**Supplementary File 2.** Functional and sex-biased expression data available for lepidopteran pheromone receptors (as of September 2018).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Species | Gene | Best ligand(s) | Expression method | Ref. | Expression bias | Quantification method | Ref. |
| *Agrotis ipsilon* | AipsOR1 |  |  |  | Male | RNAseq, qPCR | (1) |
|  | AipsOR3 |  |  |  | Male | RNAseq, qPCR | (1) |
|  | AipsOR4 |  |  |  | Male | RNAseq, qPCR | (1) |
| *Agrotis segetum* | AsegOR1 | Z5-10:OAc; Z7-12:OAc; Z8-12:OAc | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR3 | Z3,Z6,Z9-21:H | *Xenopus* oocytes | (3) |  |  |  |
|  | AsegOR4 | Z7-12:OAc | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR5 | Z9-14:OAc | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR6 | Z5-10:OH | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR7 | Z5-10:OAc | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR8 | Z5-10:OAc; Z5-10:OH | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR9 | Z5-10:OAc | *Xenopus* oocytes | (2) |  |  |  |
|  | AsegOR10 | Z9-14:OAc | *Xenopus* oocytes | (2) |  |  |  |
| *Antherea polyphemus* | ApolOR1 | E6,Z11:Ald | HEK293 cells | (4) |  |  |  |
| *Amyelois transitella* | AtraOR1 | Z11,Z13-16:Ald | *Xenopus* oocytes | (5) |  |  |  |
|  | AtraOR3 | Z11-16:Ald | *Xenopus* oocytes | (5) |  |  |  |
| *Athethis dissimilis* | AdisOR3 |  |  |  | Male | RNAseq | (6) |
|  | AdisOR6 |  |  |  | Male | RNAseq | (6) |
|  | AdisOR14 |  |  |  | Male | RNAseq | (6) |
|  | AdisOR17 |  |  |  | Female | RNAseq | (6) |
|  | AdisOR32b |  |  |  | Female | RNAseq | (6) |
| *Bombyx mori* | BmorOR1 | E10,Z12-16:OH | *Xenopus* oocytes | (7) | Male | qPCR | (8) |
|  | BmorOR3 | E10,Z12-16:Ald | *Xenopus* oocytes | (9) | Male | qPCR | (8) |
|  | BmorOR4 |  |  |  | Male | qPCR | (8) |
|  | BmorOR5 |  |  |  | Male | qPCR | (8) |
|  | BmorOR6 |  |  |  | Male | qPCR | (8) |
|  | BmorOR24 | 2-hexenyl acetate | *Xenopus* oocytes | (10) |  |  |  |
|  | BmorOR30 |  |  |  | Female | qPCR | (8) |
|  | BmorOR42 | (±)-linalool | *Xenopus* oocytes | (10) |  |  |  |
| *Conogethes punctiferalis* | CpunOR22 |  |  |  | Male | RNAseq, qPCR | (11) |
|  | CpunOR26 |  |  |  | Male | RNAseq, qPCR | (11) |
|  | CpunOR46 |  |  |  | Male | RNAseq, qPCR | (11) |
| *Ctenopseustis herana* | CherOR7 | Z8-14:OAc | HEK293 cells | (12) | Male | RNAseq, qPCR | (12) |
|  | CherOR30 |  |  |  | Male | RNAseq, qPCR | (12) |
| *Ctenopseustis obliquana* | CoblOR7 | Z8-14:OAc | HEK293 cells | (12) | Male | RNAseq, qPCR | (12) |
|  | CoblOR30 |  |  |  | Male | RNAseq, qPCR | (12) |
| *Cydia pomonella* | CpomOR1 |  |  |  | Male | RNAseq | (13) |
|  | CpomOR3 | pear ester | HEK293 cells, *Drosophila* OSNs | (14) |  |  |  |
