

SUPPORTING MATERIAL

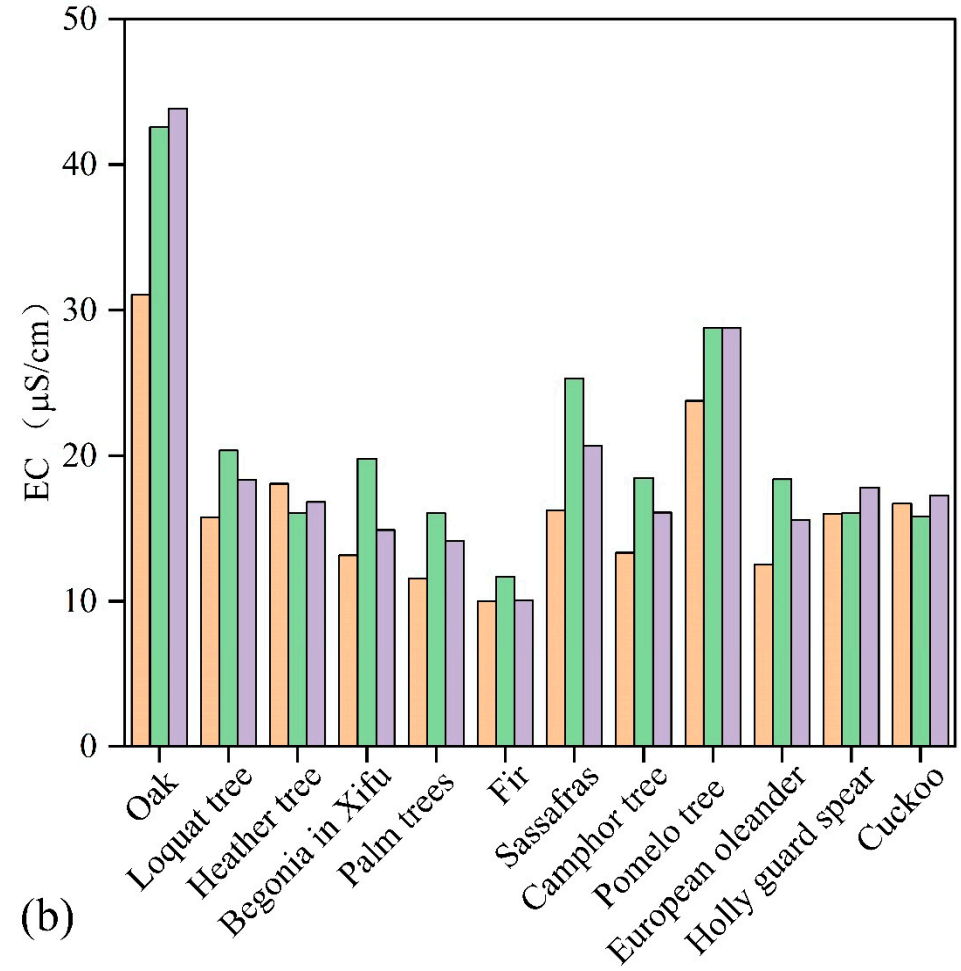
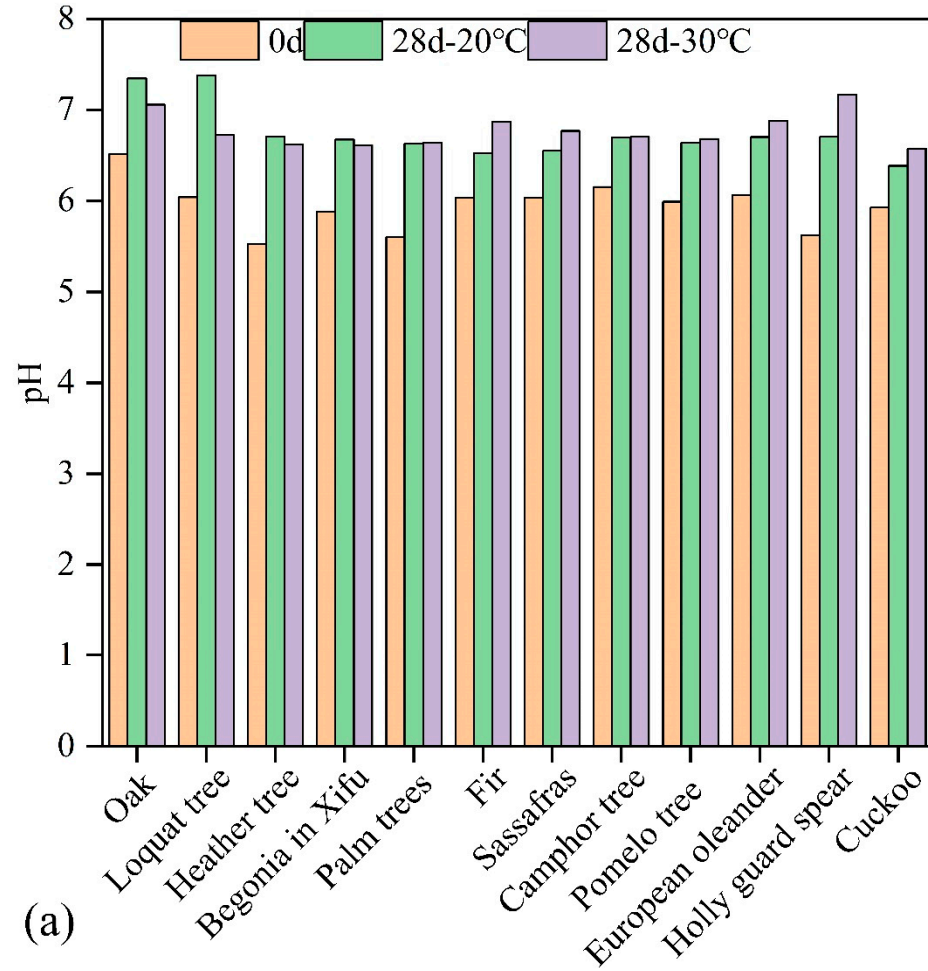


Figure. S1 pH(a) and EC(b) changes on 0d and 28d incubation.

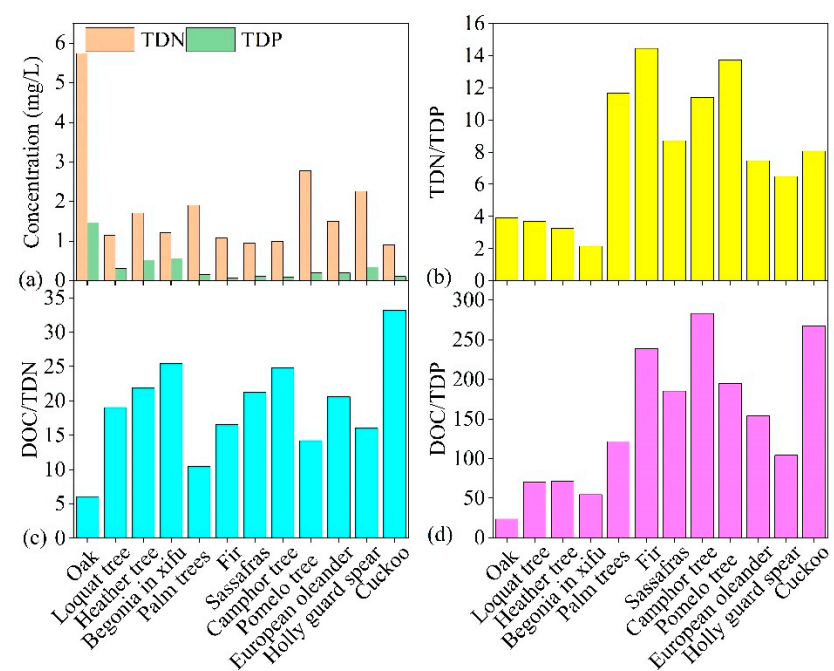


Figure. S2 TDN and TDP concentrations (a), TDN/TDP (b), DOC/TDN (c) and DOC/TDP (d) in fresh-leaf leachate.

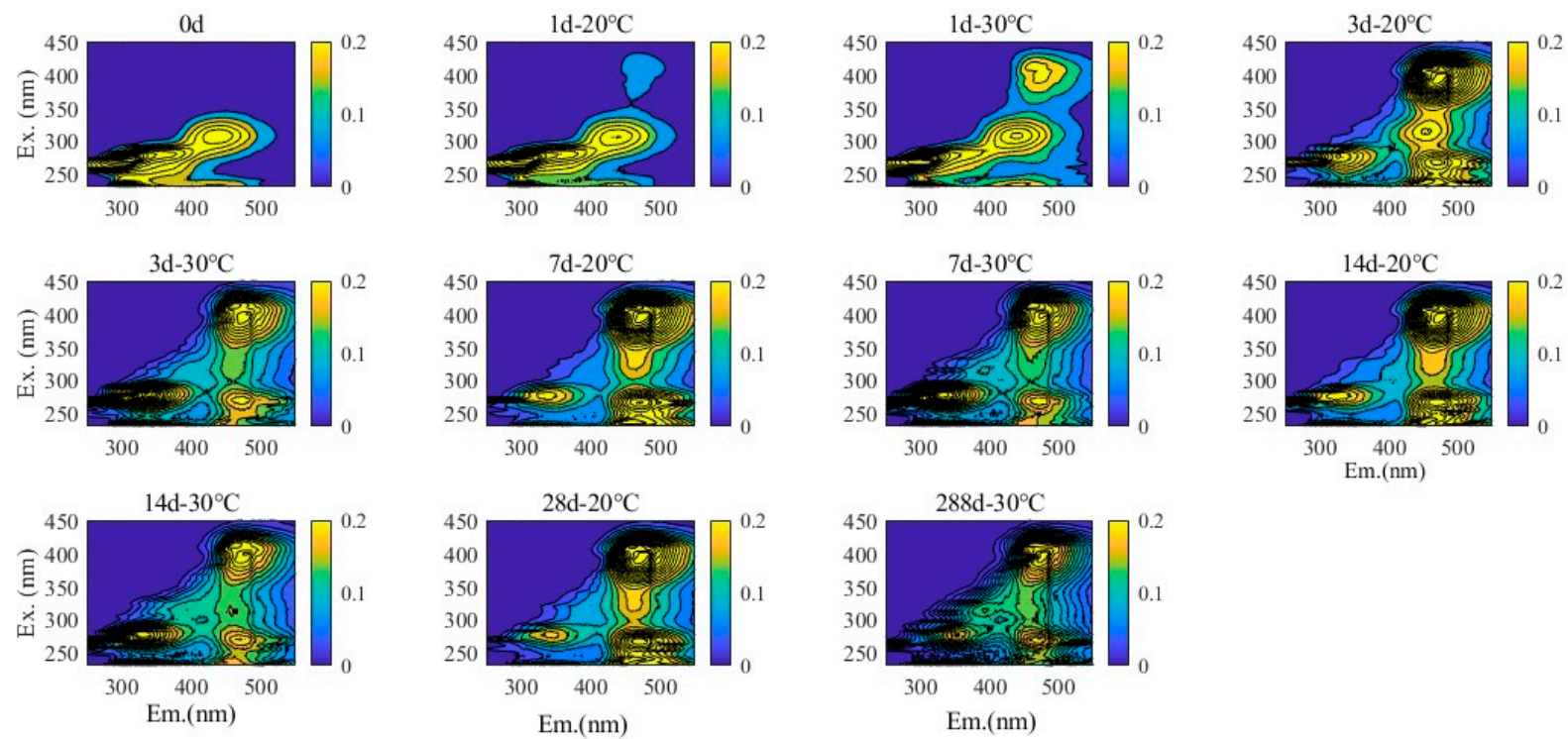


Figure. S3 Quercus oak tree leachate DOM degradation process.

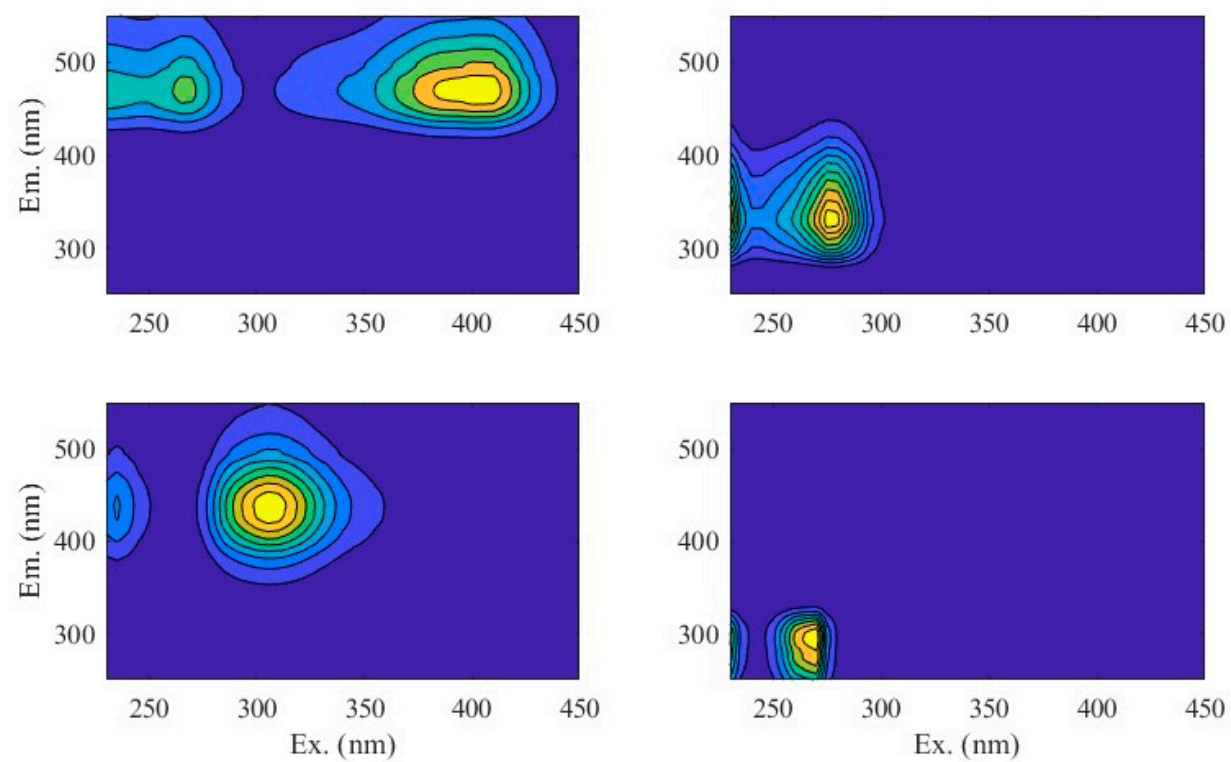


Figure. S4 Four components of fluorescent substances in Quercus oak tree leachate.

