a fórmula

CITRIMAX®

Uma nova forma da *Garcinia* concentrada

Estudos

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a fórmula

CITRIMAX®

Uma nova forma da *Garcinia* concentrada

DESCRIÇÃO

Citrimax® é um pó marrom extraído do fruto seco da planta *Garcinia cambogia*, padronizado em 60% de ácido hidroxicítrico (HCA) ligado a cálcio e potássio.

MECANISMO DE AÇÃO

O **Citrimax®** (HCA) possui destaque como inibidor da enzima ATP citrato-liase que consequentemente diminui a liberação da acetilcoenzima A, gerando um aumento do glicogênio hepático e funcionando como sacietógeno e regulador do peso. O **Citrimax®** (HCA) também promove oxidação de ácidos graxos, aumenta a liberação de serotonina e sua disponibilidade no córtex cerebral, reduzindo o apetite e diminui a concentração de leptina no soro humano, sendo esta, uma proteína transcrita pelo gene da obesidade e secretada pelos adipócitos.

INDICAÇÕES

- ✓ Inibe a produção de gordura;
- ✓ Aumenta a saciedade e queima de gordura;
- ✓ Diminui os níveis de colesterol total e LDL;
- ✓ Reduz IMC;
- ✓ Regula os níveis de leptina.

DOSE USUAL

Recomendação oral de 1,5 a 4,5 g ao dia de **Citrimax®**, uma hora antes das principais refeições.

SUGESTÕES DE FÓRMULAS

Citrimax® (*Garcinia cambogia* - 60% HCA)..... 500 mg
Slendesta™ (*Russet Nugget* – 5%PI2)..... 300 mg

Modo de uso: 1 dose, 2 vezes ao dia, 1 hora antes do almoço e jantar.
Indicação: controle da ingestão calórica.

Citrimax® (*Garcinia cambogia* - 60% HCA)..... 750 mg
Vinitrox® (*Malus domestica* e *Vitis spp* - polifenóis).....125 mg
Shake qsp.....1 dose

Modo de uso: dissolver 1 dose em 1 copo com leite ou água, 2 vezes ao dia, 1 hora antes do almoço e jantar.
Indicações: melhor desempenho físico e queima de gordura.

PRINCIPAIS REFERÊNCIAS

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a fórmula

CITRIMAX®

ESTUDOS CLÍNICOS

An overview of the safety and efficacy of a novel, natural (-)-hydroxycitric acid extract (HCA-SX) for weight management

Garcinia cambogia-derived (-)-hydroxycitric acid (HCA) is a safe, natural supplement for weight management. HCA is a competitive inhibitor of ATP citrate lyase, a key enzyme which facilitates the synthesis of fatty acids, cholesterol and triglycerides. Previous studies in our laboratories have demonstrated the superior bioavailability of a novel calcium-potassium salt of HCA derived from *Garcinia cambogia* (HCA-SX, Super CitriMax). Greater bioavailability of HCA-SX was observed when taken on an empty stomach. HCA-SX was also shown to exhibit concentration-dependent release of serotonin in isolated rat brain cortex, which may explain its appetite suppressive action. Acute oral, acute dermal, primary dermal irritation, primary eye irritation and 90-day chronic toxicity studies, as well as Ames bacterial reverse mutation and mouse lymphoma tests, were assessed to determine the safety of HCA-SX. In the 90-day toxicity study, dose- and time-dependent effects of HCA-SX were assessed on body weight, selected organ weights, hepatic and testicular lipid peroxidation and DNA fragmentation, hematology and clinical chemistry, and histopathology in male and female Sprague-Dawley rats. No remarkable toxicity results were detected, demonstrating the safety of HCA-SX. Furthermore, clinical studies to evaluate the safety and efficacy of HCA-SX over a period of eight weeks were conducted in 60 human volunteers. Subjects were given a 2,000 kcal diet/day, participated in a 30 min walking exercise program 5 days/week and given an oral dose of placebo or 4666.7 mg HCA-SX (providing 2,800 mg HCA) in three equally divided doses 30-60 min before meals, Body weight, BMI, lipid profiles, serum leptin, serotonin and excretion of urinary fat metabolites were determined at 0, 4 and 8 weeks of treatment. At the end of 8 weeks, body weight and BMI decreased by 5.4% and 5.2%, respectively. Food intake, total cholesterol, LDL, triglycerides and serum leptin levels were significantly reduced, while HDL and serotonin levels and excretion of urinary fat metabolites (a biomarker of fat oxidation) significantly increased. No significant adverse effects were reported. These results demonstrate the safety, bioavailability and efficacy of HCA-SX in weight management.

