Southern Purple-faced leaf Langur (*Semnopithecus vetulus vetulus*) – a new colour morph

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At one point in time, the Purple-faced leaf Langur had been placed in the genus *Trachypithecus* but after molecular analysis (Karanth *et al.* 2008) it was placed in genus *Semnopithecus. Trachypithecu*s now belongs to the genus *Semnopithecus*. *Trachypithecus* corresponds to leaf langurs of South East Asia. There are four subspecies inhabiting four distinct localities. They are Southern purple-faced leaf Langur *Semnopithecus vetulus vetulus* (Erxleben 1777)
Montain purple-faced leaf Langur *Semnopithecus vetulus monticola* (Kelaart, 1850)
Western purple-faced leaf Langur *Semnopithecus vetulus nestor* (Bennett, 1833)
Northern purple-faced leaf Langur *Semnopithecus vetulus philbricki* (Phillips, 1927)

The taxonomy of Purple-faced leaf Langur has been confusing as it was never given an accurate to thorough molecular scrutiny which led to many modifications in generic names. Karanth *et al.* (2008) solved the problem by sequencing and analyzing the genetic features from a variety of leaf monkey species. This work supports clustering of Nilgiri and Purple-faced Langur with Hanuman Langur. Leaf Langurs (*Trachypithecus*) form a unique clade and phylogenetic studies indicate both Purple-faced leaf Langur and Hanuman Langur belong to Genus *Semnopithecus*. Their taxonomy will be further distinguished by genetic studies within the recognized subspecies and geographical variations in both Hanuman and Leaf Langurs.

***Semnopithecus vetulus vetulus* (Erxleben, 1777)**

Size moderately large, head and body about 494-542mm; tail length range 691-734mm, weight 5.5-9kg. Small, rounded head; short, narrow neck; small round and flat ears standing out from head (Phillip 1935). Body and limbs black with rid brown tint and mid-dorsal area slightly frosted white; lower back and sacral region with triangular silver-white rump-patch, sharply defined margins, extending down the tail and sides on thighs down to knees in some instances. Whiskers white or off-white, brownish at tips; throat pure white and hairs about the mouth also white; under-parts black; tail silvery-white on two or three inches adjacent to the sacral patch, the remainder mole-grey, sometimes

Fig. 1 *Semnopithecus vetulus vetulus* Black colour morph

Fig. 2 *Semnopithecus vetulus vetulus* Galanthus colour morph

becoming reddish-brown towards the tip. Naked parts of the face, hands, feet pure black, eyes with golden brown iris (Phillip 1935). Among the National Museum primate specimen collection a pale coloured had catalog number 4G 20.11.1923, collected by W.W Philips from Matara District indicating colour diversity among Southern Purple-faced leaf Langur even in early 1900's.

Southern purple-faced leaf Langurs inhabits both thick jungles and wooded home gardens. Observations made by the research team found the number of individuals in forest troops is lower than the number of individuals found in home gardens. The number of individuals per troop may vary from four to eighteen, living in treetops, descending to ground occasionally to get fallen fruit or to get to trees beyond their movement range. They carry their tails hanging down, instead of over their backs like Grey Langur. Each troop has a favorite range and stays there mostly.

It has been recorded south of Kalu River to Ranna by Phillips (1935). Its upper inland limits are restricted to nearly 1,000m from sea level. It has been recorded at Akurassa, Kekunadura, Welihena, Dandeniya, Wattahena, Polgahaivalakande, Krindi Mahayayakele, Kalubowitigana, Deniyaya, Diyadawa, Dediyagala, Kanumulderiya, Matara, Weligama, Pitabeddara, and Gongala (Matara Baddegama, Unawatuna, Galle Fort, Richmond Hill, Udugama, Yakkalamulla, Galle, Hiyare, Alpitiya, Ambalangoda, Hikkaduwa, Pitigala, Sinharaja, Kanneiya, Kottawa, Lankagama, and Habraduwa, (Galle district); Masmullah, Matugama, and Anasigalla (Kalutara district); Bambarabotuwa, Delgoda, Delwala, Denihena, Weddagala, Walankanda, Kudawa, Rakwana, Morahela, Hadapan Ella, Suriyakande, Ratnapura, Kribatgala, and Samanala Wewa (Ratnapura district) (Philips 1935; WCSG 2010). (Map 1)

