



Knowledge Translation Platform

Feedback: From the last dengue fever season to a better prevention

Presentation of the first results of the entomological study

Present by Dr. Didot PRASETYO
Entomology supervisor from US NAMRU 2



FOR RESEARCH, FOR HEALTH,
FOR OUR FUTURE



Activities implemented

🍌 Entomological Study in Kampong Chnang & Kampong Speu

- **Species inventory (conducted by NAMRU-2 & IPC)**

Mosquito trapping and species identification to obtain list of mosquito species that present in the area

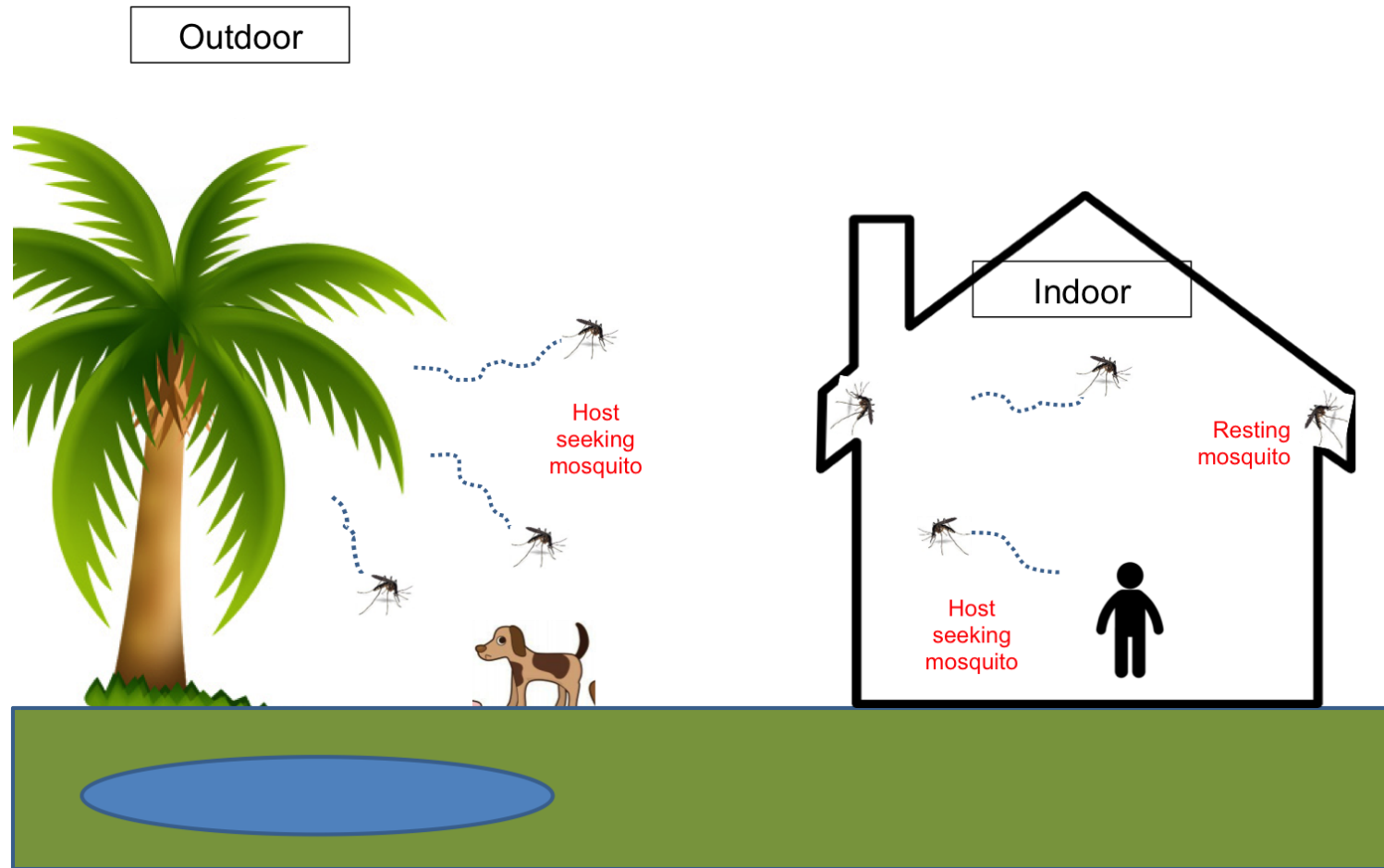
- **Mosquito population dynamic (conducted by IPC)**

Monitor the changes in total mosquito number/biomass for a certain period of time



