

# Hidden secrets of rice stored seeds:

insect pests in Guinea-Bissau's mangrove rice

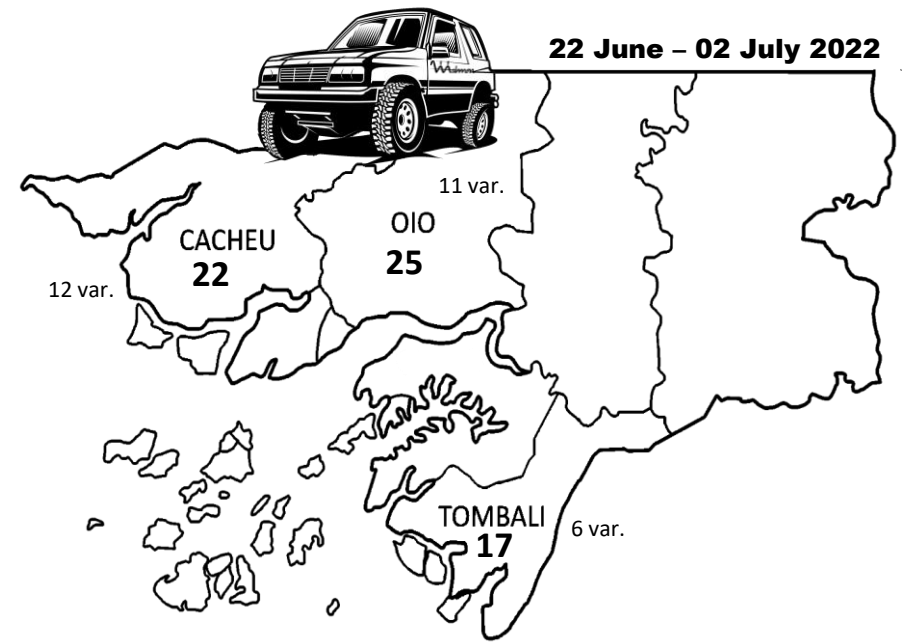
**Sofia Conde**  
(CEF&LEAF/ISA)