Super CitriMax® (HCA-SX) attenuates increases in oxidative stress, inflammation, insulin resistance, and body weight in developing obese Zucker rats

Super CitriMax (HCA-SX) is a novel calcium/potassium salt of (−)-hydroxycitric acid extracted from the dried fruit rind of the plant *Garcinia cambogia*, and commonly consumed as weight loss dietary supplement. In the present study, we investigated the effect of HCA-SX on inflammation, oxidative stress and insulin resistance in developing obese Zucker rats, an animal model of type II diabetes associated with inflammation and oxidative stress. Male Zucker rats (5-week old) were supplemented with vehicle (control) and HCA-SX in drinking water for 7 weeks. Oxidative stress markers, including malondialdehyde (MDA), protein carbonyl (DNPH), and protein tyrosine nitration (tyr-NO2) were measured in the liver and kidney tissues using biochemical and immunoblotting techniques. Compared to controls, the levels of MDA, DNPH and tyr-NO2 were lower in the liver and kidney of HCA-SX-treated animals. Furthermore, the levels of C-reactive protein and interleukin-6, markers of inflammation measured by ELISA, were lower in the plasma of HCA-SX-supplemented animals compared to controls, as were levels of fasting plasma insulin, glucose, and triglycerides. Interestingly, insulin resistance did not develop in HCA-SX-supplemented rats. Food-intake and body weight gain was also lower in rats supplemented with HCA-SX compared to their control counterparts. These results suggest that HCA-SX supplementation in obese Zucker rats reduces food-intake, body weight gain, and also attenuates the increases in inflammation, oxidative stress, and insulin resistance observed in untreated animals. Therefore, HCA-SX may be used as an intervention to overcome obesity-related complications, including inflammation, oxidative stress, and insulin resistance.

Safety assessment of (−)-hydroxycitric acid and Super CitriMax®, a novel calcium/potassium salt

(−)-Hydroxycitric acid (HCA) is a principle constituent (10–30%) of the dried fruit rind of *Garcinia cambogia*, a plant native to Southeastern Asia. The dried rind has been used for centuries throughout Southeast Asia as a food preservative, flavoring agent and carminative. Extensive experimental studies show that HCA inhibits fat synthesis and reduces food intake. The objective of this review is to systematically review the available safety/toxicity literature on HCA to determine its safety in-use. The primary mechanism of action of HCA appears to be related to its ability to act as a competitive inhibitor of the enzyme ATP-citrate lyase, which catalyzes the conversion of citrate and coenzyme A to oxaloacetate and acetyl coenzyme A (acetyl-CoA), primary building blocks of fatty acid and cholesterol synthesis. Super CitriMax®, a novel calcium/potassium–HCA extract (HCA-SX), is considerably more soluble and bioavailable than calcium-based HCA ingredients. Acute oral toxicity studies in animals demonstrate that CitriMax (50% HCA as calcium salt) has a low acute oral toxicity. In a subchronic study in rats, the gavage administration of HCA-SX at doses up to 2500 mg/kg/day for a period of 90 days caused a significant decrease in body weight and reduction in feed consumption without any adverse effects. The structure, mechanism of action, long history of use of HCA and other toxicity studies indicate that HCA-SX is unlikely to cause reproductive or developmental effects. HCA-SX was not mutagenic in the presence or absence of metabolic activation in Ames genotoxicity assays in strains TA98 and TA102. HCA-SX-induced increases in number of revertants in other strains (TA100 and TA1535 in the absence of metabolic activation and in strain TA1537 in the presence of metabolic activation) but these were not considered as biologically indicative of a mutagenic effect. In several, placebo-controlled, double-blind trials employing up to 2800 mg/day HCA, no treatment-related adverse effects were reported. There is sufficient qualitative and quantitative scientific evidence, including animal and human data suggesting that intake of HCA at levels up to 2800 mg/day is safe for human consumption.

