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## RESEARCH RESULTS OF DECOY DUCK ECOLOGY

**Abstract.** The results of long-term observations of the population of the Russian decoy duck in the nursery of decoy ducks of the Hunting Club with decoy and call ducks (HCDCD) and the study of its biology features are presented. As a result of these studies, significant differences were found between the exterior signs of mallard and decoy duck. The biology features of decoy ducks were studied, which led to changes in the process of domestication, molting, nutrition, reproduction, and behavioral changes characteristic of poultry (attitude to the aviary, people, and loss of migratory instinct). This showed that the Russian decoy duck is a breed of domesticated duck with specific hunting signs, which can be considered as a variety of domestic hunting duck with specific hunting features.

**Key words:** hunting, decoy duck, aviculture, biology, breed.

**Relevance.** In Western Europe, commercial hunting for waterfowl was widespread among people of the Baltic states as early as the 15th century. Hunting for birds of passage and wintering waterfowl was carried out in the autumn-winter period. There is a known description of duck hunting using net traps, in which game bird was lured using domestic decoy ducks in the Netherlands, Denmark and other countries. To service one of them, up to 600 decoy ducks were kept on Kevler Dune (near Geldern, the Netherlands) [1,2,3]. The use of guns for hunting for waterfowl began in the middle of the 16 century after the invention of the shot. Industrialists hunted first with muzzle-loading shotguns which were relatively heavy and slowly recharged. Therefore, the firing was conducted from legs or support and only from a shelter. The muzzle-loading guns were successfully used by hunters in wintering of waterfowl in the Netherlands, Belgium, France, Denmark, Venice, as well as in Asian countries [1].

In Russia, mallard hunting using net traps and decoy ducks was most likely born at the end of the 15th century [1].

At the same time at the end of the 19 century, the Russian hunting community has banned the use of net traps. Hunters began to catch ducks using traps of various designs, snares, etc. They began to use decoy ducks to lure birds into traps. This hunt was especially widely developed in the Nizhny Novgorod, Tula, Voronezh and Penza provinces. It can be assumed that from there this type of hunting began to spread further, first along the Don River, and then along the Volga to Saratov [14]. The earliest description of hunting with a decoy is given by L.P. Sabaneev in the "Hunting Calendar" [5].

Initially, decoy ducks were bred from domestic ducks that occurred as a result of mallard domestication [6]. In the first half of the 19 century, in Western Europe and Russia, there were call ducks.

German breeders S. Horst, P. Perlhuhner, G. Enten [7], studying the history of the creation of call duck breed, suggested several options for its occurrence. Presumably, the call duck breed was bred in the Baltic countries as a result of a targeted selection of small domestic ducks. They also considered another option for the appearance of this breed. Call ducks became popular in the Netherlands around 1800 and were widely distributed among poultry farmers in a relatively short period, which is somewhat contrary to the practice of poultry breeding [7]. S. Horst, P. Perlhuhner, G. Enten suggested that such a rapid spread of these ducks occurred because they were introduced to Holland as an already mature breed.

On the exterior, call ducks are significantly different from other breeds of ducks, since a dwarfism mutation is manifested genetically, from generation to generation. This feature is well shown in their German name - zwergeten - dwarf ducks. Thus, to create a call duck from scratch and make it a new breed in such a short time, it would have been possible only by chance [7].

In works on classical private duck genetics, using a hybridological analysis, more than 15 genes responsible for the color of plumage and other discrete morphological characters were identified in the mallard duck. In particular, a dwarf growth gene was found in mallard ducks [7,9]. In 1949, the English breeder geneticist Hutt discovered a mutation of dwarf gen (dw). In contrast to the previously described autosomal dominant the dwarf gene, the dwarf bird bred by Hutt showed no pathological abnormalities [2].

The greatest success in breeding call ducks was achieved by Tula and Nizhny Novgorod breeders, who until the beginning of the 20th century. managed to keep this breed group. Subsequently, in Russia, the call duck as an independent breed was lost, but as a result of the consolidation of various varieties of decoy ducks, the Russian decoy duck was formed, in which the exterior features of the call and local decoy ducks were largely preserved [3].

A major contribution to the study of issues related to the content, behavior patterns and methods of hunting with a decoy duck was made by Ya.S. Rusanov [10].

**Aim of the research.** To study the morphometric parameters of the decoy duck and the ecology of their distribution.

**Materials and research methods.** We studied the biological features of decoy ducks from 2000 to 2018 in the decoy duck nursery of the Hunting Club with decoy and call birds (HCDCD). The population of decoy ducks was formed by birds brought from different regions of the USSR and Russia (from Smolensk, Moscow, Tula, Vladimir regions, as well as from the decoy duck nursery of the Central Research Laboratory of Glavohota of the RSFSR). The number of the observed population varied annually from 90 to 120 ducks. For 10 years of research, about 2600 decoy ducks were studied.

During the observations, it was supposed to find out the degree of domestication of decoy ducks and the features of their biology (molting, behavior, feeding and reproduction features) when maintaining in a nursery [1].

To solve the objectives in terms of studying the biology of the Russian decoy duck, we used the following methods:

- the methodology of comparative morphometric studies of mallard and decoy duck;
- statistical methodology for determining the genetic and selective parameters of the decoy duck;
- standard methods used in poultry farming for breeding and maintenance of domestic ducks [11].

We carried out selection work with decoy ducks according to standard methods used in poultry farming for breeding and keeping domestic ducks [12].

Exterior characteristics were studied by us according to the results of expert inspections at poultry exhibitions, in the HCDCD nursery, at the Club owners, as well as in hunting establishments and on the private farms of the breeders of the Moscow, Smolensk, Tver, and Tula regions. Based on the research results, a comparison of the exterior and morphometric parameters of decoy ducks bred in different regions of Russia was conducted. The working (hunting) qualities of decoy ducks were studied both by the results of hunting and by the results of field tests [13].

Every year after spring hunting, we analyzed data obtained from hunters using specifically designed questionnaires based on the performance indicators of decoy ducks, the success and profit of the hunt in different regions.

Due to the polygenic conditionality of most morphological characters of birds and the influence of external conditions on their variability, we used statistical methods to determine the genetic selection

parameters of the studied decoy duck group. Similar methods are widely used in poultry to improve the productive and breeding qualities of geese and ducks [11].

To get an overview of the group being studied, according to generally accepted methods, we calculated the following values by signs: arithmetic mean, mean square (standard) deviation, and coefficient of variation. In order to determine the reliability of the obtained indicators and the results of the comparative analysis, the errors were determined by the calculated values [14].

For comparative morphometric investigations of the body parts of decoy duck and mallard, we carried out morphometric measurements according to six exterior indicators. The measurements were carried out according to the method proposed for conducting breeding work on poultry farms [15] and used for morphometric measurements of mallards at the Central Research Laboratory of Glavokhota [16]. For statistical analysis, the following exterior parameters of the parts of the decoy duck body were selected: body length, wing length, length of the beak with head, tarsometatarsus length, beak length, and width. The results of measurements of these parts of the duck's body are methodologically characterized by obtaining the most accurate measurement values in the absence of seasonal morphometric fluctuations. It is these parts of the duck's body that most fully reflect the degree of domestication in poultry [11].

In the process of morphological studies of the body parts of decoy duck and mallard, we measured the body parts of 695 cock ducks and 535 ducks kept in the HCDCD nursery and Club owners. For a comparative analysis of the body parts of decoy ducks and mallards, the results of measurements of 60 decoy ducks (32 cock ducks and 28 ducks) were selected. The choice of such a number of decoy ducks was determined by the number of mallard individuals participating in the morphometric research of the Central Research Laboratory of Glavokhota [16], with the morphometric parameters of which we compared our data.

For statistical analysis, we selected six indicators of body parts that characterize the length of the body, wing, tarsometatarsus, length and width of the beak, and the length of the beak with the head. These indicators most objectively reflect the degree of domestication and are methodically the most accurate, since they relate to those body parts that are not subject to seasonal changes. In total, 92 individuals of Russian decoy ducks (48 ducks and 44 cock ducks), 73 mallards (35 ducks and 38 cock ducks) were measured.

As a result of these studies, significant differences were found between the exterior characteristics of mallard and decoy duck, and criteria for voice variations of decoy duck, which were very different from the mallard, were identified and fixed. This allows considering the Russian decoy duck as a breed to select for the preservation and improvement of its exterior and hunting qualities and to breed decoy ducks with good voice features and specific "hunting" behavior [19].

To describe the appearance of the Russian decoy duck, we applied the principles used in poultry farming to describe the poultry breeds [13].

**Research results.** In the studied decoy ducks, the prevalence of common exterior and interior features, persistently inherited, was established, which characterizes the studied duck population as a breed. In 2004, the HCDCD Coordinating Council developed a draft standard for the Russian decoy duck breed, which was approved at the HCDCD general meeting on March 20, 2001.

