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## A Review on Tooth Powder



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### ABSTRACT

Powders are pharmaceutical solid dosage form encountered in almost every aspect of pharmacy both in industry and in practice. A pharmaceutical powder is a mixture of finely divided drugs and chemicals in dry form, which are meant for internal and external use. The present work is aimed to explain the relevancy of toothpowder in the current scenario. The overall study concludes about the characteristics, types, properties, preparation and evaluation of toothpowder.



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## INTRODUCTION

Powders are pharmaceutical solid dosage form encountered in almost every aspect of pharmacy, both in industry and in practice. A pharmaceutical powder is a mixture of finely divided drugs and chemicals in dry form, which are meant for internal and external use. Drugs and other ingredients, when they occur in the solid state in the course of being processed into a dosage form, usually are in a finely divided condition. A powder whose state of subdivision is critical in determining its behavior both during processing and in the finished dosage form. Although the use of powders as a dosage form has declined, the properties and behavior of finely divided solid materials are of considerable importance in pharmacy. They are available in crystalline or amorphous forms. They are considered as the oldest and simplest dosage form.<sup>1</sup>

## ADVANTAGES:

- Powders are used both internally and externally.
- They are more stable than liquid dosage form.
- Powders are convenient to handle, store and carry than liquid dosage forms.
- Pediatrics and geriatric can't swallow solid dosage form such as tablets and capsules but they can take the powdered drugs easily as such or dispersed in water or any other liquid.
- Some products are administered by mixing with food.
- Bulky and large dose drug can be convenient to administered conveniently.
- A tablet/ capsule meant for adults can be improvised in the form of powders by dose dividing.
- Provide alternative means to administer GI irritant drugs. The rapid distribution of drug powder provides less local irritation compared to tablets and capsules.
- Topical powders packed in nozzle type squeeze bottles allow touch – free application on open wound.
- They are more chemically stable to solid state than liquid state.
- They are less susceptible to microbial growth than liquid dosage forms.

- Due to high surface area, they have fast dissolution and can produce rapid onset of action than that of the other solid dosage forms.
- Due to high surface area, they exhibit faster local effects like adsorption of toxins/poisons, neutralization of gastric acid etc.
- Flavored/ coated granules have better acceptance than fibrous and earthen taste powders.
- Effervescent type of powders, which are more palatable, can be formulated to mask unpleasantness.
- Provide means of dispensing of incompatible drugs in divided form.<sup>2</sup>

#### **DISADVANTAGES:**

- Not suitable for oral administration of bitter drugs.
- Dispensing of powder is a time-consuming process.
- In powders for external use, it requires finest state of sub- division in powders. Hence, become costly.
- Powders are inconvenient to handle and administer as compared to tablets and capsules.
- Less dose accuracy than that can be achieved with tablets or capsules.
- Depending on size distribution and density variations powders undergo segregation during transport and handling.
- Coarse powders are friable or undergo size reduction to further fines.
- The inter-particular friction among the fine powders may lead to formation of lumps.
- Not suited for dispensing hygroscopic and deliquescent drugs in the form of powders.

#### **TOOTH POWDER**

Powders are pharmaceutical solid dosage form which is applied to provide cleanliness and polishness in teeth enamel to prevent dental caries. This can be achieved by using various dental care preparations. Tooth powder was historically used by the Romans to clean and whiten teeth, to fix them when loose, to strengthen the gums, and to prevent toothache. They made tooth powder from a variety of substances, such as the bones, hoofs, and horns of certain animals, crabs, oyster and murex shells and egg shells. These ingredients were

reduced to fine powder, sometimes after having been previously burnt. Some versions contained honey, myrrh, salt and hartshorn. The use of powdered substances such as charcoal, brick, salt for cleaning teeth has been historically widespread in India, particularly in rural areas<sup>3</sup>.

Mildly abrasive powders used in combination with a toothbrush to maintain oral hygiene. The abrasives are water insoluble fine powders such as precipitated chalk, dicalcium phosphate dihydrate, calcium pyrophosphate, alumina etc. These agents mechanically scrap off or abrade the enamel surface to loosen the plaque.

