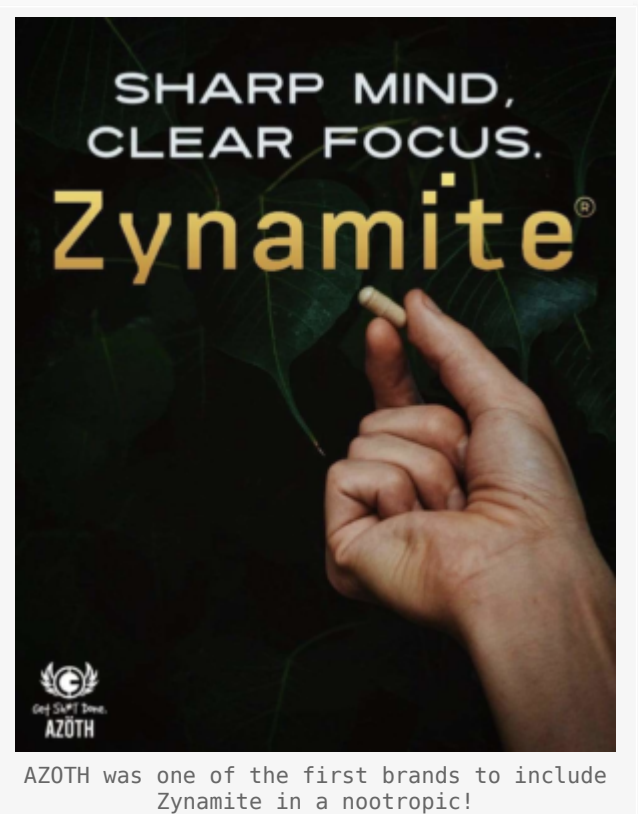


# Zynamite: 2020's Next Generation Nootropic Ingredient

written by Mike Roberto | June 25, 2020

Every now and then, a new ingredient comes onto the supplement scene and is marketed as the “*next big thing*”. A major focus in the sports supplement industry is with *stimulants*. Currently, caffeine is the most widely-used and accepted stimulant available, and that’s not going to change anytime soon. It’s in nearly every pre workout, energy drink, and is even found in some functional foods.



Unfortunately, excessive amounts of caffeine can lead to negative side effects, including *rapid heart rate, increased blood pressure, jitters, and anxiety* – due to its large effect on the cardiovascular system.

Over the years, we’ve seen several new stimulants enter the supplement market, but the majority of them are now considered to be illegal or, at best, considered to be “grey market” substances. However, there have been some newcomers with a lot of potential.

Two of the most popular neuro-activating/stimulatory agents on the market are *TeaCrine* and *Dynamine*. However, more often than not, they’re paired with caffeine to produce a synergistic effect and rarely used as a replacement for caffeine. Both are known for stimulating the central nervous system and increasing mental and physical energy without impacting the cardiovascular system. They may not be as effective as caffeine on their own, but when combined

with caffeine, you can use a much lower dose of caffeine and still get similar benefits.

## The Connection Between *Nootropics* and *Zynamite*

When most people think of caffeine, their mind immediately goes to *energy*, but what about *focus*? **Nootropics** are supplements designed to *increase mental energy, focus, and clarity* – essentially, they help you get into the *zone* and hopefully stay there.



Nootropics are popular because they're incredibly versatile – you can use them for work, studying, gaming, and anything else that requires intense concentration. Not too long ago, there were few excellent nootropics available, but now, nearly every supplement company is trying to formulate the next best focus agent.

What separates these supplements are of course the ingredients. Formulators are always looking for something new, and one novel ingredient that has begun to stand out is **Zynamite**. This novel ingredient is featured in some of the best selling nootropics on the market, such as *AZOTH Total Focus* and *Morphogen Nutrition Morphobrain*. It's even been advertised as "*caffeine's replacement*", but is that really true?

