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Original research article

Baseline semen characteristics of the Grey Partridge (*Perdix perdix* L.)

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ABSTRACT

The grey partridge (*Perdix perdix L.*) is a monogamous member of the Phasianidae family that has experienced a significant population decline across Europe in recent decades. While previous studies have focused on semen characteristics in polygamous Phasianidae species, data on *P. perdix* remain lacking. This study aimed to provide the first comprehensive characterisation of semen traits in the grey partridge, establishing the reference values essential for further reproductive research. Semen was collected from ten adult males during the breeding season, and evaluated for ejaculate volume, sperm concentration, motility (including kinematic parameters), morphology, and morphometry. The mean ejaculate volume was 4.40 µL, with significant individual variation ($P<0.05$). Average sperm concentration was 1.64×10^9 mL^{-1}, and total motility and progressive motility were 46.83% and 10.20%, respectively. Morphological assessment revealed that only 10.39% of live spermatozoa were morphologically normal, with bulb-head abnormalities being the most common (mean 27.20%). Sperm morphometry showed a relatively short midpiece (mean 1.77 µm) and total sperm length of 53.99 µm. Despite individual variability, the measured traits fall within the ranges reported for other small-bodied wild Phasianidae. The low proportion of morphologically normal sperm may represent species-specific patterns rather than abnormalities. These results provide essential baseline data for the grey partridge and support its potential inclusion in future assisted reproduction and conservation strategies.

Key words: *Perdix perdix*; sperm morphology; sperm morphometry; semen quality; avian reproduction

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Introduction

The grey partridge (*Perdix perdix* L.*)* is a representative of the Phasianidae family, formerly common in agricultural areas of Europe and parts of Asia. In recent decades, its population in Europe has declined significantly. The main causes include reduced chick survival rates, habitat loss due to intensive agricultural management, changes in agricultural practices, and pesticide use (BRO et al., 2000; PANEK, 2005; KUIJPER et al., 2009; LAUX et al., 2024).

Previous studies on Phasianidae semen characterization have mainly focused on commercially important poultry species such as chickens and turkeys (WISHART, 1989; ŁUKASZEWICZ et al., 2008), quail (KORN et al., 2000; CHEŁMOŃSKA et al., 2008), and guinea fowl (GARCÍA-HERREROS, 2016; MOHAN et al., 2016). Semen characteristics were also described for wild Phasianidae species, such as ring-necked pheasants (*Phasianus colchicus* L.) (MARZONI et al., 2000; CASTILLO et al., 2022), columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus* Ord, 1815) (SCHNEIDER et al., 2019), king quail (*Synoicus chinensis* L.) (WONG et al., 2024), and capercaillie (*Tetrao urogallus* L.) (ŁUKASZEWICZ et al., 2011). Previous studies on the characterisation of Phasianidae semen have focused on species with polygamous reproductive strategies, which contrasts with the monogamous strategy of the grey partridge (CARROLL et al., 2020). This distinction may result in unique reproductive traits when compared to polygamous Phasianidae (MØLLER, 1988; MØLLER and NINNI, 1998). Differences such as sperm morphology, sperm concentration, motility and viability have been shown to impact sperm survival and fertilisation (SAINT JALME et al., 2003; MAROTO-MORALES et al., 2016; SANTIAGO-MORENO et al., 2016; CASTILLO et al., 2021). However, the semen characteristics of the grey partridge (*Perdix perdix*) remain unexplored.

Conservation efforts for the grey partridge have so far focused on habitat management, aiming to improve environmental conditions, or supplement wild populations with individuals bred in captive breeding programs (PANEK, 1992; BRO et al., 2004; EWALD et al., 2020; BUCKLEY et al., 2021). A deeper understanding of reproductive traits, including sperm viability and motility, can affect breeding success predictions and overall population dynamics, and could enhance effective conservation strategies (GOMENDIO et al., 2007; TESFAY et al., 2020; ŁUKASZEWICZ et al., 2021).

Studies on wild Phasianidae species: capercaillie (*Tetrao urogallus*), black grouse (*Lyrurus tetrix* L.), and pheasant species, have demonstrated the importance of semen characterization in forming genetic reserves and assisting conservation efforts (MARZONI et al., 2000; CIERESZKO et al., 2011; ŁUKASZEWICZ et al., 2011). The characterization of the semen of the grey partridge can represent a step toward the implementation of assisted reproduction techniques and cryopreservation for genetic reserve formation.

