Figure captions:

Fig. S1. The XPS diagram of mPET plastic with and without aging treatment (ultraviolet, sodium hydroxide, hydrochloric acid and high temperature) (1-untreated-mPET group, 2-HCl-mPET group, 3-NaOH-mPET group, 4-HT-mPET group, 5-UV-mPET group).

Fig. S2. LC-MS image of the mPET extract DBP (dibutyl phthalate) from *Chlorella* sp. UTEX1602 (after eight days).

Fig. S3. LC-MS image of the mPET extract DEHP (2-ethylhexyl) ester from *Chlorella* sp. UTEX1602 (after eight days).

Fig. S4. The protein content in EPS of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

Fig. S5. The LC-MS image of the fragment peak of the monosaccharide glucuronic acid in EPS produced by *Chlorella* sp. UTEX1602 at 515 m/z (after eight days of culture).

Fig. S6. The LC-MS image of the fragment peak of the monosaccharide glucuronic acid in EPS produced by *Chlorella* sp. UTEX1602 at 386 m/z (after eight days of culture).

Fig. 1. Comparison of the FTIR spectra of mPET after aging by different methods (NaOH, HCl, high temperature, and ultraviolet).

Fig. 2. Zeta potential of the mPET and aged-mPET.

Fig. 3. *Chlorella* sp. UTEX1602 OD_{680} changed when the concentration of 10 μm mPET was (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L.

Fig. 4. Growth inhibition rate of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

Fig. 5. The chlorophyll content of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C)

200 mg/L of 10 μm mPET.

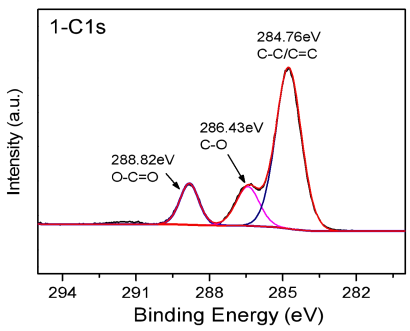
Fig. 6. The carotenoid content of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

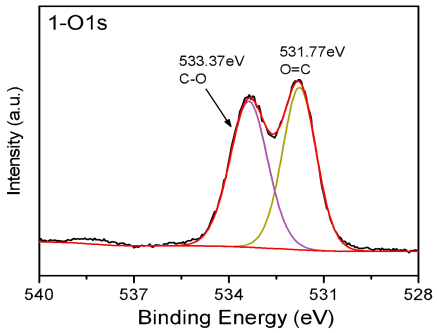
Fig. 7. The SOD enzyme activity of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

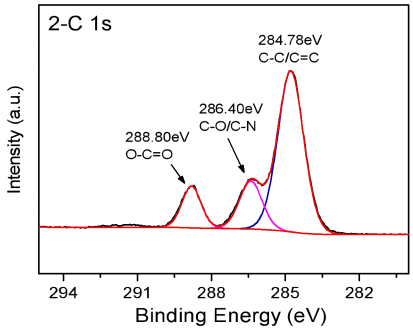
Fig. 8. The CAT enzyme activity of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

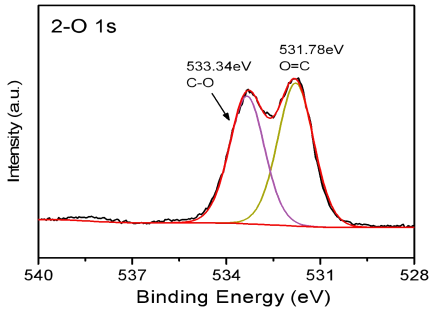
Fig. 9. The MDA content of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.

Fig. 10. The polysaccharide content in EPS of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.









