

Proposal of an antibacterial bag using catechin dyeing

Kobe University Secondary School

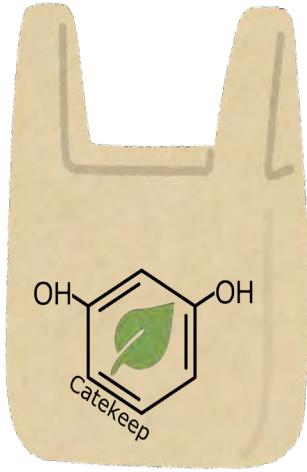
safety

COVID

plastic bags 

eco-bags

environmentally sustainable
but not socially sustainable.

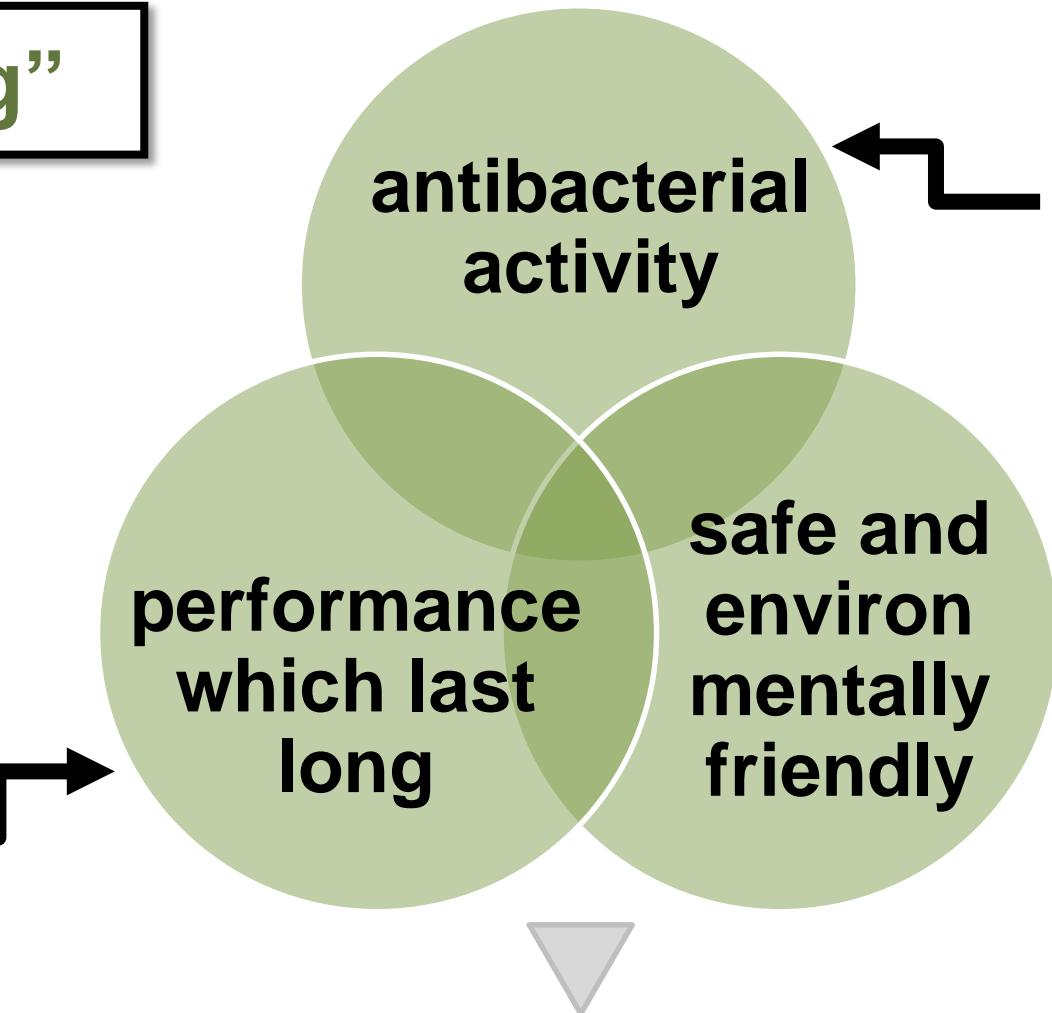


“Catekeep bag”

- to dispel people's **concerns** about the eco-bags
- to make **sustainable** eco-bags

“Catekeep bag”

last 2 years
(assuming to wash
1/week,
keeping 50% of
performance)



with copper
and catechin

of natural
material

carry food more safely without worrying about COVID

dyeing conditions for the ideal eco-bags

1. has antibacterial effect
2. which last long enough



If **binding strength** is appropriate strength,
fasteness and **bacteria activity** are well-balanced.

