Electronic Supplementary Material (ESI) for Green Chemistry.

Improving the efficiency and sustainability of chitin bioconversion through a combination of *Streptomyces* chitin-active-secretomes and mechanical-milling

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Fig. S1:

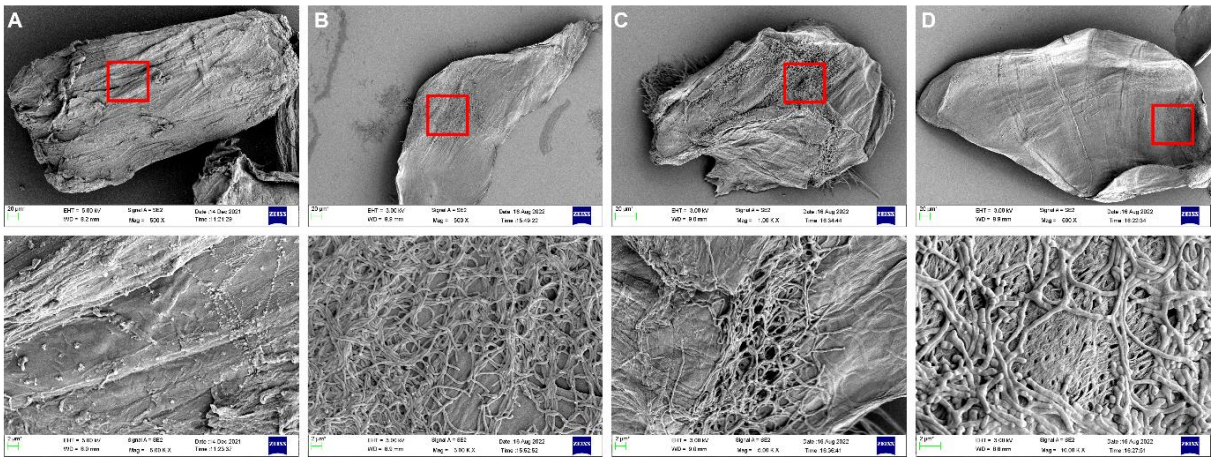

Fig. S1. FE-SEM micrographs showing the degradation of β-chitin by the *Streptomyces* spp. A – untreated β-chitin particle; B-D – β-chitin treated with *Streptomyces* sp. UH6, *S. coelicolor* and *S. griseus*, respectively. The upper panel represents the untreated and treated chitin particles, while the lower panel presents the close-up images of the target area (shown in red frame). In each panel, the scale bars of the images in the upper panel is 20 μm and for those in the lower row, they are 2 μm.

Fig. S2:

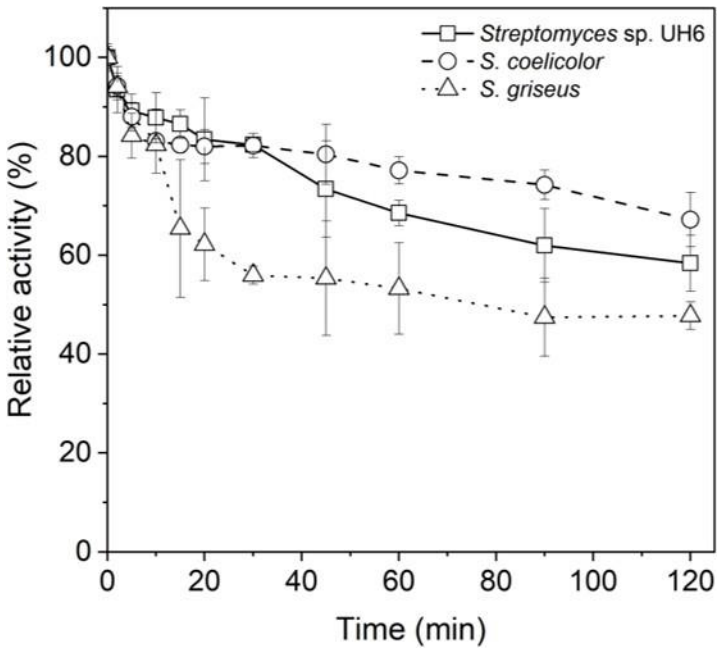

Fig. S2. Thermal stability of the *Streptomyces* spp. secretomes was assessed by pre-incubating the secretomes at 50°C for different time-intervals. The residual activity was estimated using Schales' assay. All assays were performed in triplicates, and error bars indicate standard deviation.

Fig. S3:

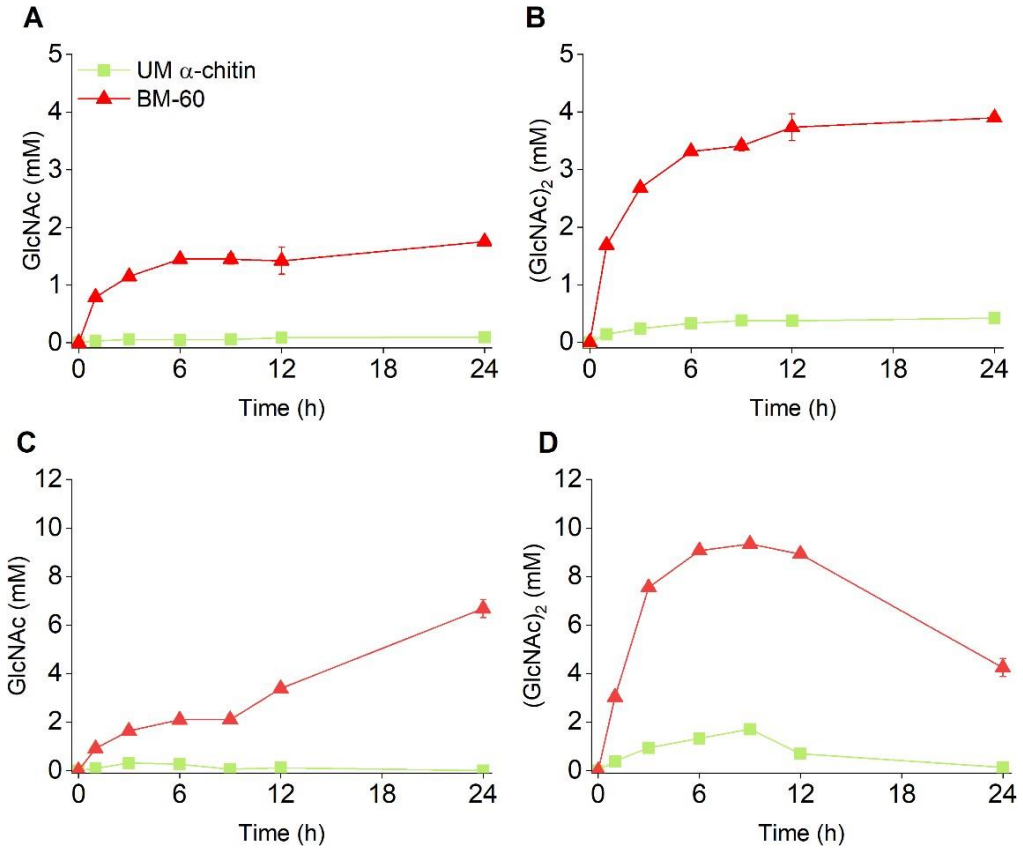

Fig. S3. A comparative analysis of GlcNAc and $(GlcNAc)_2$ production from unmilled α-chitin (light green) and the ball-milled α-chitin, BM-60 (red), using chitin-active-secretomes produced by *Paenibacillus* sp. LS1 (A and B) and *P. chitinolyticus* (C and D). All experiments were performed in biological triplicates and the error bars represent standard deviation.

Fig. S4:

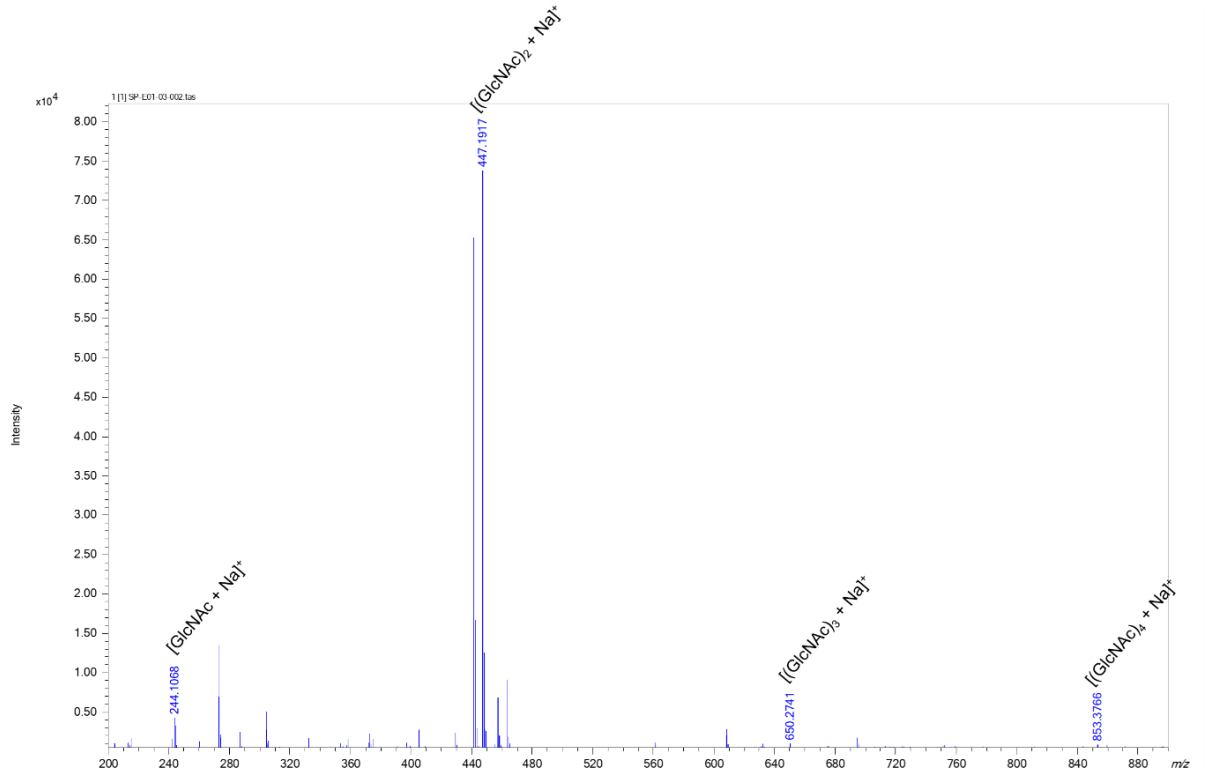

Fig. S4. MALDI-TOF-MS analysis of CHOS generated by the chitin-active-secretome of *Streptomyces* sp. UH6 from the ball-milled chitin substrate, BM-60. All identified masses were adducts of sodium $[M+Na]^+$ and labelled accordingly.