



Karst relief denudation based on limestone tablets weight loss (Slovak karst)

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Introduction

Currently, chemical denudation is one of the main geomorphological factors. Various methodologies are used to monitor it over time, mostly indirectly based on the detection of karst water mineralization. Direct methods are rarely used, one of the possibilities is based on accurate measurement of weight loss on limestone plates (samples).



Fig. 1 The first generation of plates made of local material
Source: Hochmuth, Z. (2018)

Methods

Our research is based on method of Ivan Gams and measurable results of limestone tablets weight loss at two experimental sites of the Slovak Karst. On Silica and Jasov Plateau was monitored weight loss in the 3 months intervals from December 2016 until present. We used two different types of tablets (from the Lipica quarry in Slovenia and from Slovak karst since 2018) in three different positions – one on the surface and at a depth of 20 and 50 cm. The dissolution rate (mg/year/cm^2) was calculated based on this equation:

$$DR = (W_1 - W_2) * \frac{1000}{t} * \frac{365}{S}$$

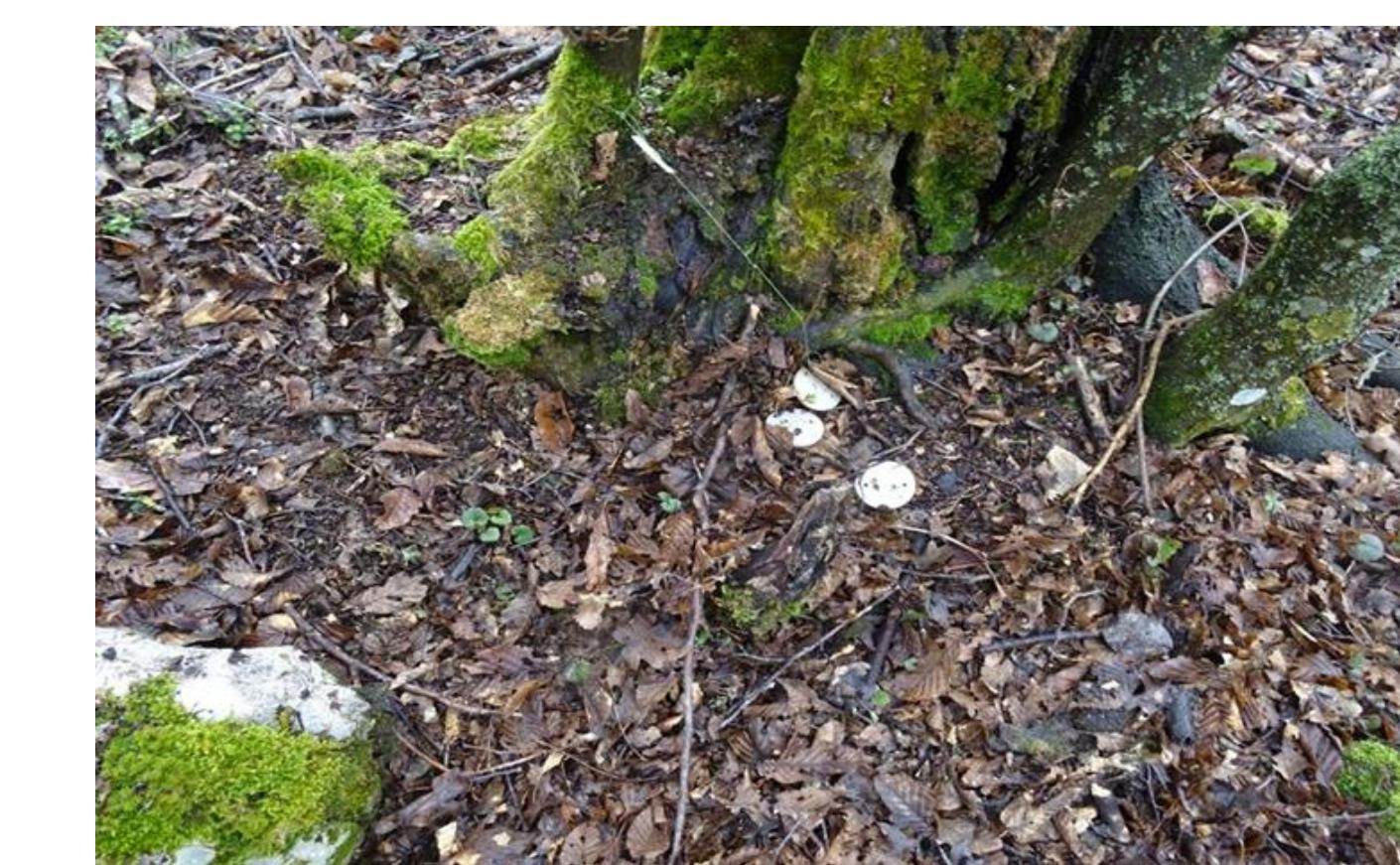


Fig. 2 Placement of Chinese samples on Jasovská plateau on the surface
Source: Hochmuth, Z., (2018)