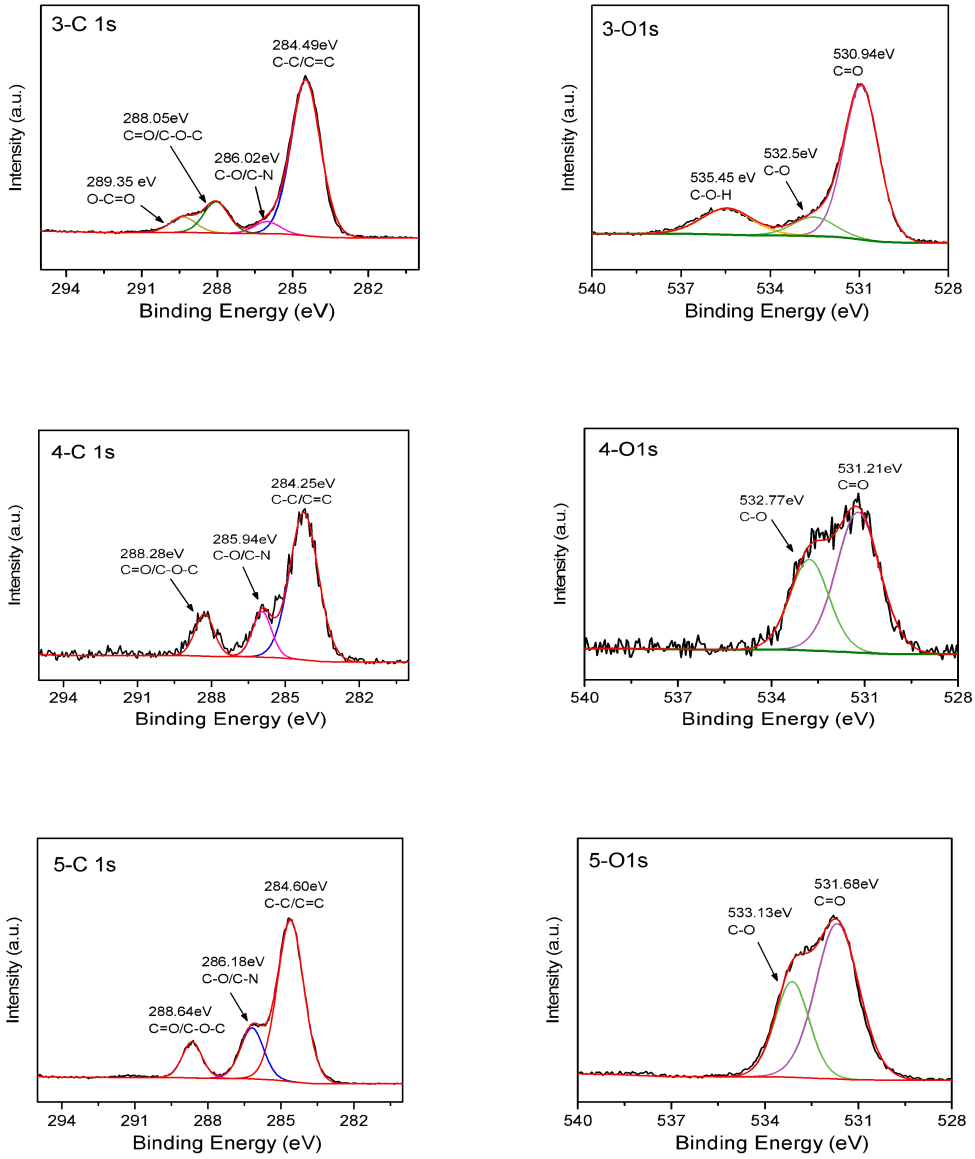
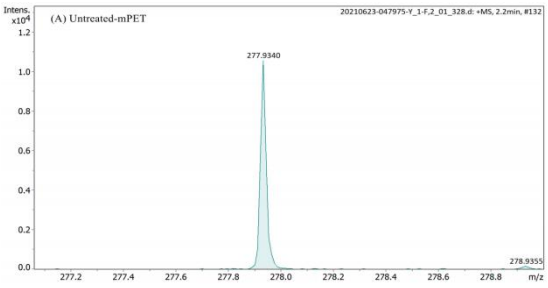


Fig. S1. The XPS diagram of mPET plastic with and without aging treatment (ultraviolet, sodium hydroxide, hydrochloric acid and high temperature) (1-untreated-mPET group, 2-HCl-mPET group, 3-NaOH-mPET group, 4-HT-mPET group, 5-UV-mPET group).