The aim of this study was to characterize the semen of the grey partridge, including the evaluation of key parameters such as: ejaculate volume, sperm concentration, motility, movement parameters, morphology, and morphometry. The data obtained provide the basis for further research into the possibility of using artificial insemination in this species.

Materials and methods

Animals. The study was conducted on 10 adult male grey partridges. All were housed in outdoor cages (80 by 40 by 50 cm) under natural photo period and temperature conditions. During the reproductive season (March-July) the birds were kept individually (since they show a strong territorial instinct) at Wrocław University of Environmental and Life Sciences. All the birds were fed a complete feed mix *ad libitum.*

Sperm collection. Sperm was collected twice or three times a week using the Burrows and Quinn (BURROWS and QUINN, 1937) method of dorsal-abdominal massage, adapted to this species. Attempts at semen collection were made from mid-April to the end of July. Viable ejaculates were obtained from early May to late June.

Semen evaluation – volume and concentration. Semen from each male was individually assessed. The volume of fresh semen was defined using an automatic pipette. Sperm concentration was determined by hemocytometer count with the use of eosin-3% NaCl solution and a Thoma-Zeiss chamber.

Sperm motility. Sperm motility was analysed using a Sperm Class Analyzer® (SCA; Microptic S.L., Barcelona, Spain). Sperm samples were diluted 1:20 in EK extender and loaded onto a warmed (38ºC) 20-µm Leja® 8-chamber slide (Leja Products B.V., Nieuw-Vennep, The Netherlands). The percentage of immotile spermatozoa, and the percentages of spermatozoa showing non-progressive and progressive motility were recorded. Sperm movement characteristics–curvilinear velocity (VCL), straight-line velocity (VSL), average path velocity (VAP), amplitude of lateral head displacement (ALH) and linearity (LIN) were also analysed by SCA®. Sperm morphology. The percentage of live and dead spermatozoa, and the morphological forms of the live spermatozoa were examined on nigrosin/eosin smears. The smears were made within 30 minutes after semen collection. Nigrosin/eosin stain was prepared according to Jaśkowski (GŁÓD, 1976). The smears were made according to ŁUKASZEWICZ et al. (2008). The results of morphological evaluation were expressed as the percentage of particular categories of spermatozoa (200 cells=100%).

Sperm morphometry. Each sperm cell was measured for total length, flagellum length (without the midpiece), and the head with the acrosome and midpiece. The head, acrosome, and midpiece were measured together, because the boundary between the parts was not clearly visible. To measure the length of the acrosome, head and midpiece accurately, Scanning Electron Microscopy (SEM) was used (Fig. 1).

