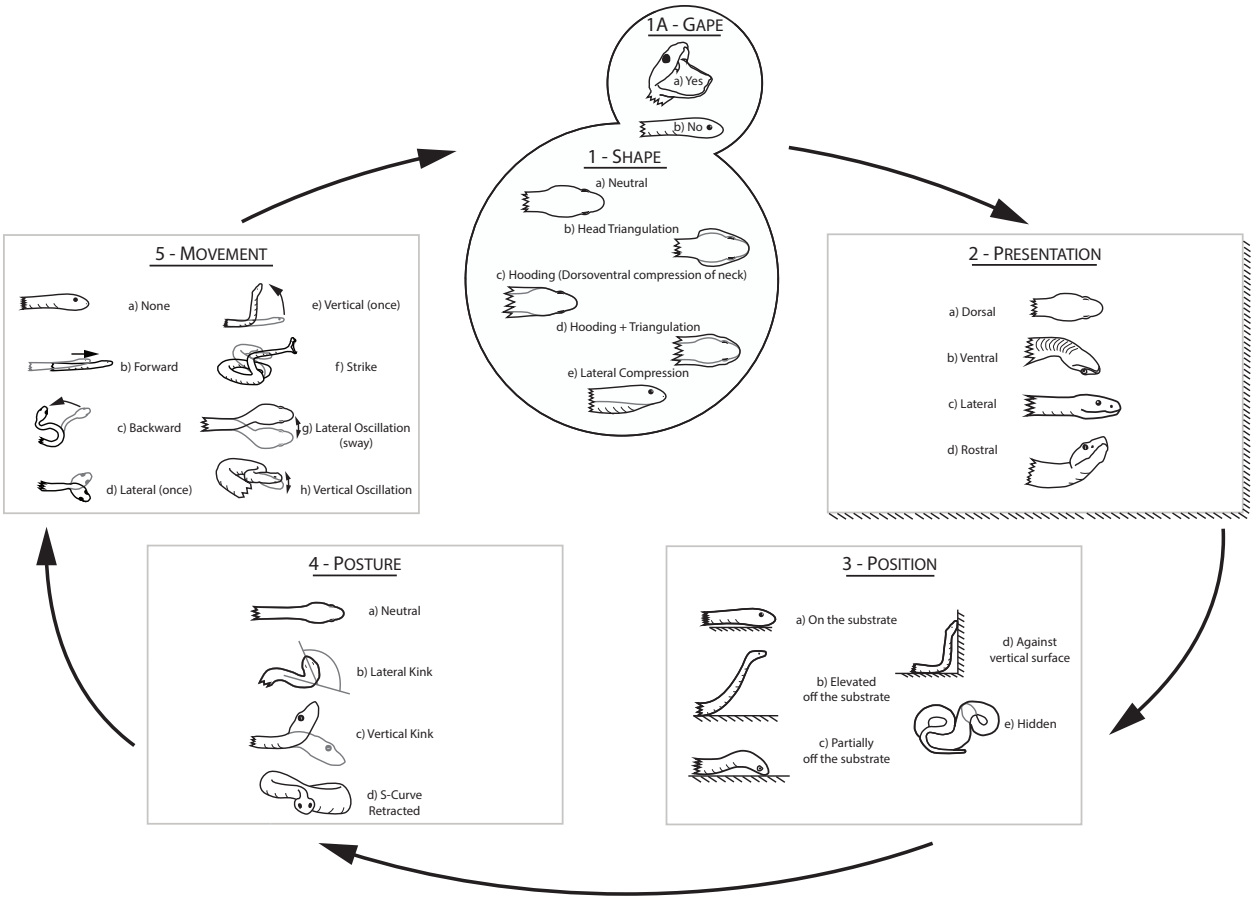

Figure S1. Scoring schematic for characterizing behavioral states in snake heads. This scoring approach assesses five major categories (Shape, Presentation, Position, Posture, and Movement) and their respective states (neutral, forward, etc.) as illustrated. Note that head "Shape" has an additional binary modifier for a gape display of the mouth. Modified from Davis Rabosky et al., 2021.

