

# Coconut crab – *Birgus latro*- population preliminary study on Tetiaroa

Study funded and requested by Direction of Environment in French Polynesia by te mana o te moana Dr. Gaspar C. / GENET Q.

2017



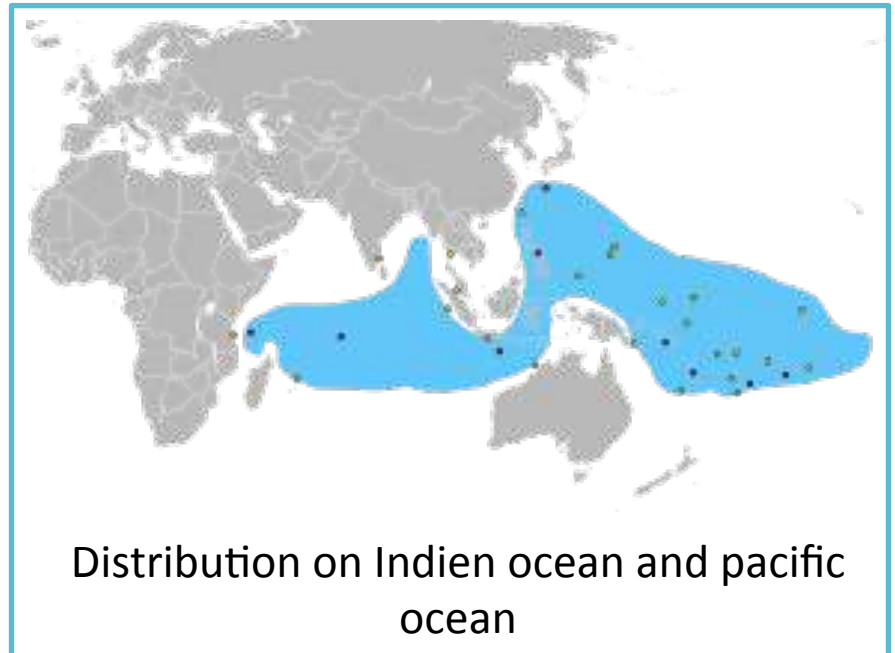
# Legal protection

- IUCN: data non available
- In French Polynesia coconut crabs are reglemented since 2016: law N° 1047 CM regulates the crab collection for human consumption and limits the collection size to individuals with thoracic lenght over 40 mm
- However, there is no control on harwesting volume nor size and the loss of habitat is one of the high threats as well.

# Classification and Distribution

## CLASSIFICATION

- **Règne** : Animalia
- **Phylum** : Arthropoda
- **Sous - phylum** : Crustacea
- **Class** : Malacostraca
- **Sous - classe** : Eumalacostraca
- **Super - ordre** : Eucarida
- **Order** : Decapoda
- **Sub- ordre** : Pleocyemata
- **Infra-order** : Anamura
- **Super family** : Paguroidea
- **Family** : Coenobitidae
- **Genus** : *Birgus*
- **Species** : *latro*



# Introduction

- *Birgus latro* is the largest land crab

✓ Belongs to the same family as hermit crab (Coenibitidae)



