CHAPTER 3

RESULTS

Antibacterial Activities of Medicinal Plants

Activities of four extracts, petroleum ether, ethyl ether, ethanol, and water, of 63 species belonging to 35 families were tested against eight species of microorganisms : *Bacillus subtilis*, *Escherichia coli*, *Lactobacillus fermentum*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Shigella dysenteriae*, *Staphylococcus aureus*, and *Streptococcus faecalis*. The results are shown in Table 7, pages 57 to 104.

Table 7*

Activities of 4 Extracted from Medicinal Plants Tested Against *Bacillus subtilis*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall	l	-	++	-	-
Rhinacanthus nasutus Kurz.	l	-	+	+	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	+	++	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn	rh	+	-	-	+
ARALIACEAE					
Schefflera venulosa Merr.	l	-	+	-	-

* Inhibition zone diameter
\- = No inhibition
\+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb, end = endosperm, fr = fruit, fl = flower, l = leaf, co = corolla, rh = rhizome, r = root, sd = seed, sb = stembark, w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Bacillus subtilis*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	+	+	-
Basella rubra Linn.	l	-	+	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	+	+	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	+	-	+
Cassia angustifolia Vahl.	l	-	+	-	-
Cassia tora Linn.	l	-	++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	-	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	++	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	-	-	-
Eupatorium odoratum Linn.	l	-	+	-	-
Gynura pseudochina DC.	l	+	-	+	-
Pluchia indica Less.	l	-	+ not clear	-	-
Vernonia elliptica DC.	l	+++	++	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Bacillus subtilis*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	+++	-	+
Momordica cochinchinensis Spreng.	l	-	+++	+	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	+	-
Euphorbia sessiliflora Roxb.	rh	-	+++	-	-
Phyllanthus distichus Muell. Arg.	l	-	+	+	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	+	+	+
Cynodon dactylon Pers.	w	-	+++	-	-
LABIATAE					
Pogostemon cablin Benth	l	+	+	+	-
LILIACEAE					
Allium ascalonicum Linn.	bu	+	+	+	-
Allium sativum Linn.	bu	+++	+	-	-
Allium tuberosum Roxb.	w	+	++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. *alba* Hassk.	l	-	+	++	+

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Bacillus subtilis

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. siamensis Valeton	l	+	+	+	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels.	w	-	-	+	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	+	-	-
Albizzia lebbek Benth.	l	-	+++	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	-	-	-
	sd	-	+	+	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	+	+	+
	l	-	-	+	-
MYRTACEAE					
Psidium guajava Linn.	l	+	+	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Bacillus subtilis*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	++	+	-
Oxalis repens Thumb.	w	+	+	+	-
PALMAE					
Areca catechu Linn.	end	-	-	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	+	+	-
PIPERACEAE					
Piper betle Linn.	l	++	+++	+	-
PLUMBAGINACEAE					
Plumbago indica Linn.	r	+++	++++	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	+	+	-
Zanthoxylum piperatum DC.	fr	-	+	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	+	+++	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Bacillus subtilis

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	+	+++	+	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	++	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	+	-
Vitex trifolia Linn. var. repens Ridl.	l	-	+	+	-
Vitex trifolia Linn.	l	-	++	-	-
VITACEAE					
Cissus repanda Vahl.	w	-	-	+	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	+	++	+	-
Alpinia sp. (ข่าตาแดง)	rh	-	+++	+	-
	fl	++	+++	-	-
Curcuma longa Linn.	rh	+	+	+	-
Curcuma zedoaria Rosc.	rh	-	+	-	-
Gastrochilus pandulatus Ridl.	rh	-	+	-	-
Globba sp. (ว่านร่อนทอง)	rh	+	++	+	-
Zingiber cassumunar Roxb.	fh	+	+	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants Tested Against *Escherichia coli*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	++	+	-
Rhinacanthus nasutus Kurz.	l	-	-	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	+	+	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn	rh	+	-	+	+
ARALIACEAE					
Schefflera venulosa Merr.	l	-	++ not clear	-	-

* Inhibition zone diameter
- = No inhibition
\+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb
end = endosperm
fr = fruit
fl = flower
l = leaf
co = corolla
rh = rhizome
r = root
sd = seed
sb = stembark
w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Escherichia coli*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	+	-	-
Basella rubra Linn.	l	-	+	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	+++	+	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	+	+	-
Cassia angustifolia Vahl.	l	-	+ not clear	-	-
Cassia tora Linn.	l	-	+++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	+ not clear	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	+++	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	+	-	-
Eupatorium odoratum Linn.	l	-	-	-	-
Gynura pseudochina DC.	l	-	-	-	-
Pluchia indica Less.	l	-	+++	-	-
Vernonia elliptica DC.	l	-	+	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Escherichia coli

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	+	-	-
Momordica cochinchinensis Spreng.	l	-	++++	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	+	-	-
Euphorbia sessiliflora Roxb.	rh	-	+++	-	-
Phyllanthus distichus Muell. Arg.	l	-	+	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	-	+	-
Cynodon dactylon Pers.	w	-	+++	-	-
LABIATAE					
Pogostemon cablin Benth.	l	-	-	-	-
LILIACEAE					
Allium ascalonicum Linn.	bu	+	+	+	-
Allium sativum Linn.	bu	+	-	-	-
Allium tuberosum Roxb.	w	+	++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. alba Hassk.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Escherichia coli*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. *siamensis* Valeton	l	-	-	-	-
MENISPERMACEAE					
Stephenia erecta Craib	r	-	-	-	-
Tiliacora triandra Diels	w	-	-	+	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	-	-	-
Albizzia lebbek Benth.	l	-	++++	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	+	-	-
	sd	-	+	-	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	+	-
	l	-	-	+	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Escherichia coli*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	++	+	-
Oxalis repens Thumb.	w	-	+	+	-
PALMAE					
Areca catechu Linn.	end	-	-	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	++	-	-
PIPERACEAE					
Piper betle Linn.	l	++	++	+	-
PLUMBAGINACEAE					
Plumbago indica Linn.	r	++	+ not clear	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	+	-	-
Zanthoxylum piperatum DC.	fr	-	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	++	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Escherichia coli*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	+	+++	+	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	+	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	+	-	-
Vitex trifolia Linn. var. *repens* Ridl.	l	-	+	-	-
Vitex trifolia Linn	l	-	+++	+	-
VITACEAE					
Cissus repanda Vahl.	w	-	+	+	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	+	+	+	-
Alpinia sp. (ข่าตาแดง)	rh	-	+++	+	-
	fl	+	++++	-	-
Curcuma longa Linn.	rh	-	-	-	-
Curcuma zedoaria Rosc.	rh	-	+	-	-
Gastrochilus pandulatus Ridl.	rh	+	-	+	-
Globba sp. (ว่านร่อนทอง)	rh	+	++++	-	-
Zingiber cassumunar Roxb.	fh	+	++	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants

Tested Against Lactobacillus fermentum

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	-	-	-
Rhinacanthus nasutus Kurz.	l	-	-	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	-	-	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	-	-	-	+ not clear
ARALIACEAE					
Schefflera venulosa Merr.	l	-	-	-	-

* Inhibition zone diameter
- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb
end = endosperm
fr = fruit
fl = flower
l = leaf
co = corolla
rh = rhizome
r = root
sd = seed
sb = stembark
w = whole plant

Table 7* (cont.)

