



Anna R. Malacrida

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ERC field of expertise: LS2, LS8, LS9

EDUCATION

1965-70 Univ. of Pavia, Curriculum in Biological Sciences

ACADEMIC POSITION

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| 1973 - 1981 | Tenured Researcher, University of Pavia, Pavia |
| 1981 - 2002 | Associate Professor of Zoology, University of Pavia, Pavia |
| 1989 - 1993 | Visiting professor, Institute of Molecular Biology & Biotechnology (IMBB-FORTH), Heraklion, Crete, Greece (Director: Prof. Fotis Kafatos) |
| 2002 - 2015 | Full Professor of Molecular Entomology, University of Pavia, Pavia |
| 2012 | Visiting Scientist, Dept. of Epidemiology of Microbial Diseases, Yale School of Public Health, USA |
| 2015- till now | Contract Professor, Dept. of Biology and Biotechnology, University of Pavia |

PROFESSIONAL EXPERIENCE AND HONORS

- Member of the Steering Committee of “International Symposium of Fruitflies of Economic Importance - International Fruit Fly Consortium”
- Section Editor of the journal *BMC Genetics*
- Scientific evaluator for Research & Development, US Department of Agriculture
- Expert of EFSA (European Food Safety Authority)
- Independent scientific evaluator for European Commission
- Consultant of Joint FAO/IAEA Division, Vienna, Austria
- Independent scientific evaluator for Israel Board of Agriculture
- Chair of the Committee of the Pasteur International Courses (PIC)
- President of the Collegio Nuovo – Foundation Sandra e Enea Mattei, Pavia

PRINCIPAL RESEARCH INTERESTS

- Structure and evolution of Insect genomes (pest and vector species of agriculture and health interest)
- Population genetics of *Ceratitis capitata* (Medfly) and related species, *Aedes* mosquitoes, *Glossina* spp. in order to infer the invasion dynamics and the possible outbreak origins
- Vector insect - pathogen relationships using functional genomics approaches
- Olfactory system of *C. capitata* and *Aedes albopictus* in order to find attractants/repellents for adults
- Transgenesis of *C. capitata* and *Aedes albopictus* in order to improve the Sterile Insect Technique (SIT) control methods
- Molecular systematics and phylogeny of Dipteran species (families: Tephritidae, Glossinidae, Culicidae)

SOME RELEVANT PROJECT – ACTIVITIES

- 1990 - 1993 “Development for a germ-line transformation system for the Medfly, *Ceratitis capitata*” (DG XII - STD)
- 1993 - 1995 “Linkage analysis and population genetics of *Ceratitis capitata*” entro il “Network of Insect Genome Analysis (NIGA)”, European Communities Program “Human Capital & Mobility” (DG XII)
- 1995 - 2000 “*Genetic and molecular characterization of natural populations and of genetic-sexing strains of Ceratitis capitata*” (International Atomic Energy Agency, Vienna, Austria)
- 1994 - 1997 “Environmentally safe, integrated system(s) for control of the Mediterranean Fruit Fly *Ceratitis capitata*”, European Communities Program AIR (DG VI)
- 1997 - 2002 “Enhancement of the Sterile Insect Technique Through Genetic Transformation Using Nuclear Techniques” (International Atomic Energy Agency, Vienna, Austria)
- 1996 -1998 “Identification of vectors and development of a climate-driven risk assessment model” (EU Program INCO, DG XII)
- 1996-1998 “Arboviral Diseases in Southern Africa - Identification of vectors and development of a climate-driven risk assessment model”, European Communities Program INCO (DG XII)
- 2009 - 2010 “Studies on the invasion dynamics of *Aedes albopictus* (Asian tiger mosquito) in Lombardy” (Fondazione Banca del Monte di Lombardia, Italy)
- 17630, AR Malacrida; FAO/ IAEA Program of the United Nations; Impact of Wolbachia and SGH virus on *Glossina* reproductive behaviour; Analyse the impact of Wolbachia and SGH on tsetse reproduction at the functional genomics level. Role: PI
- NIH R21 AI109263-02, Aksoy/Attardo (MPIs); Expanding the toolbox for tsetse reproductive biology; Role: PI of Subcontract
- WHO/TDR A80132, Ouma (PI); Integrated tsetse fly ecology and genetics for improved HAT control. Analysis of remaining in wild tsetse populations. Role: Co-investigator
- 2009 - 2014 “Research capacity for the implementation of genetic control of mosquitoes” (INFRAVEC) EU-FP7 Capacities, Research Infrastructures
- NIH R21AI109263-01, 02/01/14-12/01/17; Expanding the toolbox for tsetse reproductive biology; Role: Co-PI
- 2010 - 2014 Consortium for genome sequencing of the Medfly, *Ceratitis capitata* (USDA - University of Pavia, Italy – Baylor College, Houston, TX, USA)
- 17630, FAO/ IAEA Program of the United Nations; 02/01/13-02/01/18; Impact of *Wolbachia* and SGH virus on *Glossina* reproductive behaviour; Role: PI

