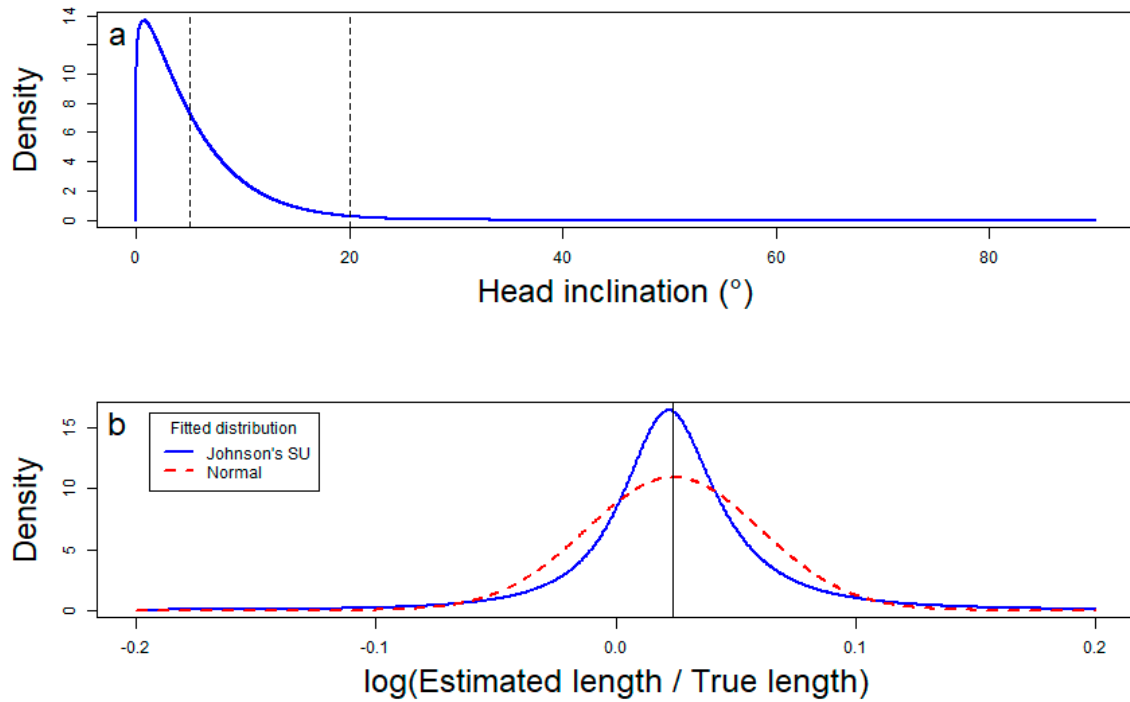


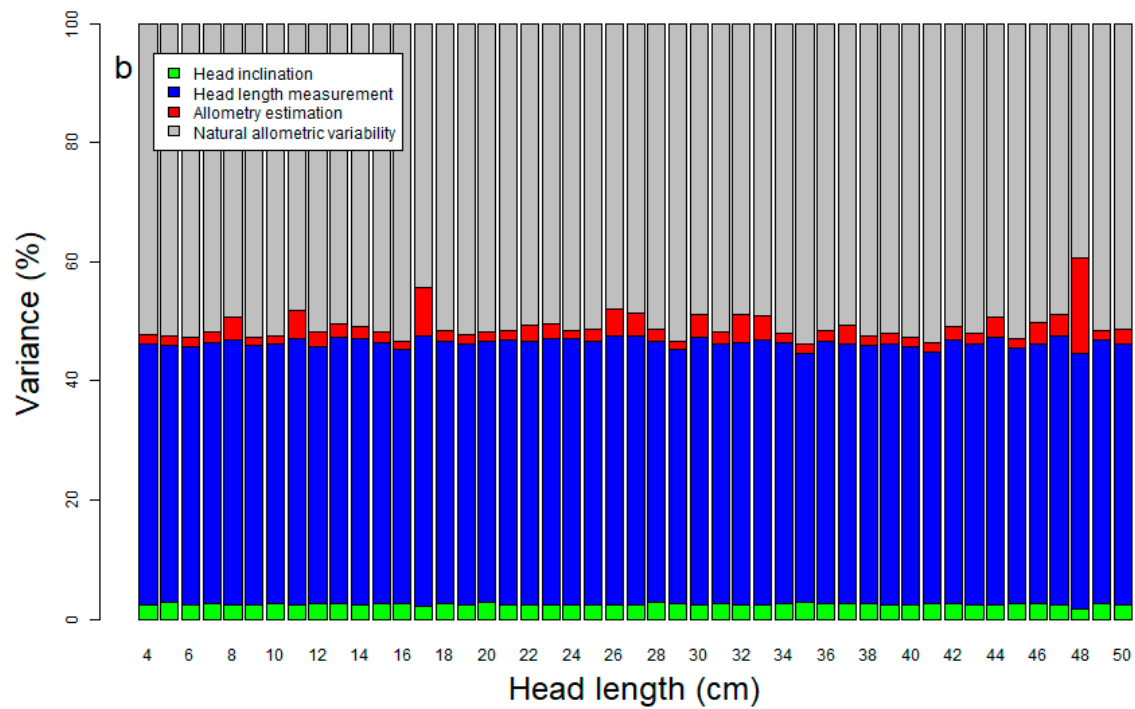
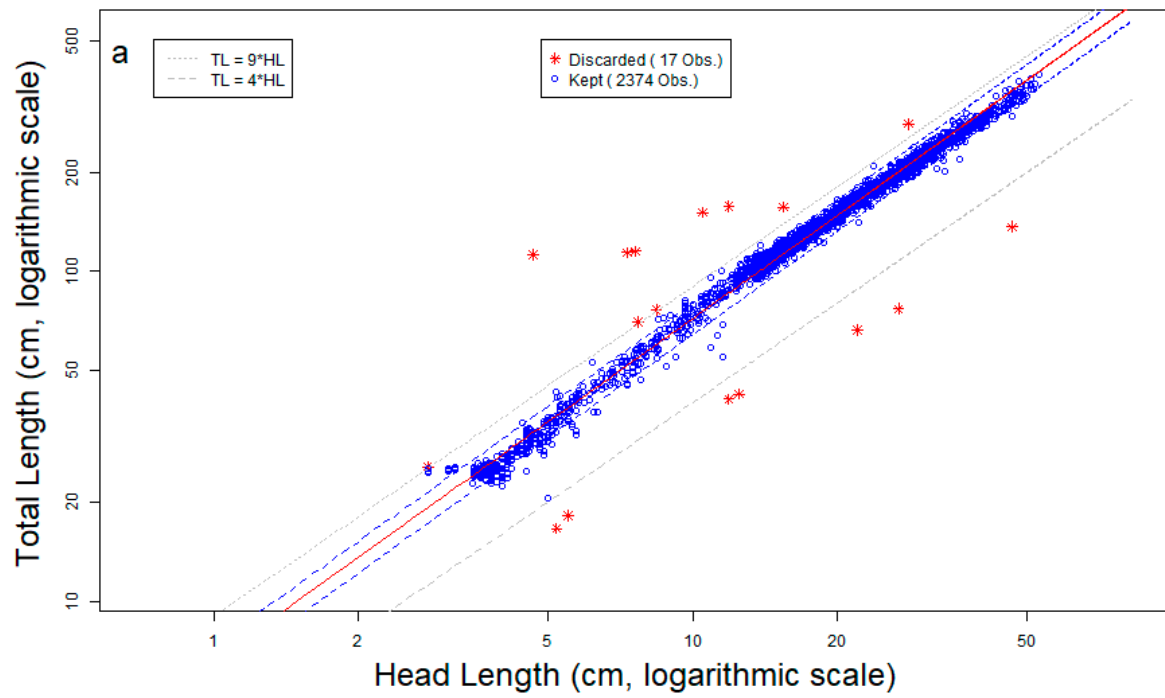
## SUPPLEMENTARY INFORMATION

**Figure S1: *A priori* distribution of crocodiles head inclination and Gaussian vs Johnson's distribution.** (a): The head inclination was simulated as a  $\beta$  distribution for  $\theta \in [0^\circ-90^\circ]$ , with distribution parameters chosen so that the average inclination  $\underline{\theta} = 5^\circ$  and  $\theta < 20^\circ$  for 99% of the samples. (b): tested both Gaussian (red dotted-line) and Johnson's SU-distributions (blue continuous-line) to represent the measurement imprecisions, where the latter better fit the observed data. The gray histogram represents the actual observations (40 m flight altitude only, combining all target sizes), the vertical black line represents their mean (note the slight bias towards estimating slightly greater size compared to the real size).

