

An In-vivo Evaluation of The Effect of Chewing Coriander Seeds on Salivary Ph.

RICKY PAL S *, AJITHKRISHNAN CG **, THANVEER K***, HARSHAL B*, HEMAL P****

ABSTRACT

Background: Saliva is one of the most important factors in regulating oral health, with flow rate and composition changing throughout development and during disease. Numerous chewing habits have been traditionally followed by various cultures and this effects salivary composition. Chewing of Coriander seeds (*Coriandrum sativum* / Cilantro) is one such practice.

Objectives:

1. To Record the salivary pH at base line, immediately and 5-minutes after chewing the seeds.
2. To compare the change in pH at baseline, immediately after chewing and five minutes post-chewing.

Materials and methods:

Total 22 subjects, aged 18 years were requested to chew a known quantity of coriander seeds (1.3grams) for five minutes in the study and salivary pH was recorded using Qualigens **Indikrom paper strips**.

Results: Highly statistically significant rise in salivary pH was seen immediately after chewing seeds ($p=0.003$)

Conclusion: Chewing of coriander seeds showed a rise in salivary pH, which can prevent demineralization and have an anti-cariogenic effect.

KEYWORDS: Coriander seeds, Salivary pH, Chewing seeds

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INTRODUCTION:

Coriander seeds contain many plant derived chemical compounds that are known to have anti-oxidant, disease preventing, and health promoting properties. The characteristic aromatic flavor of coriander seeds comes from many fatty acids and essential volatile oils. As in other spices, coriander is also rich in dietary fiber 100 g seeds provide 41.9 g of fiber. Much of this fiber is metabolically inert insoluble fiber, which helps increase bulk of the food by absorbing water throughout the digestive system and help easing constipation condition⁽¹⁾.

Coriander has been used as a folk medicine for the relief of anxiety and insomnia in Iran. Experiments in mice support its use as an anxiolytic. Coriander seeds are used in traditional Indian medicine as a diuretic by boiling equal amounts of coriander seeds and cumin seeds, then cooling and consuming

the resulting liquid. In holistic and traditional medicine, it is used as a carminative and as a digestive aid.⁽¹⁾

Wangensteen H et.al (2004) reported a stronger antioxidant activity of coriander seeds, they conclude that addition of coriander to food will increase the antioxidant content and may have potential as a natural antioxidant and thus inhibit unwanted oxidation processes⁽²⁾. Darughe F et.al (2012) reported the antioxidant and antifungal effect of essential oils of coriander seeds. Coriander essential oil (CEO) at 0.15% could inhibit the growth of fungal and can be used as natural antioxidant and antifungal in foodstuffs especially those lipid containing⁽³⁾.

Dental caries is a disease of complex etiology, and saliva plays an important role in the disease

* P.G. STUDENT, ** PROFESSOR & HOD., *** PROFESSOR, **** SENIOR LECTURER

DEPT. OF PUBLIC HEALTH DENTISTRY K.M. SHAH DENTAL COLLEGE & HOSPITAL, VADODARA, GUJARAT

ADDRESS FOR AUTHOR CORROSPONDENCE : DR. RICKY PAL SINGH. Phone: 9099777622

etiology. Consumption of food or snacks changes the salivary pH, which can be either acidic or basic and can thus result or prevent dental caries. Chewing of coriander seeds is one such practice followed in Indian society especially after meals and these seeds are used for chewing alone or with betel leaves or sugar coated.⁽²⁾ As, no such studies have been conducted to assess the effect of chewing coriander seeds on salivary pH. This particular study was conducted with the objectives of :-

- (1) Recording the salivary pH at baseline of all the subjects immediately after chewing the seeds, and 5 minutes after chewing the seeds.
- (2) To compare the change in pH at baseline, immediately after chewing and five minutes post chewing the seeds.

MATERIALS AND METHODS

Ethical approval was obtained from Human Research Review Board and Ethics Committee of Sumandeep Vidyapeeth, Piparia, Vadodara. Study was conducted by the principal investigator.

An In-vivo experimental study was conducted to assess the effect of fennel seeds on the salivary pH at different intervals on 22 Undergraduate students of KM Shah Dental College & Hospital. A written and informed consent was obtained from the individual prior to study.

Sampling Methodology

- Voluntary enrollment of individuals was done. (Non-random sampling method).
- Inclusion criteria
- Completely dentate individuals
 - Males and Females \geq 18 years studying in KM Shah Dental college & Hospital

Exclusion Criteria

- Subjects undergoing topical fluoride therapy, other

chemotherapeutic procedures, antibiotics and drugs having effect upon salivary function or salivary pH were excluded from the study.

