2.0 Executive summary of the project

Sampling of fireflies in five selected habitats in Hambantota, Matara and Galle Districts of Southern Province was conducted during October 2006 to December 2009. Samplings were carried out in two natural habitats; a mangrove forest and a natural forest and three agricultural habitats *i.e.* vegetable/ paddy cultivation, coconut and tea plantations in each district. Transect sampling was done using sweep nets. Collections of fireflies were carried out from 6.30 p.m. to 9.30 p.m. within the study period.

From the collected adult fireflies eight firefly species namely, *Luciola chinensis, L. melaspis, L. humeralis, L.cingulata, Dioptoma greeni, D. ademsi, Diopenus latesence Lampigera tenebrosa* and *Honasca necrobiodes* were identified using the available taxonomic information and reference collections at National Museum Colombo and HORDI Gannoruwa. However other fireflies were identified only up to the genus level due to the unavailability of specimens in the reference collection. All of these unidentified species were belong to the genus *Luciola.* Firefly larvae other than mature *Lampigera* sp and *Stenocladius* sp were not classified.

However, leading firefly taxonomists in the South East Asia and Australia indicated that it is necessary to revise the taxonomy of Sri Lankan fireflies in par with the recent taxonomic revisions of fireflies in the world. According to the recent reviews, L. *chinensis* is categorized under *L.praeusta* complex together with four other Sri Lankan luciolones namely, *L. vespertine, L.intricata, L.perplexa* and *L.promelaena.*

Present study also revealed that *L. chinensis (L.praeusta)* was the dominant lampyrid species in all habitats of three districts in Southern Province. The abundance of *L. chinensis* was well marked in all three agro ecosystems *i.e.* Matara (65%), Galle (58%) and Hambantota (53%). However in natural ecosystems in all the three districts their percentage abundance was less than 40%. Among other firefly species *L. melaspis* was highly abundant in tea plantations of three districts. Four species, *L. cingulata, D. ademsi* and *D. latesence* were the least abundant.

Studies on factors which favour the abundance of fireflies indicated that rainfall shows positive impact on the abundance of fireflies. Important predators of fireflies are

spiders and they were entangled in spider webs. Gastropod mollusks namely slugs and snails are the most important prey of firefly larvae and larviform females.

Studies on active time indicate that fireflies are active mostly from 7.00 pm to 9 30 pm though they could be seen throughout the night. They start initially at ground vegetation level and tend to fly higher. However, congregate synchronous flashing behaviors which are very common in *Pteroptyx* fireflies in South-east Asian countries were not observed in fireflies in the Southern region.

Mean values of Shannon's Diversity index showed that the highest species diversity in natural habitats of Galle District. Results also indicated that natural habitats had higher species diversity than the agro ecosystems in all three districts. Unidentified Luciolinae species indicated that the possibility of new species or colour morphs of fireflies in Sri Lankan firefly fauna.

Present study gives valuble information on fireflies in Sri Lanka. It is essential to carryout island wide sampling to study the firefly fauna in Sri Lanka. Larviforms and larvae of fireflies play a significant role as predators of snails and slugs, hence important as natural enemies of agriculturally important molluscan pests.

The high abundance of fireflies in our natural environments could be incorporate into future ecotourism activities as different firefly species have different light emitting patterns. Continuation of these studies very important for Biodiversity studies of Sri Lanka as it is known to have unique firefly species such as endemic fireflies, diurnal fireflies well as very active predators of harmful invertebrates.

Keywords: *Fireflies, Diversity, Natural habitats, Agro-ecosystems, Sri Lanka*