Aloe vera: Advances in Research, Products and Technology

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Abstract

Aloe vera, the most widely recognized cosmetic ingredient in history has finally received the attention of researchers with more academic studies published in the last five years than ever before. The focus of new studies has shifted to the therapeutic effects of aloe as a food or supplement, identification of bioactive constituents and the mechanism of action. Validated analytical methods for the quantification of constituents and quality assessment are now available to suppliers and customers to evaluate and control manufacturing, as well as aiding customers in the selection of quality suppliers. As the industry matures leading suppliers are funding more research to demonstrate efficacy of their aloe products and relying less on third party literature. These advancements have prompted innovations in aloe manufacturing and new product offerings that are breathing new life into a herbal ingredient that seems perpetually in its prime.

Introduction

The story of *Aloe vera* is compelling but incomplete. More cosmetic products contain aloe than any other herbal ingredient – and no other herbal ingredient is more widely recognized. After all, descriptions of *Aloe vera* as a medicinal herb span recorded history. That's compelling! However, academic research validating human efficacy, identification of biologically active constituents and mechanism of action has been slow to come.

Advances in Research, Products and Technology

New trends in aloe research have provided support for health claims and promise to expand the use of this valued ingredient in the health industry. And momentum is building. In the chart (next page) we can see that there was an average of six aloe research papers published per year during the period 1945 to 1985, doubling from 1985 through 1995, quadrupling from 1995 to 2000 and from 2000 to 2005 there have been no less than 310 academic papers published on aloe. As well known as aloe is, there have been nearly as many papers published in the last five years than the sum of all previous years. The focus of aloe research has shifted as well.

A review of the papers published from the 1940s to the 1970s reveals that most of the studies focus on the burn and wound-healing properties for which aloe was popularized. However, during the late 1970s one study on aloe polysaccharides was published[1] and in the early 1980s the first study reporting on the immunomodulatory properties of aloe polysaccharides appeared[2] in print. Human studies with aloe have been performed since the late 1960s (some might point out that the historical use of aloe constitutes a 3000 year-long human clinical study) but until recently these studies were primarily focused on the topical use of aloe. Now, human clinical studies have shown that the internal use of *Aloe vera* may help regulate blood glucose in diabetics[3], reduce cholesterol[4] and increase the bioavailability of some vitamins[5]. The scientific study of aloe is accelerating at a rapid pace and these subsequent positive results are fuelling greater interest in the use of aloe in the development of many novel products in a variety of industries for improving overall health.

Paralleling the surge of research during the last five years has been the development of analytical methods for characterizing aloe quality and quantification of its biologically important constituents. Industry leaders played an important role in these analytical advances and in standardizing aloe manufacturing in the late 1990's. In 2000, our sister company, Unigen Pharmaceuticals, published a method for stabilizing aloe and preserving its bioactivity, called the Modified Aloe Polysaccharide (MAP) process[6,7].

Early on, the acetylated mannan-rich polysaccharide of *Aloe vera* was recognized as a primary biologically active constituent. Enzymes that break down these large polysaccharides into