



Importance of Green Radish in Managing Kidney Stone Disease

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Annotatsiya: Kidney stone disease, also known as renal calculi, is a common ailment affecting millions of individuals worldwide. The excruciating pain, impaired kidney function, and potential complications associated with this condition make it imperative to explore effective preventative and therapeutic strategies. Among the various natural remedies, green radish emerges as a potent ally in the battle against kidney stones. This remarkable vegetable, with its vibrant green hue and distinct bitter taste, harbors a wealth of essential compounds that offer numerous health benefits, particularly in the context of kidney stone disease. If to drink 40-50 gr. juice of its vegetables on an empty stomach will crush and will remove stones of kidneys.

Kalit so'zlar: kidney stone disease, green radish, renal calculi.

Intrudaction. Green radish is rich in antioxidants, vitamins, minerals, and phytochemicals such as glucosinolates and isothiocyanates that exhibit potent anti-inflammatory and diuretic properties. These properties of green radish contribute significantly to reducing the risk of kidney stone formation, promoting kidney health, and aiding in the natural elimination of stones. Additionally, the alkalizing effect of green radish on the urine helps dissolve and prevent the crystallization of minerals, which are the building blocks of kidney stones. Therefore, incorporating green radish into the diet can play a crucial role in preventing and managing kidney stone disease

Chemical composition of the plant: Radish root crops are rich in carbohydrates, nitrogenous substances, contain fats, vitamins C, B2, B6, provitamin A – [23]. There are a lot of Na, Mg, Fe, S, Cl, I salts in fruits. It ranks first among vegetables in terms of potassium content (up to 1199 mg%). Radish contains phytoncides, crystalline substance raphanol, choline, adenine, enzymes diastase, glucosidase, oxidase, catalase. There is a lot of glucose and proteins in root crops and radish leaves. Glucoraphasatin glycosanalate was determined to be atypical [33]. Radish root crops concentrate Se – [37].

Radish seeds contain indole glycosides - β -D-glucopyranosyl 2-(methylthio)-1H-indole-3-carboxylate, called raphanuside A, β -D-fructofuranosyl-(2 \rightarrow 1)-(6-O-synapoyl)- α -D-glucopyranoside, (3-O-synapoyl)- β -D-fructofuranosyl-(2 \rightarrow 1)- α -D-glucopyranoside, (3-O-synapoyl)- β -D-fructofuranosyl-(2 \rightarrow 1)-(6-Osinapoyl)- α -D-glucopyranoside, (3,4-O-disinapoyl)- β -D-fructofuranosyl-(2 \rightarrow 1)-(6-O-synapoyl)- α -D-glucopyranoside, isoramnetin 3,4'-di-O- β -D-glucoside, isoramnetin 3-O- β -D-glucoside-7-O- α -L-rhamnoside, isoramnetin 3-O- β -D-glucoside, 3'-O-methyl(-)-epicatechin 7-O- β -D-glucoside – [24]. The seeds also contain derivatives of 4-methylthio-butanyl, synapoyl desulfoglucoraphenin, (E)-5-(methylsulfinyl)pent-4-enoxylimidic acid methyl ester, (S)-5-((methylsulfinyl)methyl)pyrrolidine-2-thion, 5-(methylsulfinyl)-4-pentenenitrile, 5-(methylsulfinyl)-pentanenitrile, sulforaphene, sulforaphane – [49; 26].

Ancient medicine defined the nature of the fruits of the turb ashot in the I and wet in the II degree. The seeds of the plant are hot in the III and dry in the II degree. When ingested, it dilutes thick matter, drives urine. But radish contains substances that quickly spoil in the stomach with the formation of smelly winds. Its spring leaves are more suitable for food than its fruits. Leaves of green radish drive internal winds, seeds drive urine, fruits stop phlegm. The use of a large amount of green radish is harmful to the head, teeth and palate - [1; 2; 3].

Dig out the green radish, pour rose oil there, put it on fire, thereby bringing the oil to a boil. If this oil dripping into the ear helps with winds in the ear, earache. Although taking turb is harmful to the eyes, but if you drip its juice into the eyes, it improves vision – [3].