Thoracic length TL measure

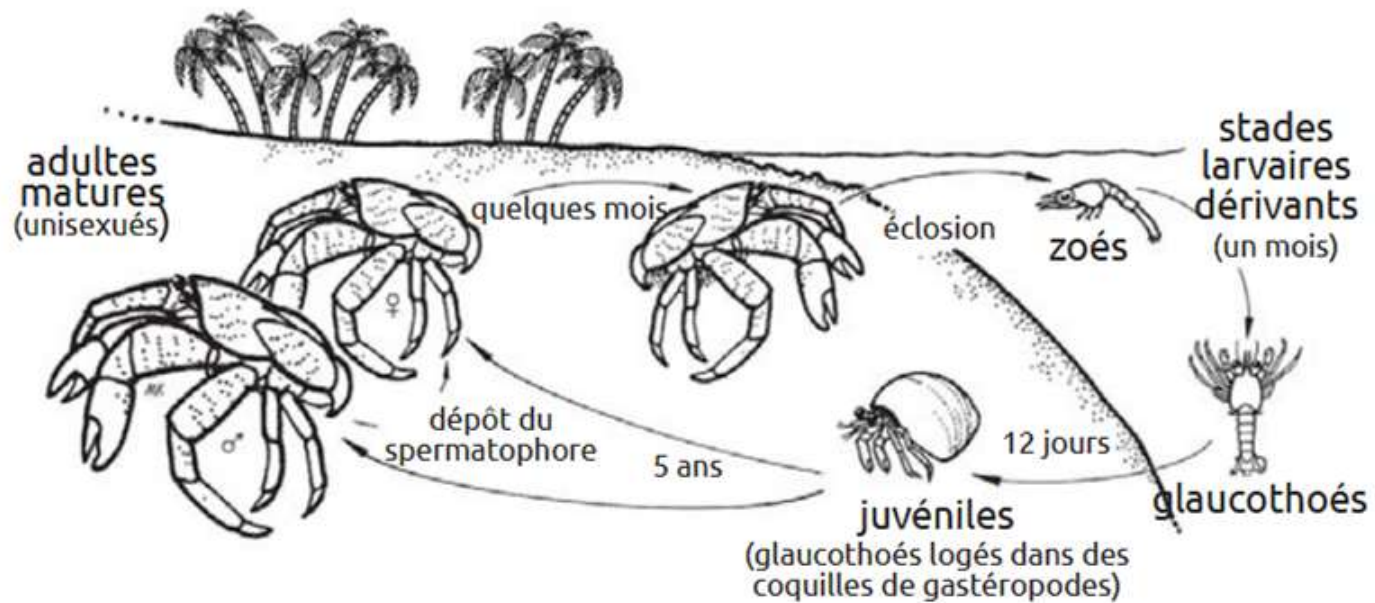
Max thoracic length up to 80 mm

Max weight up to 4 kg

Longevity : over 60 years

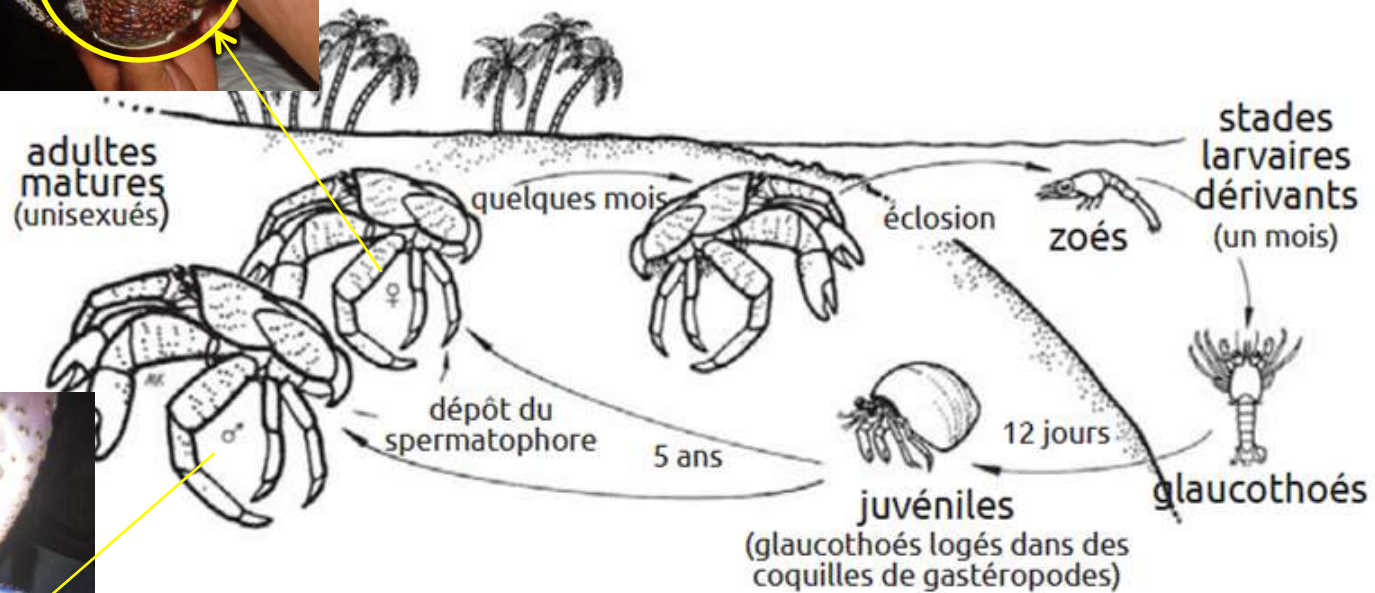
Sexual maturity at 5 years (LT approx 25 mm)

# Life cycle

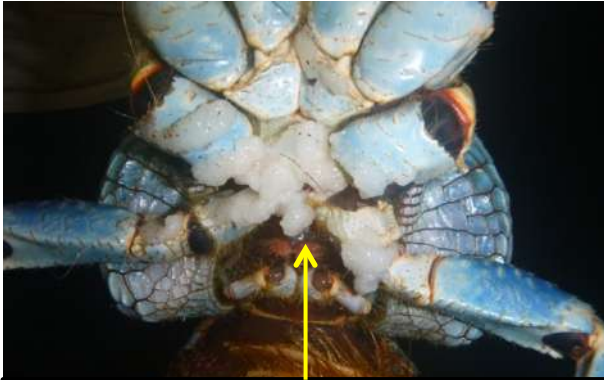




# Life cycle



# Reproduction



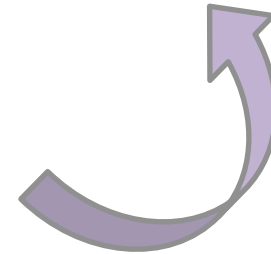
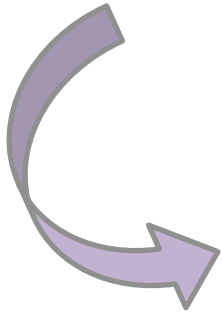
spermatophores deposit on female abdomen by the male