Today we'll find out, because we're about to dive deep into the research to find out if Zynamite is worth the hype, and reveal all of its potential uses and benefits!

But before we go any further, make sure to subscribe down below as more research and information becomes available about this new, innovative ingredient!

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## Zynamite Ingredient Overview

Zynamite is a proprietary *Mangifera indica* (mango leaf) extract patented (US10537604B2) by an ingredient developer named **Nektium**. [1,2] Zynamite is standardized to contain at least 60% or more of its main bioactive constituent, *mangiferin*. [1]



Zynamite is self-affirmed GRAS! Image courtesy of Nektium.

Zynamite is known for increasing both mental and physical performance and is considered to be a potent nootropic. In addition, Zynamite is *GRAS-affirmed*, which stands for “*generally recognized as safe*”, at clinically substantiated dosages. [1] The key benefits of Zynamite include

- Rapid onset of mental activation
- Faster reaction time
- Increased physical and mental performance, and
- *No adverse side effects*. [1]

This makes Zynamite extremely versatile – it can be used in gaming supplements, pre workouts, non-stim pre workouts, nootropics, energy drinks, and post workout recovery products. [1]

In the past two years alone, Zynamite has already won multiple awards from *Nutra Ingredients*, *Frost & Sullivan*, and *European Specialist Sports Nutrition*. [1] It's begun to make waves in the supplement industry, but the question remains: how does Zynamite work and where's the research to support these claims?

## Zynamite Research

As of writing this article, there are seven studies assessing the efficacy and safety of Zynamite:

- **Study 1: CNS stimulation, enhanced cognitive function, and synergy with caffeine**

One of the first studies conducted on Zynamite was published in 2018 and set out to determine if Zynamite would have similar stimulatory effects on the central nervous system (CNS) as caffeine. In order to answer this question, the researchers used two different animal models: *field potential analysis* in freely moving rats and the induction of *long term potentiation* in the *hippocampus* – a section of the brain that's primarily involved in long-term memory storage. [3]

The logo for Nektium, featuring the word "nektium" in a bold, blue, lowercase sans-serif font.

Nektium is on the cutting edge of ingredient development and they're the creators of Zynamite!

The rats were given one of the following:

1. placebo (*NaCl solution*)
2. 25mg/kg of Zynamite
3. 0.5mg/kg of caffeine
4. 25mg/kg Zynamite plus 0.25mg/kg caffeine, or
5. 25mg/kg Zynamite plus 0.5mg/kg of caffeine.

With specialized electrodes, the researchers were able to measure the activity in the rats' *frontal cortex*, *hippocampus*, *striatum*, and *reticular formation*. They compared the results between groups during various time frames after administration, (*5-65 min*, *65-125 min*, and *5-125 min*). The results showed that **both caffeine and Zynamite in isolation induced statistically significant**