If the radish leaves are crushed and applied externally, it will remove the bruise. Crushed turba leaves with honey, when applied externally, remove excess moisture, which led to clouding of the lens. If you drink 25 gr. of the juice of the leaves of the turba on an empty stomach, it will crush and remove kidney and bladder stones. Radish has antioxidant and antitumor properties – [7; 22; 11; 8; 39; 42]. Radish seed isocyanates – sulforaphenes have a detrimental effect on breast cancer cells [27; 36]. Radish root juice has a pronounced hypoglycemic, antidiabetic effect [41; 6]. This juice also has hypolipidemic properties, prevents the development of obesity [47].

A large number of polyphenols have been identified in the tops and stems of radish, which have antioxidant, anti-inflammatory properties [9; 34]. Experimental studies have shown that razathiol isolated from radish stimulates the production of fibrous proteins of the extracellular matrix by dermal fibroblasts – [38]. Phenylpropanoid sucrosides of radish seeds have a pronounced anti-inflammatory effect [25]. Experimental studies have shown that an aqueous extract of radish seeds can serve as a therapeutic agent for inflammatory processes in the small and large intestines [16]. Radish extracts increase the synthesis of nitric oxide, improve the condition of the vascular endothelium [28]. The hypotensive properties of alcohol extracts of radish tops were determined [17].

Conclusion. Green radish helps reduce the risk of kidney stone formation through several mechanisms. Firstly, the high water content of green radish promotes hydration, which is essential in maintaining an optimal urine volume and dilution. This helps prevent the concentration of minerals in the urine, reducing the likelihood of crystallization. Secondly, the diuretic properties of green radish increase urine output, facilitating the flushing out of waste products and preventing stone formation. Moreover, the abundance of antioxidants in green radish helps combat oxidative stress and inflammation, which are implicated in the development of kidney stones. These antioxidants neutralize harmful free radicals and protect the kidneys from damage. Lastly, green radish contains compounds such as glucosinolates and isothiocyanates, which exhibit anti-inflammatory properties and inhibit the formation of calcium oxalate crystals, a common type of kidney stone.

References

1. Абу Али ибн Сино Канон врачебной науки III том Ташкент, 1996.
2. Амасиачи Амирдовлат Ненужное для неучей М., Наука 1990.
3. Зоҳидов Х. Канзи шифо - Душанбе Ирфон 1991.
4. Кароматов И.Д. Простые лекарственные средства Бухара 2012
5. Asghari M.H., Hobbenaghi R., Nazarizadeh A., Mikaili P. Hydroalcoholic extract of *Raphanus sativus* L. var *niger* attenuates bleomycin-induced pulmonary fibrosis via decreasing transforming growth factor β 1 level - Res. Pharm. Sci. 2015, Sep-Oct., 10(5), 429-435.
6. Banihani S.A. Radish (*Raphanus sativus*) and Diabetes - Nutrients. 2017, Sep 14, 9(9). pii: E1014. doi: 10.3390/nu9091014.

