

**Carolina Laura Morales**  
**Biography (CURRICULUM VITAE)**



Birth Date and Site: 18 April 1975, Córdoba, Argentina

Nationality: Argentina

Current Address: Laboratorio ECOTONO, Instituto de Investigaciones en Biodiversidad y Medio Ambiente-INIBIOMA (CONICET-Universidad Nacional del Comahue), Quintral 1250 (8400). San Carlos de Bariloche, Río Negro, ARGENTINA

Phone: +54 (2944) 423374. ext 158, Fax: +53 (2944) 422111

E-mail: [moralesc@comahue-conicet.gob.ar](mailto:moralesc@comahue-conicet.gob.ar)

ORCID: <https://orcid.org/0000-0002-9989-5347>

<https://inibioma.academia.edu/CarolinaLauraMorales>

[https://www.researchgate.net/profile/Carolina\\_Morales](https://www.researchgate.net/profile/Carolina_Morales)

### **Qualifications**

(1999) Bachelor Degree in Biological Sciences. Faculty of Exact, Physical and Natural Sciences, Universidad Nacional de Córdoba, Argentina.  
Graduated with honors.

(2006) PhD in Biology. Universidad Nacional del Comahue, Argentina.  
Dissertation: "Habitat alteration and interactions between native and exotic species through pollination in temperate forests of Southern South America".

### **Present Positions**

Independent Researcher at the National Research Council of Argentina (CONICET).

Teaching Assistant. Department of Ecology, Regional University Center Bariloche, Universidad Nacional del Comahue, Argentina.

### **Ad-honorem positions**

(2011-2021) Regional Coordinator for South America, **Bumblebee Specialist Group, Species Survival Commission, International Union for**

**Conservation of Nature (BBSG, SSC, UICN). (Now subgroup within the Wild Bee Specialists Group).**

(2019-Present) Leading Author, Invasive Alien Species Assessment, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

(2016-Present) Member of the Steering Committee of the Latin-American Society for Bee Research (SOLATINA).

**Scientific Production (total citations: 3620, H-index: 26, Source: Google Scholar, 27 June 2021)**

**Selected Relevant Publications (most recent first)**

1. Chalcoff, V. R., Sasal, Y., Graham, L, Vazquez, D. and **Morales C.L.** (in review). Invasive bumblebee disrupts a pollination mutualism over broad temporal and spatial scales. *Bio.Inv.*
2. Pérez-Méndez, N. Andersson G.S, Requier F., Hipólito J., Aizen M.A., **Morales C.L.**, García N., Gennari G.P., Garibaldi L. (2020). The economic cost of losing native pollinator species for orchard production. *Journal of Applied ecology* 57: 599-608. <https://doi.org/10.1111/1365-2664.13561>
3. Antúnez K., F. Requier, P. A. Sánchez, M. Basualdo, B. Branchiccela, R. Calderón, A. Correa-Benítez, A. Delgado-Cañedo, S. Fuselli, **C. Morales**, E. Pérez-Castro, S. Plischuk, M.P. Porrini, L. Segui Goncalves, J.M. Tapia González, A. Torres, R. Velarde, C. Invernizzi (2018) SOLATINA: A Latin-American Society for Bee Research to Foster the Interactions Between Scientists and Coordinate Large-Scale Research Programs, *Bee World*, 95:4, 124-127, DOI: 10.1080/0005772X.2018.1508813
4. Aizen M.A., Smith-Ramirez C., **Morales C.L.**, Vieli L., Saez A., Barahona-Segovia R., Arbetman M.P., Montalva, J. Garibaldi, L.A., Inouye D.W., Harder L.D. (2018). Coordinated species importation policies are needed to reduce serious invasions globally: The case of alien bumblebees in South America. *Journal of Applied Ecology*. <https://doi.org/10.1111/1365-2664.13121>.
5. Arbetman M.P, Gleiser G., **Morales C.L.**, Williams P.H., Aizen M.A. (2017). Global decline of bumblebees is phylogenetically structured and inversely related to species range size and pathogen. *Proceedings of the royal society B*. 284. <http://dx.doi.org/10.1098/rspb.2017.0204>
6. Saez A., **Morales C.L.**, Garibaldi L.A, Aizen M.A. (2017). Invasive bumble bees reduce nectar availability for honey bees by robbing raspberry flower buds. *Basic and Applied Ecology*, 19:26-35. <http://doi.org/10.1016/j.baae.2017.01.001>

