

## Description of Additional Supplementary Files

**File Name: Supplementary Data 1**

**Description:** Data and scripts used in data analysis.

**File Name: Supplementary Movie 1**

**Description:** Exemplar events of wing spreading in wildtype *D. santomea* pairs.

**File Name: Supplementary Movie 2**

**Description:** Typical behavioral phenotypes of activating *dsx* brain neurons in intact and decapitated *D. santomea*, *D. melanogaster*, and *D. yakuba*.

**File Name: Supplementary Movie 3**

**Description:** Female singing induced by activating *dsx* brain neurons in *D. yakuba*.

**File Name: Supplementary Movie 4**

**Description:** Occasional wing spreading induced by activating *dsx* brain neurons in *D. melanogaster*.

**File Name: Supplementary Movie 5**

**Description:** Occasional wing spreading induced by activating *vpoDN* in *D. melanogaster*.

**File Name: Supplementary Movie 6**

**Description:** Exemplar events of wing spreading in wildtype *D. melanogaster* pairs.

**File Name: Supplementary Movie 7**

**Description:** Exemplar events of wing spreading in other species (*D. takahashii*, *D. kikkawai*, *D. malerkotliana*, *D. pseudoananassae*, *D. willistoni*, *D. mojavensis* and *D. mercatorum*) during courtship or before copulation.