

# Science Review: Comprehensive Analysis of Fast-Acting and Safe Plant-Based Pain Relief

## Introduction

Inflammatory pain is a significant health burden, impacting the lives of countless individuals globally. Acute pain serves as a critical protective mechanism; however, it can be challenging to manage effectively with common analgesics such as acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs).<sup>1</sup> Higher doses of these medications, such as single doses of acetaminophen beyond 1,000 mg or ibuprofen over 400 mg, can lead to adverse effects,<sup>1</sup> causing patients to feel uncertain about conventional analgesics. This has led to an increased demand for safer and more effective alternatives. Rhuleave-K<sup>®</sup>, a novel plant-based formulation containing curcumin and *Boswellia serrata*, addresses this need by offering a safe and rapid pain relief option which is plant-based. Clinically proven to start working as early as 30 minutes,<sup>2</sup> Rhuleave-K demonstrates a similar time-to-effect as 1,000 mg of acetaminophen, providing a safe and fast-acting approach to managing inflammatory pain.<sup>3</sup>

## Pharmacological Mechanisms of Rhuleave-K

Rhuleave-K leverages the therapeutic potential of curcumin and *Boswellia serrata*, both extensively studied for their anti-inflammatory and analgesic properties, and have been shown in clinical trials to be as effective as over-the-counter (OTC) pain relief, including NSAIDs.<sup>4,5</sup> Curcumin, the active compound in turmeric (*Curcuma longa*), modulates inflammatory pathways by inhibiting nuclear factor kappa B (NF- $\kappa$ B) and suppressing proinflammatory cytokines such as interleukin-1 $\beta$  (IL-1 $\beta$ ) and tumor necrosis factor-alpha (TNF- $\alpha$ ).<sup>5</sup> Concurrently, *Boswellia serrata* contains boswellic acids that inhibit 5-lipoxygenase (5-LOX) and microsomal prostaglandin E2 synthase-1 (mPGES-1), thereby reducing the synthesis of leukotrienes and prostaglandins.<sup>6,8</sup> The dual inhibition of cyclooxygenase-2 (COX-2) and 5-LOX by these botanicals provides a broader anti-inflammatory effect compared to NSAIDs, which typically target only COX pathways (Figure 1).<sup>7</sup> Furthermore, the safe agents in Rhuleave-K are less likely to cause adverse effects, offering a safer alternative for long-term use.<sup>4</sup>