Activities or 4 Extracts from Medicinal Plants

Tested Against *Lactobacillus fermentum*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	-	-	-
Basella rubra Linn.	l	-	-	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	-	-	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	-	-	-
Cassia angustifolia Vahl.	l	-	-	-	-
Cassia tora Linn.	l	-	-	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	-	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	-	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	-	-	-
Eupatorium odoratum Linn.	l	-	-	-	-
Gynura pseudochina DC.	l	-	-	-	-
Pluchia indica Less.	l	-	-	-	-
Vernonia elliptica DC.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Lactobacillus fermentum

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	-	-	+ not clear
Momordica cochinchinensis Spreng.	l	-	-	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	-	-
Euphorbia sessiliflora Roxb.	rh	-	-	-	-
Phyllanthus distichus Muell. Arg.	l	-	-	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	-	-	-
Cynodon dactylon Pers.	w	-	-	-	-
LABIATAE					
Pogostemon cablin Benth.	l	-	-	-	-
LILIACEAE					
Allium ascalonicum Linn.	bu	-	-	-	-
Allium sativum Linn.	bu	-	-	-	-
Allium tuberosum Roxb.	w	-	-	-	-
LYTHRACEAE					
Lawsonia inermis L. var. alba Hassk.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Lactobacillus fermentum*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. *siamensis* Valeton	l	-	-	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels.	w	-	-	-	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	-	-	-
Albizzia lebbek Benth.	l	-	-	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	+
	sb	-	-	-	+
	sd	-	-	-	+
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	-	-
	l	-	-	-	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	-	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Lactobacillus fermentum*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn	l	-	-	-	-
Oxalis repens Thumb.	w	-	-	-	-
PALMAE					
Areca catechu Linn.	end	-	-	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	-	-	-
PIPERACEAE					
Piper betle Linn.	l	-	-	-	+
PLUMBAGINACEAE					
Plumbago indica Linn.	r	-	-	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	-	-	-
Zanthoxylum piperatum DC.	fr	-	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Lactobacillus fermentum

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	-	-	-	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	-	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	-	-
Vitex trifolia Linn. var. repens Ridl.	l	-	-	-	-
Vitex trifolia Linn.	l	-	-	-	-
VITACEAE					
Cissus repanda Vahl.	w	-	-	-	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	-	-	-	-
Alpinia sp. (ข่าตาแดง)	rh	-	-	-	-
	fl	-	-	-	-
Curcuma longa Linn.	rh	-	-	-	-
Curcuma zedoaria Rosc.	rh	-	-	-	-
Gastrochilus pandulatus Ridl.	rh	-	-	-	-
Globba sp. (ว่านร่อนทอง)	rh	-	-	-	-
Zingiber cassumunar Roxb.	fh	-	-	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants

Tested Against Pseudomonas aeruginosa

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	++	-	-
Rhinacanthus nasutus Kurz.	l	-	-	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	+	+	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	-	-	-	-
ARALIACEAE					
Schefflera venulosa Merr.	l	-	-	-	-

* Inhibition zone diameter
- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb
end = endosperm
fr = fruit
fl = flower
l = leaf
co = corolla
rh = rhizome
r = root
sd = seed
sb = stembark
w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants Tested Against *Pseudomonas aeruginosa*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	-	+	-
Basella rubra Linn.	l	-	+++	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	++	-	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	-	-	-
Cassia angustifolia Vahl.	l	-	++	-	-
Cassia tora Linn.	l	-	++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	-	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	+	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	-	-	-
Eupatorium odoratum Linn.	l	-	-	-	-
Gynura pseudochina DC.	l	-	-	-	-
Pluchia indica Less.	l	-	-	-	-
Vernonia elliptica DC.	l	-	-	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Pseudomonas aeruginosa*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	+	-	-
Momordica cochinchinensis Spreng.	l	-	++++	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	+	-	-
Euphorbia sessiliflora Roxb.	rh	-	+	-	-
Phyllanthus distichus Muell. Arg.	l	-	++	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	-	-	-
Cynodon dactylon Pers.	w	-	++++	-	-
LABIATAE					
Pogostemon cablin Benth.	l	-	-	-	-
LILIACEAE					
Allium ascalonicum Linn.	bu	-	-	-	-
Allium sativum Linn.	bu	-	-	-	-
Allium tuberosum Roxb.	w	-	+	+	-
LYTHRACEAE					
Lawsonia inermis L. var. *alba* Hassk.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Pseudomonas aeruginosa

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. siamensis Valeton	l	-	-	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels.	w	-	-	-	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	+	-	-
Albizzia lebbek Benth.	l	-	++++	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	-	-	+
	sd	-	+	-	+
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	+	-
	l	-	-	-	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Pseudomonas aeruginosa*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	+	-	-
Oxalis repens Thumb.	w	-	+	-	-
PALMAE					
Areca catechu Linn.	end	-	-	-	
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	++	-	-
PIPERACEAE					
Piper betle Linn.	l	++	-	+	-
PLUMBAGINACEAE					
Plumbago indica Linn.	r	-	-	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	+	-	-
Zanthoxylum piperatum DC.	fr	-	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	+	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Pseudomonas aeruginosa*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	-	+++	+	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	+	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	-	-
Vitex trifolia Linn. var. *repens* Ridl.	l	-	+	-	-
Vitex trifolia Linn.	l	-	+++	+	-
VITACEAE					
Cissus repanda Vahl.	w	-	-	+	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	-	++++	-	-
Alpinia sp. (ข่าตาแดง)	rh	-	++	-	-
	fl	-	+++	-	-
Curcuma longa Linn.	rh	-	-	-	-
Curcuma zedoaria Rosc.	rh	-	+	-	-
Gastrochilus pandulatus Ridl.	rh	-	+	-	-
Globba sp. (ว่านร่อนทอง)	rh	-	+++	-	-
Zingiber cassumunar Roxb.	rh	-	+	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants Tested Against *Salmonella typhi*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall	l	-	++	-	-
Rhinacanthus nasutus Kurz.	l	-	++ not clear	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	+++	-	-
ANNONACEAE					
Annona squamosa Linn.	l	-	+	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	-	-	+	-
ARALIACEAE					
Schefflera venulosa Merr.	l	-	+++	-	-

* Inhibition zone diameter
\- = No inhibition
\+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb, end = endosperm, fr = fruit, fl = flower, l = leaf, co = corolla, rh = rhizome, r = root, sd = seed, sb = stembark, w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Salmonella typhi

