

ABSTRACT:

Existing literature suggests that Darcy's law is not valid in layers of different degrees of decomposed peat soil. The present study attempts to validate the applicability of Darcy's law by comparing the velocity predicted by it and the velocity obtained through experiment for a peat soil column and also to assess the changes of hydraulic conductivity, k , with the depth of peat soil layers. The suitability of Izbash's law to predict the flow through peat soil column of different degrees of decomposition was tested by determining the n value (Izbash's parameter). Izbash's law ($v = kn$) is preferred because it is in continuity with Darcy's law. Soil column studies were set up by applying different values in hydraulic gradient in order to obtain discharge velocity, v , of the sample. From the experimental data, the suitable Izbash's parameter, n , for each depth of peat soil profile was determined. The result shows that Darcy's law is only appropriate for the upper layer and as the layers become deeper, deviation from Darcy's law becomes larger. Izbash's law provides a much better approximation of water flow through much deeper peat layers.