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APPENDIX

APPENDIX

1. Culture Medium

1.1 Banana Leaf Agar

Leaves of cultivated banana (take care to get a fungicide-free batch) were cut into square pieces, dried and sterilized for 15 minutes at 121 ^{0}C, 15 pounds/inch^{2}. Spread 3-5 pieces in a plate with water agar.

1.2 Banana Leaf Agar (+1% vitamin B complex)

Leaves of cultivated banana (take care to get a fungicide-free batch) were cut into square pieces, dried and sterilized for 15 minutes at 121^{0}C, 15 pounds/inch^{2}. Spread 3-5 pieces in a plate with water agar that contained 1% vitamin B complex.

1.3 Cornmeal Malt Extract Agar

Cornmeal agar	17.0 g
Malt extract	20.0 g
Yeast extract	2.0 g
Distilled water	1,000 ml

1.4 Czapek Solution Agar

Saccharose	30.0 g
Sodium nitrate	2.0 g
Dipotassium phosphate	1.0 g
Magnesium sulphate	0.5 g
Potassium chloride	0.5 g
Ferrous sulphate	0.01 g
Agar	13.0 g
Distilled water	1,000 ml

1.5 Czapek Yeast Autolysate Agar

Czapek solution agar	49.0 g
Yeast extract	5.0 g
Distilled water	1,000 ml

1.6 Malt Czapek Agar

Czapek solution agar	49.0 g
Malt extract	40.0 g
Distilled water	1,000 ml

1.7 Malt Extract Agar

Malt extract	20.0 g
Peptone	1.0 g
Glucose	20.0 g
Agar	13.0 g
Distilled water	1,000 ml

1.8 Yeast Extract Sucrose Agar

Yeast extract	20.0 g
Sucrose	150.0 g
Agar	13.0 g
Distilled water	1,000 ml

1.9 Water Agar

Agar	13.0 g
Distilled water	1,000 ml

2. Antimicrobial Activities of Endophytic Fungus Isolates

Table 9 Inhibition zone (mm) measured from the agar block of endophytic fungus culture

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Codo 07	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	7.3
	MEA	-	-	-	1.8	-	-	-	-
	SDA	-	-	2.40	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Codo 08	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	10.3
	YES	-	-	-	-	-	-	-	-
Codo 09	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	1.5

B.S. = *Bacillus subtilis* ATCC 6633

E.F. =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213

E.C. =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853

C.A = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763

T. M. = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Codo 10	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Codo 11	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	1.40	1.5	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	4.7
Codo 12	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Codo 13	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Codo 14	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	1.65	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Codo 15	CzYA	-	-	1	-	-	-	-	-
	MCzA	-	2.45	1	-	-	-	-	1
	MEA	2.05	1	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Codo 16	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	1	1	-	-	-	-	-
	MEA	2.30	2.25	2.60	1	-	-	-	-
	SDA	1.85	1.45	1.40	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Hcre 01	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	2.0	-	4.7	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Hcre 02	CzYA	-	-	-	-	-	-	-	-
	MCzA	1.5	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Hcre 03	CzYA	-	-	-	-	-	-	-	-
	MCzA	1.9	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	2.3	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Hcre 04	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	9.7
	SDA	-	-	-	-	-	-	-	9
	YES	-	-	-	-	-	-	-	10.3
Hcre 05	CzYA	3.0	-	-	-	-	-	-	-
	MCzA	5.0	-	1.7	-	-	-	-	10.9
	MEA	-	-	-	-	-	5.4	1.0	7.9
	SDA	-	-	-	-	-	-	-	5.5
	YES	-	5.3	-	-	-	-	-	6.2

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Hcre 06	CzYA	-	-	-	-	-	-	-	10.7
	MCzA	-	-	-	-	-	1.0	-	9.6
	MEA	-	-	-	-	-	7.2	-	11.8
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	9.6
Hcre 07	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	1.0	-	1.0
	MEA	-	-	-	-	-	7.2	1.0	1.0
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Hcre 08	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	1.0
	MEA	-	-	-	-	-	-	-	7.6
	SDA	-	-	-	-	-	-	-	1.0
	YES	-	-	-	-	-	-	-	1.0
Hcre 09	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	13.4
	SDA	-	-	-	-	-	-	-	8.6
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

