

Presentación de CV y aptitudes

Desarrollo de modelos computacionales de especies invasoras en el Guadalquivir: herramientas de gestión para su control y prevención

Miguel Ángel Collado, Computación natural



Curriculum Vitae

- Grado en Ciencias Ambientales (2013) - Universidad de Cádiz
 - Colaboración en grupo de botánica



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 - Estancia en Freire Universität Berlin (2017)

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- Doctorado en Ecología Terrestre - Universitat Autònoma de Barcelona (2019)
 - Estancia en Freire Universität Berlin (2017)
- Técnico para Abejas Silvestres S.L. (2020)
- Online Ads Rater en Lionbridge/Telus international (2021)

Publicaciones científicas

- **Bees use anthropogenic habitats despite strong natural habitat preferences.**

Collado, M. Á., Sol, D., & Bartomeus, I. (2019). *Diversity and Distributions*.

- **Innovation in solitary bees is driven by exploration, shyness and activity levels.**

Collado, M. A., Menzel, R., Sol, D., & Bartomeus, I. (2021). *Journal of Experimental Biology*

- **Brain size predicts learning abilities in bees.**

Collado, M., Montaner, C. M., Molina, F. P., Sol, D., & Bartomeus, I. (2021). *Royal Society Open Science*

- **Feeding specialization and longer generation time are associated with relatively larger brains in bees.**

Sayol, F., Collado, M., Garcia-Porta, J., Seid, M. A., (...) & Bartomeus, I. (2020). *Proc B*

- **Bee brain size is positively associated with urban lifestyles (Writing)**

Bee behavioural plasticity in a global change context



Thesis: Miguel Ángel Collado
Advisors: Ignasi Bartomeus
Daniel Sol

UAB



Contexto

Cambio global



Contexto

Cambio global

- Cambio climático
- Pérdida de diversidad
- Pérdida de recursos hídricos
- Transformación y pérdida
de hábitats
- Otros fenómenos



Contexto

Cambio global

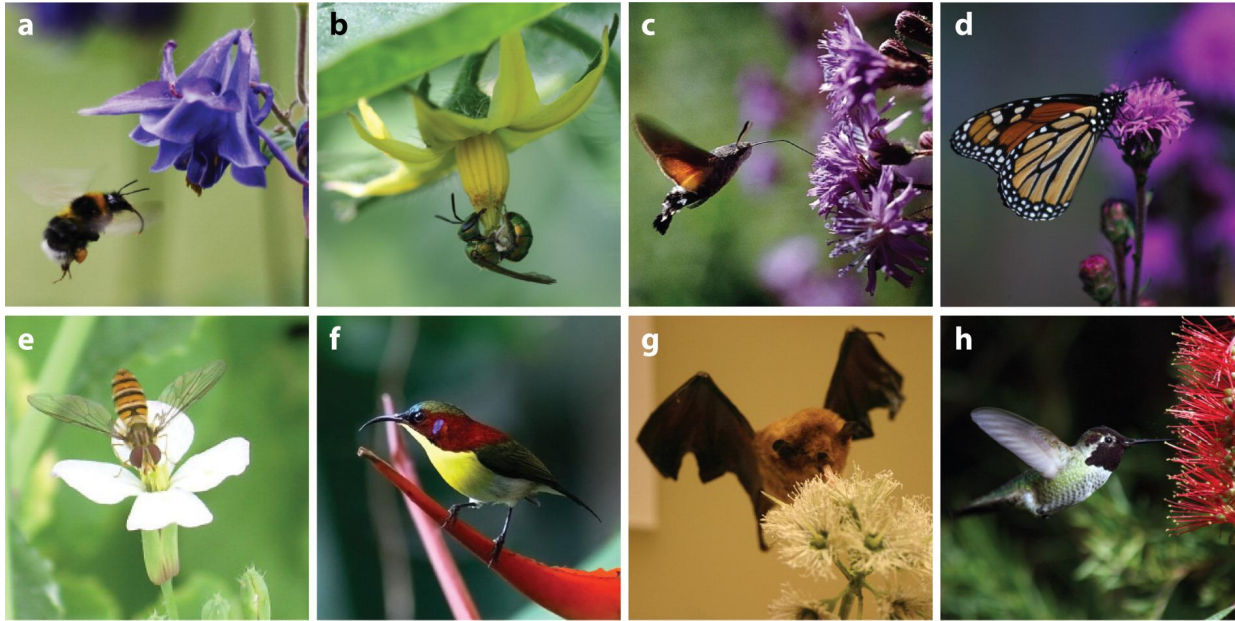
- Invasiones biológicas (Stachowicz et al. 2002; Bradley et al. 2010; Occhipinti-Ambrogi & Savini, 2003)



Caulerpa taxifolia
("Alga asesina")

Contexto

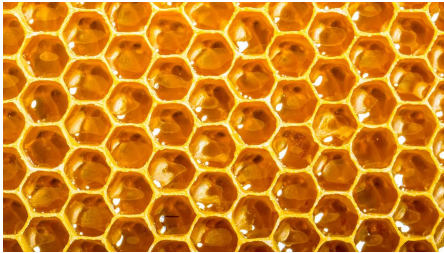
- The 40% of Earth's terrestrial surface already altered (Ellis et al., 2010)



Bee diversity



Photo by Thomas Shannon
Oregon
Department
of Agriculture



Apis mellifera



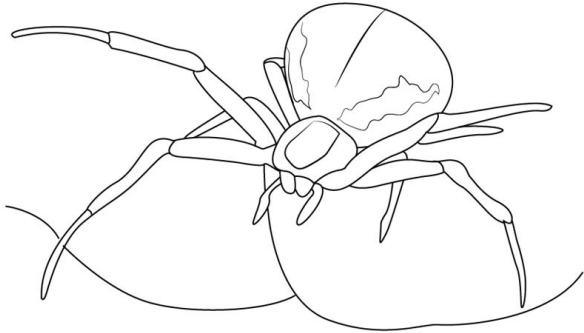
Declive de abejas

LISTA ROJA EUROPEA DE ABEJAS AMENAZADAS



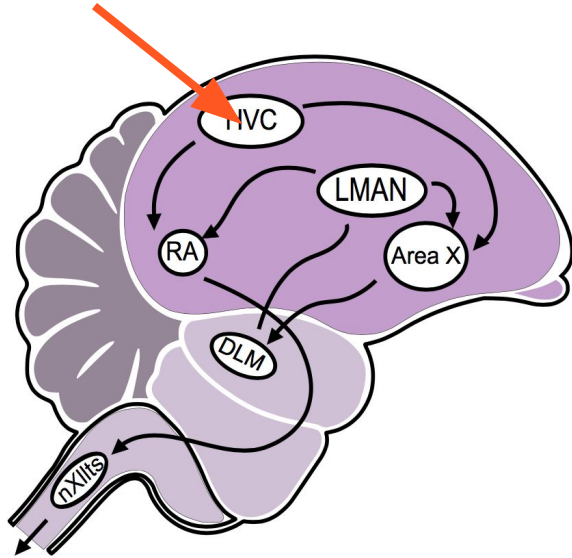
- ~ 9% amenazadas
- ~ 5 % casi amenazadas
- ~ 56 % estado desconocido