Plaque is yellowish -white sticky film forms on teeth. When bacteria in the mouth mix with sugary or starchy foods. Tooth brushing and flossing get rid of plaque. If the plaque is not removed, it hardens into tartar. Plaque can lead to cavities, gingivitis and tooth loss. Regular dental checkups remove plaque and protect teeth. The food adheres to the teeth and action of bacteria on the food particles leads to the formation of plaque. Abrasives should clean the teeth but should not damage the enamel or gum.<sup>4</sup>

Detergents increase wettability, assist to loosen the plaque and suspend the loosened dirt in the foam. In addition, foam has psychological value for acceptance of product. These include surfactants such as sodium lauryl sulphate, sodium lauryl sarcosinate, etc. The other common ingredients include flavors and mouth fresheners, including camphor, menthol, thymol, clove etc. These are mostly formulated in powder form. Tooth decay is dissolution or erosion of enamel. The food and carbohydrate residue in the mouth undergoes fermentation by bacteria or enzymes, producing lactic acid. The enamel dissolves in this lactic acid and leads to tooth decay.<sup>5</sup>

Tooth powder is different from toothpaste. It is available in both fluoride and non-fluoride type. Fluorides make enamel insoluble; bacteriostatic and enzyme inhibitors prevent fermentation of carbohydrate. Powder can be prepared by simple and inexpensive methods.

The main diseases of the teeth include plaque, caries and pyorrhea. Proper dental care is necessary for eliminating tooth decay and periodontal diseases. The people living in Indian subcontinent largely depend on the traditional systems for the treatment of toothache, caries and other diseases related to teeth. The mouth contains normal flora of opportunistic bacteria that are normally non-pathogenic. The imbalance of this situation causes infection and tooth

decay. Streptococcus mutants are considered as the main species involved in the development of dental caries<sup>6</sup>.

Characteristics of tooth powders:

- It should be finely powdered.
- It should have cleansing action.
- Abrasiveness of tooth powder help in remove of surface stains.
- It should possess good flavor.
- Helps in refreshing teeth.
- It provides healthier gums.
- It provides polishing effect.
- It shows binder property especially in toothpaste.
- It provides surfactant activity.
- It shows humectant activity.
- Compatible with sweetening and flavoring agents.
- It provides foaming effect.<sup>7</sup>

#### **TYPES OF TOOTH POWDER:**



**Figure1: Types of tooth powder**

➤ **WHITENING TOOTH POWDER:**

- It is used to freshen breath; help heal gums and reduce the amount of inflammation in the mouth.
- It can also polish and whiten teeth.
- The tooth powder is constituted of eatable silica dioxide, sodium bicarbonate, sodium glutamate, cyclohexyl amino sodium sulphonate, sodium saccharin, natural menthol, mint powder extract. These materials are comminuted, screened, mixed equably and applies.
- The application method using cotton swab dipping into tooth powder and cleaning inner and outer surface slightly every day.

➤ **NATURAL TOOTH POWDER:**

- Ingredients like sea salts, which acts as an abrasive, natural chalk, and certain essential oils like pepper mint, eucalyptus, and wintergreen are common ingredients in natural tooth powders.
- Sore or bleeding gums also can benefit from herbal tooth powder. Herbal tooth powder can have a variety of ingredients, powdered chalk and white clay are common.
- It has been around for centuries, and many believe it to be an essential part of any teeth cleaning regimen.
- Formulation of herbal toothpowder comprises of powder of zanthoxylum armatum (20-25%), Zingiber officinale (25-30%), Santalum album (8.25-8.5%), Spilanthes calva (2.0-2.5%), Pistacia lentiseus (2.0-2.5%), Quercus infectoria (8.0-8.5%), as well as roasted alum and common salt are weighed and mixed well and applies. These plant powders are employed for tooth care mainly.
- To be applied on the surface of the teeth with the help of toothbrush.

➤ **HOMEMADE TOOTH POWDER:**

- These powders can be made at home.
- Homemade herbal tooth powders can be beneficial because they may cost less, and ingredients are free from chemicals produces good effect.
- It involves chewing sticks made out of young woody stem or root pieces.

