

Staphylococcus epidermidis

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



Revealed genes encoding efflux pumps that keep chemicals out and make this bacteria **resistant** to antimicrobials like penicillin, fluoroquinolones, trimethoprim, quaternary ammonium compounds, antiseptics, and even disinfectants!

Insights



The genes for capsules, **enzymes**, proteases, **hemolysin** and attachment factors - all that allows the bacteria to grow inside udder tissue - were uncovered! *S. epidermidis* turns out to be the **major species** besides *S. aureus* associated with bovine mastitis!

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	142
GC Content	31.95
Contig L50	21
Genome Length	2,455,169 bp
Contig N50	36,140

Table 2: Annotated Genome Features	
CDS	2,404
tRNA	50
rRNA	7

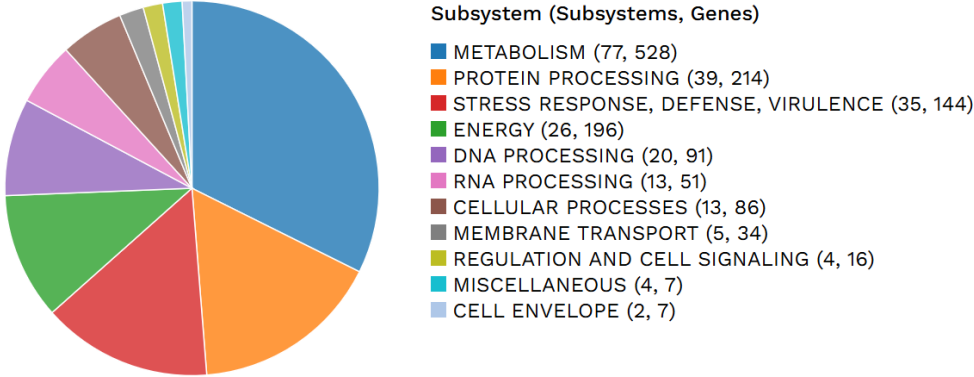


Table 3: Antimicrobial Resistance Genes	
AMR Mechanism	Genes
Antibiotic inactivation enzyme	BlaZ family, FosB, Mph(C) family
Antibiotic resistance gene cluster,cassette,or operon	TcaA, TcaB, TcaB2, TcaR
Antibiotic target in susceptible species	Alr, Ddl, EF-G, EF-Tu, folA, Dfr, folP, gyrA, gyrB, inhA, fabI, Iso-tRNA, kasA, MurA, rho, rpoB, rpoC, S10p, S12p
Antibiotic target protection protein	Msr(A)
Efflux pump conferring antibiotic resistance	BceA, BceB, NorA, YkkCD
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, BceS, LiaF, LiaR, LiaS

Genome Assembly

