

# GH13\_24 sequences alignment.

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | M | L | R | V | V | P | L | V | V | L | L | A | A | - | - | - | - | A | S | L | A | Q | W | D | P | N | S | S | N | G | Q | A | I | V | H | L | F | E | W | 35 |    |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | M | L | R | V | A | P | L | V | V | L | L | A | A | - | - | - | - | A | A | Q | A | Q | W | D | P | N | S | S | N | G | Q | V | I | V | H | L | F | E | W | 35 |    |
| <i>M. frontalis</i> orf51622                      | M | I | R | V | V | E | A | A | V | V | L | V | A | G | L | L | L | G | S | V | S | A | Q | W | D | P | N | S | S | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>G. depressus</i> orf103580                     | M | I | R | G | V | E | A | A | V | L | V | V | A | G | L | L | L | G | S | A | K | A | Q | W | D | P | N | A | S | N | G | Q | A | I | V | H | L | F | E | W  | 40 |
| <i>H. penicillatus</i> orf98658                   | M | I | R | V | V | E | A | A | V | L | V | V | A | G | L | L | L | G | A | A | N | A | Q | W | D | P | N | S | S | N | G | E | A | I | V | H | L | F | E | W  | 40 |
| <i>H. penicillatus</i> orf80721                   | M | I | R | V | V | E | A | A | V | L | V | V | A | G | L | L | L | G | A | A | N | A | Q | W | D | P | N | S | S | N | G | E | A | I | V | H | L | F | E | W  | 40 |
| <i>V. yui</i> orf55469                            | M | I | R | V | V | E | A | A | V | L | V | V | A | G | L | L | L | G | S | V | S | A | Q | Y | D | P | N | S | S | N | G | Q | A | I | V | H | L | F | E | W  | 40 |
| <i>M. longipes</i> orf59141                       | M | L | R | V | V | E | A | A | V | L | V | L | A | G | L | L | L | G | S | A | S | A | Q | Y | D | P | N | S | S | N | G | Q | A | I | V | H | L | F | E | W  | 40 |
| <i>M. longipes</i> orf70647                       | M | L | R | V | V | E | A | A | V | L | V | L | A | G | L | L | L | G | S | A | S | A | Q | Y | D | P | N | S | S | N | G | Q | A | I | V | H | L | F | E | W  | 40 |
| <i>C. convexus</i> orf134755                      | M | I | R | V | F | E | A | A | V | L | V | V | A | G | L | L | L | G | S | A | N | A | Q | W | E | S | N | S | D | N | G | Q | A | I | V | H | L | F | E | W  | 40 |
| <i>P. pictum</i> orf145589                        | M | F | R | V | V | E | A | A | V | L | L | V | V | G | L | L | L | G | S | V | R | A | Q | Y | D | D | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>N. indicum</i> orf84546                        | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | D | D | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>E. versicolor</i> orf56734                     | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | D | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>P. bidens</i> orf71218                         | M | L | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | D | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>P. affine</i> orf107341                        | M | L | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | D | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>P. affine</i> orf107263                        | M | L | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | D | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. haematocheir</i> orf125553                  | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. haematocheir</i> orf107827                  | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. haematocheir</i> orf107742                  | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>P. patshuni</i> orf73789                       | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>S. sinensis</i> orf56982                       | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | V | L | G | S | V | R | A | Q | H | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>S. sinensis</i> orf56911                       | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | V | L | G | S | V | R | A | Q | H | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. dehaani</i> orf29958                        | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. dehaani</i> orf69607                        | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |
| <i>C. dehaani</i> orf69699                        | M | F | R | V | V | E | A | A | V | L | L | V | A | G | L | L | L | G | S | V | R | A | Q | Y | E | S | N | S | D | N | G | Q | V | I | V | H | L | F | E | W  | 40 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | Y | V | E | V | Y | Q | G | E | V | K | R | P | 75 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | K | W | S | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | Y | V | E | V | Y | Q | G | D | V | K | R | P | 75 |
| <i>M. frontalis</i> orf51622                      | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | G | S | Q | D | R | P | 80 |
| <i>G. depressus</i> orf103580                     | K | W | A | D | I | A | D | E | C | E | N | F | L | S | P | R | G | Y | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | G | G | Q | N | R | P | 80 |
| <i>H. penicillatus</i> orf98658                   | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | Y | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | N | G | Q | N | R | P | 80 |
| <i>H. penicillatus</i> orf80721                   | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | Y | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | N | G | Q | N | R | P | 80 |
| <i>V. yui</i> orf55469                            | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | N | G | Q | N | R | P | 80 |
| <i>M. longipes</i> orf59141                       | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | G | G | Q | N | R | P | 80 |
| <i>M. longipes</i> orf70647                       | K | W | P | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | I | S | P | P | S | E | N | V | V | Y | Y | S | G | G | Q | N | R | P | 80 |
| <i>C. convexus</i> orf134755                      | K | W | A | D | I | A | A | E | C | E | N | F | L | A | P | R | G | Y | A | G | V | Q | T | S | P | P | S | E | N | V | V | Y | S | S | S | G | Q | D | R | P | 80 |
| <i>P. pictum</i> orf145589                        | K | W | A | D | V | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | T | E | N | M | V | Y | W | S | S | D | Q | N | R | P | 80 |
