Reviewer's report

Title: Malaria vectors and transmission dynamics in Goulmoun, a rural city in south-western Chad

Version: 1 Date: 17 February 2009

Reviewer: Frederic Pagès

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Malaria vectors and transmission dynamics in Goulmoun, a rural city in south-western Chad.

By Kerah-Hinzoumbé et al.

This paper examines the malaria transmission in a rural city in Chad during one year (from July 2006 to June 2007) outlining the vectors involved. This manuscript contains interesting data further supporting the importance of malaria transmission in this area and the role of An. pharoensis. Basically, mosquitoes were collected by human landing collection or pyrethrum spray. Anophelines mosquitoes were sorted by species using standard procedures on the field. Molecular identification of mosquitoes belonging to An gambiae s.l. complex or An. funestus group, P.falciparum infection and blood meal source identification were conducted according standard methods too. This paper highlighted the complexity of the vector system in this area and the importance of transmission in the first part of the night that could have an impact on the efficacy on ITNs based vector control program.

The question is well defined and appropriate methods have already been used. The writing is acceptable. Title and abstract are clearly describing the findings. The manuscript adheres to the relevant standards for reporting and most of the discussion and conclusions are supported by the data.

This manuscript is acceptable for publication after the authors have responded to the major compulsory revisions:

Major compulsory revisions:

1) For the blood meals, only a sample for each species has been analysed. The selection of these samples is not given in “material and methods” part. Readers have no way to understand how these samples have been made. I don’t understand why only seven An pharoensis blood meals on 48, why 52 An funestus blood meals on 286 and 144 An arabiensis blood meals on 1,611 have been analysed. At this time, these results are not consistent. These results have to be completed by the authors or to be removed of the manuscript (material and methods, results and corresponding parts of the discussion).

2) There is no data on a field larval sampling in the material and methods part.
Please, give some data on this part or delete this sentence “Anopheline’s breeding sites in the village consisted mostly…or receding periods” and all discussions on breeding sites. Larval data from Bongor could not be extrapolated to Goulmoun.

Minor essential revisions

3) The authors considered that the high mosquito nuisance from Bongor could be extrapolated to Goulmoun but no data on the culicidae fauna of Bongor and on the culicinae fauna of Goulmoun is given. Without this data, it’s difficult to follow them and to understand the nuisance in Goulmoun. A description of the culicinae fauna collected during HLC and pyrethrum spray collection, and a map of Chad with the localisation of Goulmoun and Bongor will be useful to the readers. The map used in another of their publication (ref 52) with a focus on the study area added could be informative.

4) The number of person-nights of human landing collection should be added. The number of pyrethrum spray collections (room-night) is not given. Have the bedrooms been randomly selected each collection night or the same bedrooms have been used during all the study?
These data should be added.

5) “Results from several studies…... lead to a decrease ….severe malaria and associated anaemia during pregnancy” None of the three references (3,4,5) support the last part of this sentence. Delete this part or give an accurate reference. Actually, the impact of ITNs on malaria pregnancy is still unclear.

6) The authors have chosen to treat a sample for pcr identification of mosquitoes from An. gambiae complex and from funestus group. But no data is given on the selection of these samples. These data have to be given.

7) The authors wrote, “all specimens of the An. funestus group (N=418) were …» but according to table 1, 504 An. funestus have been caught. Please explain the difference or make some changes.

8) The authors give some data on rainfall and discuss its role on anopheline abundance but they don’t give the origin of this data (national weather agency, self-measurement, or satellite measurement). This origin has to be given.

9) No information is given in the “Entomological parameters and statistical analysis” part about a statistical analysis but results of a statistical analysis are given in the results section. The statistical test and the statistical software used have to be given here.

10) Khi² corrected: why corrected and if relevant what correction?

11) The authors’ team have worked in this area on the insecticide susceptibility of An. arabiensis in Goulmoun (ref 52). It would be interesting to reminds readers of these data in the text. It would improve the conclusion.
Discretionary revisions

12) There is no data on the molecular identification of the five Anopheles nili. This information could be added.

13) Reference 13 & 14: reference 14 is not informative. Please delete it.

14) Reference 18 & 19: Please make a choice

15) “Dna extraction was carried as…” this sentence is not informative. Please delete it and its reference too.

16) Figure 2: instead of “the main anopheline species”, “the anopheline species involved in malaria transmission”

17) Figure 3: instead of “the 4 vector species”, “the 4 anopheline species involved in malaria transmission”

18) Figure 2: the diagram is “ornate” perhaps four juxtaposed figures (four histograms) would be more informative.

19) Table 3: The HBR is an average HBR. Perhaps, the authors could give this precision.

20) Table 3: I think that the column “N° of infective bites per man per night” has to be deleted. These data is not coherent with the seasonal transmission described in the text and in figure 3 and is false at least three months in the year.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests