



Arsenura armida

Giant silk moth

PANAT Reserva de la Biósfera Maya (RBM)
Petén, Guatemala

Victor Mendoza and Diana Sandoval

May 2023



APPRECIATION FOR ENCOURAGING THE RESEARCH PROJECT



FOR INITIATION AND COORDINATING THE COOPERACION PROJECT

2021-2025

- **Licda. Merle Fernandez** - CONAP
- **Marla Mercedes Bolvito Jerónimo** Unidad de Cooperación Nacional e Internacional de la Secretaría Ejecutiva de CONAP
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DISCUSSION ON ASPECTS OF PANAT THAT CAN ASSIST THE TIKAL PARK ADMINISTRATORS

- Ing. Dimas Pérez Rivera, Sub-Administrador, Parque Nacional Tikal

COMMUNICATIONS WITH PANAT DURING 2022

- **Cristel Pineda**, Unidad de Relaciones Comunitarias, PANAT

FLORA AND FAUNDA IDENTIFIERS AND EQUIPMENT PORTER

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- Esdras García
- Luis Lobos

Hotel Tikal Inn

We thank Roxana Ortiz for offering to provide lodging for our research team at the Tikal Inn for our field trips starting in October 2022. Since we are not receiving payments for our field work, our budget appreciates complimentary lodging. Every workday is exhausting because we are carrying and then using very heavy cameras, super-telephoto lenses, sturdy tripods, large gimbals or ball tripod heads. Thus it is crucial for my health to be able to rest and totally recuperate every night in order to be ready for the following day of botanical and zoological adventures in Parque Nacional Tikal.

In order to post photographs on botanical and zoological websites, you can't do this if there is either no Internet or weak Internet. Thus it is very helpful that when we are provided rooms and meals, that functional Internet is available at the Hotel Tikal Inn.

Contact info:

- Book by Phone: (502) 7861 2444 or (502) 7861 2445
- Book by email: Email: tikalinn@gmail.com
- Website: www.TikalInn.com

Photo by: EW, FLAAR Mesoamerica, Jul 20, 2022. PANAT Reserva de la Biósfera Maya (RBM), Petén, Guatemala.

Camera: Sony ILCE-1. Lens: Sony FE 90mm Macro G OSS. Settings: 1/2500 sec; f/10; ISO 250.



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- Cristina Ríos

PHOTO FROM FRONT COVER

Photo by: Edwin Solares, FLAAR Mesoamerica, Jul. 20, 2022. Aldea El Rosario, Livingston, Izabal.

Camera: Sony Alpha A7C. Lens: Sony FE 90mm Macro G OSS. Settings: 1/250 sec; f/7.1; ISO 250.

PHOTO FROM BACK COVER

Photo by: Edwin Solares, FLAAR Mesoamerica, Jul. 20, 2022. Aldea El Rosario, Livingston, Izabal.

Camera: Sony Alpha A7C. Lens: Sony FE 90mm Macro G OSS. Settings: 1/500 sec; f/9; ISO 250.

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Experience with *Arsenura armida*

by Nicholas Hellmuth

While working in Parque Nacional Yaxha, Nakum and Naranjo (PNYNN) during 2018-2019 and then again with the new current project 2021 onwards, we have found lots of larvae on tree trunks. We found lots at Yaxha the day before we reached Tikal.

While doing field work between the town of Copan Ruinas and the Copan park, a decade ago we found large groups of large larvae on trees as we hiked between the village and the park. But the ones we found on July 20th, 2022 are the largest size of individual larvae that I have ever seen. I am definitely curious whether the large size of a larva says that the resulting butterfly will also be large. Frankly I can't imagine any butterfly with a body even 33% of the length of these giant larvae.

Introduction to (species) of *Arsenura armida*

Entomology is the science that studies the invertebrate organisms of the arthropoda phylum, which can be studied in different classes such as arachnids and insects. *Arsenura armida* is a butterfly insect that belongs to the Saturniidae family and Arsenurinae subfamily, a family to which large and striking nightling butterflies belong. Commonly in a larval state they are known as cueclas, cuetlas, tzats or giant larvae whose larva feeds on tree leaves such as *Guazuma ulmifolia* (Romero, 2017). The caterpillars are large and very colorful and are grouped between 20 to 40 individuals (Yoshimoto, 2015).

