

Interactive comment on “Identification of runoff formation with two dyes in a mid-latitude mountain headwater” by Lukáš Vlček et al.

Bernhard Kohl

Field testing on runoff formation is highly valuable to get a better understanding of the decisive processes and therefore the topic of the study to investigate different hillslopes with dyes is an interesting question. The authors present an extensive work and an exciting experiment.

The text is organised in a coherent and readable way.

The literature review is modest, but suitable according to the topic. In general literature references need to be revised and should be brought to a uniform condition.

A contradiction occurs within the discussion section concerning the dominant runoff formation processes at the Podzol hillslope. This incongruity calls for an explanation.

However, in my opinion some minor revisions should be done, the authors should be invited to resubmit a revised manuscript.

General comments:

- Ambiguities concerning runoff processes HOF and SOF need to be clarified.
- At least two citations mentioned within the text cannot be found in the references-list.
- Perhaps it is recommended to check the article by a native speaker once more.

Specific comments:

- literature references need to be revised and should be brought to a uniform condition. E.g. (~~Hladný and Kašpárek, 2005; Hladný et al., 2005; Flury et al., 1995; Flury and Flüher, 1995; Hümann et al., 2011...~~; Hümann et al., 2011...)
- Perhaps it would be recommended to change the order of the tables 1 and 2 in the chronological appearance
- (Eriophorum sp. L.); (Sphagnum sp. L.)
- *“Vertical hydrological conductivity (HCv) was measured on-site with a single-ring infiltrometer (Flow-Group Comp.). A low HCv in the topsoil is supposed to generate rather surface flow – likely saturation overland flow (SOF) and possibly Hortonian overland flow (HOF) to a minor extent – or near-surface biomat flow (BMF; Sidle, 2007) during high intensity storms.”*
This line of argument is not understandable: The very low conductivity at the surface (infiltrator) implies inhibited infiltration and thus infiltration excess = HOF!
- *“Due to previous rainfall events, the soil moisture ranged between 0.40-0.45 VWC.”* 0.40 (lowest value) due to previous rainfall events?

- In order to facilitate the readability of the text perhaps it would be better to change the order of fig.4 ab and 5 ab: ~~4a frontal, 4 b lateral; 5a lateral 5b frontal~~; 4a frontal, 4 b lateral; 5a frontal 5b lateral
- “This is noteworthy since the proportion of the Peat Bog ranges from **60%** at the 2nd order stream headwater to less than 30% at the 3rd order 15 stream catchment; the remaining areas are covered by Podzol.” Table 1 gives PB 44% RH. 60% or 44%?
- “According to the runoff formation decision scheme by Scherrer and Naef (2003), the dominant runoff formation process at the Podzol hillslope **can be classified as a combination of delayed Hortonian overland flow (HOF) and delayed subsurface stormflow (SSF2).**” This is a clear contradiction to the observed results. At P16 L12 it is mentioned that “...deep percolation into the bedrock dominated...”. So deep percolation DP is the primary runoff formation process at the Podzol hillslope (fig.8). This incongruity calls for an explanation.
- “Our hypothesis of HOF was confirmed for the Peat Bog hillslope...” see the above statements on HOF, SOF
- Fig.1 Well designed illustration. WLPWS* What does the asterisk stand for?
- Fig.8b (*saturation overland flow, SOF*) see the above statements on HOF, SOF

Technical corrections:

P8 L9 for two weeks.

P11 L7 ~~to~~ to test

P13 L6 Burt-Burts