

# ABS Pap-Ango Enzyme PF



hair + skin care, revitalizing  
 stability active  
 natural exfoliation  
 proteolytic enzymes  
 sustainable, cellular renewal  
 super fruits

## BACKGROUND

Trends for natural holistic skin and hair care treatments have not gone unnoticed by cosmetic formulators. Ayurvedic lifestyles are becoming more mainstream, and naturalists are frequently using ingredients such as mango and papaya to combat issues associated with problem skin and hair. The natural enzymes in these fruits are being utilized in wide variety of cosmetic products to exfoliate and improve the overall condition of the skin and hair. **ABS Pap-Ango Enzyme PF** combines the active enzymes along with the intact chaperone proteins found in both the mango and papaya for increased stability, providing formulators a great alternative to alpha hydroxy acids.

Mango (*Mangifera indica*) is native to Southern Asia, specifically Burma and eastern India and is considered the “king of fruits” in Ayurvedic medicine.<sup>1</sup> Mangos are juicy, yellow-orange fruits rich in vitamins and minerals and high in fiber. The nutrient rich profile of the mango makes the fruit highly sought after for aiding weight loss, helping digestion, and promoting healthy skin.

Papaya (*Carica papaya*) is native to tropical America spanning the area from southern Mexico to the Andes in South America. Papayas have a high content of antioxidant nutrients such as carotenes, vitamin C, and flavonoids; as well as B vitamins, minerals and fiber. Papaya contains the digestive enzyme papain which, when applied topically, can break down inactive proteins and eliminate dead skin cells to rejuvenate and exfoliate skin.<sup>2</sup>

## SCIENCE

The enzymes within fruit as well as virtually all other organisms are natural catalysts (modify or increase the rate of a reaction with out being consumed by the reaction) that regulate intrinsic functions such as fruit ripening and color changes in the plants’ leaves. Most enzymes are proteins, which lose functional

**Code Number: 10268PF**

**INCI Name:** Carica Papaya (Papaya)  
 Fruit Extract & Mangifera Indica  
 (Mango) Fruit Extract

**INCI Status:** Conforms

**REACH Status:** Complies

**CAS Number:** 84012-30-6 &  
 90063-86-8

**EINECS Number:** 281-675-0 &  
 290-045-4

**Origin:** Botanical

**Processing:**

GMO Free

No Ethoxylation

No Irradiation

No Sulphonation

**Additives:**

Preservatives: None

Antioxidants: None

Other additives: None

**Solvents Used:** Water

**Appearance:** Pale Yellow to Amber,  
 Hazy Liquid

**Soluble/ Miscible:** Water Soluble

**Microbial Count:** <100 CFU/g  
 No Pathogens

**Suggested Use Levels:** 2.0 - 5.0%

**Suggested Applications:**

Exfoliant, Anti-Aging, Problem Skin

**Benefits of ABS Pap-Ango Enzyme PF:**

- Cellular Renewal
- Good for Problem Skin
- Anti-Aging

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activity as they denature. Utilizing enzyme extractions from fruit is not a new practice. The benefits of enzymes have been known and practiced in Ayurvedic medicine as well as folk medicines for centuries. Enzymes in both fruits are attributed with having functional properties for cosmetics. Papain in papaya and various mango enzymes are attributed with soothing skin irritations and exfoliating dead cells. Papain and mango enzymes are capable of retaining proteolytic activity over a wide pH range. Studies have indicated that mango enzymes have stability over a pH range of 2.0-8.0 and function at temperatures ranging from 10-75°C.<sup>3</sup>

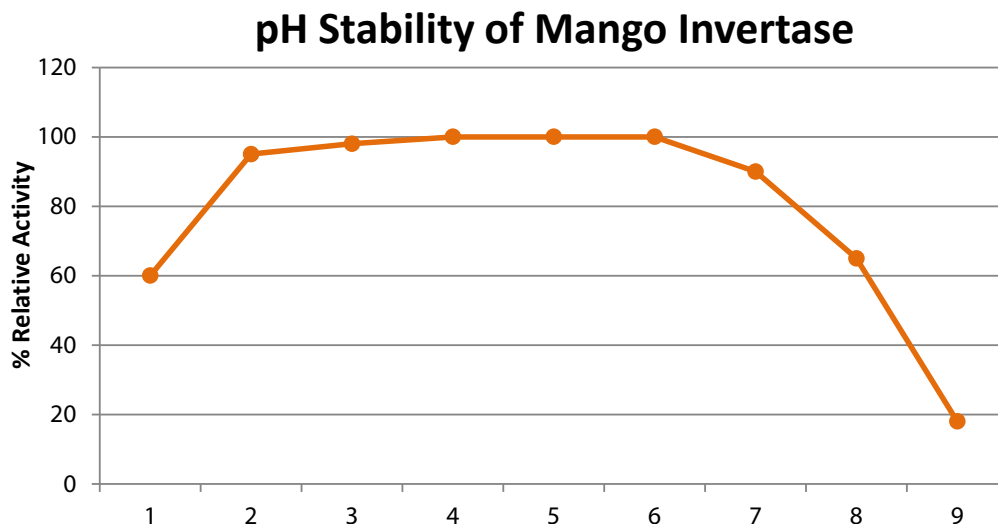


Figure 1. pH Stability of Mango Invertase<sup>3</sup>

Although the enzymes of both fruit function similarly, the combination of the two mimic a product that contains an adjuvant in terms of the functional increase in enzyme activity when they are combined. Papaya contains arginine, which is an amino acid that smoothes skin and aids in cell regeneration. Both mango and papaya have antioxidant, anti-age, anti-acne, anti-dermatitic and anti-dandruff activities<sup>4</sup>, which are all needed functions for current cosmetic products. When attempting to improve the appearance of skin, formulators also usually need to address epithelial inflammation. Inflammation often induces swelling and hyperpigmentation of the skin; fortunately papain possesses anti-inflammatory properties that may address these issues.

