**Supplementary material 3 – Indices for phytolith assemblage analysis**

Table 1. Indices used for phytoliths assemblage analysis, formulas to calculate them, scope and references.

|  |  |  |  |
| --- | --- | --- | --- |
| **Index** | **Formula** | **Scope** | **References** |
| ***Long/short cell index*** | Long/short cell index = long cells/short cells (GSSCPs[[1]](#footnote-1)). | Explain the composition of grasses (mature versus young grasses).  provide information about the age and phenomenological stage of the plants | Delhon et al. 2023 |
| ***Fs-index*** | Fs-index = bulliform/GSSCPs | Improve understanding of water stress and evapotranspiration, based on the presence of bulliform flabellate phytoliths | Bremond et al. 2005b;  Strömberg et al. 2007. |
| ***Dicot/Poaceae index* (here “*Da/P index”*)** | Da/P index (cf. Bremond et al. 2008) = Spheroid + Tracheary/GSSCPs | Measure the ratio of dicotyledon rough- and smooth-spherical morphotypes (D) versus Poaceae morphotypes (P), thus allowing to estimate of tree cover density | Alexandre et al. 1997;  Delhon et al. 2003;  Bremond et al. 2008;  Strömberg et al. 2018. |
| ***Dicotb/Poaceae index***  ***(“Db/P index”)*** | Db/P index = Spheroid + Tracheary + Jigsaw + Blocky/GSSCPs | Estimation of tree cover density, including also the blocky (Rovner 1971; Madella et al. 1998; Blinnikov et al. 2002; Strömberg 2003; Carnelli et al. 2004; Strömberg et al. 2007), jigsaw (Wang and Lu 1993; Carnelli et al. 2004; Kawano et al. 2006, Gu et al. 2008; An and Lu 2015; Potì et al. 2019; Hayashi et al. 2021) and tracheary (Alexandre et al. 1997; Bozarth 1992; Madella et al. 1998; Albert et al. 1999; Runge1999; Delhon et al. 2003; Jarl and Bruch 2023) morphotypes as variable diagnostic of dicots. | |
| ***Inflorescence/culm-leaves index*** | Inflorescence/culm-leaves index = elongate dendritic/elongate entire + elongate sinuate | Measures the ratio of Elongate dendritic phytoliths (from inflorescence bracts) versus Elongate entire and Elongate sinuate (from culms and leaves) | Piperno 1988; Tsartsidou et al. 2007; Delhon et al. 2020. |

1. GSSCPs, acronym for Grass Silica Short Cell Phytoliths. [↑](#footnote-ref-1)