Draudt (1932-1934) and Lamont and Callan (1950). Schintlmeister (2016) located two female syntypes from Trinidad in USNM and illustrated one. I have examined Lamont's specimen in NMS and matched it to material which I identified as *H. perplexa* by comparison with the lectotype (USNM ♂ French Guiana) and USNM series. The two species are similar, but currently treated as separate (Becker 2014). I did not locate the type of *H. roseoalba* in NHMUK, so I do not have an opinion as to whether they are different. Accordingly, I choose to treat the Trinidad material as one species, and apply the name *H. perplexa* based on the good match of the type and proximity of the type locality.

Identification. See under *H. consociata* above.
Status in Trinidad. An uncommon species from forested areas of central and southern Trinidad, but unusually no records from the Northern Range.

Fig. 76. Male *Heorta perplexa* (enlarged from Fig. 34).

Fig. 77. Female *Heorta perplexa* (enlarged from Fig. 34).

Lirimiris Walker 1865

Type species *Lirimiris lignitecta* Walker, 1865, TL [South America].

***Lirimiris lignitecta* Walker, 1865**

Figs. 32, 78.
OD: Walker 1865: *Lirimiris lignitecta*, TL [South America].
TT: *Lirimiris lignitecta* Walker: Lamont and Callan (1950)
Historical notes. Lamont and Callan (1950) recorded a specimen from Palmiste (15 January 1936, N. Lamont), which I have not located (there is a specimen in Lamont's UWIZM collection labelled *L. lignitecta*, but it is male *Gabara insulsa* Dognin (Erebidae, Scolepocampinae)). However, this is a very distinctive species which I have confirmed from Trinidad, so there is no reason to question Lamont and Callan's record. I identified this species by comparison with the type (NHMUK, ♀ no locality) and NHMUK series.
Taxonomic issues. In BOLD there are many DNA barcodes of material identified as *L. lignitecta* from Costa Rica in BIN BOLD:AAA8832, two from Brazil in BOLD:AAP3293 and two as *Lirimiris* sp from French Guiana in BOLD:ABX5927 which clusters close to BOLD:AAA8832. As Walker (1865) described *L. lignitecta* from a specimen in 'Mr. Norris's collection' with no locality, this is presumably the female type now in NHMUK. Walker (1865) described several species from Mr. Norris's collection, some with a locality and some without; it is clear that the collection included material from North and South America as well as the Old World, so this gives no clue as to the origin of the type specimen. It will be necessary to revise this group before it can be established to which population the name *L. lignitecta* can be applied, and establish names for the other species. In the meantime, *L. lignitecta* is applied to the Trinidad population as an interim measure.
Identification. This species is distinctive and should not be misidentified within the Trinidad fauna. Females are significantly larger, with broader wings, but both sexes have bipectinate antennae.
Status in Trinidad. An occasional widespread species, mostly in forested areas.

Fig. 78. Male *Lirimiris lignitecta*, Morne Bleu, Textel Installation, 29.xii.2013, K. Sookdeo. ©, with permission.

Magava Walker, 1865

Type species *Magava multilinea* Walker, 1865, TL [Honduras].

***Magava multilinea* Walker, 1865**

Figs. 37, 79.
OD: Walker 1865: *Magava multilinea*, TL [Honduras]
TT: *Magava multilinea* Walker: Kaye and Lamont (1927)
Historical notes. This species was recorded from Trinidad by Kaye and Lamont (1927) based on a female specimen captured by Sir Norman Lamont at Guaico 18 April 1915; this specimen is now in NMS. Identified by comparison with the type (NHMUK, ♀ Honduras) and NHMUK series.
Taxonomic issues. There are multiple DNA barcodes of this species from Costa Rica in BOLD:AAA2565, and one from French Guiana in BOLD:AAM2833, suggesting that

the South American population will prove to be one or more separate species, while the true *M. multilinea* is from Central America (type locality Honduras).

Identification. Amongst Notodontidae, this species is obviously distinct, but two unrelated Trinidad species are superficially similar: *Diastema tigris* Guenée (Noctuidae, Condicinae) and *Spinulata* sp. (Cossidae, Cossulinae). They are similar in colouring with transverse lines on the dorsal forewing, but both have a transverse row of large dark spots across the basal part of the forewing, not found in *M. multilinea*. The sexes are similar, but note the thicker male antennae, longer male abdomen with the tip visibly bifurcate in some specimens, and the difference in wing shape.

Status in Trinidad. An occasional species in forested areas.

Fig. 79. Male *Magava multilinea*, Brasso Seco, 14.iii.2015, K. Sookdeo. ©, with permission.

Malocampa Schaus 1901

Type species *Phalaena punctata* Stoll, 1780, TL Suriname, a preoccupied name for which the oldest name available is *Phalaena ziliante* Stoll, 1782, TL Suriname.

***Malocampa bolivari* (Schaus, 1894)**

Fig. 37.

OD: Schaus 1894: *Blera bolivari*, TL Venezuela.

Historical notes. A new record from Trinidad. Dyar (1908) points out that the type series of *M. bolivari*, which ostensibly comprises a male and a female is actually two females, one with bipectinate antennae, the other with simple antennae. Dyar restricted the type series of *M. bolivari* to the specimen with the bipectinate antennae, which A. Schintlmeister labelled as lectotype in 2014. I identified this species by comparison with the lectotype (USNM, Venezuela).

Taxonomic issues. Trinidad specimens are not an exact match to the lectotype of *M. bolivari*, inasmuch as the dorsal forewing has a yellower tint to the ground colour, and the tornus is dark continuously with the dark patch just before the tornus, charcteristic of *M. bolivari*. It may well be that the Trinidad material represents a separate, closely-related species.

Identification. This species is similar to *M. piratica* (Fig. 37), but differs in that the dorsal forewing discal area is pale from base to margin, whereas in *M. piratica* there is a large dark patch on the dorsum, which is joined by a dark bar to the costal spot at one-third, and the ventral wings of *M. piratica* are nuch darker. The sexes are similar, but the female is larger, with less pointed wings; the antennae are bipectinate in both sexes, but more strongly in the male.

Status in Trinidad. An uncommon species, mostly found in the forests of the Northern Range, but some records from suburban areas.

***Malocampa delosia* Schaus, 1939**

Figs. 37, 80.

OD: Schaus 1939: *Malocampa delosia*, TL Brazil, Santa Catharina.

TT: *Malocampa punctata* (Stoll): Lamont and Callan (1950) [misidentification]

Historical notes. The first record of this species was a specimen from (Palmiste, 20 September 1947, N. Lamont), which was misidentified as *M. punctata* (Stoll). *Malocampa punctata* is a synonym of *M. ziliante* (Stoll), which is a Trinidad species (below), but Lamont's specimen is a female in UWIZM, which matched material that I identified as *M. delosia* by comparison with the type (USNM, ♂ Brazil).

Identification. This species might be confused with *M.*

Fig. 80. Male *Malocampa delosia*, Inniss Field, 21.ii.2021, R. Deo (iNaturalist observation 69971080). ©, with permission.

ziliante (Fig. 37), *M.* sp. nr. *sorex* Schaus and *M. nystalina* (Felder) (Fig. 38). *Malocampa delosia* is smaller and the dorsal forewings darker than *M. ziliante*; the dark discal patch extends in a triangle to the costa, whereas in *M. ziliante*, the dark discal patch is much less intense and is separated from a smaller, lighter dark triangle closer to the apex. *Malocampa sorex* is a slightly smaller species, brown-grey rather than grey, without the discal patch of *M. delosia* and *M. ziliante*, but with two dark spots at the end of the cell, and more or less distinct small dark patches on the costa at one-third and three-quarters to the apex. The female of *M. delosia* is paler, slightly larger and with broader, more rounded wings.

Status in Trinidad. An occasional species, mainly in suburban areas.

Malocampa notabilis (Schaus, 1905)
Fig. 38.
OD: Schaus 1905: *Heterocampa notabilis*, TL French Guiana.

Historical notes. This is a new record for Trinidad, which I identified by comparison with the type (USNM, ♀ French Guiana) and NHMUK series.

Taxonomic issues. Trinidad material is more chestnut on the disc near termen, but this may not be significant.

Identification. Although this may seem a rather undistiunguished species, the colouring and markings are distinctive in Trinidad. The female is paler than the male, based on limited material examined.

Status in Trinidad. An occasional species in forested areas.

***Malocampa obscura* Schaus, 1901**
Figs. 38, 81.
OD: Schaus 1901: *Malocampa obscura*, TL Colombia.

Historical notes. This is the first record from Trinidad. My identification is based on a comparison with the type (USNM, ♂ Colombia).

Taxonomic issues. The discal area of the type is rather darker than found in Trinidad material, but otherwise this seems a good match, and I have found no similar species.

Identification. This medium-large mottled green species should be compared with those shown in Fig. 34, and the female of *Oligocentria nondescripta* (Fig. 40). It comes close to *Cecrita echina* (Fig. 34) in size an appearance, but *M. obscura* has the first two abdominal segments with a strong chestnut tint dorsally, and the central and costal discal area, and the adjacent marginal area is clearer brown, lacking green. Ventrally, the row of five dark spots on the costa towards the apex of the forewing of *M. obscura*, and the pale-yellow area on the dorsum and space 1 (Cu_2-2A) of the forewing of *C. echina* may also help. The usual sexual differences in antennae and wing shape apply, but I have not examined enough material to suggest the minor differences apparent in the dorsal forewing or other than individual variation.

Status in Trinidad. A rare species, found only in the forests of the Northern Range.

Fig. 81. Female *Malocampa obscura*, Arima Valley, Asa Wright Nature Centre, 21.iii.2015, S. Nanz. ©, with permission.

Malocampa piratica Schaus, 1905
Fig. 37.
OD: Schaus 1905: *Malocampa piratica*, TL French Guiana.
TT: *Malocampa albolineata* Druce: Lamont and Callan (1950) [misidentification]

Historical notes. Lamont and Callan (1950) record *Malocampa albolineata* Druce from Trinidad, based on specimens that Lamont caught at Palmiste, 24 March and 26 April 1947. These two female specimens are in Lamont's collection in UWIZM. I believe they were identified from Draudt (1932-1934) rather than from Druce (1881-1900) or by comparison with museum specimens. The figure of *M. albolineata* in Draudt (1932-1934, Plate 151d) is not the same species that Druce (1881-1900, Plate 25.10) illustrated when he described the species, rather it is a species of the *M. puella* Dyar / *M. piratica* group. Lamont's specimens match material which I identified as *M. piratica* by comparison with the type (USNM, ♂ French Guiana) and NHMUK series.

Taxonomic issues. DNA barcodes of material from Costa Rica identified as *M. piratica* in BOLD fall into two BINs (BOLD:AAD6916 and BOLD:AAB6063) indicating greater complexity in Central America which will need to be investigated. For now, the Trinidad population can be referred to as *M. piratica*.

Identification. See comments under *M. bolivari* above.

Status in Trinidad. A fairly common and widespread species, most common in suburban areas.

***Malocampa* sp. nr. *sorex* Schaus, 1905**
Fig. 38, 82, 83, Appendix Fig. 13.
OD: Schaus 1905: *Malocampa sorex*, TL French Guiana.

Historical notes. This is a new record for Trinidad. I initially identified it as *M. sorex* by comparison with the lectotype (USNM, ♂ French Guiana) (Schintlmeister 2016) and NHMUK series.

Fig. 82. Detail of *Malocampa* spp resembling *M. sorex*. Left, *M. nystalina* ♂; centre, *M.* sp. nr. *sorex* ♂; right, *M.* sp. nr. *sorex* ♀. Not to scale (cf. Fig. 38).

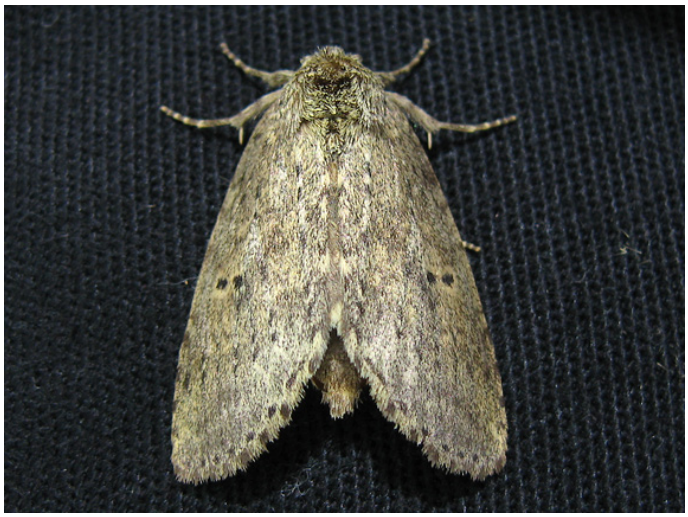

Fig. 83. Female *Malocampa* sp. nr. *sorex*, Penal, 15.vii.2010, K. Sookdeo. ©, with permission.

Taxonomic issues. Thiaucourt (2015) documents the male terminalia of *M. sorex*, in comparison with *M. boudinoti* Thiaucourt, 2015, which he described from French Guiana. I compared the terminalia of a Trinidad specimen (Appendix Fig. 13), and find that although they are similar, the profile of the valve is different, in particular the very strong tooth on the mid costa of the valve is single in Trinidad specimens, but double in Thiaucourt's (2015) preparation of *M. sorex*. It seems likely that the species in Trinidad is not *M. sorex* and may be one of the other species Thiaucourt (2015) mentions in this group: *M. nystalina* Felder, *M. satis* Druce, and 'une espèce inédite du Pérou', but I have not seen the terminalia of any of these. Based on wing markings, it seems a potential match to *M. satis*, for which Thiaucourt includes specimens from central America to Peru in BOLD, but for which there are at least two species with this name amongst BOLD material from Costa Rica and Brazil.

Identification. This is a rather plain grey species, with two small dark spots at the end of the cell. See also comments under *M. delosia*. It is close to the next species, *M. nystalina* which I had not distinguished until I examined the male terminalia. Re-examination of the details of the dorsal forewing (Fig. 38) indicates that in the current species there is a more or less evident row of white spots with a dark spot on each side spots on veins 2-6 (Cu_2-M_1) in the postdiscal area, whereas in the next species these spots are not present, but there is an indistinct dark wavy line. This band of white and black spots is also present on the type of *M. sorex*. The sexes are similar, but the female is larger with broader forewings, and only narrowly bipectinate antennae.

Status in Trinidad. An occasional and widespread species in diverse habitats, but mainly in forested areas.

Malocampa nystalina (Felder, 1874)
Fig. 38, 82, Appendix Fig. 14.
OD: Felder 1874: *Disphragis nystalina*, TL Brazil, Amazonas.

Historical notes. The record is based on a single specimen from Point Gourde, collected by John Morrall and now in MJWC.

Taxonomic issues. See comments under *M.* sp. nr. *sorex*. I had initially identified this species as *M. sorex*, but examination of the male terminalia (Appendix Fig. 14) showed it to be a different species, not matching *M. sorex* (although similar) or *M. boudinoti* (Thiaucourt 2015). A DNA barcode was obtained, which when used with the BOLD identification tool, showed it to be closely related to, and probably conspecific with specimens in BOLD identified

as *M. nystalina* (Felder, 1874) by P. Thiaucourt (99.2% match). Becker (2014) made *M. nystalina* a synonym of *M. subguttata* (which resembles *M. delosia* above), but Thiaucourt (2015) treats *M. nystalina* as a valid species resembling *M. sorex*, but without any formal taxonomic change. Felder *et al.*'s (1865-1874) plate of this species does not resemble either of these closely, but I have not examined the type. The terminalia of *M. subguttata* and *M. nystalina* have not been documented, and so I include the terminalia of the Trinidad specimen here to facilitate future identification (Appendix Fig. 14).

Identification. This species is not easily separated from *M.* sp. nr. *sorex*, without examining the terminalia. However, the postdiscal row of spots in the later and the faint zig-zag line in the same location for *M. nystalina* works for the material to hand (Fig. 82).

Status in Trinidad. Just one Trinidad record, but some museum material of *M.* sp. nr. *sorex* needs re-evaluation for this species.

***Malocampa ziliante* (Stoll, 1780)**

Fig. 37.

OD: Stoll 1780: *Phalaena ziliante*, TL Suriname
Stoll 1780: *Phal[aena] Bomb[yx] punctata*, TL Suriname [unavailable name; synonym of *M. ziliante*]

TT: *Malocampa ziliante* (Stoll): Cock (2017a)

Historical notes. Lamont and Callan (1950) recorded *Malocampa punctata* from Trinidad. *Malocampa punctata* is a synonym of *M. ziliante*, but the specimen was actually a female *M. delosia* (see above). Nevertheless, *M. ziliante* is a Trinidad species, which I have identified by comparson with the NHMUK series.

Identification. See comments under *M. delosia* above. The female of *M. ziliante* is slightly larger, paler and with broader wings than the male. Male antennae are bipectinate, female simple.

Status in Trinidad and Tobago. An uncommon species in Trinidad, mostly in forested habitats and not as common as *M. delosia* in suburban habitats. Also found in Tobago (Cock 2017a).

***Marianita* Becker, 2014**

Type species *Anita definita* Dognin, 1922, TL Brazil, Para. The species currently placed in *Marianita* were previously placed in *Anita* Schaus, 1901 (type species *Anita basipuncta* Schaus, 1901).

***Marianita syrta* Schaus, 1906**

Fig. 33.

OD: Schaus 1906: *Anita syrta*, TL French Guiana.

Historical notes. A new Trinidad record, identified by comparison with the type (USNM, ♂ French Guiana).

Taxonomic issues. The disc of the dorsal hindwing is uniform brown in the type, whereas in my Trinidad specimen it is light yellowish brown. However, the range of variation in the NHMUK, where this species is (or was) treated as *Anita minima* Draudt (TL Brazil) includes both. Schintlmeister (2013) treated *Anita minima* as a valid species, but notes that he could not locate the type in Berlin. Becker (2014) made *minima* a synonym of *syrta* which he placed in his new genus *Marianita*.

Identification. This medium-sized, pale species with obscure markings and a dark patch on the dorsum at one-third is distinctive amongst Trinidad Notodontidae. It might be confused in appearance with species of *Euglyphis* (Lasiocampidae) but no Trinidad species have this pale colouring. I have not seen the female from Trinidad.

Status in Trinidad. Just one record from Inniss Field, a forested oil field in the south of Trinidad.

***Marthula* Walker, 1856**

Type species *Marthula quadrata* Walker, 1856, TL Brazil, Para.

***Marthula grisescens* Schaus, 1905**

Fig. 39.

OD: Schaus 1905: *Marthula grisescens*, TL French Guiana.

TT: *Marthula luteopunctata* (Dognin): Lamont and Callan (1950) [misidentification]

Historical notes. Lamont and Callan (1950) recorded *Marthula luteopunctata* (Dognin) from Palmiste (1 March 1948, N. Lamont). This male specimen, along with a female, is in Lamont's collection in UWIZM curated as *M. luteopunctata*. Lamont's specimens match my material which I identified as *M. grisescens* by comparison with the type (USNM, ♂ French Guiana) and the NHMUK series. I have checked the type of *M. luteopunctata* (USNM, ♂ Peru) and its synonym *M. aurea* Druce (NHMUK, ♂ Peru, Santo Domingo), and they are not the species found in Trinidad.

Identification. This is one of two species of *Marthula* in Trinidad; they can be recognized by the three more or less parallel lines across the dorsal forewing (Fig. 39). The dorsal forewing ground colour of *M. griscens* is distinctly grey compared to the purple-brown tint of *M. multifascia*; it is shaded darker along the costa and on the dorsum between the basal and middle transverse line. Further, the male of *M. multifascia* has a strong orange tint on the middle of dorsal forewing costa, and more weakly in the submarginal area towards the apex. In contrast, the female of *M. multifascia* has this orange tint much weaker and the dorsal forewing is a more uniform paler brown than the male, and has a uniformly dark dorsal hindwing. The female of *M. grisescens* is darker than the male on both dorsal wings, and the wings are broader. The abdomen of the male *M. grisescens* in Fig.

39 is artificially extended and should normally be shorter in proportion, as for the male of *M. multifascia*.
Status in Trinidad. An occasional species, mostly found in forested areas.

***Marthula multifascia* (Walker, 1856)**
Fig. 39.
OD: Walker 1856: *Xanthia multifascia*, TL Brazil, Pará.
Historical notes. A new Trinidad record, identified by comparison with the type (NHMUK, ♂ Brazil) and NHMUK series. Furthermore, the A8 sternite matches that illustrated by Thiaucourt (1995b) for this species.
Taxonomic issues. Although the type has yellow markings, where the Trinidad specimens have orange (Fig. 39), the NHMUK series includes specimens with orange markings which match the Trinidad material.
Identification. See notes under *M. grisescens* above.
Status in Trinidad. An uncommon species in forests, but no records from the well collected area around Arima Valley.

***Meragisa* Schaus, 1901**
Type species *Orthosoma valdiviesoi* Dognin, 1890, TL Ecuador.

***Meragisa innoxia* Schaus, 1911**
Figs. 36, 84.
OD: Schaus, 1911: *Meragisa innoxia*, TL Costa Rica.
Historical notes. This species has not previously been reported from Trinidad. This identification was made by P. Thiaucourt, based on photograph that I sent him. I have since compared Trinidad specimens with a photograph of the lectotype (Schintlmeister 2016, USNM 2021), and note that the dorsal forewings of the lectotype are paler, the spot at the end of the cell is more conspicuous, and the markings have a slightly different look to them; they may well prove to be separate closely related species.

Fig. 84. Male *Meragisa innoxia*, Arima Valley, Asa Wright Nature Centre, 17.xii.2019, N. Norman (iNaturalist observation 36739416). ©, under CC-BY-NC license.

Identification. This grey-green species with multiple weak transverse lines (Fig. 36) superficially resembles *Phastia basalis* and *Pseudrdryas pistacina* (Fig. 38), but is significantly larger, and differs in the details of the markings. It is unlikely to be confused with *M. vistara*, which is a grey species with a distinct dark spot at the end of the cell of the dorsal forewing (Fig. 36).
Status in Trinidad. An occasional and widespread species in forested areas.

Meragisa vistara Schaus, 1928
Fig. 36.
OD: Schaus 1928: *Meragisa vistara*, TL Colombia.
Historical notes. A new record for Trinidad, identified by comparison with the type (USNM, ♂ Colombia, Buena Vista).
Identification. This medium-large species has grey dorsal forewings, with irregular dark markings in the costal half, a dark spot at the end of the cell and unmarked in the dorsal half, and should be recognizable from these characters. I have not seen the male, but it should be similar to the female.
Status in Trinidad. Just one record from Cumaca Road in the Northern Range.

***Moresa* Walker, 1855**
Type species *Moresa costalis* Walker, 1855, TL Brazil.

***Moresa costalis* Walker, 1855**
Fig. 39.
OD: Walker 1855: *Moresa costalis*, TL Brazil (?)
TT: *Moresa costalis* Walker: Kaye and Lamont (1927)
Historical notes. A specimen from Port-of-Spain (November 1921, A. Pierre) was the basis for Kaye and Lamont (1927) to record this species from Trinidad. Since this is the only specimen known to them, I assume that it is the female without data in Lamont's collection in NMS.

There is quite some confusion regarding the names around this species. The earliest description was as *Moresa costalis* Walker, 1855 based on a female from Brazil in NHMUK. In the same volume, Walker (1855) incorrectly treated the male of *M. costalis* as *Rosema deolis* (Cramer), similar to *R. intermedia* (below). Felder *et al.* (1865-1874, Plate 145.12) then described *Rosema costalis* C. Felder & R. Felder from Brazil (Buenos Aires), based on one or more males. Next, Schaus (1896b) realized that the male that Walker treated as *R. deolis* was incorrectly identified, and proposed the name *R. walkeri* for Walker's species. Then, Schaus (1905, p.294) realized that his *R. walkeri* (which he now misspelt *R. valkeri*) was a synonym of *Rosema costalis* C. Felder & R. Felder. Schintlmeister (2013) notes that *Rosema costalis* (C. Felder & R. Felder) belongs in the genus *Moresa*, making it congeneric with

M. costalis Walker, and so *Moresa costalis* (C. Felder & R. Felder) becomes an unavailable homonym, for which the former synonym *M. walkeri* (Schaus) is available (not *M. valkeri* as indicated by Schintlmeister). Schintlmeister (2013) treated *M. costalis* Walker and *M. walkeri* as separate species, but Becker (2014) made *M. walkeri* a synonym of *R. costalis* Walker. Meanwhile, Rothschild (1917) described *R. obliquifascia* Rothschild from French Guiana, but Becker (2014) also made this a synonym of *R. costalis* Walker. So, at the moment all these names are treated as synonyms, for which the senior name is *M. costalis* Walker (Schintlmeister 2019). I identified this species by comparison with a photo of the type of *M. obliquifascia* in NHMUK, and confirmed from Schintlmeister (2019).

Taxonomic issues. Schintlmeister (2019) noted that the A8 sternite of a Trinidad male differed from others of this species, but reached no conclusions based on a single specimen. Accordingly, I dissected a Trinidad male (MJWC dissection 1049; Fig. 39, ♂1) of similar appearance. It is the tergite that has two long slender spines centrally, and not the sternite as indicated by Schintlmeister (2019, p. 43). However, the spines of this specimen are symmetrical, resembling those of the specimen from French Guiana illustrated by Schintlmeister (2019, Fig. 32b). Accordingly, I conclude that the Trinidad male shown by Schintlmeister (2019, Fig. 32d) differs due to individual variation.

Some years ago, P. Thiaucourt (pers. comm.) suggested to me that *M. costalis* and *M. walkeri* may be separate species, noting that the former is smaller, but this was not reflected in the treatments of Becker (2014) and Schintlmeister (2019). Nevertheless, material in BOLD identified as *R. costalis* from Costa Rica falls into two BINs (BOLD:ACE3840, BOLD:AAA7172), while sequences for specimens identified as *M. valkeri* [sic] fall into two further BINs: BOLD:ABZ7654 (Brazil, Para) and BOLD:ACE8506 (French Guiana). Thus, the DNA barcode evidence points to several taxa being grouped under the name *M. costalis*. Bearing all this in mind, I use the name *M. costalis* Walker for the species in Trinidad, while acknowledging that it is probably some other species, either new, or one of the current synonyms.

Identification. This is one of six predominantly green Notodontidae found it Trinidad, the others being placed in *Rosema*. It is the largest, and the only one with the costa continuously pale, or pale with the leading-edge dark. Males are smaller with strongly pectinate antennae, and usually have no white band on the dorsal forewing (Fig. 39, ♂1), like Felder *et al.*'s (1865-1874) illustration of their *Rosema costalis*, but may have traces of a white band (Fig. 39, ♂2); females are larger with moderately pectinate antennae, and usually have a conspicuous broad white band on the dorsal forewing (Fig. 39), like the types of *M. costalis* Walker and *M. obliqiifascia*, but may have none (Curepe, October 1969 (UWIZM CABI.1801)).

Status in Trinidad. An uncommon species, but found in both suburban and forested areas.

Naprepa Walker, 1855

Type species *Naprepa camelinerdes* Walker, 1855, TL Brazil.

Naprepa elongata Schaus, 1901

Figs. 32, 85.

OD: Schaus 1901: *Naprepa elongata*, TL Brazil, Rio de Janeiro.

Historical notes. Surprisingly, this large conspicuous species has not previously been reported from Trinidad. Provisionally identified by comparison with the type (USNM, ♂ Brazil, Rio de Janeiro).

Taxonomic issues. This identification is provisional inasmuch as the southern Brazil type locality is a long way from Trinidad, so that minor differences may be significant. Thus, in Trinidad material apart from subtle differences in the dorsal forewing markings, the dorsal forewing ground colour is more chestnut, the dorsal hindwing is dark brown rather than light brown, and the dorsal abdomen is chestnut brown rather than grey-brown. Of the described species, *N. elongata* seems the best fit, but dissections of males of both are needed to test this.

Identification. This species, especially the female is the largest notodontid found in Trinidad, and the female is one of the largest of Trinidad moths. As such it cannot be mistaken for any other species (although where no scale is available, it looks rather like the very much smaller coxcomb prominent, *Ptilodon capucina* (Linnaeus) found in Europe). In addition to being larger, the female is slightly paler and has broader wings.

Status in Trinidad. An uncommon species so far only known from the forests of the Northern Range.

Fig. 85. *Naprepa elongata*, Arima Valley, Asa Wright Nature Centre, at light, 9.x.2016 (R. Gibbons photo) [iNaturalist observation 4323707]. ©, under CC-BY-NC license.