In July 2022, the FLAAR Mesoamérica team under the coordination of the engineer Vivian Hurtado was in the Peten jungle working on

the Biodiversity Documentation Project in the Mayan Biosphere Reserve, and it was a July 20, 2022 where it was possible to document this incredible finding of *Arsenura armida* in its larval state in different trunks of Caulote trees (*Guazuma ulmifolia*). In this expedition the species was documented only in its state of Larva, however in February 2023, researchers and engineers Victor Mendoza and Diana Sandoval, visited the insect collections by Dr. Jichihiro Yoshimoto at the facilities of the University of Valle of Guatemala, to investigate more about this incredible insect and photograph the butterfly that arises after its metamorphosis process that are dissected in that institution.



Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jul 20, 2022. PANAT Reserva de la Biósfera Maya (RBM), Petén, Guatemala.

Camera: iPhone 13 Pro Max.

Full zoological name and taxonomy

Reino Animalia

Filo Arthropoda

Clase Insecta

Orden Lepidoptera

Familia Saturniidae

Arsenura armida Cramer, 1780

[Click here to learn more](#)

Synonyms for *Arsenura armida*

Phalaena armida Cramer, [1779]

Phalaena casandra Cramer, [1779]

Bombyx erythrinae Fabricio, 1781

Arsenura erythrinae Godman y Salvin, 1886

Local names for *Arsenura armida*

Giant silk moth, Polilla de seda gigante, cueclas, cuetlas.

Mayan names for *Arsenura armida*

Tzats (name in tzotzil and meaning "worm")

[Click here to learn more](#)

Physical description for *Arsenura armida*

The young larvae exhibit aposematism through their bright yellow and black-ringed bodies and red heads. The later instars are darker and "dusker" than early instars. They possess a dark brown head, a soma covered with fine short setae, and black tentacle-like protuberances on the dorsum of the thoracic segments. The intersegmental membrane is colored with thin orange-yellow rings.

[Click here to learn more](#)

The adults are large brown moths that like to rest with spread wings. They are predominantly dull colored, though some may display complex patterns. The adult wingspan is 100–120 mm.

[Click here to learn more](#)



Photo by: Victor Mendoza, FLAAR Mesoamerica, Feb, 2023. Insectario por Jichihiro Yoshimoto.

Camera: iPhone 11

Habitat and geographic distribution for *Arsenura armida*

The giant silk moth occurs mainly in Central and Southern America, from tropical Mexico to southeastern Brazil.

[Click here to learn more about *Arsenura armida*](#)

Reproduction

In captivity, both sexes hatch from the pupa about an hour after dark, and mating takes place on the same night that pupation occurs. The following night, the females search for a suitable food plant such as *Guazuma ulmifolia*, where they will lay their entire egg load in a single mass on the underside of a leaf (Costa, Fitzgerald, and Janzen 2001: 18).

Behavior (examples: is it social or not, nocturnal or not, relationships with other species, etc.)

Arsenura armida is a moth which, due to its gregarious behavior of its larvae and its mobility in the trees, has attracted the attention of many naturalists.

[Click here to learn more](#)

Arsenura armida larvae have a very striking appearance with black and yellowish transverse bands with a red head, an aposematic coloration that indicates its unpleasant taste for predators, and for some bird species it is even fatally toxic.

[Click here to learn more](#)



Photo by: Edwin Solares, FLAAR Mesoamerica, Jul 20, 2022. PANAT Reserva de la Biósfera Maya (RBM), Livingston, Izabal.

Camera: Sony ILCE-1. Lens: Sony FE 90mm Macro G OSS. Settings: 1/250 sec; f/10; ISO 250.

Food habits

They are herbivores, feeding preferentially on *Guazuma ulmifolia*, but they also have trees of the genera *Annona*, *Bombax*, *Ceiba*, *Rollinia* and *Tilia* as secondary nutrient plants.

[Click here to learn more](#)

Conservation status

Does not appear on the IUCN Red List of Threatened Species.

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Arsenura armida larvae constitute an alternative source of animal protein for local inhabitants and its protection is propitious for entomological diversity and tree species where the larvae develop conservation.

On the other hand, the adults of *A. armida* are usually qualified by some people as unlucky and are even considered to announce death. Due to these beliefs and the loss of their natural habitats due to deforestation, their populations have been affected and displaced.

[Click here to learn more](#)

Facts about *Arsenura armida*

The consumption of these larvae in Mexico is practiced mainly by some ethnic groups and peasants in the Sierra de Zongolica, Veracruz; in the Sierra Norte de Puebla and in the highlands of Chiapas, among other regions, and are usually prepared in different ways, for example, boiled in water and salt or fried with vegetable oil, egg and garlic. It should be noted that the traditional consumption of the cuecelas contributes to the reduction of the damage that these larvae cause on the trees.