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S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Hcre 10	CzYA	-	-	-1.0	-	-	-	-	-
	MCzA	1	2.1	2.0	-	-	1.0	-	-
	MEA	1	-	1.4	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	2.8	3.3	5.0	-	2.1	-	-	-
Hcre 11	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	4.80	1.0	10.7
	SDA	-	-	-	-	-	-	-	9.5
	YES	-	-	-	-	-	-	-	8.8
Line 01	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	2.6	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Line 02	CzYA	-	-	-	-	-	-	-	1.0
	MCzA	-	-	-	-	-	-	-	-
	MEA	2.0	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	1.25	-	-	-	-	-	6.5

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

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Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Line 03	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Line 04	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	1.0	-	-	-	-	6.4
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	6.7
Line 05	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	1.0	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Line 06	CzYA	3.0	2.9	3.2	-	-	3.7	-	-
	MCzA	2.5	-	4.8	-	-	-	-	-
	MEA	1.7	-	1.3	-	-	-	-	5.9
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

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Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Line 07	CzYA	3.5	2.0	3.0	-	-	2.0	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	2.2	1.0	2.7	-	-	-	-	-
Line 08	CzYA	-	-	-	-	-	-	-	1.0
	MCzA	1.0	-	-	-	-	-	-	1.0
	MEA	-	-	-	-	-	-	-	1.0
	SDA	-	-	-	-	-	-	-	1.0
	YES	-	-	-	-	-	-	-	-
Line 09	CzYA	-	-	1.0	-	-	-	-	-
	MCzA	-	-	1.0	-	-	-	-	-
	MEA	1.0	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Line 12	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	2.4	-	3.7	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	1.8	-	-	-	-	-

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Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Line 13	CzYA	6.8	4.2	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	7.7	-	-	-	-	-
	SDA	-	-	1.5	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Line 14	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	4.9	4.0	6.2	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	1.5	-	1.0	-	-	-	-	-
Mpan 01	CzYA	-	-	-	-	-	-	-	7.4
	MCzA	2.3	2.0	3.8	-	-	-	-	11.9
	MEA	2.3	1.0	2.0	-	-	-	-	15.1
	SDA	-	-	-	-	-	-	-	10.0
	YES	1.0	-	-	-	-	-	-	11.9
Mpan 02	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Mpan 05	CzYA	-	-	2.1	-	-	-	-	-
	MCzA	1.0	1.7	1.7	-	-	3.5	1.6	1.0
	MEA	-	1.0	1.0	-	-	2.2	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Mpan 06	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Mpan 07	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Mpan 08	CzYA	-	-	1.4	-	-	-	-	-
	MCzA	-	-	1.0	-	-	-	-	1.0
	MEA	1.7	-	1.2	-	-	-	-	-
	SDA	-	-	1.0	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Mpan 09	CzYA	-	-	-	-	-	-	-	7.2
	MCzA	-	-	-	-	-	-	-	8.6
	MEA	-	-	-	-	-	1.0	-	10.3
	SDA	-	-	-	-	-	-	-	7.0
	YES	-	6.1	-	-	-	-	-	7.6
Mpan 10	CzYA	-	-	-	-	-	-	-	12.5
	MCzA	1.7	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	1.0	-	-	-	-	-	-	-
	YES	1.3	-	-	-	-	-	-	14.2
Pind 01	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	1.0	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Psar 02	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Psar 03	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	2.1
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Psar 04	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Psar 05	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Psar 06	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-

