

USE OF EQUINE SEMINAL PLASMA TO INITIATE MOTILITY IN ASIAN ELEPHANT (*ELEPHAS MAXIMUS*) SEMEN

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The collection of elephant semen via manual massage of the pelvic urethra and ampulla glands is useful for breeding soundness examinations and obtaining semen for AI. However, many samples containing sufficient numbers of sperm ($1-3 \times 10^9$ sperm/mL) exhibit no motility. Vital stains indicate sperm are morphologically normal with intact membranes. The lack of motility results in many samples needed for artificial insemination being discarded. A primary criterion for use in artificial insemination is evaluation of sperm motility. However, extension of non-motile samples in common extenders resulted in only a slight stimulation (<1% of the cells were motile). Attempts to identify chemical components responsible for stimulating motility at emission have not been successful. Perhaps elephant semen collected by rectal massage lacks seminal vesicle fluid; therefore, it was postulated that seminal plasma from another species could be used to initiate motility in this semen. Semen was collected (Missouri model AV) from two mature Haflinger stallions. Samples were evaluated for motility and concentration, centrifuged, and the seminal plasma transported to a central laboratory in an ice water bath. On arrival, samples were centrifuged again (under refrigeration) to ensure removal of sperm cells) and seminal plasma was stored in an ultra-low freezer until transport to the Ringling Bros. Center for Elephant Conservation.

Semen samples from two (male) Asian elephants (*Elephas maximus*), 5 and 7 years old, were used. Semen samples were obtained via rectal massage of the pelvic urethra to stimulate penis protrusion and erection in two bulls. Samples were collected via a condom with an insulated 50 mL centrifuge attached. Immediately after collection, semen was evaluated for volume, concentration and motility. Four samples (two from each bull) were used; none of the samples exhibited motility on initial examination. Aliquots (3 mL) of semen were extended with 12 mL of equine seminal plasma or 12 mL of TEST extender (control). Preliminary results indicated a significant increase in motility (40–80% progressive motility) within moments of addition of equine seminal plasma, but <1% motility after addition of TEST extender.

These preliminary data provide a means to investigate the cascade that initiates motility in sperm in elephants. Further investigations will include fluorescent stains for mitochondrial activation and fractionation of equine seminal plasma to identify potential chemical components responsible for initiating sperm motility.

Keywords: Sperm; Semen; Motility; Seminal plasma; Elephant