

**Olivera Silva, M.T. (1992).** Effects of mollusc grazing on the development of grassland species. *Journal of Vegetation Science* 3: 267-270.

**Ponder, W.F. (1997).** Conservation status, threats and habitat requirements of Australian terrestrial and freshwater mollusca. *Memoirs of the Museum of Victoria* 56(2): 42-430.

**Ramakrishna and S.C. Mitra (2002).** Endemic land molluscs of India. *Rec. zool. Surv. India, Occ. Paper* 196: 1-65.

**Rao, H.S. (1925).** On the Habits of a Succienid Mollusca of Western Ghats. *Rec. Ind. Mus.* 27: 401.

**Rao, H.S. (1925).** On Certain Succienid Molluscs from the Western Ghats, Bombay Presidency. *Rec. Ind. Mus.* 28: 385.

**Rao, V.T. and F. Ramdoss (1953).** Damage to vegetable crops by slugs observed in the Krishna District and experiments on their control. *J. zool. Surv. India* 61(3&4): 403-436, pls. 18-20.

**Rees, M. and V.K. Brown (1992).** Interactions between vertebrate herbivores and plant competition. *Journal of Ecology* 80: 353-360.

**Rodriguez, M.A. and V.K. Brown (1998).** Plant competition and slug herbivory: Effects on the yield and biomass allocation pattern of *Poa annua* L. *Octa. Oecologia* 19: 37-46.

**Sathyamurthi, S.T. (1960).** The Land Freshwater Mollusca In the Collection of the Madras Government Museum. *Bulletin of Madras Government Museum.*

**Sandhya, P.S., R.G. Mavinkurve and N.A. Madhyastha (2004).** *Diversity and Distribution of micro gastropods in Western Ghats of Karnataka (India).* (In press).

**Seddon, B.M. (2000).** Molluscan diversity and impact of large dams. Prepared for thematic review II.1, Dams, ecosystem functions and environmental restoration. IUCN Reprint.

**Smith, A. (1898).** Description of *Mulleria dalyi* n. sp. from India. *Proc. Mal. Soc. of London* 3: 14-16.

**Solem, A. (1984).** A world model for land snail diversity and abundance. In: *Worldwide snails*. Eds. A. Solem and A.C. van Bruggen. E.J. Brill/Dr. W. Backhuys, Leiden, Netherlands. 6-22 p.

**Sternberg, M. (2000).** Terrestrial gastropods and experimental climate change: A field study in calcareous grassland. *Ecological Research* 15: 73-81.

**Subba Rao, N.V. (1975).** Notes on some pestiferous snails, *Dr. B. S. Chauhan Comm. Vol.* 165-170

**Subba Rao, N.V. (1988).** *Handbook-Freshwater Molluscs of India*, ZSI, Calcutta.

**Subba Rao, N.V. and S.C. Mitra (1979).** On the land and freshwater mollusks of Pune district, Maharashtra. *Rec. zool. Surv. India* 75: 1-37

**Tonapi, G.T. (1971).** On the freshwater Molluscs of Poona. *J. Bombay Nat. Hist. Soc.* 68: 115-126.

**Tonapi, G.T. and Mulherkar, L. (1963).** Studies on freshwater and amphibious Molluscas of Poona with notes on their distribution - Part II. *J. Bombay Nat. Hist. Soc.* 60: 103-120.

**Vermeij, G. (1993).** The biological history of a seaway. *Science* 26: 1603-1604.

**Vikram Reddy, M. (ed). (1995).** Soil organisms and litter decomposition in the tropics. Oxford and IBH Co. Pvt. Ltd., 272pp.

**Wilby, H. (1996).** *Vegetation development on set aside arable land, The role of animals.* PhD Thesis, University of London, London.

#### ACKNOWLEDGEMENTS

The authors are grateful to MoEF for the Grants to study molluscs of Western Ghats under the AICOPTAX scheme and to the principal, Poornaprajna College, Udipi. We thank the anonymous reviewers for constructive suggestions in improving the manuscript.