La importancia de la plasticidad de comportamiento



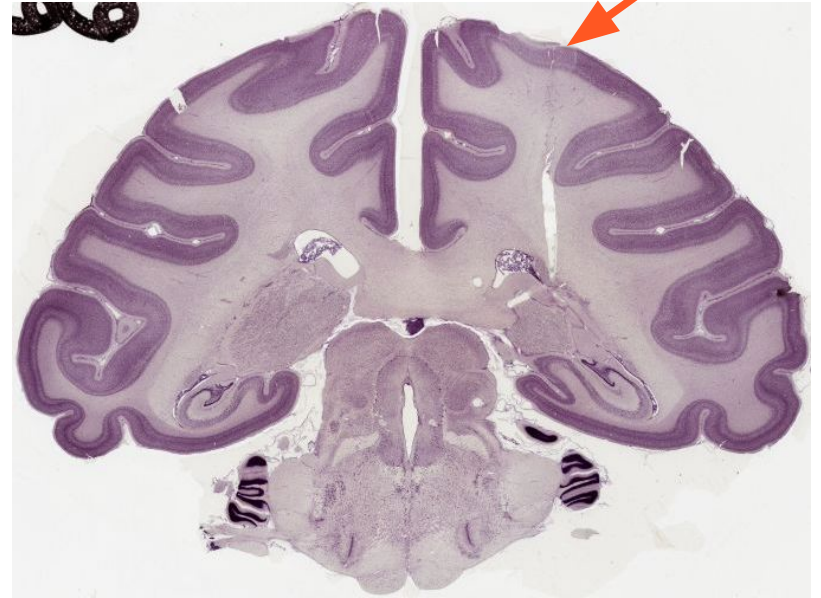
Mecanismos: plasticidad dirigida por tamaños cerebrales?

Hyperstriatum ventrale



Bird brain

Isocortex



Primate brain

(Lefebvre et al., 2004)

Modelos

- Generalized linear models (GLM) / Generalized linear mixed models (GLMM)



Modelos

- Generalized linear models (GLM) / Generalized linear mixed models (GLMM)
- Bayesian (Phylogenetic Generalised Linear Mixed Models)



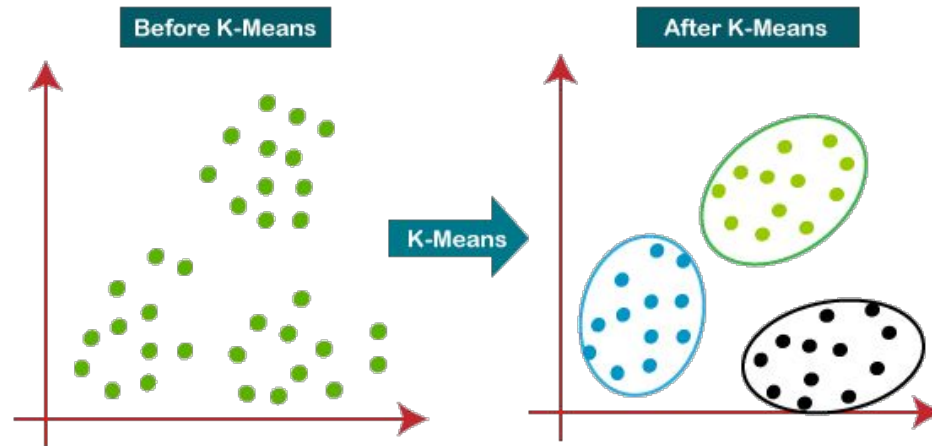
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- Generalized linear models / Generalized linear mixed models (GLM/GLMM)
- Bayesian (Phylogenetic Generalised Linear Mixed Models)
- Modelos nulos



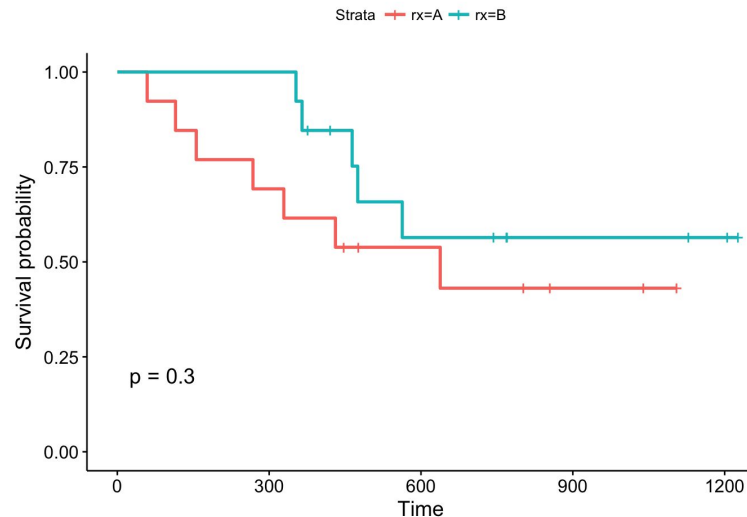
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- Modelos nulos
- k-means



Modelos

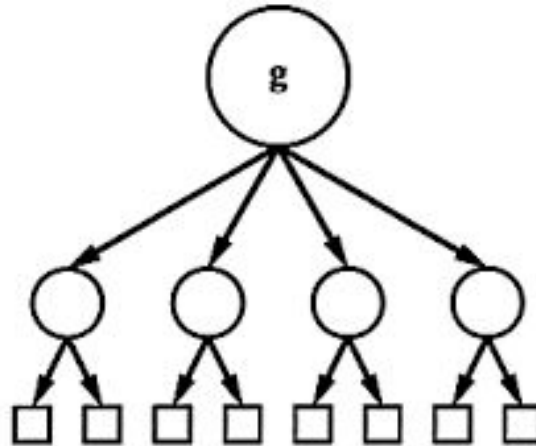
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- Modelos nulos
- k-means
- Survival & cox analysis



Modelos

- Generalized linear models / Generalized linear mixed models (GLM/GLMM)
- Bayesian (Phylogenetic Generalised Linear Mixed Models)
- Modelos nulos
- k-means
- Survival & cox analysis
- Hierarchical model

Classic Hierarchical Model



Modelos: GLM

Volume 224, Issue 3

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RESEARCH ARTICLE | 05 FEBRUARY 2021

Innovation in solitary bees is driven by exploration, shyness and activity levels **FREE**

Miguel Á. Collado  , Randolph Menzel, Daniel Sol, Ignasi Bartomeus 

+ Author and article information


J Exp Biol (2021) 224 (3):jeb232058.

<https://doi.org/10.1242/jeb.232058> [Article history](#) 

 Views ▾

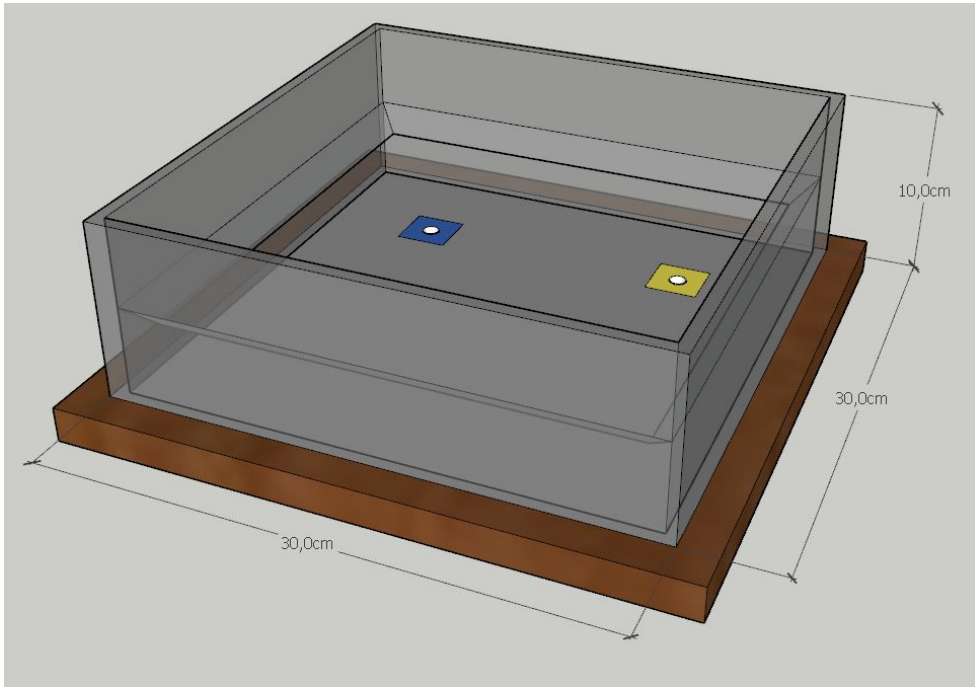
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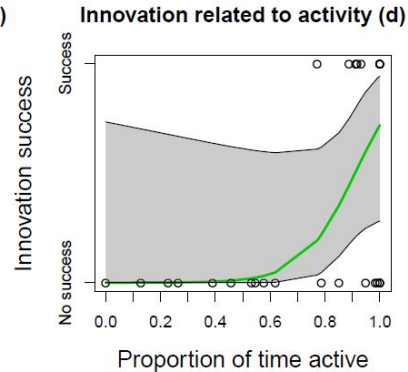
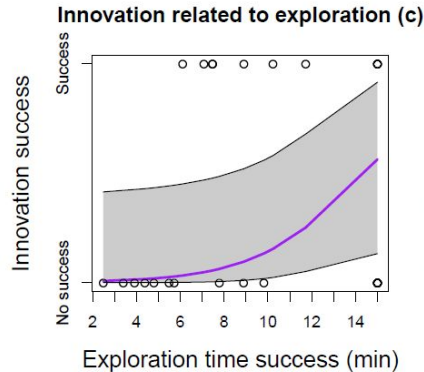
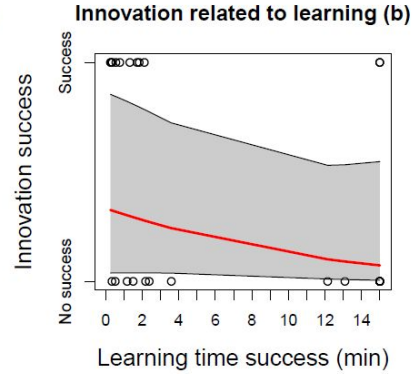
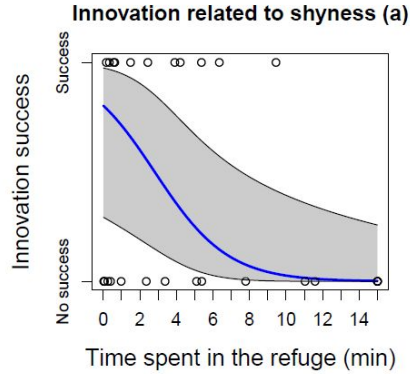
ABSTRACT

Modelos: GLM



(*Osmia cornuta*)

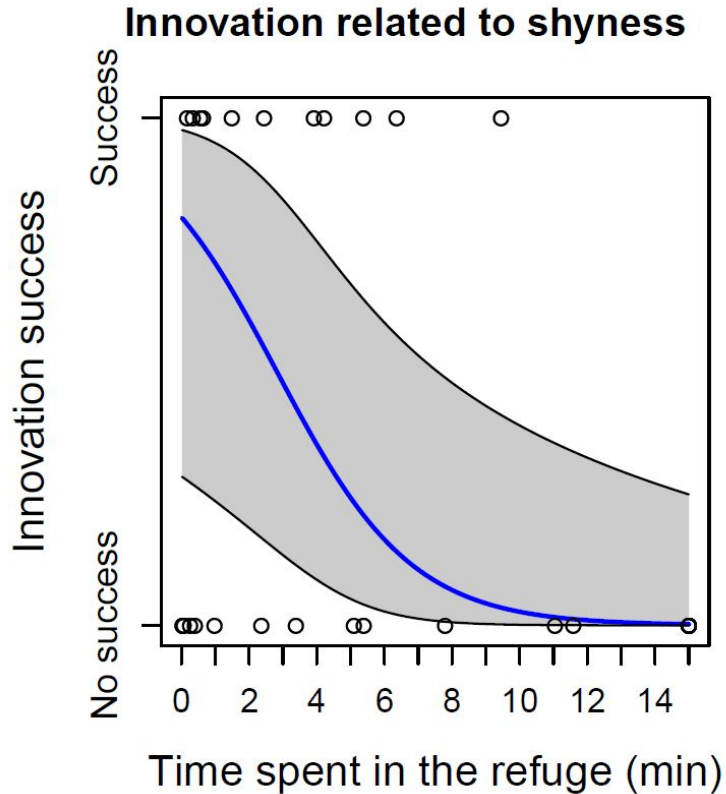
Modelos: GLM



Qué comportamientos explican la innovación?

Binomial GLM Innovation success
 \sim Shyness + Learning time +
Exploration + Activity

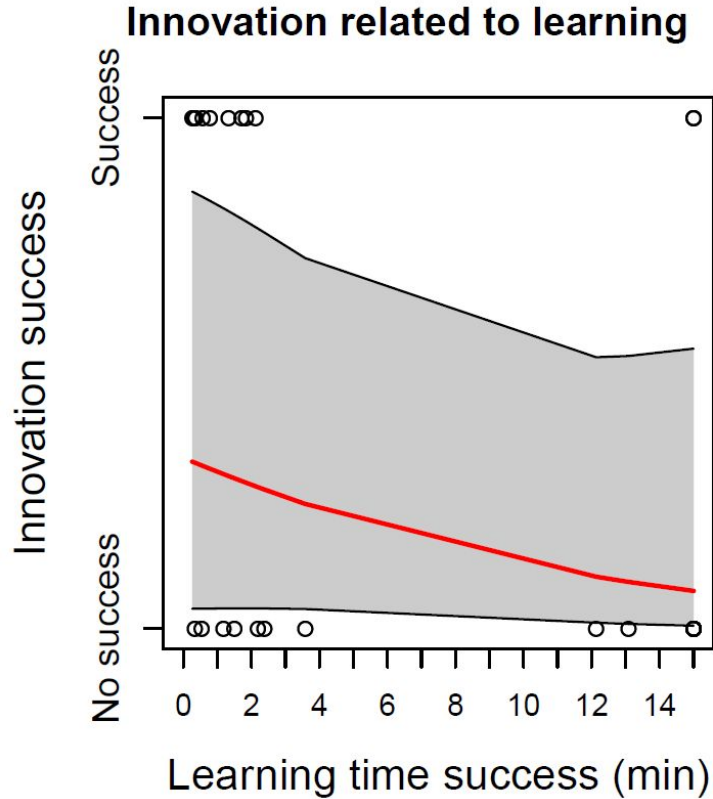
Q: Which behaviours lead to better innovation?



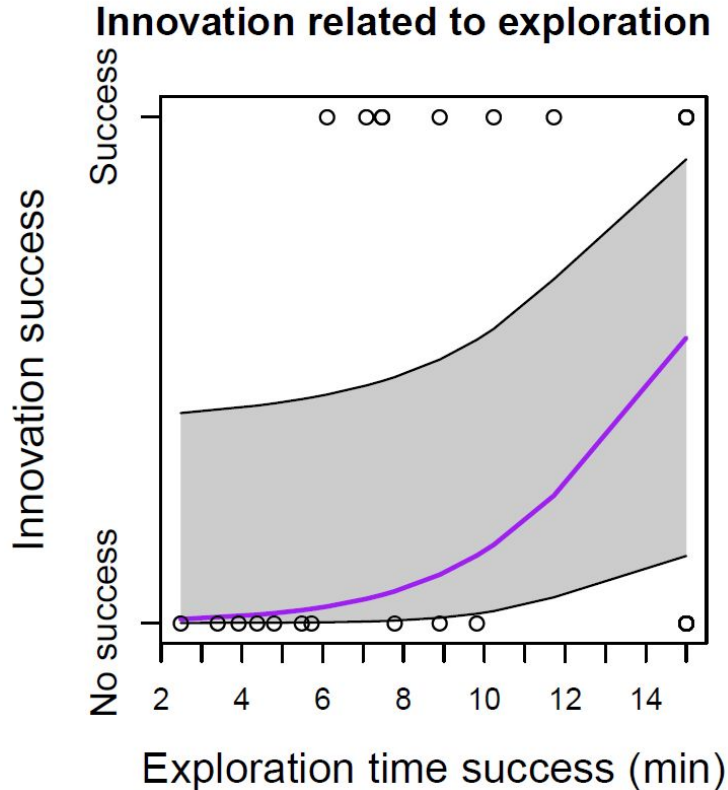
Shyness

Innovation

Q: Which behaviours lead to better innovation?



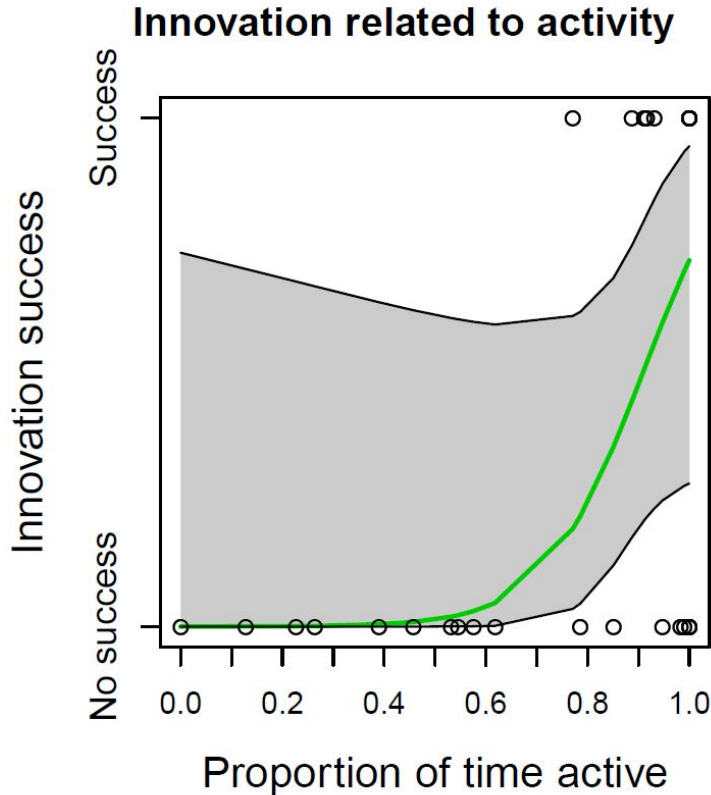
Q: Which behaviours lead to better innovation?



