



Pollinators in Brazil:

Contribution and perspectives for
biodiversity, sustainable use,
conservation and environmental services

Vera Lucia Imperatriz Fonseca
APIMONDIA
2011



Polinizadores no Brasil

Contribuição e perspectivas
para a biodiversidade, uso
sustentável, conservação
e serviços ambientais

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2011



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UNIVERSIDADE FEDERAL
UFERSA
RURAL DO SEMI-ARIDO

USP

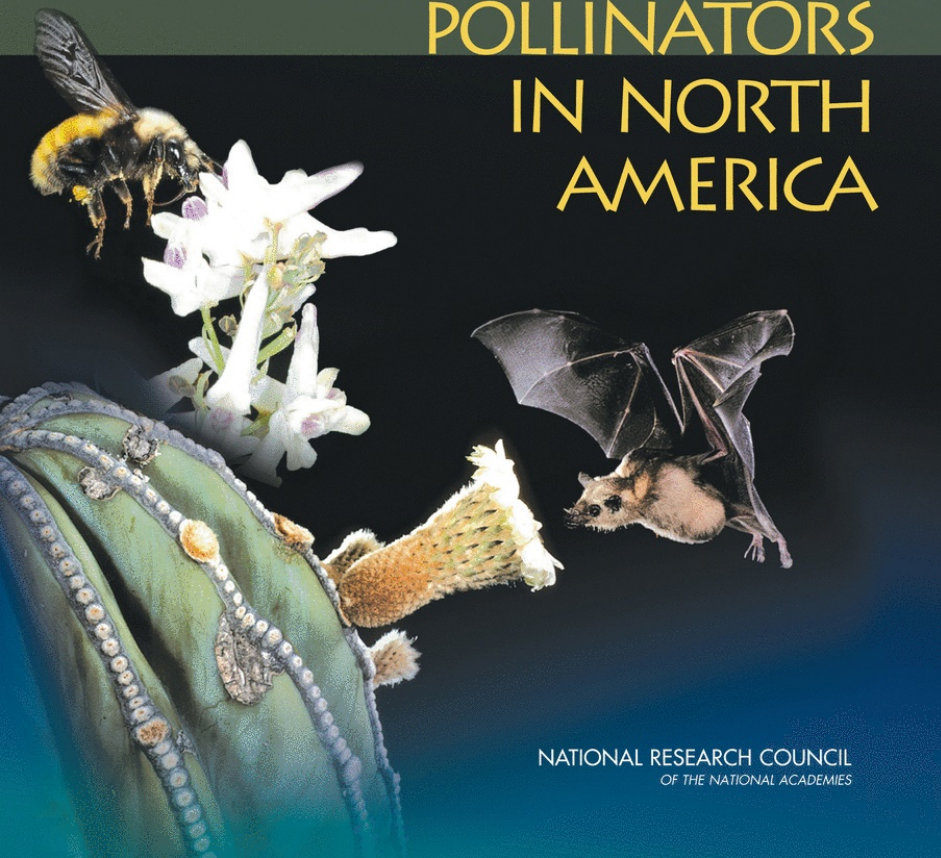
CRIA

 CNPq

 FAPESP



STATUS OF
POLLINATORS
IN NORTH
AMERICA



STATUS OF POLLINATORS IN
NORTH AMERICA

Editors

Committee on the Status of
Pollinators in North America

National Resource Council

National Academy of Sciences

2007

Pollinators in Brazil



- An evaluation of the Status of Pollinators in Brazil was proposed by the National Agencies CNPq and Agribusiness Sectorial Fund
- Pollinators, biodiversity, sustainable use and conservation were the focus of this evaluation
- Suggestion of public policies for pollinators

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POLLINATORS IN BRAZIL



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POLLINATORS IN BRAZIL

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POLLINATORS IN BRAZIL

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Section 4

POLLINATORS IN BRAZIL

- Global Change and Solitary bees
- Global Change and stingless bees
- Monitoring bees
- Palynology as a tool for restoration
- Systems of Information and computer tools for research, education and outreach



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Section 5

POLLINATORS IN BRAZIL



- Pollinators, public policies and proposals for strategies and development
 - Pollinators and Public Policies
 - Proposal for strategies for conservation and sustainable use of pollinators in Brazil

Objectives



- To make a critical analysis of the several components of the International Pollinators Initiative concerning Brazilian development in this field
- To give support to the policies and public programmes related to pollinators and pollination
- To produce a representative document on the state of art of pollinators in Brazil in Portuguese

Specific goals



- To prepare a document concerning the improvement of the knowledge in Brazil on pollinators and pollination 10 years after the S. Paulo Declaration on Pollinators
- To suggest strategies and actions to attain the goals of the Sao Paulo Declations, under the new global externalities and challenges
- To suggest and support public policies and programmes concerning pollinators and pollination

Methodology



- To develop the concerned issues by invited Brazilian specialists, that participated on preparatory meetings and received on line support and guidelines
- The groups prepared a chapter on their expertise following the guidelines received
- The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) was applied to each issue developed
- The result was sent to coordinators, that used this information to construct the policies suggested in this document

Results



- A support on line was prepared and will be available with the electronic publication of this document
- Concerning SWOT analysis, weak and strong points will be supported by specific actions proposed by this document
- Opportunities and threats are externalities to the project/programme that must be considered and monitored to improve the possibility of succesful actions to achieve our goals
- The project had 84 participants belonging to 42 Institutions

Results



- The introduction of pollination services information in public policy provides an opportunity for governments to explore innovative technology and new concepts about ecosystem services.
- Planning pollinators use based in actual and future predictions of global change indicates the importance of improving ecosystem resilience and restoration
- A scientific community more committed with integrative projects concerning pollinators.

