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Wildfire, vegetation, and climate history of central Taiwan from the end of the last glaciation to the late Holocene

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Climate change is expected to lead to an increased frequency of wildfires within forest ecosystems. To accurately anticipate the ramifications of climate change on forests, a comprehensive understanding of the ecological processes governing fire dynamics—specifically intensity, size, and type—is essential. However, the scarcity of long-term data on the intricate relationship between climate, fire, and vegetation dynamics presents a considerable challenge. In this study, a long-term relationship between wildfire, vegetation has been investigated, and climate in the central Taiwan region, spanning from the late glacial period to the late Holocene. For this, multiple proxy approach, including charcoal (CHAR and fire frequency), pollen data, and the carbon isotopic composition of total organic carbon, have been followed. The current study revealed that wildfire largely occurred during the drier climate conditions in the Taiwan region, which attributed to El-Nino like situation in region. Furthermore, it has been observed that from the late glacial period to the late Holocene, there was a shift in biofuel sources from woody plants to herbaceous plants, with a sharp change at the beginning of the Holocene. High fire frequency and intense wildfires were observed during the late glacial period, attributed to a drier climate. On the other hand, higher fire frequency and more intense wildfires during the late Holocene were attributed to human-induced wildfires in the central Taiwan region.