Synthesis of Nano particles by Alkaliphiles

Spirulina platinensis

- Free floating filamentous cyanobact.
- Grow in high pH , high conc. of carbonate and bicarbonate
- Useful in Nutrition, pharma,medicine
- Richest source of vegetable proteins, amino acids, vitamin, essential FA etc

- Also source of potent antioxidants
- Produces Gold nanoparticles and silver nanoparticles
- Chloroauric Acid = Gold Nanoparticle
- Silver nitrate = Silver nanoparticle
- Crystalline in nature
- Extracellular production
- useful in medicine and pharmacology

- The use of ultrasound for sonicating Spirulina biomass increased nanoparticle production yield
- Silver nanoparticles inhibits P.vulgaris S.aureus, Klebsiella pneumoniae,E.coli

Bacillus licheniformis

- Commonly found in soil and bird feathers
- birds living on ground and water
- Also found in manure compost
- aplha amylases and proteases
- polypeptide antibiotic bacitracin

1) Cadmium Sulfide Namo particles
- Cadmium chloride and Sodium sulfide reduced to cadmium sulfide
- sulfate reductase
- coalescent orange yellow cluster
- 1:1 ratio shows highest precipitation
- Formed in stationary phase of cycle
- late log phase

- Shows antimicrobial activity against food borne bacteria
- E.coli,B.licheniformis,B.cereus,S.aureus
- Aspergillus oxysporum,A.flavus etc
- 4:1 shows highest zone of inhibition in P. aeruginosa and Aspergillus flavus

2) Synthesis of Gold Nanoparticles
- Synthesis of gold nanoparticle using cell lysate supernatant of B.licheniformis
- Extracellular production
- shows good antimicrobial activity against Gram positive and Gram -ve pathogenic bacteria

3) Synthesis of Selenium Nanoparticle
- Intracellular conversion of toxic selenite ions into nontoxic elemental Se nanoparticle
- Se+4 to Se0
- Aerobic condition
- can inhibit proliferation
- induces caspase independent necrosis

ti human prostate adenocarcinoma cells

4) Synthesis of Silver Nanoparticles
- Bioreduction of silver ions to silver nanoparticles
- nitrate reductase = NADH dependent enzymes
- Anti angiogenic