| <i>N. indicum</i> orf84546                        | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | I | S | P | P | T | E | N | M | V | Y | W | S | S | D | V | N | R | P | 80 |
| <i>E. versicolor</i> orf56734                     | K | W | A | D | I | A | S | E | C | E | N | F | L | A | A | R | G | F | A | G | V | Q | V | S | P | P | T | E | N | V | E | Y | W | A | S | T | E | N | R | P | 80 |
| <i>P. bidens</i> orf71218                         | K | W | A | D | I | A | S | E | C | E | N | F | L | A | P | R | G | F | A | G | V | Q | I | S | P | P | T | E | N | M | V | Y | W | S | S | T | E | N | R | P | 80 |
| <i>P. affine</i> orf107341                        | K | W | A | D | I | A | S | E | C | E | N | F | L | A | P | R | G | F | A | G | V | Q | I | S | P | P | T | E | N | M | V | Y | W | S | S | T | E | N | R | P | 80 |
| <i>P. affine</i> orf107263                        | K | W | A | D | I | A | S | E | C | E | N | F | L | A | P | R | G | F | A | G | V | Q | I | S | P | P | T | E | N | M | V | Y | W | S | S | T | E | N | R | P | 80 |
| <i>C. haematocheir</i> orf125553                  | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | V | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>C. haematocheir</i> orf107827                  | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | V | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>C. haematocheir</i> orf107742                  | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | V | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>P. patshuni</i> orf73789                       | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>S. sinensis</i> orf56982                       | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>S. sinensis</i> orf56911                       | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>C. dehaani</i> orf29958                        | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>C. dehaani</i> orf69607                        | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |
| <i>C. dehaani</i> orf69699                        | K | W | A | D | I | A | A | E | C | E | N | F | L | G | P | R | G | F | A | G | V | Q | V | S | P | P | N | E | N | M | V | Y | Y | S | S | D | V | N | R | P | 80 |

|                                                   |                                                                                 |     |
|---------------------------------------------------|---------------------------------------------------------------------------------|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | W W E R Y Q P V S Y K L V T R S G D E N A F K D M V T R C N N V G V K I Y V D I | 115 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | W W E R Y Q P V S Y K L V T R S G D E N A F K D M V T R C N N V G V R I Y V D A | 115 |
| <i>M. frontalis</i> orf51622                      | W W E R Y Q P V S Y N L V T R S G D E S A F Q N M V N R C N N V G V R I Y A D I | 120 |
| <i>G. depressus</i> orf103580                     | W W E R Y Q P V S Y N L V T R S G D E A A F Q S M V S R C N N A G V R I Y A D I | 120 |
| <i>H. penicillatus</i> orf98658                   | W W E R Y Q P V S Y N L V T R S G D E S A F Q D M V T R C N N V G V R I Y A D I | 120 |
| <i>H. penicillatus</i> orf80721                   | W W E R Y Q P V S Y N L V T R S G D E S A F Q D M V T R C N N V G V R I Y A D I | 120 |
| <i>V. yui</i> orf55469                            | W W E R Y Q P V S Y N L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>M. longipes</i> orf59141                       | W W E R Y Q P V S Y N L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>M. longipes</i> orf70647                       | W W E R Y Q P V S Y N L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>C. convexus</i> orf134755                      | W W E R Y Q P V S Y N L V T R S G D E S G F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>P. pictum</i> orf145589                        | W W E R Y Q P V S Y L L V T R S G D E A A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>N. indicum</i> orf84546                        | W W E R Y Q P V S Y I L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>E. versicolor</i> orf56734                     | W W E R Y Q P V S Y L L V T R S G D E A A F Q D M V S R C N N V G V R I Y A D V | 120 |
| <i>P. bidens</i> orf71218                         | W W E R Y Q P V S Y L L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>P. affine</i> orf107341                        | W W E R Y Q P V S Y L L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>P. affine</i> orf107263                        | W W E R Y Q P V S Y L L V T R S G D E S A F Q D M V S R C N N V G V R I Y A D I | 120 |
| <i>C. haematocheir</i> orf125553                  | W W E R Y Q P V S Y I L V T R S G D E A A F Q D M V S R C N N V G V R I Y A D V | 120 |
| <i>C. haematocheir</i> orf107827                  | W W E R Y Q P V S Y I L V T R S G D E A A F Q D M V S R C N N V G V R I Y A D V | 120 |
| <i>C. haematocheir</i> orf107742                  | W W E R Y Q P V S Y I L V T R S G D E A A F Q D M V S R C N N V G V R I Y A D V | 120 |
| <i>P. patshuni</i> orf73789                       | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y A D A | 120 |
| <i>S. sinensis</i> orf56982                       | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y A D A | 120 |
| <i>S. sinensis</i> orf56911                       | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y A D A | 120 |
| <i>C. dehaani</i> orf29958                        | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y V D A | 120 |
| <i>C. dehaani</i> orf69607                        | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y A D V | 120 |
| <i>C. dehaani</i> orf69699                        | W W E R Y Q P V S Y I L V T R S G D E A G F Q D M V T R C N N V G V R I Y A D V | 120 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | V | M | N | H | M | S | G | G | W | P | Q | G | T | G | G | S | G | G | S | S | F | D | S | G | A | Q | S | Y | P | G | V | P | Y | S | A | F | D | F | N | D | 155 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | V | I | N | H | M | S | G | G | W | P | M | G | T | G | A | S | G | G | S | S | F | D | S | G | A | E | S | Y | P | G | V | P | Y | S | A | F | D | F | N | D | 155 |
| <i>M. frontalis</i> orf51622                      | V | M | N | H | M | T | G | W | H | A | S | G | T | G | A | T | G | G | S | S | F | D | A | G | S | E | S | Y | P | A | V | P | Y | S | A | F | D | F | N | D | 160 |
