

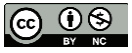
# Pacto, Pichincha Province, ECUADOR

## Seeds dispersed by bats in the Pacto's Andean Chocó

Marco A. Rodríguez-Segovia

Universidad Central del Ecuador

Photos: Marco A. Rodríguez-Segovia [marcozeus24@gmail.com]. Produced by Marco A. Rodríguez-Segovia. Grid scale = 1mm



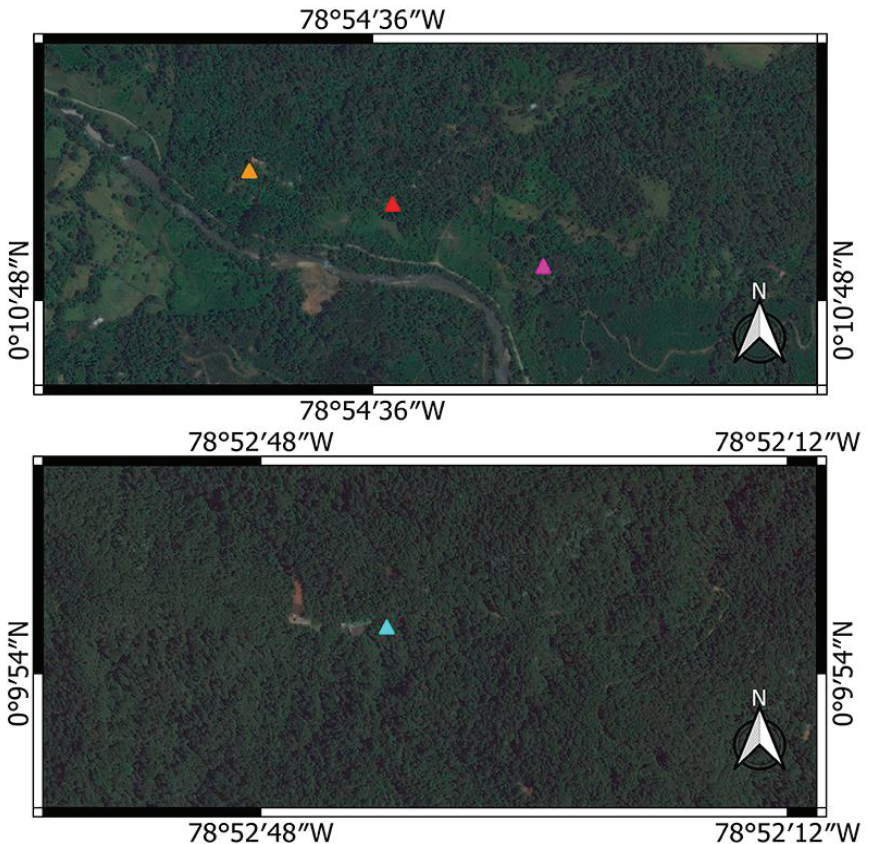
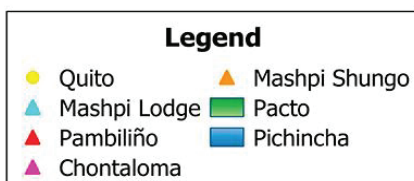
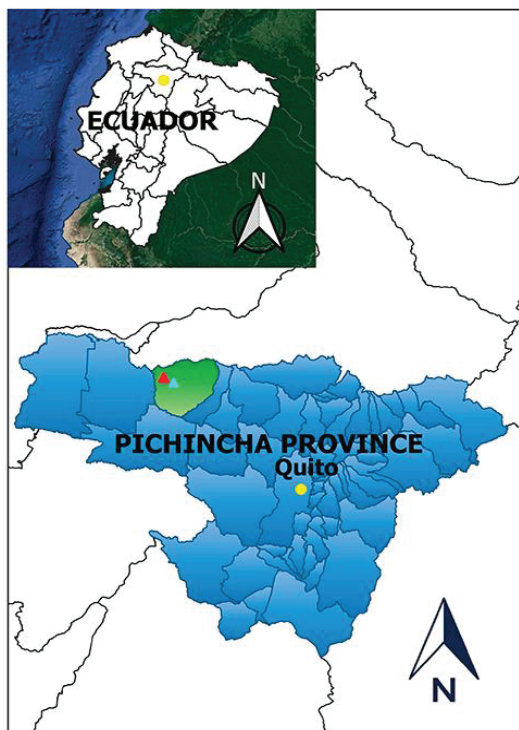
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### INTRODUCTION