Comparative morphometry of decoy ducks and mallards allowed us to obtain a reliable difference in the measurements of their body parts (table 1-3).

Table 1 – Results of a comparative analysis of the average values of the morphometric parameters of mallard (38♂ 35♀) and Russian decoy duck (44-1.0 and 48-0.1)

Body parts of decoy duck (1) and mallard (2)	Arithmetic mean		Dispersion (variance)		Error of mean		Coefficient of variation	
	1	2	1	2	1	2	1	2
Wing length	268.8 ± 7.9	266.0 ± 1.6	61.9		8.9		2.9	2.7
Tarsometatarsus length	56.9 ± 2.7	53.2 ± 0.6	7.46		0.4		2.9	2.6
Beak length	48.8 ± 3.4	52.8 ± 0.4	11.9		0.49		6.96	4.0
Head length	106.7 ± 0.8	105.3 ± 4.3	18.6		0.6		4.08	3.9

Table 2 – Results of a comparative analysis of the average values of the morphometric parameters of mallard (38♂ and 35♀) and Russian decoy duck (44-1.0 and 48-0.1) (Student criterion)

Object	Headlength	Beaklength	Winglength	Tarsometatarsuslength
Mallard♂♂	112.6±0.8	55.3±0.5	268.9±3.1	55.8±0.7
Decoy duck ♂♂	106.7±0.8	48.8±3.4	267.7±14.0	58.9 ± 3.0
Mallard♀♀	106.7±0.8	52.8±0.4	266.0±1.6	53.2 ±0.6
Decoy duck ♀♀	105.3± 4.3	48.8±3.4	268.8 ±7.9	56.9 ± 2.7

Table 3 – Comparison results of significant differences between the variance relation of features in Russian decoy duck (44-1.0 and 48-0.1) and mallard (38♂ and 35♀) (Fisher criterion)

Comparableforms	Headlength		Beaklength		Winglength		Tarsometatarsuslength	
	F	β	F	β	F	β	F	β
Mallard♂♂	1.77	–	1.76	–	1.75	–	2.24	–
Decoy duck ♂♂	14.6	0.95	14.6	0.95	14.6	0.95	14.6	0.95
Mallard♀♀	1.14	–	1.02	–	1.09	–	1.82	–
Decoy duck ♀♀	14.6	0.95	14.6	0.95	14.6	0.95	14.6	0.95

Notes: F – Fisher criterion; β – the probability of error-free forecasts; – - unreliably.

Table 4 – Morphometric parameters of the body parts of the Russian decoy duck (0.1 duck)

Body parts	Arithmeticmean	Dispersion (variance)	Error of mean	Coefficient of variation
Body length	559.6 ± 15.7	246.8	2.3	2.8
Winglength	268.8 ± 7.9	61.9	8.9	2.9
Tarsometatarsuslength	56.9 ± 2.7	7.46	0.4	4.7
Beaklength	48.8 ± 3.4	11.9	0.49	6.96
Beakwidth	24.2 ± 0.93	0.87	0.13	3.8
Beak length with head	105.3 ± 4.3	18.6	0.6	4.08

Table 5 – Morphometric parameters of the body parts of the Russian decoy duck (1.0 cock duck)

Body parts	Arithmeticmean	Dispersion (variance)	Error of mean	Coefficient of variation
Body length	559.6 ± 15.7	246.8	2.3	2.8
Winglength	268.8 ± 7.9	61.9	8.9	2.9
Tarsometatarsuslength	56.9 ± 2.7	7.46	0.4	4.7
Beaklength	48.8 ± 3.4	11.9	0.49	6.96
Beakwidth	24.2 ± 0.93	0.87	0.13	3.8
Beak length with head	105.3 ± 4.3	18.6	0.6	4.08

The results of the average values of the morphometric parameters studied by us for cock ducks (1.0) and ducks (0.1) of the Russian decoy duck, as well as a statistical analysis of the average values and variance relations are given in tables 4, 5. As a result of the analysis of morphometric parameters of the Russian decoy duck, we proposed parameters that it is desirable to observe when conducting breeding work.

**Suggestions.** In order to maintain and improve the breeding population of decoy ducks of the Russian decoy duck breed, it is necessary to:

Create a center for the organization and conduction of breeding work with decoy ducks.

Clarify the number and distribution of the breeding stock of decoy ducks in the regions of the Russian Federation.

Conduct regular exterior exhibitions and field tests of decoy ducks according to uniform rules.

