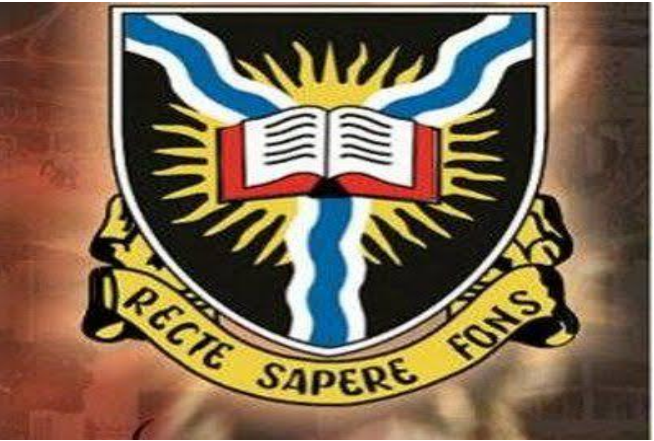




# Safeguarding the Environment Using Common Weeds as Phytoremediator of Pharmaceutical wastes ( A Sustainable Approach).

Oluwafunmilola Ogundipe

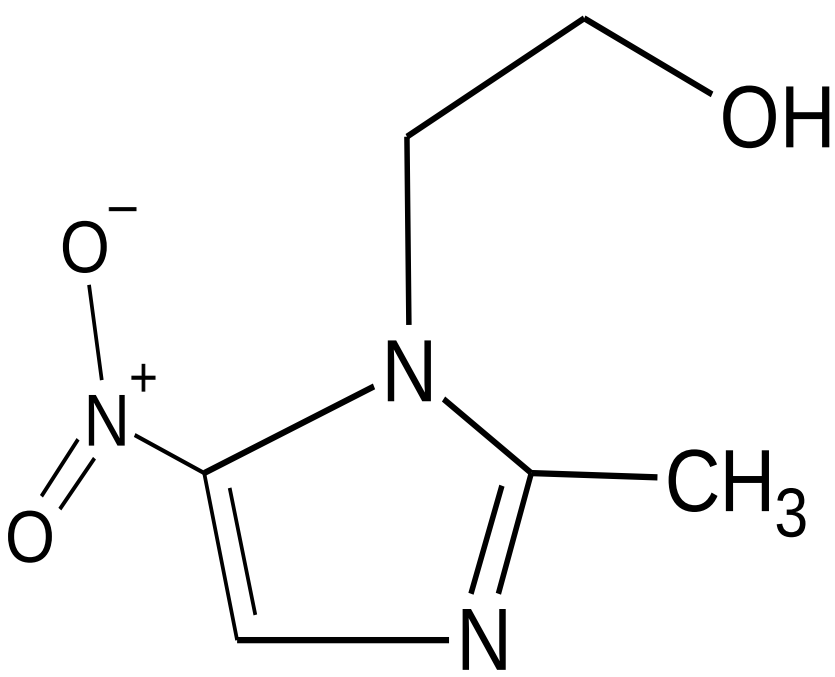
Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Ibadan, Nigeria.

## BACKGROUND

- Encapsulation,Incineration and Acid leaching are few of the common methods pharma-industry utilize in treatment of pharmaceuticals wastes. These methods were found have negative impact on environmental and human health.
- Thus, there is need for exploration of sustainable approaches such as **phytoremediation**, whereby green plants can accumulate and degrade pollutants through CYP450 -mediated metabolism to less toxic pollutants.
- This study was designed to assess the potential of ***Urena lobata*(UL), *Panicum maximum*(PM), *Chromolaena odorata*(CO) and *Eleusine indica*(EI)** to uptake four common pharmaceuticals.

## METHODOLOGY

### Drugs Used:



Paracetamol(PCM) Ibuprofen(IBU) Metronidazole (MTZ) Carbamazepine(CBZ)

## EXTRACTION AND ANALYSIS OF DRUGS



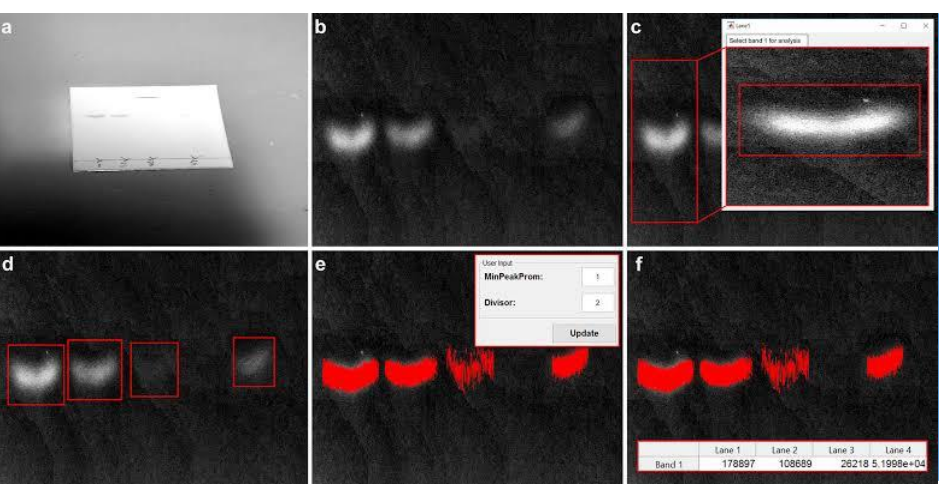
Uptake of selected drugs in plants



Freeze- dried root and leaf samples of plants



Processed drug extraction from plant sample via cold macration and C18 SPE Cartridges