7. De Palma A., Stefan Abrahamczyk, Aizen M.A. ....**Morales C.L.**.....Purvis A. (2016) Predicting bee community responses to land-use changes: Effects of geographic and taxonomic biases. *Scientific Reports*.6.
8. Lozier, J. D., Cameron, S. A., Duennes, M. A., Strange, J. P., Williams, P. H., Goulson, D.,Brown M. J.F, **Morales C.L.** & Jepsen, S. (2015). Relocation risky for bumblebee colonies. *Science*, 350 (6258), 286-287.
9. Geslin, B. & **Morales, C.L.** (2015) New records reveal rapid geographic expansion of *Bombus terrestris* Linnaeus, 1758 (Hymenoptera: Apidae), an invasive species in Argentina. *Check List* 11(3): 1620, <http://dx.doi.org/10.15560/11.3.1620>. ISSN 1809-127X
- 10.Saez A., **Morales C.L.**, Ramos L., Aizen M. (2014). Extremely frequent visits by invasive bumble bees and commercial honey bees decrease raspberry drupelet set by damaging flower styles, despite increasing pollen deposition. *Journal of Applied Ecology*. 51: 1603-1612| DOI: 10.1111/1365-2664.12325.
- 11.Aizen M.A., **Morales C.L.**, Vazquez D.P., Garibaldi L.A., Saez A. Harder D. L. (2014) When mutualism goes bad: density-dependent impacts of introduced bees on plant reproduction. *New Phytologist*. DOI: 10.1111/nph.12924.
- 12.Maharramov J, Meeus I, Maebe K, Arbetman M, **Morales C.L.**, et al. (2013) Genetic Variability of the Neogregarine *Apicystis bombi*, an Etiological Agent of an Emergent Bumblebee Disease. *PLoS ONE* 8(12): e81475. doi:10.1371/journal.pone.0081475
- 13.**Morales C.L.**, Arbetman MP, Cameron SA. Aizen, M.A (2013) Rapid ecological replacement of a native bumble bee by invasive species. *Frontiers in Ecology and the Environment* 11: 529–534. <http://dx.doi.org/10.1890/120321>.
- 14.Arbetman, M. P., I. Meeus, **C. L. Morales**, M. A. Aizen and G. Smagghe. 2013. Alien parasite hitchhikes to Patagonia on invasive bumble bee. *Biological Invasions*.15(3): 489-494 DOI 10.1007/s10530-012-0311-0.
- 15.Aizen, MA, Lozada M & **Morales, CL.** (2011) Comparative nectar-foraging behaviors and efficiencies of an alien and a native bumble-bee. *Biological invasions*. 13:2901-2909. DOI 10.1007/s10530-011-9972-3
- 16.Stout, J & **Morales, CL** (2009) Ecological impacts of invasive alien species on bees. *Apidologie*,40: 388-409.
- 17.Madjidian J, **Morales CL** & Smith H (2008) Displacement of a native by an alien bumblebee: lower pollination efficiency overcome by overwhelmingly higher visitation frequency. *Oecologia*.4:835-845.
- 18.Aizen M, **Morales CL**, Morales JM (2008) Invasive Mutualists Erode Native Pollination Webs. *PLoS Biology*. 6(2):0396-0403. doi:10.1371/journal.pbio.0060031. Comentarios: Tylianakis, J.M. Understanding the web of life: the birds, the bees, and sex with aliens. *PLoS Biology* 6 : e47 (febrero, 2008).

<http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.0060047>

19. **Morales CL** (2007) Introducción de abejorros (*Bombus*) no nativas: causas, consecuencias ecológicas y perspectivas. *Ecología Austral* 17: 51-65.
20. **Morales CL** & Aizen MA (2006) Invasive mutualisms and the structure of plant–pollinator interactions in the temperate forests of north-west Patagonia, Argentina. *Journal of Ecology* 94: 171–180
21. **Morales, CL** & Aizen, MA (2002) Does invasion of exotic plants promote invasion of exotic flower visitors? A case of study from the temperate forests of the southern Andes. *Biological Invasions*.4: 87-100.  
<https://doi.org/10.1023/A:1020513012689>

