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BODY COMPOSITION OF EDIBLE PORTION OF WILD (*LABEO GONIUS)* DURING SUMMER SEASON IN RELATION TO BODY SIZE FROM HEAD PANJNAD, ALIPUR, PAKISTAN

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Abstract
Proximate body composition is the analysis of water, fats, proteins and ash contents of fish. Present study was conducted to determine the body composition of edible portion of wild (*Labeo gonius*) during summer season in relation to its body size and condition factor. For this purpose 40 specimen ranging in weight from 95.64grams to 215.68 grams were collected from Head panjnad,Alipur, Pakistan. Each specimen was dried and powdered to determine, %age water, ash content, fat content, protein content and organic contents. Fish had higher percentage of water with mean and S.D value 76.06±3.26 as well as fish had a significant amount of proteins and fats. Ash, fat and protein contents in their (%wet weight) have mean and S.D values (3.69±0.75, 3.72±0.73, 7.26±1.34) respectively. While average (mean) plus S.D values of ash, fat and protein contents in fish (%dry weights) were recorded as (15.62±3.24, 15.64±2.73, 68.74±5.31).The aim of current study was to determine the concentration of various constituents in those parts of fish body which are consumed by human beings and play significant role in fulfilling their nutritional requirements.

Key words: Body composition, *Labeo gonius*, proximate composition

Introduction

Fish are cold-blooded organisms that live in water bodies such as seas, rivers, lakes,oceans, and streams. They are also farmed in ponds (Goldman, 1997). Fish may be found in practically any form of water habitat, from upper foothill watercourses to the depths of brinies. Fishes range in size from tiny to huge. Fish exhibit behavioral variety as inhabitants of a certain place as well as migrating in nature.Fishing is an important source of income in many emerging economies, particularly for low-income households living in rural regions. Fish, unlike other vertebrate species like as mammals or birds, are a collection of a huge variety of animal species such as lung fishes, hag fishes, rays and sharks, lampreys, and coelacanths (Setaro and John, 1990).

A wide range of variables influence the development of fish. Fish are poikilothermic, meaning that changes in their related to medium—water—have a significant impact on them. As a result, they must always be submerged in it in order to survive. These factors include season, food, space, water temperature, and salinity.One of the most significant and well researched environmental factors influencing fish development is salinity. It might be referred to as the fish growth determining factor (Weatherly and Gill.,1987)

Fish's diet and eating patterns may be used to assess their ecological importance and place in the food chain of their habitat (Allan and Castillo, 2007).Fish's biology depends heavily on food as the oomph (energy) it provides is needed for growth, parasitic development, and migrating patterns. Fishes go through several developmental phases, which causes changes in their eating patterns and preferences. When substrate are accessible in the surrounding waters, fish that exhibit opportunistic eating behavior, such as the herbivorous *Labeo rohita* and the omnivore Common *Cyprinus carpio*, can alter their feeding patterns. Fish body composition can provide us a better understanding of their physiological state, but measuring it takes time. Fish body composition analysis involves figuring out how much water, protein, fat, and ash are in the fish. Since non-protein molecules and carbohydrates are present in extremely minute concentrations, measurement of their amounts is often not done (Cui and Wotton.,1988).

A phenomenon that allows a living thing to create a new life is called reproduction. It is the only way to keep life going. Fish procreate and grow in number much like any other living thing. Given that fish are aquatic animals, their reproductive behavior is influenced by a variety of environmental conditions, including rainfall, photoperiod, dissolved oxygen, and water's temperature. Research has shown that in tilapia fish, both the development and hatching times are shortened at higher temperatures. (Lagler and others, 1962).Fish have a reproductive schedule, much like all other animals. Similar to how many marine fishes rely on their seasonal reproduction pattern for successful reproduction. The environment in which eggs are released or children are born plays a role on reproductive time (Ims.,1990; Yamahira., 2004).In addition to exhibiting erratic reproductive timing, aquatic organisms also exhibit universal reproductive features, such as lifetime, diel, intra-seaonal, and yearly cycles, which manifest in them at varying periods.2009; Lowerre-Barbieri et al.According to the lifespan scale, fish reach sexual maturity (Stearns, 1992). Different parts of the Earth are home to a wide variety of fish species.For millions of years, little alterations have been noted in several fish species. Others have changed throughout time to make use of various environmental features. Scale type is a good way to classify fish. The distinction between simple and complex scales is nonexistent. This phrase pertains solely to the temporal context of its development. Fish lived long before they became sophisticated. While some of these ancient fish are extinct, some are still in existence. The majority of fish have scales on their bodies that serve as both an animal reflector and a way to show the color of the body. Fish's integumentary system includes its scales. The color and kind of scales on a fish's body allow us to identify its species with ease. Fish typically have five different types of scales: placoid, cycloid, ctenoid, cosmoid, and ganoid. The sizes and forms of each of these scales vary. In many developing nations, raising fish is a vital source of income, particularly for those living in rural regions.The FAO estimates that some 35 million members of the general population participate in fishing activities on a part-time basis, either directly or indirectly. Over 95% of these individuals reside in developing regions, and the majority of them are small-scale fisherman (FAO., 2002).