B.S. = *Bacillus subtilis* ATCC 6633 *E.F.* =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213 *E.C.* =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853 *C.A* = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763 *T. M.* = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Sand 01	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Sand 02	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Sand 03	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	3.7	-	8.1
	MEA	-	-	-	-	-	3.3	-	1.0
	SDA	-	-	-	-	-	-	-	1.0
	YES	-	-	-	-	-	-	-	1.0
Sand 04	CzYA	-	-	-	-	-	-	-	-
	MczA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	10.1
	YES	-	-	-	-	-	-	-	4.9

B.S. = *Bacillus subtilis* ATCC 6633
E.F. =*Enterococcus faecalis* ATCC 29212
S.A. =*Staphylococcus aureus* ATCC 29213
E.C. =*Escherichia coli* ATCC 25922
P.A.=*Pseudomonas aeruginosa* ATCC 27853
C.A = *Candida albicans* ATCC 10231
S.C. =*Saccharomyces cerevisiae* ATCC 9763
T. M. = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Sand 05	CzYA	-	-	-	-	-	-	-	5.6
	MCzA	-	1.4	-	-	-	-	-	7.4
	MEA	-	-	-	-	-	3.4	-	9.2
	SDA	-	-	-	-	-	-	-	9.5
	YES	-	-	-	-	-	-	-	12.8
Sand 06	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	7.2
Sand 07	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	4.2
	MEA	-	-	-	-	-	5.6	-	10.0
	SDA	-	-	-	-	-	-	-	6.6
	YES	-	-	-	-	-	-	-	1.0
Sand 08	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	6.0
	MEA	-	-	-	-	-	2.4	-	9.4
	SDA	-	-	-	-	-	-	-	7.0
	YES	-	-	-	-	-	-	-	5.5

B.S. = *Bacillus subtilis* ATCC 6633
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S.A. =*Staphylococcus aureus* ATCC 29213
E.C. =*Escherichia coli* ATCC 25922
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C.A = *Candida albicans* ATCC 10231
S.C. =*Saccharomyces cerevisiae* ATCC 9763
T. M. = *Trichophyton mentagrophytes* (Clinical isolate)

Table 9 (Cont.)

Isolate	Culture medium	Test organisms							
		B.S.	*E. F.*	*S. A.*	*E.C.*	*P. A.*	*C. A.*	*S. C.*	*T.M.*
Sand 09	CzYA	-	-	-	-	-	-	-	-
	MCzA	-	-	-	-	-	-	-	-
	MEA	-	-	-	-	-	-	-	-
	SDA	-	-	-	-	-	-	-	-
	YES	-	-	-	-	-	-	-	-
Sand 11	CzYA	-	-	-	-	-	-	-	2.0
	MCzA	-	-	-	-	-	1.0	-	1.0
	MEA	-	-	-	-	-	1.0	2.1	1.0
	SDA	-	-	-	-	-	-	-	1.0
	YES	-	-	-	-	-	-	-	-
Sand 13	CzYA	-	-	-	-	-	-	-	1.0
	MCzA	-	-	-	-	-	3.7	-	1.0
	MEA	-	-	-	-	-	3.7	-	9.3
	SDA	-	-	-	-	-	-	-	8.7
	YES	-	-	-	-	-	-	-	1.0

B.S. = *Bacillus subtilis* ATCC 6633

E.F. =*Enterococcus faecalis* ATCC 29212

S.A. =*Staphylococcus aureus* ATCC 29213

E.C. =*Escherichia coli* ATCC 25922

P.A.=*Pseudomonas aeruginosa* ATCC 27853

C.A = *Candida albicans* ATCC 10231

S.C. =*Saccharomyces cerevisiae* ATCC 9763

T. M. = *Trichophyton mentagrophytes* (Clinical isolate)

Table 10 Endophytic fungus isolates from stock culture exhibiting the loss of anti-*S. aureus* activity

