Report on
Individual and Instiutrional Capacity Building in Taxonomy and Collection Management

as provided by the

Belgian Focal Point to the Global Taxonomy Initiative
Royal Belgian Institute of Natural Sciences – Rue Vautier 29 – 1000 BRUSSELS - Belgium

1. Coordinates trainee

Name: Pedro Luís Rodrigues de Moraes

Country: Brazil

Date of arrival and departure in / from Belgium: 01/07/2004, 03/08/2004

Number of training days: 22

Location of training (e.g. RBINS, RAM, RBG,…): Royal Botanical Garden of Belgium

Taxon for which training was received: Family Lauraceae – Angiosperm, Dicotyledon

2. Taxon specific reporting

Describe the different methodologies for collecting your taxon.

The Brazilian species of Lauraceae are mainly tall trees up to 30 m high. For collecting fertile material of these trees, for taxonomic purposes, we need climber collectors which climb them with specialized equipment to reach the crown of the trees and to cut a branch with flowers and/or fruits. For those individuals and/or species with heights up to 10 m, it is possible to collect fertile material by using a telescoping pole adjusted with a pruning head, and for treelets and small shrubs, the material can be collected by just using a hand pruner. The plant cuttings are placed between pieces of paper and dried in a plant press which is placed inside a stove. These specimens are brought back to the Herbarium, mounted on a sheet of cartridge or other archival quality paper which is kept in a folder, authoritatively identified, and preserved in the Herbarium, which is designed to protect the specimens from sunlight, humidity, and insects. To the mounted specimen, a specimen label is added with information of the plant name, a description of the plant, where and when it was collected, and who collected it. Additional information, such as local uses, is also often included in the label information. Some herbarium specimens can be cross referenced with ancillary collections, such as carpological collection, mostly for fruits and items too big to fit on a sheet of paper, and a spirit collection, used to store fragile items that would loose their tridimensional shape once pressed.

Describe how to preserve the collected specimens for taxonomic purposes.

The collected material of Lauraceae species can be preserved through traditional methodology of herborization of plant specimens, such as outlined above. In the Herbarium, specimens are arranged systematically in folders placed in the cupboards by family, region, genus and species, so that anyone can find an example of a particular species within minutes. For the maintenance of dried plants in a Herbarium placed in the tropics, under proper environmental conditions against insects and fungus proliferation, it is deserved to keep the room under low air humidity and low temperatures, what can be promoted by the utilization of air conditioners and dehumidificators. Before the incorporation of new specimens to the herbarium collection, the procedure of storing them in freezer

for two weeks has demonstrated to be effective in killing most of possible contamination by insects and larve. Additionally, once a year, the procedure of fumigating the collection with phosphine has also demonstrated to control possible insect proliferation.

Describe how to curate a collection.

