CONSERVATION OF THE IITA FOREST AND ITS RESOURCES

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In early 2010, the United Nations "International Year of Biodiversity", a new project began at the International Institute of Tropical Agriculture (IITA) at Ibadan in Nigeria, with the aim of enhancing biodiversity and restoring forest (Figure 1) in the Ibadan campus. This year, coincidentally declared the "International Year of Forests", the IITA-Leventis Foundation Project is preparing to plant over 30,000 young trees, and during the first phase (2010-2014) will substantially reforest the east bank of the IITA lake (Appendix 5.2)

Background

The IITA campus occupies approximately 1000 ha which are now largely within the city limits of Ibadan. When acquired in 1965, the land was mostly bush, interspersed with field crops and 26 villages, whose occupants were relocated, largely in the purpose-built village of Shasha. After construction of campus facilities and allocating fields for crop research, about a third of the site - some 350 ha - was designated a nature reserve, (Appendix 5.1) and in 1987 campus residents embarked on a voluntary project to create pathways through the regenerating secondary forest. Several years later, their vision and hard work resulted in the Forest Trails we still enjoy today. After more than 40 years as a reserve, and with continuing loss of forest in SW Nigeria, the IITA secondary rain-forest is increasingly important as a refuge for many plants and animals that were once widespread.

Why do tropical forests matter?

Tropical rainforests support the greatest complexity and numbers of living organisms on earth. According to the Gran Canaria Declaration (BGCI, 2000), as many as two-thirds of the world's plant species are in danger of extinction during the 21st century, and by definition a high proportion of these will be in the tropics. In pristine tropical forests, tree species alone may exceed 100 per hectare, whereas in temperate forests there may be fewer than ten, and each species has at least 15 other organisms dependent on it. The felling of trees and destruction of tropical forests therefore has a devastating impact on biodiversity. Since 1995, Nigeria has lost over 56% of its rainforests and deforestation continues at the rate of 3.5% per annum – the highest in the world. Currently only 9.6 million ha remain in Nigeria, which is less than 10% of the total land area - the lowest in West Africa. Traditionally, forests were sustainably harvested for fibres, foods, beverage ingredients, medicines, fodder, colorants, tannins, latex, oils, resins and waxes, as well as for timber, providing local employment for men and opportunities for women and children to supplement family income. Nationally, they are potentially a source of tourist revenue and carbon credits; internationally they protect watersheds, and globally they mitigate climate

change. Their loss has complex knock-on effects that are only now being quantified in terms of environmental, climatic and socio-economic change. The true extent of the damage may take many years to show; forest fragments, while appreciated for leisure and educational activities, may not be viable for the continuation of healthy populations of key species, or for sustainable harvesting of species utilised by local people. They are also vulnerable to invasion by exotic species, causing further losses in biodiversity.

Environmental degradation is increasingly seen as an economic loss that developing countries can ill afford. As resources diminish, rural livelihoods are no longer viable and more people leave the land for the cities, resulting in a greater mismatch between mouths to feed and natural resources. Now that the real cost of over-exploiting this apparently inexhaustible "free" supply of wild plants and animals is apparent, goals are being established by the United Nations via the Convention on Biological Diversity (CBD), which came into force in 1993, and more recently through incentives for Reducing Emissions from Deforestation and Forest Degradation (REDD) to protect remaining forests, reforest degraded areas and promote sustainable development.

Objectives

The IITA-Leventis Foundation Project aims to:

- Restore existing forest by removing invasive exotic species, such as *Artocarpus altilis, Chromolaena odorata, Delonix regia, Gliricidia sepium, Leucaena leucocephala* and *Tithonia diversifolia*, and replanting with indigenous species raised from seeds, wildlings and cuttings collected in the IITA campus and environs.
- Protect the IITA Forest Reserve against disturbance and theft, in particular hunting for bush meat and collection of plant parts for medicinal use.
- Catalogue the biodiversity of existing forest areas, mainly in terms of birds, butterflies and medicinal plants, and monitor changes in relation to reforestation.
- Replant the east bank of the lake with indigenous tree species and carry out research into reforestation techniques.
- Engage in conservation educational activities, especially with young people, to raise awareness of the need to protect forests.
- Form local, regional and international partnerships in tropical forest conservation, research, and education.

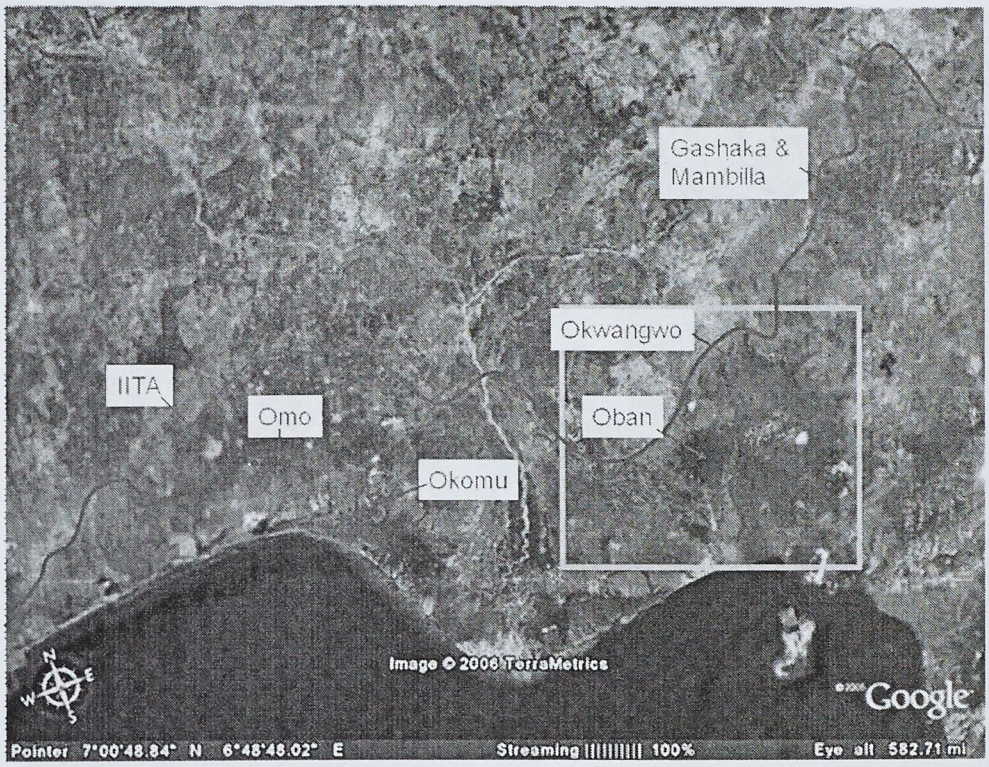

Figure 1. IITA forest in relation to other secondary rainforests in Nigeria

This article summarises the activities and achievements of the IITA-Leventis Foundation Project which also represent the main activities of the project as listed above.

Project activities and achievements

Increase forest protection and trails

IITA has faced encroachment and poaching of its forest reserves since the enclosure of its Ibadan campus in 1965. The Leventis Project team of rangers and nursery workers is led by Dr John Peacock, Project Coordinator and medicinal plant expert Ms Deni Bown and Nursery Manager Mr Olukunle Olasupo. The team (Figure 2), apart from protecting the forest, is responsible for collecting seeds and wildlings from the forest, potting, propagating, transplanting and watering. We have also utilized the expertise of Dr David Ladipo from CENRAD to assist with various issues on rainforest restoration (i.e.advising on propagation, planning experiments, and providing information on additional sources of seeds and indigenous plants). There has been a noticeable decrease in the number of gunshots heard in the forest since the start of the project. Four poachers were apprehended and two guns confiscated, along with a bag containing 45 bats that had been shot.

Figure 2. The IITA-Leventis Foundation Project team at the lower indigenous tree nursery, 2010

Forest resource collection and propagation

IITA identified areas of farmland on which to focus the planting of indigenous trees and thus, expand the forest reserve (Appendix 5.2). These are areas, which are highly vulnerable to erosion or of low value to IITA's crop research, could therefore be better utilized for conservation.

Seed collection and vegetative propagation of trees

In order to expedite planting, seeds were initially collected from both the forest and the IITA Arboretum. Seed collection and sowing of seed commenced in late January 2010 with the appointment of the Nursery Manager. A second nursery, known as the top nursery, was developed in September 2010.

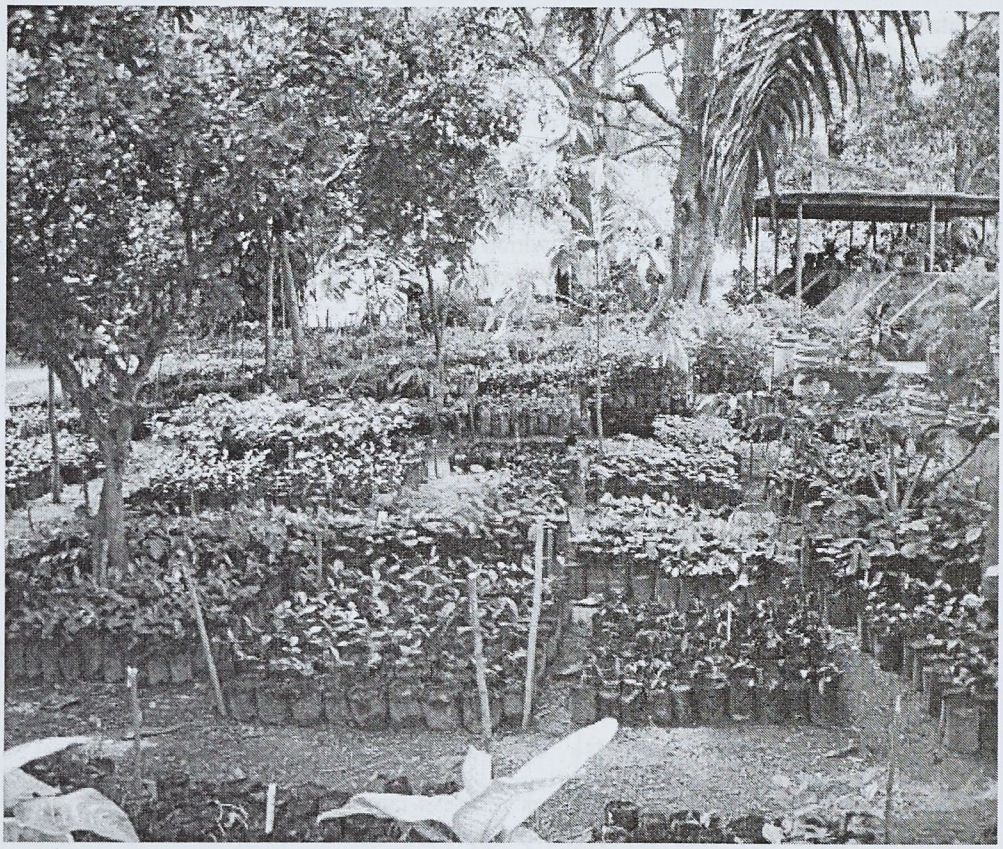

Figure 3. Indigenous tree nursery showing some of the seedlings propagated since February 2010

A necessary first step for collecting seed was to draw up a list of priority species for the IITA Leventis Foundation Project. Detailed desk studies on the original forest inventories and on past studies of priority species in the southwest area of Nigeria were undertaken. A list of fast-growing and light-tolerant pioneer species was compiled to prioritize trees for replanting in open areas in order to provide shade for slower-growing and longer-lived canopy species (Appendix 5.5).

Detailed records of methods used to propagate indigenous trees have been kept so we now have inventories of species propagated by both seed and vegetative methods. These inventories provide information on collecting, any special treatments required, success rates, and the number of plants finally established in nursery pots. An interesting example of a treatment used to break dormancy was observed in *Garcinia kola* (bitter kola). Seeds of this species normally take over nine months (272 days) to germinate. By inserting them in a

plantain stem, which was felled and incised longitudinally, germination was reduced to two months (56 days).

Considerable time was spent in collecting and cleaning seeds, particularly of *Milicia excelsa* (iroko) and *Treculia africana* (African breadfruit). Rangers were vigilant in locating and collecting surplus wildlings (self-sown seedlings) from forest areas and the arboretum. The collection of wildlings is important for two reasons: 1) it prevents overcrowding and resultant wastage of self-sown seedlings, which are commonly found under the parent tree; and 2) seedlings are approximately 1-2 years old and therefore have a head start over plants raised from seeds in the nursery.

Large cuttings of fast-growing species, such as *Newbouldia laevis* (coronation tree, akoko) and *Spondias mombin* (hog plum, *okikan*), were another priority. Attention was also given to species which are difficult to propagate, such as *Richadella dulcifera* (syn. *Synsepalum dulcificum*) (miracle berry, *agbayun*). It shows erratic germination and slow growth from seed but can be marcotted successfully. To date, 23,200 young trees of 53 indigenous species have been propagated by both seed and vegetative methods. Full details are shown in Appendices 5.3 and 5.4.

A further important activity has been the removal of invasive species, such as *Leucaena leucocephala*, *Chromolaena odorata* and *Delonix regia*, and other alien species of *Dieffenbachia, Canna and Bauhinia* from certain areas of the forest and arboretum.

Tree planting and experiments

The planting of indigenous tree seedlings in areas targeted for reforestation has been undertaken cautiously. This conservative approach was adopted in order to avoid unacceptably high losses of young trees due to insufficient scientific information on their requirements. Following our increasing success in propagating indigenous tree species, a major priority is to ensure their survival after transplanting into the various areas designated for restoration (Appendix 5.2).

To establish scientifically-based guidelines for restoration plantings, a small experiment was designed to assess the effect of different ground treatments on the establishment of selected indigenous tree species. This Ground Treatment Experiment was conducted in the wooded area known as the horse paddock, adjacent to the lower nursery at the east side of the IITA Lake, and also in the experimental field (BS26), which is part of the farmland now set aside for reforestation along the east bank of the lake. The experiment was originally designed to have five treatments (Figure 4) However, the first uncleared area was extended to give a total of six different ground treatments. Each treatment area was planted with 10 different indigenous tree species.