| <i>G. depressus</i> orf103580                     | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | S | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>H. penicillatus</i> orf98658                   | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | S | E | S | Y | P | A | V | P | Y | S | A | L | D | F | N | D | 160 |
| <i>H. penicillatus</i> orf80721                   | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | S | E | S | Y | P | A | V | P | Y | S | A | L | D | F | N | D | 160 |
| <i>V. yui</i> orf55469                            | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>M. longipes</i> orf59141                       | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>M. longipes</i> orf70647                       | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>C. convexus</i> orf134755                      | V | M | N | H | M | T | G | W | Q | P | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>P. pictum</i> orf145589                        | V | I | N | H | M | T | G | W | H | A | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>N. indicum</i> orf84546                        | V | I | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>E. versicolor</i> orf56734                     | V | I | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>P. bidens</i> orf71218                         | V | I | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>P. affine</i> orf107341                        | V | I | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>P. affine</i> orf107263                        | V | I | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | S | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>C. haematocheir</i> orf125553                  | V | M | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | G | F | D | F | N | D | 160 |
| <i>C. haematocheir</i> orf107827                  | V | M | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | G | F | D | F | N | D | 160 |
| <i>C. haematocheir</i> orf107742                  | V | M | N | H | M | T | G | W | H | E | S | G | T | G | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | G | F | D | F | N | D | 160 |
| <i>P. patshuni</i> orf73789                       | V | I | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | G | F | D | F | N | D | 160 |
| <i>S. sinensis</i> orf56982                       | V | I | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>S. sinensis</i> orf56911                       | V | I | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | A | Y | D | F | N | D | 160 |
| <i>C. dehaani</i> orf29958                        | V | I | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | A | F | D | F | N | D | 160 |
| <i>C. dehaani</i> orf69607                        | V | V | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | A | F | D | F | N | D | 160 |
| <i>C. dehaani</i> orf69699                        | V | V | N | H | M | T | G | W | H | E | S | G | T | P | A | T | G | G | S | S | F | D | A | G | T | E | D | Y | P | A | V | P | Y | S | A | F | D | F | N | D | 160 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | G | N | C | H | T | G | S | G | N | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 195 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | G | N | C | H | T | G | S | G | N | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 195 |
| <i>M. frontalis</i> orf51622                      | G | N | C | N | T | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>G. depressus</i> orf103580                     | G | N | C | N | T | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>H. penicillatus</i> orf98658                   | G | N | C | N | T | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>H. penicillatus</i> orf80721                   | G | N | C | N | T | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>V. yui</i> orf55469                            | G | N | C | N | T | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>M. longipes</i> orf59141                       | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>M. longipes</i> orf70647                       | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | K | 200 |
| <i>C. convexus</i> orf134755                      | G | N | C | N | S | G | S | G | E | I | E | N | Y | G | D | A | D | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>P. pictum</i> orf145589                        | A | N | C | N | S | G | S | G | D | I | E | N | Y | N | D | A | N | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>N. indicum</i> orf84546                        | G | N | C | N | S | G | S | G | D | I | E | N | Y | S | D | A | E | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | S | M | 200 |
| <i>E. versicolor</i> orf56734                     | G | N | C | N | T | G | S | G | E | I | E | N | Y | S | D | A | D | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | S | M | 200 |
| <i>P. bidens</i> orf71218                         | G | N | C | N | T | G | S | G | D | I | E | N | Y | S | D | A | D | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | S | M | 200 |
| <i>P. affine</i> orf107341                        | A | N | C | N | S | G | S | G | D | I | E | N | Y | S | D | A | D | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | S | M | 200 |
| <i>P. affine</i> orf107263                        | A | N | C | N | S | G | S | G | D | I | E | N | Y | S | D | A | D | Q | V | R | N | C | K | L | V | G | L | N | D | L | N | Q | G | T | D | Y | V | R | S | M | 200 |
| <i>C. haematocheir</i> orf125553                  | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>C. haematocheir</i> orf107827                  | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>C. haematocheir</i> orf107742                  | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>P. patshuni</i> orf73789                       | G | N | C | N | S | G | S | G | D | I | E | N | Y | G | D | A | D | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>S. sinensis</i> orf56982                       | G | N | C | P | S | A | S | G | D | I | E | S | Y | S | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>S. sinensis</i> orf56911                       | G | N | C | P | S | A | S | G | D | I | E | S | Y | S | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>C. dehaani</i> orf29958                        | G | N | C | A | T | S | S | G | D | I | E | N | Y | S | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>C. dehaani</i> orf69607                        | G | N | C | A | T | S | S | G | D | I | E | N | Y | S | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |
| <i>C. dehaani</i> orf69699                        | G | N | C | A | T | S | S | G | D | I | E | N | Y | S | D | A | N | Q | V | R | N | C | K | L | S | G | L | N | D | L | N | Q | G | T | D | Y | V | R | G | M | 200 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | I | R | D | Y | L | N | T | L | I | G | Y | G | V | A | G | F | R | I | D | A | S | K | H | M | W | P | G | D | M | K | A | I | F | D | S | L | N | N | L | N | 235 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | I | R | E | F | M | N | K | L | I | S | Y | G | V | A | G | F | R | I | D | A | S | K | H | M | W | P | G | D | M | K | A | I | F | D | S | L | D | N | L | N | 235 |
| <i>M. frontalis</i> orf51622                      | I | R | D | Y | M | N | K | L | I | S | Y | G | V | A | G | F | R | I | D | A | S | K | H | M | W | P | G | D | M | D | A | I | F | S | S | L | D | G | L | S | 240 |
| <i>G. depressus</i> orf103580                     | I | S | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | I | D | A | S | K | H | M | W | P | G | D | M | Q | A | I | F | S | S | L | N | D | L | S | 240 |
| <i>H. penicillatus</i> orf98658                   | I | R | D | Y | M | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | A | I | F | N | S | L | N | D | L | S | 240 |
| <i>H. penicillatus</i> orf80721                   | I | R | D | Y | M | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | A | I | F | N | S | L | N | D | L | S | 240 |
| <i>V. yui</i> orf55469                            | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | N | S | L | N | D | L | S | 240 |
| <i>M. longipes</i> orf59141                       | I | K | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | E | I | I | F | N | S | L | N | D | L | S | 240 |
| <i>M. longipes</i> orf70647                       | I | K | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | E | I | I | F | N | S | L | N | D | L | S | 240 |
| <i>C. convexus</i> orf134755                      | L | I | D | Y | M | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | G | S | K | H | M | W | P | G | D | M | Q | V | I | F | N | S | L | N | D | L | S | 240 |
| <i>P. pictum</i> orf145589                        | I | V | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | N | S | V | N | D | L | N | 240 |
| <i>N. indicum</i> orf84546                        | I | I | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>E. versicolor</i> orf56734                     | I | I | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>P. bidens</i> orf71218                         | I | V | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>P. affine</i> orf107341                        | I | V | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>P. affine</i> orf107263                        | I | V | D | F | L | N | K | L | V | S | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>C. haematocheir</i> orf125553                  | I | I | D | Y | L | N | K | L | V | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | S | D | L | N | 240 |
| <i>C. haematocheir</i> orf107827                  | I | I | D | Y | L | N | K | L | V | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | S | D | L | N | 240 |
| <i>C. haematocheir</i> orf107742                  | I | I | D | Y | L | N | K | L | V | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | S | D | L | N | 240 |
| <i>P. patshuni</i> orf73789                       | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | S | D | L | N | 240 |
| <i>S. sinensis</i> orf56982                       | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | L | S | D | L | N | 240 |
| <i>S. sinensis</i> orf56911                       | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | L | S | D | L | N | 240 |
| <i>C. dehaani</i> orf29958                        | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | Q | I | I | F | D | S | V | N | D | L | N | 240 |
| <i>C. dehaani</i> orf69607                        | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | K | I | I | F | D | R | V | N | D | L | N | 240 |
| <i>C. dehaani</i> orf69699                        | I | I | D | Y | L | N | K | L | I | G | Y | G | V | A | G | F | R | V | D | A | S | K | H | M | W | P | G | D | M | K | I | I | F | D | R | V | N | D | L | N | 240 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | T | D | F | F | K | A | G | S | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | S | G | Q | E | Y | V | G | N | G | R | V | T | E | F | R | Y | 275 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | T | D | F | F | K | A | G | A | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | S | S | G | E | Y | V | G | N | G | R | V | T | E | F | R | Y | 275 |
| <i>M. frontalis</i> orf51622                      | V | K | Y | F | K | A | G | E | R | P | F | I | Y | Q | E | V | I | D | L | G | G | E | A | I | S | S | L | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>G. depressus</i> orf103580                     | T | D | Y | F | A | A | G | T | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | S | S | D | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>H. penicillatus</i> orf98658                   | T | D | Y | F | A | G | G | T | R | P | F | V | Y | Q | E | V | I | D | L | G | G | E | A | I | S | S | D | E | Y | L | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>H. penicillatus</i> orf80721                   | T | D | Y | F | A | G | G | T | R | P | F | V | Y | Q | E | V | I | D | L | G | G | E | A | I | S | S | D | E | Y | L | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>V. yui</i> orf55469                            | T | N | Y | F | A | A | G | T | R | P | F | V | Y | Q | E | V | I | D | L | G | G | E | A | I | S | S | D | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>M. longipes</i> orf59141                       | T | D | Y | F | A | A | G | T | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | S | S | L | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>M. longipes</i> orf70647                       | T | D | Y | F | A | A | G | T | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | S | S | L | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. convexus</i> orf134755                      | T | D | Y | F | A | A | G | S | R | P | F | V | Y | Q | E | V | I | D | L | G | G | E | A | V | T | S | D | E | Y | V | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>P. pictum</i> orf145589                        | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | I | A | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>N. indicum</i> orf84546                        | T | A | Y | F | A | A | G | S | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | A | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>E. versicolor</i> orf56734                     | T | D | Y | F | P | S | G | S | R | A | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | D | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>P. bidens</i> orf71218                         | T | A | Y | F | P | S | G | S | R | P | F | I | F | Q | E | V | I | D | L | G | G | E | A | I | A | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>P. affine</i> orf107341                        | T | A | Y | F | P | S | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | I | A | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>P. affine</i> orf107263                        | T | A | Y | F | P | S | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | I | A | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | H | 280 |
| <i>C. haematocheir</i> orf125553                  | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. haematocheir</i> orf107827                  | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. haematocheir</i> orf107742                  | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>P. patshuni</i> orf73789                       | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>S. sinensis</i> orf56982                       | T | A | Y | F | P | A | G | S | R | A | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>S. sinensis</i> orf56911                       | T | A | Y | F | P | A | G | S | R | A | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. dehaani</i> orf29958                        | T | A | Y | F | P | A | G | S | R | P | F | V | F | Q | E | V | I | D | L | G | G | E | A | V | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. dehaani</i> orf69607                        | T | A | Y | F | P | A | G | S | R | P | F | V | V | Q | E | V | I | D | L | G | G | E | A | I | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |
| <i>C. dehaani</i> orf69699                        | T | A | Y | F | P | A | G | S | R | P | F | V | V | Q | E | V | I | D | L | G | G | E | A | I | S | S | T | E | Y | T | G | I | G | R | V | T | E | F | K | Y | 280 |

|                                                   |                                                                                 |     |
|---------------------------------------------------|---------------------------------------------------------------------------------|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | G K Y L G E A F R G N N Q L Q Y L K N F G E D W G M M D R A N A L V F I D N H D | 315 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | G K Y L G E A F R G N N Q L K Y L N N F G E G W G M I D R H D A L V F I D N H D | 315 |
| <i>M. frontalis</i> orf51622                      | G K F L G E A F R G Q N Q L K W L S N F G E G W G M L D R G N A L V F I D N H D | 320 |
| <i>G. depressus</i> orf103580                     | G K F L G E A F R G Q N Q L M W L S N F G E G W G M L D R G N A V V F I D N H D | 320 |
| <i>H. penicillatus</i> orf98658                   | G K F L G E A F R G N N Q L K W L F N F G E G W G M L D R G S A L V F I D N H D | 320 |
| <i>H. penicillatus</i> orf80721                   | G K F L G E A F R G N N Q L K W L F N F G E G W G M L D R G S A L V F I D N H D | 320 |
| <i>V. yui</i> orf55469                            | G K F L G E A F R G N N Q L K W L V N F G E G W G M L D R A Y S L V F V D N H D | 320 |
| <i>M. longipes</i> orf59141                       | G K F L G E A F R G N N Q L K W L V N F G E G W G M L D R A Y S L V F V D N H D | 320 |
| <i>M. longipes</i> orf70647                       | G K F L G E A F R G N N Q L K W L V N F G E G W G M L D R A Y S L V F V D N H D | 320 |
| <i>C. convexus</i> orf134755                      | G S F L G E A F R G N N Q L K W L V N F G E G W G M L D R G Y A L V F I D N H D | 320 |
| <i>P. pictum</i> orf145589                        | G K F L G E A F R G N N Q L K W L V N F G E D W G M L D R A Y A L V F V D N H D | 320 |
| <i>N. indicum</i> orf84546                        | S K F L G E A F R G N N Q L K W L V N Y G E D W G M L D R A Y A L V F V D N H D | 320 |
| <i>E. versicolor</i> orf56734                     | S S F L G D A F R G N N Q L K W L V N Y G E D W G M I D R A Y A L V F V D N H D | 320 |
| <i>P. bidens</i> orf71218                         | G K F L G E A F R G N N Q L K W L Y N F G E G W G M L D R A Y A L V F V D N H D | 320 |
| <i>P. affine</i> orf107341                        | G K F L G E A F R G N N Q L K W L Y N F G E G W G M L D R A Y A L V F V D N H D | 320 |
| <i>P. affine</i> orf107263                        | G K F L G E A F R G N N Q L K W L Y N F G E G W G M L D R A Y A L V F V D N H D | 320 |
| <i>C. haematocheir</i> orf125553                  | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>C. haematocheir</i> orf107827                  | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>C. haematocheir</i> orf107742                  | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>P. patshuni</i> orf73789                       | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>S. sinensis</i> orf56982                       | C N F L G E A F R G N N Q L K W L V N F G E E W G M I D R A Y A L V F V D N H D | 320 |
| <i>S. sinensis</i> orf56911                       | C N F L G E A F R G N N Q L K W L V N F G E E W G M I D R A Y A L V F V D N H D | 320 |
| <i>C. dehaani</i> orf29958                        | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>C. dehaani</i> orf69607                        | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |
| <i>C. dehaani</i> orf69699                        | C N F L G E A F R G N N Q L K W L V N F G E G W G M I D R A Y A L V F V D N H D | 320 |

|                                                   |                                                                                 |     |
