

INTRODUCTION

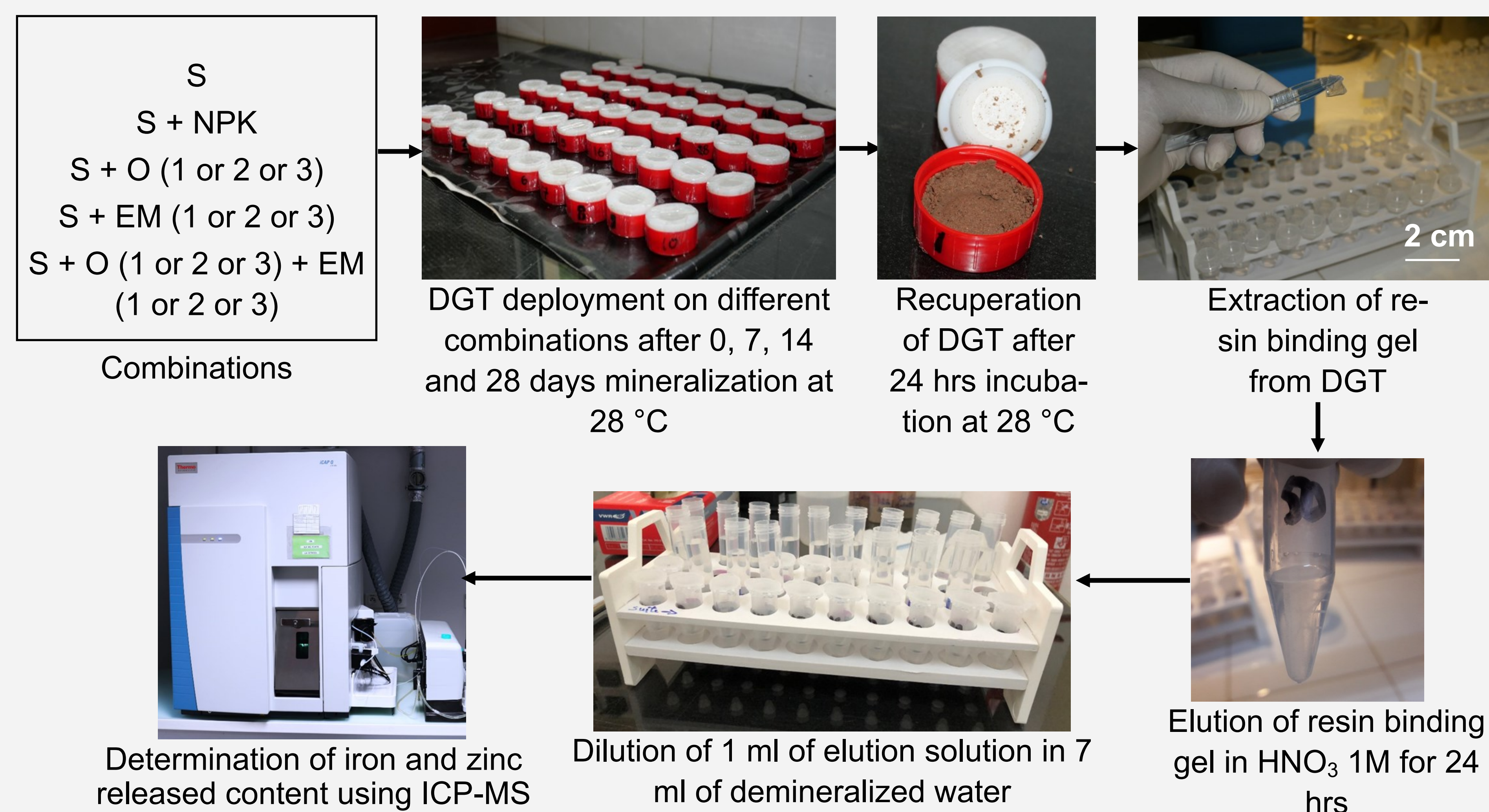
- Almost half of Africa's population suffers from iron and zinc malnutrition (Ritchie, 2017)
- Iron and zinc deficiencies are among the leading causes of diseases in Africa (WHO, 2002)
- Food products of ca. 48% of Africa's population lack essential nutrients such as iron and zinc (Wawa, 2019)
- Agro-biofortification is described by WHO (2019) as an effective process for improving the nutritional quality of food products
- Application of organic residual products rich in iron and zinc, combined with local efficient microorganisms, in a production system, is one way of agro-biofortification

OBJECTIVE

Select two combinations of organic residual products (O) collected in Senegal, and local efficient microorganisms (EM) according to their quantities of iron and zinc released