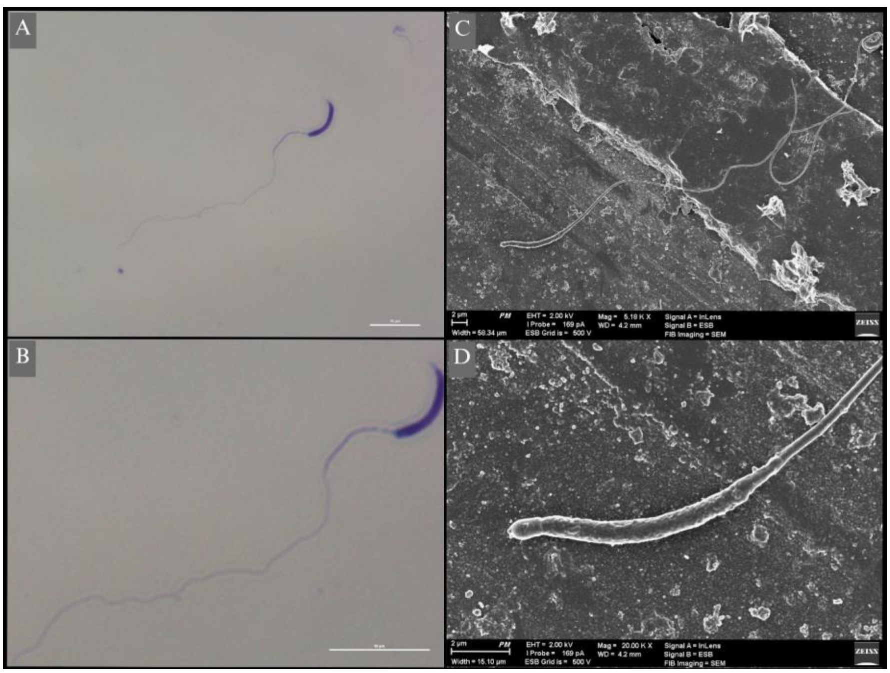

Fig. 1. Comparative visualization of partridge spermatozoa using light microscopy and scanning electron microscopy (SEM)

(A) Bright-field image of a single spermatozoon stained with Hemacolor®, showing the overall morphology. (B) The same sperm cell imaged using the Region of Interest (ROI) magnification function of the camera system, enhancing structural details. Scale bars =10 µm. (C) SEM image of a spermatozoon, revealing the head with acrosome, midpiece, and flagellum at low magnification (×5.18K). (D) High-magnification (×20K) SEM image of the sperm head, showing clearly delineated regions of the acrosome, nucleus, and midpiece. Scale bars =2 µm.

Sperm morphometry using Hemacolor® staining and light microscopy. Smears were made by spreading 10 µL of diluted semen samples (1:20 using EK extender (ŁUKASZEWICZ, 2002) onto glass slides. Air-dried smears were then fixed and dyed in Hemacolor® (Merck KGaA, Darmstadt, Germany) following the kit recommendations, with the exception of staining times. The smears were immersed and moved about in the dye solutions for 1 minute in each solution. Finally, they were immersed in buffer solution (pH 7.2) for 30 seconds and left to air-dry for at least 3 hours at 20-25ºC.

Sperm morphometry was assessed in 25 sperm smears. A total of 30 sperm cells were measured on each slide using a light microscope (Nikon Eclipse model 50i, Nikon Instruments Europe B.V.) and a camera (Nikon Digital Sight DS-Fi1c, Nikon Instruments Europe B.V.) connected to a computer with dedicated Nis-Elements version 4.51 software installed. The smears were examined using a 100× oil immersion lens objective (bright field).

Sperm morphometry using Scanning Electron Microscopy (SEM). To prepare the samples, the fresh semen collected was diluted in EK extender to achieve a total volume of 300 µL and centrifuged 800xg for 5 minutes using Eppendorf® Mini Spin Plus (r=6cm). The supernatant was removed, then the sperm pellet was resuspended in 300 µL EK extender and the centrifugation was repeated twice using the same centrifuge settings. The sperm pellet was then moved into a test tube containing 2.5% glutaraldehyde in 0.1 M cacodylate buffer (pH 7.2) and fixed at 4˚C. The probes were kept at this temperature until the SEM analysis, which was performed according to MIGDAŁ et al., 2024.

Statistical analysis. All variables were examined for normality using the Shapiro–Wilk test, and homogeneity of variance using Levene's test. For results that were not normally distributed, the Kruskal-Wallis test was used. For normally distributed data, one-way ANOVA followed by Tukey's post-hoc test for unequal sample sizes was applied.

Results

Male response to the semen collection procedure. Out of the ten male grey partridges included in this study, five individuals responded positively to dorso-abdominal massage. The remaining males did not exhibit any response to manual stimulation, and no semen sample sufficient for semen evaluation could be collected from them. Although semen collection was attempted 30 times per male, a complete semen assessment (including ejaculate volume, sperm concentration, motility and movement parameters; morphometry and morphology) was performed on the basis of a minimum of five ejaculates. It was not possible to obtain results from each ejaculate for all the determined characteristics, due to the small volume of ejaculates obtained.

Ejaculate volume. The average ejaculate volume was 4.40 µL, with statistically significant individual differences (P<0.05) observed within the studied group (Table 1). The lowest mean ejaculate volume was obtained from male A1 (1.91 µL), while the highest values were recorded for males D10 (6.50 µL) and E11 (5.20 µL). Notably, the males exhibiting the most consistent response to stimulation also produced the highest ejaculate volumes.