|---------------------------------------------------|---------------------------------------------------------------------------------|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | N Q R G H G A G G D M I L T F R V S K W Y K M A N A F M L G W P Y G Y T R V M S | 355 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | N Q R G H G A G G D M I L T F R V S K W Y K M A T A Y M L A W P Y G Y T R V M S | 355 |
| <i>M. frontalis</i> orf51622                      | N Q R G H G A G G D M I L T F R D S K L Y K M G N A F M L A W P Y G Y T R V M S | 360 |
| <i>G. depressus</i> orf103580                     | N Q R G H G A G G D M I L T F R D S K L Y K M G N A F M L A W P Y G Y T R V M S | 360 |
| <i>H. penicillatus</i> orf98658                   | N Q R G H G A G G D M I L T F R D P K L Y K M A N A F M L G W P Y G Y T R V M S | 360 |
| <i>H. penicillatus</i> orf80721                   | N Q R G H G A G G D M I L T F R D P K L Y K M A N A F M L G W P Y G Y T R V M S | 360 |
| <i>V. yui</i> orf55469                            | N Q R G H G A G G D M I L T F R V S K W Y K M A N A F M L A W P Y G Y T R V M S | 360 |
| <i>M. longipes</i> orf59141                       | N Q R G H G A G G D M I L T F R D S R W Y K M A N A F M L A W P Y G Y T R V M S | 360 |
| <i>M. longipes</i> orf70647                       | N Q R G H G A G G D M I L T F R D S R W Y K M A N A F M L A W P Y G Y T R V M S | 360 |
| <i>C. convexus</i> orf134755                      | N Q R G H G A G G D M I L T F R D S K L Y K M A T A F M L G W P Y G Y T R V M S | 360 |
| <i>P. pictum</i> orf145589                        | N Q R G H G A G G D M I L T F R D P K L Y K M A T A F T L S W P Y G Y T R I M S | 360 |
| <i>N. indicum</i> orf84546                        | N Q R G H G A G G D M I L T F R D S K L Y K M A T A F T L G W P Y G Y T R I M S | 360 |
| <i>E. versicolor</i> orf56734                     | N Q R G H G A G G D M I L T F R D S K L Y K M A T A F T L G W P Y G Y T R I M S | 360 |
| <i>P. bidens</i> orf71218                         | N Q R G H G A G G D M I L T F R T S K L Y K M A T A F T L G W P Y G Y T R I M S | 360 |
| <i>P. affine</i> orf107341                        | N Q R G H G A G G D M I L T F R D S K L Y K M A T A F T L G W P Y G Y T R I M S | 360 |
| <i>P. affine</i> orf107263                        | N Q R G H G A G G D M I L T F R D S K L Y K M A T A F T L G W P Y G Y T R I M S | 360 |
| <i>C. haematocheir</i> orf125553                  | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F G L G W P Y G F T R I M S | 360 |
| <i>C. haematocheir</i> orf107827                  | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F G L G W P Y G F T R I M S | 360 |
| <i>C. haematocheir</i> orf107742                  | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F G L G W P Y G F T R I M S | 360 |
| <i>P. patshuni</i> orf73789                       | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |
| <i>S. sinensis</i> orf56982                       | N Q R G H G A G G D M I L T F R N S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |
| <i>S. sinensis</i> orf56911                       | N Q R G H G A G G D M I L T F R N S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |
| <i>C. dehaani</i> orf29958                        | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |
| <i>C. dehaani</i> orf69607                        | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |
| <i>C. dehaani</i> orf69699                        | N Q R G H G A G G D M I L T F R D S R L Y K M A T A F A L G W P Y G Y T R I M S | 360 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | S | Y | Y | W | D | Q | W | W | E | N | G | Q | D | K | N | D | W | I | G | P | P | Q | D | S | F | N | I | I | S | P | S | F | N | A | D | G | T | C | G | 395 |     |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | S | Y | Y | W | D | Q | W | W | E | N | G | Q | D | K | N | D | W | I | G | P | P | H | D | G | S | F | N | I | I | S | P | S | F | N | A | D | G | S | C | G   | 395 |
| <i>M. frontalis</i> orf51622                      | S | Y | Y | W | D | Q | N | W | V | N | G | Q | D | Q | N | D | W | V | G | P | P | H | D | G | N | W | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>G. depressus</i> orf103580                     | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>H. penicillatus</i> orf98658                   | S | Y | Y | W | D | Q | N | W | V | N | G | A | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>H. penicillatus</i> orf80721                   | S | Y | Y | W | D | Q | N | W | V | N | G | A | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>V. yui</i> orf55469                            | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>M. longipes</i> orf59141                       | S | Y | Y | W | D | Q | N | W | V | G | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>M. longipes</i> orf70647                       | S | Y | Y | W | D | Q | N | W | V | G | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>C. convexus</i> orf134755                      | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>P. pictum</i> orf145589                        | S | Y | Y | W | D | Q | N | W | V | G | G | S | D | L | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>N. indicum</i> orf84546                        | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>E. versicolor</i> orf56734                     | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>P. bidens</i> orf71218                         | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | I | S | P | T | F | N | A | D | G | S | C | S   | 400 |
| <i>P. affine</i> orf107341                        | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>P. affine</i> orf107263                        | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | D | S | Y | N | T | L | S | P | T | F | N | A | D | G | S | C | G   | 400 |
| <i>C. haematocheir</i> orf125553                  | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | S   | 400 |
| <i>C. haematocheir</i> orf107827                  | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | S   | 400 |
| <i>C. haematocheir</i> orf107742                  | S | Y | Y | W | D | Q | N | W | V | D | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | S   | 400 |
| <i>P. patshuni</i> orf73789                       | S | Y | Y | W | E | Q | N | W | V | D | G | S | D | A | N | D | W | I | G | P | P | H | D | S | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |
| <i>S. sinensis</i> orf56982                       | S | Y | Y | W | D | Q | N | W | V | G | G | S | D | A | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |
| <i>S. sinensis</i> orf56911                       | S | Y | Y | W | D | Q | N | W | V | G | G | S | D | A | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |
| <i>C. dehaani</i> orf29958                        | S | Y | Y | W | E | Q | N | W | V | G | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |
| <i>C. dehaani</i> orf69607                        | S | Y | Y | W | E | Q | N | W | V | G | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |
| <i>C. dehaani</i> orf69699                        | S | Y | Y | W | E | Q | N | W | V | G | G | S | D | Q | N | D | W | I | G | P | P | H | D | A | S | Y | N | T | L | S | P | S | F | N | A | D | G | S | C | A   | 400 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | N | G | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | S | N | Q | I | A | F | 435 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | N | G | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | S | N | Q | I | A | F | 435 |
| <i>M. frontalis</i> orf51622                      | N | G | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | N | N | Q | I | A | F | 440 |
| <i>G. depressus</i> orf103580                     | N | G | W | M | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | N | N | Q | I | A | F | 440 |
| <i>H. penicillatus</i> orf98658                   | N | G | W | M | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | N | N | Q | I | A | F | 440 |
| <i>H. penicillatus</i> orf80721                   | N | G | W | M | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | N | N | Q | I | A | F | 440 |
| <i>V. yui</i> orf55469                            | N | G | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | G | N | N | Q | I | A | F | 440 |
| <i>M. longipes</i> orf59141                       | N | G | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | V | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | A | F | 440 |
| <i>M. longipes</i> orf70647                       | N | G | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | V | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | A | F | 440 |
| <i>C. convexus</i> orf134755                      | N | G | W | M | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>P. pictum</i> orf145589                        | N | G | W | M | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>N. indicum</i> orf84546                        | N | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>E. versicolor</i> orf56734                     | N | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>P. bidens</i> orf71218                         | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | A | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>P. affine</i> orf107341                        | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | A | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>P. affine</i> orf107263                        | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | A | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>C. haematocheir</i> orf125553                  | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | A | F | 440 |
| <i>C. haematocheir</i> orf107827                  | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | A | F | 440 |
| <i>C. haematocheir</i> orf107742                  | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | D | N | N | Q | I | A | F | 440 |
| <i>P. patshuni</i> orf73789                       | G | D | W | V | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | W | 440 |
| <i>S. sinensis</i> orf56982                       | G | D | W | V | C | E | H | R | W | R | Q | I | F | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | W | 440 |
| <i>S. sinensis</i> orf56911                       | G | D | W | V | C | E | H | R | W | R | Q | I | F | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | W | 440 |
| <i>C. dehaani</i> orf29958                        | G | D | W | I | C | E | H | R | W | R | Q | I | T | N | M | V | E | F | R | N | V | A | H | G | T | D | V | N | D | W | W | D | N | D | N | N | Q | I | S | F | 440 |
| <i>C. dehaani</i> orf69607                        | G | D | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | N | N | N | Q | I | S | F | 440 |
| <i>C. dehaani</i> orf69699                        | G | D | W | I | C | E | H | R | W | R | Q | I | Y | N | M | V | E | F | R | N | V | A | H | G | T | D | M | N | D | W | W | D | N | N | N | N | Q | I | S | F | 440 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | C | R | G | D | K | G | F | L | A | I | N | N | D | G | W | D | L | K | E | T | L | Q | T | C | L | P | A | G | T | Y | C | D | V | I | S | G | S | K | E | G | 475 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | C | R | G | N | K | G | F | L | A | I | N | N | D | G | W | D | L | K | E | T | L | Q | T | C | L | P | A | G | T | Y | C | D | V | I | S | G | S | K | N | G | 475 |
| <i>M. frontalis</i> orf51622                      | C | R | G | D | R | G | F | I | A | I | N | N | E | G | S | D | L | K | Q | T | L | Q | T | C | L | S | A | G | T | Y | C | D | V | I | S | G | S | K | D | G | 480 |
| <i>G. depressus</i> orf103580                     | C | R | G | D | R | G | F | L | A | I | N | N | E | G | S | D | L | K | Q | T | L | Q | T | C | L | S | P | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>H. penicillatus</i> orf98658                   | C | R | G | D | R | G | F | L | A | I | N | N | E | G | S | D | L | K | Q | T | L | Q | T | C | L | S | A | G | T | Y | C | D | V | I | S | G | A | K | E | G | 480 |
| <i>H. penicillatus</i> orf80721                   | C | R | G | D | R | G | F | L | A | I | N | N | E | G | S | D | L | K | Q | T | L | Q | T | C | L | S | A | G | T | Y | C | D | V | I | S | G | A | K | E | G | 480 |