- It can be easily formulated by using organic neem powder, baking soda, Sea salt, Clove powder or fennel seed powder are weighed and mixed well and applied.<sup>8</sup>

### TYPICAL FORMULA FOR TOOTH POWDER

**Table no.1: Typical Formula For tooth powder**

<i>R<sub>x</sub></i>	
INGREDIENTS	QUANTITY
Dicalcium phosphate, Dihydrate	75.0 g
Precipitated calcium carbonates	22.0 g
Sodium lauryl sulphate	1.0g
Soluble saccharin	2.0g
Peppermint oil	0.4ml
Cinnamon oil	0.2ml

### PRINCIPLE:

Teeth cleansing of tooth powder is attributed to abrasive effect imparted dicalcium phosphate, precipitated calcium carbonate or other similar agents and surface tension lowering properties of surfactant like sodium lauryl sulphate. The abrasive agents under the applied force scrap off the debris whereas the surfactant helps to dislodge the debris or plaque. In addition, powder contains sweeteners and flavoring agents.<sup>9</sup>

Properties of each ingredient:

**Abrasive/polishing Agents:** These are solid cleansing materials which primarily, act by removing debris and residual stain from the teeth by providing friction and secondarily by polishing the surface of the enamel. They generally comprise of 20-50% of the total formulation.<sup>10</sup>

Precipitated calcium carbonate or chalk were prepared by double decomposition of calcium chloride and sodium carbonate in an aqueous solution. These are low cost and are easily available in number of density grades, ranging from light to extra dense. Also has seen some

impurities present and variation in the abrasivity in different grades. Dicalcium phosphate, anhydrous is very abrasives and generally used in medium concentration. Foaming/wetting/cleaning/surface active agents.

Agents penetrate and loosen surface deposits, emulsify and suspend the debris, which the toothpowers remove from tooth surface. These agents are either a surface-active agent or a soap which is used to aid the action of abrasives by reducing surface tension of the teeth. Surface active agents are foaming agents employed at levels of 0.5-2% to provide necessary foaming action. Sodium lauryl sulphate most widely used other surfactants that used are sodium lauryl sarcosinate, sodium lauryl sulfoacetate. The soap should be completely saponified, should contain 2% moisture, not more than 0.3% free alkali.<sup>11</sup>

**Sweetening Agents:** Agents are added to mask the bitter tastes of ingredients specially produced foaming and flavoring agents. These are synthetic compounds like saccharine, aspartame, cyclamates are used between 0.05-0.25%.

**Flavoring agents:** Tooth powders flavors belongs not only to satisfy the requirements of the formula but for satisfying the consumers who is looking forward to freshen breath after brushing. Peppermint oil, clove oil, oil of winter green, eucalyptus oil helps to prepare product which have pleasant long-lasting effect and which preferably has medicinal and freshening impacts, used between 0.2-2%.<sup>12</sup>

### **PROCEDURE:**

- Pass the calculated, weighed quantity of dicalcium phosphate and precipitated calcium carbonate through sieve no. 80.
- Then mix flavoring agents with 1gm of precipitated calcium carbonate. Add sodium lauryl sulphate to it and mix well.
- Continue mixing according to the principle of geometric dilution.

### **CONTAINERS**

Tooth powders are packed in metal or plastic container with perforated lid.

### **DIRECTION**

To be applied on the surface of the teeth with the help of tooth brush.



## **STORAGE**

Store in a cool, dry place, protect from moisture.<sup>13</sup>

## **PACKING OF POWDERS**

Powders are wrapped in paper or in a wide mouth container.

### **WRAPPING OF POWDERS:**

White glazed paper is generally used for wrapping. The wrapping should be done on a clean tile or large sheet of glazed paper to protect the product. The powders are wrapped in the following manner: -

- Cut the required number of powder papers in a suitable size (120mm×100mm).
- Arrange the papers with their long edges and turn up the long edge of each paper to about one-seventh of its width.
- Weigh out the powder and place it in the center of each paper.
- Place the unfolded edge of paper under the folded edge so that it lies exactly in fold of the first fold. Then give another fold to the first fold bringing it in the center.
- Finally bend 1/4<sup>th</sup> of each end sharply to bring the ends in the middle of the powder on a plain side.
- Firm the creases using a clean flexible spatula but avoid excessive pressure which would cause caking of enclosed powder.
- The packets are arranged in pairs, flap to flap and restrained with an elastic band.
- The wrapped powders are sent in an envelope if the number of powders is less than six. In case of large quantity, the boxes are preferred.
- In a well- wrapped powder, there should be no powder within the flaps or folds.<sup>14</sup>

COMMERCIAL BRANDS OF TOOTH POWDER AVAILABLE IN MARKET

Table no.2: List of commercial brands of tooth powder available in market.<sup>15</sup>

