

Ecology of *Anopheles* mosquito and transmission of malaria and lymphatic filariasis in rural-suburban settings in rice growing areas, Côte d'Ivoire



www.csrs.ch

Dr. Julien Zahouli

30.6.18

Institution : Centre Suisse de Recherches Scientifiques (CSRS)

City & Country : Abidjan, Côte d'Ivoire

Department : Research & Development

Website : www.csrs.ch

Conference : ANH 2019, Hyderabad, India

Place : The Westin Mindspace Hotel

Session & Room : Session 6B ; Ballroom 1

Date & Time : June 27, 2019 ; 2:10 pm - 3:30 pm

CONTENT

- **Introduction**
- **Methods**
- **Results & Discussion**
- **Conclusions**

INTRODUCTION

INTRODUCTION

➤ Malaria & lymphatic filariasis (LF)

- Malaria: 450,000 deaths/y, FL: 120 million cases/y (Sub-Sahar. Africa)

➤ Côte d'Ivoire

■ Diseases

- Prevalent: Rural/suburban in **rice growing areas**



Rice growing

■ Vectors

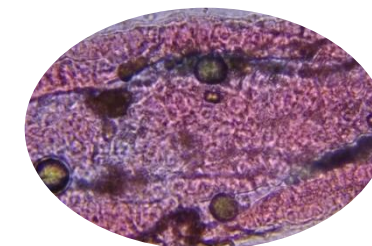
- *Anopheles gambiae* mosquito



An. gambiae

■ Parasites

- *Plasmodium falciparum*
- *Wuchereria bancrofti*



P. falciparum



W. bancrofti

➤ Aim

- ✦ To assess the ecology of *An. gambiae* and the transmission of *Plasmodium* and *Wuchereria* along a rural-urban gradient in irrigated rice growing areas

➤ Specific objectives

- ✦ Species composition of mosquitoes & dynamics of *An. gambiae*;
- ✦ Biting & resting behaviours of *An. gambiae* females;
- ✦ Transmission of *P. falciparum* & *W. bancrofti* by *An. gambiae*.