Bat communities are important because they provide several ecosystem services, such as pollination and seed dispersal, crucial for forest regeneration and human well-being. One of the last bat communities that are best preserved in Ecuador survive in the Mashpi mountains of the Pacto's Andean Chocó. In 2021, a field trip expedition performed in the reserves of Mashpi Lodge, Mashpi Shungo, Pambiliño and Chontaloma, analyzed their diversity and seed dispersal. This expedition collected many voucher specimens of bats and seeds that were deposited at the Instituto Nacional del Ecuador (INABIO), formerly, Museo Ecuatoriano de Ciencias naturales (MECN). Currently, these samples represent the INABIO's national bat-seed collection. The entire collection fits inside a shoebox and has been curated, compared, and identified at the lowest taxonomic level. It contains a unique sample in space and time of the rich Ecuadorian biodiversity. For many years, the absence of field guides, open access-articles, and books have been limiting the work of many researchers interested to understand the feeding habits of tropical bats. In his time Dr. Alwyn H. Gentry (1986), considered the Andean Chocó to be the most biodiverse ecosystem in the world. Nowadays, it is considered as the ninth-most biodiverse ecosystem. However, the vegetation of this place is mostly unknown for science. In this first version, you will be able to appreciate that Gentry was not wrong. Here, you will appreciate how incredibly diverse is the vegetation of the Andean Chocó. This guide includes 118 morphospecies of seeds dispersed by at least 25 species of bats. In this guide, I provide you with some useful comments and include mysterious species that I could not identify, but that might interest you. The backdrop of all the images has the same grid scale of 1 mm; thus, you can compare the size of each seed.



A

SRC: WGS 84 / WGS 84 geographiques (dms), Datum: WGS 84  
Taken from: Google Earth 2021, IGM 2012  
Created by MARS

0 100 200 m  
Scale 1:10000

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1 *Saurauia* sp. 1  
ACTINIDACEAE



2 *Anthurium* sp. 1  
ARACEAE



3 *Anthurium* sp. 1  
ARACEAE  
some of the Araceae presented probably correspond to epiphytic plants



4 *Anthurium* sp. 2  
ARACEAE



5 *Anthurium* sp. 3  
ARACEAE



6 *Anthurium* sp. 4  
ARACEAE



7 *Saurauia* sp. 5  
ARACEAE



8 *Anthurium* sp. 6  
ARACEAE



9 *Anthurium* sp. 7  
ARACEAE



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10 *Saurauia* sp. 8  
ARACEAE



11 *Anthurium* sp. 9  
ARACEAE



12 *Philodendron* sp. 1  
ARACEAE



13 *Philodendron* sp. 2  
ARACEAE



14 *Philodendron* sp. 3  
ARACEAE



15 *Philodendron* sp. 4  
ARACEAE



16 *Philodendron* sp. 5  
ARACEAE



17 *Philodendron* sp. 6  
ARACEAE



18 *Philodendron* sp. 7  
ARACEAE




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19 *Philodendron* sp. 8  
ARACEAE



20 *Philodendron* sp. 9  
ARACEAE



21 *Tarenaya* sp. 1  
CLEOMACEAE



22 *Tarenaya* sp. 2  
CLEOMACEAE



23 *Tarenaya* sp. 3  
CLEOMACEAE



24 *Tarenaya* sp. 4  
CLEOMACEAE



25 *Tarenaya* sp. 5  
CLEOMACEAE



26 *Tarenaya* sp. 6  
CLEOMACEAE



27 *Tarenaya* sp. 7  
CLEOMACEAE



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28 *Tarenaya* sp. 7  
CLEOMACEAE



29 *Vismia* sp. 1  
CLUSIACEAE



30 *Vismia* sp. 2  
CLUSIACEAE



31 *Vismia* sp. 3  
CLUSIACEAE



32 *Vismia* sp. 4  
CLUSIACEAE



33 *Vismia* sp. 5  
CLUSIACEAE



34 *Vismia* sp. 6  
CLUSIACEAE



35 *Vismia* sp. 7  
CLUSIACEAE



36 *Vismia* sp. 8  
CLUSIACEAE



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37 *Vismia* sp. 9  
CLUSIACEAE



38 *Vismia* sp. 10  
CLUSIACEAE



39 *Vismia* sp. 11  
CLUSIACEAE



40 *Vismia* sp. 12  
CLUSIACEAE



41 *Vismia* sp. 13  
CLUSIACEAE



42 *Vismia* sp. 14  
CLUSIACEAE



43 *Vismia* sp. 15  
CLUSIACEAE



44 *Vismia* sp. 16  
CLUSIACEAE



45 *Vismia* sp. 17  
CLUSIACEAE



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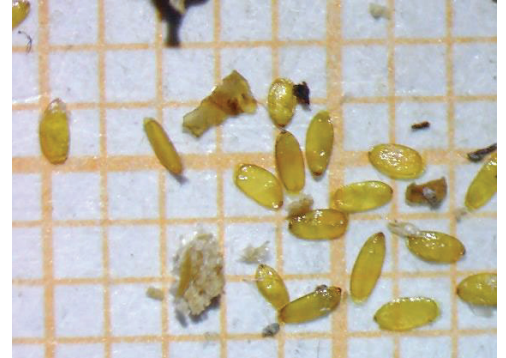
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46 *Vismia* sp. 18  
 CLUSIACEAE



47 *Vismia* sp. 19  
 CLUSIACEAE



48 *Asplundia* sp.  
 CYCLANTHACEAE  
 a detailed image of the fruit can be found [here](#)



49 *Asplundia* sp.  
 CYCLANTHACEAE



50 *Cyclanthus* sp. 1  
 CYCLANTHACEAE



51 *Cyclanthus* sp. 2  
 CYCLANTHACEAE



52 *Cyclanthus* sp. 2  
 CYCLANTHACEAE



53 *Drymonia* sp. 1  
 GESNERIACEAE  
 other probably genus dispersed or pollinated by bats are *Columnnea*, *Kholeria*, and *Gasteranthus*, neotropical Gesneriaceae usually have herb, shrub or epiphytic habits



54 *Drymonia* sp. 1  
 GESNERIACEAE



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55 cf. *Marcgravia* sp. 1  
MARGRAVIACEAE



56 cf. *Miconia* sp. 1  
MELASTOMATACEAE



57 cf. *Miconia* sp. 2  
MELASTOMATACEAE



58 *Ficus* sp. 1  
MORACEAE



59 *Ficus* sp. 2  
MORACEAE



60 *Ficus* sp. 3  
MORACEAE



61 *Ficus* sp. 4  
MORACEAE



62 *Ficus* sp. 5  
MORACEAE



63 *Ficus* sp. 6  
MORACEAE



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64 *Ficus* sp. 7  
MORACEAE



65 *Ficus* sp. 8  
MORACEAE



66 *Ficus* sp. 9  
MORACEAE



67 *Piper aduncum*  
PIPERACEAE



68 *Piper* sp. 1  
PIPERACEAE



69 *Piper* sp. 2  
PIPERACEAE



70 *Piper* sp. 3  
PIPERACEAE



71 *Piper* sp. 4  
PIPERACEAE



72 *Piper* sp. 5  
PIPERACEAE




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73

*Piper* sp. 6  
PIPERACEAE



74

*Piper* sp. 7  
PIPERACEAE



75

*Piper* sp. 8  
PIPERACEAE



76

*Piper* sp. 9  
PIPERACEAE



77

*Piper* sp. 10  
PIPERACEAE



78

*Piper* sp. 11  
PIPERACEAE



79

*Piper* sp. 12  
PIPERACEAE



80

*Piper* sp. 13  
PIPERACEAE



81

*Piper* sp. 14  
PIPERACEAE



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82 *Piper* sp. 15  
PIPERACEAE



