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**THE ROLE OF CATTLE, GREY LANGUR AND ELEPHANT IN
SEED DISPERSAL OF THE INVASIVE ALIEN PLANT
PROSOPIS JULIFLORA (MESQUITE)**

A PROJECT REPORT PRESENTED BY

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ABSTRACT

The invasive plants are a major threat to conservation of biodiversity. These plants are capable of replacing diverse ecosystems with few species, which result in a direct threat to native flora and fauna. Hambantota District is classified as the arid zone. It harbors number of areas that are of value in terms of ecology and biodiversity such as Rekawa, Kalametiya, Ussangoda, Bundala National Park, Weeravila sanctuary, Nimalawa Sanctuary, Ruhuna National Park and Lunugamwehera Natiol Park. These areas are mainly important for migratory birds, mammals, small mammals and turtles.

The main objective of this study was to determine the seed dispersal agents of *Prosopis juliflora* with a special emphasis on cattle, Gray langur and Elephant, as these are the three species that mainly feed on pods of this plant. The specific objectives are, to determine the density of *Prosopis juliflora* in the study sites, frequency of seeds present in dung of these three species, germination potential of *Prosopis juliflora* seeds found in the dung of these species and the conditions that determine seed germination, with an aim to establish the dispersal potential of *Prosopis juliflora* by animals.

The distribution of *Prosopis juliflora* in the southern region was investigated using a 500 x 500 m grid. Based on the distribution of *P. juliflora* ten sampling sites were selected. These can be classified, as 3 densely invaded sites (sites 1, 2, and 4), 3 moderately invaded sites (sites 3, 5, and 9), and 4 sparsely invaded sites (sites 6, 7, 8 and 10).

The presence of *Prosopis juliflora* seeds in the dung of the three selected species was determined. *Prosopis juliflora* seeds were found in cattle, gray langur and elephant dung. The percentage of seeds present in each animal dung were Cattle 60%, Gray langur 90% and Elephant 12%.

The in situ germination studies have shown, the best germination potential is in seeds present in Cow dung, and the least germination potential was shown by seeds present in grey langur dung. The seeds present in elephant dung has shown moderate germination potential.

Ex situ germination conducted under eight different conditions indicated that the best conditions for germination were when the dung was broken and kept in the shade with watering. The best germination potential was observed in seeds present in cow dung. Seeds present in the dung of grey langur didn't show germination under any of the conditions provided.

In-situ germination potential of *Prosopis juliflora* seeds removed from dung of cattle, elephant and gray langur on sterile soil was compared. Highest germination potential was observed in cow dung (86.7%) followed by elephant (65%) and gray langur (29.3%). Germination of seeds with and without seed coat indicated that removal of seed coat is necessary for germination and it can be inferred that during the passage of seed through the gut of these three species the seed coat is removed due to digestion.

The distribution study of *P. juliflora* revealed that the plant is undergoing a range expansion. Compared to the last study conducted in 1999 by Algama the distribution along the Matara-Hambantota road has extended by about 33 km towards Matara up to Tangalle town. On the Mirijawila-Sooriyawewa road it has expanded a further 3 km towards Sooriyawewa. On the Hambantota-Tanamalwila road up to 12 km towards Lunugamwehera. From Hambantota to Weeravila, on the Weligatta - Kirinda road *Prosopis juliflora* was recorded up to Kirinda an extension of about 12 km. In addition, during this study *Prosopis juliflora* has also been recorded from Angunakolapelessa and Yala National Park which was not recorded by Algama in 1999. Furthermore, it has invaded number of protected areas in the southern region including Bundala National Park, Lunugamwehera National Park, Weerawila Sanctuary, Nimalawa Sanctuary, Kalametiya Sanctuary, and is found about 2 Km beyond the Ruhuna National Park entrance. *Prosopis juliflora* can grow on various soil types and various climatic conditions (Prakash 1996 and Algama2000). So it can be concluded that in the near future it will disperse even further.

The results of this study clearly indicate that both cattle and elephants feed on *P. juliflora* pods and that they carry viable seeds in their dung. Hence, these two species can be considered as potential seed dispersal agents of *P. juliflora*. The elephant has an annual home range in southern Sri Lanka that vary between 50-150 sq. km for herds and 380 sq. km for a single male when in musth (Fernando 1999). With such a large home range the elephants can disperse this plant over a wide area. Even

though the cattle has a smaller home range both cattle and their dung are transported by man over long distances. For instances cattle dung is transported to as far as Nuwara Eliya as fertiliser for vegetable cultivation. Therefore, cattle dung pose even a bigger threat than elephants when one takes into consideration their role in dispersion of this invasive plant. Therefore, it becomes apparent that animal activities together with human activities has contributed to a range expansion of this invasive alien species. As the previous studies have shown that the plant can establish in a variety of soil and climatic conditions it can develop into a serious threat if quick action is not taken to mitigate the spread of this plant.