Sperm concentration. The mean sperm concentration across all evaluated males was 1.64×10^{9} mL^{-1} (Table 1). The highest sperm concentration was recorded in the ejaculates of male C4 (3.78×10^{9} mL^{-1}), whereas the lowest was observed in male A1. No statistically significant individual differences were detected (P>0.05).

Sperm morphology. Sperm viability and morphological characteristics are summarised in Table 1. The proportion of live sperm cells did not differ significantly between individuals (P>0.05), ranging from 61.67% (male C4) to 68.75% (male D10). Similarly, the proportion of structurally normal live spermatozoa did not differ significantly (P>0.05).

The most frequently observed abnormality was bulbous head deformation, with a mean prevalence of 27.20%. The lowest proportion was observed in male B3 (20.50%), which was significantly different from the other individuals (P<0.05). Significant differences (P<0.05) were also found in the occurrence of bent neck deformities, spiral tail anomalies, midpiece deformations, and other miscellaneous abnormalities. No significant differences were observed for acrosome deformations or the presence of spermatids.

Table 1. Grey partridge semen: qualitative parameters and sperm morphology (mean±SD)

Male ID	Ejaculate volume (μL)	Sperm concent-ration ($\times 10^9$ mL^{-1})	Morphological forms of sperm (%) X								
			Live in total	Live normal	Bulb head	Acrosome deforma-tion	Bent neck	Spiral tail	Mid-piece defor-mation	Sper-matids	Other abnor-malities
A1 n=7	1.91^{b}±1.09	0.79±0.57	66.80 ±12.15	11.20 ±2.44	25.80^{a} ±5.18	3.40 ±1.56	6.30^{ab} ±0.97	4.50^{b} ±1.58	11.10^{b} ±3.58	1.60 ±0.82	2.90^{a} ±1.71
B3 n=8	3.13^{ab}±1.38	1.22±0.29	63.42 ±6.08	10.75 ±4.61	20.50^{b} ±5.18	5.50 ±3.44	6.25^{ab} ±2.25	13.42^{a} ±3.46	4.33^{ab} ±1.21	0.58 ±0.58	2.08^{a} ±0.58
C4 n=8	3.80^{ab}±1.94	3.78±2.88	61.67 ±7.46	8.75 ±1.13	31.25^{a} ±4.78	7.25 ±3.58	3.25^{b} ±2.21	4.83^{b} ±1.33	3.33^{a} ±1.72	1.17 ±0.40	1.83^{ab} ±1.08
D10 n=11	6.50^{a}±5.85	1.48±1.14	68.75 ±6.88	12.92 ±5.29	33.92^{a} ±6.00	5.00 ±1.31	4.58^{ab} ±1.42	6.67^{b} ±1.78	3.25^{a} ±1.29	1.42 ±0.58	1.00^{ab} ±0.54
E11 n=11	5.20^{a}±2.24	1.03±0.93	65.00 ±3.24	8.42 ±1.34	23.70^{a} ±3.70	6.70 ±1.68	7.20^{a} ±1.89	14.30^{a} ±3.85	3.20^{a} ±0.90	1.50 ±0.79	0.30^{b} ±0.44
Total n=45	**4.40±3.40**	**1.64±1.73**	**65.07 ±7.49**	**10.39 ±3.69**	**27.20 ±6.93**	**5.61 ±2.68**	**5.43 ±2.23**	**8.70 ±4.89**	**4.89 ±3.46**	**1.23 ±0.70**	**1.63 ±1.25**

a-c: Values within a column with different superscripts differ significantly ($P<0.05$)

X: Five histological smears were obtained for sperm morphology from each male

Sperm motility. Sperm motility parameters are summarized in Table 2. Statistically significant differences ($P<0.05$) were observed in sperm motility between males C4 and E11, with C4 exhibiting the highest motility (60.75%) and E11 the lowest (30.50%). The proportion of progressively motile sperm was also significantly higher in male C4 (15.43%) compared to D10 and E11 ($P<0.05$).

Analysis of non-progressive motility revealed significant differences between E11 (22.44%) and males B3, C4, and D10 ($P<0.05$). The velocity parameters indicated that the highest values for straight-line velocity (VSL) and curvilinear velocity (VCL) were recorded in males E11, C4, and A1. In terms of average path velocity (VAP), spermatozoa from male C4 exhibited the highest values (28.91 μm$\times$s^{-1}), significantly differing from those of D10, which had the lowest (22.90 μm$\times$s^{-1}) ($P<0.05$).

