Effects of early diagenesis on the isotopic signature of wood ($\delta^{13}$C and $\delta^{15}$N): incubation in aquatic microcosm
Romain Tramoy, Thanh Thuy Nguyen Tu, Veronique Vaury, Mathieu Sebilo, Laurence Millot-Cornette, Céline Roose-Amsaleg, Johann Schnyder

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**Effects of early diagenesis on the isotopic signature of wood (δ^{13}C and δ^{15}N): incubation in aquatic microcosm**

**Objective**
- To investigate the effects of early diagenesis on the isotopic signature of wood incubated in aquatic microcosms.

**Methods**
- **Incubation in Aquatic microcosm**
  - Initial branch (60 cm)
  - Initial viability
  - Degradation
  - Sampling (Triplicate)
  - Ground for analyses

**Results**
- **CARBON DYNAMIC**
  - Pieces: Low variability in δ^{13}C and in %C
  - Loss of δ^{13}C-depleted compounds (cf. flotting particles; tannins, lignin, other non-polar compounds; Melillo et al., 1989)
  - Powders: complex dynamic

- **NITROGEN DYNAMIC**
  - Similar between pieces and powders
  - Nitrogen gain in pieces in RW = N-enrichment

**Conclusions**
- δ^{13}C values of organic matter has lower variability than δ^{15}N values, which confirms its interest as a source and environment indicator
- Without invalidating the use of δ^{15}N as a paleoenvironmental marker, this study shows that early diagenesis leads to the integration of isotopic compositions from multiple environmental origins that should be addressed when interpreting δ^{15}N in soils and sediments.

**References**

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**Introduction**

**1. Observations: Fungi as main decomposers?**

| Morphologies of the wood pieces before (t₀) and after degradation (t₀ to t₁) |
|---|---|
| A (DW) and B (RW) correspond to wood before (t₀) and after 15 weeks (t₁) |
| a. brown-rotted areas = saprot or black-rot fungus |
| b. brown fungal mycelium in water and growing in the growth-rings |
| c. floating particles of wood (bottle and spongy tissues) |
| d. molds which appear as white-rot fungus |
| e. color uniformization = white-rot fungus |

**2. Microflora in powders**

- Functional diversity of the bacterial communities using Method BiologECO (Garland & Mills 1991)

**3. Degradation state**

**Bacteria are NOT the main decomposers**

**Fungi are the main decomposers**

**4. Effects on the isotopic signature of wood pieces**

**Distilled Water (DW) VS River Water (RW)**

- Pieces of wood or powders
- T° = 22 °C - pH neutral
- Permanent Oxygenation (aerobic)
- Darkness (avoid photo-organisms development)
- 73 weeks (n = 2, 4, 8, 16, 32, 52 and 73 weeks)

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**References**