|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Glycoside Hydrolases (GHs)** | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **GH** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **GH1** | 7 | 10 | 11 |  |  | 5 | 3 |
| **GH2** | 4 | 2 | 2 | 4 | 1 | 4 | 3 |
| **GH3** | 24 | 15 | 12 | 3 | 3 | 18 | 12 |
| **GH4** |  |  |  |  |  | 1 |  |
| **GH5** | 39 | 20 | 21 | 31 | 12 | 28 | 19 |
| **GH6** | 3 | 2 | 2 |  |  | 1 | 1 |
| **GH7** | 5 | 4 | 3 | 8 |  | 4 | 3 |
| **GH8** |  |  |  |  | 1 |  |  |
| **GH9** | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| **GH10** | 9 | 7 | 6 | 6 | 2 | 13 | 7 |
| **GH11** | 3 | 2 | 1 |  | 1 |  |  |
| **GH12** | 5 | 4 | 4 | 5 |  | 7 | 3 |
| **GH13** | 10 | 14 | 15 | 7 | 4 | 12 | 9 |
| **GH15** | 3 | 5 | 4 | 4 | 1 | 5 | 3 |
| **GH16** | 40 | 37 | 37 | 11 | 20 | 37 | 36 |
| **GH17** | 3 | 7 | 6 | 2 | 2 | 1 | 3 |
| **GH18** | 19 | 15 | 16 | 15 | 3 | 40 | 40 |
| **GH20** | 2 | 2 | 2 | 3 | 2 | 7 | 6 |
| **GH23** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GH24** |  |  |  |  |  |  |  |
| **GH25** | 2 | 1 | 1 |  | 1 | 3 | 2 |
| **GH26** |  |  |  | 10 | 1 |  |  |
| **GH27** | 3 | 6 | 7 | 8 | 1 | 3 | 6 |
| **GH28** | 8 | 25 | 17 | 3 | 1 | 12 | 13 |
| **GH29** | 2 | 3 | 4 |  |  |  |  |
| **GH30** | 6 | 6 | 5 |  | 2 | 2 | 2 |
| **GH31** | 11 | 5 | 6 | 4 | 3 | 6 | 6 |
| **GH32** | 1 |  |  | 2 | 2 | 1 | 1 |
| **GH33** |  |  |  |  |  |  |  |
| **GH35** | 8 | 8 | 5 | 1 | 1 | 6 | 10 |
| **GH36** |  |  |  |  | 1 |  |  |
| **GH37** | 8 | 3 | 3 | 5 | 2 | 3 | 2 |
| **GH38** | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| **GH39** |  | 1 | 1 |  |  |  |  |
| **GH42** |  | 1 |  |  | 1 |  |  |
| **GH43** | 17 | 8 | 10 | 8 | 4 | 19 | 11 |
| **GH44** | 1 |  |  |  |  |  |  |
| **GH45** | 3 | 3 | 4 | 1 | 4 |  | 2 |
| **GH46** |  |  |  |  |  |  |  |
| **GH47** | 18 | 12 | 9 | 15 | 3 | 11 | 10 |
| **GH50** |  |  |  |  |  |  |  |
| **GH51** | 4 | 3 | 4 | 3 | 2 | 3 | 2 |
| **GH53** | 1 | 2 | 2 |  |  | 1 | 1 |
| **GH54** |  |  |  |  |  |  |  |
| **GH55** | 13 | 4 | 6 |  | 1 | 3 | 3 |
| **GH62** |  |  |  |  | 1 |  |  |
| **GH63** |  | 1 | 1 | 1 | 1 | 1 |  |
| **GH64** |  |  |  |  |  |  |  |
| **GH65** |  |  |  |  |  |  |  |
| **GH67** |  |  |  |  |  |  |  |
| **GH71** | 4 | 7 | 7 | 5 |  | 7 | 6 |
| **GH72** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GH74** | 3 | 2 | 2 |  |  | 3 | 1 |
| **GH75** | 2 | 2 | 2 |  |  |  |  |
| **GH76** | 2 | 3 | 5 | 3 | 1 | 3 | 2 |
| **GH78** | 1 | 3 | 4 |  |  | 5 | 5 |
| **GH79** | 7 | 10 | 10 | 2 | 1 | 14 | 11 |
| **GH81** |  |  |  | 2 |  |  |  |
| **GH85** | 1 | 1 | 1 | 2 | 1 | 3 | 1 |
| **GH88** | 4 | 2 | 2 |  |  | 2 | 1 |
| **GH89** |  |  |  |  |  | 4 | 1 |
| **GH92** | 12 | 4 | 4 | 2 | 3 | 7 | 6 |
| **GH93** |  | 1 | 1 |  |  | 2 | 2 |
