Study of the perception of small commensal mammals by the inhabitants of the peripheral districts of Bamako - Mali

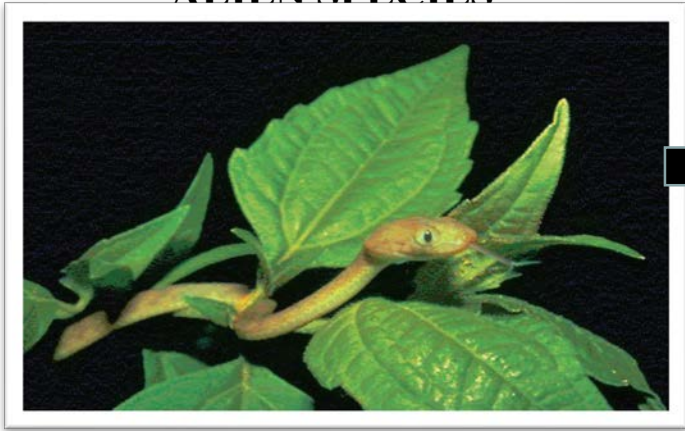*Solimane AG ATTEYNINE, Monique BERTRAND, Issa DEMBELE, Seydou TOURE, Laurent GRANJON*

Human migrations and global trade combined with rapid urbanization have resulted in the destruction of many natural habitats and the spread of some invasive organisms.

CONTEXT

100 OF THE WORLD'S WORST INVASIVE ALIEN SPECIES

Published by Contribution to the Global Invasive Species Programme (GISP)

In Association with **IUCN** SPECIES SURVIVAL COMMISSION

MAMMAL

brushtail possum *(Trichosurus vulpecula)*
domestic cat *(Felis catus)*
goat *(Capra hircus)*
grey squirrel *(Sciurus carolinensis)*
macaque monkey *(Macaca fascicularis)*
mouse *(Mus musculus)*
nutria *(Myocastor coypus)*
pig *(Sus scrofa)*
rabbit *(Oryctolagus cuniculus)*
red deer *(Cervus elaphus)*
red fox *(Vulpes vulpes)*
ship rat *(Rattus rattus)*
small Indian mongoose *(Herpestes javanicus)*
stoat *(Mustela erminea)*

CONTEXT

100 OF THE WORLD'S WORST INVASIVE ALIEN SPECIES

A SELECTION FROM THE GLOBAL INVASIVE SPECIES DATABASE

Published by Contribution to the Global Invasive Species Programme (GISP)

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2 Invasive Rodents/ 15 Mammals

R rattus, R. norvegicus, Mus musculus

Major invader with consequences:

- Biodiversity of local spiecies

- Health & Environment

- Food Security (crops, grain storage, etc.)

In this context, the importance of population control of rodents is justified by the extent of their nuisance and management therefore appears essential

For a more sustainable management of rodents (including invasive species), it is therefore important to understand people's point of view

CONTEXT

This study is the result of collaboration between

- **CESSMA/IRD (Monique Bertrand)**
- **CBGP/IRD (Laurent Granjon)**
- **Laboratoire de Rodontologie/IER**

Peripheral districts of Bamako

⬇

Field of study of Monique Bertrand who works on urbanization
Mus musculus as **MARKER** of urban sprawl
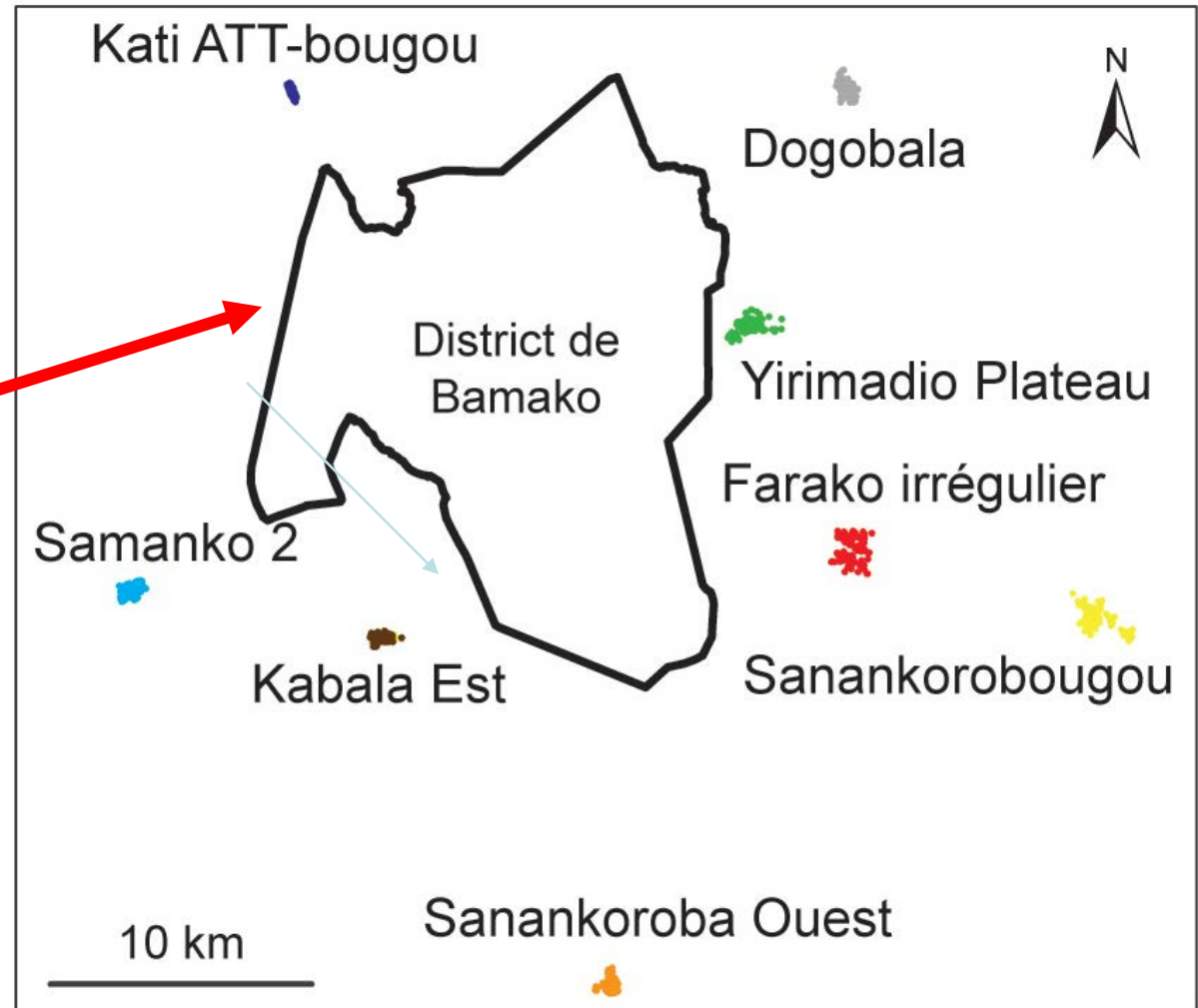
AIMS