- 2012 - 2014 “Expanding the molecular technologies to *Bactrocera* and *Anastrepha* fruit fly pests to improve the development and evaluation of SIT strains” (International Atomic Energy Agency, Vienna, Austria)
- NIH R21 A1163969-01, Serap Aksoy (PI); *Spiroplasma* effects on Tsetse flies. Role: PI of Subcontract
- NIH R21 AI128523, Geoff Attardo (PI); Unravelling intersexual interactions in tsetse. Analyse the post mating response in tsetse females at the transcriptional and metabolic level. Role: PI of subcontract

EDITORIAL ACTIVITY

Member of Editorial Board of the scientific journals: **BMC Genetics** (BioMed Central).

Reviewer for the following scientific journals:

Entomological Research; Bulletin of Insectology; Chemistry Today; Entomologia; Entomologia Experimentalis & Applicata; Environmental Entomology; European Journal of Entomology; Evolution; Genetica; Gene; Genetics; Genetics Research; Genetics Selection Evolution; Heredity; Infection, Genetics & Evolution; G3: Genes, Genomes, Genetics; Insect Biochemistry & Molecular Biology; Infection, Genetics and Evolution; Genetics and Molecular Biology; Insect Molecular Biology; International Journal of Molecular Sciences; Italian Journal of Zoology; Journal of Applied Entomology; Journal of Economic Entomology; Journal of Insects; Journal of Insect Physiology; Molecular & General Genetics; Molecular Biology & Evolution; Molecular Ecology; Parasites & Vectors; Parasitology Research; PeerJ- the Journal of Life and Environmental Sciences; Proceedings of the Royal Society B; Proceedings of the National Academy of Sciences USA; Trends in Genetics.

COLLABORATIONS

Yale School of Public Health, USA (Prof. Serap Aksoy, Dept. of Epidemiology of Microbial Diseases); Institut Pasteur, Francia (Prof. Anna-Bella Failloux, Structure Arboviruses and Insect Vectors); University of California, Davis, USA (Prof. Geoffrey Attardo, Dept. of Entomology and Nematology); Baylor College of Medicine, Houston, TX, USA (Prof. Stephen [fringy] Richards, Human Genome Sequencing Center); Imperial College, London (Prof. Andrea Crisanti e Dr. Tony Nolan, Dept. of Biological Sciences); Institute of Molecular Biology and Biotechnology, Heraklion, Creta, Grecia (Prof. Christos Louis, Infections & Immunity Division); University of Goettingen, Germany (Prof. Ernst A. Wimmer, Dept. of Developmental Biology); Institute of Entomology a Ceské Budejovice, Czech Republic (Dr. Frantisek Marec, Laboratory of Molecular Cytogenetics); CNRS di Gif- sur-Yvette, Francia (Prof. Pierre Capy, Laboratoire Évolution, Génomes et Spéciation); European Bioinformatics Institute, Hinxton, UK (Dr. Daniel Lawson)

PUBLICATIONS (since year 2000)

Bonizzoni M, **Malacrida AR**, Guglielmino CR, Gomulski LM, Gasperi G, Zheng L (2000) Microsatellite polymorphism in the Mediterranean fruitfly, *Ceratitidis capitata*. ***Insect Molecular Biology*** 9: 251-261. Doi: [10.1046/j.1365-2583.2000.00184.x](https://doi.org/10.1046/j.1365-2583.2000.00184.x)

Torti C, Gomulski LM, Moralli D, Raimondi E, Robertson HM, Capy P, Gasperi G, **Malacrida AR** (2000) Evolution of different subfamilies of *mariner* elements within the medfly genome inferred from abundance and chromosomal distribution. ***Chromosoma*** 108: 523-532. Doi: 10.1007/s004120050404

Gomulski L.M., Pitts R.J., Costa S., Saccone G., Torti C., Polito L.C., Gasperi G., **Malacrida A.R.**, Kafatos F.C., Zwiebel L.J. 2001 - Genomic organization and characterization of the *white* locus of the Mediterranean fruit fly *Ceratitidis capitata*. ***Genetics*** 157: 1245-1255.