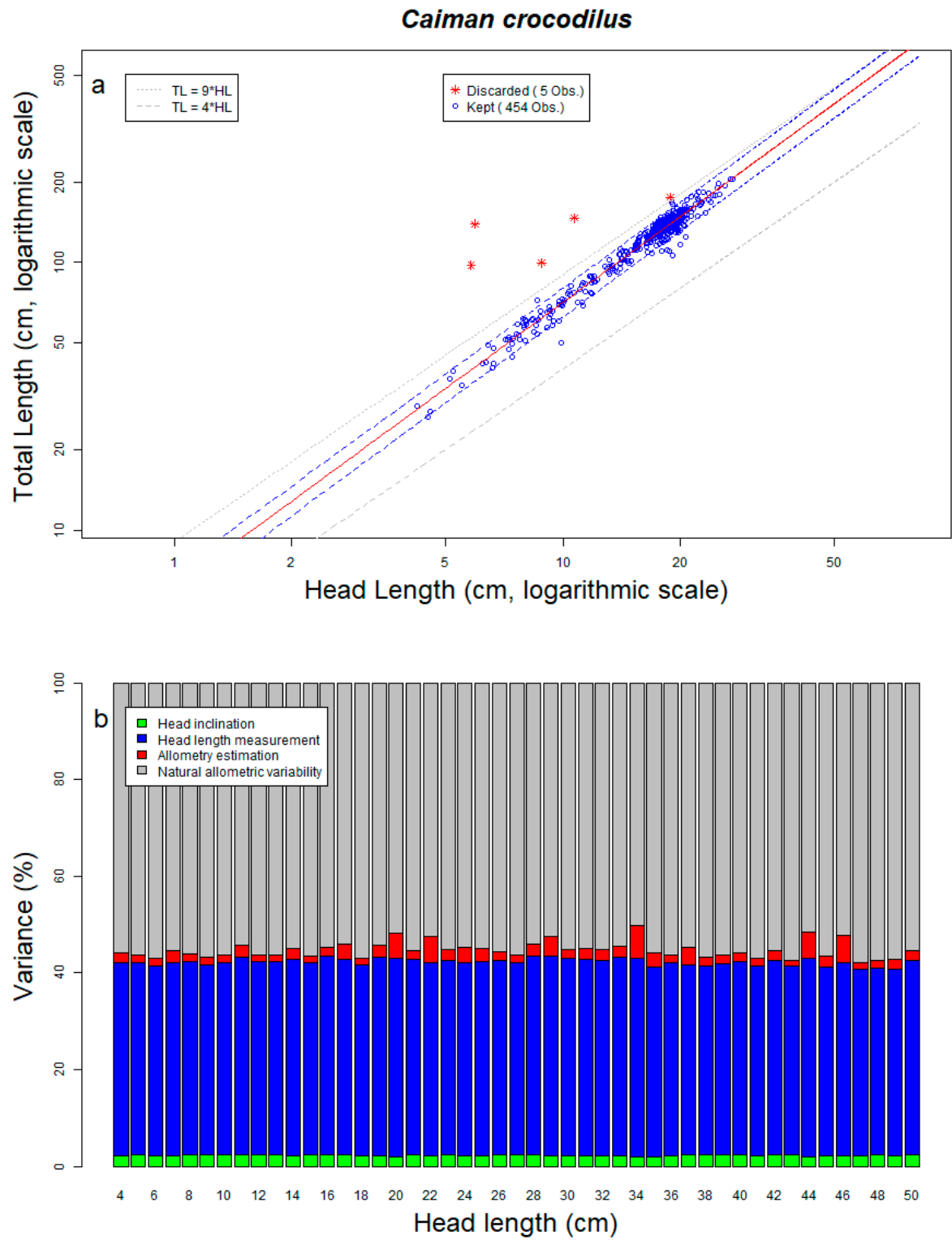


**Figure S2: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught American alligator (*Alligator mississippiensis*) measured in natural populations.** (a) The allometric relationship is derived from HL and TL measurements from 2,391 individual *A. mississippiensis* captured from throughout the species distribution. We discarded all observations for which the ratio was greater than 1:9 (grey dotted line) and less than 1:4 (grey dashed line). The allometry prediction curve (red line) and its 95% confidence envelope (blue lines) are illustrated. (b) We estimated the variance by simulating 125,000 values (i.e., 50 head inclinations x 50 target length acquisitions x 50 allometry values randomly chosen from their respective distributions) to assess the contribution of each source of bias to the overall imprecision in the predicted total length estimations based on the allometric relationship: i) head inclination (light green), ii) head length measurement (blue), iii) allometry variation (red), and iv) allometry residual, *i.e.* biological variation (grey).