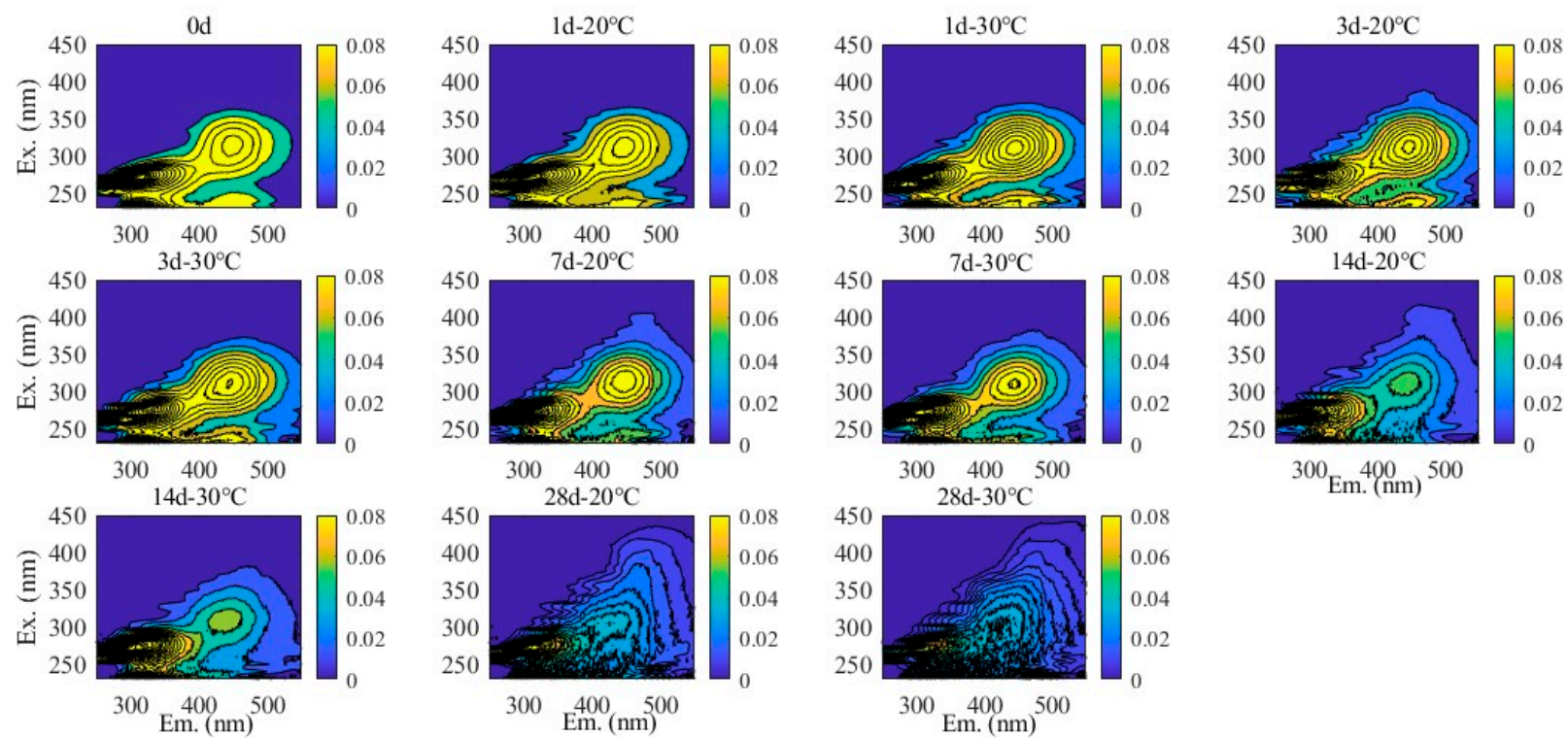


Figure. S5 Loquat tree leachate DOM degradation process.

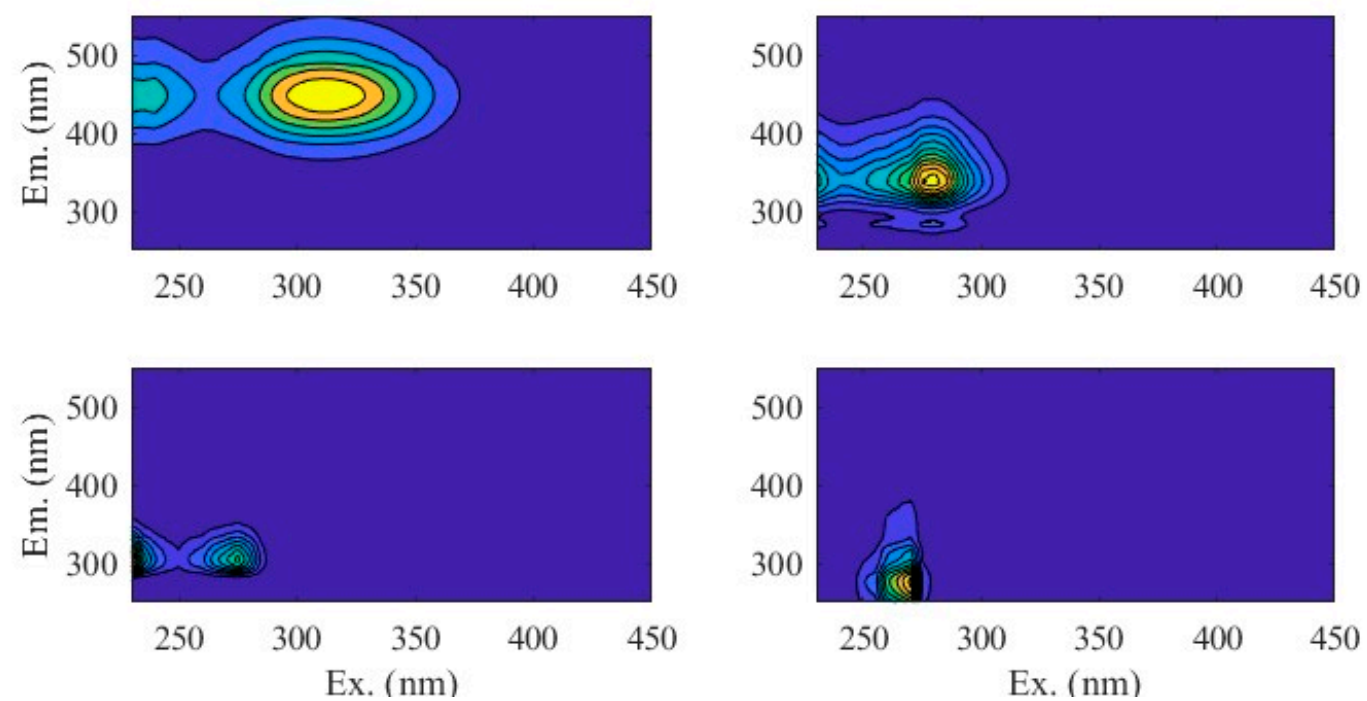


Figure. S6 Four components of fluorescent substances in loquat tree leachate.

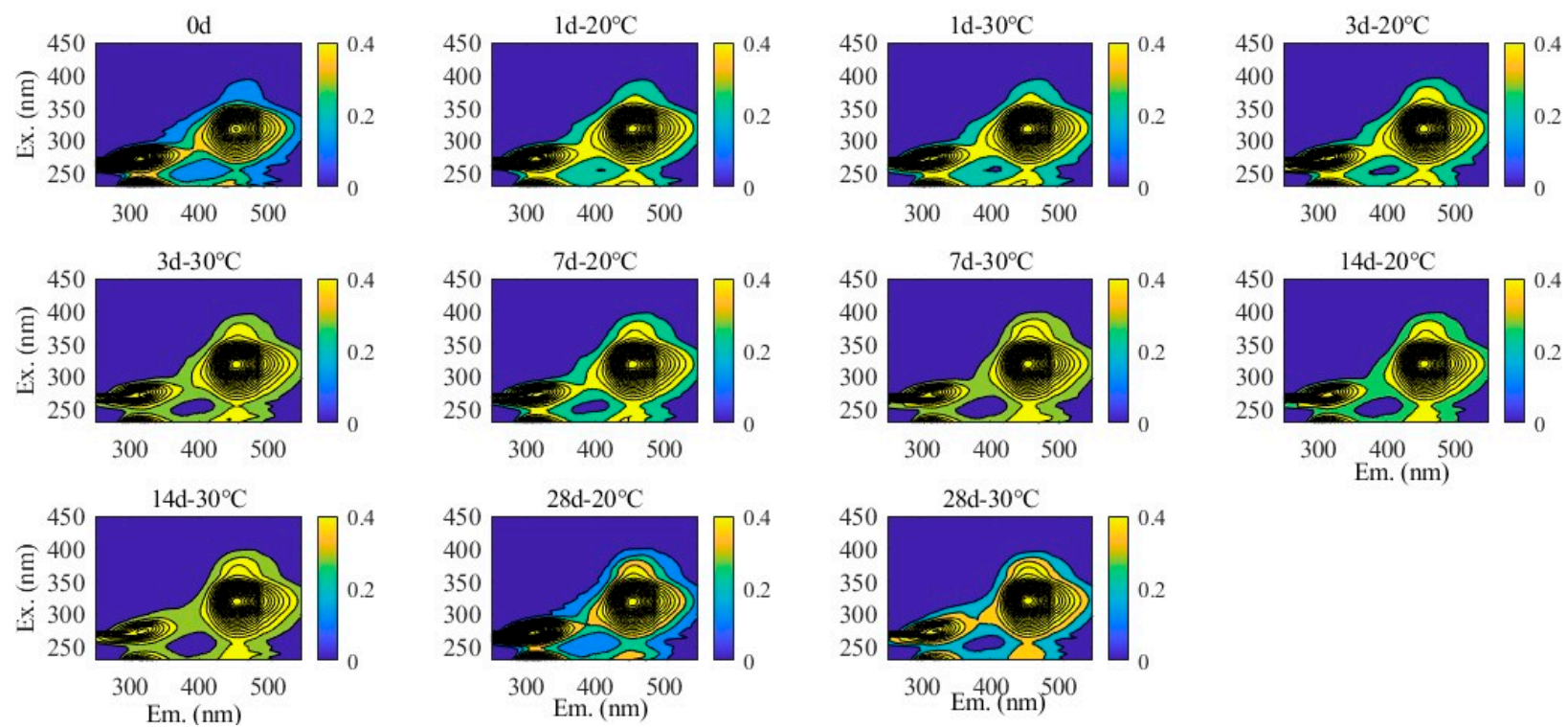


Figure. S7 DOM degradation process of Heather tree leachate.

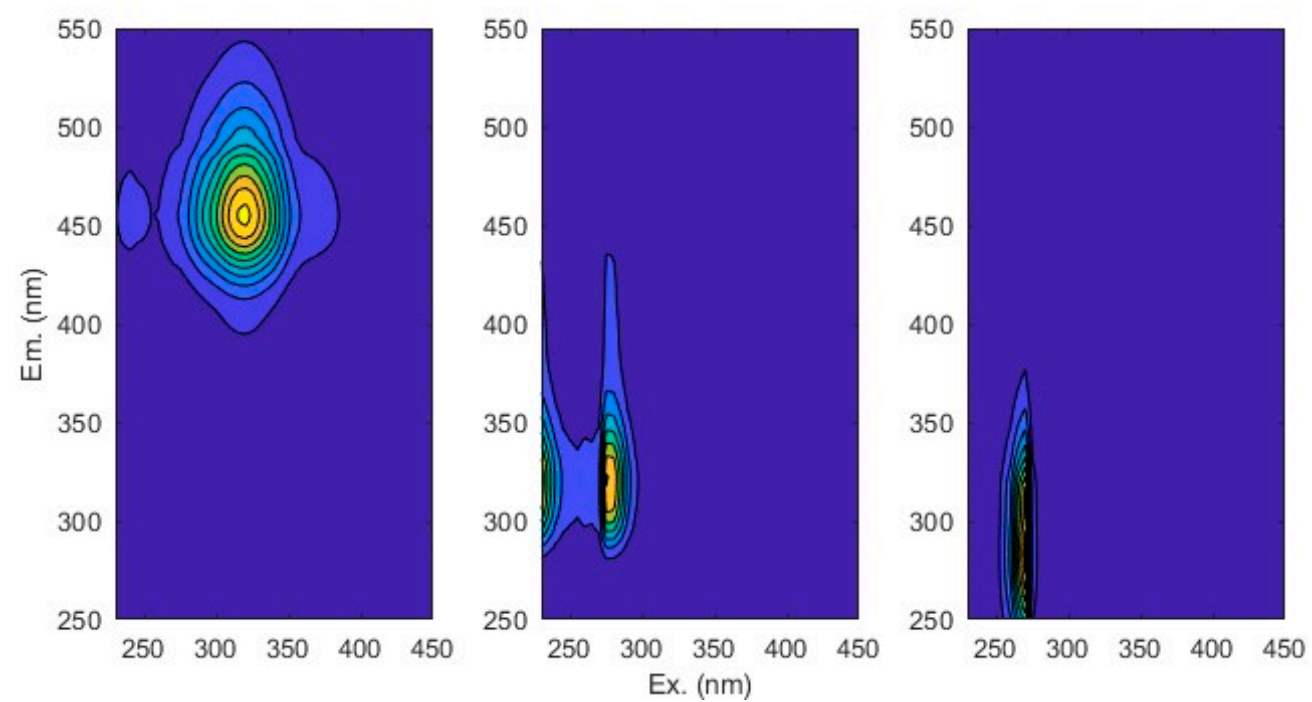


Figure. S8 Three components of fluorescent substances in Heather tree leachate.

