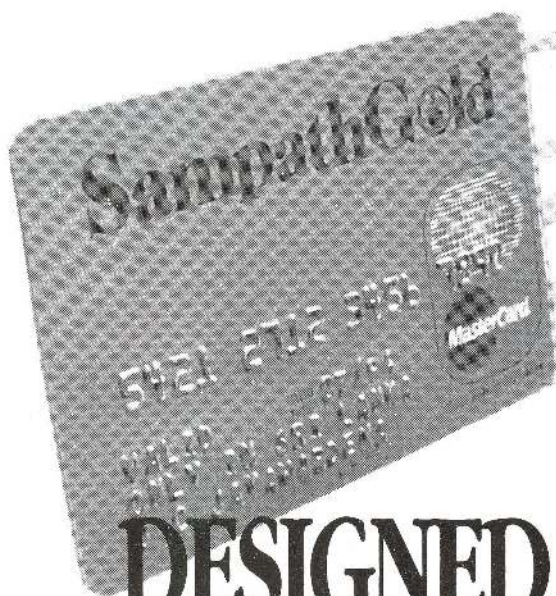




LORIS

THE JOURNAL OF THE WILDLIFE AND
NATURE PROTECTION SOCIETY OF SRI LANKA
VOL. LXI NO. 6 DEC 1997

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LORIS

THE JOURNAL OF THE WILDLIFE
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SOCIETY OF SRI LANKA



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EDITORIAL

This year, 1997, has been declared the International Year of the Reef and on marine life and coast lands and it is good for us to fix our attention on it. Sri Lanka has 1700 km. of coastline and it is vital that we pay attention to conserving it, just as we are concerned about natural forests. The coral reefs are the primeval "rain forests of the sea." Coral reefs have complex eco-systems and sea creatures such as sea weeds, polyps and a multitude of sea creatures inhabit these areas. Strict new rules on export of exotic marine life have to be introduced to stop the plunder of marine creatures. Sea horses for example are sought after for Chinese medicine and are much in demand and are sold for seven times the price of silver - \$1250 a kilo in Hong Kong.

Great rolling waves lash the coastline and there are violent storms during the monsoons when the winds blow at high velocity and the turbulent waters churn the sand and breaks the sand banks and damages the coastline. The submerged reefs running parallel to the southern coast of the Island just six miles off the coast have existed for more than 3000 years. Coral reefs, alluvium, estuarine clay, beach and dune sands and beach bedrock and sand from river alluvium are found in the coastal belt. Rivers carry a large amount of sand, silt and clay into the sea. The lowest peneplain and coastal plain extend outward from the island and under the sea as a continental shelf for a distance of 25 miles and it is 216 ft. below the level of the Indian Ocean. We have got to remember that over 2/3 of the earth's surface is covered by sea and it needs our concern. At Trincomalee, where the Mahaweli Ganga flows to the sea, in Kumana near Kumbukkan Oya, near Matara close to the Nilwala Ganga, there are "submarine valleys" where it is deep near the coast. There are other areas like Mt. Lavinia, Hikkaduwa, Bouna Vista, which have shallow seas rich in marine biodiversity. The southern beaches are broad and are extensive stretches of beach land. From Chilaw to Mannar too, the coastal areas are continuous. The Bouna Vista reef with its 491

species of fish rivals the world famous Great Barrier Reef in Australia which has 500 species of fish. Recent studies have shown it has the highest diversity as a marine habitat. It is the breeding grounds for over 491 species of reef fish and hundred of marine invertebrates including the leather back turtles and green sea turtles, and sea birds. It has one out of five species of fish and 39 out of 83 species of protected marine invertebrates. We should be alert, as it has been found that 39 out of 72 species of fish and 21 out of 37 marine invertebrates found in this reef are listed as threatened in IUCN Red data book.

The lobster is a coral species which has suffered from over harvesting. Coral has been protected under the 49th Amendment of the Fauna and Flora Act, 1993. Coral reefs are important breeding grounds for marine organisms and should not be harmed. The development of Marine Parks or Sanctuaries is good for protection of marine life. It needs to have zones of marine parks and strict control ensured. In coral reefs we find Black Groupers, Epinephems Fuscoquittas which weigh over one hundred pounds which are victims to spear fishing. Picutresque Trincomalee, with its clear blue sea and rugged outcrops, have Dolphins which need protection. In the northern coast dolphins are killed daily and it is a shame. Ornamental fish are spirited away and exported.

In the past, people like Whitcarch Bennet, a British Civil Servant, started studying coastal fish scientifically, and he published a book in 1828. P.E.P. Deraniyagala and A.S. Mendis gave us an understanding of 846 species of fish in coastal waters. In modern times, Dr. Charles Anderson and Rohan Pethiyagoda have extended our knowledge of Sri Lankan fish. It is now left to us to think seriously about the conservation of our coral reefs and coast land.

THE UNDERWATER WORLD

Valeri Ekanayake

As a Scuba Diving educator for the past 20 years, I have spent more than the average person underwater. I have dived many hours either teaching basic Scuba Diving to novices, advanced classes like Photography, Wreck or Naturalist Diving.

I have been fortunate to encourage and influence my students to take more than an initial look at our exciting and mysterious underwater realm. Many people are simply interested in the sport side and then others immerse themselves fully, going on to discover the intricate details of the last frontier on earth.

Sri Lanka offers magical vistas to any swimmer with an inquisitive desire to observe the wonders of a tropical underwater world through the glass of a mask.

I feel I need to sound a warning - Sri Lanka's Seas won't remain so clean and untouched for much longer if litter awareness and an underwater hands off approach is not endorsed.

Dynamiting is a great problem and goes had-in-glove with the authorities and it continues to have extremely destructive effects on marine life. Dynamiting leads massive areas in the ocean completely traumatised and dead. What it does to marine mammals who have eco location behaviour is anyone's guess. Dynamite fishing is not only destructive but it is senseless as the fisherman are ignorant of the sometime meter deep layer of fish lying close to the bottom and this is just left to surge with the current. Why kill if you don't eat it?. Such wastage is very concerning.

Another problem is the colour fish collectors who use the nets. Off Pigeon Island, collectors catch colour fish by placing nets over the coral heads. These fish are sold as dried fish for the Colombo market! The Maldive Islands have

their whole economy running from their lucrative underwater tourism but what do Sri Lankans do? They bomb the reefs, dry the fish and break the corals by nets or hammer.

Dynamiting is used daily on a massive scale for security purposes to prevent terrorist infiltration.

The seas are slowly but surely being taken over by the forces and the horrible noose of war strangles Sri Lanka intellectually, physically and economically. Would it not be realistic that the Navy start a monitoring system of the marine animals as they are the only ones capable of logging the sightings in the seas?. I realize that at times the locations and times must not be divulged for security reasons; but surely the Navy could provide data for logging to Universities even at a later stage. The war rages and the environmental destruction goes on and if during the boring hours a sailor at sea could help the future of the Island's fishing, tourist industries it would be a great service.

In areas wherever possible the private sector should be encouraged to invest a little time and effort to grow/construct and entice fish and mammals back into our coastal waters. Fish habitats which provides a haven for breeding and feeding should be placed in areas and guarded by wardens with scruples and a thorough understanding of the importance of keeping the seas stocked with fish.

Now is the time to grow Sri Lanka's future seafood... wait too long and a desert will develop. Other countries are creating fish habitats and developing sport fishing. Imagine the lucrative business for tourism with underwater sites (Underwater Structures) sold off by lease, Boat hire, angling amateurs can notch up records for outstanding catches. A business created for pleasure, such simple fun. Research can go hand in hand, saving the fishing industry and consultant's fees. A quote from Dr. Arthur C

Clarke at Singapore's ADEC 96 exhibition "The ocean is mans last frontier. Until now we have been hunters and gatherers..... now we must be responsible farmers."

For some reason it is not common knowledge that man made reefs are environmentally good. The idea of building or placing some object in the ocean usually receives the remark that it is not understood and it may pollute the water. My answer to this is.. have you ever dived under a pier and seen the growth on the underwater structure. I have spent hours recording on video the success of reef building and what could be considered a fish farm. From the disasters of seafarers is born a nursery for any marine fish or animal lucky enough to attach itself or take the haven of a ship wreck. Sri Lanka, for reason I shall not say, has its good share of shipwrecks along its coasts and particularly at its harbours. Shipwreck diving is exhilarating, totally absorbing and can blatantly show you the natural tendency and ability of marine life/fish to develop on objects left in the ocean.

I can personally show you on a video or by Scuba a shipwreck which was scuttled by the authorities in 1983. This wreck provides refuge to massive 7ft. groupers, jacks dwelling at the

level of 90ft. appear as weaving bodies of shiny steel as they swim in and around the massive stern of a car carrier. One can glide over the deck area which still carries the cargo of cars long doomed and now delight the diving enthusiast with bursts of purple and orange as inquisitive schools of bat fish circle over the silent engine area.

It has happened that divers have mistaken the shadow of the peaceful plankton eating whale shark with that of our boat. Sri Lanka's richly plankton laden seas support a myriad of fish and marine life. Barracuda schools circle in their magnificent swirling schools... A site to behold! Dolphins visit us but are less frequently logged as security dynamiting is now frequent.

The ocean continues to fascinate me as it draws me to it with ever increasing respect. My sense of wonder at a potentially destructive "sirry sirry" bag caught between rocks. On first examination it appeared as a new variety of sponge or tiny coral as it surged in the continual motion of the ocean. Then I discovered to my surprise that it was very beautifully covered in minute multi-coloured sponge like growth which I marvelled at their ability to attach and survive and reform. It was the most beautiful polka-dotted "sirry sirry" bag I have logged!

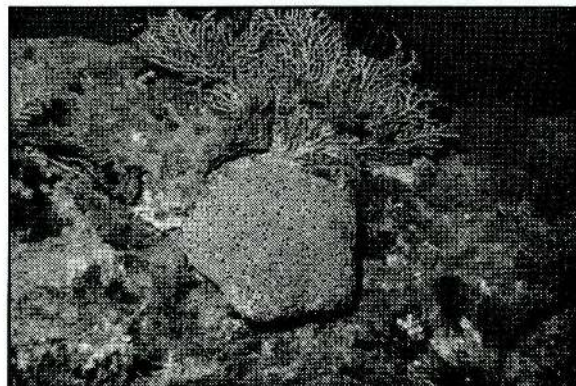
REEF PHOTOGRAPHS



Schooling sweetlips great basses reef



Pin cushion starfish very common on most reefs - Colombo



Schooling snapper shallow reef areas -
Hikkaduwa



Semicircle angelfish found in coral rich areas as well as caves and wrecks, solitary - Hikkaduwa reef.

- Valerie Ekanayake -

THE "FLAMINGO MOUNDS" OF BUNDALA

Rex I. De Silva, Aruna Kirtisinghe & Dushyantha Perera

Over the years there has been speculation that the Greater Flamingo *Phoenicopterus ruber* may breed, or attempt to breed, in the Bundala National Park (Samarasekera 1986, Perera 1987). The reasons for this belief are :

- (1) The presence of juvenile and sub-adult birds in the Park; note however that chicks have never been reported.
- (2) The presence of low mounds which become accessible when the water in Bundala Lewaya recedes during the dry season. It has been suggested that these may be nests of the Greater Flamingo (Perera *op. cit.*)

During the past three years we have regularly been visiting Bundala Lewaya and like many others before us have been intrigued by these mounds. We wondered whether they were in fact actually built by flamingoes and if so whether they were nests. John and Judy Banks (1988) quoting McLachlan and Liversidge (1978) had suggested the possibility that these mounds were the natural result of a feeding strategy adopted by Greater Flamingoes which:

"Usually feed in shallow water, the head bent down and forward so that the upper mandible is beneath the lower. In this way they move forward zig-zagging the head from side to side. More often they stand in one place and rotate while stamping up and down, thus forming a circular mound of mud."

We have seen flamingoes feed in this manner, but this explanation cannot account for the structure of the mounds in Bundala.

On 5th April 1997, after the lagoon waters had receded, we investigated the "field" of mounds near the "Moya"* at the southern part of Bundala Lewaya (Figure 1a). There were 696

mounds spread over an area of approximately 100m by 9m. Twenty one mounds, selected at random, were measured (Table I). We examined the transverse sections of two mounds which had earlier been partly damaged by vehicles (Figure 1b).

Each mound was built of lagoon substrate (mainly coarse sand and mud) and was in the form of a truncated cone with a shallow, roughly saucer-shaped, depression at the top. The upper 2 cms. or so were reinforced with flamingo feathers and shells of a bivalve mollusc *Mactra* sp. (Figure 1c). This in our opinion, precludes the suggestion that these formations were a natural consequence of the feeding process. The presence of (the distinctive) flamingo feathers appears to confirm the popular belief that the mounds are in fact the work of these birds.

The form of these structures agrees well with descriptions of the nests of Greater Flamingoes as given in the literature (Ali & Ripley 1983, Henry 1955, Legge 1983). We therefore concur with Perera (*op. cit.*) that they are probably nest-mounds; we have however found no evidence to suggest that flamingoes reproduce successfully in Bundala (or anywhere else in Sri Lanka) at present.

We suspect that these nests were abandoned prior to commencement of egg-laying possibly due to disturbances from "off-road" vehicles, tractors, fishermen, dogs etc. (Observations from Africa have shown that breeding flamingoes are apt to desert their nests at the slightest disturbance).

* Moya -

Lagoon Mouth (currently closed by a sand-bar)

Table I**Greater Flamingo "Mounds" at Bundala Lewaya**

No.	Height (cms)	Base dia. (cms)	Top dia. (cms)	Depress- ion dia. (cms)	Depress- ion depth (cms)	Distance from nearest adjacent nest (cms)*
1	10.2	45.5	28.0	15.3	1.3	92.7
2	9.9	51.0	34.0	20.3	1.3	80.0
3	10.2	47.0	27.0	17.8	1.3	75.0
4	12.7	54.5	30.5	17.8	1.3	95.5
5	12.0	56.0	29.0	17.8	1.3	99.0
6	10.2	48.0	27.5	19.0	1.4	79.5
7	12.0	49.5	26.5	17.8	1.3	67.3
8	10.2	53.5	29.0	17.6	1.3	82.5
9	12.7	43.0	26.5	16.5	1.3	100.5
10	11.4	48.0	25.5	17.6	1.4	133.5
11	9.6	57.0	29.0	17.8	1.3	101.5
12	11.4	49.5	26.5	19.0	1.2	90.5
13	10.2	56.0	29.0	17.8	1.3	95.2
14	11.4	46.0	26.5	19.0	1.3	92.7
15	10.7	53.5	28.0	17.8	1.2	73.5
16	10.7	51.0	28.5	20.0	1.3	91.5
17	12.5	44.0	28.0	13.0	2.0	99.5
18	12.5	49.5	30.0	18.0	1.5	89.5
19	15.0	45.0	31.0	20.5	1.3	73.5
20	6.5	44.5	29.5	17.0	1.5	108.0
21	9.0	46.5	30.5	19.2	2.0	107.5
Mean:	11.0	49.5	28.6	17.9	1.4	91.8
Std. Dev.	1.7	4.3	2.0	1.67	0.2	15.0
Range	6.5-12.7	43.0-57.0	25.0-34.0	13.0-20.5	1.2-2.0	67.3-133.5

*Measured between centres

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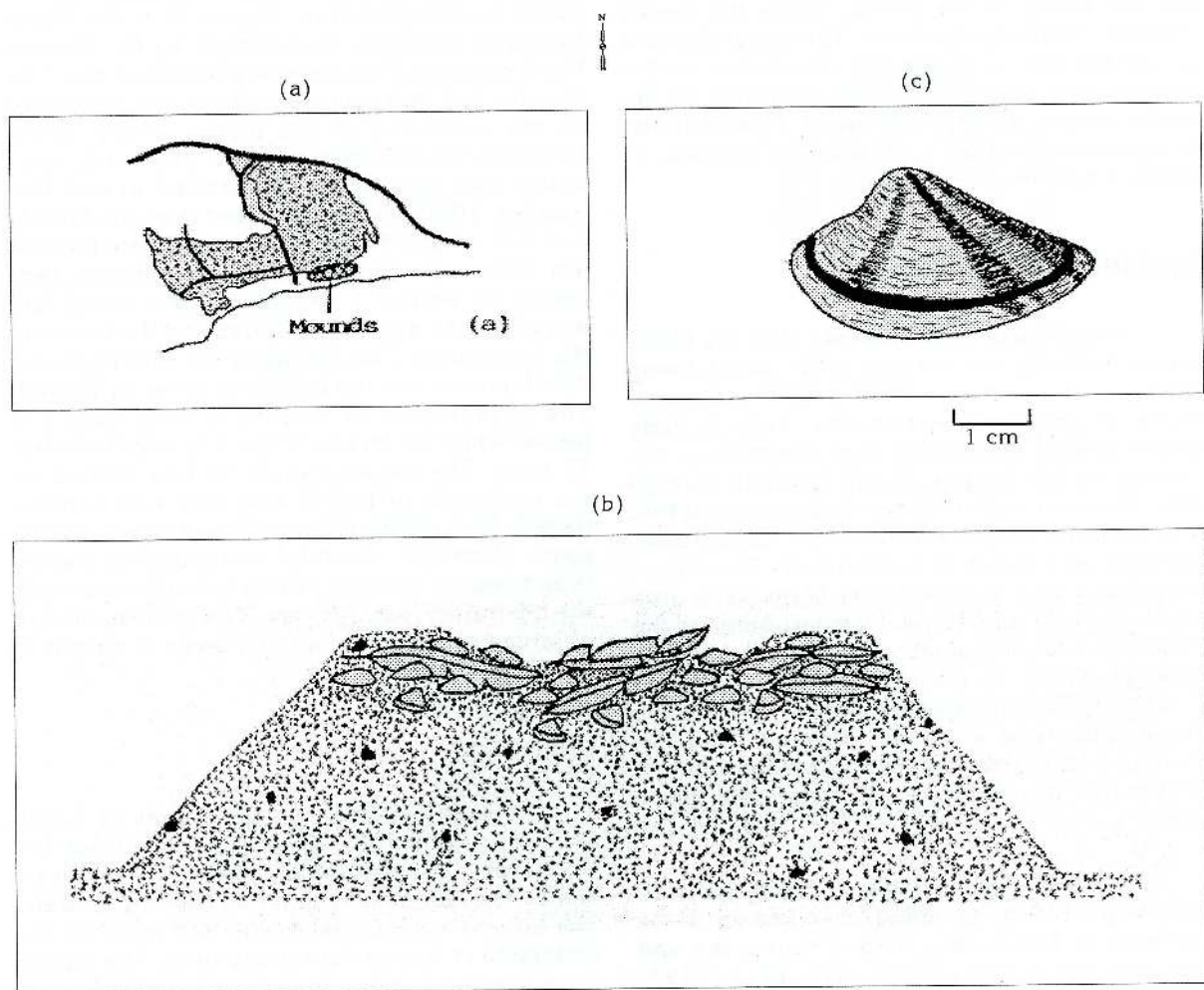


FIGURE 1

- (a) Bundala Lewaya showing approximate location of mounds.
- (b) Transverse section of a mound (semi-diagrammatic).
- (c) *Mactra* sp.

