больших усилий, чем сгибание, а у беркута, ястреба большого, кречета и канюка, наоборот, большая нагрузка во время статики и локомоции приходится на сгибатели.

Ночные и дневные хищные птицы отличаются между собой не только образом жизни (ночной и дневной), массой тела, но и различными манипуляциями конечностей: силой выноса конечности во время нападения, охотясь на добычу и способом захвата когтями. Все это накладывает определенный отпечаток на развитие костей тазовой конечности.

Ключевые слова: биоморфология, тазобедренный сустав, мышцы, птицы, орлан-белохвост, канюк обыкновенный, беркут, малый ястреб, большой ястреб, кречет, зимняк, андский кондор, воробьиный сыч, белая сова, ушастая сова, серая сова, сипуха

UDK 619:611.718:616-001.7-073.7:639.1.002

BIOMOTPHOLOGICAL FEATURES OF HIP JOINT (SKELETON, LIGAMENTS, MUSCLES) OG PINK FLAMINGO

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Abstract. *This work is devoted to the study of the biomorphological features of hip joint, namely, it's skeleton, ligaments, muscles. The study of the peculiarities of the locomotive apparatus of birds in line with other animals makes it pissible to understand phylogeny as an adaptive process, which forms the basis of evolution in general meaning. The article gives a theoretical generalization of the features of the hip joint's structure of birds, which are characterized by different types of biomorphological adaptations, namely the type and speed of ground movement in the medium of exastance. This allows to conduct from new position an analysis of processes of differentiation and transformation of the hip joint's muscles and features of skeletal elements of birds that function and develop under the influence of various external features.*

There are described generalizated of the original systematic morphological study of the hip joint elements, as the main apparatus of the bipedal locomotion of the class of birds. For the first time, detailed comparative description of the skeletal, ligaments and muscles of the hip joint of the pink flamingo is presented. The biomorphological features of the muscles, acting on the hip joint of the pink flamingo were investigated. It was established, the that

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degree of differentiation of the muscles is due to the walking type of bipolar locomotion, as well as the biomorphological features of the static, which in turn imposes certain imprints on the degree of development of each individual muscle.

Keywords: birds, bones, hip joint, illiac bone, femur bone, skeleton ,ligaments, muscles, locomotion, pink flamingo

Introduction. One of the most studied and most debatable issues throughoud the period of the formation of morphological science was the study of the peculiarities of tge structure of organs-analogues of different groups of animals ,especially, if they are differ in their habitat, ways of movement, respiration, nutrition, economic use and other features. Not less interest of scientists is also to the study of morphological and functional features of individual organs within a rather narrow group of animals (class, species, group and others),that are exposed to objective factors of the environment (temperature, humidity, elevation above sea level, insolation, feed base, industrial pollution and others),as well as caused by economic use, which is aimed at the isolation and development of certain economic and asebul features (productivity) of the animal body. Today morphological works with a combination of environmental conditions are almost absent, and especially by combining with osteoligical, X-ray and myelogenic studies.

Methods of research. The work was performed at the department of animal anatomy, histology and pathomorphology named after academican V. G. Kas'janenko of National University of Life and Environmental Sciences of Ukraine. Miological researches were performed on a fixed by 10% formalin solution of flamingo's pink corpses (3 specimens), using a tweezers and anatomical scalpel. In the process of osteometric research were used: caliper, metal ruler and roulette.

The results of research. In the studied flamingoformes (pink flamingo) it was installed, bones that of the hip joint are characterized by certain features. So, illium bone has a wrong oval shape, in the middle third somewhat concave laterally. The transition of the dorsal crust of the illium bone to the dorso-lateral is smooth (the angle is not very pronounced). Articular depression represents a round bone hemisphere, that pass into the articular hole. The antiswivel is good developed and has an extended dorso-caudal protusion, which inclined ventro-cranially (fig.1).

Sciatic bone, sciatic and obturator foramens have a wrong oval shape. Sciato-pubic window is filled with a tendon membrane, that connects sciatic and pubic bones with each other. Pubic bone is slightly longer than sciatic one.

The head of the femur bone is somewhat flatted dorsally, has a well-rounded hole, where the femoral head bone us fixed. Cervix of the femur bone is wide but short. Swivel and pectoral fossa are clearly expressed, proximal honey of the swivel is curved medially, the hollow squeeggee is pronounced.

