Supplementary Information

Biodegradability of Cellulose Diacetate in Aqueous Environments

Test	MWWTP Destelbergen	MWWTP Gent	MWWTP Lokeren	IWWTS Landegem
ISO 14851 A	-	x	x	x
ISO 14851 B	x	x	-	x
ISO 14851 C	-	x	x	-

MWWTP = municipal wastewater treatment plant

IWWTS = individual wastewater treatment system

x = sampled

- = not sampled

SI Table 1 Sludge sampling locations per test

Characteristic (unit)	ISO 14851 A	ISO 14851 B	ISO 14851 C
TSS (mg l^{-1})	45.1	35.2	33.2
VSS (mg l^{-1})	21.8	23.8	17.8
pH	7.1	7.5	7.2
NH_4^+-N (mg l^{-1})	-	1.2	2.2
NO_x^--N (mg l^{-1})	-	0.9	0.3

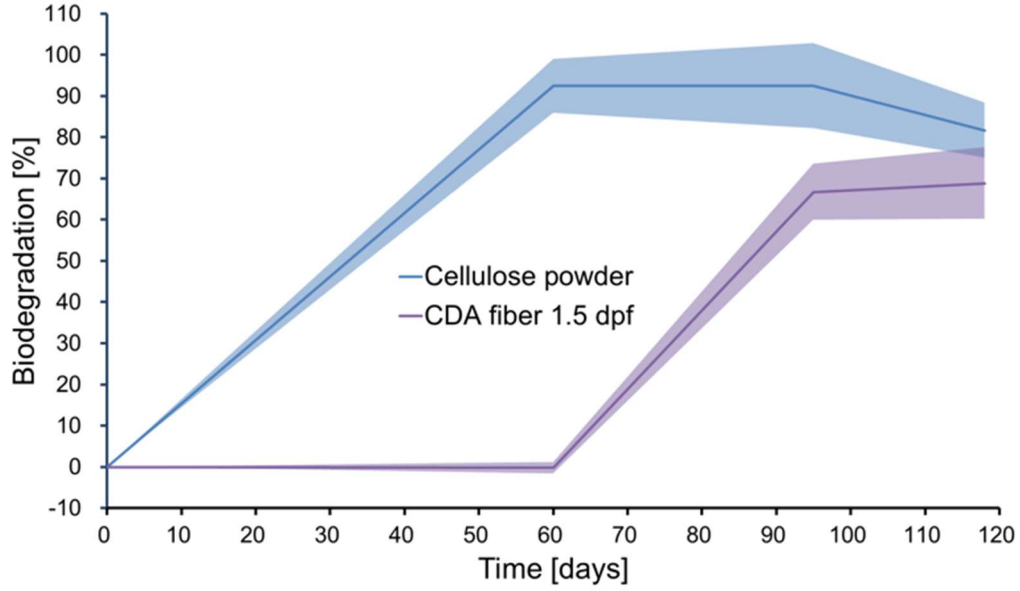
SI Table 2 Characteristics of the freshwater test medium

Characteristic (unit)	ASTM D6691	ISO 19679 seawater	ISO 19679 sediment
TS (%)	3.7	3.5	75.9
VS (% on TS)	12.4	15.1	0.5
pH	7.6	7.6	8.6
Kjeldahl-N (mg l^{-1})	21	-	-
TN (mg l^{-1})	-	23	-
TN (g/kg TS)	-	-	1.1
TOC (mg l^{-1})	-	5.5	-
TOC (%)	-	-	0.3

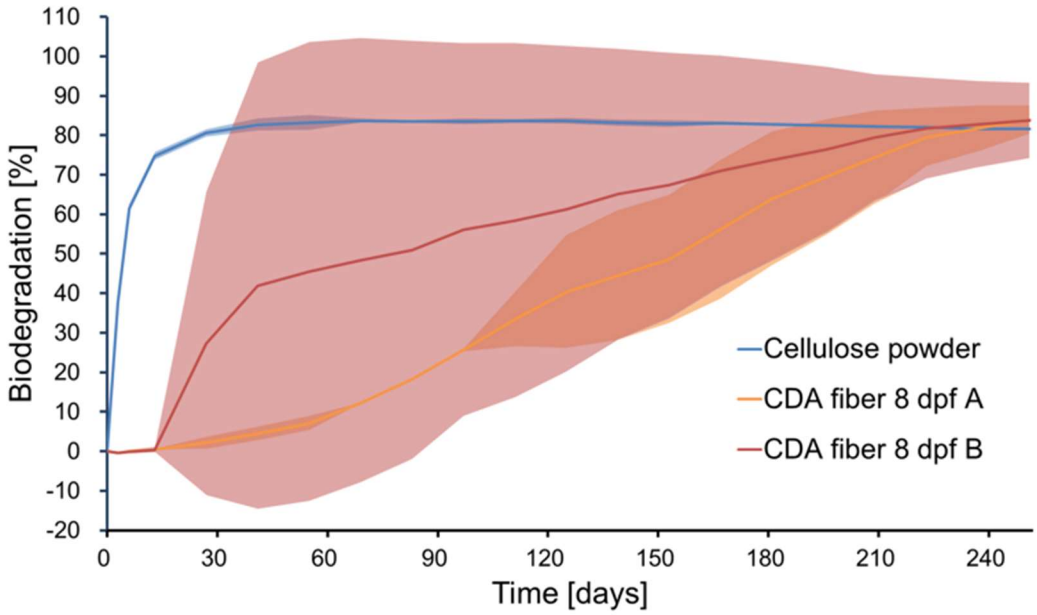
SI Table 3 Characteristics of the marine test medium

Material	pH R1 - R2 - R3	NH_4^+-N (mg l^{-1}) R1 - R2 - R3	NO_3^--N (mg l^{-1}) R1 - R2 - R3	NO_2^--N (mg l^{-1}) R1 - R2 - R3
ISO 14851 A				
Control	-	0.9 - 0.3	9.1 - 9.7	-
Cellulose powder	-	2.0 - 2.1	6.6 - 6.9	-
CDA fiber 1.5 dpf	6.5 - 6.5	0.0 - 0.0	8.4 - 9.0	-
ISO 14851 B				
Control	7.2 - 7.2 - 7.2	-	-	-
Cellulose powder	7.2 - 7.2 - 7.2	-	-	-
CDA particle	7.2 - 7.2 - 7.2	-	-	-
ISO 14851 C				
Control	7.2 - 7.1 - 7.0	-	-	-
Cellulose powder	7.1 - 7.0 - 7.0	-	-	-
CDA fiber 1.5 dpf	7.0 - 7.0 - 7.0	-	-	-
ASTM D6691				
Control	8.2 - 8.2	9.6 - 9.3	0.0 - 0.0	0.0 - 0.0
Cellulose powder	8.3 - 8.5	8.0 - 8.2	0.1 - 0.1	0.1 - 0.1
CDA fiber 8 dpf A	7.4 - 7.3	1.9 - 0.0	2.0 - 2.6	8.4 - 12.1
CDA fiber 8 dpf B	7.4 - 8.6	0.0 - 11.1	2.5 - 0.0	10.0 - 0.0

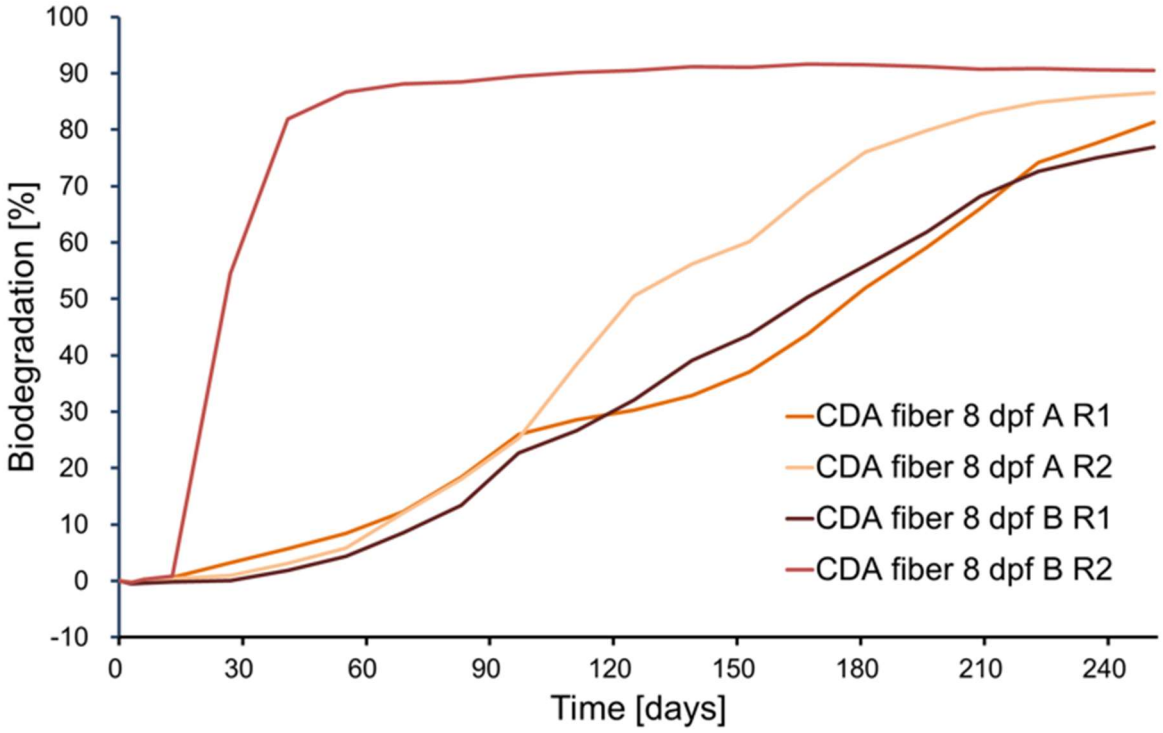
SI Table 4 Overview of pH and nitrogen analyses at the end of the test



SI Fig 1. Biodegradation of cellulose diacetate fibers (CDA) and cellulose powder reference in freshwater according to the ISO 14851 method, based on CO_2 evolution.



SI Fig. 2. Biodegradation of cellulose diacetate (CDA) fiber samples and cellulose powder reference in seawater according to the ASTM D6691 method, based on CO_2 evolution.



SI Fig. 3. Variation in the biodegradation course of the single replicates (R) of the same cellulose diacetate (CDA) fiber materials A and B in the same test in seawater according to the ASTM D6691 method, based on CO_2 evolution.