

**ERRATUM**

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# Erratum to: The $(k, s)$ -fractional calculus of $k$ -Mittag-Leffler function

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**Abstract**

In this note we present some corrections to our previous paper (Nisar et al. in *Adv. Differ. Equ.* 2017:118, 2017).

**1 Erratum**

In the paper [1], the following errors are present on pages 4, 5, 6 and 7.

In Definition 3, in equations (20) and (21), one left bracket is misplaced inside the expression  $[(\frac{1}{x^s} \frac{d}{dx})^n]$  and  $[(-\frac{1}{x^s} \frac{d}{dx})^n]$ , respectively. The correct forms of the expressions are as follows:

$$({}^s D_{a^+}^\mu f)(x) = \left[ \left( \frac{1}{x^s} \frac{d}{dx} \right)^n \right] (k^n {}^s I_{a^+}^{n-k-\mu} f)(x), \tag{1}$$

$$({}^s D_{a^-}^\mu f)(x) = \left[ \left( -\frac{1}{x^s} \frac{d}{dx} \right)^n \right] (k^n {}^s I_{a^-}^{n-k-\mu} f)(x), \tag{2}$$

respectively.

On page 5, in the proof of Lemma 1, line 6, the numerator confuses  $(1 - \mu)$  and  $(k - \mu)$ , the correct expression is

$$\begin{aligned} & \frac{1}{x^s} \frac{d}{dx} ({}^s I_{a^+}^{(1-\nu)(k-\mu)} [(t^{s+1} - a^{s+1})^{\frac{\lambda}{k}-1}]) (x) \\ &= \frac{[(1-\nu)(k-\mu) + \lambda - k] \Gamma_k(\lambda)}{k(s+1)^{\frac{(1-\nu)(k-\mu)}{k}-1} \Gamma_k((1-\nu)(k-\mu) + \lambda)} (x^{s+1} - a^{s+1})^{\frac{(1-\nu)(k-\mu) + \lambda}{k} - 2}. \end{aligned}$$

On page 6, Theorem 1, equation number (24) is misplaced and now equation (25) is (24) (accordingly, all equation numbers will change). In the statement of Theorem 1 at the beginning  $\frac{1}{x^{\frac{s}{m}}}$  should instead read  $\frac{1}{x^s}$ . Also the power  $\frac{\epsilon}{k}$  should instead read  $\frac{\beta}{k}$ . The correct expression is as follows:

**Theorem 1** For  $k > 0$ , the following result always holds true:

$$\begin{aligned} & \left( \frac{1}{x^s} \frac{d}{dx} \right)^m \left[ (x^{s+1} - a^{s+1})^{\frac{\beta}{k}-1} E_{k,\rho,\beta}^\delta (\omega (x^{s+1} - a^{s+1})^{\frac{\beta}{k}}) \right] \\ &= \frac{(s+1)^m (x^{s+1} - a^{s+1})^{\frac{\beta}{k}-m-1}}{k^m} E_{k,\rho,\beta-mk}^\delta (\omega (x^{s+1} - a^{s+1})^{\frac{\beta}{k}}), \end{aligned} \tag{3}$$

where  $s \in \mathbb{R} \setminus \{-1\}$ ,  $\mu, \rho, \beta, \delta \in \mathbb{C}$ ,  $\Re(\mu) > 0$  and  $\Re(\beta) > 0, \Re(\rho) > 0, \Re(\delta) > 0$ .

Also, in the proof of Theorem 1, the error:  $\frac{1}{x^{\frac{s}{m}}}$  should instead read:  $\frac{1}{x^s}$ .

On page 7 in the proof of equation (27) (just after the sentences ‘This completes the proof of (26). Now, we have’ in the second line of the expression) the error:  $(\frac{1}{x^{\frac{s}{n}}} \frac{d}{dx})^n$  should instead read:  $(\frac{1}{x^s} \frac{d}{dx})^n$ . Also (just after the sentences ‘and using (26) this takes the following form’ in the second line of the expression) the error:  $(\frac{1}{x^{\frac{s}{n}}} \frac{d}{dx})^n$  should instead read:  $(\frac{1}{x^s} \frac{d}{dx})^n$ . This has now been included in this erratum.

#### Competing interests

The authors declare that they have no competing interests.

#### Authors' contributions

All the authors contributed equally and significantly in writing this paper. All authors read and approved the final manuscript.

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1. Nisar, KS, Rahman, G, Baleanu, D, Mubeen, S, Arshad, M: The  $(k, s)$ -fractional calculus of  $k$ -Mittag-Leffler function. *Adv. Differ. Equ.* **2017**, 118 (2017). doi:10.1186/s13662-017-1176-4

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