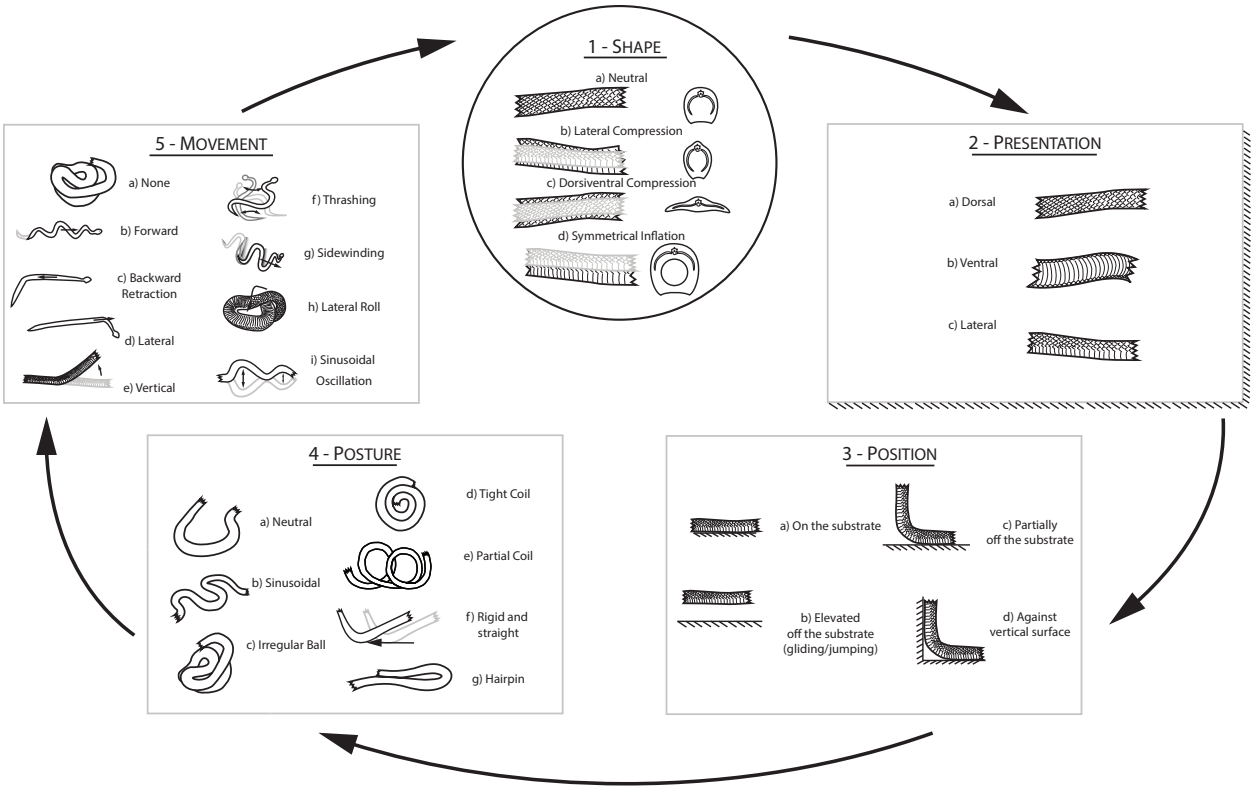

Figure S2. Scoring schematic for characterizing behavioral states in snake bodies. This scoring approach assesses five major categories (Shape, Presentation, Position, Posture, and Movement) and their respective states (neutral, forward, etc.) as illustrated. Modified from Davis Rabosky et al., 2021.

