

BLACK CARBON AEROSOLS OVER INDIAN OCEAN

There is a large emission of black carbon in many parts of the globe including Asia and Africa. In this paper the authors have examined the source of black carbon at Maldives Climate Observatory at Hanimaadhoo from May to October during 2012 to 2017. They measured the amount of elemental carbon, organic carbon and total carbon at this observatory. They have shown that the black carbon found at Maldives can be from Africa or Asia depending on the season. The amount carbon isotopes 13 and 14 were also determined. The relative amount of carbon from fossil fuels and biomass burning was ascertained from measurement of amount of Carbon isotope 14. The measurement of carbon isotope 13 was used to differentiate between the contribution of carbon from burning

of C3 plants (trees, stubble of rice or wheat) from those from burning C4 plants (sugarcane and Savannah grasses). They have demonstrated that during May to October the black carbon aerosols observed in Maldives does not come from south Asia but from biomass burning in Africa and Madagascar. The study has shown that the residence time of black carbon aerosols is more than 2 weeks.

Reference: K. Budhavanta, August Andersson, H. Holmström, S. K. Satheesh, and Örjan Gustafsson, Black carbon aerosols over Indian Ocean have unique source fingerprint and optical characteristics during monsoon season Proceedings of the National Academy of Sciences, 120, 2023. <https://doi.org/10.1073/pnas.2210005120>

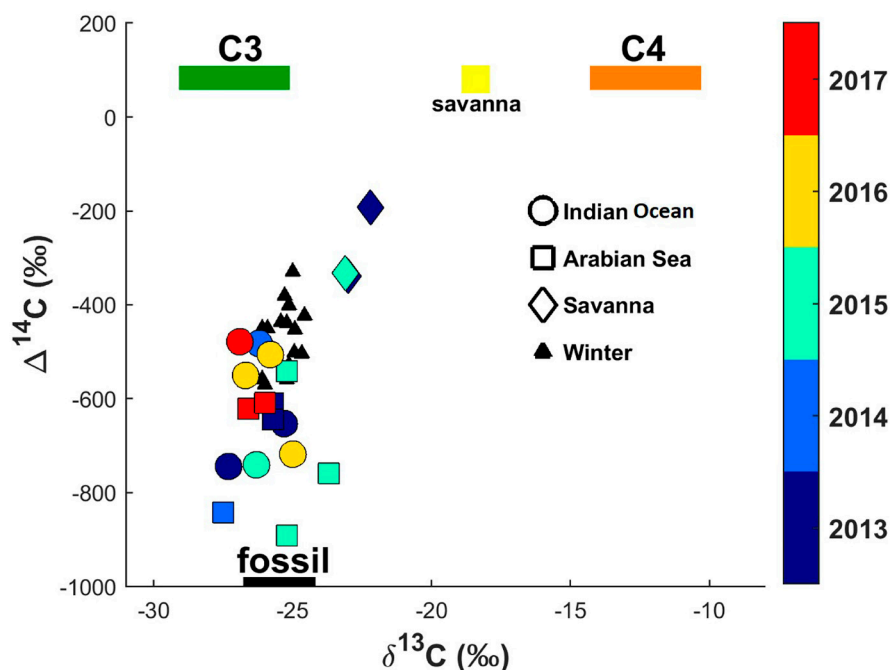


Figure 2: Two-dimensional carbon isotope plot for BC intercepted at MCOH during summer/monsoon season.