Chapter 16

Bioactive Compound Analysis of *Coriandrum* Sativum L against Microbial Keratitis

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ABSTRACT

In recent years, multiple drug resistance has been developed due to indiscriminate use of existing drugs in the treatment of infectious diseases. One such herbal drug is *Coriandrum* Sativum L that possesses potential pharmaceutical activities and used in several ayurvedic formulations. Keratitis caused by bacteria, viruses, fungi and parasites. The main goal of this study is to evaluate the antibacterial, antifungal activity, anti-oxidant activity and anti-inflammatory activity of *Coriandrum* Sativum L leaves and seeds using various organic solvent of plant extract against keratitis disease. The present study carried out the effect on various organic solvents extract of leaves and seeds of Corindrum sativun not only on the bacterial and fungal populations isolated from the conjunctivitis infected eyes but also to screen the phytochemical, anti-inflammatory and in vitro antioxidant potential of the leaf and seed extracts.

INTRODUCTION

Microbial keratitis is a major cause of monocular blindness in developing countries. Corneal scarring listed second only to cataracts as an important cause of blindness and visual impairment in many developing countries in Asia, Africa and the Middle East. India too suffers a major setback in public health due to blindness caused by microbial keratitis (Alexandrakis, Alfonso, & Miller, 2000). Corneal lesions were found to be responsible for 9% of all blindness in India in a recent national survey. The factors that can predispose to infectious keratitis include age, occupation, environmental factors, trauma into the eye, foreign bodies, extended wear of conventional contact lenses (Alfonso, Mandelbaum, Fox, et al., 1986). chronic ocular surface disease, prior ocular surgery, diabetes mellitus, leprosy, rheumatoid arthritis, use of topical corticosteroids. Rapid initiation of treatment is required to halt the progression of disease so

that the extent of corneal scarring can be limited and thereby loss of vision (Ahmadi & McKenna 2003; Baker, Smith, & Cowan, 2003).

The antibiotics and steroid-based eye drops for the management of ophthalmic disorder has been found clinically unsafe in recent times and a current demand is to investigate alternative drug. A serious adverse drug reactions (ADRs) occurring due to use of herbal drugs is very rare event. A common argument that favours the use of herbal medicines is that they have a longstanding history of traditional use. Even after being used from ancient times, plant-derived medicines can result in some adverse reaction so needs have been raised for safety evaluation. Microorganisms develop resistance to present day antibiotics that has created immense clinical problem in the treatment of infectious diseases. However, today it is necessary to provide scientific proof as to whether or not it is justified to use a plant or its active principles. It is still a problem to use these medicinal plants for ophthalmic problems.

Coriandrum is the dried fruit of the tall perennial herbaceous plant, *Coriandrum Sativum*, and belonging to the family Apiaceae. This herb is cultivated commercially in Europa, Asia and Africa. The leaves are lanceolate, green or dark green, glabrous on both surfaces with acuminate apex. The fruit are, ovoid. The Coriandrum seeds have a warm, slightly pungent and highly aromatic flavour. Therefore, it is used as a spice in meat products such as Bologna and Frankfurter. Coriandrum oil is used in food, perfumery, and liquor in pharmaceutical industries as a flavour and a carminative. In medicine, it is used as a powerful aromatic, antiseptic, stimulant, carminative, stomachic, expectorant, anti-spasmodic and diuretic. In some parts of the world, especially the Near East and Saudi Arabia, Coriandrum is used mostly in the preparation of “Gahwa” a strong Coriandrum coffee concoction.

The World Health Organization (WHO) noted that the majority of the world’s population depends on traditional medicine for primary healthcare. Medicinal and aromatic plants are widely used as medicine and constitute a major source of natural organic compounds. Some medicinal plants have been used for a wide variety of purposes such as food preservation, pharmaceutical, alternative medicine, and natural therapies for many thousands of years (Chopra, Nayar, & Chopra, 1965). It is generally considered that compounds produced naturally, rather than synthetically, will be biodegraded more easily and therefore be more environmentally acceptable.

In the present study, the *Coriandrum Sativum* L was extracted by using various solvents of increasing polarity like petroleum ether, benzene, ethyl acetate, acetone, methanol and water. These extracts were characterized to demonstrate photochemical screening of secondary metabolites, antimicrobial property against microbes causing eye infections such as bacteria and fungi. The active antioxidiant property and scavenging free radical activity was evaluated using FRAP assay. The anti-inflammatory activity of plant extracts using UV-VIS.

**BACKGROUND**

Plants have a vast potential for their use as curative medicine. In India, medicinal plants are widely used by all sections of people both directly as folk medicines in different indigenous systems of medicine like Siddha, Ayurveda and Unani and indirectly in the pharmaceutical preparations. India has about 4.5 million plant species and among them, several thousands have been claimed to possess medicinal properties against human diseases (Nadakarni, 1973). Although traditional medicinal healers have used medicinal plants for treatment of ailments for hundreds of years, there has always been a lingering question in scientific circles about their therapeutic efficacy. As a consequence, the pharmacological activity