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Study the Differences in the Eyes Shape in some Local Fish

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Abstract
This study focused on collecting different species of local fish to study the eye shine of those species and the degree of variation in the intensity and color of this shine or glow in addition to the differences in the eye shine of these speciesdue to the difference in ways and habits of feeding, which gives evidence of the diversity of color in eyes shine in fish is different between fish species, The feeding style, type of nutrition and fish activity had an effect on variation in color of eye shine. Sex of fish had no clear effect on eye shine, it was not possible to tell the sex of fish according to the eye shine of the local fish.

Introduction
The first one to discover eye shine in some animals and to refer to the presence of a reflective layer in the eyes of some animals is (1),he found that the reason for this shine or glow in the eyes of some animals was due to the presence of the tissue layer that reflects glow or shine in the eyes that is known as **Tapetum lucidum** (2), It was also clarified that the reason for eye shine or glow is due to the presence of ***guanine tapeta*** (which is a nitrogenous base that is found in DNA composition) in some animals including fish specially in predators including predator fish and *demersal / benthic fish*(3). Eye shine or glow vary in different species of fish and according to the type of nutrition for those species (4), it was noted that the species that are carnivores have more eye shine than species that herbivores (5). Differences in eye composition between different species has an impact on eye shine or glow when subjecting a strong light specially in the dark areas, the difference in eye tissue composition leads to difference in the intensity of the reflection of the light (6). The eye shine intensity luster or fade after the fish is killed or deeply frozen and re-thawed at room temperature, as for the color of eye shine it does not change(7).The color of fish skin,especially the thin skin that surrounds the eyes, has an obvious impact on the intensity and color of eye-shine. The difference in fish activities has an important impact on the eye shine and color changes in eyes, Nocturnal *animals like dogs cats and some predator demersal/benthic fish has stronger eye shine than* crepuscular animals that feed on plants like sheep and Carp fish ***Cyprinus carpio*** .

Materials and Procedure
The species for this study are ***Cyprinus carpio***, ***Cterophary Godon dellus*** , ***Liza abu*** , ***Carassius auratus*** , ***Carasobarbus luteus*** , ***Leuciscus vorax*** , ***Silurus triostegus*** and ***Tilapia zilli*** . Strong light beam was shed on fish in quick flash, each kind of fish was put in glass aquariums with 50liter capacity and have the following dimensions: width = 60cm, height = 30cm, length = 60 cm. Pictures for the eyes of the fish were taken for alive fish and after killing the fish by putting it in water with ice cubes and then putting fish in nylon bags then the fish was put in a regular home deep freezer for six days after that the fish were taken from the freezer and were thawed at room temperature then pictures were taken for eyes of each species of fish using the same light beam that was used with alive fish then fish were classified according to species then according to style and type of feeding.

Results and discussion
The difference in the color of eye shine between fish was obvious, the intensity and shine of light reflected by fish eyes depends on many factors that includes age, species and the color of the outer shell of the eye. The type of feeding has and important impact on the intensity on fish eye shine according to (4) and as shown in figure (1) the eye shine in local ***C. luteus*** is tend to be sliver bright white.

Fig (1) eye shine in local *Carasobarbus luteus* .

The eye shine in local ***L. vorax*** was hazy dark as shown in figure (2).

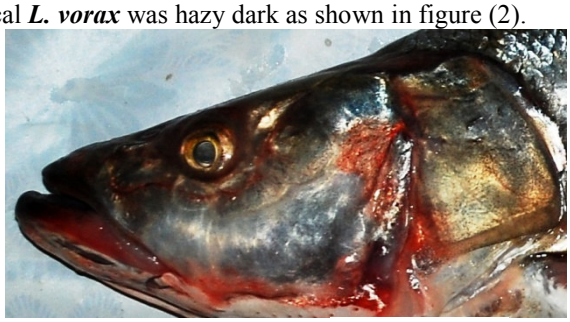

Fig (2) eye shine in local *Leuciscus vorax* .