**attenuation of spectral power within the first hour after administration.**[3]

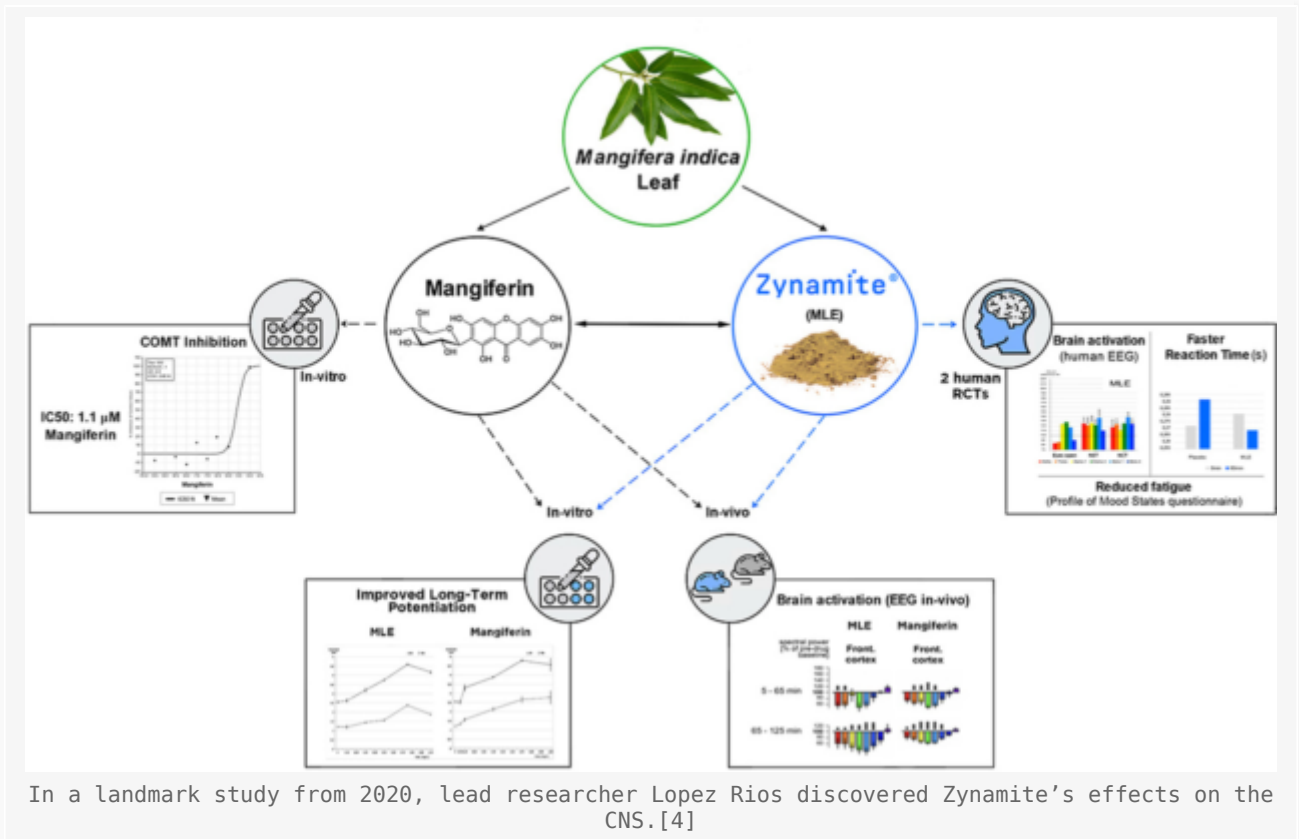
They reported that Zynamite specifically attenuated the *beta-1* and *alpha-2 spectral frequencies*. Since *alpha-2* waves are primarily affected by *dopamine*, a catecholamine neurotransmitter, it's proposed that Zynamite carries out some of its stimulatory effects through activation of dopamine receptors. Whereas, *beta-1* waves are primarily affected by a neurotransmitter called *glutamate*. Interestingly enough, cognitive-demanding tasks typically lead to alterations in the *glutamatergic system*, and ***mangiferin* has previously been shown to improve memory in rats.**[3]

Furthermore, the results show that *alpha-1* waves were significantly attenuated by Zynamite in the second hour after administration. *Serotonin* is the primary neurotransmitter that controls *alpha-1* waves and **the researchers interpreted this finding as an increase in wakefulness**. What's even more interesting is that the *combination of low dose caffeine and Zynamite had a synergistic effect in attenuating nearly all frequencies in all areas of the brain.*[3]

From the second part of their study, the researchers reported that Zynamite alone and in combination with caffeine resulted in **enhanced long-term potentiation**, which is a measurement of *time and space dependent memory*. Thus, *the main conclusion was Zynamite and caffeine act in a similar way to stimulate the CNS and increases cognitive function, suggesting that it could be a potential replacement for caffeine.*[3]