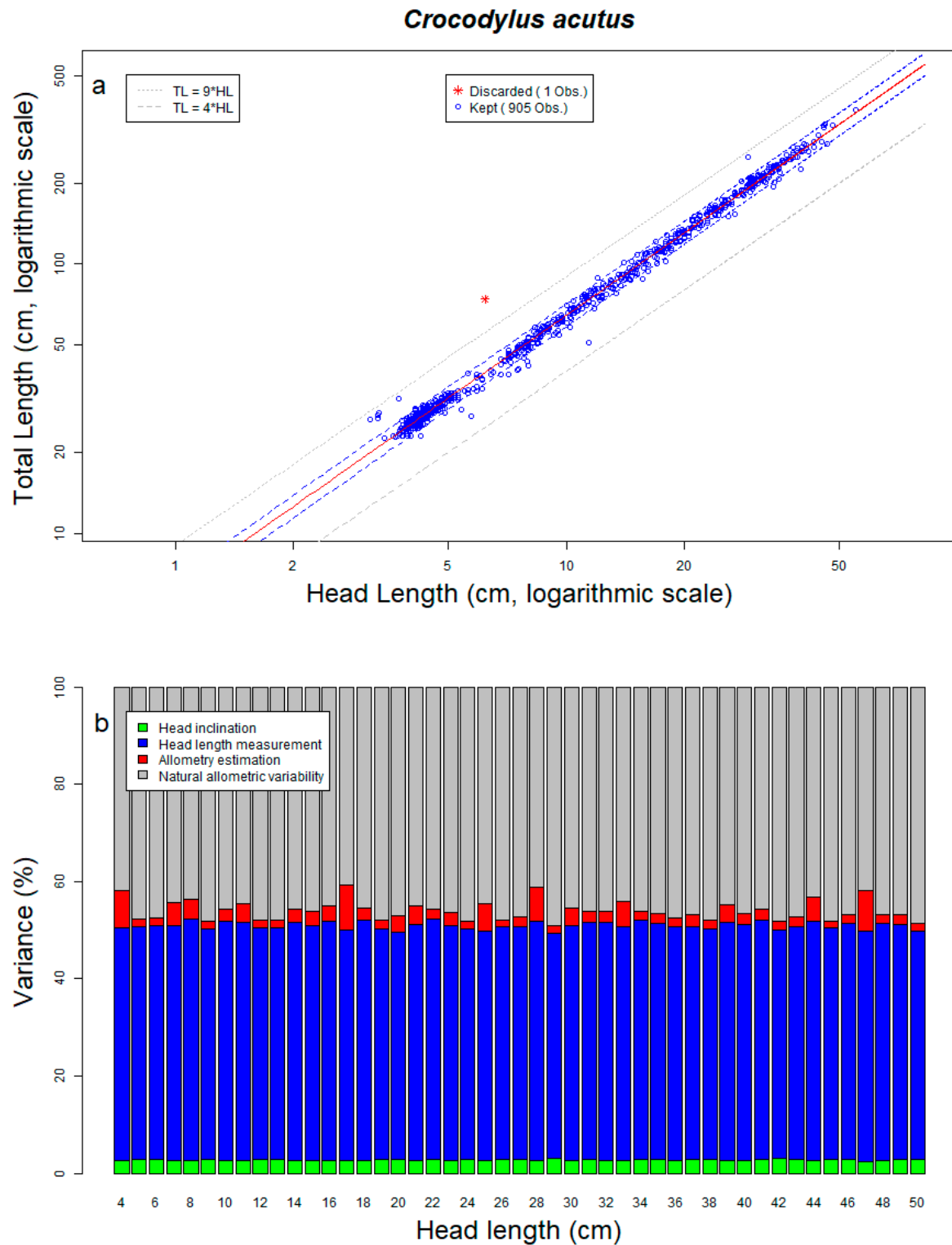
*Alligator mississippiensis*



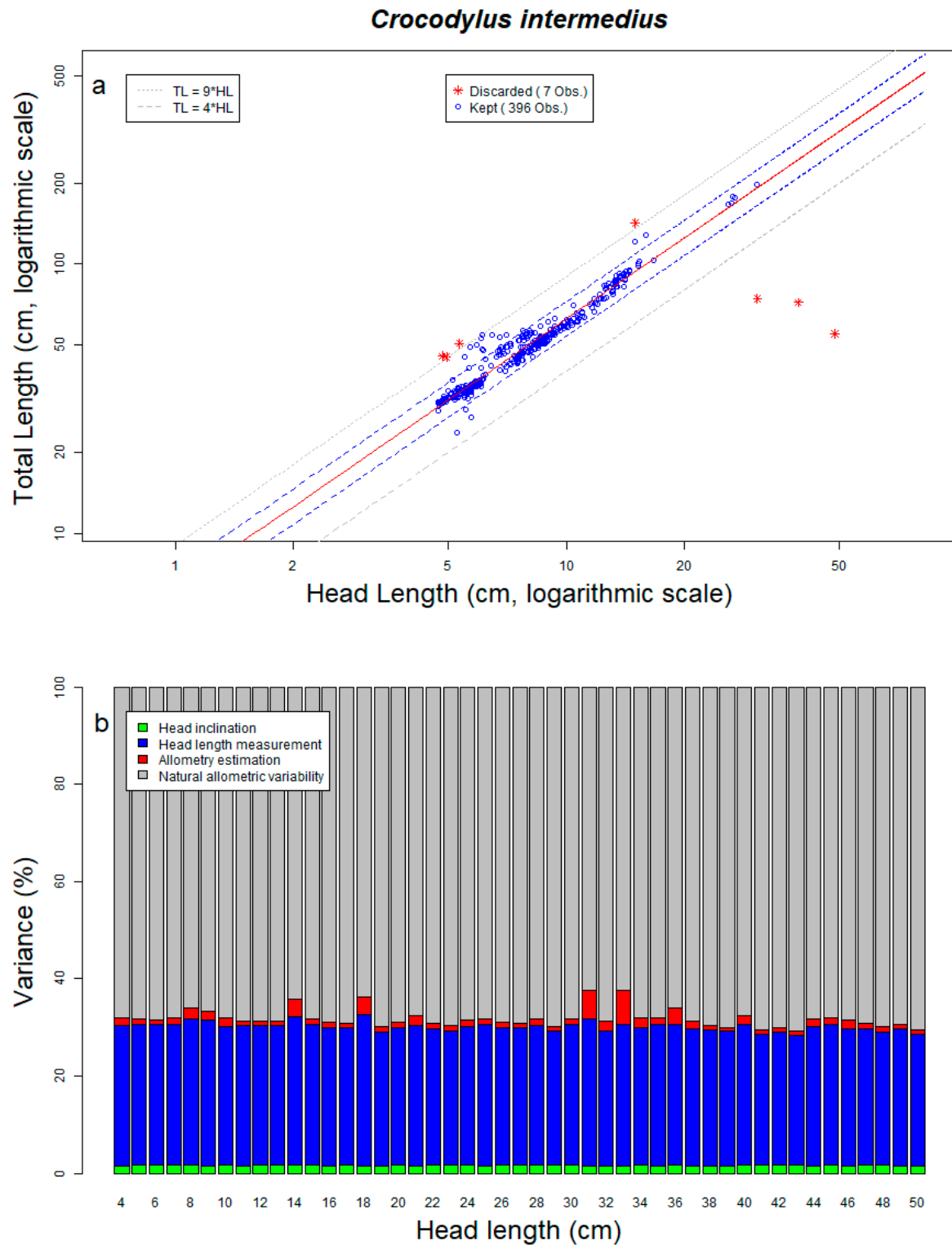
**Figure S3: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught spectacled caiman (*Caiman crocodilus*) measured in natural populations (n=459). See figure S2 for caption.**



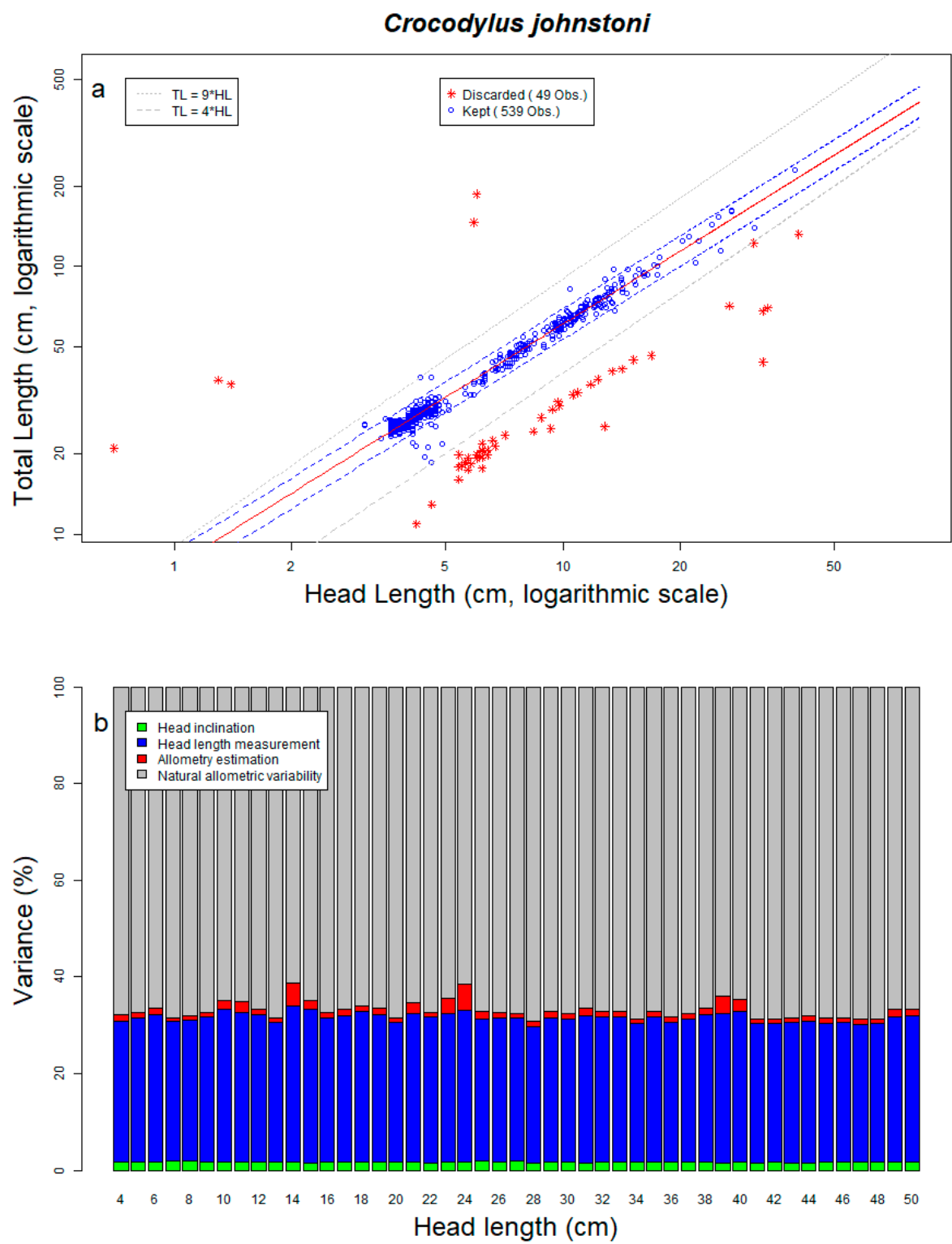
**Figure S4: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught American crocodile (*Crocodylus acutus*) measured in natural populations (n=906). See figure S2 for caption.**



