

試験報告書

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検体 六角ナイロン(備長炭+抗菌剤入り)

表題 抗菌力試験

2017 年(平成 29 年)07 月 04 日当センターに提出された上記検体について試験した結果をご報告いたします。

抗菌力試験

1 依頼者

株式会社 シケン

2 検体

六角ナイロン(備長炭+抗菌剤入り)

3 試験概要

JIS L 1902 : 2015「繊維製品の抗菌性試験方法及び抗菌効果」8.1 菌液吸収法により検体の抗菌力試験を行った。

4 試験結果

生菌数測定結果を表-1に、次式により算出した抗菌活性値を表-2、試験概要を表-3、試験成立条件の確認を表-4に示した。

なお、培養後の生菌数測定平板を写真-1~4に示した。

$$A = (\log C_t - \log C_0) - (\log T_t - \log T_0) = F - G$$

$\log C_0 > \log T_0$ の場合は、 $\log T_0$ を $\log C_0$ に置き換えて計算する。

A : 抗菌活性値

F : 対照試料の増殖値 ($F = \log C_t - \log C_0$)

G : 試験試料の増殖値 ($G = \log T_t - \log T_0$)

$\log C_t$: 18~24時間培養後の対照試料の生菌数の算術平均の常用対数

$\log C_0$: 接種直後の対照試料の生菌数の算術平均の常用対数

$\log T_t$: 18~24時間培養後の試験試料の生菌数の算術平均の常用対数

$\log T_0$: 接種直後の試験試料の生菌数の算術平均の常用対数

表-1 試験片中の生菌数測定結果

試験菌	区分	試験片	試験片1個当たりの生菌数		
			測定-1	測定-2	測定-3
黄色 ぶどう球菌	接種直後	検体	1.0×10^4	5.4×10^3	1.6×10^4
		対照	4.0×10^4	4.4×10^4	4.4×10^4
	37 °C 18時間 培養後	検体	2.3×10^2	8.4×10^2	3.0×10^2
		対照	2.4×10^7	2.1×10^7	1.8×10^7

黄色ぶどう球菌 : *Staphylococcus aureus* subsp. *aureus* NBRC 12732

菌液調製溶液 : 0.05 %ポリソルベート80(Tween 80)添加1/20濃度のニュートリエント培地

対照 : 標準布(綿)[一般社団法人 繊維評価技術協議会]

表-2 抗菌活性値

試験菌	抗菌活性値*
黄色ぶどう球菌	4.7

* 抗菌効果 : 2.0以上

表-3 試験概要

定量測定方法	混釈平板培養法
試験片の滅菌法	高圧蒸気滅菌(121 °C, 15分間)
培養時間	18時間

表-4 試験成立条件の確認

黄色 ぶどう球菌	接種菌液濃度 (/mL)*1	2.9×10^5	
	対照試料の増殖値 (F)*2	+2.7	
	試験試料の増殖値 (G)	-2.0	
	対照試料の常用対数での 生菌数の最大最小の差*3	接種直後	0.0
		培養後	0.1
	試験試料の常用対数での 生菌数の最大最小の差*4	接種直後	0.5
培養後		0.6	

[試験成立条件]

*1 $1.0 \times 10^5 \sim 3.0 \times 10^5$ /mL

*2 1.0以上

*3 1以下

*4 2以下



写真-1 黄色ぶどう球菌 接種直後 検体
(洗い出し液1 mL)



写真-2 黄色ぶどう球菌 接種直後 対照
(洗い出し液1 mL)



写真-3 黄色ぶどう球菌 18時間後 検体
(洗い出し液1 mL)



写真-4 黄色ぶどう球菌 18時間後 対照
(洗い出し液1 mL)

以 上

Test Report

Client: SHIKEN Co.,Ltd. a partner company of Sanyei Corporation

一般財団法人
日本食品分析センター
52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo 151-0062, Japan

Sample: Hex Nylon (which contains Japanese bincho charcoal & antibacterial agent)

Title: Bactericidal Effect Test

This document reports the results of the test conducted with the sample submitted to the Japan Food Research Laboratories on the 4th of July, 2017.