Fisheries provide a living for commercial fisherman in the most developed and industrialized countries, such as the United States. Not only do many people depend on fish as a staple meal, but fishermen active in global fisheries, whose communities and livelihoods depend on the sustainable exploitation of fishery resources, are also impacted by a decline in fish variety. About 1 billion people in developing countries rely on fish as their primary source of animal protein(FAO.,2002).

"The primary factor influencing structure, function, and biodiversity in deep waters is fish harvesting." Fish harvesting is a staple food in many communities, with fish coming from oceans, lagoons, and tarns. In addition to being a means of obtaining food, fishing creates jobs for thousands of people worldwide. Moral, creative, and scientific ideas unquestionably support efforts to comprehend and ease humankind's impact on aquatic life. How much seafood will be eaten? This

question's answer depends on people's ethnic values and level of affluence (York and Gossard,2004).
Fish are members of the paraphyletic category of organisms, which includes all creatures that have gills, are aquatic, and lack appendages and figures. Hagfish that are still alive, lampreys, cartilaginous and bonyfish, and several extinct groupings are all included in this category. (Goldman et al., 1997). We know from the fossil record that the earliest fish are a tiny, armored genus of fish known as Ostrachoderm, which is also jawless. We now know that there are no longer any jawless fish families. Fish that are thought to be pre-jawed and old are called lampreys. Fossils of placodermi provide proof that the first jaws existed. The diversity of jawed vertebrates seen on land provides a good understanding of the evolutionary relevance of jawed mouths. Nelson, 2006).
Fish are ectothermic, meaning that their bodies are adapted to swim quickly and efficiently. They can also get oxygen from the water by utilizing gills, and some even utilize an auxiliary organ to breathe more efficiently by using the oxygen in the surrounding air. A fish also has two sets of paired fins, one anal fin, two, sometimes three, dorsal fins, and a tail fin. Jaws, skin that is normally covered in scales, and laid eggs. It is important to remember that there are exceptions to each of these criteria. Warm blood characteristics allow swordfish, tuna, and some shark species to raise their body temperature above that of the surrounding water.In contrast to species like eels and rays, which are unable of swimming more than 0.5 body lengths per second, species like tuna, salmon, and jack have different swimming speeds and streamlining capacities, ranging from 10 to 20 body lengths per second. Numerous families of freshwater fish species employ distinct organs to take in oxygen from the air and water. The labyrinth organ seen in gouramis serves the same purpose as the paired lungs found in lungfish. However, Corydoras is one of the catfish species that uses its stomach or intestine to get oxygen from the water.The arrangement and form of fins of fish has a higher degree of polymorphism and includes creatures that don't look like fish, such pufferfish, gulpers, angler fish, and seahorses. The skin's surface can be coated in various types of scales or left bare, as in the case of moray eels.(Helfman and others, 1997)
For the majority of cartilaginous and bony fish, the outer covering is made of scales. Naturally, scales vary from one another in terms of extent, composition, dimensions, and form. In certain fish, such as shrimpfishes and boxfishes, scales appear as extremely stiff and armored plates, whereas in other fish, such as anglerfishes and eels, scales can be minuscule or even missing.By carefully inspecting the scale, we can anticipate that type of fish species with ease. The most prevalent types of scales are cycloid, found on salmon and carp; ctenoid, found on perch; ganoid, found on sturgeons and gars; and placoid, found on the body of sharks and rays.The reason that human scales differ from those of reptiles is that they often originate from the mesodermal layer of the dermis.In mammals, the genes involved in the formation of teeth and hair also have a role in the development of scales (Oddard, 1996).
Certain fish employ weak electrical signals for social communication and navigation. For example, gymnotiforms can use numerous codes and indications to detect or modify their location. It is revealed that fish can distinguish between different pictures and can see both three- and four-dimensional structures when they are challenged to navigate a maze (Helfman et al., 1997). Fish's sensory system is thought to be extremely important. Fish eyes have spherical lenses, but land-dwelling vertebrates such as birds and mammals also have comparable lenses.Cones and rods can be seen in fish eyes. Since the convex lenses in the eyes of proto-vertebrates are more capable of collecting light than the concave lenses, it is obvious that these species were designed to dwell in more mysterious and dark waters where they are secure from predators. To focus on an item, move the lens close to or away from the retina (Lee et al., 2009).
Although lenses are often oval, some species have extend egg-shaped lenses. Fish lenses are often more rotund or condensed than those of terrestrial species.Since there is little variation in the refractive index of the surrounding water and the cornea in the aquatic environment (as opposed to the air on land), lenses handle the bulk of the refraction. The fish's spherical lens is capable of producing crisp pictures without of spherical aberrations (Folkvord and Ottera., 1993).