The following species were randomly chosen for the experiment and numbered 0-9: *Afzelia*

africana (0), *Bombax buonopozense* (1), *Cleistopholis patens* (2), *Cola gigantea* (3), *Dactyladenia barteri* (4), *Hildegardia barteri* (5), *Pentaclethra macrophylla* (6), *Pterocarpus santalinoides* (7), *Spondias mombin* (8), and *Tetrapleura tetraptera* (9). Criteria for selection were based on the following, namely that seedlings should be at least 30cm high, have 4-5 nodes, and be available in sufficient numbers for the purpose. All trees were raised from seeds collected from the IITA campus during 2010, with the exception of *Bombax buonopozense* (from Oshogbo).

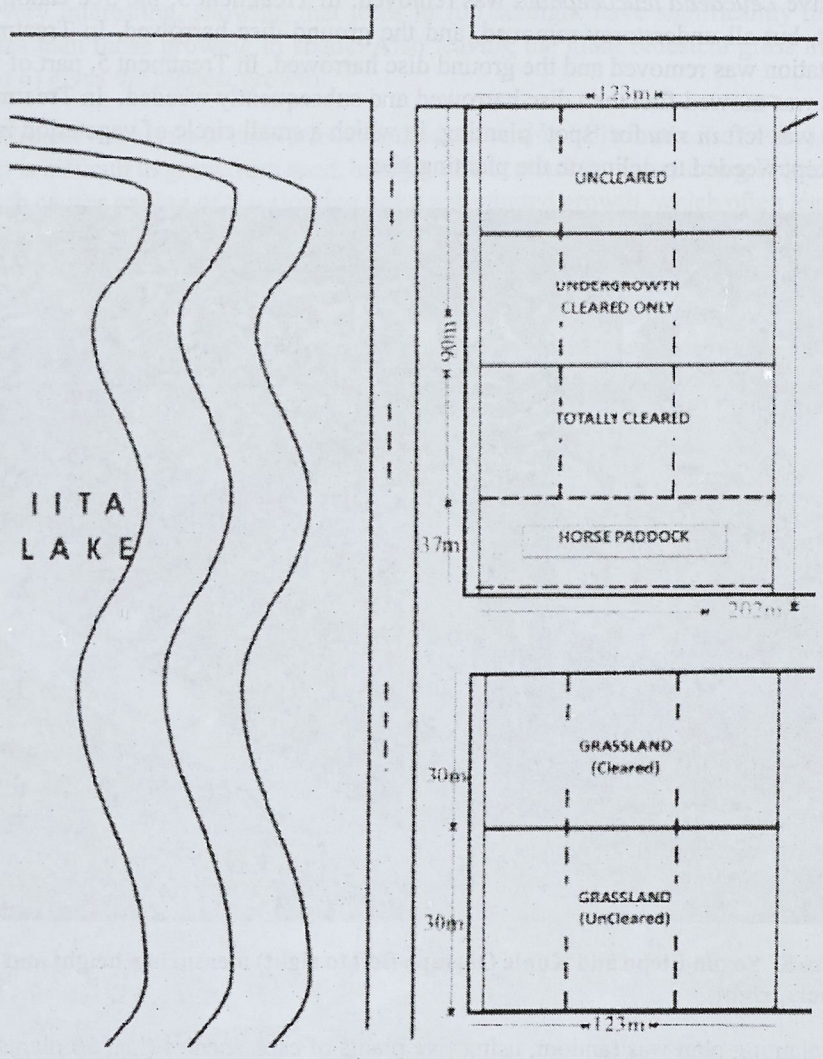

Figure 4. Layout of Ground Treatment Experiment

The above figure shows only five treatments as originally planned. The uncleared treatment was extended to give two different uncleared treatments. The first four treatments were in a very small remnant of highly degraded secondary forest while the remaining two were in former farmland, now dominated by *Andropogon tectorum* (giant bluestem), a grass that reaches 2m high. Each plot measures 20m x 30m.

In Treatment 1, the entire area was left untouched, with canopy, understorey, and invasive species intact. In Treatment 2, the canopy and understorey were again left intact but all invasive *Leucaena leucocephala* was removed. In Treatment 3, the tree canopy was left intact, but all understorey removed, and the ground disc harrowed. In Treatment 4, all vegetation was removed and the ground disc harrowed. In Treatment 5, part of BS26, the grass was mowed first then disc harrowed and subsequently weeded. In Treatment 6, the grass was left *in situ* for 'spot' planting, in which a small circle of vegetation is removed and kept weeded to delineate the planting site.

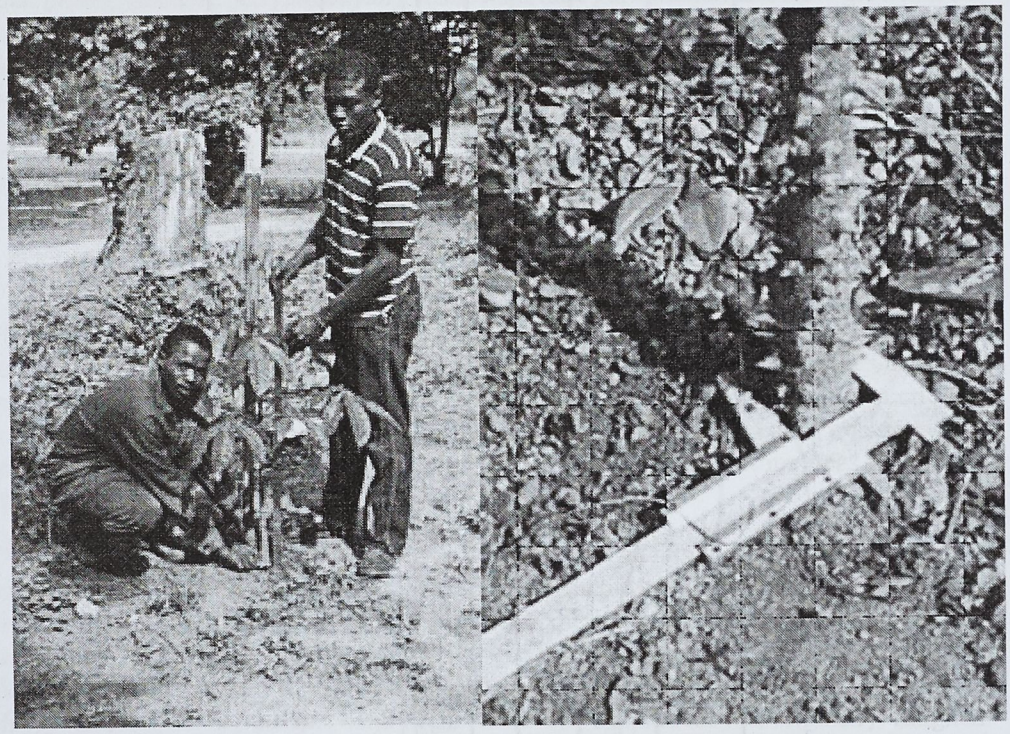

Figure 5. Segun Elepo and Kunle Olusupo (left to right) measuring height and girth with calipers (right)

The planting plan was random, using five plants of each species (i.e., 50 plants per plot). Bamboo canes 3m high were painted at the tips with different colors representing each

species to mark each planting station. Individual planting positions were recorded by GPS. Soil samples and light intensity readings at ground level were taken from each plot. Planting holes 75cm deep, back-filled with topsoil 30cm deep were prepared and trees were planted in late August 2010.

Records comparing growth, health and vigor of seedlings of the same species in each treatment area were made on 8th January and 7th March 2011 using a metre ruler to measure height and calipers to measure girth (Figure 5). Statistical analysis of the initial results is very interesting, showing that trees in full sunlight have significantly higher growth rates than those growing in shade. Also leaving the giant bluestem grass in situ (Treatment 6) gives the highest growth.

The Iroko Project was set up to test various methods of raising Milicia excelsa (iroko) from seed. Iroko is difficult to grow from seed, being prone to attack by the gall bug Phytolyma fusca, which causes galling of the growing point and stunted growth, which often leads to further infections and/or death. Research indicates that the insects are active at up to 1m from the ground, and in areas with higher light intensity and lower humidity than normally found in undisturbed forest.

Figure 6. Young Iroko seedlings grown at ground level show heaviest gall infection.

At the top nursery, an area for the experiment was cleared of vegetation and four treatments, each measuring 6 x 10m in area, were prepared: 1) left as bare ground 2) covered by a bamboo structure 2m high to provide shade 3) shaded by a bamboo structure 3m high, with bamboo staging 1m high and 4) covered by an insect-proof mesh cage. Seedlings were transplanted from the seedbed into nursery pots. The same number of seedlings were placed in each treatment area and monitored regularly for signs of gall infection. Results showed that apart from full protection in the mesh cage, all seedlings were infected by the gall bug. The greatest infection occurred when pots were placed at ground level in full sun (Figure 6). Raising the seedlings on benches only delayed the infection.

For educational and promotional purposes, further tree plantings were organized within the Experimental Plots on the east bank of the lake (Appendix 5.2). The first took place in early October 2010 (at the start of the new school year). Children from the IITA School planted 150 trees grown from seeds which they had collected in February, each labeled with the child's name and both the scientific and Yoruba names of the tree. The total number of trees planted during 2010 was 590. Based on our increasingly successful rates of propagation, to date, and information gained from our Ground Treatments and Iroko Experiments, it is proposed to plant approximately 30,000 tree seedlings in 2011. We also intend to repeat the successful tree propagation and planting project with the IITA School.

Catalogue of forest resources

To maximize our efforts to conserve the forest and enhance its use for education and ecotourism, the resources of the forest in terms of checklists, databases, photographs, and other media are being catalogued. The degree of invasion by exotic species is also being monitored. Building on previous surveys and catalogues, our focus is on three main areas: birds, butterflies, and medicinal plants.

Birds

Ornithological surveys were undertaken throughout 2010, mainly by Mr Adeniyi Taiye, Dr Shiiwua Manu, Mr A.P. Leventis, Phil Hall and Dr Matt Stephens. These surveys were primarily to provide a baseline of the birds in the forest before any major restoration activities commence and also to ascertain if there had been any significant change in the bird species to be found in the area. The original bird list for IITA details over 350 recorded species compiled by numerous ornithologists since the early 1980s.

However, many of these were recorded infrequently and there are doubts about the authenticity of some of the records. During 2010, 191 species were recorded (Appendix 5.6). Further surveys will continue throughout the life of the project so that a new comprehensive bird list for IITA can be compiled

During the surveys, the team also performed some small-scale mist-netting in an attempt to

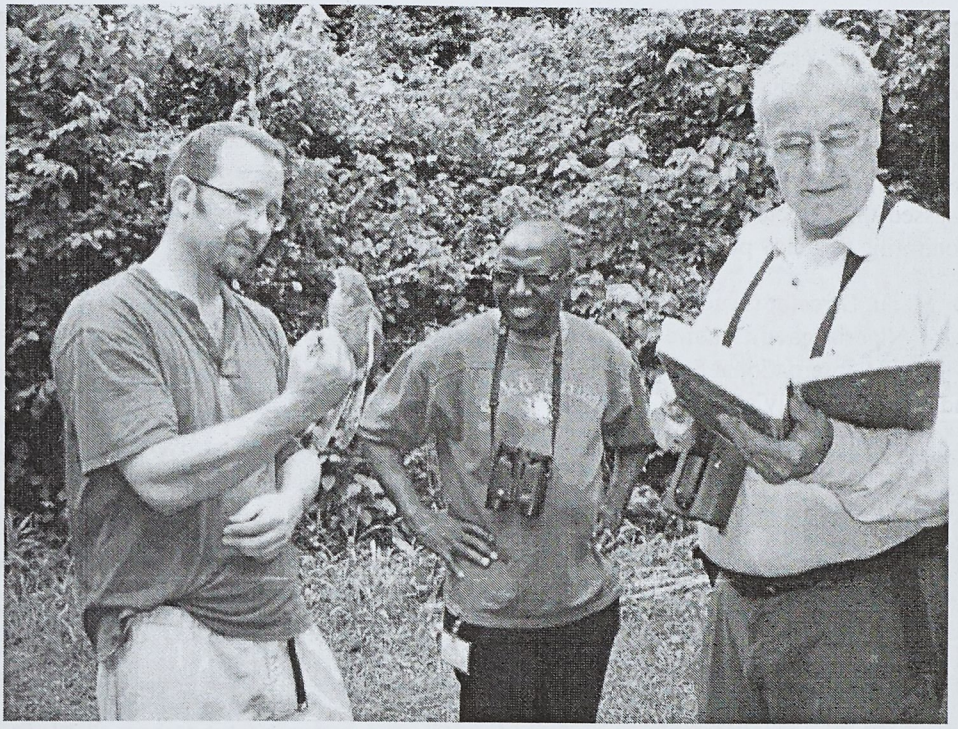

Figure 7. From left to right: Matt Stevens, Shiiwua Manu, and Phil Hall

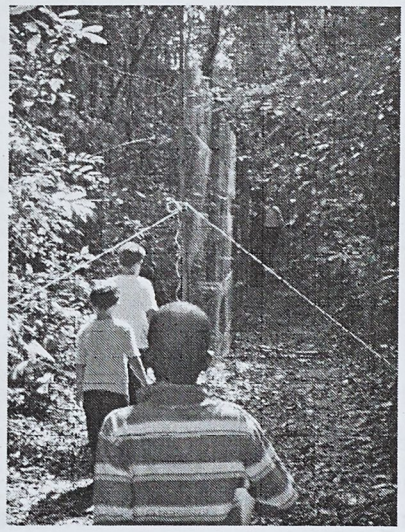

Figure 8. (left) One of the mist-nets being visited by the children and (right) a Red-chested Goshawk (Accipiter toussenelii macroscelides) after being extracted from a mist-net

improve detection of those species otherwise difficult to observe (Figure 8). For these exercises, mist-nets were erected at numerous strategic sites within the secondary forest on the west bank of the lake.

Previous work carried out in the savannah areas of northern Nigeria has provided interesting insights into the life histories of small tropical birds. As yet, there have been few studies that assessed these factors in tropical forest species, but it is hoped that through continual monitoring this may prove possible within the remaining forest habitat in IITA-Ibadan.