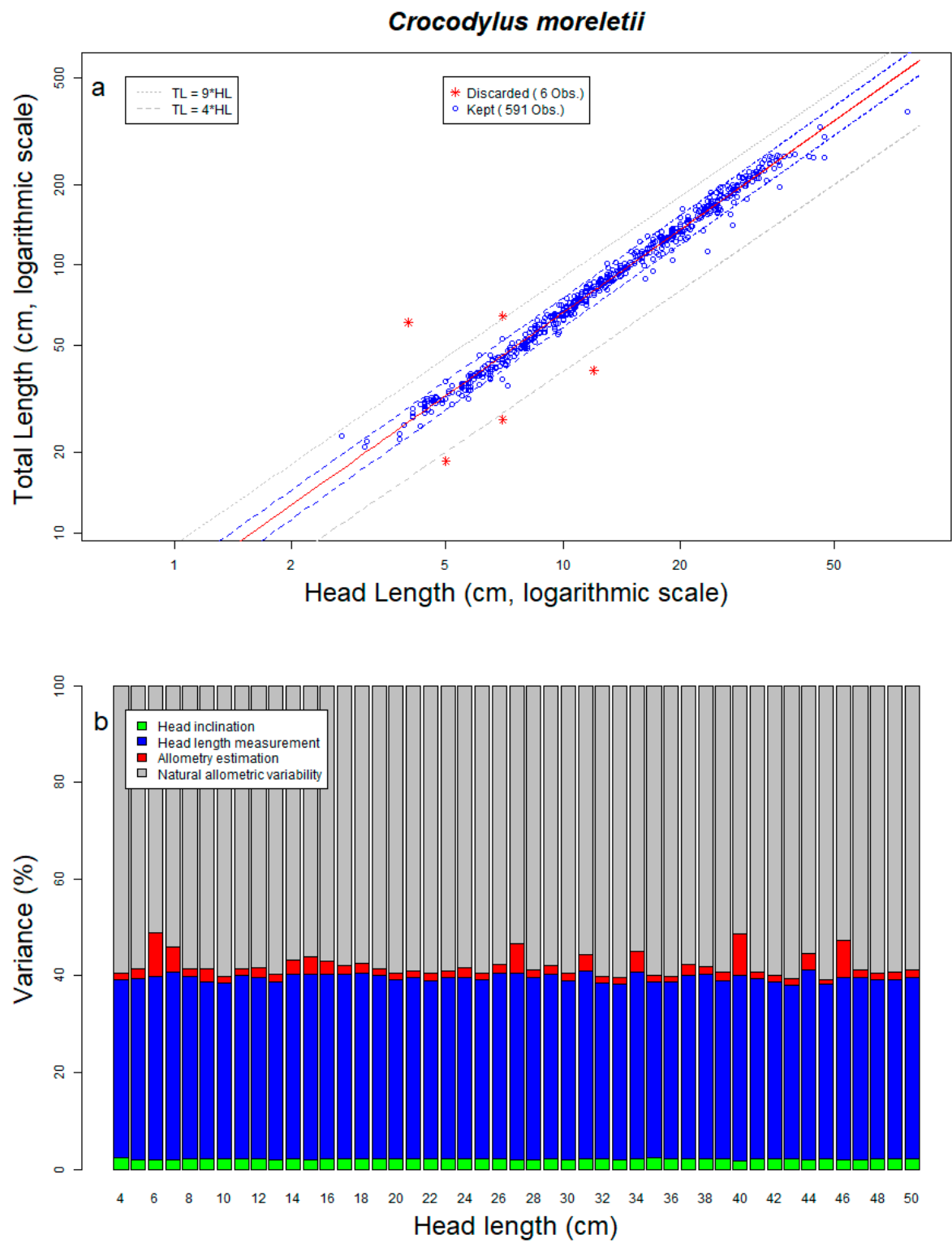
**Figure S5: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Orinoco crocodile (*Crocodylus intermedius*) measured in natural populations (n=403). See figure S2 for caption.**



**Figure S6: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught freshwater crocodile (*Crocodylus johnstoni*) measured in natural populations (n=588). See figure S2 for caption.**

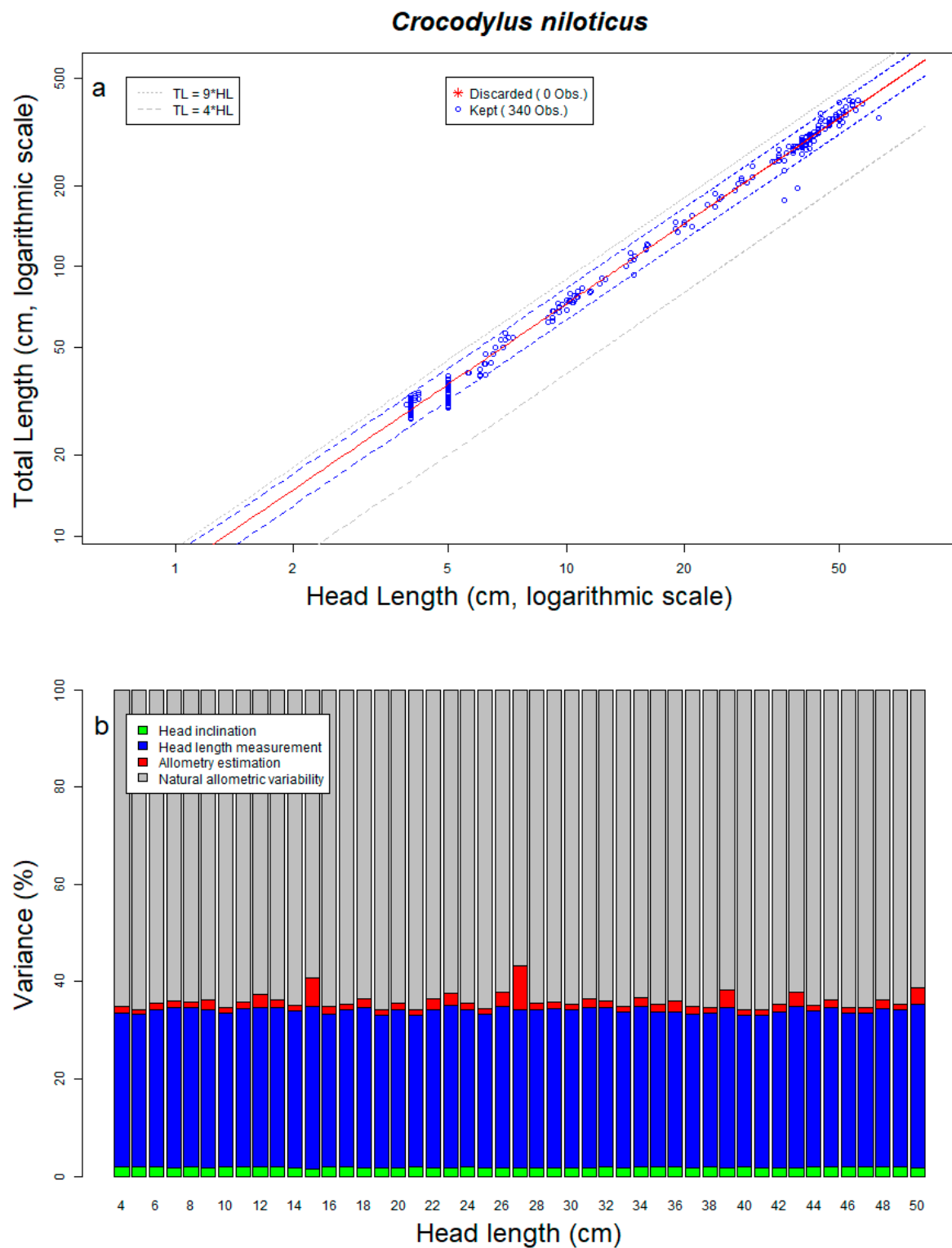


**Figure S7: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Morelet's crocodile (*Crocodylus moreletii*) measured in natural populations (n=597). See figure S2 for caption.**

