Comparing the Growth and Yield of Kenaf Produced in Two Different Climatic Types in Soils Contaminated by Zinc, Copper, Chromium and Lead

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AIM: **to compare the growth and biomass production of Kenaf (cultivar H328, developed by IBFC in China) in soils contaminated by zinc, copper, chromium and lead in two different climate types (Tropical climate and Mediterranean climate).**

Methodology:

1,5 kg of soil in each pot

Biometric parameters were already assessed

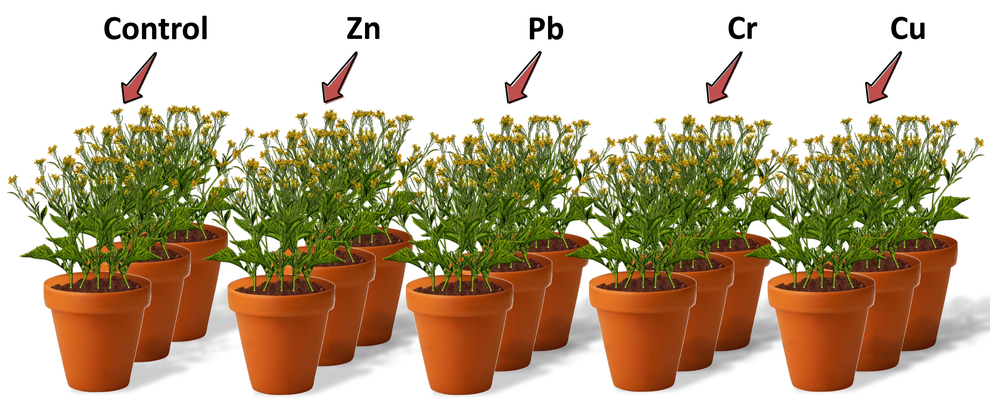
Zn: 450 mg Zn.kg^{-1}

Pb: 450 mg Pb.kg^{-1}

Cr: 300 mg Cd.kg^{-1}

Cu: 200 mg Cu.kg^{-1}

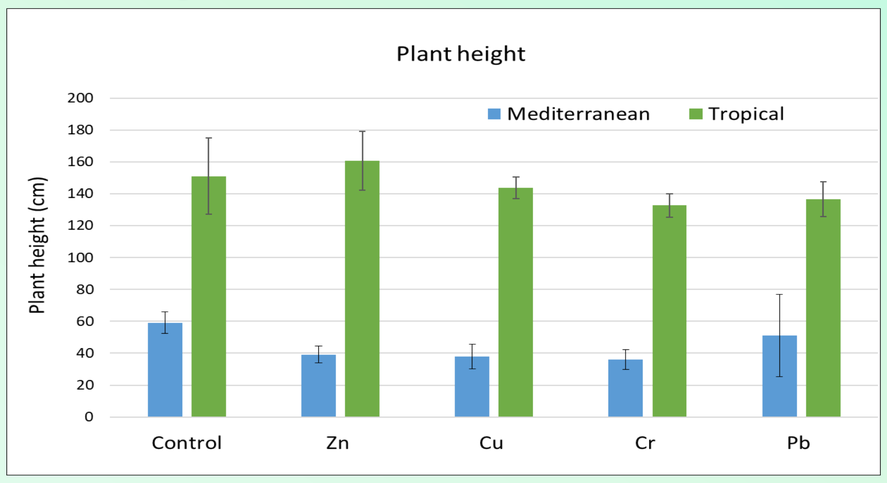
Soil Contamination



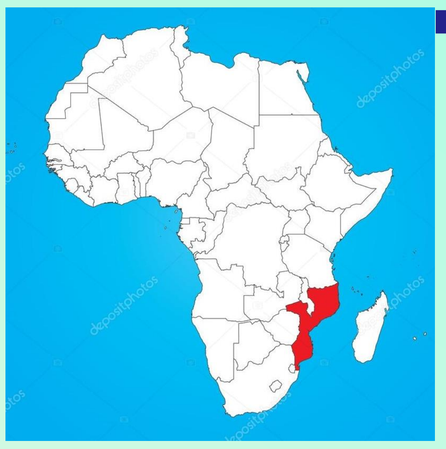
All pots received NPK and were irrigated in order to avoid nutrient and water stress

Results

Plant growth



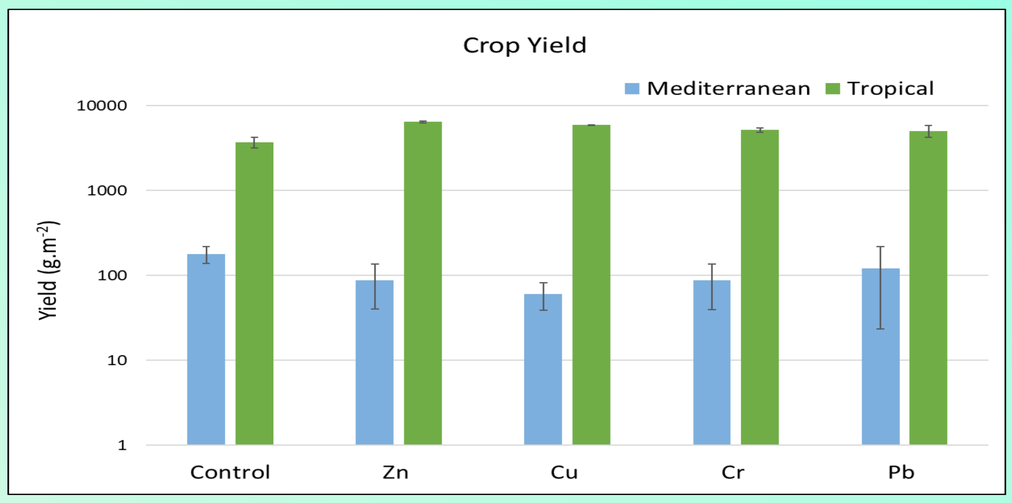
- **Tropical climate**
  - Contamination by Zn, Cu, Cr and Pb showed no effects
- **Mediterranean climate**
  - Contamination by Pb did not affect the growth of Kenaf plants, but Zn, Cu and Cr reduced the growth of kenaf plants



In Tropical climate

- Contamination by Zn, Cr, Cu or Pb does not affect the yield of Kenaf plants

Crop yield



In Mediterranean climate

- Contamination ↓ productivity, specially with Cu contamination

- **Growth in Mozambique contaminated soils was much higher than in the Portuguese conditions.**
- **On average, the yields in Mozambique were 4900 g/m², and in Portugal, merely 107 g/m².**

Phytoextraction

- **Characterization of biomass indicate that kenaf is able to phytoextract Zn, Cu and Cr, and less Pb**
- **Higher metal accumulation is observed in the roots and leaves**
- **Higher translocation is observed for Zn**
- **Accumulation in the seeds may represent a problem**

	Zn	Cu	Cr	Pb
Bark	+ +	+	+	=
Core	+	+	+	=
Leaves	+ + +	+ +	+ +	+ +
Flowers	+ + +	+ +	=	=
Seeds	+ +	=	=	=
Roots	+ + +	+ +	+ + +	+ + +
+ + + High extraction	+ + Medium extraction		+ Low extraction	= No extraction

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