**Supplementary material**

**Suppl. Table 1** Representation analysis. Coverage of protein-coding genes in read libraries from *D. chrysippus* females and a male analysed by TBLASTN. Queries are proteins from *B. mori*. The respective chromosome assignments are given together with the homologous chromosomes of *B. betularia*. Coverage data are presented as female/male ratios, corrected for library size.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Protein | Query | Bombyx | Biston | WatamuFemale | KitengelaFemale |
|  | acc. no. | chr.# | chr.# | /WatamuMale | /WatamuMale |
|  |  |  |  | ratio | ratio |
| kettin | NP\_001108348 | 1 | 1 | 0.51 | 0.48 |
| lactate dehydrogenase | NP\_001095933 | 1 | 1 | 0.47 | 0.48 |
| paramyosin | ACF21977 | 1 | 1 | 0.44 | 0.42 |
| ATP-binding cassette sub-family F member 2 | NP\_001040334 | 1 | 1 | 0.48 | 0.46 |
| distal-less | XP\_004933291 | 2 | 2 | 0.92 | 0.74 |
| ARP6 | NP\_001040469 | 2 | 2 | 0.97 | 0.90 |
| HMG-R\_Bm | BAF62108 | 2 | 2 | 0.99 | 0.79 |
| ribosomal protein L23 | AAV34834 | 2 | 2 | 1.14 | 1.26 |
| v-ATPase H subunit | ABF51492 | 3 | 3 | 1.09 | 0.92 |
| Mn superoxide dismutase | BAD51413 | 3 | 3 | 0.94 | 1.25 |
| LAMTOR3 | XP\_004924436 | 3 | 3 | 1.14 | 1.27 |
| protein msta isoform B | XP\_012546907 | 3 | 3 | 1.02 | 1.02 |
| kinase 7-like | XP\_004931740 | 3 | 3 | 1.30 | 1.11 |
| RACK 1 | NP\_001041703 | 3 | 3 | 1.37 | 1.30 |
| dopa decarboxylase | XP\_012549895 | 4 | 4 | 1.07 | 0.96 |
| Wnt-1 | NP\_001037315 | 4 | 4 | 0.97 | 0.85 |
| DDC | AAK48988 | 4 | 4 | 1.06 | 0.95 |
| kiser | AAS91007 | 4 | 4 | 1.12 | 0.99 |
| EF-1a | D13338 | 5 | 5 | 0.97 | 0.77 |
| EIF3S6 | ABD36299 | 5 | 5 | 1.15 | 0.94 |
| patched | XP\_004930076 | 5 | 5 | 1.02 | 0.93 |
| ultrabithorax | NP\_001107632 | 6 | 6 | 0.97 | 0.86 |
| vacuolar protein sorting 4 | NP\_001161188 | 6 | 6 | 0.91 | 0.83 |
| antennapedia | BAA04087 | 6 | 6 | 1.01 | 0.90 |
| cadherin-like membrane protein | BAA99404 | 6 | 6 | 1.19 | 1.17 |
| BmChi-h | BAC67246 | 7 | 7 | 1.00 | 0.87 |
| single-minded homolog 2 | XP\_012553046 | 7 | 7 | 1.22 | 1.26 |
| ribonuclease L inhibitor | NP\_001036911 | 7 | 7 | 1.15 | 1.10 |
| enolase | NP\_001091831 | 8 | 8 | 0.91 | 1.17 |
| SEC62 | XP\_004924120 | 8 | 8 | 0.92 | 0.80 |
| BmBR-C Z4-1 | BAD24049 | 8 | 8 | 0.88 | 0.84 |
| BmHSC70-4 | BAB92074 | 9 | 9 | 1.01 | 0.92 |
| aminopeptidase N | BAA32140 | 9 | 9 | 1.05 | 0.85 |
| ecdysteroid-inducible angiotensin-converting | NP\_001036859 | 9 | 9 | 1.02 | 0.96 |
| c-Cbl-associated protein | NP\_001166801 | 9 | 9 | 1.19 | 1.12 |