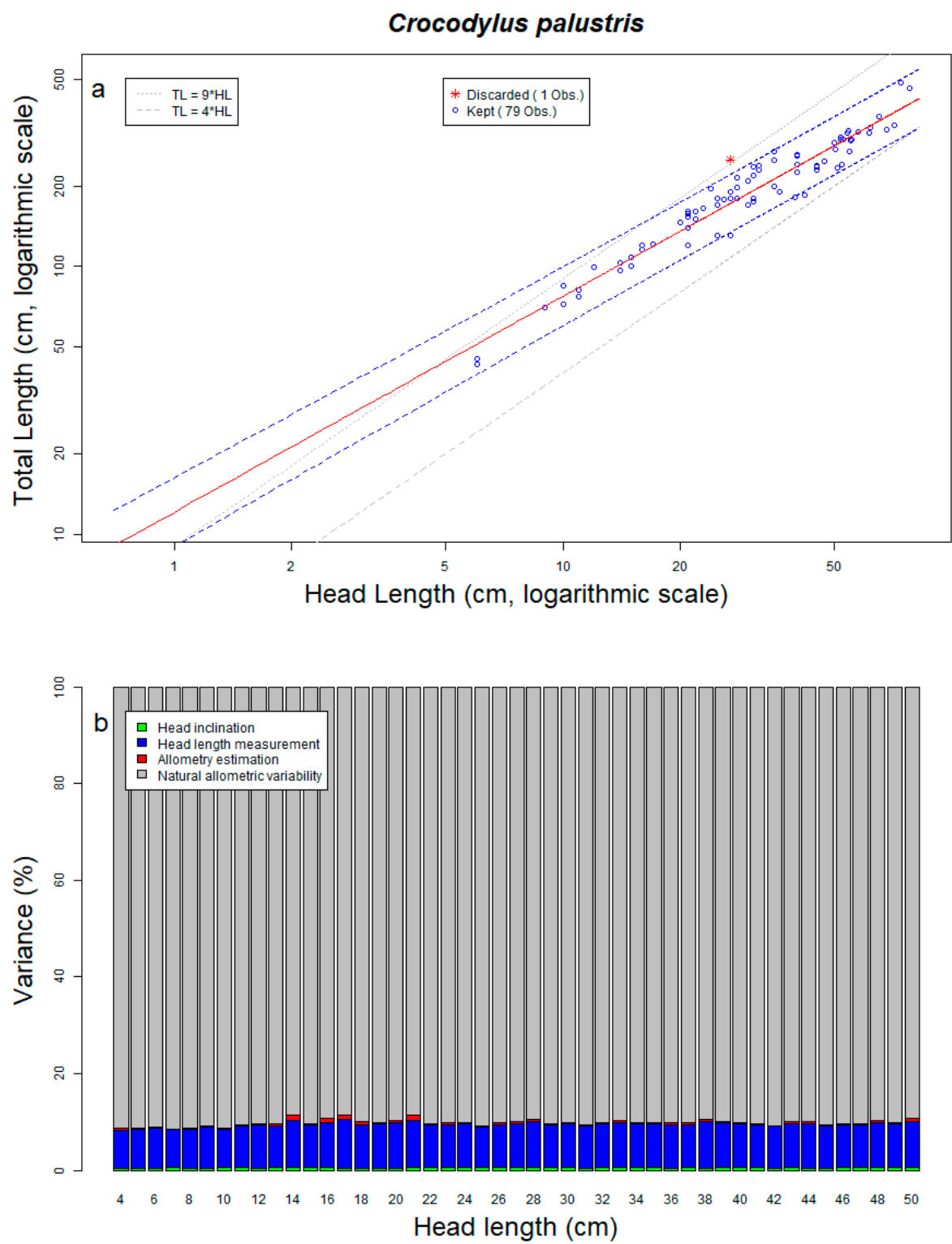




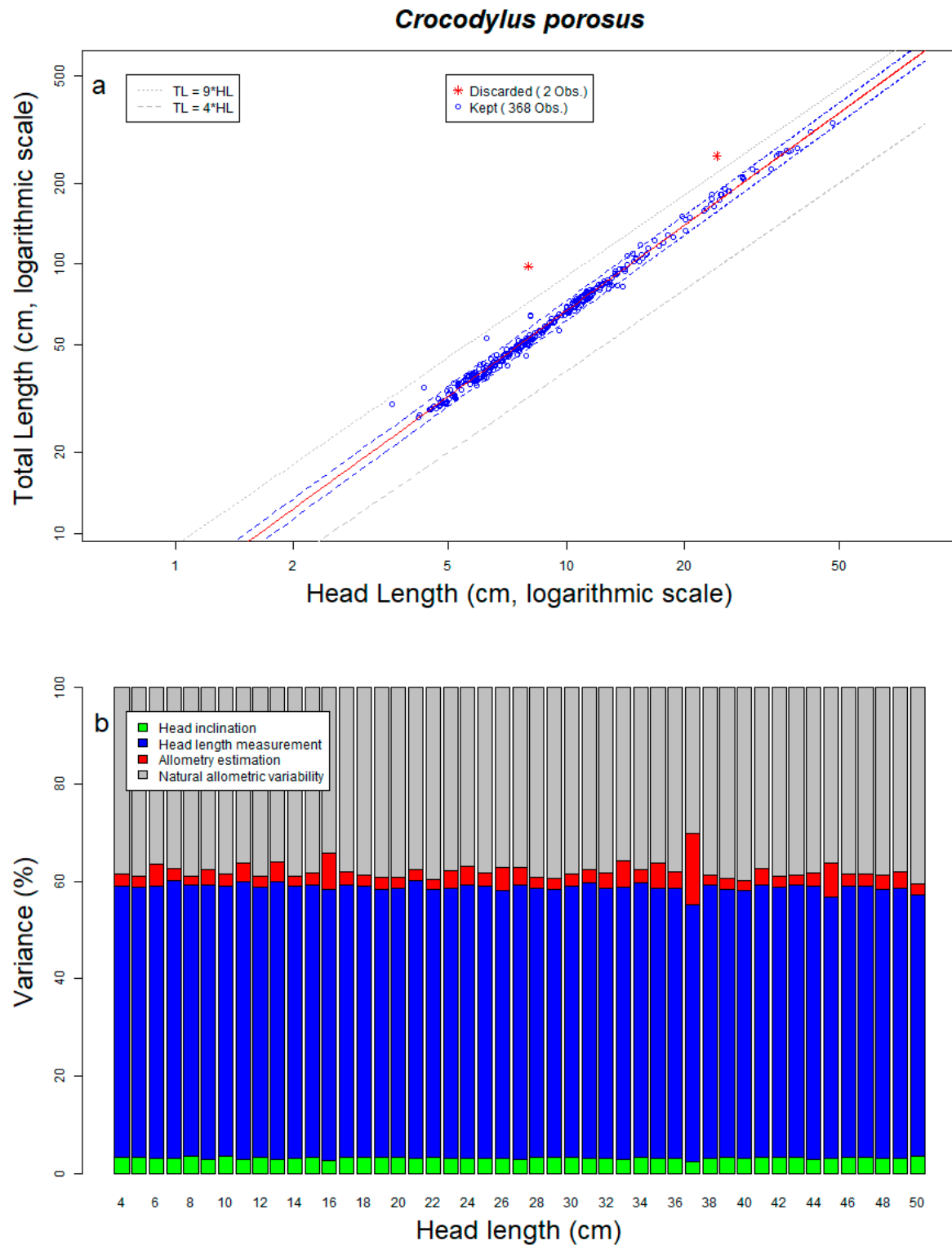
**Figure S8: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Nile crocodile (*Crocodylus niloticus*) measured in natural populations (n=340). See figure S2 for caption.**