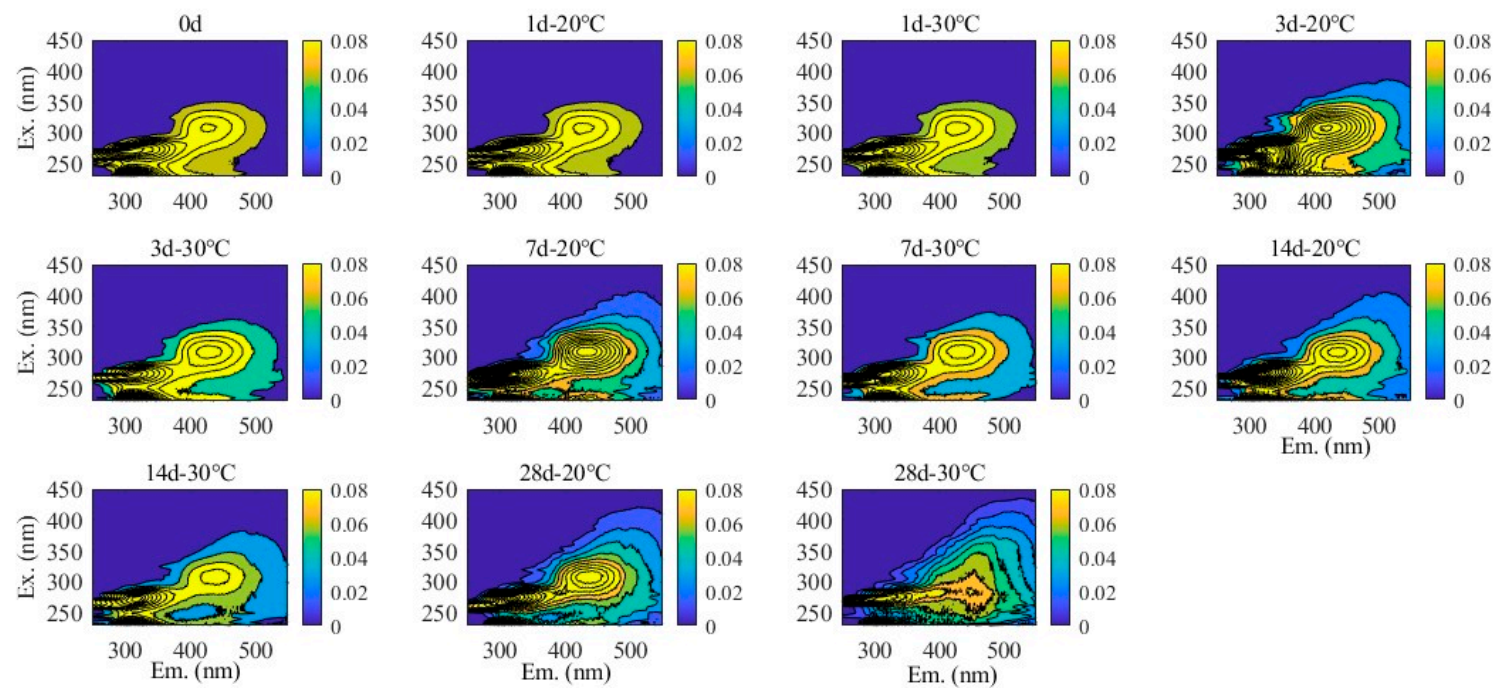


Figure. S9 DOM degradation process of Begonia in Xifu tree leachate.

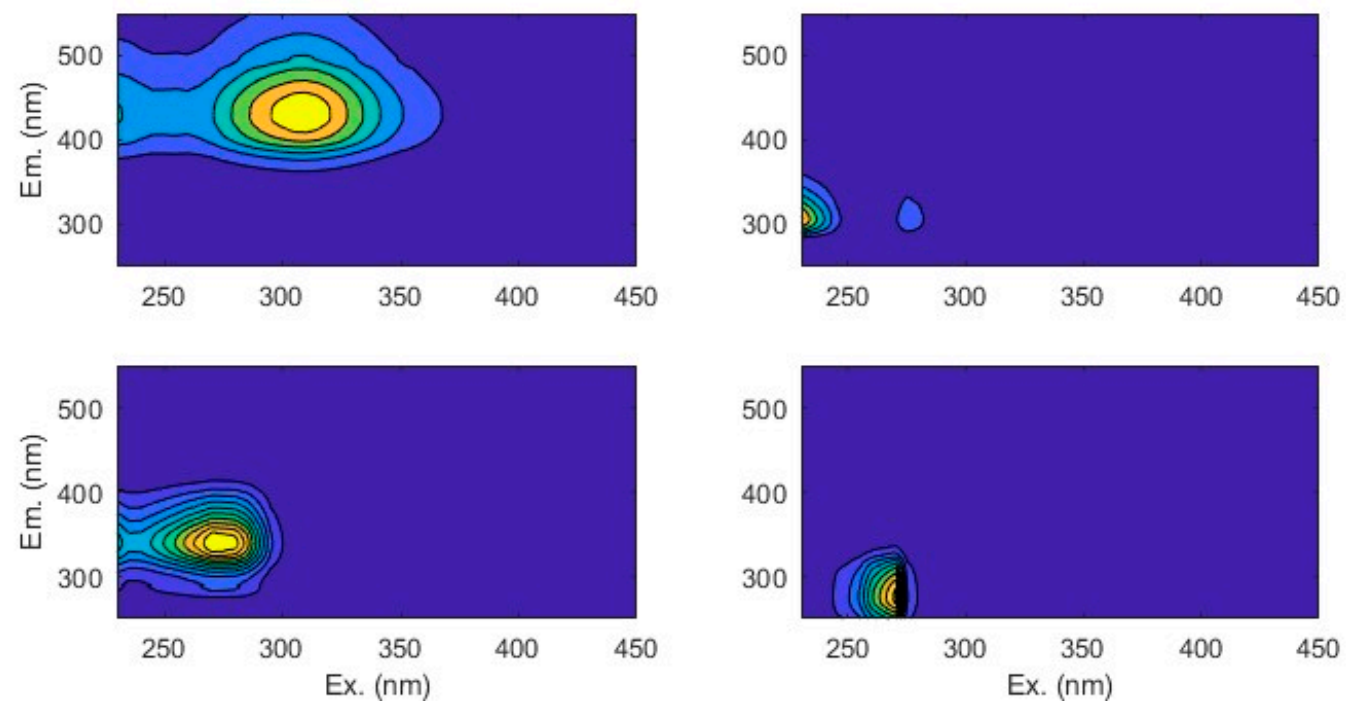


Figure. S10 Four components of fluorescent substances in Begonia in Xifu tree leachate.

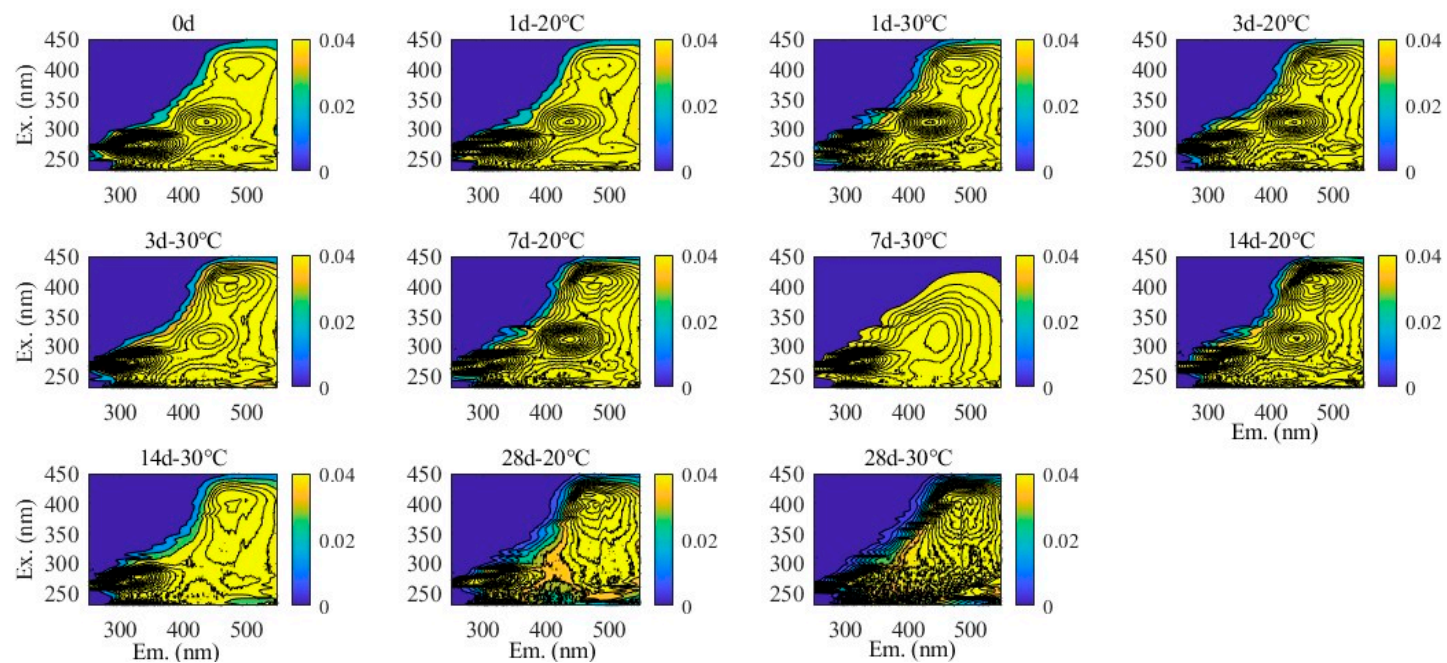


Figure. S11 DOM degradation process of palm tree leachate.

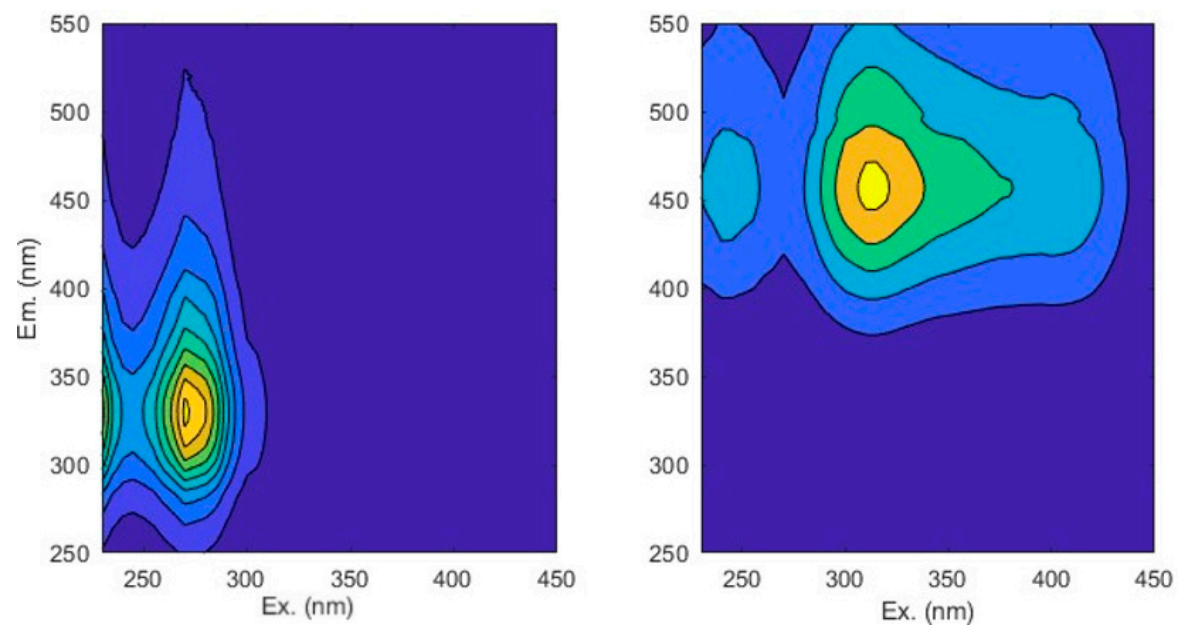


Figure. S12 Two components of fluorescent substances in palm tree leachate.