***Oligocentria* Herrich-Schäffer, 1855**

Type species: *Oligocentria violascens* Herrich-Schäffer, 1855, TL [Brazil]. Schintlmeister (2013) recognised the genus *Oligocentria* (type species *Notodonta violascens* Herrich-Schäffer) as valid, but Becker considered *Oligocentria* a synonym of *Ianassa* Walker, 1855 (type species *Ianassa lignicolor* Walker, 1855). Thiaucourt (2015) treated *Oligocentria* as a valid genus in line with Schintlmeister (2013), although he took no formal taxonomic action to reverse the treatment of Becker (2014). Miller *et al*. (2021) concluded that both genera are valid, but that while *Ianassa* is essentially a North American genus, *Oligocentria* is Central and South American.

***Oligocentria brunnipennis* (Kaye, 1923)**

Fig. 40.

OD: Kaye (1923): *Rifargia brunnipennis*, TL Trinidad

TT: *Rifargia brunnipennis* Kaye: Kaye (1923) TL, Kaye and Lamont (1927)
Dicentria violascens (Herrich-Schäffer): Kaye and Lamont (1927) [misidentification]
Oligocentria brunnipennis (Kaye): Cock (2021)

Historical notes. Kaye (1923) described and illustrated *Rifargia brunnipennis* from Trinidad (Palmiste, 25 December 1920, N. Lamont), and Kaye and Lamont (1927) repeated this record. I have examined the female type in NMS (Bland 2010). Schaus (1928) placed *R. brunnipennis* in synonymy with *Oligocentria violascens* (Herrich-Schäffer), which has been followed by subsequent authors (Schintlmeister 2013, Becker 2014).

In addition to recording *R. brunnipennis* from Trinidad, Kaye and Lamont (1927) also recorded *O. violascens* (as *Dicentria violascens*), citing a specimen from Palmiste (1 February 1922, N. Lamont), a female which is now in UWIZM. It is not clear what difference they saw between the two species. I initially identified this species as *O. violascens* by comparison with the NHMUK series and the type of *R. brunnipennis* (NMS, ♀ Trinidad). Recently, however, Cock (2021) raised Kaye's *O. brunnipennis* to species status, based on *O. guianensis* Thiaucourt (Thiaucourt 2015) which became a synonym.

Identification. Sexual dimorphism is strong, and it is not immediately obvious that the two sexes belong to the same species. The male dorsal forewing with a strong discal spot and a dark streak from base to the disc with a small submarginal continuation, is quite distinctive. The female dorsal forewing is predominantly dull brown, with indistinct markings and a weak violet sheen; a white notch on the margin just above the tornus is also quite distinctive.

Status in Trinidad. An occasional species associated with suburban and disturbed areas.

***Oligocentria nondescripta* (Kaye, 1923)**

Figs. 40, 86.

OD: Kaye 1923: *Dicentria nondescripta*, TL Trinidad.

TT: *Dicentria nondescripta* Kaye: Kaye (1923) TL, Kaye and Lamont (1927), Draudt (1932-1934), Cock (2003)
Boriza crossaea (Druce): Kaye and Lamont (1927) [synonym of *B. tonac* (Schaus); misidentification]

Historical notes. I believe this variable and sexually dimorphic species has appeared in the Trinidad literature under different names as follows. Kaye (1923) described and illustrated *Dicentria nondescripta* from Trinidad (Palmiste, 25 December 1920, N. Lamont). Although not stated in the description, the illustration shows that this specimen is a female, and I have examined this holotype in NHMUK. Kaye and Lamont (1927) added another record (Palmiste, 14 July 1917, N. Lamont); this specimen in NMS is also female and was incorrectly labelled as 'type'. Bland (2010) is incorrect to state that it is the holotype and Kaye's (1923) date was in error.

Kaye and Lamont (1927) listed *Boriza crossaea* on the basis of a Caparo specimen collected by S.M. Klages. *Boriza crossaea* is a synonym of *B. tonac* (Schaus) (Becker 2014). I found this specimen in the NHMUK as *B. crossoea* [sic]; in my opinion, it is a male *I. nondescripta*.

I identified this species by comparison with the type (NHMUK, ♀ Trinidad), and associated the male based on the markings (but note very different wing shape). Kaye and Lamont (1927) did not know the male except as *B. crossaea*, and Lamont appears to have struggled with this species (3♀ in coll. Lamont [UWIZM] as *Dicentria nondescripta* are ♀ *O. nondescripta* and 2♀ *O. psamathe*, while another 3♀ *O. nondescripta* appear as *Disphragis proba* (i.e. *Cecrita proba*)).

Taxonomic issues. In the course of examining type material, I noted possible older names for this species. *Heterocampa limosa* (Schaus) based on the type (USNM, ♀ Brazil, Rio Janeiro) is very close (but not synonymous according to Becker 2014); I have a Trinidad female that is a good match, which I treat as *O. nondescripta*. If the greenish markings of male specimens from Trinidad vary or become discoloured to pale brown, then they would match *Dicentria fechima* Schaus, 1928 (paratype USNM, ♂ Rio Purus, Brazil; a synonym of *I. limosa* according to Becker (2014)); old female specimens in coll. Lamont (UWIZM) as *D. nondescripta* do show just such colouring. Judging by the NHMUK series, *D. limosoides* Schaus (TL Costa Rica; type not examined) is a similar species, but a male Trinidad specimen placed in that series appeared to me to be *O. nondescripta*. Other Trinidad males in NHMUK were noted over a blank label. It seems clear that this is a group that would benefit from more attention. It seems possible that *O. nondescripta* will

prove to be a synonym of *O. limosa*, and I may be wrong to treat all the Trinidad material as one species, but for now treating them all as the unambiguous *O. nondescripta* described from Trinidad causes least ambiguity.

Identification. This species may be compared with other mottled green species in Trinidad (Figs. 34, 40), but can be recognized by the relatively uniform mottled green colouring of the dorsal forewing, and the black-margined, narrow discal spot. Faded specimens might be confused with *O. psamathe*, but that species has the discal spot rounder, normally has a dark streak extending beyond the discal spot, and lack any green colour on the dorsal forewings.

Status in Trinidad. This is a common species, mainly found in forested areas, but also extending into suburban areas.

Fig. 86. Female *Oligocentria nondescripta*, Arima Valley, Simla, 6.vii.2017, N. Block (iNaturalist observation 7135644). ©, under CC-BY-NC license.

Oligocentria psamathe (Schaus, 1892)

Fig. 40.

OD: Schaus 1892: *Phya psamathe*, TL Brazil, Rio de Janeiro. Druce 1911: *Dicentria klagesi*, TL Trinidad [synonym].

TT: *Dicentria klagesi* (Druce): Druce (1911) TL, Kaye and Lamont (1927), Draudt (1932-1934)

Historical notes. Druce (1911) described *Dicentria klagesi* from Trinidad, based on a specimen from Caparo (S.M. Klages). The holotype is a male and is now in NHMUK. Kaye (1923) and Kaye and Lamont (1927) illustrated the female, but do not refer to this species in the text. I surmise that Kaye was planning to describe the female as a new species until he realized that it is the female of Druce's *D. klagesi*. Kaye and Lamont (1927) added further records from Palmiste (3 December 1916, 18 December 1918, 4 April 1919, 3 May 1921, N. Lamont), and without locality (1915, F.W. Jackson). Three of Lamont's specimens have been located in NMS, and there are two of Jackson's in NHMUK; all are female. Becker (2014) made *Dicentria* a synonym of *Ianassa*, but Miller *et al.* (2021) refer South American species to *Oligocentria*. Becker (2014) made 11 species from Central and South America, including *O. klagesi*, synonyms of *O. psamathe*. I identified this species by comparison with the type of *klagesi* (NHMUK, ♂ Trinidad) and NHMUK series.

Oligocentria centralis (Herrich-Schäffer) (TL Brazil, Rio [de Janeiro]), is a separate valid species (Schintlmeister 2013, Becker 2014) which does not occur in Trinidad. There is a male *Agrotis repleta* Walker (Noctuidae) in coll. Lamont [UWIZM] misidentified as *Dicentria centralis*.

Identification. This species can be distinguished from *O. nondescripta* as set out under that species. The forewing discal spot and the streak beyond it are normally dark and conspicuous, but can blend with the ground colour (Fig. 40, ♂3, ♀2). I have dissected males with and without the discal spot and conclude that they are conspecific. Males and females differ in wing shape in a similar way to *O. nondescripta*, but the variable markings of the two sexes are similar.

Status in Trinidad. A common species in suburban and disturbed areas, also found in forested areas.

***Ophitis* Felder & Rogenhofer, 1874**

Type species: *Ophitis magnaria* Felder, 1874, TL French Guiana. Becker (2021d) treats this genus.

***Ophitis magnaria* Felder, 1874**

Fig. 36.

OD: Felder 1874: *Ophitis magnaria*, TL French Guiana. Druce 1911: *Rifargia imitata*, TL Trinidad [synonym]

TT: *Rifargia imitata* (Druce): Druce (1911) TL, Kaye and Lamont (1927), Draudt (1932-1934), Becker (2021d)

Historical notes. Druce (1911) described this species as *Rifargia imitata* based on a single male from Caparo, Trinidad (♂ NHMUK, Fig. 36). Kaye and Lamont (1927) had no further information, and there have been no subsequent captures. Schintlmeister (2013) transferred it to *Ophitis*, based on the similarity to *O. magnaria*, and Becker (2014) made it a synonym of *O. magnaria*.

Taxonomic issues. There are two public DNA barcodes in BOLD from French Guiana (currently as *Rifargia imitata*). They are treated as BOLD:AAN8875, and it is anticipated that Trinidad material will also fit here.

Identification. As Druce (1911) pointed out, this species resembles *Nystalea aequipars* (Fig. 106), but *O. magnaria* is a much paler species, the dark basal area of the dorsal forewing is less extensive and it does not extend to the dorsum.

Status in Trinidad. Still only known from the type of *R. imitata*, suggesting this is a rare species of lowland forest. There seems no reason to doubt this record, but confirmation would be desirable.

***Pauluma* Schaus 1901**

Type species *Pauluma nubila* Schaus, 1901, TL Brazil, Paraná

***Pauluma punctata* (Dognin, 1924)**

Figs. 33, 87.

OD: Dognin 1924: *Lirimiris punctata*, TL Brazil, Santa Catarina.

Historical notes. Not previously recorded from Trinidad, I identified this species by comparison with the type (USNM, ♂ Brazil).

Identification. This is one of the smallest Trinidad notodontids (Figs. 33, 87). The dark streak of the dorsal forewing from near the base of the costa, to the margin near the apex, together with the conspicuous white spot at the end of the cell should serve to identify it. There are no obvious look-alikes in other families, but an enlarged image is also included to help with identification. I have not seen the female from Trinidad.

Status in Trinidad. Just one record from Curepe.

Fig. 87. Male *Pauluma punctata* (enlarged from Fig. 33)

***Phastia* Walker, 1862**

Type species *Phastia basalis* Walker, 1862, TL Brazil, Rio de Janeiro.

***Phastia alcimede* (Druce, 1890)**

Fig. 38.

OD: Druce 1890: *Oedemasia* ? *alcimede*, TL Panama.

TT: *Phastia alcimede* (Druce): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded two specimens captyred at Caparo (October 1904, December 1904, F. Birch), which are now in NHMUK. This species was identified from the NHMUK series.

Taxonomic issues. DNA barcodes from Costa Rica of this species appear in two BINs in BOLD (BOLD:ABZ0089 and BOLD:AAA7923) indicating there is greater hidden diversity under this name in Central America, if not in South America.

Identification. This species resembles a dark version of *Phastia basalis*, but can be readily distinguished by the conspicuous white basal area of the dorsal forewing (Fig. 38). Other characters include a white apical patch, three white dots on the costa before the apex, an undulating line of black and white submarginal spots, a narrow dark spot at the end of the cell very narrowly white on the inner margin, and a curved postdiscal line with elements of pale blue in it. Both sexes have simple antennae. The female is larger and the dorsal forewing ground colour is not as dark, but the contrasting white basal area and other features are still good diagnostic features.

Status in Trinidad. A rare species found in forested areas.

***Phastia basalis* Walker, 1862**

Figs. 38, 88.

OD: Walker 1862: *Phastia basalis*, TL Brazil, Rio de Janeiro

TT: *Phastia basalis* Walker: Kaye and Lamont (1927), Cock (2017a)

Historical notes. Kaye and Lamont (1927) recorded specimens from Guaico (18 April 1915, N. Lamont) and Caparo (October 1904, F. Birch). Specimens matching the former are in both NMS and UWIZM, while the latter is in NHMUK. I identified this species by comparison with the NHMUK series.

Identification. This is a rather plain dull mottled green species that should be compared with the larger *Meragisa innoxia* (Fig. 35) and the smaller *Pseudodryas pistacina* (Fig. 38). Differences from *Phastia alcimede* are discussed under that species (above). Apart from size, perhaps the clearest feature to separate *P. basalis* from *M. innoxia* is the post-discal band that runs from the costa just before the apex to space 2 (Cu_1-Cu_2), which is straight in *P. basalis*, but displaced outwards in space 3 (M_3-Cu_1) in *M. innoxia*. The

Fig. 88. Male *Phastia basalis*, Brasso Seco, 11.i.2014, K. Sookdeo. ©, with permission.

male of *Pseudodryas pistacina* has conspicuous bipectinate antennae where those of *Phastia basalis* and *M. innoxia* are simple. Note also on the dorsal forewing of *Pseudodryas pistacina* a large dark patch on the costa near the base (less conspicuous in the female), an irregular row of dark submarginal spots and a fairly conspicuous white spot at the end of the cell.

Status in Trinidad and Tobago. A common and widespread species in Trinidad, primarily from forested areas.

Porionella Thiaucourt, 1988

Type species: *Farigia fragilis* Schaus, 1905, TL French Guiana. A monotypic genus, for the one unusual species (Thiaucourt 1988a).

***Porionella fragilis* (Schaus, 1905)**

Figs. 33, 89.

OD: Schaus 1905: *Farigia fragilis*, TL French Guiana.

TT: *Porionella fragilis* (Schaus): Cock (2017b)

Historical notes. Cock (2017b) recorded this species from the Five Islands and Trinidad. Identification was by comparison with the type (USNM, ♂ French Guiana).

Identification. This is one of the least representative notodontids in Trinidad, being relatively lightly built, with broad wings, superficially resembling a species of Geometridae (Ennominae) or Erebidae (Lymantriinae). Although there are no obvious look-alikes in these families, an enlarged image (Fig. 89) should help separate it from species of other families. I do not know the female.

Status in Trinidad. A rare species in Trinidad with one record from the Arima Valley. Also recorded from the Five Islands (Cock 2017b).

Fig. 89. Male *Porionella fragilis* (enlarged from Fig. 33).

Procolax Schaus, 1910

Type species *Procolax apulana* Schaus, 1910, TL Costa Rica.

***Procolax apulana* Schaus, 1910**

Fig. 28, 90.

OD: Schaus 1910: *Procolax apulana*, TL Costa Rica.

Historical notes. A new record from Trinidad. I compared Trinidad material with the type (USNM, ♂ Costa Rica), and noted that the type has a plain, pale dorsal hindwing, whereas Trinidad material is darker. P. Thiaucourt (pers. comm.) dissected my male specimen and confirmed this identification, which is a significant extension of the range he previously reported from Central America and western Colombia and Ecuador (Thiaucourt 2004).

Identification. See comments under *Colax apulus* above.

Status in Trinidad. An uncommon species, with five records from the northern part of the island.

Fig. 90. Female *Procolax apulana*, Maracas Valley, 12.vi.2021, R. Williams-Littzen (iNaturalist observation 82696724). ©, under CC-BY-NC license.

Pseudodryas Möschler, 1878

Type species *Pseudodryas olivacea* Möschler, 1878, TL Suriname.

***Pseudodryas pistacina* (Schaus, 1901)**

Figs. 38, 91.

OD: Schaus 1901: *Salluca pistacina*; TL Honduras.
Kaye 1923: *Phastia maricolor*, TL Trinidad [synonym (Schaus 1928, Becker 2014)]

TT: *Phastia maricolor* Kaye: Kaye (1923) TL, Kaye and Lamont (1927) [synonym]
Salluca pistacina Schaus: Lamont and Callan (1950)
Pseudodryas pistacina (Schaus): Cock (2017a)

Historical notes. Kaye (1923) described and illustrated *Phastia maricolor* from Trinidad. The female type specimen is in NMS (Bland 2010). Lamont had not labelled the specimen, which was his practice with material collected at Palmiste before 1915. Kaye and Lamont (1927) listed *P. maricolor* from Palmiste (N. Lamont) and Caigual (30 August, Agnes Lickfold); they added that the type is in Lamont's collection, and by implication is the specimen they listed as being from Palmiste without date of collection. The second specimen they listed from Caigual is in OUMNH; it is not *P. maricolor*, but a small female specimen of *Cecrita echina* (above).

Schaus (1928) made *P. maricolor* a synonym of *Salluca pistacina* Schaus (TL Honduras), which has been followed by subsequent authors, including Lamont and Callan (1950), who recorded an additional male specimen now in NMS. In 2002, P. Thiaucourt (pers. comm.) dissected one of my male specimens from Trinidad, compared it with Central American specimens (Honduras, Costa Rica, Mexico) and confirmed this synonymy, although he did not mention this in his subsequent treatment of *Pseudodryas*, to which he transferred *S. pistacina* (Thiaucourt 2006). I identified this species by comparison with the type (USNM, ♂ Honduras) and the type of *P. maricolor* (NMS, ♀ Trinidad).
Identification. See notes under *Phastia basalis* above.
Status in Trinidad and Tobago. An uncommon species, with no clear habitat association.

Fig. 91. Female(?) *Pseudodryas pistacina*, Brasso Seco, 14.iii.2015, K. Sookdeo. ©, with permission.

Rhapigia Schaus, 1928

Type species *Hapigia accipiter* Schaus, 1892, TL Brazil, Rio de Janeiro.

***Rhapigia accipiter* (Schaus, 1892)**
Fig. 31.
OD: Schaus 1892: *Hapigia accipiter*, TL Brazil, Rio de Janeiro.
Historical notes. A new record for Trinidad, identified by comparison with the NHMUK series (I failed to find the type of *accipiter* in the USNM).
Taxonomic issues. DNA barcodes from Costa Rica in BOLD fall into two BINs, indicating greater complexity than currently recognized. Yet again, more work is needed.
Identification. See notes under *Rhapigiodes frederica* (below).
Status in Trinidad. A rare species with records from forest areas only.

***Rhapigiodes* Miller & Thiaucourt, 2015 (in Thiaucourt 2015)**

Type species *Hapigiodes frederica* Dyar 1910, TL Mexico. The species now placed in *Rhapigiodes* were formerly placed in *Hapigiodes* Dyar, 1910 (type species: *Hapigia xolotl* Schaus, 1892, TL Mexico) (Schintlmeister 2013, Becker 2014).

***Rhapigiodes frederica* Dyar, 1910**
Fig. 31.
OD: Dyar 1910: *Hapigiodes frederica*, TL Mexico.
Historical notes. This species has not previously been recorded from Trinidad. I provisionally identified it by comparison with the type (USNM, ♂ Mexico).
Taxonomic issues. P. Thiaucourt examined the terminalia of one of my male specimens and found it slightly different from *R. frederica*. Hence the application of this name to Trinidad material should be considered provisional pending further study. Since *R. frederica* was described from Mexico, it is quite likely that Trinidad material will be shown to represent a separate species.
Identification. This species superficially resembles a *Hapigia* sp. but the strong distal hook on the forewing dorsum immediately distinguishes it. It is more likely to be confused with *Rhapigia accipiter* (Schaus), which shares this character. *Rhapigia accipiter* is larger with narrower wings; it has an orange-brown spot on the dorsum of the dorsal forewuing at about one-third, whereas *Rhapigiodes frederica* has a dark spot at about mid dorsum. In the males, *Rhapigiodes frederica* has the basal half of the antennae bipectinate, whereas in *Rhapigia accipiter* they are simple throughout, but with the swollen first segment also found in *Hapigia* spp., but not in *Rhapigiodes*. The female is significantly larger with obviously broader wings. The extent of the discal spots is variable; in all three male Trinidad specimens they are silver-white, whereas in the single female specimen they blend with the ground colour (as is the case with the type).
Status in Trinidad. A rare species, with records from Curepe and Hollis Reservoir only.

***Rhuda* Walker, 1857**

Type species *Rhuda basifera* Walker, 1857, TL Brazil, Rio de Janeiro. This genus has been treated by Becker (2021a), but the range of barcodes in BOLD indicate that there are further cryptic species.

***Rhuda focula* (Stoll, 1782)**

Figs. 39, 92, 93.

OD: Stoll 1782: *Phal[aena] Noct[ua] focula*, TL Suriname.

TT: *Rhuda focula* (Stoll): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded a specimen from Port-of-Spain (A. Pierre), as *Rhuda focula*. I anticipate this is the unlabeled female specimen from Lamont's collection in NMS (see also comments under *Moresa costalis* which is a similar case). I confirmed this identification from Thiaucourt (1996) and Becker (2021a).

Taxonomic issues. The DNA barcodes of material in BOLD identified as *R. focula* falls into two BINS: BOLD:ACE9143 (Costa Rica to French Guiana and Paraguay), and BOLD:AAB2321 (Costa Rica). In view of the Suriname type locality, it is assumed that BOLD:ACE9143 represents the true *R. focula*.

Identification. A second species of this genus, *R. tuisa* Schaus also occurs in Trinidad. *Rhuda tuisa* is similar, but has extensively yellow hindwings, with a well defined broad dark border, whereas those of *R. focula* are narrowly yellow along the dorsum only, with at most a small, diffuse yellow patch mid-hindwing. Comparing the dorsal forewings, the white area at the base of the wing extends further parallel to the dorsum in *R. tuisa*, and the proximal margin of the dark area on the costa has a small notch in it. Thus far, *R. focula* is the only species found in the Northern Range.

Biology in Trinidad. R. Deo photographed a caterpillar of a *Rhuda* sp. (Fig. 92) in the Northern Range, which is assumed to be this species since it is the only member of the genus known from the Northern Range of Trinidad. It also matches images in BOLD identified as *R. focula* (BOLD:ACE9143). The Trinidad food plant was not identified.

Status in Trinidad. This is an occasional and widespread species with no strong habitat association.

Fig. 92. Dorsal and lateral views of the caterpillar of *Rhuda focula*, Blanchiseuse area, 24.ii.2020, R. Deo (iNaturalist observation 39247301). ©, with permission.

Fig. 93. *Rhuda focula* Brasso Seco, 14.iii.2015, K. Sookdeo. ©, with permission.

***Rhuda tuisa* (Schaus, 1911)**

Fig. 94.

OD: Schaus 1911: *Rhuda tuisa*, TL Costa Rica.

Historical notes. In 2010, Kris Sookdeo photographed a *Rhuda* specimen at Penal, which I initially identified as *R. focula*, as that was the only species of the genus I knew from Trinidad at the time. On re-examination of this image when preparing this account, I realise it is a different species, which I now identify as *R. tuisa* from Becker (2021a) and by comparison with Schintlmeister's (2016) images of two types.

Fig. 94. *Rhuda tuisa*, Penal, 6.vii.2010, K. Sookdeo. ©, with permission.

Taxonomic issues. Male specimens need to be obtained and dissected to confirm this identification.
Identification. See under *R. focula* above.
Status in Trinidad. Just one photographic record from Penal (K. Sookdeo).

Rifargia Walker, 1862

Type species *Rifargia xylinoides* Walker, 1862, TL Brazil, Rio de Janeiro.

***Rifargia xylinoides* Walker, 1862**

Figs. 41, 95, Appendix Fig. 15.
OD: Walker 1862: *Rifargia xylinoides*, TL [Brazil], Rio de Janeiro.
TT: *Disphragis cloelia* (Schaus): Kaye and Lamont (1927) [synonym]
Historical notes. Walker (1862) described the genus *Rifargia* and its type species *R. xylinoides* from one or more male specimens from the vicinity of Rio de Janeiro (Brazil) in the collection of 'Mr Fry'. Schaus (1896b) states that *R. xylinoides* is a good species, implying that he examined a type from OUMNH. Schaus (1901) mentions that some of Walker's types from the Fry collection are lost, but does not specifically refer to *R. xylinoides* in this context. Schintlmeister (2013) states that he could not locate the type in OUMNH, so it may be lost. Schaus (1892) described *Rifargia cloelia* from Rio [de] Janeiro (Brazil); he doesn't mention the sex, but the type in USNM is a female. Draudt (1932-1934) indicated that *R. cloelia* is a synonym of *R. xylinoides*, which subsequent authors have followed.

Kaye and Lamont (1927) recorded this species as *Disphragis cloelia* from Palmiste (N. Lamont) and Caparo (S.M. Klages). They list *R. gelduba* Schaus as a synonym. Lamont's specimen, a female, is in NMS. There are two specimens from Caparo in NHMUK; both are female; one undated is (or was) curated as *Disphragis gelduba*, and the other from November 1905 appears (or appeared) over a blank label in *Disphragis*. Since Kaye and Lamont (1927) gave no date for this specimen, the former is probably the one they referred to, and it is not a coincidence that they listed *R. gelduba* as a synonym. Both specimens match Lamont's in NMS, and I have associated males and females which match these (see next section).
Taxonomic issues. I compared Trinidad material with the type of *R. cloelia* (USNM, ♀ Rio [de] Janeiro); the apical streak of the dorsal forewing is slightly more pronounced in the type, and Trinidad material lacks the small submarginal streaks in spaces 2-4 (Cu_1-Cu_2 – M_2-M_3). The match is good enough to be sure this is the species Kaye and Lamont (1927) intended, but not good enough to be entirely confident it is the same species. I noted apparently the same species in NHMUK as *D. gelduba* (including the Caparo female mentioned above), but examination of the type (USNM, ♀ Mexico) indicates this is not the Trinidad species. In 1981, R.W. Poole (USNM) examined a male Trinidad specimen for me and suggested it was *R*. sp. nr. *mortis* Schaus. *Rifargia mortis*, identified from the type (USNM, ♂ Tucuman, Argentina) is close in regard to the dorsal forewing, but the dorsal hindwing is uniform plain white, and not heavily shaded on the margins as in Trinidad material. My use of this name for Trinidad material is based on my dissections (Appendix Fig. 15), which V. Becker (pers. comm. 2020) confirmed to be the same as his understanding of this species from southern Brazil.
Identification. Although there is doubt about what name to apply to this species, in Trinidad it is fairly distinctive. The dorsal forewings of the male are a rather uniform dark brown, with obscure markings, of which a small black spot near the tornus, a pale dot on the costa at about two-thirds and a diffuse pale apical streak are the more obvious; the ventral forewing is mostly dark and the aforementioned markings are more obvious. The female is larger, but also mostly dull brown; it is only likely to be mistaken for *Skaphita surinamensis* (below). It features a pair of small black spots near the tornus and a large, broad semicircular post-discal arc, with a narrow black border basal and dorsally, and merging apically with a diffuse apical streak. Female *S.* ?*surinamensis* (Fig. 41) has a green tint to the ground colour, lacks the obvious black spots near the tornus and at the lower end of the post-discal arc has a distinct clear khaki green round marking. *Rifargia xylinoides* can also be compared with the dull mottled green species of Notodontidae (Fig. 34), but a comparison of the images should readily separate them.
Status in Trinidad. A common and widespread species found in both forest and suburban habitats.

Fig. 95. Male *Rifargia xylinoides* (enlarged from Fig. 41).

***Rosema* Walker, 1855**

Type species *Rosema dorsalis* Walker, 1855, TL Brazil.

***Rosema demorsa* C. Felder and R. Felder, 1874 ssp. *aruga* Schintlmeister, 2019**

Figs. 39, 96.

OD: Felder & Rogenhoffer [1865-1875]: *Rosema demorsa*, TL Colombia.
Schintlmeister 2019: *Rosema demorsa aruga*, TL French Guiana

TT: *Rosema demorsa aruga* Schintlmeister: Schintlmeister (2019)

Historical notes. *Rosema demorsa* is widespread in South America, but the northern population shows differences in the terminalia, so that Schintlmeister (2019) described ssp *aruga* from the Guianas and Venezuela (TL French Guiana). Schintlmeister (2019) mentioned a female from 'Trinidad' (his inverted commas) as very probably *R. demorsa aruga*.