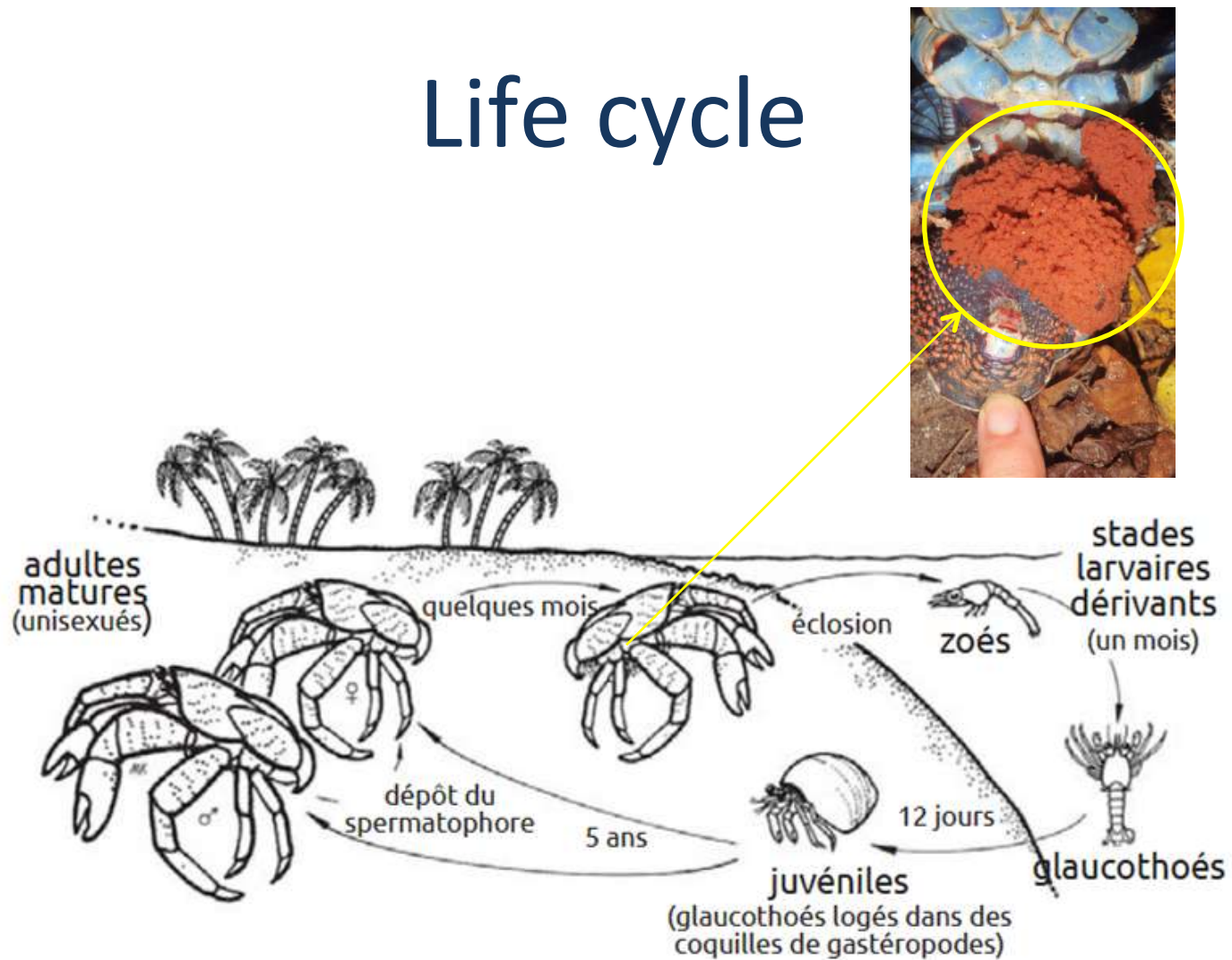
Egg maturation on female abdomen



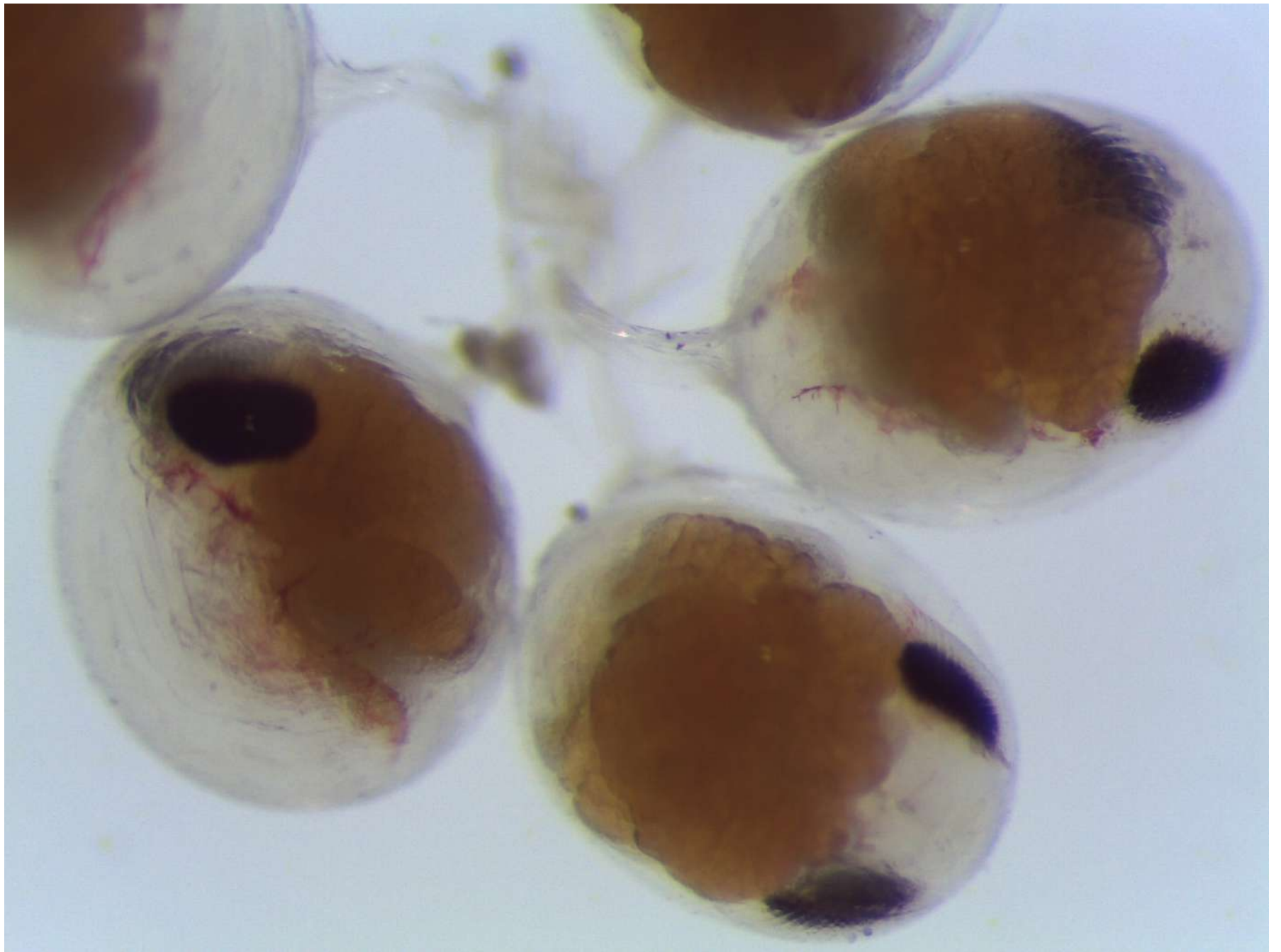
Extrusion of the eggs by the female and fertilisation in contact of eggs with spermatophore



