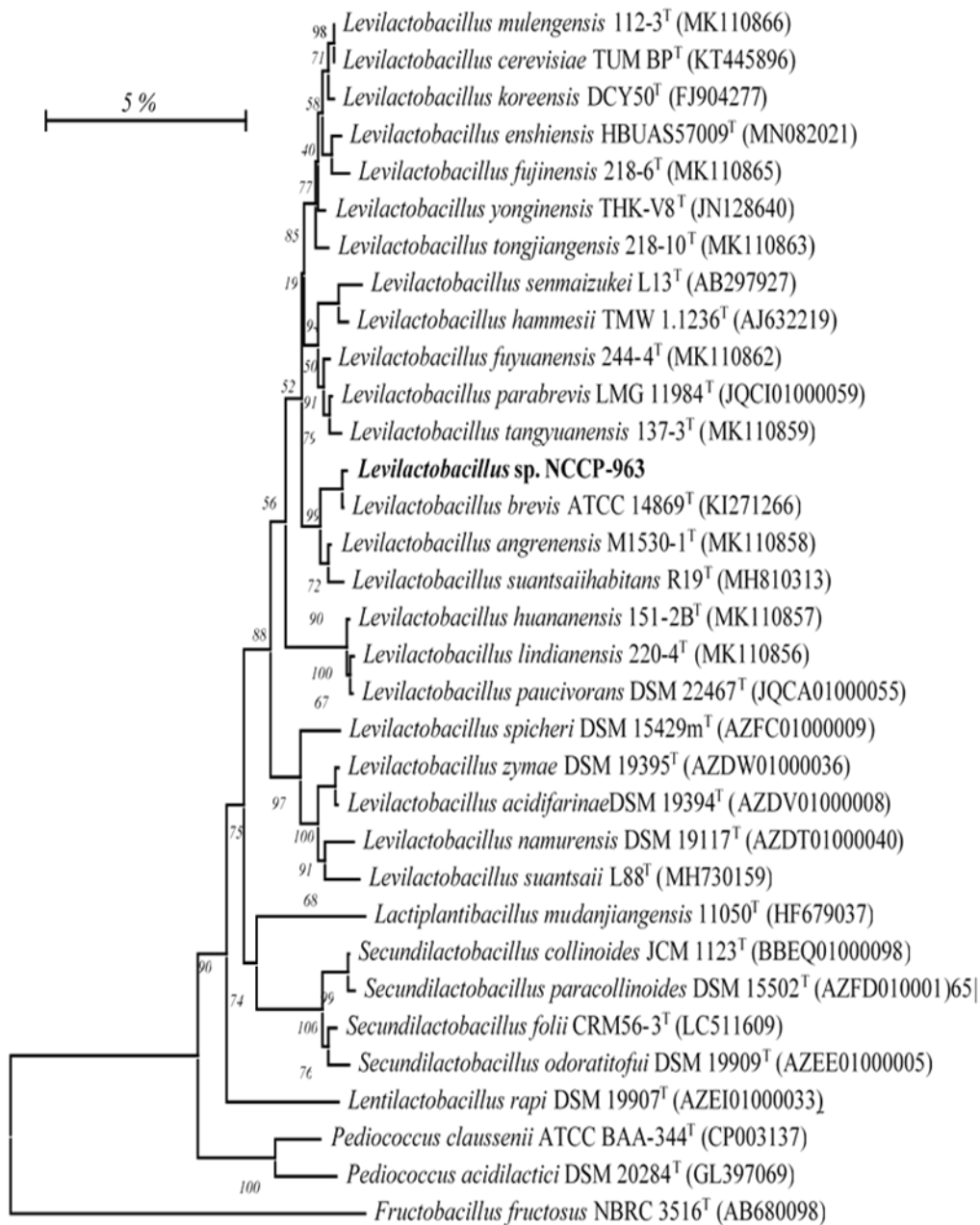
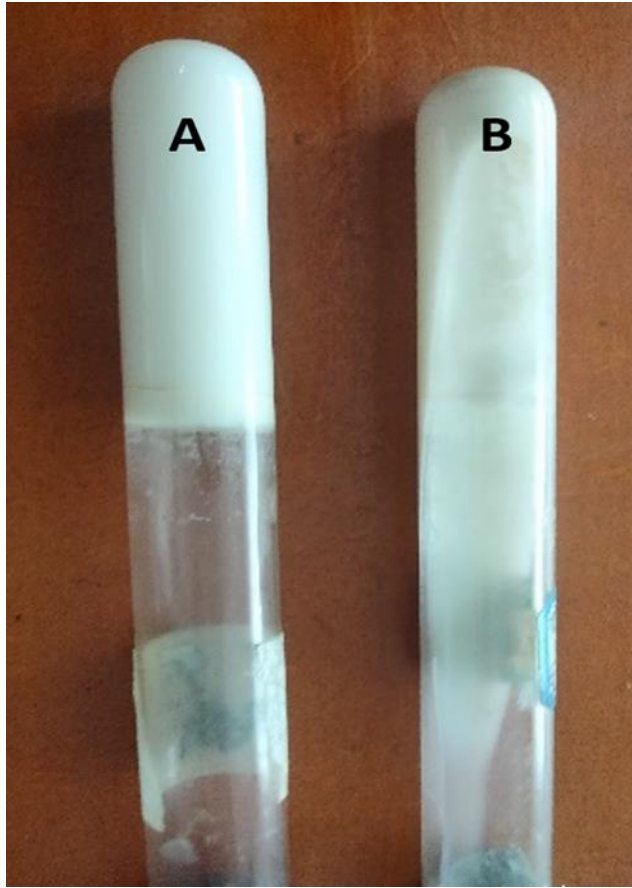


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CCAAAGCCGGTGAGATAACCTTCGGGAGTCAGCCGTCT

Fig. S1: 16s rRNA sequencing of *Levilactobacillus brevis* -NCCP 963



**Fig. S2: Phylogenetic tree**



**Fig S3:** Solidification of skim milk (10%). A: Yogurt fermented with *Levilactobacillus brevis* strain, B: Control – milk without *Levilactobacillus brevis* strain

**Table S1: Plackett Burman experimental design matrix for screening of important variables**

| Run | A: | B: | C: | D: | E: | F: | G: | H: | J: | K: | L: | EPS YIELD |
|-----|----|----|----|----|----|----|----|----|----|----|----|-----------|
|     | %  |    |    |    |    |    |    |    |    |    |    | mg/L      |
| 1   | -1 | -1 | 1  | -1 | 1  | 1  | -1 | 1  | 1  | 1  | -1 | 145.14    |
| 2   | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 70.81     |
| 3   | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 65.67     |
| 4   | 1  | -1 | 1  | 1  | 1  | -1 | -1 | -1 | 1  | -1 | 1  | 201.7     |
| 5   | 1  | -1 | -1 | -1 | 1  | -1 | 1  | 1  | -1 | 1  | 1  | 67.89     |
| 6   | 1  | 1  | -1 | -1 | -1 | 1  | -1 | 1  | 1  | -1 | 1  | 84.51     |
| 7   | 1  | 1  | -1 | 1  | 1  | 1  | -1 | -1 | -1 | 1  | -1 | 91.44     |
| 8   | -1 | 1  | 1  | 1  | -1 | -1 | -1 | 1  | -1 | 1  | 1  | 81.66     |
| 9   | 1  | -1 | 1  | 1  | -1 | 1  | 1  | 1  | -1 | -1 | -1 | 99.41     |
| 10  | -1 | 1  | -1 | 1  | 1  | -1 | 1  | 1  | 1  | -1 | -1 | 71.81     |
| 11  | -1 | -1 | -1 | 1  | -1 | 1  | 1  | -1 | 1  | 1  | 1  | 50.19     |
| 12  | 1  | 1  | 1  | -1 | -1 | -1 | 1  | -1 | 1  | 1  | -1 | 140.78    |
| 13  | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 73.43     |
| 14  | -1 | 1  | 1  | -1 | 1  | 1  | 1  | -1 | -1 | -1 | 1  | 53.04     |

A:Glucose, B:Fructose, C:Lactose, D:Sucrose, E:Yeast Extract, F:Beef Extract, G:Tryptone, H:MgSO<sub>4</sub>, J:CaCl<sub>2</sub>, K:K<sub>2</sub>HPO<sub>4</sub>, L:NaH<sub>2</sub>PO<sub>4</sub>

