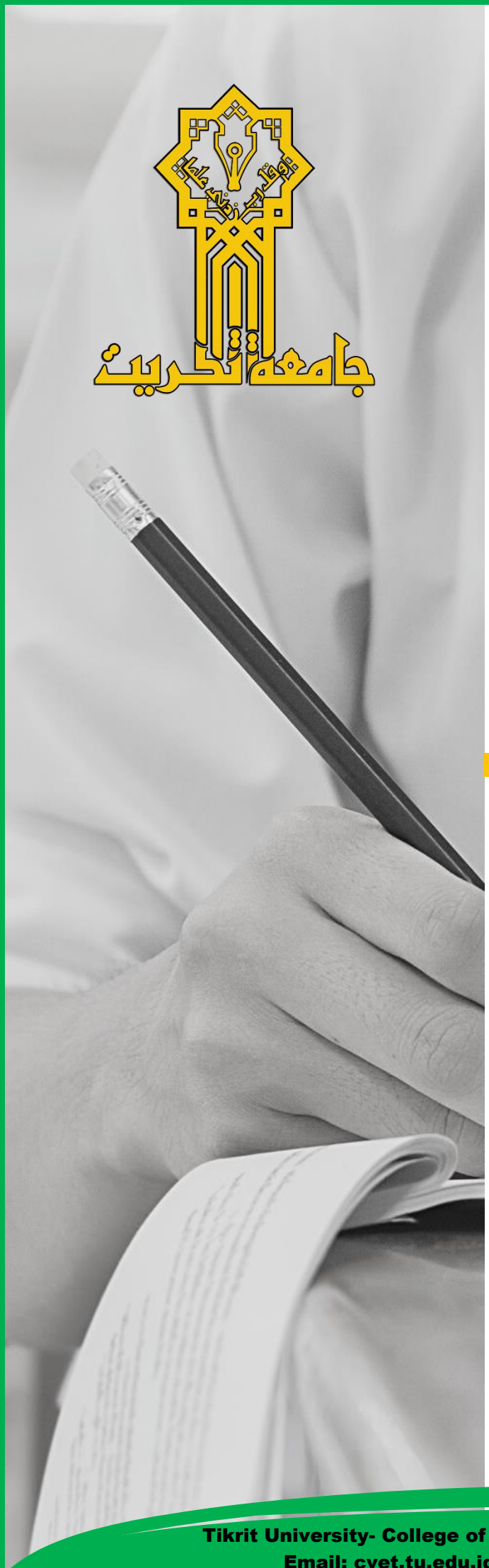

Tikrit University
College of Veterinary Medicine

Lect.2: Microbiology

Subject name: Streptococci

Subject year:Third-year

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SCAN ME

Lecturers link

Streptococci

Species :

Streptococcus agalactiae
S. dysagalactiae subsp. dysagalactiae
S.equi subsp. equi
S.equi subsp. zooepidemicus
S. uberis
S.bovis
S. pyogenes
Enterococcus faecalis

Morphology and staining :-

1-*Streptococci* and *Enterococc*i are **Gram+ positive cocci**.
2-They occur in **pairs or chains of varying length**.
3-**Non motile with the exception of some of the enterococci, non spore forming**.

Cultural characteristics:-

1-Most types of *Streptococci* are **aerobes or facultative anaerobes**.
2-They are **fastidious and require the addition of blood or serum or glucose to cultural media** .
3-**Optimum temperature for growth is 37c**.
4-the important media which are uses to cultivate the streptococci are.

a-**Blood Agar:-**Regarded the important media for cultivated these bacteria, because is stimulated streptococcal growing and we can observing the haemolysis types. The colonies are small spherical pin-head shape 1 µm in diameter, white to grayish in color ,on horse blood agar produce B-haemolysis(complete haemolysis).

b-**Edwards medium**:- it is selective media for *Streptococci* especially these which causing mastitis .this medium contains esculain and crystals violate which inhibiting other contaminates bacteria .

c-**MacConkey Agar:-** using for cultivating of enterococci which tolerate the bile salts on this medium and appear as small pin-head colonies.

d-**Brain heart infusion Agar:-**use to cultivated of streptococci .in this medium the characteristic chains arrangement seen more obviously in microscopic examination.

CAMP test:-this test is use to distinguished group B *Streptococcus agalactiae*Which cause chronic mastitis. demonstrating the arrow head- shaped enhancement heamolysis that occurs when the beta-toxin produced by *s. aureus* (the microorganism streaked horizontally across the sheep blood agar plate acts synergistically with the CAMP facter protein produced by group *Streptococc*i (streaked perpendicular to the staphylococcus but not quite touching).

Lance field groups:-is the serological method to classification of streptococci based on the group specific C- substance (polysaccharide) in the bacterial cell wall, which precipitated with anti'sera. therefore distinguish streptococcus to groups(A,B,C,D,E,G,…ect

Procedure method of the test:-

1- cultural the *Streptococcus* species in nutrient broth for 24hr.then precipitated it by centrifuge.
2- Add 2ml from diluted HCL 200:1 to bacterial precipitate,then putting in water bath at 100c for10 minutes. Then filtration (the filter consider polysaccharide).
3- Putting the Antigen extract (polysaccharide) in test tubes and add antisera of different specificities. incubater in temperature room.
4- Positive result formation precipitate line during 30 minutes

Biochemical test :-

1-catalase Negative and oxidase positive.
2-haemolysis patterns.

Table(2) Biochemical tests uses in the differential between types belong to *Streptococc*i

Species	Lancefield group	B-hemolysis	inulin	lactose	raffinose	salicin	sorbitol	trehalose
S. pyogenes	A	B	-	+	-	+	-	+
Streptococcus agalactiae	B	B(α,Y)	-	+	-	+	-	+
S. dysagalactiae subsp . dysagalactiae	C	α(B,y)	-	+	-	-	-	+
S.equi subsp. equi	C	B	-	-	-	+	+	-
S. uberis	none	α(Y)	+	+	-	+	+	+
S.bovis	D	α	+	+	+	+	-	V
*S.*pneumoniae	none	α	+	+	+	V	-	+
Enterococcus faecalis	D	α (B,y)	-	+	-	+	+	+

Diagnosis :-

1- depending on the pathological condition of the cause and animal types.
2- Smears from pus, milk samples can be fixed and stained by the gram stain and seen the chain arrangrment.
3- Inoculating the specimen on the blood agar and selective media for streptococci.
4- Recognized it by lancefield groups.
5- Identification by using biochemical tests.