SOME OBSERVATIONS ON THE NATURAL HISTORY OF THE BLACK PRINCE

Dhammithra Samarasinghe

INTRODUCTION

The black Prince (*Rohana parisatis*), which belongs to the family Nymphalidae is the only species found in Sri Lanka, under the genus *Rohana* (Formerly *Apatura*). The genus *Rohana* is represented by 9 species distributed in the tropical and some temperate countries of the world (Smart, 1989). The family Nymphalidae is represented in Sri Lanka by 40 species, of which 8 species are endemic.

DISTRIBUTION & STATUS

Woodhouse (1940) stated that the black prince butterfly was not rare in Sri Lanka, being fairly common between 2000-4000 ft and scarce below or above these altitudes. John & Judy Banks (1985) stated that it is uncommon, occurring in the jungles of the foothills to high hills. However, recent observations suggest that this butterfly is quite rare in Sri Lanka now, possibly as a result of habitat loss. Recently, I recorded a pair at Kaluntenna-Idamakelle area (Upland area) and some breeding pairs at the Peradeniya Royal Botanical Gardens. It has also been observed at Maskeliya (Highland area, C.N.B. Bambaradeniya pers. comm.), Peradeniya Royal Botanical Gardens (Upland area, G. Vanderpooten pers. comm.), and Peradeniya University premises (P. Paranagama pers. comm.)

This species occurs in India as well (Gaonkar, 1996). In India, it is known to be common in Tamilnadu, Kerala, Karnataka and Goa and rare in Maharashtra. Gay et al (1992) states that this species is confined to hilly forests in southern India and also distributed from Kumaon in northern India to further eastwards.

OBSERVATIONS ON THE LIFE HISTORY

On the first week of January, 1997, a couple of black prince butterflies was observed in a *Celtis lycodaxylon* tree (Figure 1) at the Royal Botanical Gardens, Peradeniya, by Mr. George Vanderpooten, who promptly informed me. The females had laid a single egg per leaf cemented to the underside of the leaves. Many newly hatched caterpillars were also observed, indicating that egg laying had started in late December, 1996. It was estimated that one female had laid around 50 eggs. The eggs were located 4m above ground level and distributed randomly on leaves. I collected three newly laid eggs from the above tree and raised the larvae in the laboratory. The details of the metamorphic development and life history is given in Table I. The eggs (Figure 2) hatched in three days (72 hours) while the larvae (Figure 3) pupated after 27 days. The pupae (Figure 4) was formed on the underside of leaves and was well camouflaged. The adults (Figure 5) emerged after 8 days. Therefore, the total metamorphic period (egg to adult) of black prince butterflies reared in the laboratory was 38 days. The growth change of larvae recorded on a daily basis is shown in Figure 6.

FEEDING

The larvae feeds on the leaves of *Celtis lycodaxylon* and *C. tetrandra* (Family: Ulmaceae). It is a voracious feeder, which consumes the leaf margin and mid regions as well. The larva is a nocturnal feeder and rests on the underside of leaves during day time. The adults were observed in scrubland, visiting flowers of *Lantana camara* (Family: Verbenaceae), *Eupatorium odoratum* (Family: Compositae) and other small shrubs.

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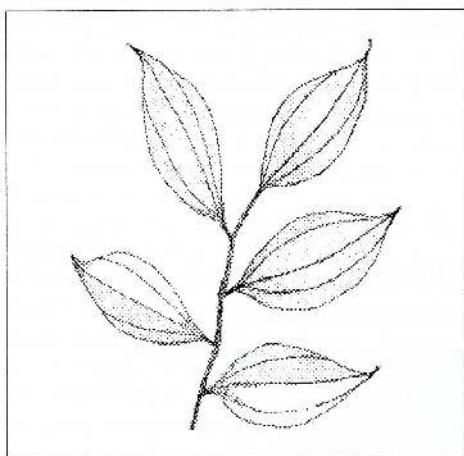
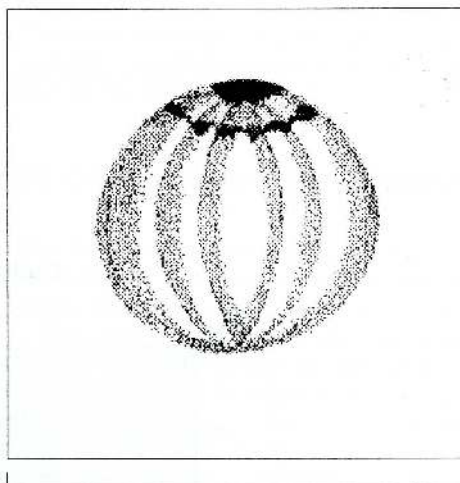


Figure 1

The leaves of larval food Plant (*Celtis lycodaxylon*)



Scale : 1mm : 5cm

Figure 2 : The Egg

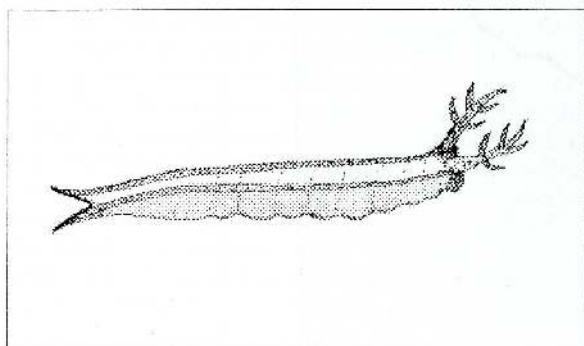


Figure 3

The larvae

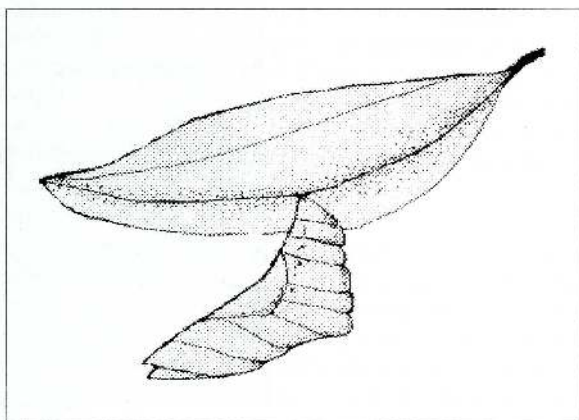


Figure 4

The pupae

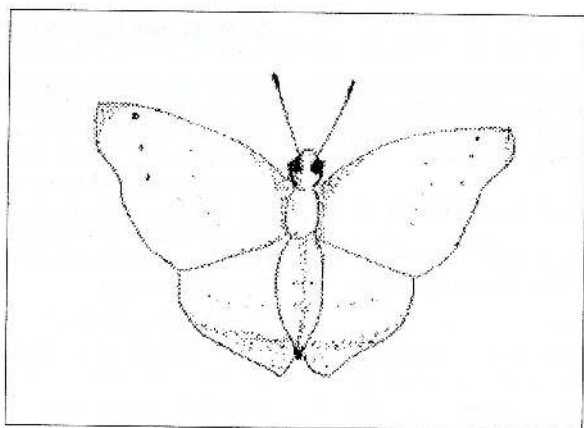


Figure 5
The adult

Daily growth of Caterpillar

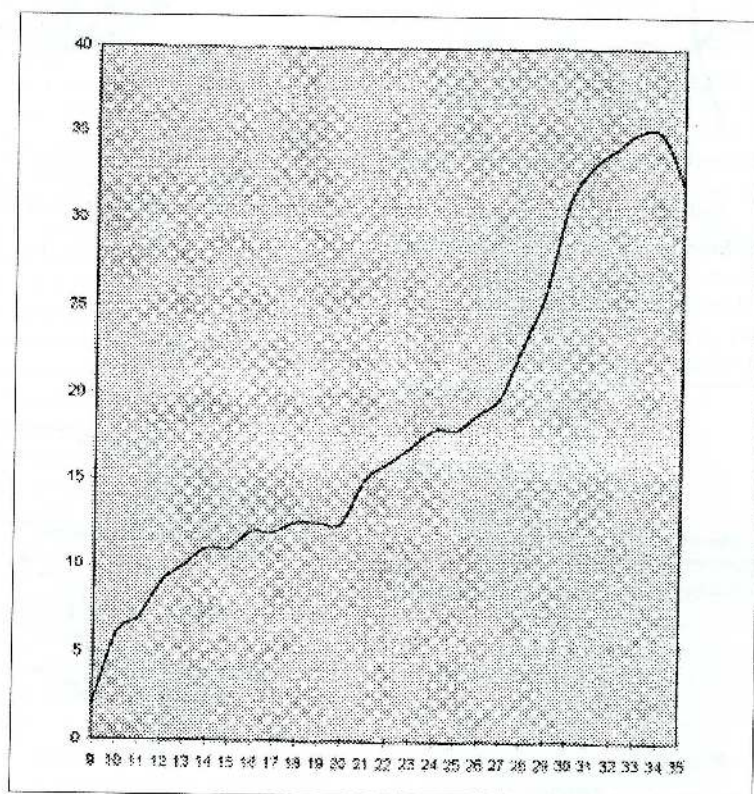


Figure 6

Daily growth of larvae

IN THE LAND OF THE SINGING FISH

Sepala Kulatunga

By the time I was posted to the Government Rice Mill in Batticaloa around the year 1954, it had been my fortune to experience more than my fair share of the wilderness and the wonderful fauna and flora of our blessed country. Feathered friends from the Arctic and Tundra regions; from Curlew to Whimbrel; Gargeny, Flamingo and Little Stint; our indigenous avi-fauna from Whistling Teal and Jacana, Coot, Heron and Comorant; have been met on my annual visits to our lagoons in the deep south. Crowned Hornbills, Pied Kingfishers and all members of the exotic dove family; from Bronze Wing to the humble Ash Dove; Raptors from Kestrel to Serpent Eagle; have been observed from the banks of the Kirindi Oya. Elephants from Elephas maximus Linne' to Elephas maximus ruhunu getaya, from Bundala to Lunugamvehera; Kirindi Oya to Tantrimalle in the Medawachchiya wilderness; have been met with, studied and enjoyed to my hearts content.

THE LAND OF THE SINGING FISH

Batticaloa, the land of the singing fish, within close proximity to those wonderful places that gladden the hearts of all jungle lovers in Sri Lanka - Arugam Bay - Okanda - Lahugala - Vakara - Panichankerni and the Maha Oya, with their wealth of wild exotic vegetation, and the singing fish, had been calling me for quite some time. To observe the habits of the herds of elephants, living throughout the year on the lush 'box' grass at Lahugala and to observe the wealth of wildlife in the Poonani jungles, where a man-eating leopard held sway a few decades back, had been my ardent wish. The transfer to Batticaloa was a god sent gift, and just what the doctor ordered for a wilderness addict like me.

Whilst spending a holiday with my family at the Kalkudah Rest House, long before my transfer to Batticaloa, I had the privilege of meeting and making friends with the Grand Old Gentleman of Batticaloa, the late Mr. S.V.O.

Somanader. He was a retired educationist and authority on the fauna and flora of the east coast. Friendly, soft spoken, cultured, Mr. Somanader was a mine of information, ready to share his knowledge with those interested. Within a few months of my settling down in Batticaloa, it was the most natural thing for me to roam the shrub jungle country around Kalkudah in the company of Mr. Somanader.

AMONG OUR INDIGENOUS ORCHIDS

Our indigenous orchids of the dry zone may not interest the modern collector of the new, exotic hybrid varieties of the vast orchid family. The new orchid hybrids are certainly fantastic. However it cannot be denied that our own indigenous orchids have a charm of their own with their intriguing indigenous and haunting fragrance. Mr. Somanader, who was an authority on the subject, introduced me to the world of our dry zone orchids. We set off early one morning from the Kalkudah Rest House with only a flask of tea and binoculars. Our destination was where the wild orchids grew in profusion, untouched by man, and only known to Mr. Somanader, who had made it his personal responsibility to be the unofficial guardian of these wild orchids. There was always the threat from would-be collectors and vandals. This morning was reserved for the 'Vanda tessellata' (Roxbergia), sometimes called the Batticaloa orchid.

A three mile walk along the beautiful Kalkudah beach brings us to a grove of tall Palmyrah palms in thorny shrub jungle, now verdant green after the rains, and covered with a profusion of beautiful pink and white powder-puff like flowers. We stop in the shade of these flowering shrubs and enjoy some hot tea. On close observation of the tall Palmyrah palms, I was thrilled to notice that most of these palms had large clusters of vanda tessellata orchids in full bloom. Almost all the variations of the vanda

Roxbergia range were represented. Shades from bluish grey to ashy grey-dark grey to the tessellata with the pink lip were there-blooming to glory and spreading their fragrance around.

On a Mara (Inga Saman) tree not far from the palmyrah grove two small clumps of the rare "vanda tessellata Kotiya", the grey Roxbergia with distinctive dark spots - and many rare yellow variations of the vanda tessellata were also in bloom. These two rare variations of the tessellata had been collected by Mr. Somanader from Arugam Bay and introduced into his secret grove in the Kalkudah wilderness to bloom unheard and unseen.

We spent over two hours among these beautiful wild orchids. I went up to every palmyrah palm with clumps of orchids, counted the flower sprigs, admired the beauty of every flower, observed their variations of form and colour. I inhaled deeply of their fragrance. I was in a world of my own. On one of the palmyrah palms a large clump of "Cymbidium bicolour", another humble member of our dry zone orchids, was in bloom - throwing out three sprigs of brown and white flowers. This humble member of our orchid family had been on display at an international orchid show during the reign of George VI, the father of our Elizabeth Regina. King George who had visited the flower show took a fancy to our Sri Lankan orchids and our humble "Cymbidium bicolour" was named King George VI orchid.

About a mile away from the display of the "Vanda tessellata" Mr. Somanader took me to see the "Vanda spatulata" in bloom. It is difficult to spot this orchid due to its peculiar habit of surreptitiously climbing to the very top of tall shrubs and bursting into bloom forming a canopy of golden yellow orchids. No orchid house anywhere in the world could have put on such a show of orchids. This was nature at its best and we know that nature is impossible to duplicate. Even the thought of shifting these plants would be an environmental catastrophe amounting to sacrilege. I was naturally very moved by what I saw this February morning. I had no words to express my feelings. I silently looked up with gratitude at the face of this rare human being

who introduced me to this wonderful world of wild orchids in the Kalkudah wilderness.

IN THE SOMAWATHIYA SANCTUARY

My old friend Arthur Mathes was the General Manager of the Welikanda Livestock Project, which extended up to the border of the Somawathiya Sanctuary. The Somawathiya 'Cheitiya' is one of our oldest monasteries, dating back to the second century BC. Herds of wild elephants had free range and roamed wild and free in the Somawathiya Sanctuary. There is a legendary belief in this area that wild elephants paid homage at this Cheitiya on full moon nights. My new friend Mr. Somanader was keen to see the Somawathiya herd of wild elephants.