METHODS

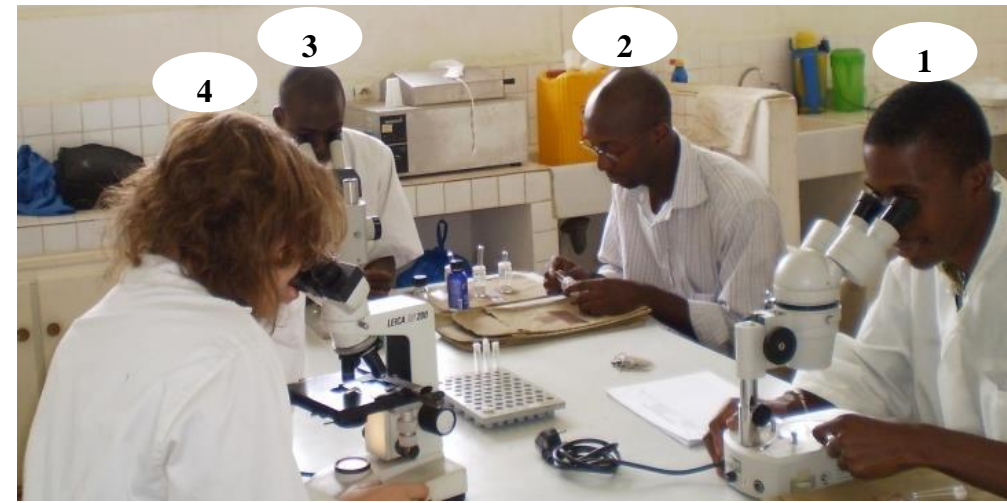
METHODS



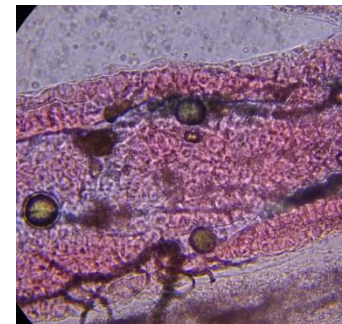
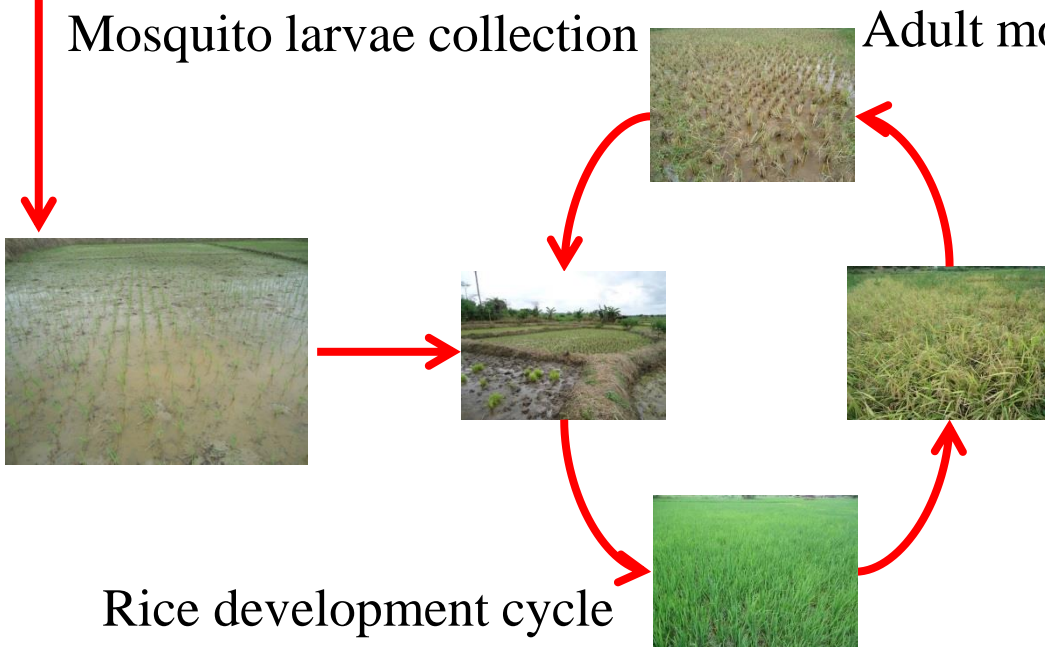
Mosquito larvae collection



