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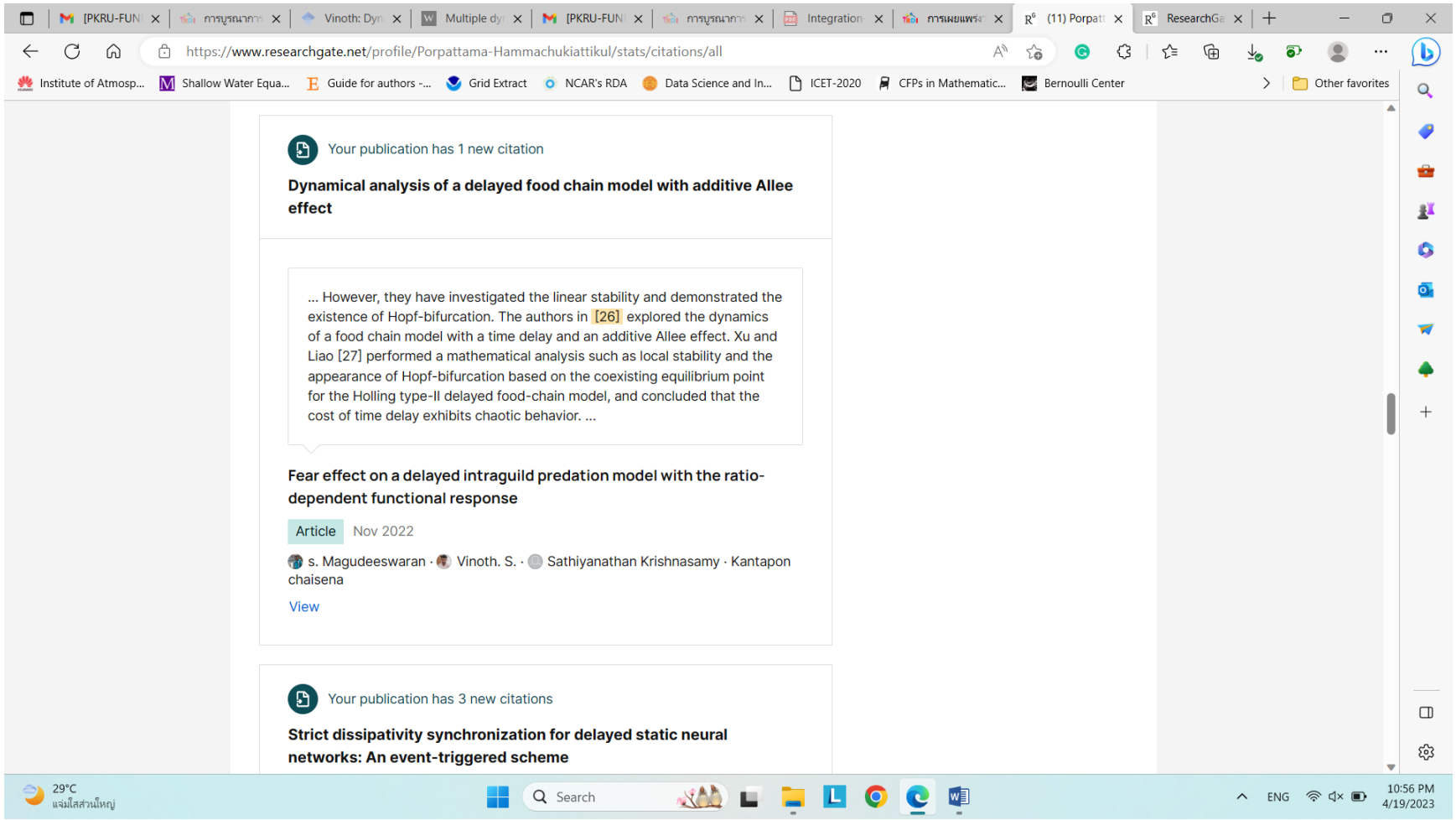

# Fear effect on a delayed intraguild predation model with the ratio-dependent functional response

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**Abstract**

In this work, we explore the consequences of fear and time delay on the intraguild predation model. Also, the predator consumes its prey in the form of a ratio-dependent type of interaction. We consider the fear in the prey population and the gestation effect on the predator population. We analyze the existence and the local stability of the proposed model without delay near all non-negative equilibrium points. Furthermore, by taking the fear parameter, the condition to satisfy the existence of Hopf-bifurcation near the coexisting equilibrium is derived. Moreover, we also examine the local stability property and Hopf-bifurcation investigation for the corresponding model in the presence of time delay. Some simulation results were also done to support the primary analytical findings.

**Keywords**

Fear effect ; Hopf-bifurcation ; Intraguild predation ; Local stability ; Time delay

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