The WCS Galle primate research team carried out research on distribution, feeding ecology and behaviour of Southern Purple-faced leaf Langur since 2007. This included tracking and recording distribution using GPS locations, feeding behaviour, food selection and social interactions of the troops. We observed 26 troops from rainforests and home gardens in Galle and Matara Districts during the study. Our team observed more than 30 primates with unusual white colour morph in 14 troops. During the research all troops were given a troop number (e.g. T7) and all individuals were given an ID consistent with the troop number including a unique number to identify each individual

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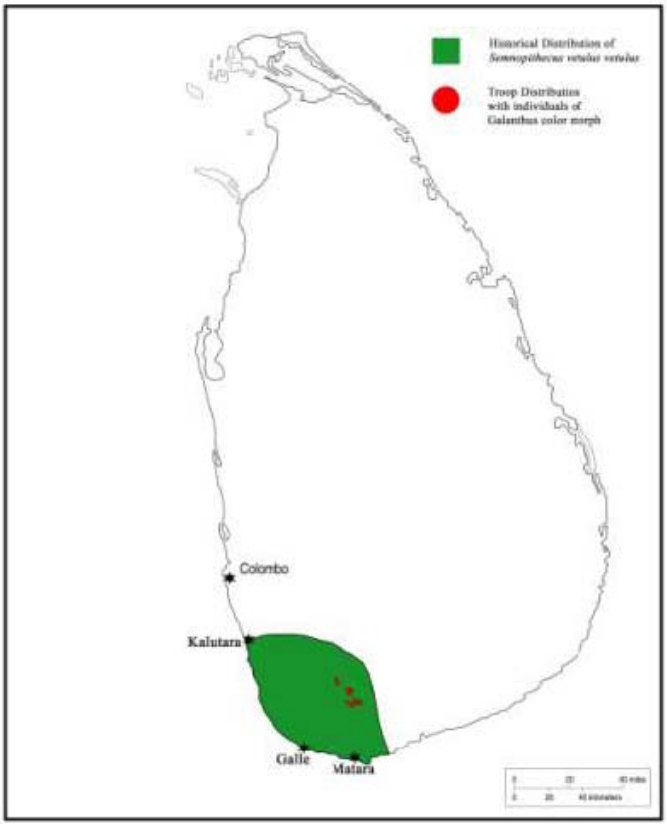

Map 1. Distribution of troops having the Galanthus colour morphs

within the troop (e.g. T5I7 is the seventh individual of fifth troop). There is no evidence to suggest full albinism of Galanthus (Etymology: Named for its white body colour, Galanthus = Snow white) forms due to following reasons:
- All white individuals had black naked parts of the face.
- None of the white individuals had red eyes.
- All of the white individuals had beige to ashy brown crown hair.
- T4 troop had a white coloured alpha male.
- Face of T3I1 showing the black naked part of the face and the eyes.

Individuals with Galanthus colour morph were observed among 14 troops mainly from rain forest and rain forest associated habitats. The maximum ratio of individuals of the Galanthus morph to the normal morph was 4:6 (Troop ID: T4). This includes adults, juveniles and infants of both sexes. The alpha male of the troop T4 was a Galanthus male. (Fig.4 and 5)

Galanthus colour morph

Body and limbs white, sometimes with ashy patches, whiskers white or off-white, throat pure white and hairs about the mouth also white; under-parts pinkish to yellowish white, tail white. Naked parts of the face and ears black, hands and feet pinkish yellow with black patches. Eyes with golden brown iris and beige to ashy brown crown hair.

The number of individuals with a white coloured coat is extraordinary. This can be an indication of the difference between the rain forest troops and the surrounding non-rainforest troops of Purple-faced leaf Langurs. Determination of genetic or taxonomic differences among the sub-species of these Langurs requires molecular and morphological studies, which the primate research team of WCSG is hoping to carry out in the feature.

Conservation Issues

Globally a third to half of all primate species are threatened due to habitat destruction and over-exploitation (Mulu 2010). Developments in agriculture and irrigational strategies, along with an increase in human settlements, have caused damage to areas of Sri Lankan rainforest for decades (Erdelen 1988). Consequently, much of the rainforest is fragmented and troops that inhabit home ranges bordering human districts inevitably exploit agricultural land for food sources. Conflict in Southern areas may alter perceptions of the Purple-faced leaf Langur, currently considered as a pest in the more populated Western province, where it is the most common primate (Dela 2007; Rudran 2007) *Semnopithecus vetulus vetulus* inhabit the same space with humans in periurban and rural areas. They struggle to survive on stolen garden fruits and tree leaves in and surrounding homes.