One afternoon in the month of May the late Lionel Gunaratne, Superintendent of Excise Batticaloa, and I decided to take Mr. Somanader to the Somawathiya Sanctuary. The three of us set off from Batticaloa and reached the Welikanda Livestock Farm by evening. My friend Arthur Mathes had already made arrangements to see the elephants by jeep. This is the 'villu' country of Sri Lanka, where the lush growth of grass due to the annual flooding of the Mahaweli Ganga made it the ideal location for a livestock farm.

This was also the home of the marsh elephants. Every animal species, elephants in particular, have adapted to tolerate a range of physical conditions. The animals may have even changed their physical shape to match the environment it lives in. These massive but tuskless swamp elephants (*Elephas maximus vilaliya* - Deraniyagala) that live their entire lives in the lush villus of the Mahaweli Flood Plains have developed long legs and broad feet that prevent them from getting bogged down in the swampy earth they live in.

The establishment of the livestock farm does not seem to have disturbed the elephants to any noticeable extent. By 5.30 p.m. this evening the elephants came out silently from within 'villus' and started to feed peacefully on the lush grass in the open parkland. Since these elephants have been left undisturbed, they

showed no fear of man. The farm workmen got about their work quit unconcerned, while a herd of up to twelve elephants were feeding leisurely a few hundred yards away.

We got down from the jeep and observed the feeding elephants from a distance of a few hundred yards. We were alert and excited but the elephants remained calm. For some strange reason there was not a single baby elephant in the herd. We feasted our eyes on these magnificent beasts, the rare swamp or 'villu' elephants of Sri Lanka, till almost dusk. By the time we reluctantly left the elephants to their feeding and returned to the farm bungalow, the villu country was bathed in moonlight. It was two days after the Wesak Full Moon.

My friend Arthur treated us to a sumptuous dinner of string hoppers, chicken curry and wild boar roast. We left for Batticaloa after early dinner. On our long drive back this moonlight night Mr. Somanader regaled us with stories and anecdotes from his vast experience amongst the fauna and flora of the eastern wilderness.

A few miles after passing Welikanda, we spotted an elephant about 300 yards ahead of us, standing broadside right across the narrow macadamised road. I stopped the car, keeping the headlights on expecting the elephant to cross the road and give us the right of way. But this elephant had other ideas. He stood without movement quite unconcerned about the powerful headlights focussed on him. I switched off the lights giving the animal a chance to move out. When I switched on the lights, after an interval of ten minutes, the elephant was still across the road. This time we noticed that he had urinated copiously and the frothy liquid was flowing down the road, while his virile maleness was fully erect and exposed. Mr. Somanader was of the opinion that the animal was in 'musth' and undoubtedly a rogue. We switched off the lights once again and getting off the vehicle shouted out loud. The elephant was unconcerned and stood his ground. We were helpless with this elephant obstructing our right of way. However after about another half an hour, to our great relief, the elephant moved very slowly into the jungle.

THE ROGUE ELEPHANT ATTACKS

It was almost midnight by now. We gave the elephant a few more minutes grace and started off. I brought the car to a fair speed by the time we approached the area where the elephant was last seen. Then suddenly the elephant rushed out with ears folded, trunk curled up, screaming like the exhaust of a steam engine and lashed out at the moving car with its trunk. It had rained the previous day and the drain by the road was muddy. The elephant in its mad rush lost its footing, slipped on the mud and missed the fast moving car by inches. He then regained his balance and gave chase. Mr. Somanader and Lionel watched the elephant give chase to the speeding car for a few hundred yards, and then give up the chase, all in the bright moonlight. I kept concentrating on the driving and did not stop till we covered a few miles. Well all this happened in a flash. A narrow shave indeed.

I had experienced mock attacks by wild elephants at Yala and Palatupana on many occasions, but my friends, this was the real thing. This drama in real life, so difficult to describe, but has to be experienced, may be just once in a lifetime. We reported this incident to the Government Agent, Batticaloa. This elephant was identified, declared a rogue, and shot down within two weeks. The hunter was also Mr. Somanader of Batticaloa - popularly known as Elephant Somanader, due to his having shot down several rogue elephants in the eastern province. He was not a kinsman of Mr. S.V.O. Somanader.

The behaviour pattern of most elephants does not happen by chance. Sex hormones initiate the elaborate courtship displays in most animals, whilst in the case of the elephants this period is identified as 'musth'. During this period the male elephant in 'musth' is restless and aggressive. All adult males and some female elephants come into 'musth' periodically. An oily secretion from the temporal gland located between the eye and ear, pours down their faces. During this period all elephants, both wild and tame, are dangerous.

IN VEDDAH COUNTRY

We were regular visitors to the old Rest House at Maha Oya. This dilapidated old rest house was made famous by the visits of the late Dr. R.L. Spittel on his journeys into veddah country. Nestling in the shade of giant 'Burutha' and wild fig trees, this was the ideal hideout for those interested in observing the wealth of bird life in this wild country where Poromola and Randuna may have roamed in years gone by. Today there is not one full blooded veddah left. The last of the pure aborigines have ceased to exist some hundred or more years back.

Our main target was to meet the elusive Broad-billed Roller (*Eurystomus orientalis*), maybe the rarest bird one would like to meet in Sri Lanka. We spent many days roaming this wild country, met almost all the birds of this area - including the Red-faced Malkoha and the Forest Eagle Owl (*Bubo nipolensis blighi*) which is believed to be the legendary devil bird responsible for the deadly shrieks like a woman being strangled. This sound is dreaded by all village folk. After all, these awful shrieks may be nothing but love calls of this poor owl - who knows? We never sighted the elusive Broad-billed Roller.

This was the country where the fox tail orchid (*Rhynchoetyus retusa*) flourished. On one occasion my friends Lionel Gunaratne, Carl de Vos and I saw a clump of fox tail orchids with eleven flower sprigs in full bloom. Eleven sprigs

of mauve and white bushy fox tails, what a glorious sight. The fox tail orchid is the most beautiful orchid of Sri Lanka. A few months later we visited this tree to see that vandals had removed the whole clump of orchids. Sad but true. This is the fate of most of our wild orchids.

MOONLIGHT AND SINGING FISH

On a marine survey of the Batticaloa estuary, my friend the late Rodney Jonklaas was staying with me for a few days. On a moonlight night we decided to go out in a fibre glass boat to listen to the singing fish. It was ten p.m. and the lagoon and the countryside was bathed in moonlight. Although equipped with marine torch, face mask and fins, Rodney was not in a mood to dive this night. We could see masses of jelly fish around which irritate the skin of the diver. Instead we were happy to listen to the music of the singing fish. We heard many croaks around us, then from a distance we heard the faint but distinct music of harp strings in the wind.

It was a wonderful experience for me to hear the singing fish for the first time. I was sorry my wife was not with us this night to share my experience. Rodney, the veteran diver, was of the opinion that the musicians were none other than the shoals of a particular variety of lagoon fish. However, Rodney was not certain. The mystery of the singing fish of Batticaloa is yet unsolved, but the beautiful music of distant harp strings in the wind shall remain for ever.

WE HAVE OUR OWN LEOPARD NOW - ENDEMIC

Lal Anthonis

Certain animals of one and the same kind (species) coming from different geographic areas differ in certain features from those coming from other areas. To recognize and identify these characteristic forms and features from different geographical and environmental areas, taxonomists described them as 'subspecies'.

To quote Seidensticker "Members of a subspecies share a unique geographical range or habitat, have identifiable physical characteristics, and have a unique natural history relative to other subspecies in the species. Subspecies may arise over time; for instance, the fossil lions of America are considered one species of lion, and the modern lion another. Subspecies may also arise through what scientists call "geographic partitioning". This simply means that populations of animals living in different areas, usually separated by barriers such as mountain ranges or seas, evolve some different traits, but not ones that would prevent individuals from breeding successfully with one another should they come together. In fact, sometimes subspecies "collapse" when the barrier that separated them is removed. In contrast, species, such as lions and tigers, retain their identity even when they occur in the same areas in the wild. Scientists add a third word to the scientific name to indicate a subspecies. For example, fossil lions are called *Panthera leo atrox* and the modern African lions *Panthera leo*."

On this basis there were 30 subspecies of leopard the world over under the classification *Panthera* (roaring cats). Taking the 3 main leopards-Africa, India and Sri Lanka all were known as *Panthera pardus fusca*, thus grouping them together as one subspecies (Ref Larger Mammals of Africa by Dorst & Dandelot, Indian Animals by S.H. Prater and Mammals of Ceylon by W.W.A. Phillips).

Very recently Stephen J. O'Brien (a principal contributor to the Human Genome Project and holds adjunct faculty appointments at seven

Universities in the U.S.A.) and our own biologist Dr. Sriyanie Miththapala (now an internationally recognized authority on big cats) re-classified the *Pantheras* on a genetic DNA basis (now officially recognized) refer map. With the data found they reduced the 30 leopard subspecies to 8. With that Sri Lanka gets her own endemic leopard - *Panthera pardus kotiya*.

While chatting with Sriyanie, she told me that another interesting aspect of the Sri Lankan leopard was that it was not 'furtive' in its behaviour, unlike the African and Indian cousins who are very furtive and secretive in their demeanor. This could very well be due to the fact that unlike in the continent and sub-continent, here in this island the leopard is the 'prime predator'. Here, among the predators, he is monarch of all he surveys. No one to disturb him eating or steal his kill, while in Africa and India the lion and tiger would readily kill a leopard to steal his kill.

It is also interesting to note that all this time that the lion in Africa and the tiger in India were their 'prime predators'. However today, with recent research, observation and highly advanced night filming techniques it is found that the wild dogs and hyenas take this place. It has now been observed that packs of these creatures have made lions - even prides - and tigers to abandon their kills. And night filming results have up-graded the hyena from scavenger to predator.

Some interesting facts:-

Others in the *Panthera* group:

Lion - *Panthera leo* (Africa, India), Tiger - *Panthera tigris* (8 subspecies), Jaguar - *Panthera onca* (Central & South America). The beautiful snow leopard found in the Himalayas was classified as *Panthera uncia*. The new basis of classification has taken it out of *Panthera* and is now *Uncia uncia*.

A few notes on the Sri Lankan leopard:

Widely distributed - From the 7200ft Horton Plains through the clammy high canopied wet zone forests to the rolling bush country of the arid low country dry zone. Sometimes found close to human habitation in the upcountry estate sector, where they take the occasional domestic dog. About 10 years ago, when I was staying in the Hakgala Gardens circuit bungalow the Curator warned me not to hang around outside the bungalow at night as a leopard had been seen in the Gardens at night. This particular, bold animal had been seen many times in broad daylight, close to the Gardens on the main Nuwara Eliya Hakgala road.

Two officially recorded Man-eaters-

Man-eater of Punani (1924)..Shot by Shelton Agar

Man-eater of Pottana. Along Potuvil Kataragama pilgrim route early 1950s. History obscure. Unaccounted.

Average size. (Length measured tip of nose to tip of tail)

Sri Lanka - Length 6ft 11.3 inches. Weight 124 Lbs aprx. Height 25.3 inches (Phillips)

India - Length 7ft. Weight 150 Lbs. Height (not recorded by Prater)

Africa - Length 7ft. Weight 110-180 Lbs. Height 28 inches (Dors & Dandelot)

Special Note:

Man-eating leopard of Punani (Sri Lanka)

Length 6ft 3inches (E.C. Fernando. Taxidermist National Museum Colombo. Mounted specimen can still be seen)

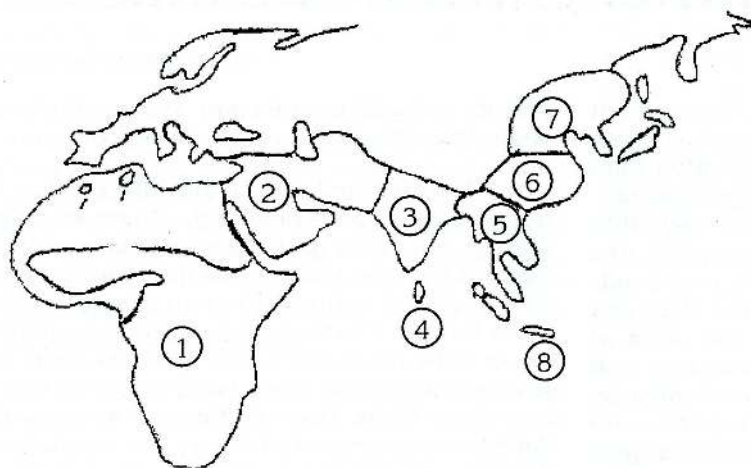
Man-eating leopard of Rudraprayag (India) shot during the same period. Length 7ft 6 inches (Corbett)

The largest known leopard shot in Sri Lanka is claimed by a planter now residing in Australia, in the 1950s in Namal Oya in the Gal Oya Valley. Length 8ft 8inches. Height 30 inches. Weight 250 lbs. (Trevor Labrooy. Jungle Lure)

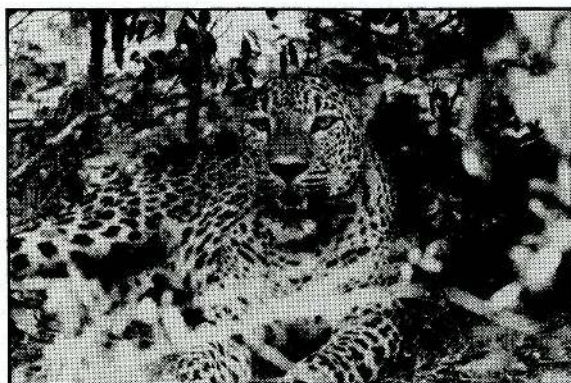
Trevor Labrooy also claims that he shot a black leopard about this same period close to Tanamalwila. He states in his book that he still has the mounted specimen at his residence in Australia and a photograph of this appears in his book. Going by this picture it is not completely black like a black panther but patchy with the spots or rosettes clearly visible.

Sometime ago a past late President of Sri Lanka asked me whether I could give him six reasons why we should protect the wild elephant in this country. I told him that I could give him twenty five reasons, but for the moment with respects could I give him just one to see if he would be satisfied. I told him that for an island only just twenty five thousand sq mls, with only 10% of that coming under the Dept of Wildlife (perhaps less now) it is a zoological miracle that we have wild elephants roaming our jungles. He was satisfied. Further in this little island we have over 425 species of birds resident and migrant of which 26 sp are endemic and over 80 subspecies endemic. We have from the golden beaches and living reefs to the only primeval forest in this part of the world the Sinharaja. We have from the mangrove swamps of the beautiful lagoons and the rolling plains of the dry zone to the nature's wonder, the Horton Plains. And now we have our own leopard - another feather in Sri Lanka's wildlife cap. Dieter Plage the wildlife cameraman for Survival told me once, that in 16 years in Africa he had only six leopard sightings, in two years in Wilpattu he had over two hundred. Surely aren't these enough reasons for every citizen of this country to be proud of, whether a nature lover or not. Are these reasons not enough to protect these for those generations yet to come even if we are to sacrifice some development projects in the sensitive areas.

Leopards of the World

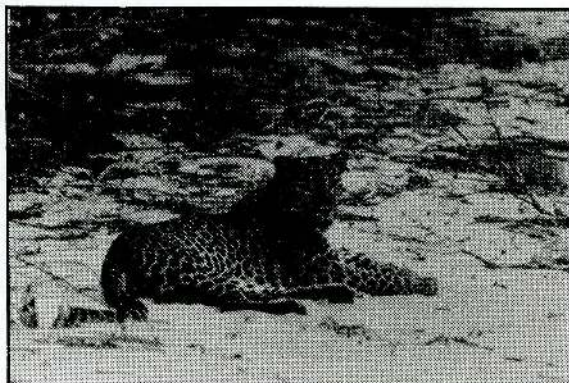


- 1 *Panthera pardus pardus*
- 2 *Panthera pardus saxicolor*
- 3 *Panthera pardus fusca*
- 4 *Panthera pardus kotiya*
- 5 *Panthera pardus delacouri*
- 6 *Panthera pardus japonensis*
- 7 *Panthera pardus orientalis*
- 8 *Panthera pardus melas*



A deep of fangs

On the sand dunes of Mahapatassa



IN THE MEDAWACHCHIYA WILDERNESS

Sepala Kulatunga

I was appointed Manager, Government Rice Mill, Medawachchiya in the year nineteen hundred and forty five, a few months after I got married. Medawachchiya was an important railway junction, where the railway branched off to Jaffna and Talaimannar. The government rice mill was situated in close proximity to the railway station. My wife, her little nephew Tissa and I travelled to our new station, in the wilds of Medawachchiya, by train. Taking the night mail from Colombo we reached Medawachchiya by dawn. Large Palu (*Mempos hexandra*) and Burutha (*Chloroxylon*) trees of massive girth covered the five acres of the mill premises. During the construction of the mill only the bare minimum of these exotic trees had been felled-retaining the natural beauty of this section of the dry zone wilderness. The clarion call of the jungle fowl "Jock George Joyce" from the jungle close to my bungalow, greeted us every blessed morning. The jungle hare and 'Meeminna' (*Chevrotian*) came up to our back garden. This was an excellent way to start our married life in our new home nestling under the shade of Burutha and Palu trees.

