

A Research on Some Techniques for Buildup a Herbarium from Preserved Plant Specimens

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Abstract – A herbarium is a storehouse of plant specimens which are collected, dried and mounted on handmade paper sheets. They will be organized in plant families perceived system of characterization and kept in pigeon holes of steel or wooden cup boards and kept up carefully for present and future investigations. It is a reference material for naming, identification and order of the plants.

With increment in way of life and intra transferable disorders, similar to hypertension, diabetes, asthma and numerous others individuals slanted towards the Ayurvedic medicine. Numerous little pharmaceutical organizations are developing for the satisfaction of the above interest. It is important to produce plan of medicine ought to be standard and according to portrayed in the traditional content. The specialist of old times used to collect medicinal plants from timberland themselves, some of them used to develop medicinal plants around their center. This training used to guarantee them of the utilization of right plant. In any case, these days vaidyas started to recommend medicines, and they are completely relied upon producers. In this circumstance, it is mandatory to build up the herbarium that helps in the identification of medicinal plants.

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INTRODUCTION

The herbarium is collection of dried plant specimens identified and assembled based on similitudes and utilizing a standard system of order. In the improvement of herbarium example, the plant material is collected, handled and preserved that all parts are spoken to and full data on territory, natural surroundings and plant characters are recorded. Herbarium is generally connected with gardens, instructing and investigate foundations and their possessions are important hotspot for investigation of regular develop, appropriation and loss of decent variety. Herbarium, in connection to plant hereditary assets activities can be utilized for identification of specimens, finding source zones for overview and collection and investigation of assorted variety in regular conditions.

In our country the learning of utilization of medicinal plants was persisted starting with one age then onto the next by method for experience. The expert of old times used to collect medicinal plants from woodland themselves, some of them used to develop medicinal plants around their facility. This training used to guarantee them of the utilization of right plant. Be that as it may, with the time the Vaidyas started to compose remedies which were apportioned by pansari and he being specialist used to give old plant

part, and furthermore contaminated the drugs with material which had even no medicinal esteem. At present a considerable lot of the drugs utilized in Ayurveda are not even legitimately identified. A few distinct drugs are well known by one regular name and by one name a few unique drugs are accessible. It is accordingly important to distinguish the plant source botanically which might be followed by vernacular names. The plant specimens collected ought to be appropriately kept for future record and reference. For this reason it is important to keep up a Herbarium and Museum of medicinal plants.

A Herbarium is a collection of dried plants systematically named and masterminded prepared reference and insurance. In the investigation of systematic herbal science such collections have existed for identification of species, the investigation of plants of some random territory and the examination of the flora of various districts. This is additionally vital for medicinal plants since concentrate on medicinal plants must be led completely just when specimens of the plants under thought are within reach and can be promptly counseled.

The science of Medicinal plants in India its beginnings in a remote age. Indians of the vedic

periods (2000-800 B.C.) officially cultivated harvests. In Vedic literature there are numerous terms utilized in the portrayal of plants and plant parts. Restorative science and collection of the medicinal plants additionally had their start in the old times. The ATHARVEDA contain an abundance of subtleties bearing regarding the matter of medicinal plants and the diseases against which they were connected. One of the most punctual works a managing plant life from a logical stance is the Briksha Ayurveda (Science of plants and plant life).

One of the biggest Herbarium with most established collections from various piece of world is at Kew (England). In India Central Herbarium at Sibpur Kolkata and Dehra Dun Herbarium are notable.

A herbarium serves researchers, teachers, government specialists, and private natives.

Customarily, the dried specimens are mounted on sheets of paper and recorded in organizers in cupboards. These specimens can keep going for a long time when given appropriate care and security from harm from creepy crawlies, light, and mugginess. A few collections additionally suit cumbersome materials, for example, pine cones, expansive organic products, or fossils that must be documented independently. Most organisms and green growth present extraordinary issues since they should be preserved in fluid. Our exchange will concentrate on a conventional collection of vascular plants.

In this workshop, two noteworthy regions will be secured:

1. Arrangement of plant specimens. Basic plant presses will be gathered. Field techniques, including collecting agent specimens and recording information, will be displayed. Drying, mounting, and naming specimens will likewise be talked about.
2. Plant identification. Characterization and identification is practiced by utilizing distributed keys from fitting floras and manuals. Numerous fledglings recognize plants by "coordinating" them with pictures in famous field guides, yet two potential issues are: much of the time distinctive species can appear to be comparative (i.e., they may have comparable flowers yet extraordinary organic products) and, furthermore, not all species of a given region are shown in such books. The favored method to distinguish an obscure plant is to "key" it out in a manual or flora for the zone. A little practice with keys constructs one's trust in utilizing them.

Specimens of greenery species from the Florida State University Herbarium will be utilized for this workshop.