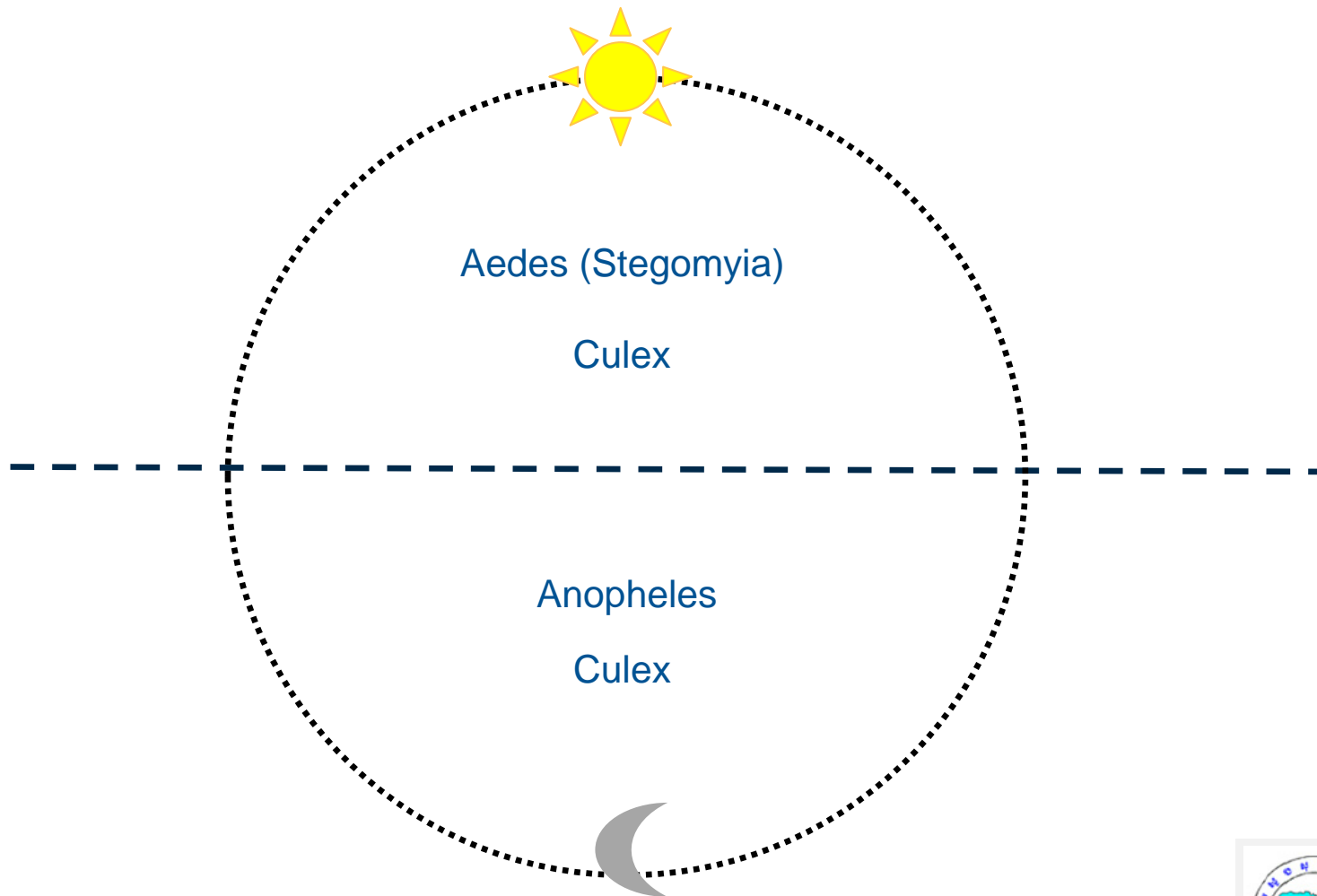
Species Inventory

Mosquito habitat differences (indoor/outdoor)



Species Inventory

Mosquito Active time differences (day/night)



Species Inventory: methods

Differences in outdoor/indoor preferences and active time

→ deployment of several kind mosquito traps

Traps used in this study:

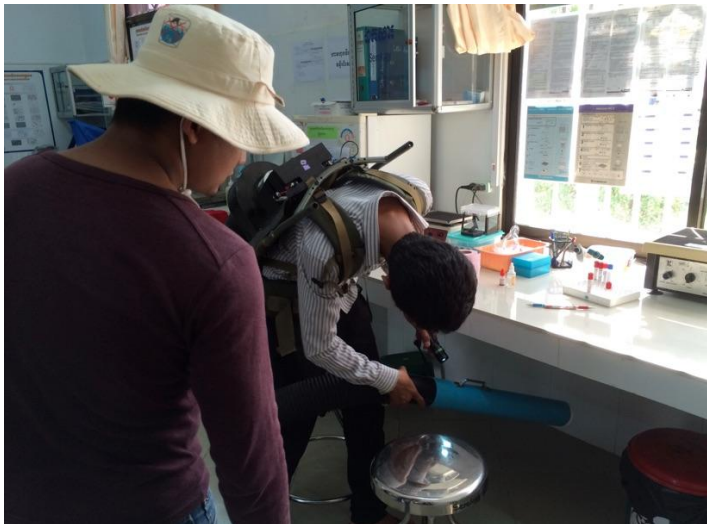
1. Backpack aspirator
2. BG sentinel traps
3. Light Traps
4. Double Bed Net