MAIN OBJECTIVE
Study the problem of invasive species within the rodent community through the perception of populations in the peripheral districts of Bamako

SPECIFIC OBJECTIVES

- Identify rodent communities

- Know the place of invasive species within the rodent community in the districts surveyed

- List the types of rodent damage, control methods and their effectiveness

- Compare the results of the survey and trapping data in Dogobala district

- Analyze the presence of *Mus musculus* in the districts surveyed
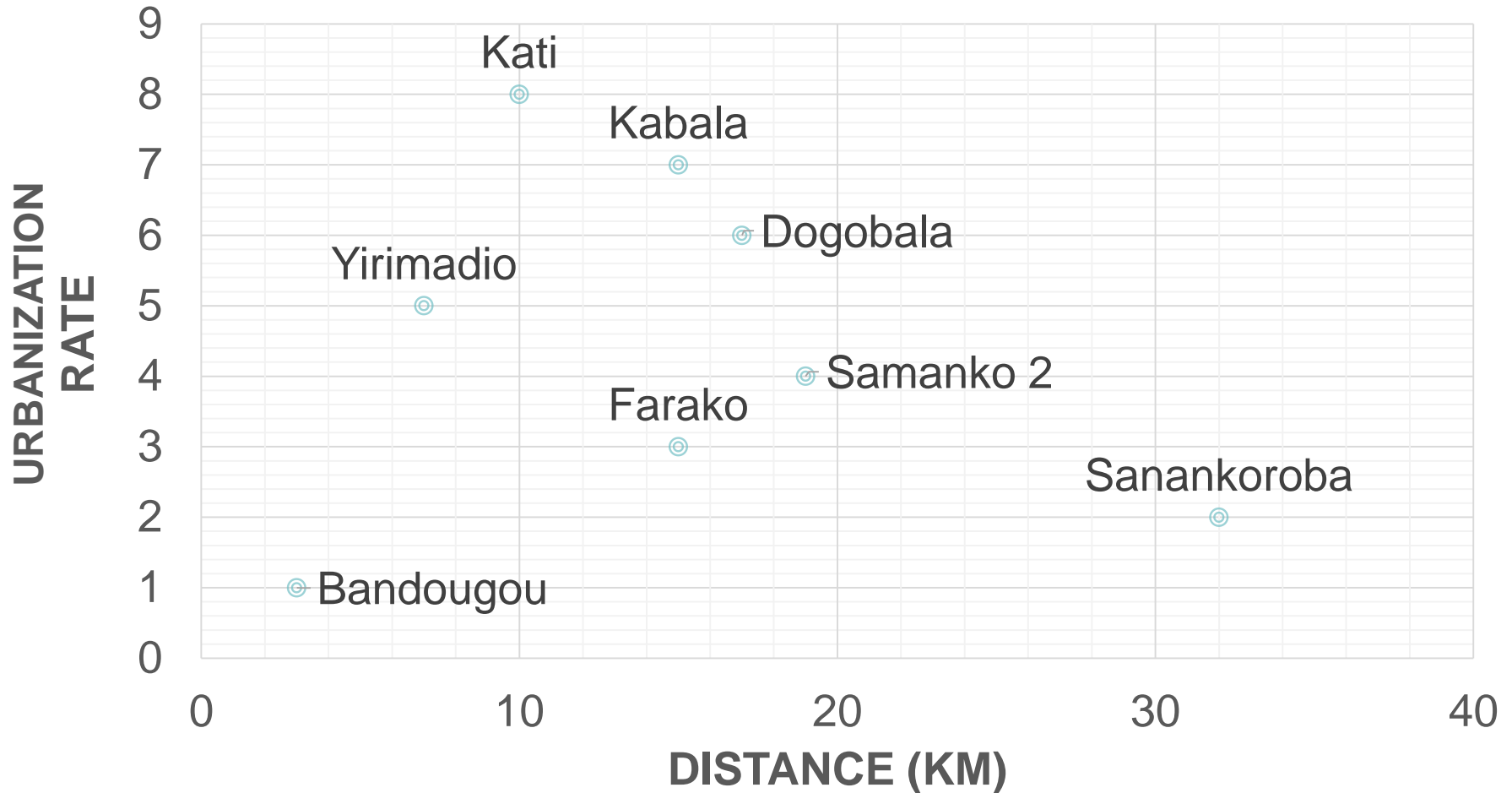
MATERIAL & METHODS