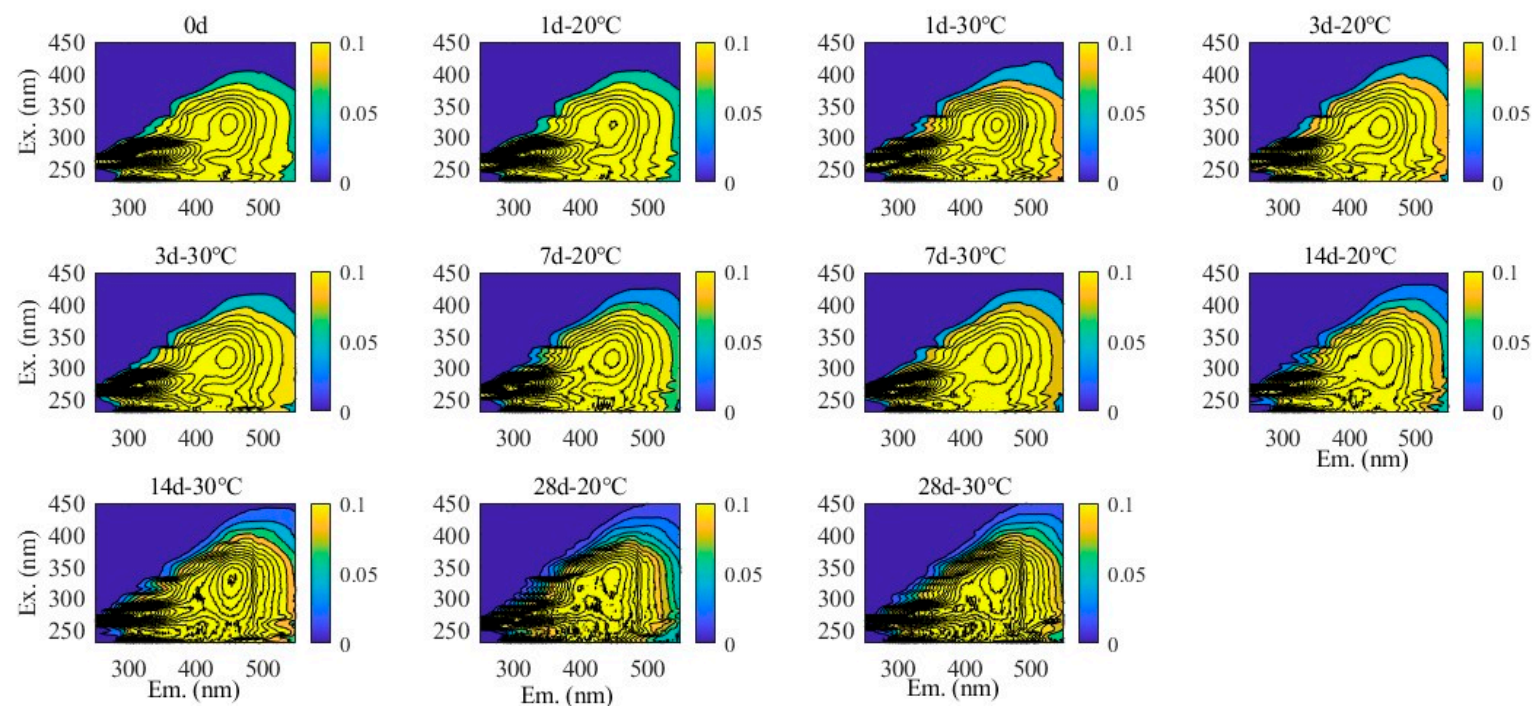


Figure. S13 DOM degradation process of fir tree leachate.

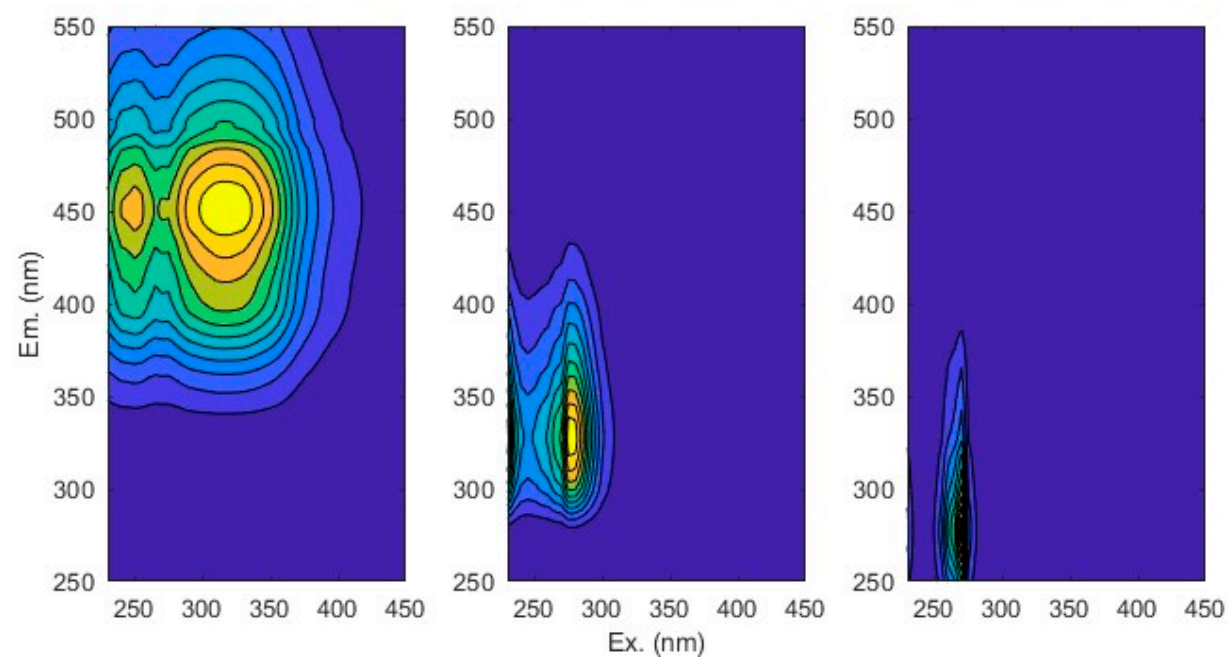


Figure. S14 Three components of fluorescent substances in fir tree leachate.

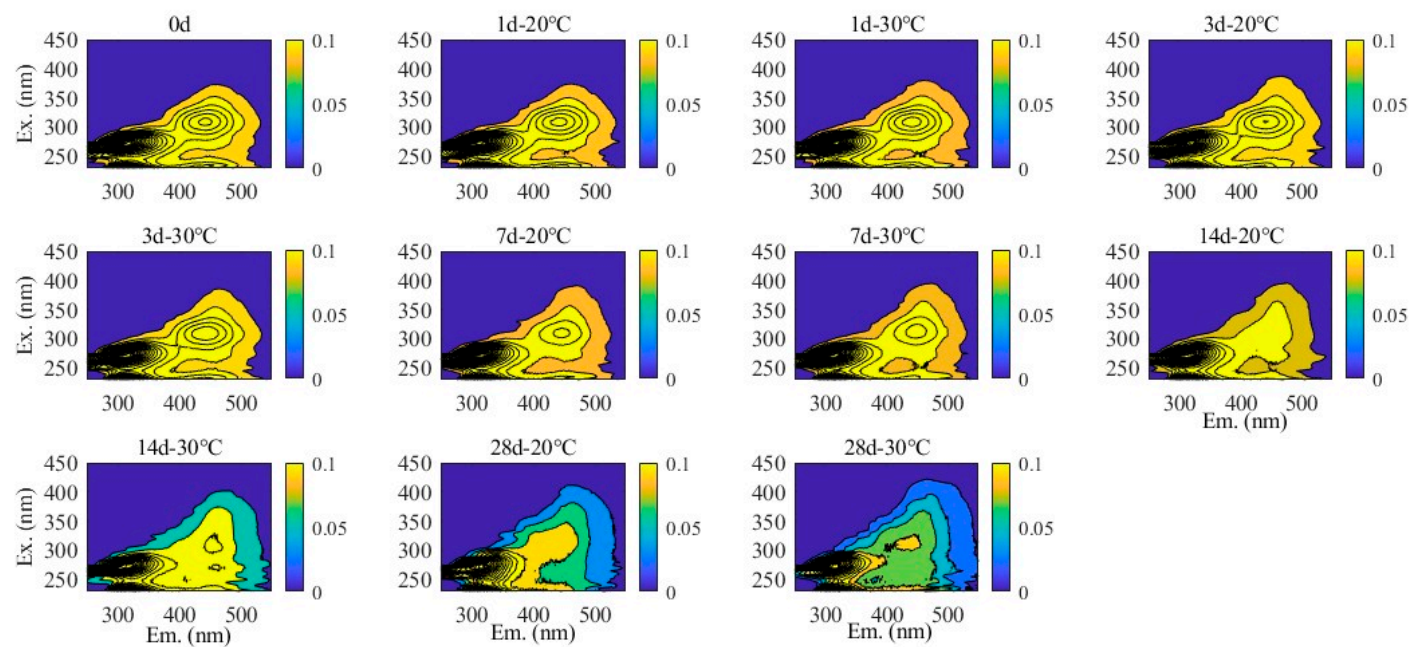


Figure. S15 DOM degradation process of Sassafras leachate.

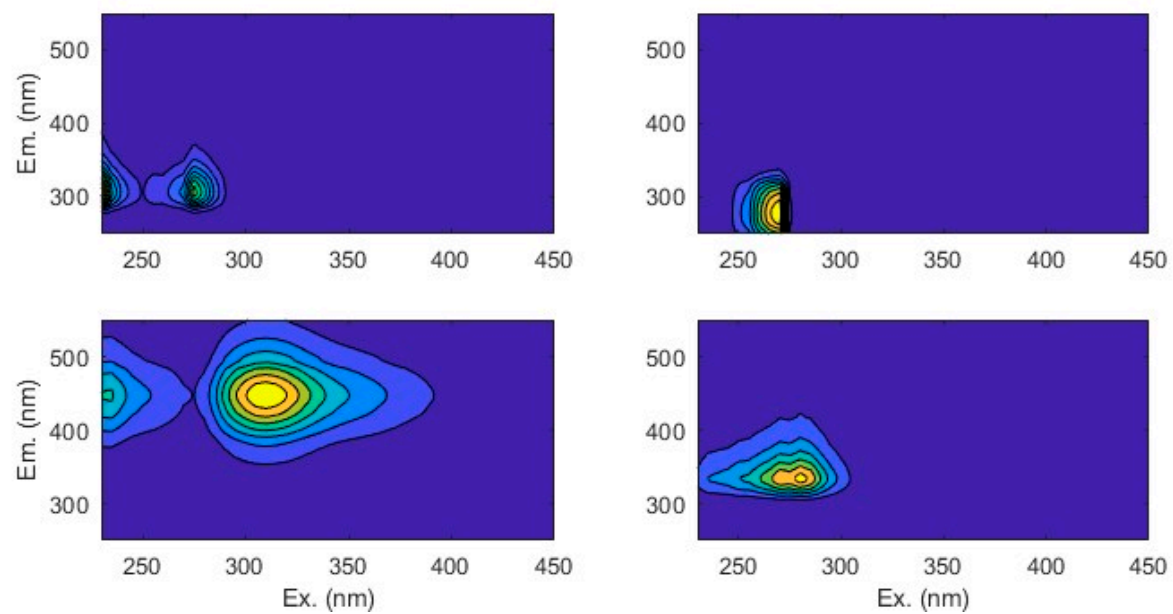


Figure. S16 Four components of fluorescent substances in Sassafras leachate.

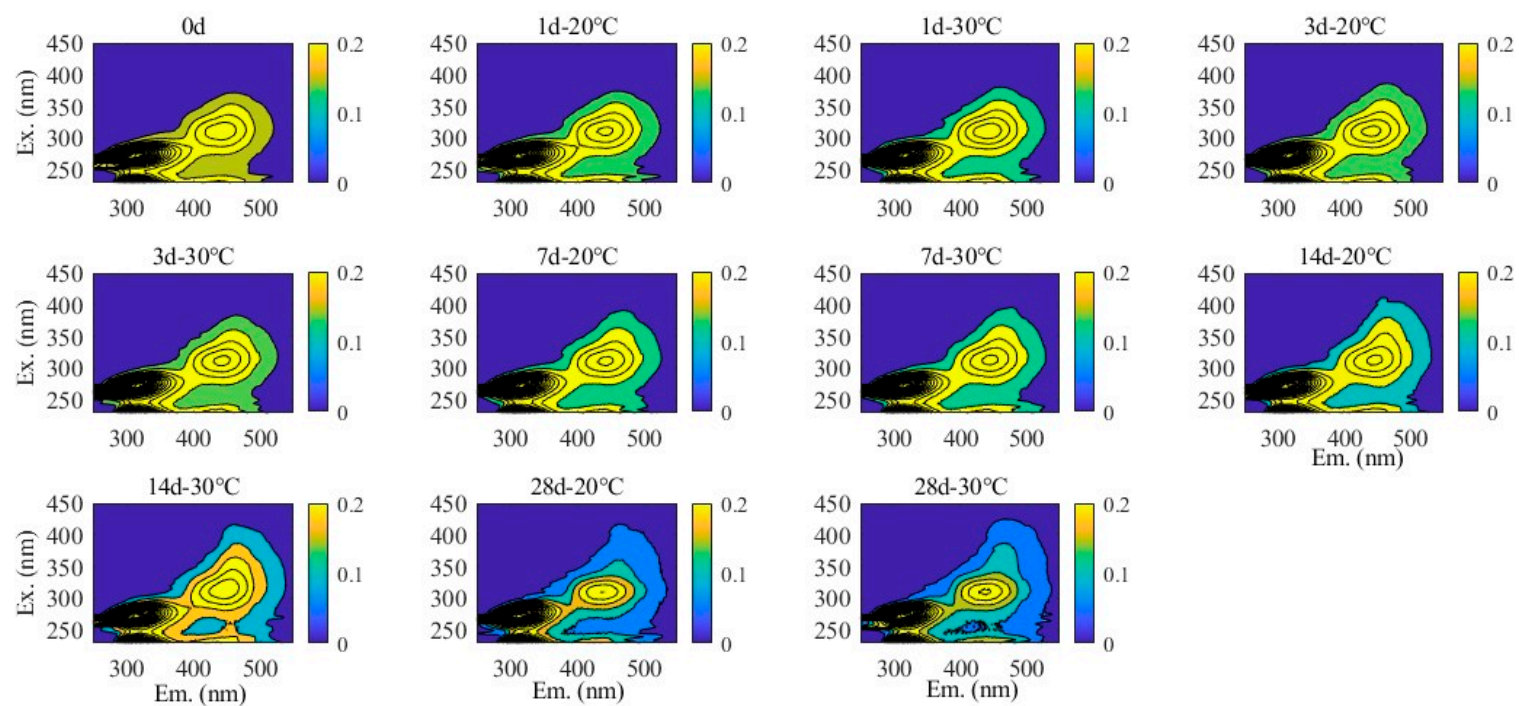


Figure. S17 DOM degradation process of camphor tree leachate.