# METHODOLOGY

**3 Regions**  
**13 Villages**  
**30 Farmers**

22 June - 02 July 2022



## STORAGE STRUCTURES



**BAG**



**200 L CONTAINER  
(METAL OR PLASTIC)**



**BOTTLE**



**FUÚLE**



**RICE BUNDLES**



# METHODS | LAB PROCEDURE



TAXONOMIC IDENTIFICATION | MORPHOLOGY



LABORATORY OF PLANT HEALTH |  
GUINEA BISSAU

## 1. Storage insect screening

Preservation in 96% alcohol



## 2. Preliminary taxonomic identification

Separation into Morphotypes



# RESULTS

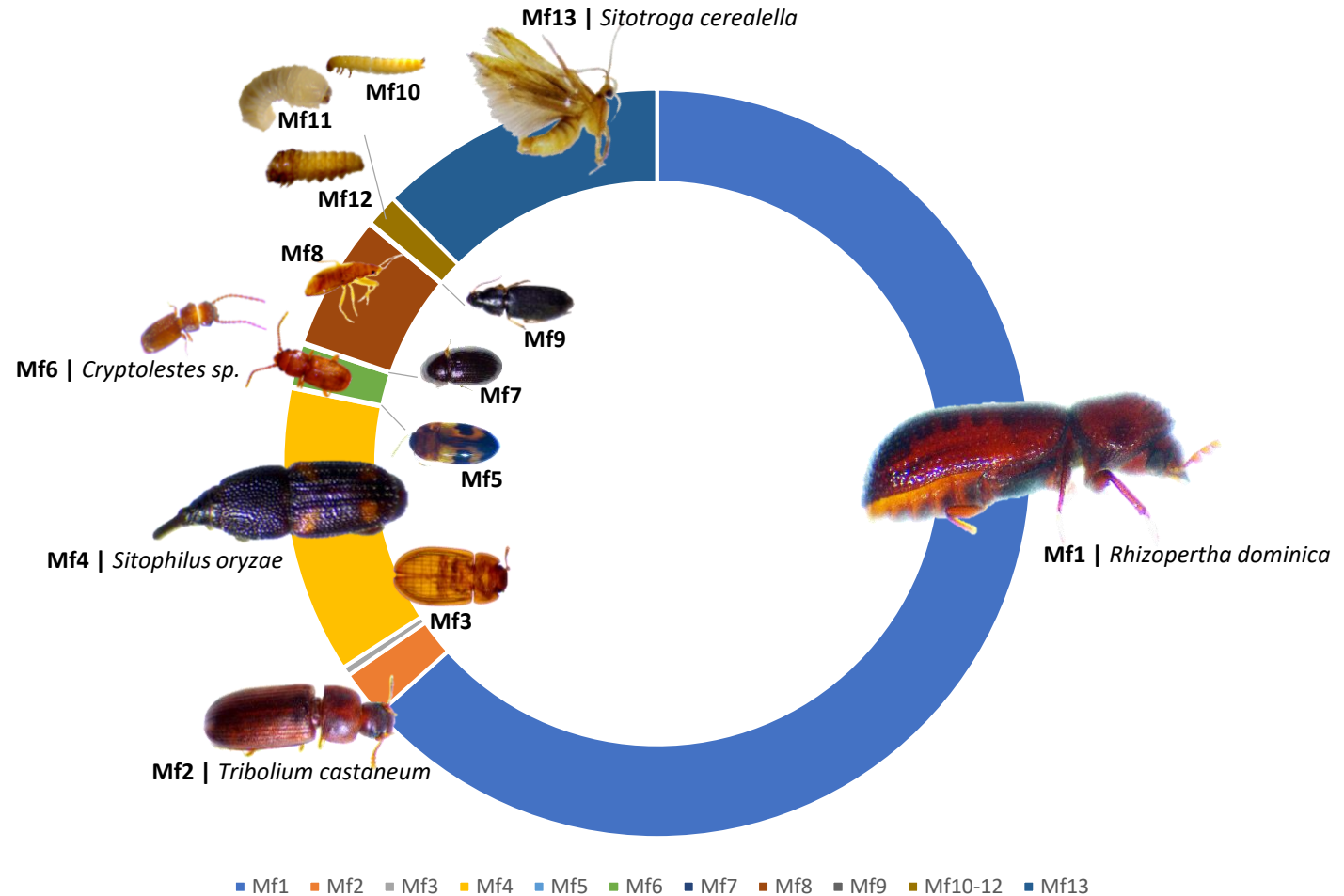


TAXONOMIC IDENTIFICATION | MORPHOLOGY



[1.498 samples]

| Morphotype | Order       | ID                          |
|------------|-------------|-----------------------------|
| Mf1        | Coleoptera  | <i>Rhizopertha dominica</i> |
| Mf2        | Coleoptera  | <i>Tribolium castaneum</i>  |
| Mf3        | Coleoptera  |                             |
| Mf4        | Coleoptera  | <i>Sitophilus oryzae</i>    |
| Mf5        | Coleoptera  |                             |
| Mf6        | Coleoptera  | <i>Cryptolestes sp.</i>     |
| Mf7        | Coleoptera  |                             |
| Mf8        | Hemiptera   |                             |
| Mf9        | Coleoptera  | Carabidae                   |
| Mf10       | Coleoptera  | larvae                      |
| Mf11       | Coleoptera  | larvae                      |
| Mf12       | Coleoptera  | larvae                      |
| Mf13       | Lepidoptera | <i>Sitotroga cerealella</i> |



Mf = MORPHOTYPE

# METHODS | LAB PROCEDURE



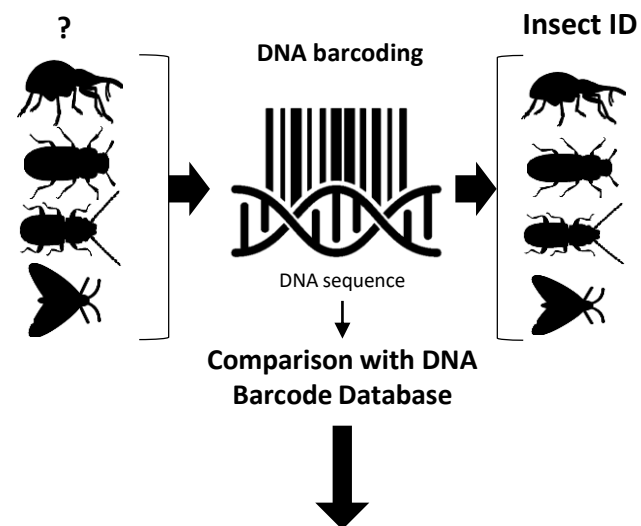
TAXONOMIC IDENTIFICATION | DNA BARCODING