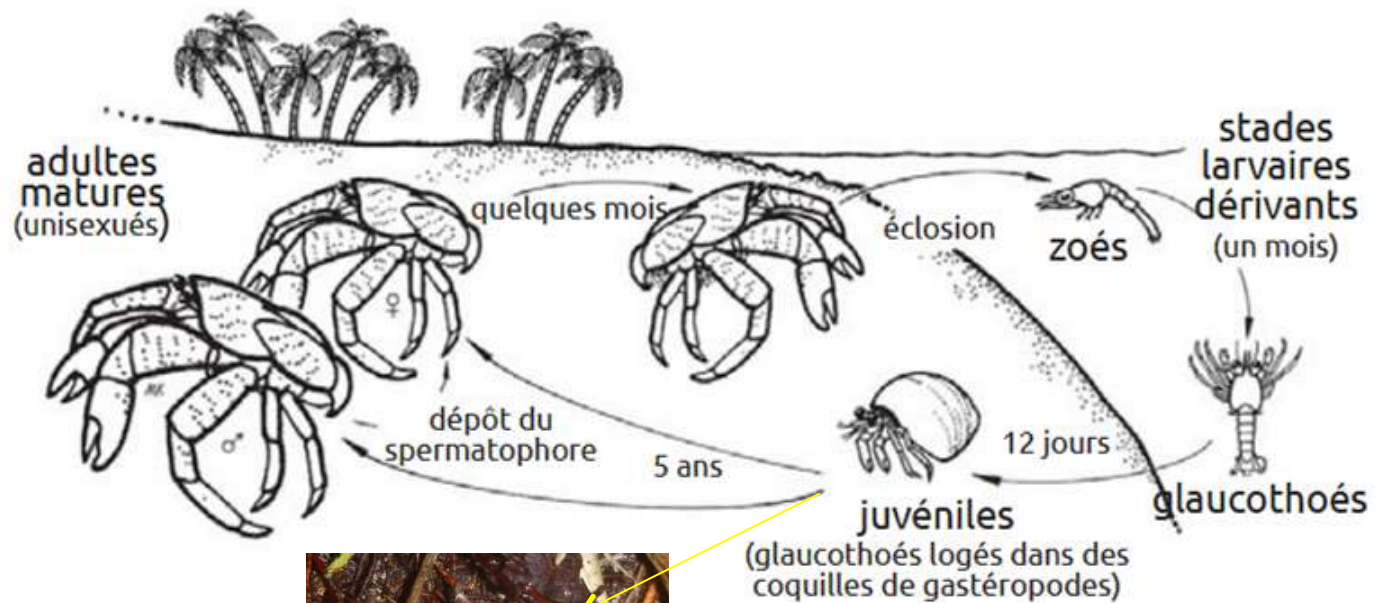
# Life cycle







# Life cycle



# In French Polynesia: few studies

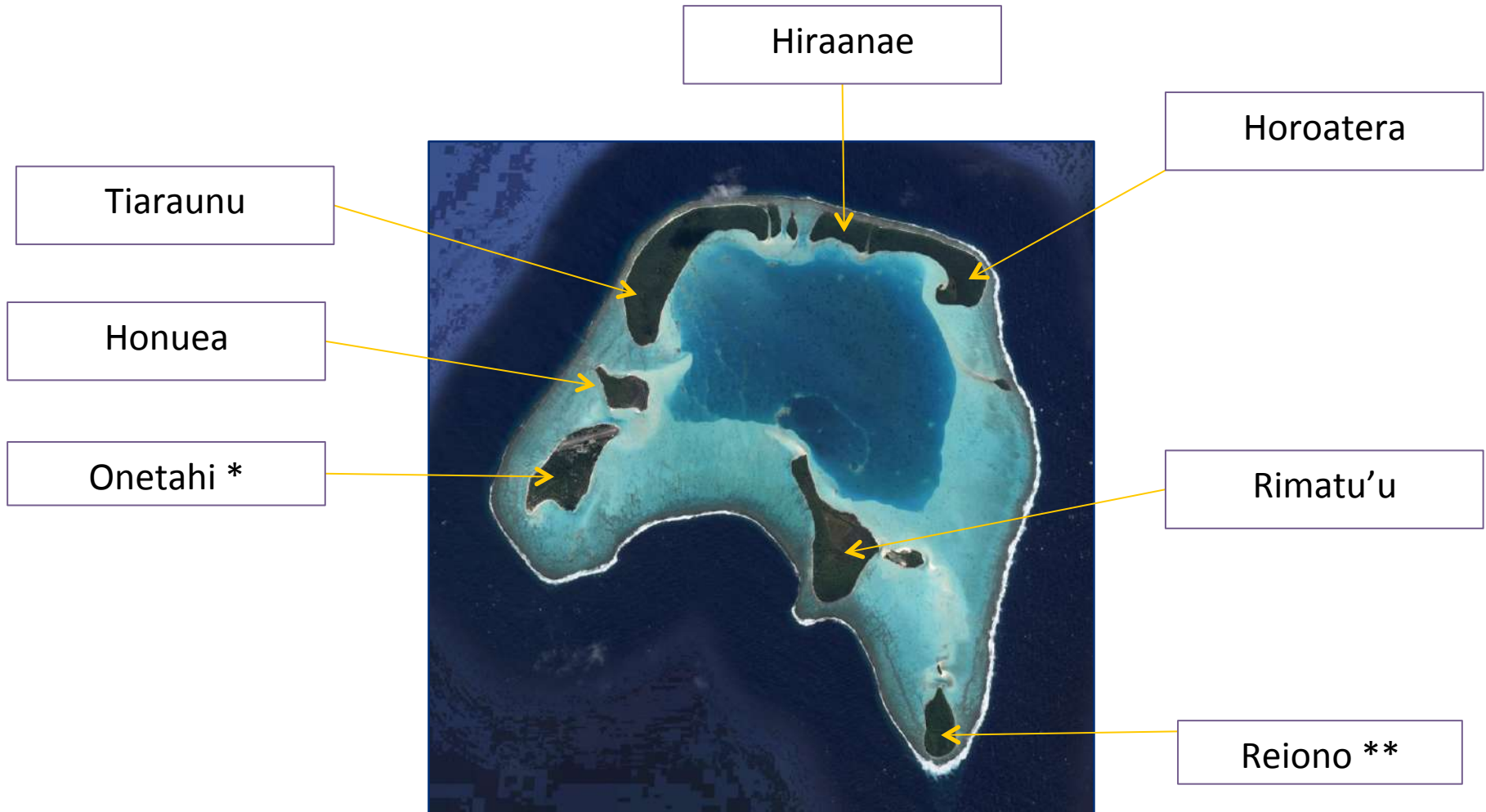
Between 2007 and 2012 4 different kaveu studies have been requested by Direction of Environment