Monitor the impact of hunting with decoy ducks on the mallard population using the example of the Central Federal District of the Russian Federation.

Develop hunting technology with decoy duck.

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### **ОТЫРҒЫЗАТЫН ҮЙРЕКТІҢ ЭКОЛОГИЯСЫН ЗЕРТТЕУ НӘТИЖЕЛЕРІ**

**Аннотация.** «Орыс қонымды үйрегінің» биологиялық ерекшеліктерін зерттеудің және бақылаудың нәтижелері келтірілген. Бақылау қонымды үйрекке аңшылық жасаушылардың әуесқойлар клубында жүргізілді. Осы зерттеулердің нәтижесінде барылдауық үйректің және қонымды үйректің экстерьерлік ерекшеліктері анықталды. Қолға үйрету, түлеу, азықтану, көбею, мінез-құлық өзгеруі (торға, адамға үйренуі және миграциялық инстинктінен айырылу) нәтижесінде орын алған қонымды үйректің биологиясындағы ерекшеліктер зерттелді. Нәтижелер ерекше аңшылық қасиеттерге ие орыстың қонымды үйрегінің қолға үйретілген аңшылық түр ретінде қолдануға болатынын көрсетті.

Зерттелген морфометрикалық көрсеткіштердің орташа мәндері кежек үйректер (1.0) және орыс қонымды үйректеріне байланысты (0.1). Дисперсионды қатынастардың және орташа мәндерінің статистикалық талдауы нәтижесі селекциялық жұмыстарды жасау кезінде сақтауға тиіс параметрлерді ұсынды.

XV ғасырда қонымды үйректердің екі шығу ошағы анықталды (Батыс Еуропа және Ресейдің Еуропа бөлігі, Волга алабы). XIX екінші жартысында аңшылық қарудың кең таралуына байланысты, қонымды үйректердің саны ұлғайды.

Ресей Федерациясының және дәстүрлі түрде қонымды үйректермен аңшылық жасайтын аймақтарда қонымды үйректердің (Russian Decoy Duck) генетикалық біртекті басы қалыптасты, олар ұқсас тұқымдық белгілерге ие және тұрақты морфометрикалық параметрлерін – мінез-құлық ерекшелігі және жұмысшы аңшылық қасиеттері ұрпағына береді. Ол екі үйрек түрлерін шағылыстыру барысында алынған – қонымды үйрек (Decoy Duck) және ақжелкен үйрек (Call Duck).

Орыс қонымды үйрегінің статусын анықтау үшін қонымды үйректің және барылдауық үйректің дене бөліктерінің морфометрикалық талдауы жасалды, олардың айқын ерекшеліктері көрсетілді.

Орыс қонымды үйрегі түріне стандарттар және далалық сынақтар ережелері жасалған. Қазіргі кезде ол экстерьерлік, аңшылық жұмысшы қасиеттерін бағалау үшін қолданылады.

Үй жағдайында қонымды үйректерді ұзақ селекциялау оны барылдауық үйректен және үй үйрегінен ерекшелейтін экстерьерлік сипаттамасының қайтымсыз өзгерістеріне алып келді. Барылдауық үйректен салыстырғанда, қонымды үйректің дене өлшемі 20 %-ға ұлғайды, өкпесінің, жүрегінің салыстырмалы массасы және қанатының ұзындығы және тұмсығы 10 %-ға қысқарған. Ұшу аппаратының бұлшықет массасы азайған. Барылдауық үйректен салыстырғанда, морфометрикалық талдау нәтижелері қонымды үйректің қолға үйретілгенін аңғартады. Ұзақ қолға үйрету нәтижесінде фенотиптік және генетикалық өзгергіштіктің

ұлғаюына алып келді. Бұл заңдылықтар үйге үйрету және селекциялар нәтижесінде орын алды. Бұл құбылыс қолға үйретілген жануарлар мен құстардың барлық түрлерінде байқалады.

Қонымды үйректі этологиялық бақылаулар оларда тек үй құстарына тән сипаттар бар екенін көрсетті. Қонымды үйректер торда ұстауға үйренген. Барылдауық үйректермен салыстырғанда, олардың мінез-құлқы өзгерген: адамнан қорықпайды, миграциялық инстинктен айырылған, ұяға келуге үйренген, үй жағдайында көбеюге және азықтануға үйренген.