Biological collections in Brazil



- *speciesLink* is a distributed information system that integrates primary data from biological collections. The development was funded by [FAPESP](#), [GBIF](#), [JRS Foundation](#), [MCT](#), [CNPq](#), [FINEP](#) and [CRIA](#)
- 11 collections of pollinator insects are digitized
- More than 200 thousands registers on line; 82% georeferenced

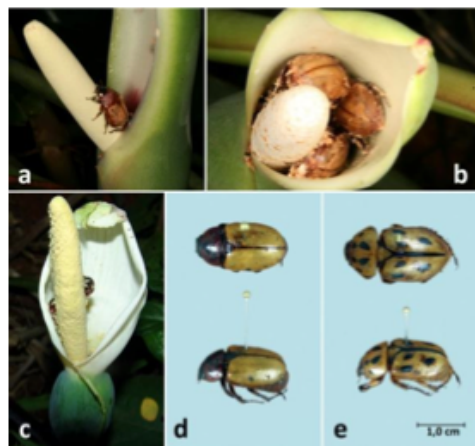


Fig. 2.5.2.1. Besouros e Araceae. a) Besouro polinizador (Scarabaeidae, Dynastinae) visitando inflorescência de *Philodendron acutatum* (Araceae) durante a fase feminina da antese; b) Besouros da espécie *Cyclocephala celata* (Scarabaeidae, Dynastinae) abrigados na câmara floral de inflorescência de *P. acutatum* durante a fase masculina da antese; c) Besouros polinizadores da espécie *C. celata* em inflorescência de *Caladium bicolor* (Araceae) durante a fase masculina da antese; d) *Cyclocephala celata* e e) *C. latericia*, polinizadores de aráceas no estado de Pernambuco. Créditos: C. Schindwein e A. C. D. Maia.

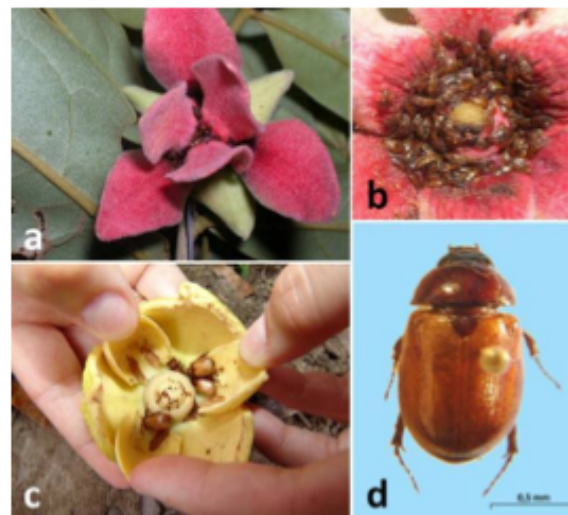


Fig. 2.5.2.2. Besouros e Annonaceae. a) Flor de *Duguetia furfuracea* (Annonaceae); b) Besouros polinizadores (Nitidulidae) abrigados no interior de câmara floral de *Duguetia furfuracea*; c) Besouros polinizadores (Scarabaeidae, Dynastinae) abrigados no interior de câmara floral de *Annona muricata*; d) *Cyclocephala vestita* (Scarabaeidae, Dynastinae), polinizador da gravioleira (*Annona muricata*) na Bahia e em Pernambuco. Créditos: H. F. Paulino Neto e A. C. D. Maia.

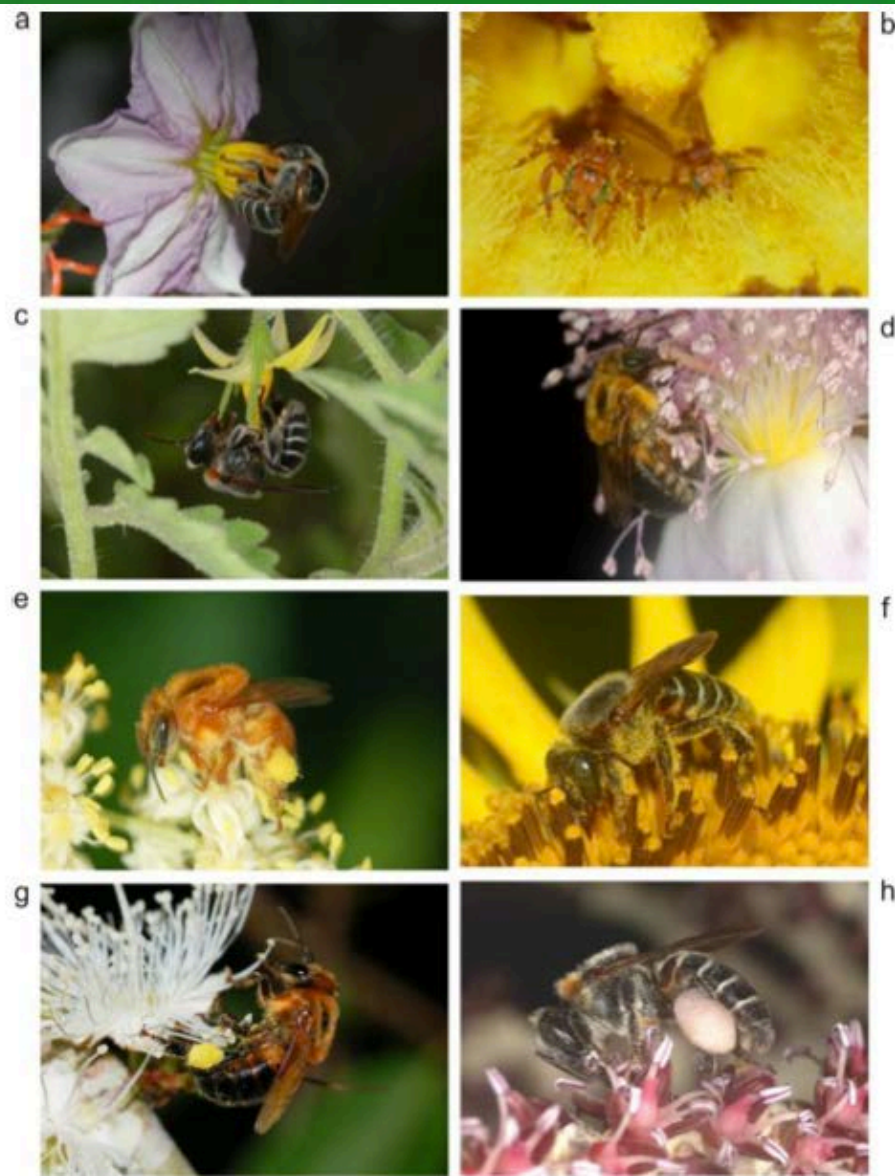
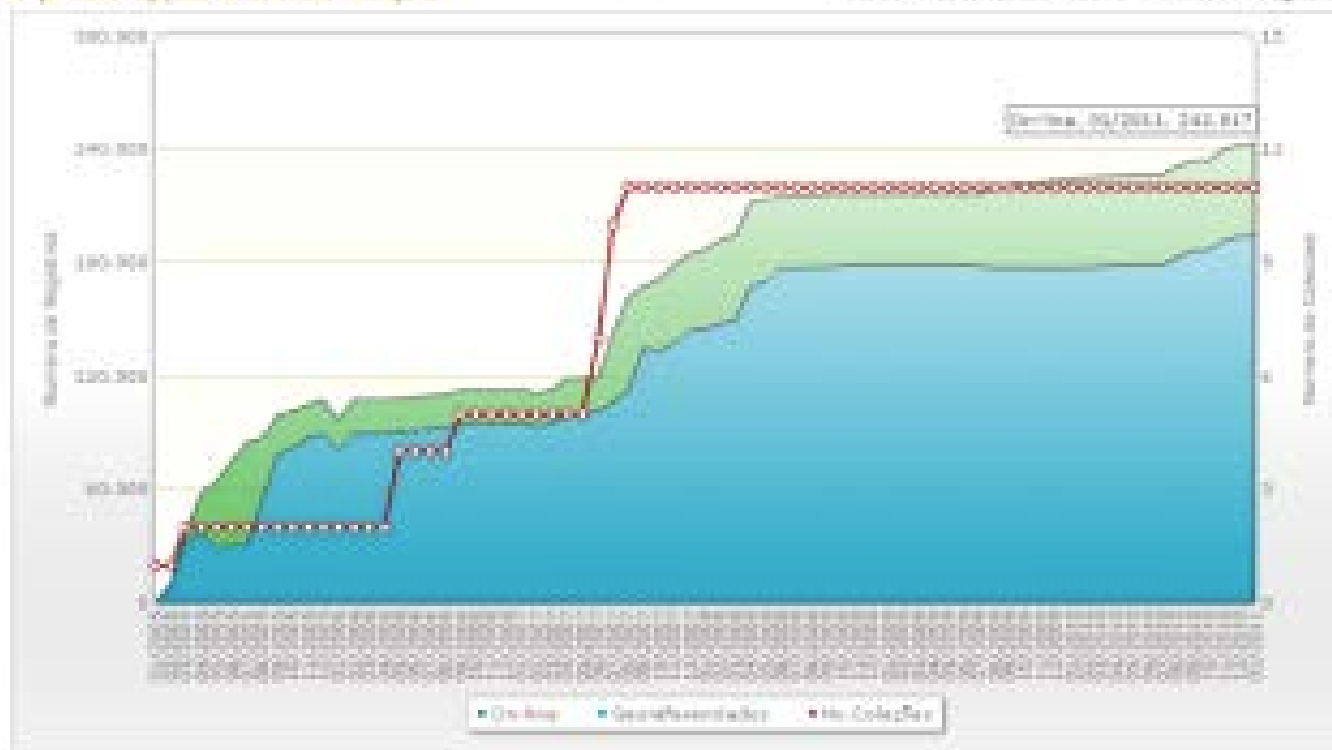