|  | CpomOR5 |  |  |  | Male | RNAseq | (13) |
|  | CpomOR6 | E8,E10-12:OH | HEK293 cells, *Drosophila* OSNs | (14) | Male | RNAseq | (13) |
|  | CpomOR7 |  |  |  | Male | RNAseq | (13) |
|  | CpomOR21 |  |  |  | Female | RNAseq | (13) |
|  | CpomOR22 |  |  |  | Female | RNAseq | (13) |
|  | CpomOR30 |  |  |  | Female | RNAseq | (13) |
|  | CpomOR31 |  |  |  | Male | RNAseq | (13) |
|  | CpomOR41 |  |  |  | Female | RNAseq | (13) |
| *Dendrolimus punctatus* | DpunOR4 |  |  |  | Female | RNAseq, qPCR | (15) |
|  | DpunOR7 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR20 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR45 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR46 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR47 |  |  |  | Female | RNAseq, qPCR | (15) |
|  | DpunOR49 |  |  |  | Female | RNAseq, qPCR | (15) |
|  | DpunOR51 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR54 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR63 |  |  |  | Male | RNAseq, qPCR | (15) |
|  | DpunOR67 |  |  |  | Female | RNAseq, qPCR | (15) |
|  | DpunOR68 |  |  |  | Female | RNAseq, qPCR | (15) |
| *Diaphania indica* | DindOR1 | E11-16:Ald | *Xenopus* oocytes | (16) |  |  |  |
| *Ectropis grisescens* | EgriOR24 |  |  |  | Male | RNAseq | (17) |
|  | EgriOR28 |  |  |  | Male | RNAseq | (17) |
|  | EgriOR31 | Z3,Z6,Z9-18:H | *Xenopus* oocytes | (17) | Male | RNAseq | (17) |
|  | EgriOR37 |  |  |  | Male | RNAseq | (17) |
|  | EgriOR44 |  |  |  | Male | RNAseq | (17) |
| *Epiphyas postvittana* | EposOR1 | methyl salicylate | Sf9 cells | (18) |  |  |  |
|  | EposOR3 | citral | Sf9 cells | (18) |  |  |  |
|  | EposOR6 |  |  |  | Male | RNAseq, qPCR | (19) |
|  | EposOR7 |  |  |  | Male | RNAseq, qPCR | (19) |
|  | EposOR30 |  |  |  | Male | RNAseq, qPCR | (19) |
|  | EposOR31 |  |  |  | Female | RNAseq, qPCR | (19) |
|  | EposOR33 |  |  |  | Female | RNAseq, qPCR | (19) |
|  | EposOR34 |  |  |  | Male | RNAseq, qPCR | (19) |
|  | EposOR36 |  |  |  | Female | RNAseq, qPCR | (19) |
|  | EposOR40 |  |  |  | Female | RNAseq, qPCR | (19) |
| *Eriocrania semipurpurella* | EsemOR1 | β-caryophyllene | HEK293 cells | (20) |  |  |  |
|  | EsemOR3 | (2S,6Z)-6-nonen-2-ol | HEK293 cells | (20) |  |  |  |
|  | EsemOR5 | Z6-nonen-2-one | HEK293 cells | (20) |  |  |  |
| *Heliconius melpomene* | HmelOR5 |  |  |  | Female | RNAseq | (21) |
|  | HmelOR46 |  |  |  | Female | RNAseq | (21) |
|  | HmelOR70 |  |  |  | Female | RNAseq | (21) |
| *Helicoverpa armigera* | HarmOR6 | Z9-14:Ald; Z9-16:Ald | *Xenopus* oocytes | (22) |  |  |  |
|  | HarmOR12 | 3,7-dimethyl-2,6-octadienal | *Xenopus* oocytes | (23) |  |  |  |
|  | HarmOR13 | Z11-16:Ald | *Xenopus* oocytes | (22) | Male | qPCR | (22) |
|  | HarmOR14a |  |  |  | Male | qPCR | (22) |