	<i>Taiaro</i>	<i>Aratika</i>	<i>Niau</i>	<i>Makatea</i>
<b>Année</b>	2012	2010	2009	2007
<b>Mois</b>	2-12 Décembre	14 - 28 Juillet	4 - 18 sept	18 avril - 11 mai
<b>data</b>				
<b>Densité/ha</b>	298	60 / 100	80 / 133	234 / 390
<b>sex ratio M:F</b>	1:0,62	1:1	1:1,49	1:0,39
<b>taille moyenne</b>	38,74	38,22	43,14	34,6

Results show sex ratio and density with large difference amongst populations

# Tetiaroa

- Selected motu studied



\* Not included in the results \*\* *Motu monitored 2 times*



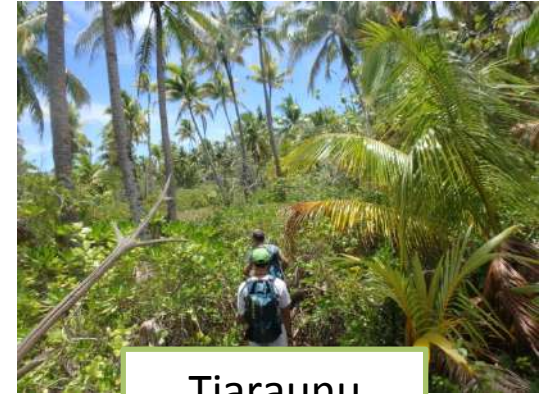
# A vegetation diversity



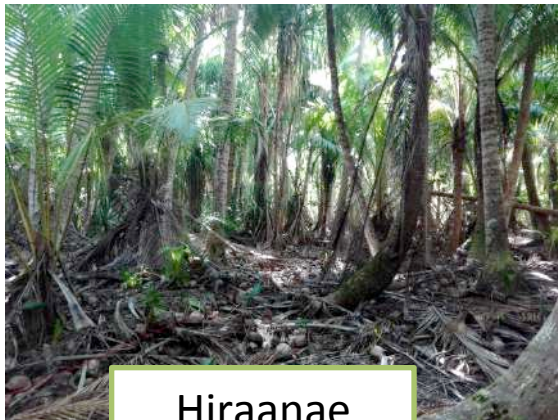
Honuea



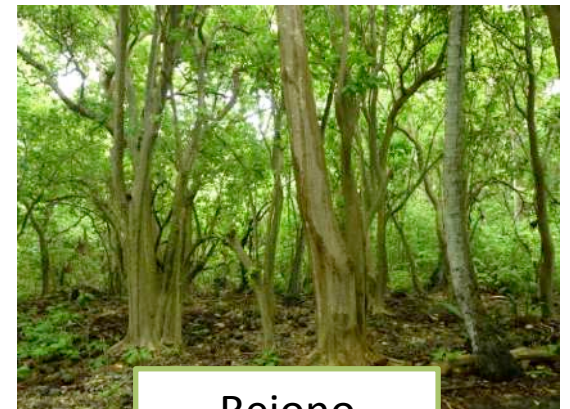
Tiaraunu



Tiaraunu



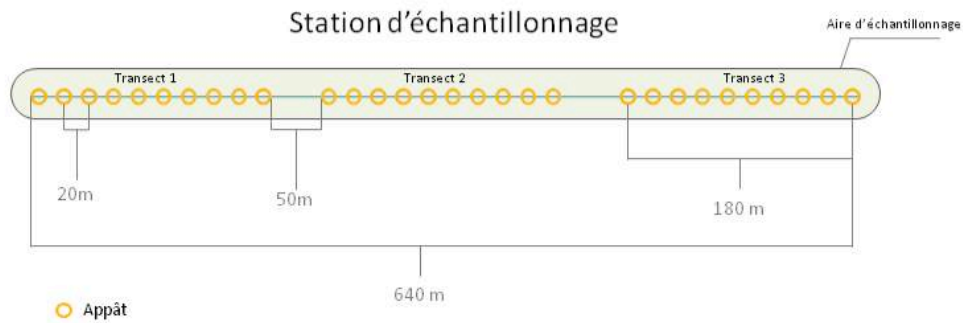
Hiraanae



Reiono

# Protocol

Bait-laying between  
13:00 et 15:00



capture

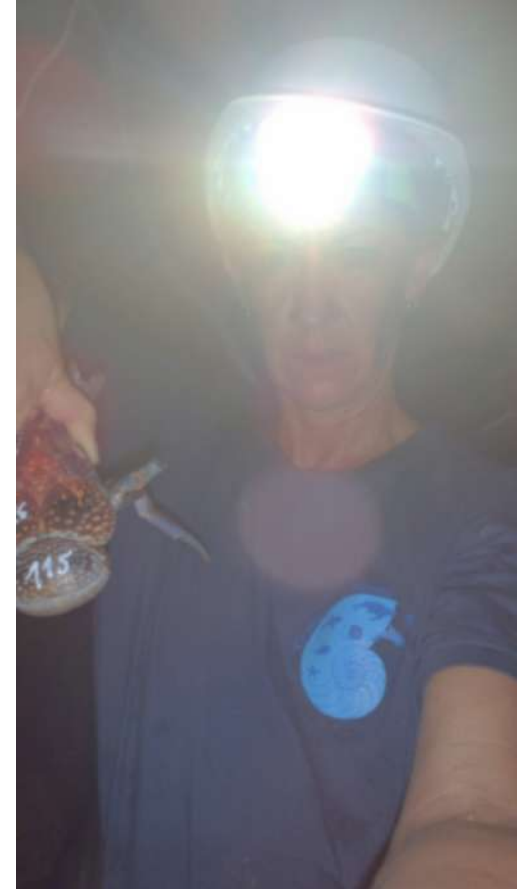


Thoracique length mesuring  
and sex determination

tagging



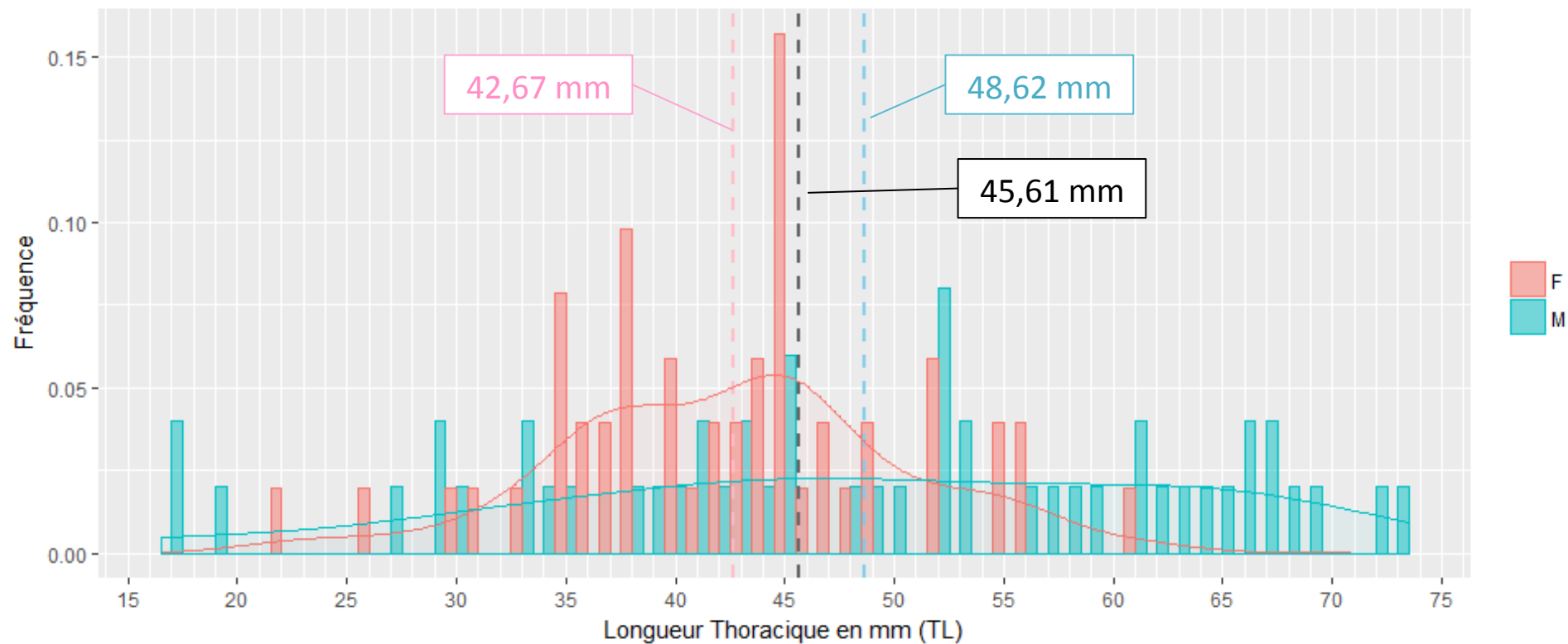




# Results

- Sizes distribution in the population

Distribution des tailles des individus dans la population (M/F)