STUDY PLACES

STUDY SITES

URBANIZATION ACCORDING TO DISCTANCE BAMAKO

SURVEY IPR – 5 « GNINE »
RODENTS IN THE HOUSES

Study Zones :
A_Kati_ATTbougou
B_Samanko2_Djikoroni_Coura
C_Kabala_Est / Nyamakoro kourani
D_Dogobala
E_Yirimadio_Plateau
F_Farako
G_Sanankoroba_Ouest
H_Sanankorobougou_Bandougou

Survey Agents :
Seydou TOURE
Issa DEMBELE

March – April 2022

MATERIAL & METHODS

Period (March 23 to May 25, 2022)

800 homes surveyed ➡ **100 homes/district**

- The perception survey was conducted through an interview based on a questionnaire

- The interview was conducted by an IPR/IFRA trainee from Katibougou who showed the images of the rodents and 1 support staff experienced in surveys who directly transcribed the answers of the questionnaire in the Kobo Toolbox application.

Survey Questionnaire

Name : …………………………   **Surname :** ……………………………

1. Have you noticed rodents in your home in the past 30 days? If yes, which ones ?

2. How do you call them in the local language?

3. Are they causing damage? If yes, which ones ?

4. Do you know of any other rodent problems?

5. Are you trying to control rodents?

6. What are your means of struggle?

7. How efficient are they?

Survey Questionnaire

8. Do you recognize the animals showed here?

9. If so, how do you call them?

10. Do you know this rodent (*Mus musculus*) on this board and what do you call it?

11. How long has this rodent (*Mus musculus / "*Messi*")* been present in your area?

- Less than 1 year

- Between 1 and 5 years

- Between 6 -10 years

- More than 10 years

Rodents' Identification

Pictures --- **Description** --- **Behaviour**

Data Analysis

- Information from KoboToolbox is saved in Excel format

- Data are translated in the form of percentages (overall and by district)

- Data are visualized in the form of Pie charts and/or Histograms.

MATERIAL & METHODS

Data in Kobo Toolbox – Example of the perception of duration of presence of Mus musculus in the area
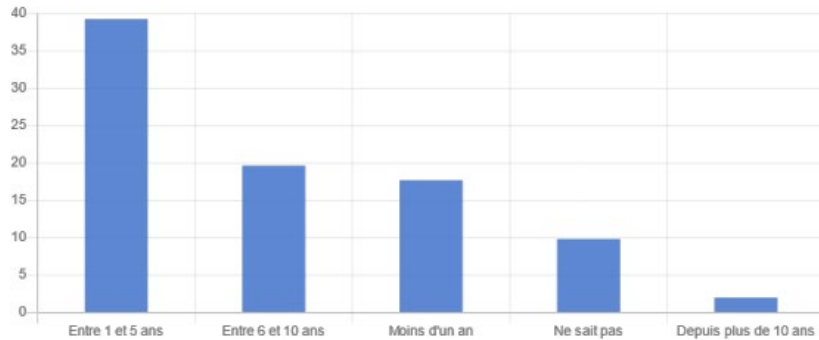
Valeur	Fréquence	Pourcentage
Entre 1 et 5 ans	40	39.22
Entre 6 et 10 ans	20	19.61
Moins d'un an	18	17.65
Ne sait pas	10	9.8
Depuis plus de 10 ans	2	1.96

RESULTS

Rodents Presence

District / Homes	Kati Attbougou	Samanko	Kabala Est	Dogobala	Yirimadio	Farako	Sanankoroba Ouest	Sanakorobougou
With Rodents	83%	89%	91%	**94%**	**79%**	90%	96%	82%
Without Rodents	17%	11%	9%	6%	21%	10%	4%	18%