- **Study 2: Zynamite and CNS Activity**

Two years later, a landmark study published 2020 was conducted to determine if *mangiferin*, what's known as the *primary bioactive constituent* of mango leaf extract (MLE), is responsible for Zynamite's *neurocognitive activity*, and if the central nervous system effects of MLE has *translational potential*. This study actually consisted of *three separate studies in one* – it included *one in-vitro study and two double-blind randomized placebo-controlled crossover clinical trials.*[4]



## In-vitro study

The in-vitro testing was performed to assess mangiferin's effects on *radioligand binding and enzyme inhibition*. Interestingly enough, they found that isolated mangiferin is a *selective antagonist of catechol-O-methyltransferase (COMT)*. COMT is an enzyme that's primarily responsible for the breakdown of *catecholamines*, including *dopamine, norepinephrine, and epinephrine*. [4]

Catecholamines are hormones that get secreted by the adrenal glands in stressful situations and are heavily involved in your *sympathetic nervous system*, also known as your "*fight or flight*" response. Typically, during intense exercise or mentally demanding tasks, catecholamine levels become depleted which is one of the reasons why you feel both physical and mental fatigue. Therefore, taking a substance that blocks this from occurring is advantageous for peak mental and physical performance. [4]



They also noted that the in-vitro study revealed that mangiferin had *no effect on the same CNS targets as caffeine, including adenosine receptors and phosphodiesterase 4 enzymes*. This suggests that **there could be a strong synergistic effect between mangiferin and caffeine since they work on different pathways**. [4]

In addition, they found that both mango leaf extract extract *and* isolated mangiferin produced similar effects in *long-term potentiation* within the hippocampus. This supports the idea that **mangiferin is the primarily bioactive constituent of mango leaf extract**, especially in the context of *brain boosting benefits*. [4]

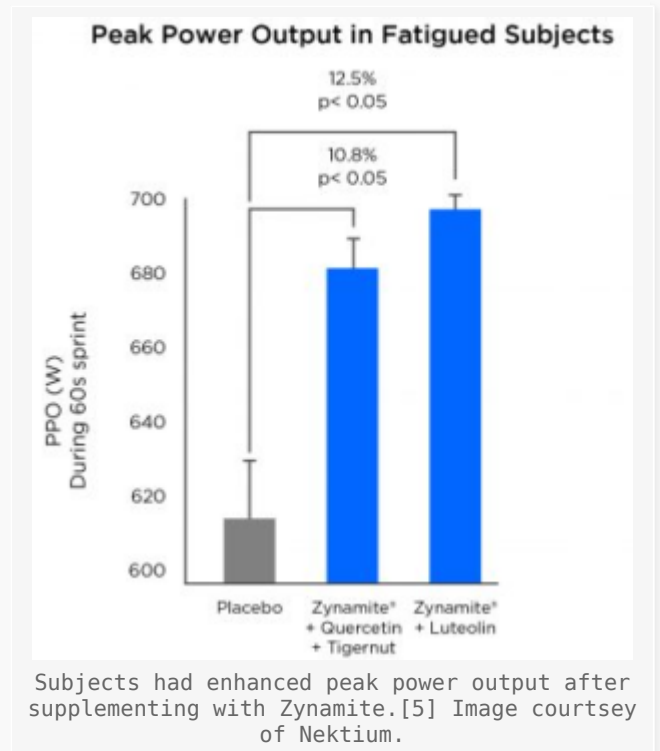
### Human clinical trials

In both human clinical trials, mango leaf extract was *well tolerated* and there were *no reported cardiovascular side effects*. This is a key finding, because one of the issues with an excessively high caffeine intake is negative effects on the cardiovascular system, such as rapid heartbeat, palpitations, and increased blood pressure. [4]

According to the results of the two clinical trials, the researchers concluded that mango leaf extract can *modulate brain electrical activity during challenging cognitive tasks, significantly increase reaction time, and decrease self-reported mental fatigue* compared to a placebo. [4]

It's also important to note that the sample size was relatively small with only 16 individuals, and these positive effects were noticed after just a *single dose of mango leaf extract at 500mg*. [4] Therefore, more research is warranted to truly understand Zynamite's *full potential*.