Species Inventory: methods

1. Backpack Aspirator

- Works like vacuum
- Used in 10 randomly selected house per village
- 10 minutes per house
- Capture indoor host seeking & resting mosquito



Species Inventory: methods

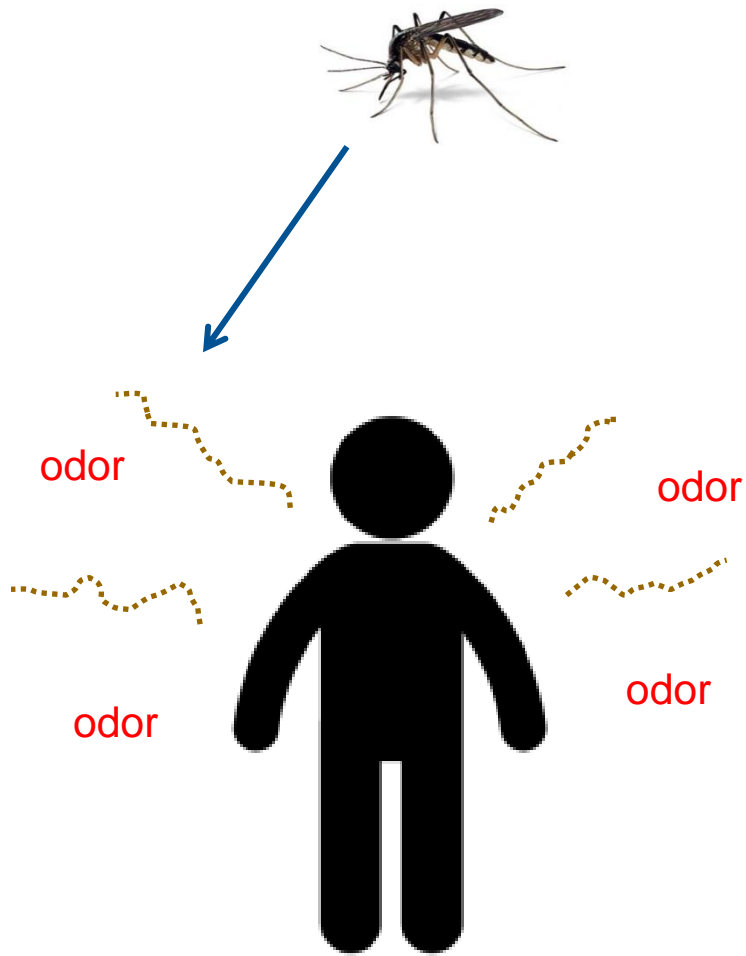
2. BG sentinel traps

- Using human skin chemical → attract mosquito
- Deployed one trap per village
- 24 hours collection
- Capture indoor host seeking mosquito



Species Inventory: methods

How BG Trap works?



By mimicking human odor to attract mosquito

Attracted mosquito will fly near the trap, and then sucked into collecting net by fan



