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CURRENT POSITION

2020- present **Associate Researcher** of the Argentina National Scientific and Technical Research Council (CONICET), Argentina

ACADEMIC BACKGROUND

2015- 2020 **Assistant Researcher** of the Argentina National Scientific and Technical Research Council (CONICET), Argentina

2017 - 2019 **Visiting scientist fellow.** Dr. Robert Raguso's Lab, Dept. of Neurobiology and Behavior, Cornell University (Ithaca, NY, USA).

2013 - 2015 **Post-Doctorate in Biological Sciences**
FCEN, University of Buenos Aires — Argentina

2008 - 2013 **Ph.D. in Biological Sciences**
FCEN, University of Buenos Aires — Argentina

2006 **Bachelor of Science Degree in Biology**
FCEN, University of Buenos Aires — Argentina

RESEARCH PAPERS

- Palottini, F.; Lucia, A.; Martínez, E.; **Balbuena, M.S.** (2025) Volatile organic compounds under threat in bumblebees: chemical identification and antennal detection. *Journal of Chemical Ecology* 51: 74, <https://doi.org/10.1007/s10886-025-01627-w>
- **Balbuena, M.S.***; Latorre-Estivalis J.M.; Farina W. (2025). Sugar response and gustatory gene expression in the stingless bee *Tetragonisca fiebrigi*. *Journal of Insect Physiology*. <https://doi.org/10.1016/j.jinsphys.2025.104818> (*corresponding author)

- Palottini, F.; Fernández, C.; **Balbuena, M.S.** (2024) Antennal sensilla pattern distribution and odor detection in *Bombus pauloensis* foragers (Hymenoptera: Apidae). *Apidologie*, <https://doi.org/10.1007/s13592-024-01123-2>
- **Balbuena, M.S.***; Grüter, C. (2024) Chapter 11: "Use of resins for defense and nest building in stingless bees". Libro "Stingless bee cerumen and propolis, Volume 1", Springer Nature Switzerland AG 2024, P. Vit et al. (eds.). https://doi.org/10.1007/978-3-031-43274-3_11. (*corresponding author)
- **Balbuena, M.S.***; Latorre-Estivalis J.M.; Farina W. (2024) Identification of chemosensory genes in the stingless bee *Tetragonisca fiebrigi*. *G3 Genes Genomes Genetics* <https://doi.org/10.1093/g3journal/jkae060>. (*corresponding author).
- **Balbuena, M.S.**; Buchmann, S.; Papaj, D.; Raguso, R.A. (2024) Organ-specific volatiles from Sonoran Desert *Krameria* flowers as potential signals for oil-collecting bees. *Phytochemistry* 218:1139337, <https://doi.org/10.1016/j.phytochem.2023.113937>
- Grüter, C.; **Balbuena, M.S.**; Valadares, L. (2023) Mechanisms and adaptations that shape division of labour in stingless bees. *Current Opinion in Insect Science*. <https://doi.org/10.1016/j.cois.2023.101057>
- Farina, W.M.; Palottini, F.; Estravis-Barcala, M.C.; Arenas, A.; **Balbuena, M.S.**; González, A. (2023) Conditioning honeybees to a specific mimic odor increases foraging activity on a self-compatible almond variety. *Apidologie*, doi: 10.1007/s13592-023-01019-7
- **Balbuena, M.S.**; Broadhead, G.T.; Dahake, A.; Barnett, E.; Vergara, M.; Skogen, K.A.; Jogesh, T.; Raguso, R.A. (2022) Mutualism has its limits: consequences of asymmetric interactions between a well-defended plant and its herbivorous pollinator. *Phil. Trans. R. Soc. B* 377: 20210166, <https://doi.org/10.1098/rstb.2021.0166>
- **Balbuena, M.S.***; Farina, W.M. (2020) Chemosensory reception in the stingless bee *Tetragonisca angustula*. *Journal of Insect Physiology*, 125(2020) 104076, doi.org/10.1016/j.jinsphys.2020.104076 (*corresponding author)
- Vázquez, D.E.*; **Balbuena, M.S.***; Chaves F.; Gora, J.; Menzel, R; Farina, W.M. (2020) The herbicide glyphosate affects wake/rest behavior of the honey bee. *Scientific Reports*, 10:10516, doi.org/10.1038/s41598-020-67477-6 (2020) (*first author)

MENTORSHIPS

- Member of the Supervisory Committee of the Master student Rosa Isela Delgado Espinoza. Colegio de Postgraduados Campus San Luis de Potosí, Mexico. (2023- 2024)
- Member of the Supervisory Committee of the Ph.D. candidate Ana María Gutierrez Zuluaga, College of Science, Utah State University, Utah, USA. (2023-2024)
- Co-supervisor postdoc student Dr. Cecilia Estravis-Barcala (CONICET 2022-2025). Project "Desarrollo larval de la abeja solitaria nativa *Xylocopa augusti* evaluación de

la composición de volátiles de las provisiones de polen de celdas de cría" (Larval development of the native solitary bee *Xylocopa augusti*: evaluation of the volatile composition of brood cell pollen supplies). Co-supervisor: Dr. Mariano Lucía.

- Co-supervisor bachelor thesis "Feromona de alarma en el abejorro *Bombus pauloensis*" (Alarm pheromone in the bumblebee *Bombus pauloensis*). Student: Carolina Fernández. Co-supervisor: Dr. Florencia Palottini. Facultad de Ciencias Exactas y Naturales-Universidad de Buenos Aires, Argentina. 2022-2023

CONFERENCES AND TALKS IN SCIENTIFIC MEETINGS

- Nery, D.; Estravis-Barcala, M.C.; **Balbuena, M.S.**; Palottini, F. "Interacción entre árboles nativos del Río de la Plata y la mariposa bandera argentina". XL Jornadas Argentinas de Botánica (JAB). 23-27 septiembre 2025. Mar del Plata, Argentina.
- Estravis-Barcala, M.C.; **Balbuena, M.S.**; Amela García, M.T. "Recursos polínicos provisionados por *Plebeia droryana* (Apidae, Meliponini) en el Jardín Botánico Lucien Hauman (FAUBA) de la Ciudad Autónoma de Buenos Aires". XL Jornadas Argentinas de Botánica (JAB). 23-27 septiembre 2025. Mar del Plata, Argentina.
- Avalos, A.A.; Solís, S. M.; **Balbuena, M.S.**; Raguso, R.A.; Torretta, J.P. "Sin bandera, aterrizaje forzoso: estructura y ubicación de los osmóforos de los pétalos en flores de *Stigmaphyllon bonariense* (Malpighiaceae)". XL Jornadas Argentinas de Botánica (JAB). 23-27 septiembre 2025. Mar del Plata, Argentina.
- **Balbuena, M.S.** "Sugar response and gustatory gene expression in stingless bees". ISCE-APACE 2025 (Joint Conference of the International Society of Chemical Ecology and the Asia-Pacific Association of Chemical Ecologists). 18-22 agosto 2025, Christchurch, Nueva Zelanda.
- **Balbuena, M.S.**; Ávalos, A.; Torretta, J.P.; Raguso, R.A. "Waiting for moths – risks and benefits of hawkmoth pollination in the Anthropocene". 61st Annual Meeting of the Association of Tropical Biology and Conservation (ATBC 2025). 29/06-04/07 de 2025, Oaxaca, México.
- Raguso, R.A.; **Balbuena, M.S.**; Torretta, J. P.; Ávalos, A. "Hidden links - community subsidies for specialized plant-pollinator interactions". 61st Annual Meeting of the Association of Tropical Biology and Conservation (ATBC 2025). 29/06-04/07 de 2025, Oaxaca, México.
- Delgado Espinoza, R.I.; Rodríguez Morales, D.; Palacio Núñez, J.; Peredo Rivera, E.; **Balbuena, M.S.** "Comportamiento de forrajeo de abejas nativas y exóticas asociadas a cafetal de sombra". IX Congreso Mexicano de Ecología. 2024
- **Balbuena, M.S.** "Chemosensory genes of the stingless bee *Tetragonisca fiebrigi*". Meeting Biology & Genomics of Social Insects, Cold Spring Harbor Laboratory, USA. 25-28 March 2024. Virtual poster.

- **Balbuena, M.S.;** Buchmann, S.; Papaj, D.; Raguso, R.A. "Krameria flower volatiles as potential signals for oil-collecting bees". VII ALAEQ, Buenos Aires, Argentina. 4-7 Dec 2023.
- Palottini, F.; Lucía, A.; **Balbuena, M.S.** "Chemical ecology of *Bombus pauloensis*: first evidence of an alarm pheromone?". Bombus 3.0. Chiapas, México. Nov 2023.
- Palottini, F.; Lucía, A.; **Balbuena, M.S.** "Ecología química de *Bombus pauloensis*: indicios de una feromona de alarma". XXX Reunión Argentina de Ecología. Bariloche, Río Negro, Argentina. 17-20 Oct 2023.
- **Balbuena, M.S.** Seminario "Polinizadores herbívoros, cuando tu amigo es tu enemigo". Curso-taller "Ecología de las interacciones biológicas". Posgrado en Neuroetología de la Universidad Veracruzana (México). Online, 26 Sep 2023.
- **Balbuena, M.S.** Chemosensory reception and task division in stingless bees. Animal Behaviour Live seminar. Online, 29 Aug 2023.
- Fernández, C.; **Balbuena, M.S.;** Palottini, F. Lateralización olfativa en *Bombus pauloensis* (Hymenoptera: Apidae): distribución de sensillas antenales y registro electroantenográfico. IV Reunión de Biología del Comportamiento del Cono Sur. CABA, Argentina. Aug. 2023.
- **Balbuena, M.S.** Polinizadores herbívoros, cuando tu amigo es tu enemigo. El caso de *Hyles lineata* (Sphingidae) y *Oenothera harringtonii*. XI Congreso Argentino y XII Congreso Latinoamericano de Entomología. La Plata, Buenos Aires, Argentina. Oct. 2022.
- Palottini, F.; Kolender, A.A.; Lucía, A.; **Balbuena, M.S.** ¿Existe una feromona de alarma en el abejorro nativo *Bombus pauloensis* (Hymenoptera: Apidae)? XI Congreso Argentino y XII Congreso Latinoamericano de Entomología. La Plata, Buenos Aires, Argentina. Oct. 2022.
- **Balbuena, M.S.** Chemosensory reception in the stingless bee *Tetragonisca angustula*. VI Congress of the Latin American Association of Chemical Ecology (ALAEQ). Buenos Aires, Argentina. Nov. 2021.
- **Balbuena, M.S.;** Raguso, R.A. When pollinators are herbivores: consequences for pollinator health and fitness. Conference "From flowers to landscapes: the natural processes influencing pollinator health", Kew Royal Botanic Gardens, Sept. 2021.

INVESTIGATION PROJECTS

- 2023-2025. PI of the project "Claves químicas que medían la interacción intra e interespecífica de abejas nativas, sociales y solitarias" (Chemical cues that mediated intra- and interspecific interactions of social and solitary native bees). CONICET, PIP 11220220100529CO. Argentina.
- 2022-2025. Member of the project "Osmóforos florales en especies de Malpighiaceae y su interacción con las abejas colectoras de aceites" (Floral

osmophores in Malpighiaceae species and their interaction with oil-collecting bees) (PICT-2021-GRF-TII-00314). Argentina.

- 2021-2024. PI of the Project "Ecología química de abejas polinizadoras nativas de interés económico y ecológico. Olores que median la interacción intra e interespecífica de especies sociales y solitaria" (Chemical ecology of native pollinating bees of economic and ecological interest. Odors mediating intra- and interspecific interaction of social and solitary species) (PICT-2020-SERIEA-02055). Argentina.
- 2019-2022. Member of the project "Ecología cognitiva de abejas sociales nativas e introducidas: una aproximación integrativa sobre insectos polinizadores de importancia agronómica" (Cognitive ecology of native and introduced social bees: an integrative approach to pollinating insects of agronomic importance) (PICT-2019-2019-02438). Argentina.
- 2019-2020. Member of the project "Individual and collective foraging in the eusocial bee *Apis mellifera*: the role of biogenic amines in behavioral flexibility" (CONICET-DAAD). Argentina.

REVIEWER FOR SCIENTIFIC JOURNALS

- Animal Behaviour
- AoB plants
- Behavioral Ecology and Sociobiology
- Ecofronteras
- Ethology
- Insectes Sociaux
- Journal of Chemical Ecology
- Journal of Comparative Physiology A
- Journal of Experimental Biology
- Journal of Insect Science
- Neotropical Entomology
- Proceedings of the Royal Society B
- Spanish Journal of Agricultural Research

MEMBER OF EVALUATING COMMITTEE

- Ph.D. thesis in Biology (2025): "Preferencia de recolección de hormigas *Acromyrmex ambiguus* del Delta del Paraná por plantas nativas de la región: Bases físico-químicas y sensoriales". Candidate: BSc. María Ayelén Nally. Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires. CABA, Argentina.
- Master thesis in Chemistry (March 2024): "Efecto de productos api-sanitarios en la fisiología olfativa de *Apis mellifera*" (Effect of api-sanitary products on the olfactory physiology of *Apis mellifera*). Student: Andrea Carolina Sosa Labadie. Facultad de Química, Universidad Nacional de la República, Uruguay.

OTHERS

- Member of the Scientific and Organizing Committees of the VII Congress of the Latin American Association of Chemical Ecology (ALAEQ). Dec. 2023. Buenos Aires, CABA, Argentina.

- Member of the Scientific and Organizing Committees of the VI Congress of the Latin American Association of Chemical Ecology (ALAEQ). Nov. 2021. Virtual meeting.
- Member of the Committee of the Latin American Association of Chemical Ecology (ALAEQ). Period 2016-2025.