### Book Chapters

1. **Morales C.L.**, Saez A., Garibaldi L.A., Aizen M.A. (2017) Disruption of Pollination Services by Invasive Pollinator Species, pp 203-220. En: M. Vilà, P. E. Hulme (Eds). *Impact of Biological Invasions on Ecosystem Services. Series Invading Nature - Springer Series in Invasion Ecology (Volume 12)*. ISBN 978-3-319-45119-0 ISBN 978-3-319-45121-3 (eBook). DOI 10.1007/978-3-319-45121-3. Cham, Switzerland.
2. Vázquez, D. P. & **Morales, CL** (2010) Pollination. pp. 456-459. In: Simberloff D. & Rejmanek, M. (eds.) *Encyclopedia of Introduced Invasive Species*. University of California Press
3. **Morales, CL**, Traveset A. & Ramírez, N. (2009) Capítulo 8. Especies invasoras y mutualismos planta-animal. Pp. 247-261. En: Medel, R., Zamora, R., Aizen, M. y Dirzo, R. (eds.). *Ecología y Evolución de Interacciones planta-animal*, Santiago de Chile
4. Traveset A., **Morales CL**, Nogales M., Padrón B. & Bartomeus I. (2008) Los mutualismos facilitan las invasiones y las invasoras impactan sobre los mutualismos. pp. 77-89. En: Montserrat V, Valladares F, Traveset A, Santamaría L & Castro P (eds.) *Invasiones Biológicas*. Consejo Superior de Investigaciones Científicas, Madrid

### Published Red-list Assessments

**Morales, C.**, Montalvo, J., Arbetman, M., Aizen, M.A., Smith-Ramírez, C., Vieli, L. & Hatfield, R. 2016. *Bombus dahlbomii*. The IUCN Red List of Threatened Species 2016: e.T21215142A100240441.

**Morales, C.**, Montalvo, J., Arbetman, M. & Hatfield, R. (2015). *Bombus dahlbomii*. The IUCN Red List of Threatened Species 2015: e.T21215142A21215201.

### Outreach relevant publications (in Spanish)

1. “Mangu, un abejorro patagónico”. Book printed in braille, video and audiobook for children, inspired in the Giant Patagonian Bumblebee. <https://mangu.com.ar/>
2. Arbetman PA, **Morales CL** (2014) Parásitos introducidos por los abejorros exóticos ¿estaremos más cerca de entender las causas de la declinación del abejorro nativo? Macroscopia (revista de divulgación técnica científica del PN Nahuel Huapi) (with cover picture).
3. **Morales CL** (2009) “El abejorro como portador de Vida”. Bariloche Naturaleza y Tecnología, 36:20-24 (with cover picture)
4. **Morales CL** (2006) “El generoso vuelo del Abejorro”. Vida Silvestre, Revista de la Fundación Vida Silvestre Argentina. 97:24-29
5. **Morales CL** (2006) “Un polinizador en riesgo”. Ecos del Parque, Periódico del Parque Nacional Nahuel Huapi.4:3 (with cover picture)

### **Most relevant International Congress Lectures with published abstracts**

- Morales C.L., Saez A., Arbetman, M.P., Aizen M.A. (2018) Impactos de la invasión del abejorro introducido *Bombus terrestris* sobre la apicultura- efectos ecológicos y sanitarios. Congreso Latinoamericano de Apicultura, Montevideo, Uruguay.
- Morales C.L, Strelin M., Lord J., Cunningham S., Montalva J., Armstrong J., Iwasaki J., Garibaldi L, Aizen, M. A., Gleiser, G. (2016) Floral traits selected by European bumblebees (*Bombus*) in Southern lands: a comparison among species and regions. VIII Southern Connections Congress, Punta Arenas, Chile. (Conference Paper).
- Morales C.L., Arbetman M.A, Saez A., Garrahan L., Chalcoff V.R., Aizen M.A. (2015) Impactos ecológicos de la invasión de abejorros introducidos no nativos sobre la biota nativa, agricultura y apicultura. Aprendizajes desde el sur del continente. IX Congreso Mesoamericano sobre Abejas Nativas. San Cristobal de las Casas, Chiapas, México (Invited Lecture).
- Morales C.L.(2014). “Abejorros introducidos para la polinización de cultivos: efectos en la agricultura, apicultura y biota nativa”. XI Congreso Latinoamericano de Apicultura. Misiones, Argentina (Invited Lecture).
- Morales, C.L., Aizen, M.A. (2010) Reemplazo ecológico del abejorro nativo (*Bombus dahlbomii*) por abejorros introducidos (*B. terrestris* y *B. ruderatus*). 2do Taller Iberoamericano sobre degradación de hábitats y funcionamiento de interacciones planta-animal, Bariloche, Argentina (Oral session).
- Morales C.L., Aizen, M.A. (2010) Invasion success of European bumblebees in SW South America - Similarities and differences with Oceania and conservation implications-VI Southern Connection Congress 2010. Bariloche, Argentina (Poster Session)
- Morales, CL, Aizen MA (2005) “Impact of invasive species on the structure of plant–pollinator webs in the temperate forests of South Argentina”. Diversitas Open Science Conference, Oaxaca, México (Oral session).

- Morales CL & MA Aizen (2004) "Invasive mutualisms and the structure of plant-pollinator interactions in the temperate forest of NW Patagonia (Argentina)" 12th International Symposium on Insect-Plant relationships, Berlin, Germany (Oral session).
- Morales CL & MA Aizen (2004) "Potential Displacement of the native bumblebee *Bombus dahlbomii* by the invasive *Bombus ruderatus* in NW Patagonia". 8<sup>th</sup> International Bee Research Association Conference, Riberao Preto, Brazil (Oral session).
- Morales CL (2003) "Invasión de *Bombus ruderatus* en el NO de la Patagonia y su posible impacto en las interacciones planta-polinizador". VI Congreso Internacional de Gestión de Recursos Naturales, Valdivia, Chile (Poster Session).

#### **Non-published Invited Lectures**

- Morales (2016) Integrando a Nivel internacional la gestión en polinización: la introducción de colonias de *Bombus terrestris* para polinizar cultivos, lecciones aprendidas de la experiencia sudamericana. Primera Reunión Nacional sobre Polinización en Chile. Instituto de Ecología y Biodiversidad Chile (IEB) y Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO), Santiago, Chile.

#### **Relevant Technical Reports to public institutions**

- Morales CL (2010) Assessment of the permit request to collect *Bombus* spp. Living material for the Department of Wildlife of Neuquén Province.
- Morales CL and Arbetman MP (2010) Assessment of the permit request for exporting *Bombus atratus* specimens Belgium for scientific purposes. Under request of the National Secretary of Environment of Argentina.
- Morales CL and Aizen MA (2006) Technical Report on the Request of Importation of *Bombus impatiens* to Argentina. Under request of National Service of Agri-food Health and Quality of Argentina (SENASA).
- Morales CL (2006) Comments on the Report on the Terms of Reference for Assessing the Suitability for live import into mainland Australia of the large Earth Bumblebee (*Bombus terrestris*, L.1758). Submitted to the Department of the environment and Heritage, Science and Natural Resources Section, Australia.

#### **Grants and Funds:**

- National Geographic RFP Species Recovery Grant: Is continuous importation of European bumble bees driving the Patagonian bumble bee to extinction? (47.500 USD, 09/2019-01/2021). Member of Group.
- National Fund for Research of Argentina (FONCyT): Sustainable agriculture in Patagonia: importance of domesticated, invasive and native pollinators in fruticulture (2016-2019). Member of Responsible Group.

National Fund for Research of Argentina (FONCyT): Impact of invasion of bumblebee *Bombus terrestris* on *Apis mellifera*, underlying mechanisms and effects on agricultural and apicultural yields in Patagonian Region. (150.000 ARS, 20013-2016). Principal Investigator.

Rufford Small Grants Program: Interspecific pathogen transmission as potential cause of ecological replacement of native *Bombus dahlbomii* by introduced invasive bumblebee species, Argentina. (£5719, 2010-2012). Principal Investigator.

[http://www.ruffordsmallgrants.org/rsg/projects/carolina\\_laura\\_morales](http://www.ruffordsmallgrants.org/rsg/projects/carolina_laura_morales)

Award The Canon National Parks Science Scholars Program: Habitat alteration and interactions between native and exotic species through pollination in temperate forests of Southern South America (78.000 USD, 2002-2005). Principal Investigator.

**Supervision and Co-supervision of relevant theses and projects:**

(2012- 2017) PhD Marina Arbetman (Universidad Nacional del Comahue). Bumblebee decline and potential causes at different spatial scales (Advisor).

(2012- 2016) PhD Agustín Saez (UNComahue). Impacts of *Bombus terrestris* invasión on agriculture and apiculture in NW Patagonia (Co-advisor).

(2004-2005) Mg Josefin Madjidjan (Master in Environmental Sciences, University of Lund, Sweden) (Co-advisor).