Species Inventory: methods

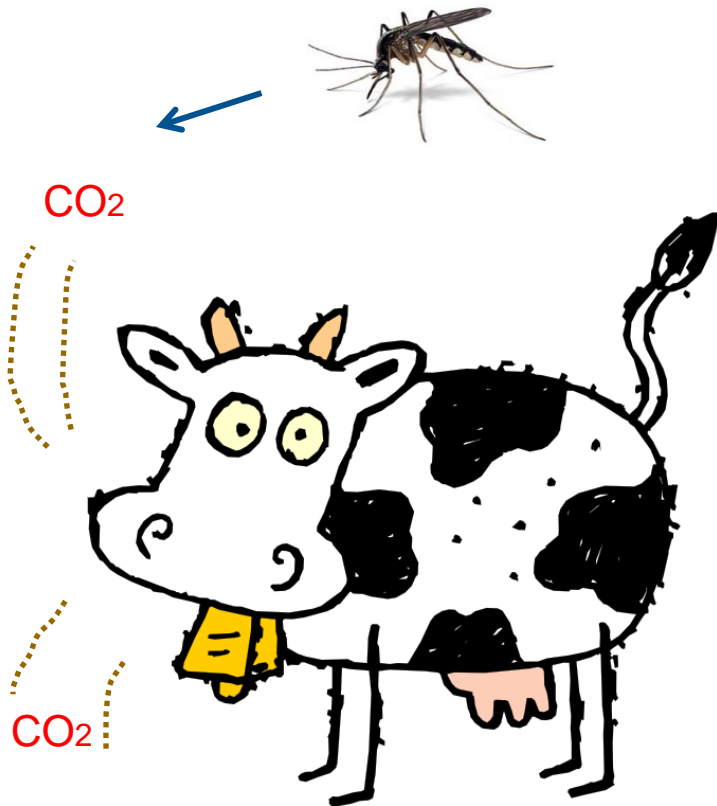
3. Light Traps

- Using two attractants : Light and CO₂
- Deployed two traps per village
- Capture night host seeking mosquito



Species Inventory: methods

How Light Trap works?



attracted to CO₂ from Dry Ice



Species Inventory: methods

4. Double bed Net

- Using human as bait
- inner layer to protect human bait
- outer layer of net have approximately 10 cm of opening to trap mosquito
- Trapped mosquito were collected by 2nd volunteer using mouth aspirator
- Deployed six traps per village with both day (06.00 – 17.00) and night (17.00-21.00) collection



Species Inventory: Results

1. In total 2001 mosquitoes collected at villages in Kampong Chnang Province

- Backpack Aspirator: **2.2** mosquitoes per house
- BGS trap: **3.5** mosquitoes per trap per 24 hours
- Light Trap: **69.4** mosquitoes per trap per 12 hours
- Double bed net day time: **7.5** mosquitoes per trap per 11 hours
- Double bed net night time: **30.4** mosquitoes per trap per 4 hours

2. Consists of 31 Species in 10 Genera



Species Inventory: Results

Mosquitoes in Kampong Chnang villages

	Species	Proportion (%)	Total Number
Dengue & CHIK vector	<i>Aedes (stegomyia) aegypti</i>	2.9	58
	<i>Aedes (stegomyia) albopictus</i>	0.9	18
	<i>Aedes (Aedimorphus) mediolineatus</i>	0.6	12
CHIK vector	<i>Aedes (Fredwardsius) vittatus</i>	0.6	13
Secondary malaria vector	<i>Anopheles (cellia) phillipinensis</i>	3.9	78
	<i>Anopheles (cellia) karwari</i>	1.5	30
	<i>Anopheles (cellia) vagus</i>	1.7	35
Possible malaria vector	<i>Anopheles (Anopheles) argyropus</i>	1.2	24
	<i>Anopheles (Anopheles) barbirostris Group</i>	0.5	10
	<i>Anopheles (Anopheles) nigerimus</i>	0.2	5
	<i>Anopheles (Anopheles) nitidus</i>	0	1
	<i>Anopheles (cellia) kochi</i>	0	1
	<i>Anopheles (cellia) subpictus</i>	0	1
	<i>Anopheles (cellia) spp Unidentified</i>	2.8	56
	<i>Anopheles (Anopheles) spp Unidentified</i>	2.2	45
Japanese Encephalitis	<i>Culex vishnui Group</i>	19.9	399
	<i>Culex whitmorei</i>	9.6	193
	<i>Culex fuscocephala</i>	3.4	68
	<i>Culex gelidus</i>	3.1	62
	<i>Culex tritaeniorhynchus</i>	2.7	54
	<i>Culex bitaeniorhynchus</i>	0.7	15
Filariasis	<i>Culex sinensis</i>	11.6	233
	<i>Culex quinquefasciatus</i>	5.1	102
	<i>Culex nigropunctatus</i>	0	1
	<i>Culex brevipalpis</i>	0	1
	<i>Culex spp Unidentified</i>	9	181



Species Inventory: Results

Mosquitoes in Kampong Chnang villages

	Species	Proportion (%)	Total Number
Filariasis	<i>Mansonia uniformis</i>	7.2	145
	<i>Mansonia annulifera</i>	0.3	7
	<i>Mansonia spp</i>	0.4	9
Filariasis	<i>Armigeres subalbatus</i>	5.4	108
	<i>Armigeres spp</i>	0.5	11
	<i>Leicesteria spp</i>	0.5	10
	<i>Uranotaenia spp</i>	0.1	3
	<i>Verralina spp</i>	0.2	5
	<i>Zeugomyia spp</i>	0.0	1
	<i>Coquillettidia crassipes</i>	0.3	6