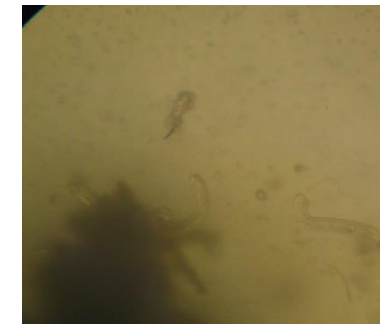
Adult mosquito collection



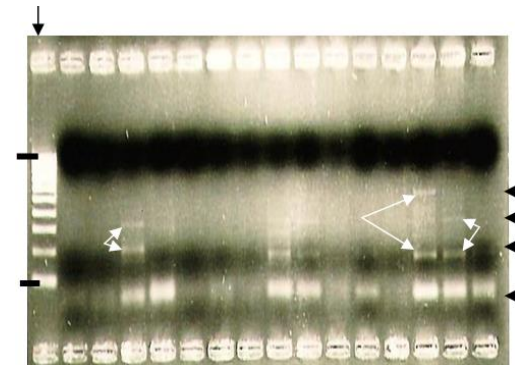
Laboratory treatment



P. falciparum



W. bancrofti



PCR technique

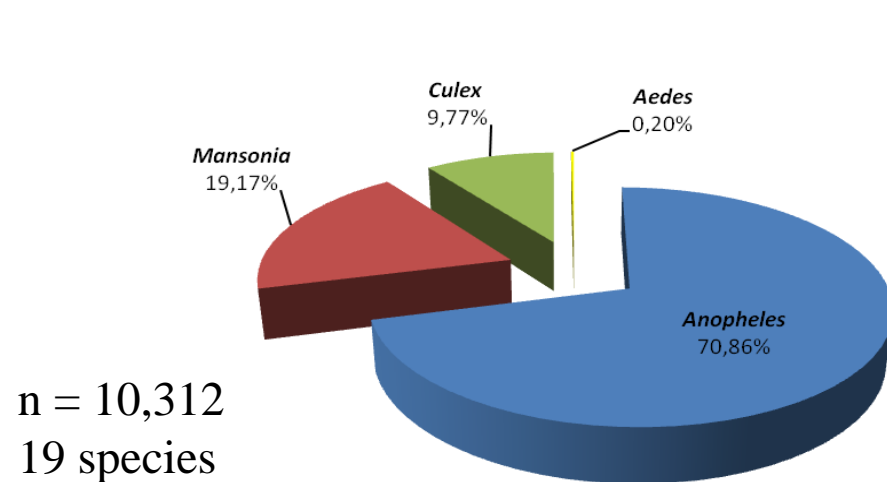
RESULTS & DISCUSSION

RESULTS & DISCUSSION

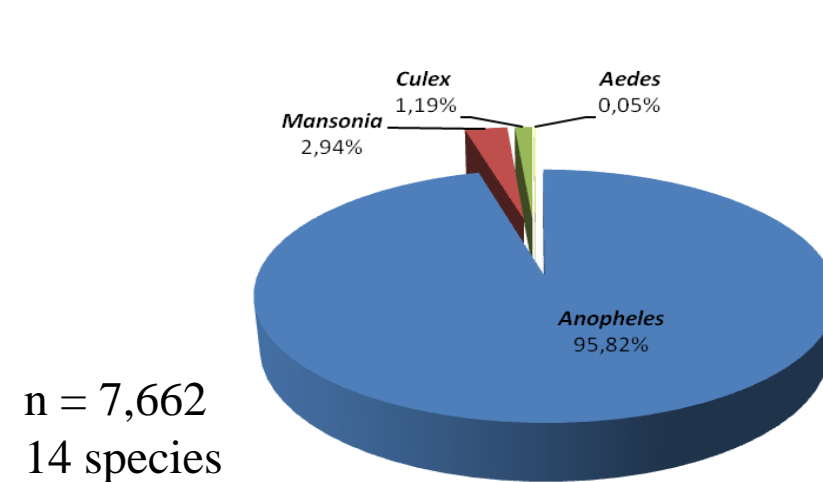
➤ Dominance of *Anopheles* genus & *An. gambiae* species

Mosquito genera

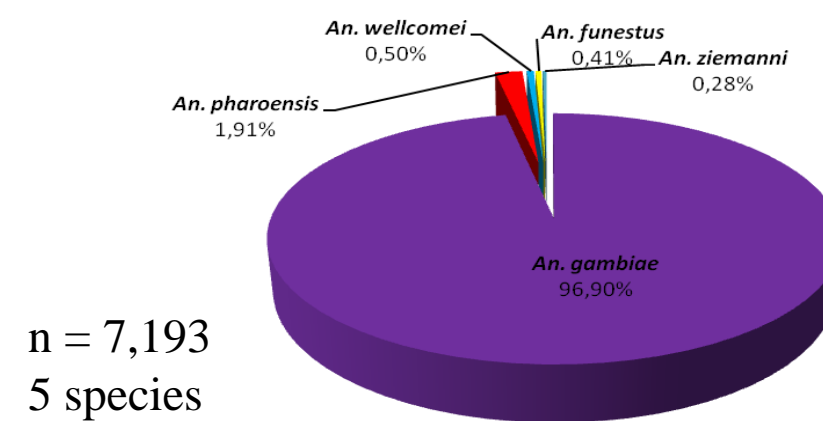
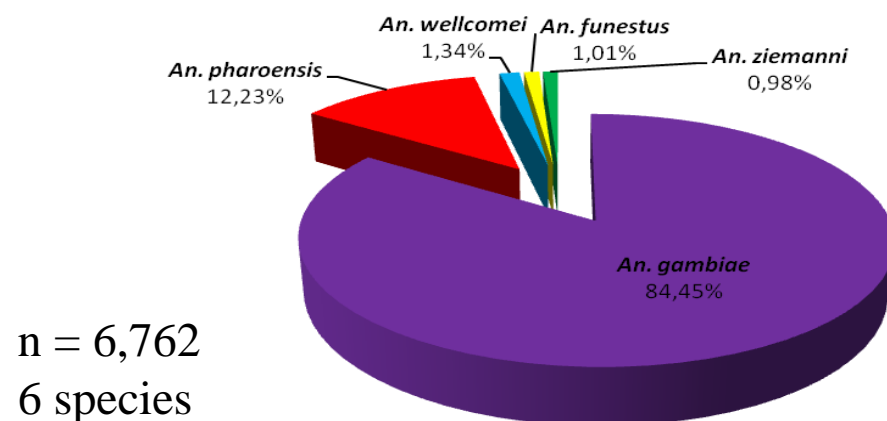
Rural