qTLC for quantitative analysis

## RESULTS

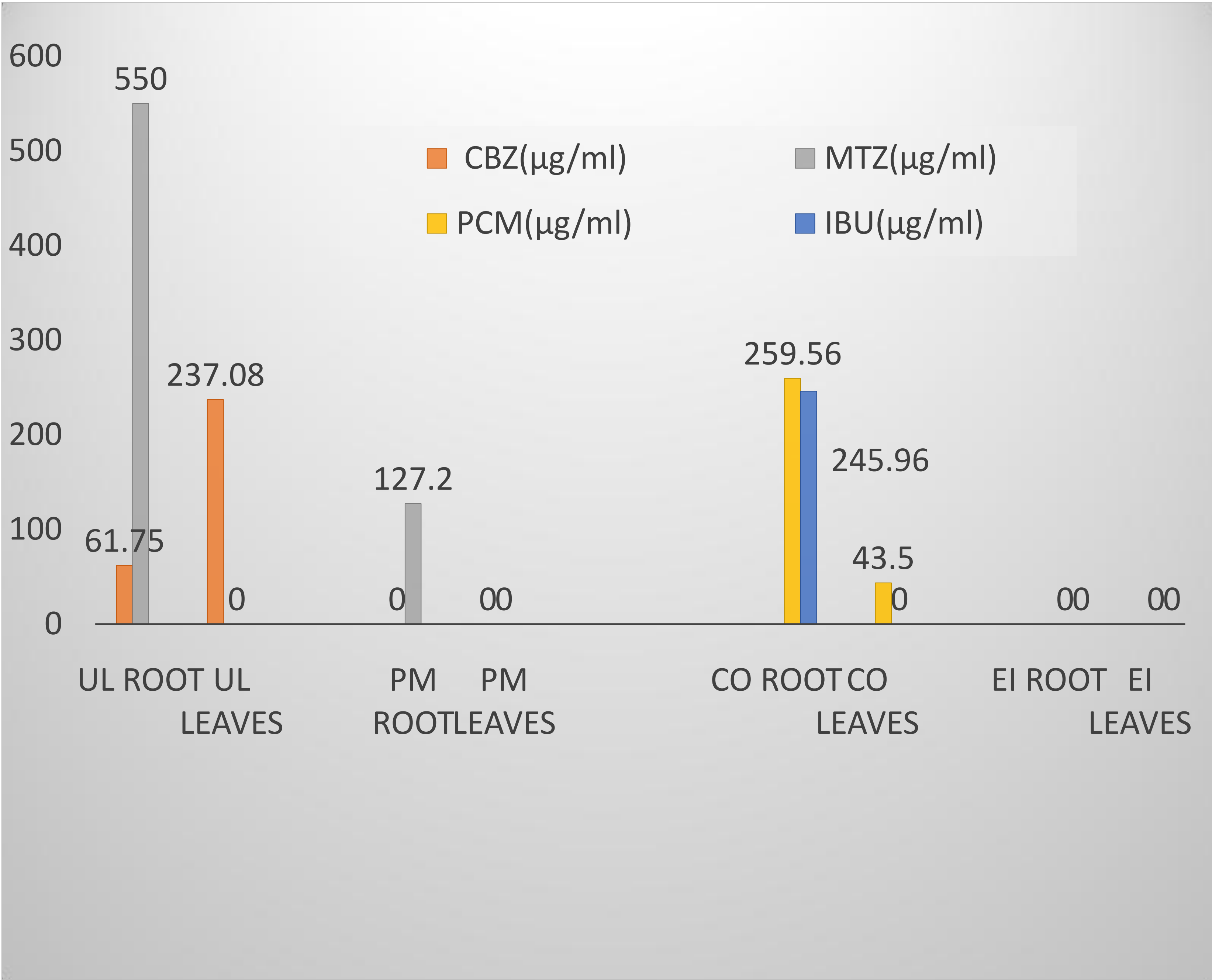
**Table 1: Optimum mobile phase and Rf values for drugs on TLC placte**

| Drug | Optimum mobile phase                         | Rf Value |
|------|----------------------------------------------|----------|
| CBZ  | n-He: EtOAc(3:7)                             | 0.35     |
| MTZ  | CHCl <sub>3</sub> : MeOH (9.5: 0.5)          | 0.64     |
| PCM  | CHCl <sub>3</sub> : EtOAc(7:3)               | 0.59     |
| IBU  | n-He: EtOAc drops CH <sub>3</sub> COOH (1:9) | 0.83     |

## DISCUSSIONS

- UL, PM , and CO are widely growing weeds can be employed in phytoremediation of pharmaceuticals from the environment but not likely EI. The latter plant withered with ibuprofen and paracetamol was neither detected in its roots or leaves.
- The phytoremediation capacity and mode of the plants for the pharmaceuticals differed. this could be dependent on different physicochemical properties of the drugs.
- Phytoextraction and phytotranslocation of pharmaceuticals were identified process of phytoremediation of the selected weeds.
- Advent of AI allows hypenation of mpbile devices with analytical techniques in preliminary detection and quantitation of environmental pollutants of concern.

**Figure 1: Concentration of drugs in plant samples**



## CONCLUSION

- Phytoremediation of pharmaceutical wastes supports a sustainable planet by:
- Protecting food systems (SDG 2)
- Enhancing urban environmental health (SDG11)
- Reducing carbon footprint (SDG 13)
- Safeguarding aquatic life (SDG 14)
- Restoring terrestrial ecosystem (SDG 15)

## REFERENCE

loatru et al., 2017.  
<https://doi.org/10.1016/j.jhazmat.2017.02.005>