

# Climate variability and dynamics of malaria and schistosomiasis transmission in Korhogo (northern Côte d'Ivoire) and Kaedi (southern Mauritania)

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# research

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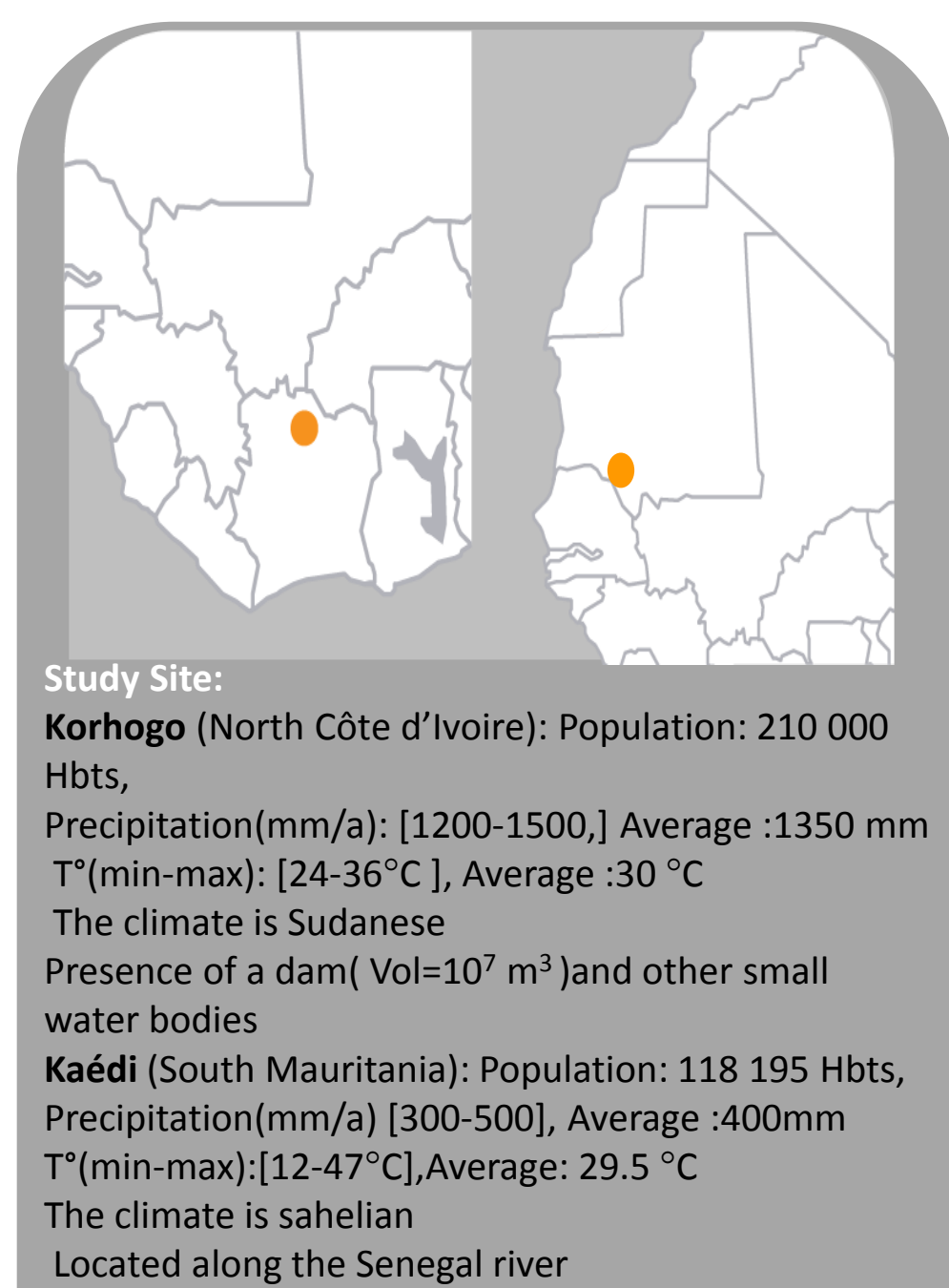
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## Study context