83 *Piper* sp. 16  
PIPERACEAE



84 *Piper* sp. 17  
PIPERACEAE



85 *Piper* sp. 18  
PIPERACEAE



86 *Piper* sp. 19  
PIPERACEAE



87 *Piper* sp. 20  
PIPERACEAE



88 *Piper* sp. 21  
PIPERACEAE



89 *Piper* sp. 22  
PIPERACEAE



90 *Piper* sp. 23  
PIPERACEAE




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91 *Piper* sp. 24  
PIPERACEAE



92 *Piper* sp. 25  
PIPERACEAE



93 *Psychotria* sp. 1  
RUBIACEAE  
many of the presented *Psychotria* would correspond to cryptic genus of Rubiaceae, like *Palicourea*, but a genetic review is necessary



94 *Psychotria* sp. 2  
RUBIACEAE



95 *Psychotria* sp. 3  
RUBIACEAE



96 *Psychotria* sp. 4  
RUBIACEAE



97 *Psychotria* sp. 5  
RUBIACEAE



98 *Psychotria* sp. 6  
RUBIACEAE



99 *Solanum* sp. 1  
SOLANACEAE



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100 *Solanum* sp. 2  
SOLANACEAE



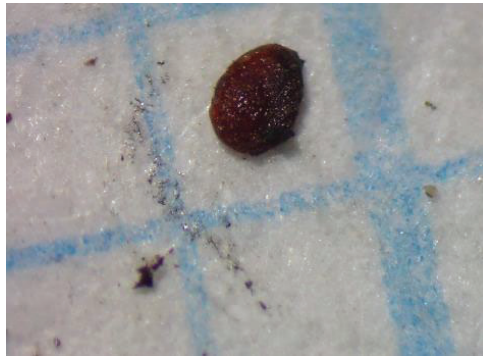
101 *Solanum* sp. 3  
SOLANACEAE



102 *Solanum* sp. 4  
SOLANACEAE



103 *Solanum* sp. 5  
SOLANACEAE



104 *Solanum* sp. 6  
SOLANACEAE



105 *Solanum* sp. 7  
SOLANACEAE



106 *Solanum* sp. 8  
SOLANACEAE



107 *Cecropia* sp. 1  
URTICACEAE  
similar to *Cecropia hispidissima* presented  
by Linares and Moreno-Mosquera (2010)



108 *Cecropia* sp. 1  
URTICACEAE



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109 *Solanum* sp. 2  
SOLANACEAE  
similar to *Cecropia angustifolia*



110 *Solanum* sp. 3  
SOLANACEAE  
this seed was broken



111 *Solanum* sp. 4  
SOLANACEAE



112 *Cecropia* sp. 5  
SOLANACEAE



113 *Cecropia* sp. 6  
SOLANACEAE  
similar to *Cecropia longipes*



114 *Cecropia* sp. 6  
SOLANACEAE



115 *Cecropia* sp. 7  
URTICACEAE  
similar to *Cecropia obtusifolia*



116 Morpho 1  
FAMILY UNKNOWN  
when reviewing natural history collections, I found a little similarity with some Solanaceae



117 Morpho 2  
FAMILY UNKNOWN



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118 Morpho 3  
FAMILY UNKNOWN  
when reviewing natural history collections, I found a little similarity with some *Arecaceae*



119 Morpho 3  
FAMILY UNKNOWN



120 Morpho 4  
FAMILY UNKNOWN  
they would be aborted seeds



121 Morpho 5  
FAMILY UNKNOWN  
similar to the exocarp of some aggregated fruits



122 Morpho 5  
FAMILY UNKNOWN



123 Morpho 6  
FAMILY UNKNOWN



124 Morpho 7  
FAMILY UNKNOWN



125 Morpho 8  
FAMILY UNKNOWN



126 Morpho 9  
FAMILY UNKNOWN  
similar to some *Psychotrya*, but the 8 form was confusing



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