

العمر والنمو

Age and Growth



# Objective

# Methods of studying age and growth

- Tagging
- Length frequency
- Otoliths
- Scales

# Types of Scales

- Normal scales
- Bony plates
- Scutes

# Scales group

- Placoid , Cycloid , Ctenoid
- **Depend of structure**
- Placoid or non placoid
- Placoid called dermal denticles
- Vitrodentine , Dentine , Puple cavity
- **Non placoid**
- Cosmoid scales , Ganoid scales , Bonds ridges scales

# Scales Structure

- Focus , Radii , Circuli
- Posterior field and anterior field

# Criteria of Annuli

- The relation between length and number of annuli
- The observed length must be equal with calculated length
- There is a little variation between year classes in different period

# Terms in age and growth

- Age group
- Year class
- Yearling
- Young of the year



# Back calculation

## Lees phenomenon

- The methods of back calculation is not correct
- Non selectivity to collected the sample
- Natural mortality
- Fishing mortality

# Length-Weight Relationship

- Condition factors
- Von Bertalanffy method
- Longevity



**The End**