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A report on eye affections in captive Asian elephants *(Elephas maximus)* of Kerala state during 2010-2024

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Abstract

Kerala, a State of South India has large number of captive Asian elephants (Elephas maximus), mostly tuskers, as tuskers are preferred for temple festivals. Because of large captive elephant population, a greater number of health issues are reported from Kerala and the number of cases having eye affections are also considerably high. During a period of 15 years from 2010 to 2024, 152 elephants suffering from eye affections were examined. Out of 152 cases during the study period, 144 (94.74%) were males and remaining eight (5.26%) were females. All of them were adults ranging from an approximate age of 22 years to 85 years. The clinical signs were excessive lacrimation, corneal opacity, cataract and ocular trauma. All the aged elephants were having multiple age-related symptoms including cataract. On detailed examination, conditions like lens luxation, retinal detachment, phthisical eye, sub-retinal haemorrhage and damaged vitreous were identified.

Keywords: *Captive Asian elephants, eye affections*

Kerala, a State of South India, is known for its cultural and diverse temple festivities, where decorated elephant processions are indispensable. Hence, Kerala has got large number of captive Asian elephants (*Elephas maximus*), mostly tuskers, as tuskers are preferred for such festivals.

Owing to the large captive elephant population, a greater number of health issues are being reported from Kerala. The number of cases with eye affections in elephants, seeking veterinary care are also high. Chandrasekharan *et al.* (1995) and Ajithkumar *et al.* (2010) have reported several cases of ocular affections in captive elephants of Kerala. Several such cases are being referred to the Department of Veterinary Surgery and Radiology, College of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala, with a myriad of clinical symptoms involving eyes.

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During a period of 15 years from 2010 to 2024, 152 captive elephants were referred to the Department of Veterinary Surgery and Radiology, with different ocular manifestations. A total of 279 ocular affections were recorded during this period, from 152 elephants. Out of 152 cases during the study period, 144 (94.74%) were tuskers and remaining eight (5.26%) were females. All of them were adults ranging from an approximate age of 22 years to 85 years. The findings are summarised in Table 1.

All the elephants were subjected to naked eye examination and digital photography using Nikon D5600 camera with 70-300mm lens. Zooming of digital photos provided better visualisation and detailing of eye and adnexa. Any attempt to perform a detailed physical examination of the eye in an elephant was nearly impossible without anaesthesia due to its propensity to close the palpebral fissure whenever the clinician manipulates the eyes (Wong *et al*., 2012). The mahouts helped in the physical restraint of these animals for clinical examination. Seven animals were subjected to ultrasonography (MyLab Gamma, Esoate, SpA, Italy) with linear probe (SV3513, Esoate, SpA, Genova, Italy) of 10 MHz. Direct (Fig.1) and indirect ophthalmoscopy (Fig. 2), fluorescein dye test and Schirmer tear test were performed whenever necessary. Out of 152 elephants examined, 106 (69.74%) were having lacrimation as a major symptom with signs of varying degrees of conjunctivitis and keratitis. Adnexal lesions were observed rarely. In 83 (54.61) cases, varying degrees of corneal opacity was noticed (Fig. 3 and 4). The most common anterior ocular abnormalities included ocular discharge, corneal oedema and conjunctivitis which were similar to the observations of Kraiwong *et al*. (2015). A total of twelve animals showed total or partial loss of visual function, either unilateral (eight cases) or bilateral (four cases). Among them, nine elephants were approximately above 70 years of age and one elephant rescued recently from the forest was in its thirties. All the aged elephants were having multiple age-related symptoms including cataract (Fig. 4 and 5). Cataract in animals aged above 70 years were included under the category of "blindness", as there may be other associated changes also, rendering them blind. There were animals below the age of 70 years as per the records, presented as cases of cataract. There were 43 (28.29 %) animals in this category and the onset of this condition was not known to the owners or handlers. Even though the elephant owners and handlers used to refer all cases of corneal opacity as cataract, on ophthalmological examination they were found to be mostly corneal oedema or scarring on account of trauma, resulting in corneal opacity. Noronha *et al.* (2014) observed that maximum affections of eye in animals were involving cornea. On detailed examination, twelve cases of cataract were diagnosed during this period, out of which one case was in a female elephant.