Suburban

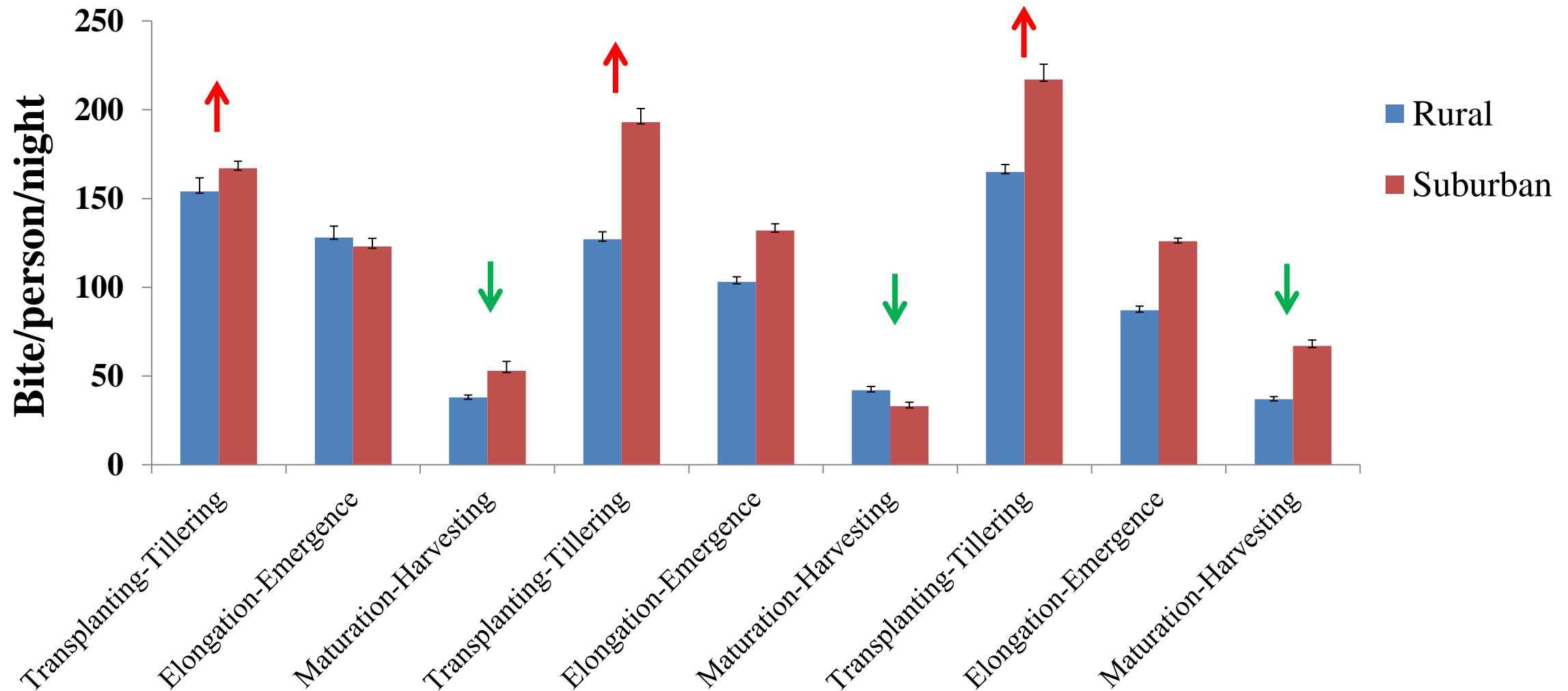


Anopheles species



RESULTS & DISCUSSION