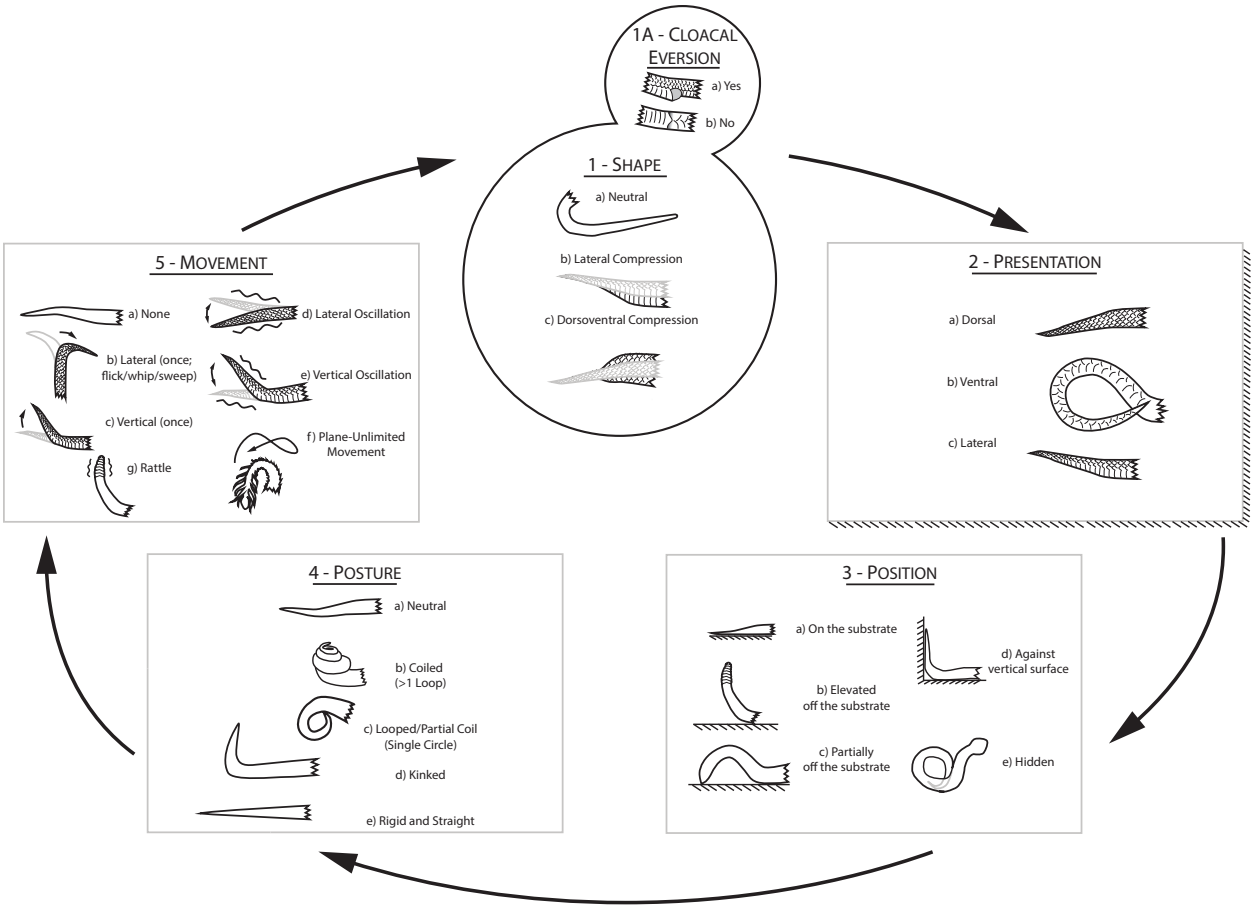

Figure S3. Scoring schematic for characterizing behavioral states in snake tails. This scoring approach assesses five major categories (Shape, Presentation, Position, Posture, and Movement) and their respective states (neutral, forward, etc.) as illustrated. Note that tail "Shape" has an additional modifier for cloacal eversion. Modified from Davis Rabosky et al., 2021.