Dr Manu, Director General of AP Leventis Ornithological Research Institute (APLORI) in Jos, Nigeria, gave a lecture on the importance of conservation and bird diversity to pupils at the IITA International School in March 2010 (Figure 9). The lecture was well attended and enthusiastically received.

Figure 9. Dr Manu talking with children at the IITA International School

On the two days following the lecture, 15 children from the school joined the survey team in the forest to witness at first hand the trapping of birds for scientific studies, including weighing the birds, determining their age and gender, and finally placing a bird ring on one leg for further scientific study (Figure 10).

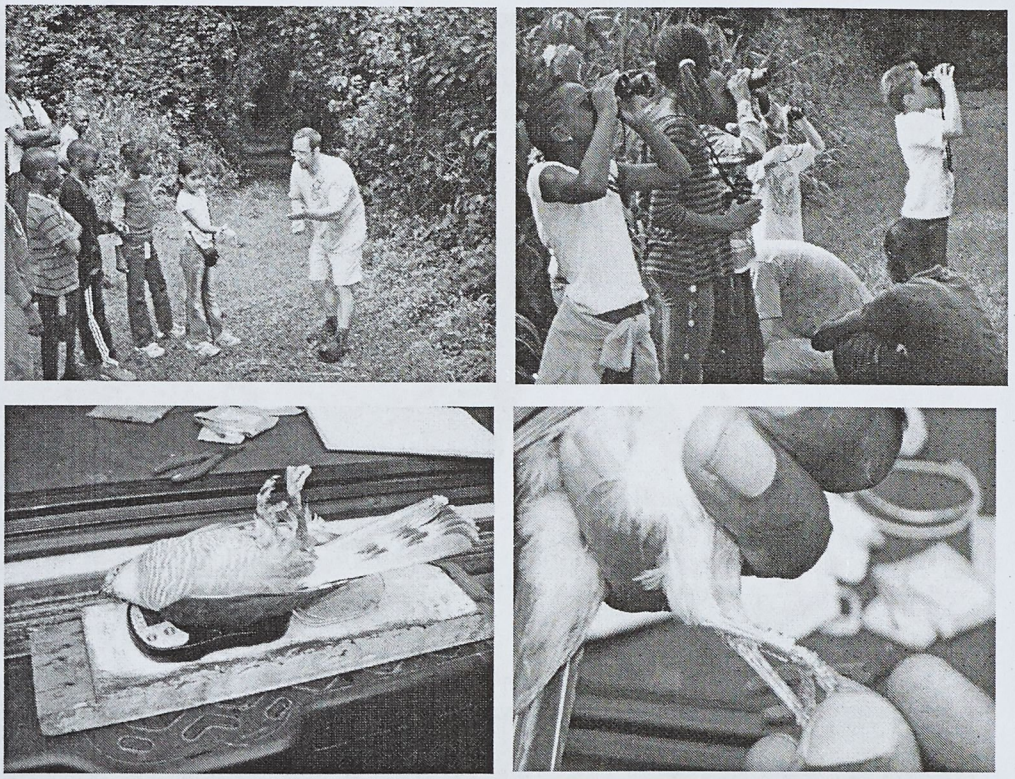

Figure 10. Children releasing, watching, weighing, and ringing different birds

Detailed reports of these experiences were nicely documented by the children in their school Newsletter. Hopefully, this experience will encourage some of the children to take an active interest in bird conservation.

During this period, Adeniyi Taiye also carried out mist-netting activities as part of his PhD study on bird viruses. The main objectives of Taiye's thesis are to monitor and compare bird species' distribution, diversity, and viral incidence; and to determine possible transmission routes between wild and domestic birds at the IITA watershed.

For this exercise, 18 mist-nets totaling 228m long were erected at six sites within the secondary forest on the west bank of the lake. Figures 11 and 12 show two of the birds trapped, examined, and ringed on 12 August 2010.

Butterflies

Knowledge about the diversity of butterfly species at IITA is incomplete. A preliminary survey conducted by Robert Warren confirmed the presence of 149 species. He concluded

Figure 11. Blue-shouldered Robin-chat

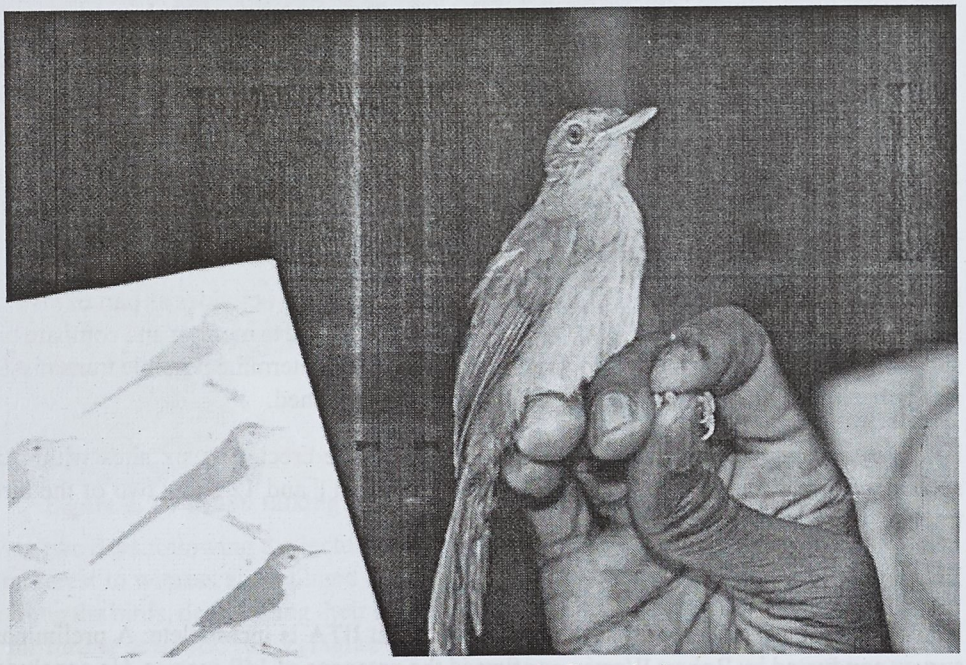

Figure 12. Baumann's Greenbul

that this number is a long way short of the ultimate total. At this stage it is not possible to predict the ultimate number with any degree of certainty, but realistically it will fall somewhere in the range of 250-400. Display cases of most of the 149 species collected, identified and mounted by Robert Warren have been donated to IITA to promote further interest and are on display in the library of the IITA International School.

Further surveys were carried out by Szabolcs Sáfián, Robert Warren, and Oskar Brattström in March 2010 (Figure 13) and by Szabolcs Sáfián during September and October 2010. This period was chosen because of the less frequent rains, being at the tail-end of the rainy season. Although rains in 2010 were unexpectedly heavy and continued until the end of the survey, many species were on the wing, especially the fruit-feeding Nymphalids which were out in high numbers.

During this survey, 158 butterfly species were positively recorded, 31 of which proved new to IITA forest. The majority were true forest butterflies, including Western Nigerian specialists such as *Gorgyra bule* and *Euphaedra exerrata* (species previously known only

Figure 13. The three butterfly experts (From left to right: Robert Warren, Szabolcs Sáfián, and Oskar Brattström) with Chiamaka and Tolu from the IITA International School

from the Niger Delta). Other rare forest skippers are *Melphina unistriga*, *Artitropa comus*, and *Pteroteinon pruna*.

It is worth noting that Epitolini are under-represented at the IITA forest. The main reason for their absence seems to be the previous felling of old trees in the campus that hosted nests of Crematogaster ants, with which almost all species of Epitolini have a myrmecophilous relationship. Despite the absence of ant-infested trees, small colonies of Geritola gerina and an unidentified species were found in the Arboretum and on an ant-tree on the ITTA golf course. Trapping along transects was also carried out to record differences between the butterfly communities in the IITA forest and those at the open area proposed for reforestation. Differences between the two butterfly communities were striking. In a five-day trapping period, the observed species richness in the forest transects was 25 while it was as low as seven in the open area. Additional data are needed for statistical analysis.

These two surveys identified an additional 71 species, bringing the current total to 220 (see Appendix 5.7 where the new species are shown in red). The surveys also provided data that suggest a final total of around 300 species for the IITA Forest. During each survey, specimens were captured in a hand-net or in traps. Traps were baited with rotting fruit or carrion, which are attractive to certain species, mainly *Nymphalidae*. Bait such as pawpaw and urine is put on the ground for butterflies that do not enter traps.

Figure 14. Robert Warren talking to IITA School pupils about butterflies in Nigeria

Habitats within the campus are very varied. The track running north-south through the IITA forest provides the best locations for trapping, as it combines sunlight with proximity to full canopy cover. The trails provide greater habitat variation but less sun. They are suitable for seeking the small, largely stationary butterflies of the *Lipteninae genera* by examining the ends of dead branches and young forest growth. The tracks on the outside of the forest find Lycaenidae seeking a burst of sunshine before returning to the forest. The track on the west side of the lake is good for mud puddling. Habitats yet to be covered include the marshy area north of the lake and the open area of the IITA golf course. Year-round surveillance is critical for the accurate assessment of diversity.

These butterfly surveys at IITA are providing useful information relative to conservation. The fact that the forest is small and now isolated gives some indication of pressures on survival. Despite the enormous destruction of West African forests to date and that the primary consideration for survival is the presence of the host plant, records indicate that significant butterfly extinction has yet to occur when viewed at a regional scale. Knowledge of the total species population within IITA and the list of specific species present could well provide answers about the cut-off at which the range is too small for survival of certain species.

The forest is also an important conservation target itself because of its location. It is quite possibly the westernmost representative of semi-deciduous forest on this scale before the Dahomey gap. Guided by satellite imagery, attempts to locate equivalent forest within Nigeria to the west of IITA yielded only one small and unprotected patch (5km west of Tapa). Forest reserves within this sylvan formation (Olokomeji, Ijaiye, Ilaro, etc.) have all disappeared. A number of butterfly species (e.g. *Liptena ilaro, Euriphene kiki*, and *Axiocerses callaghani*) found nearby have not been seen elsewhere, pointing to the biogeographical importance of such habitats. If results eventually show that the IITA forest is indeed too small to allow for the survival of all species that should be present in an equivalent forest type, it will nevertheless remain an important refuge. There is an estimated minimum of 250 species of butterfly at the IITA forest while there are fewer than 70 outside of it.

Some interesting results for specific species have emerged. The male of *Euriphene ampedusa* shows seasonal variation. This has only occasionally been noted before for *Euriphene* and may be related to IITA's proximity to the Guinea Savannah. The female of *Bebearia mardania*, also appears to exhibit two forms (not seasonally related).

During the visit of the three lepidopterists, Robert Warren gave a lecture at the IITA School in March 2010, which was well-attended by the pupils and interested IITA staff and scientists (Figure 14).

The lecture generated many questions from the children. The following day, the two children who had won the butterfly identification competition (Chiamaka and Tolu) spent

the morning learning more about butterflies, especially how to trap and identify them in the forest (Figure 15).

Figure 15. Robert Warren and Oskar Brattström showing Chiamaka and Tolu how to catch and trap butterflies

Flora and medicinal plants

Work on surveying and cataloguing the forest flora at IITA began in March 2010 with an assessment of earlier studies. These included a checklist of trees in the arboretum and a list of tree species in Forest Transects, the latter compiled by Drs John Hall and David Okali in 1975, together with a supplementary list of 16 medicinal plants found in the Forest Transects (July 2001). Exploration of the forest was made by following trails and a note was also made of labeled specimens along designated routes. This gave an overview of some of the most commonly occurring tree species. It was noted that a number of tree species in the IITA Arboretum are exotics. However, there is a good range of indigenous species which are a valuable genetic resource and more easily accessible for seed collection than in the forest.

To date, records of the flora within the forest and environs total 209 species of trees and shrubs, 120 lianes and climbers, and 112 forbs and grasses. The present list brings the total number of species recorded to 441, of which 382 have medicinal uses in West Africa. These figures show that the campus is a rich resource with considerable potential for restoration and

development, together with concomitant opportunities for education and research at all levels. The numbers of species are expected to increase further as less common and/or taxonomically more difficult species are identified. The provisional checklist of IITA flora can be requested from Deni Bown (d.bown@cgiar.org). This is updated each quarter.

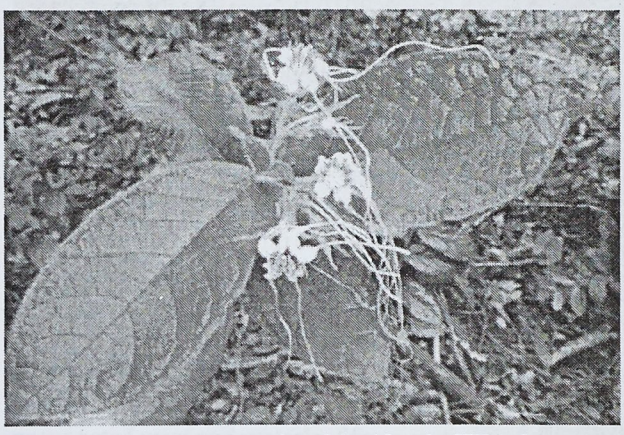

Figure 16. Strophanthus hispidus in IITA forest

Among interesting new records were two species of *Strophanthus*, namely *S. gratus* and *S. hispidus* (Figure 16), bringing the number recorded in the forest to four species. Most have showy, funnel-shaped flowers with tail-like petals to 8cm long, hence the Yoruba name *ilagba omode*, little child's horsewhip. The seeds of *Strophanthus* contain glycosides that affect the heart in a similar way to digitalis and are extracted for use in the pharmaceutical industry. Traditionally, these poisonous plants were used to make arrow poison and their importance was such that they were cultivated in villages and pruned for ease of harvesting so that they formed shrubs rather than climbers. They were also used medicinally and in rituals.

Figure 17. Rauvolfia vomitoria, a local medicinal plant with pharmaceutical importance

Other Interesting medicinal plants include *Rauvolfia vomitoria*, a relatively common species of secondary forest (Figure 17.). Since its smaller Asian relative, *R. serpentina* became endangered through over-collection, this species is now commercially important as a source of sedative and hypertensive alkaloids for the pharmaceutical industry. With careful management, this traditional medicinal plant could become a valuable resource. It is also an ornamental and a useful small

shade tree for forest seedlings, giving potential in replanting areas.

