



Male Elephant Reproduction

*Nikorn Thongtip D.V.M., Ph.D.
Faculty of Veterinary Medicine
Kasetsart University, Thailand*

The male elephant reproduction study is still going on. The most remarkable difference from other mammal species is the intra-abdominal testicles, which can weigh up to 2 kg each in an adult bull (Figure 1 and 2). The elephant has all accessory sex glands that have been characterized for most mammalian species: i.e., bulbo-urethral glands, prostate, seminal vesicles, and ampullae (Hildebrandt *et al.*, 2000). The transrectal ultrasonography was useful for evaluating the accessory glands structures (Figure 3). Asian elephant semen collection is used manual collection technique which has been described by Schmitt and Hildebrandt (1998) (Figure 4). The Asian elephant spermatozoa have the same morphology or structure with another mammalian species (Figure 5). The successful production of live calves after AI with fresh semen in the Asian elephant was demonstrated (Schmitt *et al.*, 2001; Brown *et al.*, 2004; Thongtip *et al.*, 2009). Although acceptable post-thaw survival has been reported (Thongtip *et al.*, 2004; Sa-ardrit *et al.*, 2006), the birth of live calve after AI with frozen-thawed semen in the Asian elephant has never been reported. There is only one report about the pregnant of female Asian elephant by using frozen-thawed semen in Thailand (Thongtip *et al.*, 2009). Unlucky, the full term fetus was abort and expelled during seventeen month of gestation (Thongtip *et al.*, 2009). One of the major obstacles in developing an effective method to cryopreserve Asian elephant spermatozoa is the variation in semen quality of ejaculates obtained from the same or different individuals. A majority of semen samples obtained by manual stimulation exhibit poor quality (i.e., low motility) (Thongtip *et al.*, 2001; 2004), of which the cause has not been clearly determined. Our previous reported found that a total of seventy

semen samples obtained weekly from 20 Thai's domesticated elephants (age medians were 19.5 year old) using manual collection technique over the period of five months revealed 0% medians of progressive motility. The clearing of this phenomenon is under investigating.