Species Inventory: Results

Mosquitoes in Kampong Chnang Hospital

Backpack Aspirator

	Species	Proportion (%)	Total Number
Dengue & CHIK vector ←	Aedes		
	<i>Aedes (stegomyia) aegypti</i>	6.4	13
Possible malaria vector	Anopheles		
	<i>Anopheles (Anopheles) campestris</i>	0.5	1
	<i>Anopheles (cellia) vagus</i>	0.5	1
	<i>Anopheles (cellia) spp</i>	0.5	1
Filariasis ← Japanese Encephalitis ←	Culex		
	<i>Culex quinquefasciatus</i>	87.7	179
	<i>Culex tritaeniorhynchus</i>	3.4	7
	<i>Culex spp</i>	1.0	2
	TOTAL		204

Light Trap

	Species	Proportion (%)	Total Number
Japanese Encephalitis ← Filariasis ←	<i>Culex tritaeniorhynchus</i>	68.8	11
	<i>Culex quinquefasciatus</i>	18.8	3
	<i>Culex gelidus</i>	12.5	2
	TOTAL		16

Species Inventory: Results

Mosquitoes in Kampong Speu Hospital

Dengue & CHIK vector ←

Possible malaria vector

Filariasis and Japanese Encephalitis vector

Backpack Aspirator

Species	Proportion (%)	Total Number
Aedes		
<i>Aedes (stegomyia) aegypti</i>	14.9	35
Anopheles		
<i>Anopheles (cellia) vagus</i>	5.1	12
<i>Anopheles (cellia) spp</i>	2.1	5
Culex		
<i>Culex quinquefasciatus</i>	76.6	180
<i>Culex gelidus</i>	0.9	2
<i>Culex vishnui Group</i>	0.4	1
TOTAL		235

Light Trap

Dengue & CHIK vector ←

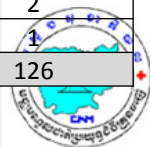
Secondary malaria vector

Japanese encephalitis

Filariasis ←

Filariasis

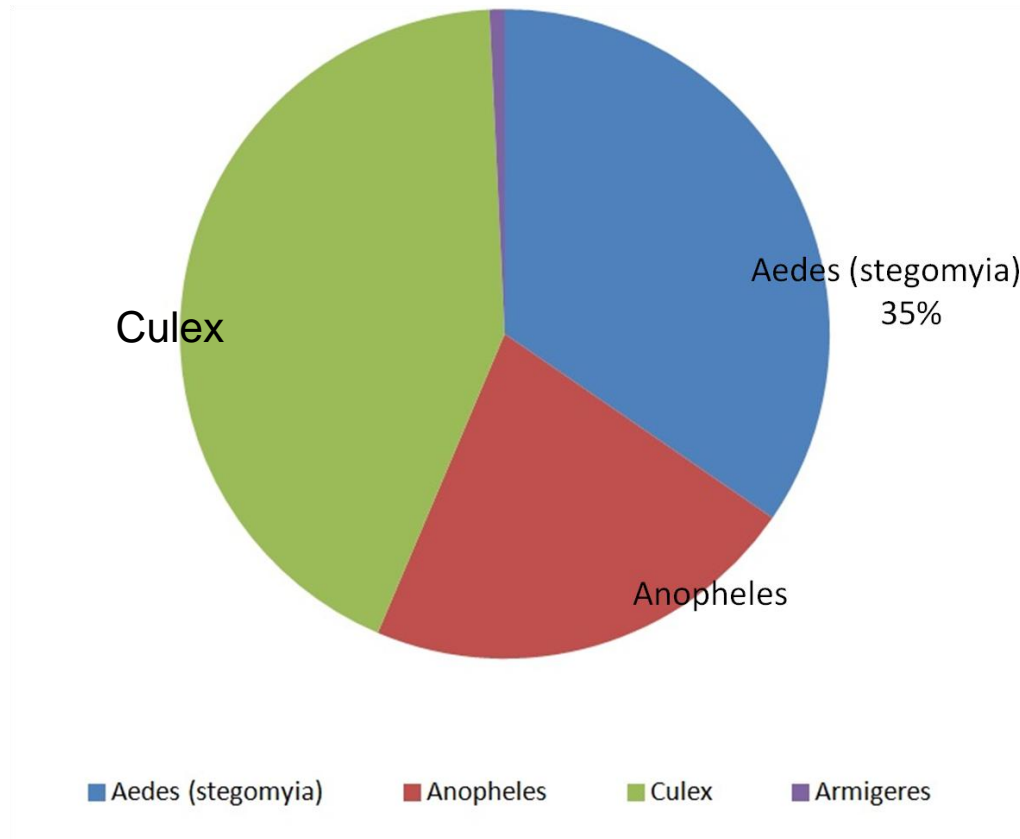
Species	Proportion (%)	Total Number
Aedes		
<i>Aedes (aedimorphus) mediolineatus</i>	23.8	30
<i>Aedes (stegomyia) aegypti</i>	0.8	1
Anopheles		
<i>Anopheles (cellia) philippinensis</i>	0.8	1
Culex		
<i>Culex fuscocephala</i>	37.3	47
<i>Culex tritaeniorhynchus</i>	14.3	18
<i>Culex gelidus</i>	9.5	12
<i>Culex nigropunctatus</i>	4.0	5
<i>Culex quinquefasciatus</i>	0.8	1
<i>Culex whitmorei</i>	0.8	1
Mansonia		
<i>Mansonia uniformis</i>	3.2	4
<i>Mansonia annulifera</i>	2.4	3
<i>Mansonia spp</i>	1.6	2
Coquillettidia	0.8	1
TOTAL		126