## ANAEMIA IN A CINEREUS VULTURE AEGYPIUS MONACHUS - A CASE REPORT

**N.A. Sudhan, K.K. Ponnuswamy, K. Hussain and M.M.S. Zama**

Division of Veterinary Clinical Medicine & Jurisprudence, Faculty of Veterinary Sciences & Animal Husbandry (SKUAST-J), R.S.Pura, Jammu & Kashmir 181102, India

A young Cinereus Vulture *Aegypius monachus* weighing about 6.75kg was brought from Akhnoor (J&K) to Manda Zoo. A veterinary medical team from Faculty of Veterinary Sciences, SKUAST-J visited the zoo to monitor the health status of the bird. The total length (from forehead to feet) was 88cm, wing to wing length was 240cm and the length of the beak was 8cm. On physical examination the bird appeared weak but was found to feed normally. In order to check for condition of anaemia an aliquot of 1ml blood was collected from wing vein in a dry vial containing 10% Ethylene Diamine Tetra Acetic acid (EDTA) and blood smears were made for routine haematology.

Literatures concerning the normal hematological profiles of raptorial birds are scarce and limited (Elliott *et al.* 1974; Cooper, 1975). However, Ivins *et al.* (1986) reported average haematological values of selected raptors while Villegas *et al.* (2002) recently documented the blood chemistry and haematocrit of Cinereous Vulture. Based on this haematological profile the Cinereous Vulture at Manda Zoo with a packed cell volume of only 19% was found to be anaemic (see Table). Oral mineral mixture (Agrimin forte powder Glaxo) was recommended at the dose of 200mg daily. After two weeks the vulture was found to be active, alert and feeding normally. The haematological profile was reevaluated and the haemogram had improved with a packed cell volume of 23% well within the normal range.

#### REFERENCES

**Cooper, J.E. (1975).** Hematological investigations in East African birds of prey. *Journal of Wildlife Diseases* 11: 389.

**Elliott, R.H., E. Smith and M. Bush (1974).** Preliminary report on hematology of birds of prey. *Journal of Zoology of Animal Medicine* 5: 11.

**Ivins, G.K., G.D. Weedle and W.H. Halliwell (1986).** Hematology and serum chemistries in birds of prey. In: Fowler, M.E. (Ed.). *Zoo and Wild Animal Medicine*. W.B. Saunders Co., Philadelphia.

**Villegas, A., J.M. Sanctez, E. Costillo and C. Corbacho (2002).** Blood chemistry and haematocrit of the black vulture (*Aegypius monachus*). *Camp-Biochem. Physiol. a. Mol. Integr. Physiol.* 132(2): 489-497.

#### ACKNOWLEDGEMENTS

The facilities and assistance rendered by the authorities of Department of Wildlife protection, Jammu are gratefully acknowledged.

**Table 1. Haematological Profile (Pre-treatment & Post-treatment) of *Aegypius monachus***

Haematological Profile	Pre-Treatment	Post-Treatment (14 <sup>th</sup> Day)	Normal Haemogram
Packed Cell Volume (%)	19	23	24 - 52
Haemoglobin (g/dl)	6	10.20	10 - 19
Total Erythrocyte Count x 10 <sup>6</sup> /mm <sup>3</sup>	1.8	2.5	2.0 - 2.8
Total Leukocyte Count x 10 <sup>3</sup> /mm <sup>3</sup>	20	19.8	7 - 46
<b>Differential leukocyte Count</b>			
a) Heterophils x 10 <sup>3</sup> /mm <sup>3</sup>	5	10.6	5 - 39
b) Lymphocytes x 10 <sup>3</sup> /mm <sup>3</sup>	11	5.9	1.5 - 13.7
c) Monocytes x 10 <sup>3</sup> /mm <sup>3</sup>	2	2.9	0 - 5.1
d) Eosinophils x 10 <sup>3</sup> /mm <sup>3</sup>	1.4	-	0 - 0.38
e) Basophils /mm <sup>3</sup>	-	296	0 - 380