The color of the skin, especially the skin that surrounds the eye had a significant impact on the intensity of the reflected eye shine according to species (4) and (8), the skin layer that surrounds the eye specially in Cyprnidae was light pink and tend to be reddish and that led to an eye shine that is either bright white silver or shiny gold as shown is figure (3).

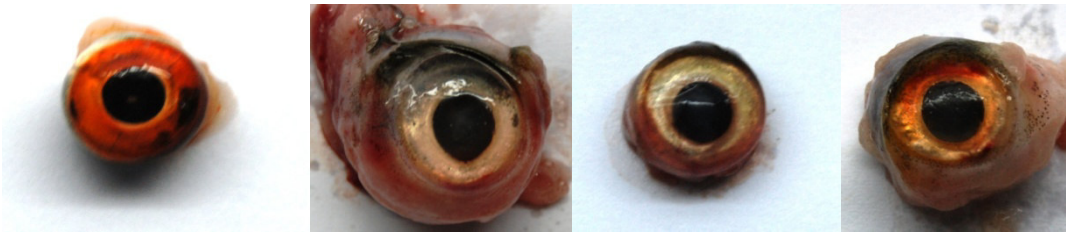

Fig (3) eyes of some local Cyprinidae fish, skin surrounds eyes is light pink and tend to be reddish.

In some local species related to Cyprinidae the eye shine color was silver whitish and mirror-like bluish as shown in figure (4).

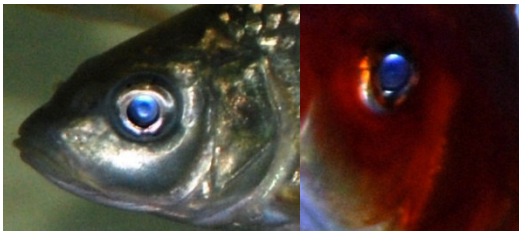

Fig (4) eyes shin in some local Cyprinidae fish.

The general component or the Tapeta cells composition is still unknown, The Tapeta cell is responsible for the differences in eye shines between most vertebrates including fish, some researchers think that these cells are generated as a result of differences in the connective tissue around the eye as referred by (9) , (10) , (11), some other researchers agree that these cells are generated from the change in the pigment cells of the eyes during the initial cell division that leads to the formation of the eye according to species (12), (13).

In general, the chemical composition of the eyes differs between the types of vertebrates including fish, this structure is related to the kind of the environment that a specific species live in and is related to the type and way of feeding as well as the nature of the diet of this species which affects the chemical composition of the eyes.

Researchers point out that collagen is the building unit of tapeta fibrous layer that is responsible for the reflection and intensity of light in the eyes of animals and constitutes 65% of thedry eye weight in addition to large quantities of amino acids that are in the composition of this layer which lead to the intensity of the reflection in the eyes, such as lysine and hydroxylysine and guanine in addition to cholesterol and high levels of zinc and a variety of different fatty acid concentrations, which differ in the composition of the eyes depending on the type of animal and feeding (5) .

The difference in the nature of animal diet including fish has an important role in determining the strength and intensity of eye shine and coloration, in addition to the timing of feeding. The intensity of eye shine of animals that feed in the day differs from that of animals that feed at night. The nature of the diet of animals whether carnivorous,omnivorous or herbivorous as in the difference between ***Leuciscus vorax***, ***Silurus triostegus*** and ***T.zilli*** that are carnivorous and carp and goldfish that are omnivorous as well as grass carp that is herbivorous (1) and (14) and (15). We infer that the chemical composition of the eyes of fish varies among different species, this difference has an impact on the intensity of the reflected color from the eyes of fish and on eye shine and eye color, in addition to the type of fish diet and the difference of amino acids protein sources that is part of the fish eye composition type of food these types and different protein sources of amino acids that enter in the composition of the eyes of fish and different sources of fatty acids which according to the diet type of different species, and on fish behavior when feeding between day and night, all of the previous factors have an impact on the shape ,composition of the eyes of the fish, differences in eye shine, reflected color in addition to the difference in the histological composition of the eyes of these species during cell divisions that leads to the formation of the eyes in the initial stages of the life of fish during the growing according to species.

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