As part of the curation process, specimens will be moved from one place in the herbarium to another, and the folders in which they are stored may have to be changed or rearranged. Specimens on old sheets may have to be repaired or remounted, loose items may have to be reattached to sheets and so on. Because of the arrangement of specimens in a herbarium by taxon, the specimens to be curated generally occur in contiguous blocks. The 'Curation Table' database records infomation on families and genera that have and have not been curated. There are range of reasons for curating specimens ranging from the institutional to the personal. Depending on the time and effort available, and the range and complexity of material in the collection, the purpose of the curation will have a strong bearing on which specimens are examined and identified. For example, if a family is in a real mess, the first pass at curation may be simply to get all the specimens into a correct genus. It is important to define and select a curation task that can be finished within a reasonable time and not labour away at something that appears to have no end. In order to minimize the amount of revisiting 'old ground', it is import to gather all the material to be curated at the start of the curation process. Plants can be identified in the absence of a published taxonomic treatment only if a person is intimately familiar with the taxonomy of the group concerned and when working with a well-curated collection. The most recent revisions or flora treatments are used to apply names to the specimens in the collection, but in some instances, for a variety of reasons, one may choose to follow older taxonomic works, or use a mixture of two or more. Copies of most publications required to curate the collection can be found in the botanical library, either as monographs or as papers in on of the serials. It is best to use photocopies of the article or section one wishes to work with as these can be annotated with corrections and comments. When the curation task is complete, copies of the literature used are conveniently stored in the collection with the specimens ready for the next round curation or specifimen identification. The primary purpose of curation is to apply correct botanical names to specimens. It is most important that the names being applied exist, are real, are validly published and legitimate in the sense of the *International Code of Botanical Nomenclature*. During the check of existing taxa and identifications, a systematic work through all of the folders of identified material in the taxon is done, checking that they are what they say they are that the determination is actually written on the specimen and not just on the folder. One must have the confidence to be skeptical of previous identifications, even if done by 'experts'. Experts often make mistakes, sometimes they may have identified a specimen carelessly or in a hurry or may have been working concepts that are no longer correct. After working through the previously identified material, the work through all the unidentified specimens and suspected misidentified specimens is done. There are several ways in which this can be approached: by keying out the specimens individually; working through key a couplet at a time making piles of specimens for each choice; sorting specimens into like piles and keying out each pile. Many floras or revisions provide lists of all or selected identified specimens examined by the author that provide a useful aid in confirming the identifications applied in the herbarium. If possible these specimens should be located and annotated. The benchmark specimen documenting the name of a taxon, known as the Type, is always cited in revision or monograph and is often cited in Floras. These are particularly important specimens for

taxonomy and if found in the collection require special treatment, such as: they are generally kept in separate collection; it is desirable to annotate Type specimen with protologue citation details; and to ensure dummy Type sheet present in main collection for all Types: holding photocopy of label, photo or photocopy of specimen, red Type folder. Any specimens identified or reidentified as part of the curation process need to be annotated as such with special slips and the new identifications will need to be added to the specimen database. These slips must include the name of the taxon as identified, the name of the person(s) making the identification, the date and must be attached to the sheet so as to occlude as little of the specimen as possible, not writing on the sheet or specimen labels. Having (re-)identified specimens, the sheets must be moved into their correct folders, ensuring that all folders are in the correct established order. A final check of the curation process is done to make sure this part of the collection is neat and tidy. After completing the curation process, the ‘'Curation Table’ must be manually updated. The final and perhaps the most important part of the curation process, recording the specimen information on the database makes the results of the curation efforts available to other staff and external clients for a range of scientific and specimen management projects. Key information such as the taxon name, collector's name and number, locality details, habitat information, field notes about the plant and a range of other information about the specimen are recorded on the database.

Describe how your collection will be made accessible for other scientists by means of a relational database.

For the three taxonomic projects that are in course and have been coordinated/executed by me (Taxonomic revision of Brazilian species of *Cryptocarya* (Lauraceae); Flora of states of Goiás and Tocantins – Family Lauraceae; and Flora of the Microregion ‘Santa Teresa’, state of Espírito Santo – Family Lauraceae), all specimens examined are going to be listed and published in scientific articles. My own duplicate gatherings of Lauraceae species have been distributed among several Brazilian herbaria as well as the foreign ones. Additionally, it is my intention to make available to the scientific community and general public, via internet, my database of the studied species with the links to their respective images from herbaria collections and field registers. For this, the most important specimens (types, historical, and recent collections showing the variability within and among taxa) have been digital photographed and/or scanned.

Describe in detail the taxonomic characters at the different hierarchical levels (e.g. on order level, family, genus, species) and use this information to describe in detail one species.

Family Lauraceae Lindl.