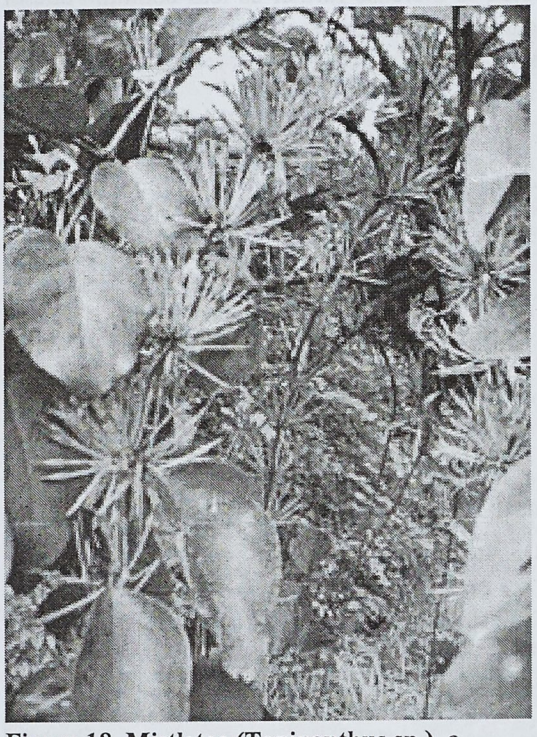

Figure 18. Mistletoe (Tapinanthus sp.), a traditional medicinal plant and food plant for butterflies

An interesting discovery was an abundance of mistletoe (probably *Tapinanthus globiferus*) in bloom in March 2010 (Figure 18). In some cases, the mass of flowers weighed down and even broke boughs of its host, which was mostly the invasive *Leucaena leucocephala*. Mistletoe is unique as a medicinal plant in traditional Nigerian medicine because it is the host species, rather than the mistletoe, that determines the uses. It also proved of special interest to lepidopterist Szabolcs Sáfián as the food plant of several butterfly species, enabling him to collect a number of pupae to hatch and identify.

Although the provisional checklist is too large to be inserted in this article, a brief guide to uses of trees and climbers on the IITA forest trails, which was compiled for the visit of the NFS on 12 June, is shown (Appendix 5.8).

Conservation education activities and materials for children

A number of conservation education activities were initiated during 2010. Most of these were with the IITA International School. Firstly, in March 2010, some of the children were involved in the collection of seeds of selected trees from the IITA Arboretum and their subsequent propagation. They kept records of germination and growth, and in October planted their trees in the old experimental fields (BS26) on the east bank of the IITA lake. Children were involved in weekly bird watching trips into the IITA forest (Figures 19 and 20).

In September, a Garden Club was started at the IITA School. An area was developed by Deni Bown for the purpose, with four raised beds for growing vegetables and herbs, for which the Leventis Project donated the topsoil. The garden will provide opportunities for children of all ages to experience 'hands-on' propagation and cultivation of plants and to learn about their uses and ecology.

Figures 19 and 20. Children from IITA International School bird watching in the IITA forest

To date, children have sown and transplanted different herbs and vegetables and extracted seeds from crops (i.e., tomatoes, okra, basil and eggplants). They have also successfully propagated mint and waterleaf from cuttings. A visit to the IITA Farm was arranged to see the vegetable growing area. The children were encouraged to identify and sample crops, and to harvest soko (local spinach) flower heads for seeds.

Figure 21. Students from St. Anne's School at the lakeside nursery

The project sets out to encourage school children from Ibadan to visit the forest and to observe and enjoy its rich resources. Thirty girls and three staff from St Anne's School in Ibadan visited the project in October (Figure 21).

The audience of children and staff learned about the importance of rainforests in Nigeria and their impact on the environment.

These educational activities also involved the staff at the IITA International School. These activities have been reported by the children in their school Newsletters. All these activities have involved staff of the IITA Communication Office, particularly Katherine Lopez, Jeffrey Oliver, and their team. Some of the events have been filmed and also reported in several issues of the IITA Bulletin, which can be accessed from the IITA Website (http://www.iita.org/bulletins).

Posters featuring photographs of birds, butterflies, and flora of the forest have been produced, and information about the forest is now available for hotel guests at IITA International House.

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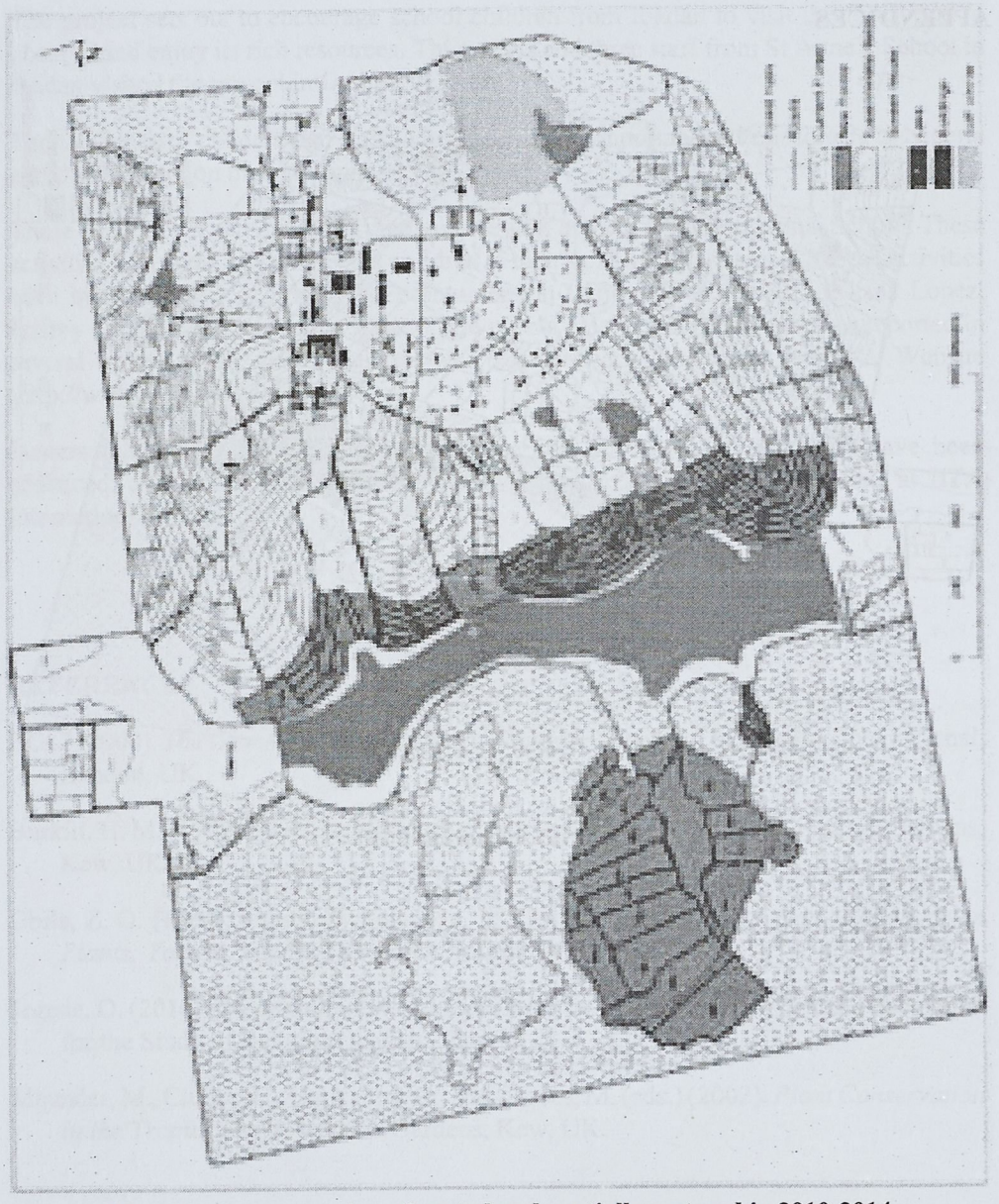
APPENDICES

Map of IITA Campus 2010



Map showing area to be reforested and partially restored in 2010-2014

Tree species' seeds collected from February to November 2010 and resultant seedlings

Species	Location	Quantity	Date collected	Date sown	Germination (%)	No. of Seedlings	Transplanting date	Treatment
Acacia nilotica	A	50 seeds	03-2-10	02-4-10	90	40	N/A	Scarified with acid for 7mins
Adansonia digitata	F	10kg	29-2-10	1-3-10	5	10	N/A	Soaked for two days
Afzelia africana	A	3.5kg	25-1-10	22-2-10	96	296	N/A	Direct sowing in pots
Afzelia bella var bella	A	1.2kg	1-2-10	21-4-10	96	30	N/A	Direct sowing in pots
Albizia ferruginea	A	0.5kg	25-2-10	28-2-10	70	143	5-3-10	Scarified with acid for 7mins
Albizia zygia	A	0.4kg	25-1-10	17-5-10	62	62	24-5-10	Scarified with acid for 7mins
Antiaris africana	F	1000 seeds	15-3-10	15-3-10	65	647	N/A	Direct sowing in pots
Baphia nitida	A	0.7kg	10-2-10	12-2-10	90	300	5-3-10	Soaked for 24hrs
Bombax buonopozense	Oshogbo Sacred Grove	0.2kg	24-3-10	24-3-10	45	45	29-4-10	Soaked for 24hrs
Brachystegia eurycoma	A	200 seeds	27-1-10	29-1-10	64	139	29-4-10	Soaked for 24 hrs
Ceasalpinia bonduc	F	7.5kg	05-5-10	05-5-10	70	155	N/A	Scarified with acid for 20mins
Cola millenii	F	10kg	23-3-10	24-3-10	95	190	N/A	Air dried for 24hrs
Cola gigantea	F	1.4kg	19-3-10	19-3-10	86	143	N/A	Direct sowing in pots
Cola gigantea	Gambari Forest Reserve	100 seeds	25-4-10	26.4.10	95	95	N/A	Direct sowing in pots
Cola acuminata	Local contact	10 seeds	13-3-10	15-3-10	80	8	N/A	Direct sowing in pots
Dactyladenia barteri	A	2.5kg	1-2-10	16-2-10	67	249	N/A	Direct sowing in

								pots
Dacroydes edulis	IITA Onne station	24 seeds	2-6-10	2-6-10	67	16	N/A	Direct sowing in pots
Dactyladenia barteri	A	2.5kg	1-2-10	16-2-10	67	249	N/A	Direct sowing in pots
Dennettia tripetala	Ugheli, Delta State	600 seeds	19-10	2-6-10				
Dialium guineense	A	0.2kg	25-1-10	30-2-10	60	238	N/A	Scarified with acid for 7mins
Erythrophleum suaveolens	A	7.5kg	11-2-10	29-4-10	70	155	N/A	Scarified with acid for 7mins
Garcinia kola	IITA Onne station	245 seeds	1-6-10	10-6-10	20	50	10-9-10	Inserted in banana
Garcinia kola	IITA Onne station	245 seeds	1-6-10	10-6-10	16	40	10-17-10	Sown in cured sawdust
Gambeya albida	F	25kg	15-3-10	15-3-10	30	234	30-3-10	Sown in cured sawdust
Hildegardia barteri	F	0.2kg	8-4-10	9-4-10	45	45	N/A	Soaked for 24 Hrs
Irvingia gabonensis	F	25 seeds	30-3-10	30-3-10	80	8	6-4-10	Sown in cured sawdust
Irvingia gabonensis	IITA Onne station	156kg	1-6-10	10-6-10	45	482	05-07-10	Sown in cured sawdust
Lecaniodiscus cupanioides	F	5kg	19-4-10	20-4-10	45	408	7-5-10	Sown under shade
Malacantha alnifolia	F	3kg	30-3-10	2-4-10	70	559	25-5-10	Soaked for

								48hrs
Milicia excelsa	F	15bags	20-3-10	23-3-10	90	1234	3-8-10	Sown under shade
Millettia aboensis	A		3-2-10	3-2-10	12	12	N/A	Direct sowing in pots
Monodora tenuifolia	Campus	15kg	2-6-10	3.6.10	95	4267	6-8-10	In open ground
Napoleonaea imperialis	Gambari Forest Reserve	11kg	25-4-10	27.4.10	85	182	10-05-10	Soaked for 48 hrs
Napoleonaea imperialis	F	17kg	23-03-10	25.3.10	75	300	10-04-10	Soaked for 48 hrs
Parkia biglobosa	A	10 seeds	26-1-10	26-1-10	80	8	N/A	Scarified in acid for 7mins
Pentaclethra macrophylla	A	100 seeds	6-4-10	6-4-10	86	86	N/A	Direct sowing in pots
Pentaclethra macrophylla	Nursery	13 seeds	14-6-10	14.6.10	92	12	N/A	Direct sowing in pots
Pterocarpus mildbraedii	A	7kg	25-3-10	25-3-10	37	75	N/A	Direct sowing in pots
Pterocarpus osun	A	3kg	02-1-10	19-03-10	10	20	N/A	Direct sowing in pots
Pterocarpus santalinoides	A	1.5kg	26-3-10	12.04.10	100	3332	02-4-10	Direct sowing in pots
Richardella dulcifera syn Synsepalum dulciferum	Nursery and CRIN	160 seeds	26-4-10	26.4.10	20	30	N/A	Direct sowing in beds
Syzygium guineense	Golf Course	400 seeds	26-5-10	26-5-10	15	60	N/A	Direct sowing in pots
Tamarindus indicus	Campus	2.3kg	1-4-10	1-4-10	60	60	19-5-10	Scarified with acid for 7mins
Tetrapleura tetraptera	A/F	14 bags	26-3-10	19-4-10	84	168	N/A	Scarified with acid for 7mins
Treculia africana	F	12 pods	19-3-10	20-3-10	100	2567	26-4-10	Direct sowing in

								pots
Trilepisium madagascariense	F	0.4kg	15.3-10	15-3-10	46	176	N/A	Direct sowing in beds
Trichilia monadelpha	F and Golf Course	3kg	1-9-10	2-9-10	85	733	20-9-10	Direct sowing in pots