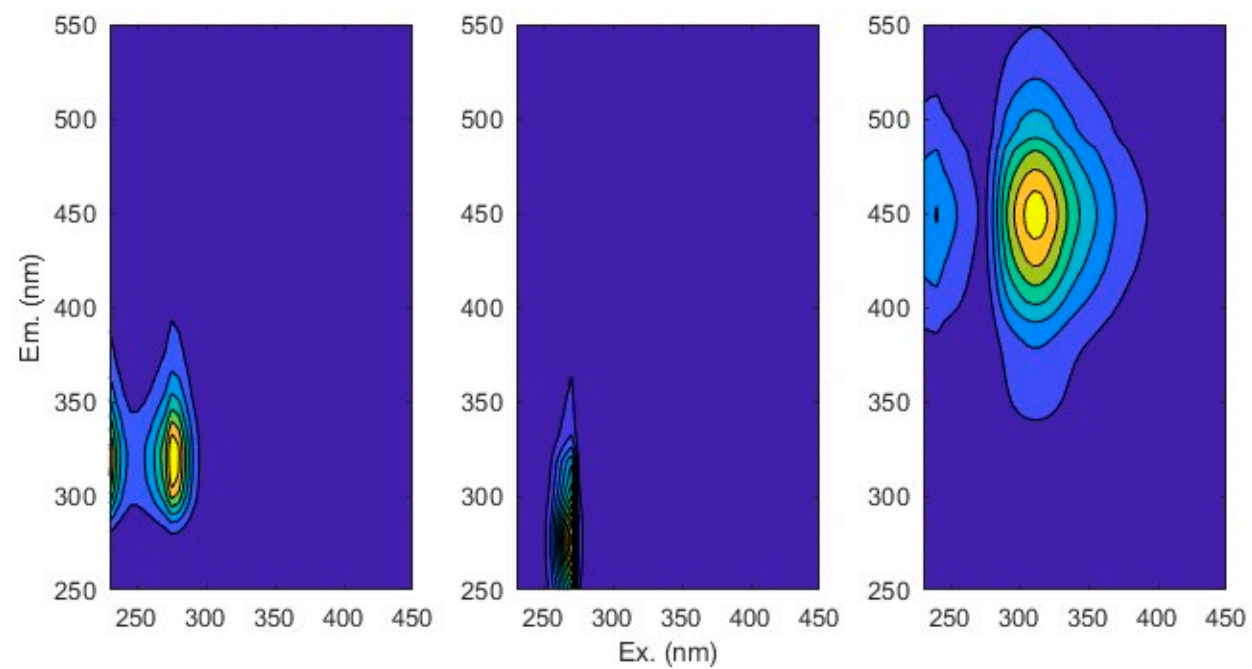


Figure. S18 Three components of fluorescent substances in camphor tree leachate.

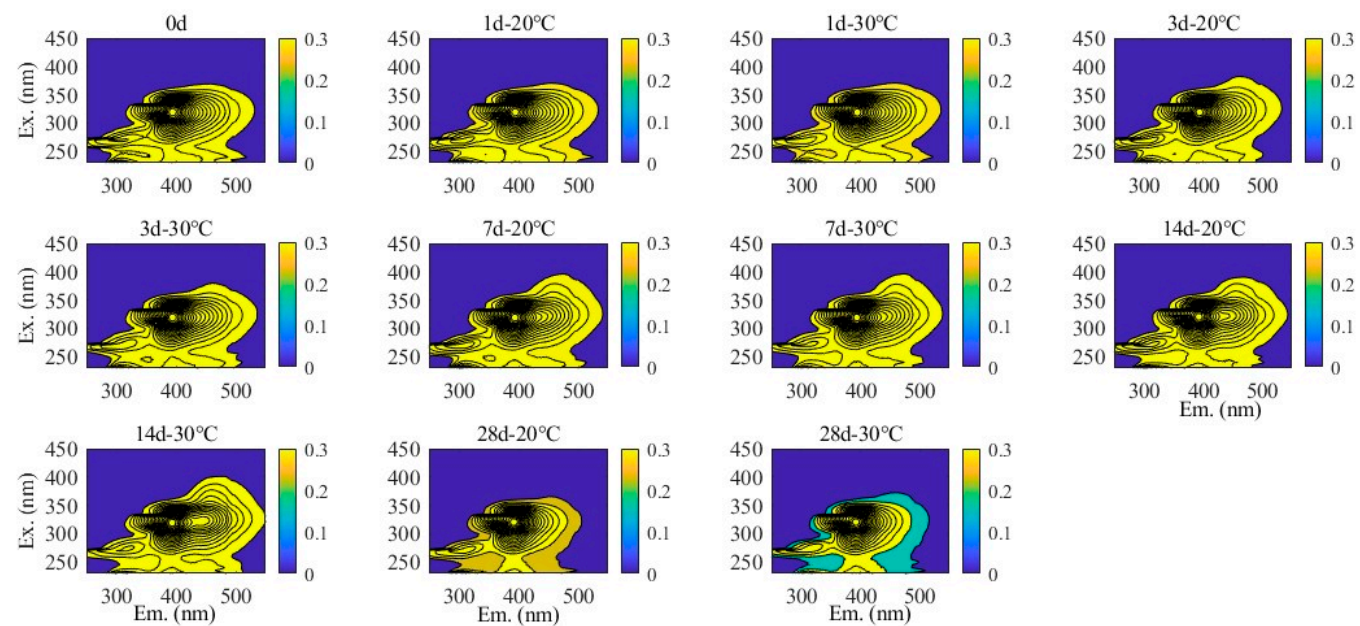


Figure. S19 DOM degradation process of pomelo tree leachate.

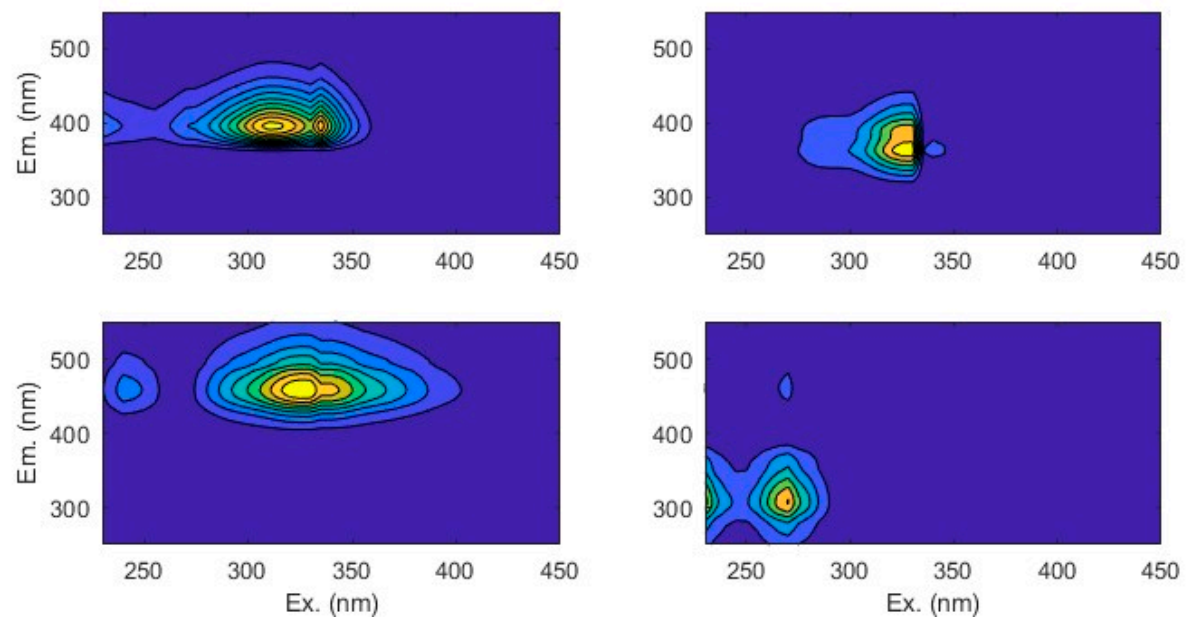


Figure. S20 Four components of fluorescent substances in pomelo tree leachate.

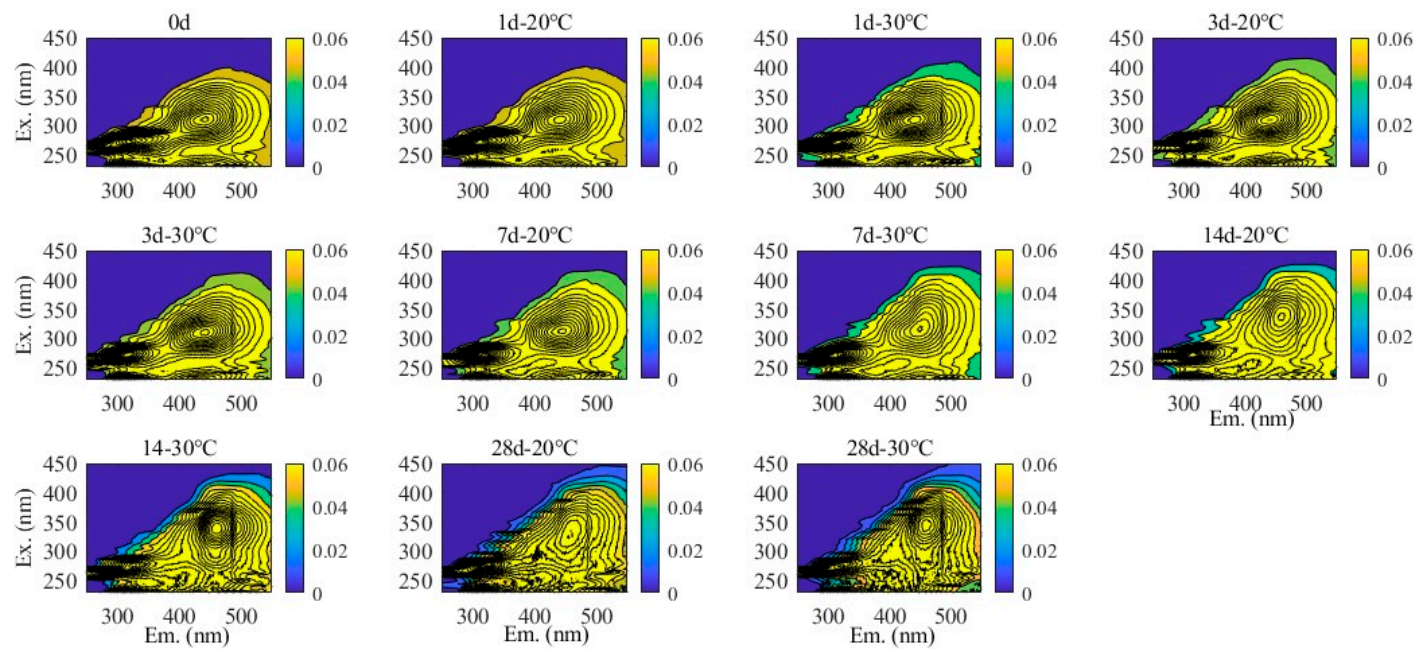


Figure. S21 DOM degradation process of European oleander leachate.

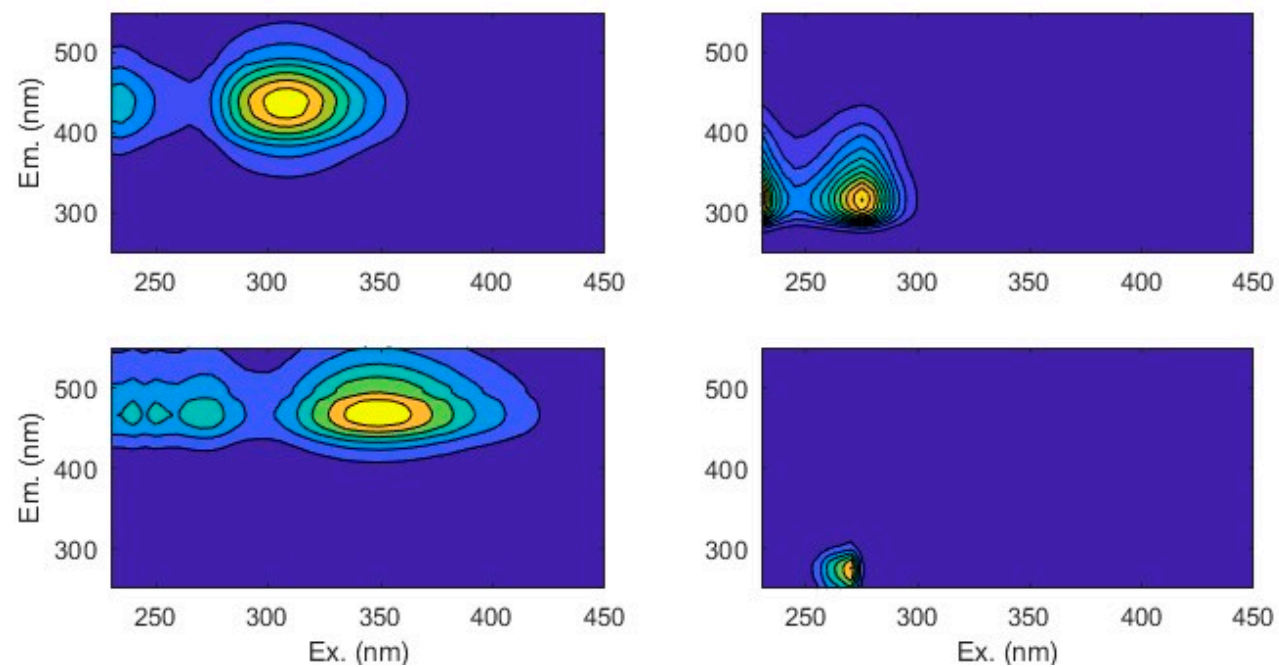


Figure. S22 Four components of fluorescent substances in European oleander leachate.

