Part A. PERSONAL INFORMATION

CV date	01/10/2019

First and Family name	Rafael Bravo de la Parra		
Passport number	AAC138214	Age	62
Researcher codes	WoS Researcher ID	K-6378-2014	
	SCOPUS Author ID	6602127898	
	Código ORCID	0000-0002-1812-5704	

A.1. Current position

Name of University	University of Alcalá			
Department	Department of Physics and Mathematics			
Address and Country	U.D. Matemáticas, E. Ciencias, Universidad de Alcalá, 28871 Alcalá de Henares, Spain			
Phone number	+34 918854903	E-mail	rafael.bravo@uah.es	
Current position	Professor of Applied Mathematics	From	18/11/2009	
Key words	Population dynamics, Dynamical systems, Mathematical Ecology			

A.2. Education

PhD	University	Year
Mathematics	National Distance Education University (UNED)	1987

A.3. JCR articles, h Index, thesis supervised…

Four research six-year terms, the last one obtained in 2016.

One doctoral thesis supervised since 01/01/2009, defended in 2011.

JCR articles: 65; Total publications in the first quartile: 16

Sum of Times Cited: 806; Average Sum of Times Cited per Year (2014-18): 42.4; h-index: 18.

Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

B.A. Mathematics, University Complutense, Madrid,1979. Ph.D. Mathematics, U.N.E.D., Madrid, 1987, Topics on Bilinear Vector Integration, supervised by Pedro Jiménez-Guerra. Three articles containing parts of my dissertation are my first publications.

Lecturer, Madrid Technical University (UPM), E.T.S.I. Montes, 1979-81. College lecturer, 1981-1991. Since 1988 member of the Department of Mathematics (presently Department of Physics and Mathematics) of the University of Alcalá: Lecturer (1988-1991), Associate Professor (1991-2009) and Professor (2009-present).

After obtaining the position of Associate Professor (1991), I changed my research subject into dynamical systems and their applications to mathematical modelling in the life sciences.

My main research topic is the development of reduction methods, called aggregation methods, for time discrete systems, and their application to various population dynamics models. In the mathematical analysis of biological problems, it is often necessary to study models, under the form of dynamical systems, of high complexity that cannot be studied analytically. Aggregation methods consist in describing the asymptotic behaviour of a complex system with the help of a reduce system expressed in terms of some global variables. The main ingredient allowing the system reduction is the existence of different time scales associated to different processes included in the model.

In the meeting “3rd International Conference on Mathematical Population Dynamics”, Pau (Francia) 1992, I took contact with the main actors of my subsequent scientific collaborations: Eva Sánchez (E.T.S.I Industriales, UPM), Ovide Arino (U. de Pau) and P. Auger (U. de Lyon). At that time, together with Eva Sánchez, we founded a research group that it is still active. We have been continuously funded through national projects from 01/01/1994 to 30/06/2019. During this time, I have been the main researcher of five national projects. Two of them were coordinated with a numerical analysis group of the University of Valladolid, and I also acted as coordinator. The group acquired international recognition after the organization of two very successful meetings (AICME I and II, 1998 and 2003, held in Alcalá) on Mathematical Ecology,

for which I acted as chairman. This fostered my election as member of the Board of the European Society for Mathematical and Theoretical Biology (2003-08).

The scientific collaboration with the French groups of P. Auger and O. Arino was funded with three Integrated Actions, whose coordination I shared with E. Sánchez. I was the Spanish responsible researcher of four projects A.E.C.I. (Program of interuniversity cooperation between Spain and Morocco) that yielded a fruitful cooperation with the group of H. Hbid of the University Cadi Ayyad (Marrakech). Other consolidated international collaborations are with the groups of J.-C. Poggiale (U. Aix-Marseille, France) and E. Venturino (U. Torino, Italy).

I have supervised three doctoral theses, L. Sanz (1998), A. Blasco (2002) and M. Marvá (2011). All the three doctors and presently Associate Professors.

Apart from having published almost seventy articles, most of them JCR, I have collaborated as invited editor in more than ten special issues of JCR journals.

I belong to the Editorial Board of two JCR journals: Journal of Biological Dynamics and Mathematical Methods in the Applied Sciences.

I belong to the Forest Ecology and Restoration Group (http://www3.uah.es/forecolab/).

Part C. RELEVANT MERITS

C.1. Publications (2009-19)

[1] L. Sanz, R. Bravo de la Parra, Stochastic matrix metapopulation models with fast migration: re-scaling survival to the fast scale, *Ecological Modelling*, accepted, 2019.

[2] R. Bravo de la Parra, L. Sanz, A Discrete Model of Competing Species Sharing a Parasite, *Discrete & Continuous Dynamical Systems – B*, accepted, 2019.

[3] L. Sanz, R. Bravo de la Parra, M. Marvá, E. Sánchez, Non-linear population discrete models with two time scales: re-scaling of part of the slow process, *Advances in Difference Equations*, 2019:401, 2019. doi.org/10.1186/s13662-019-2303-1,

[4] M. Marvá, R. Bravo de la Parra, E. Venturino, Modelling the Role of Opportunistic Diseases in Co-infection, *Mathematical Modelling of Natural Phenomena,* **13**(3):28, 2018. doi.org/10.1051/mmnp/2018034.

