**Article Abstract**

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| **Title:** | **Bioeconomic modelling of a prey predator system using differential algebraic equations** |
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| Journal: | |
| Abstract: | We propose a biological economic model based on prey-predator dynamics where the prey species are continuously harvested and predation is considered with type II functional response. The dynamic behavior of the proposed biological economic prey-predator model is discussed. Continuous type gestational delay of predators is incorporated and its effect on the dynamical behavior of the model system is analyzed. Through considering delay as a bifurcation parameter, the occurrence of Hopf bifurcation of the proposed model system with positive economic profit is shown in the neighborhood of the co-existing equilibrium point. Finally, some numerical simulations are given to verify the analytical results and the system is analyzed through graphical illustrations. |
| Keywords: | Bioeconomics, differential algebraic system, time delay, Hopf bifurcation |