Sebastiani F., Meiswinkel R., Gomulski L.M., Guglielmino C.R., Mellor P.S., **Malacrida A.R.**, Gasperi G. 2001 - Molecular differentiation of the Old World *Culicoides imicola* species complex (Diptera,

Ceratopogonidae), inferred by RAPD markers. *Mol. Ecol.* 10: 1773-1786. Doi: [10.1046/j.0962-1083.2001.01319.x](https://doi.org/10.1046/j.0962-1083.2001.01319.x)

Gomulski L.M., Torti C., Bonizzoni M., Moralli D., Raimondi E., Capy P., Gasperi G., **Malacrida A.R.** 2001 – A new basal subfamily of *mariner* elements in *Ceratitis rosa* and other tephritid flies. *J. Mol. Evol.* 53: 597-606. Doi: [10.1007/s002390010246](https://doi.org/10.1007/s002390010246)

Bonizzoni M., Zheng L., Guglielmino C.R., Haymer D.S., Gasperi G., Gomulski L.M., **Malacrida A.R.** 2001 – Microsatellite analysis of medfly bioinfestations in California. *Mol. Ecol.* 10: 2515-2524. Doi: [10.1046/j.0962-1083.2001.01376.x](https://doi.org/10.1046/j.0962-1083.2001.01376.x)

Gasperi G., Bonizzoni M., Gomulski L.M., Murelli V., Torti C., **Malacrida A.R.**, Guglielmino C.R. 2002 - Genetic differentiation, gene flow and the origin of infestations of the medfly, *Ceratitis capitata*. *Genetica* 116: 125-135. Doi: [10.1023/A:1020971911612](https://doi.org/10.1023/A:1020971911612).

Bonizzoni M., Katsoyannos B.I., Marguerie R., Guglielmino C.R., Gasperi G., **Malacrida A.**, Chapman T. 2002. Microsatellite analysis reveals remating by wild Mediterranean fruit fly females, *Ceratitis capitata*. *Molecular Ecology* 11: 1915-1921. Doi: [10.1046/j.1365-294X.2002.01602.x](https://doi.org/10.1046/j.1365-294X.2002.01602.x)

Baliraine FN, Bonizzoni M, Osir EO, Lux SA, Mulaa FJ, Zheng L, Gomulski LM, Gasperi G, **Malacrida AR** (2003) Comparative analysis of microsatellite loci in four fruit fly species of the genus *Ceratitis* (Diptera: Tephritidae). *Bulletin of Entomological Research* 93: 1-10. Doi: [10.1079/BER2002212](https://doi.org/10.1079/BER2002212)

Baliraine FN, Bonizzoni M, Guglielmino CR, Osir EO, Lux SA, Mulaa FJ, Gomulski LM, Quilici S, Gasperi G, **Malacrida AR**, 2004 - Genetic differentiation, geneflow and possible geographical origin of three African pest fruit fly species (Diptera: Tephritidae) *Molecular Ecology* 13: 683-695. Doi: [10.1046/j.1365-294X.2004.02105.x](https://doi.org/10.1046/j.1365-294X.2004.02105.x)

Gomulski L.M., Torti C., Murelli V., Bonizzoni M., Gasperi G., **Malacrida A.R.** 2004 - Medfly transposable elements: diversity, evolution, genomic impact and possible applications. *Insect Biochem. Molec. Biol.* 34: 139-148. Doi: [10.1016/j.ibmb.2003.06.015](https://doi.org/10.1016/j.ibmb.2003.06.015)

Bonizzoni M., Guglielmino C.R., Smallridge C.J., Gomulski L.M., **Malacrida A.R.**, Gasperi G. 2004 - On the origins of medfly invasion and expansion in Australia. *Molecular Ecology* 13: 3845-3855. Doi: [10.1111/j.1365-294X.2004.02371.x](https://doi.org/10.1111/j.1365-294X.2004.02371.x)

Torti C., Gomulski L.M., Bonizzoni M., Murelli V., Moralli V.D., Guglielmino C.R., Raimondi E., Crisafulli D., Capy P., Gasperi G., **Malacrida A.R.** 2005 - *Cchobo*, a *hobo*-related element in *Ceratitis capitata*. *Genetica* 123: 313-325. Doi: [10.1007/s10038-004-7126-5](https://doi.org/10.1007/s10038-004-7126-5)

Bonizzoni M., Gomulski L.M., Mossinson S., Guglielmino C.R., **Malacrida A.R.**, Yuval B., Gasperi G. 2006 - Is polyandry a common event among wild populations of the pest *Ceratitis capitata*? *Journal of Economic Entomology* 99: 1420-1429.

