

Malaria vector situation in ethnic minority villages of Rattanakiri and Mondulkiri provinces, northeastern Cambodia, 2008-2013

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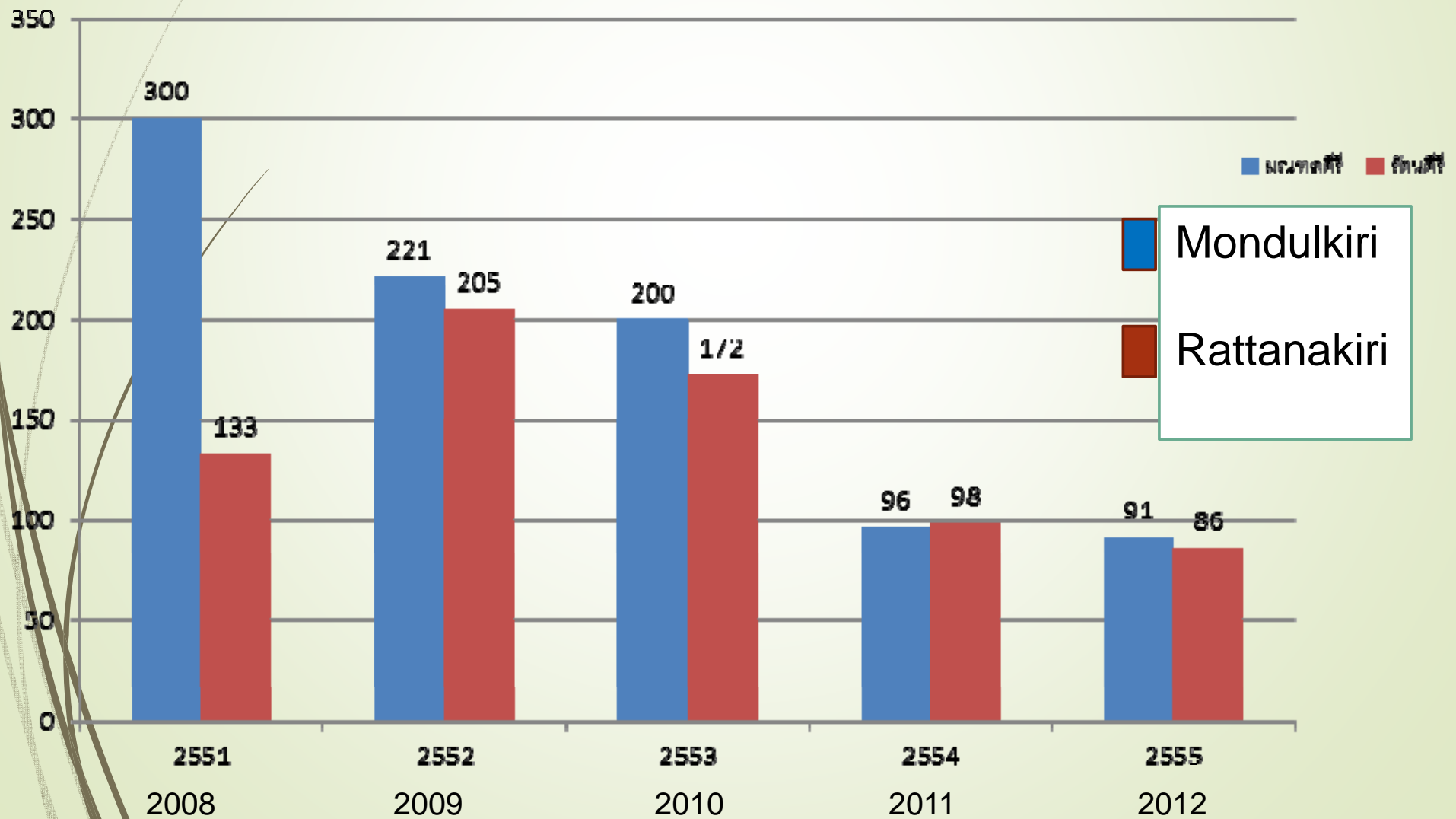
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Background

- Cambodia -Thailand Malaria Control Collaboration project was launched January 2007 by initiated of HRH and PM of Cambodia. (The activities to be undertaken jointly would be in epidemiology, entomology/VC HDR, socioeconomic study etc.)
- Model development on entomological surveillance was initiated by training of provincial malaria personnel as key persons and these key persons would have an ability to perform further training for colleagues to conduct field activities and entomological surveillance.
- Moreover, it is hoped that this model development will be applicable to other areas of Cambodia, and other Asian countries with similar malaria problems.

Fig. 1 Malaria Reported cases in the 4 study villages in Rattanakiri and Mondulkiri Provinces, 2008 -2012 (source: Provincial Health Office)





OBJECTIVES

The study aims:

- Provincial malaria personnel able to plan and perform anopheline collections by themselves
- Village Malaria Workers (VMW) to perform a broader range of activities than blood collection and provision of treatment.
- to understand the situation of anopheline vectors over 5 years.

MATERIALS & METHODS

➤ Human Resource Development:

- Provincial health personnel were trained in Thailand and Cambodia each year from 2008-2010
- VMWs were trained in Cambodia by Provincial health personnel

➤ Entomological survey

○ Study areas:

- Ban Nkoh 2, Ogum District, Rattanakiri
- Ban Krong Tes, Pich Chenda District, Mondulkiri

MATERIALS & METHODS (Cont.)

Entomological survey

○ Study period:

● dry season Nov 2012; Feb & Nov 2013

● rainy season May 2008, 2009; August 2009;
May 2011; May & August 2013

➤ A number of *Anopheles* spp were sent to Kasetsart University to confirm a sibling species by molecular technique

➤ One-way ANOVA and least significant difference (LSD) tests were applied to know the differences in selected *Anopheles* species collected from difference seasons in Rattanakiri and Mondulkiri

Fig. 2 Maps of Thailand-Cambodia and Rattanakiri and Mondulkiri provinces



Ban Nhok 2, Rattankiri province

Ban Krongtes, Mondulkiri province

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Fig. 3 Entomology training both in Cambodia and Thailand

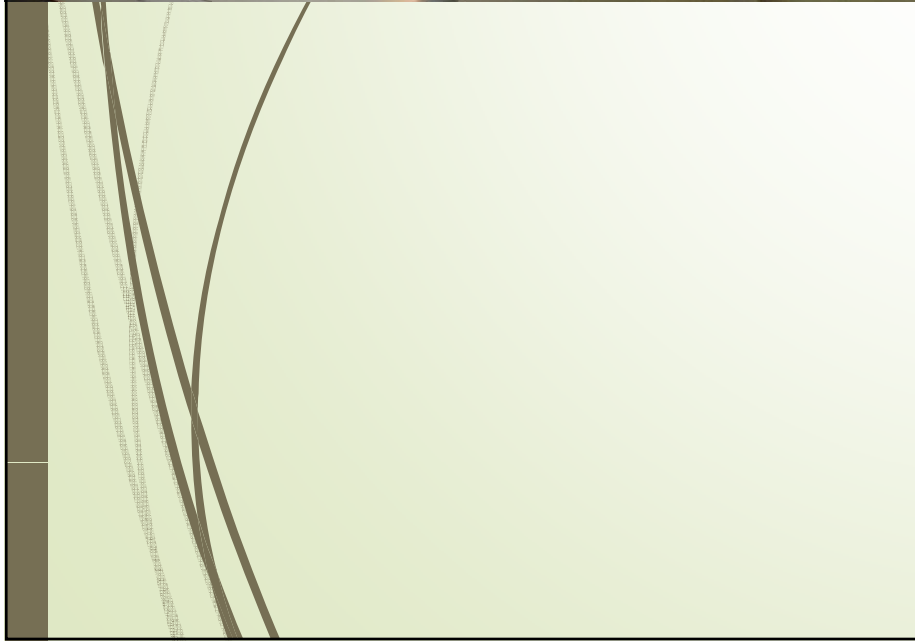


Fig. 4 The mosquito collection, human landing collection



Two houses were selected as collection sites. VMWs sat inside and outside the house to collect mosquitoes landing on their legs from 1800 to 0600 hr.