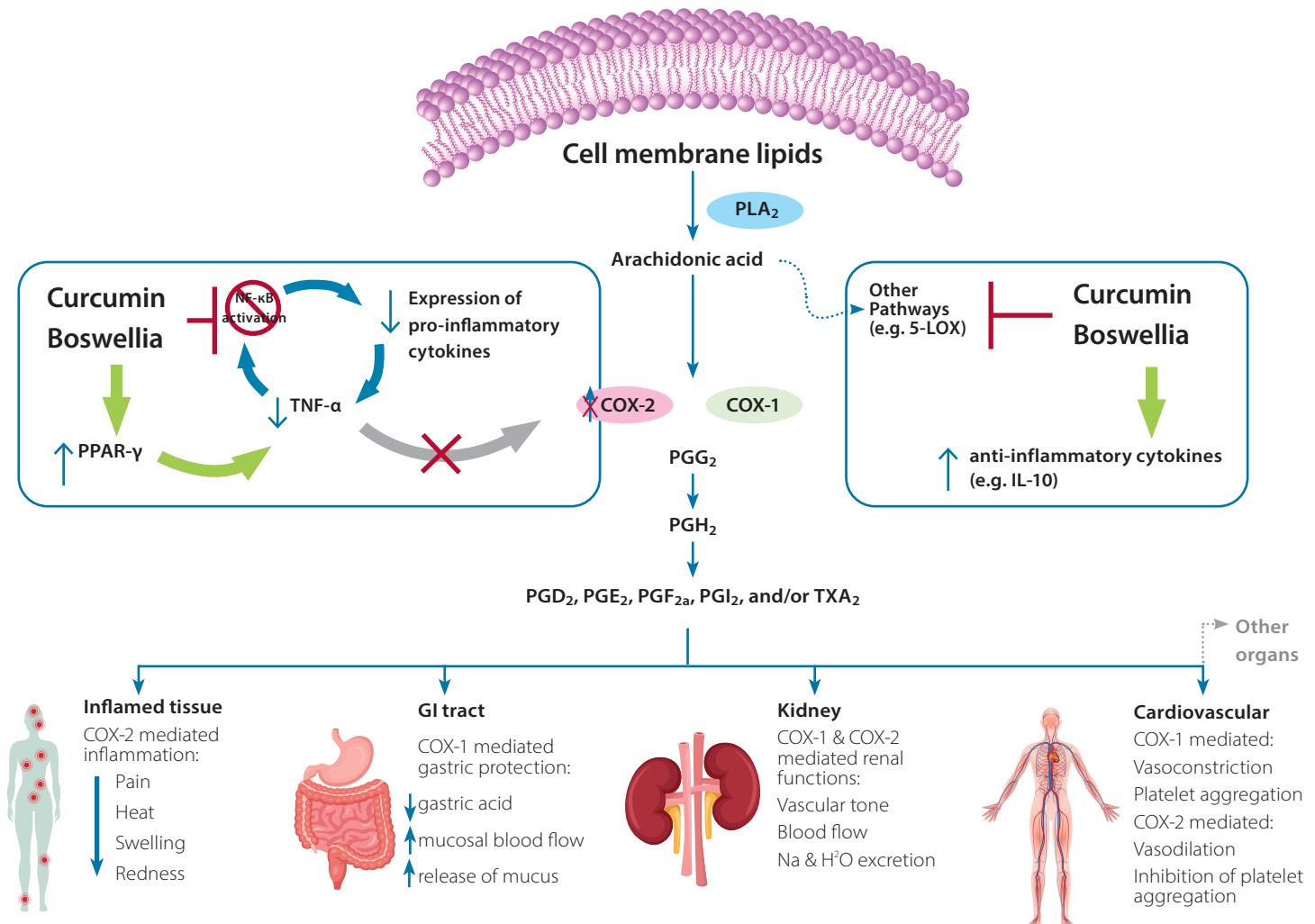


Figure 1. Rhuleave-K Mechanisms of Action

## SpeedTech Technology: Enhancing Bioavailability

Unique to the manufacture of Rhuleave-K, proprietary SpeedTech™ technology enhances curcumin and boswellia absorption, helping to offset the low bioavailability of these extracts.<sup>9,10</sup> By combining safe ingredients through a high-speed milling process, SpeedTech micronizes botanical particles within a phospholipid-rich<sup>+</sup> base of black sesame seed oil<sup>11</sup> to create a highly bioavailable dispersion of active compounds. For this reason, specialized SpeedTech technology can maximize the anti-inflammatory benefits of curcumin and boswellia extracts in Rhuleave-K for greater clinical effects.

## Clinically Studied Benefits: Acute Musculoskeletal Pain

A pivotal randomized, open-label study assessed the efficacy of Rhuleave-K in comparison to acetaminophen in 88 subjects with grade 1 musculoskeletal strain.<sup>3</sup> Participants received either 1,000 mg/day of Rhuleave-K or acetaminophen for seven days. The results demonstrated substantial pain relief within 2.5 hours of administration, with a 53.1% reduction in total pain after 6 hours, comparable to the 55.4% reduction observed with acetaminophen (Figure 2). By the end of the seven-day period, Rhuleave-K had improved pain quality and intensity by 71.8%, mirroring the 73.6% improvement achieved with acetaminophen.

