GIMLI, THE DWARF ELEPHANT: back in the Udawalawe National Park

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'*Gimli*' has the distinction of being the first scientifically recognized dwarf elephant in the world (Wijesinha et al 2013). He was first observed and identified as such in July 2013 (Wijesinha et al 2013). Subsequently it was found that he had also been in the Udawalawe Park in 2012 (de Silva et al 2014). Since then Gimli has been visiting Udawalawe every year in June - July, which corresponds with his musth period. In 2016 he was first spotted in the Park on the 28th of June and was observed on and off through the 10th of July (at the time of going to press).

In general, usage of the term 'dwarf' is used to denote individuals of unusually short stature. Two forms of dwarfism occur; proportionate and disproportionate.

Proportionate dwarfism: Proportionate dwarfism is where an individual is of very short stature, with limbs proportionate to body size. Small individuals at the lower extreme of the 'normal' range of stature may occur as a genetic trait or stunted growth due to environmental factors such as nutritional deficiency in the growing period. Stunting can currently be observed in Yala elephants, where some young exhibit short stature due to nutritional deficiency consequent to range restriction. Artificial or natural selection of small individuals with a genetic basis can cause continued decline in body size, leading to populations that are well below the 'normal' size range of the ancestral population, that could be termed 'dwarf'.

In many domestic species, selective breeding of individuals with small stature has produced breeds that are well below the 'normal' size range of the original stock. Examples of such 'miniature' or 'toy' breeds of dog are miniature **schnauzer**, miniature **bull terrier**, miniature **poodle** and **miniature pinscher**. Similarly there are miniature pigs, donkeys, horses, etc. These 'miniature' animals retain the proportions and characteristics of the parent breed, except size.

Natural selection for small stature sometimes occurs on islands and is termed 'insular dwarfism'. Insular dwarfism occurred in the now extinct elephants of the Mediterranean islands, some of which were only about 3 feet in shoulder height (Orlando et al. 2007).

Disproportionate dwarfism: In disproportionate dwarfism, the lengths of the limbs are shorter in relation to body size. Such dwarfism occurs due to genetic defects that cause selective retardation of long bone growth, resulting in individuals who are much shorter than the 'normal' range of stature in a population. In humans, achondroplasia is the commonest cause of such disproportionate dwarfism. Selective breeding of individuals with genetic defects causing disproportionate dwarfism has produced breeds of domestic animals that are very small in size and have the characteristic short limbs. Examples of such breeds among dogs are dachshund, basset hound and bulldog. Similarly, selective breeding has produced munchkin cats, Japanese brown cattle and Dexter cattle, Ethiopian dwarf goats and Vietnamese pot bellied pigs.

Genetic defects causing disproportionate dwarfism undoubtedly occur in wild animals also (Wobeser and Runge 1973). However, there are no previous records of adult wild animals so affected in the scientific literature. Disproportionate dwarfism may also be associated with other lethal defects (Wobeser and Runge 1973) and even if not, such individuals are very unlikely to survive till adult in the wild. An individual with disproportionate dwarfism who is a prey animal will find it harder to escape from predators. Similarly, such an individual that is a predator will find it hard to catch prey. In herbivores, individuals with disproportionate dwarfism may encounter difficulties in food acquisition and handling. In group-living species, such individuals may find it difficult to keep up with the group. In

arboreal species such as primates, such a deformity will entail obvious disadvantages in locomotion.

Asian elephants are perhaps an exception to this rule, as they do not have predators, except perhaps a calf being taken by a tiger and that too very rarely. As there are no tigers in Sri Lanka, elephants in Sri Lanka do not even have this threat. The absolute size of elephants and the extended period of maternal care are likely to alleviate the disadvantages of disproportionate dwarfism. While *Gimli* is still the only elephant recorded with disproportionate dwarfism, a recent Facebook post of a captive elephant in India suggests its occurrence in other populations also (see: **https://www.facebook.com/wildlifesosindia/photos/?tab=album&album_id=10151583540448526)**.

Gimli is not resident in the Udawalawe National Park and only visits the Park during his musth period. Male Asian elephants come into musth annually for a period of about two months, when they tend to wander extensively, possibly searching for mates (Fernando et al. 2008). Consequently, the 'musth ranges' tend to be much larger and encompass areas outside 'normal' home ranges. As elephants in Sri Lanka do not migrate long distances (Fernando et al. 2008), it is likely that *Gimli's* normal home range is not far from the Udawalawe Park. The northern and eastern boundaries of the park are contiguous with elephant habitats outside it, that are administered by the Forest Department. It is likely that he is resident in this region and uses the park as well as outside areas. Electric fences on the park boundary split the contiguous elephant habitat, but do not hinder movement of males (Ranjeewa et al. 2015). However, they may cause much harm to female herds, which are likely to suffer from range loss (Fernando 2015). The assertion that *Gimli's* non-musth home range is outside the Park is further strengthened by the presence of a number of lumps on his body, which are caused by gun shot injuries. It is likely that similar to many male elephants in Sri Lanka, *Gimli* spends most of his time in human-dominated habitats, raiding crops opportunistically. The only way to determine his home range, movement patterns and behavior during the non- musth period would be by radio collaring him.

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