On 3/2-stability results for continuous and discrete population models

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Abstract. We show that the famous 3/2-stability theorem obtained fifty years ago by E. M. Wright for the delayed logistic equation can be extended to general scalar functional differential equations of the form

$$x'(t) = f(t, x_t),$$

where $f : [0, \infty) \times C([-\tau, 0]; \mathbb{R}) \to \mathbb{R}$ is a Carathédory function, and, as usual, x_t denotes the function in $C([-\tau, 0]; \mathbb{R})$ defined by $x_t(s) = x(t + s), -\tau \leq s \leq 0$. Our approach allows us to improve many previous stability conditions not only for continuous delayed population models, but also for some discrete ones. In particular, our results support the conjecture stated by Levin and May in 1976 affirming that the local asymptotic stability of the equilibrium of some delay difference equations implies its global stability.