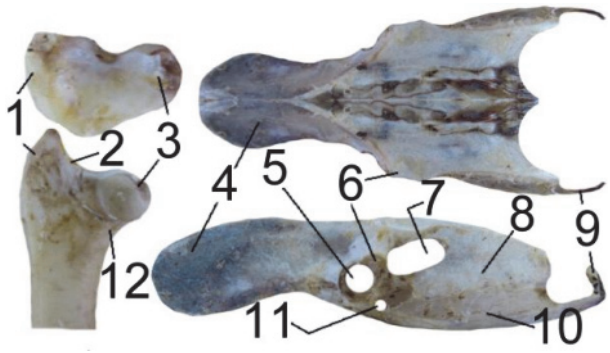

Fig. 1. Bones of the hip joint of the pink flamingo: *1* – swivel; *2* – pectoral fossa; *3* – femoral head; *4* – illium bone; *5* – articular fossa; *6* – antiswivel; *7* – sciatic foramen; *8* – sciatic bone; *9* – pubic bone; *10* – sciato-pubic window, displaced by the tendon membrane; *11* – obturator foramen; *12* – cervix

The hip joint of all birds is covered with an articulate capsule, as well as of the pink flamingo. The capsule of hip joint has a certain differences in the degree of development in the different parts, which forms a series of ligaments. So, caudally from the swivel and antiswivel and the cranial edge of the illium-sciatic foramen is the beginning of a thick and firm part of the capsule, which carries the name of the sciatic-femoral ligament. This ligament ends in the area of the caudal part of the swivel crest. In the dorsal direct the capsule if the hip joint starts from the antiswivel and dorsal edges of the swivel cavity, ends on the medial side of the swivel. This part of the capsule is, as usual thinner and weaher than the others. On the front side of the hip joint the capsule begins from the cranial edge of the articular depression and ends in the region of the femoral cervix. This part of the capsule is thickened and is called as sciato-femoral ligament. The ventral part of the capsule, originating from the lower edge of the articular cavity and the dorsal surface of the pubic bone, is also thickened, and ends slightly below the cervix of femur bone. This is called pubic-femoral ligament. Iside of the hipis a round ligament or ligament of the femoral head. This ligament begins on the ventral edge of the articular foramen and ends in the round fossa on the femur bone.

In group of flamingoformes (pink flamingo) the most powerful muscle of the flexural group of the hip joint is the caudal illio-swivel muscle. It begins as muscular-aponeurotic from the dorso-cranially part of the illium bone. Externally it is covered by superficial aponeurosis. It ends with a thick and wide tendon on the dorso-laterally surface of the swivel of the femur bone. Double-breasted muscle.

Cranial illio-swivel muscle starts from the distal half of the illium bone under caudal illio-swivel muscle. On the lateral surfaceof the muscle there is an aponeurotic mirror. The muscle ends on the lateral surface of the distal half of the swivel. This is single-breasted muscle.

External illio-swivel muscle of the flamingoformes begins musculary from the dorsal surface of the dorsal crest of the illium bone and endswith a strong and long tendon of the dorso-laterally surface of the femur, covering the swivel of the femur bone. The muscle is single-breasted.

Internal illio-femoral muscle begins from the caudal half of the ventral arc of the illium bone tendonary and ends on the femur bone slightly higher than the illio-femoral. This muscle is longitudinally-fibrous.

The illio-femoral muscle starts from tha caudo-distal part of the illium bone and ends tendonary on the cranio-lateral surface of the femur bone, tendon is differentaited into two tendon legs: proximal and distal. The muscle us longitudinally-fibrous.

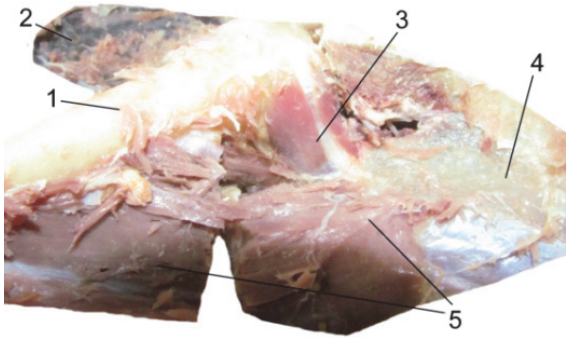

Fig. 2. Muscles of the hip joint of pink flamingo (latero-cranially surface): *1* – illium bone; *2* – femur bone; *3* – illio-femoral muscle; *4* – internal illio-femoral muscle

Among the extensor-propagating muscles sciato-femoral one of the pink flamingo begins musculary from the caudal half of the femur bone and ends muscular-tendonary on the caudo-lateral surface of the femur bone. The muscle melts on the entire surface of the sciatic bone. Single-breasted muscle.

Medial blind muscle begins on the medial surface of the caudal edge of the sciatic and pubic bones. The muscle fibers pass through the obturator foramen to the lateral surface. The muscle is differentaited into thre head: proximal and distal-musculary and middle-tendonary. It ends on the caudo-lsterally surface of the proximal epiphysis of the femur bone (fig.3). The muscle us double-breasted.

Pubic-sciatic-femoral muscle originates by muscle fibers from the caudal half of the pubic bone. The muscle ends musculary on the caudal surface of the distal epiphysis of the femur bone with the lateral tibia flexion. The indicates that the presence if these muscles is the result of differentiation of one muscle. The muscle is longitudinally-fibrous.