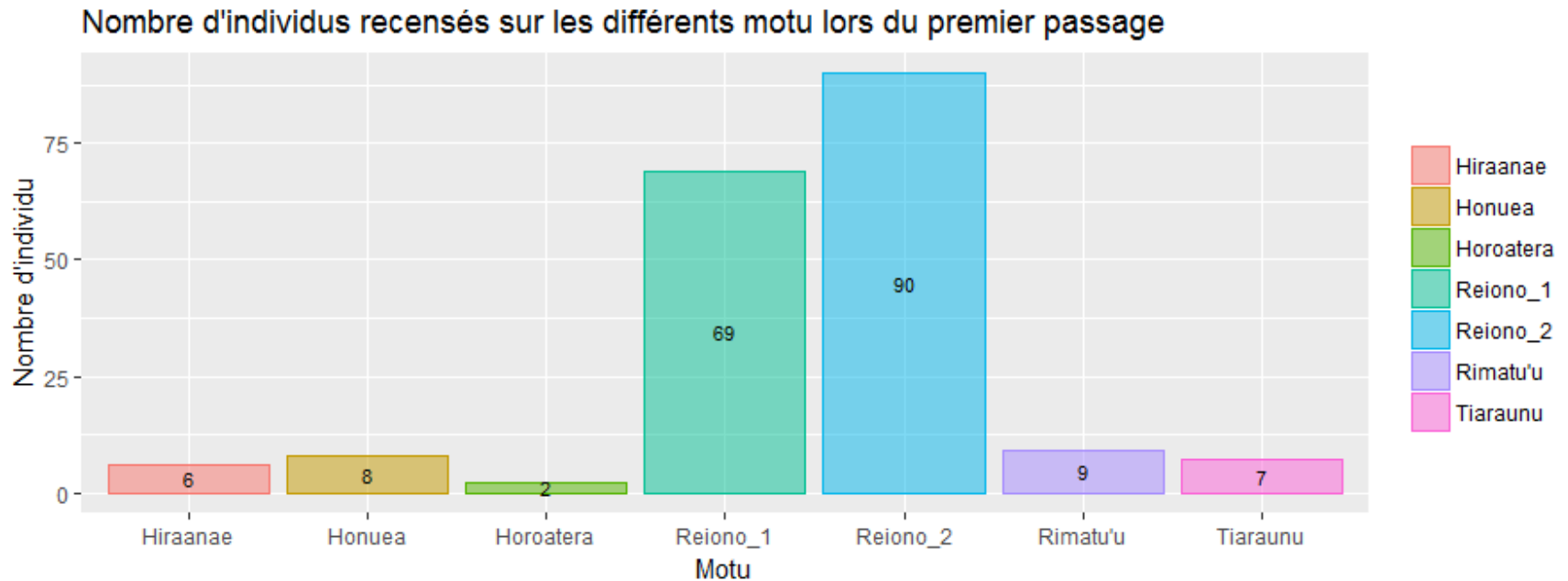


Size difference between male and female was expected



# Results

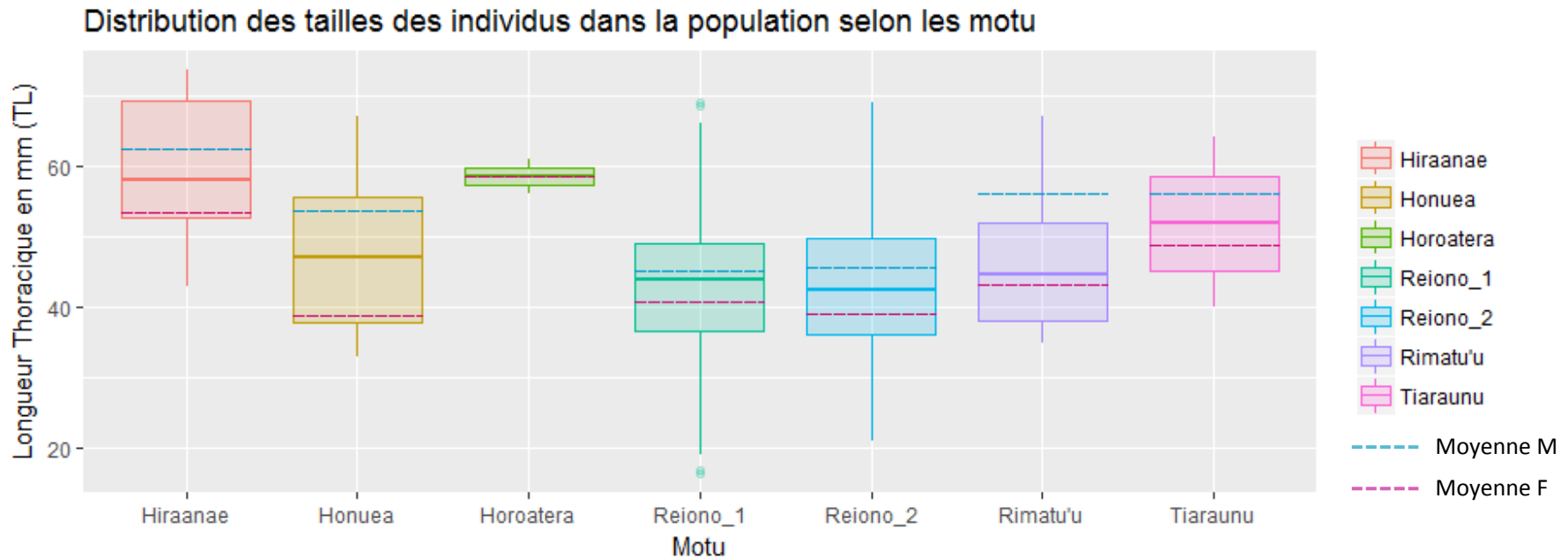
- Number of catch



Reiono have the highest rate of