[Click here to learn more about *Arsenura armida*](#)

Giant silk moth is the only species in the genus *Arsenura* that exhibits sociality. Other *Arsenura* are solitary and cryptic, but *A. armida* has adopted an aposematic and gregarious lifestyle.

[Click here to learn more about *Arsenura armida*](#)

Photo by: Edwin Solares, FLAAR Mesoamerica, Jul 20, 2022. PANAT Reserva de la Biósfera Maya (RBM), Petén, Guatemala.

Camera: Sony ILCE-1. Lens: Sony FE 90mm Macro G OSS. Settings: 1/250 sec; f/10; ISO 250.



Conclusion

Arsenura armida is an insect that belongs to the Saturniidae family, has an approximate size of 85 to 145 mm and its distribution in Guatemala goes from 0 - 1600 meters above sea level. Therefore, its finding and documentation is affirmed in the Mayan Biosphere Reserve due to its distribution and altitude.

Deforestation and predation for the edible use of the *Arsenura armida* larva are factors that can take it to an extinction point. It is recommended to study the populations of *Arsenura armida* because it depends on the trees, specifically on the caulote for their survival and perform their metamorphosis processes to get to be a nocturnal butterfly in its adult state.

As mentioned throughout this document, the giant silk moth has an important cultural value for some communities in southern Mexico, it is interesting how the larva of this species is a part of the protein diet of these people and how in turn, the adult is a victim of people's superstitions.

The gregarious behavior is typical of *Arsenura armida*, this is something that draws a lot of attention from naturists since in the other species of the genus *Arsenura* this behavior does not occur. This accumulation of larvae in the trunks of the trees is what caught the attention of the FLAAR Mesoamerica Team when they were in the Parque Nacional Tikal.

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2001 Trail-following Behavior and Natural History of the Social Caterpillar of *Arsenura Armida* in Costa Rica (Lepidoptera: Saturniidae: Arsenurinae). *Tropical Lepidoptera* Vol. 12 No. 1-2, pages 17-23.

Downloadable online:

[file:///C:/Users/dmsan/Downloads/Behavior_of_Arsenura_armida_Caterpillars%20\(1\).pdf](file:///C:/Users/dmsan/Downloads/Behavior_of_Arsenura_armida_Caterpillars%20(1).pdf)

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Most helpful reference on *Arsenura armida*:**COSTA, James T., FITZGERALD, Terrence D. and Daniel H. JANZEN**

2001 Trail-following Behavior and Natural History of the Social Caterpillar of *Arsenura Armida* in Costa Rica (Lepidoptera: Saturniidae: Arsenurinae). Tropical Lepidoptera Vol. 12 No. 1-2, pages 17-23.

Most helpful web sites on *Arsenura armida*:

<https://inecol.mx/inecol/index.php/es/2013-06-05-10-34-10/17-ciencia-hoy/1158-las-cueclas-coloridas-hermosas-y-nutritivas>

<https://www.naturalista.mx/taxa/257159-Arsenura-armida>

Web pages specifically on *Arsenura armida*:

BIOLOGICAL INFORMATION

<https://www.gbif.org/es/species/1866311>

<https://web.cortland.edu/fitzgerald/arsenura.html>

<https://inecol.mx/inecol/index.php/es/2013-06-05-10-34-10/17-ciencia-hoy/1158-las-cueclas-coloridas-hermosas-y-nutritivas>

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RESERVA DE LA BIÓSFERA MAYA - RBM - DEPARTAMENTO DE PETÉN, GUATEMALA



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- Ruta
- Aeropuertos
- Terraceria
- Carretera



MÉXICO



CATEGORÍAS DE MANEJO

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- ZONA DE USO MÚLTIPLE
- CONCESIÓN INDUSTRIAL
- CONCESIÓN COMUNITARIA
- RESERVA MUNICIPAL
- MONUMENTO CULTURAL
- ÁREAS PROTEGIDAS DEL SUR DE PETÉN



ACKNOWLEDGEMENTS TO FLAAR MESOAMÉRICA

Flor de María Setina is in charge of the financial administration of the institution and supports the supervision of daily activities.

Vivian Hurtado is the current project manager of the FLAAR divisions: Flora & Fauna and MayanToons. She is also an environmental engineer and a passionate researcher.