Total no of indigenous trees propagated by seed February-November 2010 = 18 323 representing 43 species

Notes: A = Arboretum, F = IITA Forest, N/A = Not available, CRIN = Cocoa Research Institute of Nigeria. Acid used for scarification = H2SO4 (conc. and dilute)

Tree species propagated vegetatively and by wildlings collection

Species	Location	Quantity	Date collected	Success rate (%)	Number of plants available	Final potting date
Baphia nitida	A	1000 wildlings	27-9-10	90	900	30-9-10
Blighia sapida	Opposite medical unit	1000 wildlings	8-4-10	55	550	26-5-10
Brachystegia eurycoma	A	60 wildlings	30-7-10	100	60	30-7-10
Brachystegia eurycoma	Oshogbo Sacred Grove	200 wildlings	3-4-10	75	175	10-4-10
Cleistopholis patens	F	256 wildlings	27-5-10	100	256	27-5-10
Dialium guineense	A	385 wildlings	27-7-10	100	385	27-7-10
Dacryodes edulis	IITA Onne Station	488 wildlings	2-6-10	16	77	4-6-10
Erythrophleum suaveolens	A	84 wildlings	27-7-10	100	84	27-7-10
Glyphaea brevis	A	75 cuttings	16-8-10	100	75	16-8-10
Gambeya albida	F/Golf Course	70 wildlings	3-8-10	90	60	8-8-10
Grewia carpinifolia	F	10 cuttings	24-9-10	40	4	30-9-10
Millettia	A	600 wildlings	27-7-10	100	600	28-7-10

drastica						
Millettia griffoniana	A	180 wildlings	17-8-10	100	180	17-8-10
Milicia excelsa	Mango orchard/A/F	70 wildlings	12-8-10	64	45	18-8-10
Newbouldia laevis	F	100 cuttings	20-7-10	35	35	29-7-10
Pterocarpus osun	A	100 wildlings	27-9-10	100	100	3-10-10
Rauvolfia vomitoria	F	200 cuttings	20-7-10	6.5	13	29-7-10
Richadella dulcifera	Nursery	Marcotted plants	24-6-10	63	5	30-7-10
Spondias mombin	F	200 wildlings	20-7-10	100	200	29-7-10
Spondias mombin	F	100 cuttings	27-7-10	10	10	5-8-10
Terminalia superba	A	100 wildlings	24-1-10	57	57	30-9-10
Terminalia ivorensis	A	150 wildlings	4-11-10	80	120	10-11-10
Xylopia aethiopica	A	3 wildlings	24-9-10	100	3	24-9-10
Zanthoxylum zanthoxyloides	A	45 wildlings	27-7-10	100	45	27-7-10

Total no. of indigenous tree species raised by collection of wildlings and vegetative propagation February-November 2010 = 3877 representing 23 species

Notes: A = Arboretum, F = IITA Forest

Pioneer, fast-growing, and easily grown species for forest restoration

- *Albizia adianthifolia* (*ayinre*) - Fruits December to May; saplings begin fruiting when about 8m tall; helps provide nitrogen; and should be grown in large numbers and interplant them with other saplings
- *Albizia zygia* (*ayinreta*) - Fruits January to May; common in IITA and should be grown in large numbers and interplant them with other saplings to provide nitrogen
- *Alstonia boonei* (*awun*) - Fruits December to May

- *Anthocleista vogelii* (*apa-oro*) - Fruits November to March; pioneer species
- *Blighia sapida* (*isin*) - Fruits March to September
- *Bombax buonapozense* (*ponpola*) - Fruits February to May
- *Ceiba pentandra* (*araba*) - Fruits March
- *Celtis zenkeri* (*ita-gidi*) - Fruits March to May
- *Cola gigantea* (*ogogu*) - Fruits February to April
- *Dracaena mannii* (*ope-kannakanna*) - Fruits February to May but easily grown from large cuttings. There's a big plant at the side of the golf course near a house.
- *Funtumia elastica* (*ire*) - Fruits January to April
- *Glyphaea brevis* (*atori*) - Fruits most times; shrubby tree with dense foliage, tolerates high light levels so may provide shade and shelter for slower tree seedlings
- *Hildegardia barteri* (*eso, okurugbedu shishi*) - Fruits December to February; numerous seedlings near parent tree, colonizing open ground rapidly, especially in drier forest and rocky places
- *Holarrhena floribunda* (*irena*) - Flowering now; fruits persist through wet season
- *Holoptelea grandis* (*inajoko*) - Fruits February to May; seedlings very fast-growing in full light; stumps re-sprout easily so can be cut back to allow more light for seedlings, if required
- *Lannea welwitschii* (*ekika*) - Fruits March to April and July; pioneer species
- *Lecaniodiscus cupanioides* (*aka, akika*) - Fruits April to July
- *Musanga cecropioides* (*aga*) - Fruits at most times; likes damp areas so could be useful near rice plantations
- *Newbouldia laevis* (*akoko*) - Fruits January to February; can also be propagated by large cuttings, so it is good to mark plots before planting out seedlings
- *Olax subscorpioidea* (*ifon*) - Fruits November to May (Might provide shade for other seedlings?)
- *Pentaclethra macrophylla* (oil bean tree, *apara*) - Fruits at most times and is easily cultivated; provides nitrogen

- *Spondias mombin* (hog plum, *ekikan*) - Fruits April to May, July to August, and December; quick from cuttings
- *Terminalia superba* (*afara*) - Fruits March
- *Trema orientalis* (*afere*) - Fruits all year; exceptionally rapid growth; weedy shrub but may provide shade and shelter for tree seedlings
- *Tricalysia macrophylla* - Pioneer species
- *Trichilia monadelpha* (*akika, ako rere, olomi*) - Fruits June to August; tolerates high light levels

List compiled by Deni Bown, March 2010.

Birds seen at IITA between March and November 2010

Grebes (PODICIPEDIDAE)
• Little grebe
Cormorants and Darters (PHALACROCORACIDAE)
• Long-tailed Cormorant
• White-breasted Cormorant
Pelicans (PELECANIDAE)
• Pink-backed Pelican
Herons and Egrets (ARDEIDAE)
• Little Bittern
• Dwarf Bittern
• Eurasian Bittern
• Black-crowned Night Heron
• Squacco Heron
• Cattle Egret
• Green-backed Heron
• Black Heron

• Western Reef Heron
• Little Egret
• Yellow-billed Egret
• Great White Egret
• Purple Heron
• Grey Heron
• Black-headed Heron
• Goliath Heron
Hammerkop (SCOPIDAE)
• Hammerkop
Storks (CICONIIDAE)
• Yellow-billed Stork
• African Open-billed Stork
• Abdim's Stork
• Woolly-necked Stork
• White Stork
Ibises (THRESKIORNITHIDAE)

- Glossy Ibis
- Sacred Ibis
- Eurasian Spoonbill
- **Hadada Ibis**

Ducks and Geese (ANATIDAE)

- White-faced Whistling-Duck
- Spur-winged Goose
- Hartlaub's Duck
- Knob-billed Duck
- African Pygmy Goose
- Eurasian Wigeon
- Common Teal
- Pintail
- Garganey
- Shoveler
- Ferruginous Duck

Raptors (ACCIPITRIDAE)

- Osprey
- African Cuckoo Falcon
- Honey Buzzard
- Bat Hawk
- Black-shouldered Kite
- Black Kite
- Palm-nut Vulture
- Brown Snake Eagle
- African Harrier Hawk
- Montagu's Harrier
- Marsh Harrier
- Gabar Goshawk
- Dark Chanting Goshawk
- African Goshawk (Red-chested Sparrowhawk)
- Ovampo Sparrowhawk
- Shikra
- African Little Sparrowhawk
- Black Sparrowhawk
- Long-tailed Hawk
- Lizard Buzzard
- Red-tailed Buzzard
- Tawny Eagle
- African Hawk-Eagle
- Long-crested Hawk-Eagle
- Western Little Sparrowhawk

Falcons (FALCONIDAE)

- Common Kestrel
- Grey Kestrel
- African Hobby
- Lanner Falcon
- Peregrine Falcon

Francolins, Quails and Guinea Fowl (PHASIANIDAE

- Helmeted Guinea-fowl
- African Blue Quail
- Scaly Francolin
- Double-spurred Francolin

Crakes, Gallinules and Moorhens (RALLIDAE)

- African Crake
- Spotted Crake

- Black Crake
- Allen's Gallinule
- Purple Gallinule
- Common Moorhen
- Lesser Moorhen

Finfoot (HELIORNITHIDAE)

- African Finfoot

Bustards (OTIDIDAE)

- White-bellied Bustard

Jacanas (JACANIDAE)

- Lily Trotter

Painted-Snipe (ROSTRATULIDAE)

- Greater Painted-Snipe

Stilts and Avocets (RECURVIROSTRIDAE)

- Black-winged Stilt
- Eurasian Avocet

Thick-knee (BURHINIDAE)

- Senegal Thick-knee

Coursers (GLAREOLIDAE)

- Egyptian Plover
- Temminck's Courser
- Common Pratincole
- Grey Pratincole
- Collared Pratincole

Plovers (CHARADRIIDAE)

- Little-ringed Plover
- Ringed Plover
- Kittlitz's Sand Plover
- Forbes's Plover
- Grey Plover
- Wattled Plover
- White-crowned Plover
- Spur-winged Plover
- Senegal Plover

Sandpipers, Snipes and Allies (SCOLOPACIDAE)

- Little Stint
- Temminck's Stint
- Curlew Sandpiper
- Ruff
- Jack Snipe
- Common Snipe
- Great Snipe
- Black-tailed Godwit
- Eurasian Curlew
- Spotted Redshank
- Common Redshank
- Marsh Sandpiper
- Common Greenshank
- Green Sandpiper
- Wood Sandpiper
- Common Sandpiper
- Turnstone

Gulls (LARIDAE)

- Grey-headed Gull
- Black-headed Gull

Terns (STERNIDAE)

- Gull-billed Tern
- Common Tern
- Little Tern
- Black Tern
- Moustached Tern
- White-winged Black Tern

Skimmer (RYNCHOPIDAE)

- Skimmer

Pigeons and Doves (COLUMBIDAE)

- African Green Pigeon
- Blue-headed Wood Dove
- Tambourine Dove
- Blue-spotted Wood Dove
- Bronze-naped Pigeon
- Speckled Pigeon
- Red-eyed Dove
- African Mourning Dove
- Vinaceous Dove
- Laughing Dove

Parrots (PSITTACIDAE)

- Grey Parrot
- Senegal Parrot
- Red-headed Lovebird
- Rose-ringed Parakeet

Touracos (MUSOPHAGIDAE)

- Green Turaco
- Western Grey Plantain-eater

Cuckoos and Coucals (CUCULIDAE)

- African Striped Cuckoo
- Great Spotted Cuckoo
- Thick-billed cuckoo
- Red-chested Cuckoo
- Black Cuckoo
- European Cuckoo
- Levaillants cuckoo
- African Cuckoo
- African Emerald Cuckoo
- Klaas' Cuckoo
- Didric Cuckoo
- Yellow-bill
- Black-throated Coucal
- Black Coucal
- Senegal Coucal
- Blue-headed Coucal

Barn Owl (TYTONIDAE)

- Barn Owl

Owls (STRIGIDAE)

- Pearl Spotted Owlet
- Common Scops Owl
- White-faced Scops Owl
- African Wood Owl

Nightjars (CAPRIMULGIDAE)

- Long-tailed Nightjar
- Black-shouldered Nightjar
- Plain Nightjar
- Standard-winged Nightjar
- European Nightjar

Swifts (APODIDAE)

- Mottled Spinetail
- Cassin's Spinetail
- African Palm Swift
- European Swift
- White-rumped Swift
- Little Swift

Kingfishers (ALCEDINIDAE)

- Grey-headed Kingfisher
- Blue-breasted Kingfisher
- Woodland Kingfisher
- African Pygmy Kingfisher
- Malachite Kingfisher
- African Giant Kingfisher
- Pied Kingfisher

Bee-eaters (MEROPIDAE)

- Little Bee-eater
- White-throated Bee-eater
- Carmine Bee-eater
- Rosy Bee-eater

Rollers (CORACIIDAE)

- Abyssinian Roller
- Blue-throated Roller
- Broad-billed Roller

Wood-hoopoes (PHOENICULIDAE)

- Green Wood-Hoopoe

Hoopoes (UPUPIDAE)

- Hoopoe

Hornbills (BUCEROTIDAE)

- White-crested Hornbill
- Red-billed Dwarf Hornbill
- African Pied Hornbill
- African Grey Hornbill
- Piping Hornbill

Barbets and Tinker-birds (CAPITONIDAE)

- Naked-faced Barbet
- Speckled Tinkerbird
- Yellow-throated Tinkerbird
- Yellow-rumped Tinkerbird
- Hairy-breasted Barbet
- Double-toothed Barbet
- Yellow-billed Barbet

Honey-guides (INDICATORIDAE)

- Cassin's Honeyguide
- Spotted Honeyguide
- Greater Honeyguide
- Lesser Honeyguide

Woodpeckers (PICIDAE)
• Eurasian Wryneck
• Gabon Woodpecker
• Fire-bellied Woodpecker
• Grey Woodpecker
Larks (ALAUDIDAE)
• Flappet Lark
Broadbills (Eurylaimidae)
• **Rufous-sided Broadbill**
Swallows and Martins (HIRUNDINIDAE)
• African Sand-Martin
• Sand Martin
• Red-breasted Swallow
• Mosque Swallow
• Lesser Striped Swallow
• Red-rumped Swallow
• Rock Martin
• Pied-winged Swallow
• Ethiopian Swallow
• Barn Swallow
• House Martin
Wagtails and Pipits (MOTACILLIDAE)
• Yellow Wagtail
• African Pied Wagtail
• Plain-backed Pipit
• Tree Pipit