Before long my wife and I were exploring new country and the large fresh water lakes and tanks with interesting names like 'Linda hitidamana' 'Pull eliya' and 'Maha kandarawa'. My young wife became my regular companion. Every week end we were camping at some lonely jungle tank. This is the short but idyllic period of our lives, before the hassles and responsibilities of life overtake us. We have to treasure memories of this beautiful period of our life. When we are all depressed and sick, we have only to turn a few pages from our book of time. If the nostalgia of a cherished memory can bring a youthful smile on the face of your now ailing wife, your effort will be well rewarded.

During the rainy season, from October to April, all the jungle tanks of the North Central Province are full. The lotus and other interesting water plants, like the little fragrant manel, These tanks offer sanctuary to hundreds of indigenous water birds. There is always plenty of life and

activity in the lakes and tanks as these birds rise and settle, dive and swim in search of food.

The cries and calls of the different species from the cat-like mewing of the Pheasant-tailed Jacana, the croak of the Pond Heron breakfasting on a luckless toad, to the merry whistling of a flock of Teal as they fly to raid a paddy field of some farmer. The Pelican gracefully swimming about is the most impressive of all the birds in a jungle tank. In spite of its large size, this bird is graceful in flight. The little Cormorants join the Pelicans in community fishing. The Purple Coot 'Kithala' are the most colourful of tank birds. This beautiful metallic blue and purple birds with red beaks and scarlet foreheads, keep running among the reeds, their coats shining like jewels in the morning sun.

The Indian Darter with its prehensile neck is an expert diver. It can cover long distances under water and spear fish with its needle sharp beak. We never fail to stop and admire my old friends the Little Grebes. It is a treat to see these tiny birds dive smoothly and silently at the slightest disturbance, only to pop up like toy ducks a few yards ahead.

Having spent our whole morning with the aquatic birds, we rest under the shade of some forest giant, compare notes of our mornings bird watching and enjoy the light snack of sandwiches and coffee we have brought with us. We devote the afternoon to exploring the jungle around. The large 'Ahetu' or wild fig trees in fruit have their share of Green Pigeons - mainly the Ceylon Orange-breasted Green Pigeons and the Pompadour Green Pigeon, both called Bata Goya in Sinhalese. These beautiful members of the pigeon family are found in small flocks. While feeding these birds sing in a modulated mellow whistle, quite pleasing to the ear. The larger Green Imperial, Pigeon or Maila Goya, is a very shy bird of the dry zone. It lives well hidden in the tops of tall trees. The Malabar Pied Hornbill or "Poru Kendetta" with its enormous beak is found in colonies throughout the dry zone. The large flocks of parrots, parakeets and lorikeets are too numerous to identify. Blossomheaded Para-

keets, Emerald-collared Parakeets, Ceylon Large Parakeet and Ceylon Lorikeet - they are all here screaming their heads off on their way to raid some village cultivation.

The fresh water lakes abound with fish from the 'Loola' (snake-head) to 'Mus Perthiya' (Olive barb). It is a common sight to find at least a pair of Ceylon Grey-Headed Fishing Eagles (Wew Rajaliya) perched on dead trees waiting for some sizeable fish to come up to the surface, to snatch it in its talons. The Ceylon Serpent Eagle (Rajaliya) is the other member of the eagle family we meet often.

To get to our favourite jungle tank we have to go through a newly established teak plantation. We have often surprised a Sambur 'Gona' or Ceylon Elk, feeding on tender teak shoots. The bull elk we often meet is a majestic animal with massive antlers. It will stop in mid stride, stare at us and vanish into the teak grove. At the tank spotted deer come to drink at mid day. Their dainty feet making tiny ripples in the water. The small heads held high and the white dots on their red coats shimmering in the noon day sun. Red-faced monkeys are attacking the 'Palu' trees which are in fruit. A few Red Deer (Muntjac) are feeding on the fruit dropped by the monkeys. These beautiful little red deer are very shy and at our approach disappear leaving only their strange dog-like barks behind.

We have already made friends with the wanni village folk, The 'Baiya' clan, who live in Kadawathgama, are our closest friends. This village comprises of fourteen clean little houses with neat walls of red earth and 'illuk' thatched roofs. The largest house is occupied by Kinihamy the patriarch of the clan. The red earth walls of his house are daubed with intricate artistic patterns done with white slaked lime. The whole clan is responsible for keeping the compound meticulously clean. Wild flowers bloomed around the periphery of this little jungle village. The few acres of lowland below the village tank is cultivated with paddy. The good yields made these people self sufficient in rice. The seasonal 'chena' cultivation kept the village well supplied with their requirements of 'kurakkan', chillie, green gram and gourds. The large 'Vee Bissa', or paddy barn, in front of Kinihamy's house was the most interesting feature of this village. The 'Vee Bissa' is a large receptacle made out of

woven cane and plastered very carefully with red earth and cow dung, with an opening on top. The entire paddy harvest is stored in this Bissa. The freshly harvested paddy is cleaned, sun dried and stored with the leaves of the Margosa 'Kohomba' or Neem tree. Since I was interested in grain storage, I examined several of these paddy barns or Bissas, and was pleasantly surprised to find the paddy, even after six months of storage, completely free of moths, weevils and other insects. The secret was the introduction of the margosa leaves into the Bissa at the time of storage. The margosa leaf is a safe insecticide.

Kinihamy had often spoken to me about a jungle rock pool 'Gal kema', where elephants from the surrounding jungle came to drink during the dry season. One week end in August when my friend the late Bertie Jayasekera was also at Medawachchiya, we set off to visit this famous rock water hole. It was evening when we reached our destination. On looking around we saw several rock caves and the ruins of an ancient buddhist temple. In the days gone by saintly 'Arahats' may have meditated and lived in these rock caves. The broken down 'Dagoba' and the granite pillars were still standing upright. I try to visualise the monastery that may have stood beside these silent sentinels of our history. These traces of ancient temples and monasteries carved out of granite remind us of our ancient past.

We had to climb a large rock to get a broadside view of the rock water hole. It is about six p.m. We are now on the summit of the rock and have checked on the wind direction and have taken up our positions. With the approach of dusk, large flocks of Green Pigeons are congregating near the rock hole for their last drink of water. They all drink and vanish into the thick forest. The moon has risen now and the whole countryside is bathed in moonlight. A herd of spotted deer came and had a long drink. It was wonderful to watch these animals. How every little sound would cause alarm, then a period of intense listening. Each head would go down to drink, but would be up again anxious and alert, even before taking a sip of water. After awhile these elegant creatures would drink deep and depart as cautiously as they came.

This was bear country. The many rock caves scattered around gave sanctuary to many

of these dangerous animals. We were warned about a particular dangerous animal that had attacked a villager a few days earlier. There is hardly a village in the jungle country in which cannot be found men showing gruesome effects of encounters with bears. The villagers consider the bear to be the most dangerous animal in the jungle. The Ceylon Bear (*Melursus ursinus*) is a dangerous animal indeed. A female bear with two cubs came to the rock pool, after a considerable time spent in rolling on the ground in the bright moonlight, drank and departed.

Now it is around ten p.m. The moon is very bright with not a cloud in the sky. The trumpeting of his majesty '*Elephas maximus*' is heard proclaiming to the jungle folk that the lord and master is on his way for a drink. Within minutes a herd of six elephants, all adults, have emerged from the darkness of the forest to the bright moon light around the water hole. The rock pool is deep but narrow. The elephants cannot get into the pool. They move about fondling each other with their trunks. They draw trunkfuls of water and splash the water on each other playfully. While the six elephants were thus engaged, in walks a majestic tusker all by himself. He walks with dignity and grace, without any hurry or fuss. He does not fraternise with any of the other elephants. He, in fact, ignores them completely, drinks deep, splashes some water on his body and retreats into the forest cover. Kinihamy, our tracker, has told us about this tusker and we were thrilled to have met this majestic beast. This animal was in perfect condition, with approximately five foot long tusks gleaming in the moonlight. The herd of six elephants stayed at the water hole for over two hours, giving us a grand stand view of their frolics.

We were immensely pleased with our visit to this jungle rock pool in the wilderness and grateful to our bearded tracker Kinihamy for giving us the wonderful experience. The tusker and the six elephants that came to drink and stay with us for such a length of time, were memories that will be treasured for life and sights never to be forgotten.

It was nearly mid night, no animals came to drink at the rock pool after the elephants had left. Bertie and I shared the balance of the sandwiches with Kinihamy and we were consid-

ering a well earned rest, when Bertie saw a large black object crawling and climbing up our rock. We soon realised that it was a large bear. Very alert now, we stepped down a few yards to get a clearer view. The bear saw us and quickly moved into the dark background. Within a few minutes the bear was climbing up from the rear section of the rock to get to us. He saw us again and retreated. We were certain that this bear meant business and was out to get us. This was like a game of hide and seek but a weird experience indeed. The third time we let him come a few yards closer and when he was within shot gun range, a well directed shot with Bertie's Savage Arms Company shot gun (with poly choke barrel) killed the bear instantly. In the morning we found that the bear was a large male. The villagers were jubilant, and thankful to us for having destroyed this beast. They were certain that this was the animal responsible for the attack on one of their fellow men a few days earlier. We killed this animal, that was out for our blood, in self defence. We would certainly have preferred to have come away without disturbing the sanctity of that rock pool in the wilderness.

My wife and I always felt like explorers of new virgin territory when we visited a new jungle tank for the first time. The jungle tanks of the N.C.P. have been marked and known from ancient times. However, we always approached them with a sense of violation.

I had taught my town-bred wife to respect the sanctity of the wilderness. Every little wild creature from pangolin to mongoose stops and stares at you. The crocodile that was basking peacefully on the tank bund silently slithers into the water. The jungle cock scratching on a dung heap stops in mid scratch as if to challenge our presence in his domain. We talk only in whispers as if in fear of violating the serenity of these wonderful places. We felt that this unspoilt wilderness belonged to us alone. Yet for the moment we were the trespassers. As I write this story of our youth (after a lapse of fifty long years) spent in idyllic surroundings-blessed memories of simple joys and love shared together, return. Unshed tears blur my vision, for my wife who shared these wonderful experiences with me as a young girl is no more. She has gone ahead of me on her journey through "samsara".

FIRST BREAD FRUIT TREE (*Artucarpus Incisus*)- "Rata Del"

A Landmark in Galle Fort

Hemantha V. Situge *

Galle Fort with its antiquity claims the pride of place of a landmark tree in which clusters around with many legends as the first bread fruit tree (*Sinhalese: Rata Del*) in the island.

The tree is found in the Akersloot Bastian (baptised for the first Dutch commander Jacob Coster's birthplace) the garden of the English Master Attendant's Bungalow (the present official bungalow of the Deputy Minister for Trade & Shipping) in this 36 hectar yard 'living monument'.

The first legend is based on this tree is that the Dutch introduced Bread fruit from Batavia to the island to feed their slaves.

The legend has credence but the fortresses were not built by utilizing a large number of slaves but except "the slaves imported from Tanjore, branded them with the Company's mark (VOC) and set them to cultivate the fertile lands promising them their liberty if they acquitted themselves creditably". (Perera:[1955] 145) Even slave traffic under the V.O.C. Dutch Company was very limited, (vide:Lewis[1922] C.A.L.R.)

A rather far-fetched second legend relates to Captain William Bligh of the ship "H.M.S. BOUNTY." Capt.Bligh collected several hundreds of Bread Fruit plants from East Indies with a view to transport them to America, as a cheap means of food for the negro slaves working chiefly on the sugar and tobacco plantations. Capt.Bligh was known as tough task master. Somewhere in the Pacific Ocean his men mutinied and set him and his crew adrift in a launch. Thereafter they flung-over aboard all the Bread fruit plants with the little barrels in which they were planted. (Bligh [1971]79) One of them is supposed to have come adrift to the harbour of Galle.

The third legend is that the Dutch introduced Bread Fruit from Batavia to feed the natives. Late Mr. E.V.G. William who wrote the

book on History of Galle (*Sinhalese Gaalu lthihasaya*[1967]) told the writer an interesting legend which is based on this tree. According to this legend the Dutch Governor has ordered to cut down all the Jak trees (*Artucarpus integrifolia*) the circumference in six feet to use as timber to build well-fortified citadels to meet their enemies. He also said that as a result of this order the trees bore no fruit the Dutch had to introduce Bread fruit as an alternative food for the famine prevailed in the country.

The Sinhala epic "Pujavaliya" indicates that King Parakaramabahu (I) has ordered the Del forest (endemic *Artucarpus nobili*) to be turned into a Jak forest. The Jak forest - is the present "Kosgoda" area in the maritime range. (Gnanavimala [1951] 808) But in this area the "Rata Del" plants are in abundance, curiously supports the credibility of this legend.

Bennett the pioneer English naturalist records the purpose of the plant was as to feed the lowest and the poorest natives of the country. He says "...most objectionable as the latter name is when contrasted with the produce of the tree bread fruit tree (*Artucarpus incisia* L) for none but the lowest and poorest natives will eat, and then only after having been prepared in a manner peculiar to themselves". (Bannett[1843]-71)

Bennett also cites an instance where this tree was utilised which is unknown today in the whirlgig of time. "The sap of the Bread fruit tree (*Artucarpus incisia*, L) when hardened in the sun and subsequently boiled forms a tolerable substitute for pitch, but even of that tree were not otherwise so useful as it is, the sap would be more profitably employed in a raw state, by being converted into Indian-rubber." (Bennet[1843]-131)

The 'Rata Del' - Bread fruit tree is undoubtedly introduced to Ceylon before 1796,

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(Trimen: [1888] 76) but according to other writers this is a Native of the Pacific Islands, probably introduced into Sri Lanka by the Dutch. (Fernando[1979]54); (Lewis:[1934]350).

The evidence of it having been brought to Ceylon at the time when the Island was in the hands of the Dutch rests upon an official document not merely upon tradition.

But this present place, where this landmark tree claims in history is the old Dutch bastian premises in Galle. Galle was the main port of call in the Island. The Dutch even kept Galle as their capital until 1656. Only a well-researched Dutch document could reveal the untold saga of 'Rata Del' - today a staple food as jak, rice-how it has made a close woven link with the Sinhalese of this country.

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RHODODENDRON

Dr. C. Jayendra Fernando

On my last visit to the Horton Plains, thick mist reduced visibility down to a few meters. Very soon, the mist started to clear and the wide open patna grass became distinct from the thick montane forest. This division was mostly well defined, except that a few small trees with dark red flowers seemed to emerge from the grass. They were the familiar *Rhododendron*.

This very interesting tree is found in the patnas and forests of Horton plains, the Peak wilderness, Hakgala, Moon Plains and Nuwaraeliya, all above 5500 ft in elevation. In patnas where fires occur periodically, *Rhododendron* trees seem to survive, due to the fact that the dark and spongy bark is fire resistant. Thus they are seen standing alone, away from the forest where it is common.

Rhododendron arboreum, the species found in Sri Lanka, is of the family Ericaceae, and known locally as Ma-ratmal (S) or Billi (T). Growing upto 6-12m, it derives its specific name 'arboreum' from the meaning 'tree'. Many other species of the genus are mere shrubs. The very attractive red flowers are edible¹. Leaves are silvery on the underside.

Rhododendron arboreum is also found in the Nilgris and the Himalayas in India. The genus *Rhododendron* has a wide distribution worldwide, occurring in Asia, the Alps as well as in North America.

Travellers to the Indian subcontinent in the ancient times were enthralled by the many *Rhododendron* species they found. The Moorish traveller Ibn Batuta recorded *R. arboreum* in 1343-4 on the top of Adams Peak².

Rhododendrons are not native to the British Isles³ where it is now common. Before 1780 only a few species had been imported from North America and Switzerland. However, with the arrival in India of the doctors attached to the East India Company, who were also trained in

botany, many more were imported. In fact *R. arboreum* was one of the first asiatic *Rhododendrons* to be introduced.

Due to their deep interest in *Rhododendrons*, several are named after doctors of the East India Company³. Nathaniel Wallich, a surgeon to the Danish settlement at Serampore and later superintendent of the Calcutta Botanical Garden (*R. wallichii*), Robert Wight, surgeon to the Madras medical service and author of 'Illustrations of Indian Botany' (*R. wightii*), John Forbes Royle, in charge of two hospitals in Saharanpur in Punjab and author of 'Botany of the Himalayan Mountains' (*R. cinnabarium roylei*), Hugh Falconer of Saharanpur (*R. falconeri*), William Griffith in Assam and Bhutan (*R. griffithii*) and Sir Joseph Dalton Hooker in Sikkim (*R. hookeri*) are some of them.

Along with the habitat in which it grows, the *Rhododendron* is now threatened with ever reducing distribution in Sri Lanka. Encroachment of protected areas, deforestation, death of trees due to damage by frost⁴ and other physical causes of which little is understood, are only some of the problems.

