

**Activity of Traditional Medicine Formulations (TMF-6 & TMF-23)  
on some pathogenic bacteria**

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The Myanmar Traditional Medicine Formulations (TMF-6 & TMF-23) which are mainly used in diarrhoea and dysentery by Myanmar practitioners were selected to determine the antibacterial properties. The ingredients (24 plants) present in it were selected singly and tested for their antibacterial activities. A total of 35 strains of bacteria (*Escherichia coli*= 11; *Staphylococcus aureus*=3; *Salmonella* species=7; *Shigella* species=4; *Vibrio cholerae*=7 and one species each of *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Proteus morgani*) were chosen for testing. Agar disc diffusion was done for screening. It was demonstrated that TMF-06 extract was active on *Escherichia coli* (STLT) and *Vibrio cholerae* (Inaba); TMF-23 extract was active on *E. coli* (STLT), *Staphylococcus aureus*, *Shigella boydii*, *Shigella dysenteriae* and *Vibrio cholerae* (Ogawa). The extract of the mixture of two TMFs was also found to be active on *E. coli* (LT) and *Vibrio cholerae* (Inaba). Among the 23 plants tested, they were found to be active on one, two or more of the bacteria tested with different patterns.

## INTRODUCTION

Plants and their products have been used in the treatment of infectious diseases for a very long time, even before the discovery of the microorganisms. Screening of Indian plants for biological activity was reported since 1968 [1] and recently in 1996 [2]. Various investigators also demonstrated the antibacterial activity of *Heracleum* species (sulapha variety) [3], *Euclyptus maidenii* (yuclyp) [4]; *Allium ursinum* (kyetthun variety) [5]. Antibacterial activity of Myanmar formulations were reported on limited bacteria in 1996 [6]. The LD<sub>50</sub> of the two drugs was <50mg/body weight [7] and it was found to be safe for consumption. This paper deals with investigations of bacteria which were isolated from different infections. Simultaneously, the ingredients prepared from the traditional medicine formulations were extracted singly and tested separately to show the complete picture of

the activity. These two medicines were used generally by many traditional practitioners for a long time and was used throughout the country for gastrointestinal disorders. They were prepared by the practitioners themselves or were available at Department of Traditional Medicine or as different brands from private shops. However, their potency has not been tested and proven.

## MATERIALS AND METHODS

*Traditional Medicine Formulations used for testing antibacterial activity*

TMF 06 contains 11 ingredients: samonnet, Hsanwinn, pygyee pyar, htanot pyar, yanzein, hsahlaw, sithsatpyar, mahpauk-hton, hsah kyatkho, khayuziizinn pyar and yauk thwahgone pyar.

TMF 26 contains 25 ingredients: thinbaw gyinyauk, ngayokkoug, peikchinn, samon

Table 1. Antibacterial activity of TMF 06 and its ingredients

Sr. No.	TMF/Botanical name	Myanmar	Active on
	TMF 06	Taingyin 06	<i>Escherichia coli</i> (LT) (Ec) <i>Staphylococcus aureus</i> (Sa) <i>Shigella boydii</i> (Sb) <i>Shigella dysenteriae</i> (Sd) <i>Shigella sonnei</i> (Ss) <i>Vibrio parahaemolyticus</i> (Vp)
1	<i>Nigella sativa</i> L.	samonnet	Ec, Sa, Sb, Ss, Sd, Vp
2	<i>Curcuma longa</i> L.	hsanwinn	Bs, Ec (LT), Sa, Sb, St, Vc
3	<i>Dolichos lablab</i> L.	pegyee pyar	(-)
4	<i>Borassus flabellifer</i> L.	htanot pyar	(-)

sabah, samonbyu, samonnyo, samon-phwe, samonni, kyetthunbyu, eikmwayt thee, pharlangei, samonnyo, hsinthamanwei, peikchinn myit, kantgyokni, pan-oot, ziyar, karaway ywet, zardeikpho thee, layhnyinn, sularnaphar, satugah, theindaw, sheingo and hsaypale.

#### 70% ethanolic extracts of plants and TMFs

All the tested materials were extracted by 70% ethanol for 5-days at room temperature. After maceration, the solvent was removed under reduced pressure in a rotatory evaporator. The extract was placed in a dessicator till used. All the extracts were done in Department of Chemistry, Yangon University [8].

#### Bacterial strains tested for antibacterial activity

A total of 35 strains of bacteria (*Escherichia coli*=11; *Staphylococcus aureus*=3; *Salmonella* species=7; *Shigella* species=4; *Vibrio cholerae*=7 and one species each of *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Proteus morgani*) were chosen for testing of the traditional medicine extracts.

#### Screening for antibacterial indigenous plant extracts by agar disc diffusion technique

Screening was done by the use of impregnated filter paper discs. The discs, 6 mm in diameter (Difco) were sterilized by autoclaving followed by dry heat at 60°C for

one hour. It was the impregnated with concentrated extracts (1 to 2 mg/disc) and then allowed to dry at room temperature. A few colonies (3 to 10 organisms) to be tested were picked with a wire loop from the original culture plate and introduced into a test tube containing five millilitre of Mueller Hinton broth and followed by the sensitivity testing method of Bauer, Kirby, Sherris and Turck, 1966 [8].

## RESULTS

#### Screening for antibacterial activity by agar disc diffusion technique

Antibacterial activity of TMF-06 and their ingredient plants is shown in Table 1. The TMF-06 was active on *E. coli*, *S. aureus*, *S. boydii*, *S. sonnei*, *S. dysenteriae* and *V. parahaemolyticus*. Also the plant samonnet (70% ethanolic) was found to be active on some organisms as TMF-06. However, the plant hsanwinn was found to be active on *B. subtilis*, *E. coli*, *S. aureus*, *S. typhi* and *V. cholerae*.

Antibacterial activity of TMF-23 and its ingredient plants is shown in Table 2. The TMF-23 was found to be active on *E. coli*, *S. aureus*, *S. boydii*, *S. dysenteriae* and *V. cholerae*. Peikchinn was found to be active on *S. typhi*, *S. stanley* and *S. boydii*. Samonbyu, samonnyo, samonphwe, samonni were found to be active on *E. coli*, *S. aureus*, *S. boydii*, *S. dysenteriae*,

Table 2. Antibacterial activity of TMF-23 and ingredients

Sr	Plants	Myanmar	Active on
	TMF-23	Taingyin 23	<i>Escherichia coli</i> (LT) (Ec) <i>Staphylococcus aureus</i> (Sa) <i>Shigella boydii</i> (Sb) <i>Shigella dysenteriae</i> (Sd) <i>Vibrio parahaemolyticus</i> (Vp)
1	<i>Zingiber officinale</i> Roscoe	gyin	(-)
2	<i>Piper nigrum</i> L.	ngayokkoug	(-)
3	<i>Piper longum</i> L.	peikchin thee	<i>S t, S. stanley, Sb</i>
4	<i>Foeniculum vulgare</i> Mill	samonsaba	Ec(STLT), Sa, Sb, Sd, Ps, Vc
5	<i>Trachyspermum ammi</i> L.	samonbyu	-ditto-
6	<i>Anethum sowa</i> Roxb.	samonnyo	-ditto-
7	<i>Foeniculum vulgare</i> Mill.	samonphwe	-ditto-
8	<i>Lepidium sativum</i> L.	samoni	-ditto-
9	<i>Allium sativum</i> L.	kyetthun byu	EC(STLT), Sa, Bs
10	<i>Embelia robusta</i> Roxb.	eikmwayt thee	Pm, Ec, St, Sa
11	<i>Elettaria cardamomum</i> (Roxb.) Maton	pharlarngei	(-)
12	<i>Anethum sowa</i> Roxb.	samonnyo	Sb, Ec
13	<i>Tinospora</i> spp.	<i>hsin thamanwei</i>	<i>Ec (LT), Sa</i>
14	<i>Piper longum</i> L.	peikchinn myit	Sa
15	<i>Plumbago rosea</i> L.	kangyokni	Ec, St, Sa, Bs, Sb, Vc
16	<i>Kaempferia</i> spp.	pan-oot	(-)
17	<i>Cuminum cyminum</i> L.	ziyar	Ec, Sb
18	<i>Cinnamomum</i> spp.	karaway ywet	Ec, Sa, Sb
19	<i>Myristica fragrans</i> Hoult	zardeikpho thee	Ec
20	<i>Syzygium aromaticum</i> L.	layhninn	Ec, Sa, Sb, Sd, Vc
21	unidentified	sulanaphar	Ec, Sa
22	unidentified (rhizome)	satugah	Ec, Sa, Vc
23	unidentified	hsaypale	(-)
24	Chemical origin Theindaw	Natural sodium chloride; rock salt	NT
25	<i>Ferula asafoetida</i> (latex)	sheingo	Sd, Vc

Bs = *Bacillus subtilis*Pm = *Proteus morgani*Ps = *Pseudomonas pyocyanea*St = *Salmonella typhi**S. stanley* = *Salmonella stanley*Vc = *Vibrio cholerae*

*P. pyocyanea* and *V. cholerae*. Kyetthun byu was active on *E. coli*, *S. aureus*, and *B. subtilis*. Eikmwayt thee was active on *P. morgani*, *E. coli*, *S. typhi* and *S. aureus*. Hsinthamanwei was found to be active on *E. coli* and *S. aureus* and kangyokni was active on *E. coli*, *S. typhi*, *S. aureus*, *B. subtilis*, *S. boydii* and *V. cholerae*. Moreover, ziyar was active on *E. coli* and *S. boydii*; karaway was active on *E. coli*, *S. aureus*, and *S. boydii*; zardeikpho on *E. coli*. Layhnin was active on *E. coli*, *S. aureus*, *S. boydii*, *S. dysenteriae* and *V. cholerae*; sulanaphar on *E. coli* and *S. aureus* and hsaypale was active on *E. coli*,

*S. aureus* and *V. cholerae*. Lastly, sheingo was also found to be active on *S. dysenteriae* and *V. cholerae* in this study.

## DISCUSSION

The search for antibacterial properties is worldwide. The constituents of plant compounds and their structural elucidation have been investigated in this modern era [9-14]. In this research, some biological data from the plants in Myanmar which are used for medicinal purposes have been obtained. *In vitro* study reveals that oil of kangyokni and kyetthunbyu showed more antibacterial

activity than the 70% ethanolic extracts. The active principles were mostly found in essential oil products and have been already shown [15]. Antidiarrhoeal activity of plants and traditional medicine formulation were also shown [16-18]. Antimicrobial activity of plants has been demonstrated in many countries [19-20]. The activity of garlic was shown [21] and effect on *Helicobacter pylori* was demonstrated [22]. Moreover, anti cough activity by *Psidium guajava* and plants used for urinary pathologies had been identified by other workers [23, 24]. Here, the plants which are commonly used as ingredients in Traditional medicines such as *Cuminum cyminum*, *Foeniculum vulgare*, *Piper nigrum* showed antibacterial activity regardless of the fact that they possessed variable zone sizes and therefore, variable potencies.

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