**Table: S2. Morphological and Biochemical properties of isolated strains.**

| Sr. No | Sample Code     | Gram's Staining | Cell Morphology            | Biochemical Parameters |         |          |               |        |            |                 |         |                     |                    | Growth |      |
|--------|-----------------|-----------------|----------------------------|------------------------|---------|----------|---------------|--------|------------|-----------------|---------|---------------------|--------------------|--------|------|
|        |                 |                 |                            | Catalase               | Oxidase | Motility | Spore Forming | Indole | Methyl Red | Vogesprosk Auer | Citrate | Arginine Hydrolysis | Esculin Hydrolysis | 30°C   | 37°C |
| 1.     | AAF-1           | +               | Coccid cells               | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | +                  | +      | +    |
| 2.     | AAF2            | +               | Short rods                 | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | +                  | +      | +    |
| 3.     | AAF3            | +               | Ovoid cells                | -                      | -       | +        | -             | -      | -          | +               | -       | +                   | +                  | +      | +    |
| 4.     | AAF4            | +               | Short rods                 | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | -                  | +      | V    |
| 5.     | AAF5            | +               | Rods                       | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | -                  | +      | V    |
| 6.     | AAF-6           | +               | Coccid cells               | -                      | -       | +        | -             | -      | -          | -               | -       | +                   | -                  | +      | +    |
| 7.     | AAF-7           | +               | Coccid cells               | -                      | -       | -        | -             | -      | -          | -               | -       | +                   | -                  | +      | +    |
| 8.     | AAF8            | +               | Ovoid cells                | -                      | -       | +        | -             | -      | -          | +               | -       | -                   | -                  | +      | +    |
| 9.     | <b>NCCP-963</b> | +               | <b>Rod with round ends</b> | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | +                  | +      | +    |
| 10.    | AAF-10          | +               | Short rods                 | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | +                  | V      | +    |
| 11.    | AAF-11          | +               | Short rods                 | -                      | -       | -        | -             | -      | -          | -               | -       | -                   | +                  | +      | -    |
| 12.    | AAF-12          | +               | Ovoid cells                | -                      | -       | +        | -             | -      | -          | -               | -       | +                   | +                  | +      | -    |

+ = Positive, - = Negative, V =Variable

**Table S3: Carbohydrate fermentation and EPS production by the isolates**

| <b>Sr. No</b> | <b>Sample Code</b> | <b>Sucrose</b> | <b>Glucose</b> | <b>Saccharose</b> | <b>Mannose</b> | <b>Mannitol</b> | <b>Fructose</b> | <b>Dextrose</b> | <b>Amount of EPS produced mg/L</b> |
|---------------|--------------------|----------------|----------------|-------------------|----------------|-----------------|-----------------|-----------------|------------------------------------|
| 1.            | AAF-1              | +              | +              | V                 | +              | +               | +               | V               | 88.44                              |
| 2.            | AAF2               | +              | +              | +                 | +              | +               | -               | +               | 77.67                              |
| 3.            | AAF3               | +              | +              | +                 | +              | +               | V               | +               | 63.44                              |
| 4.            | AAF4               | V              | +              | D                 | WR             | -               | +               | -               | 103.02                             |
| 5.            | AAF5               | +              | +              | +                 | +              | -               | +               | WR              | 72.95                              |
| 6.            | AAF-6              | +              | -              | +                 | +              | +               | +               | +               | 85.67                              |
| 7.            | AAF-7              | +              | +              | -                 | +              | +               | +               | +               | 53.44                              |
| 8.            | AAF8               | +              | +              | WR                | +              | +               | -               | +               | 82.66                              |
| 9.            | NCCP-963           | +              | +              | -                 | +              | +               | WR              | +               | 196.66                             |
| 10.           | AAF-10             | +              | V              | +                 | +              | -               | +               | V               | 70.14                              |
| 11.           | AAF-11             | +              | +              | -                 | +              | V               | +               | -               | 86.89                              |
| 12.           | AAF-12             | V              | +              | +                 | +              | +               | V               | +               | 76.89                              |

+ = Positive, - = Negative, D= Determinative, WR= Weak reaction, V =Variable