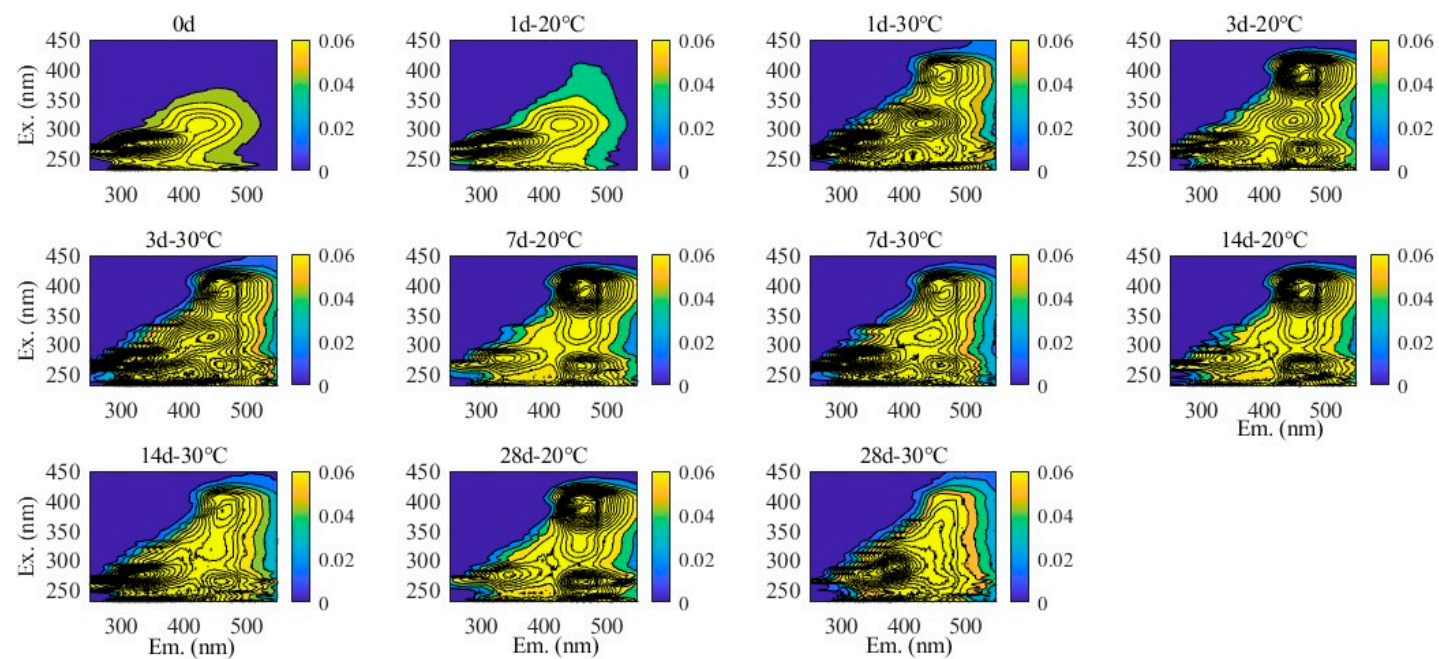


Figure. S23 DOM degradation process of Holly guard spear leachate.

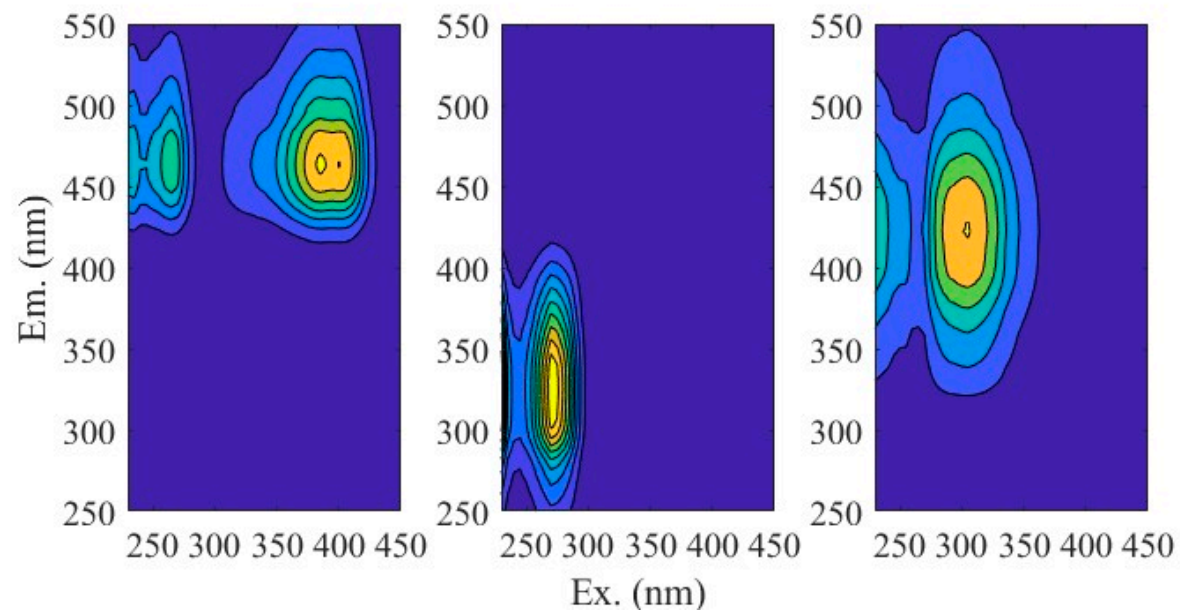


Figure. S24 Four components of fluorescent substances in Holly guard spear leachate.

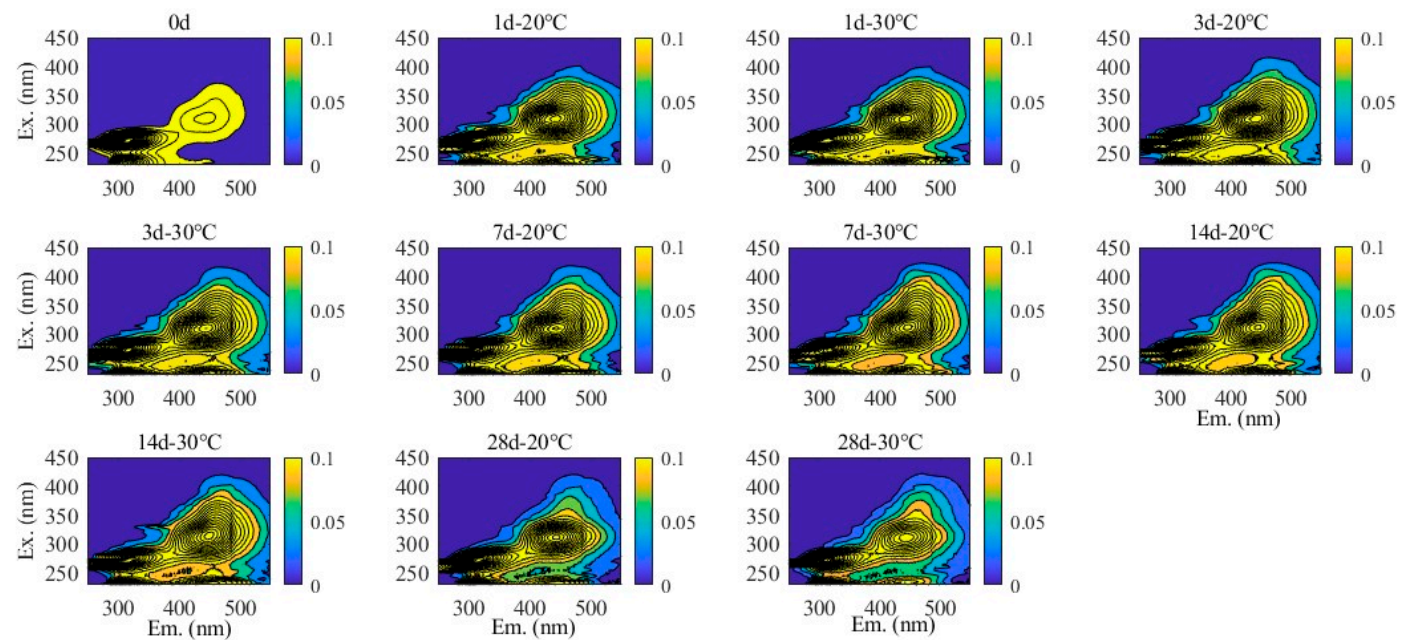


Figure. S25 DOM degradation process of Cuckoo leachate.

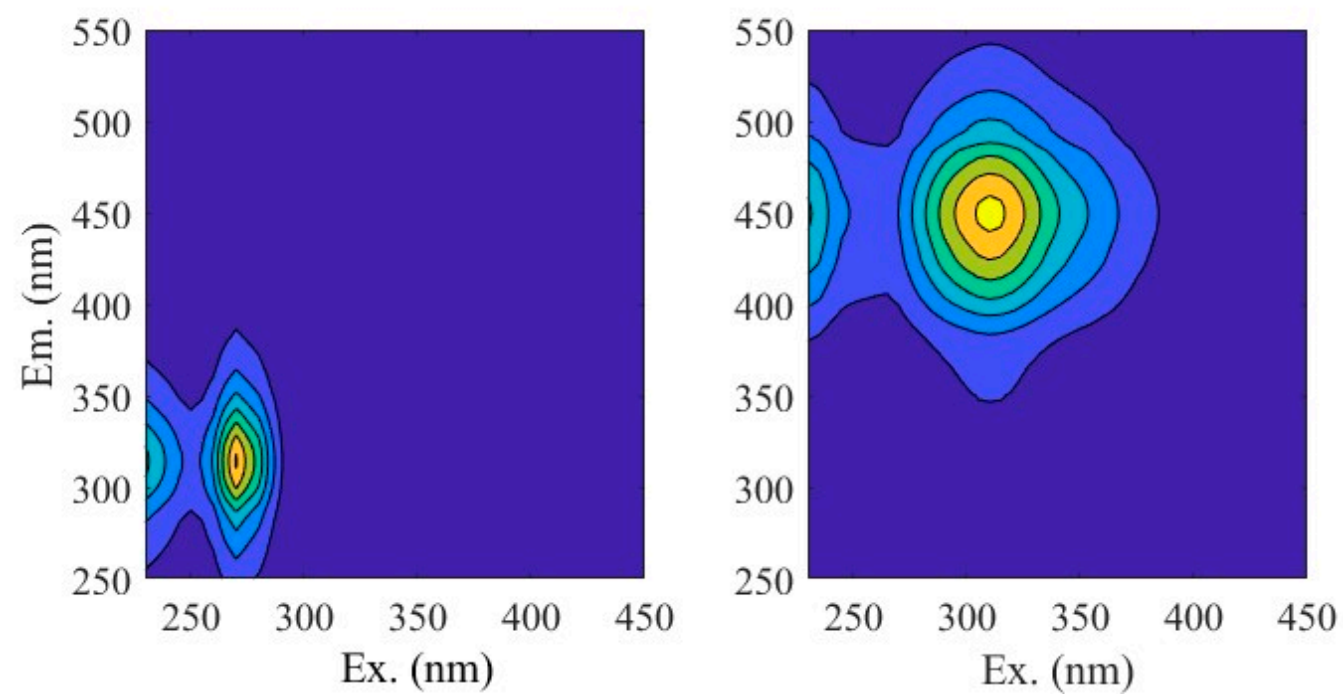


Figure. S26 Four components of fluorescent substances in Cuckoo leachate.