Fig. 3 Placement of Chinese samples on the Jasov plateau at a depth of 20 cm
Source: Hochmuth, Z., (2018)

Results

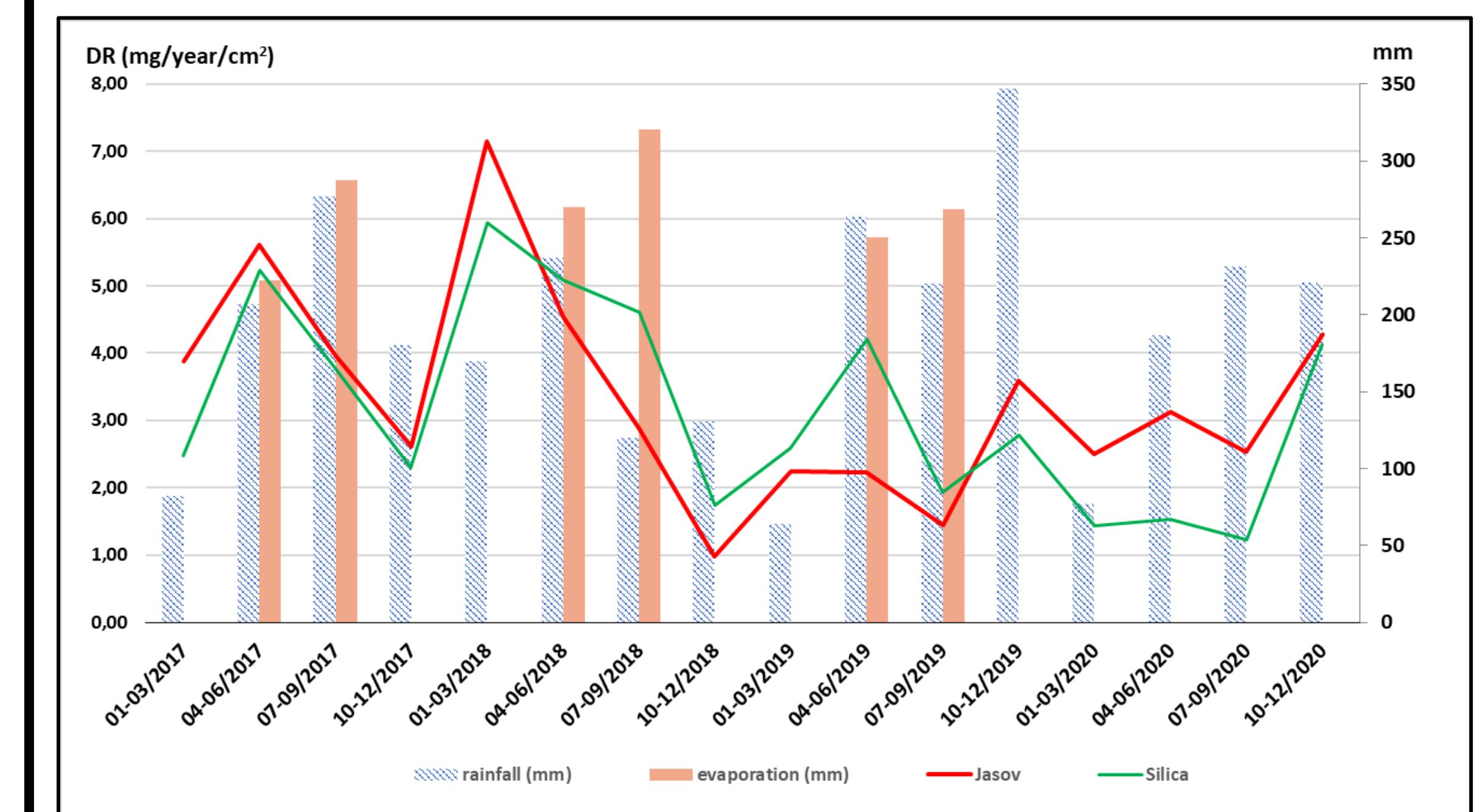


Fig. 5 The graph shows the dependence of rainfall (mm), evaporation (mm) and the values of the dissolution rate of the original plates on the Silica and Jasov plateau

