**Supporting Information**

**The ancient Chinese civilization left remarkable signals in the marine environment since the Bronze Age**

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**Includes:**

Figs. S1 to S3

Tables S1 to S2

Legend for data files S1

SI References



**Fig. S1. The trend of char at the sediment core ZY2 with 50% loess regression.**

**Fig. S2. Comparison of millennial-timescale variation of BC records from the ZY2 with other records since 6.2 ka BP.** (a) Fire activities recorded by BC from the sediment core at Daihai Lake (1); (b) Fire activities recorded by BC from the ECMZ sediment core in the inner shelf of East China Sea (2); (c) Fire activities recorded by charcoal from the sediment core at Zoige Basin (3); (d) Fire activities recorded by char from the sediment core ZY2 at South Yellow Sea (this study).

**Fig. S3. The outliers in the relationship between soot and char during 1.88-2.9 ka BP and 4-6.2 ka BP, respectively.**



**Table S1. The Dating data of sediment core ZY2 (4).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Depth(cm) | Conventional 14C age/yr BP | 14C age SD | Calendar  age/cal yr BP | Range  (2σ yr BP) |
| 67.5 | 1825 | 30 | 1360 | 1287-1457 |
| 128.5 | 2345 | 40 | 1964 | 1861-2089 |
| 237.5 | 3955 | 40 | 3947 | 3831-4072 |
| 272.5 | 4450 | 45 | 4633 | 4499-4792 |
| 330 | 5555 | 40 | 5941 | 5857-6082 |

**Table S2. The correlations between BC (this study), average grain size, clay, silt, and sand (4).**

|  |  |  |  |
| --- | --- | --- | --- |
| *R2*(*P* < 0.1) | BC | char | soot |
| Average grain size | 0.015 | 0.011 | 0.068 |
| Clay | 0.029 | 0.024 | 0.041 |
| Silt | 0.043 | 0.038 | 0.030 |
| Sand | 0.021 | 0.028 | 0.068 |

**Data file S1. The BC data of the sediment core ZY2.**

**SI References:**

1. Han, Y. M., Marlon, J. R., Cao, J. J., Jin, Z. D., and An, Z. S., 2012. Holocene linkages between char, soot, biomass burning and climate from Lake Daihai, China. Global Biogeochemical Cycles 26, GB4017.
2. Pei, W., Wan, S., Clift, P. D., Dong, J., Liu, X., Lu, J., Tan, Y., Shi, X., and Li, A., 2020. Human impact overwhelms long-term climate control of fire in the Yangtze River Basin since 3.0 ka BP. Quaternary Science Reviews 230**,** 106165.
3. Zhao, W., Zhao, Y., and Qin, F., 2017. Holocene fire, vegetation, and climate dynamics inferred from charcoal and pollen record in the eastern Tibetan Plateau. Journal of Asian Earth Sciences 147**,** 9-16.
4. Hu, B., Yang, Z., Zhao, M., Saito, Y., Fan, D., and Wang, L., 2012. Grain size records reveal variability of the East Asian Winter Monsoon since the Middle Holocene in the Central Yellow Sea mud area, China. Science China-earth Sciences 55**,** 1656-1668.