• Red-throated Pipit
• Yellow-throated Longclaw
Cuckoo-shrikes (CAMPEPHAGIDAE)
• Red-shouldered Cuckoo-Shrike
Bulbuls (PYCNONOTIDAE)
• Little Greenbul
• Slender-billed Greenbul
• Yellow-whiskered Greenbul
• Honeyguide Greenbul
• Simple Greenbul (Leaflove)
• White-tailed Greenbul (Swamp Palm Bulbul)
• Leaf-love
• Baumann's Greenbul
• Icterine Greenbul
• White-throated Greenbul
• Green-tailed Bristlebill
• Grey-headed Bristlebill
• Red-tailed Greenbul
• White-bearded Greenbul
• Common Bulbul
Thrushes and Chats (TURDIDAE)
• Forest Robin
• Nightingale
• Blue-shouldered Robin-Chat
• Snowy-crowned Robin-Chat
• Finsch's Flycatcher-Thrush
• White-tailed Ant-thrush

- Whinchat
- African Thrush

Warblers (SYLVIIDAE)

- Moustached Grass-Warbler
- Sedge Warbler
- Great Reed Warbler
- Greater Swamp Warbler
- Melodious Warbler
- Icterine Warbler
- Red-faced Cisticola
- Singing Cisticola
- Whistling Cisticola
- Chattering Cisticola
- Winding Cisticola
- Zitting Cisticola
- Tawny-flanked Prinia
- Grey-backed Camaroptera
- Yellow-browed Camaroptera
- Olive Green Camaroptera
- Senegal Eremomela
- Yellow-bellied Crombec
- Green Crombec
- Kemp's Longbill
- Green Hylia....
- Willow Warbler
- Wood Warbler
- Garden Warbler
- Oriole warbler

Flycatchers (MUSCICAPIDAE)

- Spotted Flycatcher
- Dusky blue Flycatcher
- European Pied Flycatcher

Shrike-Flycatchers and Wattle-Eyes (PLATYSTEIRIDAE)

- Black-and-white Shrike-Flycatcher
- Scarlet-spectacled Wattle-eye
- Chestnut Wattle-eye
- Red-Cheeked Wattle-eye

Paradise Flycatchers (MONARCHIDAE)

- Chestnut-capped Flycatcher
- Blue-headed Crested Flycatcher
- Black-headed Paradise Flycatcher
- African Paradise Flycatcher

Babblers (TIMALIIDAE)

- Moloney's (Brown) Illadopsis
- Pale-breasted Illadopsis
- Brown Babbler
- Capuchin Babbler

White-eyes (ZOSTEROPIDAE)

- Yellow White-eye

Sunbirds (NECTARINIIDAE)

- Collared Sunbird
- Olive Sunbird
- Green-headed Sunbird

- Blue-throated Sunbird
- Scarlet-chested Sunbird
- Buff-throated Sunbird
- Variable Sunbird
- Olive-bellied Sunbird
- Copper Sunbird
- Splendid Sunbird
- Superb Sunbird
- Little sunbird

Shrikes (LANIIDAE)

- Great Grey Shrike
- Woodchat Shrike
- Yellow-billed Shrike

Puffbacks and Bush-shrikes (MALACONOTIDAE)

- Puffback-Shrike
- Sabine's puffback-shrike
- Black-cap Bush-Shrike
- Brown-headed Bush-Shrike
- Tropical Boubou (Bell Shrike)
- Many-coloured Bush-Shrike
- Fiery-breasted Bush-Shrike
- Grey-headed Bush-Shrike
- Nicator

Helmet-Shrikes (PRIONOPIDAE)

- Red-billed Shrike

Drongos (DICRURIDAE)

- Square-tailed Drongo
- Drongo
- Velvet mantled drongo
- Forked tailed drongo

Crows (CORVIDAE)

- Pied Crow...

Orioles (ORIOLIDAE)

- African Golden Oriole
- Western Black-headed Oriole
- Black-winged Oriole

Starlings (STURNIDAE)

- Chestnut-wing Starling
- Splendid Glossy Starling
- Violet-backed (Amethyst) Starling
- Narrow-tailed Starling

Sparrows (PASSERIDAE)

- Grey-headed Sparrow

Weavers (PLOCEIDAE)

- Black-necked Weaver
- Village Weaver
- Vieillot's Black Weaver
- Yellow-mantled Weaver
- Compact Weaver
- Red-vented Malimbe
- Ibadan Malimbe
- Blue-billed Malimbe
- Crested Malimbe
- Red-headed Malimbe

• Red-headed Quelea
• Black-winged Red Bishop
• Yellow-mantled Widow-bird
• Grosbeak Weaver
Waxbills, Mannikins and Allies (ESTRILDIDAE)
• White-breasted Negro-Finch
• Chestnut-breasted Negro-Finch
• Grey-headed Negro-Finch
• Seed Cracker
• Blue-bill

• Bar-breasted Fire-Finch
• Red-bellied Fire-Finch
• frican Fire-Finch
• Orange-cheeked Waxbill
• Waxbill
• Bronze Mannikin
• Black and White Mannikin
• Tiny Tit-Weaver
Indigobirds and Whydahs (VIDUIDAE)
• Village Indigobird
• Pin-tailed Whydah
Canaries (FRINGILLIDAE)
• White-rumped Seed-eater
• Yellow-fronted Canary

Updated checklist (as of October 2010) of butterflies produced by Szabolcs Sáfián and Robert David Warren

The numbers are according to Larsen's Butterflies of West Africa (2005) while the habitat classification was adopted from Larsen (2006).

Habitat

UBQ = species that can be found in nearly all types of habitats

ALF = species that are generally found in all types of forest

WEF = species that are centered on the evergreen forest types

MEF = species that are centered on the moist semi-deciduous forest types

DRF = species that are centered on the drier forests, including riverine and forest/savannah transition

MNT = species that are limited to submontane vegetation

GUI = species that are centered on the Guinea Savannah, extending into farm bush in the forest zone

SUD = species that are centered on the Sudan Savannah and the Sahel, extending south as vagrants/migrants

SPE = species of specialized habitats

6

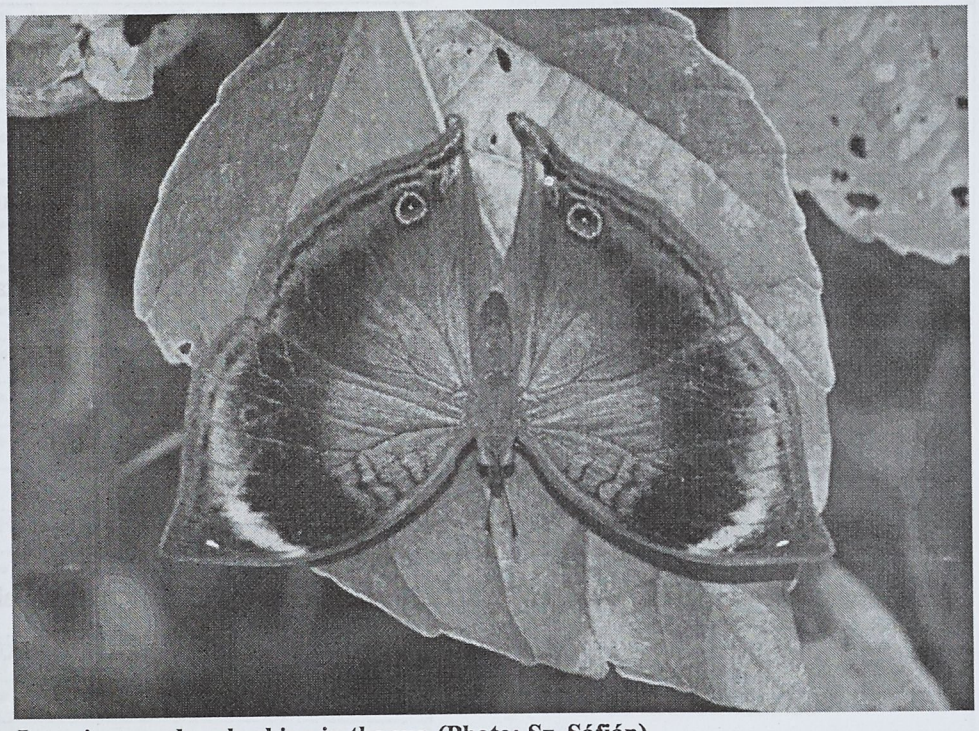
7 RDW 2002-2009 = recorded by Robert David Warren between 2002 and 2009

8 SZS 10-20.III.2010 = recorded by Szabolcs Sáfián during the present survey but previously recorded by RDW

9 SZS 10-20.III.2010 = recorded as new to IITA forest by Szabolcs Sáfián during the dry season survey in March 2010

10 SZS 22-30.IX.2010 = recorded as new to IITA forest by Szabolcs Sáfián during the last survey in September 2010

11



Junonia cymodoce basking in the sun (Photo: Sz. Sáfián)

	Superfamily PAPILIONOIDEA Latreille, 1802						
	Family PAPILIONIDAE Latreille, 1802						
	Subfamily Papilioninae Latreille, 1802						
	PAPILIO Linnaeus, 1758						
4	*P. dardanus*		Brown, 1776	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
11	*P. nireus*		Linnaeus, 1758	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
12	*P. menestheus*		Drury, 1773	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
13	*P. demodocus*		Esper, 1798	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
18	*P. cynorta*		Fabricius, 1793	ALF	RDW 2002-2009	SZS 10-20.III.2010	
	GRAPHIUM Scopoli, 1777						
29	*G. leonidas*		Fabricius, 1793	UBQ	RDW 2002-2009		
31	*G. policenes*		Cramer, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Family PIERIDAE Swainson, 1820						
	Subfamily Coliadinae Swainson, 1821						
	CATOPSILIA Hübner, 1819						
36	*C. florella*		Fabricius, 1775	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EUREMA Hübner, 1819						
38	*E. senegalensis*		Boisduval, 1836	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
39	*E. hecabe*	*solifera*	Butler, 1875	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
40	*E. floricola*	*leonis*	Butler, 1886	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
42	*E. desjardinsii*		Butler, 1876	UBQ	RDW 2002-		

					2009		
	Subfamily Pierinae Swainson, 1820						
	Tribe Pierini Swainson, 1820						
	NEPHERONIA Butler, 1870						
45	*N. argia*		Fabricius, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
46	*N. thalassina*		Boisduval, 1836	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
47	*N. pharis*		Boisduval, 1836	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	COLOTIS Hübner, 1819						
63	*C. euippe*		Linnaeus, 1758	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	BELENOIS Hübner, 1819						
73	*B. calypso*		Drury, 1773	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	DIXEIA Talbot, 1932						
80	*D. cebron*		Ward, 1871	DRF	RDW 2002-2009		
	APPIAS Hübner, 1819						
84	*A. sylvia*		Fabricius, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
86	*A. sabina*		Felder & Felder, 1865	MEF	RDW 2002-2009		
87	*A. epaphia*		Cramer, 1779	UBQ	RDW 2002-2009		SZS 22-30.IX.2010
	LEPTOSIA Hübner, 1818						
88	*L. alcesta*		Stoll, 1781	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
91	*L. medusa*		Cramer, 1777	MEF	RDW 2002-2009		
93	*L. wigginsi*	*pseudalcesta*		ALF	RDW 2002-2009		
	MYLOTHRIS Hübner, 1819						

95	*M. chloris*		Fabricius, 1775	UBQ		SZS 10-20.III.2010	SZS 22-30.IX.2010
	Family LYCAENIDAE Leach, 1815						
	SPALGIS Moore, 1879						
130	*S. lemolea*	*pilos*	Druce, 1890	DRF			SZS 22-30.IX.2010
	Subfamily Lipteninae						
	Tribe Pentilini						
	PENTILA Westwood, 1852						
147	*P. petreia*		Hewitson, 1874	MEF	RDW 2002-2009		SZS 22-30.IX.2010
152	*P. picena*		Hewitson, 1874	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	MIMERESIA Stempffer, 1961						
184	*M. libentina*		Hewitson, 1866	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Tribe Liptenini						
	CITRINOPHILA Kirby, 1887						
199	*C. marginalis*		Kirby, 1887	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	CERAUTOLA Libert, 1999						
293	*C. miranda*		Staudinger, 1889	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	GERITOLA Libert, 1999						
	G. gerina		Hewitson, 1878	WEF			SZS 22-30.IX.2010
	Subfamily Theclinae Swainson, 1830						
	Tribe Loxurini Swinhoe, 1910						
	DAPIDODIGMA Karsch, 1895						
359	*D. hymen*		Fabricius, 1775	MEF	RDW 2002-2009	SZS 10-20.III.2010	
	Tribe Aphnaeini Distant, 1884						
	APHNAEUS Hübner, 1819						
361	*A. orcas*		Drury, 1782	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Tribe IOLAINI Riley, 1958						
	IOLAUS Hübner, 1819						
	Subgenus Argiolaus Druce, 1891						
401	*I. parasilanus*	*maesseni*	Stempffer & Bennett, 1958	MEF		SZS 10-20.III.2010	
	Subgenus Tanuetheira Druce, 1891						

