

According to (2.4), the bounded solutions $\phi_\eta(t)$ and $\phi_\zeta(t)$ satisfy the following relation

$$\begin{aligned} \phi_\eta^{ij}(t) - \phi_\zeta^{ij}(t) &= - \int_{-\infty}^t e^{-a_{ij}(t-s)} \left[\sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} f(\phi_\eta^{hl}(s)) \phi_\eta^{ij}(s) - P_{ij}(s, \eta) \right. \\ &\quad \left. - \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} f(\phi_\zeta^{hl}(s)) \phi_\zeta^{ij}(s) + P_{ij}(s, \zeta) \right] ds. \end{aligned}$$

Using the inequality $|P_{ij}(t, \eta) - P_{ij}(t, \zeta)| < \frac{\epsilon}{\alpha}$, $t \in (\theta_{k_0}, \infty)$, one can obtain on the same interval that

$$\begin{aligned} |\phi_\eta^{ij}(t) - \phi_\zeta^{ij}(t)| &\leq 2(M_f K_0 \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} + M_F) \int_{-\infty}^{\theta_{k_0}} e^{-a_{ij}(t-s)} ds \\ &+ \int_{\theta_{k_0}}^t e^{-a_{ij}(t-s)} M_f \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} |\phi_\eta^{ij}(s) - \phi_\zeta^{ij}(s)| ds \\ &+ \int_{\theta_{k_0}}^t e^{-a_{ij}(t-s)} L_f K_0 \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} |\phi_\eta^{hl}(s) - \phi_\zeta^{hl}(s)| ds + \int_{\theta_{k_0}}^t e^{-a_{ij}(t-s)} \frac{\epsilon}{\alpha} ds. \end{aligned}$$

Therefore, we have for $t > \theta_{k_0}$ that

$$\begin{aligned} \|\phi_\eta(t) - \phi_\zeta(t)\| &\leq 2 \max_{(i,j)} \frac{1}{a_{ij}} \left(M_f K_0 \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} + M_F \right) e^{-\gamma(t-\theta_{k_0})} + \frac{\epsilon}{\gamma\alpha} (1 - e^{-\gamma(t-\theta_{k_0})}) \\ &+ (M_f + L_f K_0) \max_{(i,j)} \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} \int_{\theta_{k_0}}^t e^{-\gamma(t-s)} \|\phi_\eta(s) - \phi_\zeta(s)\| ds. \end{aligned} \quad (3.5)$$

Define the function $v(t) = e^{\gamma t} \|\phi_\eta(t) - \phi_\zeta(t)\|$ and let

$$R_0 = 2 \max_{(i,j)} \frac{1}{a_{ij}} \left(M_f K_0 \sum_{C_{hl} \in N_r(i,j)} C_{ij}^{hl} + M_F \right) - \frac{\epsilon}{\gamma\alpha}.$$

The inequality (3.5) yields

$$v(t) \leq R_0 e^{\gamma \theta_{k_0}} + \frac{\epsilon}{\gamma\alpha} e^{\gamma t} + (M_f + L_f K_0) \delta \int_{\theta_{k_0}}^t v(s) ds, \quad t > \theta_{k_0}.$$

Applying the Gronwall's Lemma [45] to the last inequality one can verify that

$$\begin{aligned} v(t) &\leq \frac{\epsilon}{\gamma\alpha} e^{\gamma t} + R_0 e^{(M_f + L_f K_0) \delta (t - \theta_{k_0})} e^{\gamma \theta_{k_0}} \\ &+ \frac{\epsilon (M_f + L_f K_0) \delta}{\gamma\alpha [\gamma - (M_f + L_f K_0) \delta]} e^{\gamma t} \left(1 - e^{-[\gamma - (M_f + L_f K_0) \delta] (t - \theta_{k_0})} \right). \end{aligned}$$

Multiplying both sides of the last inequality by $e^{-\gamma t}$ we obtain that

$$\|\phi_\eta(t) - \phi_\zeta(t)\| < \frac{\epsilon}{\alpha [\gamma - (M_f + L_f K_0) \delta]} + R_0 e^{-[\gamma - (M_f + L_f K_0) \delta] (t - \theta_{k_0})}, \quad t > \theta_{k_0}.$$