Screening for Antibacterial Properties of Some Plants and Chemical Antibiotic Against Two Isolates of *Escherichia coli* from Diarrhea Calves in Indonesia

M. Poeloengan [1] and I. Komala [2,3]
[1] Indonesia Research Center for Veterinary Science
[2] Institute of Bioscience, Universiti Putera Malaysia
[3] Faculty of Animal Science Bogor Agricultural University

ABSTRACT

Plants used in factory medicine of Indonesian native people were collected. Ethanol extract and powder were prepared and evaluated in a test against two isolates of *Escherichia coli* from herbal plants mahkota dewa (*Phaleria macrocarpa*), daun sembukan (*Paederia foetida*), daun sirih/betel vine (*Piper betle*), kencur/greater galingale (*Kaempferia galangal*), garlic (*Allium sativum*) and jinten hitam (*Nigella sativa*). The results showed anti *E.coli* activity at 20% concentration with the most active plants with diameter of inhibition zones of 15 mm (*Allium sativum*) powder, 11 mm (*Piper betle*) extract and 14 mm (*Nigella sativa*) extract. Extract *Paederia foetida* and extract *Phaleria macrocarpa* had no inhibition effects. The two *E. coli* isolates were sensitive to chloramphenicol at 30 μg.

Key words: *antimicrobial, Escherichia coli, Allium sativum, piper betle, Nigella sativa, Paederia foetida, Phaleria macrocarpa, Kaempferia galangal*

INTRODUCTION

The spread of multi-drug resistant pathogens is one of the most serious threats to successful treatment of microbial diseases. Down the ages, spices have evoked interest as sources of natural products for their potential uses as alternative remedies to heal many infectious diseases (Parekh *et al*., 2005).

According to the reports of many researchers, antibacterial resistance is a worldwide growing-problem. Isolation of microbial agents less susceptible to regular antibiotics and recovery of resistant isolates during antibacterial therapy is increasing throughout the world. One of the measures to combat the increasing rate of resistance in long run, is to have continuous investigation for new, safe and effective antimicrobials as an alternative agents to substitute with no-effective ones. Natural resources, especially plants and microorganisms were the potent candidates for this rum. Usage of plants in curing illnesses has deep roots in man's history since plants are sources of many life-sustaining metabolites.

Colibacillosis incidences in cattle, pig and other farm animals were well documented in Indonesia. These bacterial incidences in young calves and piglets were reported in Bali (Hartaningsih and Hasan, 1985), Lampung (Suastama, 1983) and Central Java (Setiawan, *et al*., 1982). Piglet neonatal diarrhea associated with enterotoxigenic (ETEC) *Escherichia coli* was commonly observed in intensive piggeries in Bogor and Kapok areas. Here diarrhea occurred at the rates of 13 to 40 percents within the first two weeks of life. The associated mortality rates were from 12 to 30 percents (Supar *et al*., 1989). In turn, this young animal mortality contributed considerable losses to the national farm income.

As an effort to control diarrhea and other gastro-intestinal disorders, farmers regularly added antibiotics to farm animal feeds, especially in poultry and swine rations. In the long run, this practice may damage the animal health. Supar *et al*. (1990) proved that several *E. coli* isolates were resistant to commonly use antibiotics including Ampicillin, Streptomycin, Trimethoprim and Sulphamethoxazole. Further observation show that 100 *E. coli* strains were resistant to at least one antibiotic. The highest percentages being attained for resistance was to Penicillin, Tetracycline and Cephalothin (Carvalho *et al*., 1992).

Plants used in factory medicine of Indonesian native people were collected in this experiment. Ethanol extract and powder were prepared and evaluated in a test against two isolates of *Escherichia coli* from herbal plants; mahkota dewa (*Phaleria macrocarpa*), daun