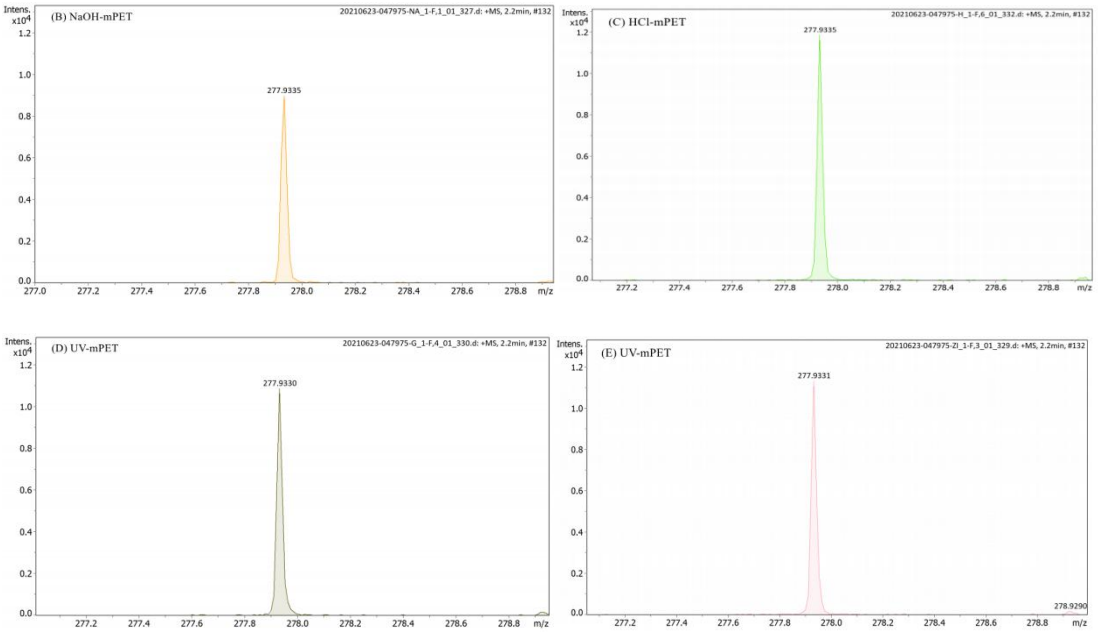


Fig. S2. LC-MS image of the mPET extract DBP (dibutyl phthalate) from *Chlorella* sp. UTEX1602 (after eight days).