- Subjects suffering from any systemic diseases/ taking any medication that affects salivary secretion.
- Participants suffering from any condition, which is contraindicated for clinical examination.
- Individuals who refrain from Coriander due to allergic or personal reasons.
- Individuals who are not willing to participate

Saliva sample and pH recording

All subjects were requested to follow their normal diet and to avoid major deviations in diet prior to the study. Baseline salivary pH (S1) was collected prior to the chewing of seeds and the subjects were asked to refrain from eating or drinking 2 hours prior to the sample collection.

Salivary pH, was recorded by placing the strip in the oral cavity below the tongue. **Qualigens Indikrom paper strips (Thermo Fisher scientific India Pvt. Ltd)** was taken for the recording of salivary pH and was matched with the pH scaled colored chart within about 15 seconds.

The subjects were then requested to chew a known quantity of coriander seeds (1.3 grams) for about 5 minutes. The salivary pH was measured again (S2) immediately after chewing the seeds using the same methodology. A third saliva sample (S3) was taken five minutes post chewing the seeds.

Statistical method used

The data was compiled and was entered into Microsoft excel sheet and then was analyzed using SPSS 11.5 for windows. Means was calculated using descriptive statistics and the change in pH from baseline to immediately chewing the seeds and 5 minutes post-chewing the seeds was done using Paired t-test.

The mean score of salivary pH at the baseline was 6.90±0.42 and the mean value of pH immediately after chewing of the seeds was 7.75±0.42. Change in pH from Baseline (S1) and after giving the intervention (S2) was found to be significant (p=0.033). The Mean value of salivary pH 5

minutes post chewing (S3) of the seeds was 7.47±0.36, and the drop of the salivary pH on immediately chewing the seeds (S2) and 5 minutes post chewing (S3) was found to be Highly Significant (p=0.001)

Statistical Procedure	Salivary pH score before chewing Coriander seeds (S1)	Salivary pH score immediately after chewing Coriander seeds (S2)	Salivary pH score 5 minutes after chewing Coriander seeds (S3)
Comparison	S1 compared to S2	S2 compared to S3	S1 compared to S3
Mean (±) standard deviation	6.90±0.42	7.75±0.42	7.47±0.36
t-value	-8.82	3.81	-6.88
p-value	0.033	0.001	0.012
Statistical significance	Significant	Highly Significant	Significant

From **Table: 1**, it can be noted that that the change in pH from baseline to immediately chewing the seeds was significant. After consumption of the seeds, the salivary pH tends to show an increase, which is also statistically significant. The drop in pH from immediately chewing the seeds (S2) to 5-minutes post chewing (S3) was found to be highly significant.

DISCUSSION

Coriander (*Coriandrum sativum*), commonly known as Cilantro or Dhania, is a powerful herb with many health benefits. This plant is rich in micronutrients and nutritional elements. It contains dietary fiber, vitamins and minerals like calcium, magnesium, sodium and potassium⁽¹⁾.

Studies conducted by Wangenstein H et.al (2004)⁽²⁾ and Darughe F et.al (2012)⁽³⁾ reported antibacterial and antifungal activity of coriander seeds. These properties indicate that it can be used to improve the oral health. Change in pH levels could be also

attributed to good oral health but there is no data was available regarding the effect of coriander seeds on salivary pH.

Thus the present was conducted with an aim to evaluate the effect of chewing coriander seeds on salivary pH. The results in present study reported that pH of the saliva increases after the consumption of coriander seeds, this increase can be attributed to the essential oils present in coriander seeds which are alkaline in nature. It can be further stated that, the alkalinity of the seeds could have a counter effect on the acids produced by the bacteria in the

oral cavity by neutralizing them. This process can further help in prevention of the demineralization of tooth. Thus it could help in prevention of dental caries.

Anju V et.al. (2011) reported Coriander is used as Digestive, Astringent, Liver stimulant, Anthelmintic, Diuretic, Dyspeptic, Anti pyretic, Anti-inflammatory, Stomatitis, haemostat, Conjunctivitis, Headache, Appetizer. The fruit extract of Coriander inhibit mycelial growth of *Pythium aphanidermatum*. The essential oil of Coriander exhibit strong antifungal activity at very low concentration(5).

Limitations

An extensive search of the literature did not reveal any substantial information on the effect of these seeds on salivary pH changes in the oral cavity due to which we were unable to compare the data with other studies.

Conclusion Derived from the study are:-

- Coriander seeds caused significant rise in the salivary pH after their consumption.
- Rise in salivary pH, prevents demineralization and can have anti-cariogenic effect.
- Coriander seeds can be amalgamated with other materials for improvement in their efficacy and can be used as a dentifrice, which will be cost-effective and can be used as a preventive measure for the control of oral diseases.
- Chewing of these seeds is beneficial for the oral health.

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