Sr. No.	BRAND NAME	MANUFACTURER
1.	Colgate Super Rakshak tooth powder.	Colgate Palmolive India Limited
2.	Dabur Red Lal Dant Manjan-Ayurvedic tooth powder.	Dabur India Limited
3.	Clove, pudina Dabur Red tooth powder.	Dabur India Limited
4.	Vicco Vajradanti tooth powder.	Vicco Laboratories Private Limited
5.	Gopal tooth powder.	S.P.S Jayam and company
6.	Kajah special tooth powder	Rajah Ayurveda
7.	Star herbal tooth powder.	Hid Ayat Ayurvedic Gruh Udhyog
8.	K.P Namboodiri's tooth powder.	KP Namboodiri's Ayurvedics
9.	Urban Botanic Activated charcoal teeth whitening powder.	Urban botanic private limited
10.	Healthvit activated charcoal powder for Natural teeth whitening.	West Coast Pharmaceutical Works Limited
11.	Lordent tooth powder.	Lord's cosmetics
12.	Meghdoot dantusha tooth powder.	Meghdoot Gramodhyog Seva Sansthan
13.	Payorin tooth powder.	Unit of Dawakhana Tibbiya college
14.	Hamdard Manjan tooth powder.	Hamdard (Wakf) Laboratories
15.	Sitaram tooth powder	Sitaram Ayurveda Limited
16.	Ancient Living Organic tooth powder.	Ancient Living Product Private Limited
17.	Georganics tooth powder.	Georganics Limited
18.	Patanjali Divya Dant Manjan.	Patanjali ayurveda Limited

EVALUATION METHODS:

❖ Determination of pH

A 1%w/v dispersion of tooth powder is prepared in distilled water and shaken gently for 30 minutes for homogenous dispersion. The dispersion is filtered through Whatman filter paper at room temperature and the pH of the filtrate is measured by digital pH meter. The

measurement of sample is performed in triplicate and the results is expressed as the mean of measured observations. The acceptable pH *is* between 3.76-8.03.

❖ Foaming Index

It is determined by taking 10ml of 1%w/v dispersion of tooth powder in 100ml measuring cylinder. The dispersion is stirred mechanically for 30 minutes for creating the foams. When the maximum foams are produced, the volume occupied by the foams is recorded and the mean of the three respective observations is recorded. Result calculated by measuring the height of foam developed in the measuring cylinder.

❖ Density of powder

The density of powders is determined by liquid displacement method in pycnometer by using following formula:

$$DP = \frac{w}{[(a+w)-b] \times SG}$$

where 'W' being the wt. of powder, 'SG' is the specific gravity of the solvent used, 'a' is weight of bottle and solvent, and 'b' is the weight of bottle+solvent+powder. The result shows the ratio of untapped powder sample and its volume including contribution interparticulate void volume.



**Figure 2:Pycnometer**

❖ Bulk Density

The tooth powder is poured freely in 100ml measuring cylinder up to the mark with their natural flow. The upper surface of powder is made regular with the help of spatula. The volume occupied by the powder is noted down and represented as bulk volume and the weight as bulk mass. The bulk density is determined by using following expression-

$$\text{Bulk density} = \frac{\text{Mass of powder}}{\text{Bulk volume occupied by powder}}$$

As the bulk volume of the powder increases the bulk density increases.

❖ Tapped Density

It is determined by using tapped density test apparatus. The powder taken in measuring cylinder (50ml) of the apparatus is tapped in up and down position up to the specified distance until it is compressed to the constant volume. The open end of the measuring cylinder is covered with aluminum foil to prevent the loss of lines due to dusting at the time of tapping. The tapped density is determined by using following

Formula-

$$\text{Tapped density} = \frac{\text{Tapped mass of tooth powder}}{\text{Tapped volume of tooth powder}}$$

As the tapped volume increases density decreases.

❖ Porosity

It is the void space that is occupied by the mass of the powder along with the entrapped air. It was determined as follows-

$$\text{Percentage porosity} = 1 - \frac{\text{Tapped volume}}{\text{bulk volume}} \times 100$$

Result shows that as the density of the powder increases porosity decreases.<sup>16</sup>

❖ Carr's Index (compressibility index) and Hausner's ratio

The usefulness of this simple ratio (Carr's index)' based on the decrementing powder volume during tapping, is to predict flowability of powders. The lower the number, the more is the free-flowing powder. An increase in the value is proportional to adhesion and friction properties of a powder. Both the Carr's index (compressibility index) and Hausner's ratio is determined by using following formula-

$$\text{Carr's index} = \frac{100 \times (V_o - V_f)}{V_o}$$

$$\text{Hausner's ratio} = \frac{V_o}{V_f}$$

Where '  $V_o$  ' initial volume of the powder taken in the measuring cylinder and '  $V_f$  ' is the final volume of powder after tapping.