Victor Mendoza environmental engineer in charge of the photographic database and its taxonomic identification. He also helps with the coordination of research activities.

Sergio Jerez agronomy engineering student involved in the identification of plants and support in research topics.

Belén Chacón biology student who organizes, tabulates and updates our ethnobotanical list.

Diana Sandoval agricultural engineer who compiles scientific information that is added to our flora and fauna reports.

Roberto Aguiar history student collects information and bibliographic references to feed our electronic library of flora and fauna and support research for reports and websites.

Samuel Herrera is in charge of processing maps of our field trips and helping with the identification and investigation of species.

Pedro Pablo Marroquín is part of the editing team, review and add information to our photographic reports

Alejandra Valenzuela is a biology student and part of the photographic reports editing team. She also supports the realization and analysis of web statistics.

Byron Pacay is our assistant during field trips to handle GPS data. He also assists in the main office with different tasks

Norma Cho is a helpful photography assistant during field trips. She also assists in the main office with different tasks

Yasmin Mencos is an environmental engineer and manages all our social networks and digital community

Isabel Rodríguez Paiz is in charge of fundraising and partnership development.

Edwin Solares is a photographer and videographer during our expeditions. Later, he edits this content to be used in our different materials.

Haniel López is a drone pilot and photographer during our expeditions.

Pedro Pablo Ranero with a degree in communication is responsible for editing videos of flora and fauna to create content on our sites.

Andrea Sánchez graphic designer who helps prepare the graphic line of our publications. She is our editorial art director.

Jaqueline González graphic designer who combines text layout and photo editing to create our reports.

Heidy Galindo graphic designer who combines text layout and photo editing to create our reports.

Cristina Ríos graphic designer who combines text layout and photo editing to create our reports.

David Arrivillaga is an experienced photographer and graphic designer. Sometimes he is a photographer during our expeditions, but he also designs our flora and fauna reports.

María Alejandra Gutiérrez is an experienced photographer who is now in charge of the preparation of photographic catalogs. She was also coordinator of the field trips for the research project in Livingston, Izabal.

Paulo Núñez is an engineer and our webmaster. He is the person in charge of the maintenance and programming of the entire network of FLAAR websites.

Juan Carlos Hernández is a graphic designer and part of the web team. Receive the material we produce to place on our sites.

María José García is a graphic designer and part of the web team. Receive the material we produce to place on our sites.

Andrés Fernández is a graphic designer and in charge of keeping our websites updated and more efficient for the user.

Karla Cho helps with general research and design assistant in the office.

Luis Molina is a professional illustrator specialized in line drawings of Maya vases, bowls, and plates.

Valeria Áviles is a graphic designer and illustrator. She is in charge of coordinating the activities of MayanToons, as well as making illustrations for the different materials that we prepare.

Laura Morales is a digital content engineer, She is in charge of directing the animation area of our MayanToons project.

Paula García is part of our MayanToons animation team. Her job is to bring our favorite characters to life.

Niza Franco is part of our MayanToons animation team. Her job is to bring our favorite characters to life.

Isabel Trejo is a graphic designer and illustrator for MayanToons and for social media posts.

Andrea Bracamonte is a graphic designer and illustrator for MayanToons and for social media posts.

Josefina Sequén is an illustrator for MayanToons.

Rosa Sequén is an illustrator for MayanToons.

Tikal Inn, Parque Nacional Tikal

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FLAAR (in USA) and FLAAR Mesoamerica (in Guatemala) are both non-profit research and educational institutes, so there is no fee. And you do not need to write and ask permission; but we do appreciate it when you include a link back to one of our sites.

FOR YOUR SOCIAL MEDIA

You can post any of the FLAAR Mesoamerica PDFs about the Municipio of Livingston or Reserva de Biódfera Maya Project on your Social Media sites.

We hope to attract the attention of professors, botanical garden clubs, orchid and bromeliad societies, students, tourists, experts, explorers, photographers and nature lovers who want to get closer, to marvel at the species of flowering plants, mushrooms and lichen that FLAAR Mesoamerica finds during each field trip each month.

Dr. Nicholas and the FLAAR Mesoamérica team can present via ZOOM, Google Meet or comparable platforms. This way there are no costs for airfare, airport shuttle, hotel, or meals. But it is appreciated when a donation can be provided before the lecture presentation to assist our decades of research.