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	+	-	-
Basella rubra Linn.	l	-	++++	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	++++	-	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	-	+	-
Cassia angustifolia Vahl.	l	-	-	-	-
Cassia tora Linn.	l	-	++++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	++ not clear	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	++++	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	+	-	-
Eupatorium odoratum Linn.	l	-	-	-	-
Gynura pseudochina DC.	l	-	-	++	-
Pluchia indica Less.	l	-	+++	-	-
Vernonia elliptica DC.	l	-	+	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Salmonella typhi*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	+	-	-
Momordica cochinchinensis Spreng.	l	-	++++	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	-	-
Euphorbia sessiliflora Roxb.	rh	-	+++	-	-
Phyllanthus distichus Muell. Arg.	l	-	+++	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	++	-	-
Cynodon dactylon Pers.	w	-	++++	-	-
LABIATAE					
Pogostemon cablin Benth.	l	-	+	+	-
LILIACEAE					
Allium ascalonicum Linn.	bu	-	-	++	-
Allium sativum Linn	bu	+	-	-	-
Allium tuberosum Roxb.	w	+	+++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. *alba* Hassk.	l	-	+	++	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Salmonella typhi*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. *siamensis* Valeton	l	-	+	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	+ not clear	-	-
Tiliacora triandra Diels.	w	-	-	-	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	+++	-	-
Albizzia lebbek Benth.	l	-	-	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	-	-	-
	sd	-	++	-	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	+	-
	l	-	-	-	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Salmonella typhi*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	++	-	-
Oxalis repens Thumb.	w	-	++	+	-
PALMAE					
Areca catechu Linn.	end	-	+	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	+++	-	-
PIPERACEAE					
Piper betle Linn.	l	++	++	+	-
PLUMBAGINACEAE					
Plumbago indica Linn.	r	+	+	++++ not clear	+ not clear
RUTACEAE					
Citrus hystrix DC.	l	-	++ not clear	+	-
Zanthoxylum piperatum DC.	fr	-	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Salmonella typhi*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	-	-	-	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	++	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	-	-
Vitex trifolia Linn. var. *repens* Ridl.	l	-	+	+	-
Vitex trifolia Linn.	l	-	++++	+	-
VITACEAE					
Cissus repanda Vahl.	w	-	+ not clear	+	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	-	+++	-	-
Alpinia sp. (ข่าตาแดง)	rh	-	++++	++++	-
	fl	-	-	-	-
Curcuma longa Linn.	rh	+	+	-	-
Curcuma zedoaria Rosc.	rh	-	+	-	-
Gastrochilus pandulatus Ridl.	rh	-	+	-	-
Globba sp. (ว่านร่อนทอง)	rh	-	++++	-	-
Zingiber cassumunar Roxb.	fh	-	+	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants Tested Against *Shigella dysenteriae*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	+++	-	-
Rhinacanthus nasutus Kurz.	l	-	++ not clear	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	+++	-	-
ANNONACEAE					
Annona squamosa Linn.	l	-	+	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	-	-	-	-
ARALIACEAE					
Schefflera venulosa Merr.	l	-	++	-	-

* Inhibition zone diameter
- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb, end = endosperm, fr = fruit, fl = flower, l = leaf, co = corolla, rh = rhizome, r = root, sd = seed, sb = stembark, w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Shigella dysenteriae*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	-	-	-
Basella rubra Linn.	l	-	+++	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	++++	-	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	-	-	-
Cassia angustifolia Vahl.	l	-	-	-	-
Cassia tora Linn.	l	-	++++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	+	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	++	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	+	-	-
Eupatorium odoratum Linn.	l	-	-	-	-
Gynura pseudochina DC.	l	-	-	-	-
Pluchia indica Less.	l	-	+	-	-
Vernonia elliptica DC.	l	-	+	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Shigella dysenteriae

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	+++	-	-
Momordica cochinchinensis Spreng.	l	-	++++	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	-	-
Euphorbia sessiliflora Roxb.	rh	-	+++	-	-
Phyllanthus distichus Muell. Arg.	l	-	+++	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	+	+	-
Cynodon dactylon Pers.	w	-	++++	-	-
LABIATAE					
Pogostemon cablin Benth	l	-	+	+	-
LILIACEAE					
Allium ascalonicum Linn.	bu	-	-	+	-
Allium sativum Linn.	bu	+	-	-	-
Allium tuberosum Roxb.	w	+	++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. alba Hassk.	l	-	+	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Shigella dysenteriae

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. siamensis Valeton	l	-	-	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels	w	-	-	-	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	+++	-	-
Albizzia lebbek Benth.	l	-	-	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	-	-	-
	sd	-	++	-	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	+	-
	l	-	-	-	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Shigella dysenteriae*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	-	-	-
Oxalis repens Thumb.	w	-	+++	+	-
PALMAE					
Areca catechu Linn.	end	-	-	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	++++	-	-
PIPERACEAE					
Piper betle Linn.	l	++	+	+	+
PLUMBAGINACEAE					
Plumbago indica Linn.	r	-	+	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	+	+	-
Zanthoxylum piperatum DC.	fr	-	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	+++	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Shigella dysenteriae

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	-	++++	-	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	++	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	-	-
Vitex trifolia Linn. var. repens Ridl.	l	-	+	-	-
Vitex trifolia Linn.	l	-	++++	+	-
VITACEAE					
Cissus repanda Vahl.	w	-	-	+	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	-	-	+	-
Alpinia sp. (ข่าตาแดง)	rh	-	+++	+	-
	fl	-	-	-	-
Curcuma longa Linn.	rh	+	-	-	-
Curcuma zedoaria Rosc.	rh	-	-	-	-
Gastrochilus pandulatus Ridl.	rh	-	-	+	-
Globba sp. (ว่านร่อนทอง)	rh	-	++++	-	-
Zingiber cassumunar Roxb.	rh	-	+	-	-

Table 7*

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	++	-	-
Rhinacanthus nasutus Kurz.	l	-	-	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	-	+	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	+	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	+	-	-	-
ARALIACEAE					
Schefflera venulosa Merr.	l	-	+	-	-

* Inhibition zone diameter
- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb
end = endosperm
fr = fruit
fl = flower
l = leaf
co = corolla
rh = rhizome
r = root
sd = seed
sb = stembark
w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	+	+	-
Basella rubra Linn.	l	-	++++	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	+++	+	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	++	+	-
Cassia angustifolia Vahl.	l	-	+	+	-
Cassia tora Linn.	l	-	++++	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	+	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	+++	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	-	-	-
Eupatorium odoratum Linn.	l	-	+	-	-
Gynura pseudochina DC.	l	+	-	-	-
Pluchia indica Less.	l	-	++	-	-
Vernonia elliptica DC.	l	-	+	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	++	-	+
Momordica cochinchinensis Spreng.	l	-	++++	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	+	-
Euphorbia sessiliflora Roxb.	rh	-	+++	+	-
Phyllanthus distichus Muell. Arg.	l	-	+++	+	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	+	++	-
Cynodon dactylon Pers.	w	-	+++	-	-
LABIATAE					
Pogostemon cablin Benth.	l	+	+	+	-
LILIACEAE					
Allium ascalonicum Linn.	bu	+	-	+	-
Allium sativum Linn.	bu	+	-	-	-
Allium tuberosum Roxb.	w	+	+++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. alba Hassk.	l	-	+	++	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. siamensis Valeton	l	-	+	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels.	w	-	-	+	-
MIMOSACEAE					
Acacia cocinna DC.	sd	-	+	-	-
Albizzia lebbek Benth.	l	-	+	+	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	+	-	-
	sd	-	+	-	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	+	+	-
	l	-	-	+++	-
MYRTACEAE					
Psidium guajava Linn.	l	+	+	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	+
	Anther	-	-	-	+

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	+	+	-
Oxalis repens Thumb.	w	-	+	+	-
PALMAE					
Areca catechu Linn.	end	-	-	-	+
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	++	+	-
PIPERACEAE					
Piper betle Linn.	l	++	++	++	++
PLUMBAGINACEAE					
Plumbago indica Linn.	r	++	++	+	-
RUTACEAE					
Citrus hystrix DC.	l	-	+	+	-
Zanthoxylum piperatum DC.	fr	-	+	+	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	+	+++	+	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Staphylococcus aureus

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	+	++	+	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	+	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	+	+	-
Vitex trifolia Linn. var. repens Ridl.	l	-	+	+	-
Vitex trifolia Linn.	l	-	++++	++	-
VITACEAE					
Cissus repanda Vahl.	w	-	+	-	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	++++	+++	+	-
Alpinia sp. (ข่าตาแดง)	rh	-	++++	+	-
	fl	++++	++++	+	-
Curcuma longa Linn.	rh	-	+	+	-
Curcuma zedoaria Rosc.	rh	-	+	+	-
Gastrochilus pandulatus Ridl.	rh	-	+	+	-
Globba sp. (ว่านร่อนทอง)	rh	-	+++	+	-
Zingiber cassumunar Roxb.	rh	-	+	-	+