Many trees are removed as villages enlarge gardens and larger cultivated areas are expanded. This leave many open areas that have to be crossed over, and the Langurs in that area are highly vulnerable. They then have to travel on the ground or on telephone and electrical wires, both options are often deadly; they are killed by dogs, traffic accident and electrocution (Fig. 7). However, most Sri Lankans are often tolerant owing to religious and cultural beliefs, which respect other forms of life, leaving habitat loss as the most fundamental threat. Although habitat loss is manageable, when whole forests are removed, the species in that habitat will not survive. Fragmentation occurs when forested areas are divided for plantations,

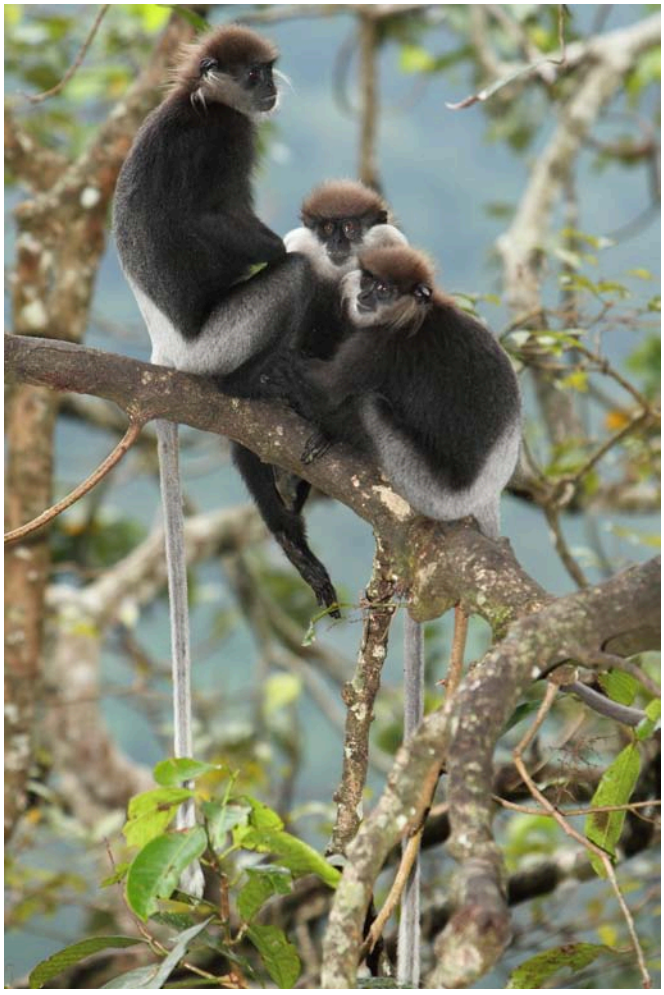

Fig. 3 Mother and infant

Fig. 4 Adult female

Fig. 5 Alpha male

roads, industry or urban expansion. Some individuals will be lost and some will survive in smaller areas but separate from their relatives. Individuals with Galanthus colour morph were mainly observed among the troops inside rain forest and rain forest associated habitats. Most of these rain forests are adjoining to commercial lowland tea plantations and tea small holders, therefore a major issue related to the Galanthus colour morph is encroachment of rain forest by tea cultivations.

Conservation Measures

Although the Purple-faced leaf Langur is protected by Sri Lankan law and categorized as Endangered by IUCN (IUCN Red List 2011) it faces uncertain future if national policies are not actively implemented to ensure the species is protected. Policies and institutions need to ensure protection by fines, research, co-operation with urban planning and strict borders to reserves with surveillance. Forests, wildlife, environment, agriculture, and urban planning all fall into different ministries that rarely cross reference issues of preservation and protection of flora and fauna. Qualitative and quantitative data on existing species is needed for the whole island.

Systematic DNA testing is needed to determine subspecies and form accurate maps of locations and where groups are isolated and gene pools are narrowed. Individual numbers, breeding records, and mortality rate will help determine how stable the populations are and where the greatest efforts are needed to ensure preservation.

Workshops and regional cooperation will help highlight issues to the general public and create awareness. The striking white color morph will also hopefully provide an iconic image for the reinforcement of the current conservational strategies employed, heightening awareness of the vast number of endemics on the island. Village schools need programs to highlight the dangers of removing forests and importance of biodiversity. Sri Lanka has very high biodiversity within the global picture and this is something people need to be proud of in order to protect and keep their rank as one of the most special places on earth.