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Mail: nhellmuth@flaar.org

IF YOUR CLUB, ASSOCIATION


Institute, botanical garden, zoo, park, university, or related wishes high-resolution photos for an exhibit in your facility anywhere in the world. The Missouri Botanical Garden (MOBOT) has had two exhibits of the FLAAR Mesoamerica photos on Neotropical flowering plants of Guatemala.

Photos by the FLAAR team have also been exhibited at Photokina in Germany and in Austria, Guatemala, and elsewhere. For use of these photos in a book or exhibit, naturally we need to discuss how to share the costs. We have material for entire exhibits on:

- Orchids of Guatemala
- Dye colorants from Mushrooms and
- Lichens of Guatemala
- Bromeliads of Guatemala
- Trees and treetop Ecosystems of Guatemala
Cacao and their Maya and Aztec Flavorings.

Front Covers

- Front covers of earlier photo essay style reports on insects, birds, pendant nests, and other aspects of the fauna of Guatemala. If you wish more FLAAR reports on fauna of Guatemala, visit our www.maya-ethnozoology.org.
- Front covers of earlier photo essay style reports on flowers, trees, vines, mushrooms, and other aspects of the flora of Guatemala. If you wish more FLAAR reports on flora of Guatemala, visit our www.maya-ethnobotany.org.
- Front covers of earlier photo essay style reports on flora and fauna during our 15-month Project in the Municipio de Livingston, Izabal, Guatemala. We have seven more months of this Project (last month will be December 2021).
- Front covers of earlier photo essay style reports on flora and fauna of Parque Nacional Yaxha, Nakum, and Naranjo (from our 12 month Project 2018-2019).

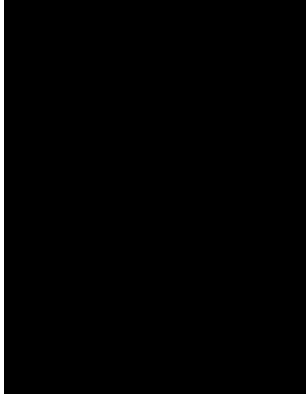


With coordination and cooperation of CONAP, we (FLAAR Mesoamerica) have now initiated a 5-year Project for the entire Reserva de la Biosfera Maya, with the initial years to be focused on PNYNN and the áreas that are allied with the park programs:

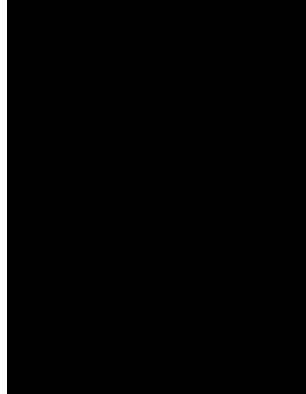
- Parque Nacional Tikal, flora, fauna, educational material for guides' association, pine forest adjacent to NE corner (known but never photographed in high resolution).
- Biotopo Protegido San Miguel La Palotada El Zotz (flora, fauna and obviously bats swarms, at high resolution with special cameras to freeze their wings in the digital image, so you can see every detail of the bat-in-flight)
- Bio Itza, to assist the local Mayan people in flora and fauna research
- Biotopo Cerro Cahuí, flora and fauna: list which flowers are flowering in which month, and which trail has them, etc.

So lots more to come. We will also be coordinating with FUNDAECO and all other entities and organizations in this part of Guatemala.