Fishes' hearing systems are more important. Sound travels quicker through water than it does through air, therefore hearing and the capacity to identify sound sources are both impaired.Three distinct vertebral processes in the Weberian Organ of carps' settled auditory system transfer sound waves to the inner ear.Testing a shark's hearing is exceedingly challenging. A tiny opening on either side of the skull points directly into the inner ear through a tiny canal. The lateral line system exhibits the same kinds of groupings.(Hidalgo and others, 1988). Fishes and amphibians use their lateral lines to show hydrodynamic stimuli. This mechanism is made up of a group of longitudinal antennas in the fish called neuromasts, where the body only retains a small range of wavelengths. Neuromasts can be filled with fluid channels or they can stand alone. Neuromasts contain developed hair cells that are contained in adhesive cupulas as sensory cells. Cupula and internal steriocilia are partially displaced and agitated as a result of the surrounding water changing. Depending on whether the hair cells they emerge from are bounced in a preferred or reverse direction, afferent nerve fibers are either stimulated or inhibited (Ellis, 1990).

Fish are afflicted with several illnesses and parasites, much like people and other animals. Fish defense mechanisms against illnesses can be either non-specific or specific. Scales, or peel skin, and sticky coating secreted via the epidermis all play a significant part in nonspecific defenses by trapping microorganisms and preventing their further development. Should diseases manage to breach fish defense mechanisms, the fish will create defensive mechanisms that increase blood flow to the affected areas and produce white blood cells, which are crucial in eliminating the pathogens. Fish have demonstrated specific defenses, sometimes known as adaptive immune responses, in response to certain infections (Helfman et al., 1997).

Regarding the treatment of fish infections, it's noteworthy to note that serums are currently commonly utilized for both ornamental fish and aquaculture. For instance, vaccinations against the Koi herpes virus and furunculosis in farmed salmon have been found.The fish body is typically home to diseases and parasites, and this comes at a cost.When they strike, the effects manifest as illnesses. But occasionally, when it comes to fish, we are unable to comprehend what illness really means. The majority of the fish infections that are now known to exist are associated with farmed fish or aquarium species. The main factor influencing fish mortality, especially in the case of juvenile fish, is disease(Hartman., 2004).

To meet the increased need for food, aquaculture output is under intense strain, hence species diversity is critical. The fish is widely employed in aquaculture methods in Pakistan and India, and it has been highlighted as an important component for diversifying aquaculture practices (Mohanta et al, 2008; Jena and Das., 2011). When raised in a culture system, Labeo gonius may gain up to 500 grams of weight in a single year, making it a strong contender to take part in aquaculture practices. Due to its herbivorous nature and capacity for bottom feeding, Labeo goniusas may be used as a bottom feeding component in composite fish culture. This is because it frequently coexists with several other fish species, including Labeo calbasu, L.bata, C. Mirigalla, and L.Fimbriatus. Because it has a high market value and is much favored by consumers, it is said to be the most ideal and cultivable fish. According to Riodran and Webber, the final applications and preferences of the customer are typically taken into consideration when choosing a fish for aquaculture. When it was young (Mohanta *et al*, 2008; Jena and Das., 2011).