Fig. 3.1.3.1. Exemplos de Meliponíneos utilizados para a polinização de cultivos agrícolas. a) *Melipona fasciculata* polinizando berinjjeira; b) *Trigona pallens* polinizando aboboreira; c) *M. fasciculata* polinizando tomateiro; d) *M. melanoventer* polinizando urucuzeiro; e) *M. flavolineata* polinizando cajazeira; f) *M. fasciculata* polinizando girassol; g) *M. seminigra* polinizando camucamuzeiro; h) *M. fasciculata* polinizando açazeiro Créditos: G. C. Venturieri.

Veja estas opções de indicadores aqui

Rede Indicadores - todos os acessos - registros

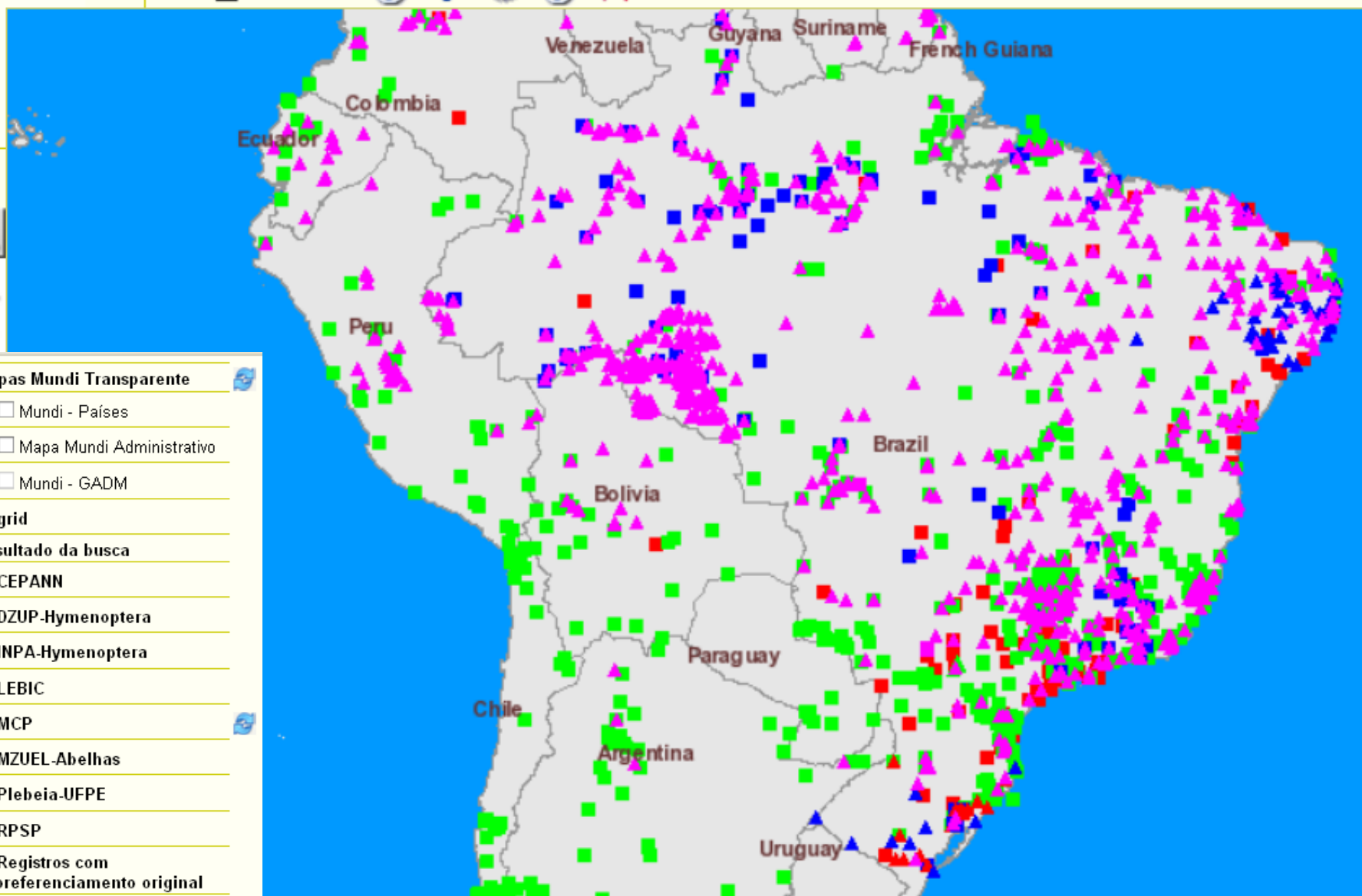


Histórico do envio e retirada de dados da rede. São apresentadas as médias mensais, tanto do número total de registros on-line, como também do número de registros georreferenciados. A linha vermelha traz o número mensal de provedores de dados (coleções biológicas ou de dados)