Table 7*

Activities of 4 Extracts from Medicinal Plants

Tested Against Streptococcus faecalis

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
ACANTHACEAE					
Acanthus ebracteatus Wall.	l	-	-	-	-
Rhinacanthus nasutus Kurz.	l	-	-	-	-
ANGIOPTERIDACEAE					
Angiopteris evecta Hoffm.	rh	-	-	-	-
ANNONACEAE					
Annona squamosa Linn.	l	-	-	-	-
APOCYNACEAE					
Cerbera odollam Gaertn.	l	-	-	-	-
ARACEAE					
Acorus calamus Linn.	rh	+	-	-	-
ARALIACEAE					
Schefflera venulosa Merr.	l	-	-	-	-

* Inhibition zone diameter
- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

** bu = bulb
end = endosperm
fr = fruit
fl = flower
l = leaf
co = corolla
rh = rhizome
r = root
sd = seed
sb = stembark
w = whole plant

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Streptococcus faecalis

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
BASELLACEAE					
Basella alba Linn.	l	-	-	-	-
Basella rubra Linn.	l	-	-	-	-
BIXACEAE					
Bixa orellana Linn.	fl	-	-	-	-
CAESALPINIACEAE					
Cassia alata Linn.	l	-	-	+	-
Cassia angustifolia Vahl.	l	-	-	-	-
Cassia tora Linn.	l	-	-	-	-
Bauhinia horsefieldii Mc. Bride.	w	-	-	-	-
Erythrophloeum succirubrum Gagnep.	sb	-	+	-	-
COMPOSITAE					
Eclipta alba Hassk.	w	-	-	-	-
Eupatorium odoratum Linn.	l	-	+	-	-
Gynura pseudochina DC.	l	-	-	-	-
Pluchiaindica Less.	l	-	-	-	-
Vernonia elliptica DC.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Streptococcus faecalis

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
CUCURBITACEAE					
Momordica charantia Linn.	w	-	-	-	-
Momordica cochinchinensis Spreng.	l	-	-	-	-
EUPHORBIACEAE					
Bridelia siamensis Craib.	l	-	-	-	-
Euphorbia sessiliflora Roxb.	rh	-	-	-	-
Phyllanthus distichus Muell. Arg.	l	-	-	-	-
GRAMINEAE					
Cymbopogon citratus Stapf.	w	-	-	-	-
Cynodon dactylon Pers.	w	-	-	-	-
LABIATAE					
Pogostemon cablin Benth.	l	-	+	+	-
LILIACEAE					
Allium ascalonicum Linn.	bu	-	-	++	-
Allium sativum Linn.	bu	+	-	-	-
Allium tuberosum Roxb.	w	-	+++	+	-
LYTHRACEAE					
Lawsonia inermis L. var. alba Hassk.	l	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Streptococcus faecalis*

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
MELIACEAE					
Azadirachta indica Juss. var. *siamensis* Valeton	l	-	-	-	-
MENISPERMACEAE					
Stephenia erecta Craib.	r	-	-	-	-
Tiliacora triandra Diels.	w	-	-	+	-
MIMOSACEAE					
Acacia concinna DC.	sd	-	-	-	-
Albizzia lebbek Benth.	l	-	-	-	-
MORACEAE					
Streblus asper Lour.	l	-	-	-	-
	sb	-	-	-	-
	sd	-	-	+	-
MYRSINACEAE					
Ardisia colorata Roxb.	fr	-	-	-	-
	l	-	-	-	-
MYRTACEAE					
Psidium guajava Linn.	l	-	-	+	-
NYMPHAEACEAE					
Nelumbo nucifera Gaertn.	co	-	-	-	-
	Anther	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against *Streptococcus faecalis*

Family Scientific Names	Part Used**	Petroleum ether	Ether	Alcohol	Water
OXALIDACEAE					
Averrhoa carambola Linn.	l	-	-	-	-
Oxalis repens Thumb.	w	-	++	+	-
PALMAE					
Areca catechu Linn.	end	-	+	-	-
PAPILIONACEAE					
Sesbania aegyptiaca Pers.	l	-	-	-	-
PIPERACEAE					
Piper betle Linn.	l	-	-	++	-
PLUMBAGINACEAE					
Plumbago indica Linn.	r	-	-	-	-
RUTACEAE					
Citrus hystrix DC.	l	-	-	+	-
Zanthoxylum piperatum DC.	fr	+ not clear	-	-	-
SAPINDACEAE					
Cardiospermum halicacabum Linn.	w	-	-	-	-

Table 7* (cont.)

Activities of 4 Extracts from Medicinal Plants

Tested Against Streptococcus faecalis

Family Scientific Names	Part Used **	Petroleum ether	Ether	Alcohol	Water
UMBELLIFERAE					
Centella asiatica Urb.	w	-	-	-	-
URTICACEAE					
Pouzolzia pentandra Benn.	w	-	-	-	-
VERBENACEAE					
Clerodendron inerme Gaertn.	l	-	-	-	-
Vitex trifolia Linn. var. repens Ridl.	l	-	-	+	-
Vitex trifolia Linn.	l	-	-	+	-
VITACEAE					
Cissus repanda Vahl.	w	-	-	-	-
ZINGIBERACEAE					
Alpinia officinarum Hance.	fr	-	-	-	-
Alpinia sp. (ข่าตาแดง)	rh	-	-	-	-
	fl	-	-	-	-
Curcuma longa Linn.	rh	-	-	-	-
Curcuma zedoaria Rosc.	rh	-	-	-	-
Gastrochilus pandulatus Ridl.	rh	-	-	-	-
Globba sp. (ว่านร่อนทอง)	rh	+	-	+	-
Zingiber cassumunar Roxb.	rh	-	-	-	-

Determination of Minimal Inhibitory Concentration (MIC)

Determination of Minimal Inhibitory Concentration (MIC) of active antibacterial extracts against microorganisms *in vitro* has been done and the results are shown in Table 8, pages 106 to 110.

Antibiotic Control

Nine antibiotic controls, Streptomycin, Tetracycline, Chloramphenicol, Colimycin, Neomycin, Penicillin, Ampicillin, Kanamycin, Cefalotin were tested against eight species of microorganisms. The results are shown in Table 9, page 111.

Chemical Tests of Active Antibacterial Extracts from Medicinal Plants

The results of eight chemical tests of Dragendorff's reagent, Marme's reagent, Wagner's reagent, Liebermann-Burchard's reagent, Kedde's reagent, Raymond's reagent, Keller-Kiliani's reagent, against active antibacterial extracts from medicinal plants are shown in Table 10, pages 112 to 114.

Percentage Yield of Extracts

Yield of four extracts of all medicinal plants studied are shown in Table 11, pages 115 to 117.

Table 8

Minimum Inhibitory Concentration (MIC) of Active Antibacterial Extracts against Test Microorganisms

Scientific Names	Extract*	MIC (mg/disc) vs. Microorganism No.**							
		1	2	3	4	5	6	7	8
Acacia concinna DC.	E					0.3	1		
Acanthus ebracteatus Hoffm.	E	5	1		4	2	2	1	
Acorus calamus Linn.	PE	12	12					12	12
	W	12	12	12				12	
Albizzia lebbek Benth.	E	10	10		10			8	
Allium ascalonicum Linn.	A	23	18			18	20	18	20
Allium sativum Linn.	PE	7	7			35	35	7	37
Allium tuberosum Roxb.	PE	4	4			4	4	4	
	E	1	1		1	1	1	1	1
	A	15	18		18	15	15	18	18
Alpinia officinarum Hance	PE	10	10					2	
	E	2	2		6	4	6		
Alpinia sp.	Rh/E	5	5		5	3	3		
	Fl/E	7	7		13			7	

* PE = Petroleum ether, E = Ethyl ether, A = Ethanol, W = Water
Rh = Rhizome, Fl = Flower, Fr = Fruit

** 1 = Bacillus subtilis
2 = Escherichia coli
3 = Lactobacillus fermentum
4 = Pseudomonas aeruginosa
5 = Salmonella typhi
6 = Shigella dysenteriae
7 = Staphylococcus aureus
8 = Streptococcus faecalis

Table 8 (cont.)