Taxonomic issues. Material in BOLD identified as *R. demorsa* from French Guiana falls in two BINs: BOLD:AAU0889 and BOLD:AAN3447. They appear to represent sibling species, and the BIN of the true *R. demorsa aruga* is ambiguous.

Identification. This species has a plain green forewing, with the costa white and brown; the apex of the forewing is falcate, the costa slightly concave before the apex and the margin noticeable concave below the apex. This combination of characters would make it distinctive if encountered in Trinidad, but a specimen from Venezuela (Rancho Grande, May 1979) is also shown with the other pinned *Rosema* spp. (Fig. 39) to facilitate identification.

Status in Trinidad. A rarely collected species; Schintlmeister (2019) includes one record, and Kris Sookdeo has photographed it at Talparo (Fig. 96).

Fig. 96. Male *Rosema demorsa aruga*, Talparo, at light, 16.xi.2020, K. Sookdeo. ©, with permission.

Rosema draudti Bryk, 1953

Fig. 39.

OD: Bryk 1953: *Rosema zelica draudti*, TL Brazil (W. Teffe).

TT: *Rosema zelica* (Stoll): Kaye and Lamont (1927) [misidentification]
Rosema draudti Bryk: Schintlmeister, 2019.

Historical notes. Kaye and Lamont (1927) recorded *R. zelica* (Stoll) from Trinidad, listing specimens from Verdant Vale (19 April 1919, N. Lamont) and Manzanilla (22 March 1922, F.W. Jackson); the former is now in NMS and the latter in NHMUK. Schintlmeister (2019) showed that *R. zelica* from Suriname and French Guiana had been confused with, but differs from, *R. draudti* from French Guiana, Trinidad, Ecuador, Peru and Brazil.

Identification. The completely plain green dorsal forewings separate this species from the other four species of green Notodontidae in Trinidad (Fig. 39). The female has simple antennae, and a white dot at the end of the cell, while the male has bipectinate antennae and no white dot.

Status in Trinidad. An uncommon species, mainly found in forested areas of northern Trinidad.

***Rosema epigena* (Stoll, 1790)**

Fig. 39.

OD: Stoll 1790: *Phal[aena] Bombyx epigena*, TL Suriname.

TT: *Rhogalia epigena* (Stoll): Cock (2017a)

Historical notes. Cock (2017a) reported this species as occurring in both Tobago and Trinidad. It was identified by comparison with the NHMUK series. Becker (2014) listed this species in the genus *Rhogalia* Hübner, and accordingly Cock (2017a) used this combination. However, Schintlmeister (2019) made *Rhogalia* a synonym of *Rosema*, and hence the combination used here.

Identification. Of the five Trinidad Notodontidae with mostly plain green dorsal forewings, *R. epigena* and *R. intermedia* (below) can be separated on the basis of their double falcate forewing apex. The dorsal forewing discal spot of *R. epigena* is white with a variable dark centre, whereas in *R. intermedia* it is black, with a very narrow pale margin. *Rosema epigena* has the marginal area adjacent to the double falcate forewing apex dark in the male, separated from the green wing by a thin white line, and pale in the female, whereas in *R. intermedia* this area is black. The dorsal hindwing is uniformly dark in the male of *R. epigenea*, paler and orange brown on the dorsum in the female, and pale brown on the disk and dorsum in *R. intermedia*.

Status in Trinidad and Tobago. A rare species of uncertain habitat association.

***Rosema intermedia* Thiaucourt, 2015**

Figs. 39, 97.

OD: Thiaucourt 2015: *Rosema intermedia*, TL French Guiana.

TT: *Rosema deolis* (Cramer): Kaye (1901), Kaye and Lamont (1927) [misidentification]
Rosema intermedia Thiaucourt: Schintlmeister (2019)

Historical notes. Kaye (1901) recorded a specimen of *R. deolis* from Verdant Vale (S. Kaye). Kaye and Lamont

(1927) added September–December 1896 as the date of this collection and reported a further specimen from Palmiste (7 September 1917, N. Lamont). I have not located S. Kaye's specimen which I would expect to be in NMHUK, but I have found Lamont's specimen in NMS. I had identified this species as *R. deolis* Cramer, 1775 (TL Surinam) by comparison with the NHMUK series, but more recently as *R. intermedia* following Thiaucourt (2015) and Schintlmeister (2019), by examination of the male terminalia (MJWC dissection 1050).

Taxonomic issues. Several DNA barcodes from French Guiana as this species form BOLD:ACF5265, and it is expected that Trinidad material will also belong to this BIN.

Identification. See notes under *R. epigenea* above. I have not seen the female of *R. intermedia* from Trinidad. *Rosema deolis* might also occur in Trinidad, as it is found in French Guiana, south-eastern Venezuela and the Amazon (Schintlmeister 2019). The two are very similar but the dark margin of the ventral forewing extends to the tornus (just) in *R. intermedia*, whereas it stops at vein 3 (Cu_1) in *R. deolis*, and the medial area of the dorsal hindwing is pale yellow in *R. deolis*, but pale brown with a yellow tint in *R. intermedia*. Typically, the black discal spot of the dorsal forewing is larger in *R. intermedia* than in *R. deolis*, but in Trinidad material they are comparable, so that I see no good diagnostic character for the dorsal forewings.

Status in Trinidad. An occasional species, primarily associated with forested habitats.

Fig. 97. Male *Rosema intermedia*, Penal, at light, 28.ix.2010, K. Sookdeo. ©, with permission.

Sericochroa Felder, 1874

Type species *Phalaena politia* Stoll, 1780, TL Suriname, a preoocupied name for which the available replacement is *Blera ceruroides* Walker, 1862, TL Brazil, Rio de Janeiro. *Blera* Walker, 1862 (type species *Blera ceruroides*) is an older name but it is a junior homonym, and *Sericochroa* is an available replacement.

***Sericochroa myconos* (Schaus, 1892)**

Figs. 33, 98.

OD: Schaus 1892: *Symmerista myconos*, TL Brazil, Rio de Janeiro.

Historical notes. A new record for Trinidad, identified by comparison with the type (USNM, ♀ [Brazil] no locality on specimen).

Taxonomic issues. Trinidad material has the dark apical patch and the collar and dorsal surface of the head variable in colour; the type falls within this range of variation.

Identification. This is one of several medium-small grey-white Notodontidae found in Trinidad (Fig. 33). It can be recognized by the extensive apical dark patch of the dorsal forewing (when present), the at least partially double narrow brown postdiscal line, details of the markings, e.g. small dark spot on dorsum just before tornus, and the basal projection at the costal end of the narrow black discal spot, as well as the broad dark border on the dorsal and ventral hindwing. The sexes are very similar.

Status in Trinidad. An occasional species in the forests of northern Trinidad.

Fig. 98. *Sericochroa myconos*, Brasso Seco, 14.iii.2015, K. Sookdeo. ©, with permission.

Sericochroa tenuis (Schaus, 1892)

Fig. 33.

OD: Schaus 1892: *Harpyia* (?) *tenuis*, TL Brazil, Rio de Janeiro.

Historical notes. Not previously recorded from Trinidad. Identified by comparison with the type (USNM, ♂ Petropolis, Brazil).

Identification. There are several small-medium grey-white Notodontidae in Trinidad (Fig. 33), with which *S. tenuis* may be compared. The male of *S. tenuis* is distinctive with the dark submarginal and costal spots of the dorsal forewing, and the dark ends to the veins of the hindwing. These markings are less obvious in the female, making it

less immediately distinctive.

Status in Trinidad. An uncommon species, found in both forested and suburban areas.

***Skaphita* Schaus, 1901**

Type species *Phya salona* Druce, 1894, TL Mexico

***Skaphita cubana* (Grote, 1865)**

Figs. 41, 99.

OD: Grote 1865: *Heterocampa cubana*, TL Cuba.
Schaus 1901: *Heterocampa aroensis*, TL Venezuela [synonym].
Kaye 1925: *Disphragis sexnotata*, TL Trinidad [synonym].

TT: *Disphragis sexnotata* (Kaye): Kaye (1925) TL, Kaye and Lamont (1927), Draudt (1932-1934) [synonym]
Disphragis daona (Druce): Kaye and Lamont (1927) [synonym]
Skaphita cubana (Grote): Cock (2021)

Historical notes. Kaye and Lamont (1927) recorded *Disphragis daona* Druce from Palmiste (♀, 29 January 1919, 27 March 1922, N. Lamont) and without locality (W.J. Kaye). The first two are in NMS and the latter in NHMUK; all are females. I matched these specimens with material which I collected from Trinidad. *Skaphita cubana* (Grote) described from Cuba, *S. androdera* Dyar (TL Mexico), *S. daona* (Druce) (TL Mexico), *S. aroensis* (Schaus) (TL Venezuela), and *S. kalodonta* Kaye (TL Trinidad) are synonyms (Becker 2014, Cock 2021). I have examined the types of *daona* (NHMUK, ♂ Mexico) and *androdera* (USNM ♀ Mexico) and the type and NHMUK series of *D. daona* (all female) and can see little obvious difference. I have compared the male terminalia of Trinidad specimens with illustrations of those of *S. cubana* (Torre y Callejas and Dalmau 1959, Thiaucourt 2003) and the lectotype of its synonym *Heterocampa aroensis* (Schintlmeister 2016, Cock 2021).

Taxonomic issues. DNA barcodes in BOLD suggest the treatment above may be simplistic. BOLD:AAA7792 includes specimens identified as *Cecrita daona* (114), *Heterocampa daona* (6), *Heterocampa andradora* (5), *Heterocampa cubana* (3), *Disphragis cubana* (1) and *D. clitiusa* (1), as well as unidentified specimens. Of the names used in this BIN, *cubana* is the oldest, offering support to Becker's (2014) treatment. However, the material is from USA (Florida), Mexico, Costa Rica, Trinidad and Tobago (LNAUT1314-14), French Guiana, Brazil (Para), Paraguay, and Argentina. Some are similar to what I treat here as *S. surinamensis*, others look more like *S. media* (Thiaucourt); the specimen from Trinidad (Morne Bleu) is one of these later and is treated under that name below. Clearly more work is needed to untangle this group.

Identification. In Trinidad, *S. cubana* can be compared with *S. media* and the female of *Rifargia xylinoides* (Fig. 41). *Skaphita media* has similar markings and is slightly larger, but the large post-discal marking is not contrasting as in *S. surinamensis*, and the contrasting dark dorsal half of the wing compared to the costal half, gives *S. media* a very different overall appearance. Female *R. xylinoides* is smaller, but the dorsal forewing postdiscal markings are similar in shape to those of *S. cubana*, but other features such as the dark streak on the basal dorsum of *S. cubana* and the dark spots near the tornus of *R. xylinoides*, do not align.

Status in Trinidad. A common and widespread species in diverse, mostly lowland habitats. Curiously I have no records from the Arima Valley, and very few from the Northern Range as a whole.

Fig. 99. Female *Skaphita cubana*, Penal, 8.x.2014, K. Sookdeo. ©, with permission.

Skaphita indirae Cock, 2021

Figs. 41, 100.

OD: Cock 2021: *Skaphita indirae*, TL Trinidad.

TT: *Skaphita indirae*: Cock (2021) TL

Historical notes. This species is newly described from a single Trinidad specimen (Cock 2021).

Identification. Similar in appearance to *S. cubana*, but much smaller. It also resembles the male of *S. surinamensis*. However, although they both have a dark line at the end of the cell, extending in an arc into space 2 (Cu_1-Cu_2) and a submarginal spot in space 3 (M_3-Cu_1), *S. indirae* has the basal area distinctly darker, and *R. surinamensis* has the distal ends of the veins dark and spots or streaks in spaces 1–6 (Cu2-2A–R_5-M_1). The female of *S. indirae* is not known, but in line with other *Skaphita* species, it is expected to be larger, with broader wings, and similar markings. Two females (Fig. 41 as *S.* sp. ?*surinamensis*) may belong to this species, although they closely resemble *Rifargia xylinoides* and *S. surinamensis* (see discussion under the latter species). Cock (2021) illustrates the male terminalia.

Status in Trinidad. Only known from the holotype from Caroni Swamp. This could prove to be a mangrove swamp specialist.

Fig. 100. Male *Skaphita indirae*, holotype (enlarged from Fig. 41).

Skaphita media (Thiaucourt, 1995)
Fig. 41.
OD: Thiaucourt 1995: *Disphragis media*, TL French Guiana.
Historical notes. This is a new record for Trinidad, which I identified by dissection of a male and comparison with Thiaucourt (1995a, 2003). There is a female specimen in Sir Norman Lamont's collection in UWIZM, which he had identified as *S. meridionalis* (Draudt) (= *Harpyia meridionalis*), presumably from Draudt (1932-1934), but this record did not appear in Lamont and Callan (1950).
Taxonomic issues. There is a DNA barcode from Trinidad in BOLD, which resembles *S. media*, but falls within BIN BOLD:AAA7792, along with many specimens resembling *S. cubana* and *S. surinamensis* (see discussion under *S. surinamensis* above). It is difficult to know how to interpret this at present.
Identification. See diagnostics under *S. surinamensis* above.
Status in Trinidad. An occasional species, widespread in forested areas.

Skaphita surinamensis **(Möschler, 1877)**
Figs. 41, 101, Appendix Fig. 16.
OD: Möschler 1877: *Heterocampa surinamensis*, TL Suriname.
TT: Kaye 1923: *Boriza kalodonta*, TL Trinidad [synonym].
Boriza kalodonta Kaye: Kaye (1923) TL, Draudt (1932-1934), Kaye and Lamont (1927) [synonym]
Skaphita surinamensis (Möschler): Cock (2021)
Historical notes. This species was described from Trinidad as *Boriza kalodonta* Kaye, but this is now a synonym of *S. surinamensis* (Becker 2014). This identification, based my dissection of a male (Cock 2021), was by Vitor Becker (pers. comm. 2020). I have two females which I am currently treating as *S. ?surinamesis* (Fig. 41) and are a close match to the female type of *S. surinamensis*. However, the terminalia (Appendix Fig. 16) differ from those of the type and they cannot be conspecific. It may be that *S. surinamensis* is two (or more) very similar species, and that occurring in Trinidad differs from the true *S. surinamensis*. Or it may be that I have not correctly associated the two females with *S. surinamensis*, but rather they are the female of *S. indirae* or some other as yet unrecognised Trinidad species. Further investigation is needed.
Identification. For the female, see under *Rifargia xylinoides* above. The male resembles a small *Skaphita* species, and might only be confused with *S. indirae*, as discussed under that species above.
Status in Trinidad. A rare species in Trinidad with just four scattered records (including the two females provisionally associated).

Fig. 101. Male *Skaphita surinamensis* (enlarged from Fig. 41).

Trumanda Dognin, 1911
Type species *Trumanda fifiana* Dognin., 1911, TL French Guiana.

Trumanda andromede **(Thiaucourt, 1995)**
Fig. 40.
OD: Thiaucourt 1995: *Trichomoplata andromede*, TL French Guiana.
Historical notes. This species has not previously been recorded from Trinidad. My identification was based on a comparison of the external male terminalia with the figures in Thiaucourt (1995b). *Trumanda cassiope* (Schaus) (TL Brazil, Rio [de] Janeiro) is a similar but widespread and variable species, that can be distinguished based on the tergites of abdominal segment 8 (Thiaucourt 1995b). I had previously identified *T. andromede* as *T. cassiope*.
Identification. This is a distinctive species, unlikely to be mistaken for any other known in Trinidad. However, the possibility that *T. cassiope* might also be found in Trinidad cannot be ignored. The type of *T. cassiope* (USNM, $ Rio

Janeiro) has a red-brown spot on the forewing dorsum, absent in Trinidad material.
Status in Trinidad. Just two records from Trinidad, a male from Morne Bleu (high altitude forest) and a female from Curepe (suburban area).

Subfamily Nystaleinae Forbes, 1948

***Antiopha* Schaus, 1901**

Type species *Antiopha multilinea* Schaus, 1901, TL Brazil, Rio de Janeiro.

***Antiopha multilinea* Schaus, 1901**

Fig. 102.
OD: Schaus 1901: *Antiopha multilinea*, TL Brazil, Rio de Janeiro.
TT: *Antiopha multilinea* Schaus: Kaye and Lamont (1927)
Historical notes. A specimen collected by F.W. Jackson from Trinidad without locality was the basis for Kaye and Lamont (1927) to record this species from Trinidad; this specimen is now in NHMUK. This identification has been confirmed by comparison with the type (USNM, ♂ Rio de Janeiro).
Identification. The dorsal forewings are rather uniformly coloured with longitudinal streaks which is unlike any other Trinidad species. The male is slightly smaller, but otherwise similar, apart from having weakly bipectinate rather than simple antennae.
Status in Trinidad. An uncommon species from diverse habitats.

***Bardaxima* Walker, 1858**

Type species *Bardaxima lucilinea* Walker, 1858, TL Brazil, Amazonas. *Gisara* Schaus, 1901, type species *Symmerista procne* Schaus, 1892, is a synonym. Becker (2021c) treats this genus.

***Bardaxima fulgurifera* Walker, 1869**

Fig. 103.
OD: Walker 1869: *Gozarta fulgurifera*, TL Honduras.
TT: *Bardaxima lucilinea* Walker: Kaye and Lamont (1927), Cock (2017a) [misidentification]
Historical notes. Becker (2021c) found that two species had been mixed together as *B. lucilinea* Walker (TL Brazil, Amazonas), and that *B. fulgerifera* had been incorrectly treated as a synonym of *B. lucilinea*. Kaye and Lamont (1927) reported a specimen of *B. lucilinea* collected at Caigual (August, J. Turner); this must be the specimen in OUMNH, labelled as collected near Caigual in August 1917 by Agnes Lickfold, with an identification label as *B. lucilinea* by Sir Norman Lamont and W.J. Kaye. I initially identified this species as *B. lucilinea* by comparison with the NHMUK series, which would have been a mixture of the two species. Using Becker's (2021c) diagnostic features, I have reidentified the limited material from Trinidad and Tobago as *B. fulgerifera.*
Identification. The rather uniform grey dorsal forewing with a dark distal streak containing a sharply defined white dash is distinctive in Trinidad, only *Elymniotis longara* having slightly comparable markings. However, the white dash in *E. longara* is usually bifurcate distally, the dark streak is much less clearly defined, and there are other markings such as the dark discal cell spot. The sexes are similar apart from males having weakly bipectinate antennae, whereas females have simple antennae.
Status in Trinidad and Tobago. A rare species in Trinidad, but apparently associated with forested areas. Only one record from Tobago (Cock 2017a).

***Bardaxima marcida* (Felder, 1874)**

Figs. 103, 109, 110.
OD: Felder & Rogenhofer 1874: *Nystalea marcida*, TL Bogota.
Historical notes. This new record for Trinidad was identified by comparison with the NHMUK series.
Identification. This medium-large species can usually be recognized by the small white submarginal patch at the tornus, but this may be absent. Sexes similar apart from the antennae.
Status in Trinidad. An uncommon species, found in suburban areas, but more commonly in forested areas.

Bardaxima procne (Schaus, 1892)

Fig. 103.
OD: Schaus 1892: *Symmerista procne*, TL Brazil, Rio de Janeiro.
Historical notes. A new record for Trinidad, based on a female in Lamont's collection in UWIZM. It was identified by comparison with the type (USNM, ♀ Rio de Janeiro) and NHMUK series, and checked against Becker (2021c). The single Trinidad specimen is not a good match to the type, being significantly darker and the white tornal patch is more restricted and differently shaped, but this is within the range of variation in the NHMUK series. Becker (2021c) treats *B. procne* and two similar species, from which *B. procne* is distinguished by having a white dot on the dorsal thorax. Lamont's specimen does have such a dot, but in my figure (Fig. 103) it is obscured by the pin.
Identification. Similar to *B. marcida* (above), but in *B. procne* there is a white marginal patch in spaces 1B and 2 (Cu_2-2A, Cu_1-Cu_2) of the dorsal forewing. I have seen no males from Trinidad, but the sexes are similar apart from the antennae.
Status in Trinidad. Just one record from the middle of last century.

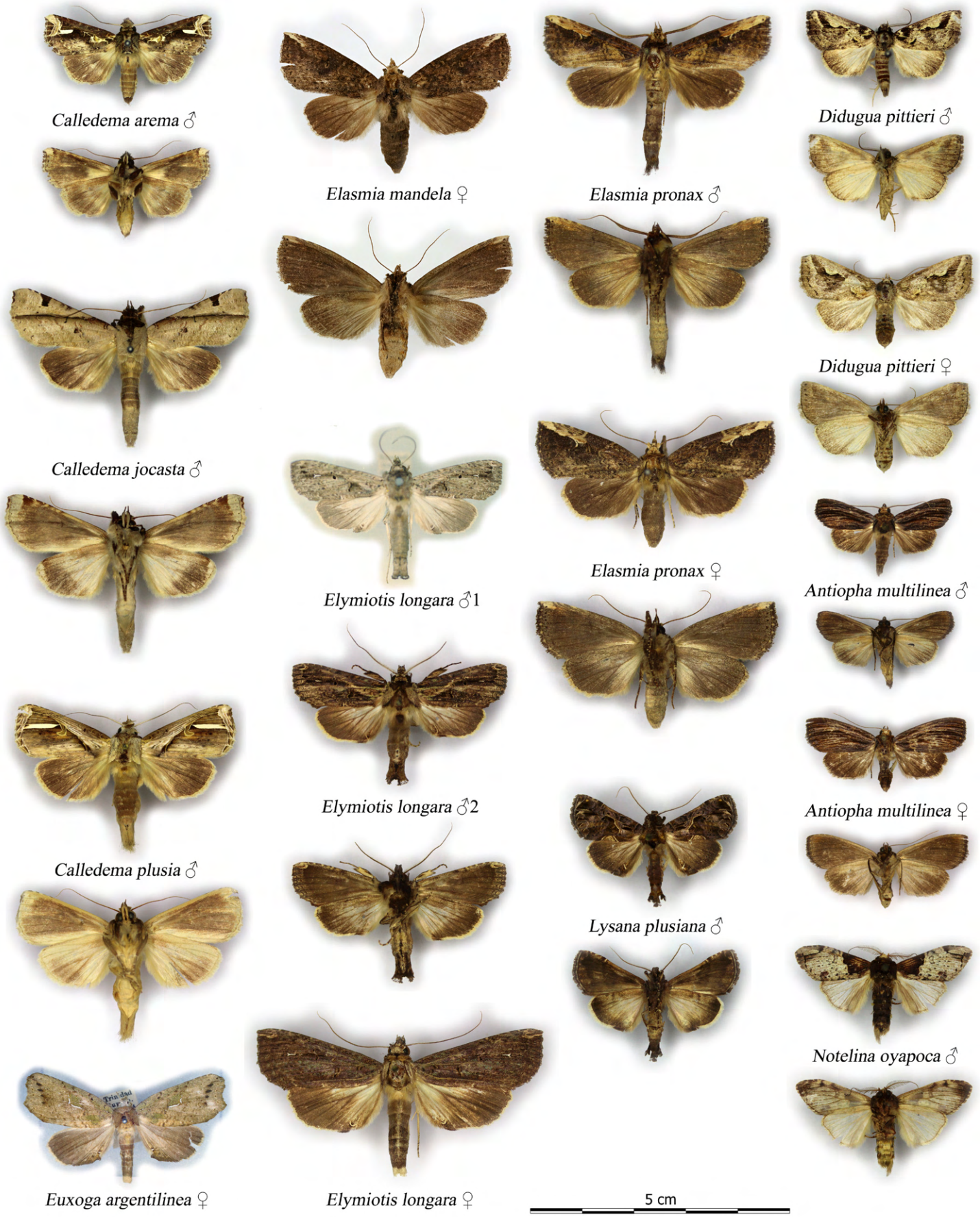

Fig. 102. Trinidad Notodontidae, Nystaleinae 1. *Elasmia mandela* ♀ is in NMS; photographed by A. Whiffen, © NMS. *Elymiotis longara* ♂1, and *Euxoga argentilinea* ♀ are in NHMUK; ©The Trustees NHMUK, made available under Creative Commons License 4.0 https://creativecommons.org/licenses/by/4.0/.

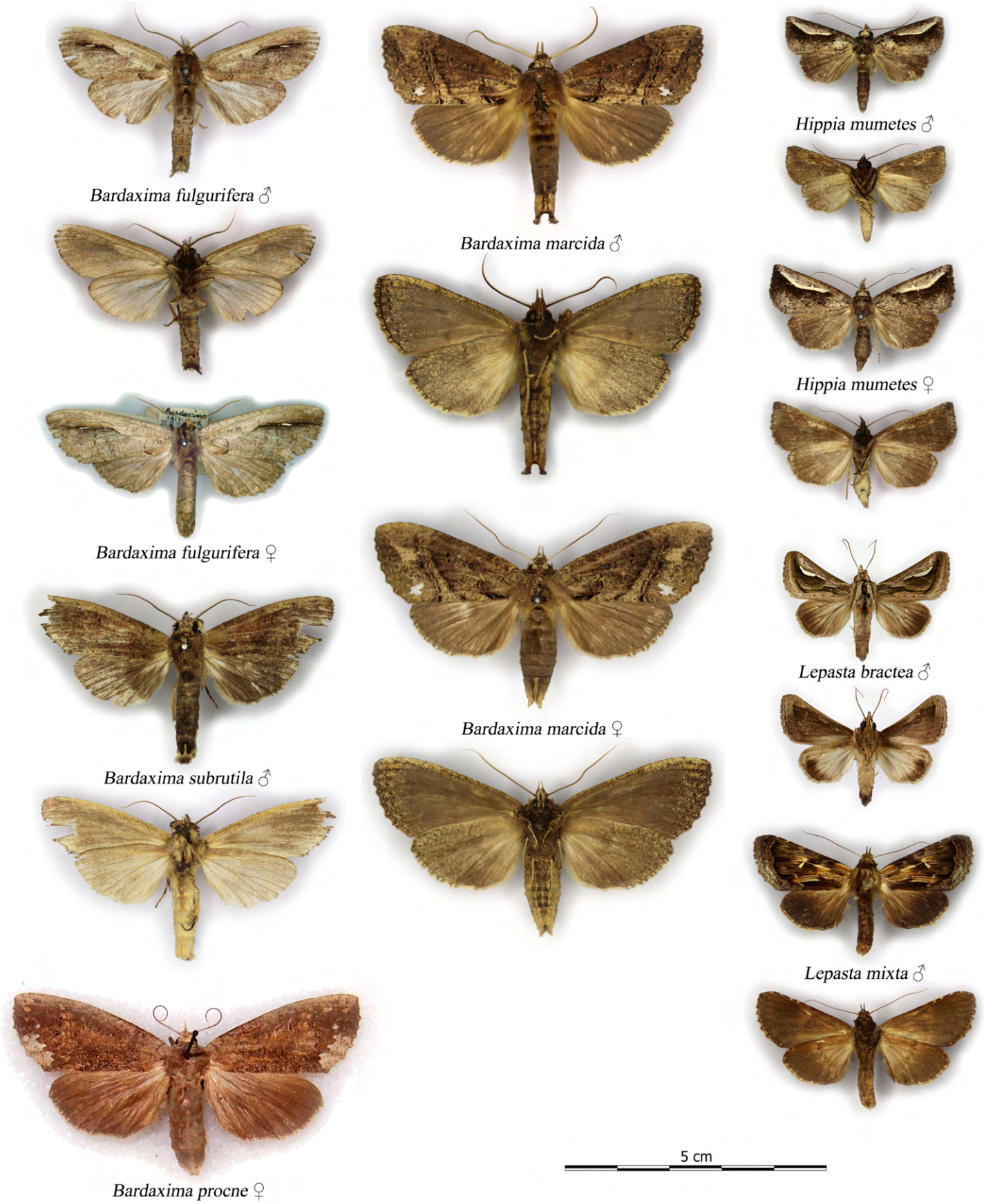

Fig. 103. Trinidad Notodontidae, Nystaleinae 2. *Bardaxima fulgurifera* ♀ and *Lepasta bractea* ♂ are in NMS; photographed by A. Whiffen, © NMS. *Bardaxima procne* ♀ is in UWIZM.