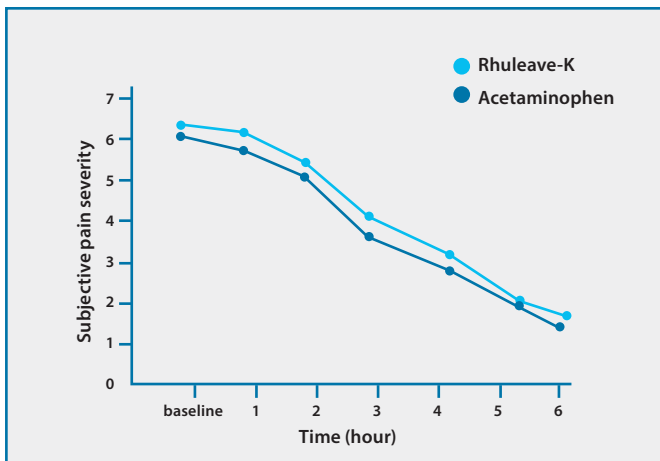


Figure 2. Pain reduction with Rhuleave-K is comparable to 1,000 mg of acetaminophen<sup>3</sup>

## Exercise-Induced Muscle Pain

The fast-acting benefits of Rhuleave-K have been documented in 232 healthy individuals (mean age 36.4 years) with exercise-induced muscle pain.<sup>12</sup> In this randomized double-blind placebo-controlled study, treatment reduced pain severity from > 74% to < 3% ( $p < 0.001$ ), while no significant relief occurred in the placebo group. Notably, perceived pain relief occurred around 63 minutes, while complete pain relief was achieved in 3.1 hours. As such, these studies support the anti-inflammatory and analgesic effects of Rhuleave-K.<sup>12,13</sup>

## Menstrual Cramp Pain Relief and Primary Dysmenorrhea

A recent double-blind, placebo-controlled study published in the Journal of Clinical Medicine examined the effects of a turmeric-boswellia-sesame formulation on primary dysmenorrhea in 60 women.<sup>2</sup> Participants received a single 1,000 mg dose of the formulation or placebo. The treatment group exhibited significant menstrual pain relief, with a total pain relief (TOTPAR) score 12.6 times greater than the placebo and a sum of pain intensity difference (SPID) at 6 hours that was 20.19 times higher than the placebo group. The formulation started working as early as 30 minutes and lasted up to 6 hours, demonstrating rapid and sustained pain relief (Figure 3).

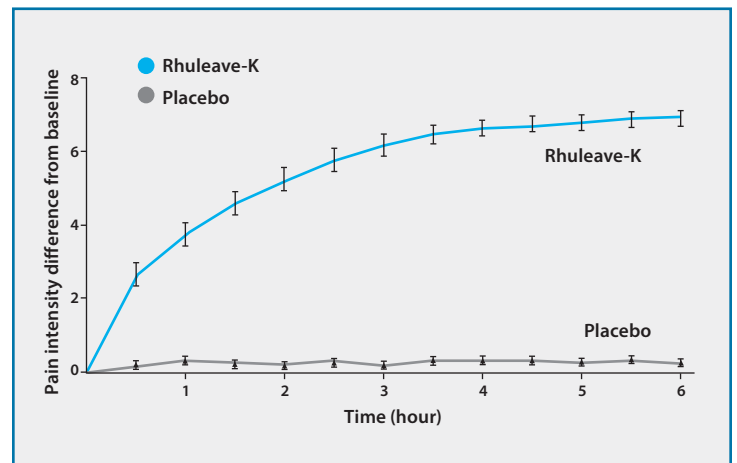


Figure 3. Pain intensity difference from baseline at different timepoints over a period of 6 h with Rhuleave-K and placebo<sup>2</sup>

## Conclusion

Rhuleave-K, enhanced by the innovative SpeedTech technology, represents a significant advancement in the management of inflammatory pain through its comprehensive anti-inflammatory and analgesic effects. This plant-based alternative to traditional NSAIDs demonstrates effective bioavailability and efficacy, as evidenced by multiple clinical studies. These studies consistently demonstrate the formulation's ability to provide rapid onset of action, starting as early as 30 minutes and lasting up to 6 hours, thus highlighting its potential as a first-line treatment for various inflammatory conditions. The unique combination of curcumin and *Boswellia serrata*, with enhanced absorption through SpeedTech methodologies, ensures that Rhuleave-K provides a safe and natural solution for those seeking nonpharmacological therapies to manage pain.

### References:

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