



Erratum

Errata to “Generalized Richards’ equation to simulate water transport in unsaturated soils” [J. Hydrol, 272:3–13][☆]

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We regret to announce that several errors have been left unnoticed in the manuscript.

1. Water flux is not governed by the Darcy law as it is mistakenly stated at p. 7. The Eq. (6) is a simplified form of the fractional Fokker–Plank equation (Sokolov et al., 2002). The latter is written as

$$\frac{\partial P(x, t)}{\partial t} = {}_0D_t^{1-\gamma} \nabla D_\gamma \nabla P(x, t)$$

where ${}_0D_t^{1-\gamma}$ is the fractional integral

$${}_0D_t^{1-\gamma} f(t) = \frac{1}{\Gamma(\gamma-1)} \int_0^t (t-\tau)^{-\gamma} f(\tau) d\tau$$

Therefore the flux value is actually equal to

$$Q = -{}_0D_t^{1-\gamma} D_\gamma \nabla P(x, t)$$

Substituting θ instead of the probability distribution P , one has

$$\begin{aligned} Q &= -{}_0D_t^{1-\gamma} D_\gamma \nabla \theta(x, t) \\ &= \frac{1}{\Gamma(\gamma-1)} \int_0^t (t-\tau)^{-\gamma} D_\gamma(\theta) \frac{\partial}{\partial x} \theta(x, \tau) d\tau \end{aligned}$$

2. The second part of the Eq. (8) should read

$$(-1)^{j-1} \frac{\gamma(\gamma-1) \cdots (\gamma-j+1)}{1 \cdot 2 \cdots j}$$

3. Equation for the asymptotic values of coefficients c_j at p. 7 should read $c_j \propto (j-1/2)^{-m}$ for large j .

4. Eq. (13) gives an expression for the $D_\gamma(\theta)$ rather than for $D(\theta)$.

Fortunately, the errors do not affect main results and conclusions of our paper.

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References

Sokolov, I.M., Klafter, J., Blumen, A., 2002. Fractional kinetics. Physics Today November, 48–54.

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