Rodents always present in a majority of homes

Indenfication

Pie chart:
- Mastomys natalensis 54%
- Mus musculus 31%
- Crocidura olivieri 28%
- Rattus spp 27%
- Cricetomys gambianus 8%
- Autres espèces; 1%
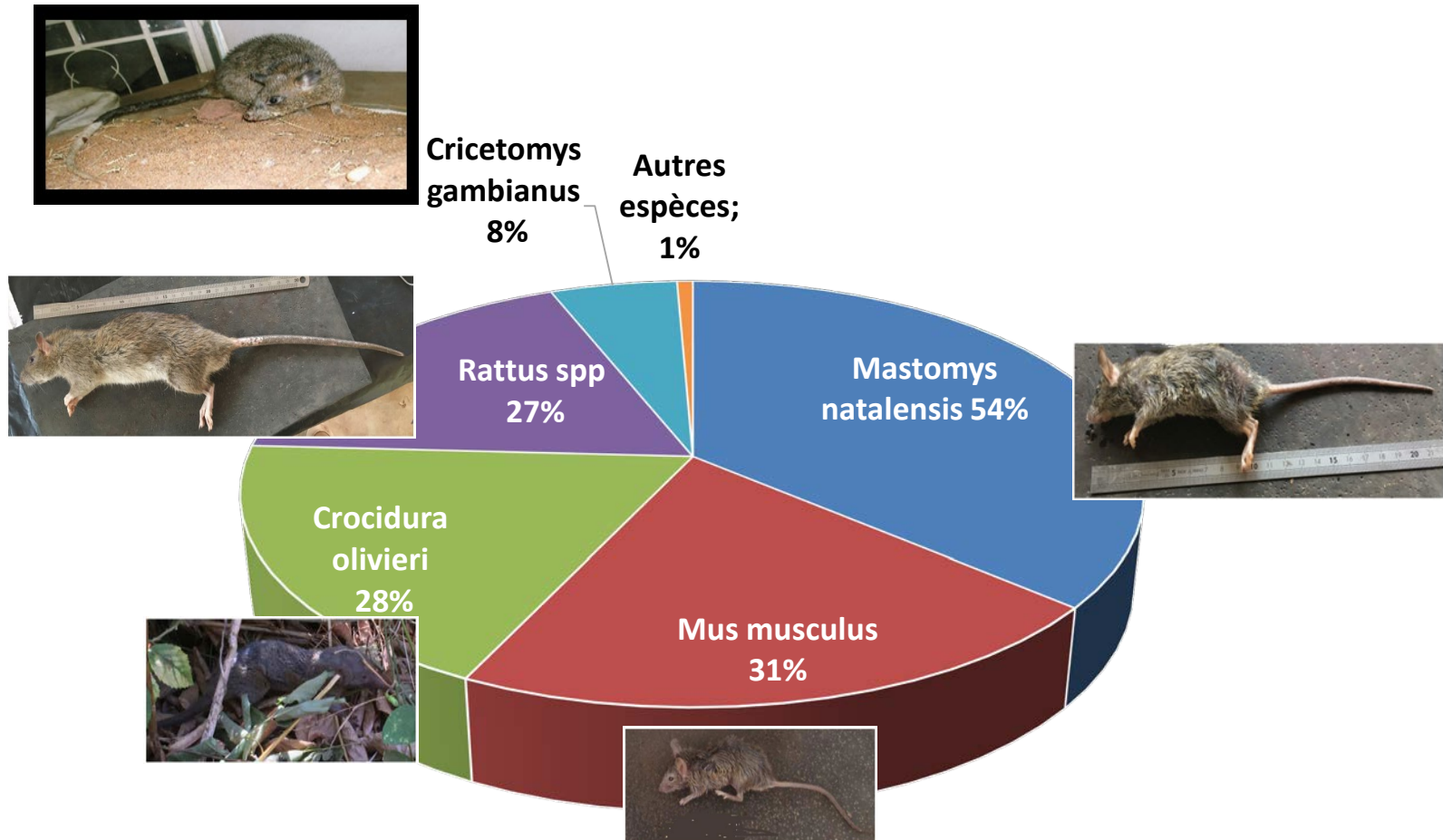
Identity of species in the different districts

