

ABSTRAK

Pada skripsi ini, model deterministik nonlinier *SEIRS* (*Susceptible, Moderate, Addicted, and Quitters*) dan analisis stabilitas digunakan untuk mengeksplorasi dinamika transmisi mengunyah khat. Bilangan reproduksi dasar (R_0) ditentukan menggunakan metode *Next-Generation Matrix*. Selanjutnya, penelitian ini menyelidiki kestabilan lokal dari titik ekuilibrium bebas mengunyah khat dan titik ekuilibrium endemik mengunyah khat. Hasilnya menunjukkan bahwa ketika R_0 kurang dari 1, titik ekuilibrium bebas mengunyah khat stabil asimtotik, dan ketika R_0 melebihi 1, titik ekuilibrium endemik juga menunjukkan kestabilan asimtotik. Dalam penelitian ini, model disimulasikan untuk memberikan validasi terhadap temuan analitis yang disajikan.

Kata Kunci : *Mengunyah Khat, Model SEIRS, Kestabilan Model, Stabil Asimtotik.*

ABSTRACT

In this Thesis, a nonlinear deterministic model *SEIRS* (*Susceptible, Moderate, Addicted, and Quitters*) and stability analysis were used to explore the transmission dynamics of chewing khat. The basic reproduction number (R_0) was determined using the Next-Generation Matrix approach. Subsequently, the study delved into the local stability assessments of the chewing khat-free and endemic equilibrium points. The results demonstrated that when R_0 is less than 1, the chewing khat-free equilibrium point is locally stable. Conversely, when R_0 exceeds 1, the endemic equilibrium point exhibits stability at local. The simulation outcomes provided further validation for the analytical findings presented in the study.

Keywords : *Chewing Khat, Model SEIRS, Model Stability, Asymptotically Stable.*