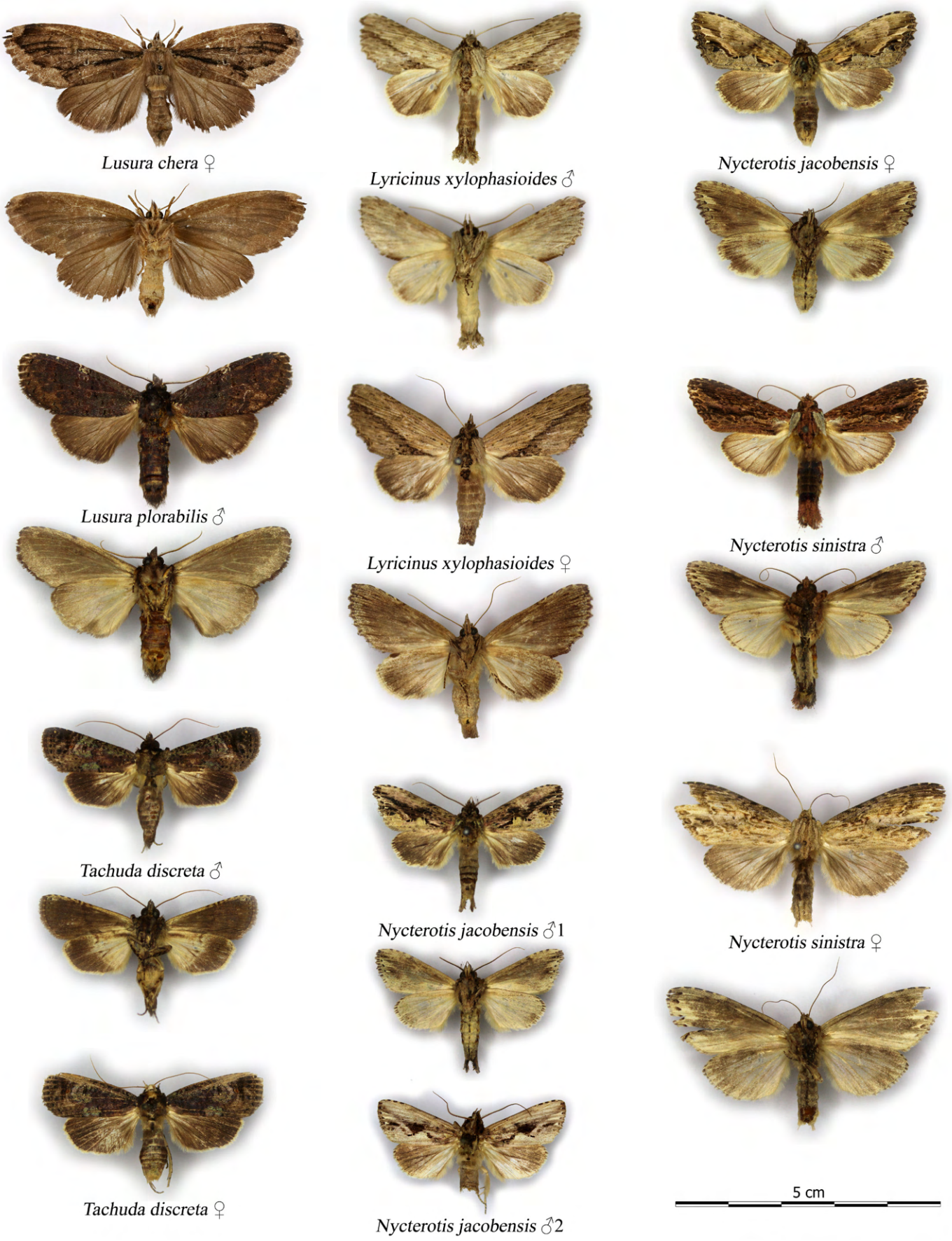

Fig. 104. Trinidad Notodontidae, Nystaleinae 3. *Lusura chera* ♀ is in NMS; photographed by A. Whiffen, © NMS.

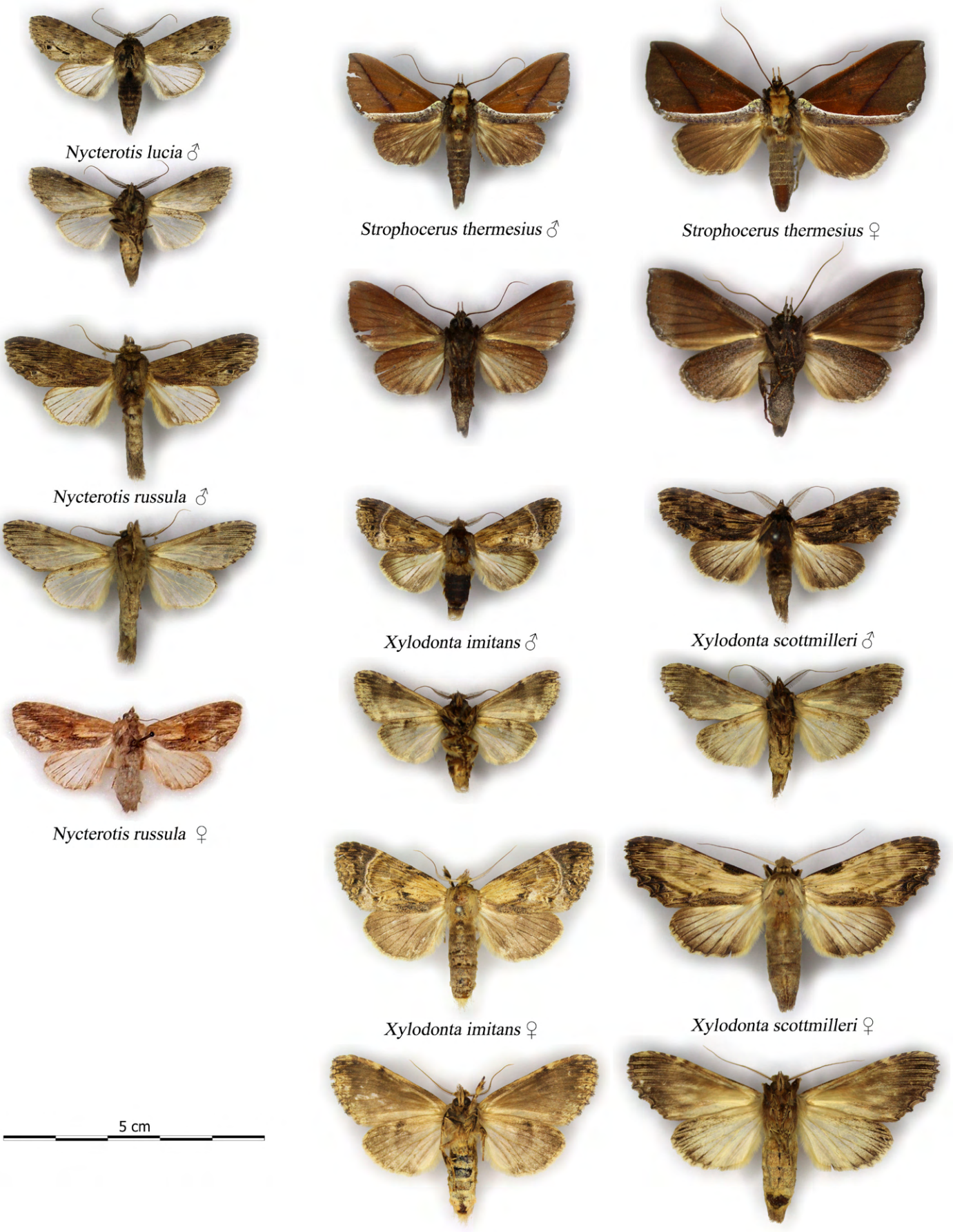

Fig. 105. Trinidad Notodontidae, Nystaleinae 4. *Nycterotis russula* ♀ is in UWIZM; © UWIZM, with permission.

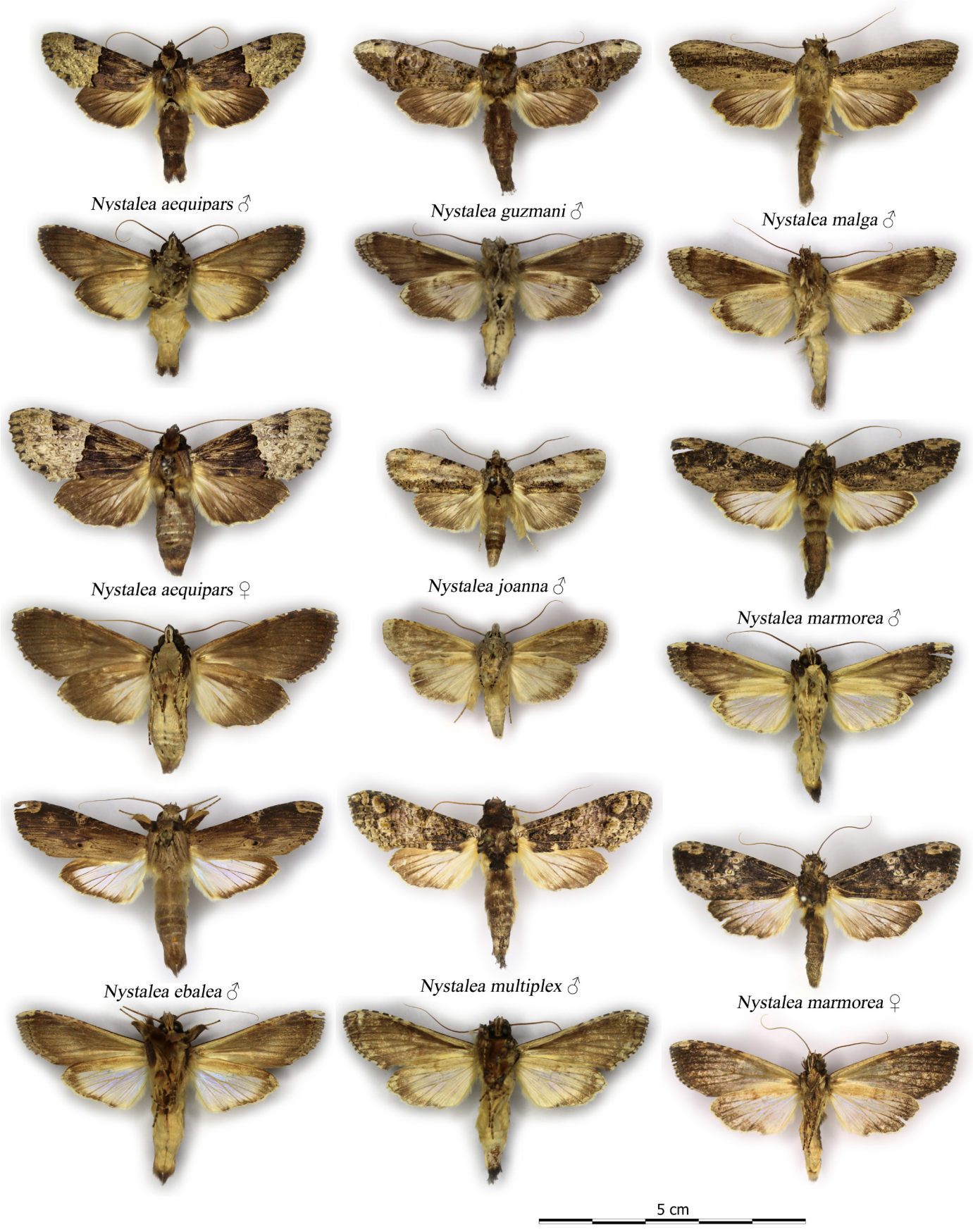

Fig. 106. Trinidad Notodontidae, Nystaleinae 5.

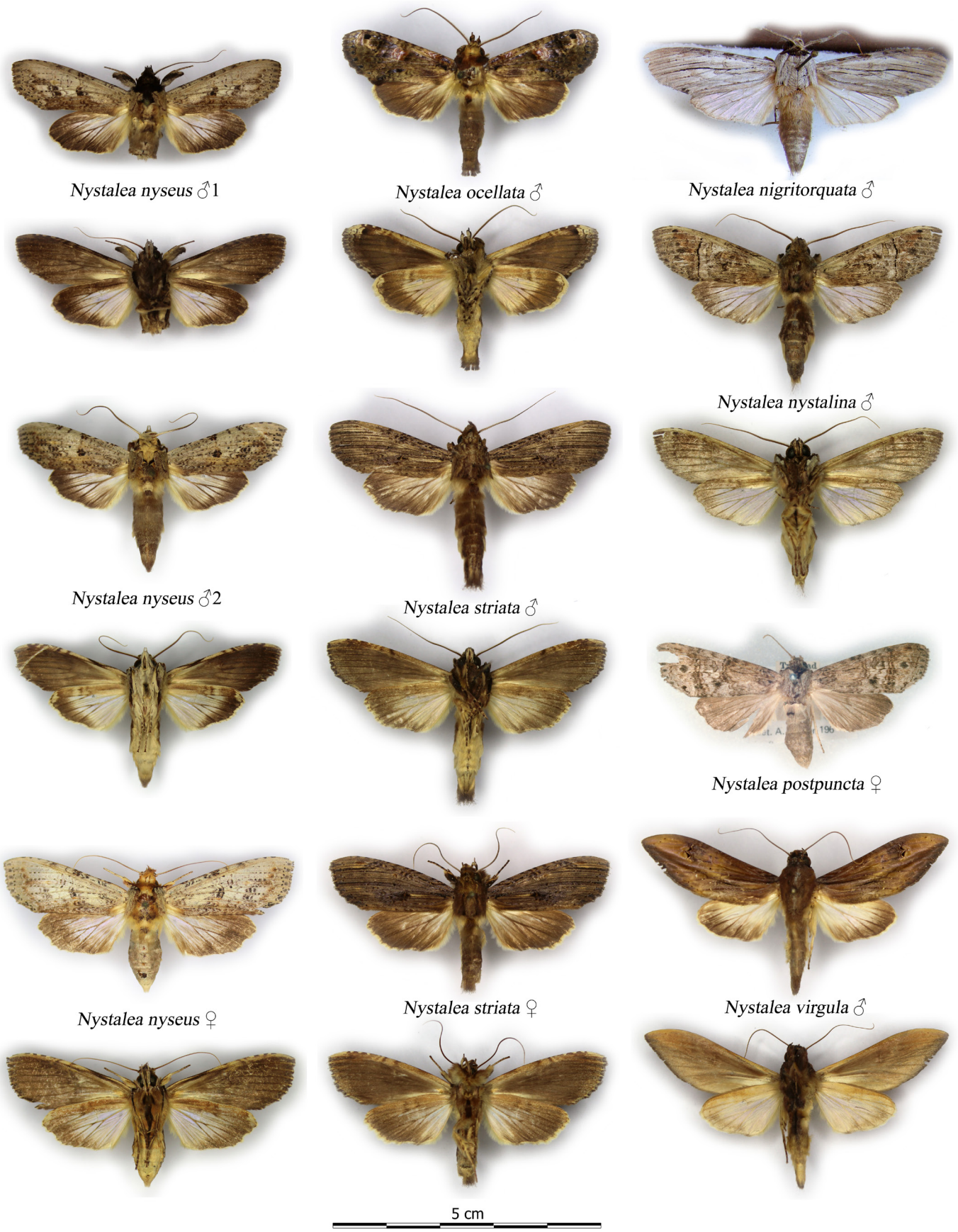

Fig. 107. Trinidad Notodontidae, Nystaleinae 6. *Nystalea nigritorquata* is in UWIZM; photographed by M. Kelly. *Nystalea postpuncta* ♀ is in NHMUK; ©The Trustees NHMUK, made available under Creative Commons License 4.0 https://creativecommons.org/licenses/by/4.0/.

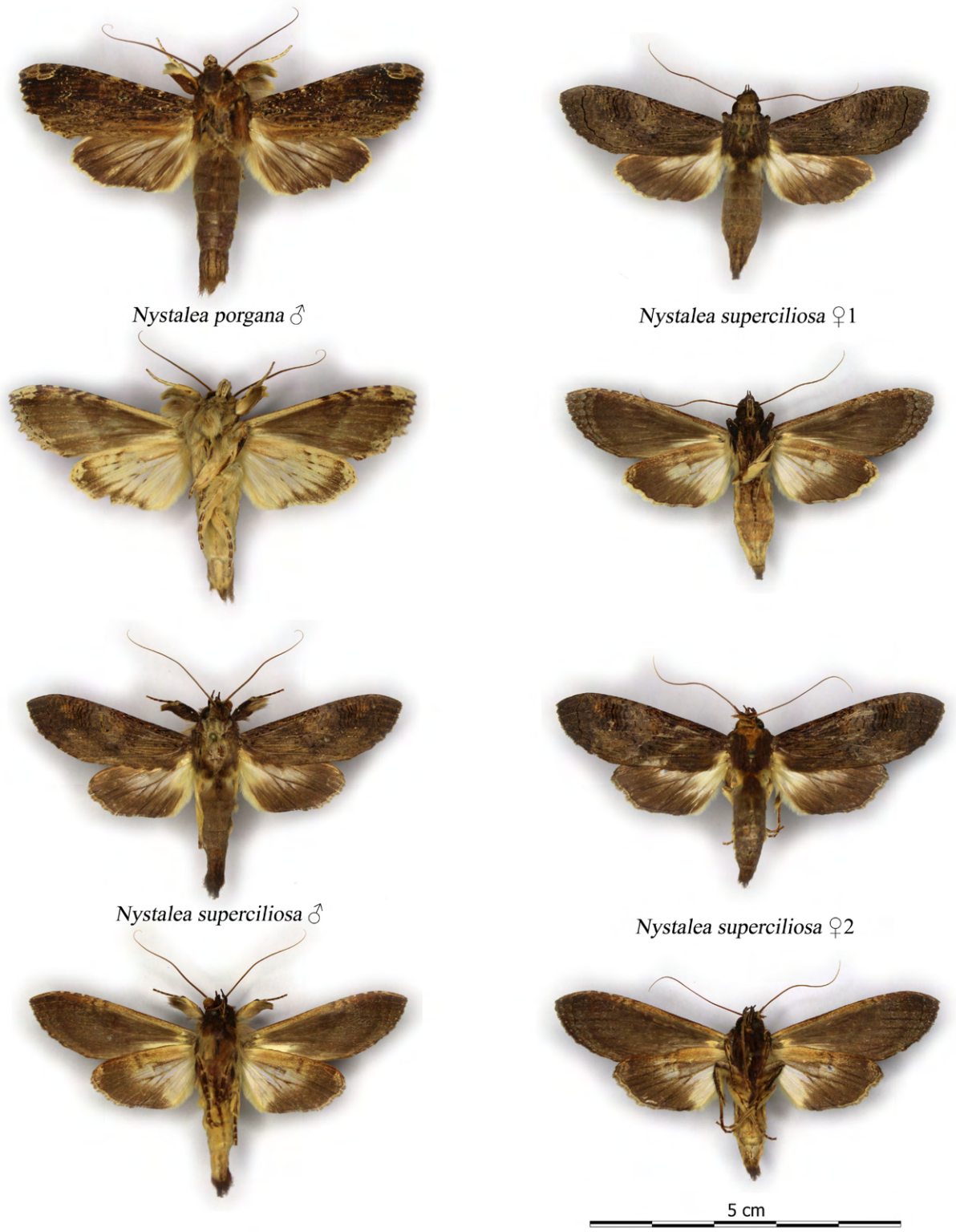

Fig. 108. Trinidad Notodontidae, Nystaleinae 7.

***Bardaxima subrutila* Dognin, 1908**
Figs. 103, 111.
OD: Dognin 1908: *Gisara subrutila*, TL French Guiana.
Historical notes. A new record for Trinidad, identified by comparison with the NHMUK series. Comparison with the type (USNM, ♂ French Guiana) is less convincing, as my single Trinidad specimen (Fig. 103) is too worn to be certain. However, Steve Nanz's photograph of a Trinidad specimen (Fig. 111) is more clearly similar to the type, notably the narrow dark discal spot in an area of plain contrasting brown.
Identification. The tightly rolled wings, projecting pale third segment of the labial palps, tuft of pale hairs on prothorax,

and narrow discal spot in a large area of plain reddish brown should make *B. subrutila* recognisable.
Status in Trinidad. A rare species with two records, both from forested areas.

Fig. 109. Male *Bardaxima marcida*, Trinity Hills Reserve, 14.xi.2020, R. Deo. ©, with permission.

Fig. 110. Female *Bardaxima marcida*, Talparo, at light, 16.xi.2020, K. Sookdeo. ©, with permission.

Fig. 111. Male *Bardaxima subrutila*, Arima Valley, Asa Wright Nature Centre, 23.iii.2015, S. Nanz. ©, with permission.

Calledema Butler, 1878

Type species *Calledema marmorea* Butler, 1878, TL Brazil, Amazon.

***Calledema arema* Schaus, 1905**

Fig. 102.
OD: Schaus 1905: *Calledema arema*, TL French Guiana.
Historical notes. A new record for Trinidad. It was identified by comparison with the type (USNM, ♂ French Guiana); the sub-apical white streak is slightly narrower and longer in the type.
Identification. The small size and intensely white subapical streak make this species distinctive (Fig. 102).
Status in Trinidad. A rare species with just two records from forests of the Northern Range.

***Calledema jocasta* Schaus, 1901**

Fig. 102.
OD: Schaus 1901: *Calledema jocasta*, TL Brazil, Rio de Janeiro.
Historical notes. Another new record for Trinidad, which was identified by comparison with the type (USNM, ♂ Rio de Janeiro) and NHMUK series.
Taxonomic issues. Material in BOLD as this species comprise two BINs: BOLD:AAI673 with more than 20 samples from Costa Rica, and BOLD:ACN8761 with samples from French Guiana (2) and Trinidad (1). The latter BIN is more likely to be the true *C. jocasta* than the former, but given the type locality is Rio de Janeiro, this might also represent a third taxon. Pending further work, *C. jocasta* is appropriate to use for the Trinidad population.
Identification. The dark streak from near the base of the costa to the termen of the dorsal forewing and the dark subapical marking on the costa make this species distinctive.
Status in Trinidad. An uncommon species from forested areas, particularly in the Northern Range.

***Calledema plusia* (Felder, 1874)**

Fig. 102.
OD: Felder 1874: *Nystalea plusia*, TL Guyana.
TT: *Calledema plusia* (Felder): Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) recorded a specimen from Verdant Vale (18 April 1919, N. Lamont); it is now in NMS. I confirmed this identification by comparison with the type (NHMUK, ♀ Guyana) and NHMUK series.
Identification. Like *C. arema*, this species has an intensely white subapical streak on the dorsal forewing, but it is signifcantly larger and has a distinct diagonal line across the forewing basal to the white streak.
Status in Trinidad. An uncommon species, normally found in forested areas.

***Didugua* Druce, 1891**

Type species *Didugua argentilinea* Druce, 1891, TL Guatemala.

***Didugua pittieri* (Schaus, 1924)**

Fig. 102.

OD: Schaus 1924: *Antiopha pittieri*, TL Venezuela.

Historical notes. A new record for Trinidad, which I identified by comparison with the type (USNM, ♂ Venezuela).

Identification. The sinuous black postdiscal marking, bordered with near white costally and distally is distinctive (Fig. 102). *Hippia mumetes* and *Lepasta bractea* (Fig 103) have a sinuous white post-discal marking with a dark area dowards the dorsum, but comparison of the figures should readily separate them.

Status in Trinidad. A rare species, so far only collected from Simla in the Arima Valley.

***Elasmia* Möschler, 1886**

Type species *lignosa* Möschler, a synonym of *insularis* Grote.

***Elasmia mandela* (Druce, 1887)**

Fig. 102.

OD: Druce 1887: *Edema mandela*, TL Mexico.

TT: *Hippia mandela* (Druce): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded a single specimen of *Hippia mandela* from Palmiste (13 February 1922, N. Lamont). This specimen is in NMS, and I have checked its identification against the type (NHMUK, ♂ Mexico).

Taxonomic issues. There are public DNA barcodes for this species from Costa Rica, Mexico and USA in BOLD as BIN BOLD:AAA6562, but as yet no barcode confirmation that the same species is found in South America.

Identification. The simple pale apical streak is distinctive in what is otherwise an undistinguished species.

Status in Trinidad. Still only known from Sir Norman Lamont's original specimen from Palmiste.

***Elasmia pronax* Dognin, 1908**

Fig. 102, 112.

OD: Dognin 1908: *Hippia pronax*, TL French Guiana [Becker (2014) says Peru, but Dognin (1908), Schintlmeister (2013) and USNM (2021) state French Guiana]

TT: *Hippia pronax* Dognin: Dognin (1908), Draudt (1932-1934), Lamont and Callan (1950)

Hippia insularis (Grote): Kaye and Lamont (1927) [misidentification]

Historical notes. Dognin (1908) described *Hippia pronax* from French Guiana based on three males, which he compared to a female from Trinidad. Draudt (1932-1934) picks up this record, and from there, it was included in Lamont and Callan (1950). Meanwhile, Kaye and Lamont (1927) recorded *Hippia insularis* (Grote), which was described from Cuba, citing specimens from Palmiste (N. Lamont) and Caparo (October 1904, F. Birch). F. Birch's specimen is in NHMUK as *H. insularis* when I examined it. I have not found Lamont's specimen, although there are specimens from the 1930s in NHM and UWIZM, which can be taken as representing Kaye and Lamont's record. I have matched all these specimens with material which I collected in Trinidad; as far as I can tell there is only one species involved, for which the most appropriate name is *pronax*, identified by comparison with the type (USNM, ♂ French Guiana). The Trinidad material is paler at tornus, but the apical markings are a good match. Metzler and Knudson (2011) transferred *H. insularis* to the genus *Elasmia*, but did not consider the neotropical species at that time treated in *Hippia*, and it was Becker (2014) who transferred *pronax* to *Elasmia*.

Identification. The dorsal forewing elongate pale rectangular mark on the costa at the apex, with a short downward streak from this at the end of the cell will serve to identify this species. The sexes are similar, apart from the slightly bipectinate antennae of the male.

Status in Trinidad. A fairly common species in forested areas, occasionally straying into suburban areas.

Fig. 112. Male *Elasmia pronax*, Arima Valley, Asa Wright Nature Centre, 8.xii.2013, P. Prior (iNaturalist observation 1788421). ©, under CC-BY-NC license.

Elymiotis Walker, 1857

Type species *Elymiotis notodontoides* Walker, TL [Dominican Republic].

***Elymiotis longara* (Stoll, 1790)**

Fig. 102, 113.

OD: Stoll 1790: *Phalaena longara*, TL Suriname.

Walker 1858: *Nystalea attenuata*, TL Venezuela [synonym]

Felder 1874: *Nystalea ancora*, TL [Brazil], Amazonas [synonym]

TT:*Elymiotis longara* (Stoll): Kaye and Lamont (1927)

Historical notes. This variable species has been treated as three species, until Becker (2014) made *Nystalea ancora* Felder (TL Brazil, Amazonas) and *N. attenuata* (TL Venezuela) synonyms. Stoll's *longara* is a pale brown form (Stoll 1787-1791, plate 18.3), while *attenuata* and *ancora* are dark forms (types in NHMUK). Kaye and Lamont (1927) recorded *Elymiotis longara* (with *E. ancora* as a synonym), listing specimens from Caparo (1904, F. Birch) and Palmiste (1 September and 3 September 1917, N. Lamont). The Caparo specimen is a pale male in NHMUK, where it is (or was) curated as *E. ancora*. The Palmiste specimens are dark females in NMS, where they were labelled as *E. longara* by Sir Norman Lamont. My comments are based on Stoll's figure of *longara* and the types of *ancora* and *attenuata* in NHMUK. At the moment, limited material suggests that there are pale and dark morphs of this species, but when more material is available it may well become apparent that the colouring is continuously variable.

Identification. This species has a dark spot at the end of the dorsal forewing cell, which is much more evident in pale individuals, and a sharply defined variable short bright white dash beyond this, which is bifurcate distally. This white dash may be reduced (Fig. 102) and possibly absent in some cases, but where present, provides a useful diagnostic feature. Females are larger and have simple rather than bipectinate antennae. The dark form dominates in Trinidad, with seven records compared to just one of the pale form.

Status in Trinidad. An uncommon species recorded from both suburban and forest areas.

Fig. 113. Male *Elymiotis longara*, Talparo, at light, 16.xi.2020, K. Sookdeo. ©, with permission.

Euxoga Möschler, 1878

Type species *Euxoga argenteopunctata* Möschler, 1878, TL Suriname. *Ctianophora* Schaus, 1901 (type species *Tiauspa argyria* Butler, 1879) is a synonym (Becker 2014).

***Euxoga argentilinea* (Schaus, 1905)**

Fig. 102.

OD: Schaus 1905: *Ctianophora argentilinea*, TL French Guiana.

Historical notes. This species has not previously been recorded from Trinidad. Identification is based on a comparison with the type (USNM, ♂ French Guiana).

