Chapter 7
Medicinal Plants and Secondary Metabolite for the Treatments of Hypertension

Bui Thanh Tung
https://orcid.org/0000-0002-7308-5039
VNU University of Medicine and Pharmacy, Vietnam

Dinh Van Anh
VNU University of Medicine and Pharmacy, Vietnam

Nguyen Thi Van Anh
VNU University of Medicine and Pharmacy, Vietnam

Nguyen Thi Anh Hong
VNU University of Medicine and Pharmacy, Vietnam

ABSTRACT

Traditional medicine encompasses a range of ancient, culturally-rooted health practices that were developed long before modern scientific approaches were applied to healthcare. Used for centuries, these practices often involve medicinal plants, which play a role in treating cardiovascular conditions such as heart disease, cerebrovascular disorders, hypertension, and heart failure. Hypertension complicates heart function and contributes to atherosclerosis, thereby increasing the risk of heart attacks and strokes. Although numerous drugs are available to manage these conditions, many commonly used anti- hypertensive medications carry significant side effects. Medicinal herbs contain active compounds with both therapeutic and

DOI: 10.4018/979-8-3693-9112-9.ch007

preventive properties, offering potential for the treatment of hypertension. This review provides an overview of several medicinal plants and secondary metabolites that have demonstrated hypertensive or anti-hypertensive effects.

INTRODUCE

Cardiovascular diseases (CVDs) are a leading cause of morbidity and premature mortality worldwide, posing a significant public health challenge. Hypertension, often referred to as the "silent killer," arises from a complex interplay between genetic predisposition and environmental factors, leading to dysregulation of blood pressure control mechanisms (Kamyab et al., 2021). Hypertension (HTN) is the most prevalent risk factor for acute myocardial infarction and is responsible for approximately 16.5% of deaths worldwide each year. It also represents the leading cause of morbidity and mortality associated with cardiovascular diseases (CVDs) (Kamyab et al., 2021). Hypertension is broadly classified into two main types: primary (essential) and secondary. Primary hypertension, accounting for approximately 90–95% of cases, refers to elevated blood pressure without an identifiable medical cause. In contrast, secondary hypertension, comprising 5–10% of cases, results from underlying conditions affecting the kidneys, arteries, heart, or endocrine system. (Tabassum & Ahmad, 2011).

Essential hypertension is characterized by elevated blood pressure of unknown etiology and significantly increases the risk of cerebrovascular, cardiac, and renal events. In industrialized countries, the lifetime risk of developing hypertension (defined as blood pressure >140/90 mmHg) exceeds 90%. Essential hypertension often coexists with other cardiovascular risk factors, including aging, obesity, insulin resistance, diabetes mellitus, and hyperlipidemia. Subclinical target-organ damage—such as left ventricular hypertrophy, microalbuminuria, and cognitive impairment—can occur early in the disease course, whereas major adverse events, including stroke, myocardial infarction, renal failure, and dementia, typically arise after prolonged periods of uncontrolled hypertension. (Messerli et al., 2007).

Secondary hypertension refers to elevated blood pressure resulting from an identifiable and often reversible underlying cause. Recognizing secondary hypertension is crucial for effective management, as it enables targeted treatment by addressing the root cause. Several conditions are known to induce secondary hypertension, including endocrine disorders such as Cushing's syndrome (characterized by excess cortisol production), hyperthyroidism, hypothyroidism, and adrenal gland tumors. Other common contributors include chronic kidney disease, obesity and metabolic disorders, pre-eclampsia during pregnancy, congenital abnormalities like coarcta-

Formulation Science in Dysphagia Care: Advances in Oral Drug Delivery Systems for Swallowing Disorders

Charuwan Thanawiroon, Rojjares Netthong, Soultana Papadopoulouand Bancha Yingngam (2026). *Dysphagia in Neurodevelopmental and Medical Disorders and Diseases: A Lifespan Approach (pp. 431-490).*

www.irma-international.org/chapter/formulation-science-in-dysphagia-care/405721