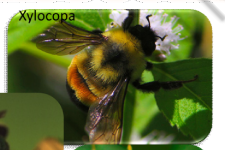
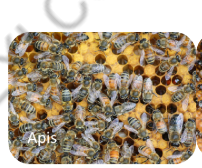
Ventana ambiental para el forrajeo de la abeja sin aguijón *Melipona flavolineata* (Apidae, Meliponini)

MUSEU PARAENSE EMÍLIO GOELDI
Pós-Graduação ZOOLOGIA MPEG/UFPA

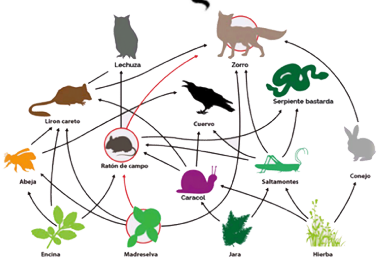
INTRODUCCIÓN

Solitarias





Sociais



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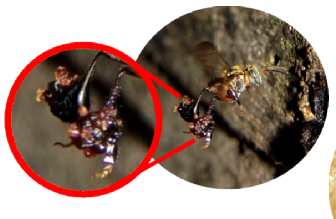


Fonte proteica

Roubik, 1992

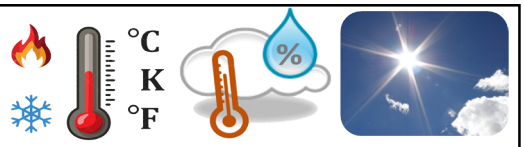
Hidratos de carbono

INTRODUCCIÓN

COMPORTAMENTO

(Ramalho et al. 1989)

INTRODUCCIÓN



- **Rendimento fisiológico**
- **Atividade externa** — **Busca e coleta** — **Voo**
- **Atividade interna** — **Trabalho de ventilação**
- **Pico de atividades** — **retardada**

INTRODUCCIÓN

Urbanización

Fragmentación

INTRODUÇÃO

Recursos no ambiente

Para abejas sin aguijón, los desajustes entre la floración y la temperatura óptima de forrajeo pueden conducir a una reducción en la cantidad de alimento almacenado, cambios en la ingesta y, finalmente, declino en la reproducción.

INTRODUCCIÓN

Urban Ecosyst (2015) 18:411–418
DOI 10.1007/s11252-014-0403-y

Eating locally: dance decoding demonstrates that urban honey bees in Brighton, UK, forage mainly in the surrounding urban area

Mihail Garbuzov · Roger Schürch · Francis L.W. Ratnieks

Published online: 3 August 2014

Abstract Urbanization is increasing worldwide. Urban habitats often support considerable biodiversity and so are of conservation value, even though they are highly modified ecosystems. Urban parks and gardens are rich in flowers that provide food for pollinators, including bees. Here, we use waggle dance decoding to investigate foraging by 3 honey bee hives located in the city of Brighton, UK, over almost an entire foraging season, April to October. Waggle dances were recorded using video cameras and decoded during frame-wise playback on a computer by measuring the angle and duration of the waggle phase. Foraging was mostly local (mean monthly distances 0.5–1.2 km) and mostly within the surrounding urban area (monthly means 78–92 %) versus the countryside (closest distance 2.2 km) even though this was well within the honey bee maximum foraging range (c. 12 km). These distances were lower than those from a previous study for hives located in a rural area 4.5 km away. Honey bees are very sensitive to foraging economics and foragers make waggle dances only after visiting high-quality feeding locations. Low distances advertised by dances, therefore, indicate sufficient forage nearby and show that urban areas can support honey bees year round. As a corollary, however, urban bees may provide little pollination service to agriculture especially in spring, which had the lowest foraging distances and is when the most economically important animal-pollinated UK crops, apple and oilseed rape, are in bloom.

Keywords Floral resources · Pollination · Urban ecosystems · Waggle dance

OPEN ACCESS Freely available online

Waggle Dance Distanc Seasonal Foraging Cha

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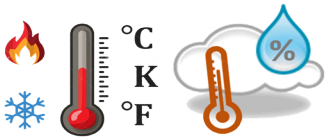
1 Laboratory of Apiculture and Social Insects, School of Life Scienc Life Sciences, University of Sussex, Falmer, Brighton, United Kingd

Abstract

Even as demand for their services increases, hor Europe and North America. Honey bees face n changes have reduced flower-rich areas. One wa most beneficial? We use the waggle dance, a u the location of visited flowers, to make a 2-yea seasonal changes in foraging, as indicated by representative rural-urban landscape. In year 3, distance/area significantly increase from springs better quality, before decreasing in autumns (12 suggests summer is the most challenging seaso Our study demonstrates that dancing bees a particular, can show the months when addition