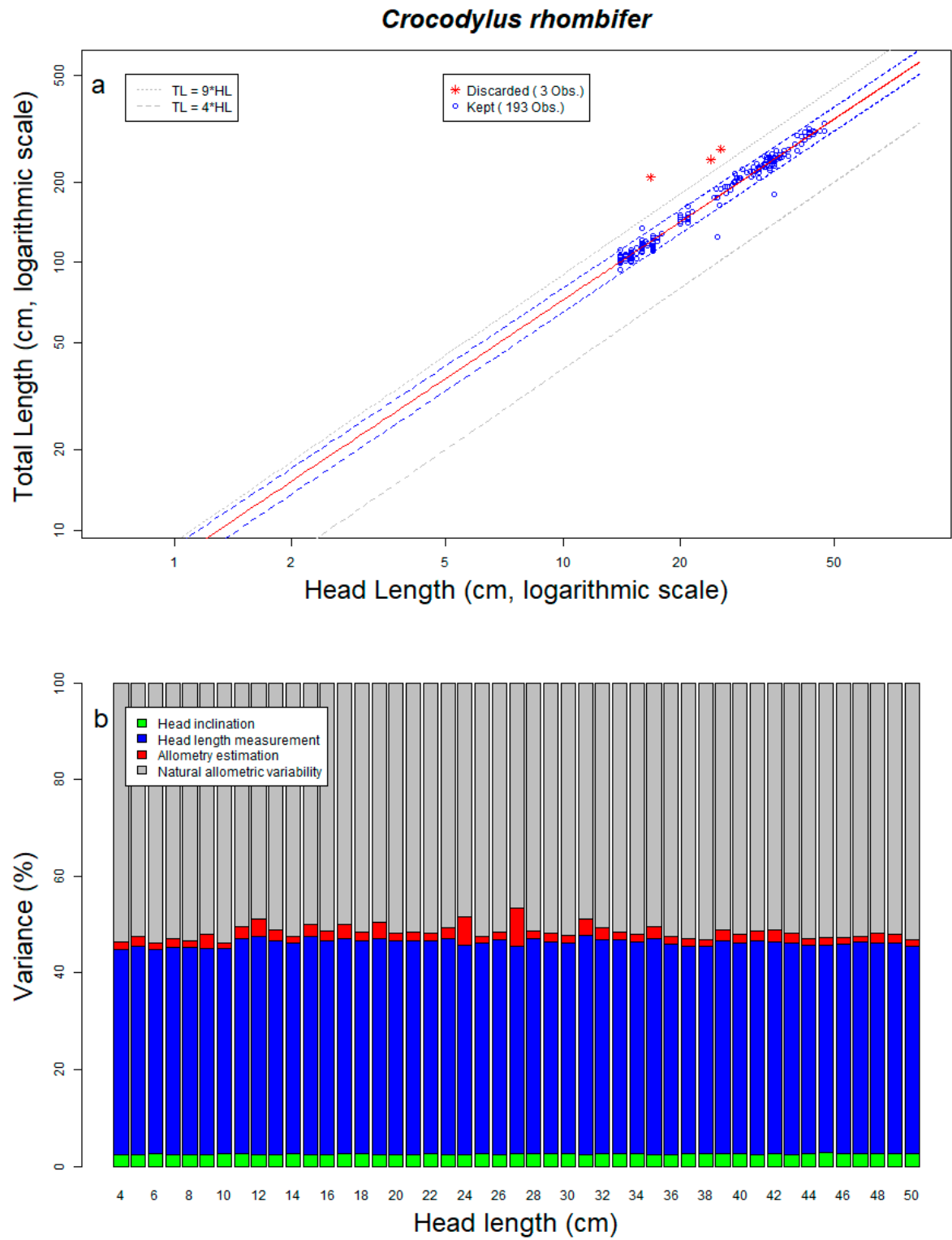
**Figure S9: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught mugger crocodile (*Crocodylus palustris*) measured in natural populations (n=80). See figure S2 for caption.**



**Figure S10: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught saltwater crocodile (*Crocodylus porosus*) measured in natural populations (n=370). See figure S2 for caption.**



**Figure S11: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Cuban crocodile (*Crocodylus rhombifer*) measured in natural populations (n=196). See figure S2 for caption.**



**Figure S12: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught gharial (*Gavialis gangeticus*) measured in natural populations (n=353). See figure S2 for caption.**

