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## Comment on hess-2021-519

Giora J. Kidron (Referee)

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Referee comment on "Resolving seasonal and diel dynamics of non-rainfall water inputs in a Mediterranean ecosystem using lysimeters" by Sinikka Paulus et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-519-RC2>, 2021

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The authors presented a thorough and clearly written research paper, which I enjoyed reading. There are some points, however, that should be pointed out, whether in order to clarify some issues or to point to possible directions for future research.

- Unfortunately, the reader is not provided with a full description of the lysimeter. I assume that the lysimeter is covered with vegetation which reflects the vegetation at the site. Data regarding the cover and height of the vegetation at the site, along with photographs would have been helpful.
- Scholars tend to refer to the amount of NRW that they obtained as representative of their site. Consequently, a comparison with other sites is often made, and similar values are taken as a supportive evidence for the reliability of the newly published data. Differences may be explained to stem from "site-specific timing" (l 302), but this may however not necessarily be the case. The authors were indeed aware of the complexity stemming from the sharp temperature gradient above ground, and the  $T_d$  was corrected to that of 10 cm above ground. One however should note that this height above ground yielded the highest NRW in the Negev (Kidron, 1998, 2010). At higher height a decrease in NRW took place due to higher wind turbulence while at lower height a decrease in NRW stemmed from the heat emitted from the soil. While the 10 cm height taken by the authors is relevant for plants (as correctly indicated by the authors, and was in line with eddy covariance measurements), it is not necessarily relevant for biocrusts.
- Large lysimeters may better reflect the NRW. The extent to which heat loss through the walls of a large lysimeter will affect the NRW in comparison to the large effect recorded for microlysimeters (MLs) has yet to be evaluated. Once MLs are used, as was the case for the Tabernas (Uclés et al., 2013, 2014, 2015, 2016), one may have assumed, based on the published NRW that the Tabernas may be considered as a 'dew desert' and that NRW has an important contribution to the biocrusts there. However, based on data from the Negev (Kidron and Kronenfeld, 2020a, 2020b; Kidron et al., 2021) and analysis of the microclimatological variables in the Tabernas (Kidron and Lázaro, 2020; Kidron and Kronenfeld, 2020c), the published data for the Tabernas should be taken with caution. It is not merely the distance from the Mediterranean (l 294), but rather

the method used that may largely explain the differences in the reported NRW between the current site and the Tabernas.

- Certainly, while the method employed by the authors may yield relatively reliable values in comparison to other methods which use lysimeters, verification against manual measurements is necessary. I assume that in this case, vapor condensation on the plant leaves should be measured. For a comparison to other sites (including the Tabernas) where great efforts were made to evaluate the amount of NRW obtained by biocrusts, direct NRW measurements also at the surface would be helpful.

With pleasure,

Giora J Kidron

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