7. Barillari J., Cervellati R., Costa S., Guerra M.C., Speroni E., Utan A., Iori R. Antioxidant and choleretic properties of *Raphanus sativus* L. sprout (Kaiware Daikon) extract - *J. Agric. Food Chem.* 2006, Dec 27, 54(26), 9773-9778.
8. Barillari J., Iori R., Papi A., Orlandi M., Bartolini G., Gabbanini S., Pedulli G.F., Valgimigli L. Kaiware Daikon (*Raphanus sativus* L.) extract: a naturally multipotent chemopreventive agent - *J. Agric. Food Chem.* 2008, Sep 10, 56(17), 7823-7830.
9. Beevi S.S., Narasu M.L., Gowda B.B. Polyphenolics profile, antioxidant and radical scavenging activity of leaves and stem of *Raphanus sativus* L. - *Plant. Foods Hum. Nutr.* 2010, Mar., 65(1), 8-17. doi: 10.1007/s11130-009-0148-6.
10. Beevi S.S., Mangamoori L.N., Gowda B.B. Polyphenolics profile and antioxidant properties of *Raphanus sativus* L. - *Nat. Prod. Res.* 2012, 26(6), 557-563. doi: 10.1080/14786419.2010.521884.
11. Ben Salah-Abbès J., Abbès S., Houas Z., Abdel-Wahhab M.A., Oueslati R. Zearalenone induces immunotoxicity in mice: possible protective effects of radish extract (*Raphanus sativus*) - *J. Pharm. Pharmacol.* 2008, Jun., 60(6), 761-770.
12. ben Salah-Abbès J., Abbès S., Zohra H., Oueslati R. Tunisian radish (*Raphanus sativus*) extract prevents cadmium-induced immunotoxic and biochemical alterations in rats - *J. Immunotoxicol.* 2015, Jan-Mar., 12(1), 40-47. doi: 10.3109/1547691X.2014.880534.
13. Cardenia V., Vivarelli F., Cirillo S., Paolini M., Rodriguez-Estrada M.T., Canistro D. Dietary effects of *Raphanus sativus* cv Sango on lipid and oxysterols accumulation in rat brain: A lipidomic study on a nongenetic obesity model - *Chem. Phys. Lipids.* 2017, Oct., 207(Pt B), 206-213. doi: 10.1016/j.chemphyslip.2017.05.005.
14. Castro-Torres I.G., De la O-Arciniega M., Gallegos-Estudillo J., Naranjo-Rodríguez E.B., Domínguez-Ortíz M.Á. *Raphanus sativus* L. var niger as a source of phytochemicals for the prevention of cholesterol gallstones - *Phyther. Res.* 2014, Feb., 28(2), 167-171. doi: 10.1002/ptr.4964.
15. Castro-Torres I.G., Naranjo-Rodríguez E.B., Domínguez-Ortíz M.Á., Gallegos-Estudillo J., Saavedra-Vélez M.V. Antilithiasic and Hypolipidaemic Effects of *Raphanus sativus* L. var. niger on Mice Fed with a Lithogenic Diet - *J. Biomed. Biotechnol.* 2012, 2012,161205. doi: 10.1155/2012/161205.
16. Choi K.C., Cho S.W., Kook S.H., Chun S.R., Bhattarai G., Poudel S.B., Kim M.K., Lee K.Y., Lee J.C. Intestinal anti-inflammatory activity of the seeds of *Raphanus sativus* L. in experimental ulcerative colitis models *J. Ethnopharmacol.* 2016, Feb 17, 179, 55-65. doi: 10.1016/j.jep.2015.12.045.
17. Chung D.H., Kim S.H., Myung N., Cho K.J., Chang M.J. The antihypertensive effect of ethyl acetate extract of radish leaves in spontaneously hypertensive rats - *Nutr. Res. Pract.* 2012, Aug., 6(4), 308-314. doi: 10.4162/nrp.2012.6.4.308.
18. Elshazly M.O., Morgan A.M., Ali M.E., Abdel-Mawla E., Abd ElRahman S.S. The mitigative effect of *Raphanus sativus* oil on chromium-induced geno- and hepatotoxicity in male rats - *J. Adv. Res.* 2016, May, 7(3), 413-421. doi: 10.1016/j.jare.2016.02.008.
19. Ghayur M.N., Gilani A.H. Radish seed extract mediates its cardiovascular inhibitory effects via muscarinic receptor activation - *Fundam. Clin. Pharmacol.* 2006, Feb., 20(1), 57-63.
20. Gilani A.H., Ghayur M.N. Pharmacological basis for the gut stimulatory activity of *Raphanus sativus* leaves - *J. Ethnopharmacol.* 2004, Dec., 95(2-3), 169-172.
21. Gutierrez R.M., Perez R.L. *Raphanus sativus* (Radish): their chemistry and biology - *Scientific World Journal* 2004, Sep., 13, 4, 811-837.

22. Hanlon P.R., Webber D.M., Barnes D.M. Aqueous extract from Spanish black radish (*Raphanus sativus* L. Var. *niger*) induces detoxification enzymes in the HepG2 human hepatoma cell line - *J. Agric.Food Chem.* 2007, Aug 8, 55(16), 6439-6446.
23. Hanlon P.R., Barnes D.M. Phytochemical composition and biological activity of 8 varieties of radish (*Raphanus sativus* L.) sprouts and mature taproots - *J. Food Sci.* 2011, Jan-Feb., 76(1), C185-192. doi: 10.1111/j.1750-3841.2010.01972.x.
24. Jin H.G., Ko H.J., Chowdhury M.A., Lee D.S., Woo E.R. A new indole glycoside from the seeds of *Raphanus sativus* - *Arch. Pharm. Res.* 2016, Jun., 39(6), 755-761. doi: 10.1007/s12272-016-0758-0.
25. Kim K.H., Kim C.S., Park Y.J., Moon E., Choi S.U., Lee J.H., Kim S.Y., Lee K.R. Anti-inflammatory and antitumor phenylpropanoid sucrosides from the seeds of *Raphanus sativus* - *Bioorg. Med. Chem. Lett.* 2015, Jan 1, 25(1), 96-99.
26. Kim K.H., Moon E., Kim S.Y., Choi S.U., Lee J.H., Lee K.R. 4- Methylthio-butanyl derivatives from the seeds of *Raphanus sativus* and their biological evaluation on anti-inflammatory and antitumor activities - *J. Ethnopharmacol.* 2014, 151(1), 503-508. doi: 10.1016/j.jep.2013.11.003.
27. Kim W.K., Kim J.H., Jeong D.H., Chun Y.H., Kim S.H., Cho K.J., Chang M.J. Radish (*Raphanus sativus* L. leaf) ethanol extract inhibits protein and mRNA expression of ErbB(2) and ErbB(3) in MDA-MB-231 human breast cancer cells - *Nutr. Res. Pract.* 2011, Aug., 5(4), 288-293. doi: 10.4162/nrp.2011.5.4.288.
28. Kuroda R., Kazumura K., Ushikata M., Minami Y., Kajiya K. Elucidating the improvement in vascular endothelial function of Sakurajima Daikon and its mechanism of action: a comparative study with *Raphanus sativus* - *J. Agric. Food Chem.* 2018, Jul 23. doi: 10.1021/acs.jafc.8b01750.
29. Lee S.W., Yang K.M., Kim J.K., Nam B.H., Lee C.M., Jeong M.H., Seo S.Y., Kim G.Y., Jo W.S. Effects of White Radish (*Raphanus sativus*) Enzyme Extract on Hepatotoxicity - *Toxicol. Res.* 2012, Sep., 28(3), 165-172. doi: 10.5487/TR.2012.28.3.165.
30. Lee Y.H., Lee J.H., Kang H.R., Ha J.H., Lee B.H., Kim S.H. A Case of Anaphylaxis Induced by Contact with Young Radish (*Raphanus sativus* L) - *Allergy Asthma Immunol. Res.* 2015, Jan., 7(1), 95-97. doi: 10.4168/aair.2015.7.1.95.
31. Lugasi A., Blazovics A., Hagymasi K., Kocsis I., Kery A. Antioxidant effect of squeezed juice from black radish (*Raphanus sativus* L. var *niger*) in alimentary hyperlipidaemia in rats - *Phytother. Res.* 2005, Jul., 19(7), 587-591.
32. Luo X., Zhang H., Duan Y., Chen G. Protective effects of radish (*Raphanus sativus* L.) leaves extract against hydrogen peroxide-induced oxidative damage in human fetal lung fibroblast (MRC-5) cells - *Biomed. Pharmacother.* 2018, Jul., 103, 406-414. doi: 10.1016/j.biopha.2018.04.049.
33. Montaut S., Barillari J., Iori R., Rollin P. Glucoraphasatin: chemistry, occurrence, and biological properties - *Phytochemistry* 2010, Jan., 71(1), 6-12.
34. Park H.J., Song M. Leaves of *Raphanus sativus* L. Shows AntiInflammatory Activity in LPS-Stimulated Macrophages via Suppression of COX-2 and iNOS Expression - *Prev. Nutr. Food Sci.* 2017, Mar., 22(1), 50-55. doi: 10.3746/pnf.2017.22.1.50.
35. Park Y.J., Moon C., Kang J.H., Choi T.J. Antiviral effects of extracts from *Celosia cristata* and *Raphanus sativus* roots against viral hemorrhagic septicemia virus - *Arch. Virol.* 2017, Jun., 162(6), 1711-1716. doi: 10.1007/s00705-017-3270-z.
36. Pawlik A., Wała M., Hać A., Felczykowska A., HermanAntosiewicz A. Sulforaphene, an isothiocyanate present in radish plants, inhibits proliferation of human breast cancer cells - *Phytomedicine.* 2017, Jun 15, 29, 1-10. doi: 10.1016/j.phymed.2017.03.007.

37. Pedrero Z., Madrid Y., Camara C. Selenium species bioaccessibility in enriched radish (*Raphanus sativus*): a potential dietary source of selenium - *J. Agric. Food Chem.* 2006, 22, 54(6), 2412-2417.
38. Roh S.S., Park S.B., Park S.M., Choi B.W., Lee M.H., Hwang Y.L., Kim C.H., Jeong H.A., Kim C.D., Lee J.H. A Novel Compound Rasatiol Isolated from *Raphanus sativus* Has a Potential to Enhance Extracellular Matrix Synthesis in Dermal Fibroblasts - *Ann. Dermatol.* 2013, Aug., 25(3), 315-320. doi: 10.5021/ad.2013.25.3.315.
39. Salah-Abbès J.B., Abbès S., Abdel-Wahhab M.A., Oueslati R. Invitro free radical scavenging, anti-proliferative and anti-zearalenone cytotoxic effects of 4-(methylthio)-3-butenyl isothiocyanate from Tunisian *Raphanus sativus* - *J. Pharm. Pharmacol.* 2010, Feb., 62(2), 231-239.
40. Sham T.T., Yuen A.C., Ng Y.F., Chan C.O., Mok D.K., Chan S.W. A review of the phytochemistry and pharmacological activities of raphani semen - *Evid. Based Complement. Alternat. Med.* 2013, 2013, 636194. doi: 10.1155/2013/636194.
41. Shukla S., Chatterji S., Mehta S., Rai P.K., Singh R.K., Yadav D.K., Watal G. Antidiabetic effect of *Raphanus sativus* root juice - *Pharm. Biol.* 2011, Jan., 49(1), 32-37. doi: 10.3109/13880209.2010.493178.
42. Siddiq A., Younus I. The Radish, *Raphanus sativus* L. Var. *caudatus* reduces anxiety-like behavior in mice - *Metab. Brain. Dis.* 2018, Aug., 33(4), 1255-1260. doi: 10.1007/s11011-018-0240-4.
43. Sipos P., Hagymasi K., Lugasi A., Feher E., Blazovics A. Effects of black radish root (*Raphanus sativus* L. var *niger*) on the colon mucosa in rats fed a fat rich diet - *Phytother. Res.* 2002 Nov., 16(7), 677-679.
44. Syed S.N., Rizvi W., Kumar A., Khan A.A., Moin S., Ahsan A. In vitro antioxidant and in vivo hepatoprotective activity of leave extract of *Raphanus sativus* in rats using CCL4 model - *Afr. J. Tradit. Complement. Altern. Med.* 2014, Apr 3, 11(3), 102-106.
45. Tabassum F., Khan M.R. Prevention of CCl4 induced hypogonadism with *Raphanus sativus* seeds in rat - *Pak. J. Pharm. Sci.* 2017, Mar., 30(2), 375-380.
46. Vargas R., Perez R.M., Perez S., Zavala M.A., Perez C. Antiuro lithiatic activity of *Raphanus sativus* aqueous extract on rats - *J. Ethnopharmacol.* 1999, Dec., 15, 68(1-3), 335-338.
47. Vivarelli F., Canistro D., Sapone A., De Nicola G.R., Babot Marquillas C., Iori R., Antonazzo I.C., Gentilini F., Paolini M. *Raphanus sativus* cv. Sango Sprout Juice Decreases Diet-Induced Obesity in Sprague Dawley Rats and Ameliorates Related Disorders – *PloS One.* 2016, Mar 17, 11(3), e0150913. doi: 10.1371/journal.pone.0150913.
48. Younus I., Siddiq A.A. Behavioral evidence of antidepressant-like activity of *Raphanus sativus* L. var. *Caudatus* in mice - *Afr. J. Tradit. Complement. Altern. Med.* 2017, Mar 1, 14(3), 142-146. doi: 10.21010/ajtcam.v14i3.15.
49. Zhang X., Liu H.B., Jia J.J., Lv W.H. Two novel sulfur compounds from the seeds of *Raphanus sativus* L. - *J. Asian. Nat. Prod. Res.* 2010, Feb., 12(2), 113-118.
50. Safarova G.A., Karomatov I.Dj. ЛЕЧЕБНЫЕ СВОЙСТВА РАСТЕНИЯ РЕДЬКА// *Fitoterapiya. Электронный научный журнал «Биология и интегративная медицина» №6 – июнь (23) 2018*
51. Тилавов, Т. Б. (2021). ЭРЕКТИЛЬНАЯ ДИСФУНКЦИЯ У БОЛЬНЫХ САХАРНЫМ ДИАБЕТОМ 1 ТИПА: МЕТОДЫ ДИАГНОСТИКИ И ЛЕЧЕНИЯ.
52. Tilavov, T. B. (2022). Sexual Dysfunction of Men in Bukhara Region. *INTERNATIONAL JOURNAL OF HEALTH SYSTEMS AND MEDICAL SCIENCES*, 1(5), 19-22.
53. Тилавов, Т. Б. У., Хамдамов, И. И. У., & Шарипова, Ш. У. (2018). Оценка действия локального УФО на резистентность микрофлоры гнойных ран. *Вопросы науки и образования*, (26 (38)), 80-82.

