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**SEMEN COLLECTION IN EMU (*DROMAIUS NOVAEHOLLANDIAE*) BIRD BY NON-
TEASER METHOD AND ITS MACROSCOPICAL EVALUATION IN HUMID
TROPICAL CLIMATE**

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ABSTRACT

A study was conducted for collection and evaluation of emu bird semen by non teaser method. Ten adult male emu birds aged 3 to 4 years were selected and housed individually in a 10' x 50' pen constructed in parallel rows at emu unit, University Research Farm, TANUVAS, Chennai, Tamilnadu, India. The male birds were selected based on their readiness in accepting human beings without fear. All the birds were housed properly under standard managemental condition. An *Isocaloric* and *Isonitrogenous* standard emu breeder ration was fed to birds and portable drinking water were made available *ad libitum*. The selected male emus were trained for semen collection by non-teaser method. Out of 10 males, only seven males responded for semen collection. The raw semen collected from individual emu birds was evaluated for macroscopical seminal attributes namely volume, colour, consistency and pH. The overall mean values for volume and pH of individual male were 0.61 ± 0.02 ml and 7.40 ± 0.03 respectively. The individual males showed varied response and significant difference in seminal attributes. Creamy white thick consistency semen had significant ($P \leq 0.01$) seminal attributes than yellow and watery semen. The temperament of male emu, sexual behavior and acceptance of the collector and courtship behavior by the male are the key factors for successful training of breeders. This study ensures the possibility of semen collection and facilitate further processing of semen.

KEYWORDS: Emu, semen collection, non-teaser, evaluation, macroscopical.

INTRODUCTION

Emu (*Dromaius novaehollandiae*) is a flightless, monogamous bird and is the second largest bird belonging to ratite family. Emu farming is gaining popularity in many parts of India for its skin, fat, feathers, meat and eggs to produce valuable products such as leather and oil. This species is well-suited for intensive rearing, adapts relatively easily to cold and hot environments, and has a high rate of reproduction (Malecki et al., 2002; Sales, 2007). In natural mating, emu farmer has to keep equal number of breeder male and female, maintain surplus breeder males to achieve optimum fertility level, thus rise in cost of production. Male emu birds that are not otherwise productive yet consume feed with increased production cost per chick. The monogamous innate behaviour of emu is a

major constraint for their genetic improvement. Apart from that, emu breeder birds are not easy to transport for natural mating to other farms resulting in inbreeding and hence, the germplasm of superior birds cannot be disseminated. The alternate choice is Artificial Insemination, for that a successful method of collection and evaluation is must. Hence, this study was conducted to collect the semen in emu bird by non-teaser method and evaluate the macroscopic semen characteristics.

MATERIALS AND METHODS

Selection and training of male emu birds

Ten adult male emu birds aged 3 to 4 years were selected and housed individually in a 10' x 50' pen

constructed in parallel rows at emu unit, University Research Farm, TANUVAS, Chennai, Tamilnadu, India. The male birds was selected based on their readiness in accepting human beings without fear. All the birds were housed properly under standard managemental condition. Standard emu breeder ration containing 18.0 per cent crude protein, 2600 Kilo calories of Metabolizable energy, 3.5 per cent calcium, 0.45 per cent phosphorus, 0.96 per cent lysine and 0.49 per cent methionine at the rate of one kg/day/bird and portable drinking water was made available *ad libitum*.

The selected male emus were trained for semen collection by non-teaser method (Malecki *et al.* 1997, Malecki and Martin 2005, Rybnik *et al.* 2007). As emu breeds between September to March months in tropical climate, all the male birds were trained for collection of semen artificially, using artificial cloaca during early morning and late evening hours daily in the absence of female emu birds. The artificial cloaca (AC) as described by Malecki *et al.*, (1997) was used after making slight modifications. The artificial cloaca was made of thick rubber hose of 15 cm long and 5 cm diameter. A thin rubber liner of length 9 inches was fitted inside the rubber hose. The space between the hose and liner was filled with warm water (42-45°C). A collection cup was placed near one end of the rubber hose to collect the ejaculated semen.

Collection of Semen by non-teaser method

The trainer cum collector spent some time with each male in the pen by walking inside, feeding, stroking its feathers and knelt near the bird in crouching state until it exhibited sexual display towards him. After the male birds had been trained, the male birds began exhibiting courtship when the trainer-cum collector entered into the pen. The male approached and pushed the trainer by exhibiting mating behavior. Then the trainer slowly knelt down and showed his back for the male. The male bird slowly sat near the trainer and approached near him on its hocks. For effective sexual stimulation, the trainer-cum collector had to turn sideways by partly facing the bird and directed the male to mount on his back by extending the shoulder and arms. When the male mounted on his shoulder, the trainer further moved his hand down towards the vent by bending his back to look for partially evaginated phallus. When the phallus evaginated partially, the collector transferred the artificial cloaca to the other hand to place the open end of the artificial cloaca directly on the evaginated phallus. Immediately on touching the warmth surface of the artificial cloaca, the male exhibited frequent intromissions repeatedly

and ejaculated semen by clasp and pecking the collectors back or head by producing peculiar sound. Immediately on ejaculation, the male dismounted and ran away with partially invaginated phallus, start preening its side back for a while, that confirms the male mounted satisfactorily. Of the 10 male birds trained, seven male birds were responded and donated semen by this method (Plate 1).

