

## Effect of Bhavana Samskara on particle size distribution in various stages of preparation of Niruha Basti with special reference to Madhutailika Basti

### Research Article

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### Abstract

*Basti* (Medicated enema) is one of the five therapeutic procedures in *Panchakarma*, is frequently used in the management of different *Vatavyadhi* (neurological disorders). It is a herbo-mineral preparation prepared by systematic step wise procedure described in Ayurvedic classics. It is a unique preparation as well as widely practised all over the world. Therefore, in the present study, a simple and widely practiced *Madhutailika bati* was used as a model formulation to assess the changes in particle size distribution in each step of preparation. It was prepared by adding *Makshika* (Honey), *Saindhava Lavana* (Rock salt), *Moorchita tila taila* (Medicated oil), *Shatapushpa kalka* (Fine paste obtaining after wet grinding of plant material), *Erandamoola kwatha* (Decoction) in a serial order for a specific duration. The changes taking place in each steps of mixing were evaluated on the basis of particle size distribution. The changes taken place, by increasing the duration of *Bhavana* (levigation) on particle size of the drug was observed under digital microscope. Overall, a remarkable difference was observed in the sample after *Bhavana* (levigation). The study underlines the significance of the procedure described in the classics emphasizing the serial order of mixing of *basti dravyas*.

**Keywords:** *Bhavana, levigation, Madhutailika basti, Basti dravya, Particle size distribution, Serial order of mixing.*

### Introduction:

*Basti* (Medicated enema) in *panchakarma* is compared with conventional enema due to its similarity in procedure of administration. But in effect, enema is simple evacuation technique,

whereas *basti* (Medicated enema) is a therapeutic measure considered as *ardhachikitsa* (half treatment). (1)

'*Madhutailika basti*' a type of *niruha basti* (decoction enema) also named as *asthapana basti*, is a mixture of equal quantity of *makshika* (honey) and *taila* (oil) along with other ingredients like *saindhava lavana* (rock salt), *Kalka* (Fine paste obtaining after wet grinding of plant material), *kwatha*(decoction). As these ingredients are immiscible with each other, classically, a systematic step wise procedure is explaining for the preparation of *niruha bastis*. By this serial mixing homogeneity is sustained for a reasonable period. (2, 3)

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Sequential order of mixing of ingredients in classics is, Honey and rock salt are mixed together in the beginning followed by addition of oil. This mixture is then meticulously mixed. The finely wet grinded paste of prescribed medicinal plants is then mixed in it. The mixture is then again mixed thoroughly. The prescribed liquid *kwatha* (Decoction) is added to it and the mixture is subjected to thorough churning to produce a homogenous mixture. (4) With the reference of modern pharmaceuticals, it can be concluded that the mixture thus produced acquires a physical state of emulsion and suspension, as it contain oil, decoction and *kalka* (Fine paste obtaining after wet grinding of plant material). An Emulsion is a biphasic liquid/semisolid preparation consisting at least two immiscible liquids And a suspensions are thermodynamically unstable biphasic systems consisting of finely divided solid particles of dispersed phase in dispersion medium. *Madhutailika basti* doesn't contain any conventional emulsifying agent, although it contains honey a natural emulsifying agent. (5)

Everything in universe is in a continuous process of change. When this transformation is performed in a proper manner, under controlled conditions to get the expected result, it is termed as *samskara*. Here, *Bhavana* is also one type of *Samskara* responsible for transformation, having its utility in almost all pharmaceutical processing. (6)

### Aims and objectives

- 1.To prepare *Madhutailika Basti* in accordance with the prescribed classical method.
- 2.To assess the role of serial order of mixing basti dravya with reference to *Bhavana Samskara*

