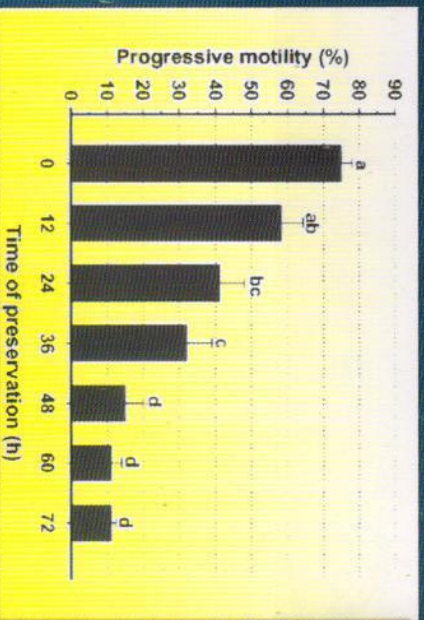


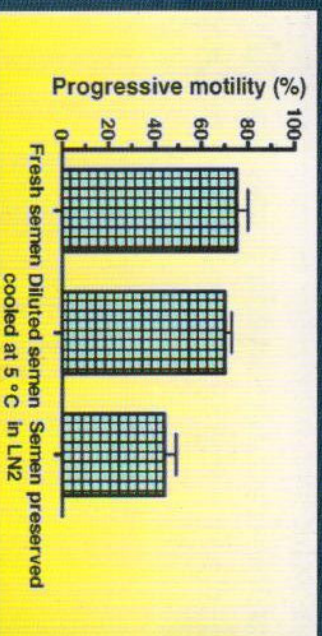
this diluent. Mithun semen can be stored at 4°C efficiently for 2 days for further use. In contrast mithun stores in LN₂ can be preserved for years for further use.



Mithun sperm (Trypan blue-Giemsa staining) A: live sperm with intact acrosome; B: dead sperm with damaged acrosome; C: dead sperm without acrosome



Progressive motility of mithun spermatozoa evaluated at 0, 12, 24, 36, 48, 60 and 72 h of in vitro storage at 4°C; 0 h indicates the evaluation just before storage; a-d on error bar indicates a significant variation at $P < 0.01$



Progressive motility of mithun spermatozoa in fresh semen, in diluted semen after cooling (5°C for 4 h) and thawing and in preserved (LN₂) semen after thawing. a-b on error bar indicates a significant difference ($P < 0.01$)



The first mithun calf born through AI

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Artificial Insemination in Mithun



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Artificial Insemination

Artificial insemination (AI) is the technique to breed female with preserved semen of defined sperm concentration. The purpose of AI is primarily to extend the usefulness of genetically superior sires. This technique allows maximizing the number of semen doses obtainable from a given ejaculate, without reducing fertility. Besides, the extended fertile life of the preserved spermatozoa reduces the wastage of semen as well. AI is probably the most popular and extensively used biotechnological tool in the area of animal husbandry. The developments that made AI the most important animal biotechnology include improved methods of male management and semen collection, evaluation, preservation, and insemination. There is a great scope for improving mithun productivity through selective breeding using this technique.

Advantages and Disadvantages of AI

The greatest advantage of AI is the maximum possible use of a superior sire

for selective breeding. A bull probably can be used for breeding less than 100 matings per year through natural insemination. In contrast, a bull now can be used even for more than 60,000 services per year through AI. AI prevents the infectious genital diseases to bull through female and in turn reduces the danger of spreading such diseases in herd. Besides the time required for establishing a reliable proof on young bulls is reduced through AI. Other advantages are early detection of infertile bulls, use of old or crippled bulls and elimination of danger from handling unruly bulls.

There are a few disadvantages of AI. An intensive human monitoring is required to detect estrus and proper time of insemination in female. The success of AI largely depends on how well the task is performed following the desired precautionary measures. AI demands more labor, facilities and intensive managerial skill compared to natural breeding. Beside, proper implementation of AI requires special training, skill and practice. Nevertheless, the utilization of few sires that commonly occurs with AI can induce excessive inbreeding and narrowing of genetic bases.

Collection and Preservation of Mithun Semen for AI

Mithun semen can be collected through rectal palpation method or artificial vagina (AV). However, it is difficult to train mithun bull to give semen through AV since it has poor sex drive. Therefore, semen collection through rectal massage method is probably a more practical method for field application in mithun. For semen collection through this method massage seminal vesicles centrally and backwardly for 5 min followed by the gentle milking of ampullae one by one from posterior to anterior end for 35 min. Following this procedure, the erection and ejaculation occur. During collection, discard the initial transparent secretions and collect the neat semen drops in a sterile graduated test tube with the help of a sterile funnel. We could preserve mithun semen successfully that collected through rectal massage method, using tris-egg yolk diluent at refrigeration (4°C) temperature. The same dilutor supplemented with glycerol can be used efficiently for preservation of liquid semen in liquid nitrogen (LN₂). We could successfully preserve mithun semen in LN₂ using