

Essay about DEB theory

HADDAD Inès
Tunisian Group
April 7, 2013

As an engineer in statistics and Information Analysis, the DEB theory course was my first step in the world of biology and complexity of living. A complex system is indeed interesting to look at since it's a whole different thing in the eyes of a biologist compared to an outsider of the domain.

A complex system is considered in the DEB theory as a set of heterogeneous entities that interact with each other by adopting a dynamic behavior and at the same time it evolves in time. Another point that makes this theory interesting to study is that it specifies that mechanisms involved in the organization of metabolism are not species specific. Also, the need of learning about a system interaction begins with understanding a single individual as it's considered to be the basic level of metabolic organization.

With my background in mathematics, I have to admit that presenting a theory with such simple models and at the same time respects all laws of physics and evolution is not as simple as it looks. This theory aims at generality which is hard to find and prove that it can be applied on various numbers of patterns among organisms.

Making the model as simple as possible helps to really understand what happens inside an organism and to get deeper insights in biology. Of course this simplification has its limits, because the model still needs to be able to predict real world measurements.

So based on 10 essential assumptions, and using numerous examples, DEB theory has proven that it's possible to find an appropriate, simple model for energy consumption, metabolism ... The catch is which properties you have to include in your model? The answer is very simple: you just need to remember that too much information kills information!! So, you just need to include sufficient, not yet too many properties to keep it as simple and as easy to deal model.

Acknowledgements

I would like to thank Professor Kooijman for his assistance in introducing the DEB Theory and for his availability to answer all of our questions.