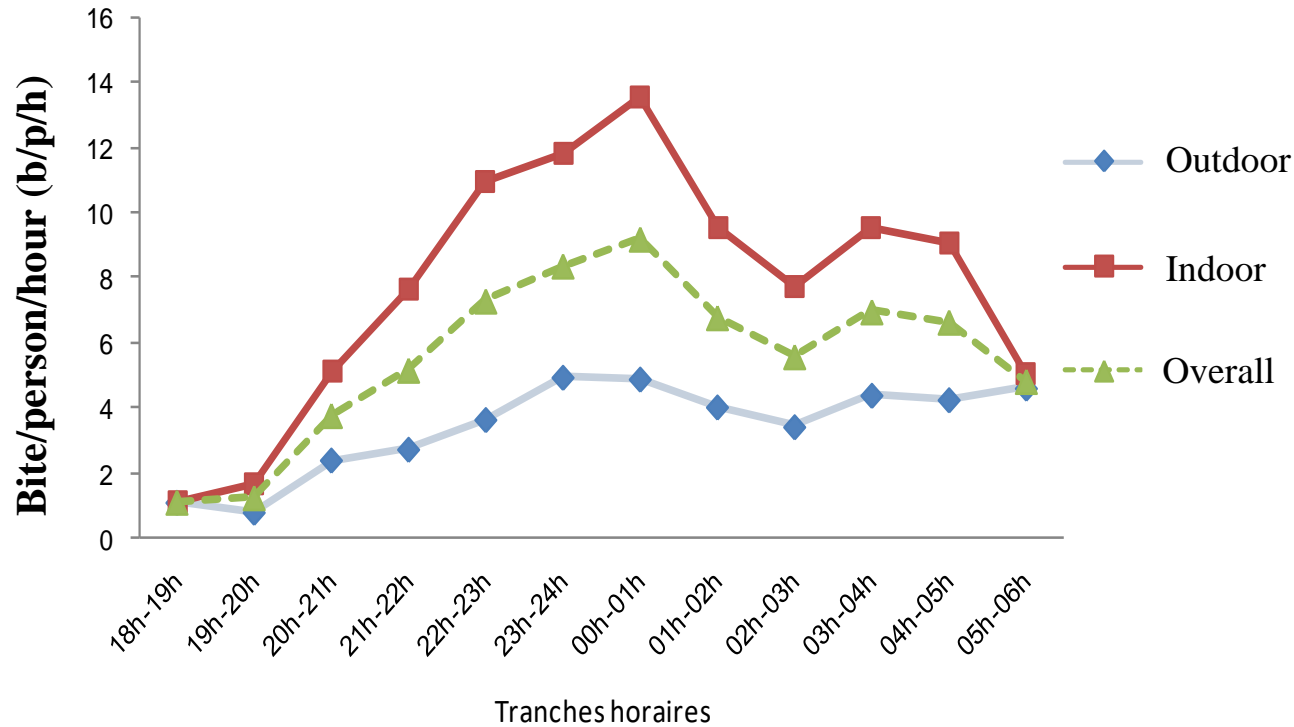
➤ *An. gambiae* abundance correlated to rice field development stage



RESULTS & DISCUSSION

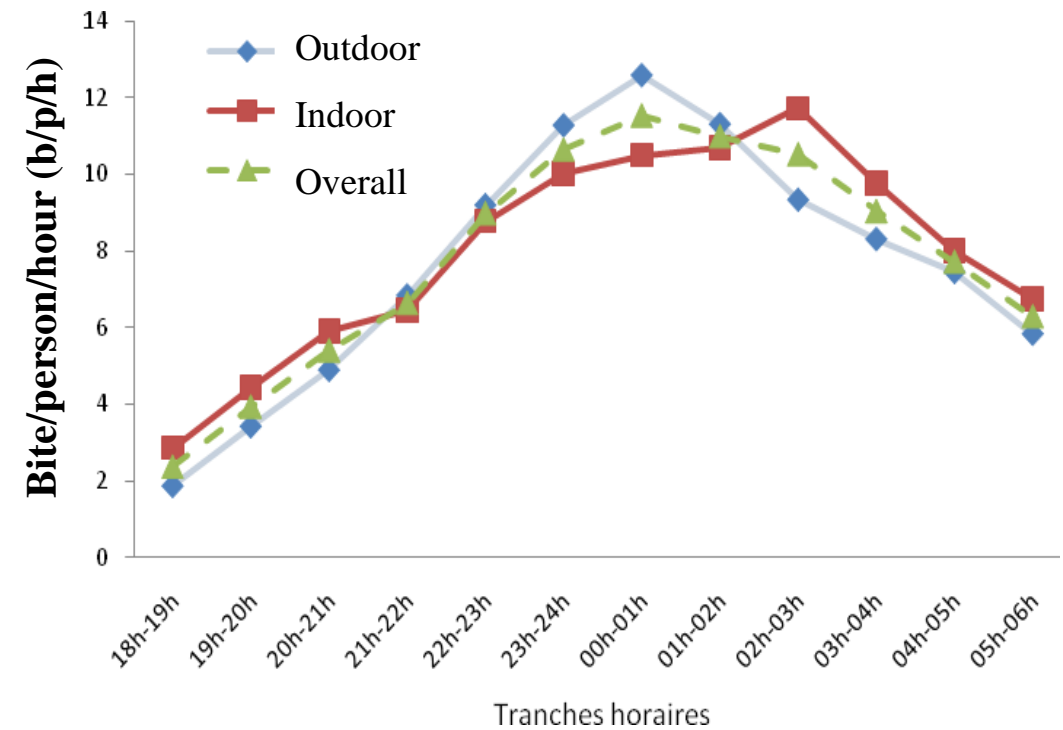
➤ Divergences in *An. gambiae* biting behaviours: Challenge for LLINs?

