

Katerina Berkova^{1*}, Johana Rondevaldova¹

¹ Department of Crop Science and Agroforestry, Faculty of Tropical AgriSciences, Czech University of Life Sciences Prague, Czech Republic
*Corresponding author, email: xberk016@studenti.czu.cz

Introduction

Today, when humanity is still facing malnutrition, diseases of affluence are emerging at the same time. A principal cause of the multiple malnutrition burdens are current food systems that produce large quantities of food that is poor in nutrients and include insufficient amounts of plant-based products. Fruits and vegetables are the keys to tackling malnutrition in both developing and developed countries [1]. Thailand (Fig. 1) is a country with significant plant biodiversity and almost unknown species can still be found there. Such species have the ability to strengthen the food and buffer economy of the country, and also the ability to increase the biodiversity of cultivated crops and thus contribute to the sustainability of agriculture [2]. This study was focused on Thai fruits and vegetables contain interesting amounts of biologically active substances, namely antioxidants, minerals, and vitamins.



Figure 1. Thailand

Source [18]

Results

In total, 73 underutilized fruit and vegetable species of 32 families originating in Thailand were identified. For 8 of them, data on the content of antioxidants, minerals, and vitamins were not available. The most promising crops seem to be *Aegle marmelos* (Fig. 2), *Sesbania grandiflora* (Fig. 3), *Spondias pinnata* (Fig. 4), and *Ziziphus jujuba* (Fig. 5). These species have been found to be a rich source of all monitored parameters (Table 1), especially vitamins B₁, B₂, B₃, C, E, and phenolic compounds [3; 4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17].

Table 1: Content of micronutrients in the most promising crops

Scientific name	<i>Aegle marmelos</i>	<i>Sesbania grandiflora</i>	<i>Spondias pinnata</i>	<i>Ziziphus jujuba</i>
Antioxidants	phenolic compounds, flavonoids, glutathione, carotenes	phenolic compounds, carotenes, tannins	phenolic compounds, flavanols, flavonoids, phytosterols, carotenes, tannins	carotenes, phenolic compounds, flavonoids
Minerals	Ca, Cu, Fe, K, Mg, P, Zn	Ca, Fe, K, Mg, Na, P	Ca, Cu, Fe, K, Mg, Mn, Na, P, Se, Zn, ...	Ca, Cu, Fe, K, Mg, Mn, Na, P, Zn
Vitamins	A, B ₁ , B ₂ , B ₃ , C, E	A, B ₁ , B ₂ , B ₃ , C	B ₁ , B ₂ , B ₃ , C, E	B ₁ , B ₂ , B ₃ , C

Source [4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17]

Methods

- Literature review performed using scientific databases (e.g. Web of Science or Scopus)
- Species selected on basis of available publications concerning their nutritional value
- Keywords: ‘micronutrient content’, ‘antioxidant activity’, ‘Thai origin’
- Correctness of plant names verified using The Plant List database



Figure 2. *Aegle marmelos* (L.) Corrêa
Bael Tree
Rutaceae

Source [3]



Figure 3. *Sesbania grandiflora* (L.) Pers.
Vegetable Hummingbird
Leguminosae

Source [3]

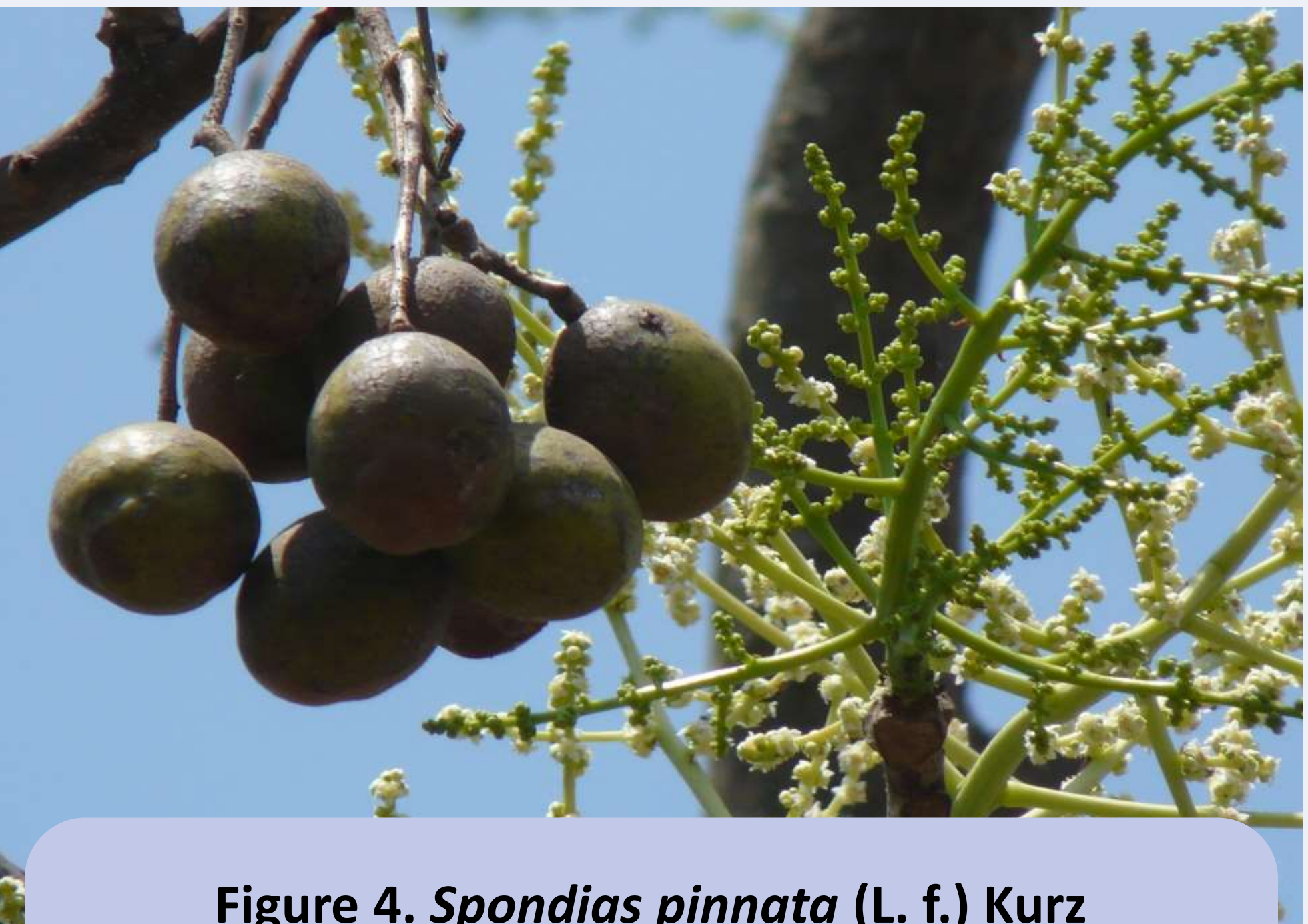


Figure 4. *Spondias pinnata* (L. f.) Kurz
Wild Mango, Hog Plum
Anacardiaceae

Source [3]



Figure 5. *Ziziphus jujuba* Mill.
Indian Jujube
Rhamnaceae

Source [3]

Conclusion

- Insufficient intake of fruits and vegetables → development of non-communicable diseases
- Mentioned species have the potential to fight various diseases and show other useful properties
- The most nutritionally interesting species include *Aegle marmelos*, *Sesbania grandiflora*, *Spondias pinnata* and *Ziziphus jujuba*
- Need for better promotion, agronomy, cultivation and research on species for which data are not available