- 🟥 *Mus musculus*
- 🟩 *Crocidura olivieri*
- 🟦 *Mastomys natalensis*
- 🟧 *Rattus norvegicus / Rattus rattus*
- 🟦 *Cricetomys gambianus*
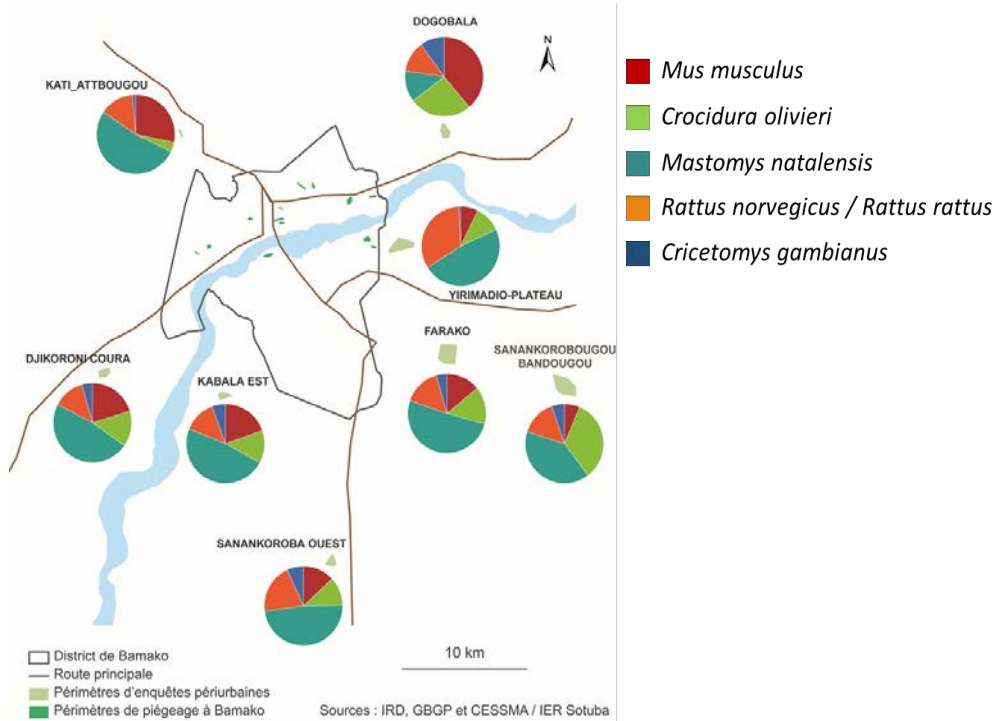
RESULTS

Damages done by Rodents (mean %ages of homes concerned / district)

Pie chart showing:
- Domestic damage; 65%
- Food stock; 61%
- Papers bank bills; 51%
- Clothes; 50%
- furniture, doors and windows; 36%
- Equipment, electrical wires; 26%
- Attack on chicks; 25%
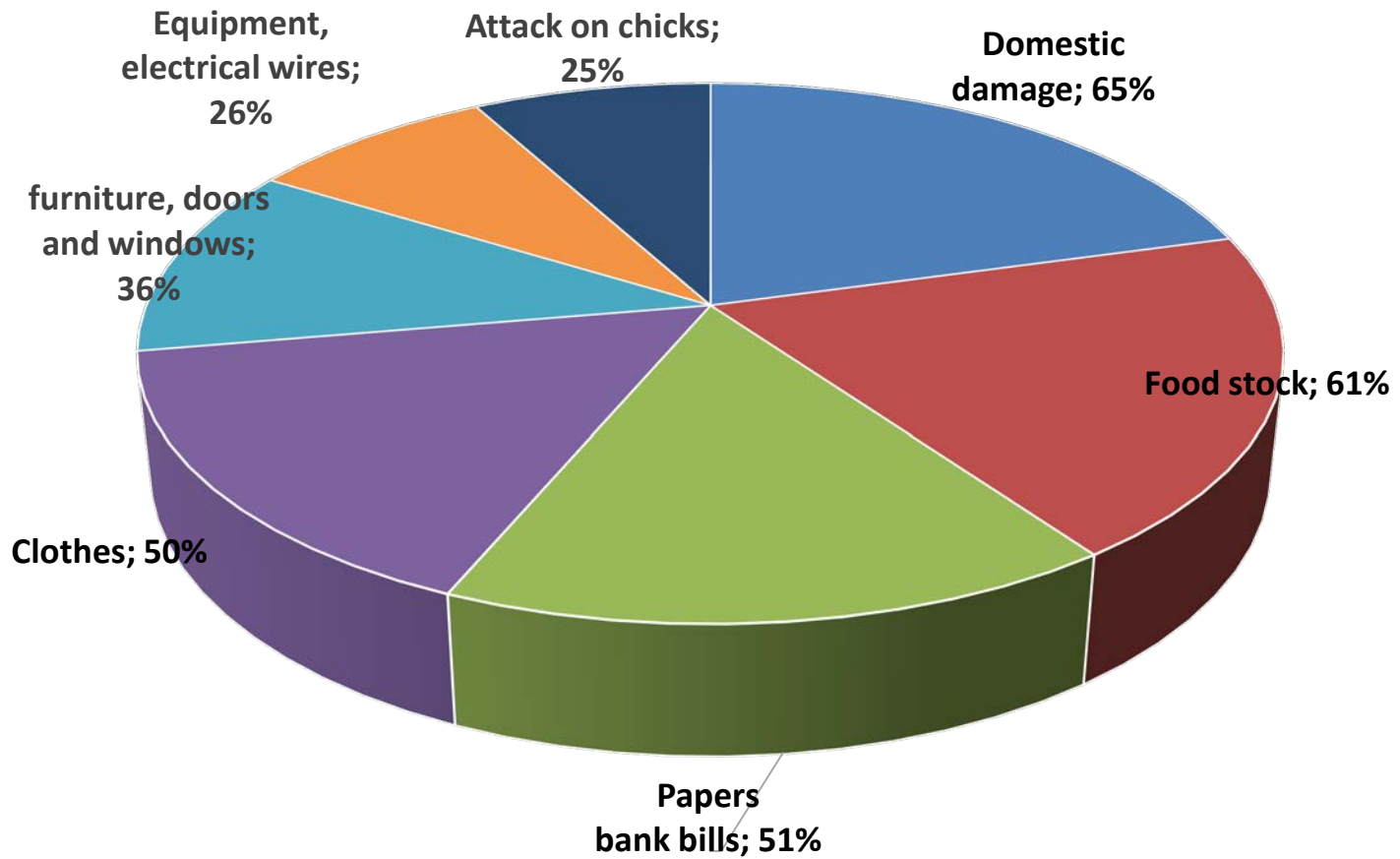
RESULTS