54. Tilavov Tolibjon Baxtiyor o‘g‘li. (2023). FEATURES OF THE DEVELOPMENT OF ALLERGIC PATHOLOGIES IN YOUNG CHILDREN IN THE CONDITIONS OF THE BUKHARA REGION . *Research Journal of Trauma and Disability Studies*, 2(11), 110–112.
55. Tilavov T. B., & Azimova S.B. (2023). THE IMPORTANCE OF MORPHOLOGICAL CHANGES IN THE THYMUS OF YOUNG WHITE RATS . *Research Journal of Trauma and Disability Studies*, 2(11), 113–118.
56. Baxtiyorovich, T. T. (2023). DIAGNOSIS OF PROSTATE CANCER IN THE CONDITIONS OF THE BUKHARA REGION. *Central Asian Journal of Medical and Natural Science*, 4(6), 42-45.
57. Tilavov Tolibjon Baxtiyorovich. (2023). DIAGNOSIS OF PROSTATE CANCER IN THE CONDITIONS OF THE BUKHARA REGION. *Central Asian Journal of Medical and Natural Science*, 4(6), 42-45.
58. Azimov, S. I., Gaziyeu, K. U., & Tilavov, T. B. (2023). QANDLI DIABET BILAN KASALLANGAN BEMORLARDA EREKTIL DISFUNKSIYANI DAVOLASHDA “TIGRALIS 5” NING AHAMIYATI. *Инновационные исследования в современном мире: теория и практика*, 2(16), 76-77.
59. Ilkhomovich, A. S., & Bakhtiyorovich, T. T. (2022). The Value of TIGRALIS 5 in the Treatment of Patients with Diabetes Mellitus Complicated by Erectile Dysfunction. *Research Journal of Trauma and Disability Studies*, 1(11), 96-100.
60. Khamdamov, I. I., & Tilavov, T. B. (2023). CARDIOVASCULAR DISEASE AMONG ARAL SEA REGION POPULATION. *European journal of molecular medicine*, 3(1).
61. Ilkhomovich, A. S., & Bakhtiyorovich, T. T. (2022). The Value of TIGRALIS 5 in the Treatment of Patients with Diabetes Mellitus Complicated by Erectile Dysfunction. *Research Journal of Trauma and Disability Studies*, 1(11), 96-100.