While L. gonius may grow to a maximum length of 150 cm in natural water sources like rivers and streams, in industrial fish culture systems, a typical bias is about 50 cm. This fish is said to be able to reach weights of over 1 kg and occasionally reach weights of up to 1.4 kg and 61 cm in length. Within the course of a year in a culture system, *L. gonius* may grow to a weight of 750 grams and a length of 40 cm. Because *L. gonius* gets higher prices in markets than other fish with greater growth rates, such rohu and catla, we can make up for its sluggish growth. Because it is a delicious fish, consumers really favor *Labeo gonius* (Kalita*et al.,* 2005). Seasonal variations and water temperature have an impact on the fish body's proximate composition, but researchers have not yet been able to reliably ascertain how the seasons alter the morphological traits and chemical composition of fish.(Yaldiz and others, 2007).While fisheries play a vital role in ensuring enough nourishment, a

greater number of people worldwide are employed in the industry and depend on it for their living. Approximately 80% of a country's animal protein comes from its fisheries (DOF., 2003). About 5% of Bangladesh's foreign exchange revenues come from frozen fish and other fishery goods (Ahmed, 2003).
Fish is a complete protein source with a high nutritional content, making it a popular choice, as well as rich in important vitamins, minerals, and amino acids. Aquaculture helps to deliver a major percentage of fish to market. Floating net cages and recirculating aquaculture systems (RAS) are being used to produce an increasing number of fish. Rainbow trout and pike perch, in addition to salmon, tilapia, and numerous carp species, are becoming increasingly popular in European aquaculture methods. According to the FAO, about 6256 tonnes of pikeperch were caught in 2013, accounting for more than 30% of global fish capture, making Russia one of the main exporters of this species.(FAO., 2015).

Material and Method
40 samples of *labeo gonius* having different body sizes were captured from Head Punjnad, Alipur, Pakistan, and measuring tray with a fixed millimeter scale and a Vernier caliper that was accurate to the closest 0.1 cm were used to compute lengths. The fish was placed on the measuring tray to determine the standard length, and lengths were measured starting from the tip of the caudal fin's concealed base.The same millimeter scale was used to measure fork lengths as well. Following that, the opercular membrane's end point to the tip of the nose was used to measure the length of the head. The real breadth of the fish's head was measured by measuring the straight space between its two eyes.The measurement of the distance between the anterior point of attachment of the body and the anterior tip of each fin, such as the various fins, was used to determine their relative lengths. The longest straight line distance between the front and posterior locations of connection with the body was used to estimate the fin bases. Afterwards, using the formula K=100 W/L3, each fish's condition factor was determined for each sample weight, in accordance with the procedures of Weatherly (1972) and Wootton (1990).
Statistical analysis including regression, calculation of coefficients, and comparison between the regression coefficient was carried out by help of computer.

Estimation of Water Content.
For the determination of water content as: Water content = Wet– Dry body weight

Estimation of Lipid content:
Lipid as
Fat content = sample initial – final weight

Estimation of Ash Contents:
Ash as:
Ash content = Sample initial - weight loss during heat

Estimation of Protein Content:
Amount of Protein in *Labeo gonius*were estimated by following Caultonand Buresell (1977) and Salam andDavies (1994).

Results
The average and standard deviation values for the percentage of water 76.06±3.26, the percentage of ash (percentage of wet weight and percentage of dry weight), the percentage of fat (percentage of wet weight and percentage of dry weight), the percentage of protein (percentage of wet weight and percentage of dry weight), and the percentage of edible portion of Labeo gonius are reported in Table 1. The percentage of water and the percentage of fat were found to be significantly correlated

in both the wet and dry weights. The dry weights of the contents of %age protein, %age ash, and %age organic showed significant connections. Additionally, it was shown that there is an inverse link between age water and age protein (wet weight) and that there is a highly significant association between age organic contents and wet weights. In contrast, it was discovered that there was little correlation between the ash wet weight and the percentage of water(Table 2). During my investigation, I observed that there was an extremely substantial correlation between the edible body weight of *Labeo gonius* and the percentage of water in its body. Likewise, there was a highly significant correlation between the fish's edible body weight and the percentages of fat, ash, and age in their wet weights.Protein, ash, and organic contents in their dry weights were shown to have a negative correlation and an insignificant association with body weight, although fat percentage (dry weight) and age protein (wet weight) had a significant link with the body weight of the edible section of fish.(Table 3).