Damages done by Rodents

RESULTS

Control

Neighborhood	Poison	Scaring	Domestic cats	Stuck or glu Trap	Hunt per child	Other trap	without action
Kati-ATTbougou	51%	17%	18%	49%	10%	1%	23%
Djicoroni-coura/Samanko2	39%	18%	26%	12%	4%	2%	25%
Kabala-Est/Nyamakoro-cour	38%	19%	23%	12%	3%	4%	28%
Dogobala	67%	24%	29%	29%	40%	13%	8%
Yirimadio-plateau	52%	28%	11%	9%	13%	0%	24%
Farako	54%	26%	27%	8%	4%	4%	17%
Sanakoroba-Ouest	59%	35%	27%	23%	14%	4%	15%
Sanakorobougou/Bandougou	50%	33%	30%	4%	48%	3%	20%
Total	**51%**	**25%**	**24%**	18%	17%	4%	20%

Other methods (Excavation, Drawning, fire, dog) < to 5%

RESULTS

Control

RESULTS

Survey vs Trapping in Dogobala

Comparison Survey Results and Trapping in Dogobala

Legend: ■ Enquête ■ Piegeage
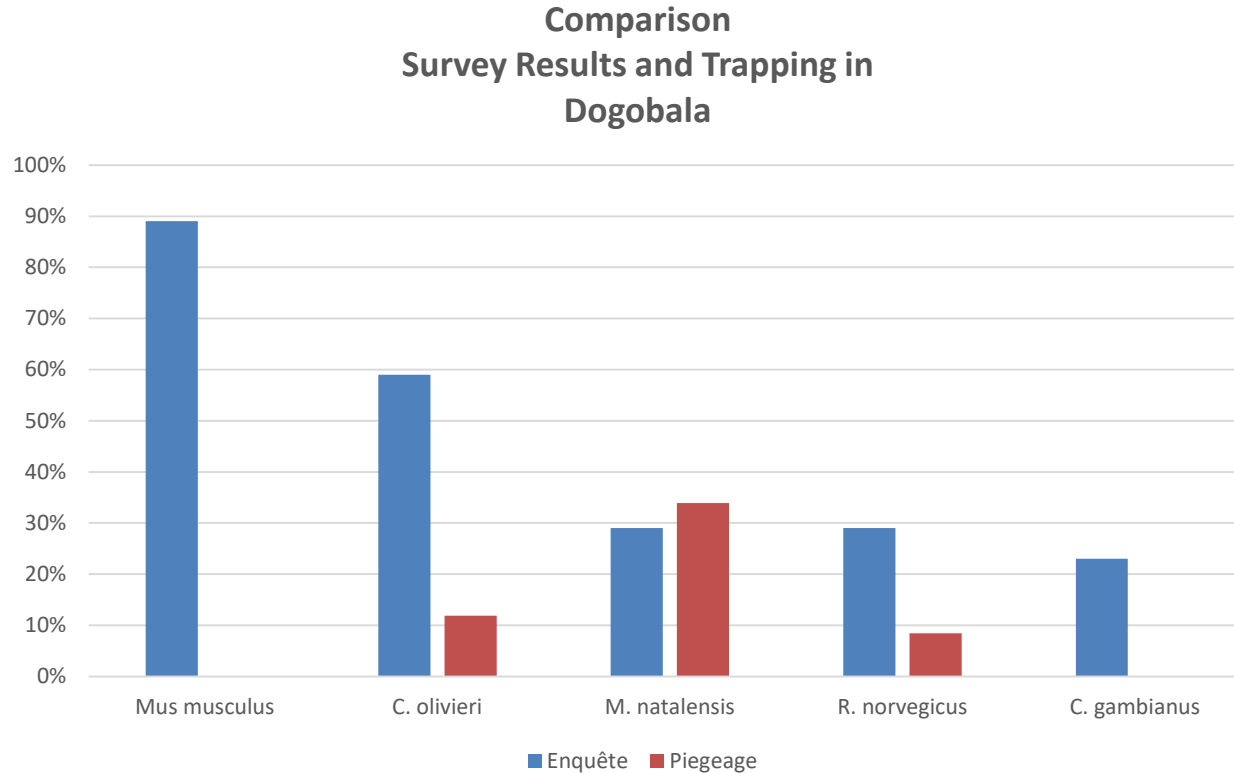
RESULTS

Presence of *M. musculus*

Presence

- After 10 years 3%
- 5 and 10 years 5%
- 1 and 5 years 10%
- Don't Know 47%
- Less than 1year 35%
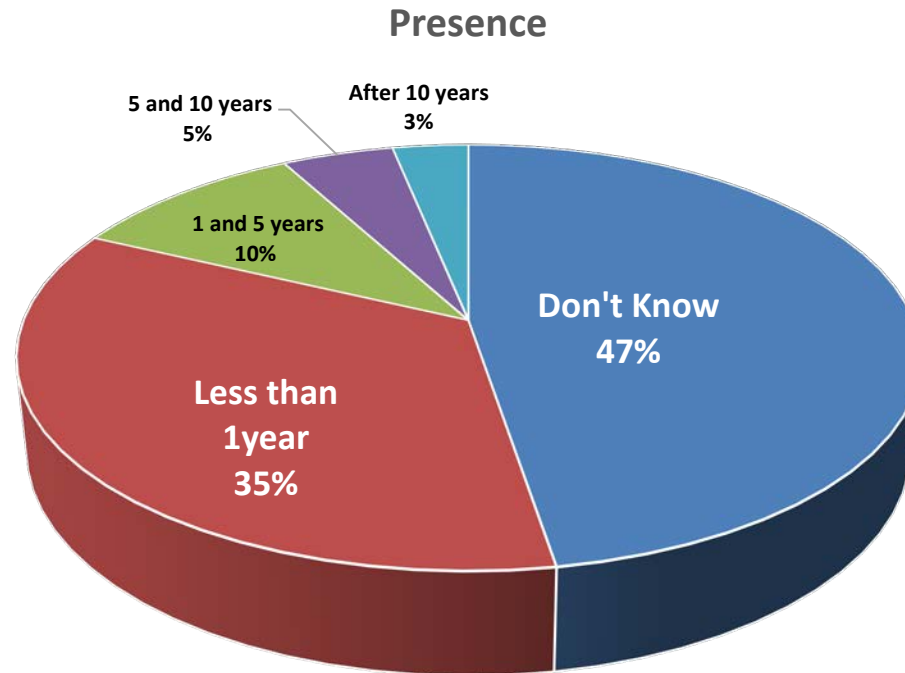
CONCLUSION

Native species

Espèce/Quartier	Mastromys natalensis	Mus musculus	Crocidura olivieri	Rattus norvegicus	Cricetomys gambianus
Kati-ATTbougou	22%	42%	6%	21%	2%
Djicoroni-coura/Samanko2	66%	28%	20%	18%	6%
Kabala-Est/Nyamakoro-courani	70%	28%	19%	19%	8%
Dogobala	29%	89%	59%	29%	23%
Yirimadio-plateau	65%	10%	15%	46%	1%
Farako	80%	20%	24%	23%	6%
Sanakoroba-Ouest	22%	20%	19%	33%	10%
Sanakorobougou/Bandougou	74%	12%	62%	28%	10%
Total	**54%**	**31%**	**28%**	**27%**	**8%**

Globally, *M. natalensis* is the most regularly mentioned species except in three districts (Kati_ATTbougou, Dogobala and Sanakoroba).

- Its low perception in Kati_ ATTbougou can be justified by the urbanization of the district?
