THE INDIAN SPICE BOX: A PANACEA

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INTRODUCTION

The world is waking to what has been the age-old wisdom we have inherited from our grandmothers. The panacea for many ailments lies right on our kitchen shelves. Popularly known as "turmeric latte" today, is nothing but a fancy word for what we have known as "haldi doodh". The health benefits of popular Indian spices have been known for decades. Globally India contributes 70% to the global spice production, ranking first in the world in terms of spice production. The International Organization for Standardization (ISO) has listed 109 spices in the world, out of which 63 spices are grown in India. In addition to imparting aroma and flavour to food items, spices are known to serve as antimicrobials and therefore are highly valued for their healing abilities. These are abundant in certain pytochemicals which possess many health promoting properties. Due to this reason, spices find immense utility in the science of Ayurveda. It is believed that consumption of a balanced amount of spices on a daily basis provides balance to the three doshas of the human body namely Vata, Pitta and Kapha. In the event of an imbalance of these doshas, the body becomes unhealthy. The common Indian spices and their principal phyto-constituents are presented in Figure 1. The figure also enumerates the potential health promoting properties of each of these spices based on the available literature. Only a few, commonly known benefits associated with consumption of these spices are listed for the purpose of brevity.

Phytochemicals are defined as bioactive chemicals of plant origin. The popular Indian spices are rich in phytochemicals like alkaloids, flavonoids, glycosides, reducing sugars, saponins, steroids, phenols, terpernoids, anthraquinones, tannin. The in vitro anti-oxidant and anti-microbial activities of extracts derived from six different spices (ajwain, coriander, cinnamon, fennel, garlic and turmeric) was estimated, it was observed that cinnamon possessed the highest antioxidant activity while turmeric had the least antioxidant potential. Both turmeric and cinnamon exhibited strong

antimicrobial activities against the bacteria *Staphylococcus aureus* and *Escherichia coli*. Owing to the various beneficial attributes of spices, these have been used for preventing or ameliorating chronic diseases such as cardiovascular disease, arthritis, cancer, and neurological disorders. The major class of polyphenols found in spices are the phenolic acids and flavonoids (mainly flavones and flavonols) and the various volatile oils and oleoresins, that are recognized to have antibacterial, antiviral, and antifungal properties. This allows their use as stabilizer or preservative agents in food. Owing to the abundance of these beneficial phytochemicals in spices, many species have also been used as natural sources of these compounds in the pharmaceutical industry. For instance, diosgenin, a steroidal saponin isolated from fenugreek, is manufactured in the form of steroidal drugs.

Spices have been used for their medicinal properties since time immemorial. However, unlike cereals and pulses, which draw considerable attention of agricultural scientists, research on spices remains notably scant. This is because cereal and pulses serve as staple food items globally and are source of nutrients and dietary energy. The disparity is more evident with the genomes sequenced for most cereal and pulse crop species. On the other hand, for many spices like fenugreek, cumin, Indian bay leaf, no whole genome sequence information is available. However, with the advances in Next-generation sequencing technologies (NGS), we believe that more species will be picked up for sequencing in the near future. Unravelling the genome of these spices would help in identifying genes and metabolic pathways involved in biosynthesis of the important phytochemicals.

CONCLUSION:

Many spices of Indian origin and the ones which are widely used in Indian cooking, are known for their therapeutic properties. Despite their health benefits, research on the genomics aspect of these remains poor. Efforts need to be undertaken to generate more genomic information for these spices, so as to be able to understand the molecular basis of biosynthesis of the beneficial phyto-chemicals.