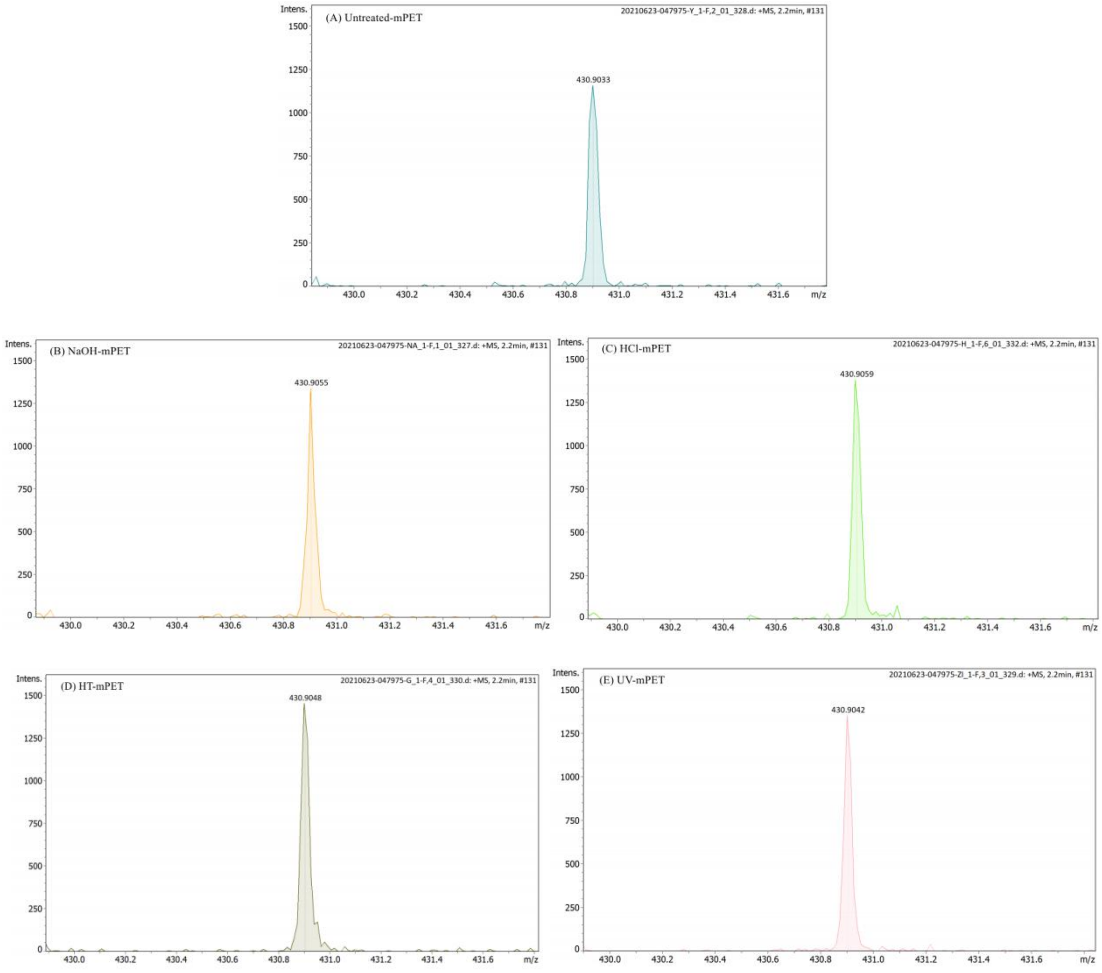


Fig. S3. LC-MS image of the mPET extract DEHP (2-ethylhexyl) ester from *Chlorella* sp. UTEX1602 (after eight days).

