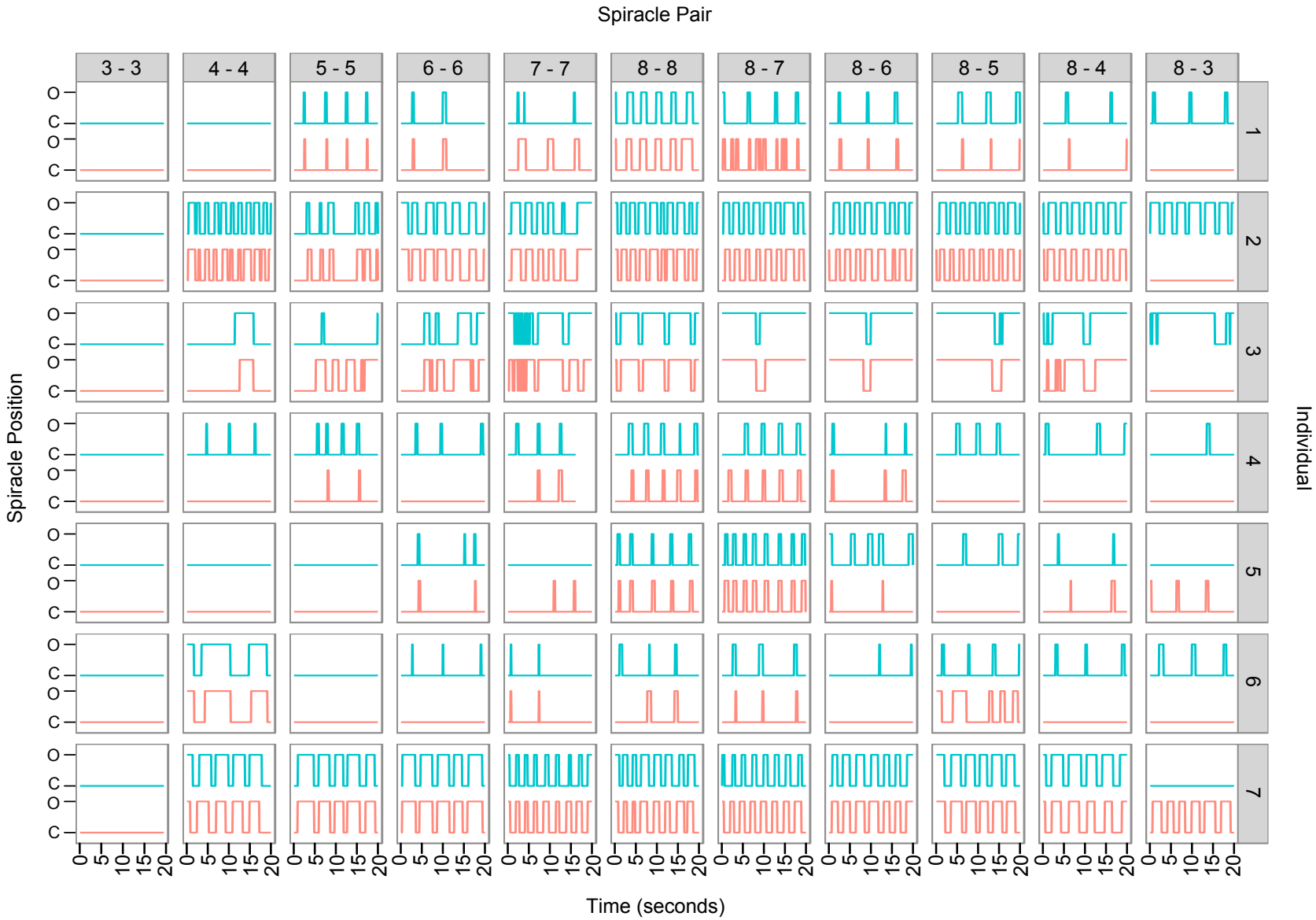

Fig. S1. Data utilized in spiracular synchrony analyses. Random 20 second video samples from 7 individual cockroaches showing abdominal spiracular activity of two spiracles on right (blue) and left (red) sides of the body. Each column includes data for one spiracle pair across 7 individuals. Spiracle pair numbers (labeled in gray boxes above each column) refer to spiracles located at the positions described in Fig. 1 of the manuscript. Each row includes data from 1 individual. Open and closed spiracle positions are referred to on the *y*-axis of each row as "O" and "C" respectively, such that an upward deflection of a line graph indicates a spiracle opening event. All videos were recorded at different times. As described in our results, some observations of discordant spiracle states resulted from short lag periods between opening events across spiracles in a pair, or from incomplete opening events (i.e. incomplete detachment from membranous structure in spiracle atrium despite small inward deflections of the valve). In most observations, spiracles across the entire abdomen appear to open and close together, with the exception of spiracle 3 which only opens during sound production.

Movie 1. Synchrony of a same-segment spiracular pair. Spiracles from same-segment pair 5 are shown opening and closing in synchrony in an adult female cockroach. The video on the right displays segments of ventral (top of video) and dorsal (bottom of video) cuticle movements associated with abdominal contractions. Videos were recorded as 640×480 pixel grayscale images at 15 frames s^{-1}. The camera fields of view are ~0.75×1 mm (left) and 1.5×2 mm (right).