

# Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale



**94<sup>th</sup> National Congress of the  
Italian Society for Experimental Biology**

**Torino, Italy, 6-9 April 2022**

ABSTRACT BOOK

[www.jbiolres.org](http://www.jbiolres.org)

jbr

# Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale

eISSN 2284-0230

## EDITORS IN CHIEF

Marco Giammanco, *University of Palermo, Palermo, Italy*  
 Gian Luigi Mariottini, *University of Genova (retired), Genova, Italy*

## ASSOCIATE EDITORS

Francesca Arfuso, *University of Messina, Messina, Italy*  
 Gaia Di Timoteo, *Sapienza University of Roma, Roma, Italy*  
 Alessia Fiorino, *University of Palermo, Palermo, Italy*  
 Filippo Macaluso, *University of Palermo, Palermo, Italy*  
 Simona Manuguerra, *University of Palermo, Palermo, Italy*  
 Carmen Rizzo, *Stazione Zoologica Anton Dohrn, Messina, Italy*

## HONORARY EDITORS

Renzo Antolini, *University of Trento (retired), Trento, Italy*  
 Massimo Cocchi, *University of Bologna (retired), Bologna, Italy*  
 Luigi Pane, *University of Genova (retired), Genova, Italy*  
 Emma Rabino Massa, *University of Torino (retired), Torino, Italy*

## EDITORIAL BOARD

James Anthony, *Michigan State University, East Lansing, USA*  
 Saema Asgari, *Pasteur Institute, Iran*  
 Han Bao, *MSU-DOE Plant Research Laboratory of Michigan State University, USA*  
 Emilia Bellone, *University of Genova, Italy*  
 Maria Grazia Bridelli, *University of Parma, Italy*  
 Dario Cantino, *University of Turin, Italy*  
 Francesco Cappello, *University of Palermo, Italy*  
 David Caramelli, *University of Florence, Italy*  
 Francesco Cappello, *University of Palermo, Italy*  
 David Caramelli, *University of Firenze, Italy*  
 Giuseppe Caramia, *G. Salesi Hospital, Ancona, Italy*  
 Emilio Carbone, *University of Turin, Italy*  
 Brunetto Chiarelli, *University of Florence, Italy*  
 Pierluigi Consolo, *University of Messina, Italy*  
 Amelia De Lucia, *University "Aldo Moro", Bari, Italy*  
 Danila Di Majo, *University of Palermo, Italy*  
 Luciano Fadiga, *University of Ferrara, Italy*  
 Caterina Faggio, *University of Messina, Italy*  
 Vittorio Farina, *University of Sassari, Italy*  
 Sara Ferrando, *University of Genova, Italy*  
 William Galanter, *University of Illinois, Chicago, USA*  
 Lorenzo Gallus, *University of Genova, Italy*  
 Valerio Gennaro, *ISDE Doctors for Environment, Genova, Italy*  
 Darren Grice, *Institute for Glycomics and School of Medical Science, Griffith University, Nathan, Australia*  
 Stefania Grimaudo, *University of Palermo, Italy*  
 Millie Hughes-Fulford, *University of San Francisco, USA*  
 Gaetano Leto, *University of Palermo, Italy*  
 Gianni Losano, *University of Turin, Italy*  
 Mansoor A. Malik, *Howard University Hospital, Washington DC, USA*  
 Herbert Ryan Marini, *University of Messina, Italy*  
 Angela Marino, *University of Messina, Italy*  
 Neville A. Marsh, *Queensland University of Technology, Brisbane, Australia*

Bruno Masala, *University of Sassari, Italy*  
 Alejandro M.S. Mayer, *Midwestern University, Downers Grove, USA*  
 Concetta Maria Messina, *Department of Earth and Sea Sciences, University of Palermo, Italy*  
 Vincenzo Mitolo, *University "Aldo Moro", Bari, Italy*  
 Amir Sasan Mozaffari Nejad, *Hamadan University of Medical Sciences, Iran*  
 Werner E.G. Muller, *Johannes Gutenberg University, Mainz, Germany*  
 Giuseppe Murdaca, *University of Genova, Italy*  
 Giuseppe Palumbo, *University Federico II, Naples, Italy*  
 Gian Luigi Panattoni, *University of Turin, Italy*  
 Antonella Pantaleo, *University of Sassari, Italy*  
 Massimo Pregnolato, *University of Pavia, Italy*  
 Mark R. Rasenick, *University of Illinois, Chicago, USA*  
 Angela Maria Rizzo, *University of Milan, Italy*  
 Giacomo Rizzolatti, *University of Parma, Italy*  
 Aldo Rustioni, *University of North Carolina, USA*  
 Salvatore Sapienza, *University of Catania, Italy*  
 Pietro Scotto Di Vettimo, *University of Naples, Italy*  
 Vinicio Serino, *University of Siena, Italy*  
 Lynne Christine Weaver, *University of Western Ontario, Canada*  
 Ming Wei, *Griffith University, Australia*  
 Mario Wiesendanger, *University of Friburg, Switzerland*