- **Study 3: Enhanced power output**



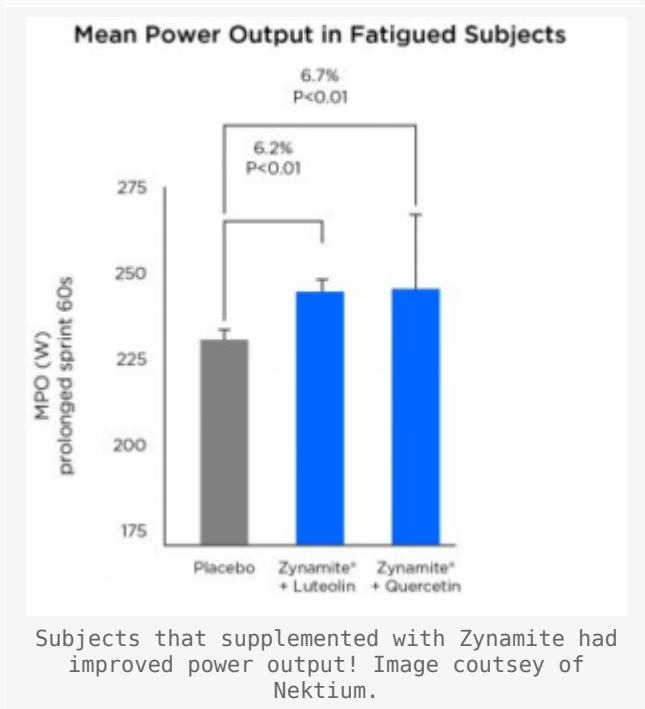
In the next study, researchers recruited 17 men and 13 females to determine the performance-enhancing effects of two different combinations. The participants were randomly assigned to review one of three treatments:

- Treatment A was the placebo group (500mg of maltodextrin per day)
- Treatment B consisted of 140mg mango leaf extract (MLE) (60% mangiferin content) with 50mg of luteolin per day.
- Treatment C included 140mg MLE with 600mg quercetin and 350mg tiger nut extract per day.[5]

The participants were instructed to take *one capsule three times per day every 8 hours*. The subjects started the treatment two days prior to being tested in the lab and pre-tests were performed on all subjects to obtain a baseline measurement. The primary outcome was *overall sprint performance on a cycle ergometer*, which was assessed by *peak power output, mean power output, brain oxygenation, vastus lateralis oxygenation, and V02*. [5]

Participants performed two 30 second Wingate tests and another 60 second sprint with 4 min rest period in between. At the end of the 60 second sprint, the participants' legs were occluded for 20 seconds to mimic *ischemia*. After that, the cuffs were released and the subjects had to perform another 15 second sprint.[5]





The results showed that both supplements containing **mango leaf extract** resulted in a **significant improvement in physical performance**, but they slightly favored the combination of *MLE, tiger nut, and quercetin*. [5]

**Both mango leaf extract supplements resulted in increased peak and mean power output, improved oxygen extraction by the vastus lateralis and the females experienced an increase in peak  $\dot{V}O_2$** . Thus, they concluded that both MLE supplements were highly effective *ergogenic aids* and specifically noted that the combination of MLE, tiger nut, and quercetin *enhanced muscle contraction* after a period of ischemia, which means lack of oxygen and blood flow. [5]

More research is needed to fully understand mango leaf extract and mangiferin's mechanism of action, but the researchers speculate that MLE may induce performance enhancement by *increasing cAMP, facilitating calcium release in a fatigued state, reducing perceived level of pain, improving contractile efficiency and mitochondrial function*.