Evaluation of semen

Immediately after collection, the semen was kept in a water bath at 20°C and then it was evaluated for its macroscopical seminal attributes like volume, colour, consistency and pH.

Statistical analysis

All the data recorded in this study were analysed as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Semen Collection Technique

The non-teaser method is a quick and easy method for collection. This concurs with the earlier findings of Malecki *et al.* (1997) and Navnath (2012) in emu and Rybnik *et al.* (2007) in ostriches. While Ya-jie *et al.* (2001), Rozenboim *et al.* (2003), Rybnik *et al.* (2007) and Walsangkar (2010) who have collected semen from ostriches using teaser method. The temperament of male emu, sexual behavior and acceptance of the collector and courtship behavior by the male are the key factors for successful training of breeders.

Macroscopic semen characteristics

The results of macroscopic semen characteristics are presented in Table 1. Individual males showed highly significant ($P \leq 0.01$) differences in volume of semen, with the mean value of 0.61 ± 0.02 ml and the minimum and maximum values of 0.18 and 0.87 ml indicating varied response and behavioral pattern of individual males. The semen volume recorded in this study was within the range observed by Petrovska *et al.* (1987) in RIR cock, Omprakash (1995) in cock, Malecki and Martin (2000) in emu, Hemberger *et al.* (2001), Ya-jie *et al.* (2001), Rozenboim *et al.* (2003), Rybnik *et al.* (2008) and Walsangkar (2010) in ostrich. However, Malecki *et al.* (1997a) in emu, Rybnik *et al.* (2008) in ostriches have observed marginally higher volume. Pandian (2003), Dhanushia (2004), Venkatesh (2005) in turkey and Navnath (2012) in emu have obtained lower volume of semen. In this study the increase or decrease in the output of semen in consecutive ejaculates was influenced by individual male and collection time preferably cool hours of early morning or late evening.

The color of the ejaculated semen was observed immediately after every collection. Out of seven responded males, one male yielded light white and another one yielded yellowish white in all the breeding periods, remaining five birds yielded creamy white semen, indicating individual pattern in colour of semen which had direct bearing on microscopic quality of semen and possible contamination. The consistency of the ejaculated semen was also observed immediately after every collection. Out of seven responded males, one male yielded watery semen in all the breeding periods which was also light white in colour owing for less consistency. Remaining six birds

had yielded thick semen. This positively concurs with the earlier findings of Hemberger *et al.* (2001) and Walsangkar (2010) in ostrich. The mean pH of ejaculate was 7.40 ± 0.03 , the pH value showed highly significant ($P \leq 0.01$) differences between males and their mean values ranged from 7.13 to 7.85. The pH of semen observed in this study harmonizes with the earlier findings of Malecki and Martin (2000) in emu, Hemberger *et al.* (2001) and Rozenboim *et al.* (2003) and Walsangkar (2010) in ostriches, the pH value in this study was slightly lower because of species difference.

**Table: 1 Macroscopic semen characteristic of selected individual male emu birds
(Mean \pm SE)**

Bird No.	Volume** ml	Colour	Consistency	pH**
E 1 (n=29)	0.43 ^d ± 0.21	Creamy white	Thick	7.13 ^{cde} ± 0.07
E 2 (n=31)	0.42 ^{de} ± 0.21	Light white	Watery	7.23 ^{bcd} ± 0.07
E 5 (n=28)	0.18 ^g ± 0.28	Yellow white	Thick	7.85 ^a ± 0.09
E 6 (n=16)	0.30 ^f ± 0.58	Creamy white	Thick	7.33 ^{bc} ± 0.12
E 7 (n=25)	0.52 ^c ± 0.21	Creamy white	Thick	7.48 ^b ± 0.02
E 8 (n=52)	0.87 ^a ± 0.51	Creamy white	Thick	7.31 ^{bcd} ± 0.06
E 9 (n=39)	0.82 ^{ab} ± 0.41	Creamy white	Thick	7.3 ^{bcd} ± 0.04
Over all mean	0.61 ± 0.02	Creamy white	Thick	7.40 ± 0.03

Means bearing different superscripts within columns differ significantly, ** Highly significant ($P < 0.01$).

Plate 1. Semen Collection in emu bird by non-teaser method



Accessories of artificial cloaca



Assembled artificial Cloaca



The male ready to mount on collector (Author)



*Male emu pecking the collectors
back during ejaculation*

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CONCLUSION

The collection of semen in emu is successful in non-teaser method, for that the birds need to be trained before breeding season. The macroscopic semen characteristics will varies with individual male birds temperament and sexual behavior. This study will facilitate for further processing of emu semen.

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