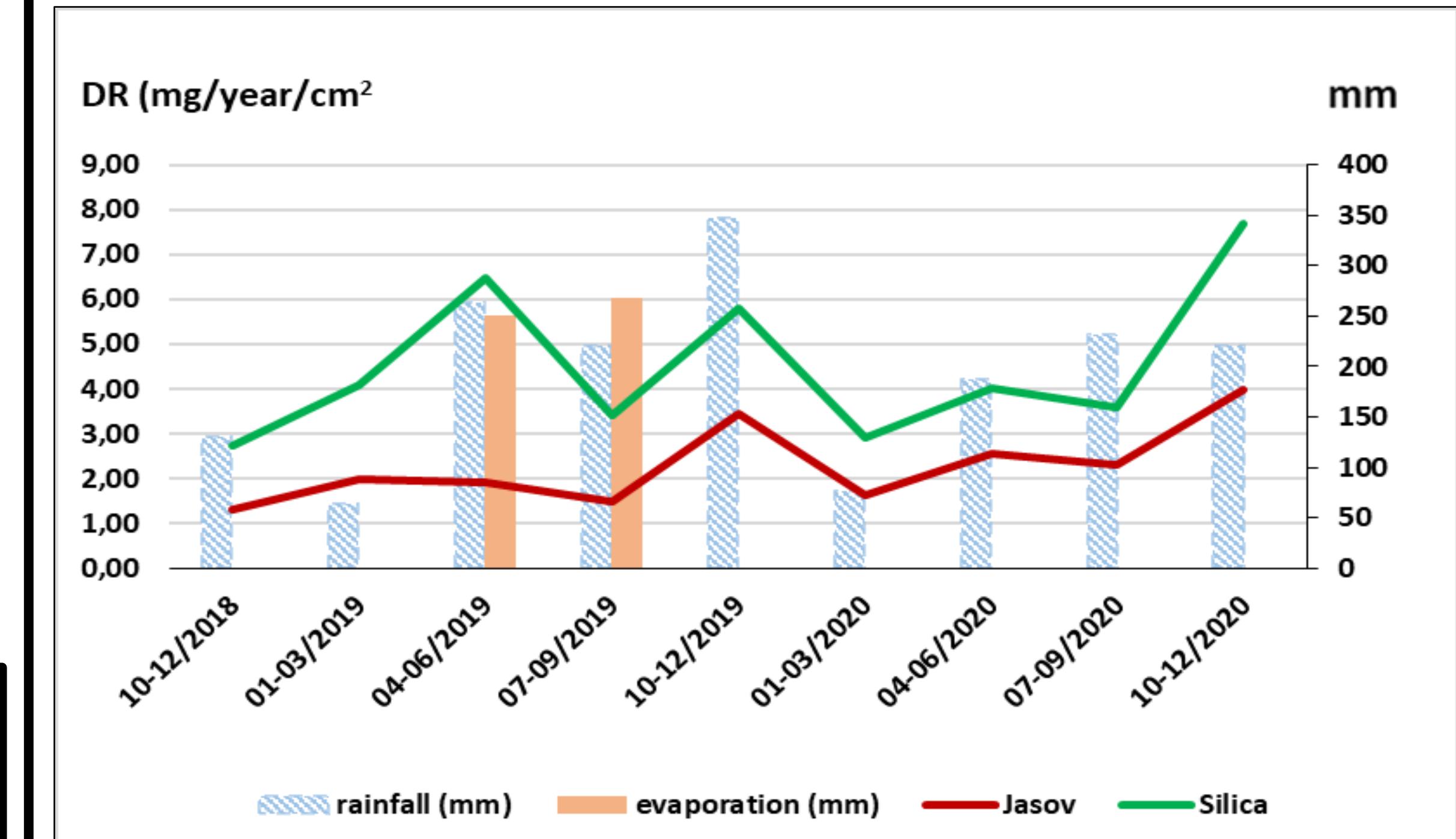


Fig. 6 The graph shows the dependence of rainfall (mm), evaporation (mm) and the values of the dissolution rate of local plates from Silická and Jasovská planina

Weight loss monitoring

During the monitoring of this process, we used a method based on the transmission of weight loss measurements using KERN ABT-NM analytical balances together with the study and measurement of various factors that affect it.



Fig. 4 Mettler Toledo analytical balance at ÚCHV

Standard tablets	Local tablets			
	S. 50	J. 50	J. 20	J. 10
0.30429129	2.7670929	4.3724880	0.6127368	5.16027727
0.6745388	7.0161476	7.5967460	1.7941438	8.34259453
0.7778360	6.0865125	4.99656757	1.1631529	5.93728819
0.8827051	12.0152663	5.2265160	1.4719600	4.82376763
0.62286516	9.3957284	8.3482185	1.68072543	1.7296488
0.81422614	8.3482185	8.3482185	0.86863039	3.03484389
1.15253138	3.3139257	1.51004275	0.4560320	0.91087344
0.69685979	5.7932616	2.43048865	0.5620292	5.9393024
0.818672051	12.0152663	5.2265160	1.4719600	4.82376763
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