### Materials & Methods:

#### Raw materials: (7)

#### Table no: 1 Showing ingredients of *Madhutailika basti*

| Ingredients                          | Quantity        |
|--------------------------------------|-----------------|
| Makshika / Honey                     | 48 ml/1 pala    |
| Saindhava lavana / Rock salt         | 12 gm/ 1/4 pala |
| Moorchita tila taila / Medicated oil | 48 ml/ 1 pala   |
| Shatapushpa kalka / Annithum sowa    | 24gm / 1/2 pala |
| Eranda moola kashaya / Decoction     | 96 ml / 2 pala  |

#### Equipments:

1. Mortar and pastel
2. Filter
3. Stainless steel vessel
4. Measuring cylinder

#### Method:

Study carried out in two phases

1. Preparation of *Madhutailika Basti*
2. Role of *Bhavana* by step wise assessment of particle distribution

#### Phase 1: Preparation of *Madhutailika basti*

Ingredients in the formulation were taken in the measure as shown in the table

All the ingredients were collected from GMP certified KLEU'S Ayurvedic pharmacy. Collection and authentication of raw materials, honey and moorchita taila had been done by experts in Central Research Facility of Shri B M K Ayurveda Mahavidyalaya. The product is prepared in Bhaishajya Kalpana lab of Shri B M K Ayurveda Mahavidyalaya under experts supervision.

The decoction of *Ricinus communis* was prepared by standard method by taking the powder (60 mesh) of *Ricinus communis* roots and water in the proportion of 1:8 and reduced to 1/4<sup>th</sup> part after boiling. The contents were filtered through double layered muslin cloth. The filtrate so obtained was used as a decoction

of *Ricinus communis* for preparation of basti. A fine paste of *Anethum sowa* fruits powder was prepared by wet grinding. The paste was used as kalka for the preparation of basti. Rock salt was grinded independently to prepare fine powder.

Basti was prepared by step wise serial order of mixing the ingredients prescribed by Sharangadhara, as indicated below.

Step1 - *Makshika* (Honey) and *Lavana* (rock salt) are mixed together in the beginning.

Step 2 - Followed by addition of *moorchita tila taila*. This mixture is then meticulously mixed.

Step 3 - The finely wet grinded paste of *shatapushpa kalka* is then mixed in it. The mixture is then again mixed thoroughly.

Step 4 - The prescribed liquid, *eranada moola kwatha* is added to it and subjected to thorough churning to produce a homogenous mixture.

### Phase 2: Particle Size distribution

In each steps, The samples were analyzed for particle size determination and distribution in CARL ZEISS, AXIO Cam model of digital microscope.

### Method:

In each step, duration of mixing the ingredients fixed as 30 minutes. 1-2 drop of liquid sample after each step of levigation at different duration (ie, 5 min, 15 min, 25 min, 30 min) were taken in a clean glass slide and cover with cover slip. Later the slides were viewed under digital microscope at 10 x magnification and the changes in distribution of particle size in each step were observed.

### Discussion:

As the ingredients in the *basti dravya* are immiscible with each other systematic stepwise procedure was described by our acharyas to make it in a homogenous form. Hence, the present study supports the importance of serial

order of mixing *basti dravyas* on the basis of particle size distribution.

In the initial step of *basti* preparation, while mixing *makshika* (Honey) and *saindhava lavana* (Rock salt) classically its said that one has to continue the levigation till the sticky sounds goes off. In the present study, while preparing *basti* it is observed that sticky sound disappeared by nearly 30 minutes of levigation. In the second step of mixing, with *moorchita tila taila* (medicated oil ) continuous homogeneity noticed nearly after 25 minutes of levigation. Homogeneity of final product, *niruha basti* depends on mainly these two steps. Improper mixing of these two steps followed by proper mixing of other ingredients doesn't serve the purpose of homogeneity. Hence these two steps are considered to be more important in the preparation of *niruha basti*. Other steps of mixing depend on the initial 2 steps of mixing and if it is properly done other 2 steps doesn't require more time to form a harmonized mixture. There for in the present study duration of mixing *niruha basti dravya* was fixed as 30 minutes in each steps .