TL showed a significantly substantial correlation with the percentage of water when the association between total length and the ages of different body constituents was examined. The wet weights' percentages of fat, ash, and organic content showed a highly significant correlation with the fish's overall length. % fat dry weight and overall length were shown to be significantly correlated. Although certain metrics had an insignificant association with length, the protein relationship had the least importance with the overall length. Dry weights of the percentages of protein, ash, and organic contents were among these metric (Table 4).

A significantly substantial correlation was observed between the edible body weight of Labeo gonius and the total amounts of water, fat, protein, ash, and organic matter. (Table 5). When the log body weight of the fish's edible section was compared to other body components, it was found that the log edible (log body weight) and log water content (log total water) had a negative allometric connection because, in this instance, the value of (b) was less than 1.However, the log body weight (log edible) and metrics such as log fat content, log protein content, log ash content, and log organic content all demonstrated a positive allometric connection with respective (Table 6). Because all of the values of (b) were more than 1 (i.e., 12.44, 1.46, 4.16, 1.21, 5.63), total length demonstrated a positive allomertic association with all body constituents, including total water, total fat, total protein, total ash, and total organic contents.(Table 7) Because all of the computed values for (b) were found to be larger than 1, the log total length displayed a positive allometric relationship with the log total fat, log total protein, log total ash, and log total organic contents (Table 8) The condition factor and %ash (wet weight) were found to be significantly correlated, whereas the condition factor and %water and %fat (wet weight) were shown to be least significantly correlated. There was no discernible correlation between the condition factor and the percentage of protein and organic contents (both in wet and dry weight). (Table 9).

Table 1.Mean values and ranges of various constituents of *Labeo gonius* (n=40)

Body constituents	*Mean ± S.D*	*Range*
Water content (%)	**76.1±3.3**	**71.8-83.9**
Ash content (%Wet weight)	**3.7±0.8**	**2.2-4.9**
Ash content (%dry weight)	**15.6±3.2**	**8.4-22.4**
Fat content (%wet weight)	**3.7±0.7**	**2.05-4.8**
Fat content (% dry weight)	**15.6±2.7**	**8.2-20.9**
Protein contents (%wet weight)	**7.3±1.3**	**3.6-9.4**
Protein contents (%dry weight)	**68.7±5.3**	**59.2-82.7**

S.D = Standard Deviation

Table 2. Statistical parameters of % water content versus % body constituents of wild *Labeo gonious* (n = 40).

Relationships	R	A	B	S. E. (b)	t value when b=0
% Water (x) %Fat WW (y)	0.470**	11.8125	-0.1064	0.0318	-3.3369
% Water (x) %Fat DW (y)	0.320**	-4.78794	0.2685	0.1289	2.0824
% Water (x) %Protein WW (y)	0.877***	0.877083	-0.3609	0.0320	-11.256
% Water (x) %Protein DW(y)	0.449**	124.44	-0.7322	0.2363	-3.0976
%Water (x) %Ash WW (y)	0.300$^{n.s}$	8.9000	-0.0700	0.0400	-2.0001
% Water (x) %Ash DW (y)	0.465**	-19.652	0.4636	0.1429	3.2438
% Water (x) % Organic contents WW (y)	0.900***	40.00885	-0.4091	0.0320	-12.7628
% Water (x) % Organic contents DW (y)	0.465**	119.652	-0.4637	0.1429	-3.2438

Table 3. Statistical parameters of body weight and various %body constituents of wild *Labeo gonius* (n = 40).

Relationships	**R**	**A**	**B**	**S. E. (b)**	**t value when b=0**
BW (x)% Water (y)	0.520***	86.16	-0.060	0.016	-3.699
BW (x)%Fat WW. (y)	0.780***	0.305	0.020	0.002	7.597
BW, (x)%Fat DW (y)	0.4000**	9.084	0.039	0.014	2.67
BW (x)%Protein WW (y)	0.451**	3.625	0.021	0.007	3.10
BW, (x)%Protein DW (y)	0.290$^{n.s}$	77.937	-0.055	0.030	-1.847
BW (x)% Ash WW (y)	0.601***	1.106	0.015	0.003	4.313
BW (x)%Ash DW (y)	0.135$^{n.s}$	12.97	0.015	0.018	0.839
BW (x)% Organic contents WW (y)	0.62***	3.365	0.033	0.006	4.862
BW (x)% Organic contents DW (y)	0.135$^{n.s}$	87.021	-0.015	0.018	-0.839

Table 4. Statistical parameters of Total length (TL, cm) and various % body constituents (wet and dry weight, g) of wild *Labeo gonius* (n = 40).

