Supporting Information

Spatio-temporal dynamics of dissolved organic matter and disinfection byproducts formation potential of Shengzhong Lak in southwest China

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1. **Supplementary text: Text S1**

1.1. Text S1: UV-Vis and fluorescence EEMs index

1.1.1. UV-Vis index

The specific UV absorbance at 254 nm ($SUVA_{254}$) was calculated by dividing the absorbance at 254 nm by the DOC concentration (Helms et al. 2008) and used to indicate DOM aromaticity. The *E*2/*E*3, negatively correlated to the molecular weight of DOM, was calculated as the ratio of the absorbance at 250 nm and 365 nm (De Haan &De Boer 1987). The spectral slope ratio (S_R) was calculated as the ratio of the spectral slope of 275 – 295 nm ($S_{275-295}$) and 350 – 400 nm ($S_{350-400}$) (Helms et al. 2008). The calculation equations were as follows:

$$\mathrm{SUVA}_{254} = 2.303A_{254}/([DOC] \times l)$$

$$E2/E3 = a(250)/a(365)$$

$$a(\lambda) = 2.303A_{\lambda}/l$$

$$\alpha_{\lambda} = \alpha_{\lambda_{ref}} exp(-S_{275-295}(\lambda - \lambda_{ref}))$$

$$\alpha_{\lambda} = \alpha_{\lambda_{ref}} exp(-S_{350-400}(\lambda - \lambda_{ref}))$$

$$S_R = S_{275-295}/S_{350-400}$$

Where: A_{λ} was the abs at the wavelength λ;

[DOC], dissolved organic carbon, $mgC{\cdot}L^{-1}$;

l, the optical path of the cuvette determined by Abs, 0.01 m;

a(λ), the absorption coefficient of DOM at wavelength λ, m^{-1};

λ_{ref}, reference wavelength, 350 nm when calculating $S_{275\text{-}295}$, and 420 nm when calculating $S_{350\text{-}400}$;

S, spectral slope;

S_R, spectral slope ratio.

1.1.2. Fluorescence index

The humification index (HIX) was calculate by dividing the peak area of the emission wavelengths between 435 and 480 nm by that between 300 and 345 nm at the excitation wavelength of 254 nm (Yeh et al. 2018). Fluorescence index (FI) was calculated as the ratio of the emission intensity at 470 and 520 nm under the excitation wavelength of 370 nm (Williams et al. 2010). The biological index (BIX) was calculated as the ratio of the emission intensity at 380 nm and 430 nm under the excitation wavelength of 310 nm (Mostofa et al. 2007).

$$HIX = \frac{\sum I_{435\to480}}{\sum I_{300\to345}}$$

$$FI = \frac{F_{ex=370,em=470}}{F_{ex=370,em=520}}$$

$$BIX = \frac{I_{Em=380}}{I_{Em=430}(\lambda_{Ex=310})}$$

2. Supplementary tables: Tables S1 to S2

Tables S1 Sample point location of Shengzhong Lake

Number	E (° ' ")	N (° ' ")
1	105°38′5″	31°29′37″
2	105°38′2″	31°30′23″
3	105°37′36″	31°31′27″
4	105°38′20″	31°31′37″
5	105°38′38″	31°32′43″
6	105°38′41″	31°32′25″
7	105°38′51″	31°32′3″
8	105°39′53″	31°32′25″
9	105°40′7″	31°34′4″
10	105°39′52″	31°35′52″
11	105°42′2″	31°35′3″
12	105°42′45″	31°33′59″
13	105°43′36″	31°33′25″
14	105°43′40″	31°32′27″
15	105°44′45″	31°32′14″
16	105°44′40″	31°31′52″

Table S2. Comparison of the four fluorescent fingerprints identified by PARAFAC analysis with previous reports

Component	Excitation Peak (nm)	Emission Peak (nm)	Reference				Description
			1(Lin &Guo 2020**)**	**2(**Chen et al. 2018**)**	**3(**Yang et al. 2022**)**	**4(**Batista-Andrade et al. 2023**)**	
C1	255 （375）	500	C2		C3		terrestrial or autochthonous humic-like substances, fulvic acid-like, present in all environments; positively related to agriculture and bacterial production.
C2	240 （275）	338		C5	C5		protein-like, plankton-derived; tryptophan-containing material that may be associated with a biological production and activity of microorganisms.
C3	240 （305）	388	C3			C2	terrestrial humic materials, possible microbial reprocessing; microbial humic-like substances.
C4	240 （340）	436	C1		C4		terrestrial humic-like (similar to syringaldehyde); microbial humic-like substances.

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