↑
Slow
exploration

↑
Innovation

Q: Which behaviours lead to better innovation?



Activity

Innovation

Time to innovation models gave similar results


Modelos: Bayesian

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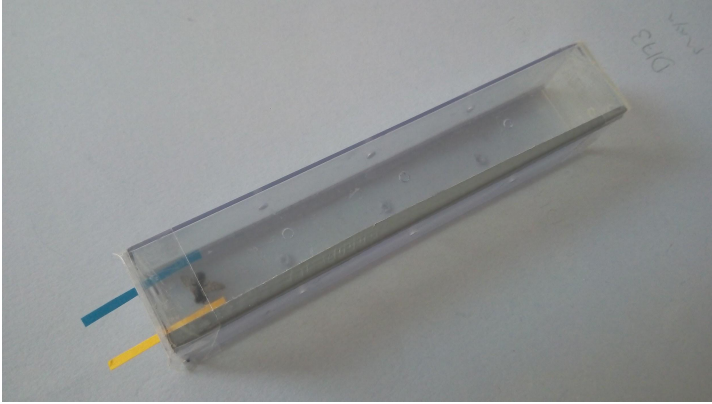
Brain size predicts learning abilities in bees

Miguel Á. Collado , Cristina M. Montaner, Francisco P. Molina, Daniel Sol and Ignasi Bartomeus

Published: 19 May 2021 | <https://doi.org/10.1098/rsos.201940>

 Review history

Modelos: Bayesian



Apis mellifera



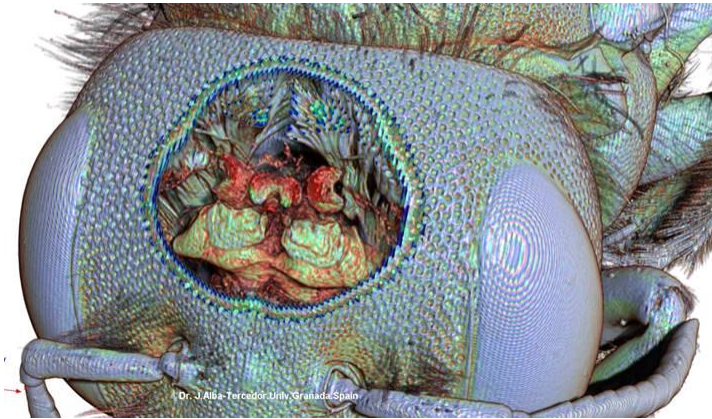
Bombus spp.



Rhodanthidium sticticum
(Photo by Henk Wallays)

