

**Antimicrobial activity of *Eupatorium odoratum* extract against Methicillin-Sensitive *Staphylococcus aureus* and Methicillin-Resistant *Staphylococcus aureus***

Nadta Sukkasem<sup>1,2</sup>, Nattharat Jearapong<sup>1,2</sup>, Waranya Chatuphonprasert<sup>2,3</sup>, Kanokwan Jarukamjorn<sup>1,2\*</sup>

**Introduction:** Skin infection is a common public health problem mostly caused by *Staphylococcus aureus*. *Eupatorium odoratum* (Asteraceae) is a Thai herb traditionally employed for bacterial skin infection. The objective of this study were to determine antimicrobial activity of the *E. odoratum* extract on Methicillin-Sensitive *S. aureus* (MSSA) and Methicillin-Resistant *S. aureus* (MRSA). **Materials and Method:** Antimicrobial activity of *E. odoratum* against MSSA and MRSA was determined using agar well diffusion. Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) were determined by microdilution method. In addition, the content of the chemical markers, (total phenolic, flavonoids, and anthocyanin), and tannin contribution of the extract were analyzed. **Results:** The methanolic extract showed the highest antimicrobial activity with the lowest MIC and MBC compared to the ethanolic and aqueous extracts. MIC and MBC of the *E. odoratum* methanolic extract were  $1.67 \pm 0.94$  and  $2.75 \pm 2.05$  mg/ml for MSSA, and  $1.00 \pm 0.34$  and  $6.25 \pm 4.01$  mg/ml for MRSA, respectively. Tannin content in the methanolic extract was the highest ( $75.60 \pm 6.90\%$ ) showing that antimicrobial activity of the *E.odoratum* extract corresponded to the tannin contribution. On the other hand, total phenolic, flavonoids, and anthocyanin contents did not rely on their antimicrobial activity. **Conclusion:** These observations suggested significant value of the methanolic extract of *E. odoratum* as a promising antibacterial compound against MSSA and MRSA.

**Keywords:** *Eupatorium odoratum*, antimicrobial activity, MSSA, MRSA

<sup>1</sup>Faculty of Pharmaceuital Sciences, Khon Kaen University,

<sup>2</sup>Research Group for Pharmaceutical Activities of Natural Products using Pharmaceutical Biotechnology (PANPB), Khon Kaen University

<sup>3</sup>Faculty of Medicine, Mahasarakham University,

\* **Corresponding author:** Research Group for Pharmaceutical Activities of Natural Products using Pharmaceutical Biotechnology (PANPB), Faculty of Pharmaceutical Sciences, National Research University- Khon Kaen University, Khon Kaen 40002 Thailand, Tel/Fax 043-202305 e-mail: kanok\_ja@kku.ac.th

**Antimicrobial activity of *Senna alata* extract against Methicillin-Sensitive *Staphylococcus aureus* and Methicillin-Resistant *Staphylococcus aureus***

Nadta Sukkasem<sup>1,2</sup>, Nattharat Jearapong<sup>1,2</sup>, Waranya Chatuphonprasert<sup>2,3</sup>, Kanokwan Jarukamjorn<sup>1,2\*</sup>

**Introduction:** Skin infection is a common public health problem mostly caused by *Staphylococcus aureus*. *Senna alata* (Caesalpinioideae) is a Thai herb traditionally used for bacterial skin infection. The objective of this study were to determine antimicrobial activity of the *S.alata* extract on Methicillin-Sensitive *S. aureus* (MSSA) and Methicillin-Resistant *S. aureus* (MRSA). **Materials and Method:** Antimicrobial activity of the herb against MSSA and MRSA was determined using agar well diffusion. Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) were determined by microdilution method. In addition the content of the chemical markers, *i.e.*, total phenolic, flavonoids, and anthocyanin contents, and tannin contribution of the extract were analyzed. **Results:** The methanolic extract showed the highest antimicrobial activity with the lowest MIC and MBC compared to the ethanolic and aqueous extracts. MIC and MBC of the *S. alata* methanolic extract were  $2.63 \pm 0.98$  and  $2.50 \pm 0.00$  mg/ml for MSSA, and  $2.36 \pm 1.28$  and  $6.87 \pm 3.75$  mg/ml for MRSA, respectively. Tannin content in the methanolic extract was the highest ( $86.12 \pm 1.75\%$ ) showing that antimicrobial activity of the *S.alata* extract corresponded to the tannin contribution. On the other hand, total phenolic, flavonoids, and anthocyanin contents did not rely on their antimicrobial activity. **Conclusion:** These observations suggested a significant value of the methanolic extract of *S.alata* as a promising antibacterial compound against MSSA and MRSA.

**Keywords:** *Senna alata*, antimicrobial, MSSA, MRSA

<sup>1</sup>Faculty of Pharmaceuital Sciences, Khon Kaen University

<sup>2</sup>Research Group for Pharmaceutical Activities of Natural Products using Pharmaceutical Biotechnology (PANPB), Khon Kaen University

<sup>3</sup> Faculty of Medicine, Mahasarakham University

\* **Corresponding author:** Research Group for Pharmaceutical Activities of Natural Products using Pharmaceutical Biotechnology (PANPB), Faculty of Pharmaceutical Sciences, National Research University- Khon Kaen University, Khon Kaen 40002 Thailand, Tel/Fax 043-202305 e-mail: kanok\_ja@kku.ac.th