In summary, MLE is capable of enhancing muscular power in individuals under fatigue, but does not increase the consumption of oxygen, or affect blood lactate levels. [5]

- **Study 4: Improved exercise performance**

The same lead researcher of the study discussed above decided to further investigate *Zynamite* and *luteolin's* effects on exercise performance. It was reported that both compounds had significant *free-radical scavenging properties* which activate the *endogenous antioxidant gene program* and down regulates the expression of enzymes that produce *superoxide*. [6]

In order to determine if these two *polyphenols* could boost exercise performance, the researchers recruited 12 physically active men to perform incremental exercise bouts to exhaustion. The researchers used a combination of *luteolin* (as *peanut husk extract containing 95% luteolin (PHE)*) and *mango leaf extract (MLE)* (as *Zynamite*). They tested two amounts of dosages – low doses – 50mg/day of PHE plus 140mg/day of Zynamite and high doses – 100mg/day of PHE plus 420mg/day of Zynamite.[6]



Subjects were randomly assigned to receive either a placebo containing 500mg of *maltodextrin* or the combination of Zynamite and PHE. Since there were only 12 participants, three of them got the low dose capsules of Zynamite+PHE and the other three got the high dose capsules, the remaining six were given the placebo. Subjects ingested the assigned supplement every eight hours over the course of 15 days, and then there was a 3-4 week washout period. After that, the test was repeated – but this time the placebo group received the treatment and the treatment group got the placebo.[6]

After just 48 hours of starting supplementation, the participants performed the prescribed exercise protocol on a cycle ergometer. Subjects did sprints on the bike until exhaustion, then a *ischemia/reperfusion* protocol was implemented to occlude the legs from blood flow and oxygen delivery. The results showed that **the combination of Zynamite+PHE enhanced exercise performance during the high intensity exercise and increased muscle oxygen extraction.**[6]

Furthermore, the Zynamite+PHE supplement was capable of *improving performance even after a period of ischemia/reperfusion*. The researchers attributed this effect to three mechanisms:

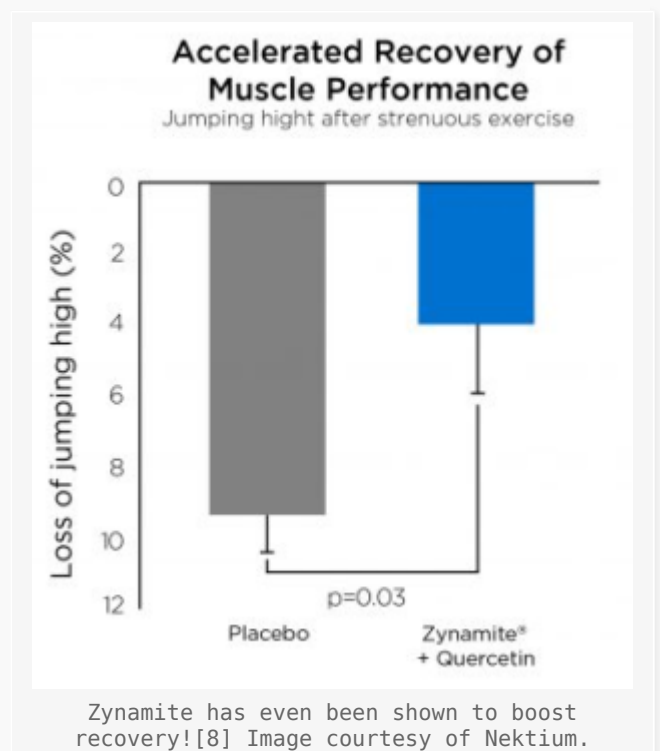
1. enhanced muscle oxygen extraction
2. *reduced oxygen consumption*, and
3. *improved ATP production through the recruitment of glycolytic energy systems*.

They also found that **brain oxygenation was improved and mean power output increased**. No significant differences were reported between the two dosages of Zynamite and PHE.[6]

- **Study 5: Enhanced peak power output during repeated-sprint exercise**

The next study assessed the combination of *Zynamite* with *Quercetin* on *peak power output* in both males and females. It was conducted by the same lead researcher as the two previous studies, therefore you can tell it's a major area of research for him.