Isolate	Culture medium	Isolate	Culture medium	Isolate	Culture medium	Isolate	Culture medium
*Aodo*01	MCzA	*Cind*03	MCzA	*Drox*04A	YES	*Mele*09	MEA
*Aodo*02	MEA	*Cind*05	MEA	*Drox*04B	MCzA	*Mfru*05	MCzA
*Aodo*03	MCzA	*Codo*02	MEA	*Ecoc*03	MCzA	*Mhor*01	SDA
*Aodo*04	MCzA	*Codo*03B	MCzA	*Gsch*01	SDA	*Mhor*04	MCzA
*Aodo*07	MCzA	*Codo*04A	MCzA	*Gsch*02	SDA	*Mhor*05	MCzA
*Aodo*10	MEA	*Codo*06A	MCzA	*Gsch*04	YES	*Mhor*06	SDA
*Aodo*12B	MEA	*Codo*06B1	MCzA	*Gsch*07	YES	*Mpan*01	MCzA
*Aodo*14B	YES	*Codo*06C	MCzA	*Hcre*01	SDA	*Mpan*05	CzYA
*Aodo*16	YES	*Codo*07	SDA	*Hcre*05	MCzA	*Mpan*08	CzYA
*Aodo*17	MCzA	*Codo*11	MEA	*Hcre*10	YES	*Oind*01B	MCzA
*Apir*06	MCzA	*Codo*14	MEA	*Hcre*11	MEA	*Oind*02A	YES
*Apir*07	MCzA	*Codo*15	MEA	*Ifin*05	MCzA	*Oind*02B	MCzA
*Apir*10	YES	*Drho*03	MEA	*Line*04	MEA	*Oind*05B	YES
*Avas*01A	MCzA	*Drho*04	MEA	*Line*07	CzYA	*Oind*05C	SDA
*Avas*01B	MEA	*Drho*08	MEA	*Line*09	CzYA	*Vneg*03	SDA
*Bstr*2/2B	SDA	*Drox*02A	MCzA	*Mele*02	MCzA	*Vneg*04	MCzA
*Ccoc*02	MEA	*Drox*02B	MCzA	*Mele*06.2	MCzA	*Vtri*03	MEA
*Cfis*01B	MEA	*Drox*03A	MCzA	*Mele*08	MCzA		

Table 11 Inhibition zone (mm) measured from the agar block of endophytic fungus culture with stable anti-*S. aureus* activity

Isolate	Culture medium	Inhibition zone (mm)	Isolate	Culture medium	Inhibition zone (mm)
*Aret*01	YES	1	*Line*06	MCzA	2
*Bore*04	YES	1	*Line13*	MEA	2
*Bpri*01.1	SDA	1	*Line*14	MEA	3
*Ccar*02	MEA	1.2	*Mele*01	YES	1
*Ccar*05	MCzA	1	*Mhor*02	MEA	1
*Ccoc*08	MEA	1	*Mhor*03	CzYA	1
*Cfis*01A	MCzA	1	*Oind*01	MEA	2
*Codo*03A	MEA	3	*Oind*03	MEA	2
*Codo*16	MEA	2	*Oind*05A	MCzA	3.1
*Cqua*01	YES	1	*Oind*07	YES	1
*Ddec*05A	MCzA	1	*Qind*07	MEA	1
*Drox*05	MEA	3.2	*Rsia*02	YES	2
*Drox*06B	MEA	2	*Vneg*02	MCzA	1
*Ecoc*02	MCzA	1	*Vtri*07	CzYA	1
*Gsch*03	MEA	2			

Table 12 Endophytic fungus isolates from stock culture exhibiting the loss of anti-*E. coli* activity

Isolate	Culture medium	Isolate	Culture medium
*Aodo*17	MCzA	*Mele*02	MCzA
*Avas*01A	MCzA	*Mele*06.2	MCzA
*Ccar*02	MEA	*Mfru*05	MCzA
*Codo*07	MEA	*Mhor*01	SDA
*Codo*11	MEA	*Oind*07	YES
*Drho*04	MEA	*Vneg*03	SDA
*Gsch*02	SDA		

Table 13 Inhibition zone (mm) measured from the agar block of endophytic fungus culture with stable anti-*E. coli* activity