24 19:00

Fig. 5 The mosquito collection, **Animal (cow) bait collection**



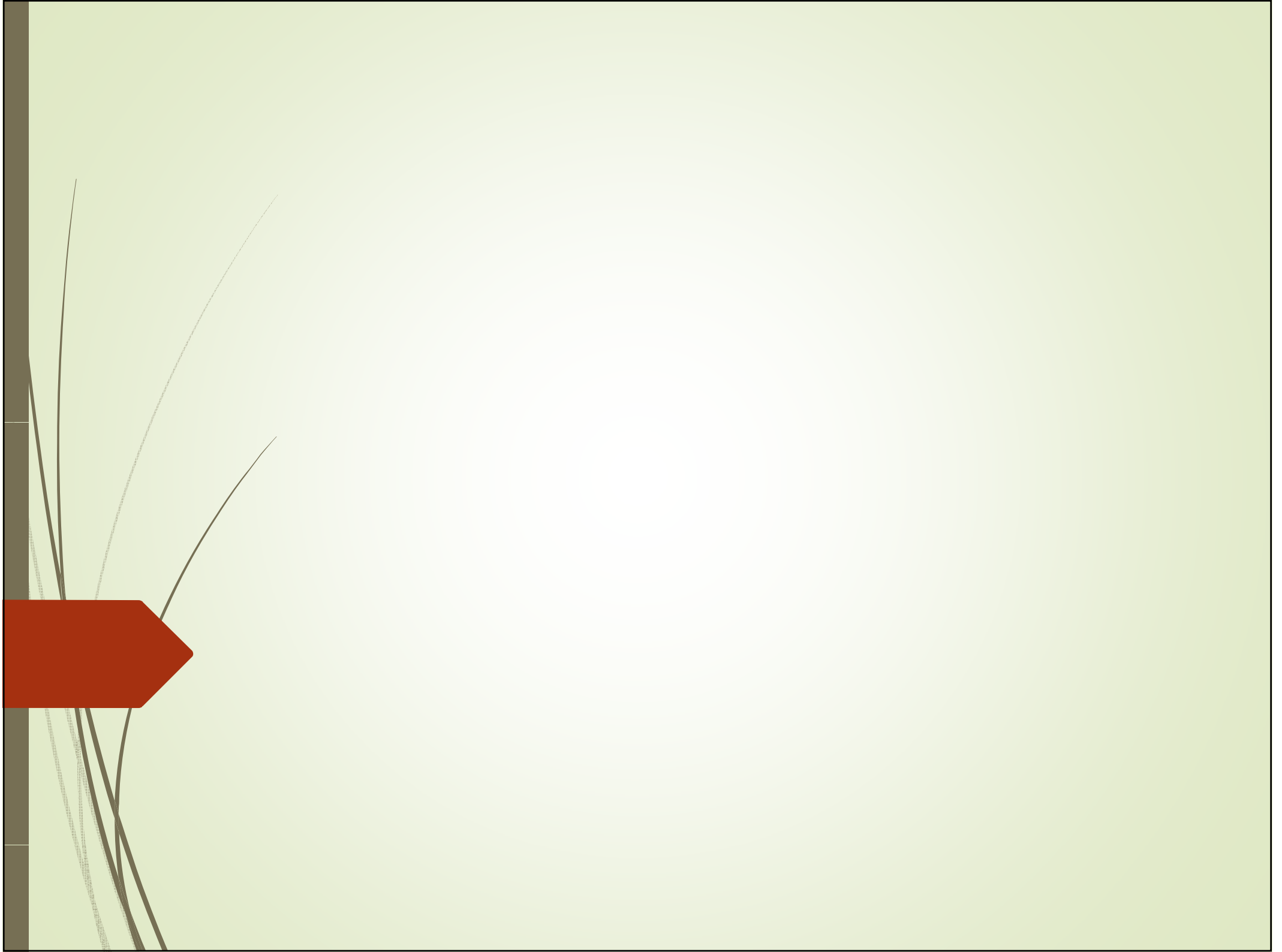
one cow was tethered in a double-net trap. Mosquito collections were performed on four consecutive nights in each village