Aketarawong N., Bonizzoni M., **Malacrida A.R.**, Gasperi G., Thanaphum S. 2006 - Seventeen novel microsatellite markers from an enriched library of the pest species *Bactrocera dorsalis sensu stricto*. *Molecular Ecology Notes* 6: 1138-1140. Doi: [10.1111/j.1471-8286.2006.01463.x](https://doi.org/10.1111/j.1471-8286.2006.01463.x)

Malacrida AR, Gomulski LM, Bonizzoni M, Bertin S, Gasperi G, Guglielmino CR 2007 – Globalization and fruitfly invasion and expansion: the medfly paradigm. *Genetica* 131: 1-9. DOI: [10.1007/s10709-006-9117-2](https://doi.org/10.1007/s10709-006-9117-2)

Bertin S, Guglielmino C, Karam N, Gomulski LM, **Malacrida AR**, Gasperi G. 2007 - Diffusion of the Nearctic leafhopper *Scaphoideus titanus* Ball in Europe: a consequence of human trading activity. *Genetica* 131: 275–285. Doi: [10.1007/s10709-006-9137-y](https://doi.org/10.1007/s10709-006-9137-y)

Bonizzoni M, Gomulski LM, Bertin S, Scolari F, Guglielmino CR, Yuval B, Gasperi G, **Malacrida AR** 2007 - Unfaithful mediterranean fruit fly *Ceratitis capitata*: impact on the SIT? In Vreysen MJB, Hendrichs J, Robinson AS (eds.) *Area-Wide Control of Insect Pests: From Research to Field Implementation*. pp 175-182. Springer, Dordrecht, The Netherlands. Doi: [10.1007/978-1-4020-6059-5_15](https://doi.org/10.1007/978-1-4020-6059-5_15)

Aketarawong N., Bonizzoni M., Thanaphum S., Gomulski L.M., Gasperi G., **Malacrida A.R.**, Guglielmino C.R. 2007 - Inferences on the population structure and colonization process of the invasive oriental fruit fly, *Bactrocera dorsalis* (Hendel). *Molecular Ecology* **16**: 3522-3532. Doi: [10.1111/j.1365-294X.2007.03409.x](https://doi.org/10.1111/j.1365-294X.2007.03409.x)

Bonizzoni M., Gomulski L.M., **Malacrida A.R.**, Capy P., Gasperi G. 2007 - Highly similar *piggyBac* transposase-like sequences from various *Bactrocera* (Diptera, Tephritidae) species. *Insect Molecular Biology* **16**: 645-650. Doi: [10.1111/j.1365-2583.2007.00756.x](https://doi.org/10.1111/j.1365-2583.2007.00756.x)

Scolari F., Schetelig M.F., Bertin S., **Malacrida A.R.**, Gasperi G., Wimmer E.A. 2008 - Fluorescent Sperm Marking to Improve the Fight against the Pest Insect *Ceratitis capitata* (Wiedemann; Diptera: Tephritidae). *New Biotechnology* **25**: 76-84. Doi: [10.1016/j.nbt.2008.02.001](https://doi.org/10.1016/j.nbt.2008.02.001)

Gomulski L.M., Dimopoulos G., Xi Z., Soares M.B., Bonaldo M.F., **Malacrida A.R.**, Gasperi G. 2008 - Gene discovery in an invasive tephritid model pest species, the Mediterranean fruit fly, *Ceratitis capitata*. *BMC Genomics* **9**: 243 Doi: [10.1186/1471-2164-9-243](https://doi.org/10.1186/1471-2164-9-243)

Scolari F., Schetelig M.F., Gabrieli P., Siciliano P., Gomulski L.M., Karam N., Wimmer E.A., **Malacrida A.R.**, Gasperi G. 2008 - Insect transgenesis applied to tephritid pest control. *Journal of Applied Entomology* **132**: 820-831. Doi: [10.1111/j.1439-0418.2008.01347.x](https://doi.org/10.1111/j.1439-0418.2008.01347.x)

Khamis FM, Karam N, Ekesi S, De Meyer M, Bonomi A, Gomulski LM, Scolari F, Gabrieli P, Siciliano P, Masiga D, Kenya EU, Gasperi G, **Malacrida AR**, Guglielmino CR 2009 - Uncovering the tracks of a recent and rapid invasion: the case of the fruit fly pest *Bactrocera invadens* (Diptera: Tephritidae) in Africa. *Molecular Ecology* **18**: 4798–4810. Doi: [10.1111/j.1365-294X.2009.04391.x](https://doi.org/10.1111/j.1365-294X.2009.04391.x)