Isolate	Culture medium	Inhibition zone (mm)
*Ccar*05	MCzA	1
*Cind*03	MCzA	1
*Codo*16	MEA	1
*Ifin*01A	MEA	1

Table 14 Endophytic fungus isolates from stock culture exhibiting the loss of anti-*C. albicans* activity

Isolate	Culture medium	Isolate	Culture medium	Isolate	Culture medium
Aodo 05	YES	*Ecoc* 03	MCzA	*Mhor* 04	MCzA
Aodo 06	SDA	*Gsch* 01	MCzA	*Mhor* 05	MCzA
Aodo 17	MCzA	*Gsch* 02	SDA	*Mhor* 06	SDA
Avas 01B	MEA	*Gsch* 03	YES	*Mpan* 05	MCzA
Bstr 02/2A	MCzA	*Gsch* 04	SDA	*Mpan* 09	MEA
Ccar 02	MEA	*Gsch* 05	SDA	*Oind* 01	MEA
Cind 01	MEA	*Gsch* 07	YES	*Oind* 05A	MCzA
Cind 03	MCzA	*Hcre* 06	MEA	*Sand* 03	MCzA
Codo 06A	MCzA	*Hcre* 07	MEA	*Sand* 05	MEA
Cqua 02	MCzA	*Hcre* 10	MCzA	*Sand* 08	MEA
Ddec 05A	MCzA	*Line* 06	CzYA	*Sand* 11	MEA
Drho 04	MEA	*Line* 07	CzYA	*Sand* 13	MEA
Drho 07	SDA	*Mele* 02	MCzA	*Smux* 01	YES
Drho 08	YES	*Mele* 07	MEA	*Vneg* 03	SDA
Drho 09	MCzA	*Mele* 08	MCzA	*Vtri* 04	MEA
Drox 02A	YES	*Mhor* 01	SDA	*Vtri* 07	CzYA
Drox 06B	CzYA	*Mhor* 02	MEA	*Vtri* 07	CzYA
Ecoc 02	MEA	*Mhor* 03	CzYA		

Table 15 Inhibition zone (mm) measured from the agar block of endophytic fungus culture with stable anti-*C. albicans* activity

Isolate	Culture medium	Inhibition zone (mm)
Hcre 05	MEA	1
Hcre 11	MEA	2
Mele 01	MCzA	1
Sand 07	MEA	1

Table 16 Endophytic fungus isolates from stock culture exhibiting the loss of anti-*S. cerevisiae* activity

Isolate	Culture medium	Isolate	Culture medium	Isolate	Culture medium
Aodo 07	MCzA	*Codo* 06C	SDA	*Mhor* 05	MCzA
Aodo 17	MEA	*Ddec* 01	CzYA	*Mpan* 05	MCzA
Avas 01B	MEA	*Ecoc* 02	MEA	*Oind* 01	MEA
Bstr 02/2A	MEA	*Gsch* 02	SDA	*Qind* 01	MCzA
Ccar 02	MCzA	*Hcre 07*	MEA	*Rsia* 01	MCzA
Ccar 05	MCzA	*Hcre* 11	MEA	*Sand* 11	MEA
Ccoc 02	MCzA	*Mhor* 01	SDA	*Vneg* 03	SDA
Cind 03	MCzA	*Mhor* 03	CzYA	*Vtri* 08	MCzA
Codo 06A	MCzA	*Mhor* 04	MCzA		

Table 17 Inhibition zone (mm) measured from the agar block of endophytic fungus culture with stable anti-*C. albicans* activity

Isolate	Culture medium	Inhibition zone (mm)
Hcre 05	MEA	1

Table 18 Codes and plant hosts of endophytic fungus isolates retrieved from the stock culture

