
Terrigenous input and microcharcoal changes in the Gulf of Papua during the last 60 kyrs

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Résumé

The last glacial cycle is characterized by abrupt climate changes at high latitudes. Less documented at low latitudes, they seem to strongly impact the hydrological cycle, and therefore the amount of burnable vegetation. In Melanesia, though records of the aborigine's

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first migrations are scarce, it is established that human settlement occurred during the last glacial. To unravel the human impact on the fire regimes from the natural hydrological variability, we reconstruct microcharcoals and records of terrigenous inputs in a sediment core (MD97-2134) in the Gulf of Papua. We use MicroCharcoals Morphotypes (MCM) and BIT index, as respective indices of the types of burnt vegetation (woodland or grassland) and of terrigenous inputs. We assume that past terrigenous inputs in the Gulf of Papua respond to precipitations changes over the mainland which also control the frequency and intensity of fires. The most striking feature of these records is the abrupt change in the MCM record at about 47 ka BP. Prior this change, from 60 ka BP to 47 ka BP, the BIT and MCM indexes are correlated, which suggests a direct forcing of droughts on the burnt vegetation. After 47 ka BP, each proxy shows a different dynamics: the elongation of microcharcoals decreases abruptly, whereas the BIT index still records high frequency oscillation until 31 ka BP. We interpret this abrupt decoupling of terrigenous and microcharcoal records as likely influenced by anthropogenic fires related to hunt practices consecutively of the first aborigines' migration wave. The MCM record further shows an increase during the early Holocene, indicating an increase in the proportion of bush/forest fires ratio. This increase might be due to the development of agriculture over Papua New Guinea, though the reduced frequency of El Niño Southern Oscillation events might have also contributed to this event.