To observe the particle size distribution in each step after *Bhavana* (levigation) at different duration the *basti dravyas* were assessed periodically at the intervals of 5, 15, 25 and 30 minutes. A considerable difference was found in the each step of preparations. After 5 minutes of mixing the ingredients, it is noticed that distribution of particles and particle size in each step were not uniform. As the duration of *Bhavana* is increases the uniformity in distribution of particle and particle size also got increased. It was much clearly noticed in the initial step of mixing *makshika* (Honey) and *Saindhavalavana* (Rock salt). This may be one of the reason behind the classical reference of serial order of mixing the ingredient of *niruha basti dravya*.

At the end of mixing, at 30 minutes, in each step homogeneity in distribution of particle and in particle size was observed. Ninety percent of the particles are below 0.010  $\mu\text{m}$  in size. The above data indicate that dravyas are more microfined as the number and duration of *Bhavana* increases.

Homogeneous mixture of Makshika (Honey), *Saindhava Lavana* (Rock salt), *Moorchita tila taila* (Medicated oil), *Shatapushpa kalka* (Fine paste obtaining after wet grinding of plant material), *Erandamoola kwatha* (Decoction) are readily absorbed and assimilated by the body very quickly. In the modern pharmaceuticals also, systematic step wise method (levigation method) is explained for preparation of emulsions (Immiscible liquids).

#### Conclusion:

In the present study it was observed that the order of mixing is very important as the ingredients like salt and grinded paste being do not get properly mixed in the emulsion if such an order of mixing is not followed. Especially honey a natural emulsifying agent has a great significance in this regard.

The study underlines the significance of the procedure described in the classics, emphasizing the serial order of mixing of *basti dravyas* with remarkable difference in the sample after *Bhavana*.

Reduction in the size of particles was found in the sample as the duration of *Bhavana* increases. Uniformity in distribution of particle as well as particle size was observed by 30 min of the *Bhavana*. This imparts homogeneity of

*basti dravyas* for a reasonable period. Thus, *Bhavana* is an important and mandatory process during *basti* preparation, affecting the physicochemical and biological properties of a dosage form.

#### Scope for further study:

Physicochemical changes of *niruha basti dravya* in each steps after *Bhavana* at different duration can be studied detail.

