



Sumatran Rhinos A Reproductive Challenge

by Dr. Terri Roth, Director of CREW

There are five rhinoceros species in the world (three species in Asia and two in Africa) and all are threatened with extinction. The African white rhino is the most plentiful with a population estimated at 7,500 animals, whereas, the black rhino population is only approximately 2,500 (down from about 60,000 in 1970). There are even fewer of the Asian species; approximately 2,000 Indian rhino, 400 Sumatran and only 75 Javan rhinos exist today.

In addition to a pair of black rhinos and a pair of Indian rhinos, The Cincinnati Zoo and Botanical Garden currently houses the only three Sumatran rhinos (two females and one male) in the United States. These animals pose a challenge for animal keepers, veterinarians and scientists because so little is known about them. Over the last few years, Cincinnati Zoo veterinarians (Drs. Mark Campbell and Ken Cameron) and Area Supervisor of Hoofstock Steve Romo have made changes to the diets of the animals, significantly improving their health. Now that the animals are healthy, we are trying to learn more about the reproductive physiology of the species.

To date, Sumatran rhinos have not reproduced successfully in captivity.

One of the problems associated with captive breeding is aggressive interaction when male and female rhinos are introduced to each other for mating. The male's aggressive behavior can result in physical harm to the female, posing a threat to her well-being. This behavioral incompatibility may be avoided if animals are introduced only at a time when the female is receptive to the male (during estrus). However, detecting estrus in a rhino can be difficult. Unlike cats, horses or dogs who are in estrus and will mate for several days, rhinos may be receptive to mating with a male for only one day. Therefore, identifying that narrow window of male receptivity in the female rhino is challenging. However, some relatively recent technology may be useful for doing just that.

Using CREW's new ultrasound machine, the reproductive tracts and ovaries of the female rhinos can be "visualized". The machine's probe is inserted rectally, and sound waves are emitted and received through this probe. The signals from the sound waves are amplified and converted into TV signals that produce an image of the ovaries on a video monitor. By scanning the animals daily, scientists

can watch follicles (containing oocytes) grow and eventually ovulate. This type of "visual" data is extremely useful for learning about reproductive characteristics in the rhino. Furthermore, after characterizing follicle development and ovulation patterns in these animals, it may be possible to more accurately predict when the females will be receptive to the male for mating (when ovulation is pending). Therefore, not only are we gaining valuable information about Sumatran rhino reproductive biology, we will also use this knowledge to reduce the risks associated with introducing them during a time when

Continued on page 2

Contents

- | | |
|-------------------------|---|
| • CREW Open House | 2 |
| • Scientific Highlights | 2 |
| • Fungi and IVC | 3 |
| • Domestic Cat Project | 4 |
| • On The Horizon | 4 |
| • IMS | 5 |
| • CREW Hosts Art Show | 6 |

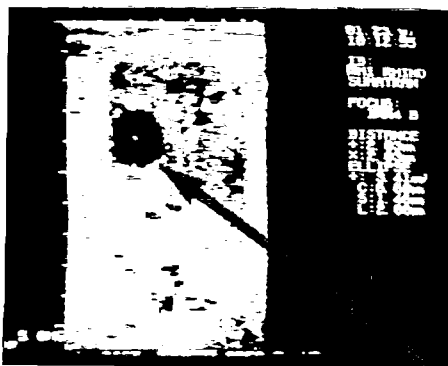


Sumatran Rhinos ...

the female is unreceptive to the male.

Critical to the success of this research, is conditioning the animals to this type of handling so they allow us to consistently conduct the ultrasound procedure. Thanks to the help and dedication of the rhino keeper staff, the animals are well conditioned to standing in a chute. Molly McRae (CREW Research Associate) plays an important role in keeping the animals occupied by hand feeding them small pieces of apple and banana while the procedure is performed. This project is rather unique in that it is research conducted on the animals' terms. The animals must voluntarily enter the chute and stand still for the procedure each morning. No drugs are used.

With an estimated 400 Sumatran rhinos left in the wild and only 20 in captivity worldwide, it is essential that we take the opportunity to learn more about this critically endangered species. We hope that information from this research will further our understanding of rhino behavior and physiology, and also will provide insight into how we can better manage these impressive animals in captivity. (This research is supported, in part, by the International Rhino Foundation.)



Ultrasound image of a Sumatran rhino ovary. Arrow points to follicle developing on ovary.

CREW Open House

Sunday, April 20, 1997 ❖ 3-6 p.m.



Join CREW staff and volunteers for an informal behind-the-scenes tour of the Carl H. Lindner Jr. Family Center for Research of Endangered Wildlife. Visitors can tour both the Plant and Animal Conservation Divisions contained within this state-of-the-art research facility. In the laboratories, CREW scientists will demonstrate and explain their research efforts to save endangered plants and animals. Guests will have the opportunity to talk with the scientists. Please RSVP at (513) 961-2739.

Photos (top) New CREW Director Dr. Terri Roth; (left) Plant Division Researchers Dr. Valerie Pence and Bernadette Plair; and Animal Division Researcher Molly McRae.

Scientific Highlights

Papers published

Roth, TL, WF Swanson, D Collins, M Burton, DM Garell and DE Wildt. 1996. Snow Leopard (*Panthera uncia*) spermatozoa are sensitive to alkaline pH, but motility in vitro is not influenced by protein or energy supplements. *Journal of Andrology* 17:558-566.

Pope CE, BL Dresser, NW Chin, JH Liu, NM Loskutoff, EJ Behnke, C Brown, MA McRae, CE Sinoway, MK Campbell, KN Cameron, OM Owens, CA Johnson, RR Evans and MI Cedars. 1997. Birth of a western lowland gorilla (*Gorilla gorilla gorilla*) following in vitro fertilization and embryo transfer. *American Journal of Primatology* 41:247-260

Professional Presentations

Pence, VC 1996. Cryopreservation of alginate encapsulated tissues from in vitro grown bryophytes and pteridophytes. Poster presentation at the 1996 World Congress on In Vitro Biology, June 20-27, San Francisco.

Pence, VC 1996. Conservation methods for the preservation of plant germplasm. Invited speaker at the 33rd Annual Meeting of the Society for Cryobiology, August 17-21, Indianapolis.

IN MEMORY

Kathryn Townsley Whiting, a long-standing friend and supporter of the Zoo and CREW, passed away on February 19, 1997. Kathryn and the late Carson Whiting founded the CREW program in 1981, and continued their generous support and commitment to the program for many years. We extend our deepest sympathies to the family and friends.



Contributors

Debbie Lentz

Angela Osborne

Dr. Valerie Pence

Dr. Terri Roth
Director of CREW