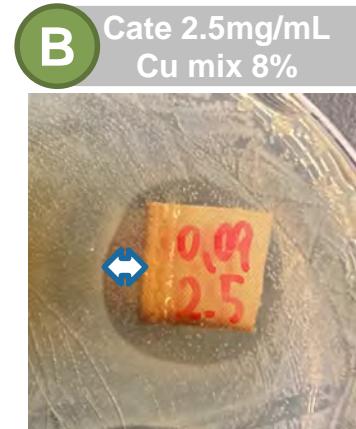
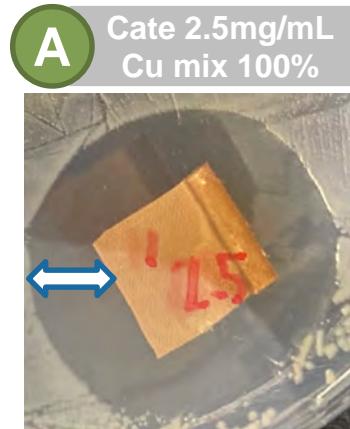
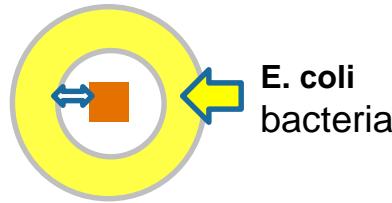


sustainable and high antibacterial activity

antibacteria activity

halo method :
size of inhibition circle \propto antibacteria activity

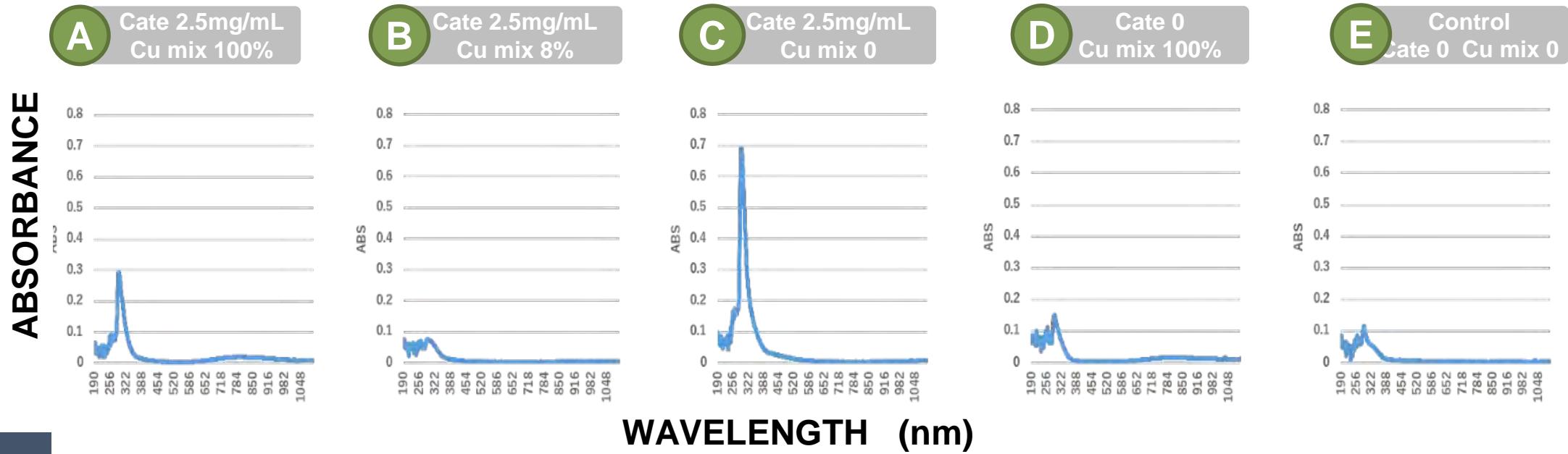
Inhibition circle
Areas around the dyed cloth
inhibited the bacterial growth.



Inhibition circle(mm)	9.6	4.4	0	7.5	0

Conditions containing copper ions are well antibacterial.

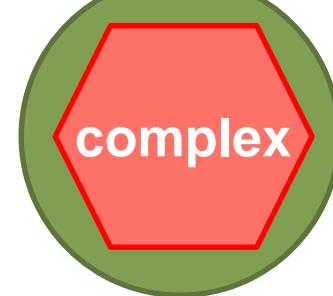
Binding strength between dye and fiber



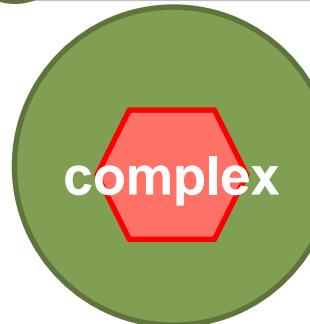
released					
Catechin	0.4	0.3	1.3	0	0
Cu mixture	16.8	4.6	0	8.5	0
complexes	0.9	0.6	0	0	0

the catechin-copper complexes saturated and Copper ions alone do not elute much.