Minimum Inhibitory Concentration (MIC) of Active Antibacterial Extracts against Test Microorganisms

Scientific Names	Extract*	MIC (mg/disc) vs. Microorganism No.**							
		1	2	3	4	5	6	7	8
Angioteris evecta Hoffm.	E		1		1	0.5	0.5		
Annona squamosa Linn.	E					10	10		
Ardisia colorata Roxb.	Fr/A	20	22		22	22	20	20	
Areca catechu Linn.	E					5			5
Averrhoa carambola Linn.	E	9	9		23	1		18	
Azadirachta indica Juss. var. *siamensis* Valeton.	E	12				12		12	
Basella alba Linn.	E	10	10			10		10	
Basella rubra Linn.	E	10	10		10	8	8	10	
Bauhinia horsefieldii Mc. Bride.	E		6			6	6	5	
Bixa orellana Linn.	E	12	2		7	2	4	2	
	A	30	30					30	
Bridelia siamensis Craib.	E		4		4				
Cassia alata Linn.	E	4	20						4
Cassia angustifolia Vahl.	E	5	7		7			7	
Cassia tora Linn.	E	6	6		6	5	30	6	

Table 8 (cont.)

Minimum Inhibitory Concentration (MIC) of Active Antibacterial Extracts against Test Microorganisms

Scientific Names	Extract*	MIC (mg/disc) vs. Microorganism No.**							
		1	2	3	4	5	6	7	8
Cardiospermum halicacabum Linn.	E	7	2		7		2	4	
Centella asiatica Urb.	E	4	2		2		2	4	
Cissus repanda Vahl.	E		12			12		10	
Citrus hystrix DC.	E	8	8		8	6	5	8	
Curcuma longa Linn.	PE	30				30	30		
	E					110		127	
	A	65						65	
Curcuma zedoaria Rosc.	E	35	35		35	21		21	
Cymbopogon citratus Stapf.	E	7				6	6	7	
	A	42	42				42	42	
Cynodon dactylon Pers.	E	1	0.5		1	0.5	0.5	0.5	
Eclipta alba Hassk.	E		8			8	8		
Erythrophloeum succirubrum Gagnep.	E	2	2		3	1	2	2	3
Eupatorium odoratum Linn.	E	13						13	13
Euphorbia sessiliflora Roxb.	E	4	2		2	2	5	1	

Table 8 (cont.)

Minimum Inhibitory Concentration (MIC) of Active Antibacterial Extracts against Test Microorganisms

Scientific Names	Extract*	MIC (mg/disc) vs. Microorganism No.**							
		1	2	3	4	5	6	7	8
Globba sp.	PE	12	12						12
	E	10	3		10	6	6	6	
Gynura pseudochina DC.	PE	10						10	
Lawsonia inermis L. var. *alba* Hassk.	E	40				4	10	10	
	A	10				10		10	
Momordica charantia Linn.	E	10	10		17	17	15	15	
Momordica cochinchinensis Spreng.	E	2	1		2	1	1		
Oxalis repens Thumb.	E	6	3		6	1	1	1	4
Piper betle Linn.	PE	1	1		3	1	1	1	
	E	2	2			2	2	1	
	A	10	10		50	8	8	10	10
Pluchia indica Less.	E	17	3			3	15	15	
Plumbago indica Linn.	PE	1	1			2	1	1	
	E	3	1			2	1	1	
Phyllanthus distichus Muell. Arg.	E	13	13		5	3	5	3	

Table 8 (cont.)

Minimum Inhibitory Concentration (MIC) of Active Antibacterial Extracts against Test Microorganisms

Scientific Names	Extract*	MIC (mg/disc) vs. Microorganism No.**							
		1	2	3	4	5	6	7	8
Pogostemon cablin Benth.	E	11				11	11	11	11
Pouzolzia pentandra Benn.	E	5	6		6	5	4	8	
Psidium guajava Linn.	E	20						20	
	A	40	30		30	40	30	30	40
Schefflera venulosa Merr.	E	5	5			4	2	5	
Sesbania aegyptiaca Pers.	E	8	4		8	4	8		
Tiliacora triandra Diels.	A	20	20					20	20
Vernonia elliptica DC.	E	2	2			2	2	1	
Vitex trifolia L. var. *repens* Ridl.	E	12	10		10	8	12	10	
Vitex trifolia Linn.	E	4	2		4	1	1	1	
Zanthoxylum piperatum DC.	E	10						8	10
Zingiber cassumunar Roxb.	E	5	5		15	5	25	5	

Table 9

Antibiotic Control Against Test Microorganisms

Test Microorganisms	Streptomycin	Tetracycline	Chloramphenicol	Colimycin	Neomycin	Penicillin	Ampicillin	Kanamycin	Cefalotin
Bacillus subtilis	++	++	+++	-	+	+	++	++	++++
Escherichia coli	+	+	++	-	+	-	++	+	+
Lactobacillus fermentum	+	-	-	-	-	+	-	-	-
Pseudomonas aeruginosa	+	-	-	-	-	-	-	++++	-
Salmonella typhi	+	+	++	+	+	-	+++	+	++
Shigella dysenteriae	+	+	++	+	+	-	-	+	+
Staphylococcus aureus	+++	+++	+++	-	+	++++	++++	+++	++++
Streptococcus faecalis	+	+	+++	-	+	-	++	+	+

- = No inhibition
+ = 10 - 15 mm
++ = 16 - 20 mm
+++ = 21 - 25 mm
++++ = 26 - 30 mm

Table 10

Chemical Tests of Active Antibacterial Extracts from Medicinal Plants.

Scientific Names	Extracts*	Dragendorff's	Mayer's	Marme's	Wagner's	Liebermann-Burchard's	Kedde's	Raymond's	Keller-Kiliani's
Acacia concinna DC.	E	-	-	-	-	-	-	-	-
Acanthus ebracteatus Hoffm.	E	-	-	-	-	+	-	-	-
Acorus calamus Linn.	PE	-	-	-	-	-	-	-	-
Albizzia lebbek Benth.	E	-	-	-	-	+	-	-	-
Allium ascalonicum Linn.	A	-	-	-	-	-	-	-	-
Allium sativum Linn.	PE	-	-	-	-	-	-	-	-
Allium tuberosum Roxb.	PE	-	-	-	-	+	-	-	+
	E	+	+	+	+	-	-	-	-
	A	+	+	+	+	-	-	-	-
Alpinia officinarum Hance.	PE	-	-	-	-	-	-	-	-
Alpinia sp. (ข่าตาแดง)	E	-	-	-	-	-	-	-	-
Angiopteris evecta Hoffm.	E	-	-	-	-	-	-	-	-
Annona squamosa Linn.	E	-	-	-	-	-	-	-	-
Ardisia colorata Roxb.	A	-	-	-	-	+	-	-	-
Averrhoa carambola Linn.	E	-	-	-	-	+	-	-	-
Azadirachta indica Juss. var. siamensis Valeton.	E	-	-	-	-	-	-	-	-
Basella alba Linn.	E	-	-	-	-	+	-	-	-

* PE = Petroleum ether
E = Ethyl ether
A = Ethanol
W = Water

- = means negative test
+ = means positive test

Table 10 (cont.)

Chemical Tests of Active Antibacterial Extracts from Medicinal Plants.

Scientific Names	Extracts*	Dragendorff's	Mayer's	Marme's	Wagner's	Liebermann-Burchard's	Kedde's	Raymond's	Keller-Kiliani's
Basella rubra Linn.	E	-	-	-	-	+	-	-	-
Bauhinia horsefieldii Mc. Bride	E	-	-	-	-	+	-	-	-
Bixa orellana Linn.	E	-	-	-	-	-	-	-	-
Bridelia siamensis Craib.	E	-	-	-	-	+	-	-	-
Cassia alata Linn.	E	-	-	-	-	+	-	-	-
Cassia angustifolia Vahl.	E	-	-	-	-	+	-	-	-
Cassia tora Linn.	E	-	-	-	-	-	-	-	-
Cardiospermum halicacabum Linn.	E	-	-	-	-	+	-	-	-
Centella asiatica Urb.	E	-	-	-	-	+	-	-	-
Cissus repanda Vahl.	E	-	-	-	-	-	-	-	-
Citrus hystrix DC.	E	-	-	-	-	-	-	-	-
Curcuma longa Linn.	PE	-	-	-	-	-	-	-	-
Curcuma zedoaria Rosc.	E	-	-	-	-	-	-	-	-
Cymbopogon citratus Stapf.	E	-	-	-	-	-	-	-	-
Cynodon dactylon Pers.	E	-	-	-	-	+	-	-	-
Eclipta alba Hassk.	E	-	-	-	-	+	-	-	-
Erythrophloeum succirubrum Gagnep.	E	-	-	-	-	-	-	-	-
Eupatorium odoratum Linn.	E	-	-	-	-	-	-	-	-
Euphorbia sessiliflora Roxb.	E	-	-	-	-	-	-	-	-
Globba sp. (ว่านร่อนทอง)	PE	-	-	-	-	-	-	-	-
	E	-	-	-	-	+	-	-	-
Lawsonia inermis L. var. alba Hassk.	E	-	-	-	-	+	-	-	-

Table 10 (cont.)

Chemical Tests of Active Antibacterial Extracts from Medicinal Plants.

Scientific Names	Extracts*	Dragendorff's	Mayer's	Marme's	Wagner's	Liebermann-Burchard's	Kedde's	Raymond's	Keller-Kiliani's
Momordica charantia Linn.	E	-	-	-	-	-	-	-	-
Momordica cochinchinensis Spreng.	E	-	-	-	-	-	-	-	-
Oxalis repens Thumb.	E	-	-	-	-	-	-	-	-
Piper betle Linn.	PE	-	-	-	-	-	-	-	-
	E	-	-	-	-	+	-	-	-
	A	+	+	+	+	+	-	-	-
Pluchia indica Less.	E	-	-	-	-	-	-	-	-
Plumbago indica Linn.	PE	-	-	-	-	-	-	-	-
	E	-	-	-	-	-	-	-	-
Phyllanthus distichus Muell. Arg.	E	-	-	-	-	-	-	-	-
Pogostemon cablin Benth.	E	-	-	-	-	-	-	-	-
Pouzolzia pentandra Benn.	E	-	-	-	-	-	-	-	-
Psidium guajava Linn.	E	-	-	-	-	+	-	-	-
Schefflera venulosa Merr.	E	-	-	-	-	-	-	-	-
Sesbania aegyptiaca Pers.	E	-	-	-	-	-	-	-	-
Tiliacora triandra Diels.	A	-	-	-	-	+	-	-	-
Vernonia elliptica DC.	E	-	-	-	-	+	-	-	-
Vitex trifolia Linn. var.	E	-	-	-	-	-	-	-	-
repens Ridl.	A	-	-	-	-	-	-	-	-
Vitex trifolia Linn.	E	-	-	-	-	+	-	-	-
Zanthoxylum piperatum DC.	E	-	-	-	-	+	-	-	-
Zingiber cassumunar Roxb.	E	-	-	-	-	-	-	-	-

Table 11

Percentage Yield of Extracts (% g)

Scientific Names	Part Used*	Petroleum ether	Ethyl ether	Alcohol	Water
Acacia concinna DC.	sd	0.2	0.3	3.0	12.0
Acanthus ebracteatus Hoffm.	l	3.4	1.4	8.0	10.0
Acorus calamus Linn.	rh	2.5	0.7	9.0	6.2
Albizzia lebbek Benth.	l	7.5	2.5	12.5	17.5
Allium ascalonicum Linn.	bu	2.4	5.0	4.6	0.8
Allium sativum Linn.	bu	7.5	3.7	11.2	6.8
Allium tuberosum Roxb.	w	4.0	1.4	18.0	24.0
Alpinia officinarum Hance.	fr	2.0	2.0	6.2	5.2
Alpinia sp.	rh	9.0	5.8	10.0	8.0
	fl	4.4	7.4	2.9	4.8
Angiopteris evecta Hoffm.	rh	0.2	0.4	6.6	3.5
Annona squamosa Linn.	l	3.5	2.0	8.0	5.0
Ardisia colorata Roxb.	fr	2.0	2.0	4.4	11.0
	l	8.7	2.9	8.7	5.8
Areca catechu Linn.	end	0.3	1.1	40.5	23.3
Averrhoa carambola Linn.	l	4.0	4.6	20.0	4.0
Azadirachta indica Juss. var siamensis Valeton	l	2.3	2.0	15.7	11.6
Basella alba Linn.	l	2.8	2.0	14.0	22.0
Basella rubra Linn.	l	4.0	2.6	13.3	13.3
Bauhinia horsefieldii Mc. Bride	w	1.3	1.3	6.6	15.0
Bixa orellana Linn.	fl	0.8	2.4	6.0	14.0

* For abbreviation codes see Table 7 page 57

Table 11 (cont.)

Percentage Yield of Extracts (% g)

Scientific Names	Part Used*	Petroleum ether	Ethyl ether	Alcohol	Water
Bridelia siamensis Craib.	l	5.7	0.8	10.2	5.8
Cassia alata Linn.	l	11.4	4.0	16.0	6.0
Cassia angustifolia Vahl.	l	4.8	1.2	5.5	5.4
Cassia tora Linn.	l	0.8	6.0	7.0	16.0
Cardiospermum halicacabum Linn.	w	2.5	2.7	6.3	4.5
Centella asiatica Urb.	w	2.5	2.0	11.2	12.5
Cerbera odollam Gaertn.	l	8.4	7.0	16.8	9.8
Cissus repanda Vahl.	w	2.5	2.5	4.5	11.5
Citrus hystrix DC.	l	2.8	2.0	16.0	12.0
Clerodendron inerme Gaertn.	l	3.7	2.0	11.0	7.5
Curcuma longa Linn.	rh	6.0	42.3	13.0	26.0
Curcuma zedoaria Rosc.	rh	1.0	7.0	1.5	8.7
Cymbopogon citratus Stapf.	w	2.4	1.5	10.0	5.5
Cynodon dactylon Pers.	w	0.6	8.8	1.3	3.5
Eclipta alba Hassk.	w	6.3	1.8	8.1	18.1
Erythrophloeum succirubrum Gagnep.	sb	1.0	0.7	20.0	7.1
Eupatorium odoratum Linn.	l	5.6	4.3	13.3	6.6
Euphorbia sessiliflora Roxb.	rh	2.4	2.4	1.6	16.0
Gastrochilus panduratus Ridl.	rh	3.4	3.0	8.0	10.0
Globba sp. (ว่านร่อนทอง)	rh	3.0	4.0	6.4	14.0
Gynura pseudochina DC.	l	2.7	1.0	1.2	12.5
Lawsonia inermis L. var. alba Hassk.	l	5.0	2.0	25.0	7.5
Momordica charantia Linn.	w	1.5	3.5	1.0	14.0
Momordica cochinchinensis Spreng.	l	1.3	2.0	13.3	13.3

Table 11 (cont.)