Malaria and Schistosomiasis are the world's two most important parasitic infections in terms of distribution, morbidity and mortality. These diseases are highly sensitive to changes in the natural environment (figure 1). Environmental condition affects both the infectious pathogens, vectors and the snails intermediate host (Chastel,2006; De la Roque & Rioux,2008).The main objective of this study is to determine parasitological, entomological and malacological factors of malaria and schistosomiasis transmission in Kaédi (KAE) and Korhogo (KGO) in climate change context in order to develop adapted resilience tools.



## Materials & Methods

### Conceptual and methodological framework

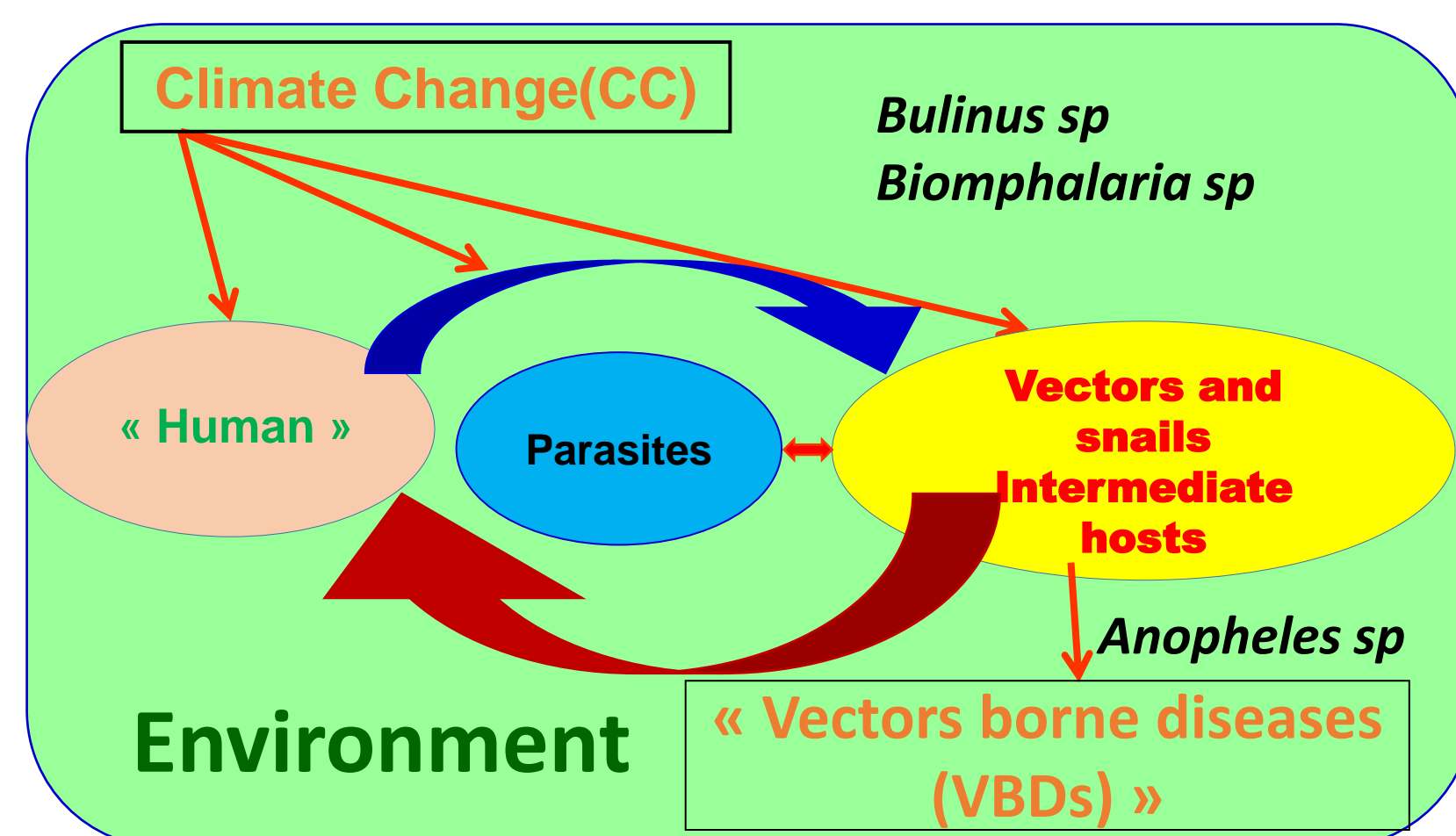


Figure 1 : Conceptual and methodological framework of the study( Duvallet, 2012 modified)

### Field and laboratory procedures

■ A cross-sectional survey (parasitological, entomological and malacological) was conducted during the rainy (RS) and dry season (DS) in KAE and KGO.

■ Thick drops of Blood Smears (BS) and malaria Rapid Diagnostic Tests (RDT) (picture a) were conducted on subjects in the households surveyed. School age(5-15) children provided urine and stool samples which were examined using standard techniques(by filtration; double Kato-Katz smears prepared for each child).

■ Mosquito larvae were collected by dipping and adults by pyrethrum spray catch, setting windows traps (picture b) and CDC miniature light trap (Model 512).

■ Snails were collected in water bodies by 2 trained field collectors (picture c) using standard snail scoops or occasionally, by hand collection. Sampling time was fixed at 15 minutes per collection site.



## Results

### Parasitological study

❖ In KGO *Plasmodium* parasite prevalence is respectively 17 % (583/3422) and 8% (280/3446) during the DS and RS. All the 8915 RDTs conducted in KAE were negative. However KAE's BS result is not available.  
 ❖ Only one case (0.05% ;1/1862) of intestinal schistosomiasis has been met in KAE. The prevalence of Schistosomiasis are summarized on figure 2.