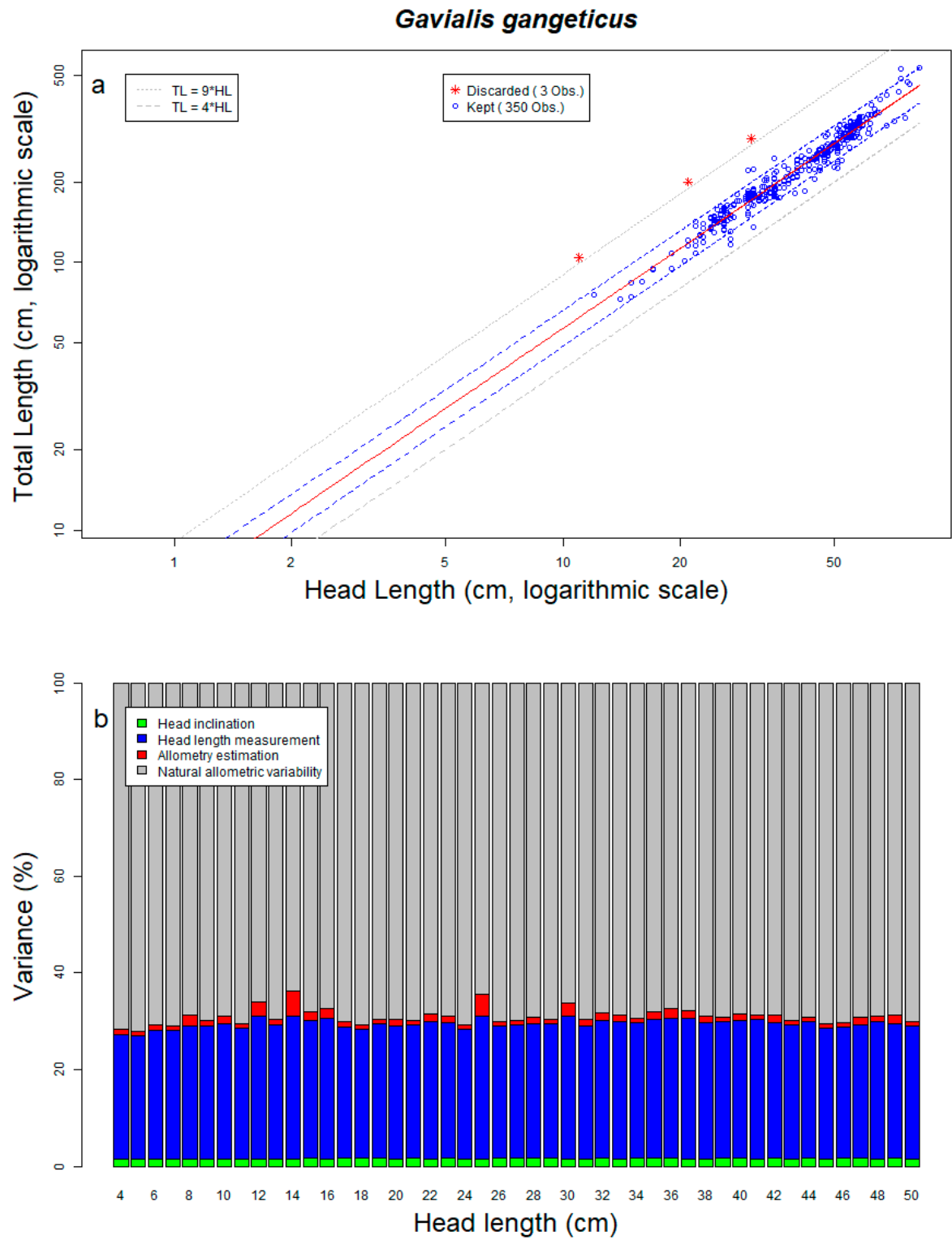
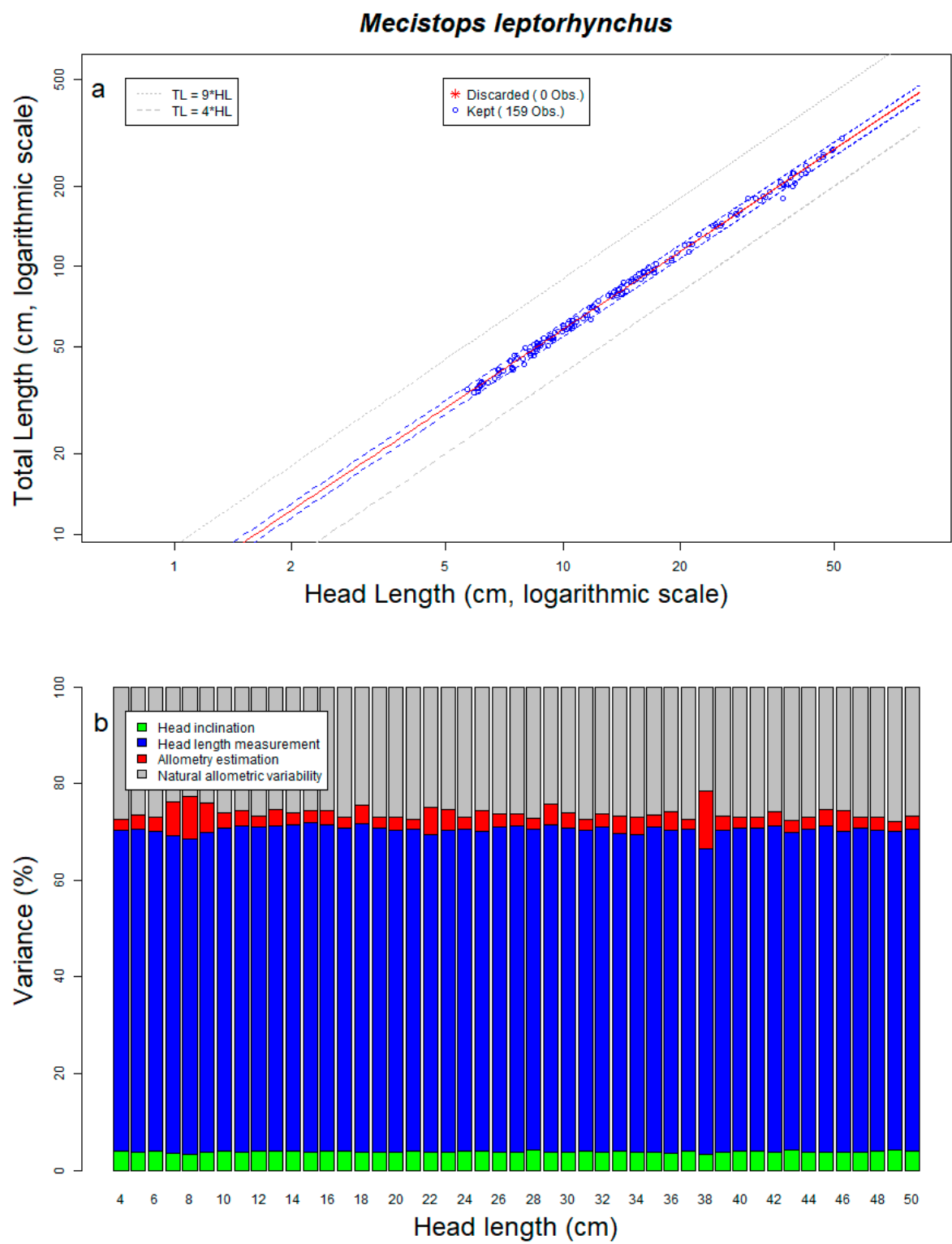
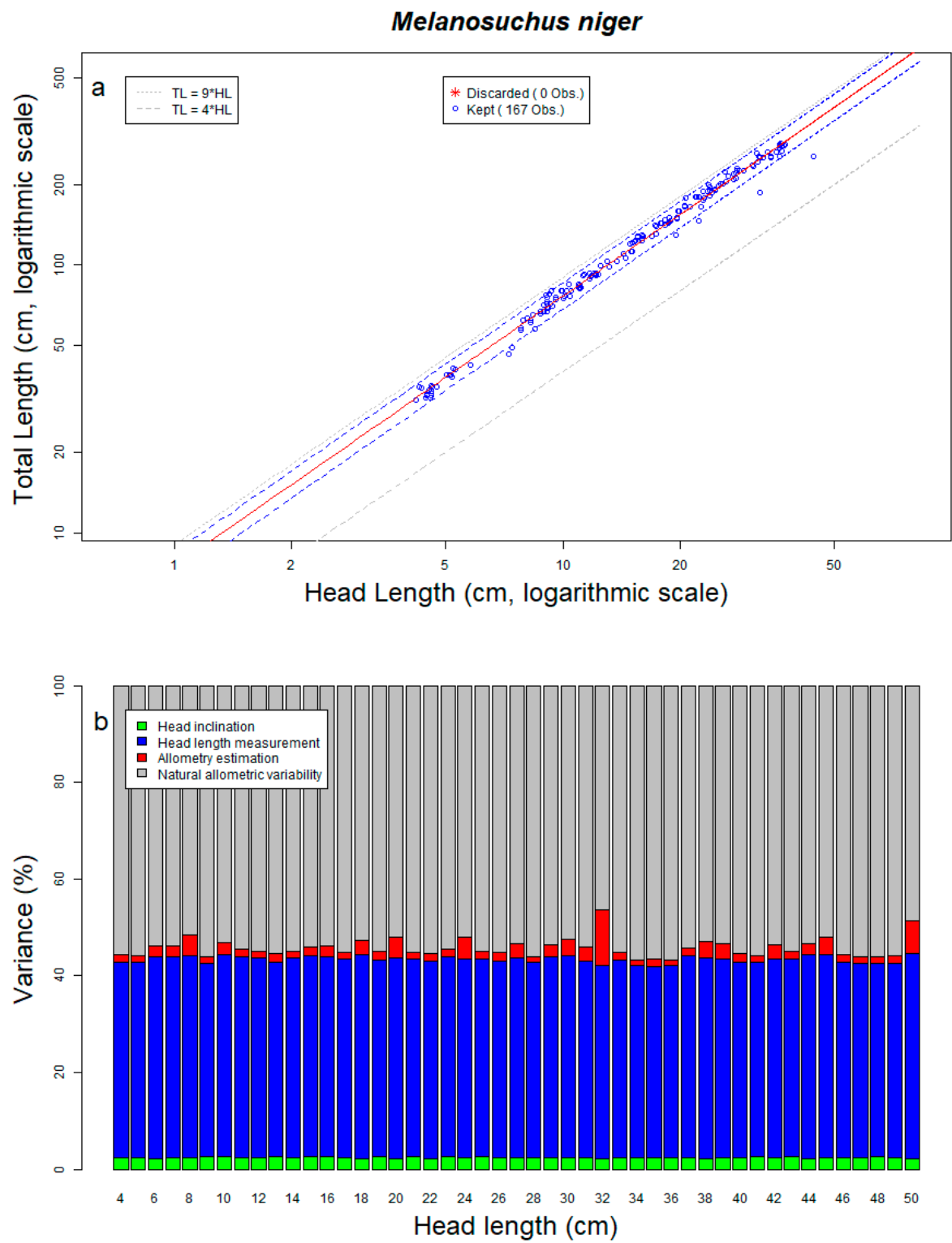


Figure S13: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Central African slender-snouted crocodile (*Mecistops leptorhynchus*) measured in natural populations (n=159). See figure S2 for caption.