Rural



Endophagy = **67.4%** ; Exophagy = **32.6%** ; LLINs: **Yes**

Suburban

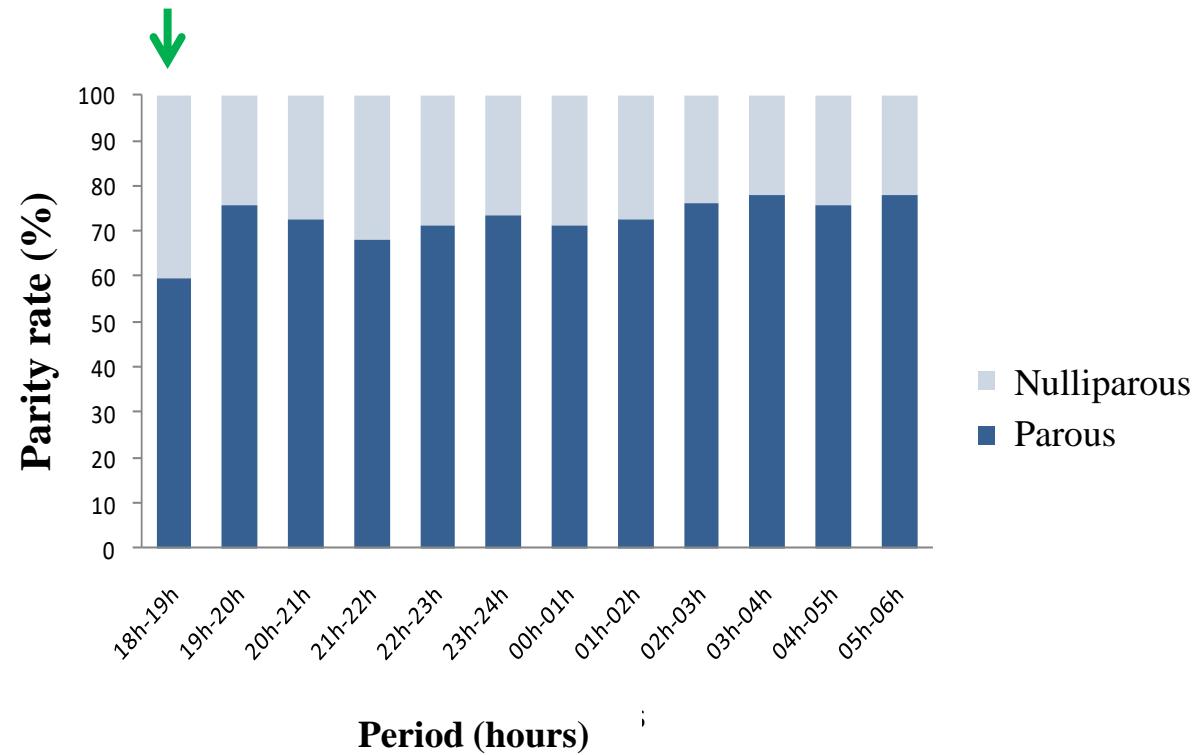


Endophagy = **49.3%** ; Exophagy: **50.7%** ; LLINs: **no?**

RESULTS & DISCUSSION

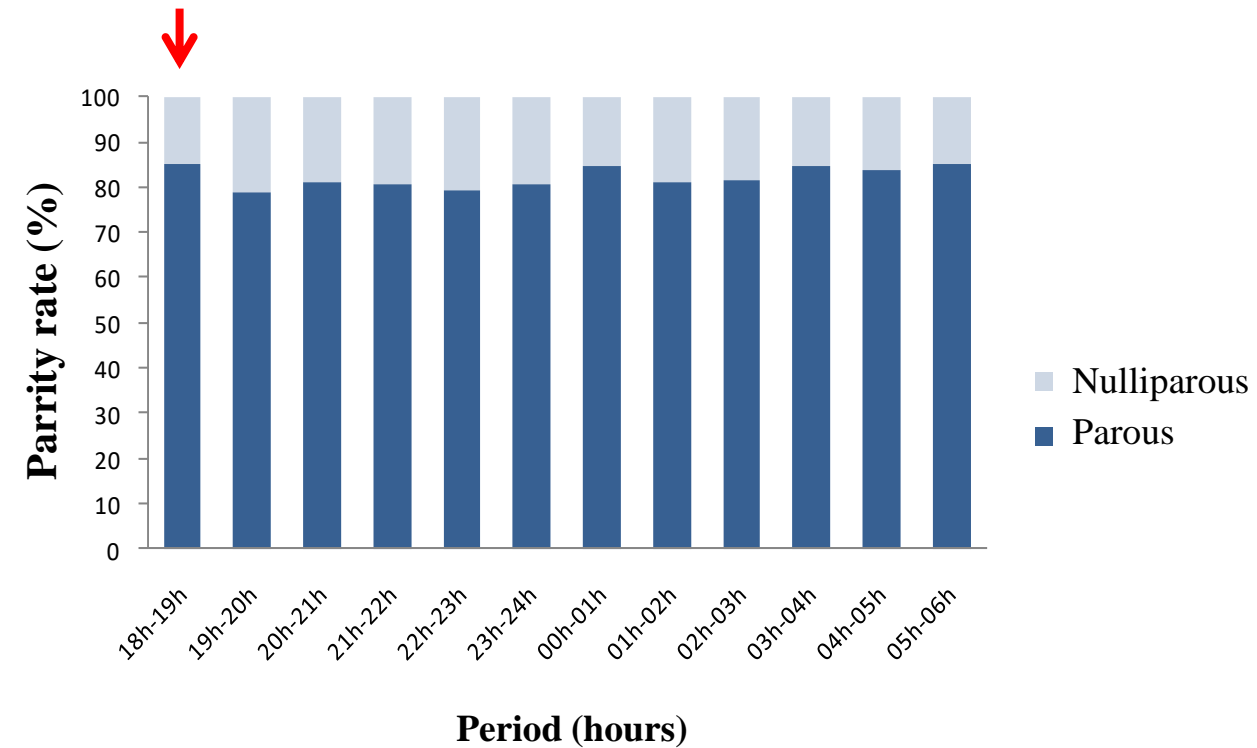
➤ Difference in the temporal distribution of *An. gambiae* parity rate

