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Successful therapeutic management of leukoderma in a buffalo

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Abstract
Leukoderma or Vitiligo is a dermatological skin affection in which patchy depigmentation of skin with premature graying of hairs were observed. Factors contributes to leukoderma includes environmental consequences, autoimmune response in which melanocytes are destroyed by immune system and hereditary predisposition and/ or copper deficiency. Buffalo treated with copper sulphate @ 8gm orally once in a week for 6 weeks along with chelated mineral mixture @ 25 gm bid orally for 2 months showed uneventful recovery.

Keywords: Leukoderma, vitiligo, copper sulphate, buffalo, chelated mineral mixture

Introduction
Leukoderma or vitiligo is the dermatological affection of skin in which patchy depigmentation of skin with premature graying of local hairs were observed. Vitiligo is characterised by spontaneous loss of melanin noticed in several animals (Constable *et al*., 2017) [2]. Vitiligo has been recorded in different species like buffaloes, horses, dogs, poultry and elephant. Several etiological factors contribute to commencement of vitiligo and its clinical progression. Due to destruction of melanocytes, pigmentary disorder due to unknown causes resulted in depigmented patches in Leukoderma (Im *et al*., 1994) [6]. Numerous theories *viz*; biochemical, cytotoxic, oxidant-antioxidant, neural, viral, autoimmune, self-destruct, growth factor and convergence have been proposed to illuminate this condition (Kaur Navneet *et al*., 2012) [7].
In buffaloes, depigmentation usually starts in the region of brisket and may extend upto neck, abdomen and flank area. In majority of cases, hypomelanosis begins with damage of melanocytes first in epidermal layer of skin and thereafter in follicular reservoir where most of the melanocytic stem cell are located. In present case, therapeutic aspects of leukoderma in buffaloe has been discussed.

Case history and clinical observations
A six year old non-descript buffalo referred with the history of generalized brownish white coloured skin discoloration since one month (Fig.1). Clinical examination revealed normal temperature, pulse and respiratory rate and conjunctival mucous membrane was pale pink in color. There were no signs of photo-sensitivity noticed. The buffalo was alert and active in behaviour. The whole blood and serum sample was collected from buffalo for complete blood count and for estimation of serum copper level. Hematological estimations revealed, decrease in the level of Hb, TEC, PCV and serum copper level was 54.6 µg/dl. However, normal serum copper level in healthy buffalo was 75.61 µg/dl (Gapat *et al*., 2016) [5].

Treatment and Discussion
Treatment of buffalo was started with copper sulphate @ 8 gm orally once in a week for 6 weeks regularly along with chelated mineral mixture 25 gm bid orally for two months. The brownish white patches slowly regressed after supplementation (Fig. 2). The spots started getting pigmented after one month onwards and almost became normal subsequent to one and half months (Fig. 3 and 4) treatment. No any relapse was observed even after six month follow-up of the case. The effectiveness of treatment was reviewed on the basis of clinical improvement in pigmentation of skin and hair coat of buffalo.

Atypical hair pigmentation might be occurred due to reduced tyrosinase activity resulting in decreased conversion of tyrosine to melanine. Causative factors of leukoderma may comprised autoimmune response in which melanocytes are damaged by the immune system (Fishman *et al*., 1997) [4] of animal and due to hereditary predisposition and/or copper deficit (Panduranga Rao *et al*., 2002) [8].

Gapat *et al.* (2016) [5] documented graying of hair and depigmentation of skin on different parts of the body in leukoderma affected buffaloes and highly noteworthy decline in Hb, PCV, TEC, serum copper, ceruloplasmin and zinc values. In leukoderma, typical clinical presentation is patchy depigmentation of the skin of muzzle, eyelids and occasionally anus and other body regions (Constable *et al*., 2017) [2]. Whereas, highly significant decline in serum copper level with non-significant alterations in zinc iron and molybdenum values reported in leukodermic buffaloes (Dube *et al*., 2014) [3]. Micro minerals such as selenium, zinc and copper helps to maintain low tissue concentration of reactive oxygen species and lipid hydroperoxide (Bettger *et al*., 1979) [1]. The combined injection contain copper, zinc, selenium and manganese (Inj. Minshot) showed potential outcome and can be used in field to treat leukoderma cases in buffaloes (Varun *et al*., 2018) [9]. A case of successful therapeutic management of leukoderma in a buffalo was put in record.

Fig 1: Generalized brownish white discoloration of skin in leukoderma affected buffalo

Fig 2: Regression of pigmentation (one and half month after treatment)

Fig 3 and 4: Normal pigmented skin (two months after treatment)

Conclusion

In conclusion, successful therapeutic management of leukoderma in a buffalo was achieved through oral supplementation of copper sulphate and chelated mineral mixture. Clinical improvement, including regression of brownish white patches and repigmentation of the skin and hair coat, was observed within one and a half months of treatment, with no relapse during a six-month follow-up. The condition's etiology may involve reduced tyrosinase activity and autoimmune responses, possibly exacerbated by hereditary predisposition and copper deficit. This study underscores the importance of micronutrient supplementation, particularly copper, in managing leukoderma in buffaloes, highlighting its potential for practical application in the field.

References

1. Bettger WJ, Saage JE, O'Dell BL, *et al.* Effect of dietary copper and zinc on erythrocyte superoxide dismutase activity in the chick. Nutr. Rep. Int. 1979;19:893.
2. Constable PD, Hinchcliff KW, Done SH, Grunberg W. *et al.* Veterinary Medicine: A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs, and Goats. 11thedn. Elsevier Ltd.; c2017. p. 1553.
3. Dube YS, Bhikane AU, Masare PS, Kanduri AB, Deshpande SD, Awaz KB, *et al.* Etiological and clinico-therapeutic aspect of leukoderma in buffaloes. XXXII Annual Convention of ISVM & International Symposium on The 21th Century Road Map for Veterinary Practice, Education and Research in India and Developing Countries; c2014. p. 17.
4. Fishman P, Merimski O, Bharav E, Shoenfeld Y, *et al.* Autoantibodies to Tyrosinase; the bridge between melanoma and vitiligo. American Cancer Society. 1997;79:126-130.
5. Gapat SM, Bhikane AU, Hase PB, Gangane GR, *et al.* Aetiological and therapeutic investigations on leukoderma in Indian buffaloes *(bubalus bubalis).* Buffalo Bulletin. 2016;35(4):619-628.
6. Im S, Hann SK, Kim HI, Kim NS, Park YK, *et al.* Biological characteristics of cultured human vitiligo melanocytes. Int. J Dermatology. 1994;33(8):556-62
7. Navneet K, Sukhbir K, Sharma AK, *et al.* A review on leukoderma and reported herbs for its treatment. Journal of drug delivery and therapeutics. 2012;2(3):53-59.
8. Pandurangrao Rao P, Dev R, Ravikumar P, Khan PM, Kavitha K, *et al.* Suspected copper deficiency in buffaloes in Andhra Pradesh. Indian Vet J. 2002;79:1068-1069.
9. Varun VK, Singh SV, Singh JP, Ramakant, Singh NK, Niyogi D. Therapeutic efficacy of multimineral injection to treat leukoderma in buffaloes. Int. J. Curr. Microbiol. App. Sci. 2018;7:249-254.