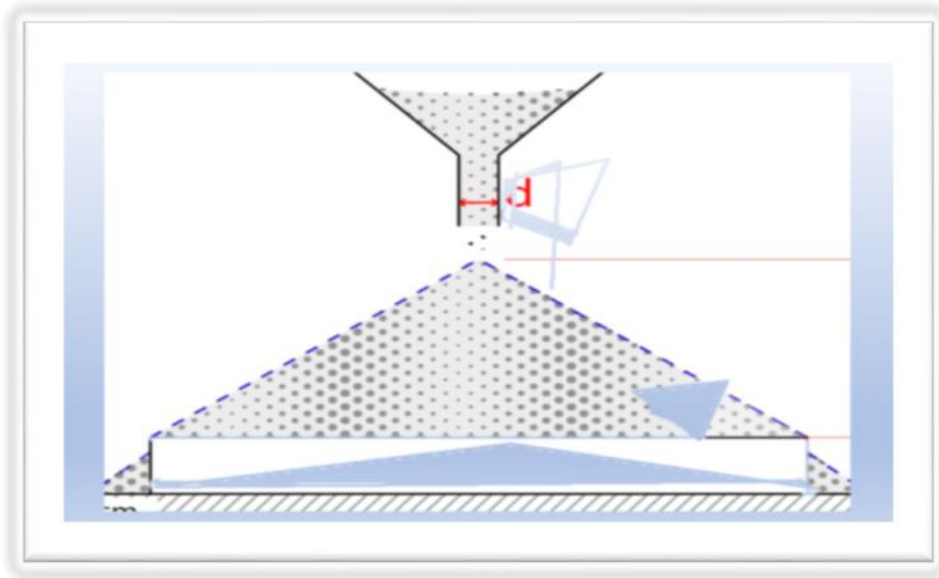
The result indicated by Hausner's ratio a good flow is greater than 1.25 and a poor flow may have a value of 1.5.

The result indicated by Carr's index is greater than 25 is considered to be an indication of poor flowability and below 15 provide good flowability.<sup>17</sup>

#### ❖ Abrasiveness

It is the measurement of the powder fineness that by rubbing on the teeth surface scrubs out the adhered particles of consumed food articles and maintains the shiny smooth surface of teeth. It is measured by rubbing the known amount of powder on glass slide for 15 minutes with the help of fingertip in the similar manner of brushing the teeth. The surface of the slide is observed microscopically and the scratches on slide generated by rubbing the powder is noted down. The results are expressed arbitrarily in positive and negative signs indicating the scratches on glass slide. More positive signs indicated the more abrasiveness.<sup>18</sup>

❖ Angle Of Repose



**Figure 3: Angle of repose**

It is determined by heap method. Briefly the powder is poured through a glass funnel from a definite distance to the smooth horizontal surface until a heap of maximum height is formed in a conical form. The diameter and the height of the heap is determined and the tangent of the angle is determined by following expression-

$$\text{Angle of repose } (\theta) = \tan^{-1} \left( \frac{h}{r} \right)$$

**Table no:3 Angle of repose**

Angle Of Repose (°)	Types of flow
25	Excellent
25-30	Good
30-40	Passable
>40	Very poor

Where, 'h' is the height of heap and 'r' is the radius heap made by powder.

The table shows,

The powder having angle of repose 25 exert an excellent powder flow.

The powder having angle of repose between 25-30 exert good powder flow.

The powder having angle of repose between 30-40 exert passable powder flow.

The powder having angle of repose greater than 40 exert very poor powder flow.

❖ Determination of ethanol-soluble extractive

A 5.0g of air-dried tooth powder is macerated with 100ml of ethanol of the 95%v/v strength in a closed flask for 24 hours and shaken frequently during the first 6 hours and then allowed to stand for 18 hours. Thereafter, it is filtered rapidly taking precautions against loss of ethanol and then 25ml of the filtrate is evaporated to dryness in a tare flat-bottomed shallow dish, dried at 105°C and weighed. The percentage of ethanol-soluble extractive with reference to air dried tooth powder is calculated. Ethanol-soluble extractive value should be 10.16% w/w.

