DANISH REVIEW OF GAME BIOLOGY Vol. 5. no. 7

Edited by Anders Holm Joensen

Sexing Day-old Game Pheasant Chicks

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HOLGER MADSEN

(Med et dansk resumé: Kønsbestemmelse af daggamle fasankyllinger)

Резюме на русском языке:
Определение пола однодневных фазаньих птенцов

Vildtbiologisk Station, Kalø, 8410 Rønde, Denmark

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Introduction

Partly for similar reasons as in domestic chickens it is of practical importance for game pheasant breeders to be able to sex their young chicks. A couple of papers on this matter have come to my attention (LATHAM 1942, 2. edit. 1951; LASSEN, DOTY and SAUCERMANN, 1955). The criteria used are patterns of feather distribution, and to a certain extent, of colour on the head. Recently (WENTWORTH, POLLACK and SMYTH, 1967) it was demonstrated that early sexing can be facilitated by deliberately crossing strains of pheasants presenting sex-linked heritage of down colour.

From material comprising more than 30,000 birds, a successful classification, ranging from 94 % to 98,5 % was reported in these papers, comparing very well with the professional sexing, being performed on domestic chickens, with a special apparatus for inspection of the cloaca. The accuracy of this kind of sexing ranges around 95 %.

In spite of this apparent success the method seems to be used only to a limited extent, and to my knowledge has found no widespread application outside the U.S.A. In Denmark it was virtually unknown.

Results

When I in 1957, during a stay at Cornell University became acquainted with the above mentioned papers, I took the matter up in cooperation with M. R. REYNOLDS at the New York State Game Farm in Ithaca, N. Y. After some preliminary trials with the method, I achieved an accuracy of 95 % on a limited sample of 110 chicks. These birds were newly dead or were killed after the determination, and the sex ascertained by examination of the internal characters. At the same time I took the opportunity of examining under the dissection microscope the interior surface of the cloaca to see if sex characters could be demonstrated, but I was not able to find any.

Having convinced myself that the method did work, I had to ask myself why it had not found a wider application, and I came to the conclusion, that one reason may be that the illustrations presented as yet seemed to be a little ambiguous, and may not depict the decisive characters clearly enough.

For various reasons I was not able at that time to follow the matter up. In the summer of 1964, however, I made some studies, particularly concerning the alleged action of arginine in the diet on the habit of feather-picking and cannibalism in partridge and pheasant chicks.

I decided to take up concurrently the sexing of the chicks, and accordingly in the experiment set up groups with treated and untreated males and females. This turned out to be a happy choice, since sexing was the only experimental procedure which had any influence on feather-picking. This latter was significantly less pronounced in the female groups (MADSEN, 1966).

Having thus worked with a considerable number of birds, I enlisted the cooperation of the well-known biological artist Henning Anthon who prepared the drawings presented here. It is my hope that in these illustrations a tool is offered, which will in the future make sex-determination of pheasant chicks a fairly simple procedure, once the eye of the observer has been sharpened for the decisive characteristics.

Only in one experiment, comprising 143 chicks, the game-breeder with whom this particular experiment was performed, sexed the chicks himself, after I had given him a »lightning course« in sexing in an odd twenty birds. He did very well, since he was eigthy per cent correct in his classification, at a time when I had not yet attained maximum accuracy of determination.

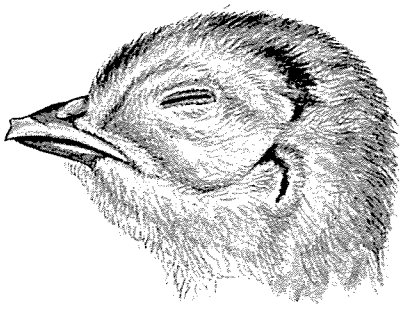
He was definitely inclined to classify too many females as males, a tendency found also in my determination, even though this overclassification in 634 determinations only approached significance (Chi-square being 3.752, against the lowest level of significance of 3.841). A group comprising 120 birds was sexed at the age of ten days. Some significant change had evidently occurred, since too many males were classified as females (Chi-square approximating significance at the 2 per cent level).

When the chicks reach an age of about four weeks, external sexing appears to be impossible, from present knowledge. This observation is at variance with a statement by LATHAM (1951): »The older the birds become, the more pronounced are the sexual characteristics, thus increasing the possible accuracy among such individuals«. This only holds true when the adult feathers begin to show, at the age of seven-eight weeks.

For practical purposes all this does not matter since the interest lies in the quite young chicks. The matter only gains interest when the change of downs and feathers during the growth of the chicks shall be traced. This would be a worthwhile study. One source of error in the determination is almost unavoidable when handling great numbers of chicks, the human one, that the classified chicks accidentally may be put in the wrong box or whatever is used during sorting.

I myself sexed 754 chicks, distributed as three groups, comprising 119, 515 and 120 birds, respectively, with an overall efficiency of 94.0 per cent. All chicks were wing banded, and the correct sex was determined when the chicks reached an age in which the adult sex-characteristics of the feathers could be seen without difficulty. The comparatively few birds which died during the experiments were sexed on internal characteristics.