ROLE OF HERBARIUM

The primary reason for herbarium is to exhibit an image by methods for agent herbarium specimens of the structure of flora; to record the dispersion everything being equal and to group them in a system which will delineate their phylogenetic history turns into a definitive objective. Herbarium examines going towards accomplishing this objective are:

- a) Herbarium material and taxonomic examinations related with it structure the reason for gathering species and arranging them and arrangement system of plants are fundamentally founded on herbarium material.
- b) Herbarium thinks about give a genuinely close estimation to irregular inspecting for the complete species territory. In biosystematic investigations, the undertaking of testing generally dissipated populations incredible; the herbarium give a helpful methods by which one can legitimize or generally the extrapolations being produced using test populations.
- c) Study of relationship dependent on new confirmations, a lot of subtleties of characters is preserved subsequent to drying. Moreover, macro morphological traits, the micro morphological traits and testimonies are similar with those from new specimens. Moreover, epidermal highlights (hairs, trichomes) dust grains remains for all intents and purposes the equivalent, chemical constituents, for example, phenolics, alkaloids, additionally stays same as in living plants.
- d) Additional utilization of herbarium in different investigations is a store for voucher specimens of concentrates on cytology, chemistry, breeding and so forth., which are the main methods where by a consequent laborer can check the material from past research.
- e) The status of plant species about their territory of accessibility, fluctuation design flowering/fruited time, status with respect to uncommon/imperiled/endemic sorts, and so on accumulated from herbaria may support the adventurers and scientists in setting their objectives.

HERBARIUM METHODS

While collecting medicinal plants for the preparation of Herbarium the following are to be observed:

1. Collecting of plants and plant material
2. Field book for field notes
3. Drying and preserving of specimens
4. Mounting the specimens
5. Arrangements of specimens sheets
6. Museum for display of the unmountable material
7. Periodic care
8. Indexing of preserved plants and preparation of Nomenclature index of Botanical, Sanskrit, Local name of cross indexing.

Collection of Plant and plant material -

The field collector must carry the following necessary appliances for collection of plant material.

- a) Vasculum (A box with a lid and strap for carrying medicinal plant)
- b) Wire press
- c) Knife pruning, Secature, Khurpi and Pathal etc.
- d) Absorbent sheets and old news paper
- e) Field book for field notes
- f) Pocket lens
- g) Rope and tripal
- h) Alpine tent for higher hill
- i) Alcohol in polythene bottle for collection of delicate plant specimens and plant parts.

For the medicinal plants the period of collection ought to be fixed by the region and flowering fruiting time of the plants. While collecting plant specimens for herbarium it must be remembered that these specimens are to be mounted on sheet of 11"x16.5" size and consequently the specimens ought to be collected in like manner. Little plants ought to be brought with roots. From bigger plant regular branch ought to be taken that will demonstrate average leaves, flowers and organic products. Plant material of medicinal plants for example bark, nerves and so forth., must be collected along with the plant specimens, beyond what many would consider possible no less than six specimens of each plant ought to be collected. This likewise empowers to note down variety assuming any. It is attractive that the plant specimens ought to be placed in the

retentive sheets and fragile plants ought to be kept in liquor kept in container. In field it isn't a few times conceivable to put the plant in drying sheets, at such times vasculum ought to be utilized. Just free stuffed specimens ought to be put away in vasculum, with the goal that plant part may not harmed. There are sure plants which hang on the double when they are culled, such plants ought to constantly be squeezed on the double. The permeable sheet with plants specimens are kept one on the other and fixed in the wire press.

Field book and field notes -

The field book is utilized to note down the field characters, general depiction of the plant, their partners, legends about the nearby utilization of the plant and other fascinating data. This will keep up appropriate record for each plant. Field for the most part contain one hundred pages in a single book. Each page comprises of six similarly cut number as given on the primary page. The slips are put along with the plant specimens and crude material. The field book number become stamp mark for plant specimens. Insight about substance for example latex or watery substance and so on. Flower shading, scent ought to likewise be noted. The spot of collection its elevation and information of collection ought to likewise be entered in the field book.

Drying and preservation of specimens -

The drying sheets ought to blotch paper or old newspaper that may accomplish the size of 12"x18" on collapsing. The plant specimens ought to be saved over the paper keeping in view that the leaves may not fold. Both surface of leaves and complete flower ought to likewise noticeable. One two cut of Transverse segment of the greater sized natural product. 2% arrangement of Mercuric chloride in methylated soul ought to be connected on the plant with camel hair brush or plant ought to be plunged into the arrangement. The wire presses are very helpful for field reason yet for cumbersome pack wooden presses are utilized in the herbarium.