Relationships	R	A	B	S. E. (b)	t value when b=0
Total length (x) % Water (y)	0.595***	120.95	-1.50	0.32	-4.56
Total length (x) %Fat wet wt. (y)	0.884***	-11.20	0.49	0.04	11.71
Total length (x) %Fat dry wt. (y)	0.452**	-13.02	0.95	0.30	3.13
Total length (x) %Protein wet wt. (y)	0.381*	-4.57	0.39	0.15	2.54
Total length (x) %Protein dry wt. (y)	0.282[n.s]	103.52	-1.16	0.64	-1.81
Total length (x) % Ash wet wt. (y)	0.569***	-6.16	0.32	0.07	4.27
Total length (x) %Ash dry wt. (y)	0.081[n.s]	9.50	0.20	0.40	0.50
Total length (x) % Organic contents wet wt. (y)	0.553***	-10.05	0.63	0.15	4.09
Total length (x) % Organic contents dry wt. (y)	0.081[n.s]	90.49	-0.20	0.40	-0.50

Table 5. Statistical parameters of wet body weight (w, g) versus total body constituents (wet weight, g) of wild *Labeo gonius* (n = 40).

Relationships	R	A	B	S. E. (b)	t value when b=1
BW (x)Water content (y)	0.9742***	14.67907	0.6693	0.0251	-39.1713
BW (x)Fat content (y)	0.9278***	-5.01839	0.0683	0.0044	-227.204
BW (x)Protein content (y)	0.7998***	-5.65972	0.2005	0.0244	-40.7831
BW (x)Ash content (y)	0.8609***	-4.00079	0.0617	0.0059	-169.43
BW (x)Organic contents (y)	0.8665***	-10.6781	0.2688	0.0251	-39.5718

Table 6. Statistical parameters of log edible wet body weightversus total log body constituents of wild *Labeo gonius*

Relationships	R	A	B	S. E. (b)	t value when b=1
Log edible body weight (x) Log water content (y)	0.975***	0.145	0.880	0.032	-30.079
Log edible body weight(x) Log fat content (y)	0.928***	-3.458	1.912	0.124	-6.139
Log edible body weight(x) Log protein content (y)	0.788***	-1.535	1.337	0.169	-4.580
Log edible body weight(x) Log ash content (y)	0.856***	-2.918	1.666	0.162	-4.475
Log edible body weight (x) Log organic contents (y)	0.617***	-16.94	11.673	2.414	11.258

Table 7. **Total length (TL, cm) with total body constituent (g) of wild *Labeo gonius***

Relationships	R	a	b	S. E. (b)	t value when b=3
Total length (x) Water (y)	0.850***	-246.27	12.44	1.24	10.05
Total length (x) Fat content (y)	0.934***	-37.52	1.46	0.09	-31.75
Total length (x) Protien content (y)	0.779***	-96.790	4.16	0.54	-1.36
Total length (x) Ash content (y)	0.797***	-30.14	1.21	0.14	-18.83
Total length (x) Organic contents (y)	0.851***	-134.31	5.63	0.56	0.29

Table 8. **log total length with body constituents (g) of wild *Labeo gonious* (n = 40).**

Relationships	R	A	B	S. E. (b)	t value when b=3
Log total length (x) Log water content (y)	0.866***	-2.621	3.196	0.299	-6.833
Log total length (x) Log fat content (y)	0.948***	-11.01	7.990	0.431	1.037
Log total length (x) Log protein content (y)	0.771***	-6.464	5.347	0.714	1.151
Log total length (x) Log ash content (y)	0.817***	-8.817	6.500	0.743	2.465
Log total length (x) Log organic contents (y)	0.846***	-6.923	5.720	0.584	0.585

Table 9.Condition factor with % body constituent of wild *Labeo gonious* (n = 40).