Establishment of a Highland National park⁴ joining Horton Plains and the Peak Wilderness, bringing in new areas under protection and upgrading the existing ones are some of the solutions. In fact preserving the *Rhododendron* addresses most problems concerning the preservation of Montane forests and patnas of Sri Lanka.

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CITES - JUNE 1997

DEATH KNEEL FOR THE ELEPHNATS

Lal Anthonis

In October 1989 the CITES (Convention on International Trade in Endangered Species) meeting held at Lausanne, Switzerland, upgraded the African elephant from the Appendix II of the threatened species to Appendix I of the endangered list. (The Asiatic elephant has been listed in Appendix I for many years).

Let us get to the beginning. The estimated elephant population in Africa in 1979 - 1.3 million. The estimated elephant population in Africa 1991- 610,000 According to the African Wildlife Foundation in 1989 - 90,000 elephants were killed by poachers in Africa. Another 10,000 orphaned calves died as a direct result. Total 100,000.

That is more than 270 elephants a day or 11 in an hour or 1 in every five and a half minutes.

"If this current trend is not stopped" says Marcus Schneck" the African elephant will never live to see the turn of the century". Further, according to Nehemiah K. Rotich - Director, East African Wild Life Society -

Between 1960 and 1989 Kenya lost 85% of her elephants, Uganda 90% and the estimated loss in Tanzania during this period is around 70 a day.

In 1987 February two young investigators, Allan Thornton and Dave Currey of the Environmental Investigation Agency based in London began a worldwide investigation which took them to Dubai, Singapore, HongKong etc to look into the illegal trade in ivory with a hope of bringing about a total ban in the trading of ivory at the CITES in 1989. Their actions brought them into direct contact and conflict with some of the big names in the trade and towards the latter part of their investigation even their lives were threatened by interested parties.

While they were going on with their investigation, in January 1989 President Bush of the U.S.A. made use of powers entrusted to him by Congress in the 1988 October African Elephant Conservation Act and banned the import of ivory from Somalia. Then on 18th July 1989, under the guidance of Richard Leakey, the then Director of Kenya Wildlife, Kenyan President Daniel Arap Moi set fire to twelve tons of poached ivory worth 3 million dollars. Just before he lit the flames he said these words that will be written in gold in the annals of world wildlife "Great objectives require great sacrifices. I now call upon the people of the world to join us in Kenya by eliminating the trade in ivory once and for all".

Thornton and Currey went about their work meticulously meeting Government representatives and other VIPs of the CITES member nations and lobbying for the ivory ban. To cut a long story short at the October 1989 CITES meeting their good work showed results and with the enormous backing of Costa Mlay, the then Director of Wildlife Tanzania, the vote was taken for the Appendix upgrade. The voting went thus: Abstentions - 4, Against - 11, For - 76.

The African elephant went up to Appendix 1.

The ban on the ivory trade was to commence from January 1990. But in the wake of the listing, the price of ivory dropped from about 100 dollars a pound to less than 2 dollars. Many ivory carving factories had shutdown and others had radically cut down their workforces.

In June 1990 the United States ban (mentioned earlier) was extended to include ivory imports from all over the globe. During this period the European Economic Community, Japan and Hong Kong issued similar bans.

Despite the enormous lobbying by countries like Zimbabwe, South Africa, Botswana and Malawi against the CITES ban the African elephant remained in Appendix I.

The Tide Turns

As the June 1997 CITES meeting to be held in the Zimbabwean capital Harare approached, many international conservation organizations and conservationists expressed fears that the African elephant would be downgraded to Appendix II - albeit with disastrous results.

In the May/June 1997 issue of the SWARA, the bi-monthly magazine of the East African Wild Life Society, it's President said "Clearly the Appendix listing has been a conservation success in all three East African countries. Here, in Kenya, populations have increased by 30% since 1989 - from 19,000 to 26,000. However, if the ban is lifted there is no doubt that poaching will return, and there is every chance that it will be even more voracious than before". He goes on to say "During the 1970s and 80s, wildlife staff not only stole revenue but also poached wildlife. Wildlife authorities were riddled with corruption. Senior park and Government officials controlled the ivory trade and protected poachers. There is no guarantee that this will not happen again". And finally "Political instability, civil wars and the ready availability of weapons, inadequate human and financial resources, low staff morale and greed make a deadly recipe for elephants. It only requires one more ingredient-trade in ivory - for the situation to explode. Let's not add this final ingredient". (This applies to our island as well - Author's comment).

In the magazines editorial, it's Editor David Simpson said "How we will deal with the problems of reconciling growing populations of elephants and humans will be one of the major conservation challenges of the next century. If we fail to deal with the problem equitably, flexibly and imaginatively, we may not have elephant around either to love or hate. And that could be a tragedy, not only for the elephants, but for the environment, for much as they are destructive and difficult to manage, elephants

are immensely important shapers of the landscape. If we lose our elephants, how many other species will we lose along with them? This year's CITES meeting will, therefore, be crucial not only for elephant conservation, but for habitat protection in general. If the CITES Parties decide to resume even a limited trade in elephant products, many fear they will simply be reopening the floodgates to massive levels of poaching. Here, at EAWLS, we fervently hope that will not happen".

Sadly however, in a very controversial CITES meeting - according to BBC Wildlife "..... and probably the most politicized meeting of CITES to date" *Loxodonta africana* was relegated to Appendix II.

The main theme taken by the nations wanting the ban on ivory trade lifted was that the wildlife in that country was ".....this is our wildlife, and we must be able to manage it our way". And again most countries with large stockpiles of ivory was not going to follow Kenyas theme of burning them but wanted to trade them for the finances they wanted for development. The new catch phrase "'sustainable utilization' echoed mantra-like through hundreds of speeches". Whatever said and done the CITES this time took a very sinister turn. Quoting BBC Wildlife "Secret ballots, virtually unknown before, proliferate. Bloc voting by states with a shared interest in 'harvesting' animals frequently overrode the conservation argument - Southern Africa thus joined pro-whaling Norway and Japan against moves to protect rare Pacific parrots.

Conservation groups were shut out of the debate - there were 62 speeches on the elephant issue, none from a non-governmental organization. And the developing world, which possesses the bulk of the world's wildlife, made its presence felt as never before". Continuing it goes on to say "But even before the conference was over, there were reports of a rise in poaching in India, of armed gangs moving in on Kenya's Tsavo National Park. Allowing a trade to resume in 21 months is clearly an experiment. It may well, as one leading conservationist put it, prove a lethal one".

This downgrading of the African elephant is not only going to prove lethal for *Loxodonta* but for the Asiatic species as well. Now ivory can be extracted from the Asian countries and falsely identified as African ivory. I can remember in 1985 (before the ban) when the Director of Wildlife sent me to the Tangalla police station to identify the tusks of 'podi puttuwa' the famous tusker of Yala shot by poachers, there were people there who were saying that these tusks had been brought from India and did not belong to the Yala tusker. On the 1st of September this year this case came up at the Magistrates Courts at Tissamaharama and I had to give evidence on behalf of the Department of Wildlife. During the cross examination one of the questions asked me by the defence was whether I could prove this was not Indian or African ivory. I had to admit that only a scientist could perhaps do it with the assistance of a microscope or other specialized equipment. I just cannot see how every little ivory carving, leaving aside the rest of the island, only in the curio shops in Colombo could be brought under a microscope.

During the last decade I have seen more than twenty tuskers shot down in different parts of the island and that I fear is about 10% of the entire tusker population we have now. If this

goes on, there is very little doubt that the tusker in this island will go the same way as the Quagga, the Dodo and the Great Auk.

William Travers of ELEFRIENDS says "If we can step back a moment from our conventional view of the world that places us at the centre, with all other life forms conscripted for our use and abuse, the elephant is certainly one species that can challenge our self-appointed position as the supreme being on earth. With a complex social society to rival our own - one based on love, understanding, compassion, remorse, and tolerance - elephants have long lived in harmony and balance with the plants and animals that share their environment.

Human beings, on the contrary, are driven by a desire to dominate, an insatiable greed for material wealth, and a rampant urge to procreate beyond the needs of survival or sanity". There is a school of thought that extinction is a part of evolution. That we should permit the natural process of losing plants and animal species to run its course. So, we have to sit and watch and say goodbye to the elephant. From an anthropocentric point of view it is -yes. I wonder then when *Homo sapiens* will have to say "well, its time to go".

A VISIT TO THE KRUGER NATIONAL PARK

Dr. N. W. Karunaratne

Kruger National Park is one of the last wild areas in South Africa. It offers the majesty of the African bush, the excitement of the Big Five (Lion, Elephant, Buffalo, Leopard and Cheetah) not to forget the Rhino and Hippo, the dramatic seasonal changes and a chance for adventure and relaxation.

The motto LIONS stands for:

Learn - Interpret - Observe - Never - Slow

Learn *As much as you can before you drive - Read books which give much information about the park. This will increase your knowledge and chances of discovery.*

Interpret *What you read and what you see by using your senses.*

Observe *Carefully by stopping often and waiting patiently.*

Never *Disobey the park rules. They are for your safety and benefit, as well as the park's.*

Slow *Down. This is the best way to see more.*

A Board States:

The park is not only a refuge for wildlife, but it is also your national park. It is your responsibility to look after it. When in the park do not pick things, damage them or take them away. Try not to change anything.

The Park's Main Aims

Kruger is one of the largest wildlife sanctuaries in the world. Its aim is to conserve a unique part of nature as a natural, functioning system. The park also plays an important role in education, recreation and tourism.

Census

Part of Kruger's Research and Management involves counting the major herbivores (Plant-eaters) on a regular basis.

These populations change from year to year, depending mainly on rainfall and disease. This information influences management decisions and helps the staff to understand population trend in the Park. The last Kruger National Park census was done in 1993.

At that time there were

Blue Wilder Beast	- 12720	Lions	± 2000
Buffalo	- 14230		
Eland	- 490	Hyaena	± 2000
Elephant	- 7830		
Giraffe	- 4900	Leopard	± 1000
Hippo	- 2100		
Impala	- 97290	Wild Dog	± 380
Kudu	- 3130		
Roaw Antelope	- 40	Cheetah	± 200
Sable Antelope	- 880		
Tsessebe	- 360		
Warthog	- 720		
Water buck	- 1430		
White Rhino	- 1870		
Zebra	- 29140		

There are Strict Instructions

Never feed any kind of animal - This includes birds, monkeys, baboons, hyenas - However tame they may seem to be.

When driving

Remember the children's story of the tortoise and the hare where the tortoise won the race. To see as many animals as possible, slow down, relax, and drive like a tortoise. The speed limit on tar roads is 50km/h. But because animals are camouflaged, you will not see much at this speed. Speeding also scares game away and there is always a chance of hitting an animal. If you are serious about game viewing, rather drive under 20km/h. Tortoise-time will win the day for you.

The best times for Game-Viewing

Are early morning and late after-noon, because many animals go down to the river to drink. If you are out in the hot mid-day period, follow the animal's example-find a shady spot near a riverbed or water wheel, and wait quietly. Once you have stopped, look around carefully for tell-tale signs.... The flick of an ear, fresh dung or spoor, next to the road; a blur of movement deep in the bush; flattened grass tells where an animal may have rested. Also look for signs of recent feeding, which are especially obvious with elephants and recent kills.

Kruger's rest camps

Are luxurious and are the best places to see certain animals and plants at very close range. Bird watching can be very rewarding in camp, as well as the fascinating world of insects, lizards, bats and squirrels just to mention a few.

Trees

Can be like old friends. Once you get to know them, it is always very rewarding to recognise them in the veld. Apart from their beauty many have fascinating magical and medicinal properties. Many trees in camp have labels and the national tree numbers to help you identify them. Books are available in the camp shops to help you learn more.

Even the entry/exit permit gives much information on the park rules.

Many creatures, from fascinating insects to large predators, come to life at night. Take a walk along the fence of your camp with a torch and look for nocturnal animals like genets, civets, nightjars. Should you take a night drive in an open jeep you may see lions, Hyaena, buffalo, elephant, leopard and rhino at close range to chill your spine!. Listening to the incredible sound of the African night is a unique experience. And so is looking up at the stars from the African soil.

Sudden Movements

Will often frighten animals away. Keep still and you will observe their natural

behaviour. You will also start to feel the pace and peace of the bushveld and realise that here there is no predictable rush hour....only the occasional dash of speed when a predator is round.

Hooting, shouting, teasing or throwing things at animals frightens them and may cause them to run away or to panic and act with aggression. Treat the wildlife as you yourself would want to be treated.

Driving off the road

You may kill smaller creatures and destroy their food and homes.

Nature provides the perfect diet for all living creatures. By feeding animals you disturb the natural chain and the animal and its young are discouraged from finding their own food. Human' food also causes digestive disorders in animals. Feeding monkeys and baboons could be dangerous to you, as well as endanger their lives. Once they become a nuisance or a threat to humans, they have to be shot by a ranger.

Litter

Litter is life threatening. Plastic, broken bottles, tins and other rubbish can cause death. Even an apple core thrown onto the road can attract animals out of their natural habitat and they may be run over. The management requests by using the rubbish bag given you at the gate will eliminate this hazard. All refuse at Kruger is sorted into degradable and non-degradable rubbish. This is essential in today's world and perhaps if you have not done so already, you can follow Kruger's recycling example at home.

Noise Pollution

Not only litter, but loud radios and intrusive parties spoil the harmony of Kruger and ruin other people's enjoyment. When you leave you should be able to take some of the pace, the wisdom and tranquillity of the bush home with you.

Animal Manners

Usually we say someone with bad manners behaves like an animal. But in Kruger it is a good idea to watch animal's good behaviour and learn from it.

- *Notice the order of their social structure and the interactions between individuals.*
- *Watch their excellent teamwork and communication.*
- *See how they teach their young the discipline and order which creates harmony and secures survival.*
- *Notice how efficiently they move and how aware they are of their surroundings.*
- *Be aware that nature wastes nothing.*

Drive your vehicle as silently as possible. When you have stopped-listen, smell and look carefully. The smells and sounds of the bush give excellent clues which you would not notice from a moving vehicle... A nearby snort or bark; the nervous chattering of monkeys or birds; a different smell on the breeze! Listen carefully to the noises of nature and in time you will learn to interpret mating calls or alarm calls that give away the presence of a predator.

Kruger and Research

Kruger's research Programme is aimed at improving the management of the Park. New data also increases environmental awareness and education even for people who live in towns and cites. It helps us appreciate the value of nature and teaches us that conservation is a vital part of the economy.

Scientific Research

Links at the inter-relationships of plant and animal species which helps park management. It also benefits other conservation areas, farmers and communities living nearby, who have similar weather, soil and altitude to Kruger.

The Ecozone

Includes the underlying geology and rainfall which determines the soil type. Most plants grow better in certain soils and are more common there.

Animals prefer specific types of plants and will concentrate where their favourite food is to be found. Where two ecozones meet, the vegetation of the two zones is likely to be mixed. Vegetation near the koppies and rivers will also be mixed and less reliable.

The Kruger National Park is 30-40 miles wide on an average and 230 miles long. Nearly one million visitors came to see this splendidly managed park. For all its vastness Kruger is only a fragment of the wildlands its inhabitants once depended on. The boundaries are arbitrary and the park is increasingly surrounded by human activity. The entire Park is enclosed by an electric fence. The wires are intended to keep wildlife safe from people while protecting humans from predators and diseases that game animals can transmit to livestock. Part of Kruger's attraction has to do with the fine qualities of its facilities. The main roads are paved. Over twenty four immaculately tended rest camps offer accommodation from bungalows to tent site. The food served in the restaurants is first class. Kruger is maintained as a strict natural habitat where man does not interfere with nature.

BINOCULARS AND TELESCOPES FOR ORNITHOLOGISTS: A SUPPLEMENT

Rex I. De Silva

"However it is believed that a 'good' binocular has not been made and it is doubtful whether one ever will be..... Nevertheless there are millions of these instruments in use and people like them with all their faults."

(G. Douglas Hanna, 1996)

An earlier article on binoculars and telescopes (De Silva, 1993) evoked considerable feed back from readers, suggesting that the many birdwatchers are almost as interested in their optics as they are in birds. Hence, this account is in part a response to readers' inquiries and also an attempt to discuss some subjects which earlier were either omitted or only treated superficially. As this is only a supplement it should be read in conjunction with the previous article. (Note that as this paper is only concerned with hand-held binoculars and portable telescopes used by ornithologists, the comments and opinions expressed may not necessarily apply to instruments designed for other purposes).

Porro-prism Binocular Types

Porro-prism binoculars come in two configurations; the German (Z) and American (B) body types (Figure 1). In the former each barrel consists of two main assemblies viz. the prism housing and objective bell which are connected together at the "Z" joint. When this joint gets worn, damaged or cross-threaded, collimation errors can arise, also moisture and dust may gain entry, hence "Z" instruments should not be subjected to rough treatment. The American (B) type consists of a one-piece body which is very strong; it is for this reason that virtually all "military specification" binoculars are of the "B" type. (It should be noted that the expressions "American" and "German" do not denote country of origin but only the design).