The linearity coefficient (LIN) was highest in males E11 (53.26%) and A1 (51.72%). Interestingly, these males also exhibited the lowest overall motility values. The amplitude of lateral head displacement (ALH) was highest in males C4 (3.02 μm) and B3 (2.89 μm), with a mean value of 2.71 μm across all samples.

Table 2. Grey partridge sperm motility parameters determined by CASA (mean±SD)

Male ID	Motile sperm (%)	Progressive motility (%)	Non-progressive motility (%)	VCL ($\mu m x s^{-1}$)	VSL ($\mu m x s^{-1}$)	VAP ($\mu m x s^{-1}$)	LIN (%)	ALH (μm)
A1 n=7	46.66^{ab} ±12.59	12.23^{ab} ±4.11	34.46^{ab} ±9.22	38.68^{ab} ±4.11	20.01^{ab} ±2.50	26.44^{ab} ±3.37	51.72^{ab} ±3.45	2.47^{ab} ±0.19
B3 n=9	49.79^{ab} ±13.42	8.12^{ab} ±3.60	41.66^{a} ±12.45	38.27^{ab} ±4.07	15.87^{b} ±3.59	24.92^{ab} ±3.50	41.13 ±6.10	2.89^{a} ±0.27
C4 n=13	60.75^{a} ±20.77	15.43^{a} ±7.56	45.32^{a} ±15.80	44.30^{a} ±5.36	18.92^{ab} ±2.50	28.91^{a} ±3.17	43.04^{bc} ±6.30	3.02^{a} ±0.54
D10 n=10	49.07^{ab} ±20.80	6.86^{b} ±4.25	42.21^{a} ±17.42	34.70^{b} ±4.83	14.84^{b} ±3.17	22.90^{b} ±3.98	42.55^{bc} ±4.93	2.82^{ab} ±0.31
E11 n=14	30.50^{b} ±11.86	8.06^{b} ±4.55	22.44^{b} ±9.98	39.59^{a} ±6.89	21.41^{a} ±6.20	27.69^{a} ±6.14	53.26^{a} ±7.87	2.34 ±0.34
Total	**46.83 ±19.45**	**10.20± 6.08**	**36.63 ±15.90**	**39.48 ±6.13**	**18.43 ±4.68**	**26.45 ±4.74**	**46.47 ±7.93**	**2.71 ±0.45**

a, b, c: Values within a column with different superscripts differ significantly (P<0.05)

Sperm morphometry. Sperm morphometric parameters are presented in Table 3. The mean acrosome, nucleus and midpiece lengths, determined using Scanning Electron Microscopy (SEM), were 1.03 µm, 7.44 µm and 1.77 µm, respectively. The shortest acrosomal length was recorded in male D10 (0.78 µm), which was significantly different from the other males (P<0.05). The longest sperm heads were observed in males E11 (8.14 µm) and B3 (8.05 µm), significantly differing from male C4, which had the shortest nucleuses (6.92 µm) (P<0.05). Midpiece length followed a similar trend to acrosome length, with the shortest recorded in male D10 (1.45 µm), significantly differing from males B3 (1.96 µm) and C4 (1.87 µm) (P<0.05).

Flagellum and total spermatozoon lengths, measured using Hemacolor® staining, were 43.72 µm and 53.99 µm, respectively. Statistically significant differences were observed (P<0.05), with the shortest flagella recorded in male E11 (36.48 µm), differing from all other males. Male A1 also had significantly shorter flagella (39.49 µm) than the other individuals. The longest flagella were observed in males B3 (47.50 µm), C4 (47.32 µm) and D10 (46.64 µm).