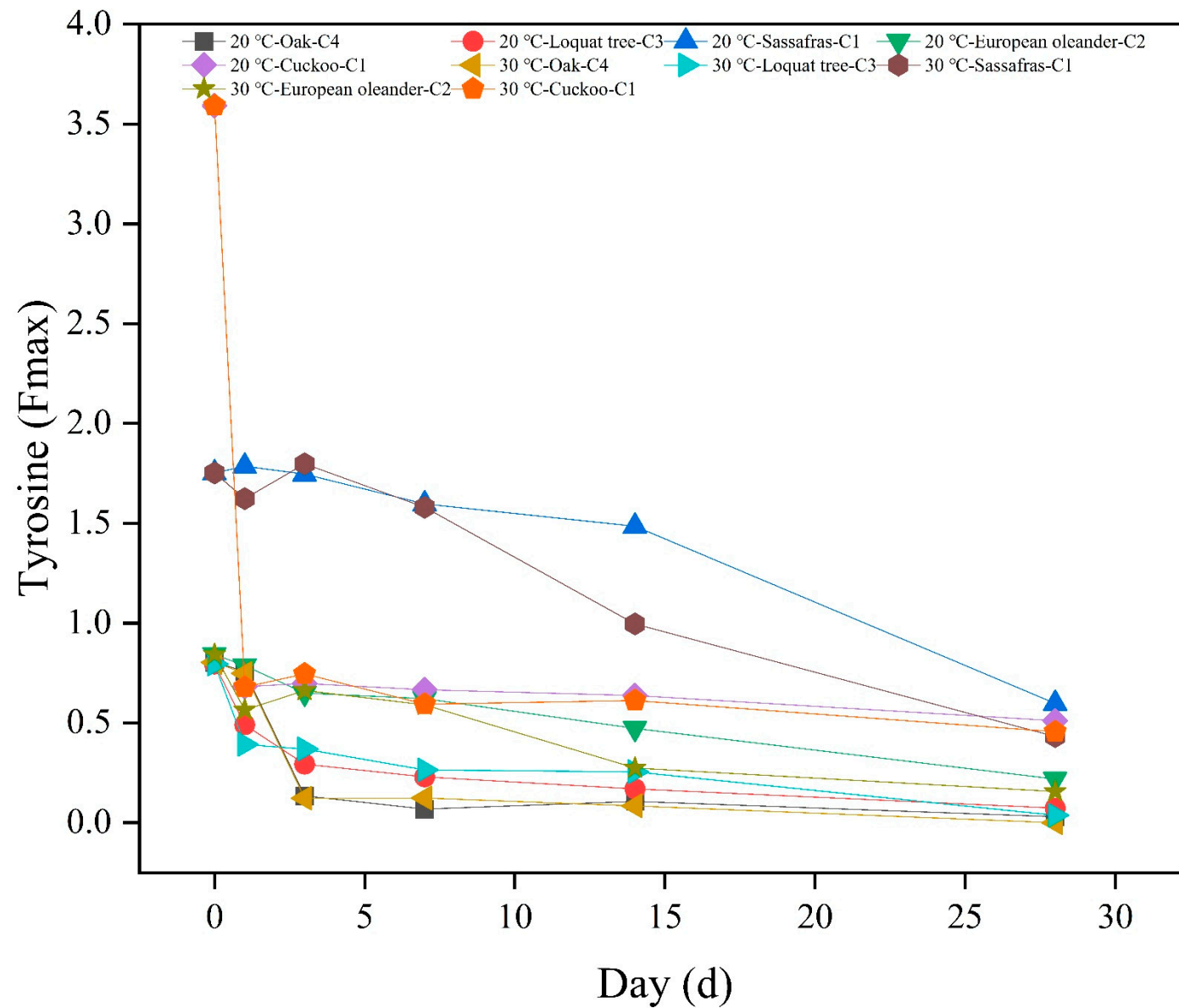


Figure. S27 Tyrosine-like fluorescence intensity change process

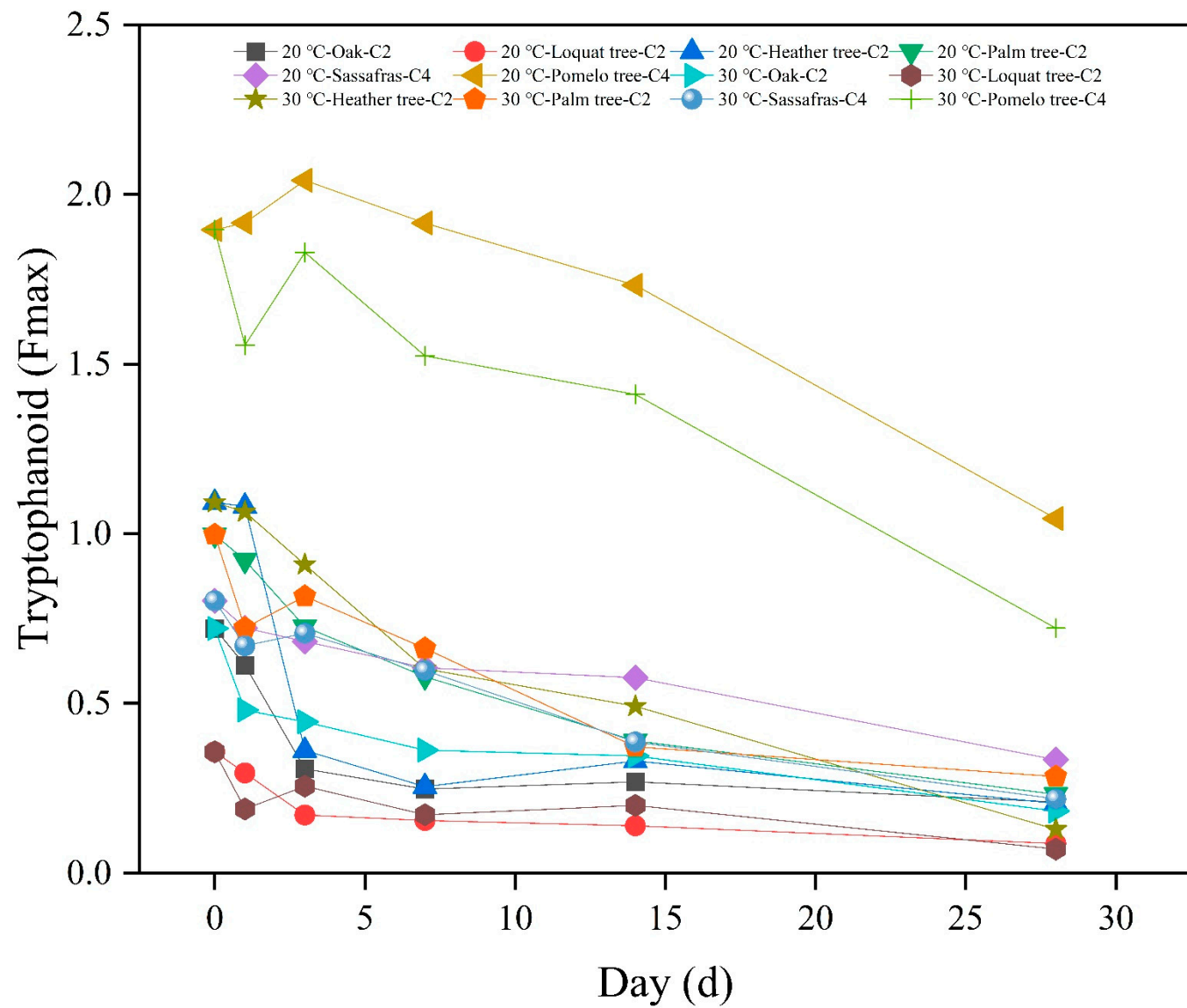


Figure. S28 Tryptophan-like fluorescence intensity change process

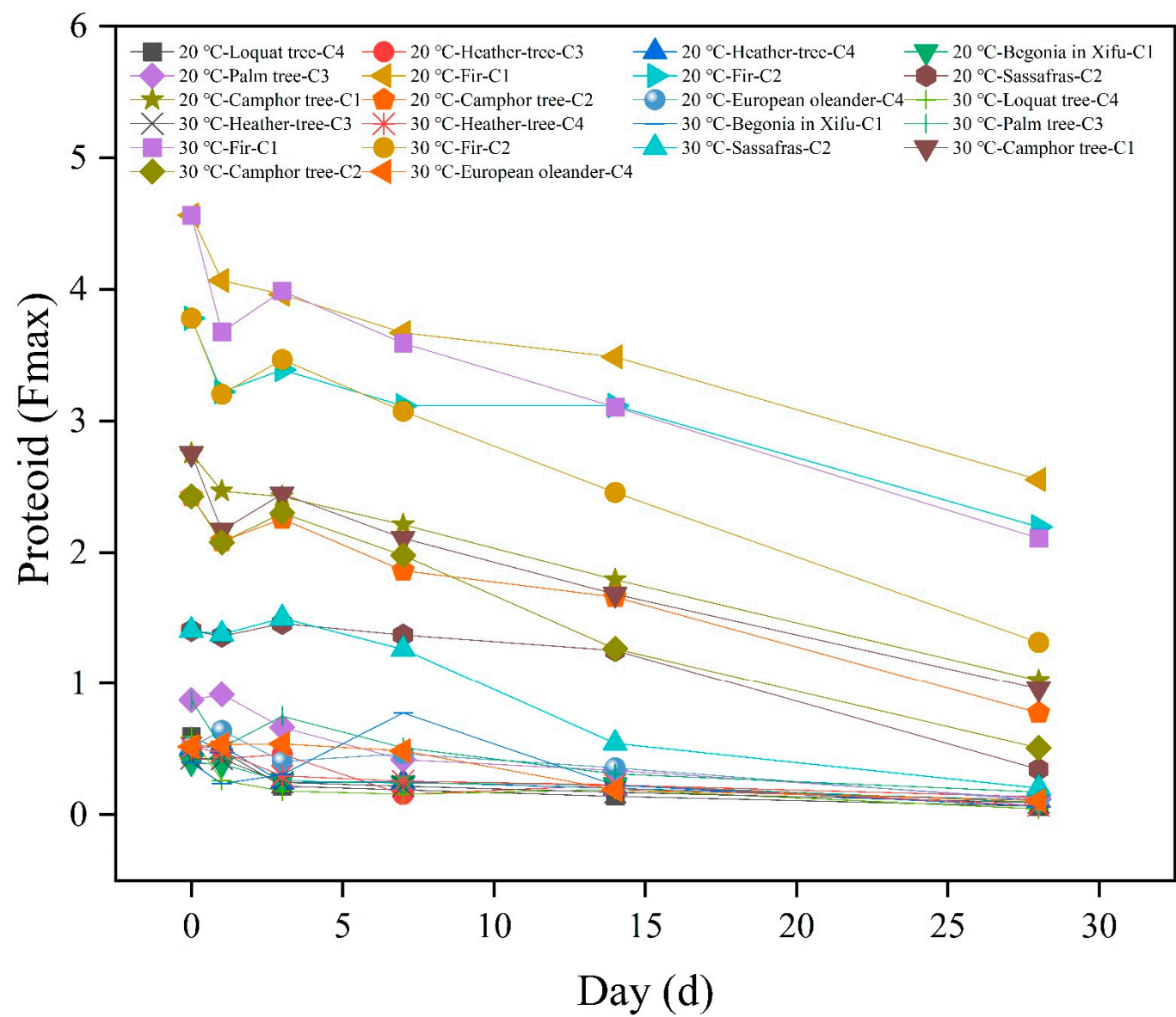


Figure. S29 Protein-like fluorescence intensity change process

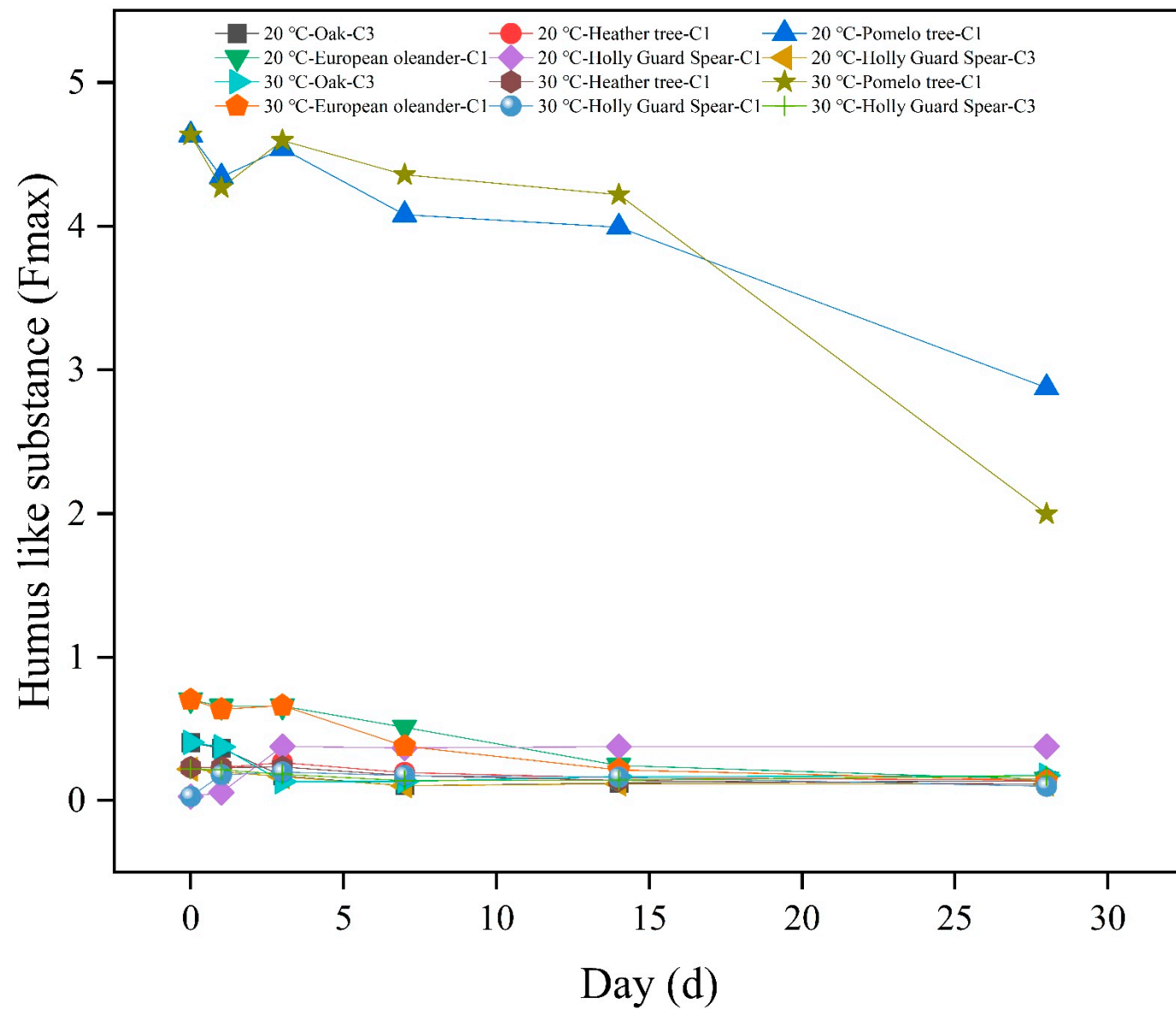


Figure. S30 Humic-like substance fluorescence intensity change process

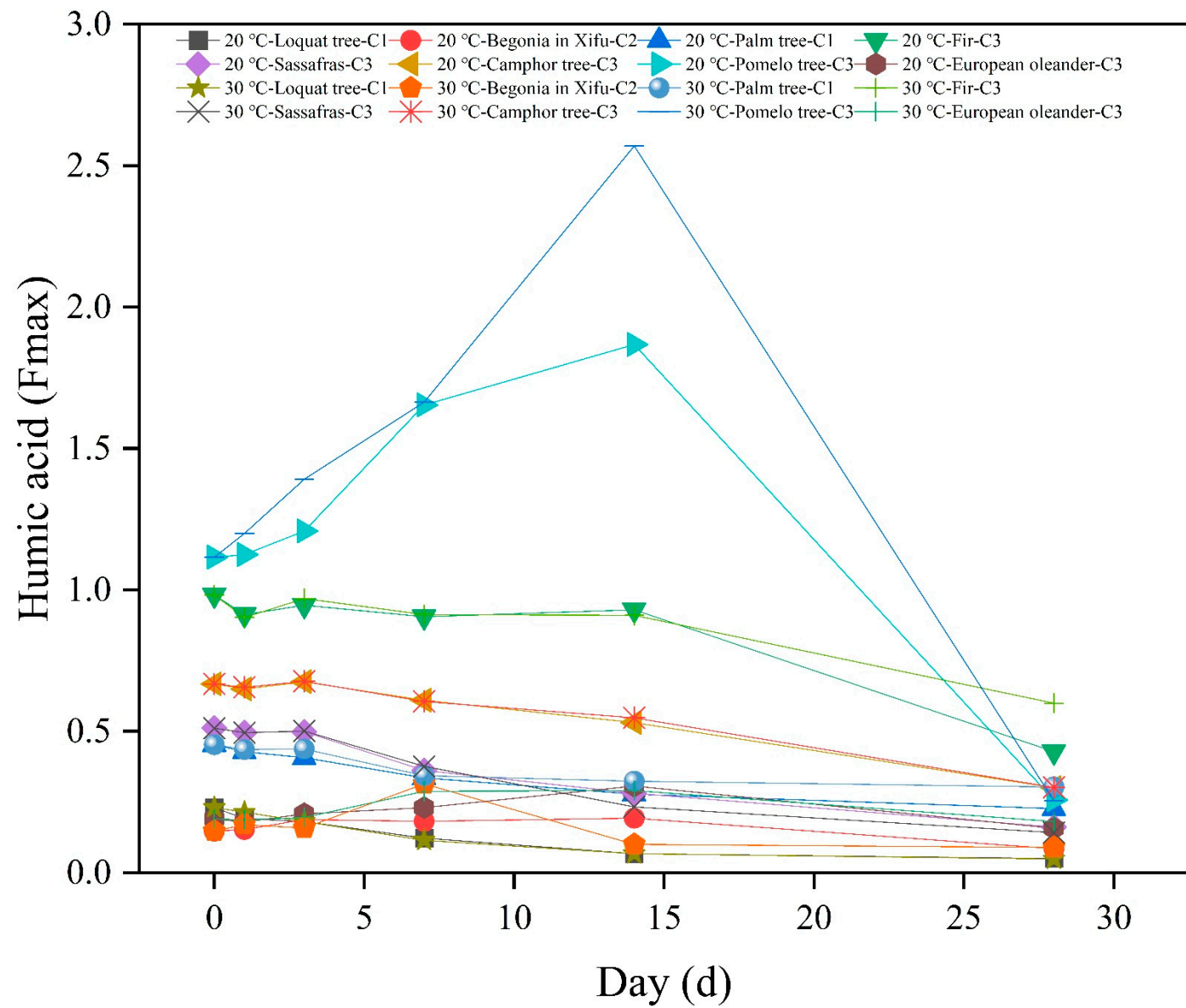


Figure. S31 Humic-like acid fluorescence intensity change process

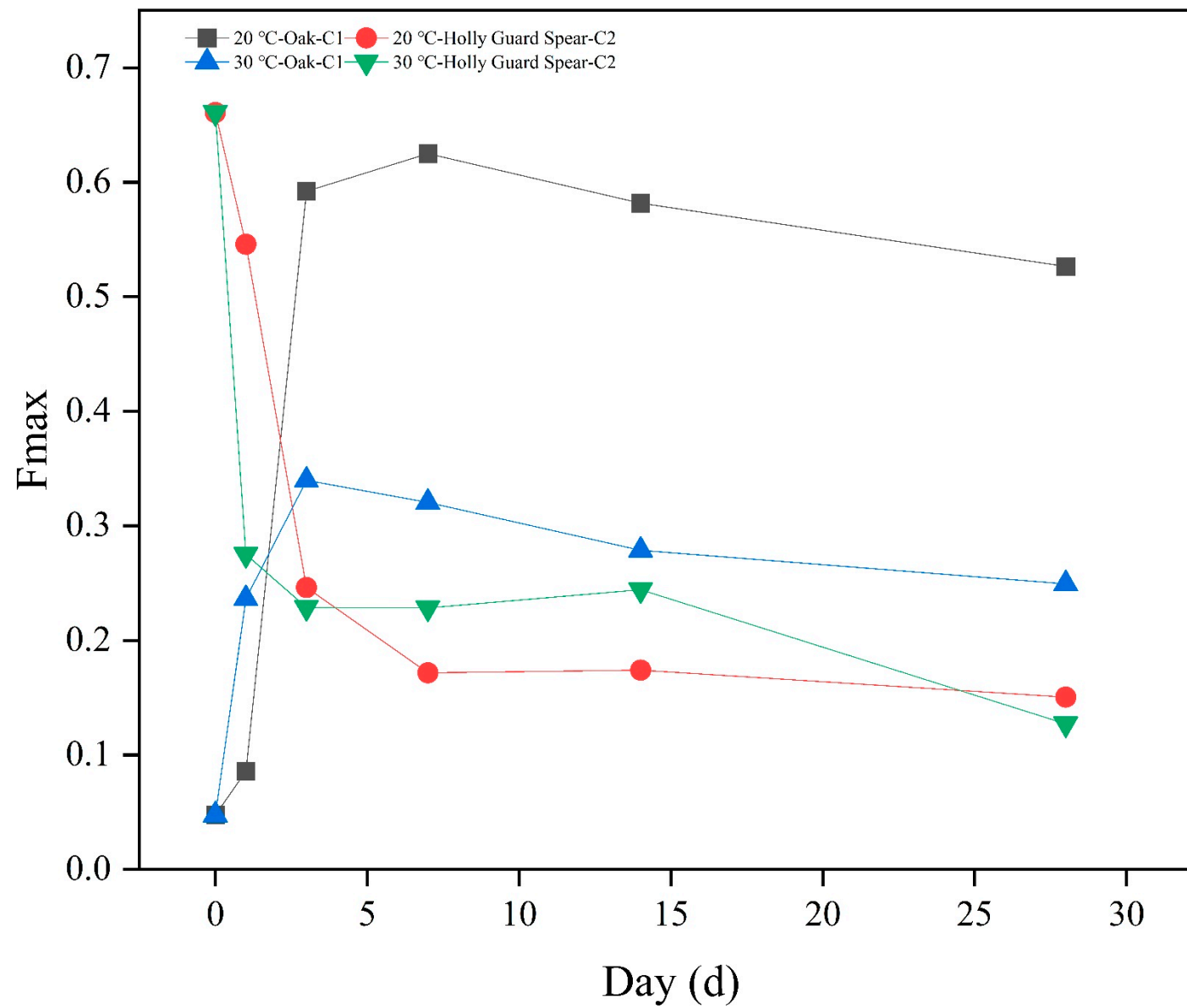


Figure. S32 The change of fluorescence intensity of microbial source protein-like and Amino-like acid

Table S1 Abbreviation and symbol mapping table

Abbreviations and Symbols	Annotation
DOM	dissolved organic matter
CDOM	colored dissolved organic matter
DOC	dissolved organic carbon
TDN	total dissolved nitrogen
TDP	total dissolved phosphorus
EC	electrical conductivity
CO ₂	carbon dioxide
FRI	frontal rayleigh line
BIX	biological index
HIX	humification index
DOC/TDN	ratio of dissolved organic carbon to total dissolved nitrogen
DOC/TDP	ratio of dissolved organic carbon to total dissolved phosphorus
TDN/TDP	ratio of total dissolved nitrogen to total dissolved phosphorus

Table S2 Parameter Significance

Parameter indicators	Meaning or significance	Reference
α_{254}	The concentration of CDOM	Cartisano et al., 2018
E_2/E_3	E_2/E_3 ($\alpha_{250}/\alpha_{365}$) shows a significant negative correlation with the molecular weight of DOM	De Haan, 1993
E_4/E_6	E_4/E_6 ($\alpha_{465}/\alpha_{665}$) shows a significant negative correlation with the degree of polymerization of the benzene ring carbon skeleton in DOM	Chin et al., 1994
$S_{275-295}$	The spectral slope in the wavelength range of 275-295 is translated	Praise et al., 2018
$S_{350-400}$	The spectral slope in the wavelength range of 350-400 is translated	Praise et al., 2018
S_R	S_R is the ratio of $S_{275-295}$ to $S_{350-400}$, which can be used to indicate the source of DOM	Praise et al., 2018
FRI	FRL is the ratio of fluorescence intensity at $E_m=380$ nm when excited at $E_x=310$ nm to the maximum fluorescence intensity between $E_x=420-435$ nm. It indicates the proportion of newly generated DOM (Dissolved Organic Matter) in the total amount.	Parlanti et al., 2000
BIX	BIX is the ratio of fluorescence intensity at $E_m=380$ nm to that at $E_m=430$ nm when excited at $E_x=310$ nm. It is used to characterize the proportion of self-derived components in DOM. When $BIX>1$, there is a strong self-source characteristic.	Ohno, 2002
HIX	HIX is the ratio of the integral of the region with $E_m=435-480$ nm to the sum of the integrals in the regions of $E_m=300-345$ nm and $E_m=435-480$ nm. It is used to indicate the degree of humification. $HIX>0.9$ indicates a strong Humic-like characteristic, while $HIX<0.8$ suggests a weak one.	Huguet et al., 2009)

