

SATURDAY 28 OCTOBER

 SESSION 2:  
 ENVIRONMENT AND HUMAN HEALTH

## MARIOTTINI LECTURE (INVITED)

**UTILIZATION OF BIOACTIVE COMPOUNDS FROM MARINE ORGANISMS: IS THIS AN UTOPIA OR A POSSIBLE RESOURCE?**

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Starting from the ancient ages, and throughout all human history, humans have learned to utilize Nature to satisfy their basic needs, such as feeding, wrapping, inhabiting, etc. Also for the treatment of diseases plants and also animals have been used to prepare extracts and medicines. Notably, plants have been the basis of traditional medicine for human populations since time immemorial, and the uses of plant-derived substances (a number of around 1000) is estimated to date from around 2600 BCE in Mesopotamia. As a matter of fact, extracts coming from a lot of micro-organisms, plants and animals have been a source of interesting and useful compounds having medicinal and therapeutic activity, several of them have been and are at present used to treat diseases or for other purposes connected with the maintaining of physiological functions of tissues, organs and apparatuses. A branch of science, named "chemistry of natural products" has been defined and organized starting from the study and the assessment *in vivo* and *in vitro* of natural compounds produced by organisms. During the past decades many organic substances having biological activity were recognized and developed and, at present, several of them are currently used as drugs or have other applications, for example as pigments, insecticides, substances of nutritional value, nutraceuticals, additives, cosmetics, molecular tools, fine chemicals, agrochemicals, etc. Furthermore, many natural compounds have been used as a basis to synthesize other bioactive molecules. Recent estimates emphasize that at present 60% and more than 75% of drugs having a natural origin are currently utilized in oncology and for the care of infectious diseases, respectively. Nevertheless, the main source of these compounds was historically the terrestrial environment, while the marine one was always less considered from this point of view. Oceans, and globally the marine environment, are the greatest environment existing on the Earth, occupying more than 70% of its total surface. Therefore, such enormous extension could contain more and more interesting compounds in comparison to those we know and utilize from the terrestrial environment. Many marine organisms are known to be able to produce a wide range of different bioactive compounds originating from metabolites, exudates, excretion, venoms, whole tissues, etc. which are utilized by organisms themselves for their life and for the relationships with other organisms (predation activity, getting food, protection purposes, etc.); so, the effectiveness for utilization of many of these compounds can be presumptively very high. For this reason, oceans are to be considered an enormous resource of bioactive molecules waiting for being discovered and potentially useful to be utilized as therapeutic agents. We can wonder because, heedless of their abundance and variety, historically marine organisms have been scarcely considered as a source

of pharmacologically-active substances. Indeed, the sampling of terrestrial organisms is easy, while strong difficulties to collect marine specimens may exist. Furthermore, scarce amount of extracts can be obtained from several marine organisms and their extreme variety presumes as much extreme variety of compounds. Anyhow, some recent reviews about marine pharmacology literature pointed out that in several countries findings on the preclinical pharmacology of 257 marine compounds having antibacterial, antifungal, antiprotozoal, antituberculosis, antiviral and anthelmintic activity have been reported. Other compounds were reported to have antidiabetic, anti-inflammatory or miscellaneous activities and to affect the immune and nervous system. Therefore, it is proper to wonder if this that can resemble an utopia could originate a new way, transforming also possible problems, such as those coming from venomous organisms, in a possible resource.

## ORAL COMMUNICATIONS

