

# Product data sheet



MedKoo Cat#: 596449 Name: Quebrachitol CAS#: 642-38-6 Chemical Formula: C <sub>7</sub> H <sub>14</sub> O <sub>6</sub> Exact Mass: 194.0790 Molecular Weight: 194.1830	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C > 4 years In solvent: -80°C 3 months; -20°C 2 weeks.

## 1. Product description:

Quebrachitol is a naturally occurring optically active cyclitol, a cyclic polyol. It can be found in *Allophylus edulis* and in the serum left after the coagulation of the *Hevea brasiliensis* latex in the operation of rubber tapping. It is also found in *Cannabis sativa*, in *Paullinia pinnata* and in seabuckthorn. Quebrachitol is a versatile building block in the construction of naturally occurring bioactive materials.

## 2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

## 3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	125	643.73
H <sub>2</sub> O	100	514.99

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	5.15 mL	25.75 mL	51.50 mL
5 mM	1.03 mL	5.15 mL	10.30 mL
10 mM	0.52 mL	2.57 mL	5.15 mL
50 mM	0.10 mL	0.52 mL	0.52 mL

## 5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

## 6. Recommended literature which reported protocols for in vitro and in vivo study

### In vitro study

- Nobre Júnior HV, Cunha GM, Moraes MO, Luciana MF, Oliveira RA, Maia FD, Nogueira MA, Lemos TL, Rao VS. Quebrachitol (2-O-methyl-L-inositol) attenuates 6-hydroxydopamine-induced cytotoxicity in rat fetal mesencephalic cell cultures. *Food Chem Toxicol.* 2006 Sep;44(9):1544-51. doi: 10.1016/j.fct.2006.04.002. Epub 2006 Apr 26. PMID: 16797817.
- Yodthong T, Kedjarune-Leggat U, Smythe C, Wititsuwannakul R, Pitakpornpreecha T. 1-Quebrachitol Promotes the Proliferation, Differentiation, and Mineralization of MC3T3-E1 Cells: Involvement of the BMP-2/Runx2/MAPK/Wnt/β-Catenin Signaling Pathway. *Molecules.* 2018 Nov 26;23(12):3086. doi: 10.3390/molecules23123086. PMID: 30486330; PMCID: PMC6321399.
- Ortbauer M, Popp M. Functional role of polyhydroxy compounds on protein structure and thermal stability studied by circular dichroism spectroscopy. *Plant Physiol Biochem.* 2008 Apr;46(4):428-34. doi: 10.1016/j.plaphy.2008.02.002. Epub 2008 Feb 8. PMID: 18343146.

### In vivo study

- de Olinda TM, Lemos TL, Machado LL, Rao VS, Santos FA. Quebrachitol-induced gastroprotection against acute gastric lesions: role of prostaglandins, nitric oxide and K<sup>+</sup> ATP channels. *Phytomedicine.* 2008 May;15(5):327-33. doi: 10.1016/j.phymed.2007.09.002. Epub 2007 Oct 31. PMID: 17976970.

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## 7. Bioactivity

### Biological target:

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Quebrachitol promotes osteoblastogenesis by upregulation of BMP-2, runt-related transcription factor-2 (Runx2), MAPK (ERK, JNK, p38 $\alpha$ ), and Wnt/ $\beta$ -catenin signaling pathway.

### In vitro activity

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Findings from this study indicate that quebrachitol may promote osteoblastogenesis by triggering the BMP-2-response as well as the Runx2, MAPK, and Wnt/ $\beta$ -catenin signaling pathway. Quebrachitol significantly promotes proliferation and cell DNA synthesis. It also enhances mineralization accompanied by increases in mRNA expression of bone matrix proteins. Quebrachitol upregulates the mRNA and protein expression of bone morphogenetic protein-2 and runt-related transcription factor-2, while down-regulating the receptor activator of the nuclear factor- $\kappa$ B ligand mRNA level. The expression of regulatory genes associated with the mitogen-activated protein kinase and wingless-type MMTV integration site/ $\beta$ -catenin signaling pathways are also upregulated.

Reference: Molecules. 2018 Nov 26;23(12):3086. <https://pubmed.ncbi.nlm.nih.gov/30486330/>

### In vivo activity

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Quebrachitol was investigated against gastric damage induced by absolute ethanol and indomethacin, in mice. Quebrachitol at oral doses of 12.5, 25, and 50mg/kg markedly attenuated the gastric lesions induced by ethanol to the extent of 69%, 64%, and 53% and against indomethacin by 55%, 59%, and 26%, respectively. Quebrachitol's effect was significantly reduced in mice pretreated with L-NAME, the respective inhibitors of nitric oxide synthase, and K(+)(ATP) channel activation. Quebrachitol reduces the gastric damage induced by ethanol and indomethacin by mechanisms that involve endogenous prostaglandins, nitric oxide release, and or the activation of K(+)(ATP) channels.

Reference: Phytomedicine. 2008 May;15(5):327-33. <https://pubmed.ncbi.nlm.nih.gov/17976970/>

*Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.*