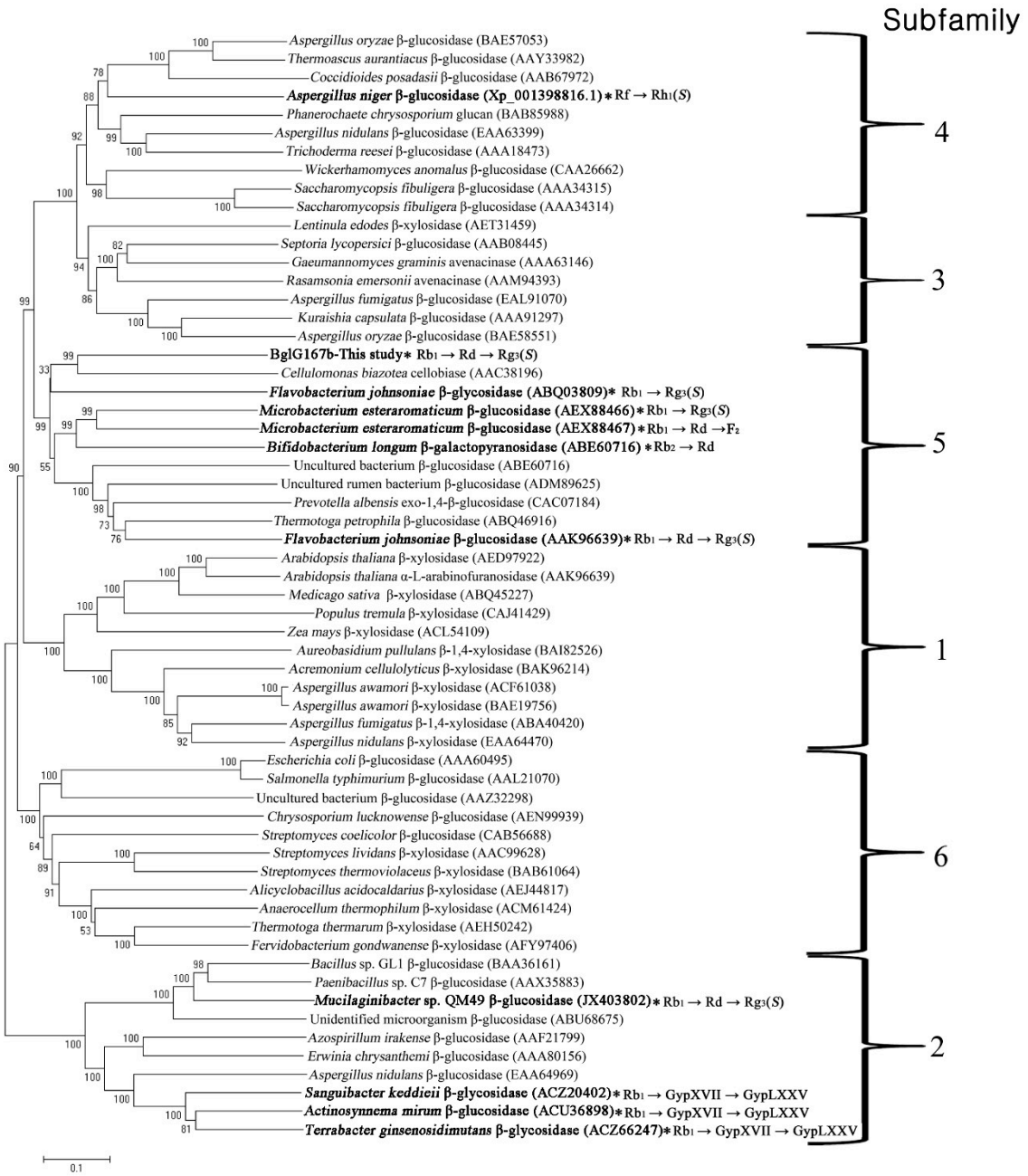


**Fig. S1.** Phylogenetic analysis of BglG167b in characterized glycoside hydrolases in family 3. Amino acid sequences were obtained from the NCBI database and CAZy database (accession numbers are indicated on the tree). This tree was made using the neighbor-joining method with a Kimura two-parameter distance matrix and pairwise deletion.

**Table S1.** Effects of metal ions and chemical agents on the activity of purified recombinant BglG167b.

| Metal ion and reagent | Relative activity ± SD (%) | |
|---|---|---|
| | 1 mM | 10 mM |
| NaCl | 100.0±6.3 | 94.4±1.6 |
| KCl | 104.9±1.7 | 95.7±3.3 |
| $MgCl_2$ | 90.9±2.8 | 93.9±1.4 |
| $CaCl_2$ | 94.4±5.7 | 61.0±4.7 |
| $ZnCl_2$ | 44.6±6.0 | 26.3±9.6 |
| $CoCl_2$ | 93.1±5.4 | 38.2±4.5 |
| $CuCl_2$ | 13.8±1.0 | 14.0±1.0 |
| SDS | 33.8±9.0 | 19.9±0.6 |
| EDTA | 81.0±3.7 | 28.9±2.8 |
| DTT | 85.9±1.1 | 46.9±5.9 |
| Control | 100.0 | 100.0 |

**Table. S2.** Relative activity of purified recombinant BglG167b towards various chromogenic substrates as measured by *o*NP or *p*NP release at 37°C. ND: not determined.

| | Substrate[a] | Relative activity ± SD (%)[b] |
|---|---|---|
| 1 | *p*NP-*α*-D-glucopyranoside | 8.1 ± 2.6 |
| 2 | *p*NP-*α*-D-mannopyranoside | ND |
| 3 | *p*NP-*α*-D-xylopyranoside | ND |
| 4 | *p*NP-*α*-L-arabinofuranoside | ND |
| 5 | *p*NP-*α*-L-arabinopyranoside | ND |
| 6 | *p*NP-*α*-L-rhamnopyranoside | ND |
| 7 | *p*NP-*β*-D-fucopyranoside | ND |
| 8 | *p*NP-*β*-D-galactopyranoside | ND |
| 9 | *p*NP-*β*-D-glucopyranoside | 100.0 ± 7.2 |
| 10 | *p*NP-N-acetyl--*β*-D-glucosaminide | ND |
| 11 | *p*NP-*β*-D-mannopyranoside | ND |
| 12 | *p*NP-*β*-D-xylopyranoside | ND |
| 13 | *p*NP-*β*-L-arabinopyranoside | ND |
| 14 | *o*NP-*α*-D-galactopyranoside | ND |
| 15 | *o*NP-*β*-D-fucopyranoside | ND |
| 16 | *o*NP-*β*-D-galactopyranoside | ND |
| 17 | *o*NP-*β*-D-glucopyranoside | 22.9 ± 0.9 |

[a]Final concentration, 2.0 mM.

[b]Activity toward *p*NP-*β*-D-glucopyranoside was set as 100%.

## REFERENCES

Kimura, M. (1983). The neutral theory of molecular evolution. Cambridge University Press, Cambridge.