|  | HarmOR14b | Z9-14:Ald | *Xenopus* oocytes | (24) | Male | qPCR | (24) |
|  | HarmOR15 |  |  |  | Male | qPCR | (22) |
|  | HarmOR16 | Z11-16:OH; Z9-16:Ald | *Xenopus* oocytes | (22) | Male | qPCR | (22) |
|  | HarmOR52 | 1-pentanol | *Xenopus* oocytes | (23) |  |  |  |
| *Helicoverpa assulta* | HassOR6 | Z9-16:OH | *Xenopus* oocytes | (24) | Male | qPCR | (24) |
|  | HassOR13 | Z11-16:Ald | *Xenopus* oocytes | (24) | Male | qPCR | (24) |
|  | HassOR14b |  |  |  | Male | qPCR | (24) |
|  | HassOR16 | Z9-14:Ald | *Xenopus* oocytes | (24) |  |  |  |
| *Heliothis virescens* | HvirOR6 | Z9-14:Ald | *Xenopus* oocytes | (25) |  |  |  |
|  | HvirOR13 | Z11-16:Ald | *Xenopus* oocytes | (25) | Male | qPCR | (26) |
|  | HvirOR14 | Z11-16:OAc | *Xenopus* oocytes | (25) | Male | qPCR | (26) |
|  | HvirOR16 | Z11-16:OH | *Xenopus* oocytes | (25) |  |  |  |
| *Lampronia capitella* | LcapOR3 |  |  |  | Female | RNAseq | (27) |
|  | LcapOR6 | Z9,Z11-14:Ald | HEK293 cells | (27) | Male | RNAseq | (27) |
|  | LcapOR7 | Z11-14:OH; Z11-14:OAc; Z11-14:Ald | HEK293 cells | (27) | Male | RNAseq | (27) |
|  | LcapOR8 | Z9,Z11-14:OH | HEK293 cells | (27) | Male | RNAseq | (27) |
|  | LcapOR28 |  |  |  | Female | RNAseq | (27) |
| *Manduca sexta* | MsexOR1 | E10,Z12-16:Ald | HEK293 and CHO cells | (28) | Male | RNAseq | (29) |
|  | MsexOR4 |  |  |  | Male | RNAseq | (29) |
|  | MsexOR15 |  |  |  | Female | RNAseq | (29) |
|  | MsexOR51 |  |  |  | Male | RNAseq | (29) |
|  | MsexOR83 |  |  |  | Male | RNAseq | (29) |
|  | MsexOR86 |  |  |  | Female | RNAseq | (29) |
| *Mythimna separata* | MsepOR1 | Z11-16:OAc | *Xenopus* oocytes | (16) |  |  |  |
| *Ostrinia furnacalis* | OfurOR3 | E12-14:OAc; Z12-14:OAc | *Xenopus* oocytes | (30) | Male | RNAseq, qPCR | (31) |
|  | OfurOR4 | Z12-14:OAc | *Xenopus* oocytes | (32) | Male | RNAseq, qPCR | (31) |
|  | OfurOR5a |  |  |  | Male | RNAseq, qPCR | (31) |
|  | OfurOR5b | Z9-14:OAc; Z11-14:OAc; E11-14:OAc; Z12-14:OAc | *Xenopus* oocytes | (32) | Male | RNAseq, qPCR | (31) |
|  | OfurOR6 | E12-14:OAC | *Xenopus* oocytes | (32) | Male | RNAseq, qPCR | (31) |
|  | OfurOR7 | Z9-14:OAc | *Xenopus* oocytes | (32) |  |  |  |
|  | OfurOR8 | E11-14:OAc; Z11-14:OAc | *Xenopus* oocytes | (32) | Male | RNAseq, qPCR | (31) |
|  | OfurOR53 |  |  |  | Female | RNAseq, qPCR | (31) |
| *Ostrinia latipennis* | OlatOR1 | E11-14:OH | *Xenopus* oocytes | (33) |  |  |  |
| *Ostrinia nubilalis* | OnubOR1 | E12-14:OAC | *Xenopus* oocytes | (34) | Male | qPCR | (34) |
|  | OnubOR3 | E12-14:OAc | *Xenopus* oocytes | (34) | Male | qPCR | (34) |
|  | OnubOR5 | E11-14:OAc; E12-14:OAc | *Xenopus* oocytes | (34) | Male | qPCR | (34) |
|  | OnubOR6 | Z11-14:OAc | *Xenopus* oocytes | (34) | Male | qPCR | (34) |