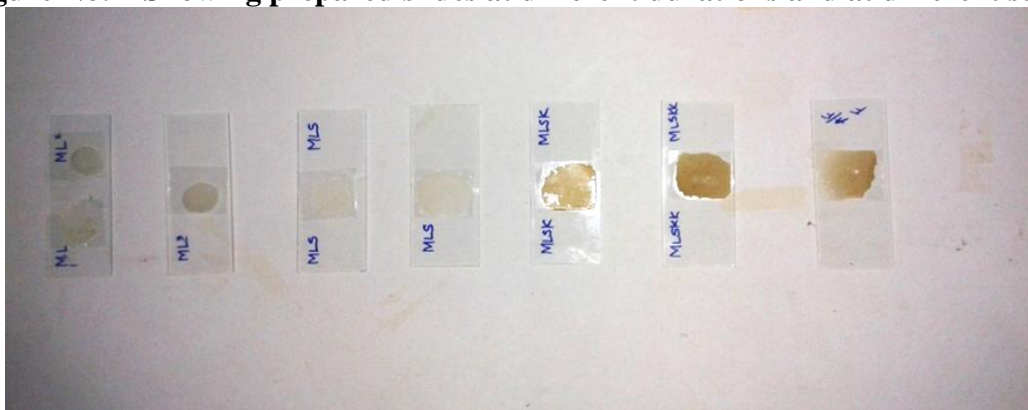
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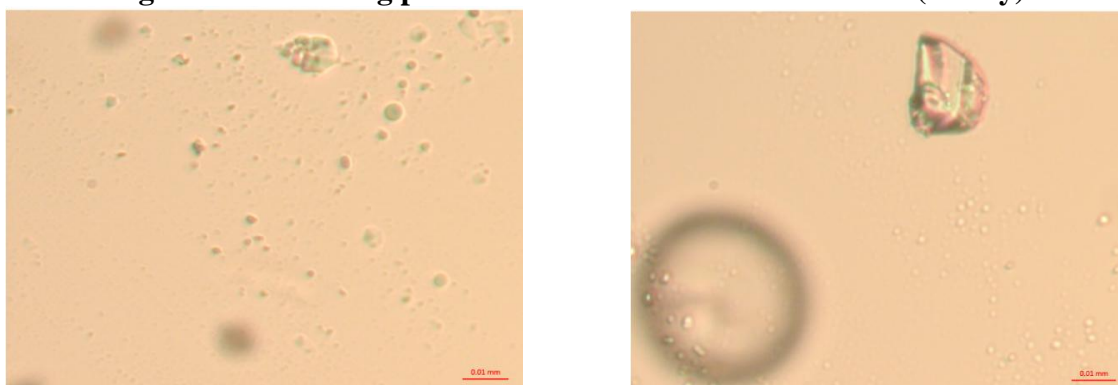
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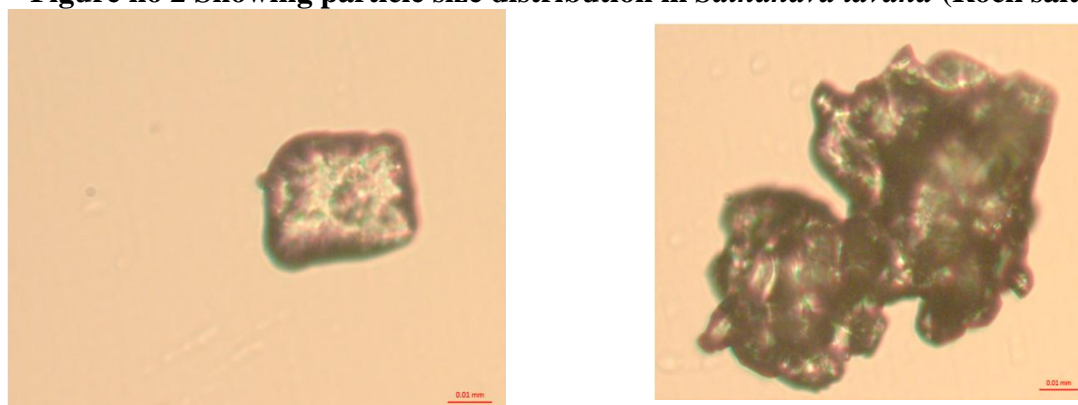
**Figure No: 1 Showing prepared slides at different durations and at different steps**



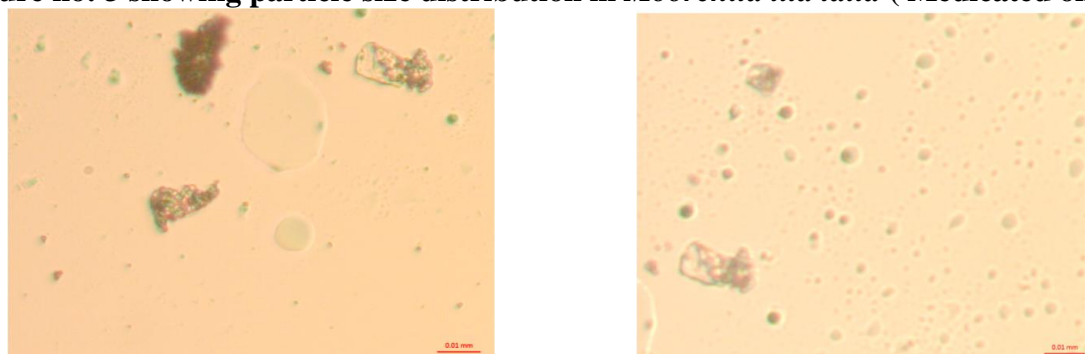
**Figure no 2 Showing particle size distribution in *Makshika* (Honey)**