capturability and highest crab density

# Results

- Sizes distribution according to the *motu*



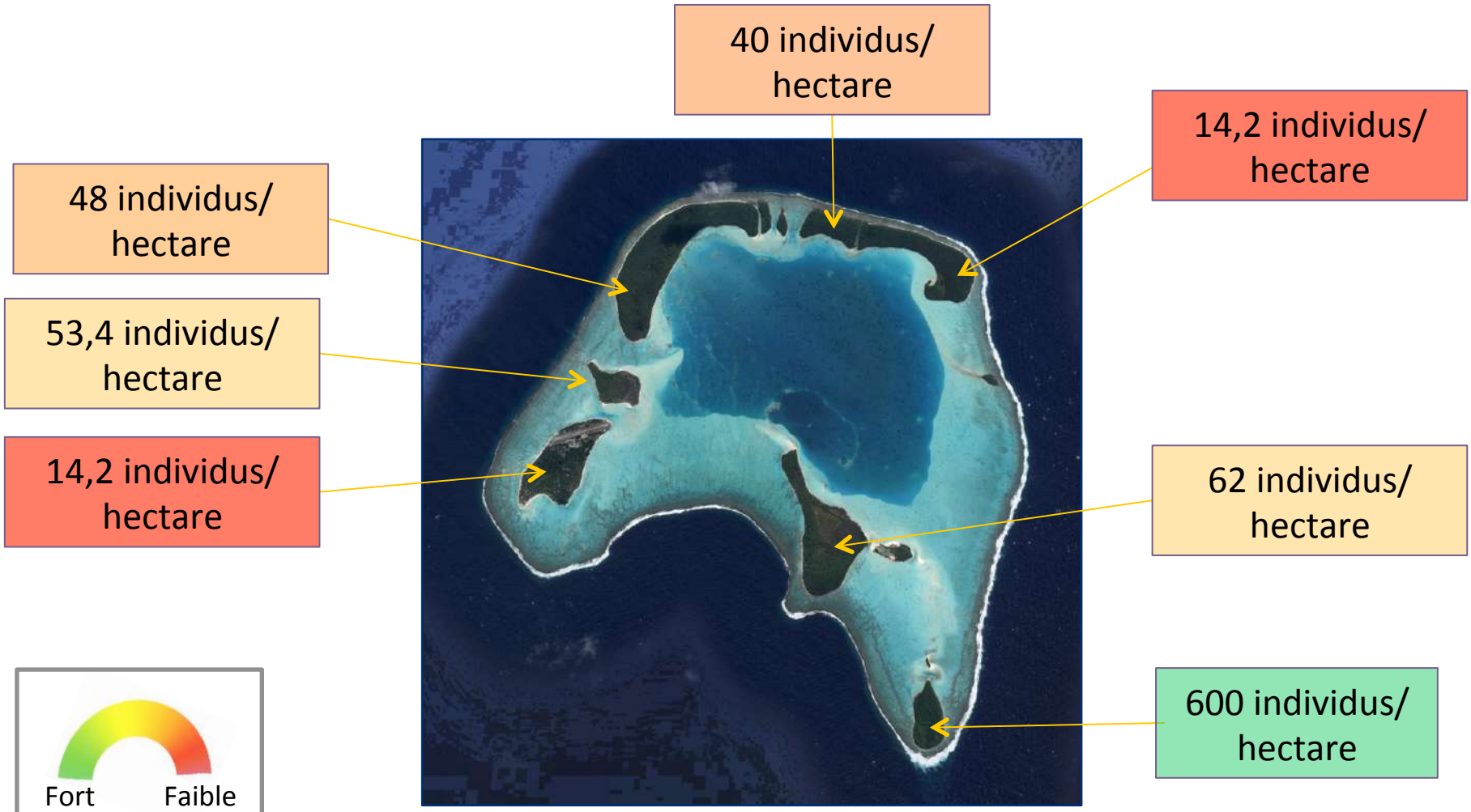
Individual with LT < 30 mm have been catch only on  
*Reiono*

