

## Proteus

Proteus species :

- *Proteus vulgaris*
- *Proteus mirabilis*
- These species are found as normal flora in the colon, soil and water

❖ Morphology

- Gram negative bacilli
- Highly motile
- Very pleomorphic

❖ Cultural characters

- On nutrient agar have swarming growth and fishy odor
- On macConkey's agar pale non lactose fermenting colonies

❖ Biochemical reactions

- Urease +
- Phenylalanine deaminase +
- $H_2S$  +
- Indole + ( except *proteus mirabilis*)



## Morganella species

- *Morganella morganii* is only species
- Documented cause of UTI
- Urease positive
- Phenylalanine deaminase positive

## Providencia species

- *Providencia rettgeri* is pathogen of urinary tract and has caused nosocomial outbreaks
- *Providencia stuartii* can cause nosocomial outbreaks in burn units and has been isolated from urine
- Both are phenylalanine deaminase positive

## Citrobacter species

- *Citrobacter freundii* associated with nosocomial infections (UTI, pneumonias, and intraabdominal abscesses)
- Ferments lactose and hydrolyzes urea slowly