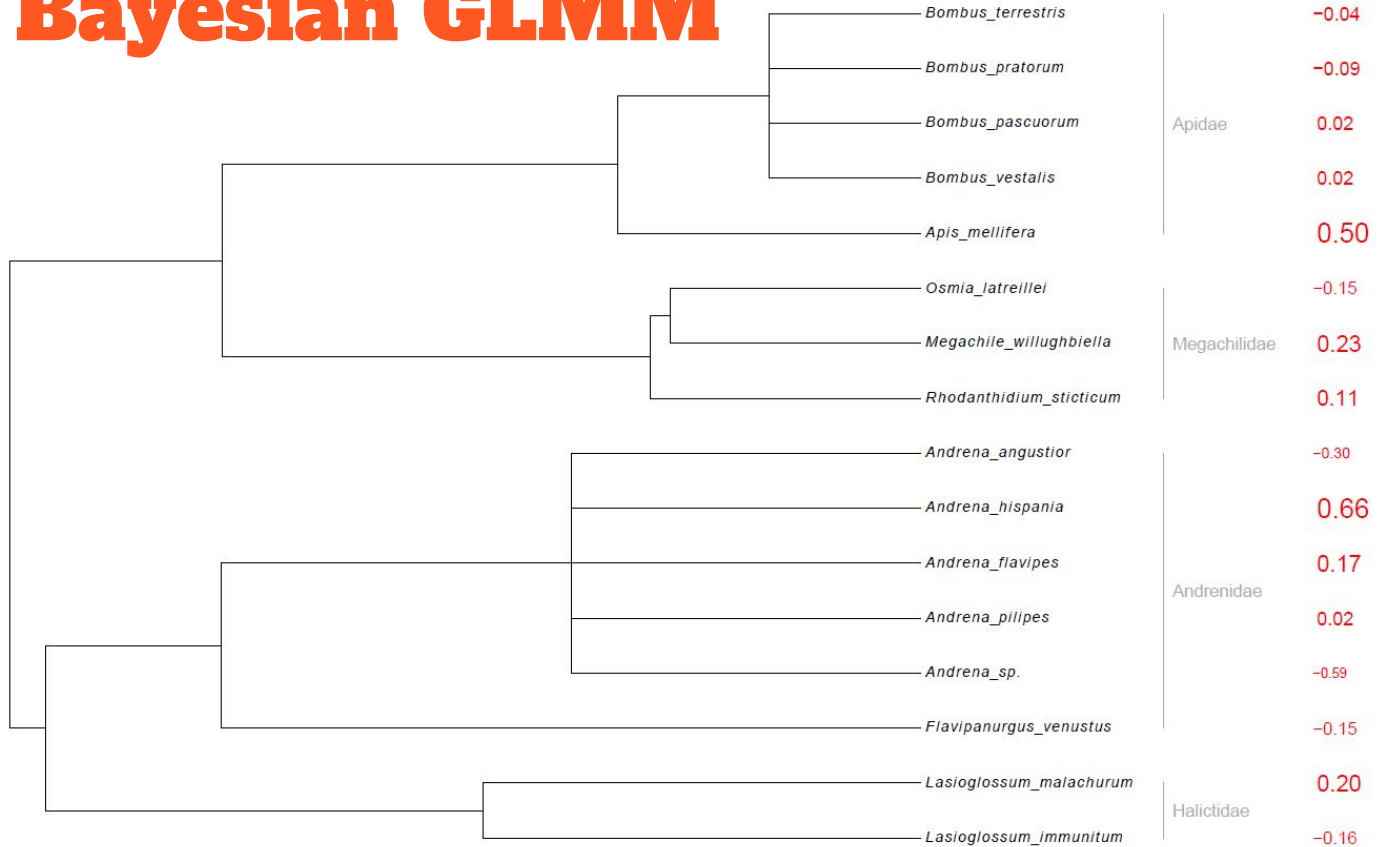


Lasioglossum spp.



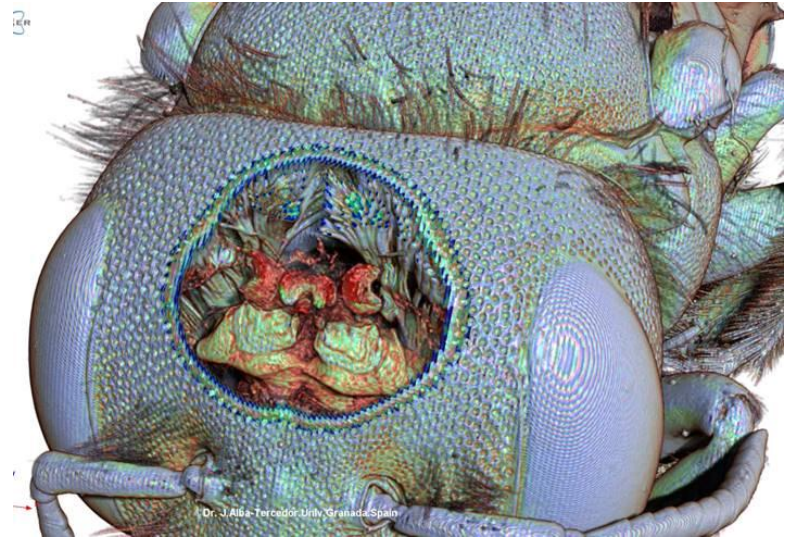
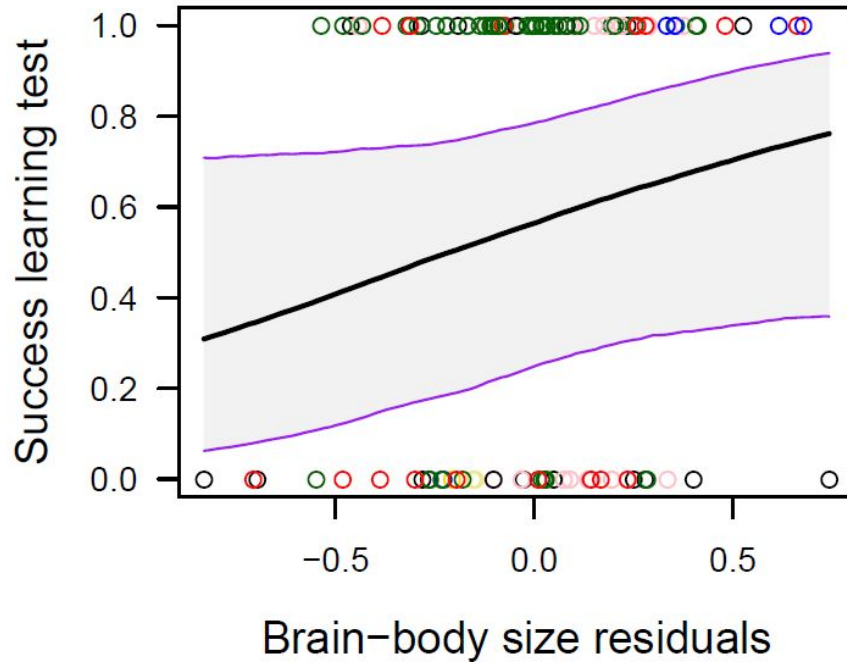
Phylogenetic tree:
Body size – brain weight residuals