MATERIALS AND METHODS

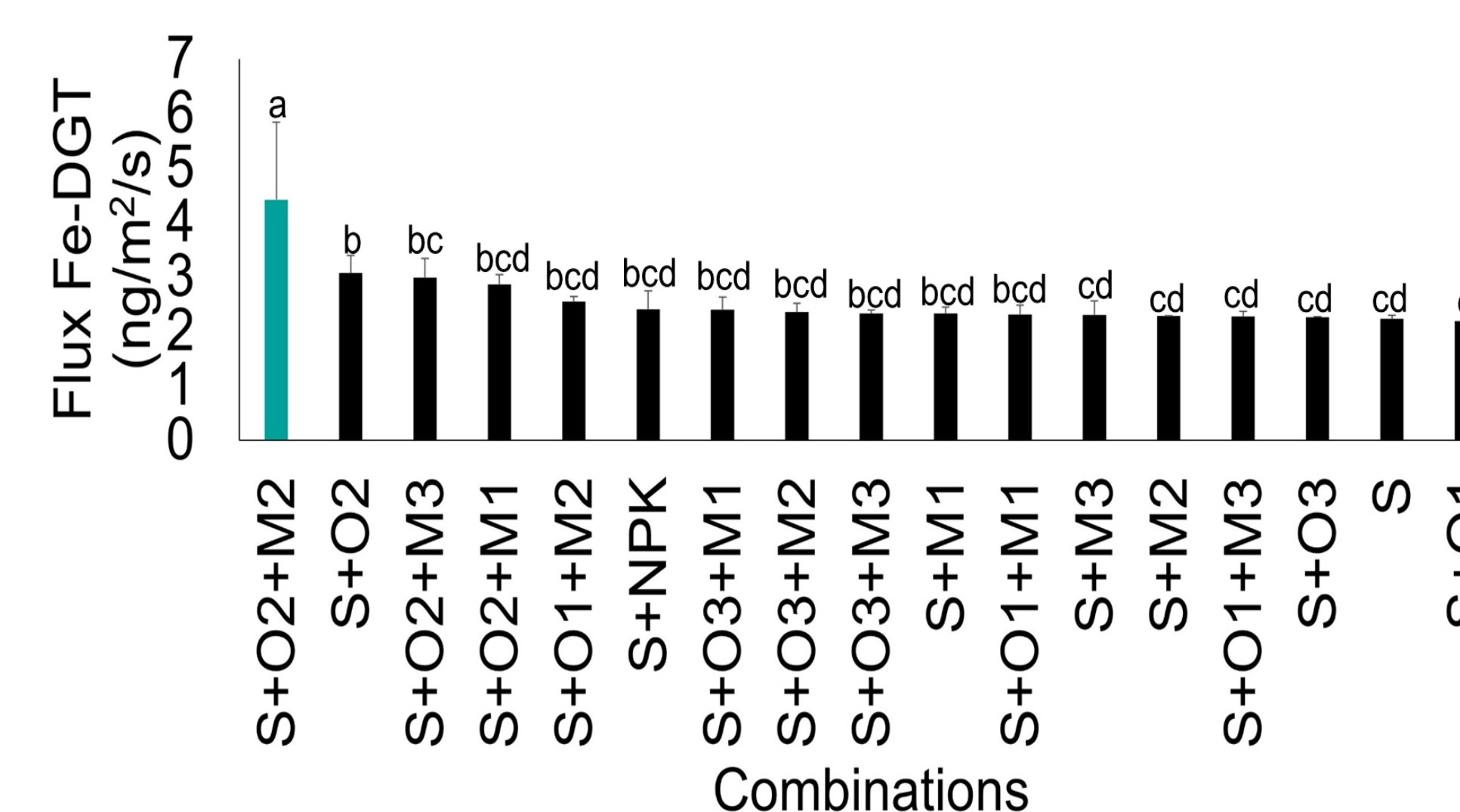
Evaluation of quantities of iron and zinc released in different combinations was carried out using diffusive gradient in thin films (DGT) technique, after mineralization during 0, 7, 14 and 28 days



S = soil; O1 = cow dung; O2 = poultry droppings; O3 = sewage sludge; EM1 = Saint Louis (peanut + millet); EM2 = south groundnut basin (peanut); EM3 = south groundnut basin (rice); ICP-MS = Inductively coupled plasma mass spectrometry

