

Symposium

Biodiversity conservation and drug discovery: Can they be combined?

The Suriname and Madagascar experiences

Shugeng Cao^a, David G. I. Kingston^a

^aDepartment of Chemistry, M/C 0212, 3111 Hahn Hall, West Campus Drive, Virginia Polytechnic Institute & State University, Blacksburg, VA 24061

Introduction. The approach to new drugs through natural products has proved to be the single most successful strategy for the discovery of new drugs, but in recent years its use has been deemphasized by many pharmaceutical companies in favor of approaches based on combinatorial chemistry and genomics, among others. Drug discovery from natural sources requires continued access to plant, marine, and microbial biomass, and so the preservation of tropical rainforests is an important part of our drug discovery program. Sadly, many of the tropical forests of the world are under severe environmental pressure, and deforestation is a serious problem in most tropical countries. The Rio Convention on Biological Diversity (CBD) in 1992 sets out commitments for maintaining the world's ecological underpinnings as we go about the business of economic development. The Convention establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources."

Objectives. To combat biodiversity loss in Suriname and Madagascar by demonstrating its value as a potential source of new pharmaceutical or agrochemical products, and to promote environmentally sensitive economic development in these countries.

Methods. As part of an effort to integrate biodiversity conservation and drug discovery with economic development, we initiated an International Cooperative Biodiversity Group (ICBG) to discover potential pharmaceuticals from the plant biodiversity of Suriname and Madagascar. The Group, established with funding from agencies of the United States government, involved participants from the USA, Suriname, and Madagascar. The basic approach was to search for bioactive plants in the Suriname and Malagasy flora, and to isolate their bioactive constituents by the best available methods, but the work included capacity building as well as research.

Results. The work of this Group will be presented as a Case Study to investigate the advantages and limitations of this particular approach to biodiversity conservation and drug discovery.

Conclusion. The combination of drug discovery efforts with biodiversity conservation can bring significant benefits to the host country even if a major drug discovery is not made.

Keywords

Biodiversity, drug discovery, Madagascar, economic development

Selected references

Cao, S., Guza, R.C., Wisse, J.H., Evans, R., van der Werff, H., Miller, J.S., Kingston, D.G.I. 2005. Ipomoeassins A-E, Five New Cytotoxic Macrocyclic Glycoresins, from the Leaves of *Ipomoea squamosa* from the Suriname Rainforest. *J. Nat. Prod.* 68:487-492.

Kingston, D.G.I., Abdel-Kader, M., Zhou, B.-N., Yang, S.-W., Berger, J.M., van der Werff, H., Miller, J.S., Evans, R., Mittermeier, R., Famolare, L., Guerin-McManus, M., Malone, S., Moniz, E., Wisse, J.H., Vyas D., and Wright, J.J.K. 1999. The Suriname International Cooperative Group: Lessons From the First Five Years. *Pharm. Biol.* S37:22-34.