Erratum to: Characterization of a GH family 8 β -1,3-1,4-glucanase with distinctive broad substrate specificity from *Paenibacillus* sp. X4

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Unfortunately, the order of authors' affiliation, placement of the Figure 1 and 2 legends and the word "its" in the abstract article had been published incorrectly. The correct version is published in this erratum.

The online version of the original article can be found under doi:[10.1007/s10529-014-1724-x](https://doi.org/10.1007/s10529-014-1724-x).

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The Abstract of this paper should read as follows:

Abstract A β -1,3-1,4 glucanase gene of *Paenibacillus* sp. X4, *bglc8H*, was cloned and characterized. BGlc8H was predicted to be a protein of 409 amino acid residues, including a signal peptide of 31 amino acids. The mature enzyme was predicted to have 378 amino acid residues; its molecular mass and pI were estimated as 41,561 Da and 7.61, respectively. BGlc8H belongs to glycoside hydrolase family 8 (GH8). Site-directed mutants of Glu95 and Asp156 of BGlc8H showed a near-complete loss of activity, indicating that they are catalytically-active residues. Unlike other GH8 members, BGlc8H had broad substrate specificity and hydrolyzed barley- β -D-glucan > chitosan > carboxy > methyl-cellulose > and lichenan. BGlc8H had a lower ratio of lichenase/barley- β -D-glucanase activities compared to GH16 enzymes. BGlc8H was optimally active at pH 5 and 50 °C, except for barley- β -D-glucanase (40 °C) and chitosanase (pH 7) activities. BGlc8H hydrolyzed cello-oligosaccharides (G3–G6) to G3 and G2 but not to G1. Ca^{2+} increased the activity and thermostability of BGlc8H for lichenan suggesting its use for the saccharification of cellulosic biomass.

There was an error in the placement of the legends for Figures 1 and 2 which should have been reversed.

Figure 1 Alignment of the amino acid sequences of BGlc8H and other β -1,3-1,4-glucanases, lichenases and endoglucanases. BGC, the mixed-linked endo- β -

1,3-1,4-glucanase (lichenase) of *B. circulans* WL-12 (P19254), (Bueno et al. 1990b); Pgl8A, the cellulase of *Paenibacillus cookii* (AB644221 = BAL46897), (Shinoda et al. 2012); Csn1794, the GH8 family chitosanase of *Paenibacillus* sp. 1794 (AFP58892), (Zitouni et al. 2013); Egl-257, the endo- β -1,4-glucanase of *B. circulans* KSM-N257 (BAB69035 = AB059267)

(Hakamada et al. 2002). Glu95 and Asp156 residues were shown in *red boxes*. Conserved motif was shown in a *blue box*

Figure 2 Phylogenetic tree showing the evolutionary relatedness and levels of homology between β -1,3-1,4-glucanase, lichenase and endoglucanase enzymes