GLM vs Bayesian GLMM



Modelos: Bayesian

Success related to
brain-body size residuals





PGLMM Bernoulli $\beta = 1.26 \pm 0.78$, IC =
-0.26 - 2.80, ICC: 0.24

Modelos: Modelos nulos

Diversity and **Distributions**

Open Access

A Journal of
Conservation
Biogeography

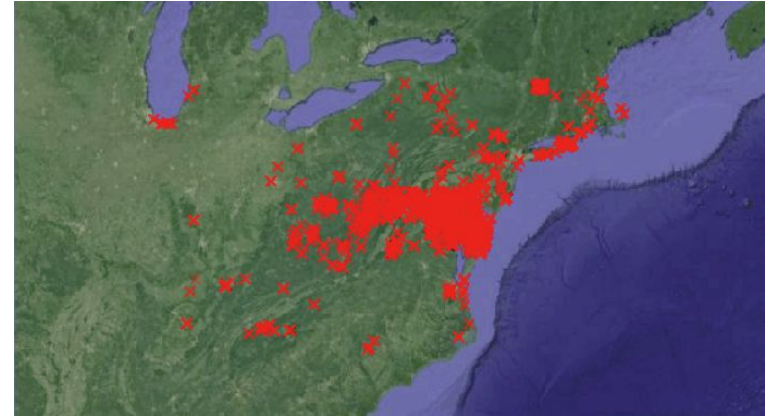
BIODIVERSITY RESEARCH |  Open Access |  

Bees use anthropogenic habitats despite strong natural habitat preferences

Miguel Á. Collado  Daniel Sol, Ignasi Bartomeus

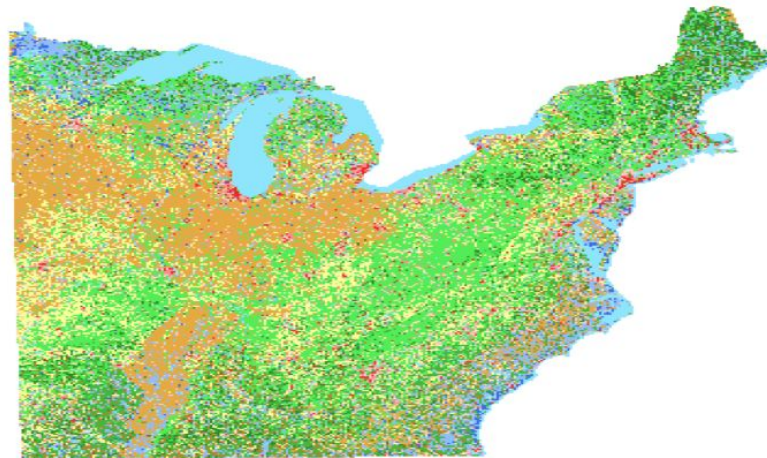
First published: 06 February 2019 | <https://doi.org/10.1111/ddi.12899> | Citations: 12

Modelos: Modelos nulos



National Land Cover Database

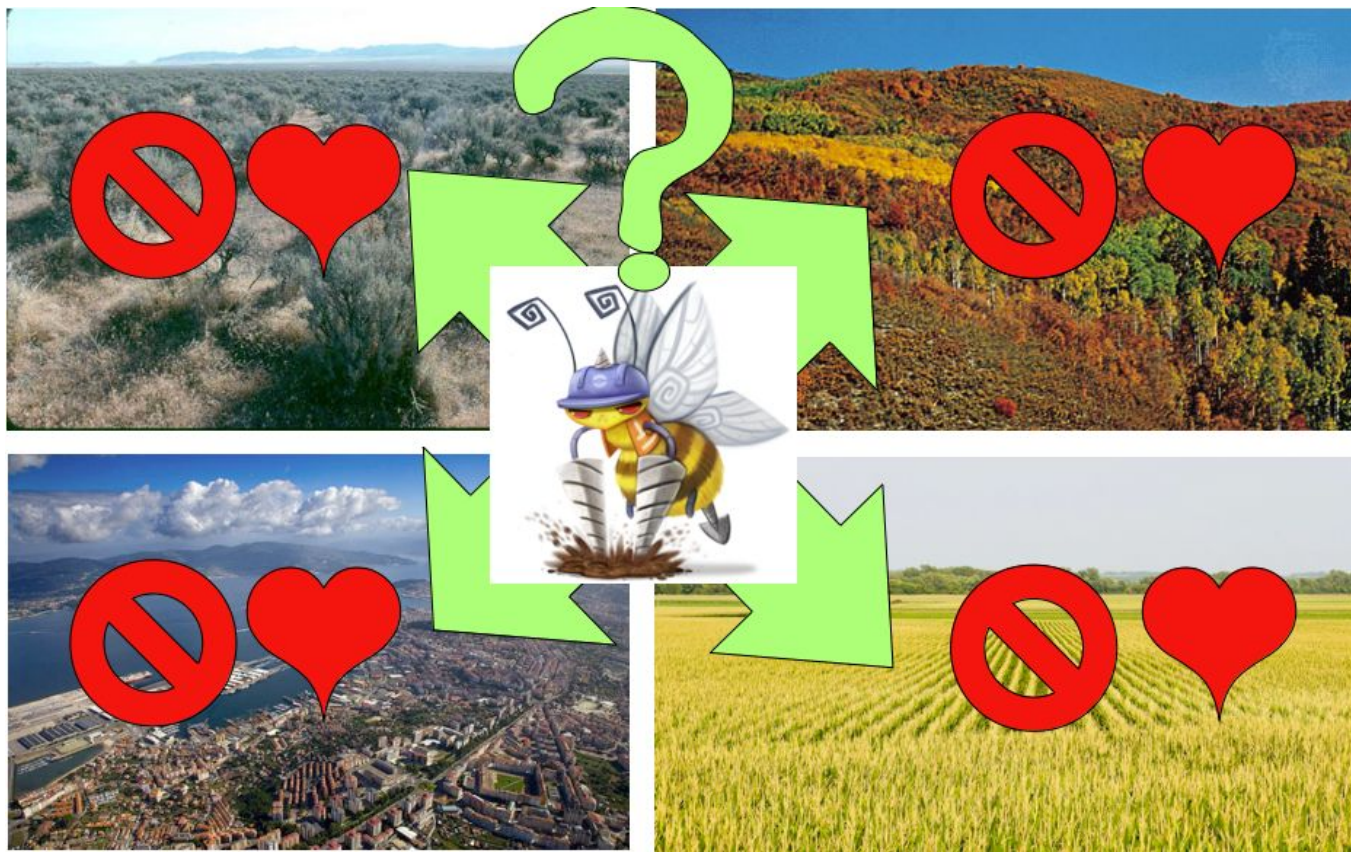
(Homer et al. 2015)



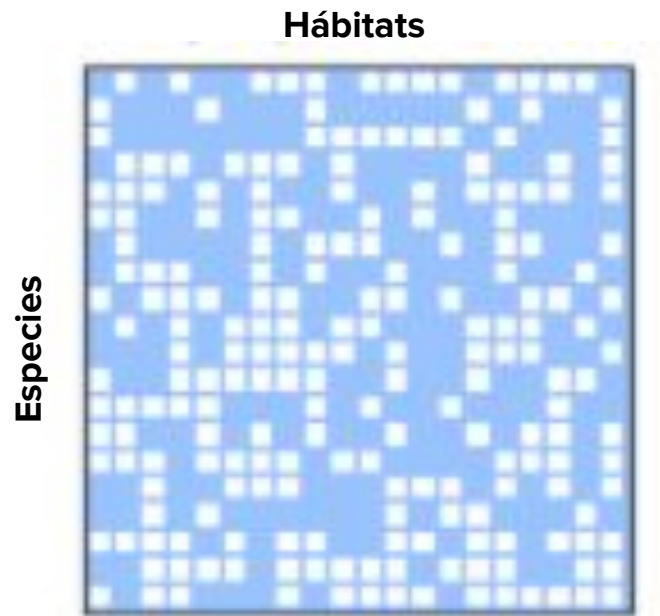
Legend

- Open water
- Developed Open Space
- Developed Low Intensity
- Developed Medium Intensity
- Developed High Intensity
- Barren land
- Deciduous forest
- Evergreen forest
- Mixed forest
- Scrub
- Shrub/Scrub
- Hay pasture
- Cultivated crops
- Woody wetlands
- Emergent herbaceous wetlands