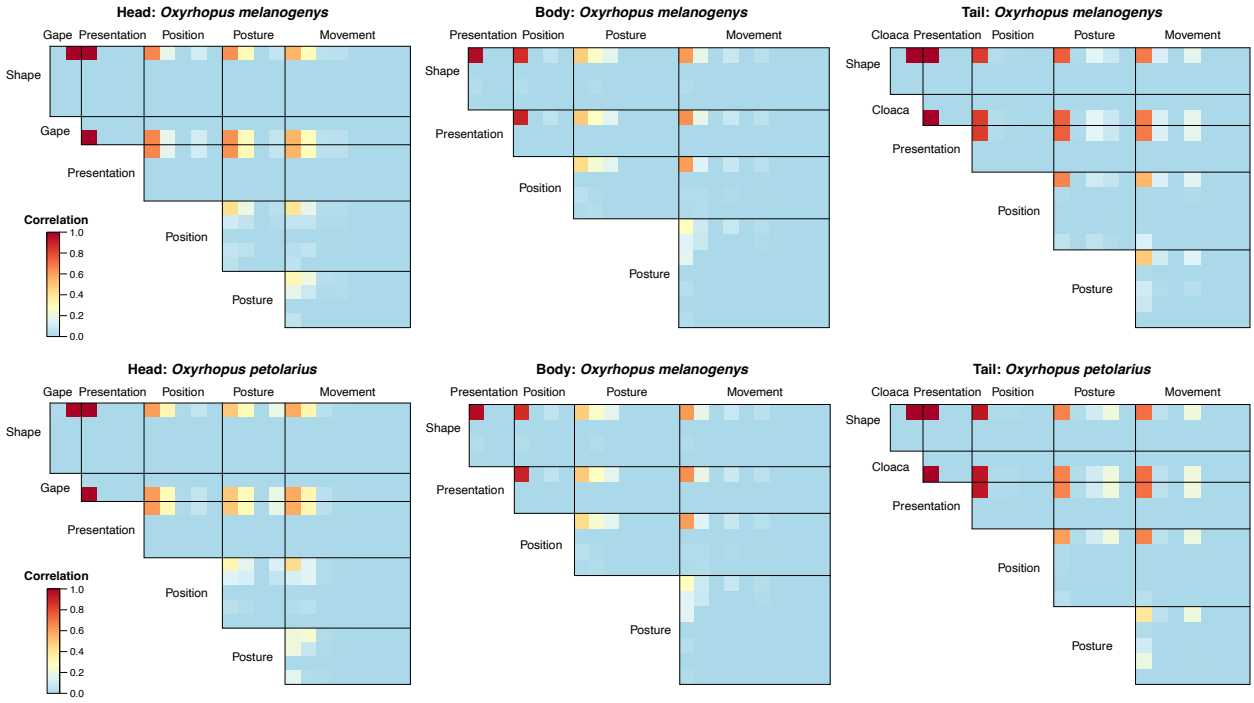

Figure S4. Correlation coefficients between behavioral states across body regions and species. The visualization of correlation coefficients within heads (left), bodies (center), and tails (right) and across *Oxyrhopus melanogenys* (top) and *O. petolarius* (bottom) demonstrates stereotyped responses and minimal differences among species. Warmer colors indicate stronger association among states (*e.g.*, shape and gape), and states within each category correspond to ordered letters in Fig. S1-S3 (*e.g.*, Head Presentation states a-d are ordered left to right in the four "Presentation" columns in the head heat maps).