Identification. This species can be recognized by the distinctive forewing shape, deeply excavate at the termen, the two intense white lines in the discal area almost at right angles, and the row of dark submarginal spots in the apical half. I do not know the male from Trinidad.

Status in Trinidad. Known from just one 1904 specimen collected at Caparo.

***Hippia* Möschler, 1878**

Type species *Phalaena mumetes* Cramer, 1775, TL Suriname.

***Hippia mumetes* (Cramer, 1775)**

Fig. 103, 114.

OD: Cramer 1775: *Phal*[*aena*] *Tortrice mumetes*, TL Suriname.

TT: *Hippia mumetes* (Cramer): Kaye and Lamont (1927)

Historical notes. Kaye and Lamont (1927) recorded a specimen of this species from Guaico (18 April 1915, N. Lamont), which is now in NMS. I identified this species by comparison with the NHMUK series.

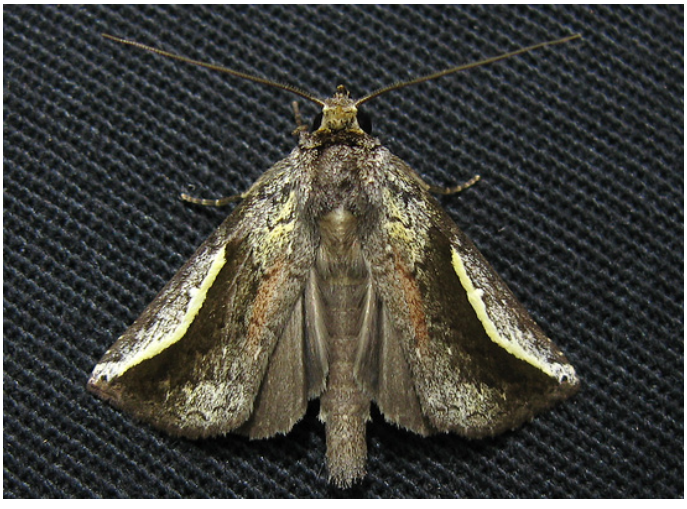

Fig. 114. Male *Hippia mumetes*, Penal, 1.viii.2010, K. Sookdeo. ©, with permission.

Identification. The long white streak, angled at the middle, placed not far from the costal margin of the dorsal forewing is distinctive (Fig. 103), so this species is only likely to be confused with *Lepasta bractea*. However, in that species the white streak is significantly shorter and the wing shape is more obviously triangular (Fig. 103). The sexes are similar, but the male is smaller.
Status in Trinidad. An uncommon species, primariuly associated with forest areas.

Lepasta Möschler, 1878

Type species *Nystalea bractea* Felder, 1874, TL Venezuela.

***Lepasta bractea* (Felder, 1874)**
Fig. 103, 115.
OD: Felder 1874: *Nystalea bractea*, TL Venezuela.
TT: *Lepasta bractea* Felder: Kaye and Lamont (1927)
Historical notes. Kaye and Lamont (1927) listed a specimen from Palmiste (7 September 1916, N. Lamont), which is now in NMS. Although I did not encounter this species myself, I have confirmed the identification by comparison with the type (NHMUK, ♂ Venezuela) and NHMUK series.
Identification. The arrangement of white dashes on the dorsal forewing, especially the longest which extends beyond the cell, will facilitate identification of this species. It does bear a superficial resemblance to the erebid moth *Heteropygas ziczac* Felder & Rogenhofer, but in that species, the main white marking is continuous from the base of the wing to beyond the cell, and deeply divided in the distal third.
Status in Trinidad. A rare species with old records from Palmiste, and one recent observation from Penal (Fig. 115).

Fig. 115. Male *Lepasta bractea*, Penal, 9.vii.2010, K. Soodeo. ©, with permission.

Lepasta mixta Möschler, 1883
Fig. 103.
OD: Möschler 1883: *Lepasta mixta*, TL Suriname.
TT: *Nystalea calophasioides* Kaye: Kaye (1901) TL [synonym]
Lepasta mixta Möschler: Kaye and Lamont (1927), Draudt (1932-1934)
Historical notes. Kaye (1901) described this species from Trinidad as *Nystalea calophasioides* Kaye, based on a specimen collected by J.H. Hart in NHMUK. Subsequently, Kaye and Lamont (1927) listed *N. calophasioides* as a synonym of *L. mixta*, and added a record from Guiaco (18 April 1915, N. Lamont), which is now in NMS. My identification is based on Kaye's male type in NHMUK.
Identification. The yellow-brown and dark brown streaky appearance, and the white discal streak, with a shorter distal portion at almost a right angle directed towards the tornus can be used to recognize this species. The sexes are similar, but the female is generally darker.
Status in Trinidad. A rare species, recorded from forested areas.

***Lusura* Walker, 1855**

Type species *Lusura discalis* Walker, 1855, TL Brazil, Para, a synonym of *Phalaena chera* Drury, 1773, TL Suriname. Note that *Lusura ancha* Schaus, 1921 was described with 'Trinidad, Paraguay' as the type locality. This is not a Trinidad species; the type locality refers to the town of Trinidad in Paraguay, not two type localities.

***Lusura chera* (Drury, 1773)**
Fig. 104.
OD: Drury 1773: *Phal[aena] Noct[ua] chera*, TL Suriname.
TT: *Lesura altrix* (Stoll): Kaye and Lamont (1927) [synonym]
Historical notes. Kaye and Lamont (1927) recorded a specimen from Palmiste (N. Lamont) as *L. altrix* (Stoll); this is the unlabeled female specimen in NMS (Fig. 104). *Phal[aena] Bomb[yx] altrix* Stoll, 1780, TL Suriname is a synonym. I confirmed this identification by comparison with the USNM series.
Identification. Distinctive features include the two dark streaks from the forewing base, the lower interrupted by a small black spot partiually encircled with white, the two dark post-discal streaks, and the broad, irregular pale margin. The male is lighter than the female, with more contrasting markings, a less distinct pale margin, and bipectinate antennae.
Status in Trinidad. The original specimen from Palmiste is still the only record from Trinidad.

***Lusura plorabilis* Schaus, 1905**
Fig. 104.
OD: Schaus 1905: *Lusura plorabilis*, TL French Guiana.
Historical notes. This is a new record from Trinidad which I identified by comparison with the type (USNM, ♂ French Guiana). There is a specimen in Sir Norman Lamont's collection in UWIZM, which he had misidentified as *Nystalea marmoreal.*
Identification. The size, rounded wings and rather uniformly black dorsal forewing will serve to identify this species in Trinidad. I have not seen the female from Trinidad, but it is similar to the male, but slightly larger, and with simple as opposed to slightly bipectinate antennae.
Status in Trinidad. An uncommon species found in forested areas.

***Lyricinus* Weller, 2014 (in Becker 2014)**
Type species *Etobesa xylophasioides* Butler, 1878, TL Brazil, Amazonas.

***Lyricinus xylophasioides* (Butler, 1878)**
Fig. 104.
OD: Butler 1878: *Etobesa xylophasioides*, TL [Brazil] Amazonas.
Historical notes. This is a new record from Trinidad which I identified by comparison with the type (NHMUK, ♂ Amaz.) and NHMUK series.
Identification. This is an easily recognized species due to the streaky brown wings (paler in male), with a darker band from mid dorsum to below apex of the termen.
Status in Trinidad. An uncommon species, so far only known from the forests of the Northern Range.

***Lysana* Möschler, 1883**
Type species *Lysana plexa* Möschler, 1883, TL Suriname.

***Lysana plusiana* Schaus, 1901**
Fig. 102, 116.
OD: Schaus 1901: *Lysana plusiana*, TL Venezuela.
Dognin 1908: *Lysana postpicta*, TL French Guiana, [a synonym in NHMUK but not in Schintlmeister (2013)].
TT: *Lysana plusiana* Schaus: Lamont and Callan (1950)
Historical notes. Lamont and Callan (1950) recorded a specimen from Palmiste (26 December 1921, N. Lamont). I believe that this is the specimen in NMS with the same date but 1929, and that 1921 in Lamont and Callan (1950) was an error. I identified this species by comparison with the type of *Lysana postpicta* Dognin (USNM, ♂ French Guiana), which is a synonym in NHMUK, and the NHMUK series.
Taxonomic issues. Costa Rica DNA barcodes in BOLD appear in two BINs: BOLD:ACL2788 and BOLD:AAB2891 indicating greater complexity than currently recognized, although this does not necessarily extend to South America.
Identification. The dark brown mottled forewings with irregular obscure pale lines and an inconspicuous dark spot in the upper cell and the tufts on the end of the abdomen make this species easy to separate from other Trinidad Notodontidae. However, it bears a superficial resemblance to some Noctuidae Plusiinae, so a careful comparison is needed. The female (Fig. 116) is larger, slightly paler, and the white premedial line of the forewing is straighter.
Status in Trinidad. A rare species with just four records, all from lowland areas.

Fig. 116. Female *Lysana plusiana*, near Freeport, Wa Samaki Ecosystems, 16.i.2021, R. Deo. ©, with permission.

***Notelina* Becker, 2014**
Type species *Notoplusia oyapoca* Schaus, 1923, TL French Guiana.

***Notelina oyapoca* Schaus, 1923**
Fig. 102.
OD: Schaus 1923: *Notoplusia oyapoca*, TL French Guiana.
Historical notes. A new record for Trinidad, identified by comparison with a cotype (USNM, ♂ French Guiana).
Identification. The white-grey dorsal forewings with the basal third sharply contrasting dark brown make this species easy to recognize. I have not seen a female from Trinidad.
Status in Trinidad. A rare species with just two records from the forests of the Northern Range.

***Nycterotis* Felder, 1874**
Type species *Edema xylinoides* Walker, 1866, TL Colombia. *Pentobesa* Schaus, 1901, type species *xylinoides* Walker, 1866 is a synonym (Becker 2014).

***Nycterotis jacobensis* (Thiaucourt, 2008)**
Fig. 104.
OD: Thiaucourt 2008: *Nycterotis jacobensis*, TL Ecuador.
TT: *Proelymiotis lignicolor* (Möschler): Kaye and Lamont (1927) [misidentification]
Historical notes. Kaye and Lamont (1927) recorded a specimen from Palmiste (30 August 1917, N. Lamont) as *Proelymiotis lignicolor* (Möschler); this specimen is in UWIZM and matches material in MJWC. I initially identified this species as *N. lignicolor*, by comparing it with the type of *Elymiotis arpia* Schaus (USNM, ♂ Brazil, Rio de Janeiro), which is a synonym (Schaus 1928), and the NHMUK series of *N. lignicolor*. Since then, Thiaucourt (2008b) established that *N. lignicolor* (which he treated in the genus *Pentobesa*) is a complex of very similar species with diagnostic terminalia. I dissected Trinidad males and was able to readily identify them as *N. jacobensis* (Thiaucourt). This species was recently described from Ecuador, and found from Bolivia to Venezuela (Bolivar), mostly occurring at 650–1300 in the east Andes (Thiaucourt 2008b).
Taxonomic issues. In external appearance it is difficult to distinguish from others of the group, including *N. lignicolor*, but the terminalia offer diagnostic characters as illustrated by Thiaucourt (2008b). However, while Thiaucourt (2008b) indicated that the projections of the posterior margin of the A8 sternite are symmetrical, I observe that although they are symmetrical compared to other species of this group, in fact the posterior margin of the sternite is at a slight angle (the sternite is longer on the right), and the right projection is narrower, and in life orientated slightly laterally, rather than just ventrally. Once dissected, these differences are less apparent.
Identification. This seems to be the only species of this group in Trinidad. On the dorsal forewings, the generally brown to dark brown costal two-thirds, the irregular grey area along the dorsum and the salmon-pink shades at the boundary, especially in the female make this species distinct. The female has broader wings and is paler with stronger salmon-pink colouring than the male. In one male (Simla, 30.vii.1981), the costal half of the dorsal forewing is rather uniformly white-brown (Fig. 104, ♂2), but this seems to reflect individual variation as the terminalia are the same.
Status in Trinidad. An occasional species mostly from forested areas.

***Nycterotis lucia* (Schaus, 1901)**
Fig. 105, 117, Appendix Fig. 17.
OD: Schaus 1901: *Dasylophia lucia*, TL St Lucia.
TT: *Nycterotis lucia* (Schaus): Cock (2017b), Sookdeo and Cock (2017)
Historical notes. Cock (2017b) recorded this species from the Five Islands, indicating that it also occurs in Trinidad, and Sookdeo and Cock (2017) documented its presence on Huevos Island. It was identified by comparison with the type (USNM, ♂ St. Lucia) including the male terminalia (Schintlmeister 2016, USNM 2021).
Identification. This species might be confused with *N. russula* and *X. scottmilleri* (Fig. 105). Differences are discussed under *N. russula* below.
Status in Trinidad. This species is uncommon in Trinidad collections. It seems to be primarily associated with drier areas of Trinidad, especially the offshore islands, where it can be relatively common, e.g. Sookdeo and Cock (2017) recorded at as the commonest species at light on Huevos in February 2014. Although it has not been recorded from Tobago (Cock 2017a), it is expected to occur there.

Fig. 117. Female *Nycterotis lucia*, Huevos Island, 21.ii.2014, K. Sookdeo. ©, with permission.

***Nycterotis russula* (Dognin, 1909)**
Fig. 105, Appendix Fig. 18.
OD: Dognin 1909: *Dasylophia russula*, TL French Guiana.
TT:*Dasylophia angustipennis* Schaus: Kaye and Lamont (1927) [misidentification]
Historical notes. This species was recorded from Trinidad by Kaye and Lamont (1927) as *Dasylophia angustipennis* Schaus, referring to a specimen from Palmiste (6 November 1917, N. Lamont), which I have examined in NMS and matched with material in MJWC. *Dasylophia angustipennis* is now placed in the genus *Xylodonta* (Becker 2014); it does not occur in Trinidad.

Sir Norman Lamont clearly had (understandable) difficulty with this species. Thus, three males in coll. Lamont (UWIZM) as *Dasylophia angustipennis* (labelled in error as *Palthis angustipennis* – a species of Erebidae: Herminiinae) are two male *X. scottmilleri* and one male *Nycterotis lucia*, while two of three females in the same collection as *Dasylophia terrena* Schaus are *N. russula*, and the other is *X. scottmilleri*.

Dasylophia terrena is a separate valid species now placed in *Xylodonta* (Becker 2014, Chacón *et al.* 2017) and not found in Trinidad. *Nycterotis russula* was identified from my dissections (Appendix Fig. 18) by Vitor Becker (pers. comm. 2020; Becker 2021); Becker (2021) transferred it from *Xylodonta* to *Nycterotis*, based on the male genitalia.
Taxonomic issues. Although the type of *russula* (USNM ♂ French Guiana) (Schintlmeister 2016) is browner than any of the greyish Trinidad specimens (Fig. 105), Becker (pers. comm. 2020; Becker 2021) has dissected specimens from the mainland of different shades and finds them identical.
Identification. In Trinidad, this species might be confused with *N. lucia* and *X. scottmilleri* (Fig. 105), especially the males. In all three species, the antennae of the females are simple, but in males they are bipectinate in the basal half, most strongly in the male of *X. scottmilleri.* When the hindwings are visible, those of *X. scottmilleri* are broadly dark at the margin, whereas those of the other two *species* are white with the veins dark towards the margin, and the margin itself very narrowly dark. In the general colouring of the dorsal forewing, *X. scottmilleri* is dark brown, *N. lucia* is grey, and *N. russula* is intermediate, but it is difficult to separate the species based on the detail of the wing markings. *Nycterotis lucia* is a little smaller than the other two species. The female of *X. scottmilleri* is clearly recognizable by the yellow-brown area covering the dorsal forewing apart from the margin and dorsum, and the usually strong dark brown or black patch on the costa at about one-third. The female of *N. lucia* (Fig. 117) has more or less obvious prediscal and postdiscal transverse lines and the extent of yellow-grey on the wings seems variable; in contrast, the the transverse lines are not or scarcely evident in the female of *N. russula,* which is browner, with the basal and distal areas of the wing more contrastingly yellow brown.
Status in Trinidad. An occasional species in suburban areas, but uncommon in forested areas.

***Nycterotis sinistra* (Weller, 1991)**
Fig. 104, 118.
OD: Weller 1991: *Pentobesa sinistra*, TL Costa Rica.
Walker 1866: *Edema xylinoides*, TL Colombia, is a separate valid species (Weller 1991).
TT: *Pentobesa xylinoides* Walker: Lamont and Callan (1950) [misidentification]
Historical notes. There may be more than one species of this appearance in Trinidad, but for now I treat them as a single species. Lamont and Callan (1950) recorded *Pentobesa xylinoides* Walker from Palmiste (7 March 1934, N. Lamont), and this specimen is now in NMS. Weller (1991) divided *P. xylinoides* Walker into a complex of four species, which Becker (2014) subsequently transferred to *Nycterotis*. I identified a male and female from Trinidad in MJWC as *N. sinistra* by comparison of the male and female eighth sternites with the figures in Weller (1991).
Taxonomic issues. *Nycterotis xylinoides* was described from Colombia and has been reported from French Guiana, and thus may also occur in Trinidad. It is very close to *N. sinistra* in appearance (Weller 1991), and hence, all other Trinidad records need verification by examination of the terminalia. Cock (2017a) assumed that Ingraham's specimen from Tobago is *N. sinistra*, but this needs to be checked, now that the specimen is preserved in UWIZM.
Identification. There is strong sexual dimorphism. The dorsal forewings, thorax and abdomen of the male are fairly uniformly mottled dark brown, with the extreme base and adjacent thorax grey. The female is larger, and much paler brown so that the wing markings are more discernable, including irregular areas on the dorsum and distal to the sell that are paler, and irregular sub-discal and post-discal double lines. The ventral sternites of specimens will need to be examined against Weller (1991) to check for *N. xylinoides.* Until checking a larger sample of specimens clarifies which species occur in Trinidad, photographs such as Fig. 118 can only be assumed to be *N. sinistra*.
Status in Trinidad and Tobago. Assuming only one species is present in Trinidad and Tobago, this is widespread and not uncommon in both suburban and forest habitats.

Fig. 118. Male *Nycterotis ?sinistra*, Asa Wright Nature Centre, 21.iii.2015, S. Nanz. ©, with permission.

Nystalea Guenée, 1852

Type species *Nystalea conchyfera* Guenée, 1852, TL St. Thomas, a snonym of *Phalaena ebalea* Stoll, 1780, TL Suriname. *Proelymiotis* Schaus, 1901, type species *Nystalea aequipars* Walker, 1858 is a synonym (Weller 1990). In the following, for many species the female has not been observed in Trinidad but is normally larger, with broader wings. Most of the following records are new for Trinidad, which is probably linked to their association with forested areas.

***Nystalea aequipars* Walker, 1858**
Figs. 106, 119.
OD: Walker 1858: *Nystalea aequipars*, TL Brazil, Amazonas.
TT: *Nystalea aequipars* Walker: Weller (1990), Cock (2017a)
Historical notes. Weller (1990) recorded this species from Tobago, and Cock (2017a) indicated that it also occurs in Trinidad. Identification was made based on Weller (1990).
Taxonomic issues. Public DNA barcodes in BOLD as this species are from Costa Rica, Brazil (Parana), and French Guiana as BIN BOLD:AAB5463, implying that this is a single widespread species.
Identification. This is the only Trinidad species with the basal half of the dorsal forewings dark brown and the distal half grey-white.
Status in Trinidad and Tobago. An uncommon but widespread species found in both forest and suburban habitats.

Fig. 119. Male(?) , Maracas Valley, 24.x.2019, R. Williams-Littzen (iNaturalist observation 34823290). ©, under CC-BY-NC license.

Nystalea ebalea (Stoll, 1780)
Figs. 106, 120.
OD: Stoll 1780: Phal[aena] Noct[ua] ebalea, TL Suriname.
TT: *Nystalea ebalea* (Stoll): Cock (2017a)
Historical notes. Recording this species from Tobago, Cock (2017a) also indicated that it is present in Trinidad. I made this identification based on the NHMUK series.
Identification. *Nystalea ebalea* (Fig. 106) can be compared with other *Nystalea* spp., particularly *N. malga*, *N. marmorea* (Fig. 106), *N. porgana* and *N. superciliosa* (Fig. 108). It can be recognized by the pale patches on the dorsal forewing costa, just beyond half way and at the apex, and the black spot in space 1B (Cu_1-2A) just beyond half way. *Nystalea malga* also has a dark spot in space 1B, but lacks the costal spots; *N. marmorea* has the pale costal spots to a lesser or greater degree, but lacks the dark spot in space 1B; *N. porgana* has a weak pale apical patch on the costa only; and *N. superciliosa* has neither character.
Status in Trinidad and Tobago. An uncommon species mainly recorded from suburban situations.

Fig. 120. , South Oropouche, 26.viii.2021, T.P. Maharaj (iNaturalist observation 92634535). ©, under CC-BY-NC license.

Nystalea guzmani Schaus, 1910
Figs. 106.
OD: Schaus 1910: *Nystalea guzmani*, TL Costa Rica.
Historical notes. A new record for Trinidad, which I identified by comparison with the type (USNM, ♂ Costa Rica).
Taxonomic issues. I saw slight differences in markings between Trinidad material and the type. The type is paler, and the has a row of white slotches from the lateral thorax to the forewing apex, whereas these are really only evident in the distal part of the wing of Trinidad specimens and are less white. However, otherwise the markings appear the same. Given that *N. guzmani* was described from Costa Rica, it is possible that the South American population may prove to be a different species, but for now I treat the differences as not significant.
Identification. The extended whitish apical patch reaching the post discal line is distinctive for this species, and judging from the type specimen, pale patches may also extend from there to the thorax.
Status in Trinidad. A rare species in the forests of the Northern Range.

***Nystalea joanna* Schaus, 1905**
Fig. 106.
OD: Schaus 1905: *Nystalea joanna*, TL French Guiana.
Historical notes. A new Trinidad record. Identified by comparison with the type (USNM, ♂ French Guiana) and NHMUK series.
Taxonomic issues. The type has clearer and stronger pale

markings than my Trinidad material, but I do not think this difference is necessarily significant.

Identification. These characters should serve to recognize this species: the dorsal forewings are predominantly pale dirty white; the dorsum, a patch on the costa before the apex, and on the termen before the apex are all pale brown, and a triangular patch at mid costa is dark brown.

Biology in Trinidad. One of my specimens was reared from a field collected flimsy cocoon between leaves, but there was no associated feeding and the plant was not identified. The newly emerged moth ran rapidly around the rearing container before it settled down to expand its wings.

Status in Trinidad. A rare species with two records only showing no clear habitat association.

***Nystalea malga* Schaus, 1904**

Fig. 106.

OD: Schaus 1904: *Nystalea malga*, TL [Brazil], Rio de Janeiro.

Historical notes. This is a new record for Trinidad, which I identified by comparison with the type (USNM, ♂ Rio de Janeiro).

Identification. See notes under *N. ebalea* (above).

Status in Trinidad. A rare species, with just three records from the forests of the Northern Range.

***Nystalea marmorea* Schaus, 1901**

Fig. 106.

OD: Schaus 1901: *Nystalea marmorea*, TL Trinidad.

TT: *Nystalea marmorea* Schaus: Schaus (1901) TL, Kaye and Lamont (1927), Draudt (1932-1934)

Historical notes. Schaus (1901) described this species from Trinidad, and I have examined the type in USNM. Kaye and Lamont (1927) included it in their catalogue based on the type locality, but did not know this species themselves (Sir Norman Lamont had a ♂ *Lusura plorabilis* in his collection in UWIZM as *Nystalea marmorea*).

Taxonomic issues. Public barcodes of material identified as *N. marmorea* from Costa Rica in BOLD appear in three different BINs: BOLD:AAY8192, BOLD:ACL3563 and BOLD:AAC4757 indicating additional cryptic biodiversity. However, since *N. marmorea* was described from Trinidad, this is only an issue if there are two or more species of this appearance in Trinidad.

Identification. See notes under *N. ebalea* (above).

Status in Trinidad. This is an uncommon species, recorded from both forest and suburban habitats.

***Nystalea multiplex* Dognin, 1909**

Fig. 106.

OD: Dognin 1909: *Nystalea multiplex*, TL French Guiana.

Historical notes. This is a new species for Trinidad. I identified it by comparison with the type (USNM type, ♂ French Guiana).

Taxonomic issues. *Nystalea idonea* (Walker) (TL West coast of America) is very similar, and I did not see any diagnostic differences, so that they may be synonyms. At the moment, both are considered valid (Schintlmeister 2013, Becker 2014), so I use the name *multiplex* as it was described from French Guiana; should they prove to be synonyms, *N. idonea* would have priority as the older name (1858).

Identification. The irregular pale blotches all over the dorsal forewing, but in particular two pale blotches in the post-discal area, make this a distinctive species in Trinidad

Status in Trinidad. There is just the one Trinidad record, at Morne Bleu Textel, at 700m in the Northern Range.

***Nystalea nigritorquata* Dognin, 1900**

Fig. 107.

OD: Dognin 1900: *Nystalea nigritorquata*, TL Colombia

TT: *Nystalea nigritorquata* Dognin: Cock (2017a)

Historical notes. Cock (2017a) recorded a specimen from Tobago, but there are no records from Trinidad. It was identified by comparison with an image of the lectotype (USNM, ♂ Colombia) (Schintlmeister 2016, USNM 2021) and the NHMUK series.

Identification. The pale grey forewing with a dark line from base to mid termen make this an easily recognized species.

Status in Tobago. No Trinidad records; the Tobago specimen was taken in mixed forest and other habitats.

***Nystalea nyseus* (Cramer, 1777)**

Fig. 107.

OD: Cramer 1777: *Phal[aena] Noct[ua] nyseus*, TL Suriname.

TT:*Nystalea nyseus* (Cramer): Kaye (1901), Kaye and Lamont (1927)

Historical notes. Kaye (1901) reported a specimen from Verdant Vale (Arima Valley, S. Kaye), and Kaye and Lamont add a record from Caparo (November 1904, F. Birch). Both should be in NHMUK, but I failed to locate them there. Given that this is an easily recognized species, there is no reason to doubt their identification. I identified this species by comparison with the NHMUK series, and in light of Todd's (1973) treatment.

Taxonomic issues. *Nystalea nyseus* is a South American species, with type locality Suriname (Todd 1973). It is a variable species, particularly with regard to the colour of the head and prothorax, which are pale yellow-brown in the original plate by Cramer. It is replaced in Central America by *N. collaris* Schaus (TL Costa Rica), which was originally described as a subspecies of *N. nyseus*, but is now considered a valid species (Todd 1973, Becker 2014). *Nystalea collaris* resembles *N. nyseus*, but with the head and prothorax dark

brown. Specimens with both colour forms of the head and prothorax occur in Trinidad, but I dissected a male of each and confirmed that just one species is present. There are three females of *N. nyseus* in Sir Norman Lamont's collection in UWIZM as '*Nystalea quaesita* n. sp.' *Nystalea quaesita* Draudt (TL Mexico) resembles *N. nyseus* including the light yellow-brown head and thorax and it is now treated as a synonym of *N. collaris* (Todd 1973, Becker 2014).

Identification. This species can be recognised by the mostly grey dorsal forewings, dark spot in the middle of the wing below the origin of vein 2 (Cu_2), and small dark patches on the costa. To a variable extent the dorsum is brown, and post-discal spots may be present in spaces 2 and 3 (Cu_1-Cu_2 and M_3-Cu_1). As noted above, the head and prothorax may be pale yellow brown (Fig. 107, ♂2; typical *N. nyseus*) or dark brown (Fig. 107, ♂1; resembling *N. collaris*).

Status in Trinidad. An occasional species, primarily found in suburban habitats.

***Nystalea nystalina* (Draudt, 1932)**

Fig. 107.

OD: Draudt 1932: *Proelymiotis nystalina*, TL Brazil, Santa Catarina.

Historical notes. This is a new record for Trinidad. I identified the specimen by comparison with the NHMUK series.

Identification. The strong, narrow black line across the grey dorsal forewing, together with the reddish suffusion distal to this will facilitate recognition of this species.

Status in Trinidad. A rare species with just one record from the Arima Valley.

***Nystalea ocellata* Rothschild, 1917**

Fig. 107.

OD: Rothschild 1917: *Nystalea ocellata*, TL Peru.

Historical notes. This species has not previously been recorded from Trinidad. My identification was based on a comparison with the type (NHMUK, ♂ Peru) and NHMUK series.

Taxonomic issues. Trinidad material is not an exact match to the type, as the type is paler, making the black spots before apex and in space 1B (Cu_2-2A) much more conspicuous. If the species in Trinidad is not *N. ocellata*, it is certainly something very similar, presumably undescribed.

