

Welcome students to the 10th module of the second unit that is common characters and sexual dimorphism of goldfish outline introduction to goldfish ecology behavior of goldfish characteristic features of goldfish sexual dimorphism in goldfish variants of goldfish and economic importance of goldfish will be dealt in this module at the end of this module the student will be able to state the classification behavior ecology of goldfish describe the features of goldfish sexual dimorphism and goldfish cite examples of selectively bred variants of goldfish and list the economic importance of goldfish introduction is a very common uh aquarium fish from the supreme day family of carps it requires no introduction goldfish is found in almost all aquarium shops and in almost all aquariums wherever there are aquariums it is belonging to the supremity family and like all siblings it is a egg layer it's an egg laying fish and when the eggs are laid they are adhesive and they tend to get attached to the vegetation which is there in the natural environment it is native to east asia and it is one of the most hardy aquarium fishes that is it can tolerate a lot of temperature fluctuations a lot of ph fluctuations cloudy water and also low dissolved oxygen levels can be tolerated by this fish hence it is called as a hardy aquarium fish now the goldfish which we see in the market today or in the aquarium shops today was always not the same color this particular golden yellow orange goldfish which is there today it is a domesticated variant of a dark gray brown carp which was native to east asia in this picture you can see that cup the prussian cup the prussian carp um has undergone mutations and of course because of selective breeding is what it is it has changed or it has uh led to uh to the birth of the goldfish what we find in the market today on the aquarium market the aquarium industry to be precise this particular fish belongs to phylum caudata class acting of therapy order supremely farmers families sabrini day genus is coracius and species is auritus that scarces auritus is the scientific name of this particular fish ecology and behavior unlike the saw tail the goldfish is found to inhabit rivers lakes ponds and ditches with stagnant or slow flowing waters that is it likes a lentic habitat rather than a lotic one like the saw tail they are omnivores they eat plant as well as animal matter they will eat crustaceans nails mosquito larvae whatever available plant matter they can consume they will consume also it is also advised when you are adding goldfish in an aquarium not to keep delicate plants in the aquarium hardy varieties like animals can be planted in the aquarium goldfishes tend to be gregarious that is they exhibit uh similar schooling behavior similar feeding and predator avoidance behavior is also noticed in goldfish characteristic features of course the color is the goldfish which is uh present uh which is the just which is there in the aquarium industry the goldfish is of goldish hue that is it has orange pigments orange yellow red pigments the color varies there are two sets of paired fins that is pelvic and pectoral fins are paired whereas there are three single fins that is the dorsal fin the chordal fin and the anal fin it has large eyes a very acute sense of smell and hearing it is also a very intelligent fish there are about 27 to 31 scales along the lateral line system in this picture you can see the lateral line along if you count these scales they'll be around they will they will be ranging from 27 to 31 that helps in the identification of the fish also the goldfish will not have bubbles sometimes in the market some fishes are sold as goldfish which have bubbles the goldfish does not have bubbles they lack teeth in their jaws unlike the saw tail the sawtill has a teeth in their jaws whereas the goldfish does not have teeth in their jaw but something called as the pharyngeal teeth are present now pharyngeal teeth are characteristic of the grenade fishes and since it's a cyprint there are present pharyngeal teeth which help to crush the food and the throat region the average lifespan of the goldfish is about 10 to 30 years in captivity but a maximum of 41 years have been recorded sexual dimorphism now unlike the swordtail sexual dimorphism is not very pronounced if you see two goldfishes you will not come to know which is the male and which is the female but during the breeding season the males develop something called as the tubercles now in this picture you can see the tubicals tubicules are white pimple like eruptions which are present on the opiculum sometimes they are present on the dorsal side also but uh most of the time they are present on the opiculum this shows that the the fish is a male fish and it is in the

breeding uh just during the breeding time the female's body usually remains swollen with eggs okay the the body the belly becomes the bulged up and swollen with eggs and they lay about 500 eggs at a time 500 to 1000 is the capacity but on an average about 200 to 300 eggs are laid and once eggs are laid takes about three to seven days for the larvae to hatch now that depends on the temperature of the water what temperature is it also once the larvae are hatched they take about a month to assume the goldfish characters that is the size and the shape of the goldfish however the color is not gained within a month but it takes about a year for the young ones to attain the color of this particular goldfish that is the pigments red orange yellow pigments till then till then the young ones are look like their ancestor that is the prussian cup they have a greyish brownish color today there are a lot of variants of goldfish available in the market lots have been created by selective breeding and to uh the way the the way the aquarists want the fish they have tried to produce those kind of variants in goldfish now in this picture on the left side you can see the celestial eye goldfish now if you see this particular picture you see that the eyes are permanently upturned they are uh looking pointing upwards the eyes look upwards and also the fish lacks the dorsal fin now in some celestial like goldfish there are dorsal fins but uh mostly sulphins are absent also these eyes are called as telescope eyes now these variants are very delicate you cannot give them an aquarium which has uh rough or sharp uh structures inside the aquarium you need to keep them uh they are very delicate and you need to look after them when you're housing them in your aquarium on the right we see the bubble eye goldfish and other variant here the eyes are situated on fluid filled sacs the and the eyes are placed on top of the sac now again this fish is very delicate because if the sack ruptures there is a chance that the fish might may get infection but uh it can be uh regrow the sex okay the sacks can be regrown and they form but they take some time and during that uh period when the sack is not there there is a chance that the fish might get infection and may get affected both the both the fishes cannot be kept in aquarium which have rough or sharp objects placed inside the aquarium another set of variants in the on the left side you can see the goldfish pearl scale now as the name suggests you know why it is called as the pearl scale because the scales are they are in they look like pearls the scales are very delicate they look like pearls and there is the potential that this the scales may be lost in these fishes they are not permanent scales also the body of the fish is shorter and it is deep very deep and since it is this structure it is said that these fishes are at an increased risk of constipation so it is advised if flake food or granulated food is given from the commercial market of course commercial feed is supplied then the feed has to be soaked in water prior to giving the feeding the fish on the right you have another fish another variant this is called as a lion head fish uh in this picture the fish is go gold red and white lion hit now the lion head head has an uh modified head structure called as the hood now this fish was selectively bred in china to imitate the chinese the mythical character of the lion dock hence they bred this particular fish which looks like the lion hit both the fishes are again very delicate because the structures if disturbed or if are removed because of the presence of hard objects in the aquarium the fishes are exposed to the risk of infection economic importance uh this fish is the most popular aquarium fish used for its ecstastic value that looks very pretty in an aquarium or in a fish bowl in some parts of the world this particular fish is cultured in large numbers as a way to sport fishes and to feed the larger carnivorous fishes so it is also a feeder fish whereas in some countries this particular activity that is producing the fish for as a feeder fish is prohibited also since the goldfish is an omnivorous fish it feeds on anything on everything you can use it as a bio control agent also and it is used in some parts of the world these are the references you can refer them to prepare your notes