| <i>V. yui</i> orf55469                            | C | R | G | D | R | G | F | I | A | I | N | N | E | G | S | D | L | A | Q | T | L | Q | T | C | L | S | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>M. longipes</i> orf59141                       | C | R | G | D | R | G | F | I | A | I | N | N | D | G | Y | D | L | G | E | T | L | Q | T | C | L | S | Q | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>M. longipes</i> orf70647                       | C | R | G | D | R | G | F | I | A | I | N | N | D | G | Y | D | L | G | E | T | L | Q | T | C | L | S | Q | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>C. convexus</i> orf134755                      | C | R | G | D | R | G | F | V | A | I | N | N | E | G | Y | D | L | A | Q | T | L | Q | T | C | L | S | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>P. pictum</i> orf145589                        | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>N. indicum</i> orf84546                        | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | S | 480 |
| <i>E. versicolor</i> orf56734                     | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | S | E | G | T | Y | C | D | V | I | S | G | S | L | E | S | 480 |
| <i>P. bidens</i> orf71218                         | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>P. affine</i> orf107341                        | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | A | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>P. affine</i> orf107263                        | C | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | A | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>C. haematocheir</i> orf125553                  | C | R | G | D | R | G | F | L | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>C. haematocheir</i> orf107827                  | C | R | G | D | R | G | F | L | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>C. haematocheir</i> orf107742                  | C | R | G | D | R | G | F | L | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | C | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>P. patshuni</i> orf73789                       | A | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>S. sinensis</i> orf56982                       | A | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>S. sinensis</i> orf56911                       | A | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>C. dehaani</i> orf29958                        | A | R | G | D | R | G | F | V | A | I | N | G | D | S | Y | D | L | K | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | N | 480 |
| <i>C. dehaani</i> orf69607                        | A | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |
| <i>C. dehaani</i> orf69699                        | A | R | G | D | R | G | F | V | A | I | N | G | D | T | Y | D | L | T | Q | T | L | Q | T | G | L | A | E | G | T | Y | C | D | V | I | S | G | S | L | E | G | 480 |

|                                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| alpha-amylase <i>Penaeus japonicus</i> AHN91843.1 | G | S | C | T | G | K | S | V | T | V | G | G | D | G | K | A | Y | I | E | I | T | T | M | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 512 |
| preamylase 1 <i>Penaeus vannamei</i> CAA54524.1   | G | S | C | T | G | K | S | V | T | V | G | G | D | G | K | A | Y | I | E | I | T | T | M | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 512 |
| <i>M. frontalis</i> orf51622                      | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | T | T | M | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>G. depressus</i> orf103580                     | G | A | C | T | G | K | S | V | T | V | G | G | D | G | T | A | Y | I | E | I | T | T | M | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>H. penicillatus</i> orf98658                   | G | A | C | T | G | K | S | V | T | V | G | G | D | G | T | A | Y | I | E | I | A | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>H. penicillatus</i> orf80721                   | G | A | C | T | G | K | S | V | T | V | G | G | D | G | T | A | Y | I | E | I | A | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>V. yui</i> orf55469                            | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | Q | I | A | N | S | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>M. longipes</i> orf59141                       | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | Q | I | G | T | A | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>M. longipes</i> orf70647                       | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | Q | I | G | T | A | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>C. convexus</i> orf134755                      | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | A | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | L | 517 |
| <i>P. pictum</i> orf145589                        | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>N. indicum</i> orf84546                        | G | A | C | T | G | K | T | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>E. versicolor</i> orf56734                     | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>P. bidens</i> orf71218                         | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>P. affine</i> orf107341                        | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>P. affine</i> orf107263                        | G | S | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. haematocheir</i> orf125553                  | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. haematocheir</i> orf107827                  | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. haematocheir</i> orf107742                  | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>P. patshuni</i> orf73789                       | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>S. sinensis</i> orf56982                       | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>S. sinensis</i> orf56911                       | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | S | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. dehaani</i> orf29958                        | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | T | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. dehaani</i> orf69607                        | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | T | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |
| <i>C. dehaani</i> orf69699                        | G | A | C | T | G | K | S | V | T | V | G | S | D | G | T | A | Y | I | E | I | L | T | T | E | D | D | G | V | L | A | I | H | A | N | S | K | V | 517 |

### Supplementary Figure 5. GH13\_24 sequences alignment.

Red: Identical amino acid; Blue: Similar amino acid; Green: Catalytic site residues