➤ **Onetahi:** few adults  
but higher number of  
juveniels

# Tetiaroa

- Population density

**On the atoll:**  
72,1 individus/ hectare



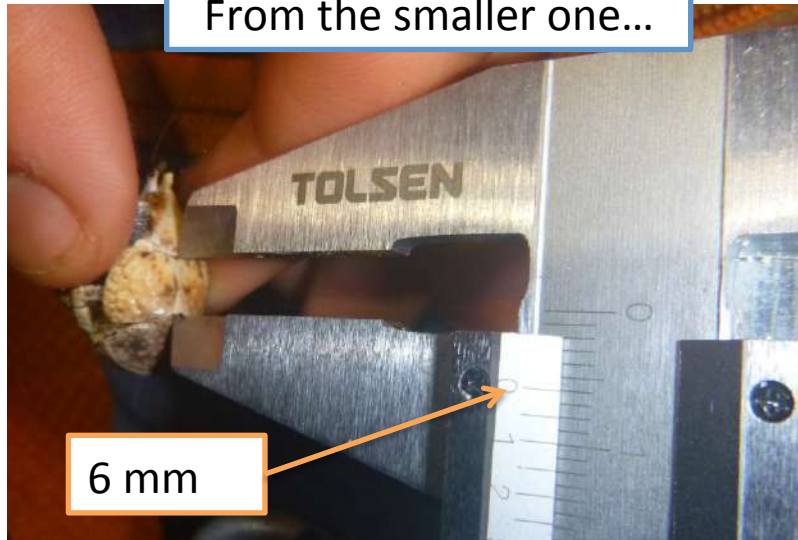
# Color diversity



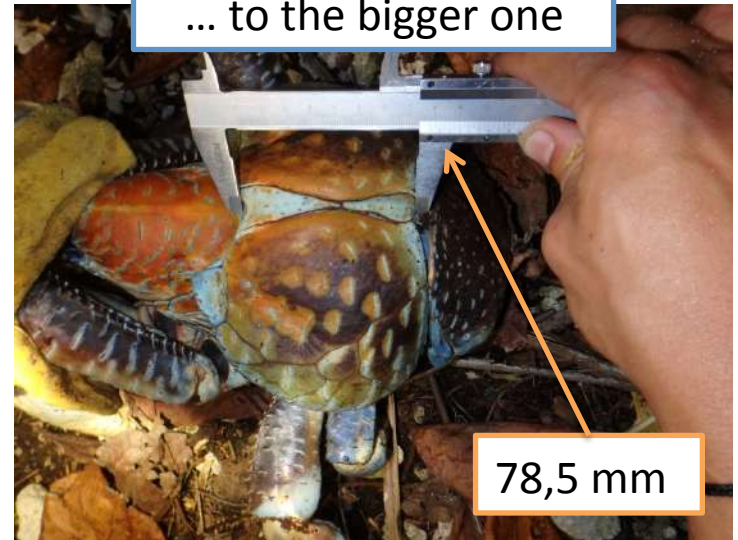


# Every sizes

From the smaller one...



... to the bigger one



# Predation marks



# Conclusion

- Population density are very different, but Reiono has the highest density among all studies in FP
- The sex ratio is balanced
- Low number of juveniles is probably due to a rat predation
- Tetiaroa population density (72 individus par hectare) is low compared to the different studies done in French Polynesia. However Reiono in itself is AN EXCEPTION and needs to be PROTECTED and STUDIED

# Perspectives

## **a/ Continue the monitoring focusing on two time intervals:**

1/ **Every month on Reiono motu** in order to document and better understand the reproductive cycle of *kaveu* in this Pacific area (not documented at the moment). That study is based on the *kaveu* density of *kaveu* on this motu and furthermore it is the one motu on which rat eradication will occur in the next year. This will enable us to monitor juvenile density.

For larger *kaveu* we may use another, more permanent marking process (cold marking) in order to better understand their movement patterns.

Monitor the Reiono beaches at night to try and observe larvae climbing back inshore and also the movement of adult crabs

Monitor the crab molting periods on Reiono using non-invasive methods like motion activated cameras as well as reproduction phase –mating

2/ **Every year: On the same motu (7)** we have monitored in this study (with Onetahi) data collection will be continued in order to follow long term development of the population. Protection and surveillance will be increased by the Tetiaroa Society who prohibits poaching of *kaveu* on the atoll.

b/ **Document *kaveu* life stages and larval recruitment.** There is the opportunity to work with CRIOBE which is leading a project of PCC (), and evaluate larval density of *kaveu*

Observe beached use by larvae stages and adults during reproduction periods on Reiono

Study *kaveu* larvae by having eggs hatching in a tank at Ecostation and monitor their growth

c/ **Study specific growth of the youngest *kaveu* found on Reiono and Onetahi and create a nursery for *kaveu* on Onetahi** to study their growth, their successive molting (max 15 individual both sex)

d/ **Perform genetic study** of *kaveu* populations on Tetiaroa to have a better understanding of distribution and evolution and include this in a genetic project for French Polynesia.

e/ **Develop an awareness campaign** for The Brando staff and service contractors living on Tetiaroa in order for them to respect the prohibition of harvesting *kaveu* but also for them to participate in the data collection. Develop curriculum for local school and conference for adult public



**Put in place a long-term *kaveu* sanctuary on with the support of by  
Direction of Environment in French Polynesia and accordig to the  
CASUP conservations plan of Tetiaroa Society.**



We need to study them and learn more...