RESULTS

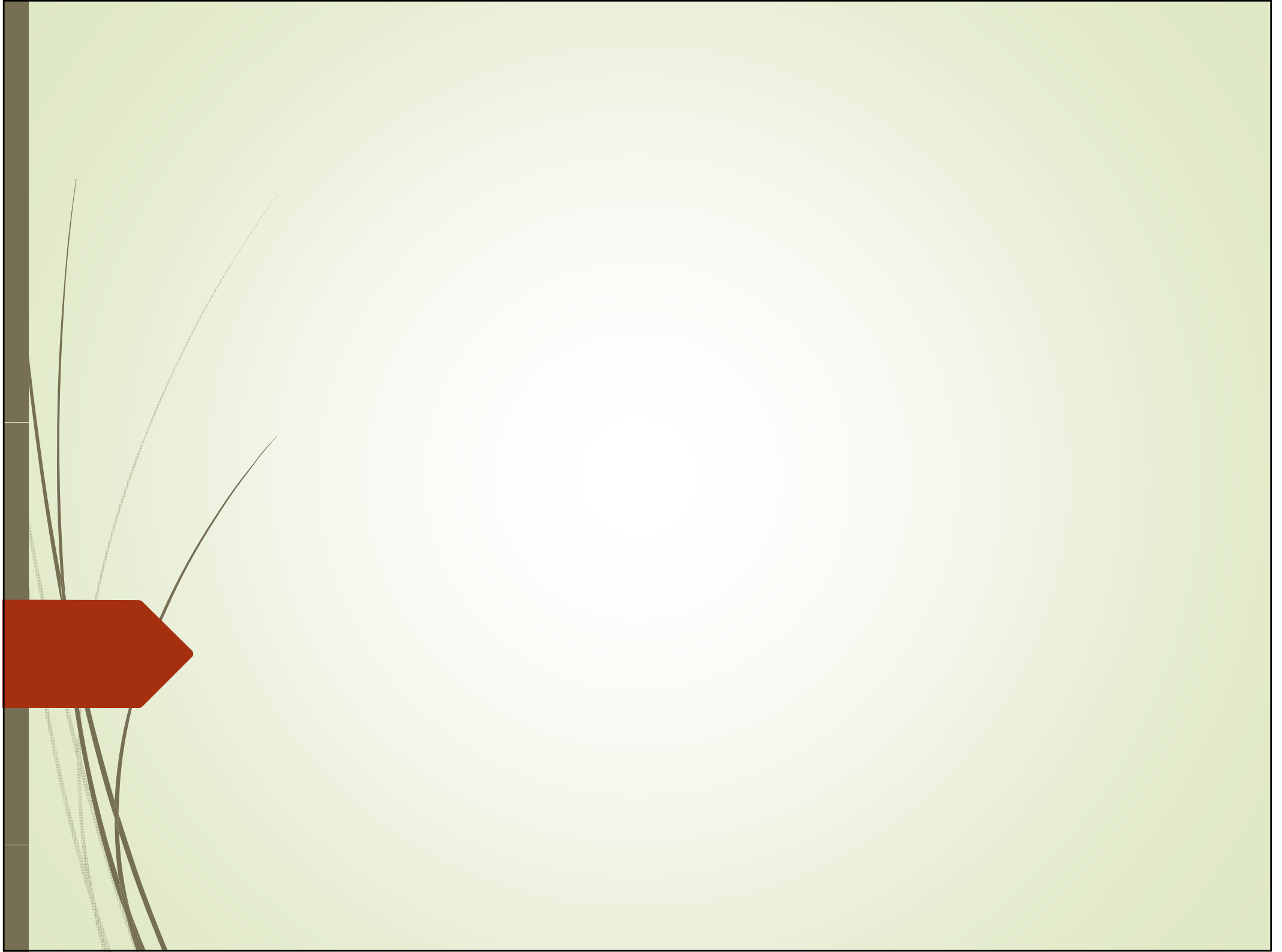
- ▶ 19 species of Anopheles fauna were collected:
Anopheles minimus, dirus, maculatus, barbirostris, aconitus, jamesii, jeyporensis, kawari, kochi, peditaeniatus, philippinensis, nivipes, sawadiwonporni, sinensis, splendidus, tesellatus, umbrosus, vagus, willmori.
- ▶ The most common anopheline vector species showed season- and focal-specific.



ENTOMOLOGICAL RESULTS

in Mondulkiri province

- *Anopheles minimus*, *An. dirus s.l* and *An. maculatus* were found in all seasons, BUT
- *An. minimus* showed higher abundance in dry season than in rainy season with early biting (1900-2000 hr)
- *An. dirus s.l.* was mostly anthropophilic with high abundance in rainy season
- *An. maculatus* showed half-night biting (1900-2400 hr), with decline after midnight
- However, one-way ANOVA and least significant difference (LSD) tests for difference in seasons of three anopheline spp revealed no significant difference.



ENTOMOLOGICAL RESULTS

► In Rattanakiri Province

- *An. minimus* showed higher abundance in dry season with two distinct biting periods of evening (1900-2200 hr) and early morning (0400-0500hr).

It was found in very low number in wet season.

- *An. dirus* s.l is more anthropophilic with irregular biting time through the night.
- *An. maculatus* showed whole-night biting from 1900 to 0500 hr.
- However, one-way ANOVA and least significant difference (LSD) tests for differences in seasons of three anopheline spp revealed no difference.



ENTOMOLOGICAL RESULTS (cont.)

- All *An. minimus* s.l. was confirmed by molecular technique as *An. minimus* (former species A).
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CONCLUSIONS

- PHD personnel received training in Thailand and Cambodia.
- These personnel became successful entomological field workers and trainers
 - Rattanakiri were most adept; more limited success in Mondulkiri.
 - Reasons for less success in Mondulkiri were competing work interests and lack of self-motivation in some selected workers.



CONCLUSIONS (cont.)

- VMWs were trained in Cambodia by PHD personnel.
- All VMW workers were successfully trained to carry out field work.
- The planned model was achieved.



CONCLUSIONS (cont.)

- Despite environmental and human-settlement rapidly changes over time, the first three malaria species were still commonly found over the five-year period in both provinces, but abundance was seasonal and focal-specific.
- we are re-evaluating in view of environmental changes both in RTK and MDK, specifically deforestation followed by Rubber plantation development, to obtain information most useful and effective.

ACKNOWLEDGEMENTS

- ▶ We would like to thank
 - ▶ CNM and PHD Rattanakiri and Mondulkiri for collaborative
 - ▶ VMWs for general help in insect collectors
 - ▶ And the Royal Thai Aide-De-Camp Department for all arrangements and general support for the trip and Study budget





ขอบคุณค่ะ

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