## Editorial Staff

Maria Teresa Carrara, *Managing Editor*  
 Claudia Castellano, *Production Editor*  
 Tiziano Taccini, *Technical Support*

## Publisher

PAGEPress Publications  
 via A. Cavagna Sangiuliani, 5  
 27100 Pavia, Italy  
 Tel. +39.0382.1549020 – Fax. +39.0382.1727454  
 info@pagepress.org – www.pagepress.org

# 94<sup>rd</sup> National Congress of the Italian Society for Experimental Biology

Torino, Italy, 6-9 April 2022

*Palazzo degli Istituti Anatomici  
Corso Massimo D'Azeglio 52, Torino*

## **HONORARY PRESIDENTS OF THE CONGRESS**

Massimo Cocchi (*Presidente Onorario Società Italiana Biologia Sperimentale*)  
Stefano Geuna (*Magnifico Rettore dell'Università degli Studi di Torino*)

## **PRESIDENTS OF THE CONGRESS**

Marina Boido, Corrado Cali

## **HONORABLE GUESTS**

Bartolomeo Biolatti (*Magnifico Rettore Università di Scienze Gastronomiche*), Gennaro Ciliberto (*Presidente Federazione Italiana Scienze della Vita*), Giacoma Cristina (*Presidente Unione Zoologica Italiana*), Giovanni Ferrara (*Presidente BRAYN*), Alessandro Mauro (*Direttore del Dipartimento di Neuroscienze dell'Università degli Studi di Torino*), Giancarlo Panzica (*Presidente Gruppo Italiana Studio Neuromorfologia*), Bartolomeo Sammartino (*Presidente Istituto Euro-Mediterraneo di Scienza e Tecnologia*), Luca Sineo (*Presidente Associazione Antropologica Italiana*), Massimo Terzolo (*Direttore del Dipartimento di Scienze Cliniche e Biologiche dell'Università di Torino*), Luca Ventura (*Coordinatore Nazionale del Gruppo italiano di Paleopatologia*)

## **LOCAL SCIENTIFIC COMMITTEE**

Rosa Boano, Benedetta Bussolati, Silvia De Marchis, Ivan Norscia, Stefania Raimondo, Giulia Ronchi, Serena Stanga, Alessandro Vercelli

## **LOCAL TECHNICAL-ORGANIZING COMMITTEE**

Anna Caretto, Sveva Dallere, Giovanna Menduti, Gianna Pavarino, Daniela Maria Rasà, Roberta Schellino, Elena Signorino

year of research have allowed us to understand that there is a permanence in life of microorganisms both within the replacement wood and in the catabolites present inside and outside the foraging areas. It was found that the humidity of the replacement wood and the catabolites is related to the duration of the half-life of the viruses present. It has also been noted that the type of wood (therefore the general composition of the rosura and the catabolites) can influence, all other things being equal, the half-life time of the viruses present. From the point of view of the transmissibility of the viruses, given the stomach contents of the collected *Scleroderma* specimens, it was possible to verify that the microorganisms survive for a certain period and can be transmitted to humans.

## THE USE OF NATIVE SPECIES FOR URBAN FORESTRY TO PREVENT ALLERGIES

Fortunato CIRLINCIONE<sup>1</sup>, Maria Letizia GARGANO<sup>2</sup>, Giuseppe VENTURELLA<sup>1</sup>, Raimondo PARDI<sup>2</sup>

<sup>1</sup>Department of Agricultural, Food and Forest Sciences, University of Palermo, Palermo, Italy; <sup>2</sup>Department of Agricultural and Environmental Science, University of Bari Aldo Moro, Bari, Italy