Bactericidal Effect Test

1. Client

SHIKEN Co.,Ltd. a partner company of Sanyei Corporation

2. Sample

Hex Nylon (which contains Japanese bincho charcoal & antibacterial agent)

3. Abstract

A test to measure antibacterial capability was conducted using the “bacterial fluid absorption method.” This method is described in the section 8.1 of JIS L 1902 "Testing Antibacterial Activity and Efficacy on Textile Products", a test conducted in 2015 by Japanese Industrial Standards (JIS).

4. Results

Table-1 shows the result of viable bacteria count. Table-2 shows the antibacterial activity value calculated by the formula below. The test overview is shown on Tabel-3, and the required value for test validity on Table-4.

Additionally, the pictures 1-4 show the bacteria test plate after incubation.

$$A = (\log C_t - \log C_0) - (\log T_t - \log T_0) = F - G$$

In case of “ $\log C_0 > \log T_0$ ”, $\log C_0$ is replaced with $\log T_0$ for calculation.

A: Antibacterial activity value

F: Bacterial growth in the control sample ($F = \log C_t - \log C_0$)

G: Bacterial growth in the test sample ($G = \log T_t - \log T_0$)

$\log C_t$: Common logarithm of arithmetic average of the control sample's viable bacteria count after 18 to 24 hours culturing.

$\log C_0$: Common logarithm of arithmetic average of the control sample's viable bacteria count immediately after inoculation.

$\log T_t$: Common logarithm of arithmetic average of the test sample's viable bacteria count after 18 to 24 hours culturing.

$\log T_0$: Common logarithm of arithmetic average of the test sample's viable bacteria count immediately after the inoculation.

Tabel-1 The results of a viable bacteria count on the test piece

Test bacteria	Classification	Test piece	Viable bacterial count per one test piece		
			Measurement-1	Measurement-2	Measurement-3
Staphylococcus aureus	Immediately after inoculation	Sample	1.0 x 10 ⁴	5.4 x 10 ³	1.6 x 10 ⁴
		Control	4.0 x 10 ⁴	4.4 x 10 ⁴	4.4 x 10 ⁴
	37°C 18 hours after incubation	Sample	2.3 x 10 ²	8.4 x 10 ²	3.0 x 10 ²
		Control	2.4 x 10 ⁷	2.1 x 10 ⁷	1.8 x 10 ⁷

Staphylococcus aureus subsp. aureus NBRC 12732

A manufacture solution of Liquid containing a bacillus: 0.05% polysorbate 80 (Tween 80) was added.

Nutrient media of 1/20 addition concentration

Control: Standard cloth (cotton) [Japan Textile Evaluation Technology Council]

Tabel-2 Value of antibacterial activity

Test bacteria	Value of antibacterial activity
Staphylococcus aureus	4.7

*Antibacterial effect: 2.0 and above

Tabel-3 Test Overview

Quantitative measurement method	Poured plate method
Disinfection method for test piece	High-pressure steam sterilization (121°C, 15minutes)
Incubation time	18 hours

Tabel-4 Confirmation of the required value for test validity

	Inoculum concentration *1	2.9 x 10 ⁵	
	Bacterial growth value in the control sample*2	+2.7	
	Bacterial growth value in the test sample	-2.0	
Staphylococcus aureus	Difference between the maximum and minimum number of viable bacteria count in the control sample in a common logarithm *3	Immediately after inoculation	0.0
		After culturing	0.1
	Difference between the maximum and minimum number of viable bacteria count in the test sample in common logarithm *4	Immediately after inoculation	0.0
		After culturing	0.1

[Required value for test validity]