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Body Weight and Abdominal Fat Gene Expression Profile in Response to a Novel Hydroxycitric Acid-Based Dietary Supplement

Obesity is a global public health problem, with about 315 million people worldwide estimated to fall into the WHO-defined obesity categories. Traditional herbal medicines may have some potential in managing obesity. Botanical dietary supplements often contain complex mixtures of phytochemicals that have additive or synergistic interactions. The dried fruit rind of Garcinia cambogia, also known as Malabar tamarind, is a unique source of (−)-hydroxycitric acid (HCA), which exhibits a distinct sour taste and has been safely used for centuries in Southeastern Asia to make meals more filling. Recently it has been demonstrated that HCA-SX or Super Citrimax, a novel derivative of HCA, is safe when taken orally and that HCA-SX is bioavailable in the human plasma as studied by GC-MS. Although HCA-SX has been observed to be conditionally effective in weight management in experimental animals as well as in humans, its mechanism of action remains to be understood. We sought to determine the effects of low-dose oral HCA-SX on the body weight and abdominal fat gene expression profile of Sprague-Dawley rats. We observed that at doses relevant for human consumption dietary HCA-SX significantly contained body weight growth. This response was associated with lowered abdominal fat leptin expression while plasma leptin levels remained unaffected. Repeated high-density microarray analysis of 9960 genes and ESTs present in the fat tissue identified a small set (1% of all genes screened) of specific genes sensitive to dietary HCA-SX. Other genes, including vital genes transcribing for mitochondrial/nuclear proteins and which are necessary for fundamental support of the tissue, were not affected by HCA-SX. Under the current experimental conditions, HCA-SX proved to be effective in restricting body weight gain in adult rats. Functional characterization of HCA-SX-sensitive genes revealed that upregulation of genes encoding serotonin receptors represent a distinct effect of dietary HCA-SX supplementation.

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Dose- and time-dependent effects of a novel (-)-hydroxycitric acid extract on body weight, hepatic and testicular lipid peroxidation, DNA fragmentation and histopathological data over a period of 90 days

(-)-Hydroxycitric acid (HCA), a natural extract from the dried fruit rind of Garcinia cambogia (family Guttiferae), is a popular supplement for weight management. The dried fruit rind has been used for centuries as a condiment in Southeastern Asia to make food more filling and satisfying. A significant number of studies highlight the efficacy of Super CitriMax (HCA-SX, a novel 60% calcium-potassium salt of HCA derived from Garcinia cambogia) in weight management.

These studies also demonstrate that HCA-SX promotes fat oxidation, inhibits ATP-citrate lyase (a building block for fat synthesis), and lowers the level of leptin in obese subjects. Acute oral, acute dermal, primary dermal irritation and primary eye irritation toxicity studies have demonstrated the safety of HCA-SX. However, no long-term safety of HCA-SX or any other (-)-hydroxycitric acid extract has been previously assessed. In this study, we have evaluated the dose- and time-dependent effects of HCA-SX in Sprague-Dawley rats on body weight, hepatic and testicular lipid peroxidation, DNA fragmentation, liver and testis weight, expressed as such and as a % of body weight and brain weight, and histopathological changes over a period of 90 days. The animals were treated with 0, 0.2, 2.0 and 5.0% HCA-SX as feed intake and the animals were sacrificed on 30, 60 or 90 days of treatment. The feed and water intake were assessed and correlated with the reduction in body weight. HCA-SX supplementation demonstrated a reduction in body weight in both male and female rats over a period of 90 days as compared to the corresponding control animals. An advancing age-induced marginal increase in hepatic lipid peroxidation was observed in both male and female rats as compared to the corresponding control animals. However, no such difference in hepatic DNA fragmentation and testicular lipid peroxidation and DNA fragmentation was observed. Furthermore, liver and testis weight, expressed as such and as a percentage of body weight and brain weight, at 30, 60 and 90 days of treatment, exhibited no significant difference between the four groups. Taken together, these results indicate that treatment of HCA-SX over a period of 90 days results in a reduction in body weight, but did not cause any changes in hepatic and testicular lipid peroxidation, DNA fragmentation, or histopathological changes.

Physico-chemical properties of a novel (-)-hydroxycitric acid extract and its effect on body weight, selected organ weights, hepatic lipid peroxidation and DNA fragmentation, hematology and clinical chemistry, and histopathological changes over a period of 90 days

Garcinia cambogia-derived (-)-hydroxycitric acid (HCA) is a popular and natural supplement for weight management. HCA is a competitive inhibitor of the enzyme ATP citrate lyase, which catalyzes the conversion of citrate and coenzyme A to oxaloacetate and acetyl coenzyme A (acetyl CoA) in the cytosol. Acetyl CoA is used in the synthesis of fatty acids, cholesterol and triglycerides, and in the synthesis of acetylcholine in the central nervous system. Studies have demonstrated the efficacy of a novel 60% calcium-potassium salt of HCA derived from Garcinia cambogia (HCA-SX, Super CitriMax) in weight management. Results have shown that HCA-SX promotes fat oxidation, enhances serotonin release and availability in the brain cortex, normalizes lipid profiles, and lowers serum leptin levels in obese subjects. Acute oral, acute dermal, primary dermal irritation and primary eye irritation toxicity, as well as Ames bacterial reverse mutation studies and mouse lymphoma tests have demonstrated the safety of HCA-SX. However, no detailed long-term safety of HCA-SX or any other HCA extract has been previously assessed. We evaluated the dose- and time-dependent effects of HCA-SX in Sprague-Dawley rats on body weight, selected organ weights, hepatic lipid peroxidation and DNA fragmentation, hematology and clinical chemistry over a period of 90 days. Furthermore, a 90-day histopathological evaluation was conducted. The animals were treated with 0, 0.2, 2.0 and 5.0% HCA-SX of feed intake and were sacrificed on 30, 60 or 90 days of treatment. The body weight and selected organ weights were assessed and correlated as a % of body weight and brain weight at 90 days of treatment. A significant reduction in body weight was observed in treated rats as compared to control animals. An advancing age-induced marginal increase in hepatic lipid peroxidation was observed in both male and female rats, while no such difference in hepatic DNA fragmentation was observed as compared to the control animals. Furthermore, selected organ weights individually and as a % of body weight and brain weight at 90 days of treatment exhibited no significant difference between the groups. No difference was observed in hematology and clinical chemistry or the histopathological evaluation. Taken together, these results show that 90 day treatment of HCA-SX results in a reduction in body weight, and does not cause any changes in major organs or in hematology, clinical chemistry, and histopathology.

Bioefficacy of a novel calcium-potassium salt of (-)-hydroxycitric acid

Obesity is associated with cardiovascular disease, diabetes and certain forms of cancer. Popular strategies on weight loss often fail to address many key factors such as fat mass, muscle density, bone density, water mass, their inter-relationships and impact on energy production, body composition, and overall health and well-being. (-)-Hydroxycitric acid (HCA), a natural plant extract from the dried fruit rind of Garcinia cambogia, has been reported to promote body fat loss in humans without stimulating the central nervous system. The level of effectiveness of G. cambogia extract is typically attributed solely to HCA. However, other components by their presence or absence may significantly contribute to its therapeutic effectiveness. Typically, HCA used in dietary weight loss supplement is bound to calcium, which results in a poorly soluble (<50%) and less bioavailable form. Conversely, the structural characteristics of a novel Ca2+/K+ bound (-)-HCA salt (HCA-SX or Super CitriMax) make it completely water soluble as well as bioavailable. An efficacious dosage of HCA-SX (4500 mg/day t.i.d.) provides a good source of Ca2+ (495 mg, 49.5% of RDI) and K+ (720 mg, 15% of RDI). Ca2+ ions are involved in weight management by increasing lipid metabolism, enhancing thermogenesis, and increasing bone density. K+, on the other hand, increases energy, reduces hypertension, increases muscle strength and regulates arrhythmias. Both Ca and K act as buffers in pH homeostasis. HCA-SX has been shown to increase serotonin availability, reduce appetite, increase fat oxidation, improve blood lipid levels, reduce body weight, and modulate a number of obesity regulatory genes without affecting the mitochondrial and nuclear proteins required for normal biochemical and physiological functions.

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The effect of (-)-hydroxycitrate on energy intake and satiety in overweight humans

OBJECTIVE: Assessment of the effects of 2 weeks of daily administration of HCA on energy intake and satiety in overweight men and women. DESIGN: A 6-week randomized placebo-controlled single-blinded cross-over trial.
SUBJECTS: consumed three times daily for 2 weeks 100 ml tomato juice (placebo) and, separated by a 2 week wash-out period, 100 ml tomato juice with 300 mg HCA.Subjects: Twelve males and 12 females (body mass index 27.5+/-2.0 kg/m(2); age 37+/-10 y). MEASUREMENTS: After 2 weeks, 24 h energy intake (EI), appetite profile, hedonics, mood and possible change in dietary restraint were assessed in the laboratory restaurant. Prevention of degradation and bio-availability was documented. RESULTS: Twenty-four-hour EI was decreased by 15-30% ($P<0.05$) with HCA treatment compared to placebo, without changes in the appetite profile, dietary restraint, mood, taste perception and hedonics, while body weight tended to decrease ($P=0.1$). CONCLUSION: HCA treatment reduced 24 h EI in humans while satiety was sustained.

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Safety and mechanism of appetite suppression by a novel hydroxycitric acid extract (HCA-SX)

A growing body of evidence demonstrates the efficacy of Garcinia cambogia-derived natural (-)-hydroxycitric acid (HCA) in weight management by curbing appetite and inhibiting body fat biosynthesis. However, the exact mechanism of action of this novel phytopharmaceutical has yet to be fully understood. In a previous study, we showed that in the rat brain cortex a novel HCA extract (HCA-SX, Super CitriMax) increases the release/availability of radiolabeled 5-hydroxytryptamine or serotonin ([3H]-5-HT), a neurotransmitter implicated in the regulation of eating behavior and appetite control. The aim of the present study was 2-fold: (a) to determine the effect of HCA-SX on 5-HT uptake in rat brain cortex in vitro; and (b) to evaluate the safety of HCA-SX in vivo. Isolated rat brain cortex slices were incubated in oxygenated Krebs solution for 20 min and transferred to buffer solutions containing [3H]-5-HT for different time intervals. In some experiments, tissues were exposed to HCA-SX (10 microM - 1 mM) and the serotonin receptor reuptake inhibitors (SRRI) fluoxetine (100 microM) plus clomipramine (10 microM). Uptake of [3H]-5-HT was expressed as d.p.m./mg wet weight. A time-dependent uptake of [3H]-5-HT occurred in cortical slices reaching a maximum at 60 min. HCA-SX, and fluoxetine plus clomipramine inhibited the time-dependent uptake of [3H]-5-HT. At 90 min, HCA-SX (300 microM) caused a 20% decrease, whereas fluoxetine plus clomipramine inhibited [3H]-5-HT uptake by 30%. In safety studies, acute oral toxicity, acute dermal toxicity, primary dermal irritation and primary eye irritation, were conducted in animals using various doses of HCA-SX. Results indicate that the LD50 of HCA-SX is greater than 5,000 mg/kg when administered once orally via gastric intubation to fasted male and female Albino rats. No gross toxicological findings were observed under the experimental conditions.

Taken together, these in vivo toxicological studies demonstrate that HCA-SX is a safe, natural supplement under the conditions it was tested. Furthermore, HCA-SX can inhibit [3H]-5-HT uptake (and also increase 5-HT availability) in isolated rat brain cortical slices in a manner similar to that of SRRIs, and thus may prove beneficial in controlling appetite, as well as treatment of depression, insomnia, migraine headaches and other serotonin-deficient conditions.

Safety of a Novel Calcium/Potassium Salt of Hydroxycitric Acid (HCA-SX): I. Two-Generation Reproduction Toxicity Study

ABSTRACT (-)-Hydroxycitric acid (HCA), a natural plant extract from the dried fruit rind of Garcinia cambogia, has been reported to inhibit fat synthesis and reduce food intake. The objective of this study was to evaluate the effects of a novel calcium/potassium salt of (-)-hydroxycitric acid (HCA-SX) on the reproductive systems of male and female rats, the postnatal maturation and reproductive capacity of their offspring, and possible cumulative effects through multiple generations. Sprague-Dawley rats (30/sex/group) were maintained on feed containing HCA-SX at dose levels of 0, 1000, 3000, or 10,000 ppm for 10 weeks prior to mating, during mating, and, for females, through gestation and lactation, across two generations. During the period of study, animals were examined daily for signs of clinical toxicity and their body weight and feed consumption were recorded twice a week. For the parents (F(0) and F(1)) and the offspring (F(1) and F(2a)), reproductive parameters such as fertility and mating, gestation, parturition, litters, lactation, sexual maturity, and development of offspring were assessed. At termination, necropsy and histopathological examinations were performed on all animals. Dietary exposure of HCA-SX to parental male and female rats of both (F(0) and F(1)) the generations during the premating and mating periods, for both sexes, and during gestation and lactation in case of female rats, did not reveal any remarkable incidence of mortality or abnormal clinical signs. Compared to respective controls, HCA-SX exposure did not affect feed consumption or body weight at any of the exposure levels. HCA-SX exposure did not affect reproductive performance as evaluated by sexual maturity, fertility and mating, gestation, parturition, litter properties, lactation, and development of the offspring. Based on the results of this study, the parental as well as the offspring no-observed-adverse-effect level for HCA-SX was determined to be greater than 10,000 ppm in diet or equivalent to 1018 and 1524 mg/kg body weight/day in male and female rats, respectively.

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