Zoom Optics

The opinions of experts relating to zoom instruments may be of interest. Seyfried (1995) considers that they are heavy, extremely complex and impossible to collimate; the zoom mechanisms are subject to constant jams and they are extremely difficult to repair. Harrington (1994) regards zooms as compromises which intensify aberrations.

Prisms

Binocular prisms are made of either borosilicate crown (BK-7) or barium crown (BaK-4) glass. BK-7 prisms are cheaper but absorb noticeable amounts of light and slightly reduce contrast, hence they are normally used in inexpensive instruments. BaK-4 prisms give bright images of high contrast. Instruments having BK-7 prisms can be identified by exit-pupils with cropped edges, whereas those with BaK-4 prisms are circular (figure 11)

Porro-Prisms or Roof-Prisms?

Binoculars come in two basic designs viz. the traditional porro-prism models and the more recent roof-prism instruments. Which is better? The answer depends on personal requirements and tastes but, experts agree that good porro-prism instruments usually provide better quality images. Harrington (*op.cit.*) states "All other things being equal, porro-prism binoculars will yield brighter, sharper images than roof-prism glasses". Seyfried (*op.cit.*) says "...an excellent quality roof-prism binocular can equal, but never exceed an excellent porro-prism binocular". Edberg (1996) considers that roof-prisms create "irritating spikes" around bright objects, the result of light scattering off the prism edges but, he concedes that, this fault is minimized in more expensive models. Because of their unique shape, roof-prisms cause light passing through them to shift "out-of-phase"

(i.e. produce aberrations which degrade resolution and contrast). Better instruments therefore incorporate expensive "phase-correction coatings" to restore performance. This, combined with the high cost of producing good roof-prisms, makes these binoculars much more expensive than equivalent porro-prism models. Another minor disadvantage of roof-prism binoculars is their reduced stereoscopic effect (caused by the close spacing of the objectives). I have found roof-prism binoculars very difficult to service and collimate (but I am no expert). On a positive note roof-prism binoculars are lighter in weight, more compact and (on account of the internal focusing mechanisms in the better models) more likely to be weatherproof than equivalent porro-prism instruments. A glance at the advertisements in any birding magazine shows that roof-prism binoculars are extremely popular with birders and, notwithstanding earlier comments, the more expensive instruments from reputable manufacturers are quite good. So which type should an ornithologist use? My personal opinion is that if very sharp, high contrast images are a priority, good porro-prism binoculars are possibly the better choice. However if light weight, compact dimensions and weatherproof qualities take precedence, roof-prism instruments are recommended.

Country of Origin

Seyfried ([op.cit.](#)) considers that the best roof-prism binoculars are made in Germany whereas the best porro-prism instruments come from Japan. (But also note he warns that some instruments supposedly "Made in Germany" are actually manufactured in a South-east Asian Country).

Recent Developments

Condensed moisture on optics absorbs carbon dioxide CO₂ from the atmosphere, forming carbonic acid which attacks lens surfaces. Traditional crown and flint glasses are fairly resistant to this (U.S. Navy 1969). In recent years "nitrogen purged" designs have been introduced in an effort to make binoculars and telescopes weatherproof. These instruments are filled with nitrogen, which is retained by means of hermetic seals, enabling them to be used in rain and other adverse conditions without

misting up. Within the last decade or so new optical materials such as ED (extra-low dispersion) and fluorite (calcium fluorite) glasses have been used in binocular and telescope optics. These result in superior images of high resolution and contrast. Regrettably some of these new glasses are easily degraded by moisture and atmospheric pollutants (Anon. 1992, U.S. Navy. [op.cit.](#)) requiring that instruments using them should necessarily be of weatherproof or waterproof design. In an equatorial climate (such as Sri Lanka's) the seals could deteriorate after some time; if this happens, the instrument should immediately be forwarded to the manufacturer for attention. In any case it is advisable to keep all binoculars (including "weatherproof" and "waterproof" models) in a dessicator when not in use.

High-power Binoculars

My earlier comments on high-power binoculars have caused some confusion, hence, I shall elaborate. Seyfried ([op.cit.](#)) says "In reality, beyond a certain point, 8x to 10x a high power binocular shows us less when used to view objects on land". Harrington ([op.cit.](#)) states that when using binoculars of more than 10x some sort of external support is a must. Readers who may be puzzled by this are urged to carry out the following test. Using a standard optical test chart compare a high-power instrument (say 12x or 16x) against a standard one (say 8x or 10x). Tests will usually show that a standard instrument, if of a good make, will invariably resolve 4"-5" of arc, meeting U.S. Military Specifications for resolution, whereas a high-power binocular (regardless of make) will often have difficulty in resolving better than 6" to 8" of arc. This is very roughly analagous to comparing a small but sharp photograph with a large coarse one in a newspaper. (Suitable test charts are the 1951 U.S. Airforce Test Pattern, Cobb Test Chart, [U.S.] National Bureau of Standards 1963A Resolution Target, Kodak Imaging Test Chart and Seyfried's Binocular Test Chart). A more detailed explanation for the generally poor performance of high power binoculars is beyond the scope of this article but the basic principles are covered by Conrady (1950), Kingslake (1995) and Rutten and van Venrooij (1988).

Focusing

In focusing the ideal is to ensure that the instrument is so adjusted that the image of the target accommodates itself to the user's eyes and not vice versa. To do this the eyes should be relaxed and the eyepieces moved all the way out (i.e. to the closest focusing distance). They should then be moved slowly inwards until the target is sharply defined. If this point is passed no attempt should be made to refocus from the last position but, the procedure should be repeated (U.S. Navy [op.cit.](#))

The reason for this practice is that if the eyepieces are focused from an "in-to-out" position, the eyes have opportunity to overcompensate or "accommodate", thereby stressing the eye-muscles. This results in eyestrain and slightly inferior image sharpness (U.S. Navy [op.cit.](#)) This procedure is frequently impossible when watching birds but if the method is adopted whenever practicable, observations can be made for long periods without eyestrain; additionally the image will be slightly sharper. This is the method recommended by most armed forces where binoculars and telescopes are used continuously for long periods, often under arduous conditions.

Eye-relief and Spectacles

Eye-relief is the distance between the eye and eyepiece. This should be at least 15mm if spectacles are to be worn. As the focusing mechanism of most binoculars and telescopes can usually be adjusted to compensate for defective eye-sight (other than astigmatism) the need to use spectacles is minimized. As they slightly degrade resolution spectacles should, if possible, be avoided even when the instrument provides adequate eye-relief.

Body Materials

Many modern binoculars have bodies of various plastics-especially polycarbonates. These are light and strong but are easily degraded by insecticide sprays, mosquito repellents, petrol etc. Many plastic bodied instruments are glued and pressed together making repairs and adjustments extremely difficult. Even models assembled with screws

can pose problems as screw-threads in the plastic get stripped easily. These difficulties do not normally occur with metal-bodied instruments.

Cleaning Optics

I earlier warned against the use of cotton wool for cleaning optics. It appears I was wrong, as I find that most authorities approve of it. There are many new cleaning methods, a popular one being a solution which is "painted" on the lens and allowed to dry. When this is subsequently peeled off dirt and contamination come off too. The only problem is that the solution is expensive.

Sun

No binocular or telescope should ever be pointed at the sun. Blindness or severe eye damage could result; additionally concentrated heat could damage the optics.

Anti-reflection Coatings

There are several grades of anti-reflective "coated optics". The following descriptions are extracted from various sources. To determine the type of layers present, the instrument should be examined in good light from the objective end and, the colours of reflections noted since these are indicative of the coatings present.

COATED: Only the exposed faces of the objectives and eyepiece are coated with Magnesium fluoride MgF_2 . (Reflections are magenta and white).

FULLY COATED: All air-to-glass surfaces are coated with MgF_2 . (Reflections are magenta).

MULTICOATED: At least the external surfaces of objectives and eyepieces are multicoated (i.e. coated with five or more thin anti-reflective layers) other surfaces may be uncoated or coated with MgF_2 . (Reflections are green, reddish, magenta and [for uncoated elements] white).

FULLY MULTICOATED: All air-to-glass surfaces are multicoated (Reflections are greenish or reddish).

A few manufacturers offer binoculars with optics having interference coatings. These are claimed to reduce or eliminate harmful infrared and ultraviolet rays. They are best avoided as the images have a light bluish hue. Binoculars with such coatings can be identified, when held at arm's length, by a reflective metallic gold effect in each eyepiece.

Miscellaneous

A minor point which seems to trouble many, concerns the correct way of describing say, a 7x50 binocular. Refer to it as a "7 by 50" (Seyfried, *op. cit.*). An optical engineer may however describe it as a 7 power 50mm instrument.

In Conclusion

Not all birdwatchers will have (or require) instruments of the highest quality and, some of the opinions expressed here may make readers unhappy with their instruments. A few simple improvisations can enhance the performance of some instruments: but, as these will vary with the items concerned, it is not possible to generalize. The writer will be glad to advise readers concerning their instruments, although he warns

against expecting too much. Readers' comments and inquiries may be forwarded through the W.L.& N.P.S.)

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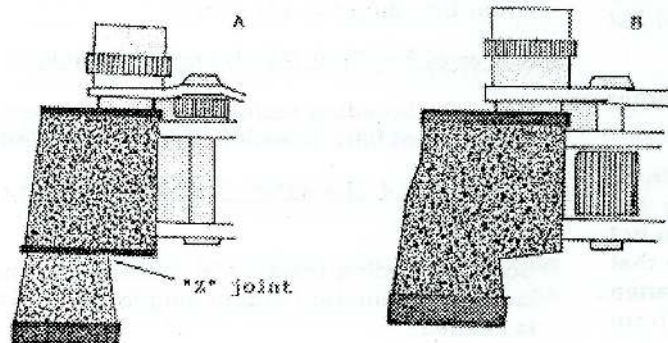


FIGURE I

Porro-prism binocular types.

(a) German "Z" type. (b) American "B" type.

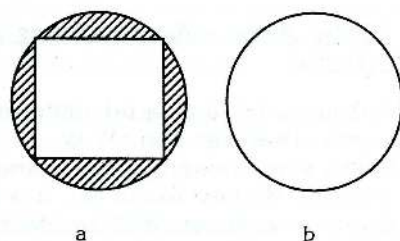


FIGURE II

Exit-pupils

(a) BK-7 prism

(b) Bak-4 prism

GAPS ON FIELD DATA FOR SRI LANKAN BIRDS

The Checklist published by the Ceylon Bird Club in 1991 records that there are 463 species and sub species of Birds in Sri Lanka. This include the 26 endemic species as already recognized by Vincent Legge (1868-1877).

As per the note published in 1994 by Th. W. Hoffmann titled "Bird Studies Needed" in Ceylon Birds Club Bulletin; the following gaps on Field Data still exists:

(A) Data on the breeding of following species

(1) Black-necked Stork (*Ephippiorhynchus asiaticus*)

A rare breeding resident in dry lowlands confined to South East of the Country. Though birds carrying nesting material have been observed no nest has yet been found.

(2) Glossy Ibis (*Plegadis falcinellus*)

It is a rare winter visitor to lowlands and formally a breeding resident in the dryzone. It did breed in the last Century; (As per V. Legge in March 1872 he has found a small colony numbering about eight pairs nesting in Uduvila, near Tissamaharama in South of Sri Lanka. The nest was placed on thorny trees in a half dried bed of a small tank) but not since found.

(3) Crested Honey - Buzzard/ (*Pernis ptilorhynchus ruficollis*)

It is considered as a breeding resident in all zones. However Maj. W.W. A. Phillips believes some remain in the island and do not migrate. No nest found yet. It is definite that there is a substantial resident population which may be reinforced in Winter from India.

(4) Black Eagle (*Ictinaetus malayensis perniger*)

Scarce breeding resident in medium and lower attitudes of hills, rare in wet zone. Though the Eagles have been found carrying nesting material no nest have been found yet.

(5) Indian Kestrel (*Falco tinnunculus objurgatus*)

Scarce breeding resident in hills, vagrant elsewhere. Nest not found, probably eggs having deposited on a ledge of rock. As per G.M. Henry young birds fed by their parents have been observed.

(6) Ruddy Crake (*Porzana fusca zeylonica*)

A scarce breeding resident throughout the island except highest hills, evidently also a winter visitor.

(7) Gull-billed Tern (*Gelochelidon nilotica nilotica*)

It is a winter visitor to low lands, summer loiterer and possibly, a breeding resident (Adam's Bridge) in north-west Sri Lanka. As per Th. W. Hoffmann he has seen numerous juveniles and there is little doubt that it breeds in north-west area of the Island.

(8) Brown-throated spinetail swift (*Hirundapus gigantea indica*)

Breeding resident in lower hills, occasional in low lands. As per Th. W. Hoffman it is a Breeding resident at least in the Sinharajah Area. Breeding not yet proved.

(9) Blue-eared Kingfisher (*Alcedo meninting phillipsi*)

Very rare breeding resident in low lands and eastern foot hills. Breeding not yet recorded.

(10) Blue-tailed Bee-eater (*Merops philippinus philippinus*)

Scarce breeding resident in eastern dry low lands. Confirmation of breeding in Sri Lanka is needed.

(11) Large Pied Wagtail (*Motacilla maderaspatensis*)

A rare winter visitor to Coastal Areas of North and lower hills. Confirmation of suspected breeding in North eg. Delft is needed.

(12) Brahminy Mynah (*Sturnus pagodarum*)

Breeding resident in dry low lands, more frequent in arid Coastal Areas. As per Th. W. Hoffman there is no recent evidence of breeding and even the original information (Legge) may be second hand. We need information whether this bird is truly a breeding resident or whether it may not after all to be a migrant from India, as it is mostly seen in winter.

(13) Yellow-legged Green Pigeon (*Treron phoenicopters phillipsi*)

Scarce breeding resident restricted to eastern foothills and adjacent lowlands (Bibile Area and the foothills of Uva Range up to Nilgala). Nest not yet found.

(B) The Distribution and Status of the following species need fresh study.(1) Brown Baza/Legge's Baza (*Aviceda jerdoni ceylonensis*)

It is a scarce breeding resident in hills.

As per Legge it is scattered throughout the Central province and not recorded beyond the vicinity of Kandyan Capitol.

As per Henry it inhabits the Hillzone in which it is widely distributed.

As per Phillips it is more plentiful in Uva Hills than elsewhere, seen in Central Hills than elsewhere, seen in Central Hills and rarely seen below altitudes of about 2000 ft.

(2) *Shahin falco* (*Falco peregrinus peregrinator*)

Breeding resident in all zones favouring rugged hilly areas; occasional in towns.

As per Hoffmann it has been observed in Urban Environments (eg. Colombo). Its breeding in towns needs study.

(3) Painted Partridge (*Francolinus pictus watsoni*)

It is a scarce breeding resident restricted to eastern foothills and adjacent lowlands. Endangered.

As per Phillips though it was formerly plentiful throughout the "patanas" or grass land of the Uva basin to an altitude of about 4000 ft. but now almost extinct in these areas.

It was moderately distributed in "Park-country" of the foot hills towards Bibile, Moneragala and around Nilgala.

(4) Barn Owl (*Tyto alba stertens*)

Uncommon breeding resident in dry northern low lands, scarce elsewhere.

As per Phillips it a scarce breeding resident in the low country Dry Zone. Resident, in very small numbers in the north-western coastal strip Puttalam northwards to Jaffna Peninsula.

As per Hoffmann, the Barn Owl has been observed in Urban Areas (eg. Colombo, Kandy, Kurunegala) and areas outside North (Anuradhapura, Polonnaruwa).

(5) Ceylon Bay Owl (*Phodilus badius assimilis*)

Rare breeding resident in wet low lands and lower hills. Endangered. As per Legge eight specimens had been captured or shot in Ceylon (eg. Kandy, Dickoya) showing that its range extends throughout the Hill Regions of the island. Habitat of the Bird lies between 1500-3000 ft. elevation. Future research will reveal its presence in low country and upper hills.

As per Phillips it is a very scarce breeding resident in all Zones. Resident in small numbers in wet zone and hill zone.

As per Hoffmann, practically nothing is known of this owl except it occurs around Kandy, Kurunegala and Ratnapura.

(6) Raquet-tailed Drongo (*Dicrurus paradiseus ceylonicus*)

Breeding resident in dry low lands.

As per Legge he has selected a specimen from Kottawa forest near Galle and procured specimens from the neighbourhood of Kandy.

As per Phillips it is a breeding resident in the low-country dryzone in tall forest around large irrigation reservoirs and along river banks.

As per Hoffman its presence in wet zone forest (eg. Gilimale) has to be confirmed.

(7) Fairy Blue Bird (*Irena puella puella*)

Status uncertain, probably now extinct. Former resident in wet low lands and lower hills.

As per Legge specimens were procured by Layard, Kellart near Kandy, and the taxidermist of Colombo Museum met with a small flock near Rakwana in the Ratnapura District of wet zone in 1868 and 1877.