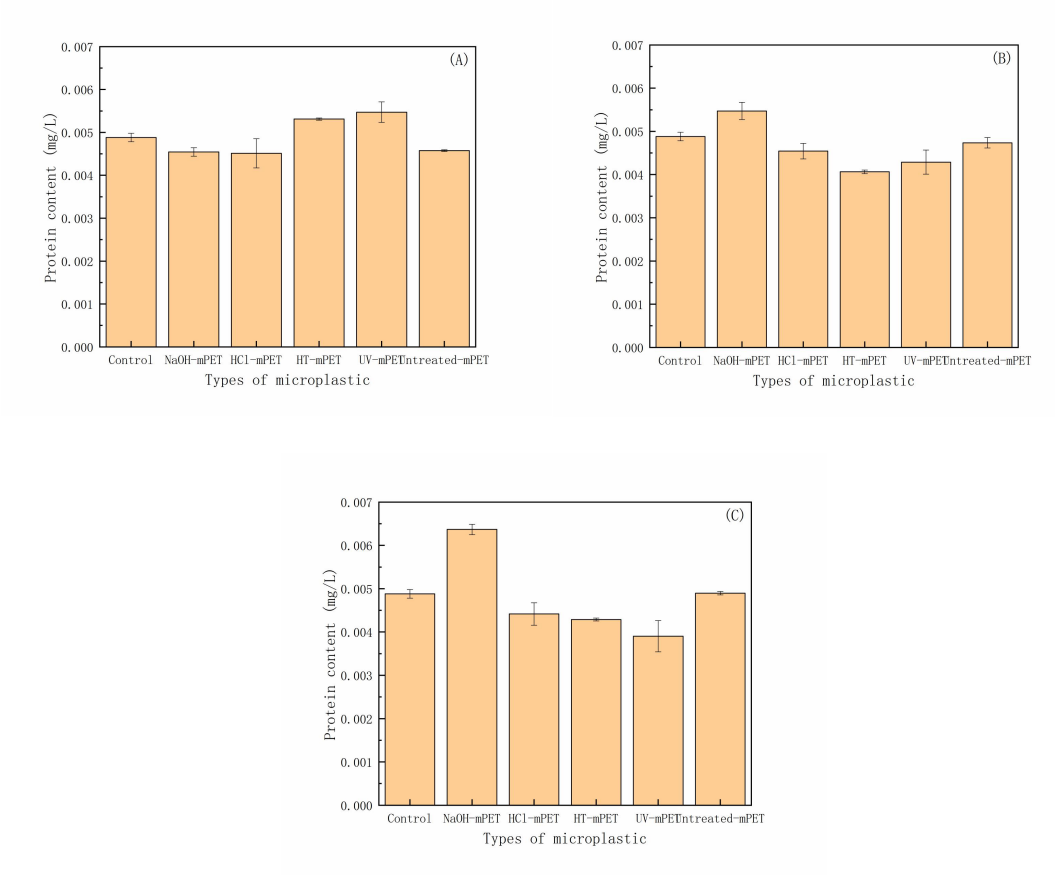
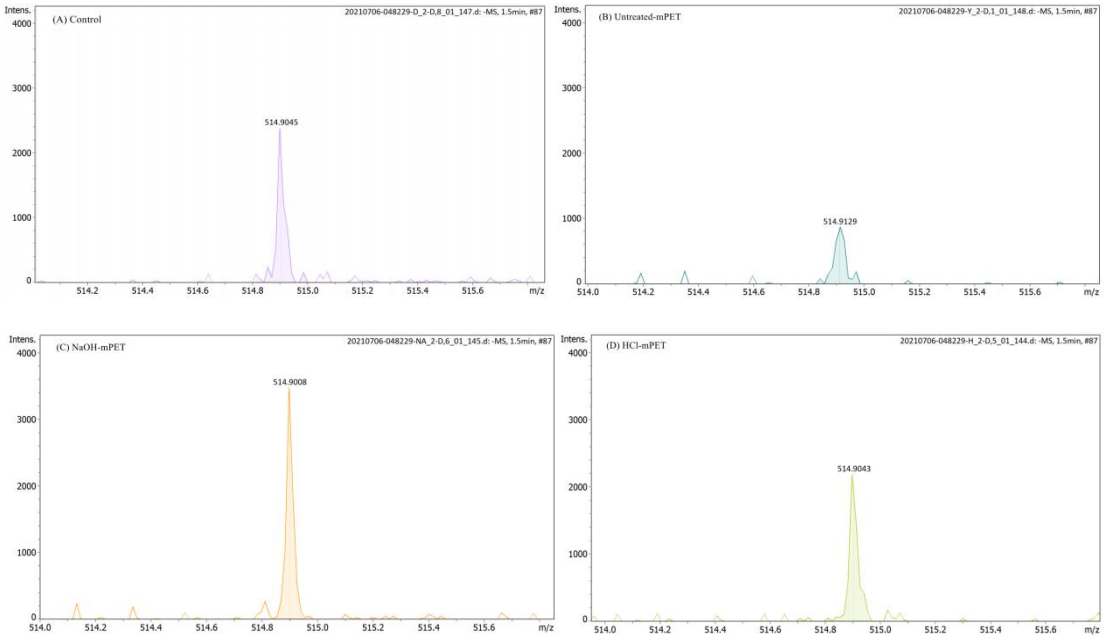


Fig. S4. The protein content in EPS of *Chlorella* sp. UTEX1602 in (A) 20 mg/L, (B) 100 mg/L, and (C) 200 mg/L of 10 μm mPET.



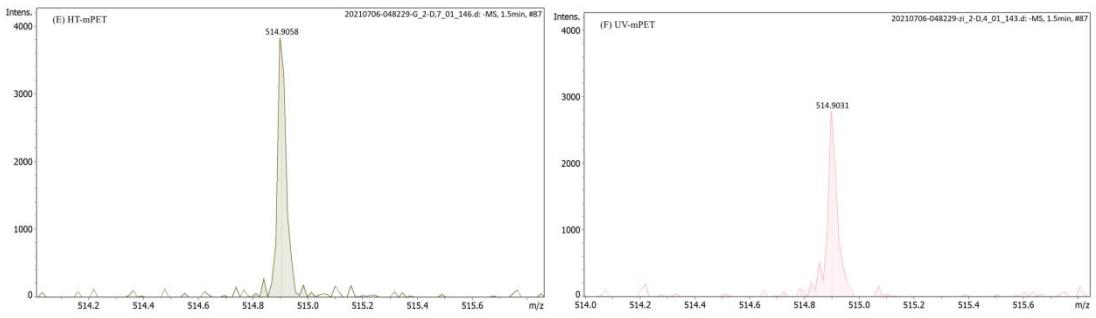


Fig. S5. The LC-MS image of the fragment peak of the monosaccharide glucuronic acid in EPS produced by *Chlorella* sp. UTEX1602 at 515 m/z (after eight days of culture).

