Tohoku Math. J.
53 (2001), 629–631

CORRECTION: EXTREME STABILITY AND ALMOST PERIODICITY IN A DISCRETE LOGISTIC EQUATION

(Tohoku Math. J. 52 (2000), 107–125)

SANNAY MOHAMAD AND KONDALSAMY GOPALSAMY

(Received February 22, 2001, revised June 22, 2001)

The authors of the article [1] have noticed a few errors in [1] and the following corrections have to be made:

(I) The inequalities in (2.4) should read

$$x_{\max} = \frac{K^*}{r_*}\exp(r^* - 1)\,, \qquad x_{\min} = K_* \exp\left(r_* - \frac{r^*}{K_*}x_{\max}\right).$$

In view of this redefinition of $x_{\min}$, Lemma 2.1 needs a revised proof and the following is a complete new proof of Lemma 2.1 with the above modification of the inequalities in (2.4). Define $f_n(x),\ F(x),\ g(x), x_{\max}, x_{\min}$ as follows:

$$f_n(x) = x\ \exp\left[r(n)\left(1 - \frac{x}{K(n)}\right)\right], \qquad F(x) = x\ \exp\left(r^* - \frac{r_* x}{K^*}\right)$$

$$g(x) = K_* \exp\left(r_* - \frac{r^* x}{K_*}\right); \quad x_{\max} = F\left(\frac{K^*}{r_*}\right), \quad x_{\min} = g(x_{\max})\,.$$

Proof of Lemma 2.1 is divided into four steps for convenience:

Step 1. We have from

$$x(n+1) = f_n(x(n)) \le F(x(n)) \le \sup_{x>0} F(x) = x_{\max}$$

that

$$\limsup_{n\to\infty} x(n) \le x_{\max} \qquad \text{since} \quad x(n) \le F\left(\frac{K^*}{r_*}\right) \quad \text{for all} \quad n \ge 1\,.$$

Step 2. Suppose there exists an integer N such that $x(n+1) \ge x(n)$ for all $n \ge N$. Then one can show that

$$\liminf_{n\to\infty} x(n) \ge x_{\min}\,;$$

for instance we have from the boundedness of $\{x(n)\}$, that $\lim_{n\to\infty} x(n) = x^*$ exists and is finite. By letting $n \to \infty$ in the relation

$$x(n+1) = x(n)\exp\left[r(n)\left(1 - \frac{x(n)}{K(n)}\right)\right],$$