*1 1.0 x 10⁵ to 3.0 x 10⁵ /mL

*2 1.0 and over

*3 1 and under

*4 2 and under

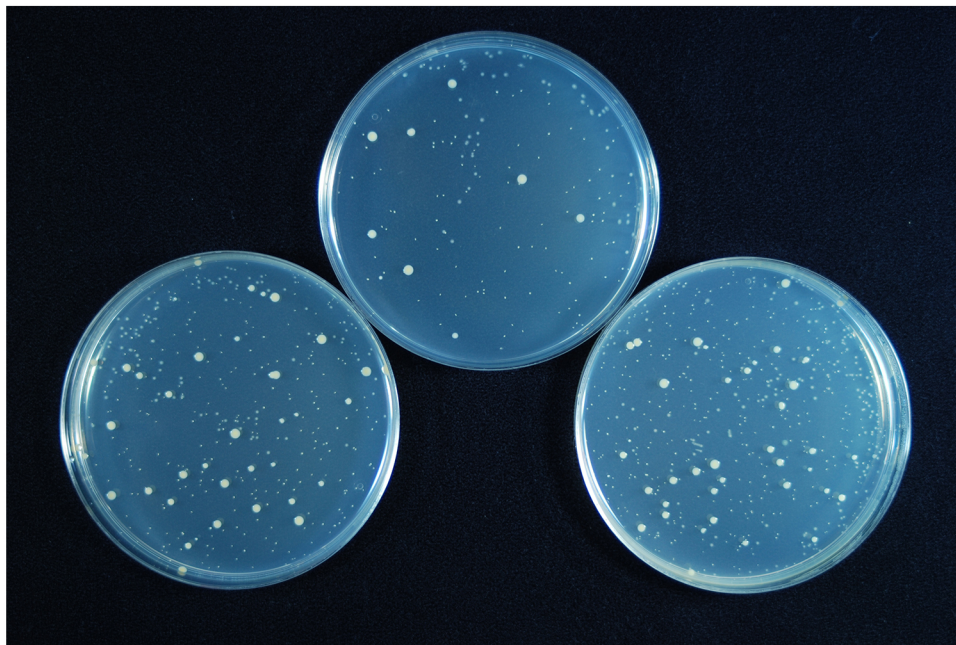


Fig. 1
Staphylococcus aureus / Sample / Immediately after inoculation
(extracted solution 1mL)

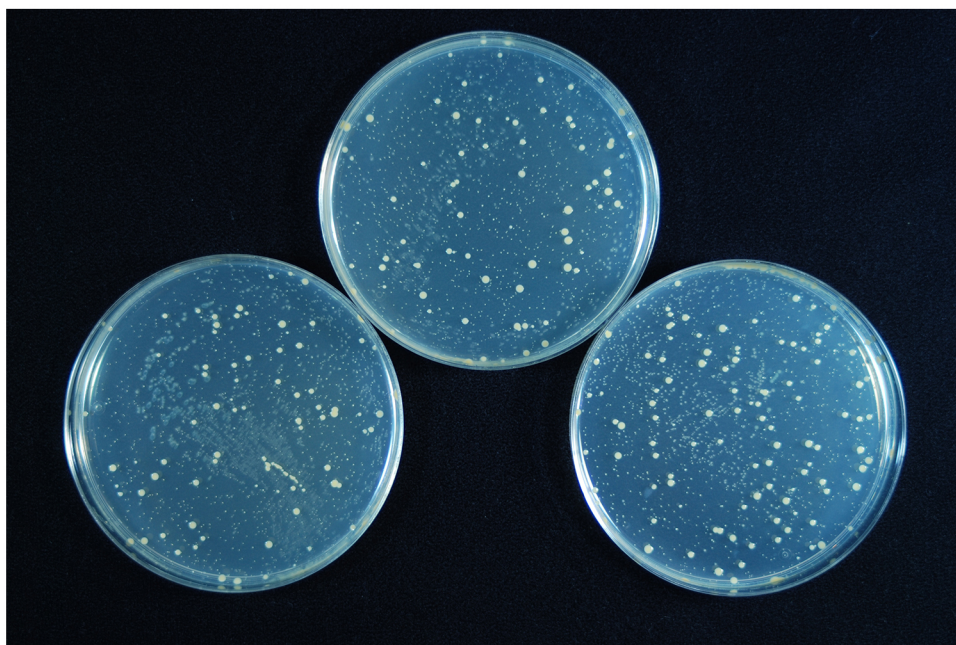


Fig. 2
Staphylococcus aureus / Control / Immediately after inoculation
(extracted solution 1mL)