Relationships	R	A	b	S. E. (b)	t value when b=0
K (x)% Water (y)	0.3417*	112.256	-25.7961	11.5088	-2.2414
K (x)% Fat WW (y)	0.3880*	-5.47495	6.5506	2.5236	2.5957
K (x)% Protein WW(y)	$0.1618^{n.s}$	0.204668	5.0265	4.9728	1.0108
K (x)% Ash WW (y)	0.4513**	-7.27913	7.8183	2.5073	3.1182
K (x)% Organic contents WW (y)	$0.2338^{n.s}$	-2.36242	8.0212	5.4093	1.4828

K=Condition factor

Discussion

We are aware of the fact that fish meat is extremely nutrient-dense and that fishery products include important minerals and nutrients like proteins and lipids in relatively large amounts in addition to

water. Because they are present in modest amounts, carbohydrates are typically ignored. Together with many other animal products, fish also contain minerals, vitamins, and nitrogenous compounds. However, the composition of these components varies among species, and various environmental factors, including temperature, breeding season, and fish age and sex, can affect them. (Huss, 1995). The proximate composition of fish bodies is influenced by seasonal variations in water temperature, but investigators have not yet been able to discern how the seasons affect the morphological traits and composition of fish bodies (Yaldiz and others, 2007). The study's average and standard deviation values for the percentage of water (76.06±3.26), ash contents (%age wet weight and %age dry weight), fat contents (%wet and %dry weight) and percentage of protein (%age wet and dry weight) were determined to be (7.26±1.34, 68.74±5.31) of the edible portion of *Labeo gonius*. Comparable research on the body composition of the edible part of *Aristichthys nobilis*, family Cyprinidae), in connection to its body size and condition factor, was carried out by Naeem and Salam (2010). Significant negative correlations were identified between the percentage of water content, the percentage of fat content (%WW) with a correlation coefficient value of i.e., 0.906, and the percentage of protein content (%WW) with r = 0.847. Body weight has a negative impact on water content (%) (r = 0.595) and a positive link with fat (%WW) (r = 0.453) and protein contents (r = 0.497). Total length has a negative link with water content (%) (r = 0.649) and a positive impact on fat (%WW) (r = 0.507) and protein content (%WW) (r = 0.539). Condition factor shows a substantial positive association with correlation coefficient (r = 0.581) between fat content (%WW) and protein content (%WW) and a significant inverse correlation with H2O content (%) (r = 0.701)
In 2018, Naeem and Khalid carried out more research on the approximate composition of grass carp (Ctenopharyngodon idella). The findings indicated that the water content (%) had a mean and standard deviation of 80.76±4.40, whereas the labeo gonius, our representative animal, had a mean and standard deviation of around 76.06±3.26, which is lower than that of grass carp.In percentage terms, the mean and standard deviation of the ash content were 3.40±0.98 for the age wet weight and 17.76±3.46 for the dry weight. On the other hand, the percentage of fat (wet weight) was 4.31±1.48. Grass carp had a fat content (% dry weight) of 23.89±10.14, whereas Labeo gonius had mean and standard deviation values of 15.64±2.73 for the same parameter. Protein contents (%wet weight) and (%dry weight) for grass carp, on the other hand, were found to be 11.53±4.18 and 58.35±10.49, respectively, whereas protein contents (%wet weight) for L. gonius are 7.26±1.34. However, compared to grass carp, the mean and standard deviation of the protein contents in dry weight are much greater for *Labeo gonius*, indicating that it is a healthier and more nutritious fish that is preferred by users.
In Labeo gonius, a highly significant association was found between total length and fat contents. The correlation coefficient (r) for wet fat contents was measured as (0.884).Since both fish are members of the same family and genus (i.e., Cyprinidae, Labeo), these values were found to be quite similar to the findings of research done on the species *Catla catla* (Badal Das and Mahir Das, 2015). The dry fat contents slightly differed from the findings of earlier research. Fish age, sex, body condition, water temperature, eating habits, and changes in a variety of physical and physiological parameters can all contribute to these variances. The current study found a substantial link between the wet and dry protein contents of fish and their overall length and body weight. This indicates that as protein concentrations increased, so did the fish's weight and length. The average percentages of *Labeo gonius* wet and dry protein contents were determined to be 7.26±1.34, 68.74±5.31.

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