Atualizado em 2011/11/04 21

Fig. 4.1.1. Histórico do envio de dados à rede speciesLink.

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Mapas Mundi Transparente

- Mundi - Países
- Mapa Mundi Administrativo
- Mundi - GADM

grid

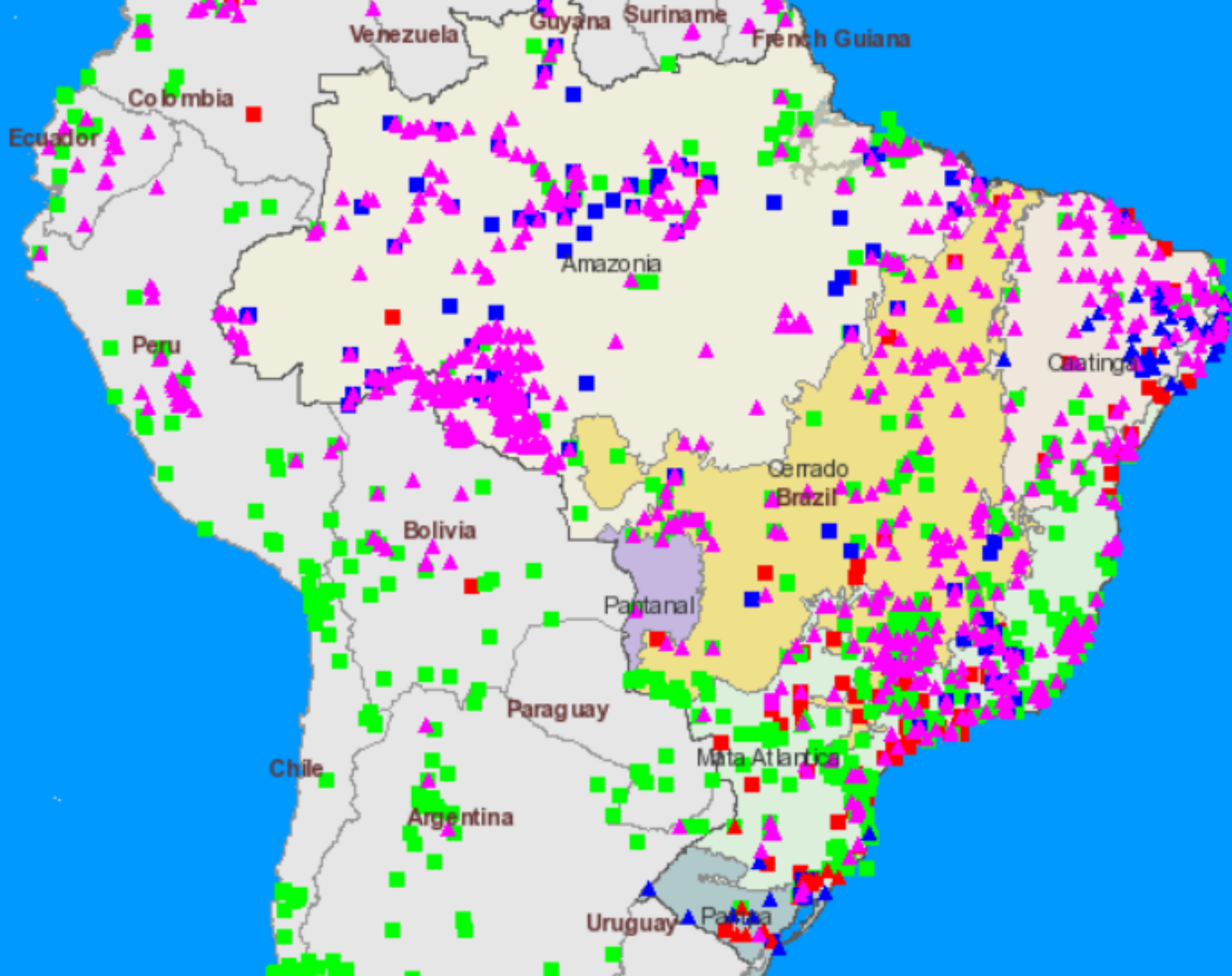
Resultado da busca

- CEPANN
- DZUP-Hymenoptera
- INPA-Hymenoptera
- LEBIC
- MCP
- MZUEL-Abelhas
- Plebeia-UFPE
- RPSP