| ribosomal protein S14 | Q5UAM9 | 9 | 9 | 1.29 | 1.31 |
| laccase 2A | BAG70891 | 10 | 10 | 1.05 | 0.94 |
| ABC transporter | BAH03523 | 10 | 10 | 1.13 | 0.96 |
| kynurenine 3-monooxygenase | ABE68382 | 10 | 10 | 0.96 | 0.91 |
| iNOS-LP | BAB33296 | 10 | 10 | 0.89 | 1.25 |
| aconitase | XP\_004922163 | 11 | 11 | 0.83 | 0.80 |
| orb2 | XP\_012548285 | 11 | 11 | 0.91 | 0.75 |
| aprataxin | XP\_004932950 | 11 | 29 | 1.21 | 1.04 |
| eukaryotic transl. initiation factor 3 subunit L | NP\_001037217 | 11 | 29 | 0.91 | 0.91 |
| ribosomal protein L18 | XP\_004924182 | 11 | 29 | 0.92 | 0.69 |
| signal sequence receptor | NP\_001091760 | 11 | 29 | 1.20 | 0.89 |
| cysteine sulfinic acid decarboxylase | XP\_004932908 | 11 | 29 | 1.06 | 0.96 |
| decapentaplegic | NP\_001138801 | 12 | 12 | 1.00 | 0.80 |
| serine protease easter-like | XP\_012548716 | 12 | 12 | 0.97 | 0.87 |
| XDH I | BAA07348 | 12 | 12 | 0.98 | 0.99 |
| ribosomal protein S2 (RpS2) | AAV34857 | 13 | 13 | 0.94 | 1.06 |
| cytochrome P450 | ABF51415 | 13 | 13 | 1.23 | 1.18 |
| troponin T | NP\_001040221 | 13 | 13 | 0.89 | 0.97 |
| ribosomal protein S3 (RpS3) | AAV34858 | 14 | 14 | 0.91 | 0.79 |
| enoyl-CoA hydratase | ABD36107 | 14 | 14 | 1.10 | 1.07 |
| eukaryotic translation initiation factor 3 | NP\_001037656 | 14 | 14 | 0.87 | 0.86 |
| M6-b | XP\_004928477 | 15 | 15 | 0.95 | 0.88 |
| Notch | NP\_001157370 | 15 | 15 | 1.02 | 0.94 |
| clathrin heavy chain | NP\_001136443 | 16 | 16 | 0.53 | 0.51 |
| NIPSNAP | NP\_001040139 | 16 | 16 | 0.48 | 0.52 |
| phenoloxidase subunit 1 | NP\_001037335 | 16 | 16 | 0.63 | 0.68 |
| Sex-lethal | BAE86938 | 16 | 16 | 0.66 | 0.57 |
| eIF3-S8 | ABG54288 | 16 | 16 | 0.55 | 0.43 |
| cytoplasmic actin A4 | AAC47432 | 17 | 17 | 0.97 | 0.71 |
| eIF3-S9 | ABF55967 | 17 | 17 | 1.05 | 0.91 |
| snmp1 | CAB65730 | 18 | 18 | 1.55 | 1.47 |
| gsk3 | ADM32521 | 18 | 18 | 1.18 | 1.02 |
| microtubule-associated protein EB3 | ABD36296 | 19 | 19 | 1.22 | 1.05 |
| eEF-2 | ABF51485 | 19 | 19 | 1.03 | 0.98 |
| beta-tubulin | BAA19845 | 20 | 20 | 0.99 | 0.83 |
| cytochrome c oxidase | NP\_001073120 | 20 | 20 | 0.89 | 1.00 |
| glucose-6-phosphate isomerase | NP\_001091761 | 20 | 20 | 1.08 | 0.86 |
| ribosomal protein L7 | NP\_001037135 | 20 | 20 | 1.02 | 0.72 |
| MAP kinase-ERK kinase | NP\_001036922 | 21 | 21 | 1.32 | 1.24 |
| ribosomal protein S6 (RpS6) | AAV34862 | 21 | 21 | 0.91 | 0.92 |
| RpS4 | AAV34860 | 22 | 22 | 1.20 | 1.34 |
| calreticulin | BAC57964 | 22 | 22 | 1.07 | 0.94 |
| ribosomal protein L26 | NP\_001037233 | 23 | 23 | 1.03 | 0.94 |
