Insect chromosomal polymorphism has been frequently associated with environmental adaptation (Coluzzi et al., 1979; Hoffmann et al., 2004; Krimbas and Powell, 1992; Krimbas, 1967). Natural populations of *Drosophila* and *Anopheles* species have recurrently shown clinal variation in some paracentric chromosomal inversions along latitudinal or altitudinal gradients (Balanya et al., 2003; Collinge et al., 2006; Hoffmann et al., 2004; Simard et al., 2009). Numerous chromosomal rearrangements have been linked to effects on *Drosophila* morphometric traits, establishing additional variation on which selection may be acting (Colombo et al., 2001, 2004; Orengo and Prevosti, 2002; Santos et al., 2004). Hence, the observations of adaptive environmental clines where chromosomal polymorphisms and morphometric traits running in parallel suggest that both might be related and subject to similar evolutionary forces (Orengo and Prevosti, 2002). In Africa, malaria transmission is primordially ensured by three anopheline species, *Anopheles gambiae*, *A. funestus* and *A. arabiensis*, which are widely distributed across sub-Saharan Africa. The ability of those malaria vectors to thrive the wide range of habitats present in Africa has been associated to the richness of chromosomal polymorphisms (Ayala et al., 2011; Coluzzi et al., 2002; Pombi et al., 2008). However, to date, no study has examined how this ecological plasticity has modeled their phenotypic traits, contributing to increasing their local population fitness.

In this study, we questioned the effect of chromosomal polymorphism and environmental conditions on phenotypic variation (wing size and shape) of the malaria mosquito, *A. funestus*. We hypothesized that, as observed in other insect species, environmental conditions and chromosomal background have an impact on morphometric traits, directly linked to local adaptation. Natural populations of adult females *A. funestus* were sampled across nine eco-geographical zones in Cameroon (Central Africa) displaying large variation in environmental conditions. First, we compared patterns of wing size and shape among ecological zones. Second, we related wing traits to environmental variables and we

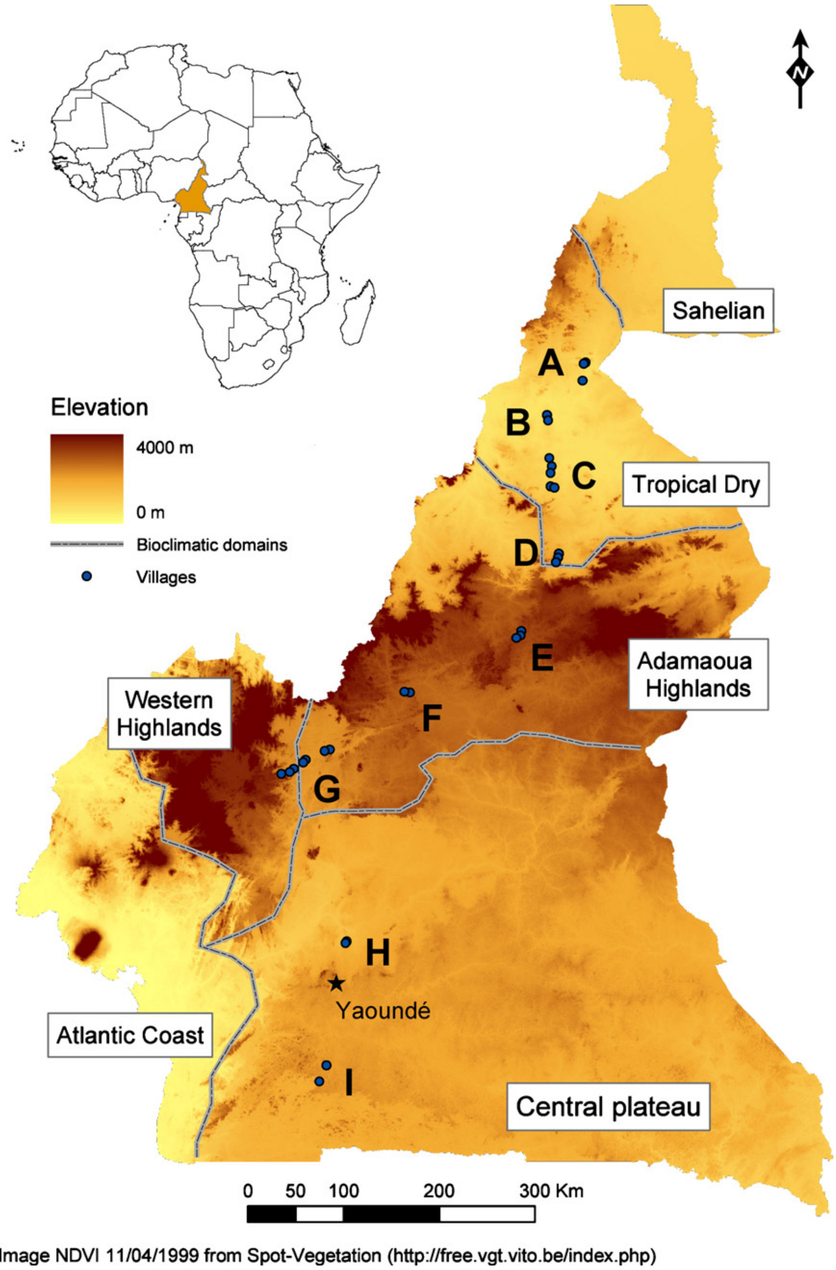

Fig. 1. Topographic map of Cameroon showing sampling zones (A–I) and villages in each zone (dots). Dotted lines delimit biogeographical domains (Olivry, 1986).