

THE ROLE OF MODERN HEALTHCARE FACILITIES IN THE ZOO

Dr. Abdul Samad and S. Jagadish

Editor's note :

All of us do appreciate that in spite of providing all the possible care and facilities, the animals kept in the zoo are in an unnatural environment and, hence, under some degree of stress and health-related problems. It is therefore essential that holistic, comprehensive, state-of-art facilities are provided for their health care. At the outset we will consider the existing problems faced by zoo animals and the constraints under which the facilities will have to be provided.

The major constraints when we deal with the health problems of the captive animals kept in zoos are:

1. The diseases of zoo animals may not be obvious as clinical signs or the signs of illness are expressed very late in the course of the disease and at this stage no treatment is fruitful.
2. The clinical signs often are vague and detailed physical examination is not possible due to problems of handling and restraints.
3. Many modern diagnostic investigations may be difficult to carry out or interpret since handling may alter the physiochemical responses of the animals.
4. The treatment often is non-specific and hence expensive and a number of times not effective. Administration of drugs to animals is also another constraint.

Comprehensive preventive medical programmes:

Thus, the zoo management has to be geared up for providing comprehensive preventive medical programmes. Such programmes in domestic animals and people has been found to be beneficial and cost-effective, but their role in zoo practice needs to be evaluated on a long-term basis.

The modern concept of disease causation has undergone tremendous changes. The earlier Koch-Henle postulate of disease causation has been found to be inadequate to explain the disease causation in many non-infectious as well as infectious diseases. This postulate in fact led to narrowing of the concept of disease causation since it gave more emphasis to the single causal theory. But, now it has been recognized that most of the diseases in animals or human are caused due to multiple factors. For example, in Marsupials and Monotremes, it has been found that mere presence of *Bacillus necrophorus* is not sufficient to cause Necrobacillosis. The disease is produced only when factors such as, overcrowding and feeding of soft diets are present. Thus, although the bacillus is the cause of Necrobacillosis, this by itself is not sufficient to cause the disease. Hence such causal factors are now called necessary causal factor, whereas the causal cycle is completed only when there is overcrowding and feeding of soft feed. These two causes are therefore called component causes. This new theory of causal mechanisms, also called Evans Hypothesis or canons, have revolutionized the concept of preventive medicine. Thus, looking at the sufficient causal models, it will be easier to devise preventive strategies. For example, in the Necrobacillosis model, if overcrowding of soft feed is avoided, even if the organisms are present, the disease

will not occur. As is evident, such strategies are not only rational but are also pragmatic for implementation as these are cost-effective.

Now it is well known that nutrition, environment, husbandry practices, sanitation, genetics, etc., are important determinants of the diseases in domestic and zoo animals. There is however a need to understand the interactions of these factors with different diseases under our zoo conditions. If the zoo veterinarian is a vigilant and keen observer with simple mathematical calculations, the presence and impact of these factors on disease causation can be established. The zoo veterinarians should therefore be trained in this modern clinico-epidemiological concepts.

The above holistic approach has been incorporated into preventive medical programmes. For zoo animals the preventive medical programme consists of following basic practices.

- a. Quarantine
- b. Nutrition and feeding
- c. Proper caging
- d. Routine surveillance and prophylactic medication
- e. Proper disposal of dead animals and disinfection
- f. Sanitation
- g. Animal care personnel

For implementing preventive medical programme the following issues should be addressed.

a. Establishment of a health monitoring laboratory:

A modest laboratory for routine laboratory procedures should serve the purpose. The laboratory should be equipped to carry out routine blood, smears, urine and faeces examination. For other works however, the services of either a regional district laboratory or college laboratories should be availed. It will also be prudent if the college laboratories have technical personnel, material resources and facilities specifically earmarked for wild life-related investigations.

b. Establishment of Diagnostic facilities at zoos: Although human and pet animal practice have witnessed dramatic improvement in availability of the diagnostic facilities, which has also changed the approach to therapeutics, such facilities may not prove that useful for zoo animals, since there are constraints of cost, sustainability or maintenance cost, restraints and problems with interpretation of the results. At least for the time being, Indian zoo veterinarians will have to depend on their own clinical acumen.

c. Reorienting the zoo veterinarians in modern art of diagnosis:

The art of diagnosis of the diseases based on symptoms and physical examination has also become rational since now there are ways to calculate the strength of these signs in predicting a correct diagnosis. For example, if the lion is showing signs of diarrhoea which is greenish in colour, based on the predictive value of the one or a collection of signs, the disease can be diagnosed with a reasonable

Department of Medicine, Bombay Veterinary College, Parel, Mumbai 400 012

confidence. At present the zoo veterinarians have to rely only on the clinical presentation to diagnose the diseases but they are not reasonably sure about the diagnosis. By following a dichotomous approach, certain indices, such as, predictive value, likelihood ratios, gain in certainty, etc., can be calculated. If these values for different clinical signs in various diseases are available, an algorithm path can be drawn which will help in diagnosis.

