

## Lotka Volterra Model Simulation for Rice-field Rat and Tyto Alba Owls in Sumpiuh District, Banyumas Regency, Central Java

<b>Title</b>	Lotka Volterra Model Simulation for Rice-field Rat and Tyto Alba Owls in Sumpiuh District, Banyumas Regency, Central Java
<b>Author Order</b>	2 of 3
<b>Accreditation</b>	2
<b>Abstract</b>	<p>Rice-field rat (<i>Rattus argentiventer</i>) is a rodent that has a high level of productivity. These animals attack rice plants from the vegetative to the generative phase. This research aimed to analyze and to predict the accuracy of the use of owls with mathematical equations model in Kebokura and Lebeng villages, Sumpiuh district. Lotka - Volterra and Competitive Lotka-Volterra models were used to predict the population dynamics of Owl (predator) and rice-field rats (prey), then Runge - Kutta numerical method was applied to analyze the population dynamics of predator and prey at a certain time. The results of the analyses using the Lotka - Volterra, Competitive Lotka - Volterra equations and simulation data, each graph data showed that the rats population was able to be maximally suppressed. Based on the analysis result, started with 24 owls and 1,689 rats, the rats population could be suppressed to 104 using Lotka - Volterra, and to 176 using the Competitive Lotka - Volterra model. Then in the first and second simulation, started with 50 and 100 owls and 1,689 rats, analysis using Lotka - Volterra and Competitive Lotka - Volterra showed that the rat population could be suppressed to as much as 126, 188 and 145, 189, respectively. Based on the analysis, it could be concluded that use of Serak Jawa owl strategy was able to reduce and stabilize the rat populations. Furthermore, the higher population of owls can prevent the population explosion of rats and can suppress the rat population to a lower number.</p>
<b>Publisher Name</b>	Faculty of Agricultural Technology, Universitas Gadjah Mada, Yogyakarta, Indonesia
<b>Publish Date</b>	2019-11-05
<b>Publish Year</b>	2019
<b>Doi</b>	DOI: 10.22146/agritech.46456
<b>Citation</b>	
<b>Source</b>	agriTECH
<b>Source Issue</b>	Vol 39, No 4 (2019)
<b>Source Page</b>	323-332
<b>Url</b>	<a href="https://jurnal.ugm.ac.id/agritech/article/downloadSuppFile/46456/8273">https://jurnal.ugm.ac.id/agritech/article/downloadSuppFile/46456/8273</a>
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