Identification. The complicated colour-rich markings are characteristic, but the black spots near the apex and in space 1B (Cu_2-2A) can be used to confirm the identification.

Status in Trinidad. A rare species with just one record from the Arima Valley.

***Nystalea porgana* Schaus, 1905**

Fig. 108.

OD: Schaus 1905: *Nystalea porgana*, TL French Guiana, Guyana.

Historical notes. A new Trinidad record, identified by comparison with the type (USNM, ♂ French Guiana).

Taxonomic issues. The type is slightly darker than Trinidad material, but I am not treating this as significant at this time. However, I note that public barcodes as *N. porgana* from Costa Rica comprise two BINs: BOLD:AAE6037 and BOLD:AAC6390), while a further BIN, BOLD:AAN1660 (one barcode from Brazil, as *Nystalea* sp.) is grouped with them. It seems that *N. porgana* will be shown to be a species complex.

Identification. This is the largest of Trinidad *Nystalea* spp. See identification notes under *N. ebalea* (above).

Status in Trinidad. A rare species, with records from forested areas and once from a suburban area.

***Nystalea postpuncta* Schaus, 1920**

Fig. 107.

OD: Schaus 1920: *Nystalea postpuncta*, TL Guatemala.

Historical notes. This species has not previously been recorded from Trinidad, although there is a 1904 specimen from Trinidad in NHMUK. I identified the NHMUK specimen as *N. postpuncta* by comparison with the lectotype male illustrated by Schintlmeister (2016).

Taxonomic issues. This seems to be a little-known species and I have not traced any other records from outside Central America. Confirmation based on further captures, terminalia comparisons and/or DNA barcodes would be worthwhile.

Identification. This is a pale species with clear prediscal and post discal lines; is distinctive due to the conspicuous dark submarginal spot in space 4 (M_2-M_3), and the less conspicuous dark spots midway between the prediacal and postdical lines in upper space 1B (Cu_1-2A), and at the margin in the same space.

Status in Trinidad. Just the one record from Caparo, more than 100 years ago.

***Nystalea striata* Schaus, 1910**

Fig. 107.

OD: Schaus 1910: *Nystalea striata*, TL Costa Rica.

Historical notes. A new record for Trinidad, identified by comparison with the type (USNM, ♀ Costa Rica).

Identification. See notes under *N. ebalea* (above).

Status in Trinidad. An uncommon species, mostly recorded from a suburban area (Curepe).

***Nystalea superciliosa* Guenée, 1852**
Fig. 108, 121.
OD: Guenée 1852: *Nystalea superciliosa*, TL French Guiana.
Historical notes. This species has not hitherto been recorded from Trinidad. It was identified by comparison with the NHMUK series.
Taxonomic issues. The colouring of the thorax seems to be variable in females, but I have not analysed this further. DNA barcodes in BOLD from Costa Rica (many), French Guiana (2) and Trinidad (1) are all grouped in BOLD:AAA8476, suggesting a single widespread species.
Identification. See notes under *N. ebalea* (above).
Status in Trinidad. An uncommon species from both forested and suburban areas.

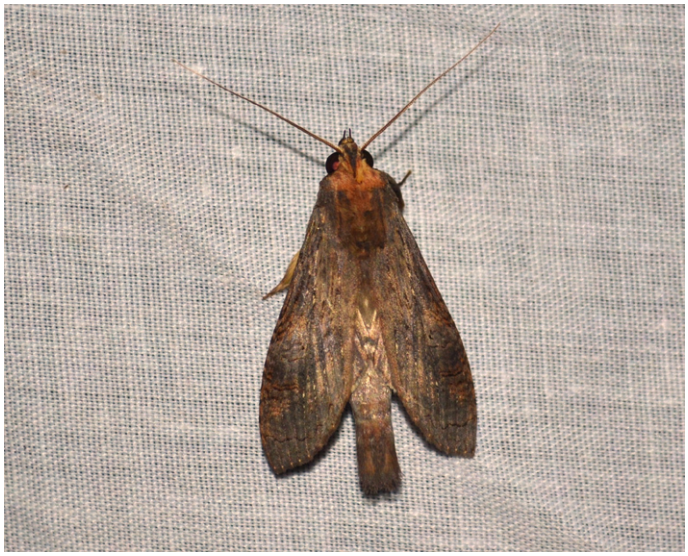

Fig. 121. Male *Nystalea superciliosa*, Talparo, at light, 1.ix.2020, K. Sookdeo. ©, with permission.

Nystalea virgula Felder & Rogenhofer, 1874
Fig. 107.
OD: Felder & Rogenhofer 1874: *Nystalea virgula*, TL [Brazil], Amazonas.
Historical notes. A new record for Trinidad, identified by comparison with the type (NHMUK) and NHMUK series (none from Trinidad).
Identification. An easily recognized species in Trinidad; in addition to the general appearance, note the two white-edged, black semi-circles at the end of the dorsal forewing cell. The female has not been recorded from Trinidad.
Status in Trinidad. An uncommon species found mostly in forest habitats of the Northern Range, but also in suburban areas.

***Strophocerus* Möschler, 1883**

Type species *Strophocerus flocciferus* Möschler, 1883, TL Suriname.

***Strophocerus thermesia* (Felder, 1874)**
Fig. 105, 122.
OD: Felder 1874: *Nystalea thermesia*, TL [Brazil] Amazonas.
TT: *Strophocerus thermesia* (Felder): Lamont and Callan (1950)
Historical notes. Lamont and Callan (1950) recorded specimens of *S. thermesia* from St. Augustine (10 November 1906, E.M. Fountain [sic]) and St. Patricks, Arima (1 April 1938, N. Lamont). Margaret E. Fountaine visited Trinidad several times to collect and rear butterflies (Cock 2004) and also pinned a few moths that I have noted in NHMUK, although I have not located this specimen. Lamont's specimen is in NMS, although it is labelled from Arima, without mentioning St. Patrick's (something he seems to have done more than once). My identification was originally based on a comparison with the NHMUK series. Since then, I have examined the A8 sternite and compared it with those figured by Thiaucourt (1995b, 2015), and it is a good match to *S. thermesia*.
Taxonomic issues. Public DNA barcodes of this species in BOLD are from Costa Rica in BIN BOLD:AAB3591 and Brazil (Para, Parana) in three different BINs (BOLD:ADG2449, BOLD:ADF9010 and BOLD:AAM8496). Thiaucourt (1995b, 2015) has described new species of this group, but there may still be more species here than hitherto recognized. On the basis of the DNA barcodes, it is not obvious that

Fig. 122. Male *Strophocerus thermesia*, Arima valley, Asa Wright Nature Centre, 10.xii.2018, C.D. Jones (iNaturalist observation 18949650). ©, under CC-BY-NC license.

Trinidad material is conspecific with the true *S. thermesia* described from the Amazon, but here I follow Thiaucourt's (1995b) treatment.

Identification. This species can hardly be mistaken for any other in Trinidad. Females are significantly larger than males, and the dorsal forewing is darker chestnut in colour (Fig. 105).

Status in Trinidad. This is an uncommon species, mostly recorded from forested areas, but also found in suburban areas.

Tachuda Schaus, 1901

Type species *Lochmaeus albosigma* Druce, 1887, TL Guatemala.

***Tachuda discreta* Schaus, 1905**

Fig. 104.

OD; Schaus 1905: *Tachuda discreta*, TL 'The Guianas, Brazil, Trinidad, British West Indies' [French Guiana].

TT: *Tachuda albosigma* Druce: Schaus (1901), Kaye and Lamont (1927) [misidentification]
Tachuda discreta Schaus: Schaus (1905) PTL, Draudt (1932-1934), Lamont and Callan (1950), Cock and Kelly (2020)
Tachuda marma Schaus unpublished: nomen nudum.

Historical notes. In his revision of the American Notodontidae, Schaus (1901) described the new genus *Tachuda*, with the single species *Tachuda albosigma* (Druce), which he noted is widely spread and variable, in particular that 'Brazilian and Trinidad specimens are usually paler with the markings more defined'. Soon afterwards, Schaus (1905) described *T. discreta* from the Guianas, Brazil, and Trinidad, noting that it is allied to *T. albosigma*, 'but easily distinguished by the postmedial markings'. Becker (2014) designated a male from French Guiana in USNM as lectotype but failed to find any Trinidad type material in USNM. Implicitly, he was separating the paler material from Brazil and Trinidad that he mentioned previously as *T. albosigma* (Schaus 1901) as a separate (i.e. discrete) species. Hence, Kaye and Lamont's (1927) record of *T. albosigma* based on Schaus (1901) may be taken as referring to *T. discreta*. Lamont and Callan (1950) subsequently noted *T. discreta* as a Trinidad species based on Schaus (1905), but did not appreciate that this was the species previously recorded as *T. albosigma* by Kaye and Lamont (1927). Cock and Kelly (2020) recorded this species from Tobago.

A further complication is that some similar material appears in NHMUK as *Tachuda marma* Schaus. This name appears in the NHMUK card index, Lepidoptera names database (Beccaloni *et al.* 2003), and now appears in some on-line databases of available names. I have seen no date of publication associated with this name, and it does not appear in Becker (2014). As far as I can tell, it was never published. It may represent a further species Schaus planned to describe, or a manuscript name for *T. discreta* that was not used. I treat it here as a nomen nudum.

Taxonomic issues. There are many DNA barcodes from Costa Rica as *T. albosigma* in BOLD, which cluster in two BINs: BOLD:AAC6705 and BOLD:AAA7694, indicating there is likely to be more species involved than presently recognised. I identified *T. discreta* by comparison with the type (USNM, ♂ French Guiana) and NHMUK series. I could locate no Trinidad specimens of *Tachuda* in the USNM which might be Schaus' Trinidad paratype(s), although there is a specimen of *T. discreta* from Rio Trinidad, Panama. To my eye, the Trinidad material that I have seen is darker than *T. discreta*, and a better match to specimens treated as '*T. marma*' in NHMUK. Trinidad specimens are not *T. albosigma*, based on my examination of the type in NHMUK. More work is needed, but for now I treat this species as *T. discreta*, based on its inclusion in the type localities.

Identification. This species does not look like a typical Notodontidae, and as such it can be readily distinguished from the rest of the family. However, this atypical appearance might suggest to the observer that its affinities lie with Noctuidae or Erebidae. Note the blotchy green areas of the dorsal forewing, and at the end of the cell two well-separated white dots in an elongate transverse dark oval. Cock and Kelley (2020) illustrate a living adult from Tobago.

Status in Trinidad and Tobago. An uncommon species from forested areas.

Xylodonta **Becker, 2014**

Type species *Nystalea xylinata* Walker, 1865, TL Colombia. Recent work on the species of Costa Rica (Chacon *et al.* 2017) and Brazil (Becker 2021b) has untangled much confusion in this genus.

***Xylodonta imitans* Becker 2021**

Fig. 105, 123, 124, Appendix Fig. 19.

OD: Becker (2021b): *Xylodonta imitans*, TL Brazil.

TT: *Dasylophia terrena* Schaus: Kaye and Lamont (1927) [misidentification]
Dasylophia guarana (Schaus): Guppy (1911), Marshall (1939), Lamont and Callan (1950), Laurence (1974) [misidentification]

Historical notes. Guppy (1911) first recorded this species from Trinidad as *Dasylophia guarana* when he reported food plant records; this record was subsequently picked up by Lamont and Callan (1950), who added additional rearing records from 1928 and 1929, the specimens for which are now in UWIZM. Independently, Kaye and Lamont (1927) misidentified a specimen from Palmiste (N. Lamont) as *X. terrena* (Schaus); this specimen is in

NMS with Lamont's cabinet label and is a female *X. imitans*. My initial identification as *X. guarana* was by comparison with the type (USNM, ♀ Rio de Janeiro) (Schintlmeister 2016, USNM 2021). However, the terminalia of a Trinidad specimen (Appendix Fig. 19) are completely different to those illustrated by Chacon *et al.* (2017) as *X. guarana* and match none of the species treated in that work. This species has now been identified as the newly described *X. imitans* from Becker (2021b).

Taxonomic issues. The terminalia are almost identical with an unidentified species from the west coast of Costa Rica, which appears in BOLD as BIN BOLD:ACL4233 (I. Chacón pers. comm. 2020). Pending the availability of further DNA barcodes from South America, this BIN is assumed to represent *X. imitans*.

Fig. 123. Male *Xylodonta imitans*, South Oropouche, 15.viii.2021, T.P. Maharaj (iNaturalist observation 91386426). ©, under CC-BY-BC license.

Fig. 124. Female *Xylodonta imitans*, Penal, 8.iii.2014, K. Sookdeo. ©, with permission.

Identification. The irregular dark brown post-discal line, bordered internal by a pale yellow-brown line and externally by a white line, with the area distal to this grey-brown, contrasting with yellow-brown or brown area basal to it, make this species distinctive. Females are larger, have more weakly bipectinate antennae, and the area basal to the post-discal line is a brighter yellow-brown.

Biology in Trinidad. Guppy (1911) reported that 'roble' [*Platymiscium trinitatis*, Bignoniaceae] and 'poui' [*Tabebuia* spp. Bignoniaceae] was occasionally defoliated by this species (treated as *Dasylophia guarana*). They were parasitized by a tachinid fly, which Guppy referred to as *Winthemia quadripustulata* (Fabricius), but it is unlikely to be correctly identified as that polyphagous Holarctic species (Arnaud 1978, O'Hara *et al.* 2009). Lamont and Callan (1950) recorded that Lamont bred out a series of nine moths from larvae taken on roble (*Platymiscium*) at Palmiste, 1.i.1928 and 30.i.1928; Lamont's specimens with these dates, but not labelled as reared are in UWIZM. Laurence (1974) was more specific regarding food plants, referring to this species as a defoliator of yellow poui (*Tabebuia serratifolia*), black poui (*T. rufescens*) and roble (*Platymiscium trinitatis*), but this may be based on the earlier records, rather than fresh observations, as no specimens have been located. The species treated as *X. guarana* in Costa Rica feeds exclusively on Fabaceae (Chacon *et al.* 2017) offering further evidence that it represents a different species to that treated here.

Status in Trinidad. A fairly common and widespread species found in suburban and forest habitats.

Xylodonta scottmilleri Chacón, 2017

Fig. 105.

OD: Chacón *et al.* 2017: *Xylodonta scottmilleri*, TL Costa Rica

TT:*Dasylophia xylinata* Walker: Kaye and Lamont (1927) [misidentification]
Dasylophia terrena Schaus: Poulton (1939) [assumed misidentification]

Historical notes. Kaye and Lamont (1927) recorded this species as *Dasylophia xylinata* based on specimens from Palmiste (11 April 1916, N. Lamont; October 1921, F.H. Stent). I have not located Stent's specimen, but Lamont's is in NMS. I initially identified this species as *X. xylinata* (Walker) by comparison with the type of *xylinata* (NHMUK, ♀ Colombia), and the types of its synonym *pythia* Druce (NHMUK, ♂, ♀ Mexico). Recently, I examined the external male terminalia of three males in MJWC and dissected one, and was able to reidentify it as *X. scottmilleri* from the very

distinctive terminalia figures in Chacón *et al.* (2017) – once I worked out that the assymetrical A8 sternite and tergite are shown external surface downwards in their figure.

Poulton (1939) reported on a collection of insect wings from bat roosts in Trinidad, and included a record of a male *X. terrena*. The identifications were provided by NHMUK and OUMNH. It may be that these wings are preserved in one of these museums but I have not tried to find them. Since I have no evidence that *X. terrena* is a Trinidad species, I am assuming that this record is a misidentification of *X. scottmilleri*, which had yet to be described at the time.
Identification. See notes under *Nycterotis russula* (above).
Status in Trinidad. A common and widespread species in suburban and forest habitats.

Subfamily Dioptinae Walker, 1862

The species of this subfamily are mostly day-flying and many are apparently distasteful, based on their aposematic wing patterns and that many species of Josiini feed on Passifloraceae (Miller 1996, 2009). Becker (2014) did not include this subfamily in his checklist of American Notodontidae, referring instead to Miller's (2009) revision, which is followed here for phylogeny and nomenclature modified to reflect that the group is now treated as a subfamily of Notodontidae rather than a family in its own right.

Five species (one Dioptini and four Josiini) are recorded from Trinidad (Miller 2009), of which I have been able to substantiate two. The other three records are each based on single museum specimens, and need confirmation as Trinidad species as discussed below. Dioptinae appear to be weak fliers, and we can only speculate about the possibility of vagrants from the mainland, as I have found no information regarding mobility of Dioptinae. However, we do know that weak-flying, non-feeding species such as *Hylesia metabus* (Stoll) (Saturniidae) can be brought to Trinidad on wind currents (Polar *et al.* 2010), so this possibility should not be ignored. No Dioptinae have been recorded from Tobago (Cock 2017a).

Tribe: Dioptini Minet, 1983

***Erbessa* Walker, 1854**

Type species *Dioptis sobria* Walker, 1854, TL Brazil, Pará.

***Erbessa priverna* (Cramer, 1777)**

OD: Cramer 1777: *Phal[aena] Noct[u]a priverna*, TL Suriname.
TT: *Erbessa priverna* (Cramer): Miller (2009)
Historical notes. Miller (2009) noted a single female labelled Trinidad in NHMUK, collected by T.T. Dyer in 1922. As *E. priverna* is present in the Guianas and Venezuela, there is no reason why it should not occur in Trinidad. However, Miller (2009) stated that this species is common in collections, so it seems unlikely that this large (forewing length up to 25mm), colourful, day-flying species (Miller 2009, plate 6) should have only been collected once in Trinidad, and then by a visiting collector, rather than a resident or regular visitor. T.T. Dyer made a small collection of day-flying Lepidoptera in Trinidad in 1922 and again in 1923, and hitherto I have had no reason to doubt any of his records. The single specimen might be a vagrant. However, T.T. Dyer also collected in Suriname in October – November 1922, so a mix-up is not impossible. Possibly, it is simply a very rare resident, but this seems the least likely explanation.

Tribe Josiini Miller & Otero, 1994

***Ephialtias* Hübner, 1819**

Type species *Hypocrita abrupta* Hübner, 1806, TL [Suriname]

***Ephialtias tenuifascia* (Prout, 1918)**

OD: Prout (1918) *Josia Lyces tenuifascia*, TL Guyana
TT: *Ephialtias tenuifascia* (Prout): Miller (2009)
Historical notes. Miller (2009) noted a female in the AMNH collection labelled: 'Lady Chancellors Rd., St. Anne, Trinidad, 4 Mar 1933, leg. A.S. Pinkus'. There are no other records from Trinidad. Indeed, apart from one Venezuela record 'pending confirmation', this species is only otherwise known from Guyana (Miller 2009). This is a very conspicuous moth, black with a yellow bar on the forewing and a large red patch on the hindwing (Miller 2009, plate 29); it seems unlikely that it could have been overlooked in Trinidad by other collectors.

A.S. Pinkus visited Trinidad in 1933 and made a collection of insects including day-flying Lepidoptera. His specimens are labelled with detailed localities and date, and the impression is of a careful worker. I am aware of at least four species of Hesperiidae described from his Trinidad collecting (Bell 1934, 1959). Three of these are substantiated by other captures, but *Argon casca* Bell, which is now a synonym of *Moeros moeros* (Möschler) (Mielke 2004), has not been. The type specimen of *A. casca* was collected on 'Cascade Mountain Road, St. Ann's, Trinidad' 12 March 1933. When I reviewed this group of Hesperiidaae (Cock 2005), before I was aware that *A. casca* had been synonymized with *M. moeros*, I wrote 'This specles is a puzzle in Trinidad - apparently still only known from the original capture from a well-collected site, why has this distinctive large species never been caught again?'. Given that *M. moeros* is known from the Guianas, Amazon and Bolivia (Evans 1955), one possible answer is that it was

a vagrant from the mainland, while another is that it was mislabelled. Pinkus was also active in Guyana and donated collections of insects and fish to the AMNH (AMNH 1937, 1938, Lutz 1935), so it is not impossible that he collected these Lepidoptera specimens in Guyana, and there was subsequent confusion over the collection details. A vagrant specimen or a very rare resident are alternative explanations, and confirmation is needed that this is a species found in Trinidad.

***Josia* Hübner, 1819**

Type species: *Hypocrita ligula* Hübner, [1808], TL [Suriname]

***Josia ligula* Hübner, [1808]**

Fig. 125, 126.

OD: Hübner [1808]: *Hipocrita ligula*, TL [Suriname].

TT: *Josia ligula* (Hübner): Kaye and Lamont (1927), Miller (2009)

Josia oribia Druce: Cock (2003) [misidentification]

Historical notes. Kaye and Lamont (1927) recorded this species from Trinidad as *Josia ligula* (Hübner) (Dioptidae), based on a specimen captured at Penal, 9 March 1922 by Sir Norman Lamont. I have examined this specimen, a female in NMS.

Taxonomic issues. I have treated this species as *J. oribia* Druce (Cock 2003), having identified it as this based on an examination of the type of *J. oribia* (NHMUK, Peru, ♂). Miller (2009) considered *J. oribia* and *J. ligula* very similar and distinguished them based on the wide, distally rounded longitudinal stripes of the forewing and hindwing of *J. oribia*, which are not as wide in *J. ligula* and do not reach as close to the wing margin. Miller (2009) illustrated a male of *J. oribia* and a female of *J. ligula*, based on which Trinidad specimens (Fig. 125) seem intermediate, in some cases closer to *J. oribia*. However, Miller (2009) considered *J. ligula* to occur in the Guianas, Venezuela and Amazon, whereas *J. oribia* is restricted to the eastern Andes of Peru and Bolivia. In view of the geographical separation of the two, I here follow Miller's treatment and refer to this species as *J. ligula*.

Fig. 126. Female *Josia oribia*, Rousillac, 22 June 2013, K. Sookdeo. ©, with permission.

Identification. No other species in Trinidad has this appearance. The orange stripes are more extensive in the female, which has simple antennae compared to the bipectinate antennae of the male.

Status in Trinidad. This seems to be an uncommon species, with a few scattered records, mostly from the south of the island.

***Lyces* Walker, 1854**

Type species: *Lyces angulosa* Walker, 1854, TL Brazil

***Lyces ena* (Boisduval, 1870)**

Fig. 125. BIN BOLD:ABA9930.

OD: Boisduval (1870): *Retila ena*, TL French Guiana.

TT: *Ephialtias tryma* Schaus: Schaus (1896a) TL, Kaye (1901) [synonym]

Josia ena Boisduval: Prout (1918), Kaye and Lamont (1927), Hering (1925)

Lyces ena (Boisduval): Miller (1996), Miller (2009)

Historical notes. *Ephialtias tryma* Schaus was described from Trinidad (Schaus 1896a) and placed in the Cyllopodidae – a group of day-flying geometrid moths based on *Cyllopoda*, now treated as tribe Cyllopodini within Sterrhinae (Sihvonen and Kaila 2004). Kaye (1901) included a record from Maraval Valley (C.W. Ellacombe) under this name, which he placed in

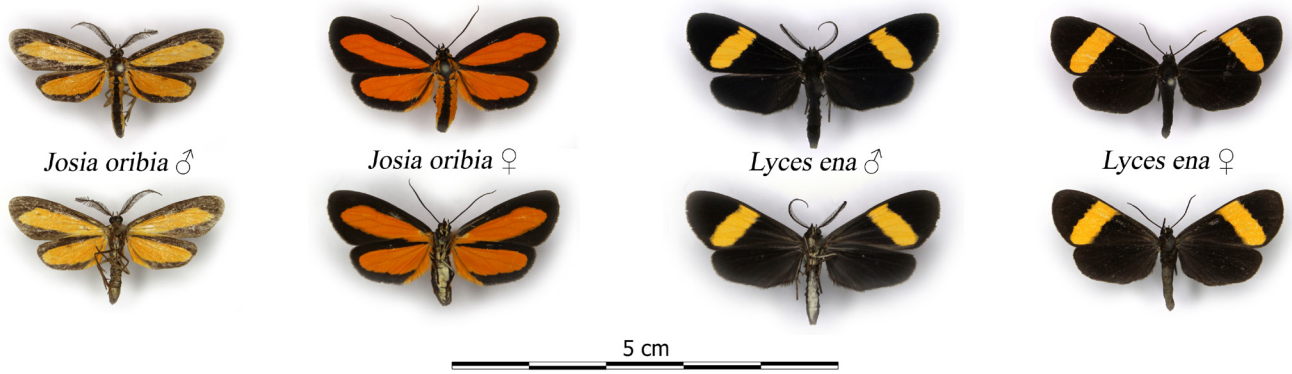

Fig. 125. Trinidad Dioptinae.

Oenochrominae (Geometridae). Prout (1918) indicated that *E. tryma* is a synonym of *Josia ena* in the Dioptidae. Kaye and Lamont (1927) followed this arrangement and included additional Trinidad records from Guaico (18.iv.1915, N. Lamont), Mitan (10.ii.1922, N. Lamont), Moruga (P.L. Guppy), and without locality (W.J. Kaye, F.W. Jackson, W.E. Broadway); most of these have been located and are listed below. Miller (2009) confirmed this synonymy and transferred *ena* to *Lyces*, listing a female he dissected from the Arima Valley (25 February 1957) in AMNH. I identified this species by comparison with a syntype of *J. ena* (NHMUK ♀) and the NHMUK series.

Taxonomic issues. A Trinidad specimen was DNA barcoded; it is the only specimen in BOLD identified as *L. ena*, and forms BIN BOLD:ABA9930 together with two specimens from Panama identified as *Lyces* sp.

Identification. This small black species with a broad yellow bar across the forewing is distinctive in Trinidad. It might be confused with the male of *Polyptychia hermieri* Miller (below) if that is confirmed as a Trinidad species, but that species has a more triangular forewing, a narrower yellow band and white hair-like androconia on the hind legs and in a pouch adjacent to the dorsum of the hindwing. Adults are quite variable in size. There is little sexual dimorphism apart from the bipectinate antennae of the male compared to the simple antennae of the female.

Biology in Trinidad. There is a specimen in NHMUK reared from passion flower in Moruga by 'Guppy' (assumed to be P.L. Guppy). It is known to feed on several species of *Passiflora* on the mainland (Miller 2009).

Status in Trinidad. This is a common and widespread species in Trinidad. Miller (2009) indicates there are additional specimens in other museums, including USNM.

***Polyptychia* C. Felder and R. Felder, 1874**

Type species *Polyptychia fasciculosa* C. Felder and R. Felder, 1874, TL Colombia

***Polyptychia hermieri* Miller, 2009**

OD: Miller 2009: *Polyptychia hermieri*, TL French Guiana.
TT: *Polyptychia hermieri*: Miller (2009)

Historical notes. Miller (2009) described this species from French Guiana, and included parts of the Amazon Basin in its distribution. He added 'A female from Trinidad bears a wing pattern and genital morphology (JSM-1744) suggesting it to be *P. hermieri*, which extends the species' range west across the Guyana Shield'.

Taxonomic issues. Miller (2009) did not seem convinced that the Trinidad female is true *P. hermieri*, and this would be a significant extension of its range.

Identification. See Miller (2009, pl. 27) for figures of the male and female, which are strongly dimorphic. The male might be overlooked as *Lyces ena* (above), under which differences are discussed. The female has a yellow band across the forewing and a small subapical yellow patch on the hindwing. It resembles some female forms of *Calodesma* (Erebidae, Arctiinae), but none of these seem to have the subapical spot on the hindwing. It also superficially resembles several Riodinidae species (*Isapis agyrtus* (Cramer), *Pirascca sagaris* (Cramer) ♀, *Xenandra helius* (Cramer) ♂) in colour and markings, but not flight and resting position, so is unlikely to be overlooked as one of these in the field.

Status in Trinidad. The only known record from Trinidad of this day-flying moth is the female without locality other than Trinidad in Carnegie Museum of Natural History examined by Miller (2009). As for the two other species of Dioptinae based on single records, this could represent a rare resident, a vagrant, or an error of labelling, so confirmation of this as a Trinidad species is desirable.

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New records of butterflies and moths (Lepidoptera) from Tobago, W.I.