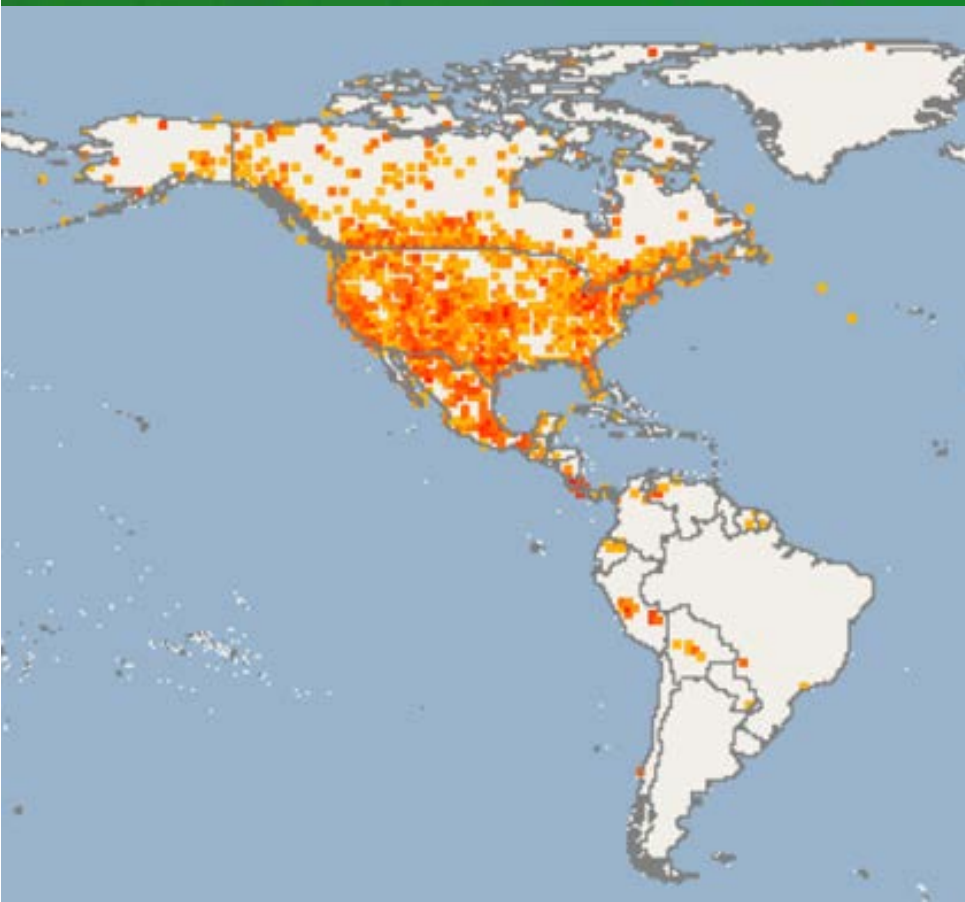
Registros com georeferenciamento original