As per Phillips it is a rare vagrant to low country wet zone and hill zone. It has not been recorded since 1877.

As per Hoffmann a search may be made for its presence in forests of wet zone foothills (probably hopeless).

(8) European Bee-eater (*Merops apiaster*)

As per sight record it is a rare winter visitor to dry zone. Hoffmann suggest to check out presence during winter in lower and medium hills.

(9) Grey-headed Mynah (*Sturnus malabaricus*)

Sight records reveal. It is rare, irregular visitor to low lands, mainly of North.

As per Hoffmann its presence and probable breeding in Sri Lanka (North, around Anuradhapura) has to be confirmed.

(10) Wood Snipe (*Gallinago remorica*)

Status uncertain, probably a rare winter visitor to higher hills.

(11) Jack Snipe (*Lymnocyrtas minimus*)

Winter visitor to low lands, rarely in higher hills.

(12) Swinhoe's Snipe (*Gallinago megala*)

Winter vagrant to low lands.

(13) Woodcock (*Scolopax rusticola*)

Rare winter visitor to higher hills, also on passage in wet low lands.

(14) Lesser Coucal (*Contropus bengalensis*)

Status uncertain, perhaps a rare vagrant to low lands.

(15) Broad-tailed grass warbler (*Schoenocola plargura*)

Status uncertain, probably a vagrant to low lands and lower hills.

(C) Doubtful species

The following species have been reported as doubtful from Sri Lanka mostly on the basis of inadequate or otherwise problematic sight records.

As per Wijesinghe additional evidence is necessary before they can be admitted to the National list.

1. White-headed Petrel (*Pterodroma lessonii*)
2. Soft-plumaged Petrel (*Pterodroma mollis*)
3. White Pelican (*Pelecanus onocrotalus*)
4. Lesser Flamingo (*Phoeniconaias minor*)
5. Mallard (*Anas platyrhynchos*)
6. Marbled Teal (*Marmaronetta angustirostris*)
7. Red-crested Pochard (*netta rufina*)
8. Common Pochard (*Aythya ferina*)
9. Long-billed Plover (*Charadrius placidus*)
10. White-rumped Sandpiper (*Calidris fuscicollis*)
11. Slender-billed Curlew (*Numenius tenuirostris*)
12. White-cheeked Tern (*Sterna repressa*)
13. Wryneck Jynx (*torquilla*)
14. Small Sunbird (*Nectarinia minima*)

Compiled by – Douglas B. Ranasinghe

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SKY OVER UDAWALAWE

Dr. A. N. Dharmawansa

It is somewhat unusual for someone to go all the way to Udawalawe and not step into the National Reserve to meet the jumbos. And it is still rarer for someone to not visit the park, sleep during the day and keep up during the night, out in the wild and gaze at the sky! Well, this is exactly what I did, when I booked into the W.N.P.S. Bungalow for three days last March '97.

The days of my stay there were carefully preselected to be moonless during the new-moon time. Although it was the dry season, the fulfilment of my desires were entirely at the hands of the weather gods.

My inherent interest in astronomy made me select this site where a large expanse of the sky is visible, and the place all to myself and most of all the total absence of artificial light pollution, except for the little sky glow on the western horizon from the security lights of the reservoir bund, which makes this an ideal site for sky-gazing.

It was hot and very sunny when we reached there at lunch time, but became cloudy and rather gloomy towards the evening. I was rather perturbed as to my prospects of seeing anything at all that night. Had it been that way, it would have been an utter waste of time and money, as I had to planned to go into the park during this visit - meaning, no elephants, no sky! However I was not that unlucky. By 7.30 pm Orion was beginning to peep through and within the hour, it and some of the other constellations were clearly visible. Then I knew that the luck was on my side. A little while later the sky was jet black, with only the brilliance of the myriads of sparkling stars, dotting the inky black sky. The sight was simply magnificent! This is the kind of sky that any one with the remotest interest in astronomy would love to see.

Observations started in earnest with the meagre equipment I had taken with me including binoculars and a 3 inch telescope. The bungalow 'petromax' lamp was off, and only a dim

glow of a kerosine lamp well out of sight was there in the case of an emergency. I was all by myself in the dead of night, out in the open air surrounded by the tall grass and the few bushes, being continuously entertained by the symphonic chorus of a plethora of nocturnal insects. Now and again the rustle of the leaves indicated some crawly creature nearby. At the time I went, there was this story of a lone elephant that had escaped from the confines of the park, haunting the area, and had even trampled a cyclist the previous week, and that the poor guy being in hospital with a broken leg. With this scare at the back of my mind, I, at times even had hallucinations of the shadow of the jumbo slowly trudging along the dark narrow path towards me!

The dome of a black sky with myriads of sparkling stars over you with the gentle chilly wind carressing your body is something that is indescribable and difficult to put into words but is an ethereal situation that certainly has to be experienced. The loneliness that encircles you at that time of the night and the vastness of the display of our Universe above, makes one feel how insignificant we are in this infinite cosmos, and makes one wonder what a minute role one single individual would play in a lifetime in this unfathomable web of space and time.

Unlike in the suburbs, absence of artificial light and noise pollution except for the lights and sounds of nature is the norm here. To the astronomically minded, the sight of the various constellations and the other celestial objects in an absolutely dark sky is a delight by itself. The occasional stray meteor, that whizzed past helped to remind me of the dynamic nature of an otherwise static picture of the night sky. Low in the southeastern sky once I saw some nebulous looking clouds appear in the distant horizon, and as time passed these things became bigger and bigger and finally almost stretched from one to the other end of the sky. I was rather puzzled by this sight. But strangely these 'clouds' remained in the same position with regard to the stars with no relative movement at all! Only then it dawned on me that what I was seeing are

certainly not bands of clouds, but the fantastic magnificence of our own 'Milky Way'! What a delightful sight it was. This just goes to show, what absence of light pollution can do to one's perception of the night sky. This hardly is ever seen in the suburbs as seen in Colombo where the 'Milky Way' is practically invisible except under the very best of circumstances.

The 'icing on the cake' for me however, was the dawn appearance of the comet Hale-Bopp. This was very clearly visible, with the tail and all, just after about 5.30 am. Binoculars showed this very dramatically, and as the sunlight gradually pervaded the sky, the tail began to lose its lustre and visibility, until it practically disappeared and the comet appeared like a fuzzy star.

One of the things that happen during the cold nights in the open is the condensation of

dew. This hampered my observations towards the dawn when the lenses got covered with dew.

Although what I have written may not impinge directly on wildlife per se, where a lot of space is devoted in "LORIS", the very name of our society is in pursuance of both wildlife and nature. Hence the birth of this short article.

The Udawalawe bungalow which is situated on a hillock overlooking the reservoir, is well placed for star gazing in spite of a little obstruction on the South side by a few tall trees. By and large it is quite a suitable spot for any amateur star gazer. I thought I should share my thoughts and views with the other members of our society, in order to impress upon them that the Udawalawe bungalow is not only for wild life, but also for the more diverse and absorbing study of the sky above.

THE SPIDERS OF SRI LANKA (Arthropoda-arachnida-araneae) AND SOME NOTES ON THEIR NATURAL HISTORY

C N B Bambaradeniya

INTRODUCTION

Spiders are a diverse group of predatory invertebrate animals distributed throughout the terrestrial world. Although 37,000 species of spiders have been described so far, the total number is expected to exceed 100,000 (Levi & Levi, 1990). A majority of them occur in the tropical region. A little over 400 species of spiders belonging to 236 genera have been recorded from Sri Lanka, but it is estimated that the actual total number present may be close to 1000 (Wijesinghe, 1987)

Spiders are members of the phylum Arthropoda, the large group of animals with jointed legs and a hard outer skeleton. They belong, more specifically, to the class Arachnida, which includes animals with four pairs of legs, no antennae or wings, and only two body regions - a cephalothorax and an abdomen (ie., Spiders, scorpions, mites etc). Spiders are divided into two groups-Mygalomorpha and Araneomorpha, based on the attachment and movement of their jaws. The mygalomorphs includes the largest spiders of the world and are commonly called "tarantulas" or the bird-eating spiders. Their jaws are attached on front of the head and move up and down, opening parallel to the long axis of body. Majority of the spiders are araneomorphs, whose jaws are attached below the head and open side ways. Of the total spiders recorded in Sri Lanka, 18 are mygalomorphs, while the rest are araneomorphs (Wijesinghe, 1987). The body size of Sri Lankan spiders range from 0.5mm (Linyphiid dwarf spiders) to about 9cm (Theraphosids - tarantulas). Table 1 includes the families and some genera of Sri Lankan spiders (according to Wijesinghe, 1987) and their habits and habitats, based on personal observations and published information.

SILK OF SPIDERS

A characteristic feature of spiders is the production of silk. Spider silk consists of a fibrous protein - fibroin, which is insoluble in water. Silk, which is produced in the silk glands situated in the abdomen, comes out through the spinnerets in a liquid form and hardens immediately. Silk is used in many ways. Most spiders make silken egg cases, while some species use silk to make a nursery for spiderlings. Many hide in silk tunnels or use silk to line their burrows. Others build webs or snares with silk to capture prey. Spiderlings use masses of ballooning silk threads to float in air and disperse. Most spiders lay down drag lines of silk to serve as safety lines or to retrace a path (Levi & Levi, 1990).

HABITATS OF SPIDERS

Spiders occur in a variety of terrestrial habitats, either as sedentary web-spinners or active cursorial hunters. In a typical forest environment, different species of spiders occur in a variety of habitats, which exhibits vertical zonation. For instance, the Theraphosid mygalomorphs (ie., *Poecilotheria* spp - tarantulas) and Barychelid mygalomorphs (ie., *Diplothele* spp) occupy ground burrows, ground litter and crevices. The Linyphiids (dwarf spiders - *Lygarina* spp etc) also occupy the leaf litter. The Oonopids (ie., *Orchestina* spp, *Aprusia* spp etc) and Dysderids (ie., *Ariadna* spp) occurs in the understorey vegetation and barks. Many species of Araneids (ie., *Araneus* spp, *Argiope* spp), Tetragnathids (ie., *Tetragnatha* spp) and Thomisids (ie., *Thomisus* spp) inhabit the canopy. Spiders occur in a variety of habitats such as paddy fields, grasslands, scrublands and forests. Some spiders occur in

aquatic habitats such as ponds (ie., *Dolomedes* spp-fishing spider). Many species of spiders occur in human habitations such as houses and other buildings. I was able to record 11 genera of spiders belonging to eight families, occurring in my residence at Weligalle (Gampola). These included: *Pholcus* spp, *Spermophora* spp (Pholcidae), *Hersilia* spp (Hersiliidae), *Theridion* spp, *Argyrodes* spp & *Archaeearanea* spp (Therididae), *Theridiosoma* spp (Theridiosomatidae), *Pardosa* spp (Lycosidae), *Selenops* spp (Selenopidae), *Plexippus* spp (Salticidae) and *Hyptiotes* spp (Uloboridae).

FEEDING HABITATS OF SPIDERS

All spiders are predatory carnivores which feeds on live prey. The jaws of spiders are tipped by a pair of fangs containing an opening of a duct connected to poison glands. Once the prey is bitten by the fangs, it is paralysed or killed with poison secreted by the poison glands. Juices from the digestive glands liquify the prey before it is sucked into the mouth by the stomach's pumping action.

Spiders are active at different times; some are nocturnal, some are diurnal, while some others are active during both day and night as well. Their prey consists chiefly of insects, but they also feed on other spiders, if the situation permits and even on weaker members of their own species (Tikader, 1987). The Theraphosid tarantulas are known to occasionally feed on nestling birds, lizards, small snakes and worms. The Dolomedids (*Dolomedes* spp), which inhabit the water surface of ponds, feed on aquatic insects, small fish and tadpoles as well.

METHODS OF PREY CAPTURE

The majority of sedentary spiders spin webs or snares to trap insects, and wait either in or near the webs. The eye-sight of web-spinning spiders is generally poor and they locate prey by the vibration and tension of the threads in their web due to the movements of the entangled prey (Tikader, 1987).

The types of webs and snares vary considerably among the different families of spiders. The family Araneidae (ie., *Araneus* spp, *Argiope* spp and *Nephila* spp) includes the typical orb weavers which spins a vertical, circular web with spirals and radii on a regular arrangement, mainly on vegetation. The family includes the giant wood spider (*Nephila maculata*) found in the wet zone of Sri Lanka, which makes a huge strong web, 1m or more in diameter. The tetragnathids (*Tetragnatha* spp), metids (*Leucauge* spp) and some uloborids (*Uloboros* spp - horizontal web) also spin circular orb webs.

The family Agelenidae (ie., *Tegenaria* spp) includes the funnel web weavers which spreads a sheet like web on grass, with a funnel (tube/retreat) extending from one edge, where the spider hides. The lycosid *Hippasa* also builds a funnel web. Some linyphiids construct sheet webs which are closely woven sheet like structures extending in a single plain with no apparent regularity of arrangement. The theridids (*Theridion* spp etc) and the long-legged pholcids (*Pholcus* etc) are domestic spiders that construct cobwebs which are irregular, loose webs with threads extending in all directions. The web of the uloborid spider genus *Hyptiotes* is triangular. The dinopid spider genus *Dinopis* makes a small rectangular web supported by silk lines, which it holds with its front legs. When an insect approaches, the web is spread and thrown. Most of the web building species (*Araneus*, *Argiope*, *Neoscona* etc) swathe (wrap) their victims in a sheet of silk.

The non-web weavers (no webs or snares) are commonly called hunting or running spiders. The spiders of the families Lycosidae, Gnaphosidae, Clubionidae, Sparassidae, Salticidae, Oxyopidae and Thomisidae belong to this group. These hunting spiders have sharp eye sight, which aids in detection of prey.

The lycosids (wolf spiders - *Pardosa* spp etc) chase and capture prey. The salticids (jumping spiders - *Plexippus* spp etc), thomisids (crab spiders - *Thomisus* spp etc), oxyopids (lynx spiders - *Oxyopes* spp etc) and the sparassids (giant crab spiders - *Heteropoda* spp etc) wait and pounce upon prey. Some thomisids

(*Thomisus* spp, *Runcinia* spp etc) are well camouflaged and wait in ambush on flowers for passing insects, with their front legs outstretched in readiness. Some salticids mimic ants (ie. *Myrmarachne* spp - ant spiders) and are usually observed mingling with ants, and this behaviour enables them to deceive and capture prey.

The genus *Argyrodes* (family Therididae) are a tiny group of spiders that live in the webs of other spiders (ie: *Nephila* web) as commensals. These feed upon the smaller entrapped insects that are neglected by the owner of the web, or join the host in a large meal. The family Scytodidae includes the spitting spiders (*Scytodes* spp) which has a large pair of glands that secretes sticky threads. These spiders squirts sticky threads (upto 2cm) at prospective prey and holds it in place. The family Mimetidae (*Mimetes* spp) includes pirate spiders which invade webs of other spiders. They bite the web owner and sucks it dry.

LIFE HISTORY OF SPIDERS

In spiders, the females are generally larger than the males. Males usually die soon after mating (Levi & Levi, 1990). Some females are known to kill and feed on the male soon after mating. The mated female deposits her eggs in a silk cocoon. Some species carries the egg sac in their jaws (ie. *Pholcus*) while others carry the egg sac attached to the spinnerets in their abdomen. Some attach the egg sac into objects or place in their web, while few others deposit egg sacs in burrows. The number of eggs in a sac varies from only one or two upto about 500, depending on the species. After the spiderlings emerge from the eggs, they shed their exoskeleton (moult) many times before maturity. The mygalomorph spiders (tarantulas) do not mature for several years and their females may live upto 20 years.

ENEMIES OF SPIDERS

Spiders are vulnerable to some birds such as sunbirds, flowerpeckers and woodpeckers and also to members of their own kind (due to

their cannibalistic habit). Other major enemies include hymenopteran insect parasitoids. The hymenopteran wasp families Sphecidae and Pompilidae (spider wasps) includes members that parasitize spiders. Many of these wasps occur in Sri Lanka as well and some of them include:

Family: Sphecidae - *Sceliphron madraspatanum* and *S. coromandelicum* ("mud-daubing wasps" - found in paddy fields), *Trypoxylon* spp. and *Mischophus* spp.

Family: Pompilidae (spider wasps) - *Cryptochilus* spp, *Auplopus* spp and *Pepsis* spp (The genus *Pepsis* includes members which attack large spiders, including tarantulas).

The female wasps locate and sting spiders, introducing poison which paralyses or kills them. The poison is also known to act as an antiseptic, keeping the tissues fresh for many weeks. These spiders are then carried to be stored in nests (sphecids - mud nests with cells, pompilids - sub-terrestrial nests or mud cells). A considerable number of spiders are stored in a single nest. Then the female wasp lay eggs and seals off the nest. The emerging wasp larvae feeds on the stored spiders whose tissues are in good condition.

Some spiders rely upon concealment, disguise, or mimicry to avoid enemies. Many species of spiders are able to autotomize limbs and escape from enemies. The lost limb is regenerated after the next moult.