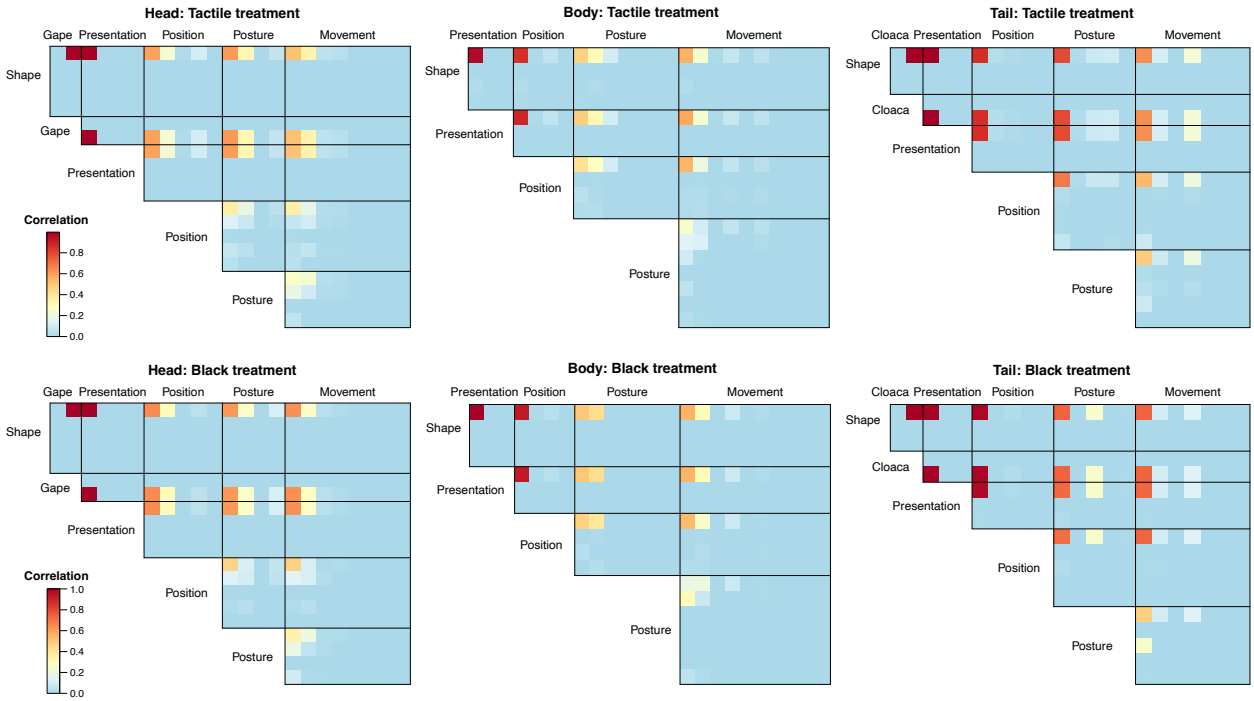

Figure S5. Correlation coefficients between behavioral states across body regions and treatments. The visualization of correlation coefficients within heads (left), bodies (center), and tails (right) across the "tactile" treatment (top) and the overhead "black looming" treatment (bottom) demonstrates stereotyped responses. Warmer colors indicate stronger association among states (*e.g.*, shape and gape), and states within each category correspond to ordered letters in Fig. S1-S3 (*e.g.*, Head Presentation states a-d are ordered left to right in the four "Presentation" columns in the head heat maps).