Percentage Yield of Extracts (% g)

Scientific Names	Part Used*	Petroleum ether	Ethyl ether	Alcohol	Water
Nelumbo nucifera Gaertn.	co	2.0	0.6	20.0	23.3
	anther	5.6	0.5	8.7	23.2
Oxalis repens Thumb.	w	2.1	2.8	14.2	8.5
Piper betle Linn.	l	1.7	2.1	10.0	14.0
Pluchia indica Less.	l	3.1	10.6	11.6	24.0
Plumbago indica Linn.	r	0.5	0.7	20.0	5.4
Phyllanthus distichus Muell. Arg.	l	4.0	3.1	5.1	6.7
Pogostemon cablin Benth.	l	4.6	2.3	8.3	16.6
Pouzolzia pentandra Benn.	w	2.0	1.3	5.0	5.0
Psidium guajava Linn.	l	3.6	4.1	13.1	10.0
Rhinacanthus nasutus Kurz.	l	1.7	1.0	7.5	15.0
Schefflera venulosa Merr.	l	1.6	1.6	17.5	14.1
Sesbania aegyptiaca Pers.	l	3.3	4.2	12.6	12.6
Stephania erecta Craib.	r	0.3	0.5	8.3	10.0
Streblus asper Lour.	l	3.0	3.5	12.0	14.0
	sb	1.6	0.8	8.0	15.0
	sd	1.9	1.5	7.5	11.0
Tiliacola triandra Diels.	w	1.2	1.4	4.3	21.8
Vernonia elliptica DC.	l	9.2	2.1	5.0	22.8
Vitex trifolia L. var. repens Ridl.	l	3.2	2.4	12.0	8.0
Vitex trifolia Linn.	l	1.8	4.0	20.0	14.0
Zanthoxylum piperatum DC.	fr	1.2	2.0	12.5	18.7
Zingiber cassumunar Roxb.	rh	8.0	5.0	7.2	10.0

Results of antibacterial activities of all medicinal plants studied which have been listed according to

(i) Families of plants,

(ii) Test microorganism,

(iii) Solvents used,

(iv) Part(s) of plants used.

All of these are shown in Tables 12, 13, 14 and 15 respectively.

Illustrated plates showing inhibition zones of some plant extracts can be seen from Figures 1 - 12, pages 122 to 126.

Table 12

Results Listed According to the Families of Plants Tested.

Families	No. of Crude Drugs Tested	No. of Effective Crude Drugs
Acanthaceae	2	2
Angiopteridaceae	1	1
Annonaceae	1	1
Apocynaceae	1	-
Araceae	1	1
Araliaceae	1	1
Basellaceae	2	2
Bixaceae	1	1
Caesalpiniaceae	5	5
Compositae	5	5
Cucurbitaceae	2	2
Euphorbiaceae	3	3
Gramineae (Poaceae)	2	2
Labiatae	1	1
Liliaceae	3	3
Lythraceae	1	1
Meliaceae	1	1
Menispermaceae	2	2
Mimosaceae	2	2
Moraceae	1	1
Myrsinaceae	1	1
Myrtaceae	1	1
Nymphaeaceae	1	1
Oxalidaceae	2	2
Palmae	1	1
Papilionaceae	1	1
Piperaceae	1	1
Plumbaginaceae	1	1
Rutaceae	2	2
Sapindaceae	1	1
Umbelliferae	1	1
Urticaceae	1	1
Verbenaceae	3	3
Vitaceae	1	1
Zingiberaceae	7	7

Table 13

Results Listed According to the Test Microorganisms.

Test Microorganisms	No. of Crude Drugs Tested	No. of Effective Crude Drugs	Effective %
Bacillus subtilis ATCC 6633	63	56	88.9
Escherichia coli ATCC 10536	63	49	77.9
Lactobacillus fermentum ATCC 9338	63	4	6.4
Pseudomonas aeruginosa (Med. Tech.)	63	38	60.4
Salmonella typhi (Med. Tech.)	63	52	82.5
Shigella dysenteriae 115 118 1SS	63	45	71.4
Staphylococcus aureus ATCC 1538-P	63	59	93.8
Streptococcus faecalis (Med. Tech.)	63	19	30.2

Table 14

Results Listed According to the Solvents Used.

Solvent Used	No. of Crude Drugs Tested	No. of Effective Crude Drugs	Effective Ratio*
Petroleum ether	63	22	60
Ether	63	56	266
Ethanol	63	46	153
H_2O	63	12	24

* The figure represents the sum of the species of microorganisms which were inhibited by each extract.

Table 15

Results Listed According to the Parts of Plants Used.

Parts of the Plants Used	No. of Crude Drugs Tested	No. of Effective Crude Drugs
Rhizome	9	9
Roots	2	2
Stem-bark	2	2
Leaves	31	30
Fruits & Seeds	5	5
Whole plants	12	12
Bulbs	2	2
Flowers & Anthers	3	3