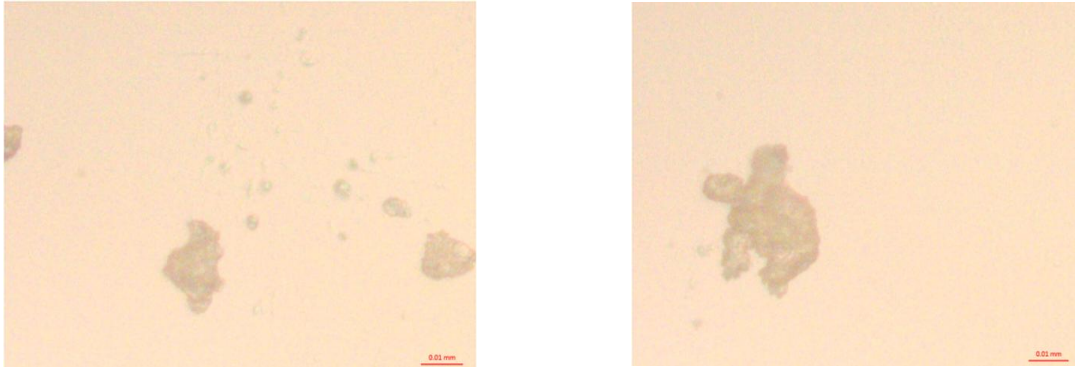
**Figure no 2 Showing particle size distribution in *Saindhava lavana* (Rock salt)**



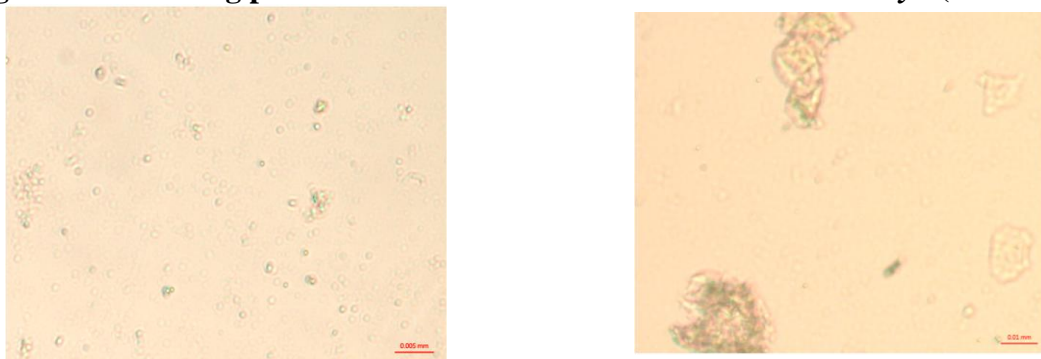
**Figure no: 3 showing particle size distribution in *Moorchita tila taila* (Medicated oil)**