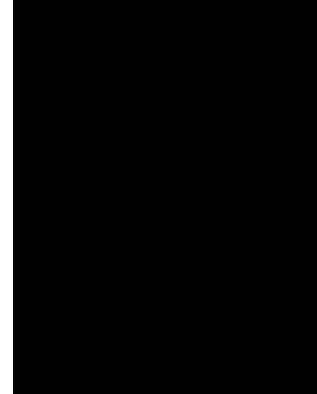
Other publications of RBM Project



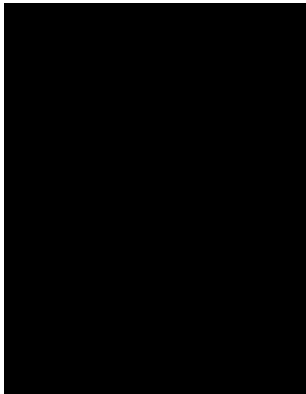
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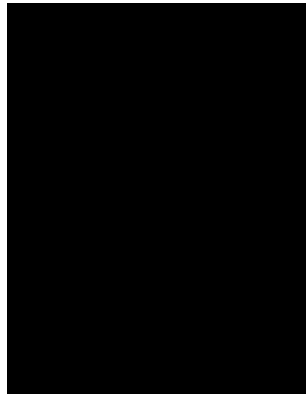
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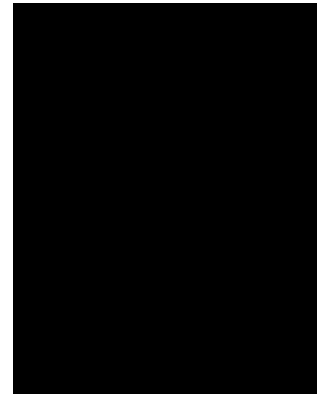
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*Cassia grandis***
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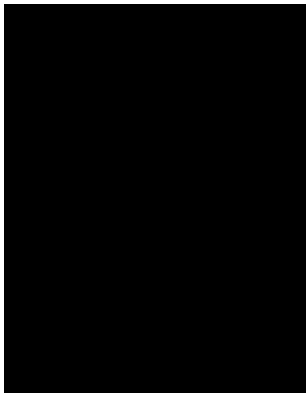
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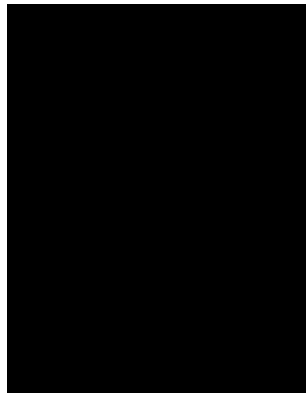
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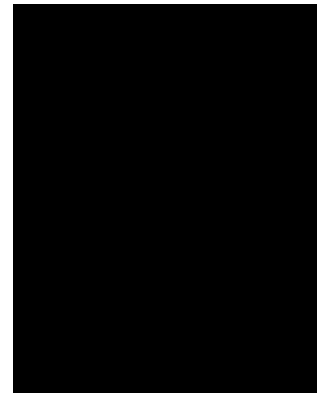
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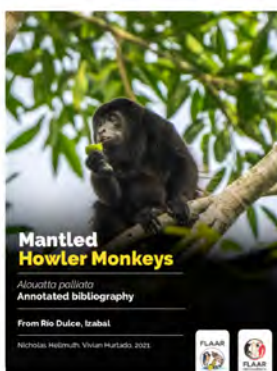
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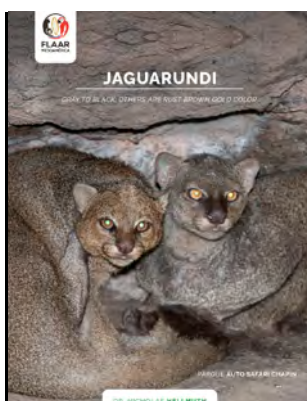
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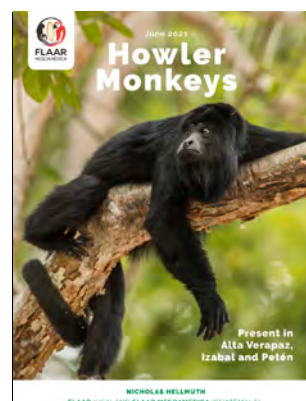
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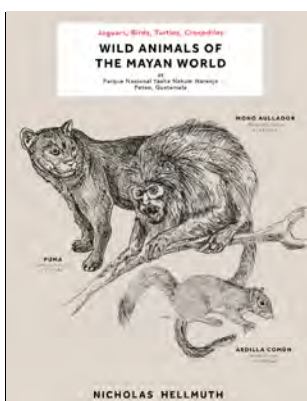
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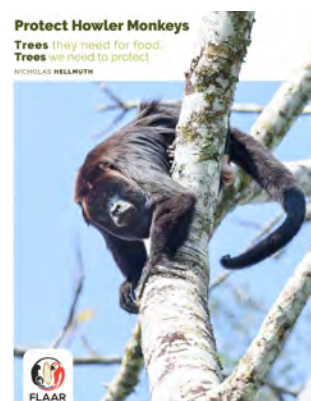
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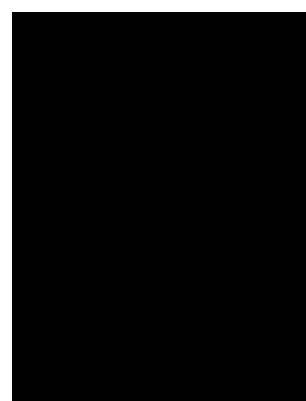
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