INTRODUCCIÓN







COMPORTAMENTAL

ATIVIDADES EXTERNAS

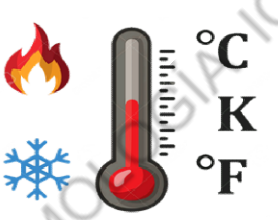
ATIVIDADES INTERNAS

OBJETIVO

Determinar la Ventana Ambiental óptima para el forrajeo de la abeja sin aguijón *Melipona flovolineata en ambiente urbanizado*

HIPÓTESIS Y PREDICCIÓN

El éxito de búsqueda de recursos de una especie se limita a un medio ambiente. La ventana, es una combinación de temperaturas óptimas y disponibilidad de recursos.



MATERIAL Y METODOS: Especie modelo

Uruçu - Amarela

Melipona flavolineata, Friese, H. (1900)

Camargo & Pedro, 2008; Pedro, 2014

PROPOSTA PARA A CHAMADA CNPQ/MCTIC/IBAMA/ASSOCIAÇÃO ABELHA Nº 32/2017

ESTRUTURA DA PAISAGEM E ABELHAS SEM FERRÃO

EFEITOS SOBRE A COLETA E USO DE RECURSOS ALIMENTARES E A DINÂMICA DAS COLÔNIAS E INDIVÍDUOS

MATERIAL E METODOS: Diseño experimental

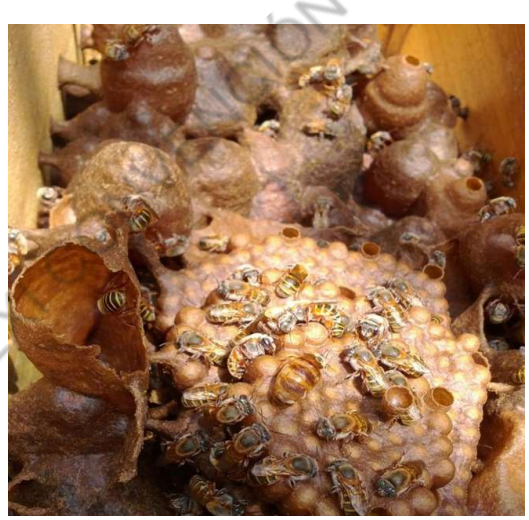
Performance/Comportamento Colônia/Indivíduos ~ **Ambiente**

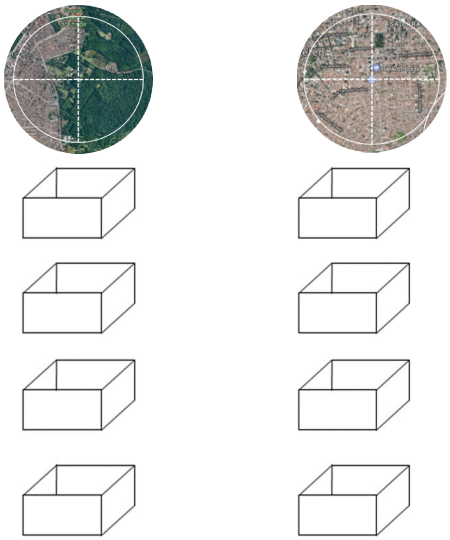
- **Atividades internas**
  - Taxa de Postura
  - Estoques alimentares
- **Atividades externas**
  - Forrageio
  - Carga Polínica
  - Número de Forrageiras

- **Variável categórica – 3 níveis**
  - A. Amb. Preservado
  - B. Amb. Intermediario
  - C. Amb. Urbanizado
- **Variáveis continuas**
  - Temperatura
  - Umidade
  - Luminosidade
  - Pressão barométrica

MATERIAL E METODOS: Área de estudio

MATERIAL E METODOS: Diseño experimental



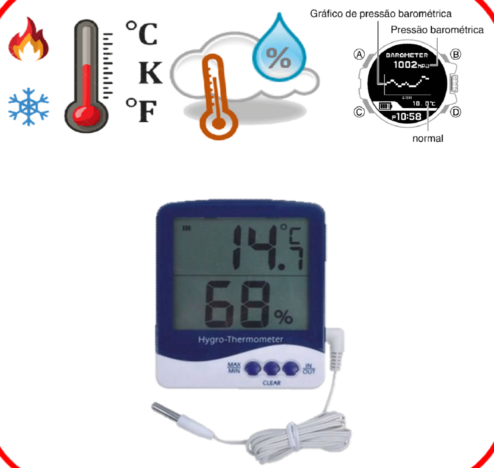


1° semana: atividade externa
2° semana: atividade interna

3 meses

MATERIAL E METODOS:

Factores climáticos

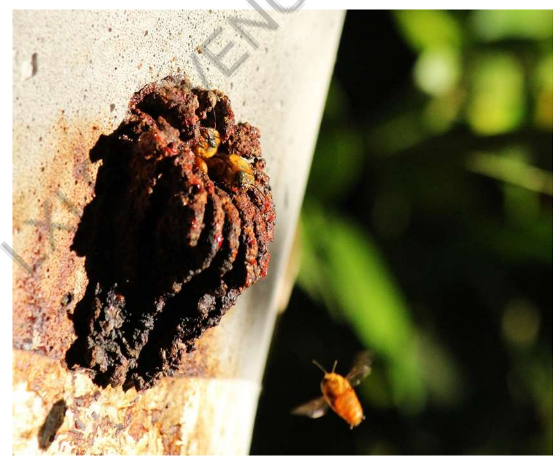


MATERIAL E METODOS: Desenho experimental

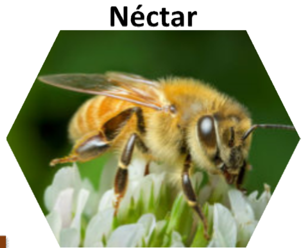
Atividade externa: Taxa de forrageio

5min/hora/colônia

Nates-Parra & Rodriguez, 2011



Néctar



Pólen

07h00 até 11h00
90% atividade

Nates-Parra & Rodriguez, 2011

MATERIAL E METODOS: Análise estatístico

Variáveis

- **Colônia**
- **Área**
- **n = 70**

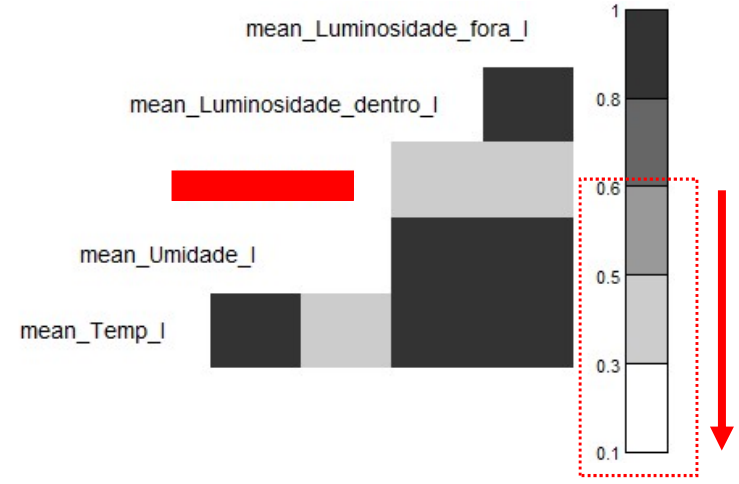
- **Parâmetros climatológicos**
  Matriz de Correlação (60%)
- nls

Nonlinear Regression Analysis (Gaussian Peak Model)