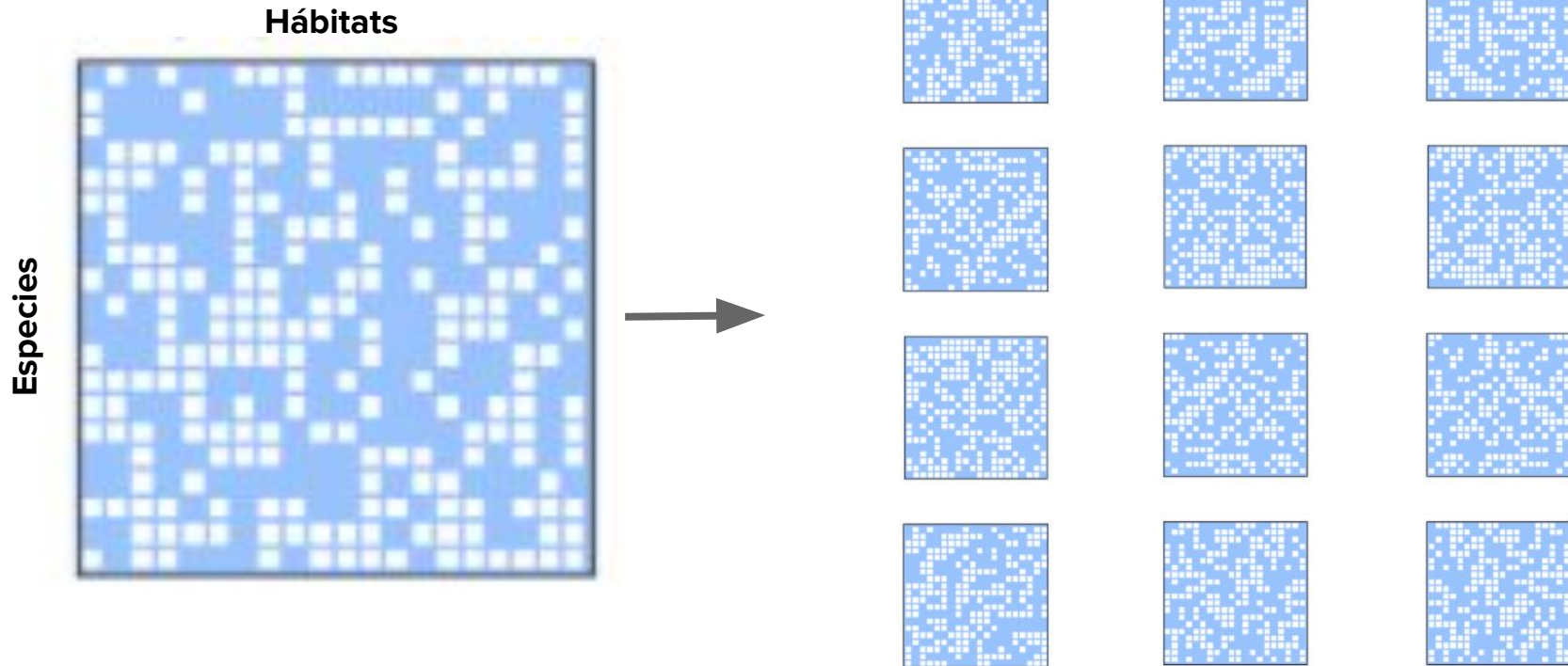
Modelos: Modelos nulos



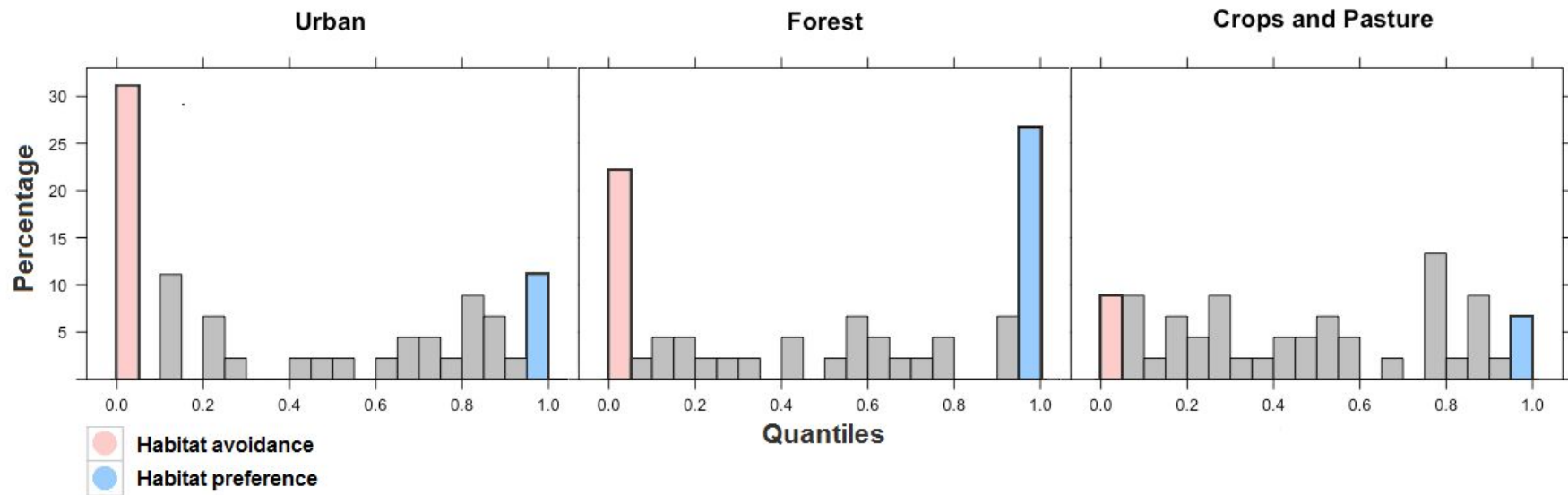
Modelos: Modelos nulos



Modelos: Modelos nulos



Modelos: Modelos nulos



Presentación de CV y aptitudes

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