Table 3. Grey partridge sperm morphometry (mean±SD)

Used method	**Scanning Electron Microscope (SEM)**			**Hemacolor® staining**	
Male ID	**Acrosome length (µm)**	**Nucleus length (µm) (%)**	**Midpiece length (µm)**	**Flagellum length (µm) (%)**	**Total spermatozoon length (µm)**
A1	1.15^{a} ±0.31 n=13	7.27^{ab} ±0.77 n=13	1.64^{ab} ±0.45 n=13	39.49^{b} ±5.26 n=142	49.93^{b} ±5.27 n=142
B3	1.16^{a} ±0.18 n=30	8.05^{a} ±1.51 n=30	1.96^{a} ±0.46 n=30	47.50^{a} ±4.85 n=151	57.97^{a} ±5.50 n=151
C4	1.02^{a} ±0.22 n=32	6.92^{b} ±0.79 n=32	1.87^{a} ±0.30 n=32	47.32^{a} ±5.07 n=176	57.27^{a} ±5.62 n=176
D10	0.78^{b} ±0.14 n=27	7.15^{ab} ±0.90 n=27	1.45^{b} ±0.31 n=27	46.64^{a} ±4.03 n=152	56.35^{a} ±4.27 n=152
E11	1.13^{a} ±0.21 n=11	8.14^{a} ±1.24 n=11	1.87^{ab} ±0.63 n=11	36.48^{c} ±5.15 n=145	47.35^{c} ±5.44 n=145
Total	**46.83 ±19.45 n=113**	**7.44 ±1.19 n=113**	**1.77 ±0.45 n=113**	**43.72 ±6.68 n=750**	**53.99 ±6.75 n=766**

a, b, c: Values within a column with different superscripts differ significantly (P<0.05)

Discussion

This study provides the first comprehensive characterisation of semen parameters in the grey partridge, contributing to the growing knowledge on the reproductive biology of wild Phasianidae species. Although the birds were kept under controlled environmental and nutritional conditions, notable individual variability was observed across most traits analysed. This suggests a high degree of intra-species variation potentially reflecting both genetic and physiological diversity within captive populations.

The average ejaculate volume was relatively low (mean 4.40 µL), consistent with the small body size of *P. perdix*, and comparable to those reported for other small-bodied Phasianidae, such as *Coturnix coturnix L.* or *Synoicus chinensis* (CHEŁMOŃSKA et al., 2008; GOLZAR ADABI et al., 2011; WONG et al., 2024). In birds, ejaculate volume typically relates to body size, while sperm count is influenced by female sperm storage duration (MØLLER, 1988; LIAO et al., 2019).

The sperm concentration (mean 1.64×10^{9} mL^{-1}) fell within the lower to intermediate range reported for other wild Phasianidae, and was lower than values recorded in domesticated or intensively selected lines. This difference is likely species-specific. Moreover, total motility (mean 46.83%) and progressive motility (mean 10.20%)

were within the range observed in other non-domestic Phasianidae, such as *Lyrurus tetrix* or *Alectoris rufa* L. (CIERESZKO et al., 2011; SANTIAGO-MORENO et al., 2015). These values may reflect the reproductive strategy of the species. The grey partridge is considered a strictly monogamous bird, forming stable pair bonds and showing genetic monogamy (RYMEŠOVÁ et al., 2017; CARROLL et al., 2020). In such systems, selection pressure on sperm traits related to post-copulatory competition is typically lower than in polygamous species. Consequently, the observed seminal characteristics—moderate sperm concentration and low progressive motility—may be aligned with the reproductive biology of this species.

A notable observation was the low percentage of live, morphologically normal spermatozoa (mean 10.39%). This is considerably lower than values seen in domesticated poultry species, but might still fall within the natural range for wild birds (ŁUKASZEWICZ et al., 2008; KOWALCZYK et al., 2017; SCHNEIDER et al., 2019). Interestingly, the overall proportion of live sperm suggests that many sperm cells are alive but present non-standard forms.

Among the abnormal morphologies, bulb-head spermatozoa were the most frequent type. While such abnormalities may sometimes indicate structural issues or chromatin immaturity in other species (PRISANT et al., 2007; DU PLESSIS and SOLEY, 2011; GAGGINI et al., 2017), in this case, their high prevalence should be interpreted cautiously due to the absence of a comparative baseline data for *P. perdix.* The same applies to the elevated frequencies of spiral tails and midpiece defects, which, although higher than expected in relation to other Phasianidae, cannot yet be linked to functional impairment.