Registros com georeferenciamento automático

km



Pollinators of the Americas Project Data Contribution



5 November 2006
~90,000 specimens & Observations
(Source: L. Speers, [GBIF](#))

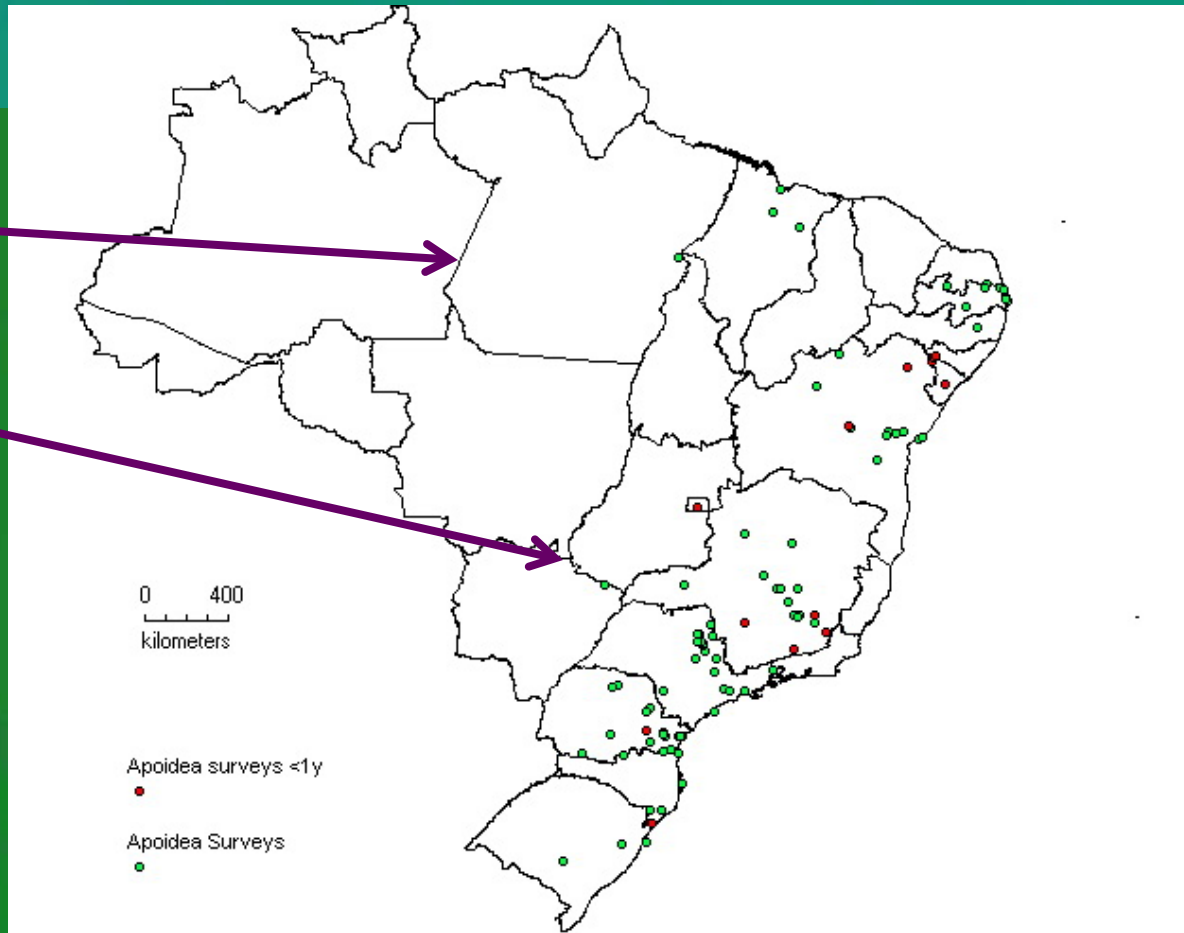


18 August 2009
281,037 specimens & observations
(Source: [IABIN PTN Portal](#))

Evaluation of the status of the interactions between bees and plants

North region
without any
surveys

Central-West
few surveys



Results

Apoidea surveys: 82 surveys: n=129 localities

Surveys lasting one year or more – 71 surveys: n=109 localities

Surveys lasting less than one year – 11 surveys: n=20 localities

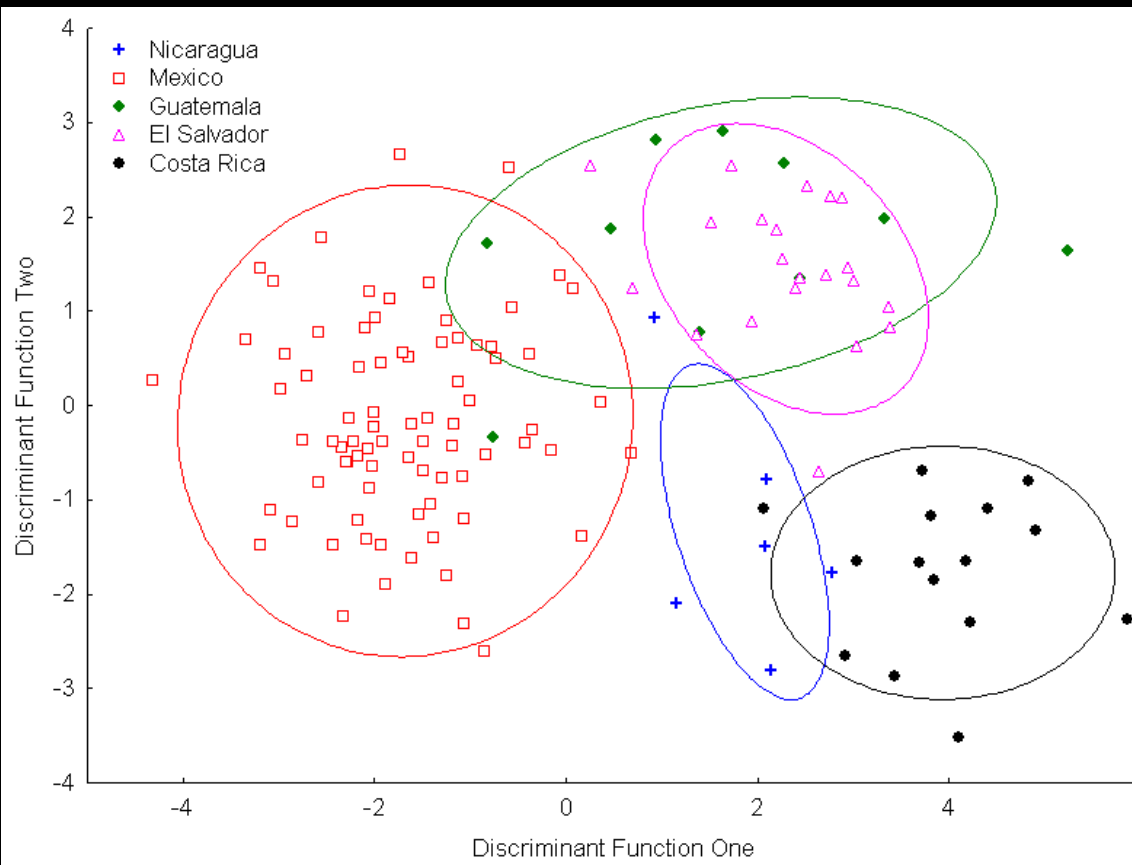
Methods for Assessing
biodiversity and tracking
distribution: Morphometry
and Barcoding DNA



Melipona beecheei

87.5% of the colonies correctly assigned to their geographic origin

Fast, unexpensive and reliable method for a previous identification, leaving the most costly molecular methods only for doubtful cases



Biological collections and Genetics

- Consortium for the Barcode of Life (CBOL)
- DNA amplification from pin-mounted bumble bees (*Bombus*) in a museum collection: effects of fragment size and specimen age on successful PCR (James P. Strange, Joyce Knoblett, Terry Griswold, *Apidologie* 2009)
- Conservation needs information from genetics and molecular tools



B. terrestris in
South America

Acosta, A. L., Giannini, T. C.,
Imperatriz-Fonseca, V. L., Saraiva, A.M.

Modeling invasive species: *Bombus terrestris*.



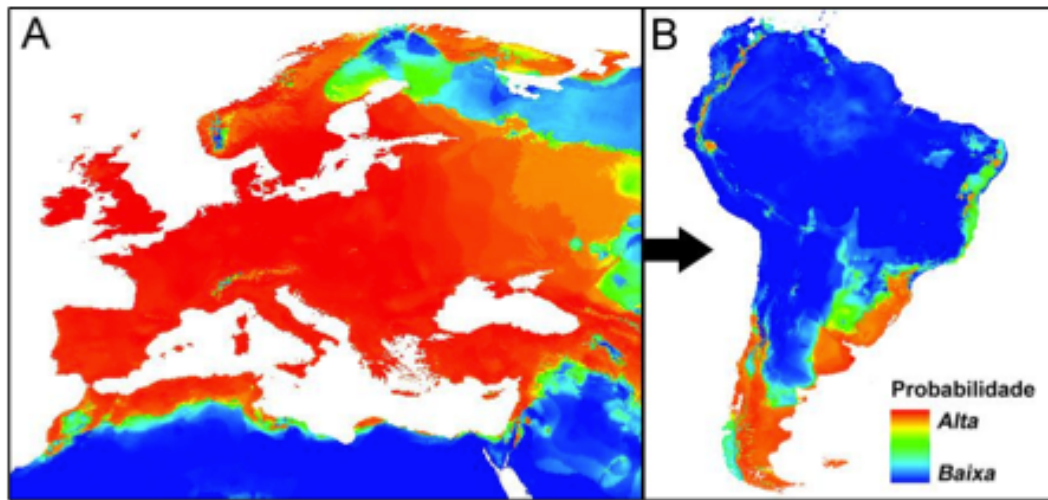


Fig. 4.2.2.4. Por meio da modelagem de máxima entropia bioclimáticas de *Bt* em sua área de ocorrência natural projetadas para a América do Sul (B), exibindo as áreas:

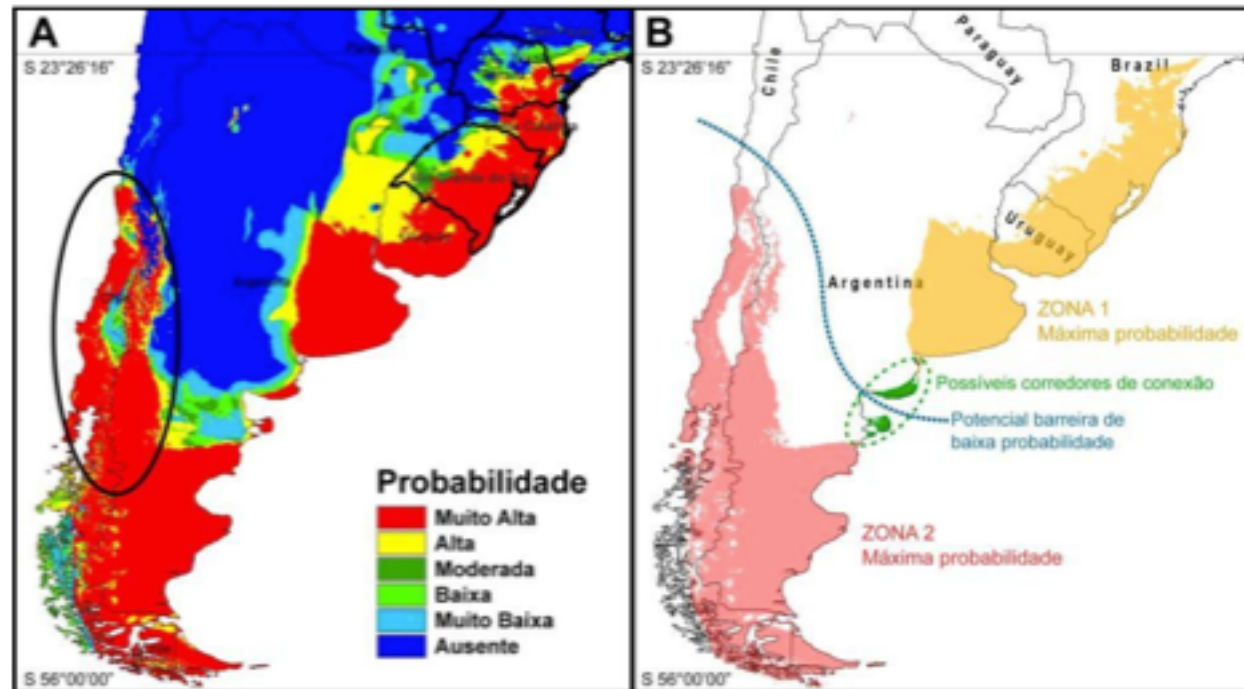
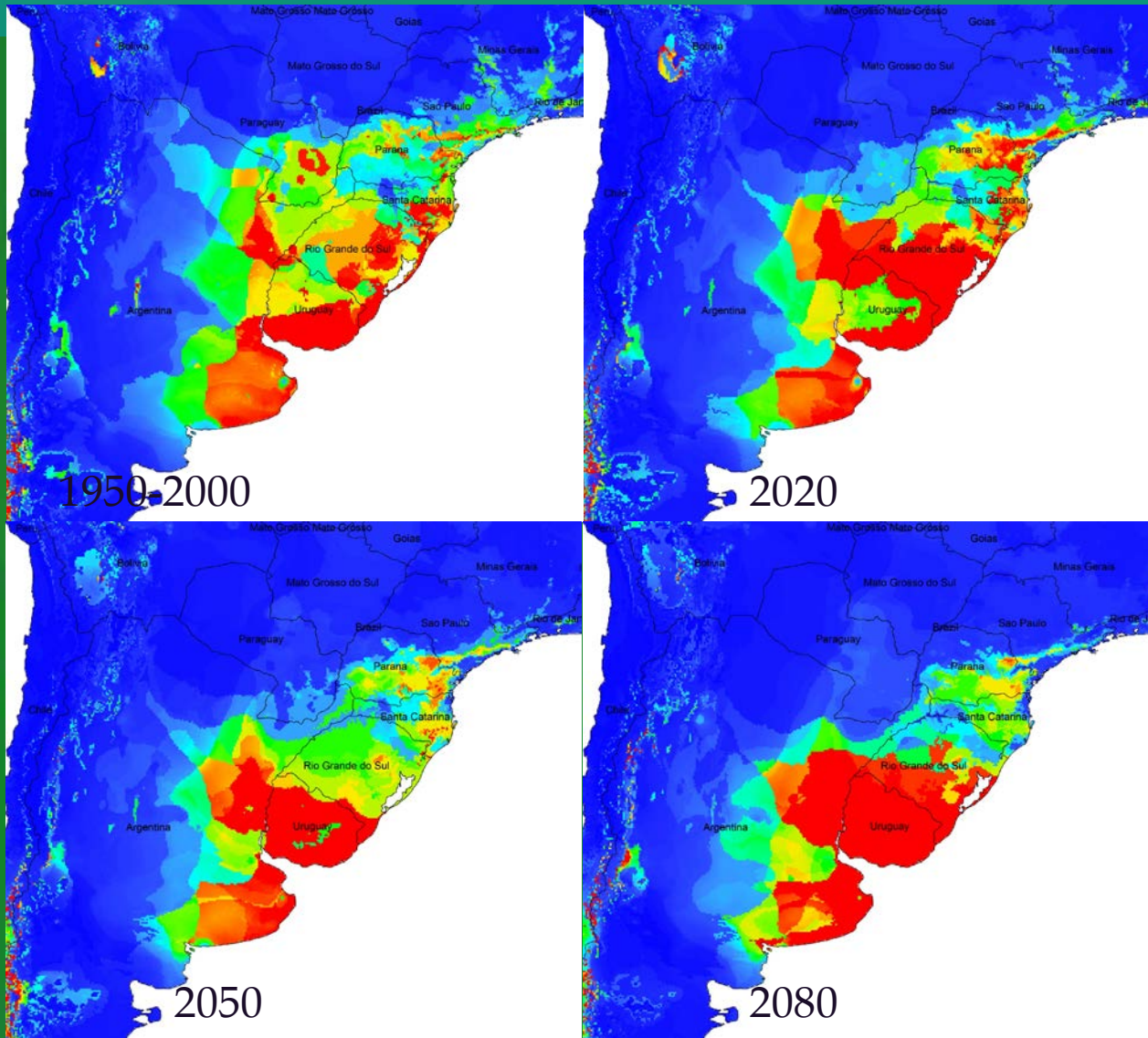


Fig. 4.2.2.5. A: Mapa exibindo as categorias de probabilidade de ocorrência de *Bt* mais proximais à área já invadida pela espécie - destacada pelo círculo; B: Análises biogeográficas das potenciais conexões e barreiras entre as zonas de máxima probabilidade.