**3. Selection of 95 representative samples from all the morphotypes and DNA extraction for DNA barcoding**



## 4. DNA barcoding



LABORATORY OF CIBIO |  
PORTUGAL



# BOLD SYSTEMS

# RESULTS



TAXONOMIC IDENTIFICATION | DNA BARCODING



[95 representative samples]

## Identified samples at species level

Morphology VS DNA barcoding



*Tribolium castaneum*



*Cryptolestes pusillus*



*Rhyzopertha dominica*



*Sitophilus oryzae*



*Platymetopus vestitus*



*Sitotroga cerealella*



*Stemorrhages sericea*


Morphotype identification was verified by  
DNA barcoding of the representative samples

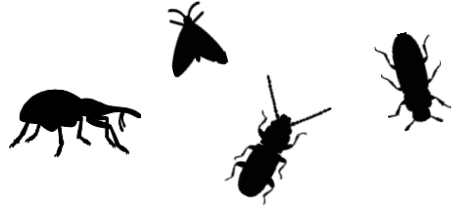


Results allow us to identify all individuals grouped into  
morphotypes with a greater degree of certainty



# METHODS | LAB PROCEDURE

 TAXONOMIC IDENTIFICATION | DNA BARCODING vs MORPHOLOGY



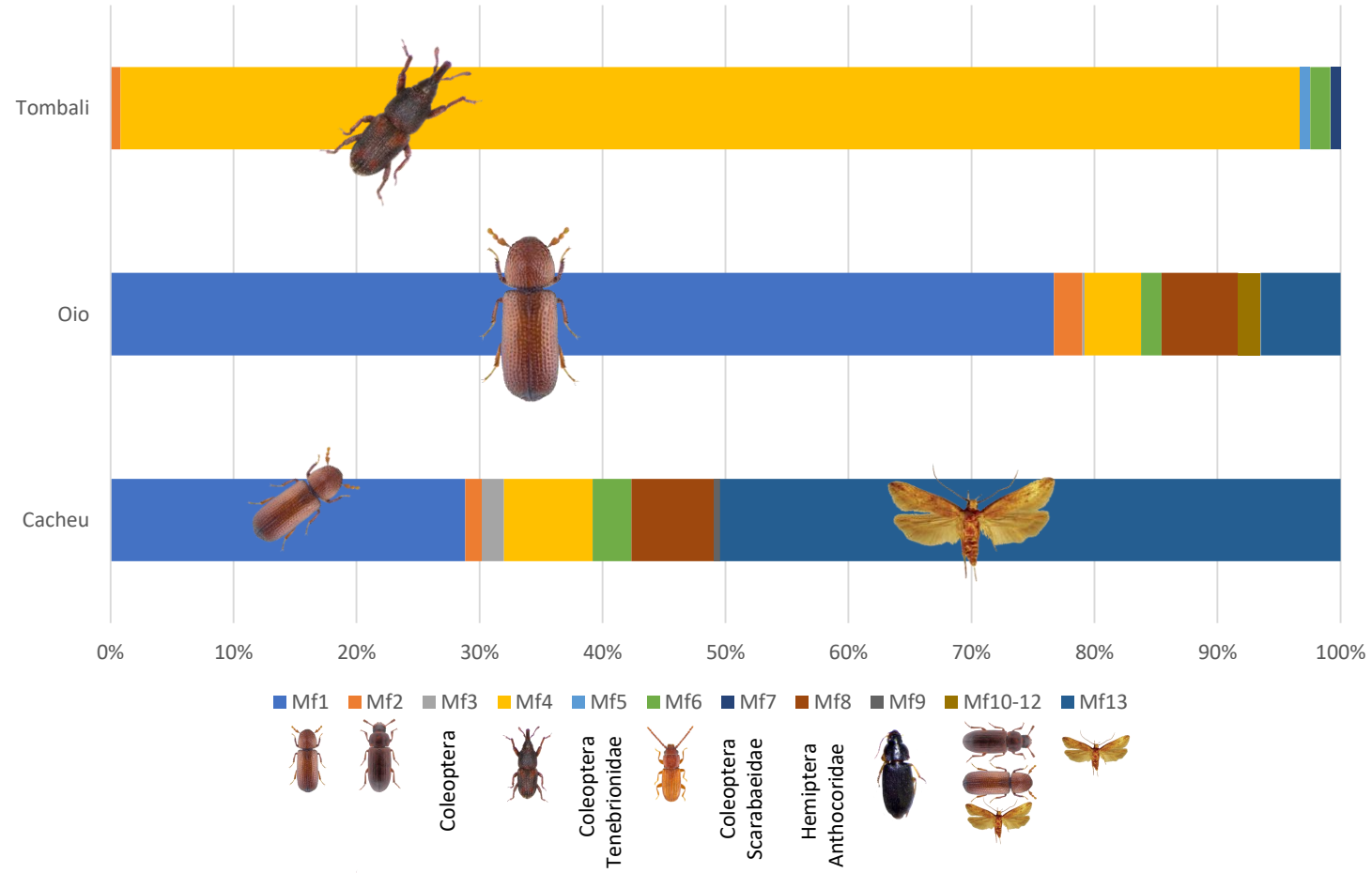
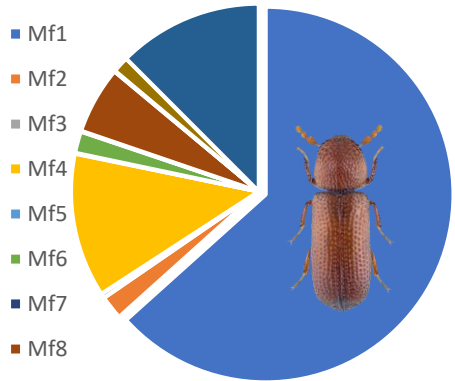
| Morphotype | Morphology  |                             | DNA barcoding |   |
|------------|-------------|-----------------------------|---------------|---|
|            | Order       | ID                          | Order         | Final ID  |
| Mf1        | Coleoptera  | <i>Rhizopertha dominica</i> | Coleoptera    | <i>Rhizopertha dominica</i>                               |
| Mf2        | Coleoptera  | <i>Tribolium castaneum</i>  | Coleoptera    | <i>Tribolium castaneum</i>                                |
| Mf3        | Coleoptera  | --                          | Coleoptera    | 4 ID only to order level;<br>2 <i>Tribolium castaneum</i> |
| Mf4        | Coleoptera  | <i>Sitophilus oryzae</i>    | Coleoptera    | <i>Sitophilus oryzae</i>                                  |
| Mf5        | Coleoptera  | --                          | Coleoptera    | Tenebrionidae   |