410	*I. timon*		Fabricius, 1787	MEF			SZS 22-30.IX.2010
	Subgenus Epamera Druce, 1891						
436	*I. iasis*		Hewitson, 1865	ALF		SZS 10-20.III.2010	
	Tribe Hypolycaenini Swinhoe, 1910						
	HYPOLYCAENA Felder, 1862						
443	*H. philippus*		Fabricius 1793	GUI		SZS 10-20.III.2010	SZS 22-30.IX.2010
452	*H. antifaunus*		Westwood, 1851	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Tribe Deudorigini Doherty, 1887						
	PILODEUDORIX Druce, 1891						
458	*P. diyllus*	*occidentalis*	Libert, 2004	MEF	RDW 2002-2009	SZS 10-20.III.2010	
	PARADEUDORIX Libert, 2004						
484	*P. eleala*		Hewitson, 1865	ALF			SZS 22-30.IX.2010
	DEUDORIX Hewitson, 1863						
496	*D. lorisona*		Hewitson, 1862	ALF		SZS 10-20.III.2010	
	Subfamily Polyommatinae Swainson, 1827						
	Tribe Lycaenesthini Toxopeus, 1929						
	ANTHENE Doubleday, 1847						
507	*A. rubricinctus ssp.*		Holland, 1891	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
510	*A. sylvanus*		Drury, 1773	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
512	*A. liodes*		Hewitson, 1874	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
523	*A. larydas*		Cramer, 1780	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	NEURYPEXINA Bethune-Baker, 1910						
540	*N. lyzanius*		Hewitson, 1874	MEF		SZS 10-20.III.2010	
	NEURELLIPES Bethune-Baker, 1910						
543	*N. chryseostictus*		Bethune-Baker, 1910	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	TRICLEMA Karsch, 1893						
556	*T. nigeriae*		Aurivillius, 1905	GUI		SZS 10-20.III.2010	
	URANOTHAUMA Butler, 1895						
568	*U. falkensteini*		Dewitz, 1879	ALF	RDW	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2002-2009		
	PHLYARIA Karsch, 1895						
574	*P. cyara*	*stactalla*	Karsch, 1895	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	CACYREUS Butler, 1898						
575	*C. lingeus*		Stoll, 1782	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	LEPTOTES Scudder, 1876						
578	*L. pirithous*		Linnaeus, 1767	UBQ		SZS 10-20.III.2010	
	TUXENTIUS Larsen, 1982						
584	*T. carana*		Hewitson, 1876	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EUCHRYSOPS Butler, 1900						
601	*E. malathana*		Boisduval, 1833	UBQ			SZS 22-30.IX.2010
	THERMONIPHAS Karsch, 1895						
617	*T. micylus*		Cramer, 1780	MEF	RDW 2002-2009		SZS 22-30.IX.2010
	OBORONIA Karsch, 1893						
622	*O. punctatus*		Dewitz, 1879	MEF			SZS 22-30.IX.2010
626	*O. ornata*		Mabille, 1890	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	AZANUS Moore, 1881						
630	*A. mirza*		Plötz, 1880	UBQ		SZS 10-20.III.2010	
	ZIZEERIA Chapman, 1910						
635	*Z. knysna*		Trimen, 1862	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Family NYMPHALIDAE Swainson, 1827						
	Subfamily Libytheinae Boisduval, 1833						
	LIBYTHEA Fabricius, 1807						
646	*L. labdaca*		Westwood, 1851	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Subfamily Danainae Boisduval, 1833						

	Tribe Danaini Boisduval, 1833						
	DANAUS Kluk, 1802						
647	*D. chrysippus*		Linnaeus, 1758	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	TIRUMALA Moore, 1880						
648	*T. petiverana*		Doubleday, 1847	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	AMAURIS Hübner, 1816						
650	*A. niavius*		Linnaeus, 1758	GUI	RDW 2002-2009	SZS 10-20.III.2010	
652	*A. hecate*		Butler, 1866	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
653	*A. damocles*		Fabricius, 1793	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Subfamily Satyrinae Boisduval, 1833						
	Tribe Melanitini Reuter, 1896						
	GNOPHODES Westwood, 1849						
656	*G. betsimena*	*parmeno*	Doubleday, 1849	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
657	*G. chelys*		Fabricius, 1793	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	MELANITIS Fabricius, 1807						
658	*M. leda*		Linnaeus, 1758	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
659	*M. libya*		Distant, 1882	UBQ	RDW 2002-2009		SZS 22-30.IX.2010
	Tribe Elymniini Herrich-Schäffer, 1864						
	ELYMNIOPSIS Fruhstorfer, 1907						
661	*E. bammakoo*		Westwood, 1851	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	BICYCLUS Kirby, 1871						
687	*B. taenias*		Hewitson, 1877	MEF			SZS 22-30.IX.2010
690	*B. vulgaris*		Butler, 1868	ALF	RDW 2002-	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2009		
691	*B. dorothea*		Cramer, 1779	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
695	*B. mandanes*		Hewitson, 1873	DRF	RDW 2002-2009	SZS 10-20.III.2010	
701	*B. safitza*		Hewitson, 1851	GUI	RDW 2002-2009		SZS 22-30.IX.2010
702	*B. funebris*		Guérin-Méneville, 1844	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
709	*B. martius*		Fabricius, 1793	MEF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	Tribe Satyrini Boisduval, 1833						
	YPTHIMA Hübner, 1818						
719	*Y. doleta*		Kirby, 1880	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Subfamily Charaxinae Guenée, 1865						
	Tribe Charaxini Guenée, 1865						
	CHARAXES Ochsenheimer, 1816						
725	*C. varanes*	*vologeses*	Mabille, 1876	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
726	*C. fulvescens*		Aurivillius, 1891	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
728	*C. candiope*		Godart, 1824	GUI			SZS 22-30.IX.2010
729	*C. protoclea*		Feisthamel, 1850	ALF	RDW 2002-2009	SZS 10-20.III.2010	
730	*C. boueti*		Feisthamel, 1850	DRF	RDW 2002-2009		SZS 22-30.IX.2010
731	*C. cynthia*		Butler, 1866	ALF	RDW 2002-2009		SZS 22-30.IX.2010
732	*C. lucretius*		Cramer, 1775	ALF	RDW 2002-2009		SZS 22-30.IX.2010
734	*C. epijasius*		Reiche, 1850	GUI			SZS 22-30.IX.2010
737	*C. brutus*		Cramer, 1779	DRF	RDW 2002-2009	SZS 10-20.III.2010	
741	*C. tiridates*		Cramer, 1777	ALF	RDW	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2002-2009		
743	*C. numenes*		Hewitson, 1859	ALF			SZS 22-30.IX.2010
745	*C. imperialis*	*albipunctus*	Joicey & Talbot, 1920	DRF	RDW 2002-2009		
754	*C. etesipe*		Godart, 1824	DRF	RDW 2002-2009	SZS 10-20.III.2010	
756	*C. eupale*		Drury, 1782	ALF	RDW 2002-2009		SZS 22-30.IX.2010
758	*C. anticlea*		Drury, 1782	ALF	RDW 2002-2009		SZS 22-30.IX.2010
760	*C. etheocles*		Cramer, 1777	ALF	RDW 2002-2009		SZS 22-30.IX.2010
761	*C. catachrous*		van Someren & Jackson, 1952	???	RDW 2002-2009		
768	*C. cedreatis*		Hewitson, 1874	MEF			SZS 22-30.IX.2010
772	*C. pleione*		Godart, 1824	ALF	RDW 2002-2009		SZS 22-30.IX.2010
773	*C. paphianus*	*falcata*	Butler, 1872	MEF	RDW 2002-2009		SZS 22-30.IX.2010
777	*C. lycurgus*		Fabricius, 1793	ALF	RDW 2002-2009		
	Tribe Euxanthini Rydon, 1971						
	EUXANTHE Hübner, 1819						
780	*E. eurinome*		Cramer, 1775	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	Tribe Junoniini Reuter, 1896						
	PRECIS Hübner, 1819						
792	*P. octavia*		Cramer, 1777	GUI		SZS 10-20.III.2010	
793	*P. antilope*		Feisthamel, 1850	GUI		SZS 10-20.III.2010	
797	*P. pelarga*		Fabricius, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	HYPOLIMNAS Hübner, 1819						

801	*H. misippus*		Linnaeus, 1764	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
802	*H. anthedon*		Doubleday, 1845	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
806	*H. salmacis*		Drury, 1773	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	SALAMIS Boisduval, 1833						
808	*S. cacta*		Fabricius, 1793	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	PROTOGONIOMORPHA Wallengren, 1857						
811	*P. parhassus*		Drury, 1782	ALF	RDW 2002-2009		
	JUNONIA Hübner, 1819						
813	*J. orithya*	*madagascariensis*		SUD	RDW 2002-2009		
814	*J. oenone*		Linnaeus, 1758	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
816	*J. cymodoce*		Cramer, 1777	MEF	RDW 2002-2009		
817	*J. westermanni*		Westwood, 1870	DRF		SZS 10-20.III.2010	
819	*J. sophia*		Fabricius,1793	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
820	*J. stygia*		Aurivillius, 1894	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
822	*J. chorimene*		Guérin-Méneville, 1844	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
823	*J. terea*		Drury, 1773	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Subfamily Cyrestinae Guenée, 1865						
	Tribe Cyrestini Guenée, 1865						
	CYRESTIS Boisduval, 1832						
825	*C. camillus*		Fabricius, 1781	ALF	RDW 2002-	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2009		
	Subfamily Biblidinae Boisduval, 1833						
	Tribe Eurytelini Doubleday, 1845						
	BYBLIA Hübner, 1819						
826	*B. anvatara*	*crameri*	Aurivillius, 1894	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	MESOXANTHA Aurivillius, 1898						
828	*M. ethosea*		Drury, 1782	MEF	RDW 2002-2009		
	ARIADNE Horsfield, 1829						
829	*A. enotrea*		Cramer, 1779	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	NEPTIDOPSIS Aurivillius, 1898						
833	*N. ophione*		Cramer, 1777	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EURYTELA Boisduval, 1833						
834	*E. dryope*		Cramer, 1775	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Tribe Epicaliini Guenée, 1865						
	Subfamily Limenitidinae Behr, 1864						
	Tribe Limenitidini Behr, 1864						
	HARMA Doubleday, 1848						
843	*H. theobene*		Doubleday, 1848	MEF	RDW 2002-2009		SZS 22-30.IX.2010
	PSEUDACRAEA Westwood, 1850						
880	*P. eurytus*		Linnaeus, 1758	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
887	*P. lucretia*		Cramer, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	NEPTIS Fabricius, 1807						
901	*N. nemetes*		Hewitson, 1868	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
903	*N. metella*		Doubleday, 1848	ALF			SZS 22-30.IX.2010
907	*N. morosa*		Overlaet, 1955	GUI	RDW 2002-	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2009		
918	*N. nysiades*	*s.l.*	Hewitson, 1868	MEF			SZS 22-30.IX.2010
936	*N. agouale*		Pierre-Baltus, 1978	ALF	RDW 2002-2009		
937	*N. melicerta*		Drury, 1773	ALF	RDW 2002-2009		
938	*N. troundi*		Pierre-Baltus, 1978	MEF	RDW 2002-2009		
	Tribe Adoliadini Doubleday, 1845						
	CATUNA Kirby, 1871						
941	*C. crithea*		Drury, 1773	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
944	*C. angustatum*		Felder & Felder, 1867	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EURYPHURA Staudinger, 1891						
948	*E. chalcis*		Felder & Felder, 1860	ALF	RDW 2002-2009	SZS 10-20.III.2010	
	HAMANUMIDA						
951	*H. daedalus*		Fabricius, 1775	GUI			SZS 22-30.IX.2010
	ATERICA Boisduval, 1833						
953	*A. galene*		Brown, 1776	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EURIPHENE Boisduval, 1847						
960	*E. barombina*		Aurivillius, 1894	ALF	RDW 2002-2009		
974	*E. amicia*		Hewitson, 1871	MEF	RDW 2002-2009		
976a	*E. aridatha*		Hewitson, 1866	MEF			SZS 22-30.IX.2010
987	*E. ampedusa*		Hewitson, 1866	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	BEBEARIA Hemming, 1960						
995	*B. tentyris*		Hewitson, 1866	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1008	*B. mardania*		Fabricius, 1793	ALF	RDW 2002-	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2009		
1011	*B. cocalia*	*continentalis*	Hecq, 1988	ALF	RDW 2002-2009		SZS 22-30.IX.2010
1014	*B. sophus*		Fabricius, 1793	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EUPHAEDRA Hübner, 1819						
	Subgenus Medoniana Hecq, 1976						
1046	*E. medon*		Linnaeus, 1763	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	Subgenus Euphaedrana Hecq, 1976						
1066	*E. themis*		Hübner, 1807	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1069	*E. aureola*		Kirby, 1889	MEF	RDW 2002-2009		SZS 22-30.IX.2010
1070	*E. exerrata*		Hecq, 1982	WEF			SZS 22-30.IX.2010
1075	*E. janetta*		Butler, 1871	ALF			SZS 22-30.IX.2010
1083	*E. ceres*	*lutescens*	Hecq, 1979	ALF	RDW 2002-2009		SZS 22-30.IX.2010
1115	*E. edwardsii*		van der Hoeven, 1845	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1116	*E. ruspina*		Hewitson, 1865	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1118	*E. harpalyce*		Cramer, 1777	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1120	*E. losinga*	*wardi*	Druce, 1874	MEF	RDW 2002-2009		
	Subfamily Heliconiinae Swainson, 1822						
	Tribe Acraeini Boisduval, 1833						
	ACRAEA Fabricius, 1807						
	Subgenus Actinote Hübner, 1816						
1148	*A. peneleos*		Ward, 1871	ALF	RDW 2002-2009		
1149	*A. parrhasia*		Fabricius, 1793	MEF			SZS 22-30.IX.2010

1152	*A. pharsalus*		Ward, 1871	ALF	RDW 2002-2009		
1153	*A. encedon*		Linnaeus, 1758	UBQ	RDW 2002-2009	SZS 10-20.III.2010	
1154	*A. encedana*		Pierre, 1976	SPE			SZS 22-30.IX.2010
1155	*A. alciope*		Hewitson, 1852	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1158	*A. lycoa*		Godart, 1819	ALF	RDW 2002-2009		
1159	*A. serena*		Fabricius, 1775	UBQ	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1165	*A. bonasia*		Fabricius, 1775	ALF	RDW 2002-2009	SZS 10-20.III.2010	
	Subgenus Acraea Fabricius, 1807						
1176	*A. egina*		Cramer, 1775	ALF		SZS 10-20.III.2010	
1178	*A. pseudegina*		Westwood, 1852	UBQ	RDW 2002-2009		
1180	*A. zetes*		Linnaeus, 1758	ALF	RDW 2002-2009	SZS 10-20.III.2010	
1181	*A. endoscota*		le Doux, 1928	ALF		SZS 10-20.III.2010	
1184	*A. quirina*		Fabricius, 1781	ALF		SZS 10-20.III.2010	
1188	*A. vestalis*		Felder & Felder, 1865	ALF	RDW 2002-2009		
1190	*A. umbra*		Drury, 1782	ALF		SZS 10-20.III.2010	
1191	*A. alcinoe*		Felder & Felder, 1865	MEF	RDW 2002-2009		
1196	*A. epaea*		Cramer, 1779	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	Superfamily HESPERIOIDEA Latreille, 1809						
	Family HESPERIIDAE Latreille, 1809						
	Subfamily Coeliadinae Evans, 1937						
	COELIADES Hübner, 1818						
1203	*C. chalybe*		Westwood, 1852	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010