Isolate code	Family	Thai name	Scientific name
Aarb	Sapindaceae	คงคาเดือด	*Arfeuillea arborescens* Pierre
Aili	Acanthaceae	เหงือกปลาหมอ	*Acanthus ilicifolius* Linn.
Aodo	Meliaceae	ประยงค์	*Aglaia odorata* Lour.
Apav	Mimosaceae	มะกล่ำตาช้าง	*Adenanthera pavonina* Linn.
Apir	Meliaceae	ค้างคาว	*Aglaia pirifera* Hance
Asqu	Annonaceae	น้อยหน่า	*Annona squamosa* Linn.
Avas	Acanthaceae	เสนียด	*Adhatoda vasica* Nees
Blup	Acanthaceae	เสลดพังพอน	*Barleria lupulina* Lindl.
Bore	Bixaceae	คำแสด	*Bixa orellana* Linn.
Bpri	Acanthaceae	อังกาบหนู	*Barleria prionitis* Linn.
Bstr	Acanthaceae	สังกรณี	*Barleria strigosa* Willd.
Ccar	Apocynaceae	หนามแดง	*Carissa carandas* Linn.
Ccoc	Apocynaceae	หนามพรม	*Carissa cochinchinensis* Pierre
Cfis	Caesalpiniaceae	คูน	*Cassia fistula* Linn.

Table 18 (cont.)

Isolate code	Family	Thai name	Scientific name
Cind	Verbenaceae	ไม้เท้ายายม่อม	*Clerodendrum indicum* Ktze.
Cine	Lauraceae	เชียด	*Cinnamomum iners* Bl.
Cqua	Vitidaceae	เพชรสังฆาต	*Cissus quadrangularis* Linn.
Ddec	Ebenaceae	จันอิน	*Diospyros decandra* Lour.
Drho	Ebenaceae	ตะโกนา	*Diospyros rhodocalyx* Kurz
Drox	Euphorbiaceae	มะคำไก่	*Drypetes roxburghii* Wall.
Ecoc	Euphorbiaceae	กระบือเจ็ดตัว	*Excoecaria cochinchinensis* Lour.
Gpic	Acanthaceae	ใบเงินใบทอง	*Graptophyllum pictum* Griff.
Gsch	Guttiferae	มะดัน	*Garcinia schomburgkiana* Pierre
Ifin	Rubiaceae	เข็มขาว	*Ixora finlaysoniana* Wall.
Jgen	Acanthaceae	กระดูกไก่ดำ	*Justicia gendarussa* Burm.
Mele	Sapotaceae	พิกุล	*Mimusops elengi* Linn.
Mfru	Annonaceae	ลำดวน	*Melodorum fruticosum* Lour.
Mhor	Bignoniaceae	ปีป	*Millingtonia hortensis* Linn.
Oind	Bignoniaceae	เพกา	*Oroxylum indicum* Vent.
Pser	Burseraceae	มะแฟน	*Protium serratum* Engler
Qind	Combretaceae	เล็บมือนาง	*Quisqualis indica* Linn.
Rnas	Acanthaceae	ทองพันชั่ง	*Rhinacanthus nasutus* Kurz
Rsia	Annonaceae	นมแมว	*Rauwenhoffia siamensis* Scheff.

Table 18 (cont.)

Isolate code	Family	Thai name	Scientific name
Rtub	Acanthaceae	ต้อยติ่ง	*Ruellia tuberosa* Linn.
Seri	Solanaceae	ช้าแป้น	*Solanum erianthum* D. Don
Sleu	Araliaceae	หนุมานประสานกาย	*Schefflera leucantha* Vig.
Snux	Strychnaceae	แสลงใจ	*Strychnos nux-vomica* Linn.
Tcri	Menispermaceae	บอระเพ็ด	*Tinospora crispa* Miers ex Hook. f. & Thomas
Vneg	Verbenaceae	คนทีเขมา	*Vitex negundo* Linn.
Vtri	Verbenaceae	คนทีสอ	*Vitex trifolia* Linn.

Biography

Miss Rachanee Sawatchupong was born on October 17, 1975 in Bangkok, Thailand. She received her Bachelor Degree of Science in Pharmacy in 1999 from the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand.