

Chapter I

Introduction

1.1 Background and Significance of the Research Problem

Elephants hold a significant position in Thailand; they form an essential part of Thai culture and national symbols. In ancient times, for many centuries, elephants were trained for warfare, as royal vehicles of the kings, mounted on the elephants fighting the enemy to defend Thailand on many occasions or even to re-establish the country's independence. They were also once an essential part of the Thai economy, used widely for transportation and to help harvest timber in the dense jungle. Today, time and technology have changed the usage of the elephant; they have become part of the tourism economy yet remain important both as a national symbol and an economic asset.

A century ago, Thailand's elephants numbered over 100,000 but today, according to the Department of Livestock Development and the Ministry of Interior, only about 2,500-3,000 domestic elephants are left in Thailand (Ratanakorn, 2000). The lessened elephant population has resulted from many reasons; however, one of the main reasons is illness without in-time remedy (Lungka, 2002).

A frequent elephant health problem is a gastrointestinal disease. They often have diarrhea, flatulence, compressed food in the stomach, and dyspepsia as they eat fiber-rich plants such as coconut leaves and uncut banana trees. The poor chewing character also contributes to these problems. Treatment for digestive health issues in elephants has difficulties and limitations, mostly being treated by supportive treatment and intravascular infusion. Due to delays in diagnosis and treatment, about ten elephants die annually from gastrointestinal diseases. Therefore, the best solution for elephants suffering from these ailments might be preventive treatment (Puangkham, et al., 2005).

Bacterial probiotics are widely used for many domestic animals such as chickens, pigs, dairy cattle and beef cattle to improve both animal health and production. (Musa, 2009, Chiquett, 2009)

Nutritional supplements containing probiotics are popular among horse owners with beneficial claims supported by the research findings, but for other wild animals very little are known, especially elephants. Elephants have very similar gastrointestinal

tracts with horses, so use of probiotic supplements in elephant's diet will help to improve the overall health.

This background and rationale led to the interest in screening for microbial activity in the elephant gastrointestinal tract and finding a suitable strain of microorganism with definite health benefits, as a food supplement to actually reduce morbidity and mortality of elephants with gastrointestinal diseases and improve overall health.

1.2 Objective

1. To screen the microorganisms with probiotic properties from the feces of captive Asian elephants.
2. To investigate the growth ability of isolated microbes in various pH; tolerance to bile salt; cellulose digestibility; carbohydrate, protein and fat utilization; aerobic and anaerobic tolerance ability; the ability to inhibit enteropathogens; and growth profiles.

1.3 Expected Benefits

1. The active probiotic supplementation improves the digestion and absorption of plant components, especially celluloses, present in elephant feed.
2. The active probiotic supplementation inhibits the enteropathogens in the elephant's gastrointestinal tract.
3. The active probiotic supplementation will stimulate the elephant immunity.
4. The active probiotic supplementation will help to reduce the gastrointestinal diseases, and morbidity in elephant population.
5. Reduce the cost of elephant medication.
6. Significantly improves the elephant health.
7. Cooperate with elephant conservations.

1.4 Scope of the Research

Isolation and characterization of microorganisms from the feces of captive elephants. Bacterial colonies with cellulolytic properties were subjected to the screening of probiotic properties such as growth ability in various pH; tolerance to bile salt conditions; carbohydrate, protein and fat utilization; aerobic and anaerobic tolerance

ability; the ability of inhibiting enteropathogens; and growth profiles. Afterward, isolated organisms that have preferred characteristics were identified to the species level for the confirmation of active strain and for the documentation purposes.



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