Sperm kinetic parameters measured using CASA, such as VAP, VSL and VCL, were generally lower than those reported for *Coturnix coturnix*, *Lyrurus tetrix*, or *Tetrao urogallus* (CIERESZKO et al., 2009; CIERESZKO et al., 2011; KOWALCZYK and ŁUKASZEWICZ, 2015; FAROOQ et al., 2018). The relatively short path lengths and moderate curvilinear velocities observed might reflect the overall sperm morphometry of *P. perdix,* including its notably short midpiece. While shorter midpieces could indicate lower mitochondrial loading and energy capacity (LASKEMOEN et al., 2010; MÍČKOVÁ et al., 2023) further ultrastructural and functional studies are needed to confirm this hypothesis.

Together, these results establish the baseline semen characteristics for the grey partridge, and provide a reference point for future studies on its reproductive biology. Given the conservation relevance of this species, understanding semen traits is an essential step in developing effective assisted reproduction protocols to support captive breeding or population reinforcement programmes (ŁUKASZEWICZ et al., 2021)

Conclusions

This study provides the first detailed assessment of the characteristics of semen in the grey partridge (*Perdix perdix),* establishing essential reference values for future research and conservation programmes. Despite substantial individual variability, the traits analysed, including ejaculate volume, sperm concentration, motility, morphology, and kinematics, fall within the expected range for small-bodied, wild Phasianidae. Although certain parameters, such as the proportion of morphologically normal sperm, appear lower than in domestic species, they may reflect natural species-specific patterns rather than pathological conditions. These findings highlight the importance of continuing research on wild bird reproduction, and support the potential application of assisted reproduction techniques in management and conservation of *P. perdix.*

Ethics approval

The study was conducted according to Resolution No. 021/2023/P1 of 21 June 2023 issued by the Local Ethical Committee for Animal Experiments in Wrocław. On the basis of the activities described in the application, the Committee discontinued the proceedings, as the research involved routine veterinary procedures and standard agricultural practices related to animal husbandry. The birds were housed in facilities and cages designed to meet their behavioural needs.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, Marcel Bawej, upon request.

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BAWEJ, M., M. MICHALAK, P. MIGDAŁ, A. KOWALCZYK: Osnovna obilježja sjemena sive jarebice (*Perdix perdix* L.). Vet. arhiv 96, 377-388, 2026.

SAŽETAK

Siva jarebica *(Perdix perdix* L.) monogamna je vrsta iz porodice Phasianidae koja je u posljednjih nekoliko desetljeća diljem Europe doživjela značajan pad u brojnosti populacije. Dok su prethodna istraživanja bila usmjerena na obilježja sjemena poligamnih vrsta Phasianidae, podaci o *P. perdix* još uvijek nedostaju. Istraživanje je imalo za cilj pružiti prvi sveobuhvatni pregled obilježja sjemena sive jarebice te uspostaviti referentne vrijednosti ključne za daljnja istraživanja njihove reprodukcije. Sjeme je prikupljeno od deset odraslih mužjaka tijekom sezone razmnožavanja i procijenjeno prema volumenu ejakulata, koncentraciji spermatozoida, pokretljivosti (uključujući kinematičke parametre), morfologiji i morfometriji. Prosječan volumen ejakulata iznosio je 4,40 µL, s izraženom individualnom varijacijom ($P<0,05$). Prosječna koncentracija spermatozoida bila je $1,64\times10^9$ mL^{-1}, ukupna pokretljivost 46,83%, a progresivna pokretljivost 10,20%. Morfološka ocjena pokazala je da je samo 10,39% živih spermatozoida morfološki normalno, pri čemu su najčešće bile abnormalnosti glave (prosjek 27,20%). Morfometrija spermatozoida otkrila je relativno kratak srednji dio (prosjek 1,77 µm) i ukupnu dužinu spermatozoida od 53,99 µm. Unatoč individualnoj varijabilnosti, izmjerena su obilježja unutar raspona prijavljenih za druge male divlje vrste Phasianidae. Nizak udio morfološki normalnih spermatozoida može upućivati na vrsno specifične obrasce, a ne abnormalnosti. Ovi rezultati pružaju ključne početne podatke za sivu jarebicu i podržavaju njihovu potencijalnu primjenu u budućim strategijama asistirane reprodukcije i zaštite ove vrste ptica.

Ključne riječi: *Perdix perdix*; morfologija spermatozoida; morfometrija spermatozoida; kvaliteta sjemena; reprodukciju ptica