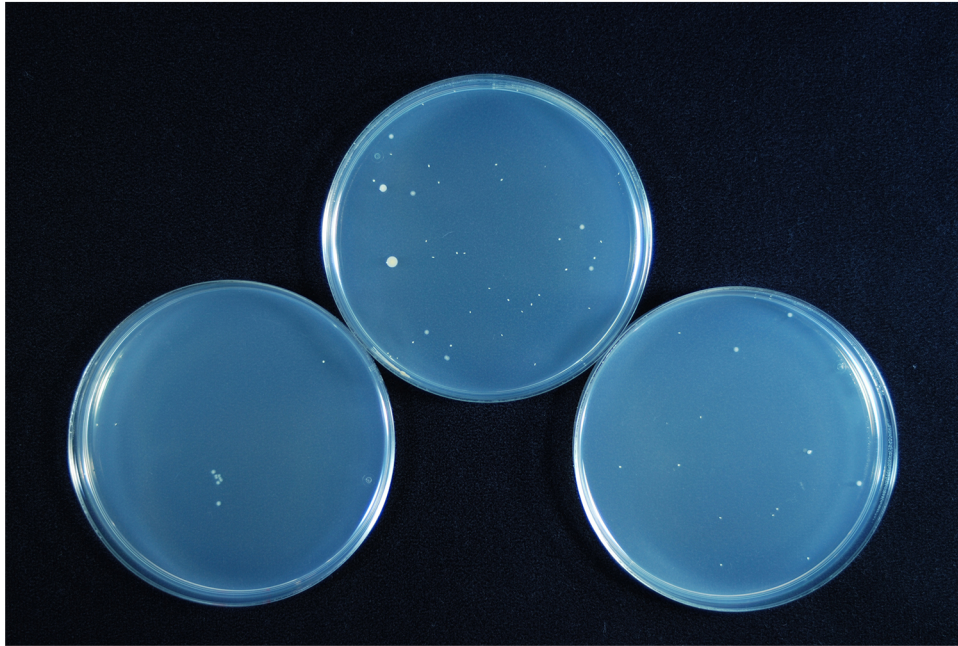


Fig. 3
Staphylococcus aureus / Sample / After 18 hours culturing
(extracted solution 1mL)

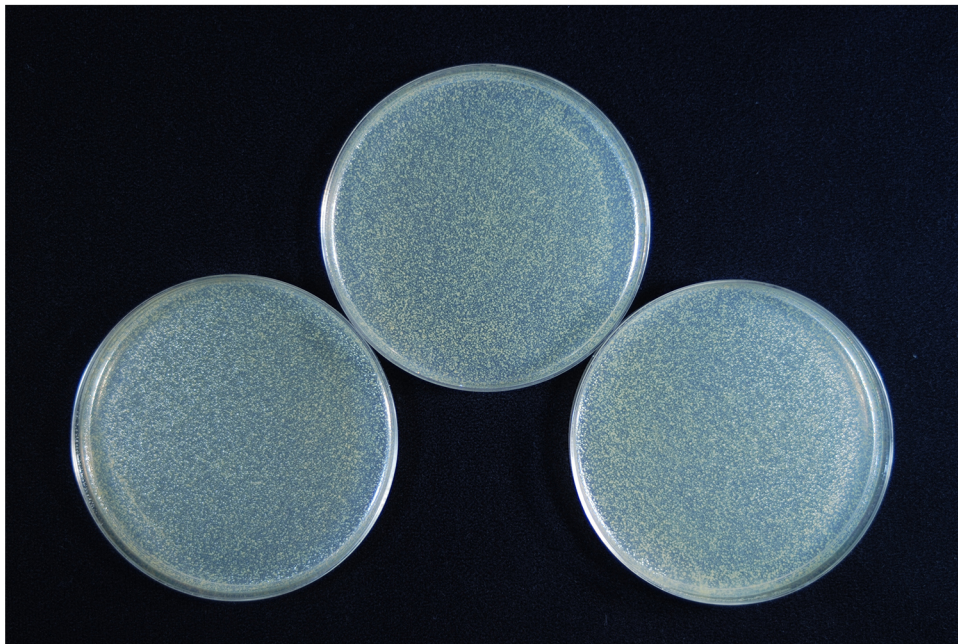


Fig. 4
Staphylococcus aureus / Control / After 18 hours culturing
(extracted solution 1mL)

End of the report.