The criteria used for discerning the sexes are characteristics in the distribution and pattern of the downs in the cheek patch or eye field. This pattern is best understood when taking the organization of the cheek patch in the adult birds into consideration. In the adult birds the eye field is delimited by clearcut ridges, particularly pronounced in the male bird, where furthermore the eye field is almost devoid of feathers. Particularly in the parts of the eye field in front of the eye in the chicks, these ridges can be discerned to varying degrees when pushing the downs aside, and often they are more pronounced in the males, as, like in the adult birds, the eye field tends to be larger, and extends further down the cheek than in the case of the female, often reaching a level below the lower beak. But in any case the upper ridge presents itself as a clearcut line, which even often describes an angle. It will be seen in the figures that this line provides one safe characteristic. Another one is the patch of downs descending obliquely down-



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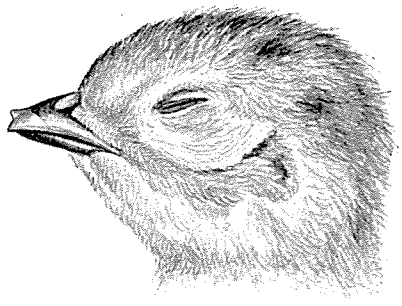

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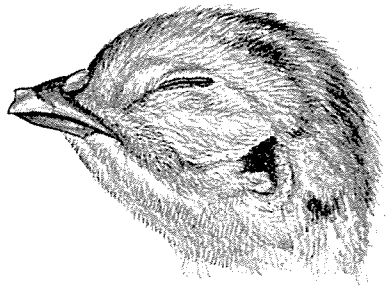

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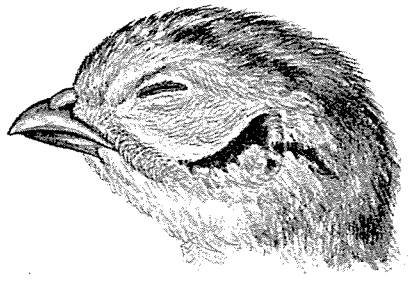

6. ♀

Drawings by Henning Anthon.

wards from the nasal opening along the upper beak (Figs. 1–3). I have often used the comparison that in contrast to conditions in man, the female chick is the more »bearded« sex. The patch of downs mentioned is clearly broader and longer in the female chick, and at the end sometimes fades out without a clear boundary, whereas it in the male chick is narrow and short (Figs. 4–6). A quite safe female characteristic, which occurs however only in a smaller proportion of the chicks, is seen clearly in Fig. 6 (it may be still more pronounced than in the illustration). This characteristic is a colour patch which stretches more or less to the fore from the ear opening along the lower ridge of the eye field. I will not conceal that the sharp eye of the biologically trained artist has made the characteristics of sex determination still more clear to me than they were beforehand, so that the efficiency now without doubt would surpass my 94 % successful determination.

Summary

Based upon drawings executed by a biologically trained artist and after having sexed some nine hundred young game pheasant chicks myself an improved version of a method of sexing is presented. It is demonstrated that the criteria used, patterns of down in the cheek patch or eye field, complemented with some colour characteristics, are foreshadowing configurations of the same region in the adult birds. In the males the eye field is generally larger than in the females, and in any case is delimited in front of the eye by a clear cut line, sometimes forming an angle. The patch of downs (»beard«) extending obliquely downwards from the nasal opening is narrow and short. In the female chick the eye field is not clearly delimited in front of the eye, and the »beard« is broad and long. When a colour patch extends forward along the lower border of the eye field the chick is a female. This latter characteristics applies only to a minor proportion of the chicks.

Dansk resumé

Kønsbestemmelse af daggamle fasankyllinger

På grundlag af tegninger udført af den naturhistoriske tegner HENNING ANTHON, og efter selv at have kønsbestemt ca. 900 ganske unge fasankyllinger, gives der en forbedret version af en oprindeligt i U.S.A. udviklet metode til kønsbestemmelse. Kendetegnene, der bruges, er fordelingen af dunene på feltet omkring øjnene, samt visse farvefordelinger. Disse karakterer viser i deres fordeling en sammenhæng med, hvordan »kinden« ser ud hos de voksne fasaner. Hos hannerne er øjefeltet i almindelighed større end hos hunnerne, og er under alle omstændigheder fortil afgrænset ved en tydelig linie, der ofte viser et »knæk«. En dunstribe (»skægget«) strækker sig skråt nedad og bagud fra næseåbningen. Denne stribe er hos hannerne smal og kort, hos hunnerne bred og lang. Hunnens øjefelt er ikke klart afgrænset foran øjet. Hvis en farvet plet under øjet strækker sig fremad langs øjefeltets nedre rand, er kyllingen en hun. Dette kendetegn findes dog kun hos en mindre del af kyllingerne.

Резюме на русском языке
Определение пола однодневных фазаньих птенцов

На основании рисунков и по собственному опыту после опредедения пола прибл. 900 фазаньих птенцов самого младшего возраста, предлагается усовершенствованный вариант способа определения пола, первоначально разработанного в С. Ш. А.
Признаками служат распределение пуховинок на поле вокруг глаз, и некоторые распределения цветов. По своему распределению, эти характерные признаки связаны с тем, как выглядит »щека« взрослого фазана. У самцов поле вокруг глаза обыкновенно большего размера, чем у самок, и во всяком случае передняя часть его ограничена четкой линией, часто с изгибом в форме надлома. От носового отверстия, в направлении искоса вниз и назад простирается полоса пуха (»борода«); у самцов эта полоса узка и коротка, у самок широка и длинна. Глазное поле у самки не имеет четкого ограничения впереди глаза. Если цветное пятно под глазом простирается вперед вдоль нижнего края глазного поля, птенец является самкой. Однако, этот признак имеется только у небольшой части птенцов.

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