SPIDERS POISONOUS TO MAN

Although spiders use venom (poison) to kill their prey, only a few species in the world have jaws sufficiently powerful to penetrate human skin, and even among these the venoms are, with a few exceptions, harmless. The theraphosids (tarantulas - *Poecilotheria* etc) are capable of giving a painful bite and their urticulating hairs that clothe their body can cause severe irritation and pain (Cloudsey-Thompson, 1993). Of the other spiders occurring in Sri Lanka, the genera *Latrodectes*

(Widows-family Theridiidae) and *Loxosceles* (Brown spiders - family Loxoscelidae) are mildly venomous to humans (not lethal).

IMPORTANCE OF SPIDERS

Spiders, being predatory carnivores, form an important component of natural food webs. They help to control the large populations of different species of insects, including pest species, and thereby serve as important biological control agents. The spiders that occur in our houses contribute immensely in reducing the number of pest and parasitic household insects such as houseflies, mosquitoes and cockroaches. Many species of spiders occur in paddy fields and serve as important biological control agents of paddy insect pests. Barrion & Litsinger (1995) were able to record 342 species of spiders from paddy fields of South and South-East Asia.

THREATS TO SPIDERS OF SRI LANKA

Unnecessary and uncontrolled use of agrochemicals (pesticides) in agricultural lands such as paddy fields, results in the destruction of many species of spiders, which are farmer friendly organisms. Forest fires result in the death of numerous forest dwelling spiders. Unfortunately, spiders are not pleasant animals to most people and they receive the same treatment as serpents do - being killed unnecessarily. Many people believe that all spiders are poisonous to humans and this results in the killing of spiders. Some local collectors in Sri Lanka capture and export the large theraphosid

tarantulas to foreign buyers who pay well for live specimens. Recently (January, 1997), the Sri Lankan customs officials were able to detect about 20 live tarantulas ready for illegal export. These were confiscated and later released to their original habit locality (Pidurutalagala area).

Wijesinghe et al (1993) listed 10 species of mygalomorphs (tarantulas) and 04 species of araneomorphs as nationally threatened spiders.

Many species of spiders await discovery and identification. Therefore, it is important that more people get involved in collecting data and conduct ecological studies on these neglected faunal groups of Sri Lanka.

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Table. 1:

The families and some genera of Sri Lankan spiders and their habits and habitats.

Group/family	Total genera & some examples	Web type	Prey capture	Habitats
Mygalomorpha Theraphosidae (Tarantulas)	(3)* Poecilotheria, Chilobrachys, Plesiophrictus	--	N,pounce	litter, tree holes
Barichelidae (Trapdoor mygalomorphs)	(4) Plagiobothrus, Diplothele	--	N'hide & pounce	burrows
Dipluridae (Funnelweb mygalomorphs)	(1) Ischnothele	Funnel web	N/D, entangle in silk	Crevices in trees & rocks
Araneomorpha a. Web spinners				
Araneidae (Orb weavers)	(24) Araneus, Gea, Argiope, Nephila,	Orb-web	N/D, entangle & wrap	vegetation, Houses
Tetragnathidae (Long-jawed spiders)	(1) Tetragnatha	Orb-web	N/D, entangle	vegetation
Metidae (Orchard spiders)	(7) Leucauge, Atimiosa*	Orb-web	N/D, entangle	vegetation
Uloboridae	(4) Uloborus, Hyptiotes	Orb-web Triangular web	N/D, entangle	vegetation, houses
Loxoscelidae (Brown spiders)	(1) Loxosceles	Irregular sheet web	N/D, entangle	Houses, under stones
Palpimanidae	(1) Steriphopus	Irregular web	N, entangle	Litter debris
Pholcidae (Daddy-longleg spiders)	(7) Pholcus, Spermophora	Irregular loose web	N/D, entangle	Houses, cellars
Titanoecidae	(1) Pandava	Loose web	N/D, entangle	Under logs, stoness
Psechridae	(2)Psechrus, Fecenia	Irregular web	N/D, entangle	vegetation crevices
Theridiidae (Cob web weavers)	(17)Theridion, Argyrodes, Latrodectes, Achaearanea	Irregular cobweb	N/D, entangle	vegetation Buildings

Nesticidae (cave spiders)	(1) Nesticella	Irregular cobweb	N/D, entangle	moist caves and cellars
Dictynidae	(5) Dictyna, Atelolathys	Irregular cobweb	N/D, entangle	vegetation crevices
Linyphiidae (Dwarf spiders)	(11) Lepthyphantes, Lygarina, Oribimona*	Sheet web	N/D, entangle	vegetation litter, under stones
Eresidae	(1) Stegodyphus	Funnel web	N,entangle	Litter,under stones
Agelinidae (Funnel weavers)	(1) Tegenaria	Funnel web	N,entangle	vegetation grasslands houses
Oecobiidae	(1) Oecobius	Flat webs	N/D, entangle	Houses, Tree trunk
Segestriidae (Dysderidae)	(1) Ariadna	Radial strands with tube	N,trap	under stones, barks
Filistatidae	(1) Pritha	Radial silk strands	N,entangle	Crevices
Hahniidae	(2)Aviola, Hahnia	soft webs on ground	N,entangle	Ground
Theridiosomatidae (Ray spiders)	(2) Theridiosoma	Ray web	N/D, entangle	Vegetation
Clubionidae (Sac spiders)	(12) Copa Cheiracanthium Corinna	Sac in rolled leaf	N/D, ambush	vegetation under stones
Dinopidae (Ogre-faced spiders)	(1) Dinopis	Rectangular web with lines	N, throw web on prey	vegetation
b. Hunting spiders				
Scytodidae (Spitting spiders)	(1) Scytodes	--	N/D,squirt sticky,threads	Buildings Barks
Mimetidae (Pirate spiders)	(2) Mimetus, Phobettinus	--	N/D,pounce on spiders	vegetation rocks
Hersiliidae	(2) Hersilia, Tama	--	N/D,pounce & wrap	Houses,barks, stone wall
Zodariidae	(2) Cryptothele, Storena	--	N,pounce	under stones and sand

Oonopidae	(7) Orchestina Epectris, Aprusia*	--	N/D, Capture	under stones and litter
Oxyopidae (Lynx spiders)	(2) Oxyopes, Peucetia	--	N/D, chase, ambush	Vegetation Paddy fields
Lycosidae (Wolf spiders)	(2) Hippasa, Pardosa	--	N/D, Chase, ambush	Houses, ground, Paddy fields
Pisauridae (Nursery web spiders)	(2) Perenethis, Thalassius	--	N/D, Chase	Houses, vegetation
Gnaphosidae	(1) Orthobula	--	N, ambush	Under stones
Salticidae (Jumping spiders)	(52) Plexippus, Menemerus, Hasarius, Myrmarachne	--	N/D, ambush, pounce	Buildings, paddy fields, ground, vegetation
Ctenidae (Wandering spiders)	(1) Ctenus	--	D, chase	vegetation ground
Philodromidae (Crab spiders)	(2) Gephyrota, Tibellus	--	D, ambush	vegetation grasslands
Thomisidae (Crab spiders)	(20) Thomisus, Runcinia, Tagulis	--	D, ambush	vegetation paddy fields
Selenopidae (Crab spiders)	(1) Selenops	--	N, ambush	Houses under rock barks, crevices
Sparassidae/ Eusparassidae (Giant crab spiders)	(5) Heteropoda, Olios	--	N, ambush	Houses, crevices
Dolomedidae	(1) Dolomedes	--	D, capture	Ponds, marshes

* Nationally threatened

Habits: N - Nocturnal, D - Diurnal

Other Sri Lankan spider Families & Genera:

Mygalomorphs - Nemesiidae (1) Idiopidae (2)

Araneomorphs - Ochyroceratidae (2) Tetrablemmidae (5)

Zoridae (1) Anapidae (1) Mysmenidae (2) Miturgidae (2)

Liocranidae (2)

WILDLIFE & NATURE PROTECTION SOCIETY SCHOOL NATURE CLUB PROGRAMME

The Wildlife and Nature Protection Society (WNPS), formed in 1894, is the oldest NGO dedicated to nature conservation of the country, and perhaps one of the oldest of its kind in Asia. The Society has rendered a valuable service in the promotion of conservation over the last hundred years.

The School Nature Club Programme (SNCs), launched by the Society in 1976, is within the broad objective of conservation, and specifically aims at the following.

- a) Generate interest within the younger generation of the country in conservation, and involve them in conservation related activities.
- b) Educate youth in conservation, and through them establish a communication link to the local communities and parents.
- c) Promote future leadership development for conservation.

Clubs have had a phenomenal growth since inception (Table 1), and now enjoys a country wide network (Table 2) with around 15,000 to 20,000 student participants and teachers.

Table 1

Growth of School Nature Clubs 1976-1997

<u>Year</u>	<u>Cumulative growth</u>
1976	20
1980	44
1985	82
1990	140
1995	311
1996	345
1997	356

Table 2

School Nature Club - Distribution (1997)

<u>District</u>	<u>No. of Clubs</u>
Anuradhapura	16
Ampara	01
Badulla	15
Colombo	30
Gampaha	14
Galle	28
Kalutara	70
Kandy	39
Kegalle	11
Kurunegala	06
Matara	06
Monaragala	84
Matale	01
Nuwara Eliya	01
Polonnaruwa	04
Puttalam	10
Ratnapura	13
Vavuniya	01

Individually taken, these clubs are independent bodies, each managed by elected committees under the patronage of school principals.

The WNPS plays no role in club management except for the provision of a model constitution, and services in the form of advice, publications (including a quarterly Newsletter), organisation of lectures and workshops and school visits.

The WNPS has employed two graduates namely a Programme Coordinator and a Research Assistant under this programme. Their salaries are paid through a grant given by the Mc Arthur Fund (USA) whereas other expenses are met through Society earnings.

Over the last 12 months ie July 1996 to June 1997, the field officers of the Society have undertaken 26 school visits and participated or organised 11 workshops for school children. In addition, the Society has developed a series of slides on Fresh Water Fishes of Sri Lanka and undertaken a pilot project to up-root an exotic weed (*Ulex* european) from the Horton Plains in collaboration with the Dept. of Wildlife Conservation. Fifteen undergraduates from the University of Colombo participated in this project.

Some of the activities directly undertaken by the SNCs are as follows:

Meetings and discussions

Eassy and poster competitions

Field trips

Managing "Nature Sections" in libraries

Tree Plantation

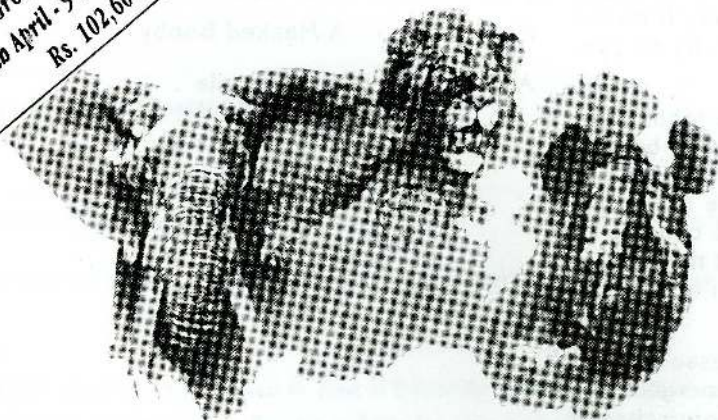
Distribution of Saplings

Maintaining school garden/herbariums

Where clubs are active, the impact is visible with the school garden looking greener, clean and well maintained. The Society is continuously in receipt of queries from clubs and articles for the Newsletter which reflects student enthusiasm in the programme. Interest created early in life in conservation is having a lasting impression, and number of club members have become members of our Society, and continue to play a role in conservation in their adult life.

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LETTER

Dear Ms. Gunawardana

I write to ask whether any of your readers have heard of or seen red-vented bulbuls cuckolding magpie-robins?

A pair of magpie robins visiting my garden were busily training and feeding a newly-emergent young magpie robin that they were parenting. Each time one of the adult magpie robins found an insect, a (?) baby red-vented bulbul too kept hopping or flying up to them, obviously expecting to be fed. I didn't ever see the magpie robins feed the (?) baby bulbul but it was clearly associating with the magpie robin family, and well tolerated by them.

Two days later, the bulbul was being treated very differently. It was not tolerated within the threesome of the magpie robin family and was definitely being chased away from the vicinity of the young magpie robin, by its parents.

I wondered whether magpie-robins had been tricked into rearing a red-vented bulbul? More so because the bulbul was a loner. A month or more ago, a pair of bulbuls were building a nest, and it was disturbed by some children in the neighbourhood. Could it be that the bulbuls were pushed to use a magpie-robin nest to lay their eggs, as a result?

A similar scene, again witnessed in Mt. Lavinia, was of a koel, that had emerged perhaps on that day (morning) itself, being chased by a flock of crows. Whenever the young koel alighted on a branch one adult crow kept flying around and keeping the attacking crows at bay. The folklore I had heard was that the parenting crows, when they discovered they'd been cheated into raising a koel, pushed it out of the nest and attacked it. But what we witnessed this day was the young koel which had emerged from the nest still being protected from other crows by at least one of the crows which had nurtured it!

Yours sincerely,

Diyanaath Samarasinghe

Ceylon Bird Club Notes-1995 (Loris Vol. XXI - No:1)

Errata

- | | | |
|-----------|---|--|
| Page 16 | - | Second Column - Heading <u>Raptors</u> |
| | - | line 9 - 'Mountain and <u>Rufous</u> - <u>bellied</u> Hawk-Eagles' |
| February | - | " A month of nesting, e.g. Red-faced Malkoha at Sinharaja, about 60ft above ground, Ceylon Blue Magpie as usual on top of a small tree, and many other species. A White Wagtail at Chandrika Wewa. A Banded Crake at Nuwara Eliya. 2 Large Sand Plovers and a Black-headed, Gull at Yala". |
| May | - | A Masked Booby |
| August | - | Randenigala |
| September | - | Kitulgala |

WILDLIFE & NATURE PROTECTION SOCIETY OF SRI LANKA

(ESTD. 1894)



CHAITIYA ROAD, (Opposite New Light House) FORT, COLOMBO 1.

Telephone : 325248

Date:.....

PROPOSAL FORM

Name (in block letters with surname underlined).....hereby
make an application to join the Wildlife & Nature Protection Society and I agree to abide by its rules. I enclose herewith
my entrance fee and subscription for the current year.

Private Address

Official/Business Address

School Address for Junior Members

Profession /Occupation (Present, if not Past)

Interest (Conservation, Environment Etc)

If Junior Member, date of birth

Have you been elected a member earlier. Yes/No. If yes date.....

.....
*Proposer Name Signature & Membership No.

.....
Signature of Applicant

.....
*Seconder Name Signature & Membership No.

I prefer LORIS/WARANA (delete-one)

* Proposer & Seconder should be members of the Society for more than one year

Note

1. LORIS (English) is published in June & December and WARANA (Sinhala) in March & September
2. The Financial Year of the Society is from 1st January to 31st December.
3. Applicants must pay the entrance fee along with the Subscription at time of applying.
4. While the initial payment must be made direct to the Society, those who wish to make subsequent payments by Banker's Order should make them effective from the following year.
5. Kindly quote your membership number in all Communications with the Society.

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Date Received.....Date Elected.....

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In undertaking to make these remittances, it is expressly understood that the Bank is relieved from all claims for loss which may accrue through error, omission or delay in making such remittances Please note that this cancels any existing order in favour of the Wildlife & Nature Protection Society of Sri Lanka.

Signature

Rs. 2/-

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OBJECTS OF THE SOCIETY

- To prevent the destruction and harmful commercial exploitation and wherever desirable and possible, to preserve wildlife intact in natural conditions in Sri Lanka.
- To assist in protecting nature in all its forms such as landscape, soil, water, flora, fauna marine habitat and to conserve it for future generations.
- To co-operate actively with other organisations in Sri Lanka and in other countries in the interests of nature conservation and to give support for study and research concerning wildlife.
- To negotiate and co-operate with the State and Public bodies in the interest of wildlife and nature conservation especially to establish and support national reserves and sanctuaries and assist in their administration.
- To establish, administer and hold private wildlife sanctuaries and nature reserves.
- To publicise the importance of wildlife and nature conservation in this country.

MEMBERSHIP ENTITLES YOU TO THE FOLLOWING PRIVILEGES

- Free receipt of our English journal "LORIS" in June and December or our Sinhala journal "WARANA" in March and September, news letters.
- Access to Library facilities at our Headquarters.
- Occupation of the Society's bungalows at Wilpattu Udawalawe and Yala which are exclusively reserved for members and their guests. (We hope to provide more camp sites in other wildlife reserves).
- Participation in the Society's meetings, film shows etc. which are organised from time to time.
Through your membership you also support the efforts of the Society to preserve Sri Lanka's wildlife, national parks, nature reserves and promote conservation interests in pursuance of the objects of the Society.

P.S.: Please quote your membership number in all communications and when remitting membership fees.

	Entrance Fee	Subscription rates
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