- For the other districts, it may be linked with the fact that the houses surveyed have particularities (building type, better sanitation, etc.).

C. olivieri is more often mentionbed in Dogobala and Sanankorobougou/Bandougou, where this species may find favorable conditions

CONCLUSION

Invasive Species

Espèce/Quartier	Mastromys natalensis	Mus musculus	Crocidura olivieri	Rattus norvegicus	Cricetomys gambianus
Kati-ATTbougou	22%	42%	6%	21%	2%
Djicoroni-coura/Samanko2	66%	28%	20%	18%	6%
Kabala-Est/Nyamakoro-courani	70%	28%	19%	19%	8%
Dogobala	29%	89%	59%	29%	23%
Yirimadio-plateau	65%	10%	15%	46%	1%
Farako	80%	20%	24%	23%	6%
Sanakoroba-Ouest	22%	20%	19%	33%	10%
Sanakorobougou/Bandougou	74%	12%	62%	28%	10%
Total	**54%**	**31%**	**28%**	**27%**	**8%**

Mus musculus ⟶ Dogobala et Kati_ATTbougou **(Urbanized area)**

Rattus norvegicus ⟶ Yirimadio plateau **(District very close to Bamako)**

CONCLUSION

Damages of the rodents

Dégâts/Quartier	Domestic damage	Food stock	Papers bank bills	Clothes	furniture, doors and windows	Equipment, electrical wires	Attack on chicks
Kati-ATTbougou	53%	67%	58%	55%	32%	24%	3%
Djicoroni-coura/Samanko2	61%	63%	54%	48%	45%	40%	19%
Kabala-Est	61%	55%	52%	54%	46%	39%	18%
Dogobala	64%	75%	52%	65%	47%	16%	47%
Yirimadio-plateau	52%	51%	31%	34%	8%	7%	7%
Farako	70%	60%	53%	55%	31%	32%	21%
Sanakoroba-Ouest	87%	57%	62%	54%	37%	29%	22%
Sanakorobougou/Bandougou	73%	61%	49%	38%	38%	24%	63%
Total	**65%**	**61%**	**51%**	**50%**	**36%**	**26%**	**25%**

These various damages can be due to a lack of sanitation, poor storage of food in rooms and other factors at the level of houses.