Fig.1. Direct ophthalmoscopy

Fig.2. Indirect ophthalmoscopy

Corneal ulcerations were noticed in 28 elephants (18.42%) and all the cases were unilateral, suggestive of

Fig. 3. Developing cataract with corneal opacity

Table 1. Occurrence of ocular affections studies in captive Asian elephants in Kerala

Sl. No.	Ocular affection observed	Number of ocular affections observed			Male	Female
		Unilateral		Bilateral		
		Left	Right			
1.	Lacrimation	62	44	--	104	2
2.	Photophobia	16	14	--	29	1
3.	Pannus	8	6	--	14	--
4.	Visual deficit	4	4	4	9	3
5.	Corneal oedema	21	26	2	48	1
6.	Cataract	5	6	1	11	1
7.	Corneal ulceration	16	12	--	28	--
8.	Corneal scarring	2	3	--	4	1
9.	Corneal trauma	1	2	--	3	--
10.	Lens luxation	6	4	1	11	--
11.	Retinal detachment	1	2	1	4	--
12.	Sub-retinal haemorrhage	--	1	--	1	--
13.	Phthisis bulbi	2	1	--	3	--
14.	Vitreal injury	--	1	--	1	--
Total cases		144	126	09	270	09

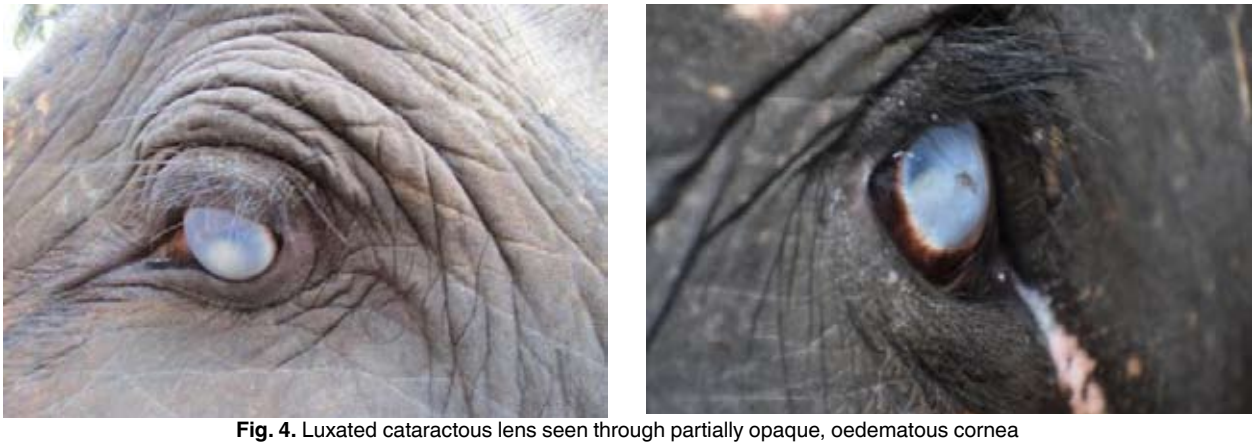

Fig. 4. Luxated cataractous lens seen through partially opaque, oedematous cornea

Fig. 5. Luxated cataractous lens

Fig. 6. Retinal detachment visualised during ultrasonography

traumatic origin. In one case, there was corneal ulceration along with adnexal injury, involving the third eyelid and conjunctiva due to accidental contact with a chemical agent. In other cases, the exact nature of trauma was not clearly known, most of them could be attributed to accidental injury with twigs and forage materials. Unilateral phthisis bulbi was noticed in three cases of tuskers and all of them were having history of traumatic injuries. Lens luxation was noticed in eleven tuskers (7.23%), out of which one was having bilateral lens luxation. In all the cases of luxation, the lenses were cataractous. Ultrasonographic imaging of the eyes confirmed lens luxation.

Fig. 7. Phthisical eye

Ultrasonography of eyes of four elephants showed typical seagull wing appearance of retinal detachment. In one tusker, subretinal haemorrhage was suspected on ultrasonography. Laiju *et al.* (2022) reported ultrasonographic findings of anterior subluxation of cataractous lens with retinal detachment in an Asian tusker which was having bilateral ocular mucopurulent discharge, blepharospasm and corneal opacity. In one tusker, the cornea was having brownish white scarring suggestive of prior traumatic injury, the history of which was not available. This particular case was not included under corneal opacity due to the diagnosis of lens luxation. The percentage of conditions diagnosed by ultrasonography were not discussed in this report, as very few animals only (13 cases) were subjected to ultrasound scanning of the eye. In one tusker vitreal injury also was diagnosed during sonography, which led to blindness.

Summary

Reports of ophthalmic affections in captive Asian elephants (*E. maximus*) are on a rise due to the availability of large number of captive elephants being maintained in Kerala. In this study, various presenting symptoms like excessive lacrimation, corneal opacity, photophobia, cataract and signs of traumatic injury were recorded. On detailed examination, conditions like lens luxation, retinal detachment, sub-retinal haemorrhage, vitreal injury and phthisical eye were also diagnosed.

Conflict of interest

The authors declare that they have no conflict of interest.

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