| **GH94** |  |  |  |  |  |  |  |
| **GH95** | 7 | 1 | 2 |  |  | 3 | 1 |
| **GH105** | 5 | 2 | 2 |  | 1 | 5 | 1 |
| **GH106** |  |  |  |  |  |  |  |
| **GH109** |  |  |  |  |  | 8 |  |
| **GH114** | 1 |  |  |  |  |  |  |
| **GH115** | 6 | 2 | 4 |  | 1 | 5 | 4 |
| **GH125** | 1 | 1 | 1 |  | 1 | 1 | 1 |
| **GH127** |  |  |  |  |  |  |  |
| **GH128** | 3 | 7 | 6 |  | 5 | 8 | 6 |
| **GH130** |  |  |  |  |  |  |  |
| **GH131** | 3 | 1 | 3 | 9 |  | 4 |  |
| **GH132** |  |  |  |  |  |  |  |
| **GH133** | 2 | 1 | 1 | 1 | 1 |  |  |
| **GH135** | 1 | 1 | 1 |  | 1 | 2 |  |
| **GH145** |  | 1 |  |  |  | 1 |  |
| **GH152** |  | 5 |  |  |  |  |  |
| **Total GH** | **352** | **299** | **289** | **190** | **105** | **348** | **273** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Carbohydrate Esterases (CEs)** | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **CE** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **CE1** | 2 | 1 | 1 |  | 1 | 13 | 3 |
| **CE2** |  |  |  |  |  | 2 |  |
| **CE4** | 20 | 16 | 16 | 18 | 7 | 6 | 3 |
| **CE5** | 2 |  |  | 7 | 4 |  |  |
| **CE8** | 2 | 10 | 9 | 5 | 1 | 3 | 3 |
| **CE9** | 2 | 1 | 1 |  | 1 | 2 | 1 |
| **CE10** |  |  |  |  |  | 46 |  |
| **CE12** | 1 | 4 | 4 |  |  | 4 | 1 |
| **CE14** |  |  |  |  |  | 1 |  |
| **CE15** | 1 | 4 | 2 |  |  | 1 | 2 |
| **CE16** | 5 | 11 | 10 | 16 |  | 24 | 17 |
| **Total CE** | **35** | **47** | **43** | **46** | **14** | **102** | **30** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Polysaccharide Lyases (PLs)** | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **PL** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **PL1** | 15 | 6 | 6 | 4 | 1 |  |  |
| **PL3** | 4 | 9 | 12 |  |  |  |  |
| **PL4** | 2 | 2 | 2 |  |  |  |  |
| **PL8** |  | 3 | 3 |  |  | 3 | 4 |
| **PL12** |  |  |  |  |  | 1 |  |
| **PL14** | 1 | 4 | 4 | 2 |  | 10 | 6 |
| **PL15** |  |  |  |  |  | 1 |  |
| **PL26** |  | 1 |  |  |  |  |  |
| **Total PL** | **22** | **25** | **27** | **6** | **1** | **15** | **10** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Auxiliary Activities (AAs)** | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **AA** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **AA1** | 30 | 28 | 26 | 6 | 6 | 22 | 13 |
| **AA2** | 4 | 10 | 7 |  |  | 21 | 8 |
| **AA3** | 72 | 67 | 61 | 7 | 9 | 53 | 5 |
| **AA4** |  |  |  |  |  | 2 |  |
| **AA5** | 14 | 7 | 5 | 4 | 4 | 12 | 9 |
| **AA6** | 1 | 3 | 4 | 1 | 1 | 2 | 1 |
| **AA7** |  | 3 | 4 | 14 | 2 | 11 |  |
| **AA8** | 2 | 2 | 2 |  |  | 2 | 2 |
| **AA9** | 18 | 25 | 19 | 4 |  | 20 | 15 |
| **AA10** |  |  |  |  | 1 |  |  |
| **AA12** | 2 |  |  |  |  |  |  |
| **AA14** |  | 4 |  |  |  |  |  |