Species Inventory: Results

Backpack aspirator (indoor mosquitoes) in K Chnang villages

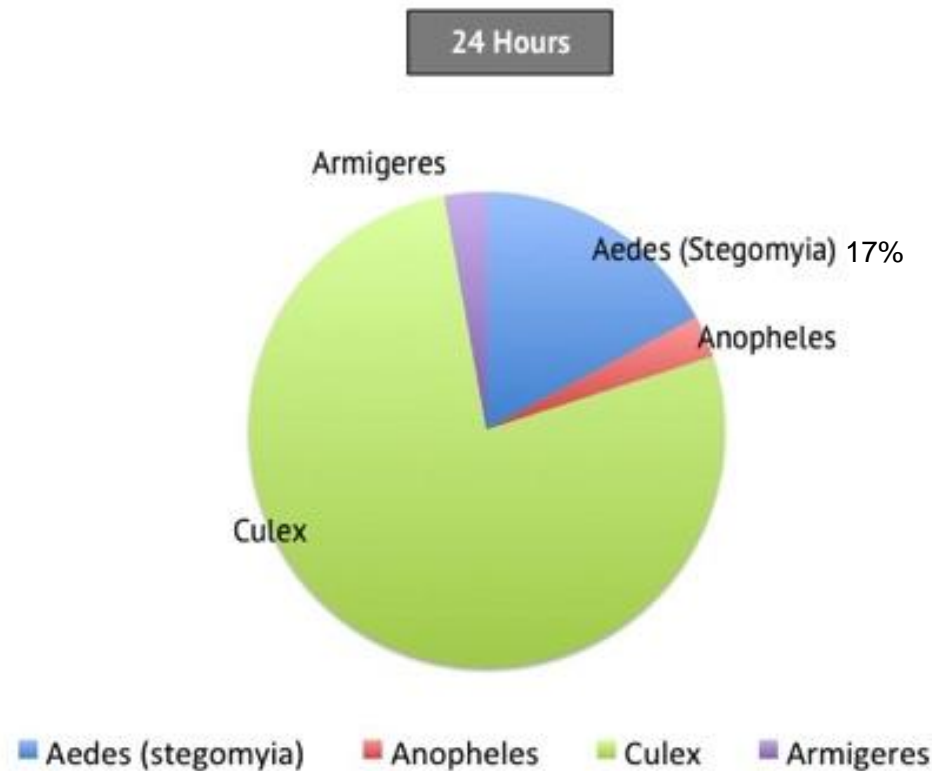
Total captured : 133



Species Inventory: Results

BGS Trap (Human skin chemical) in K Chnang villages

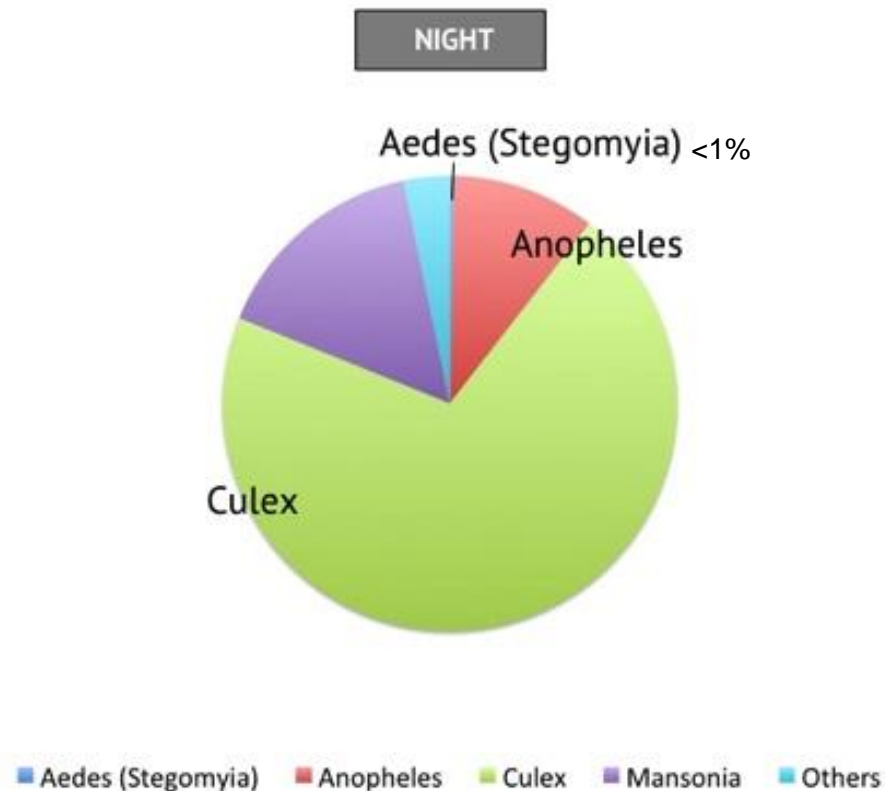
Total captured : 35