The persistence of populations migratory flows from the rural to the urban context certainly alter the habits in the connection with nature and, generally, decrease the quality of life and the well-being of inhabitants of cities. The pandemic highlighted how crucial is for citizens the connection with nature and the key role of vegetation in parks and gardens defined as a real cultural heritage to be protected and enhanced. It is not important design and develop new green areas only but also to re-evaluate and re-appropriate existing ones. Urban reforestation projects must not be just green restoration actions, but real systematic and structured programs, which consider the whole territory and its complexity. Each "green" action must be integrated inside the territory and connected with the context. The planting of thousands of new trees in the several development plans requires basic and applied research to have adequate material to effectively perform the required functions such as air purification, climate mitigation, water regulation, environmental rehabilitation, etc. (Anguelovski *et al.* 2018) The identification of native species that can be successfully used for urban landscaping and reforestation in the Mediterranean environment is crucial. Native species have the advantage of already being adapted to the environment in which they will be used, while the exotic species currently used have been selected based on aesthetic characteristics and their resistance, with low consideration of the risks on human health and ecosystem's biodiversity. One of the most underestimated issues is the allergenicity of species used for urban reforestation. Allergies are the result of a hypersensitive response of the immune system to foreign agents, called allergens, which can be represented by very different substances. (Bro ek *et al.*, 2017) In particular, pollen allergies affect the respiratory system and are characterized by seasonality and recurrence during the year, determined by the cycle of plants that produce and release into the environment the different types of pollen, large quantities of which enter the respiratory tract (Lake *et al.*, 2017). Normally this event does not have consequences, whereas in allergic people the release of pollens and their "migration" causes allergic rhinitis, commonly called hay fever, and in more serious cases it can cause real asthma attacks. (Cariñanos, *et al.* 2016.) The best fight against allergy is to try to avoid contact with the allergenic substance. For pollen this is very complicated because it means not staying outdoors during the migra-

tion period, closing windows and using air filters and air conditioning systems. In order to avoid the worsening of this problem during urban reforestation programs, it is recommended the introduction of species with low pollen emission and low or no allergenicity.

## REFERENCES

- Anguelovski I. *et al.* 2018. From landscapes of utopia to the margins of the green urban life. For whom is the new green city? Analysis of Urban Change, Theory, Action. *City* 22(3), 417-436.
- Bro ek, J. L. *et al.* 2017. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines—2016 revision. *J. Allergy Clin. Immunol.* 140(4), 950-958.
- Cariñanos, P., *et al.* 2016. Characterization of allergen emission sources in urban areas. *J. Environ. Qual.* 45(1), 244-252.
- Lake, I. R. *et al.* 2017. Climate change and future pollen allergy in Europe. *Environ. Health Perspect.* 125(3).

## METABOLIC EFFECTS OF POLYSTYRENE MICROPLASTICS IN MARINE MUSSELS AFTER SHORT-TERM EXPOSURE

Giuseppe DE MARCO, Mariachiara GALATI, Gea OLIVERI CONTI, Maria MAISANO, Tiziana CAPPELLO  
Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Italy

Over the last 50 years, plastic has saturated our world due to the high demand across all sectors because of its favourable properties. Despite the societal benefits, plastic is today a global concern owing to its persistence and bioavailability as microplastics (MPs) to aquatic biota. MPs have been found in all compartments of the environment, and numerous life forms are known to take up the anthropogenic particles. Marine filter feeders are particularly susceptible to ingest suspended MPs since their size overlaps with the size of planktonic organisms and sediments, making them bioavailable and thus facilitating their entry into the food chain. In the last years, mussels were used as test organisms in many laboratory studies to assess the ecotoxicological effects induced by MPs, but the majority of these studies covered more than one week of exposure. With the aim to fulfil this research gap and elucidate mechanistic insights into the early toxicity effects of MPs on aquatic invertebrates, this study was designed to conduct a short-term (up to 72 h) exposure to 3 mm red polystyrene MPs (50 particles/mL) in marine mussels *Mytilus galloprovincialis*, selected as model organism because being filter-feeders and thus able to ingest MPs, besides for their commercial relevance. The application of an innovative protonic Nuclear Magnetic Resonance (<sup>1</sup>H NMR)-based metabolomics, associated to chemometrics, enabled a comprehensive exploration at fixed exposure time-points (T24, T48, T72) of the metabolic effects of MPs accumulated in mussel digestive glands, chosen as the major site for contaminants storage and detoxification processes. Specifically, a Principal Component Analysis (PCA) clearly separated <sup>1</sup>H NMR metabolic fingerprints of MP-treated mussels from control, and a clear grouping was observed according to experimental time-points. Numerous metabolites, including amino acids, osmolytes, metabolites involved in energy metabolism, and antioxidants, participating in various metabolic pathways significantly changed over time in MP-exposed mussel digestive glands related to control, reflecting also the fluctuations in MPs accumulation and pointing out the occurrence of disorders in amino acid metabolism, osmotic equilibrium, antioxidant defense system and energy metabolism. Overall, findings from this work elucidate time-dependent metabolic disor-