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ABSTRACT

The following are new Lepidoptera records from Tobago: *Herpetogramma phaeopteralis* (Guenée) (Crambidae), *Celiptera levina* (Stoll), *Kakopoda progenies* (Guenée), *Lascoria purpurascens* (Kaye) (Erebidae), *Pleuroprucha hypoxia* Prout (Geometridae), *Carystoides basoches* (Latreille) (Hesperiidae), *Norape argyrorrhoea* Hübner (Megalopygidae) *Marimatha botyoides* (Guenée), *Micrathetis dasarada* (Druce), *Xanthopastis timais* (Cramer) complex (Noctuidae), *Hamadryas feronia* (Linnaeus) (Nymphalidae), *Phiditia ?cuprea* (Kaye) (Phiditidae), *Phereoeca uterella* (Walsingham) (Tineidae). Records of *Eulepidotis* sp. (Erebidae), *Neogalea sunia* (Druce) and *Tripudia quadrifera* Zeller (Noctuidae) are reidentified as *E. viridissima* (Bar), *N. caracara* Troubridge, and *T. lamina* Pogue respectively.

Key words: iNaturalist, Crambidae, Erebidae, Geometridae, Hesperiidae, Megalopygidae, Nymphalidae, Phiditidae, Tineidae

INTRODUCTION

The butterflies of Tobago are fairly well known, and an updated checklist of 150 species was recently published (Cock 2017a). In contrast, the moths of Tobago are not well known and only in 2017 was the first checklist of 355 species published (Cock 2017b). This is a small total compared to the more than 742 species extrapolated by Cock (2003), and many more moth species are expected to occur in Tobago, particularly those of smaller size. Cock and Kelly (2020) added 45 new records of moths from Tobago, based mostly on photographs taken by Kelly at the lights of his house near Englishman's Bay.

With no active collectors or entomologists currently involved in surveying the Tobago moth fauna, progress is limited to observations and images shared by resident and visiting naturalists and observers. Fortunately, the identification of photos of most species of Tobago moths is relatively straightforward given that (1) digital cameras or phones make taking identifiable images increasingly straightforward; (2) the Lepidoptera fauna of Tobago is, with very few exceptions, a subset of the fauna of Trinidad (Cock 2017b); (3) the moth fauna of Trinidad is now reasonably well known to the author, based on extensive collecting and museum work (Cock 2003). Furthermore, digital images are easily shared, facilitating rapid identification and feedback. Using this approach, I report here two additions to the butterflies and 11 to the moths of Tobago based on images posted on iNaturalist (www.iNaturalist.org) and include a voucher image for each new record. Three published records of moths from Tobago are reidentified.

I refer to material examined in the following collections: Matthew J.W. Cock, private research collection, Dolgellau, UK (MJWC), The Natural History Museum, London, UK (NHMUK), National Museums of Scotland (NMS), and the University of the West Indies Zoology Museum, St. Augustine, Trinidad and Tobago (UWIZM). As discussed in Cock (2017b) and Cock and Kelly (2020) identifications were made by comparison with the first author's collection of Trinidad moths (MJWC), which have been named primarily in the context of the collections of NHMUK and the National Museum of Natural History, Washington. Species are arranged by family alphabetically, and alphabetically within families; subfamilies are included in parentheses after each newly recorded species. Comments on the status of each species in Trinidad are based on the author's unpublished records; these give an indication of what the status of these species may be in Tobago. The figures show photographs taken in Tobago, except as indicated. © in the figure legend refers to the photographer. As the photographs are without any indication of scale, the forewing length (F: base of forewing – wing tip) is provided in the figure legends based on Trinidad material in MJWC.

CRAMBIDAE

Herpetogramma phaeopteralis (Guenée, 1854 (Spilomelinae)

This species is known as an occasional pest of lawn grass, and is sometimes abundant in Trinidad (Callan 1953). Perhaps surprising, Cock (2017b) knew of no records from Tobago, so recent photographs by Aaron Wheeler (Fig. 1) and Liam Wheeler (Black Rock, 29 August 2021) are the first for the island. To aid future identifications, Fig. 2 shows a clearer image from Trinidad.

EREBIDAE

Celiptera levina (Stoll, 1782) (Erebinae)

This species was described from Suriname. It is known from Trinidad (Kaye and Lamont 1927) and has been reported as a pest of sugar cane in Trinidad (Box 1954). Mark Hulme photographed a female at Bloody Bay (Fig. 3).

Fig. 1. Female *Herpetogramma phaeopteralis*, Plymouth, 24.viii.2021, A. Wheeler (iNaturalist observation 92504084); F 9 mm. © under CC-BY-NC license.

Fig. 2. Female *Herpetogramma phaeopteralis*, Trinidad, St. Augustine, 27.viii.2020, M. Hulme (iNaturalist observation 68547464). © under CC-BY-NC license.

Fig. 3. Female *Celiptera levina*, Bloody Bay, 4.i.2021, M. Hulme (iNaturalist observation 67617630); F 24 mm. © under CC-BY-NC license.

***Eulepidotis viridissima* (Bar, 1876) (Eulepidotinae)**

Cock and Kelly (2020) recorded and illustrated a *Eulepidotis* sp. photographed by Matt Kelly at light above Englishman's Bay on five occasions. Since then, Kelly found a dead specimen on 30 March 2020 which he forwarded to me. I was able to identify this as *E. viridissima*, although the green is a different tone to my Trinidad specimen. Further, a DNA barcode was obtained for this specimen (DNA sample MJWC-443), on the basis of which it forms part of Barcode Index Number BOLD:AAM8852 in the in the Barcode of Life Data System (https://v3.boldsystems.org/), which includes material from French Guiana, Ecuador and Peru, all identified as *E. viridissima*.

***Kakopoda progenies* (Guenée, 1852) (Erebinae)**

This species was described from St Thomas and Guadeloupe. It has not previously been recorded from Trinidad &Tobago, but I have female specimens from Curepe (17.viii.1980, 22-25.i.1981), which I identified by comparison with the NHMUK collection. Rachael Williams-Littzen found and photographed a female between Buccoo and Black Rock (Fig. 4).

Fig. 4. Female *Kakopoda progenies*, Buccoo to Black Rock, 22.xi.2020, R. Williams-Littzen (iNaturalist observation 68781859); F 13 mm. © under CC-BY-NC license.

***Lascoria purpurascens* (Kaye, 1923)**

Kaye (1923) described this species from Trinidad, and I identified it by comparison with the type in NHMUK. It is a common and widespread species in Trinidad. Amy Deacon photographed a male near Parlatuvier (Fig. 5).

GEOMETRIDAE

***Pleuroprucha hypoxia* Prout, 1938 (Sterrhinae)**

Trinidad material of this species was identified by comparison with the type (NHMUK, ♂ Venezuela). It has not previously been reported from Trinidad, but there are several records:

Fig. 5. Male *Lascoria purpurascens*, Parlatuvier, 4.i.2021, A. Deacon (iNaturalist observation 67663089); F 13 mm. © under CC-BY-NC license.

Caparo, Curepe, Morne Bleu Textel, North Coast lookout track. Liam Wheeler photographed one near Black Rock (Fig. 6). As the photo is not quite sharp a pinned Trinidad specimen is also shown for comparison (Fig. 7).

Fig. 6. *Pleuroprucha hypoxia*, Black Rock, 17.xi.2021, L. Wheeler (iNaturalist observation 91626535); F 10 mm. ©, under CC-BY-NC license.

Fig. 7. Female *Pleuroprucha hypoxia*, Trinidad, Morne Bleu Textel Installation, at light, 6.xii.1980, M.J.W. Cock [MJWC].

HESPERIIDAE

***Carystoides basoches* (Latreille, 1824) (Hesperiinae)**
This species is known from Trinidad (Cock 2005), but Rich Kosteeke's photo from Tobago (Fig. 8) is the first record I have seen from the island (Cock 2017a).

Fig. 8. Male *Carystoides basoches*, Tobago, 28.xi.2007, R. Kosteeke (iNaturalist observation 69887858); F 22 mm. © under CC-BY-NC license.

LIMACODIDAE

***Miresa clarissa* (Stoll, 1790)**
This species was treated as a new Tobago record by Cock and Kelly (2020), but was already included in Cock's (2017b) checklist.

MEGALOPYGIDAE

***Norape argyrorrhoea argyrorrhoea* Hübner, [1823] (Trosiinae)**
Norape is a species-rich genus of Megalopygidae, the last full treatment of which was that of Hopp (1934-1935), although Becker (1995) provided a checklist. I initially identified this species as *N. pura* (Butler) by comparison with the NHMUK collection and examination of the external male genitalia (Hopp 1927), but Becker (1995) made *N. pura* a synonym of *N. argyrorrhoea*. christiannezakour (iNaturalist name) photographed a specimen at Charlotteville (Fig. 9). *Norape plumosa* (Butler) also occurs in Trinidad and Tobago (Cock 2017b); it differs in having transverse shiny bands on the forewing, giving a ripple appearance.

Fig. 9. *Norape argyrorrhoea*, Charlotteville, 10.viii.2021, christiannezakour (iNaturalist observation 90872690); F 14 mm.

NOCTUIDAE

***Marimatha botyoides* (Guenée, 1852) (Eustrotinae)**
I identified this species from the NHMUK series, which includes material from Trinidad (Kaye and Lamont 1927) and confirmed this from Ferris and Lafontaine (2010). Sookdeo and Cock (2017) illustrate this species from Huevos Island. *Marimatha aurifera* (Walker) also occurs in Trinidad, but can be distinguished as it has no dark shading before the margin on the dorsal forewing. Mark Hulme photographed a specimen of *M. botyoides* at Bloody Bay (Fig. 10).

Fig. 10. *Marimatha botyoides*, Bloody Bay, 11.302N -60.638W, 6.i.2021, M. Hulme (iNaturalist observation 67687825); F 9 mm.

***Micrathetis dasarada* (Druce, 1898) (Condicinae)**
I identified Trinidad material as this species by comparison with the NHMUK series. It has been recorded from Trinidad by Lamont and Callan (1950), based on one or more specimens in NHMUK. Kaye and Lamont (1927) misidentified it as *Eublemma obliqualis* Fabricius; the specimens they refer to from Palmiste (22.xii.1921, 7.i.1922 N.L.) are in NMS, where I identified them as *M. dasarada*. It is an occasional species in lowland areas of Trinidad. Fig. 11 shows a specimen photographed at Bloody Bay by Mark Hulme.

Fig. 11. *Micrathetis dasarada*, Bloody Bay, 11.302N -60.638W, 4.i.2021, M. Hulme (iNaturalist observation 67617631); F 7 mm.

***Neogalea caracara* Troubridge, 2020 (Oncocnemidinae)**
This species was recently described from the Florida Keys (Troubridge 2020) and is also found in Brazil (Becker 2021) and Trinidad (M.J.W. Cock unpublished). Cock (2017b) listed *Neogalea sunia* (Druce, 1852) as a Tobago species, based on a male collected at mercury vapour light at Speyside, 14–17 May 1982 (M.J.W. Cock) [MJWC]. Examination of the male genitalia showed that this specimen is actually the newly described *N. caracara*. At this time, there are no confirmed records of *N. sunia* from Tobago, although it does occur in Trinidad.

***Tripudia lamina* Pogue, 2009 (Cobubathinae)**
Cock (2017b) reported this species from Tobago as *T. quadrifera* Zeller, based on specimens collected at Charlotteville. However, this overlooked a study by Pogue (2009) which showed that there are eight species of this appearance, which can be separated only by examination of their genitalia. Dissection of a male from Charlotteville showed that it is actually *T. lamina*. *Tripudia quadrifera* is a Nearctic species, but *T. lamina* is widespread in the Neotropics including Trinidad (Pogue 2009). A further species, *T. grapholithoides* (Möschler) occurs in Trinidad, where the author has reared it from pods of *Ruellia tuberosa* (Acanthaceae); it too is expected to occur in Tobago, as it is found in northern South America and the Lesser Antilles (Pogue 2009).

***Xanthopastis timais* (Cramer, 1780) complex (dark antennae) (Noctuinae)**

This is part of a species complex, traditionally known as the Spanish moth, *Xanthopastis timais*, and recorded as such from Trinidad (Kaye and Lamont 1927). Lafontaine and Schmidt (2011) indicate that there are at least six species in the complex. The whole complex is American, so Cramer (1779-1782) made an error when he described this species from the Coromandel Coast (India). I have examined Trinidad material and noted two probable species, one with dark antennae and the other with brown antennae. Unfortunately, Cramer's (1779-1782, pl. 275B) plate shows a specimen with pale antennae, so this does not resolve the identity of either of the Trinidad species. Accordingly, I currently refer to the two Trinidad species as *X. timais* complex, noting that one has dark antennae and the other brown. Neither form has been recorded from Tobago until now, so christiannezakour's photo of the species with dark antennae from Charlotteville is a new island record (Fig. 12).

Fig. 12. *Xanthopastis timais* complex (dark antennae), Charlotteville, 10.viii.2021, christiannezakour (iNaturalist observation 90802995); F 19–20 mm. © under CC-BY-NC license.

NYMPHALIDAE

***Hamadryas feronia feronia* (Linnaeus, 1758) (Biblidinae)**

This common Trinidad species does not seem to have been recorded from Tobago before (Cock 2017a). Liam and Aaron Wheeler photographed one near Lowlands, south-west Tobago (Fig. 13). This could be a vagrant, an overlooked resident or a newly established introduction; the last seems more likely given it is such a conspicuous species, so further observations may confirm this in the future.

Fig. 13. *Hamadryas feronia feronia*, Lowlands, 20.viii.2021, L. Wheeler (iNaturalist observation 91959810); F 35–39 mm. © under CC-BY-NC license.

PHIDITIIDAE

***Phiditia* ?*cuprea* (Kaye, 1901)**

Kaye (1901) described and illustrated *P. cuprea* from Trinidad. The doubly indented hindwing margin near the tornus has not been seen in any other similar Trinidad species. In life, the adults rest with the abdomen sharply curved to one side (Fig. 14), which should help distinguish this species in the field.

rastabenz (iNaturalist name) photographed a male in Tobago (Fig. 14) which resembles *P. cuprea* from Trinidad (Fig. 15) in markings, but it is darker and the markings are more contrasting. At this stage, with just one photographic record from Tobago, it is not clear whether this represents a distinct species, a subspecies of *P. cuprea*, or is just an unusual variety, but a Tobago subspecies of *P. cuprea* seems the likeliest. When specimens are available, this can be further evaluated.

Fig. 14. Male *Phiditia* ?*cuprea*, Castara – Parrot Hill, 24.vii.2021, rastabenz (iNaturalist observation 88454966). © under CC-BY-NC license.

Fig. 15. Male *Phiditia cuprea*, Trinidad, Maracas Valley, 25.xii.2019, R. Williams-Littzen (iNaturalist observation 36952855); F 22 mm.

TINEIDAE

***Phereoeca uterella* (Walsingham, 1897) (Tineinae)**

The larvae of *Phereoeca* spp. are case-bearing debris feeders found in houses throughout the tropics. There has been significant confusion in the literature regarding names, but the current view is that there are two species likely to be found in the Neotropical Region: the probably indigenous *P. uterella* and the Old World species *P. allutella* (Rebel) which is adventive in Latin America (Zimmerman 1978, Heppner 2005). The two species can be reliably separated only by examination of the genitalia. To date, only *P. uterella* has been recorded from Trinidad (Busck 1910; dissected identified material in MJWC, NHMUK, UWIZM), so at present I am assuming that all Trinidad and Tobago material is this species. This assumption should be checked at intervals as *P. allutella* can be expected to spread to the islands. Given that *P. uterella* definitely occurs in Brazil (Pará), Trinidad and the Virgin Islands, it is expected to occur in Tobago. Hence, Liam Wheeler's photograph of a larval or pupal case in Tobago (Fig. 16) is taken as confirmation that at least one *Phereoeca* species occurs in Tobago, and given our current state of knowledge, this is reported here as *P. uterella*. However, authoritative identification of Tobago material is needed to confirm this.

Fig. 16. Caterpillar or pupa case of *Phereoeca uterella*, Black Rock, 28.viii.2021, L. Wheeler (iNaturalist observation 92806195).

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Nature Notes

Dicephalic *Oxybelis rutherfordi* (Serpentes: Colubridae) hatchling in Trinidad, W.I.

Snakes with two heads are known as dicephalic, axial bifurcated or bicephalic snakes. They were first described 2400 YBP by Aristotle. Fascination with these animals resulted in many cases being reported worldwide. Two review papers by Wallach (2007, 2018) uncovered 1850 cases of snake dicephaly. These were based upon records in the primary literature, museum specimens, the internet, and images on postcards. From these cases, Wallach identified 213 species from 111 genera. Here we report on an occurrence of a dicephalic snake discovered by SM.

In early June 2019, a gravid adult *Oxybelis rutherfordi* Jadin *et al.* 2020 was collected from a poui tree (*Tabebuia* sp.) in Endeavour, Chaguanas, Trinidad by SM. It was kept in captivity and laid six eggs on 6 June. This timing and clutch size concurs with previous reports (Emsley 1977). The adult was then released the following day. The clutch contained one infertile and five fertile eggs, four of which hatched on 14 September 2019. These hatchlings were all healthy, but the fifth egg could not hatch unaided. SM cut open this egg and found a dicephalic snake (Fig. 1).

The snake was alive but only showing limited movement. Tongue flicking was observed from one of the heads. After a few hours it died of natural causes. Without human assistance it is most likely that this snake would not have hatched at all. Of 450 dicephalic snakes, for which there was data, 40% where stillborn and 18% died within hours or days (Wallach 2018) so this occurrence is not unusual. The extreme angle of the neck, approximately 1cm behind the heads, would likely have interfered with movement and feeding even if the snake had survived.

The two heads looked to be complete and separate with two short necks fusing together approximately 5mm from the back of the skulls (Figs. 2 & 3). An x-ray was taken (Fig. 4) and although the resolution was not very clear, it does seem to confirm that the skulls are totally separate and that the axis and atlas vertebrae are also separate making this a prodichotomous example of dicephaly (Smith and Pérez-Higareda 1987).

The total length of the specimen was 321mm and the snout to vent length (SVL), 203mm. This is similar to the 200mm SVL for hatchlings reported by Murphy *et al.* (2018).

As far as we are aware there have been no records of dicephaly in the genus *Oxybelis* and no records of any occurrences of two-headed snakes in Trinidad (V. Wallach per. com.). Therefore, this note is a first record for dicephaly in the genus and species and for its occurrence in Trinidad.

Fig. 1 *Oxybelis rutherfordi* hatchling with yolk sack and egg attached. Scale in cm.

Fig. 2 Dorsal view of dicephalic *Oxybelis rutherfordi* heads.

Fig. 3 Ventral view of dicephalic *Oxybelis rutherfordi* heads.

The specimen was preserved by MGR using formalin and is currently kept in SM's private collection.

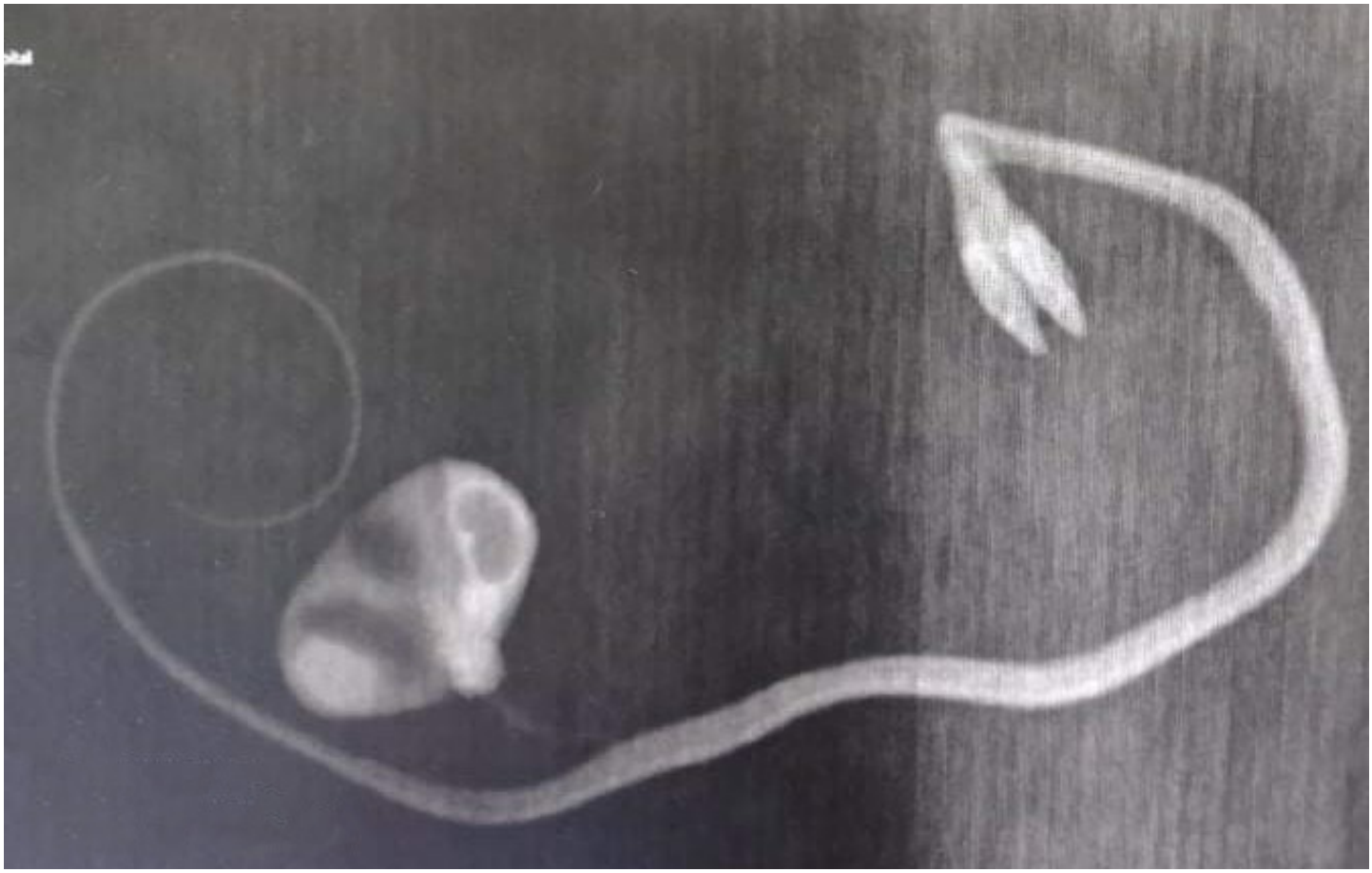

Fig. 4 X-ray of *Oxybelis rutherfordi* hatchling with yolk sack and egg attached.

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A Tale of Two Species in Tamana Caves (Trinidad, W.I.): Tropical Wolf Spider *Ancylometes bogotensis* (Ctenidae) preying upon Trinidadian Stream Frog *Mannophryne trinitatis* (Aromobatidae)

Currently there are close to 50,000 accepted species of spiders worldwide, belonging to 129 families (World Spider Catalogue 2021). Fifty-four of these families are found in Trinidad and Tobago (Sewlal and Cutler, 2003; Sewlal 2019). Spiders are emerging model organisms to study disturbance of biodiversity due to their global distribution, size, morphology, behaviour and habitat specificity (Čandek *et al.* 2019). In general, spiders display the behaviour of opportunistic predators (Vollrath and Selden 2007). It is well documented that the tropical wolf spider *Ancylometes bogotensis* (Keyserling 1877) can capture a prey much heavier and larger than itself and can move it with ease (Todelo *et al.* 2007). In Trinidad, *A. bogotensis* was reported to prey on the killifish *Anablepsoides hartii* (Deacon *et al.* 2015), the freshwater crab *Poppiana dentata* (Bhukal *et al.* 2015) and two amphibians: the bufonid *Rhinella beebei* (snout-to-vent length (SVL) 51-61mm) (White 2015) and the leptodactylid *Leptodactylus validus* (SVL 42-50mm) (Auguste *et al.* 2018).

We visited the Tamana caves located in central Trinidad (Fig. 1) on 30 April 2018 in the period 1100h to 1430h. There is a well known, relatively isolated, population of the Trinidadian stream frog *Mannophryne trinitatis* (Garman 1887) that inhabits these caves (Kenny 1969). The field trip was part of ongoing research activities carried out at the Department of Life Sciences (UWI) to identify the biologically-active components in skin secretions of frogs of Trinidad and Tobago that might confer protection against infections and predators (Mechkarska *et al.* 2018; Barran *et al.* 2020).

The entrance to the caves was humid and we noticed the presence of various bats and several arthropod species. To gain access, we had to crawl through a short narrow horizontal tunnel. The cave floor was blanketed with leaves, shrubs and twigs. There were large amounts of bat guano and slow-flowing waterways as we manoeuvred through interconnected caverns. At the end of one of those caverns, we found a population of *M. trinitatis*. This particular cavern had an open overhead space and was under the canopy of several large trees.

The Trinidadian stream frog *M. trinitatis* (also known as the yellow-throated frog and the Trinidad poison frog) is endemic to Trinidad (Murphy *et al.* 2018). They are small brown frogs with a black postocular stripe often extending onto the body, and their toes lack webbing (Fig. 2A). The females are slightly bigger, lighter in coloration with an intense yellow-pigmented throat that distinguishes them from the males (Fig. 2B). The males are darker and turn almost black when calling (Fig. 2C). This species displays parental care to increase offspring survival; the males carry the tadpoles on their backs (Fig. 2D) to protect them from desiccation of rearing pools and from predation by killifish, prawns, crabs and snakes. Because of pollution, habitat loss and habitat degradation, the frog was listed on the IUCN Red List as "vulnerable" (Angulo 2010). However, as the population is reported to be abundant and thriving, its status has been revised to "least concern" (IUCN SSC Amphibian Specialist Group 2020).

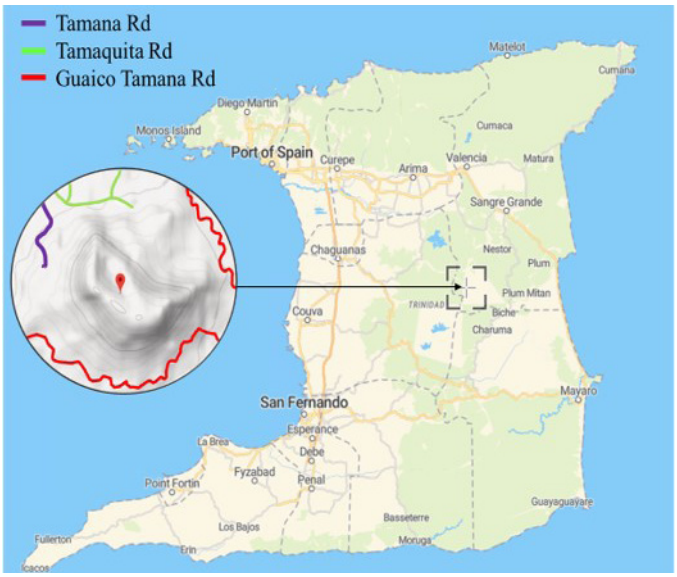

Fig. 1. A map of Trinidad including a topographic representation of Tamana caves on the North Slope of Mount Tamana (GPS 10.469818, -61.193698; elevation approximately 200-240m above sea level) (image: maptiler and Google Maps modified by Gervonne Barran).

During the collection of the diurnal terrestrial frogs for sampling, we made a fortuitous observation of a predation event that took place on the cave floor. The spider, identified to be *A. bogotensis* from the photos taken, was hidden amongst a small rock formation. As the group of juvenile *M. trinitatis* dispersed while being collected, the spider lunged and captured one individual (Fig. 3). The frog showed neither signs of distress nor attempted to free itself remaining immobile, most likely because the spider paralysed it quickly. The venom of *Ancylometes rufus*, another species of the Ctenidae family, is known to have a rapid effect - paralysis occurring in 45 seconds - on an individual frog (Pinto and Costa-Fields 2017). The spider with its catch then retreated

Fig. 2. (A) Lateral view of *M. trinitatis* displaying the black postocular stripe. (B) Ventral view of yellow-throated female (left) and a male (right). (C) Calling male turning jet black. (D) Male frog carrying tadpoles on his back.

into a nearby crevice, thus precluding our observation of consumption of the prey.

The adult frogs have a SVL of ~22mm and weight of about 1.3g (Murphy *et al.* 2018). We measured the SVL of the frogs before collecting their skin secretions to confirm that they were adults. Using those measurements and the picture in Fig. 3 (bottom), we estimated the length of the spider body to be approximately 20-22mm, if measured from cephalothorax (fused head and breast) to the opisthosoma (abdomen). This indicated that the size of the prey and the body of the predator in this case were relatively similar.