1206	*C. libeon*		Druce, 1875	ALF		SZS 10-20.III.2010	
1207	*C. forestan*		Stoll, 1782	UBQ	RDW 2002-2009		SZS 22-30.IX.2010
1208	*C. pisistratus*		Fabricius, 1793	ALF		SZS 10-20.III.2010	
1209	*C. hanno*		Plötz, 1879	MEF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	CELAENORRHINUS Hübner, 1819						
1224	*C. galenus*		Fabricius, 1793	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1230	*C. proxima*	*maesseni*	Berger, 1976	ALF		SZS 10-20.III.2010	
	TAGIADES Hübner, 1819						
1232	*T. flesus*		Fabricius, 1781	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	EAGRIS Guenée, 1863						
1233	*E. denuba*		Plötz, 1879	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1238	*E. tetrastigma*	*subolivescens*	Holland, 1892	MEF	RDW 2002-2009		SZS 22-30.IX.2010
	SARANGESA Moore, 1881						
1250	*S. thecla*		Plötz, 1879	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1251	*S. bouvieri*		Mabille, 1877	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	NETROBALANE Mabille, 1903						
1255	*N. canopus*	Trimen, 1864		GUI			SZS 22-30.IX.2010
	PROSOPALPUS Holland, 1896						
1279	*P. styla*		Evans, 1937	DRF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
	GORGYRA Holland, 1896						
1297	*G. bule*	Miller, 1964		MEF			SZS 22-30.IX.2010
	PARDALEODES Butler, 1870						
1311	*P. incerta*	*murcia*	Plötz, 1883	GUI	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1312	*P. edipus*		Stoll, 1781	ALF	RDW 2002-	SZS 10-20.III.2010	SZS 22-30.IX.2010

					2009		
	PAROSMODES Holland, 1896						
1321	*P. lentiginosa*		Holland, 1896	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	RHABDOMANTIS Holland, 1896						
1322	*R. galatia*		Hewitson, 1868	MEF	RDW 2002-2009		SZS 22-30.IX.2010
1323	*R. sosia*		Mabille, 1891	MEF			SZS 22-30.IX.2010
	OSMODES Holland, 1892						
1328	*O. thora*		Plötz, 1884	ALF	RDW 2002-2009		SZS 22-30.IX.2010
	ACLEROS Mabille, 1885						
1341	*A. ploetzi*		Mabille, 1890	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
1342	*A. mackenii*	*olaus*	Plötz, 1884	ALF	RDW 2002-2009	SZS 10-20.III.2010	
	MEZA Hemming, 1939						
1354	*M. meza*		Hewitson, 1877	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1359	*M. cybeutes*	*volta*	Miller, 1971	ALF			SZS 22-30.IX.2010
	ANDRONYMUS Holland, 1896						
1365	*A. neander*		Plötz, 1884	ALF		SZS 10-20.III.2010	
1367	*A. caesar*		Fabricius, 1793	ALF		SZS 10-20.III.2010	
1370	*A. evander*		Mabille, 1890	MEF			SZS 22-30.IX.2010
	ZOPHOPETES Mabille, 1904						
1374	*Z. cerymica*		Hewitson, 1867	ALF			SZS 22-30.IX.2010
	ARTITROPA Holland, 1896						
1379	*A. comus*		Stoll, 1782				SZS 22-30.IX.2010
	GRETNA Evans, 1937						
1381	*G. waga*		Plötz, 1886	ALF		SZS 10-20.III.2010	
1383	*G. cylinda*		Hewitson, 1876	ALF			SZS 22-30.IX.2010
	PTEROTEINON Watson, 1893						
1387	*P. laufella*		Hewitson, 1868	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1391	*P. caenira*		Hewitson, 1867	ALF	RDW 2002-2009	SZS 10-20.III.2010	SZS 22-30.IX.2010
1394	*P. pruna*		Evans, 1937	WEF			SZS 22-30.IX.2010
	CAENIDES Holland, 1896						

1412	*C. dacela*		Hewitson, 1876	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
1414	*C. dacena*		Hewitson, 1876	MEF			SZS 22-30.IX.2010
	MONZA Evans, 1937						
1416	*M. cretacea*		Snellen, 1872	ALF		SZS 10-20.III.2010	SZS 22-30.IX.2010
	MELPHINA Evans, 1937						
1417	*M. noctula*		Druce, 1909	WEF	RDW 2002-2009	SZS 10-20.III.2010	
1419	*M. unistriga*		Holland, 1893	WEF			SZS 22-30.IX.2010
	FRESNA Evans, 1937						
1427	*F. netopha*		Hewitson, 1878	DRF			SZS 22-30.IX.2010
1430	*F. cojo*		Karsch, 1893	ALF		SZS 10-20.III.2010	
	PELOPIDAS Walker, 1870						
1444	*P. mathias*		Fabricius, 1798	UBQ		SZS 10-20.III.2010	SZS 22-30.IX.2010
	BORBO Evans, 1949						
1448	*B. perobscura*		Druce, 1912	GUI	RDW 2002-2009		
1453	*B. fatuellus*		Hopffer, 1855	UBQ		SZS 10-20.III.2010	SZS 22-30.IX.2010
	GEGENES Hübner, 1819						
1459	*G. niso*	*brevicornis*	Plötz, 1884	GUI		SZS 10-20.III.2010	

A brief guide to some uses of trees and climbers found on forest trails (includes description of species collected by IITA school children)

Albizia ferruginea (*ayinre semise olose*): Root bark powdered and taken with salt to cure constipation

Albizia zygia (*ayinre-bona-bona, ayinreta*): Leaves help to control diarrhea but roots are strong purgative; fine timber substituted for iroko

Alstonia boonei (*awun*): Bark and root lower fever, especially in malaria; bark also relieves pain in joints and toothache

Antiaris toxicaria subsp *welwitschii* (*oro*): Sap (latex) and bark are very toxic, causing blistering of skin through handling; used medicinally as a purge and to treat hepatitis; In Asia, subsp toxicaria is even more deadly and is used as arrow poison

Blighia sapida (*akee, isin*): Leaves used as poultice for yaws; seeds used to make soap and unripe fruit used as fish poison; fruit contains an aril that causes 'vomiting sickness.' Yoruba saying: 'He who knows how to eat the isin knows to remove the deadly part.'

Ceiba pentandra (*araba*, silk cotton tree): Bark is astringent, controls diarrhea, heals wounds, sores and skin problems, and also lowers fever; fluffy 'silk' around the seeds can cause allergies but has industrial uses in lifejackets, acoustic insulation, and fireworks

Celtis wightii (*awagba, itako*): Leaf sap used to treat facial eczema

Celtis zenkeri (*ita-gidi, uta, fide*): Wood ground with oil to apply to cuts

Chrysophyllum albidum (now *Gambeya albida*) (*agbalumo*): Sacred to Igbo, revered especially by women praying to become pregnant; fruits are very nutritious and also used medicinally to control diarrhea and vomiting

Cnestis ferruginea (*akara-oje*): Roots are laxative and used to treat skin infections; leaves are rubbed on body to relieve fever; fruits are rubbed on teeth to clean them and freshen mouth; whole fruits with seeds are ground with wine or spirit as a remedy for snakebite

Coffea liberica (*kofi*): Medicinal uses precede roasting and grinding of seeds to make beverage; dried fruits were once pressed into blocks to carry as rations on long journeys; leaves, fruits, and seeds were traditionally consumed to increase stamina

Cola nitida (*obi gbanja*): Kernels are valued as a tonic and stimulant, increasing stamina and supporting the nervous system against stress and anxiety

Combretum smeathmannii (agbon): Leaves are boiled and eaten to prevent illness

Dialium guineense (*amoyin, awin*): Fruit pulp is refreshing and very high in vitamin C; leaves are decocted as a lotion for tumors; tree is invoked as awin, meaning 'lender', to obtain money quickly

Entandrophragma angolense (*ijebu*, ijebu mahogany): Mahogany-like timber is an important export; bark and sap have pain-killing properties

Ficus mucosa (*oguro*): Twigs when dried and peeled glow at night, associating tree with witchcraft; fruits and young leaves are edible; bark has pain-relieving properties

Funtumia elastic (*ako ire*, Lagos rubber tree, false rubber tree): Latex is tapped for use as birdlime and to adulterate superior kinds of rubber; leaves lower blood pressure and can be used as local anaesthetic; roots control urinary incontinence and dysentery

Holarrhena floribunda (*ire, ire ibeji*, male false rubber tree): Latex is used as substitute for rubber from Funtumia elastica; bark is well-known cure for dysentery; leaves and bark are regarded as anti-malarial

Irvingia gabonensis (*oro*, bush mango): One of the most important trees of the forest for its mango-like fruits; kernels are a source of oil and are processed into dika paste as a food additive; bark is astringent, used in mouthwash, enemas, and dressings

Lecaniodiscus cupanioides (*aka*): Bark lowers fever; leaves heal injuries and sores, and are mixed with those of Dialium guineense to bathe the body during convalescence; fragrant flowers are used to make floral water

Lonchocarpus sericeus (*ipapo, apapo*): Bark makes gentle laxative for children and treats stomach-ache, backache and convulsions; its antibacterial properties treat skin infections

Malacantha alnifolia (now *Pouteria alnifolia*) (*akala*): Leaves used for wrapping food; when heated and mashed, they are applied to wounds caused by thorns, splinters, nails, gunshot, etc.

Margaritaria discoidea (*asasa*): Bark has stimulant, tonic, purgative, and pain-killing properties

Millettia thonningii (*ito*): Important for chew-sticks; bark and root are boiled as a blood cleanser and remedy for menstrual problems and intestinal parasites; leaves are good for goats and used as veterinary medicine to cure diarrhea

Milicia excelsa (*iroko*): Latex is stimulant, pain-killer, and antiseptic; applied to sores, burns, skin irritations, and infected teeth; bark also has pain-killing effects, used for menstrual and stomach cramps, rheumatic joints, and sprains

Monodora tenuifolia (*lakosin*), African nutmeg: Bark is used in remedies for toothache and dysentery. Aromatic seeds are ground as a spice, and also applied to skin diseases.

Morinda lucida (*oruwo*, brimstone tree): One of the most important medicinal trees in the region; bark, roots, and leaves are bitter and astringent, highly regarded for treating all kinds of fever, especially yellow fever; used externally to relieve backache, joint pain, sores, abscesses, and skin irritations; leaf and stem extracts have hypotensive, anticancer, and tranquillizing effects; contains bright yellow dye compounds, hence 'brimstone tree'

Myrianthus arboreus (*ibisere*, soup tree): Young leaves made into a favorite vegetable soup; leaves also an ingredient in remedies for diarrhea and vomiting, and fever in children; fruit and seeds are highly nutritious: rich in oil, sugars, proteins and amino acids, especially cystine

Newbouldia laevis (*akoko*): Bark used to treat dysentery; roots expel roundworms and relieve migraine and earache; leaves used in eye lotion for conjunctivitis

Pterocarpus osun (*irosun, osun*): Bark contains red resin; an astringent and lowers fever; controls discharges and bleeding; heals wounds and relieves feverish illnesses

Pycnanthus angolensis (*akomu*, false nutmeg): Sap has anti-inflammatory effects; useful in mouthwash for thrush and other oral infections; twigs are sucked for similar problems; seeds are high in fat, suitable for soap, candles, and external treatment of skin diseases

Rothmannia longiflora (*buje*): Bark has astringent, healing, and pain-killing properties; lowers fever; fruit pulp is emetic

Spondias mombin (*akika*, hog plum): Bark is used to treat fungal skin infections and deter driver ants; leaves help control bleeding, pain, and infection, often during pregnancy and childbirth; for intestinal disorders, tumors, and uterine cancer; fruit juice has diuretic effects and soothes fever

Sterculia tragacantha (alawefan, African tragacanth): Gum has many uses as a stimulant, tonic, antiseptic, and anti-inflammatory; an adulterant of gum Arabic; leaves are edible and used as food wrappers

Tetrapleura tetraptera (*arida, aidan*): Roots are mashed to use as poultices for wounds and ulcers and decocted as a remedy for jaundice; fruits have two hard woody wings and two soft wings containing sweet pulp with a caramel aroma; pulp is processed into balls with other products (i.e., palm oil or shea butter for cosmetic and medicinal uses - body creams and lotions to soothe fever); whole fruits contain substances that have anticonvulsant and tranquillizing properties; used to kill freshwater snails that cause schistosomiasis; the tree is revered in a Yoruba incantation to release people overpowered by witches, hence the name aridan or aidan, meaning 'cast no spell'

Trichilia monadelpha (*akika*): Bark is antiseptic, painkiller, and sedative with a wide range of uses to heal injuries and skin infections, joint, muscle and gastro-intestinal pains; leaves are a remedy for heart problems

Trilepisium madagascariense (*koko-eran, gangaran*): Latex is used as a tonic and remedy for eye problems; bark has astringent and pain-killing properties; used to relieve diarrhea and rheumatism; roots are a remedy for skin infections; tree is invoked in a Yoruba incantation for a miscarried child

Triplochiton scleroxylon (*obeche, arere, African maple*): Bark is pulped to relieve edema in pregnancy and soothe menstrual pain; tree has valuable timber, known as African whitewood and is the food plant of a native silkworm, *Anaphe venata*; it is invoked in Yorubaland to stop thieves

Zanthoxylum leprieurii (ata): Various species belonging to this genus contain sedative and pain-killing compounds that are well known for relieving toothache and inflamed gums; the bark and branches are prickly, often covered with conical, spine-tipped protuberances which are very conspicuous; most have aromatic bark, leaves, and fruits; twigs are used as chew-sticks; roots expel intestinal worms

Important notice

These uses are taken from *The Useful Plants of Tropical West Africa* by H.M. Burkill (Royal Botanic Garden Kew, 1997). They are not recommendations for your own use. Follow at your own risk. If you have health problems, please consult your doctor or medical adviser. Consultant Deni Bown and IITA cannot be held responsible for any ill-effects you may experience by ignoring this advice.