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Lead Levels in Fresh Medicinal Herbs and Commercial Tea Products from Manila, Philippines

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Abstract

Alternative medicine utilizing the therapeutic effects of plants is commonly used in the community. Contaminants in the raw materials, like lead, may lead to adverse health effects. This study aimed to determine the presence or absence of lead and specifically aimed to obtain its levels in plants and commercial tea utilized as herbal medicine in Manila, Philippines. The blood levels of the heavy metals were mathematically projected as well. The concentrations were compared with the World Health Organization (WHO) and Center for Disease Control (CDC) allowable standards for plants and blood, respectively. Flame Atomic Absorption Spectrophotometry (FAAS) was used to analyze the heavy metals from the samples. All samples tested contained lead but conformed with the WHO limits at 10 ppm. However, only the tea preparation samples conformed with the CDC limit at 10 ug/dL but not the collected plants which went above the prescribed concentration. Herbs and its preparations must be decontaminated prior to use for better health provision to the Filipino people.

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1. Introduction

1.1. Background

The use of plants as medicinal substances (crude or processed), have long been utilized. It is the foundation

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of modern medicine, botany, pharmacy, aromatherapy and chemistry. Herbalism is both an art and a science [1]. The World Health Organization (WHO) stated that over 80% in Asian and African populations use traditional medicine for primary health care where herbal medicine is an integral part of [2,3]. Further WHO estimated that about 70% to 80% of the population in developed countries also used some form of alternative or complementary medicine including Ayurvedic, homeopathic, naturopathic, traditional oriental, and Native American Indian medicine [2,4]. Though plants are naturally grown from soil, studies revealed association of its use to adverse effects in the kidneys [2,5] and liver [2,6]. Over the past 30 years, the use of herbal supplements has increased. Herbal supplements are classified as dietary supplements by the U.S. Dietary Supplement Health and Education Act (DSHEA) of 1994. These must be made according to good manufacturing practices, but not necessarily tested for safety and effectiveness [7].

Lead results to adverse effects on the renal, endrocrine, digestive, cardiovascular, reproductive system. It affects development and neurologic system the most. WHO recommended 10 mg/kg or 10ppm as the maximum permissible level of lead in medicinal plants [9], [10].

1.2. Objectives

This study in general, aimed to determine the presence or absence of lead in plants and commercial tea usually utilized as herbal medicine in the Manila communities. Specifically, the determined levels were compared with the maximum acceptable limits set by the WHO for lead in plants. The projected blood levels were compared with the acceptable limit set for lead in blood by the Center for Disease Control.

1.3. Significance of the study

By the determination of the levels of lead in the usual community plants used as herbal medicines and herbal tea preparations in the market, the Filipino population will be given the chance to choose intelligently to avoid contaminations. The Food and Drug Authority may come up with more stringent policies and its strict implementation for herbal preparation/nutritional supplements in the commercial market. The Department of Agriculture together with the Department of Environment and Natural Resources may tie up for environmental clean-up to decontaminate plants grown in Manila, Philippines.

2. Methodology

2.1. Research Design

The study followed the descriptive exploratory design. The amounts of the lead in the varied samples collected were experimentally explored using FAAS for analysis. The results described the content of lead in the medicinal plants and tea preparations.

2.2. Locale of the Study

The study was conducted in Manila Philippines from April to May of 2013. Samples were collected from Ongpin, Ermita and Divisoria areas. The samples were quantitatively analyzed at Dela Salle University Manila, Philippines

2.3. Collection and preparation of Samples