**Figure no 4 showing particle size distribution of *Shatapushpa choorna* ( Powder)**

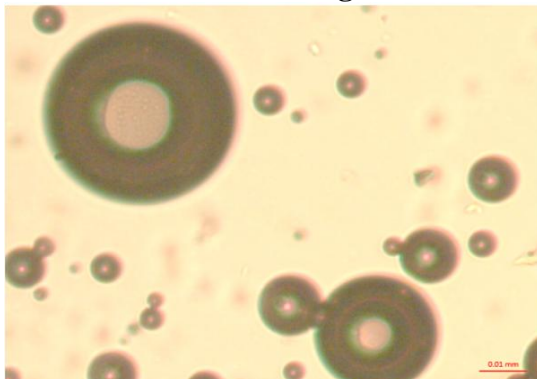


**Figure no 5 showing particle size distribution of *Erandamoola kashaya* (Decoction)**

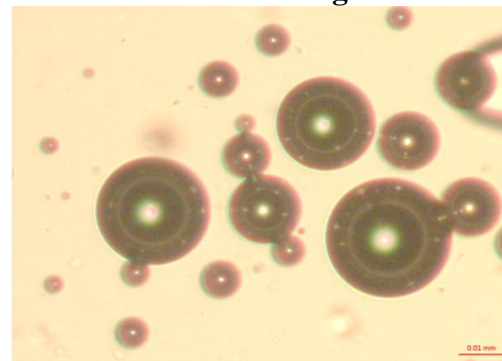


**Figure no: 6 Showing particle size distribution of *Makshika + lavana* at different intervals of Levigation**

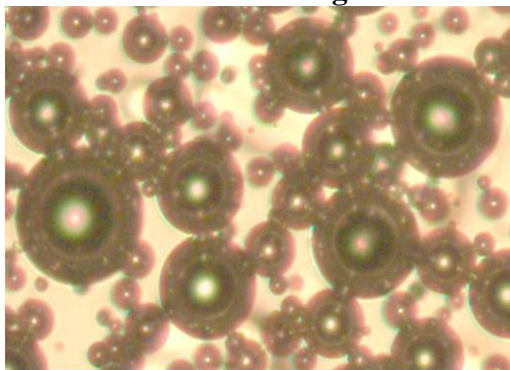
**5 min after Levigation**



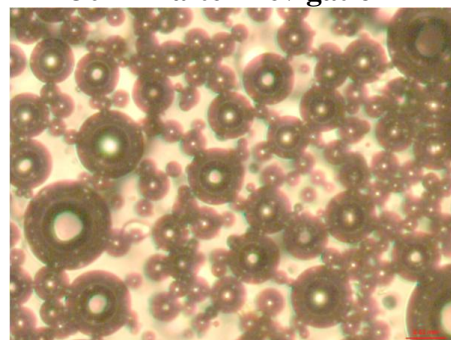