A Cate 2.5mg/mL
Cu 100%



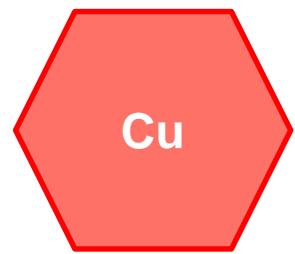
B Cate 2.5mg/mL
Cu 8%



C Cate 2.5mg/mL
Cu 0



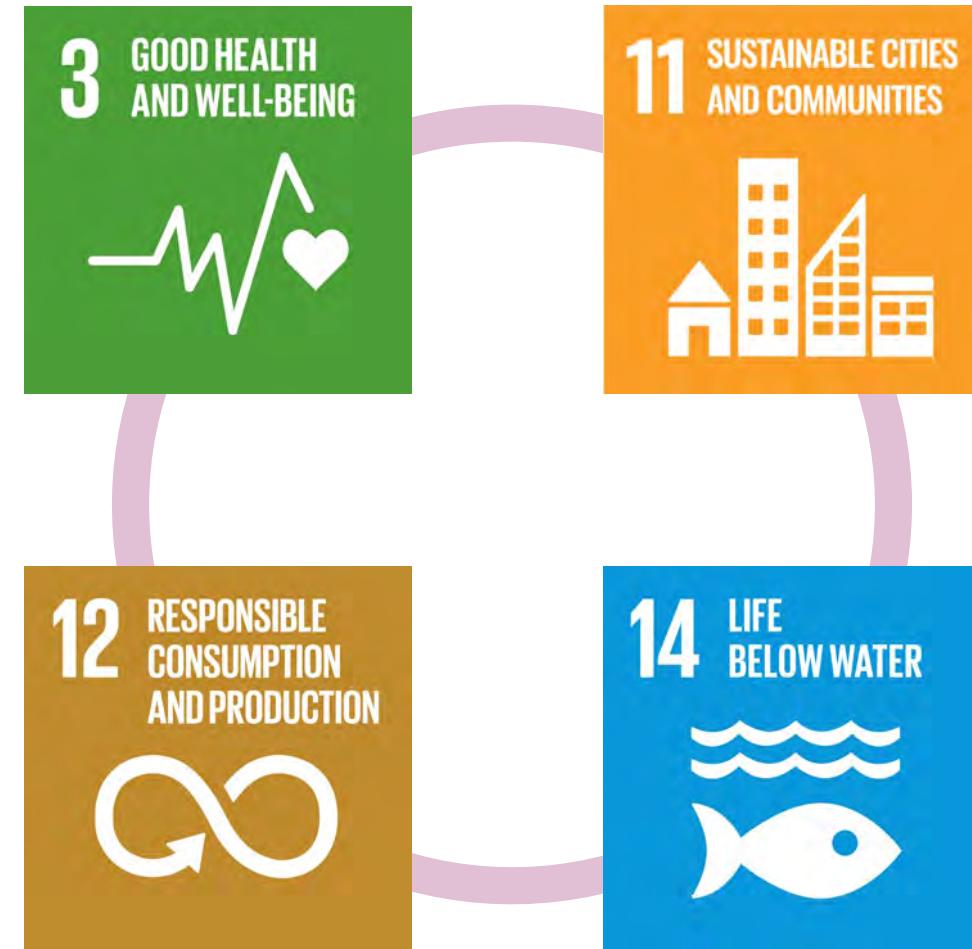
D Cate 0
Cu 100%



	A	B	C	D
Biting strength	●	● ● ●	● ● ● ●	● ●
fasteness	●	● ● ●	● ● ● ●	● ●
antibacterial activity	● ● ● ●	● ●	●	● ● ●

Against food poisoning, allergies, drug resistant bacteria

responsible action for the future of society with naturally derived materials



promote the use of reusable bags and materials to create a sustainability

protecting the environment by not using chemicals or disposables

Our "catekeep bag" will help us achieve these four SDGs goals.

	Ordinal pla bag	Ordinal eco bag	Catekeep bag
cost	3 yen	100 yen~	100.5 yen
anti bacterial	○	△	○
eco frinendlly	✗	○	○

No excuse

No disposable plastic

Let's use “Catekeep bag”

Reference

1. 星野伸夫「カテキン-銅(Ⅱ)錯体による酸化ストレスと選択的殺菌作用」2000
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2020.07.03
5. 大林弘和「抗菌加工製品は安全か？」2007.06.08

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Project of an antibacterial bag using Catechol dyeing