| **Total AA** | **143** | **149** | **128** | **36** | **23** | **145** | **53** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Carbohydrate-Binding Modules (CBMs)** | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **CBM** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **CBM1** | 5 | 11 | 11 |  |  | 18 | 14 |
| **CBM5** | 3 | 3 | 4 |  |  | 8 | 10 |
| **CBM12** | 1 | 1 | 1 | 1 |  | 3 | 1 |
| **CBM13** | 4 | 7 | 7 |  |  | 10 | 9 |
| **CBM18** | 1 |  |  |  | 2 |  | 2 |
| **CBM19** |  |  | 1 |  |  | 4 |  |
| **CBM20** | 2 | 3 | 5 |  |  | 5 | 3 |
| **CBM21** | 1 | 2 | 2 | 1 |  | 2 | 2 |
| **CBM32** |  |  |  |  |  | 1 |  |
| **CBM35** |  | 1 | 2 | 3 | 1 | 1 |  |
| **CBM43** |  | 1 | 1 | 1 | 1 | 1 | 1 |
| **CBM48** | 2 | 3 | 3 | 3 | 2 | 2 | 3 |
| **CBM50** | 4 | 14 | 21 | 1 | 1 | 12 | 8 |
| **CBM52** |  |  |  |  |  |  |  |
| **CBM63** |  |  |  | 4 |  |  |  |
| **CBM67** | 1 | 2 | 29 |  |  |  |  |
| **Total CBM** | **24** | **48** | **87** | **14** | **7** | **67** | **53** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Glycosyltransferases (GTs)** | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **GT** | ***M. perniciosa*** | ***A. mellea*** | ***A. solidipes*** | ***M. larici-populina*** | ***U. maydis*** | ***G. boninense*** | ***G. lucidum*** |
| **GT1** | 9 | 11 | 7 | 7 | 5 | 12 | 10 |
| **GT2** | 7 | 13 | 13 | 14 | 14 | 11 | 12 |
| **GT3** | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT4** | 8 | 7 | 8 | 5 | 4 | 5 | 4 |
| **GT5** | 1 | 1 | 1 | 2 |  |  | 1 |
| **GT8** | 3 | 6 | 6 | 2 | 2 | 7 | 6 |
| **GT10** |  |  |  |  |  |  |  |
| **GT15** | 7 | 6 | 6 | 2 | 2 | 5 | 3 |
| **GT17** | 2 | 1 | 1 |  | 1 | 1 | 2 |
| **GT18** |  |  |  | 2 |  |  |  |
| **GT20** | 5 | 4 | 4 | 3 | 3 | 4 | 3 |
| **GT21** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT22** | 4 | 1 | 3 | 4 | 4 | 2 | 3 |
| **GT24** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT25** |  |  |  | 1 |  |  |  |
| **GT31** | 1 | 1 | 1 | 6 | 3 |  | 1 |
| **GT32** | 1 | 2 | 3 | 6 | 3 | 4 | 1 |
| **GT33** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT35** | 4 | 2 | 1 |  |  | 2 | 1 |
| **GT39** | 6 | 4 | 3 | 3 | 3 | 3 | 3 |
| **GT41** |  |  |  | 2 | 1 | 1 |  |
| **GT43** |  |  |  |  |  |  |  |
| **GT48** | 9 | 2 | 2 | 8 | 1 | 3 | 4 |
| **GT49** | 1 | 1 | 1 | 1 |  | 1 | 1 |
| **GT50** | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT57** | 4 | 1 | 2 | 2 | 2 | 2 | 2 |
| **GT58** | 2 | 1 | 1 | 3 | 1 | 1 | 1 |
| **GT59** |  | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT65** |  |  |  |  |  | 2 |  |
| **GT66** |  | 1 | 1 | 1 | 1 | 1 | 1 |
| **GT69** | 1 | 4 | 3 | 1 | 3 | 3 | 2 |
| **GT71** |  |  |  | 2 | 2 |  |  |
| **GT76** |  |  | 1 | 1 | 1 | 1 | 2 |
| **GT90** | 2 | 5 | 4 | 9 | 2 | 1 | 1 |
| **Total GT** | **83** | **80** | **78** | **93** | **64** | **78** | **70** |

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