For doing this some planned initiatives and efforts will have to be undertaken by all the zoo veterinarians and the nodal veterinary college experts in science of clinical epidemiology. The nodal agency then can compile the data and calculate the predictive indices for each clinical sign and a spectrum of diseases. In human beings this approach has rationalized the art of diagnosis, and resulted in development of soft-wares to aid the clinicians in diagnosis. In addition, the algorithm paths drawn for each set of diagnostic and prognostic sign would also guide the clinicians in deciding on a particular therapeutic or preventive strategy. The details of organising such studies can be obtained from any standard text book of clinical epidemiology.

Summary:

The modern zoo animal healthcare facility should constitute following components:

1. Properly oriented zoo veterinarian(s) trained in basic concepts of clinical epidemiology, preventive medical health

programmes and zoo animal behaviour.

2. Vigilant support animal care staff trained in personal hygiene, animal behaviour, basics of nutrition, food hygiene, environment, sanitation, mode of transmission of infections role played by management, husbandry and other factors.

3. Modest diagnostic laboratory for routine investigation work.

4. An elaborate zoo record maintenance and database facility.

5. Zoo to zoo linkages for rapid exchange of information specially via internet or if not feasible at least by way of bulletins, news letter, etc., which are specially based towards zoo animal health management problems.

6. Linkages with regional state-level diagnostic laboratories, regional stations of national laboratories, veterinary colleges, and national laboratories.

7. Establishment of a national nodal agency to enforce, monitor and evaluate preventive health programmes in zoos and establishment of functional linkages throughout the country, if possible via internet or website.

8. A policy decision to expedite the relocation of excess animals in order to keep the population density at optimum level.

New Book

Conservation of Wild Orchids of Kodagu in the Western Ghats

Compendium developed with the assistance of The centre for technology development and agricultural technologies and Services Private Ltd., Bangalore in co-ordination with The Karnataka Association for the Advancement of Science, Bangalore and World Wide Fund for Nature - India, New Delhi 1998

Conservation of Wild Orchids of Kodagu in the Western Ghats
Dr. T. Ananda Rao

The wild blooming orchids are no less majestic in beauty than many other cultivated flowers of commercial interest. They are the ultimate in rarity, beauty and allure. Of late, they have become quite popular among professionals and amateur orchid lovers for collection either as a hobby or an item of cut-flower trade. Following the explicit mandate and objectives of conservation of Bio-diversity and Hot Spots conservation programmes of WWF-India, this illustrated document brings in in-situ and ex-situ conservation programmes as a demonstration project in respect of wild orchids of Kodagu in the Western Ghats. The objective is also to serve as a benchmark for monitoring the species losses in the area.

The book outlines a group of potential ornamental orchids of the District. Some of them could be a valuable addition to the gene pool and would help in tissue cultural and hybridization experiments.

The book is essentially a in-situ conservation development study linked to ex-situ conservation in the form of orchidaria through a mapping strategy. This has the potential for replication in other Hot Spots of the Western Ghats and as a supplemental economic activity of local people to promote awareness and disseminate knowledge of orchids.

Apart from conservation interest, the book spells out the kind of further research needed in this area such as orchids and pollution, orchids and epiphytism, microbiology of orchid root system and foliar idioblasts as an aid in the systematics of orchids.

The inadequacy of Botanical nomenclature of orchid species recorded in the western ghats has been kept in purview in changing the names of some orchids and their synonyms which would be necessary for scientific study and their utilisation in the study of orchids. This list includes all up dated binomials hitherto recorded from the western ghats. This would help to improve further the status column by knowledgeable persons to substantiate actual field date for all engaged in orchids studies.

Contents : Foreword by Dr. M.S. Swaminathan, Preface by Sri. Samar Singh Part -1. In-situ conservation : Hot spots, shola forests, mapping techniques Ecological outlook. Distribution pattern of orchids in the hot spot area.

Part -II. Ex-situ conservation in Orchidaria : Cauvery Nisargadhama Orchidarium under natural settings : Cultivation, Medicinal and Ornamental orchids. 98 coloured photos and 65 Black & White sketches with descriptions from fresh material of the Hot Spot region. Binomial charts of 274 orchids of the Western Ghats. Orchids index. 1998, 262 pp. Rs. 400/-.

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Chief Executive
Agricultural Technologies
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525, Meera Cottage, XI Cross
Sadashivanagar, P.O.
Bangalore 560 080
Tel. & Fax : 91-80-3343676