| *Ostrinia scapulalis* | OscaOR1 | E11-14:OH | *Xenopus* oocytes | (33) |  |  |  |
|  | OscaOR3 | Z9-14:OAc; Z11-14:OAc; E11-14:OAc | *Xenopus* oocytes | (35) |  |  |  |
|  | OscaOR4 | E11-14:OAc | *Xenopus* oocytes | (35) |  |  |  |
| *Operophtera brumata* | ObruOR1 | 1,Z3,Z6,Z9-19:H | *Xenopus* oocytes | (3) | Male | qPCR | (3) |
| *Planotortrix excessana* | PexcOR7 |  |  |  | Male | RNAseq, qPCR | (36) |
|  | PexcOR30 |  |  |  | Male | RNAseq, qPCR | (36) |
| *Planotortrix octo* | PoctOR7 |  |  |  | Male | RNAseq, qPCR | (36) |
|  | PoctOR30 |  |  |  | Male | RNAseq, qPCR | (36) |
| *Plutella xylostella* | PxylOR6 |  |  |  | Male | qPCR | (37) |
|  | PxylOR48 | Z9,E12-14:OAc; Z9-14:OAc | *Xenopus* oocytes | (38) | Male | qPCR | (38) |
|  | PxylOR49 | Z9-14:Ac; Z9-14:OH; Z9-14:Ald | *Xenopus* oocytes | (37) | Male | qPCR | (37) |
|  | PxylOR50 |  |  |  | Female | qPCR | (37) |
|  | PxylOR59 | Z11-16:Ald | *Xenopus* oocytes | (38) | Male | qPCR | (38) |
| *Sesamia inferens* | SinfOR21 | Z11-16:OH | *Xenopus* oocytes | (39) |  |  |  |
|  | SinfOR27 | Z9,E12-14:OAc | *Xenopus* oocytes | (39) |  |  |  |
|  | SinfOR29 | Z11-16:OAc | *Xenopus* oocytes | (39) |  |  |  |
| *Spodoptera exigua* | SexiOR3 | (E)-β-farnesene | *Xenopus* oocytes | (40) |  |  |  |
|  | SexiOR6 |  |  |  | Male | qPCR | (41) |
|  | SexiOR11 |  |  |  | Male | qPCR | (41) |
|  | SexiOR13 | Z9,E12-14:OAc; Z9-14:OAc | *Xenopus* oocytes | (42) | Male | qPCR | (41) |
|  | SexiOR16 | Z9-14:OH | *Xenopus* oocytes | (42) | Male | qPCR | (41) |
|  | SexiOR18 |  |  |  | Female | qPCR | (41) |
|  | SexiOR28 |  |  |  | Female | qPCR | (41) |
|  | SexiOR34 |  |  |  | Female | qPCR | (41) |
|  | SexiOR40 |  |  |  | Female | qPCR | (41) |
| *Spodoptera littoralis* | SlitOR3 | (E)-4,8-dimethylnona-1,3,7-triene | *Drosophila* OSNs | (43) |  |  |  |
|  | SlitOR4 | (±)-linalool | *Drosophila* OSNs | (43) |  |  |  |
|  | SlitOR5 | Z9,E11-14:OAc | *Drosophila* OSNs |  | Male | qPCR |  |
|  | SlitOR6 | Z9,E12-14:OAc | *Drosophila* OSNs | (44) | Male | qPCR | (44) |
|  | SlitOR7 | sulcatone | *Drosophila* OSNs | (43) |  |  |  |
|  | SlitOR13 | Z9,E12-14:OAc | *Drosophila* OSNs | (45) | Male | qPCR | (45) |
|  | SlitOR28 | Z3-hexenyl acetate | *Drosophila* OSNs | (43) |  |  |  |
|  | SlitOR35 | 3-carene | *Drosophila* OSNs | (43) |  |  |  |
|  | SlitOR36 | benzyl alcohol | *Drosophila* OSNs | (43) |  |  |  |
| *Spodoptera litura* | SlituOR6 | Z9,E12-14:OAc | *Xenopus* oocytes | (46) | Male | qPCR | (46) |
|  | SlituOR12 | Z3-hexenyl acetate | *Xenopus* oocytes | (47) |  |  |  |
|  | SlituOR13 | Z9-14:OAc; Z9,E12-14:OAc | *Xenopus* oocytes | (46) | Male | qPCR | (46) |
|  | SlituOR16 | Z9-14:OH | *Xenopus* oocytes | (46) |  |  |  |

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