Species Inventory: Results

Light Trap (Light and CO₂) in K Chnang villages

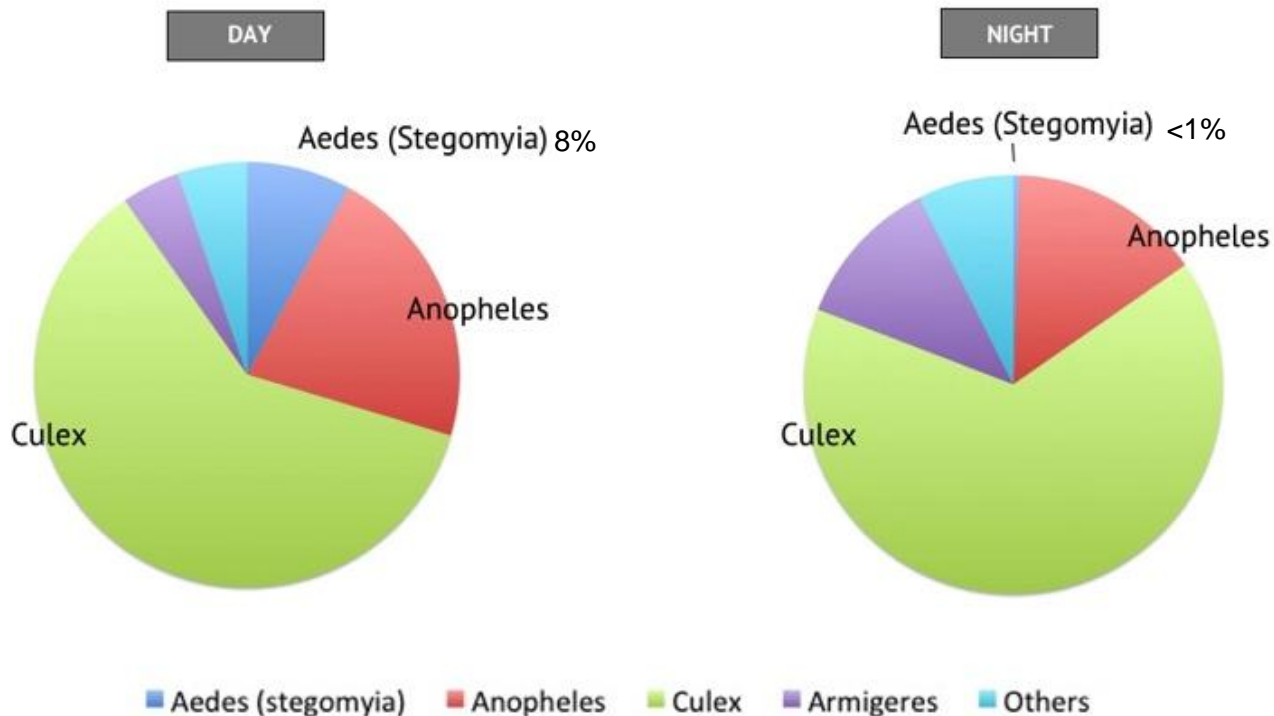
Total captured : 694



Species Inventory: Results

Double Bed Nets (Human bait) in K Chnang villages

Total captured: 226 (Day), 913 (Night)



Species Inventory: Conclusion

Points to remember!

