

Eutrophication increases methane emission to the atmosphere in tropical lagoons: insights from two Ivory Coast sites

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Eutrophication is a worldwide environmental problem and a definitive solution is far from being achieved, despite the large number of studies documenting its causes. In small aquatic ecosystems, excessive growth of macrophytes is a well known undesirable consequence of eutrophication. When these plants die and sink to the bottom the decomposing biomass depletes oxygen content in the water column thus leading to anoxia promoting methane (CH₄) production. Here, we reported the CH₄ data obtained during six campaigns covering the annual cycle in two small lagoons of Ivory Coast (Ono, Kodjoboué) that are contrasted in the degree of eutrophication and the corresponding coverage of macrophytes (e.g. *Echinochloa pyramidalis*, *Eichhornia crassipes*, *Hydrilla verticillata*). Our data showed a high spatio-temporal variability of CH₄ within the lagoons and between the two systems, with CH₄ concentrations in surface waters ranging between 80 to 74,604 nmol L⁻¹. The highest CH₄ concentration values were observed in the eutrophic Ono lagoon that is covered by 80% of macrophytes, suggesting that lagoons dominated by macrophytes are significant sources of CH₄ toward the atmosphere.