Fig. 6 School children engaged in plantation

Education programmes for schools children and general public

Five education programmes were organized for school children and public, highlighting the importance of the Southern purple-faced leaf Monkey. Local schools, farmers and public were encouraged to plant the food plants of the monkey (Fig. 6). The role of these primates on pollination and seed dispersal were explained to them.

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***Note**:*
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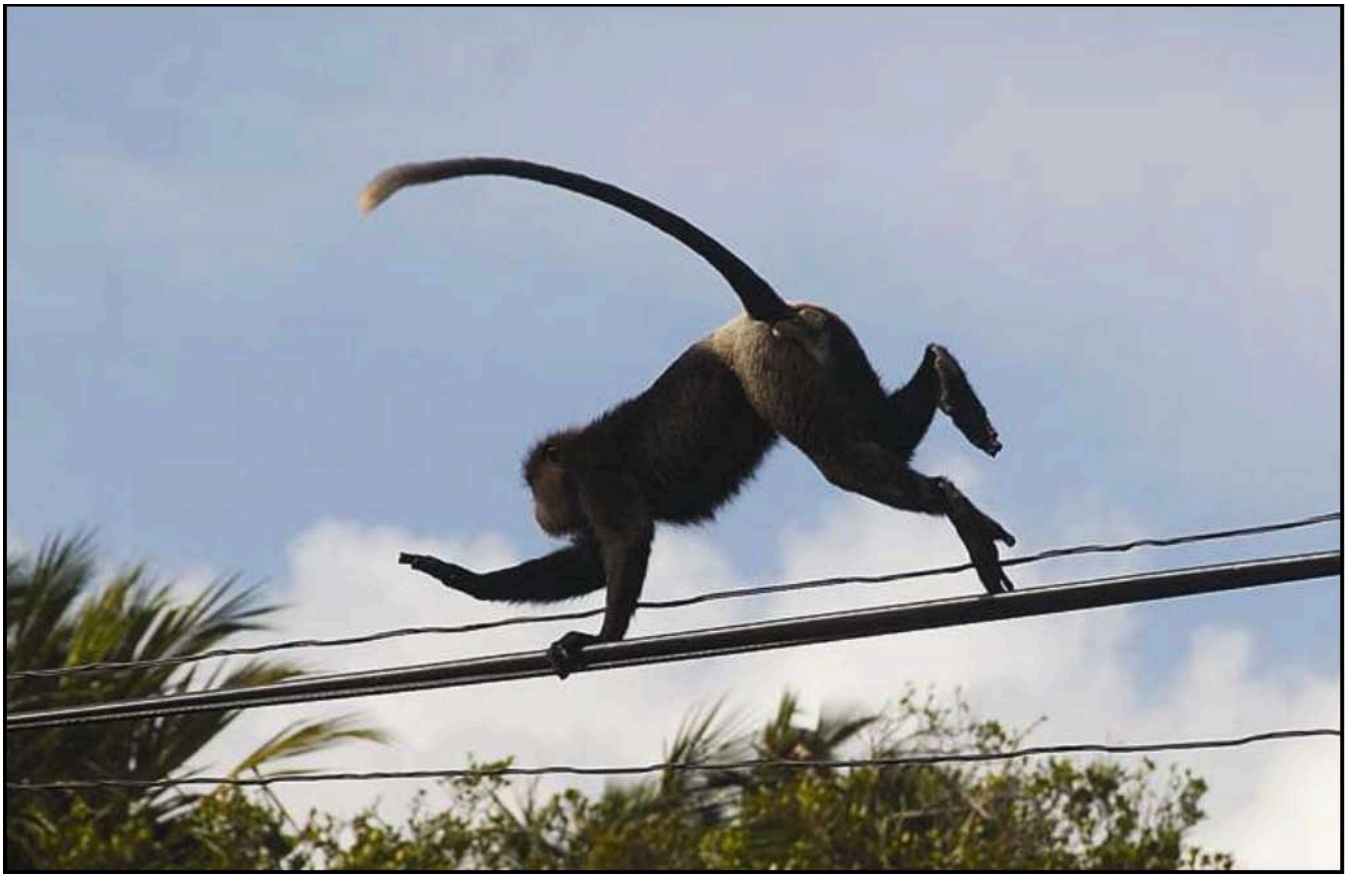

Purple faced leaf Langur using telephone cables to cross the road