Ресейде өсірілетін асыл тұқымды орыс қонымды үйрегіннің басын сақтау үшін келесі жұмыстарды жүргізу қажет: қонымды үйректермен селекция жұмыстарын жасайтын және ұйымдастыратын бұрынғы орталық; санын анықтау және Ресей аймақтарына асыл тұқымды қонымды үйректерді тарату; бұрынғы ережелер бойынша экстерьерлі көрмелер және далалық сынақ жұмыстарын жасау; РФ орталық аймағында қонымды үйрекпен аңшылық еткенде, барылдауық үйрек санына әсер етуіне мониторинг жасау.

**Түйін сөздер:** аңшылық, қондырмалы үйрек, өсіру, биология, тұқым.

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## **РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ ЭКОЛОГИИ ПОДСАДНОЙ УТКИ**

**Аннотация.** Приводятся результаты многолетних наблюдений за поголовьем породы «русская подсадная утка» в питомнике подсадных уток Клуба любителей охоты с подсадными утками (КЛОСПИМП) и изучение особенностей ее биологии. В результате этих исследований были установлены достоверные отличия экстерьерных признаков кряквы и подсадной утки. Были изучены особенности биологии подсадных уток, приведшие к изменениям в процессе домостикации, линьки, питания, размножения и изменения в поведении, свойственные домашней птице (отношение к вольеру, людям и утрата миграционного инстинкта). Это показало, что русская подсадная утка представляет породу подружейной домашней утки, обладающую специфическими охотничьими качествами, что можно рассматривать как разновидность домашней охотничьей утки со специфическими особенностями охотничьего характера.

Результаты средних значений исследованных нами морфометрических показателей для селезней (1.0) и уток (0.1) русской подсадной утки, а также статистический анализ средних значений и дисперсионных отношений позволили предложить параметры, которые желательно соблюдать при ведении селекционной работы.

Установлены два очага происхождения подсадных уток в XV в. (Западная Европа и европейская часть России, бассейн Волги). Здесь же, но уже во второй половине XIX в. произошло увеличение поголовья разводимых подсадных уток, связанное с изобретением и широким распространением охотничьего оружия и дроби.

На территории Российской Федерации в регионах традиционной охоты с подсадными утками сформировалось генетически однородное поголовье подсадных уток (RussianDecoyDuck), обладающее сходными породными признаками и передающее по наследству стойкие морфометрические параметры, особенности поведения и рабочие охотничьи качества. Она была получена в результате метизации двух разновидностей – подсадной утки (DecoyDuck) и манной утки (CallDuck).

Для установления статуса русской подсадной утки был проведен морфометрический анализ частей тела подсадных уток и кряквы, который показал их достоверные отличия.

На породу русская подсадная утка были разработаны стандарт и правила полевых испытаний, которые в настоящее время применяются для оценки экстерьерных и охотничьих рабочих качеств, что необходимо для ведения селекционной работы.

Длительная селекция подсадных уток в условиях домашнего содержания привела к необратимым изменениям экстерьерных характеристик, отличающих ее от кряквы и пород домашних уток. У подсадной утки по сравнению с кряквой увеличилась на 20% масса тела, уменьшилась относительная масса легких, сердца и несущая поверхность крыла, произошло укорочение клюва на 10%, уменьшилась масса мышц летательного аппарата. Не менее показательны результаты сравнительного морфометрического анализа,

отражающие степень domestikации подсадных уток и одновременно показывающие четкие различия между кряквой и подсадной уткой. Объясняется это тем, что в результате длительной domestikации произошла разблокировка естественного стабилизирующего отбора, что привело к увеличению фенотипической и генетической изменчивости. Это явление закономерно произошло в результате domestikации и последующей селекции. Оно наблюдается у всех видов domestikцированных животных и птиц и приводит к образованию пород.

Этологические наблюдения за подсадными утками выявили у них черты поведения, присущие только домашней птице. Подсадные утки отлично приспособлены к содержанию в вольерах. У них по сравнению с кряквой произошли изменения поведения: пропал страх перед человеком, пропал миграционный инстинкт, выработался хоминг на птичник и развились приспособительные свойства к приему пищи и размножению в условиях домашнего содержания.

В целях сохранения и улучшения разводимого в России поголовья племенных подсадных уток породы русская подсадная утка необходимо: создание единого центра по организации и проведению селекционной работы с подсадными утками; выяснение численности и распределения племенного поголовья подсадных уток в регионах РФ; проведение регулярных экстерьерных выставок и полевых испытаний подсадных уток по единым правилам; проведение мониторинга воздействия охоты с подсадными утками на популяцию кряквы на примере Центрального федерального округа РФ.

**Ключевые слова:** охота, подсадная утка, разведение, биология, порода.

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