



EDITORIAL NOTE

A quantitative method to establish the clinical evolution of HIV infected patients and the reproductive biology of an echinoid species from Brazil

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AIDS is one of the several diseases that affect the human being. Vast amount of resources are being spent by governments to develop new drugs and therapies for the treatment of infected individuals with distinct results (e.g., Scherer et al. 2007). However, although several antiviral drugs have proved to successfully reduce the advance of the virus in the organism, they have also caused a series of undesired side effects. The most common of them are diarrhea and nausea that in several cases can severely reduce the quality of the patient's life.

In order to understand the clinical evolution of HIV infected individuals, some mathematical models have been applied. In the present issue of the *Anais da Academia Brasileira de Ciências* (AABC), Juliana Grégio of the *Instituto Tecnológico de Aeronáutica* (ITA) and colleagues present a method that can be used to reduce the side effects while enhancing effectiveness of the drugs applied to HIV infected patients. The basis of this method is the optimal control theory, which is essentially a mathematical optimization method (e.g., Lewis 1986). As the authors point out, this quantitative method has been applied in a variety of fields such as economics, sociology and biology. In the present contribution, Grégio et al. (2009) discuss the problematic involving LQR (Linear Quadratic Regular) to establish the drug doses for extensive periods of treatment and advocate the use of Extended Kalman Filter for predicting the dosage of drugs in HIV infected patients in order to minimize the side effects. The authors carried out extensive simulations that have shown the possibility of decreasing drug doses and still maintaining the viral counts at a satisfactory level. As they pointed out, this quantitative method can help doctors to develop a better treatment strategy for their patients.

Among the several other important papers published in the present volume of the AABC, one study provides relevant information regarding the reproduction strategy of a sea urchin (Echinoidea) from the northeastern part of Brazil. Sea urchins are important components of marine invertebrate faunas worldwide and an important food resource in some areas. Their long evolutionary history has been very useful in establishing paleoenvironments (e.g., Smith 1984) and their reproduction cycle is of great interest (e.g. Bosch et al. 1989).

In some localities species of sea urchin have been regarded as responsible for the destruction of coral reefs. This impact is directly related with the amount of population present in a locality. Therefore, to evaluate the ecological interaction between rock-boring sea urchins and the reef, it is paramount to understand their life-history.

Eduardo Lima of the *Universidade Federal de Pernambuco* (UFPE) and colleagues have studied the gematogenesis and reproductive strategy of *Echinometra lucunter* population at the Muro Alto beach, on the southern coast of the Pernambuco State. This species of sea urchin is quite widely distributed, from North Carolina of the United States of America to Santa Catarina, reaching the Caribbean, West Central America and East Africa (e.g., McCartney et al. 2000). Despite several important studies about their taxonomy and distribution, the information on their reproduction is very limited and Lima et al. (2009) provided critical information about the reproductive biology of this species.

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