❖ Determination of water-soluble extractive

A 5.0g of air-dried tooth powder is macerated with 100ml of chloroform water in a closed flask for 24 hours and shaken frequently during the first 6 hours and then allowed to stand for 18 hours. Thereafter, it is filtered rapidly taking precautions against loss of chloroform and then evaporated 25ml of the filtrate to dryness in a tare flat-bottomed shallow dish, dried at 105°C and weighed. The percentage of water-soluble extractive with reference to air dried tooth powder is calculated. Water-soluble extractive value should be 2.56%w/w.<sup>19</sup>

❖ Particle rearrangement behavior

The rearrangement behavior of the powder particles is determined by following equation:

$$\left[ \frac{(V - V_{\infty})}{(V_0 - V_{\infty})} \right] = (1 + kn)^{-0.25}$$

Where 'V<sub>0</sub>' indicates the initial volume of a powder sample, which is then shaken 'n' times, giving rise to a volume 'V' after 'n' taps. The final volume (corresponding to the mostly

closely arranged packing) is ' $V_{\infty}$ ' and 'k' is a rearrangement constant. Evaluation of particle rearrangement by under tapping and consolidation by deformation under applied pressure.

❖ Compatibility and Cohesiveness of Tooth Powders

Tooth powder is poured into 50 ml measuring cylinders of bulk density test apparatus through an angle of 45° and the heap of particles in the cylinder is labeled off horizontally with a thin metallic spatula and the bulk volume ( $V_0$ ) is accurately measured.

The cylinder is then mechanically tapped and values for the volume of powder column (V) after a specific number of taps 'N' is determined. Three measurements taken and the contents of the linear equation is calculated using tapping numbers. The following Kawakita equation is applied to assess the value of compatibility and cohesiveness of powders.

$$\frac{N}{C} = \left[ \frac{N}{a} + \frac{1}{ab} \right]$$

Here 'a' and 'b' are constants, 'a' describes the degree of volume reduction at the time limit of tapping and is called compactability. '1/b' is considered to be a constant related to cohesion and is called cohesiveness. 'C' is the degree of volume reduction and is calculated from the initial ' $V_0$ ' and tapped volume 'V'.

$$C = \frac{(V_0 - V)}{V}$$

Here, 'a' and 'b' are constants whose values are obtained from the slope and intercept of the graph plotted between 'N/C' and number of taps 'N'. As the cohesiveness increases flow property decreases also when compatibility increases flow property decreases.<sup>20</sup>

## DISCUSSION

It is often believed that the use of tooth powder has higher benefits in our lifestyle. They can produce good healthcare to teeth. Powders are pharmaceutical solid dosage form encountered in almost every aspect of pharmacy both in industry and practice. They are the mixture of finely divided drugs and chemicals in dry form, meant for internal and external use.



They have several advantages including better stability than liquid dosage form, convenient to handle carry, usage in pediatrics and geriatrics etc. It may also possess disadvantages like bitter taste of drugs, less dose accuracy and time consuming.

Toothpowder provide cleanliness and polishness in teeth enamel to prevent dental caries. Historically used by Romans to clean and whiten teeth, to fix them when loose and to prevent toothache. They usually made toothpowder with bones, hoofs and horns of certain animals like oyster, crabs and eggshells after previously burnt and reduced to fine powder. Also, some mixture contain honey, myrrh, salt etc. Powders contain abrasive agents like precipitated chalk, Dicalcium phosphate, alumina etc. These act by scraping off the enamel surface to loosen the plaque.

Plaque is yellowish- white sticky film forms on teeth. The food adhere to teeth leads to formation of plaque. Also, untreatness leads to major gingivitis and periodontal disease. The people living in Indian subcontinent largely depend on the traditional system for the treatment of toothache, caries and others disease related to teeth.

Toothpowder undergoes several characteristics like cleansing action, refreshing, foaming and polishing effect etc. Different types of toothpowders are available with different ingredients of preparation like whitening toothpowder, Natural toothpowder and homemade toothpowder. Toothpowder always follows formula with different penetrating agents like abrasives, polishing agents, Flavoring agents. Their storage condition, containers they get filled and direction, packaging and wrapping are very important for better quality.

