

SILENT VALLEY PHYSIOGRAPHY, FAUNAL EXPLORATIONS AND GENERAL OBSERVATIONS ON FAUNA

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A. PHYSIOGRAPHY

Located within the bowels of the Western Ghats in Kerala, Silent Valley, also known as Syrandhri Vanam, is a reserve forest covering an area of 8952 hectares. The Western Ghats mountain range has a broad, saddle-shaped depression near Palghat, constituting the Palghat gap. North of this gap, the ghats rise rather abruptly and the Silent Valley plateau is perched on the western side of this steep slope and is located at 11° 05' N latitude and 76° 26' E longitude. Towards its north, part of the boundary is formed by Nilgiris and part by the vested forests of Nilambur Division which extend slightly on the western side also. The northern side of the range is about 1800 metres above sea level and is fringed by hills such as Anginda, Sispara and Kozhipara rising to 2200 to 2400 metres. On its south, Silent Valley Reserve is about 685 metres high and is bounded by vested forests of Palghat Division. On the east, Attapadi Reserve is contiguous with it and on the west it is shared by the forests of Nilambur.

Silent Valley is roughly a rectangular table land at an elevation of around 1100 metres and is flanked to the south and the west by steep escarpments descending a thousand metres to the plains of Kerala and to the north and east by sheet walls rising another thousand metres to the upper plateau of Nilgiris. The rugged topography, steep slopes, dense forest cover and abundant streams make the area almost impenetrable. This natural inaccessibility was largely responsible for the area to remain very much unknown even to forest officials till lately. Even tribal settlements do not exist in this plateau. The area remains even today as one subject to least disturbance from human agencies in comparison with the rest of the Western Ghat forests.

Kunthipuzha (Kunthi River), a tributary of Bharatha Puzha, takes

its origin from Silent Valley and runs all along the centre of the Silent Valley in a north-south direction. Originating at an elevation of almost 2400 metres on the outer rim of Nilgiris, Kunthipuzha descends rapidly to 1150 metres on the northern edge of the plateau. Thereafter it pursues a gentle southwardly course to cascade down to the plains of Mannarghat through a gorge. All its major tributaries originate from the eastern slopes. The main stream channel is uniformly shallow with vegetation often coming right upto the water's edge indicating absence of water level fluctuations during the heavy monsoon months. The average annual run-off is estimated at 293 million cubic metres. The catchment forests are practically undisturbed, thick and impenetrable. The riparian zones also sustain some of the finest evergreen forests. The Kunthipuzha drainage is separated from the Bhavani drainage to the east by a north-south ridge, starting from Anginda and terminating at Mukkali.

The Silent Valley plateau has an average precipitation of 460 centimetres distributed over the eight months from May to December. There are two monsoon periods ; the principal monsoon is from May to August. Dry season extends usually from January to March/April. The average temperature ranges from 15°C to 25°C. Atmospheric humidity in the dry season varies from 30 – 80%.

Scanty geological data available shows that the Silent Valley forest area is a laterite table land with soil belonging to red ferruginous series with rock formation of gneisses and granites.

Silent Valley forests have been variously designated as Savannah Forest, Monsoon Forest, Tropical evergreens etc. According to the accepted revised survey of forest types in India by Champion & Sethi (1968) Silent Valley forests fall under the tropical wet evergreen forests. The common trees in these forests are *Palanquium ellipticum*, *Mesua nagassarium*, *Poeciloneuron indicum*, *Cullenia exarillata*, *Machilus macrantha*, *Calophyllum elatum* etc. Treeferns belonging to the genus *Alsophila* are also present in this forest.

Silent Valley is very important from the botanical point of view because of the diversified complexity of vegetation and flora. The Botanical Survey of India has so far identified 77 species of lichens, 83 species of mosses, 77 species of pteridophytes and more than 1600 species of angiosperms. Many new species and new additions to India/

South India have been discovered from this area. The diversified complexity of flora and the presence of new, rare, endangered economically important species has been brought out by Nair (1980, 1981).

Silent Valley has attracted more public attention and debate in recent years than any similar region anywhere else in the world in the wake of a hydel project proposed to be constructed across Kunthipuzha. In view of the continuing controversy over the project, a Joint Committee was set up by the Government of India to arrange for studies and to examine all aspects relating to the ecology of the Silent Valley with the specific task of determining as to whether the hydel power project, could be taken up without significant ecological harm. It was at the instance of this committee that the multi-disciplinary field investigations were undertaken in these forests. The Southern Regional Station of the Zoological Survey of India, Madras spearheaded these field studies and the papers appearing in the following pages arose out of these. A report embodying the findings and establishing its faunal uniqueness has already been submitted (Pillai, 1981). A plea for the total preservation of the Valley and abandonment of the project has been made in this report.

B. FAUNAL EXPLORATIONS

Silent Valley forests were totally unexplored from the Zoological point of view. Practically nothing was known in scientific literature on the fauna of the area and this was one of the primary urges for initiating faunal studies in the region by the Zoological Survey of India. The opportunity offered itself in the wake of the controversy over the hydel project.

The tropical rainforests that covered the entire Western Ghats in the past have so much been modified and interfered with, that only few areas now remain which represent the original conditions that prevailed before. Though the stability of such "ecological islands" is fast declining, the relict characters of fauna and flora are largely preserved here. Silent Valley forests represent one such large ecological island in Western Ghats, the faunal features of which was totally unknown.