## BENEFITS

Find the beauty that lies beneath. **ABS Pap-Ango Enzyme PF** provides exfoliation, reduces the appearance of fine lines and wrinkles and provides a great alternative to alpha hydroxy acids. Sustainably manufactured, **ABS Pap-Ango Enzyme PF** is extracted from the unused residual fruit pulp, along with the intact chaperone proteins, which helps increase stability and higher enzyme activity. **ABS Pap-Ango Enzyme PF** may be used in cleansers, facial masks, anti-age creams, anti-acne products, exfoliators, shampoo and conditioner as well as other hair care treatments.

## EFFICACY

**ABS Pap-Ango Enzyme PF** was evaluated for its ability to accelerate cell renewal by means of a traditional skin pigmentation assay protocol. Skin cells are frequently exposed to ultraviolet light damage and other chemical and environmental aggregates. Their death and replacement through cellular renewal processes minimize the potential longer-term harmful effects of these exposures. Aiding in the processes of cellular renewal can improve the skin's physical appearance as well as function as a protective barrier. Dermal Dye Max™ was used to induce skin pigmentation. The active ingredient in Dermal Dye Max™ is dihydroxyacetone (DHA), also known as glycerone, and is a simple saccharide.

Five volunteers, male and female, between the ages of 20 and 45 and who were known to be free of any skin pathologies participated in this study. Derma Dye Max™ was applied to four identified test patches on the volar

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forearm. The dye was left to develop for 24 hours prior to baseline readings. A fifth skin patch was identified as the skin baseline control and no dye nor treatment were applied to this site. Post dye development and prior to the initial application, baseline DemaLab pigmentation index readings were taken for all five identified sites.

Approximately 0.2 g of each lotion treatment, 5% glycolic acid positive control, 5% **ABS Pap-Ango Enzyme PF**, and the base formula were applied to three 2cm x 2cm respective locations on the volar forearm. The fourth test site was left untreated as a dye baseline test site. Readings were taken every 24 hours until the active test site returned to baseline. After each daily reading, treatment of each respective test site was performed following the same parameters listed above.

**ABS Pap-Ango Enzyme PF** was able to return the test site to baseline pigmentation readings in three days. The results indicate that ABS Pap-Ango Enzyme PF is capable of increasing cellular renewal when compared to the untreated skin dye control site. Cellular renewal is beneficial for visibly improving skin tone and texture as well as aiding in the skin's function as a protective barrier from harmful chemical and environmental exposure that can lead to premature aging.

As seen in Figure 2, **ABS Pap-Ango Enzyme PF** had the greatest percent change reduction back to baseline when compared to all other test controls. **ABS Pap-Ango Enzyme PF** outperformed the glycolic acid positive control in the induction of cellular renewal and was able to return skin to the untreated baseline pigmentation readings. **ABS Pap-Ango Enzyme PF** induced a 98.5% change in pigmentation over the course of 3 days compared to the glycolic acid positive control which only induced a 95.2% change in pigmentation. It can therefore be concluded that at normal use concentrations, **ABS Pap-Ango Enzyme PF** contributes to cellular renewal, indicating a healthier, more vibrant skin tone and helping to reverse the signs of aging.

## Comparative Cellular Renewal ABS Pap-Ango Enzyme PF

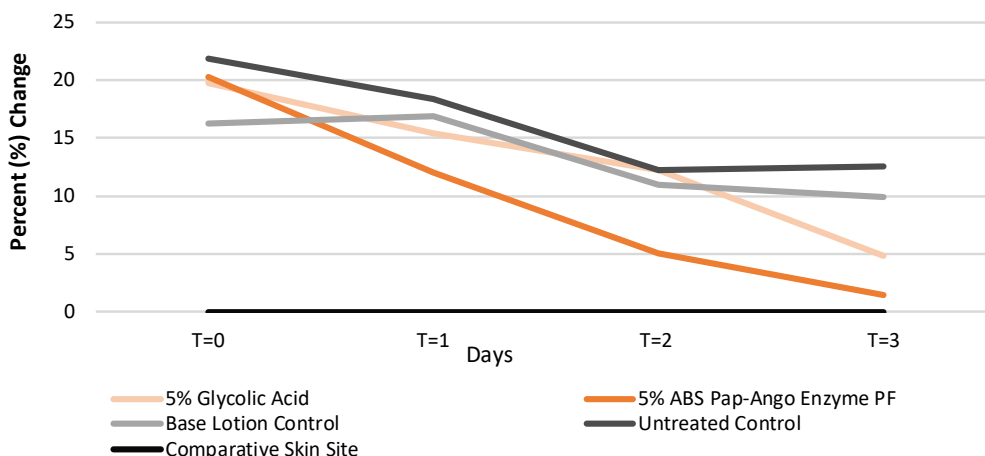


Figure 2. Cellular Renewal Results

References

- 1) Morton, J. 1987. Mango. p.221-239. In: Fruits of warm climates. Julia F. Morton, Miami, FL
- 2) Papaya, University of Georgia. [www.uga.edu/fruit/papaya.htm](http://www.uga.edu/fruit/papaya.htm)
- 3) Rahman, M.Habibur. et. al. Purification and properties of invertase from mango fruit. Pakistan Journal of Biological Sciences 4(10): 1271-1274,2001.
- 4) USDA, Dr. Duke's Phytochemical and Ethnobotanical Databases. [www.ars-grin.gov/duke](http://www.ars-grin.gov/duke)



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