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AN OVERVIEW OF ENERGETIC APPROACHES DESCRIBING BIOLOGICAL GROWTH PROCESSES

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ABSTRACT

To control biological growth processes of an individual, it is very important to have an idea about the distribution of energy in various biological processes involved in an organism. Different types of well-established mathematical model based on energetic approach, e.g., von Bertalanffy growth model, ontogenetic growth model proposed by West et al. based on first principle approach, are basically founded on the concept of surplus power which is the difference between rate of energy intake and metabolic cost of an organism. These mathematical models can successfully explain several experimental finding of biological growth processes, e.g., growth rate, maximum attainable mass of an individual, energetic optima etc. These growth models mainly deals with the growth rate of individuals. In this communication, we should point out some of the limitation of these growth models. One of the important factors that may influence growth rate and other allied factors is the reproduction rate of an organism. These growth models do not consider the reproduction rate in their description. As a result, these models cannot explain different attainable mass of the same species (means of same *genus* and *species*) growing up in the same environment but offering different reproduction rate. The description of a biological growth process of an organism therefore should include the reproduction rate. Another drawback of these models is that they never consider the effect of environmental fluctuation on growth. The effect of reproduction rate on growth rate and a model based description of it may be useful to control biological growth processes in the field of farming and harvesting.

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