In anticipation of a unique fauna, the Zoological Survey of India undertook faunal explorations in Silent Valley. The main objective

was to study the fauna which was expected to reveal species hitherto unknown to science, to bring out their Zoogeographical importance and affinities and to catalogue and assess the overall wealth of animal resources available there, particularly in the wake of the possible damages that are likely to be introduced to the ecosystems along with the construction of the hydel project. Accordingly four faunistic explorations were carried out by the Southern Regional Station, Madras as detailed below.

1) A multi-disciplinary expedition organised by the Geological Survey of India, Kerala circle in January-February, 1979 was the first one. The Geological Survey of India provided all infrastructure such as tentages, porters and such other help needed by the other participating departments. The object of our participation was to make general faunal collections. All major groups excepting Birds and Mammals were collected. Special emphasis was given to Amphibia and fishes. The survey was carried out from three camps, the first one at the proposed dam site. The second and third camps were established in the remote, interior areas. Collections from one end to almost the other end of Silent Valley were made along the course of Kunthipuzha. This expedition was before the controversy.

2) The second survey was carried out jointly by the Zoological Survey of India, Madras, Zoological Survey of India, Calcutta (Headquarters Office) and the Botanical Survey of India, Coimbatore in January-February 1980. Two camps were established for collections, one near the damsite and the other at Valiaparathode. General faunistic collections were made as in the earlier survey.

3) A multi-disciplinary study team drawn from Zoological Survey of India, Botanical Survey of India, National Bureau of Plant Genetic Resources, Birbal Sahni Institute of Palaeobotany and Centre for Advanced studies in Botany (University of Madras), visited Silent Valley in April-May 1980. This expedition, undertaken at the instance of the Department of Science and Technology, New Delhi, conducted further surveys with special emphasis on the submergible area and the riparian zone. The study teams addressed themselves to the filling up of a questionnaire earlier prepared, besides collection of information useful to ascertain the ecological importance of the area with reference to the possible impact of the hydel project.

4) The last multi-disciplinary expedition was organised in December, 1980 wherein 5 departments participated.

The faunal collections were made primarily for taxonomic studies. Part of the material was studied by the scientists of the Southern Regional Station, Madras but the bulk of the material was sent to specialists working in Headquarters, Calcutta and other Regional Stations of the Survey.

As a result of these more than 10,000 examples of animals belonging to several groups were collected from a wide variety of ecological niches. Some of these niches are, thickly wooded forests with unbroken canopy, open forests, grasslands along hill slopes and valleys, reed forests, marshes, riparian forests, forest litter, aquatic (main stream, tributaries and stagnant water) and soil. Fauna from inside fallen, rotting timber and those from vegetation was also collected. Light trap collections and nocturnal excursions were also made to collect nocturnal forms.

The following are the more important groups of animals collected from Silent Valley.

INVERTEBRATA : Nematelminthes, Annelida, Crustacea, Collembola, Diplura, Thysanura, Odonata, Orthoptera, Phasmida, Dermaptera, Isoptera, Hemiptera, Thysanoptera, Neuroptera, Lepidoptera, Diptera, Dictyoptera, Hymenoptera, Coleoptera, Arachnida, Myriapoda and Mollusca.

VERTEBRATA : Pisces, Amphibia and Reptilia.

Visual identification was done for the larger reptiles, birds and mammals. A few small vertebrates were collected.

C. GENERAL OBSERVATIONS ON FAUNA

The faunal explorations made so far in Silent Valley have been far from exhaustive. In fact the collections hitherto made constitute only a very small proportion of its faunal wealth. Even so, it reveals that the animal resources here are both rare and unique. Rare, because many animals of similar kind which originally inhabited the Western Ghats belt in the past have been lost due to habitat destruction. How-

ever, they are available still in this tract which has been relatively free from human intrusion on account of its providential inaccessibility. A number of species which were available in the past and which have not subsequently been collected are still available in Silent Valley. They include insects, arachnids, fishes, amphibians, reptiles and mammals. Type specimens of many of these, described earlier by foreign scientists have been deposited in museums outside our country, even topotypes not available in India for reference studies. It is unique because what has been collected and studied proves to be of immense scientific interest from the taxonomic, zoogeographic and ecological points of view.

A few primitive groups and species of animals which could throw light on phylogenetic relations of higher taxa have been collected. Several endangered and rare species, particularly of higher taxa, are available here. The lion-tailed macaque, *Macaca silenus* and the Nilgiri Tahr, *Hemitragus hylocrius* are already endangered. Some very rare mammals like Peshwa's Bat (*Myotis peshwa*) and Hairy-winged bat (*Harpiocephalus harpia*) have also been recorded. Both these species are represented by only a handful of specimens in the museums all over the world. Five "vulnerable" mammals also live here. Other rare birds such as Ceylon frogmouth, Travancore red spurfowl, Grey jungle fowl, Bush Quail, Black eagle, Blue-winged parakeet and reptiles like the Indian monitor and Rock python and the only endangered species of Amphibia viz. The Malabar Tree toad, *Nectophryne tuberculosa* are also available here. Many new taxa have been published from this area. Some more are being published in this volume. It is quite legitimate to expect that more explorations would unfold more number of new taxa. The material collected so far has yielded very many new records, some for western ghats and some for the country. Zoogeographically this area is very interesting. Close relatives of a number of animals found in Burma, Thailand, Malaya, Philippines, Sri Lanka etc. have been discovered here.

The Valley also presents a wide variety of habitats ; living resources are available here in all their glorious diversity ; populations of globally rare species of animals, both higher and lower groups of vertebrates continue to exist here. In short, Silent valley satisfies all the basic attributes required of a Biosphere Reserve.

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