Modeling the potential distribution



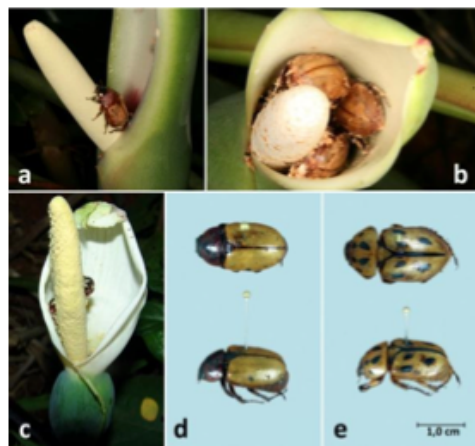


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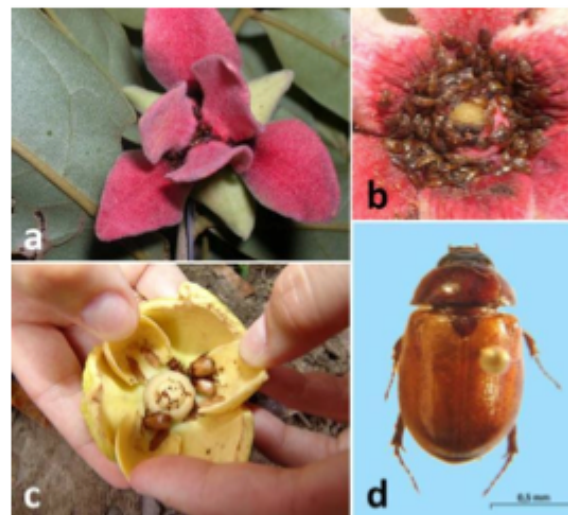


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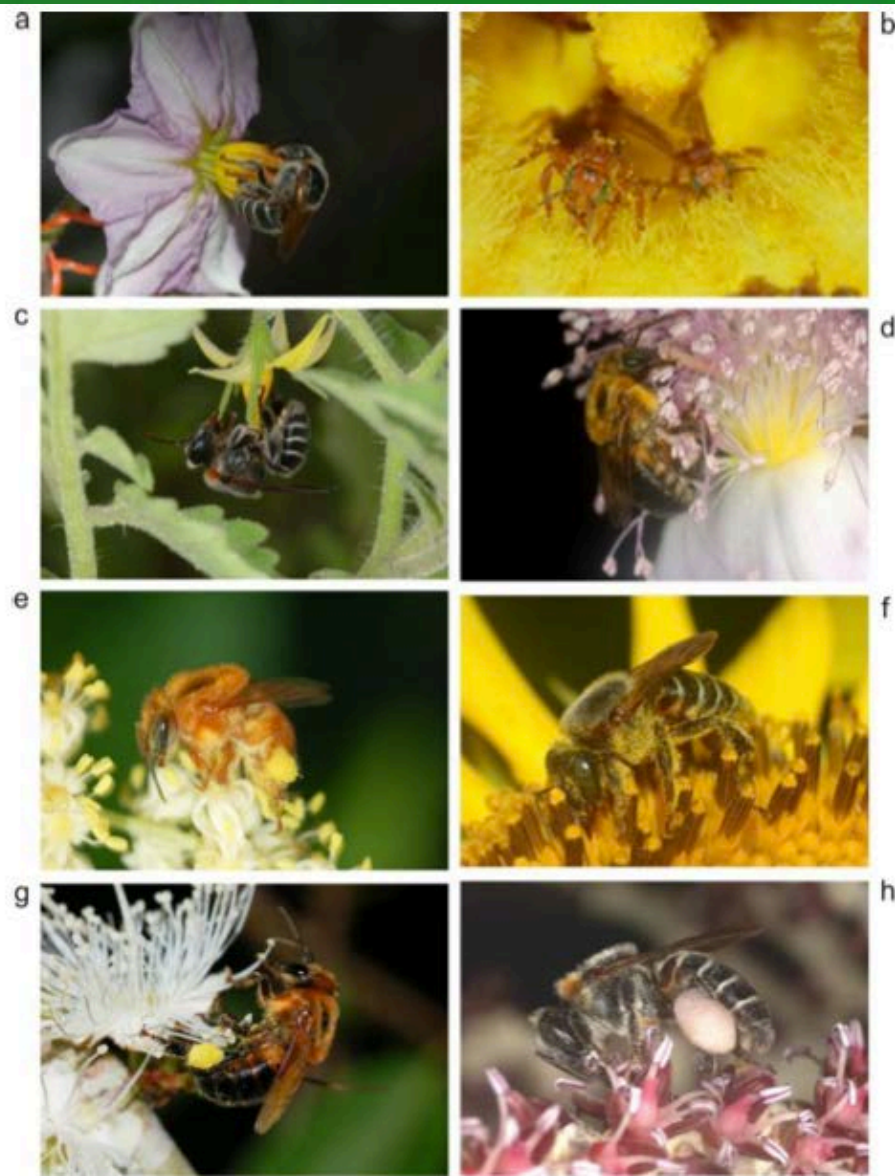
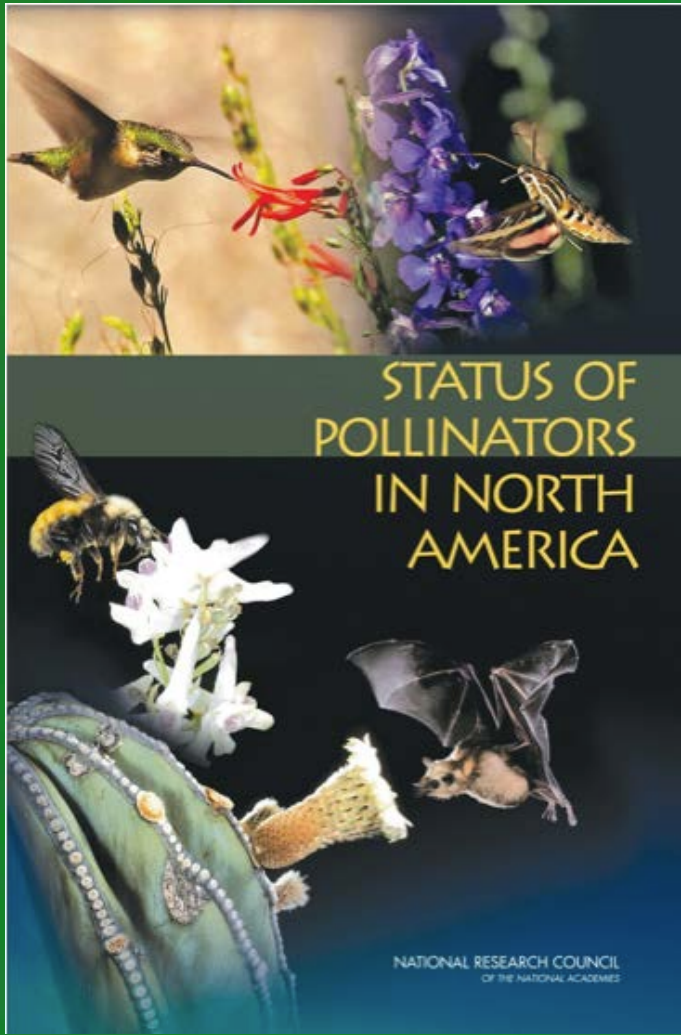


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STATUS OF POLLINATORS IN BRAZIL





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