Table S3 Fluorescent substances in the fresh leaf leached DOC.

Leaf name	C1	C2	C3	C4
Oak	Protein-like of microbial origin Ex400,Em471	Tryptophan-like Ex275,Em331	Humus-like substance Ex305,Em438	Tyrosine-like Ex270,Em293
Loquat tree	Humic-like acid Ex310,Em446	Tryptophan-like Ex280,Em336	Tyrosine-like Ex230,Em303	Protein-like Ex270,Em278
Heather tree	Humus-like substance Ex310,Em429	Tryptophan-like Ex230,Em305	Protein-like Ex270,Em338	Protein-like Ex270,Em275
Begonia in Xifu	Protein-like Ex270,Em331	Humic-like acid Ex315,Em456	-	-
Palm tree	Humic-like acid Ex315,Em452	Tryptophan-like Ex275,Em327	Protein-like Ex270,Em277	-
Fir	Protein-like Ex275,Em322	Protein-like Ex270,Em277	Humic-like acid Ex320,Em456	-
Sassafras	Tyrosine-like Ex230,Em307	Protein-like Ex270,Em279	Humic-like acid Ex310,Em447	Tryptophan-like Ex280,Em336
Camphor tree	Protein-like Ex230,Em322	Protein-like Ex270,Em276	Humic-like acid Ex310,Em449	
Pomelo tree	Humus-like substance Ex310,Em396	- Ex330,Em362	Humic-like acid Ex325,Em458	Tryptophan-like Ex270,Em306
European oleander	Humus-like substance Ex310,Em440	Tyrosine-like Ex230,Em316	Humic-like acid Ex350,Em466	Protein-like Ex270,Em275
Holly Guard Spear	Humus-like substance Ex385,Em464	Amino acid Ex270,Em329	Humus-like substance Ex305,Em422	-
Cuckoo	Tyrosine-like Ex270,Em313	Humic-like acid Ex310,Em450	-	-

References

1. Cartisano, C. M., Del Vecchio, R., Bianca, M. R., Blough, N. V., 2018. Investigating the sources and structure of chromophoric dissolved organic matter (CDOM) in the North Pacific Ocean (NPO) utilizing optical spectroscopy combined with solid phase extraction and borohydride reduction. *MAR CHEM*, 204, 20-35.
2. De Haan, H., 1993. Solar UV-light penetration and photodegradation of Humic-like substances in peaty lake water. *LIMNOL OCEANOGR*, 38(5), 1072-1076.
3. Chin, Y.-P., Aiken, G., O'Loughlin, E., 1994. Molecular weight, polydispersity, and spectroscopic properties of aquatic Humic-like substances. *ENVIRON SCI TECHNOL*, 28(11), 1853-1858.
4. Huguet, A., Vacher, L., Relexans, S., Saubusse, S., Froidefond, J. M., Parlanti, E., 2009. Properties of fluorescent dissolved organic matter in the Gironde Estuary. *ORG GEOCHEM*, 40(6), 706-719.
5. Ohno, T., 2002. Fluorescence inner-filtering correction for determining the humification index of dissolved organic matter. *EST*, 36(4), 742-746.
6. Parlanti, E., Worz, K., Geoffroy, L., Lamotte, M., 2000. Dissolved organic matter fluorescence spectroscopy as a tool to estimate biological activity in a coastal zone submitted to anthropogenic inputs. *ORG GEOCHEM*, 31(12), 1765-1781.
7. Praise, S., Ito, H., An, Y., Watanabe, K., Watanabe, T., 2018. Dissolved organic matter characteristics along sabo dammed streams based on ultraviolet visible and fluorescence spectral properties. *ENVIRON MONIT ASSESS*, 190(3), 146.