The aim of this study was to assess if supplementing with Zynamite and quercetin *one hour* prior to exercise would *improve repeated sprint performance*. The previous study showed that Zynamite supplementation enhanced performance when consumed *48 hours* prior to exercise, but at the time, the acute effects were unknown.[7]



This study included 40 physically active adults (20 males and 20 females). The subjects were randomly divided into three groups:

- Treatment group A received 140mg Zynamite plus 140mg of quercetin, 147.7mg maltodextrin, and 420mg of sunflower lecithin

- Treatment group B received *140mg of Zynamite plus 140mg of quercetin, and*
- *2126mg of maltodextrin, and*
- Treatment group C served as the placebo and were administered *2,548mg of maltodextrin.*[7]

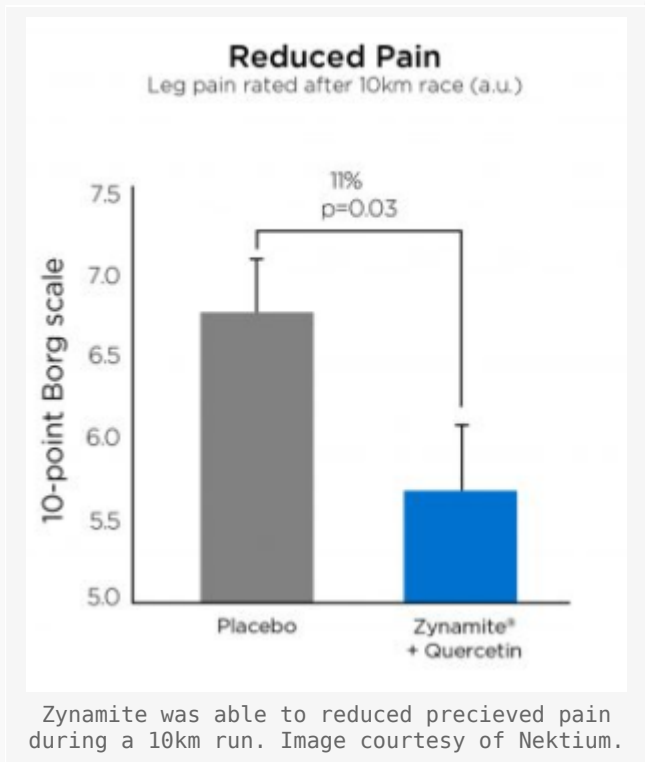
All subjects performed *three Wingate tests* with four minutes of recovery in between and a 15 second sprint followed by a period of *ischemia*. *Treatment group A and B had improved peak power output* during the Wingate tests, *enhanced vastus lateralis oxygen extraction, increased oxygen extraction after the period of ischemia*, and some of the male participants had a *significant decrease in blood lactate concentration.*[7]

The researchers concluded that acute supplementation of Zynamite combined with quercetin *enhances sprint performance, muscle oxygen extraction, and mitochondrial oxygen consumption*. Furthermore, since there were no significant differences between treatment groups A and B – they noted that the additional phospholipids from the additional sunflower lecithin did not provide any more benefits.[7]

- **Study 6: Decreased muscle damage, pain, and increased recovery**

This article was also published in 2020, further exploring Zynamite's potential performance enhancing effects. Similar to the study above, the researchers used a combination of *Zynamite and quercetin*, but this time, they looked at its effects on *muscle damage, pain, and recovery.*[8]

They recruited 24 women and 33 men to participate in this study and randomly assigned them to two groups matched by gender and 5k running performance. One group received *140mg of Zynamite plus 140mg of quercetin* and the other group were given a placebo filled with *728mg of maltodextrin.*[8]



The subjects were instructed to take the supplement one hour before the trial and every 8 hours afterwards for 24 hours. The exercise test consisted of a 10km run followed by 100 drop jumps. The goal was to induce as muscular damage as possible through exercise.[8]

The results showed no significant differences between the groups as far as race times in the 10km, however they did note that **the treatment group had decreased perceived pain after the race, a lower drop-off in jump performance, and better mechanical impulse 24 hours afterwards.**[8]

The researchers also noted that the supplementation *inhibited the increase of serum myoglobin and alanine aminotransferase*, but that was only observed in men. They concluded that Zynamite plus quercetin supplementation before and after exercise is capable of *attenuating muscle damage, pain, and increases recovery.*[8]

They speculate that the decrease in pain perception after exercise is most likely attributed to Zynamite and quercetin's *free radical scavenging properties* and ability to inhibit enzymes that produce *reactive oxygen species*. In addition, Zynamite has *potent anti-inflammatory properties*, which also may improve recovery and muscular damage.[8]

- **Study 7: Zynamite toxicology assessment**

The last study we're going to discuss does not assess Zynamite's effect on physical or mental performance, but it's crucial for ensuring the *safety* of the ingredient and recommended dosages. What's even more important is that

they specifically used Zynamite in this study which is standardized to contain 60% of the primary bioactive constituent, *mangiferin*. This allows us to directly correlate their findings with Zynamite.[9]

Through various *in-vitro* and *in-vivo* assessments, along with a *90-day repeated dose toxicity study*, the researchers were able to conclude that the *no observed adverse effect level* for Zynamite in rats was approximately **2,000 mg/kg of body weight per day**. [9]

It's important to note that this was performed in both male and female rats, however, 2,000mg/kg of body weight is *well* above the recommended dosages of Zynamite.[9] Therefore, we're fairly confident that it's safe to ingest and the chance of seeing adverse effects are extremely low.



Zynamite is incredibly versatile and can be included in several different supplements! Image courtesy of Nektium.

## Recommended Dosing and Where to Find Zynamite

According to the literature and the ingredient supplier, the recommended dosage for Zynamite falls between *140mg-200mg once or twice per day*. [10] Some of the top selling products that contain an efficacious dose of Zynamite are **AZOTH Total Focus**, **AZOTH Pure Zynamite**, and **Morphogen Nutrition MorphoBrain**.

## All PricePLOW Articles Mentioning Zynamite

- Ekkovision Formula 2.1: New-Gen Pre-Workout with 7 Trademarked Ingredients Posted on: July 25, 2022
- Unbound UNLOAD Pre Workout: Prepare to Unload on the Weights Posted on: June 17, 2021
- Zynamite: 2020's Next Generation Nootropic Ingredient Posted on: June 25, 2020
- Azoth Total Focus: Stop Procrastinating with Zynamite Posted on: June 17, 2020

This ingredient is starting to increase in popularity, so don't be surprised if more products, such as pre workouts, single-ingredient, and nootropics, start including it!

### Final Thoughts: Be On The Lookout For Zynamite

Although more research is needed before any major claims can be made, the research looks very promising for Zynamite.



AZOTH Total Focus is powered by Zynamite.

Several studies have shown an increase in both *mental and physical performance* with Zynamite supplementation. Furthermore, there seems to be a *strong synergistic effect* between moderate doses of Zynamite and low doses of caffeine. This combination can be very *advantageous* for nootropics, since they are designed to boost mental energy, focus, clarity, without going too overboard.

It's also great to see that Zynamite has a different mechanism of action than

caffeine and does not affect the cardiovascular system. We speculate that this ingredient has a lot more potential and may be the next big thing in the supplement industry. We've already noticed that some well-known brands have included Zynamite in their nootropics, and based on the feedback, are doing extremely well.

Based on the exercise performance research, Zynamite could be an innovative and novel ingredient to include in a pre workout. Although the majority of exercise research was conducted on Zynamite in combination with another ingredient, it still has major potential. Since Zynamite is caffeine-free it could be used in both stimulant-free and regular pre workouts.

**As more research comes out, we will be updating this article, so make sure to subscribe down below for the latest information on Zynamite!**

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