Different commercial brands of toothpowder are available in market, when it comes to brands names and manufacturers. So, it helps people to find their characteristic toothpowder for the use. Different evaluation methods including Determination of pH, Foaming Index, Density of powder, Bulk density, Tapped density, porosity, Carrs' index and Hausner's' ratio, Abrasiveness, Angle of repose, Determination of ethanol -soluble extractive, Determination of water- soluble extractive, Particle rearrangement behavior, Compatibility and cohesiveness of tooth powder.

## **CONCLUSION**

Powders are pharmaceutical solid dosage form which is applied to provide cleanliness and polishness in teeth to prevent dental caries. Tooth powders are common oral care product used to control plaque and other deposits from tooth surface thereby reducing gingivitis.

From the current study, it may be concluded that toothpowder has been shown to be statistically superior to toothpastes in controlling dental plaque and gingivitis. The impact of toothpowder in the healthcare system can't be excluded.

## REFERENCES

1. Robert E O Connor and Joseph B Schwartz. Powders: Introduction. Remington The Science and Practice of Pharmacy vol.10; 2000. page no.681.
2. Michael Bayba. Powders: Advantages and disadvantages. Asian Journal of Aesthetic Dentistry vol.9; 2022.page no.629-632.
3. MK Khan. Comparison of the plaque removing efficacy of tooth powder, Europe PMC, Journal of the International academy of periodontology vol.11; 2009.Page no. 147-150.
4. Janakiran, Chandrashekar. Comparison of plaque- removing efficacy of tooth powder in young adults in India: A Randomized controlled Clinical trial; Journal of the International Academy of periodontology US National Library of Medicine vol.1; 2018.Page no.203-215.
5. Muhammed, Khan Khalil. Evaluating the Clinical Efficacy of toothpowder on plaque- induced gingivitis: A randomized controlled trial. Journal of compendium of continuing Education in Dentistry, US National Library of Medicine vol.17; 1995.page no. 234-240.
6. Singh, Ramprakash. Comparative evaluation of tooth substance loss and its correlation with the abrasivity and chemical composition of different dentifrices. Research Gate, Indian journal of Dental Research vol.12 ;2016. Page no. 123-128.
7. Corey Whelan. Toothpowder: The surface effect of dentifrices Aust dent Journal vol.15; 2020. Page no.567-570.
8. Van der Weijden Slot DE. Oral hygiene in the prevention of Periodontal diseases; the evidence. Journal of the Periodontology vol.20; 2000. Page no.104-112.
9. Swaminathan DM, Addy JM. The efficacy of detergents on stain removal. Asian Journal of Aesthetic Dentistry vol.14; 1996. page no. 25-29.
10. Meyers IA. The surface effect of dentifrices Aust dent Journal vol.45; 2000. Page no. 118-124.
11. Yankell SL. Clinical study to assess the stain removal efficacy of tartar control dentifrices and a low abrasive dentifrice. Journal of clinical Dentistry vol.5; 1994.Page no.125-128.
12. Vipin Kumar, Bhaskar Mazumder, Prince Prashant Sharma. Anti-microbial and powder characterization of herbal dentifrices. Journal of the International Academy of Periodontology vol.16; 2013. Page no.101-116.
13. Mithal BM and Saha R.N. A Handbook of cosmetics vol.1; 2000. Page no. 203-215.
14. Sheikh Zayed. Clinical Effects of toothpowder on gingivitis vol. 18; 2013.Page no. 122-145.
15. Alaul Hasan Abad Farooqi, Srikant Sharma, Asifudilla khan, Raghubind Kumar, Sushil Kuma. Formulation useful as a natural herbal toothpowder. Journal of the International Academy of periodontology vol.1;2001. Page no. 98-200.
16. Bharathi, D. Rajalingam, Kausalya. Formulation and Evaluation of herbal toothpowder for Oral care. Journal of clinical Dentistry vol.22; 2020. Page no. 456-467.
17. Khan M.K, Ayyaz AK, Tasleem H. Comparison of the plaque removing efficacy of toothpowder. Journal of the International Academy of periodontology vol.92;2009. Page no. 147-150.
18. Ivan SP. Dental Caries and periodontal diseases. Journal of clinical Dentistry vol.11;1999. Page no. 29-36.
19. RM Mehta. Solid dosage forms. Dispensing Pharmacy vol.4;2008. Page no.110-118.
20. Ohrn k, Sanz. prevention and therapeutic approaches to antimicrobial and powder characterization of dentifrices. Journal of Clinical periodontology. Vol.10;2009. Page no.20-26.