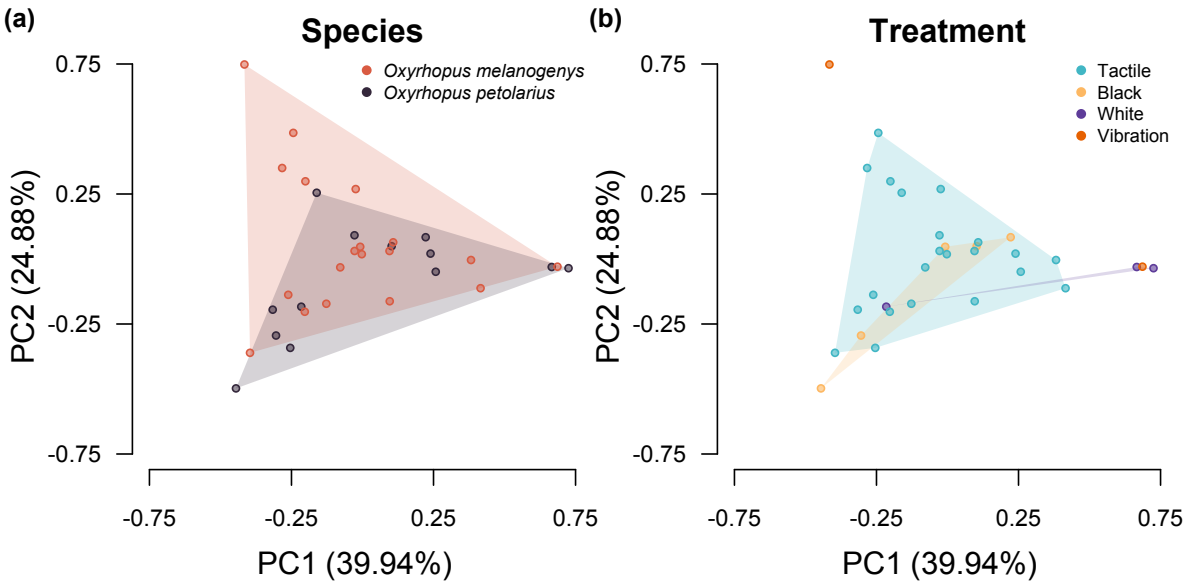

Figure S6. Shared morphospace of body behaviors in snake defensive displays. We found high similarity in defensive displays across both (a) species identity and (b) treatment (note overlapping polygons) when assessing body behavior as a multidimensional phenotype using principal components analysis (PCA). Each point represents one trial, and percent variance explained by each component is labeled along each axis. Note that there are outliers for some white and vibration trials, but that sample sizes are modest. See main manuscript Fig. 3 for heads and Fig. S7 for tails.

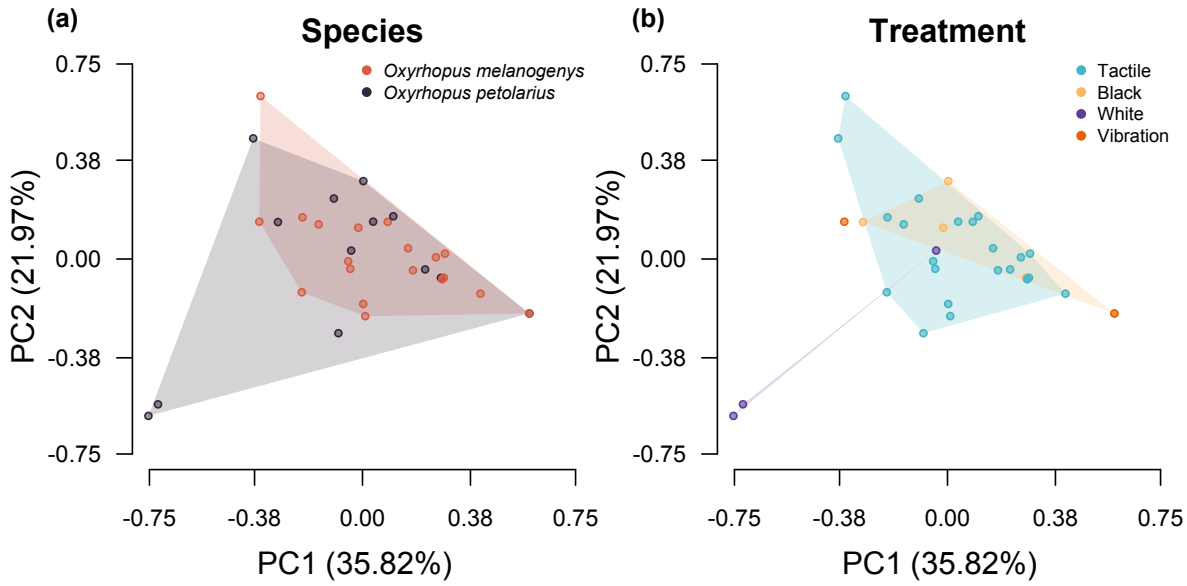

Figure S7. Shared morphospace of tail behaviors in snake defensive displays. We found high similarity in defensive displays across both (a) species identity and (b) treatment (note overlapping polygons) when assessing tail behavior as a multidimensional phenotype using principal components analysis (PCA). Each point represents one trial, and percent variance explained by each component is labeled along each axis. Note that there are outliers for some white and vibration trials, but that sample sizes are modest. See main manuscript Fig. 3 for heads and Fig. S6 for bodies.