| acyl-coenzyme A dehydrogenase | NP\_001037672 | 23 | 23 | 1.19 | 1.07 |
| superoxide dismutase [Cu-Zn] | NP\_001037084 | 23 | 23 | 1.11 | 1.20 |
| ribosomal protein S3Ae | NP\_001037255 | 23 | 30 | 0.90 | 0.80 |
| SID1 | XP\_004930735 | 23 | 30 | 1.27 | 1.26 |
| deoxyhypusine synthase | NP\_001129357 | 24 | 24 | 1.25 | 1.03 |
| PRP1 | XP\_004926349 | 24 | 24 | 0.93 | 0.72 |
| actin-depolymerizing factor 1 | NP\_001093278 | 24 | 31 | 1.06 | 1.17 |
| rho guanine nucleotide exchange factor 11 | XP\_012543780 | 24 | 31 | 1.49 | 0.95 |
| ryanodine receptor 44F | XP\_012544761 | 24 | 31 | 1.10 | 1.06 |
| nephrin-like | XP\_012552892 | 24 | 31 | 1.25 | 1.29 |
| dsx | BAB19780 | 25 | 25 | 0.96 | 0.76 |
| PPAE-3 | AAL31707 | 25 | 25 | 1.02 | 0.99 |
| octopamine receptor | BAF33393 | 26 | 26 | 1.11 | 1.00 |
| ebony | XP\_012551705 | 26 | 26 | 1.02 | 0.96 |
| attractin | NP\_001138793 | 26 | 26 | 1.17 | 1.11 |
| heat shock protein 70 | ABD36134 | 27 | 27 | 0.97 | 0.90 |
| lethal(2)essential for life-like | XP\_004923510 | 27 | 27 | 1.05 | 0.81 |
| cubitus interruptus | XP\_012553219 | 27 | 27 | 1.14 | 0.96 |
| serpin-4A | AAS68505 | 28 | 28 | 1.02 | 0.95 |
| H+ transporting ATP synthase gamma subunit | ABF51367 | 28 | 28 | 0.87 | 1.01 |
| 6-phosphogluconolactonase | NP\_001091839 | 28 | 28 | 1.16 | 1.16 |
| RRP41 | XP\_004933567 | 28 | 28 | 1.04 | 0.95 |

**Suppl. Table 2** Conserved synteny. Mapping of protein-coding genes from *B. betularia* to *M. cinxia* scaffolds and chromosomes by TBLASTN.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Query | nt/aa | Protein | Biston chr # | Melitaea scaffold | Melitaea chr # |  |
| AEP43804 | aa | aconitase | 11 | scaffold2552 | 31 |  |
| ADF43214 | aa | yellow2 | 11 | scaffold1237 | 18 | ! |
| AEP43795 | aa | orb2 | 11 | scaffold4121 | 31 |  |
| AEP43782 | aa | rpl4 | 11 | scaffold1765 | 31 |  |
|  |  |  |  | and scaffold3468 | 31 |  |
| AEP43785 | aa | Cu-Zn superoxide dismutase | 23 | scaffold664 | 14 |  |
| AEP43800 | aa | rpl26 | 23 | scaffold4093 | 14 |  |
| ADO33057 | aa | sex comb on midleg | 23 | scaffold2353 | 14 |  |
| AEP43787 | aa | hexokinase | 23 | scaffold1715 | 14 |  |
| AEP43789 | aa | rps30 | 23 | scaffold3712 | 14 |  |
|  |  |  |  | and scaffold11020 | unassigned |  |
| AEP43801 | aa | acyl-CoA dehydrogenase | 23 | scaffold4319 | 14 |  |
| ADO32997 | aa | ATP-dependent RNA helicase | 24 | scaffold663 | 29 |  |
| ADF43205 | aa | ferritin heavy chain | 24 | scaffold3190 | 29 |  |
| ADF43204 | aa | ferritin light chain | 24 | scaffold3190 | 29 |  |