RESULTADOS Y DISCUSIÓN

Temperatura

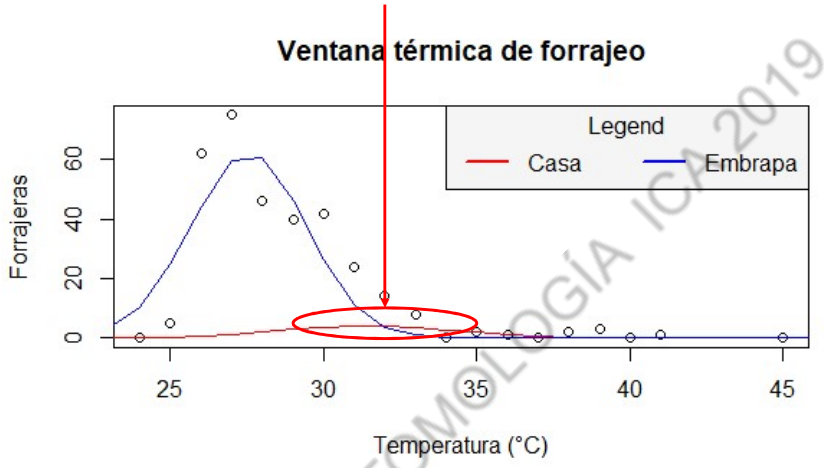
°C
K
°F



RESULTADOS Y DISCUSIÓN

Tendencia de forrajeo

Constante

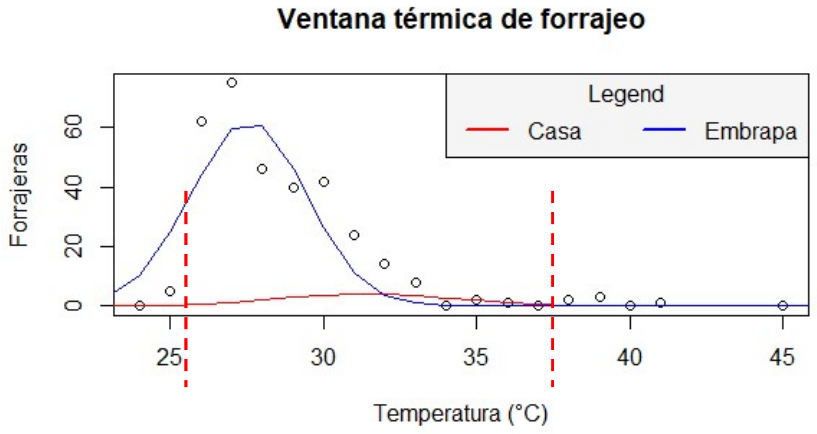


RESULTADOS Y DISCUSIÓN

Inicio y final

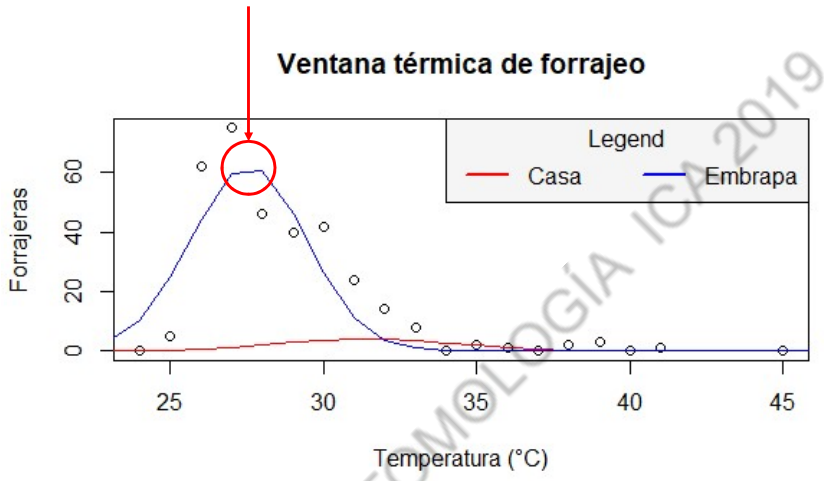
Ligeramente visibles

25.8 °C – 38 °C



RESULTADOS Y DISCUSIÓN

Pico de actividad



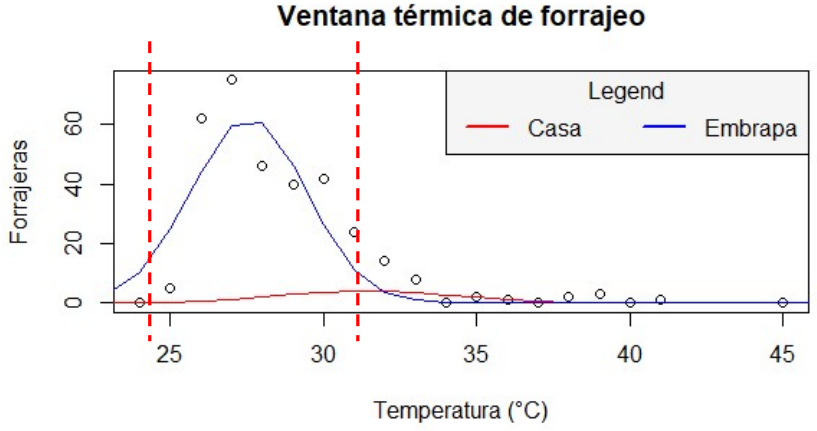
RESULTADOS Y DISCUSIÓN

MQ =12 and 22 °C (maximum foraging 17.7 °C)
MS= *17 and* 24 °C (maximum foraging: 19.3 °C).
Maia, et al. 2015

Inicio y final

Diferenciados

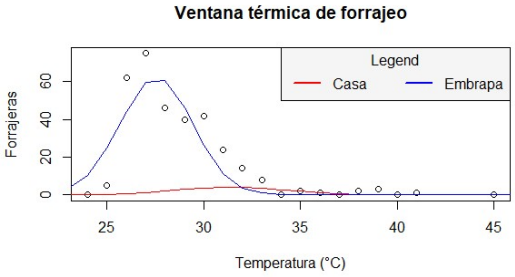
24 °C – 31 °C



RESULTADOS Y DISCUSIÓN

En el área urbanizada no se encuentran plantas próximas a las colonias, a este déficit en la colecta de recursos alimentares se le podría atribuir la muerte de cuatro de las ocho colonias monitoreadas de *M. flavolineata*, las cuales no sobrevivieron al período de estudio.

Maia, et al. 2013
Maia, et al. 2015



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