Trees or shrubs dioecious and/or gynodioecious, or monoecious, rare parasitic climbers, usually with perenne leaves. Leaves alternate, rare opposite, subopposite or subverticillate; stipules absent. Inflorescence usually determinate, axillar, sometimes pseudoterminal, rarely terminal, thyrsoid, thyrsoid-paniculate, racemose, pseudo-umbellate, rarely capitulum-like or reduced to a unique flower. Flowers in general small, incomplete, unisexual, bisexual, or polygamous, actinomorph, in general trimerous; hypanth not connated to the ovary, indistinct to conspicuous and urceolate; tepals 6 or 4 in two whorls, rare 9 in three whorls, equal to unequal (the externals smallers), early or late caducous, or persistent and enlarged in the cupule of fruit; stamens in four whorls (I, II, III and IV), the fourth staminodial or absent; one or two external whorls could be equally staminodial; third whorl

with two glands at the base of filaments, rare glands in the other whorls; filaments shorter, equal or longer than anthers, or anthers sessile, 2-4 sporangiate, sporangia dehiscent by valves introrses to extroses; ovary unicarpellate, unilocular, with one ovule, pendulous. Fruit baccaceous or nucoid, one-seeded, base of fruit without cupule or cupule low to well developed, envolving the fruit totally or partially.

Genus *Cryptocarya* R. Br.

Monoecious trees or shrubs up to 30 m high, branches sericeous to villose or glabrous. Spiral leaves, alternate or subopposite; petiolated; lamina chartaceous to coriaceous, glabrous or pubescent. Inflorescence paniculate and pseudoterminal, sometimes almost cymose and axillar. Flowers hermafrodite, short, trimerous, tepals 3 + 3, symmetric, often equal; stamens 6 introrses + 3 extrorses, lateral or introrses, 9 to 6 or 3 fertiles, bilocular; connectives sometimes surpassing sporangia; stamens of third whorl with adnate glands in the base of filaments, sometimes stalked; staminodes 3, cordate-ovate to cordate-sagittate, acuminate, foliaceous; ovary semi-inferior ± sessile, glabrous (american species), immersed into the tube of perianth; stigma often inconspicuous. Fruits nucoid, nucule type, completely immersed into the accrescent tube of flower, unilocellate, monospermic. Seeds with large cotyledons, planoconvex.

Cryptocarya saligna Mez

Trees up to 30 m high. Leaves alternate; lamina 4-12x1.5-3 cm, lanceolate to narrowly lanceolate, chataceous or rigid-chataceous, apex acuminate to caudate-acuminate, base acute, domatia absent, venation camptodromous-brochidodromous, adaxial face glabrous, subnitid, abaxial face obsolete, rufescent-glaucous; petiole 5-10 mm, glabrous, slightly canaliculate. Inflorescence paniculate thyrse, pyramidal, axillar, submultiflowered, lax, 3-8 cm, shorter than leaves, glabrous to glabrescent; pedicel 1-4 mm, glabrous; bracteoles diminute, deciduous to subpersistent. Flowers 2-3x2-2.5 mm, densely pilose to glabrous, glaucous; hypanth cylindrical to obconic-urceolate, glabrous inside; tepals ca. 1 mm, ovate, subequal, erect-patent, externally glabrescent, hirsute inside; filaments of stamens from whorls I and II very short or subnulls, subglabrous to densely hirsute, anthers glabrous, widely ovate, connective papilose, surpassing the large introrse sporangia; filaments of stamens from whorl III densely hirsute, anthers narrowly ovate, glabrous, connective thick, obtuse, surpassing the large lateral sporangia, basal glands small, globose, sessile to shortly stalked; staminodes narrowly sagittate, glabrous, filaments very short, pilose; pistil glabrous, ovary ellypsoid, attenuate towards the long style, not rare emerging above the tepals, stigma diminute, truncate. Fruit nucoid, 2.6-5x0.9-3 cm, pyriform or ellyptic, orangish or reddish, smooth.

THIS QUESTIONNAIRE MUST BE SUBMITTED ELECTRONICALLY (OR BY FAX) WITHIN ONE MONTH AFTER THE OFFICIAL CLOSURE OF THE TRAINING.

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