| Mf6        | Coleoptera  | <i>Cryptolestes sp.</i>     | Coleoptera    | <i>Cryptolestes pusillus</i>                              |
| Mf7        | Coleoptera  | --                          | Coleoptera    | Scarabaeidae  |
| Mf8        | Hemiptera   | --                          | Hemiptera     | Anthocoridae  |
| Mf9        | Coleoptera  | Carabidae                   | Coleoptera    | <i>Platymetopus vestitus</i>                              |
| Mf10       | Coleoptera  | larvae                      | Coleoptera    | <i>Tribolium castaneum</i>                                |
| Mf11       | Coleoptera  | larvae                      | Coleoptera    | <i>Rhizopertha dominica</i>                               |
| Mf12       | Lepidoptera | larvae                      | Lepidoptera   | <i>Sitotroga cerealella</i>                               |
| Mf13       | Lepidoptera | <i>Sitotroga cerealella</i> | Lepidoptera   | <i>Sitotroga cerealella</i>                               |



# RESULTS



TAXONOMIC IDENTIFICATION | DNA BARCODING



# KNOWLEDGE SHARING

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2<sup>nd</sup> ENTOMOLOGICAL CONFERENCE  
— OF CÔTE D'IVOIRE —



Because science is not done alone  
but among everyone  
And together we do better science!

*Parce que la science ne se fait pas seul mais entre tous  
Et ensemble nous nous faisons une meilleure science!*

To all the participants  
À tous les participants



I invite the sharing of studies on stored rice  
pests in West African countries

*J'invite au partage des études sur les  
ravageurs du riz stocké dans les pays  
d'Afrique de l'Ouest*



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Tank you very much  
*Merci beaucoup*