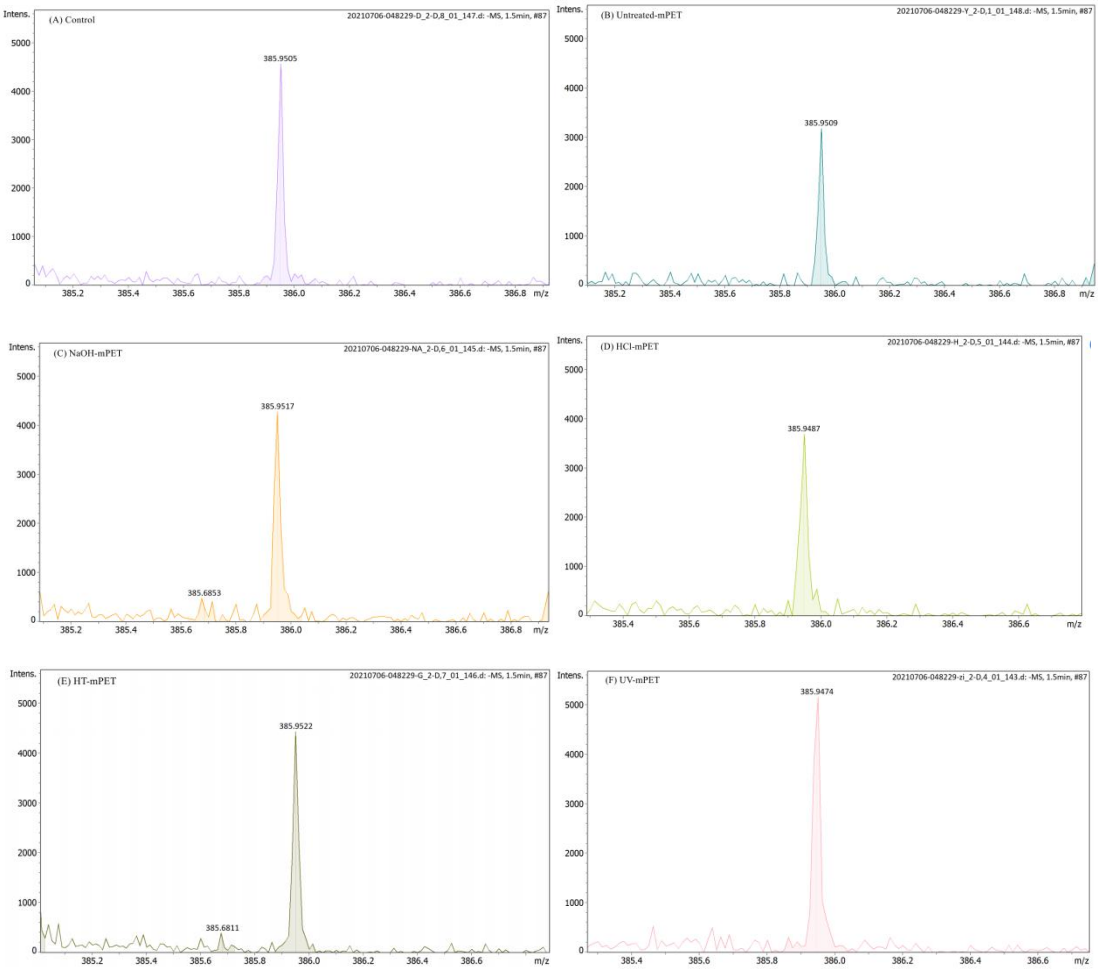


Fig. S6. The LC-MS image of the fragment peak of the monosaccharide glucuronic acid in EPS produced by *Chlorella* sp. UTEX1602 at 386 m/z (after eight days of culture).