This is the first report of *M. trinitatis* being preyed upon by *A. bogotensis*. Given the relatively secluded nature of the Tamana caves, and the species of bats, arthropods and frogs inhabiting it, we assumed that there were well-established food chains. Small frogs are prey species, especially for spiders that display such opportunistic behaviour as already reported. Since *A. bogotensis* is the only spider belonging to this genus found in Trinidad and Tobago, this note adds to the existing body of knowledge providing opportunities for further studies of the feeding behaviour, ecology and distribution of the species in the country.

Fig. 3. Predation on *Mannophryne trinitatis* by *Ancylometes bogotensis* in Tamana caves, Trinidad. Top: side view of the predator-prey pair. Bottom: dorsal view of the pair used for size comparison.

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Observation of a Trinidad Motmot *Momotus bahamensis* using an anvil to prey on a Manicou Crab *Rodriguezus garmani* (Decapoda: Pseudothelphusidae), in Tobago.

Motmots are highly adaptable birds that predate on a variety of vertebrates including small birds (García-C and Zahawi, 2006), small mammals (Chacón-Madrigal and Barrantes, 2004), amphibians (Master 1999) and invertebrates such as beetles, centipedes, millipedes, cockroaches and scorpions (ffrench 1991). They may strike their prey on the ground, a tree branch or other hard objects to either stun or kill it before swallowing it (Sandoval *et al.,* 2008, Skutch 1971). Forcefully striking their prey may also soften and dismember it for ease of feeding it to young birds (Skutch 1964). The Trinidad Motmot *Momotus bahamensis* has been observed by Rutherford and Bianco (2014), on camera traps and through direct filming, habitually using rocks as anvils to smash open the shells of snails. The majority of shells they observed were from *Plekocheilus glaber* (Gmelin, 1791) (Stylommatophora: Amphibulimidae), a species of land snail. At the anvil sites, the remains of several other taxa including Coleoptera, Decapoda, Diplopoda and Neogastropoda were found, however, there was no direct observation that these remains resulted from predation by the Trinidad Motmot. Some of the remains were from the Manicou Crab *Rodriguezus garmani* (Rathbun, 1898) (Rutherford and Bianco, 2014). The Manicou Crab or Mountain Crab is found in the eastern coastal ranges of Venezuela, Margarita, Trinidad and Tobago (Rodriguez 1966, Rostant 2005) at high elevations (Stonley 1971) in self-constructed burrows, beneath rocks and in between rock crevices near clear, flowing streams. They are generally encountered at night but may be seen out in the open during the day after rainy weather (Maitland 2003). This article serves as confirmation that the Trinidad Motmot utilizes rocks as anvils when predating on the Manicou crab.

On 5 May 2018, at 1119h while trekking along the Gilpin trail, Main Ridge Forest Reserve, Tobago, I observed a Trinidad Motmot perched on a rock projecting approximately 16cm above water level within a shallow, slow-moving stream (Fig. 1) (UTM 20P 1249011N 761200E, elevation 450m above sea level). The bird remained on the rock for about five minutes, allowing the author to photograph it, before taking off towards us and flying very low to the ground to a burrow in the bank of the trail. There, it quickly pulled a Manicou crab out of the burrow and flew over to a rock

Fig. 1 *Momotus bahamensis* perched on a rock, immediately before preying upon a Manicou Crab *Rodriguezus garmani*.

further down, in the middle of the trail. There, it could be seen swinging its head and striking the crab against the rock. The crab would sometimes slip out of the beak of the bird, be ricocheted off the rock to a short distance away and then be retrieved by the bird. It continued its process of extracting the food for around three minutes before flying off into a tree. When observing the anvil site afterwards, we noticed the crab's chelae, its carapace, a few walking legs and other broken pieces of its exoskeleton. The crab was categorized as a sub-adult due to the width of its carapace measuring more than 25mm but less than 50mm and being reddish-brown in colour (Rostant *et al.* 2008). To our knowledge, this is the first recorded observation of Trinidad Motmot using a rock as an anvil to predate a Manicou crab. This note contributes to the information regarding the use of anvils by the Trinidad Motmot and hopes to encourage further research on the use of tools by birds and other animals.

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First Records of the Terrestrial Nemertean *Geonemertes pelaensis* (Hoplonemertea; Prosorhochmidae) in Trinidad, W.I.

The terrestrial nemerteans are an unfamiliar group of animals to most people, the authors included. At first sighting they are often mistaken for terrestrial planarians or flatworms. Nemerteans are a relatively small phylum with approximately 1149 species known worldwide (Gibson 1995), of these the vast majority are aquatic and only a handful are terrestrial.

This note is an account of the first reports of *Geonemertes pelaensis* Semper, 1863 from the island of Trinidad. The first sighting was by HA when on a night walk to the Double River Waterfall, Madamas Road, Brasso Seco on 21 June 2020 at 02:57h. What was initially thought to be a single worm was observed on the rocks surrounding the top of a small 2m high waterfall (approximate location UTM 693990E, 693990N, 174m elevation). The rocks were wet and covered in moss and lichen. An estimate of length of the worm suggested that it was more likely to have been two individuals intertwined, each one approximately 6cm long. One worm moved its upper body very slowly during the period that it was observed. The sighting was added to iNaturalist (https://www.inaturalist.org/observations/58937963).

The second sighting was by RND in the forests of Moruga in the Iniss Oilfields (approximate location UTM 693990E, 693990N, 37m elevation) during fieldwork on 6 September 2020 at 20:48h. The specimen measured approximately 8cm long, although it could have been shorter. It was found on the leaf of a *Heliconia* sp. about 1.5m off the ground. It remained motionless for the period that it was observed. It was noted that the leaf of the Heliconia had tiny water droplets due to the high levels of moisture in the air. The sighting was added to iNaturalist (https://www.inaturalist.org/observations/58838224).

Although the worms were not collected for closer examination, *G. pelaensis* is a distinctive looking species and can be identified from photographs according to nemertean expert Leigh Winsor, who made the first identifications for both records on iNaturalist.

According to Moore (1985) this species is Indo-Pacific in origin but it has spread throughout the tropics. Records for the Caribbean region include Cuba (Morffe *et al.* 2020), Dominica (Moore and Moore 1982), Jamaica (Moore and Gibson, 1986), Guadeloupe and Martinique (L. Winsor, per comm.). These two observations of *Geonemertes pelaensis* were both in fairly remote areas of forest some distance from human habitation. This could be thought to be unusual for an introduced species but given Trinidad's past agricultural history and the wide range of plant species that have been brought to the island over hundreds of years there would have been ample time for the worms to distribute widely.

Fig. 1 Possibly two *Geonemertes pelaensis*, Double River Waterfall, Brasso Seco

Fig. 2 *Geonemertes pelaensis*, Iniss Oilfields, Moruga

The fact that this species could easily have been mistaken for terrestrial Platyhelminthes may have contributed to the reason that it has not been recorded from Trinidad previously.

The first sighting in Trinidad was in montane forest and the second in semi-evergreen seasonal forest (Helmer *et*

al. 2012), compared with the records from Cuba where the specimens were collected in a garden on the outskirts of a city and in semi-deciduous forest (Morffe *et al.* 2020); it shows that *G. pelaensis* is a very adaptable species able to survive in many habitats. Both sightings were made at night-time, which is when this species is known to be active (Gerlach 1998).

G. pelaensis is a hermaphrodite, a characteristic that makes dispersal much easier (Moore *et al.* 2001), and which makes the first record mentioned here of two specimens together all the more interesting.

To encourage further observations, it is important that people can differentiate between terrestrial planarians and nemerteans. Leigh Winsor provided us with following guide: "*Terrestrial nemerteans tend to move relatively slowly, with the anterior end "nodding" from side to side compared to the more extensible active vibratory tactile movement seen in most land planarians, and if you gently prod a specimen, the nemertean generally everts its proboscis; land planarians do not have a proboscis. Finally, the eye pattern on the anterior end - in nemerteans the eyes are generally in distinct clusters, whereas in planarians there may be just two eyes anteriorly, or if multiple eyes they usually contour the anterior end, generally in a single row, may cluster antero-laterally, and generally pass along the sides of the body."*

Although the request and suggestion for further study is perhaps overstated in these Nature Notes, in this case we feel it is warranted so that actual specimens can be collected for examination. For notes on preservation techniques see Winsor (1991).

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Diurnal Nesting of the Hawksbill turtle *Eretmochelys imbricata* in North East Trinidad, W.I.

Hawksbill turtles *Eretmochelys imbricata* can be found globally in tropical oceans. Their wide distribution includes the Caribbean Sea and Atlantic Ocean, yet they have low nesting densities of fewer than 100 nesting females per year for most countries in the Caribbean (Murphy *et al.* 2018). In 1975, the Atlantic population of hawksbill turtle was added to Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Mortimer and Donnelly 2008), due to international trade issues which contributed to its decline in proceeding decades. In the 1990s it was listed as critically endangered on the IUCN Red List of Threatened Species due to further global decline (Mortimer and Donnelly 2008), with an estimated maximum of 5000 females nesting per annum in the Caribbean (Beggs 2007, Meylan 1999). This is one of five marine turtles found in Trinidad and Tobago, all of which have been designated as Environmentally Sensitive Species (ESS) by the Environmental Management Authority (ESS Rules, 2001 through Legal Notice Nos. 88-92 of 2014).

Hawksbills are primarily spongivorous, but their diets also include a variety of other invertebrates like tunicates (sea squirts) and zoanthid corals (León and Bjorndal 2002). Juvenile and adult life stages forage in sponge and coral populated reefs, in addition to reef walls, and hard-bottom habitats within the tropics (León and Bjorndal 2002). They can also be found in clear water estuaries and mangroves (Murphy *et al.* 2018; Phillips 2013 and Beggs *et al.* 2007).

They are solitary nesters, often nesting at the back of beaches near vegetative berms (Murphy *et al.* 2018). There is a dearth of information regarding nesting of hawksbills due to challenges to data collection such as few tagged females, non-annual nesting, males remaining at sea and remigration periods of females ranging between 1 and 6 years (Murphy *et al.* 2018; Phillips *et al.* 2014 and Beggs *et al.* 2007). Moreover, nesting sites for the hawksbill in Trinidad and Tobago are usually located on small inaccessible beaches and at times in close association with shallow offshore reefs (Save Our Sea Turtles 2015).

In the western Indian Ocean nesting occurs year-round but peaks December to January and is a diurnal event with some idiosyncratic nocturnal nesting (Phillips *et al.* 2014). This is similar to nesting behaviour in northern Brazil (Vieita and Godfrey, 1999). On the Pacific coast of Costa Rica nesting occurs July to December but peaks July to August (Bjorndal *et al.* 1993). Within the Caribbean, nesting is primarily nocturnal (2100h to 0300h) and peak nesting months vary (Walker and Gibson 2015). In Barbados peak nesting occurs from June to August with only 32 occurrences of diurnal nesting were documented over an eight-year period (Beggs *et al*. 2007). In Antigua, nesting is common from June to November (Richardson *et al.* 1999) and in Turks and Cacaos fresh nests can be found in the months of January and September to October (Richardson *et al.* 2006). The National Sea Turtle Recovery Action Plan for T&T purports hawksbill nesting occurs mainly from July to November in Trinidad and April to November in Tobago, although it should be noted that local studies of nesting hawksbills are limited (Forestry Division *et al.* 2010). In Tobago, the NGO Save Our Sea Turtles' annual reports have regularly documented nesting by hawksbills in the months of May through November, with occasional off-season nesting in the months of January through April (Save Our Sea Turtles 2015).

In Trinidad hawksbills have been found to nest along the north and east coasts as well as on the Bocas Islands (Dow *et al.* 2007, Eckert and Eckert 2019). In Tobago, hawksbill nesting is widely distributed around both coasts (Walker *et al*. 2015). Hawksbill nesting is typically diffuse and with limited patrols around the islands data on the distribution and abundance of nests is limited. This widespread distribution of nesting combined with the strong natal nest site fidelity exhibited by hawksbills can also mean that Trinidad and Tobago has the potential to host multiple distinct genetic stocks that experience limited gene flow, such as has been recorded for Barbados between hawksbill rookeries separated by as little as 30km (Browne *et al*. 2010).

This Nature Note seeks to highlight an unusual diurnal nesting event by a hawksbill sea turtle. The nesting occurred between 1200h and 1400h on 18 January 2020, at Penzance Beach, Guayamara Bay (10°46'12.4"N 60°56'54.6"W). The nest site was less than two metres from the edge of the Toco Main Road. Several children and an adult (Mr. Rameshwarsingh) from a nearby village stood guard at the nest. They alerted us of the turtle's presence. Prior to our arrival, a poacher (adult male) took some of the eggs while the turtle was still laying. Mr. Rameshwarsingh said he frequently volunteers his services during nesting seasons for patrols and was happy to see the children showing so much concern for the turtle's well-being. Figure 1. shows the female hawksbill turtle laying with one of the local children 'standing guard' to dissuade others from harming the turtle.

The proximity of the nesting turtle to the road raises concerns related to anthropogenic impacts on marine turtles due to road infrastructure. The close proximity of the road and any future development to the nesting site can impact this nesting beach due to coastal erosion, pollution (noise, litter and light) as well as direct habitat loss by vegetation clearing and drainage manipulation.

Fig.1. Hawksbill turtle *Eretmochelys imbricata* nesting at noon along the Toco Main Road, Penzance Beach, Guayamara Bay on 18 January 2020. Note the utility posts in the background. Several children stood guard to dissuade potential poachers.

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Eighteenth Report of the Trinidad and Tobago Birds Status and Distribution Committee, Records Submitted during 2020

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The Trinidad and Tobago Birds Status and Distribution Committee (TTBSDC) was established in 1995 to assess, document and archive the occurrence of rare or unusual birds in Trinidad and Tobago and thus provide reliable long-term monitoring of our rarer species. We have assessed all records submitted during 2020. A total of 95 records were assessed, representing 48 different species, in a year where fieldwork was seriously impeded by the onset of the global COVID-19 pandemic. One species was added to the National Official List and a further two species were found in Tobago for the first time. As in previous years, we commend the quality of photographic submissions by so many observers. Of the submissions assessed, in only five cases did we find the identification inconclusive.

The Committee is comprised of the following members: Martyn Kenefick (Secretary), Faraaz Abdool, Geoffrey Gomes, Nigel Lallsingh, Bill Murphy, Kris Sookdeo and Graham White. There are instances where we have benefited from supporting international expert knowledge to assist us with certain identification issues. We acknowledge with thanks the invaluable assistance provided by Pete Clement, Dave Cooper, Bob Flood, Keith Hansen, Steve Howell, Tom Johnson, Chris Rimmer, David Sibley, James Smith, Sheri Williamson and Joe Wunderle.

Archived records including photographic submissions number 1,666 at the end of 2020. This report is the eighteenth report of this committee. All reports were published in Living World and are available at https://ttfnc.org/livingworld/index.php/lwj/issue/archive.

The list of species considered by the TTBSDC, together with the Official List of the Birds of Trinidad and Tobago and details of all accepted records by the Committee can be accessed from our website at http://rbc.ttfnc.org. We urge finders to document and report their sightings to us.

Records presented below follow the revised nomenclature and taxonomic order of the South American Classification Committee as at December 2020 (Remsen *et al.* (2021). All sightings occurred in 2020 unless otherwise stated.

Records accepted

A female **Comb Duck** ***Sarkidiornis sylvicola*** was found in Caroni Rice Project on 24 June (JMM, DN). The bird remained for several days but elusive. Whilst widespread throughout much of South America, it is a rare austral wanderer to Trinidad. This is the first documented sighting for ten years.

A male **Northern Shoveler** ***Spatula clypeata*** in non-breeding plumage was found in a flooded field at Caroni Rice Project on 20 October (RJ, MK). With just five documented records in the last 20 years, this remains a very rare visitor from the north with sightings from October-February.

An immature **Lesser Scaup** ***Aythya affinis*** was photographed in flooded fields and lakes at Caroni Rice Project on 28 November (CC, MK, NL). Altogether, 17 birds have been found in the last ten years, nine of which have occurred during the last week of November.

A pair of **Masked Ducks** ***Nomonyx dominicus*** were found in a flooded weedy field within Caroni Rice Project on 31 October (NL). This is a rarely seen, extremely shy resident of both Trinidad and Tobago which usually remains hidden in well-vegetated stands of water.

A pair of **Eurasian Collared Doves** ***Streptopelia decaocto*** were photographed in a residential area of Chaguanas on 24 May (KF) (Fig. 1). Elsewhere, one was seen along Rahamut Trace on 16 August (FA). Having been introduced initially into the USA and subsequently The Bahamas, this species is now spreading through the Antilles island chain south to at least St. Lucia and Barbados.

Fig. 1 Eurasian Collared Dove, *Streptopelia decaocto*. Chaguanas, 24 May 2020. Photo Kevin Foster .

Single **Dark-billed Cuckoos** ***Coccyzus melacoryphus*** were found adjacent to Caroni Rice Project on 2 August (DH, NL) and at Orange Grove on 11 October (DH). There is now a pattern emerging of mid-year sightings of this austral cuckoo with 16 documented records in the last 16 years; all but one during the period 12 July to 31 August.

A male **Amethyst Woodstar** ***Calliphlox amethystina*** in non-breeding plumage, was found feeding on Vervain bushes at Asa Wright Nature Centre on 16 May (JMM, DN, MK) and seen intermittently in the grounds until 26 May. There have now been sightings in each of the last six years ranging from the end of April to the end of July.

For the fourth year running a **Double-striped Thick-Knee** ***Burhinus bistriatus*** was found day-roosting within the Queens Park Savannah, Port of Spain. First observed on 29 August, it remained until 26 September at least (Bd'A). Of the 17 documented sightings in the last 25 years, all but two have occurred between 6 July and 7 September.

Two **Upland Sandpipers** ***Bartramia longicauda*** were found in a wet grassy field within the Caroni Rice Project on 31 October (NL). Of the 16 birds found in T&T during the last 20 years, all but one occurred on southbound migration between 29 August and 31 October.

A **"Eurasian" Whimbrel** ***Numenius phaeopus phaeopus*** was carefully studied and photographed in Bon Accord, Tobago on 14 February (TJ *et al.*). This nominate form is visually separable from the *hudsonicus* subspecies found throughout the New World by colder plumaged tones, whitish underwing coverts and a white wedge from rump to mid mantle. This is just our second documented record, previously only seen at Turtle Beach, Tobago in February 2001.

The year 2020 was a "bumper year" for sightings of **Buff-breasted Sandpiper** ***Calidris subruficollis*** with a total of 18 birds present between 16 September and 10 October. Records were as follows: two at Rahamut Trace (JMM); 12 on Caroni Rice Project (MK, NL) and four in Orange Grove farmland (MK, RJ). This species is a "high Arctic" breeder which winters on southern South American grasslands. It is considered "near threatened" by IUCN. Over 80 birds have been found in T&T during the last 20 years with 88% occurring during the southbound migration window of 16 September to 28 October.

An immature **Ring-billed Gull** ***Larus delawarensis*** was found flying along the shoreline at Carli Bay on 1 January (TJ *et al.*). This remains a very scarce visitor to the west coast of Trinidad from continental North America and is the first documented sighting since 2016.

An exhausted **Great Shearwater** ***Ardenna gravis*** was rescued from the tide line at Mayaro beach on 7 June (RP, SP) (Fig. 2) It did not survive the night. This was the first documented report for 16 years. This species breeds on islands in the South Atlantic, then undertakes a migration loop via the eastern seaboard of North America. Almost all sightings in T&T have been during June and July.

Fig. 2 Great Shearwater *Ardenna gravis*, Manzanilla Beach,7 June 2020. Photo Raymond Parkinson.

A **Gray Heron** ***Ardea cinerea***, first found on the west coast tidal mudflats in 2016 was seen intermittently all year by many observers.

An adult **Capped Heron** ***Pilherodius pileatus*** flew out of a small ravine close to the shore at Granville on 16 May. It was photographed heading into a heavily forested area and not seen subsequently (RG) (Fig. 3). This is the first documented record for T&T. It is a secretive and generally scarce resident throughout much of South America.

Fig. 3 Capped Heron *Pilherodius pileatus*, Granville, 16 May 2020. Photo Rishi Goordial.

A juvenile **Roseate Spoonbill** ***Platalea ajaja*** was found feeding in a west, grassy field within Caroni Rice Project on 5 September (NL). This is just the fifth documented record in the last 25 years with all previous sightings being from the same geographic area.

An adult male **Snail Kite** ***Rostrhamus sociabilis*** was photographed inside Aranguez farmland on 13 June (CC) and a female was found there on 22 October, remaining until the 30th at least (RJ, MK). Elsewhere one, possibly two, were present on Caroni Rice Project from 1 August until the end of the year (NL *et al.*).

What is presumed to be the same **Roadside Hawk *Rupornis magnirostris*** that frequented the Cascadoux Trace, Kernaham settlement area during the early part of 2019 was once again photographed on 22 January (FB, MR). Its whereabouts in the intervening nine months remains a mystery.

An immature **White-tailed Hawk *Geranoaetus albicaudatus*** was photographed perched on a coconut tree stump along Fullerton Rd., Icacos on 8 November (KF, RAR)(Fig. 4). Of the nine documented records during the last 20 years, this is the first sighting from the south-west peninsula.

Fig. 4 White-tailed Hawk, *Geranoaetus albicaudatus*, Fullerton Rd. Icacos, 8 November 2000. Photo Kevin Foster.

An adult **Zone-tailed Hawk *Buteo albonotatus*** was photographed flying along the leeward coast of Tobago on 22 February (KF, DHu). Whilst there have been several anecdotal reports, this was the first documented record for the island.

Whilst **Crested Caracara *Caracara plancus*** is now established throughout much of Trinidad, with several confirmed breeding sites, two birds were found on 25 October in the Mt. Irvine area of Tobago, constituting the first documented record of the species for the island (KT).

There now appears to be regular post-breeding dispersal of **Small-billed Elaenias *Elaenia parvirostris*** northwards to Trinidad during the austral winter. First to show were two birds at Millennium Golf Course on 8 June (RJ) followed by two more at Orange Valley on 17 July (NL). Up to six birds were present along the borders of Caroni Rice Project from 23 July to 29 August (NL, MK) whilst three birds were present at Carlsen Field on 15-16 August (DH, VR). Finally, one was photographed along Tortuga Shortcut Road on 27 September (FA).

A **Lesser Elaenia *Elaenia chiriquensis*** was carefully studied and photographed at Carli Bay on 22 March (NL). This is an infrequently identified resident species in lowland Trinidad, however our understanding of its status and distribution may be distorted by its very close visual resemblance to the larger and common Yellow-bellied Elaenia.

A **Yellow-throated Vireo *Vireo flavifrons*** was found foraging in the canopy along Gilpin Trace, Tobago on 16 February (TJ *et al*.). This is an extremely rare migrant visitor from continental North America with just two records over the last 30 years.

Single **Black-whiskered Vireos *Vireo altiloquus*** were photographed at Chaguaramas on both 26 December 2019 and 19 July (BdA) whilst another was found on Morne Blue on 6 June (JMM, DN). Whilst this species is a fairly widespread resident throughout much of the Lesser Antilles, it has historically been considered a non-breeding winter visitor to T&T. These sightings may reflect a gradual change in status.

A **Cliff Swallow *Petrochelidon pyrrhonota*** was found hawking for insects over Caroni Rice Project on 26 September (NL, MK). Whilst found almost annually, this remains an uncommon passage migrant to both islands.

A 1st winter plumaged **Gray-cheeked Thrush *Catharus minimus*** was photographed along the Blanchisseuse Rd. on 22 November (JMM)(Fig. 5). This was the first documented sighting in Trinidad since 1989 of this migrant thrush which predominantly winters in north-eastern Colombia.

Fig. 5 Gray-cheeked Thrush *Catharus minimus*, Blanchisseuse Road. 22 November 2020. Photo Jason-Marc Mohamed.

Eight **Bobolinks *Dolichonyx oryzivorus*** were found feeding in grassy fields along Rahamut Trace on 16 October (FA, JMM) (Fig. 6) shortly followed by a flock at the Caroni Rice Project. Initially 80 birds were sighted but this increased to at least 200 birds by the end of the month (NL *et al.*). October is the traditional month to find Bobolink in T&T with 20 of the last 26 documented sightings occurring in this month.

Fig. 6 Bobolink *Dolichonyx oryzivorus*, Caroni Rice Project, 24 October 2020. Photo Nigel Lallsingh.

An adult female **Great-tailed Grackle *Quiscalus mexicanus*** was photographed at La Brea on 12 December (KF). This is just the second documented sighting in Trinidad. While this species is commonly found in north-western South America and is gradually spreading eastwards along the coast, there seems to be no recent sightings east of Caracas.

A female **Black-and-White Warbler *Mniotilta varia*** was found on Lalaja Trace during the Christmas Bird Count on 27 December (NL, RJ). This migrant from the north remains a rare visitor to T&T, found almost annually between October - March.

An immature female **Common Yellowthroat *Geothlypis trichas*** was photographed at Carli Bay on 22 March (NL) (Fig 7). This is the first sighting in over 50 years of this migrant North American warbler which mainly winters in Central America and north-western South America**.**

Fig. 7 Common Yellowthroat *Geothlypis trichas*, Carli Bay, 22 March 2020. Photo Nigel Lallsingh.

A female **Cerulean Warbler *Setophaga cerulea*** was found in the forested hills above Gran Couva on 4 December 2017. What is assumed to be the same individual returned to over-winter in the same Samaan tree in both 2018 and 2019. After presumably migrating north once more in March 2020, it returned yet again on 28 October (NL) and was present until the year's end.

A female **Indigo Bunting *Passerina cyanea*** was carefully studied at Carli Bay on 22 March (NL). This extremely rare migrant from North America has only previously been documented once in Trinidad: an adult male in March 1977.

Escaped cage and aviary species

A **Black-headed Parrot** *Pionites melanocephalus* was photographed in Princes Town and a **Festive Parrot** *Amazona festiva* in Port of Spain. **Red-and-Green Macaws** *Ara chloropterus* continue to be regularly reported from the south-west peninsula and north coast of Trinidad plus sightings near Chaguanas. **Village Weavers** *Ploceus cucullatus* are frequently seen inside Caroni Rice Project and a known "ship assisted" **Hooded Crow** *Corvus cornix* made landfall near Pt. Fortin (having travelled aboard ship from Israel).

The provenance of most seedeater and seed-finch species continues to be a problem. The Committee has taken a decision that, unless there is supporting evidence to the contrary, all sightings will be considered under this category and that assessment will be based on identification alone.

Additional records

Acceptable records were also received or submitted to eBird for a further 42 sightings of the following species for which status has been established but their distribution continues to be monitored by the Committee. **White-faced Whistling-Duck** *Dendrocygna viduata;* **Scaled Dove** *Columbina squammata;* **Little Egret** *Egretta garzetta;* **Glossy Ibis** *Plegadis falcinellus;* **Hook-billed Kite** *Chondrohierax uncinatus;* **Black Hawk-Eagle** *Spizaetus tyrannus;* **Double-toothed Kite** *Harpagus bidentatus;* **Crane Hawk** *Geranospiza caerulescens;* **Rufous Crab Hawk** *Buteogallus aequinoctialis;* **Aplomado Falcon** *Falco femoralis;* **Variegated Flycatcher** *Empidonomus varius;* **Summer Tanager** *Piranga rubra* and **Yellow-bellied Seedeater** *Sporophila nigricollis.*

Inconclusive records

Submissions of the following species were deemed inconclusive :- **Gray Heron**, *Ardea cinerea;* **Glossy Ibis** *Plegadis falcinellus;* **Great Black Hawk** *Buteogallus urubitinga;* **Small-billed Elaenia** *Elaenia parvirostris* and **Indigo Bunting** *Passerina cyanea.*

Nomenclature changes

Part of the mission statement of the South American Classification Committee is to create a standard classification, with English names, for the birds of South America. This

is subject to constant revision by the proposal system to allow incorporation of new data. The following changes were made in 2020 (Remsen *et al.* 2021):-

Comb-Duck *Sarkidiornis sylvicola* following a further review, the previous English name has been reinstated (proposed as American Comb Duck in 2019). It remains a separate species from **Knob-billed Duck** *Sarkidiornis melanotos* of Africa.

Additionally, the Committee maintains an ongoing review of individual and genera scientific nomenclature. During 2020 the following changes were made:

Leach's Storm Petrel :- now *Hydrobates leucorhous*
Red-rumped Woodpecker :- now *Dryobates kirkii*
Copper-rumped Hummingbird :- now *Saucerottia tobaci*
White-chested Emerald :- now *Chrysuronia brevirostris*
Crested Caracara :- now *Caracara plancus*

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