

## General introduction

By adopting in January 2000 the Cartagena Protocol on Biosafety, the Parties to the Convention on Biological Diversity have created an essential tool to facilitate the development of regulatory and technical frameworks necessary for the appropriate risk assessment and management of genetically modified organisms (GMOs). To support these decision-making processes, the Cartagena Protocol and European Union directives each require considerations based upon a comprehensive pool of valid scientific information. Under these provisions, the Italian Ministry of the Environment has strengthened its collaboration with the International Centre for Genetic Engineering and Biotechnology (ICGEB), in order to collate and make available the necessary information.

The promotion of the safe use of biotechnology is one of the main goals of the ICGEB. In this context, it is recognised that the complexity of the issues related to the environmental release of GMOs raises scientific, industrial, commercial and political concerns, and therefore calls for a wide diffusion of information. In this framework, ICGEB serves the international community by disseminating scientific information through its Biosafety Web Pages, featuring the Biosafety Database (a scientific bibliographic searchable database containing the abstracts of scientific papers published in the most relevant international journals in this field), the Risk Assessment Searching Mechanism (an index providing on-line access to all available scientific documentation related to risk assessments implemented world-wide), as well as through comprehensive capacity building programmes, that include specific training and technology transfer activities.

The scientific literature compiled in the ICGEB Biosafety Database concern studies relating to the effects of the release and use of GMOs. These are classified according to a number of topics, relating to human health, food safety, environmental protection, enhancement of agriculture and other general concerns. A thorough analysis of the issues was undertaken, and found that specific research areas critical to the determination of risks associated with GMOs was lacking, despite the great abundance of scientific literature on these subjects. Accordingly, ICGEB has been requested by the Italian Ministry for the Environment to help resolve this situation by instigating a number of scientific studies on areas of major interest for biosafety and risk assessment. As an initial step, ICGEB approached internationally recognised scientists, asking them to produce

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scientific reviews summarising the state of the art in their field of expertise. Their efforts were deemed useful for dissemination to a wider audience and have resulted in this Collection of Biosafety Reviews.

For the current volume of the Collection, as there is a long history in problems associated with alien species in general, an overview of the main issues concerned with their introduction is presented. Areas are then outlined in which GMOs may have a similar negative impact if not competently regulated. We then identified the aquaculture of GM fish as an emerging industry given relatively little attention by the scientific community, and therefore asked for an introductory article describing the present state of play. And finally, herbicide tolerance is the major trait for which GM crops have and are being developed, therefore a review of possible environmental impacts of this trait was deemed timely. Thus, the three current technical reports are as follows:

- 1) The occurrence of invasive alien species (IAS), their impacts on global trade, new environments, and human health, and lessons to be learned for the use of GMOs.
- 2) The present status of GM fish, their associated benefits and risks, the necessary safety considerations, and their regulation.
- 3) The potential environmental impacts of herbicide-resistant GM crops, with particular attention to their effect on soil and water, and non-target organisms, the development of herbicide-resistant weeds, and gene flow concerns.

Future volumes "ICGEB Biosafety Reviews" will include subjects dealing with the regulation of GMOs, allergenicity issues derived from GM products, the detection of GM contaminants in food and feed, concerns arising from environmental (trans)gene flow, and the potential benefits and risks associated with "biopharming" (molecular farming).

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