Gabrieli P., Falaguerra A., Siciliano P., Gomulski L.M., Scolari F., Zacharopoulou A., Franz G., **Malacrida A.R.**, Gasperi G. 2010 - Sex and the single embryo: early development in the medfly, *Ceratitis capitata*. *BMC Developmental Biology* **10**: 12 Doi: [10.1186/1471-213X-10-12](https://doi.org/10.1186/1471-213X-10-12)

Bertin S., Scolari F., Guglielmino C.R., Bonizzoni M., Bonomi A., Marchini D., Gomulski L.M., Gasperi G., **Malacrida A.R.**, Matessi C. 2010 - Sperm storage and use in polyandrous females of the globally invasive fruitfly, *Ceratitis capitata*. *Journal of Insect Physiology* **56**: 1542–1551. Doi: [10.1016/j.jinsphys.2010.05.006](https://doi.org/10.1016/j.jinsphys.2010.05.006)

Scolari F., Siciliano P., Gabrieli P., Gomulski L.M., Bonomi A., Gasperi G., **Malacrida A.R.** 2011 - Safe and fit genetically modified insects for pest control: from lab to field applications. *Genetica* **139**: 41–52. Doi: [10.1007/s10709-010-9483-7](https://doi.org/10.1007/s10709-010-9483-7)

Gabrieli P., Gomulski L.M., Bonomi A., Siciliano P., Scolari F., Franz G., Jessup A., **Malacrida A.R.**, Gasperi G. 2011 - Interchromosomal duplications on the *Bactrocera oleae* Y chromosome imply a distinct evolutionary origin of the sex chromosomes compared to *Drosophila*. *PLoS ONE* **6**: e17747. Doi: [10.1371/journal.pone.0017747](https://doi.org/10.1371/journal.pone.0017747)

Gomulski L.M., Dimopoulos G., Xi Z., Scolari F., Gabrieli P., Siciliano P., Clark A.R., **Malacrida A.R.**, Gasperi G. 2012 - Transcriptome profiling of sexual maturation and mating in the Mediterranean fruit fly, *Ceratitis capitata*. *PLoS ONE* **7**: e30857. Doi: [10.1371/journal.pone.0030857](https://doi.org/10.1371/journal.pone.0030857)

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Gasperi G, Bellini R, **Malacrida AR**, Crisanti A, Dottori M, Aksoy S 2012 - A new threat looming over the Mediterranean basin: emergence of viral diseases transmitted by *Aedes albopictus* mosquitoes. *PLoS Neglected Tropical Diseases* **6**: e1836. Doi: [10.1371/journal.pntd.0001836](https://doi.org/10.1371/journal.pntd.0001836)

Scolari F, Gomulski LM, Ribeiro JMC, Siciliano P, Meraldi A, Falchetto M, Bonomi A, Manni M, Gabrieli P, Malovini A, Bellazzi R, Aksoy S, Gasperi G, **Malacrida AR** 2012 - Transcriptional profiles of mating-responsive genes from testes and male accessory glands of the Mediterranean fruit fly, *Ceratitis capitata*. *PLoS ONE* **7**: e46812. Doi: [10.1371/journal.pone.0046812](https://doi.org/10.1371/journal.pone.0046812)

Siciliano P, Scolari F, Gomulski LM, Falchetto M, Manni M, Gabrieli P, Field LM, Zhou J-J, Gasperi G, **Malacrida AR** 2014 - Sniffing out chemosensory genes from the Mediterranean fruit fly, *Ceratitidis capitata*. *PLoS ONE* 9: e85523 Doi: [10.1371/journal.pone.0085523](https://doi.org/10.1371/journal.pone.0085523)

Siciliano P, He X.L., Woodcock C., Pickett J.A., Field L.M., Birkett M.A., Kalinova B., Gomulski L.M., Scolari F., Gasperi G., **Malacrida A.R.**, Zhou J.J. 2014 - Identification of pheromone components and their binding affinity to the Odorant Binding Protein CcapOBP83a-2 of the Mediterranean fruit fly, *Ceratitidis capitata*. *Insect Biochemistry and Molecular Biology* 48: 51-62. Doi: [10.1016/j.ibmb.2014.02.005](https://doi.org/10.1016/j.ibmb.2014.02.005)

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International Glossina Genome Initiative (**Malacrida AR** among the authors) 2014 - Genome sequence of the tsetse fly (*Glossina morsitans*): vector of African trypanosomiasis. *Science* 344: 380-386. doi: [10.1126/science.1249656](https://doi.org/10.1126/science.1249656).

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