



सत्यमेव जयते

DEPARTMENT OF BIOTECHNOLOGY
Ministry of Science & Technology
Government of India



#OneDayOneGenomeInitiative

Mammaliicoccus sciuri

Causes mastitis i.e. inflammation (pain, redness, and swelling) in the udder of cows, also contaminating the milk they produce.

*Isolated
from*



Milk of affected
cows

Genomic Analysis



Genes for resistance to several
antimicrobials, some metals,
disinfectants and antiseptics!

Insights



The genomic analysis tells about its
capacity to stick in (adherence) and
survive in the cells of the cow's
udder (intracellular survival)!

Application



Genetic information can help
design better drugs, thus ensuring
animal health and consequently,
milk quality, food security and even
public health!



Quality of Genome Assembly and Annotation:

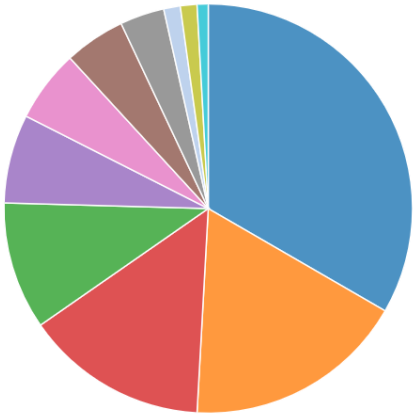
Results from indigenously developed **BHARAT** analysis pipeline: (**B**acterial **H**ybrid genome **A**ssembly and **R**apid **A**nnotation **T**oolset)

Table 1: Assembly Details

Contigs	18
GC Content	32.35
Contig L50	3
Genome Length	2,702,737 bp
Contig N50	391,383

Table 2: Annotated Genome Features

CDS	2,715
tRNA	13
Repeat Regions	5
rRNA	3



- Subsystem (Subsystems, Genes)
- METABOLISM (76, 453)
 - PROTEIN PROCESSING (40, 207)
 - STRESS RESPONSE, DEFENSE, VIRULENCE (33, 105)
 - ENERGY (23, 179)
 - DNA PROCESSING (16, 74)
 - RNA PROCESSING (13, 51)
 - CELLULAR PROCESSES (11, 64)
 - MEMBRANE TRANSPORT (8, 30)
 - MISCELLANEOUS (3, 6)
 - REGULATION AND CELL SIGNALING (3, 9)
 - CELL ENVELOPE (2, 7)

Table 3: Antimicrobial Resistance Genes

AMR Mechanism	Genes
Antibiotic inactivation enzyme	BlaZ family, FosB, Mph(C) family
Antibiotic target in susceptible species	Alr, Ddl, dxr, EF-G, EF-Tu, folA, Dfr, folP, gyrA, gyrB, inhA, fabI, Iso-tRNA, kasA, MurA, rho, rpoB, rpoC, S10p, S12p
Antibiotic target protection protein	Sal(A)
Efflux pump conferring antibiotic resistance	BceA, BceB, NorA
Gene conferring resistance via absence	gidB
Protein altering cell wall charge conferring antibiotic resistance	GdpD, MprF, PgsA
Regulator modulating expression of antibiotic resistance genes	BceR, LiaF, LiaR, LiaS

Genome Assembly