Rural



Parturity rate = **75.8%**

Suburban



Parturity rate = **84.5%**

➤ Heterogeneous biting & resting behaviour in *An. gambiae*

	Endophagic rate (%)	Exophagic rate (%)	Indoor resting density (f/b/d)
Rural	67.4	32.6	14.9
Suburban	49.3	50.7	2.9

%: percentage f/c/j: female/bedroom/day d: day

➤ *P. falciparum* & *W. bancrofti* transmitted by *An. gambiae*

	Biting rate (b/p/n)	<i>P. falciparum</i> EIR (ib/p/n)	<i>W. Bancrofti</i> IR (%)
Rural	92.2	6.5	0.34
Suburban	99.0	6.4	0.53

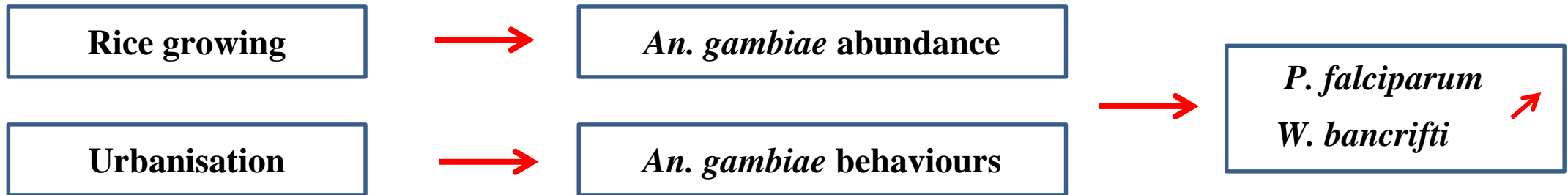
b/p/n : bite/person/night ib/p/y : infectd bite/person/night EIR: entomological inoculation rate IR: Infection rate

CONCLUSIONS

CONCLUSIONS

➤ Conclusion, Perspectives & Recommendations

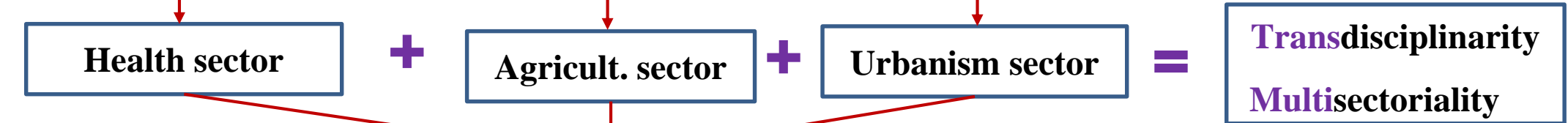
Results



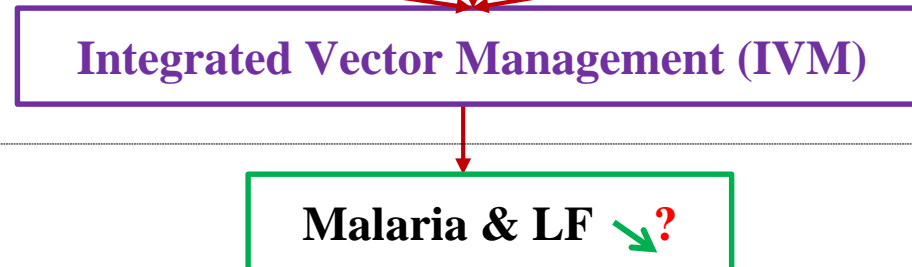
Research



Intervention



Outcomes



ACKNOWLEDGEMENT

CSRS
Centre Suisse de Recherches
Scientifiques en Côte d'Ivoire



CSRS

Centre Suisse de Recherches
Scientifiques en Côte d'Ivoire

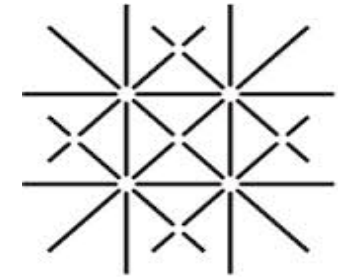


Swiss TPH



Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Associated Institute of the University of Basel



**UNI
BASEL**



UAO
Université Alassane Ouattara