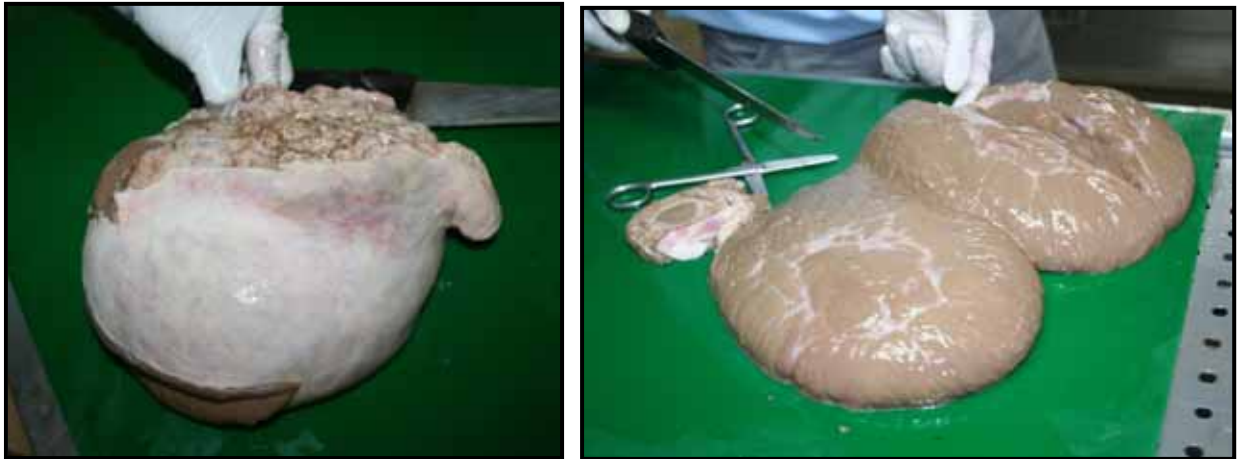


Figure 1. Anatomy of Asian Elephant testis

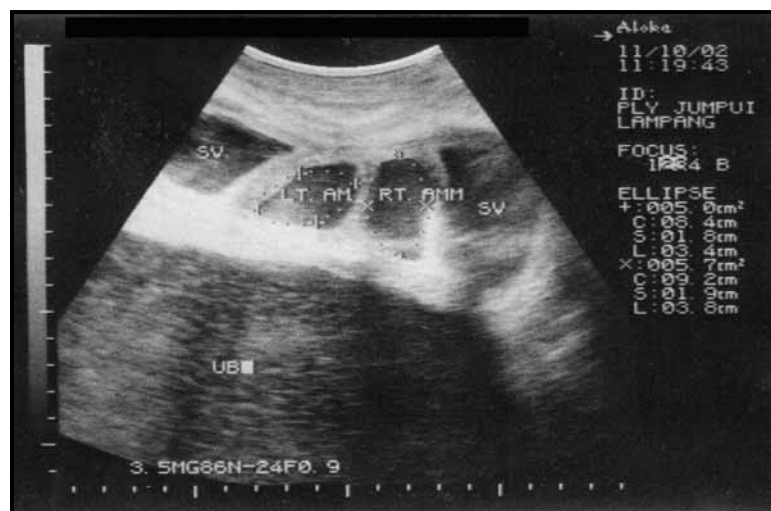


Figure 2. Transrectal ultrasonography of Asian elephant accessory glands

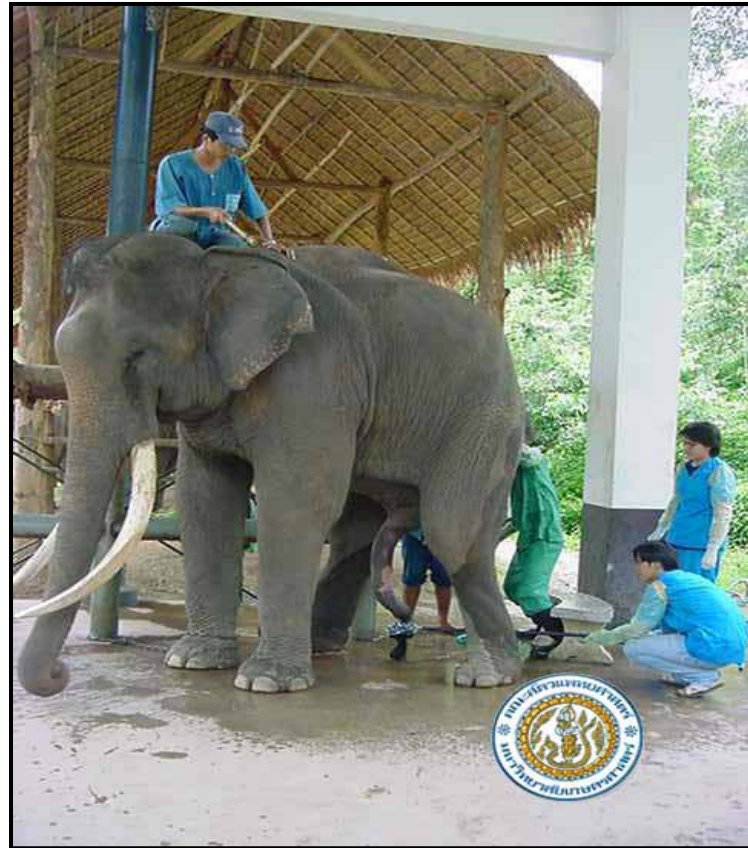


Figure 3. Semen collection by manual collection technique



Figure 4. Spermatozoa of Asian elephant



References

- Brown, J. L., F. Goritz, N. Pratt-Hawkes, R. Hermes, M. Galloway, L. H. Graham, C. Gray, S. L Walker, A. Gomez, S. Moreland, S. Murray, D. L. Schmitt, J. Howard, J. Lehnhardt, B. Beck, A. Bellem, R. Montali, and T. B. Hildebrandt. 2004. Successful artificial insemination
- Hildebrandt, T. B., F. Goritz, N. C. Pratt, D. Schmitt, S. Quandt, C. Raath and R. R. Hoffman. 2000. Reproductive assessment by ultrasonography in elephants: I Sonomorphology of the male urogenital tract. *In* proceeding of assessment and management of reproductive system in Asian elephants, 3-16 th of May, 2000, Faculty of Veterinary Medicine, Mahidol University, Salya, Nakhonpathom, pp. 55-74.
- Sa-ardrit, M., J. Saikhun, N. Thongtip, M. Damyang, S. Mahasawangkul, T. Angkawanish, S. Jansittiwate, Y. Kitiyanant, K. Pavasuthipaisit, A. Pinyopummin. 2006. Ultrastructural alterations of frozen-thawed Asian elephant (*Elephas maximus*) spermatozoa. *Int. J. Androl.* 29: 346-352.
- Schmitt DL, Hildebrandt TB. 1998. Manual collection and characterization of semen from Asian elephants (*Elephas maximus*). *Anim Reprod Sci.* 53 (1-4): 309-14.
- Schmitt, D. L., T. B. Hildebrandt, R. Hermes and F. Goritz. 2001. Assisted reproductive technology in elephants. *In* Proc 1st Int Symp Assisted Reprod Technol Conservation Genet Manage Wildlife, Omaha's Henry Doorly Zoo. 15-17.
- Thongtip, N., P. Sanyathitiseree, M. Damyong, W. Theerapan, P. Suthummapinunta, S. Mahasawangkul, T. Angkawanish, S. Jansittiwate and A. Pinyopummin. 2001. The preliminary study of semen evaluation from Thai captive elephants. *In* 39th Kasetsart University Animal Conference, Bangkok, pp. 312 – 315.
- Thongtip, N., J. Saikhun, M. Damyang, S. Mahasawangkul, P. Suthunmapinata, M. Yindee, A. Kongsila, T. Angkawanish, S. Jansittiwate, W. Wongkalasin, W. Wajjwalku, Y. Kitiyanant, K. Pavasuthipaisit and A. Pinyopummin. 2004. Evaluation of post-thaw Asian elephant (*Elephas maximus*) spermatozoa using flow cytometry: the effects of extender and cryoprotectant. *Theriogenology.* 62: 748 - 760.
- Thongtip N, Mahasawangkul S, Thitaram C, Pongsopavijitr P, Kornkaewrat K, Pinyopummin A, Angkawanish T, Jansittiwate S, Rungsri R, Boonprasert K, Wongkalasin W, Homkong P, Dejchaisri S, Wajjwalku W, Saikhun K. 2009. Successful artificial insemination in the Asian elephant (*Elephas maximus*) using chilled and frozen-thawed semen. *Reprod Biol Endocrinol.* 19. 7: 75.