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## Musth in Elephant and Its Management

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### Abstract

**M**usth is a periodic reproductive phenomenon occurring in Asian and African male elephants in their post-pubertal age. It is characterized by pronounced change in behavior and physiological condition due to increased androgenic hormone which is seen in form of aggressiveness and increased physical activity. The condition is identified by increased swelling of the temporal gland with brownish discharge and the animal behaves erratically. The management of musth is very essential in captive elephants else the animal may destroy property and could hurt, even kill the *Mahouts*. Musth animal is basically managed by providing ample rest, which often required tranquilization of the animal and later the animal is tied for some days. During this rest period the animal can be given some calming medication and later on treated for its injury and provided with high nutritious feed to regain the lost strength.

### Introduction

**A**ll animals show some unique type of reproductive behaviors under the influence of their increased reproductive hormones. In almost all males of animal kingdom, the increased androgenic hormones make the animal restless and activate him to perform his sexual activities. In adult male elephants such change in the behavior is noticed once or twice in a year in the age group of 15 to 60 years old. The sexual behavior in male elephants is commonly known as 'musth' and is usually seen in winter or rainy season with less often in summers. The musth animal can be identified by enlargement of the temporal glands and a brown coloured, foul smelling viscous secretion oozes out from the gland openings (Figure 1), penis will emerge, there will be dribbling of urine constantly etc. (Ananth, 2000). The animal under influence of increased hormone behaves aggressively and does not obey its Mahout. Sometime there is blockage of the temporal gland openings by these viscous fluids and the animal is in discomfort and easily become irritated leading to man-animal conflicts. The animal is over-alert with ear wide open, extended blowing trunk, a stiff-tense body and often is in charging mode. During musth period it is usual that the animal destroy crops, properties and have a destructive tendency to all what is in his way. Many *Mahaouts* get killed during these times while trying to control the animals. Musth is well documented in Asian elephants and also in African elephants but in Asian elephants the behavioral changes are more pronounced. The duration of musth ranges between two weeks to even five months. The musth can be observed in three phases Pre-musth, Violent musth or Mid-musth and Post-musth. The musth period is an uncomfortable time for male elephants, at least for the captive elephants and if not properly managed

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than they can injure themselves or their *Mahaouts*. The mean normal serum testosterone concentration in captive Asian male elephants vary from 1-10 ng/ml; and there is an elevated level in musth animals which ranges from 10-50 ng/ml, which is the basic cause for such aggressive and violent behavior of the male elephants during musth. The secretions from the temporal gland are basically chemical of proteins, steroids and volatiles nature. Examination of temporal gland secretion on gas chromatography showed mainly five volatiles namely phenol, 4-methyl phenol farnesol, farnesol-monohydrate and dehydrate and cyclohexanone (Ananth, 2000). In nature these volatile chemicals give signal to females for mating.

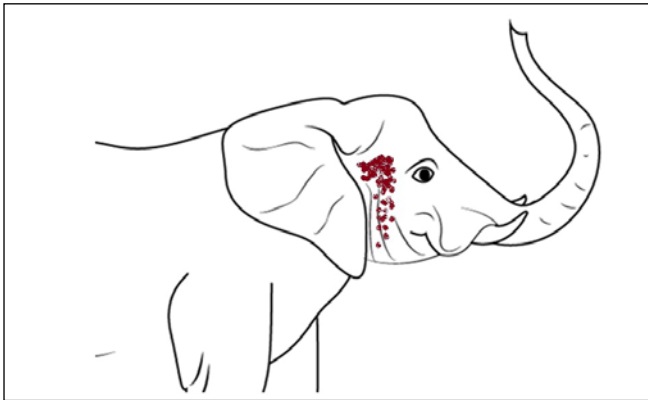


Figure 1: Male elephant showing secretions of temporal gland during musth

## Management of Musth

The association of man and elephant is very long. The elephants were domesticated for the purpose of draught, recreational and in early century for wars. In spite of this long association the humans are not able to domesticate elephants fully because of the musth condition. Though, this elephant-human long association had documented musth and its various management aspects, still it is a challenge in present time also. Musth is essentially a normal reproductive physiological condition, not a disease condition and hence it does not require any treatment but management. The general management includes securing the animal properly, giving him proper rest, feed, bath and if required some medication to calm him. Indigenous ayurvedic medicines like *shatawar* (*Asparagus racemosus*), winter cherry (*Withania somnifera*) *Aswaganda rasayanam* and *Kalayanagulam*, sugar, gingelly, jiggery, milk, etc. can be given during this period. Homeopathic drugs, Zincummet 200, Belladonna, Gelsimium, Chamomilla, Sabal serrulata, Orchitinum, Ferrum picricum, Agaricus muscaricus, Stamonium are reported to be effective in controlling the aggressiveness (Ananth, 2000). Many allopathic anti-androgen drugs are also being reported effective for controlling the aggressive behavior of

male elephants during musth namely flutamide @ 5000 mg and 7500 mg, haloperidole @ 100 mg and potassium iodide @ 20 gm orally once daily for three days (Chandrasekharan and Cheeran, 1996). Chemical sedatives are also useful such as diazepam 400 mg morning and 200 mg evening for five days followed by tapering the dosage for five days to 100 mg per day and dosage @ 100 mg per day for ten days. Another such sedative lorazepam 40 mg morning and evening for three days and then reduced to half the dosage on the next day and tapered to 10 mg for four days is also effective (Thakuria and Barthakur, 1994). After musth, elephants are provided with a special diet, to improve their health and should be treated for the injuries which got developed due to the struggle done when it was tied for a long time. The legs, the temporal area, penis are the places where they usually got injuries during the musth phase and these prone places should be checked and treated accordingly.

## Tranquillization

Tranquillizing elephants is most often needed for those musth elephants which are on loose and are threat to property and life. The tranquillization is carried out with dart gun and Xylazine hydrochloride is the most often used and the elephant feel drowsy with 8-10 minutes after injecting the drug. During darting, care must be taken for noise and the darting should be done with a safe distance. The first sign to identify whether the drug had acted is the relaxation of penis followed by drowsiness and the elephant will go on sleep in standing position. It is better to wait for 45 minutes after injecting and there after the animal can be approached silently. The darted elephant than should be chained on feet to the nearest big tree and if required can be dragged with due care that it doesn't get injuries. The fastening site should offer plenty of shade and the mahouts must frequently water the elephant's head to keep it cool. The elephant resumes its normal activity of feeding and drinking water after about 4-5 hours.

## Conclusion

Musth is a normal physiological process of male elephant which arises because of increased testosterone level which occurs once or twice in a year. Musth is manifested as swelling of temporal gland with secretions coming out of its opening and the musth animals behave widely under the influence of elevated hormone. The musth animal especially the captive ones should not be left loose else it may cause destruction of property and even can kill peoples. The management of musth lies on keeping the animal secured by chains, if required tranquillization can be done and then kept under close observation with proper feed, water and medication so as to keep the animal calm. After

the musth period is over the animal is again given nutritious laxative diet to regain its strength and the injuries are treated before it is further taken for work.

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