[5] R. Bravo de la Parra, M. Marvá, E. Sánchez, L. Sanz, Discrete Models of Disease and Competition, *Discrete Dynamics in Nature and Society*, **2017**: 5310837, 2017. doi.org/10.1155/2017/5310837.

[6] R. Bravo de la Parra, M. Marvá, E. Sánchez, L. Sanz, A Discrete Predator-Prey Ecoepidemic Model, *Mathematical Modelling of Natural Phenomena,* **12**(2):116-132, 2017.

[7] R. Bravo de la Parra, M. Marvá, F. Sansegundo, Fast Dispersal in Semelparous Populations, *Mathematical Modelling of Natural Phenomena,* **11**(4):121-135, 2016.

[8] M. Marvá, E. Venturino, R. Bravo de la Parra, A Time Scales Approach to Coinfection by Opportunistic Diseases, *Journal of Applied Mathematics*, **2015**:275485, 2015.

[9] M. Marvá, J.G. Alcázar, J.-C. Poggiale, R. Bravo de la Parra, A simple geometrical condition for the existence of periodic solutions of planar periodic systems. Applications to some biological models, *Journal of Mathematical Analysis and Applications*, **423**(2):1469-1479, 2015.

[10] M. Marvá, R. Bravo de la Parra, Coexistence and superior competitor exclusion in the Leslie–Gower competition model with fast dispersal, *Ecological Modelling*, **306**:247-256, 2015.

[11] M. Marvá, R. Bravo de la Parra, Reduction of nonautonomous population dynamics models with two time scales, *Acta Biotheoretica*, **62**(3): 285-303, 2014.

[12] E. Sánchez, H. Hbid, R. Bravo de la Parra, Mathematical Analysis of a Population Model with an Age-weight Structured Two-stage Life History: Asymptotic Behaviour of Solutions, *Journal of Evolution Equations*, **14**(3): 603-616, 2014.

[13] R. Bravo de la Parra, M. Marvá, E. Sánchez, L. Sanz, Reduction of Discrete Dynamical Systems with Applications to Dynamics Population Models, *Mathematical Modelling of Natural Phenomena*, **8**(6): 107–129, 2013.

[14] O. Angulo, R. Bravo de la Parra, J.C. López-Marcos, M.A. Zavala, Stand dynamics and tree coexistence in an analytical structured model: the role of recruitment, *Journal of Theoretical Biology*, **333**(1):91-101, 2013.

[15] M. Marvá, R. Bravo de la Parra, J.-C. Poggiale, Reduction of slow-fast asymptotically autonomous systems with applications to gradostat models, *Ecological Complexity*, **14**(1):75-84, 2013.

[16] M. Marvá, A. Moussaoui, R. Bravo de la Parra, P. Auger, A density dependent model describing age structured population dynamics using hawk-dove tactics, *Journal of Difference Equations and Applications*, **19**(6):1022-1034, 2013.

[17] M. Marvá, J.-C. Poggiale, R. Bravo de la Parra, Reduction of slow-fast periodic systems with applications to population dynamics models, *Mathematical Models and Methods in Applied Sciences*, **22**(12):1250025, 2012.

[18] M. Marvá, R. Bravo de la Parra, P. Auger, Reproductive Numbers for Nonautonomous Spatially Distributed Periodic SIS Models Acting on Two Time Scales, *Acta Biotheoretica*, **60**(1-2):139-154, 2012.

[19] M. Marvá, R. Bravo de la Parra, J.-C. Poggiale, Approximate aggregation of a two time scales periodic multi-strain SIS epidemic model: A patchy environment with fast migrations, *Ecological Complexity*, **10**(1):34-41, 2012.

[20] T. Nguyen Huu, R. Bravo de la Parra, P. Auger, Approximate aggregation of linear discrete models with two time-scales: re-scaling slow processes to the fast scale, *Journal of Difference Equations and Applications*, **17**(4):621-635, 2011.

[21] P. Ruiz Benito, J.A. Cuevas, R. Bravo de la Parra, J.M. García del Barrio, M.A. Zavala, Land use change in a Mediterranean metropolitan region and its periphery: assessment of conservation policies through CORINE Land Cover data and Markov models, *Forest Systems*, **19**(3):315-328, 2010.

[22] D. Nguyen Ngoc, R. Bravo de la Parra, M.A. Zavala, P. Auger, Competition and species coexistence in a metapopulation model: Can fast asymmetric migration reverse the outcome of competition in a homogeneous environment? *Journal of Theoretical Biology*, **266**:256-263, 2010.

[23] A. Kebir, S. Ben Miled, M.L. Hbid, R. Bravo de la Parra, Effects of density dependent sex allocation on the dynamics of a simultaneous hermaphroditic population: Modelling and analysis, *Journal of Theoretical Biology*, **263**:521–529, 2010.