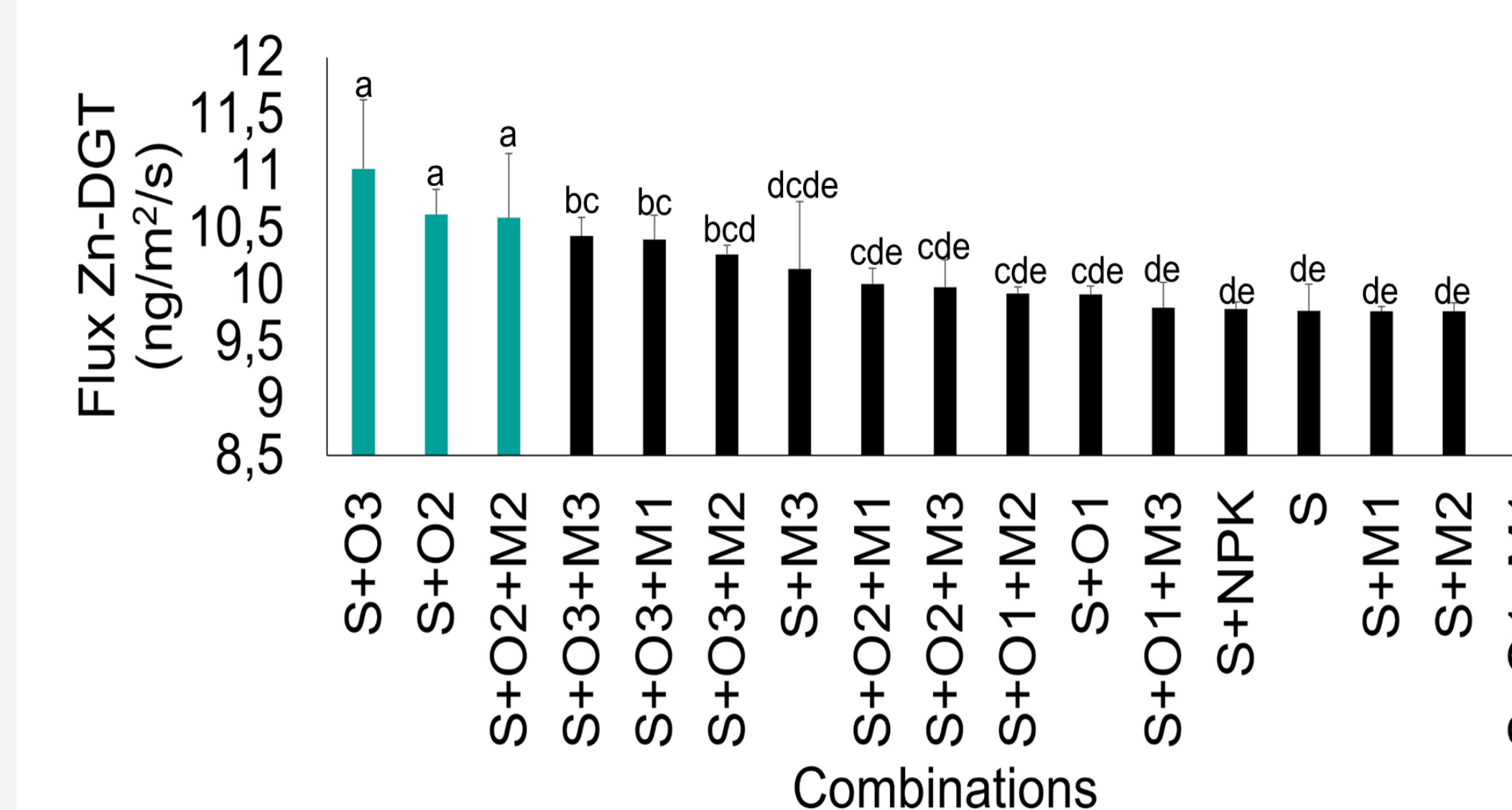
RESULTS

1. Quantities of available iron after 14 days incubation



Duncan's test at the 5% level shows a significant difference (p-value < 0.001) between the iron fluxes of different combinations

2. Quantities of available zinc after 7 days incubation



Duncan's test at the 5% level shows a significant difference (p-value < 0.001) between the zinc fluxes of different combinations

CONCLUSION

1. Soil + poultry droppings + EM south groundnut basin (peanut) combination has the highest quantity of iron released
2. Soil + sewage sludge, soil + poultry droppings and soil + poultry droppings + EM south groundnut basin (peanut) combinations have the highest quantity of zinc released
3. **Poultry droppings, sewage sludge and south groundnut basin (peanut)** were selected among organic residual products and local efficient microorganisms tested for further field trials

PERSPECTIVES

Poultry manure and sewage sludge in combination with EM from south groundnut basin (peanut) will be tested under experimental field conditions considering also local agricultural practices, to evaluate the Fe and Zn gain of the grain of cowpea and millet

REFERENCES

1. Ritchie H. (2017) - "Micronutrient Deficiency"
2. Wawa B., 2019. Fighting 'hidden hunger' with fortified foods, Africa Renewal
3. WHO, 2002. The World Health Report: reducing risks, promoting healthy life. Geneva
4. WHO, 2019. Biofortification of staple crops. e-Library of Evidence for Nutrition Actions