**Figure S14: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught black caiman (*Melanosuchus niger*) measured in natural populations (n=167). See figure S2 for caption.**



**Figure S15: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught dwarf crocodile (*Osteolaemus tetraspis*) measured in natural populations (n=106). See figure S2 for caption.**

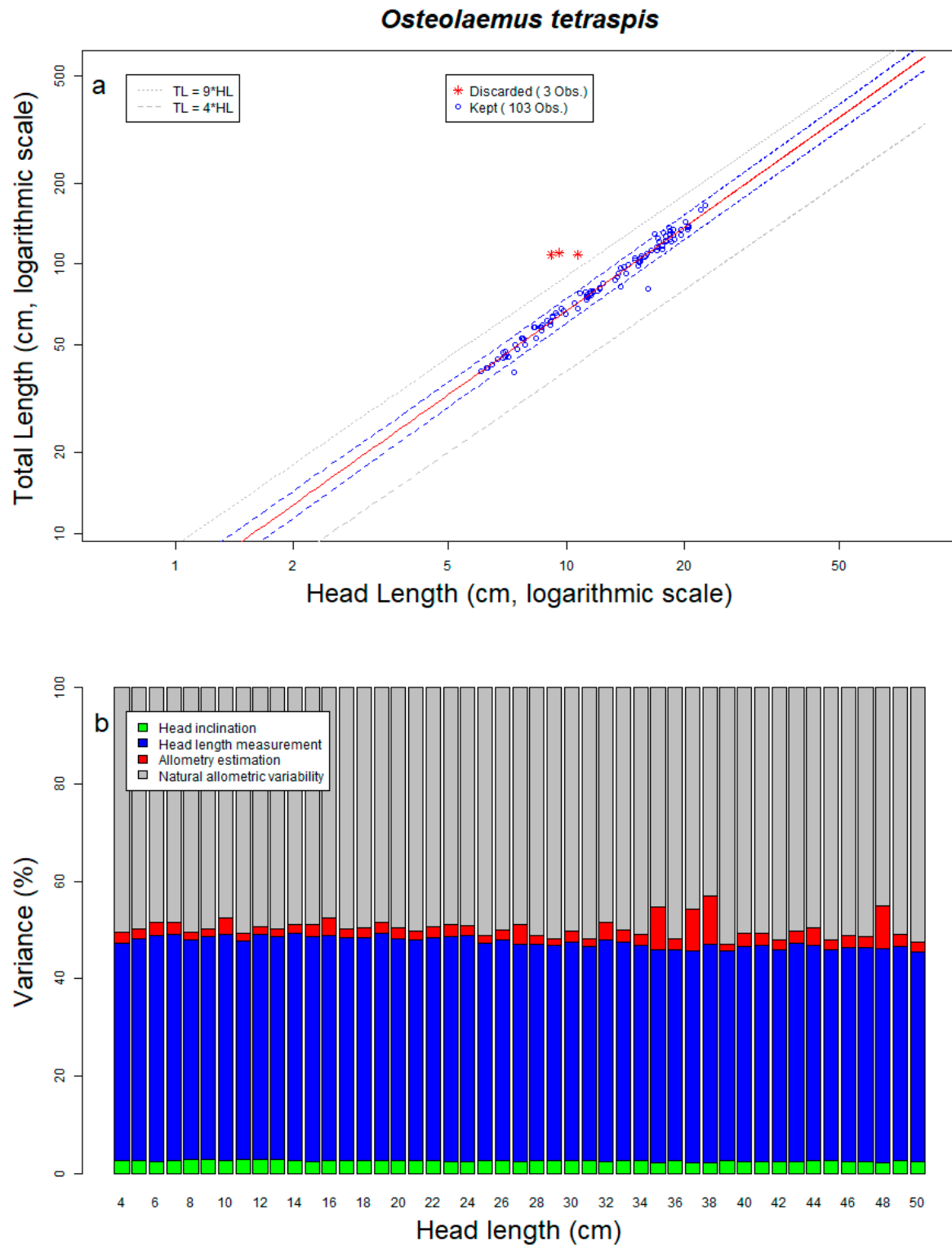




Figure S16: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught Cuvier's dwarf caiman (*Paleosuchus palpebrosus*) measured in natural populations (n=149). See figure S2 for caption.

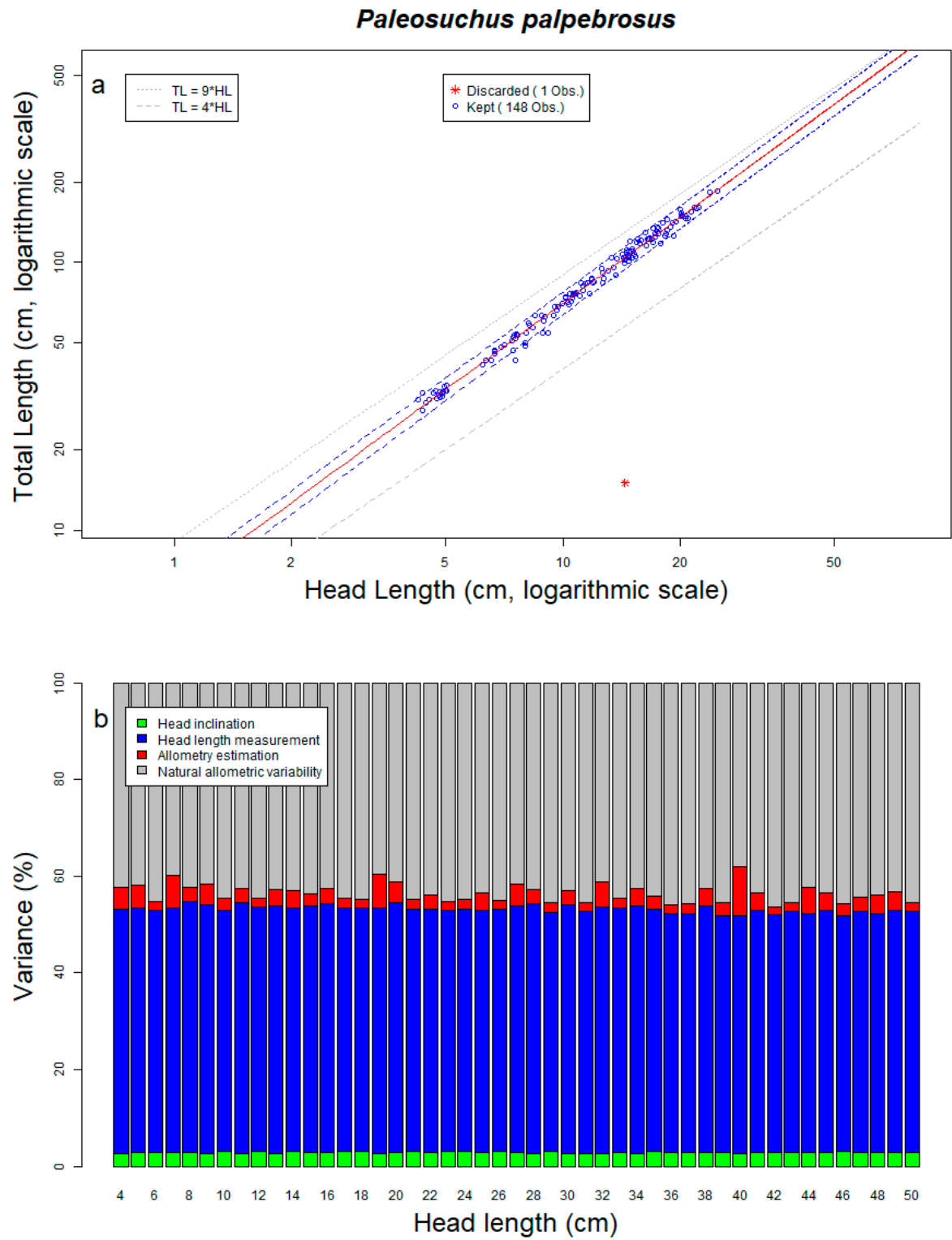


Figure S17: Allometric relationship between head length (HL) and total length (TL) in log-log scale of wild-caught smooth-fronted caiman (*Paleosuchus trigonatus*) measured in natural populations (n=87). See figure S2 for caption.