| ADV76084 | aa | AX11 | 24 | scaffold1431 | 29 |  |
| ADO33016 | aa | H+ tr ATP synthase subunit e | 24 | scaffold2396 | 29 |  |
| ADO33048 | aa | rpl18 | 29 | scaffold4822 | 12 |  |
| AEP43797 | aa | radical sam | 29 | scaffold3566 | 12 |  |
| AEP43784 | aa | zinc and ring finger 2 | 29 | scaffold272 | 12 |  |
| ADO32992 | aa | aprataxin | 29 | scaffold1663 | 12 |  |
| AEP43793 | aa | black | 29 | scaffold795 | 12 |  |
| ADO33072 | aa | wee | 30 | scaffold1228 | 30 |  |
| AEP43796 | aa | pollux | 30 | scaffold601 | 30 |  |
| AEP43786 | aa | fatty-acyl CoA reductase 3 | 30 | scaffold1218 | 30 |  |
| AEP43788 | aa | rps3a | 30 | scaffold1318 | 30 |  |
| ADO33043 | aa | RhoGEF2 | 31 | scaffold1271 | 27 |  |
| ADF43206 | aa | GTPCHI | 31 | scaffold7454 | 27 |  |
| ADO33053 | aa | ryanodine receptor | 31 | scaffold2911 | 27 |  |
| ADO33036 | aa | puff | 31 | scaffold1406 | 27 |  |
| ADO33044 | aa | ribonucleoprotein | 31 | scaffold1393 | 27 |  |
| ADO33068 | aa | twinstar | 31 | scaffold1179 | 27 |  |
|  |  |  |  | and scaffold494 | 27 |  |
| ADN84940 | aa | sticks and stones | 31 | scaffold4925 | 27 |  |

**Suppl. Table 3** Conserved synteny. Mapping of DNA segments and protein-coding genes from *H. armigera* to *M. cinxia* scaffolds and chromosomes by BLAST and TBLASTN.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Query | nt/aa | Protein | Helicoverpa chr # | Melitaea scaffold | Melitaea chr # |  |
| BU038739 | aa |  | 11 | scaffold1524 | 31 |  |
| KF982847 | nt | 18s rDNA | 11 | scaffold34886 | 31 |  |
| EY120734 | nt |  | 23 | scaffold4395 | 14 |  |
| EY121788 | nt |  | 23 | scaffold4319 | 14 |  |
| AAB14955 | aa | methionine-rich storage protein | 23 | scaffold3593 | 14 |  |
| EY118312 | nt |  | 23 | scaffold455 | 14 |  |
| EY117529 | nt |  | 23 | scaffold2432 | 14 |  |
| BAN14651 | aa | phosphatidylethanolamine binding | 24 | scaffold4488 | 29 |  |
| EE399561 | nt | ribosomal protein L32 | 24 | scaffold3837 | 29 |  |
| EY121429 | nt |  | 24 | scaffold2437 | 29 |  |
| EY120156 | nt |  | 29 | scaffold547 | 12 |  |
| EY121096 | aa |  | 29 | scaffold5256 | 12 |  |
| EY120701 | aa |  | 29 | scaffold2053 | 12 |  |
| EY119508 | nt |  | 29 | scaffold6500 | 12 |  |
| EY117442 | nt |  | 29 | scaffold1896 | 12 |  |
| ACC63240 | aa | olfactory receptor 20 | 30 | scaffold6628 | 5 | ! |
| GR968654 | nt |  | 30 | scaffold2688 | 30 |  |
| EY119869 | aa |  | 31 | scaffold494 | 27 |  |
|  |  |  |  | and scaffold1179 | 27 |  |
| BU038461 | nt |  | 31 | scaffold2911 | 27 |  |