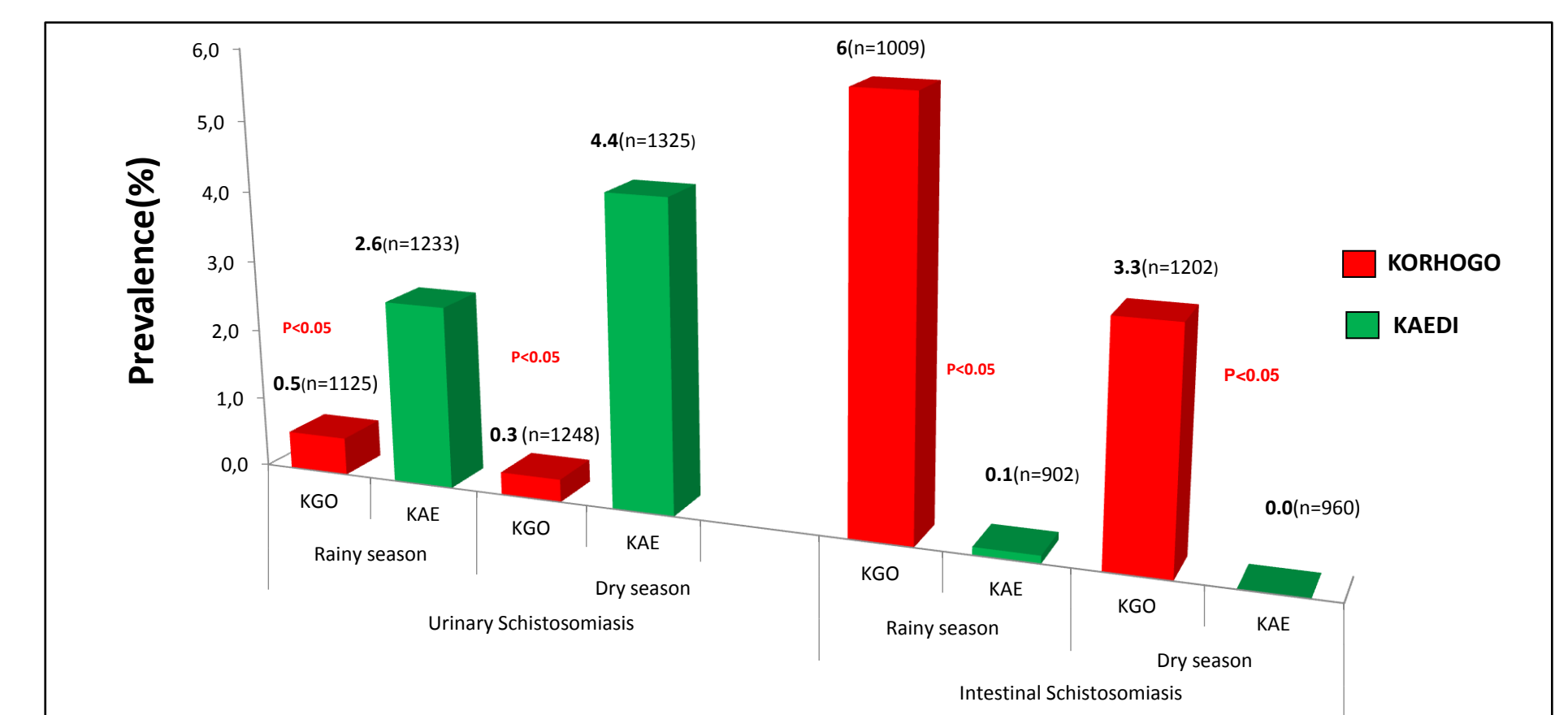


Figure 2:Prevalence of the two forms of Schistosomiasis

### Entomological study

➤ In both sites, *Anopheles* breeding sites were skeptic thank, spoilt containers, road puddle, temporaries and permanent mares.

➤ *Anopheles* larvae fauna collected is 0.3% (4/1056) in KAE against 19.44% (3803/19560) in KGO (P<0.05).

➤ *An. gambiae s/l* adult were 6% (6/100) and 21.7 % (309/1423) respectively in KAE and KGO (P<0.05).

➤ The aggressive rate is 0.19 and 0.35 bites per man per night (b/m/n) in KGO and in KAE 0.4(b/m/n) and 0 (b/m/n) respectively during RS and DS.

### Malacological study

❑ Seven species of snails were found in both sites. Three of them are intermediate hosts of schistosomiasis (*Bulinus senegalensis*, *B.truncatus*, *Biomphalaria. pfeifferi*).

❑ The number of intermediate host in the DS was greater than that obtained in RS (p <0.05) in the two sites.

❑ During the DS, *B. pfeifferi* has been found naturally infected by cercaria of *S. mansoni* in KGO.

## Key message / lessons

- KAE and KGO are endemic to urinary schistosomiasis.
- The only case of intestinal schistosomiasis encountered in KAE could be an imported case. Furthermore, no snail intermediate host of intestinal schistosomiasis (*B. pfeifferi*) was obtained.
- Urban malaria is a reality in Korhogo, however with low *Plasmodium* prevalence unlike other ivoirian city.
- Malaria vectors are present in KAE at low density.
- Laboratory analysis will allow us to better assess the level of malaria transmission in the two sites.

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## Collaborating Institutions



## Three main references related to the study :

1. Chastel C., 2006 : Changements climatiques et maladies infectieuses, La Lettre de l'Infectiologie - Tome XXI - n° (6), 258-262
2. De La Roque S., Rioux J.A., 2008 : Influence des changements climatiques sur l'épidémiologie des maladies transmissibles, Bull Soc Pathol Exot, ( 101), 3, 213-219
3. Duvallet Gerard, 2012 : Changements globaux et maladies vectorielles émergentes, Colloque CEMI SMVIPP15/03/2012/http://www.agropolis.fr/pdf/actu/2011-colloque-homme-dans-la-nature.pdf