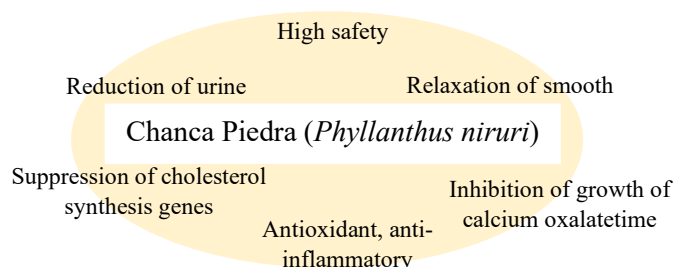


### Effect of Natural Herb Chanca Piedra on Calcium Oxalate

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What is anti-calculus herb Chanca Piedra?

Chanca Piedra (*Phyllanthus niruri*) is a perennial shrub of the Euphorbiaceae family. It has been used from ancient times in folk medicines ranging from South America and Asian countries, including traditional Amazonian medicine and Ayurveda in India, and is particularly known to be effective for renal calculus and urinary infections. As a result of a search on PubMed (<https://pubmed.ncbi.nlm.nih.gov/>) using *Phyllanthus niruri* as the keyword, 233 academic articles have been identified. A variety of different studies and articles have demonstrated that *Phyllanthus niruri* protects the kidneys from calculus formation by inhibiting the growth of uric acid crystals. In addition, it has been reported to induce urethral relaxation, thereby reducing the forming of crystallization by the excretion of its forming factors, such as calcium in the urine.



With consideration for the above, literature and articles related to Chanca Piedra were collected for review.

[Safety] An acute toxicity study was conducted in rats using an extract of Chanca Piedra. The extract was administered by oral gavage at a dose of 2,000 mg/kg and 5,000 mg/kg, then 14 days of observation and blood chemistry tests were performed. As a result, LD<sub>50</sub> was found to be > 5,000 mg/kg, demonstrating the safety of Chanca Piedra in oral administration. [1]

[Cell experiments, mouse experiments] Human renal tubular epithelial HK-2 cells were cocultured with ellagic acid as the main component of Chanca Piedra and calcium oxalate (NaOx), then this was subjected to comprehensive gene analysis by microarray. The results showed that ellagic acid suppresses the induction of cholesterol synthesis (deposition) genes (HMGS1, SCD, and SQLE) caused by NaOx. Similarly, the results of the experiment in mice showed the inhibition of the HMGS1, SCD, and SQLE genes in the glyoxylic acid-induced calcium oxalate calcium model, thereby preventing calculus formation in the kidneys. [2]

[Rat experiments] Seeds for the generation of calcium oxalate (CaOx) calculus were implanted in the rat bladder, and this was followed by 50 days of oral administration of Chanca Piedra at 5 mg per rat per day. As a result, generation of what is known as struvite calculus due to CaOx was observed to be suppressed in the Chanca Piedra group [3]. Also, when Chanca Piedra was orally administered at a dose of 200 and 400 mg/kg per day to diabetic nephropathy in diabetes-induced rats, suppression of the blood oxidative stress marker (TBARS) and suppression of inflammatory markers (SOD, TNF- $\alpha$ , TGF- $\beta$ ) were observed,

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and this was accompanied by improvement in inflammation, fibrosis, and apoptosis pathology in the kidneys [4].

[Clinical experiment in humans] Fifty-six patients with renal calculus less than 10 mm in size were given Chanca Piedra extract (extracted from 4.5 g of dried leaves) or placebo for three months. As a result, the urine potassium value, Mg/Cr, and K/Cr were increased significantly with a significant decrease in the size of the renal calculus [5]. In addition, three-month administration of Chanca Piedra at 45 mg per day in patients with the formation of calcium calculus (39 males, 30 females) was found to decrease the urine calcium level compared with that of placebo [6]. Furthermore, a different study conducted in five healthy subjects where tea containing 750 mL per day of Chanca Piedra was given, a decrease in catalase derived from white blood cells was observed in the blood test conducted one, two, and four hours after ingestion, along with an increase in the blood antioxidation indicator (SOD) [7].

[Component analysis] More than 50 compounds have been identified as active ingredients, including alkaloids, flavonoids, lignan, and triterpene, specifically substances such as quercitrin, rutin, niranthin, nirtetralin, phyllanthin, phyltetralin, corilagin, ellagic acid, astragalol, lupeol, cubebin, urinatarlin, hinokinin, hypophyllanthin, isolintetralin, lintetralin, phyllnirurin, phyllanthine, and gallic acid. In particular, alkaloids identified amongst these compounds have antispasmodic effect leading to the relaxation of the smooth muscles. This efficacy has been observed primarily in the urinary tract and is thought to promote the elimination of calculus by urinary relaxation [8].

#### **Summary**

As shown above, ingestion of Chanca Piedra is expected to take effect on problems regarding calculus and urination, such as those involving calcium oxalate, from the perspective of pharmacology and components. While clinical research in pets is planned to commence at full scale going forward, there is a long history of ingestion as traditional medicine, as well as many reports on research involving mice, rats, and humans, and for this reason, there is a major expectation of anti-calculus effects in dogs and cats.