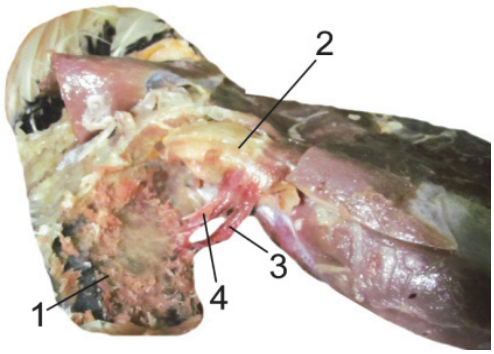

Fig. 3. Muscles of the hip joint of pink flamingo (latero-caudally surface): *1* – femur bone; *2* – illium bone; *3* – medial blind muscle; *4* – sciatic bone; *5* – pubic-sciatic -femoral muscle

Described by us for the first time, the superficial sciato-femoral muscle begins with a long, subtle aponeurosis from the caudal half of the ventral arc of the sciatic bone. The muscle ends on the caudo-laterally surface of the diaphysis if the femur. The muscle is longitudinally-fibrous (fig.4).

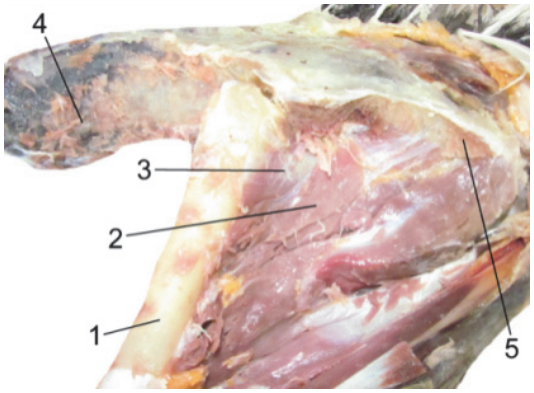

Fig 4. Muscles of the hip joint of pink flamingo (laterally surface): *1* – femur bone; *2* – superficial sciatic-femoral muscle; *3* – sciatic -femoral muscle; *4* – illium bone; *5* – sciatic bone

Among the leading muscles the blind -femoral also has a longitudinally-fibrous structure and originates from the cranio-distal edge of the obturator foramen and ends on the caudo-medial surface of the proximal epiphysis if the femur bone musculary. The most powerful muscle of the pink flamingo is caudal illium-swivel muscle – 48,2%,and the least developed-internal illium-femoral – 0,7%.

Disscusion. The difference of the shape and relative dimensions of the structural elements of the hip joint of pink flamingo is determined by the biomorphological adaptations if it in the medium if existance.

Among the muscles, examined by us, that act on the hip joint, were found muscles that have not been described previously (superficial sciatic-femoral muscle).

The stages of development of individual muscles and muscle groups that act on the hip joint and their differentiation us due to the functional loads due to the adaptation to finger movement. Correlation of muscle's mass of the hip joint to body weight is 0,5 %.

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БІОМОРФОЛОГІЯ ТАЗОСТЕГНОВОГО СУГЛОБА (СКЕЛЕТ, ЗВ'ЯЗКИ, М'ЯЗИ) У ФЛАМІНГО РОЖЕВОГО

Н. В. Друзь, К. О. Савчук

Анотація. *Дана робота присвячена вивченню біоморфології тазостегнового суглоба, а саме його скелету, зв'язок та м'язів. Вивчення особливостей будови локомоторного апарату птахів у порівнянні із іншими тваринами дає можливість зрозуміти філогенез як адаптивний процес, що складає основу еволюції взагалі.*

У статті наведене теоретичне узагальнення особливостей будови тазостегнового суглоба птахів, які характеризуються різними типами біоморфологічних адаптацій, а саме типом та швидкістю наземного пересування у середовищі існування. Це дозволяє з нових позицій провести аналіз процесів диференціації та трансформації м'язових та особливостей скелетних елементів тазостегнового суглоба птахів, що функціонують та розвиваються під дією різних зовнішніх чинників.

Викладено узагальнені результати оригінального системного морфологічного дослідження елементів тазостегнового суглоба, як основного апарату біпедальної локомоції класу птахів. Вперше наводиться детальний порівняльний опис скелету, зв'язок та м'язів тазостегнового суглоба у фламінго рожевого. Досліджено біоморфологічні особливості м'язів, що діють на тазостегновий суглоб у фламінго рожевого. Встановлено, що ступінь диференціації м'язів обумовлений крокуючим типом біпедальної локомоції, а також біоморфологічними особливостями статики, що, у свою чергу, накладає певні відбитки на ступінь розвитку кожного окремого м'яза.

Ключові слова: птахи, кістки, тазостегновий суглоб, клубова кістка, сіднична кістка, лобкова кістка, стегнова кістка, скелет, зв'язки, м'язи, локомоція, фламінго рожевий

БИОМОРФОЛОГИЯ ТАЗОБЕДРЕННОГО СУСТАВА (СКЕЛЕТ, СВЯЗКИ, МЫШЦЫ) У ФЛАМИНГО РОЗОВОГО

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