Dengue and Chikungunya vector (*Aedes aegypti* & *Aedes albopictus*) captured in higher proportion using BGS trap, Backpack Aspirator, and Double Net (Day time)

Light Trap and Double net (Night Time) captured lower proportion of Dengue and Chikungunya vector



Population dynamic: Methods

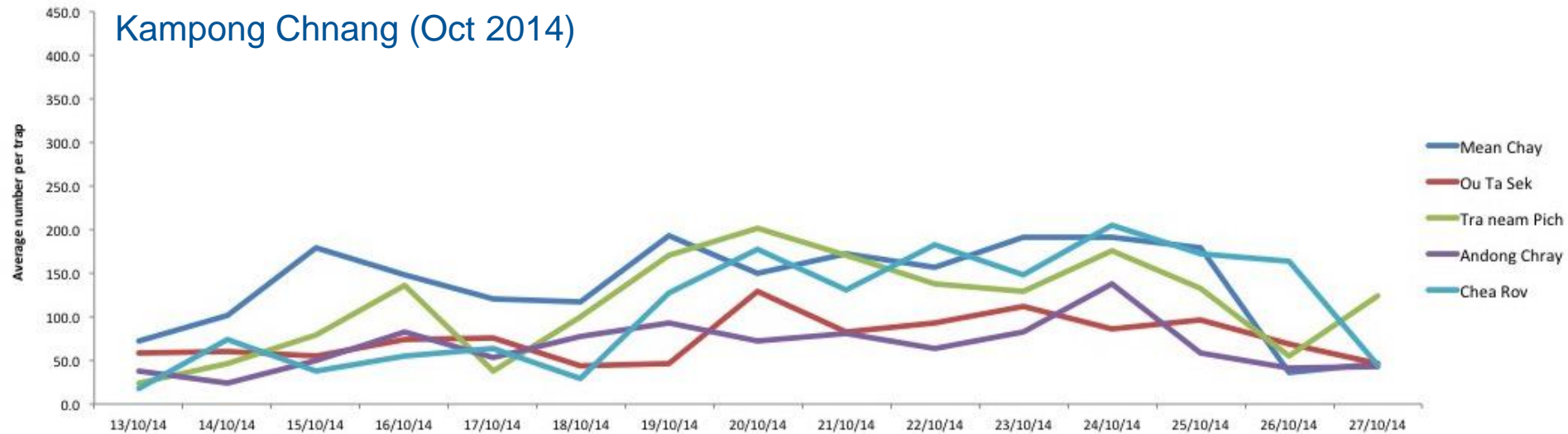
Mosquito Population Dynamic study (On going)

- Using double bed net methods
- Deployed six traps per village with night time collection (18.00 – 21.00)
- Period of collection: 15 days per month
- Total number / biomass will be observed

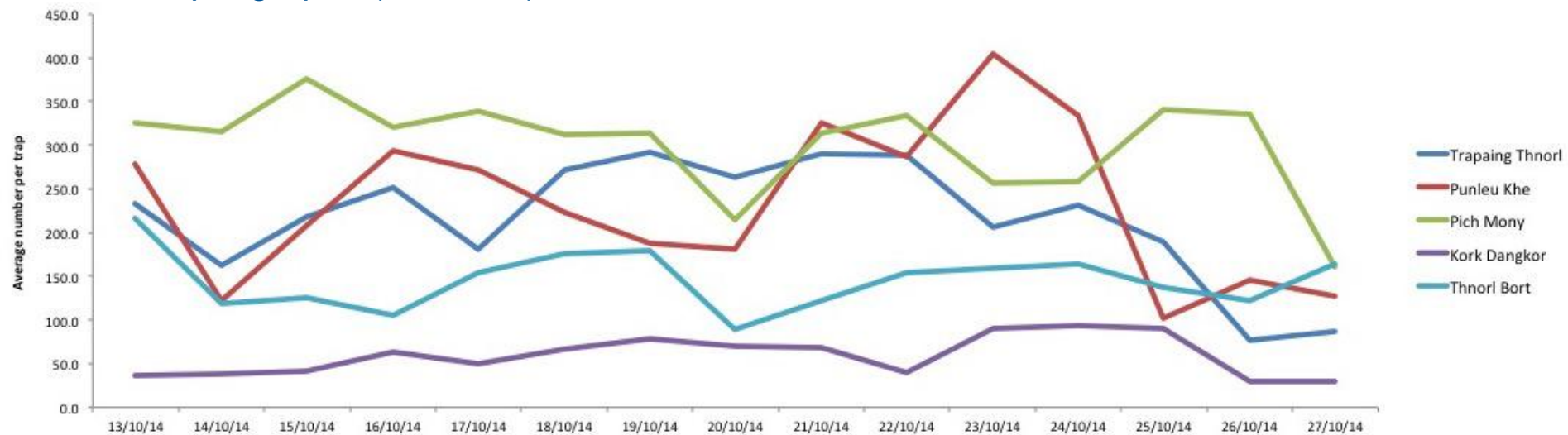


Population dynamic: Results

Kampong Chnang (Oct 2014)



Kampong Speu (Oct 2014)



Population dynamic: Conclusion

Mosquito Population Dynamic study

- Total mosquito number/biomass data for more than one month is required for better visualisation of population dynamic

Future Steps

- Continuing total mosquito number/biomass calculation
- Observing correlation between mosquito population dynamic and disease incidence in every village



Thank you for your attention !