In the most peripheral districts of Bamako, livestock farming is important, as in Sanankorobougou located 35km, where chicken farms are numerous. This could justify the high number of attacks on chicks reported in this locality

CONCLUSION

Control

| Neighborhood	Poison	Scare crow	Domestic cats	Stuck or glu Trap	Hunt per child	Other trap	without action
Kati-ATTbougou	51%	17%	18%	49%	10%	1%	23%
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Yirimadio-plateau	52%	28%	11%	9%	13%	0%	24%
Farako	54%	26%	27%	8%	4%	4%	17%
Sanakoroba-Ouest	59%	35%	27%	23%	14%	4%	15%
Sanakorobougou/Bandougou	50%	33%	30%	4%	48%	3%	20%
Total	**51%**	**25%**	**24%**	18%	17%	4%	20%

Use of Raticides

Domestic cats and scaring are used in the most peripheral districts

→ Move towards EBRM (sanitize, store the grain in closed cans, encourage biological control …).

Survey vs Trapping in Dogobala

**Comparison
Survey Results and Trapping in
Dogobala**
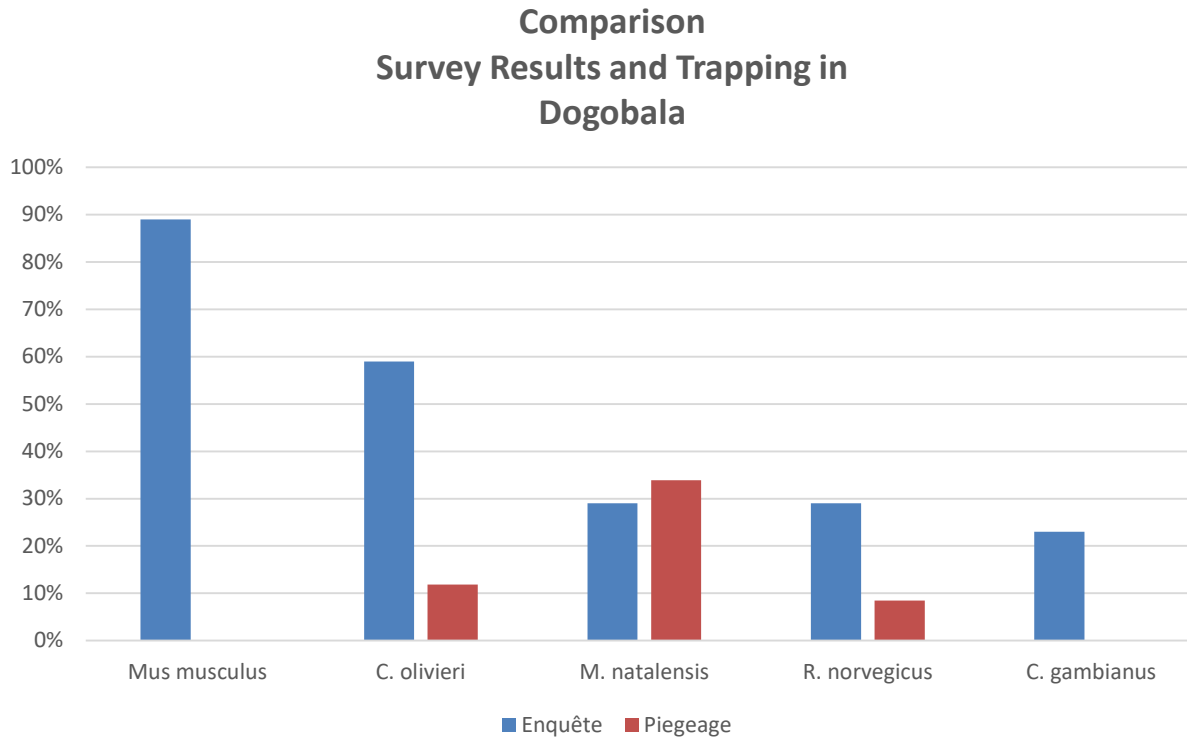
Potential explanations of differences:

- Survey realized one year after trapping

- Probable confusion of *Mus musculus* & young *M. natalensis*

- Influence of Bamako

CONCLUSION

Presence of M. musculus

Quartiers	Don't Know	Less than 1year	Betwen 1 and 5 years	Betwen 5 and 10 years	After 10 years
Kati ATTbougou	38,1	45,24	14,29	2,38	0
Kabala Est	89,29	10,71	0	0	0
Dogobala	12,36	19,1	44,94	22,47	1,12
Yirimadio	10	70	0	0	20
Djicoroni coura_Samanko 2	82,14	10,71	7,14	0	0
Farako	59,09	22,73	9,09	4,55	4,55
Sanankoroba_Ouest	38,1	57,14	4,76	0	0
Sanankorobougou/Bandougou	50	41,67	0	8,33	0
Moyenne	**47,39**	**34,66**	**10,03**	**4,72**	**3,21**
Presence			**49,41**		

No data on its presence in Mali

1st identified specimen was captured in Bamako in 2015, probable presence before 2015

49,41%   *M. musculus*   1--------10 years

Trapping in the same houses as those surveyed in Dogobala

Do this type of survey in Bamako

… THANK YOU FOR YOUR ATTENTION…

…