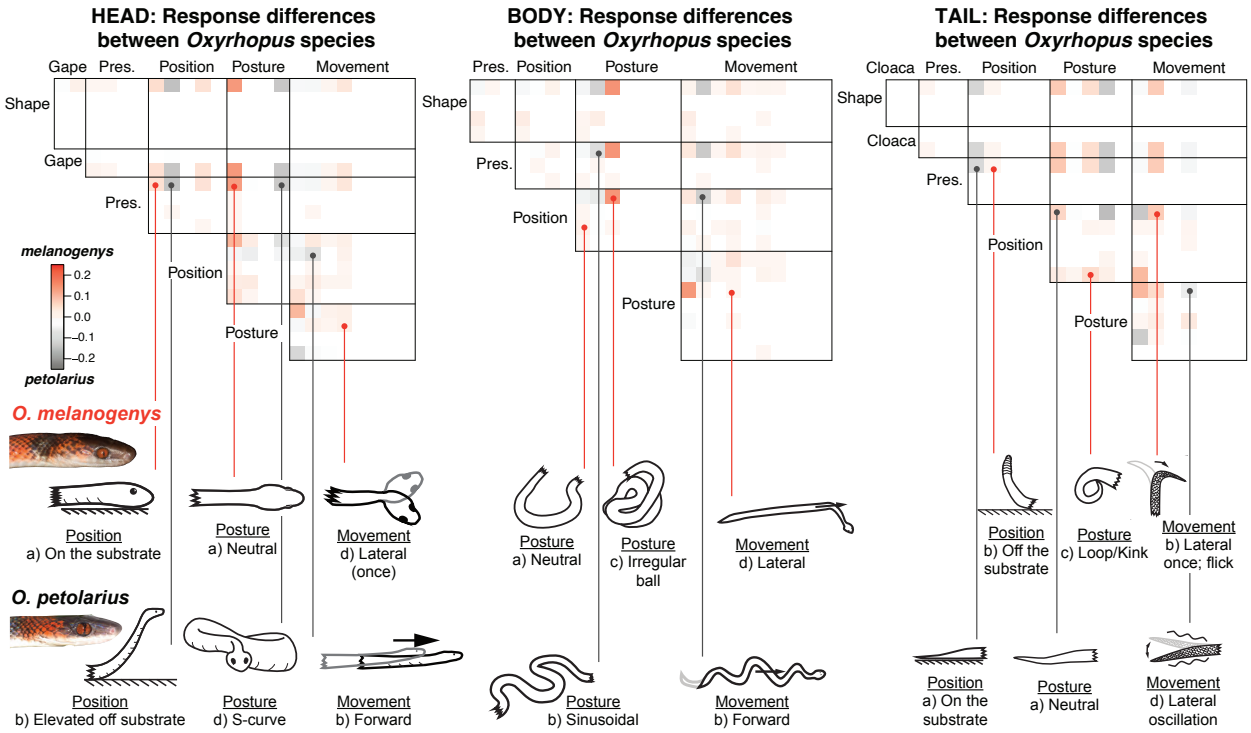

Figure S8. Matrix comparison heat map of subtle behavioral differences among species. By decomposing videos into matrices of correlation coefficients among observed states (e.g., position and presentation of the head; see also Fig. S5) and averaging these matrices within species, we found that *Oxyrhopus melanogenys* ($N = 17$ individuals) and *O. petolarius* ($N = 6$ individuals) differed slightly in which combinations of behavioral states they displayed during trials. Redder squares display state combinations seen more often in *O. melanogenys*, grayer seen more often in *O. petolarius*, with a graphical legend (below) highlighting some combinations with the highest species-specific display bias across heads (left), bodies (middle), and tails (right). This matrix visualization approach allows us to quickly and easily summarize variation across all 32 trials with a defensive response and identify the state combinations driving small areas of mismatch in morphospace overlap in Fig. 3a. Note that most cells are white, showing no average difference among species. Abbreviations: Presentation (Pres.).