**15 min after Levigation**



**25 min after Levigation**

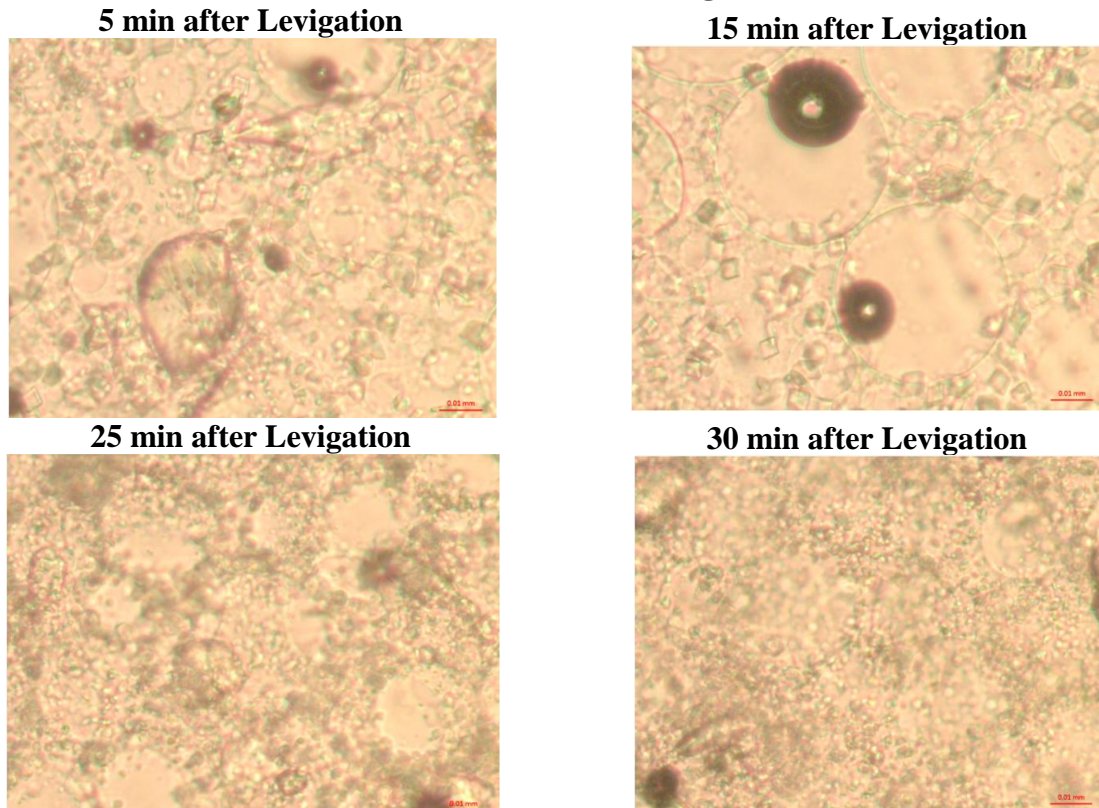


**30 min after Levigation**

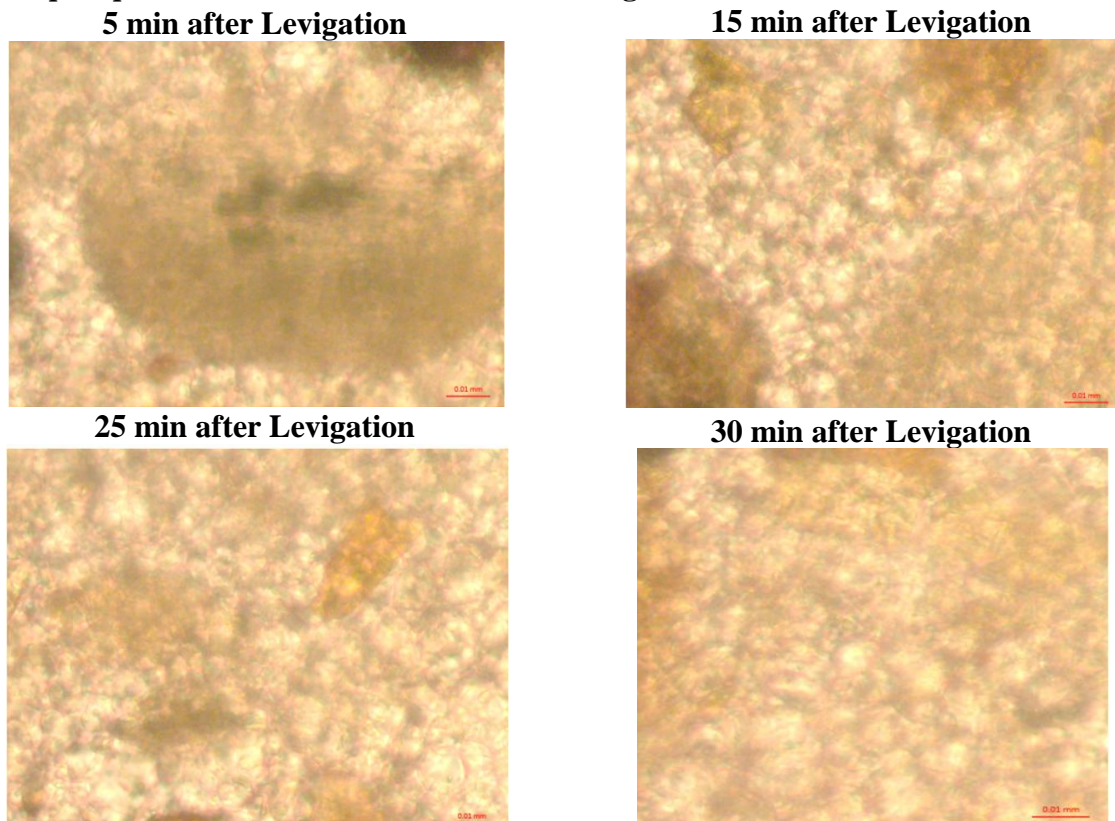




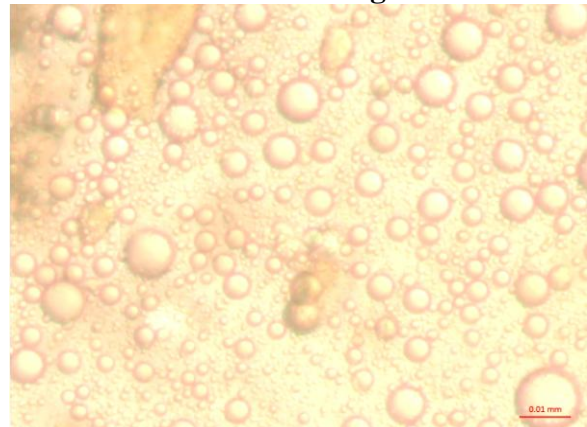
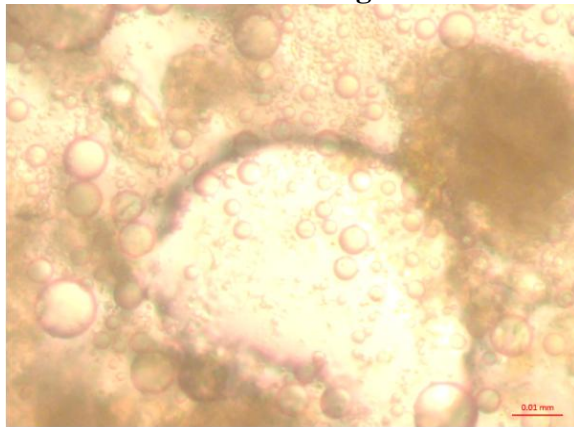
**Figure no 7 showing particle size distribution of *Makshika + lavana +Moorchita tila taila* at different intervals of Levigation.**



**Figure no 8 showing particle size distribution of *Makshika + lavana +Moorchita tila taila +Shatapushpa kalka* at different intervals of Levigation**

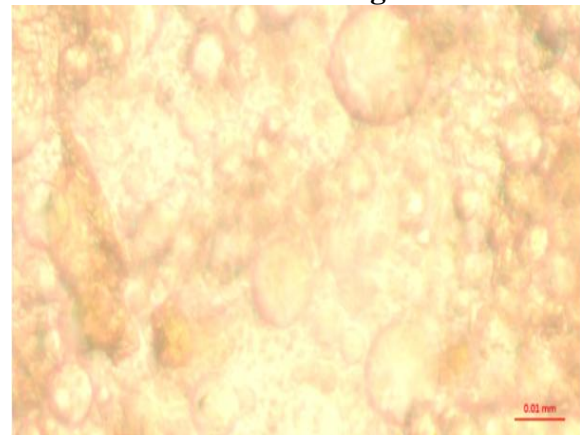
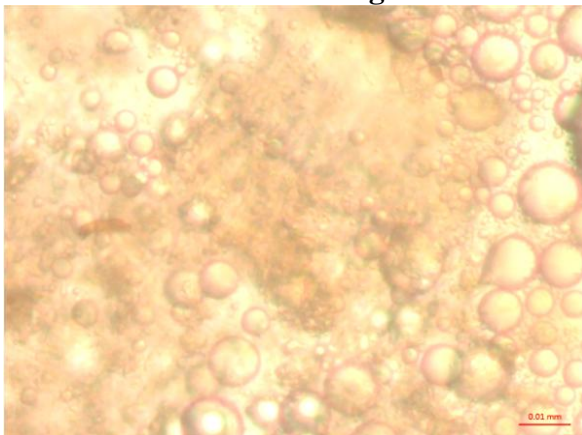


**Figure no 9 showing particle size distribution of Makshika + lavana +Moorchita tila taila +Shatapushpa kalka + Erandamoola kashaya at different intervals of Levigation**  
**5 min after Levigation** **15 min after Levigation**



**25 min after Levigation**

**30 min after Levigation**



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