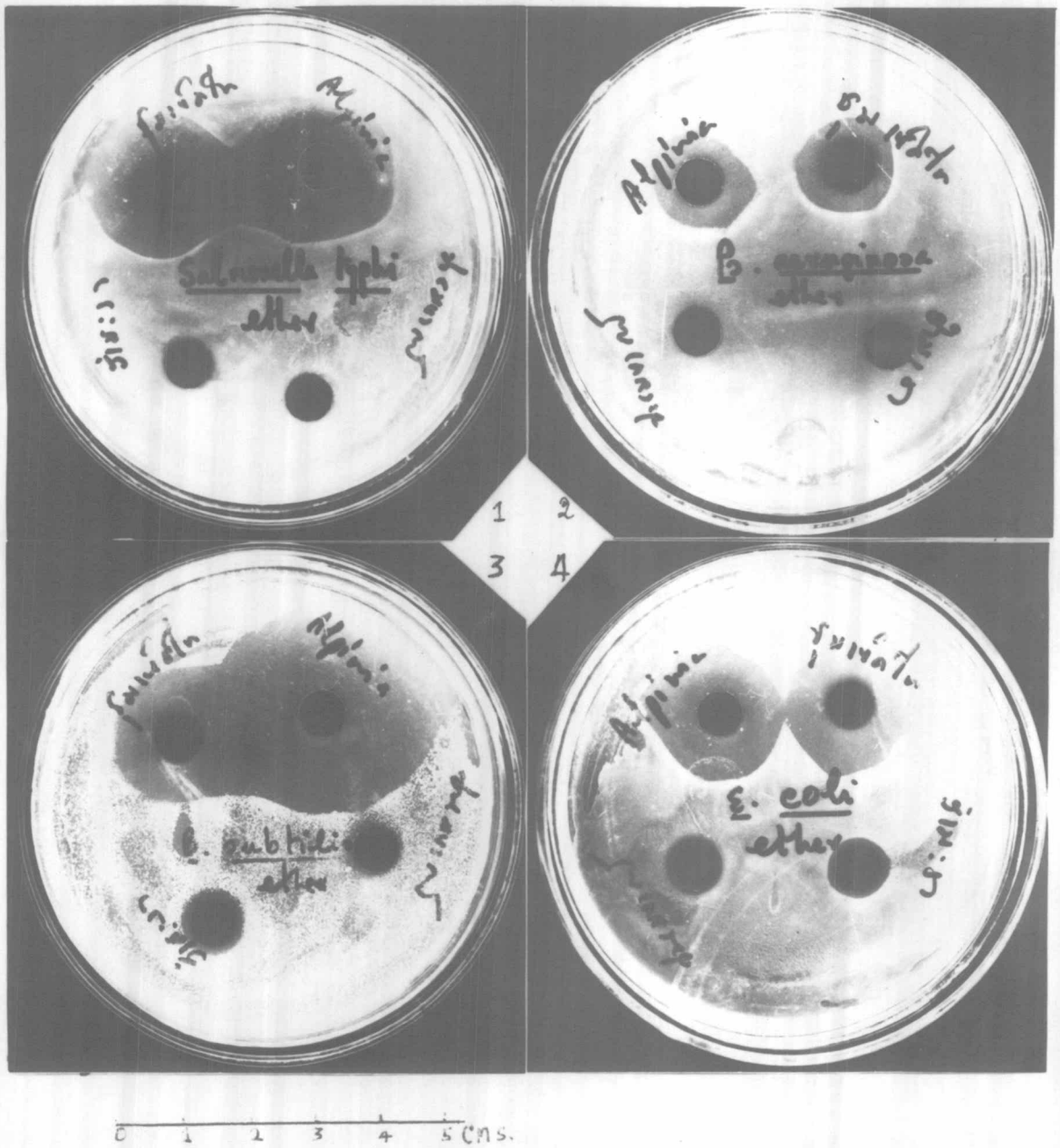


Figure 1 - 4

Activities of Alpinia sp. (ข่าตาแดง) and Cassia tora Linn. against

Salmonella typhi (Figure 1)

Pseudomonas aeruginosa (Figure 2)

Bacillus subtilis (Figure 3)

Escherichia coli (Figure 4)

0 1 2 3 4 CMS.

Figure 5

Activity of Allium ascalonicum Linn. (upper 3 Zones) and Lawsonia inermis Linn. var. alba Hassk. (lower 3 zones) against Bacillus subtilis .

0 1 2 3 4 CMS.

Figure 6

Activities of Plumbago indica Linn. (upper 3 zones) and Allium sativum Linn.(lower 2 zones) against Bacillus subtilis .

0 1 2 3 4 CMS

Figure 7

Activity of Cynodon dactylon Pers. (upper) Bixa orellana Linn. (Middle, Left.) Sesbania aegyptiaca Pers. (Middle, Right) and Momordica cochinchinensis Spreng. (Lower) against Bacillus subtilis .

0 1 2 3 4 CMS

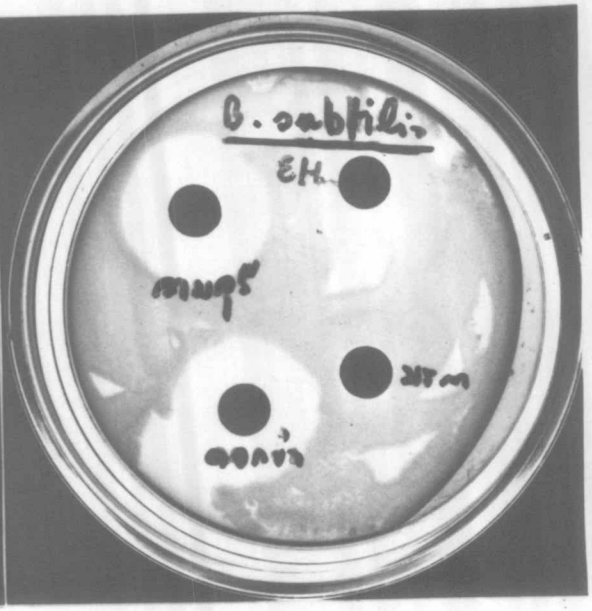
Figure 8

Activity of Momordica cochinchinensis Spreng (upper), Cynodon dactylon Pers. (Middle, Left), Bixa orellana Linn. (Middle, Right) and Basella rubra Linn. (Lower) against Staphylococcus aureus.

0 1 2 3 4 CMS.

Figure 9

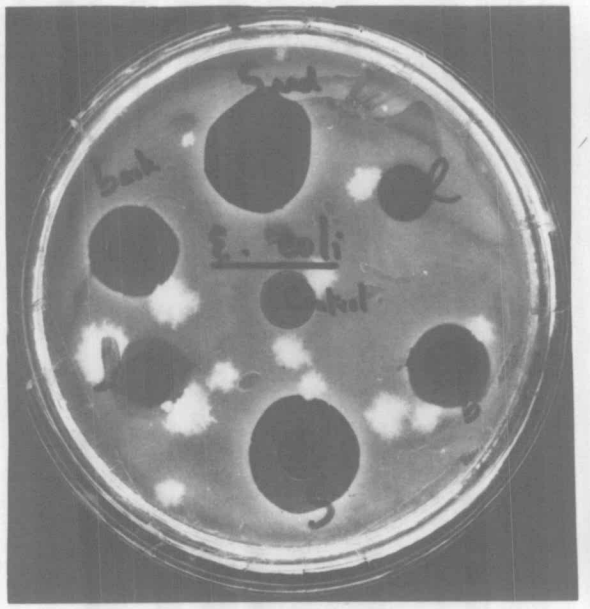
Activities of Cassia tora Linn. (upper Left) and Alipinia sp. (ขาคาแดง) (upper Right) against Shigella dysenteriae



0 1 2 3 4 CMS.

Figure 10

Activities of Albizzia lebbek Benth. (upper Left), and Alipinia sp. (ขาคาแดง) (Lower, Left) against Bacillus subtilis



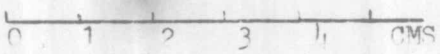
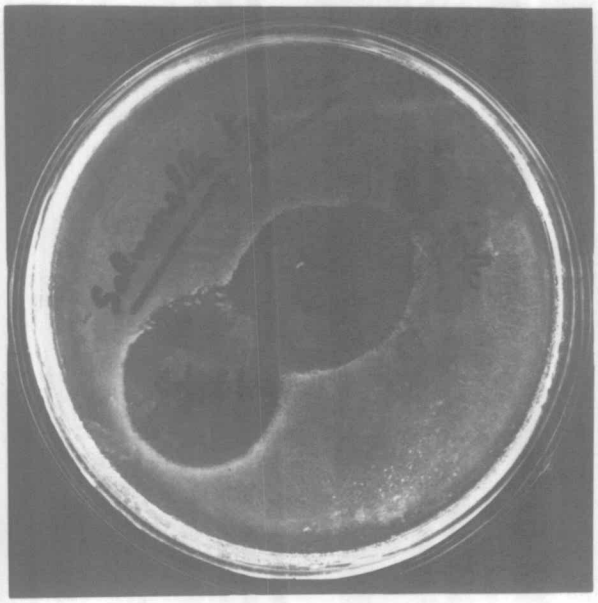


Figure 11

Activities of Streblus asper Lour. (ขอย) (Seed, bark leaf,) and control against Escherichia coli. (2 sets)



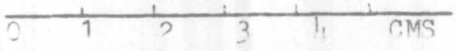


Figure 12

Activities of Sterblus asper Lour. Seed (Middled), and Cefalotin (Lower, Left) against Salmonella typhosa .