[24] M. Marvá, E. Sánchez, R. Bravo de la Parra, L. Sanz, Reduction of slow–fast discrete models coupling migration and demography, *Journal of Theoretical Biology*, **258**(3):371-379, 2009.

C.2. Research projects and grants (2009-19)

[1] Project MTM2014-56022-C2-1-P
Analysis and reduction of structured populations models and applications.
Ministery of Science and Innovation. Main researcher: Rafael Bravo de la Parra.
Duration : 01/10/2015 – 30/06/2019. Grant amount : 38.000 euros.
Participation type: Main researcher and coordinator.

[2] Project MTM2011-24321
Time scales and reduction of population dynamics models.
Ministery of Science and Innovation. Main researcher: Luis Sanz Lorenzo (UPM)
Duration : 01/01/12 a 31/12/14. Grant amount : 27.900 euros.
Participation type: Researcher.

[3] Project MTM2011-25238
Modelling, analysis and numerical simulation of structured population dynamics.
Ministery of Science and Innovation. Main researcher: Miguel Ángel López Marcos (UVA)
Duration : 01/01/12 a 31/12/14. Grant amount : 41.400,00 euros.
Participation type: Researcher.

[4] Project MTM2008-06462-C02-01
Structured population and spatial heterogeneity: reduction methods and applications.
Ministery of Science and Innovation. Main researcher: Rafael Bravo de la Parra.

Duration : 01/01/2009 – 31/12/2011. Grant amount: 55.500 euros.
Participation type: Main researcher and coordinator.

[5] Project SUM2008-00004-C03-00
Multiscale analyses, modelling and prospective of carbon sinks dynamics in Spanish forest ecosystems under Global Change.
INIA, Min. of Science and Innovation. Main researcher : Miguel Á. de Zavala Gironés (UAH)
Duration : 01/01/09 a 31/12/11. Grant amount: 320.000 euros.
Participation type: Researcher.

C.3. Other.

[1] Member of the Editorial Board of Journal of Biological Dynamics since 2007.

[2] Member of the Editorial Board of Methods in the Applied Sciences since 2014.

[3] Research stay at Institut de Recherche pour le Développement (I.R.D.), France, 01/04/2019-30/06/2019, funded by grant « Salvador de Madariaga », 8.000 euros.

[4] Oral communication, Discrete Time Multiregional Stochastic Models with Fast Migration: Rescaling Survival to the Fast Scale, European Conference on Mathematical and Theoretical Biology, Lisboa, 2018.

[5] Invited talk, A discrete competition-epidemic model, at the 9th Workshop Dynamical Systems Applied to Biology and Natural Sciences, Torino, 2018.

[6] Co-organizer of the session Mathematical Ecology and Epidemiology in the IV Encuentro Conjunto Real Sociedad Matemática Española-Sociedad Matemática Mexicana, Valladolid, 2017.

[7] Invited talk, Discrete eco-epidemiological models with two timescales, at the BCAM Workshop: Populations in epidemics and ecology. Modelling and numerical simulations, Bilbao, 2017.

[8] Member of the Panel of experts for the Evaluation of the LIRIMA (International Laboratory for Research in Computer Science and Applied Mathematics) organized by INRIA (Institut National de Recherche en Informatique et en Automatique, France), Paris, 2014.

[9] Oral communication, Population Model with an Age-weight Structured Two-stage Life History, 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, 2014.

[10] Plenary talk, Réduction de modèles non autonomes à deux échelles de temps, at the Quatrième Conférence Internationale de la Société Francophone de Biologie Théorique (SFBT), Dakar (Senegal), 2013.

[11] Co-organizer of the session Biomathematics in the I Reunión Conjunta Real Sociedad Matemática Española-Sociedad Matemática Mexicana, Oaxaca, 2009.

[12] Professional appointement at I.R.D., in the unit GEODES (Modélisation mathématique et informatique de systèmes complexes naturels, biologiques ou sociaux). (01/06/2007-31/05/2009).

[13] Member of the Scientific Committee of the semester on Mathematical Biology: Modelling and Differential Equations organized by the Centre de Recerca Matemàtica (CRM), 2009.

[14] Member of the Board of the European Society for Mathematical and Theoretical Biology, ESMTB (http://www.esmtb.org), responsible for the organisation of workshops and summer schools. (01/01/2003-31/12/2008).

[15] Chairman of the meeting Alcalá 2nd International Conference on Mathematical Ecology, Alcalá de Henares, 5-9 September 2003. (http://euromedbiomath.aicme.free.fr/)

[16] Chairman of the meeting Alcalá 1st International Conference on Mathematical Ecology, Alcalá de Henares, 4-8 September 1998.

[17] Thesis advisor: Approximate aggregation on nonlinear dynamical systems presented by Marcos Marvá Ruiz, University of Alcalá, 2011.

[18] Thesis advisor: Aggregation methods of stochastic and non-autonomous linear discrete systems presented by Ángel Blasco Lorenzo, University of Alcalá, 2002.

[19] Thesis advisor: Aggregation methods of discrete systems presented by Luis Sanz Lorenzo, E.T.S.I. Industriales, Technical University of Madrid, 1998.