Mounting of the Specimens -

The packs containing plant specimens when kept in wooden press become dry and get a well from shape, when the plants are totally dried they ought to be mounted on the sheets solid, white, 11"x 16.5" of size, approx. 9 kg to the ream being standard weight. The regular technique by sticking them down, fish stick being utilized. The plant example is skewered fish stick being utilized. The plant example is skewered over a glass sheet and paste (arranged by water shower technique) is connected with camel hair brush on one side of the plant. The plant is presently aesthetically organized on the mounting sheet and additional paste and

water expelled with heated water wipe. The sheet is numbered with a similar number slip which has segregated from the field book. Over it is put the following mounted sheet. The pack is presently kept in wooden press overnight. The plant example winds up repaired on the sheet. After appropriate cleaning, sewing is finished with string on the parts which are probably going to be isolates in long run. Name of size 3.5"x4" are glued on right lower corner of the sheet. Data recorded in the field book is noted in this name, giving botanical name of the plant followed vernacular names. The name should bear the condensed medicinal employments of the plant and fables about its uses assuming any.

Arrangement of Specimens Sheets -

The medicinal plant identified botanically will bear botanical name which is of worldwide acknowledgment. However, the Sanskrit name, neighborhood name and names of different local dialects of such plant may shift. It is subsequently vital that the arrangement of the plants in the herbarium ought to be founded on the Benthaman-Hooker's characterization. Also, another arrangement of specimens might be organized by the grouping given in Nighantus. A list of Botanical, Sanskrit, Unani and other vernacular names might be set up for finding the specimens masterminded by the above groupings.

COLLECTION PROCEDURE

Twig with great flowers should be collected for the example. The bit of the example ought to need to contain clear phyllotaxy and the stretching system. For little herb, collection of more specimens as could fix on the herbarium sheet (up to six) is attractive. When all is said in done, secateurs are utilized to cut the twigs, while for a bit stature or down, pruner is utilized, and for prickly specimens, for example, *Berberis mucrifolia*, calfskin glove is required. For plants and herbs, digger is connected to take out underground segment. A few plants stem lies evenly under the ground; for instance, some *Salix* and *Myricaria* species. In such cases, the underground segment ought to be cleaned from the dirt particles, and so forth. In the event that it is stem, at that point, specimens have be contained spreading way.

Oceanic plants are cloudy or to some degree filamentous and are hard to be masterminded on the sheet. A sheet of mounting paper is put under a coasting or submerged moment plants, and after that slowly raising the paper until the example is lying on the paper and out of the water. At that point paper is lifted making an incline carefully, with the goal that it encourages water overflow.

These plants should be shaken well before putting in flimsies. A few plants can be placed in plastic bags. The plants that effectively harm or can be lost among bigger plants from a similar collection site can be set

in little bags inside the bigger pack. Ailing plants, depauperate specimens, tainted twigs, and so forth ought to be stayed away from.

At the time of collection, it is generally impractical to distinguish numerous specimens in the field. In this way, botanists distinguish the specimens that have been squeezed and dried. The specimens are assembled into groups as indicated by area. The affirmed specimens ought to contain their botanical name, including creator. The collection number can be utilized as an example tag. These number as a rule start with 1, 2, 3, and so forth., and proceed uncertainly. Plant collectors sometimes utilize an altered system, starting each new year. Rather than labels, collection number likewise can be written in flimsies by marker.

DRYING TECHNIQUES

Drying techniques are of two sorts; those cultivated without heat, and those with the guide of artificial heat. Drying with the guide of artificial heat is the predominant technique. It is practiced by methods for heated evaporate air going and through the channel of the layer. Creases, regularly alluded to as ventilators, are utilized in presses when plants are dried by methods for artificial heat (Lawrence 1951). It is as sheet of pasteboard or meager aluminum metal, with fluted conduits. It gives air sections through the press for development of dry heated air.

The dryer with the herbarium weight is secured by mountain survival cover. It is heat resistant cover that is connected to remain with clasps. At the base (single) for coming and at the tip, for outgoing air, arrangement ventilations need to keep. The best heat source is heater. Stove can be utilized as an elective source. The standard time period for drying specimens is 12 hours.

Be that as it may, it relies on the material; and furthermore dryer set, stickiness, the sort of heat source, atmosphere, and temperature influence the drying period. Too high a temperature for a really long time a time period will make an example become fragile and stained. Too short a drying period or too low a temperature will keep the specimens, sodden to contact, and conceivably cause mold. Specimens should be checked consistently until dry. An example isn't dry on the off chance that it is as yet limp when grabbed and cool and wet to the touch. The weights become free when the plants are dry.

The most widely recognized technique for drying is without applying heat. Plants are put in squeezing papers between the blotting surfaces of the plant press. No folds are utilized. The press is bolted up for around 24 hours, this is known as the perspiring period. It is then opened, and as blotting surfaces are evacuated each squeezing sheet is turned

back, the specimens are analyzed, and parts improved as the circumstance requests. The distinction between an inadequately and a well-arranged example for the most part results from the consideration given at this phase of the procedure. After rearrangement the organizer sheet is lifted on to a crisp dry blotting surface and secured by another dry blotting surface. The new heap of blotting surfaces and specimens is then secured up in the press and allowed to represent another 24 to 36 hours, when the way toward supplanting wet blotting surfaces with dry one is rehashed. A third difference in blotting surfaces follows typically following 2 to 3 days. Blotting surfaces must be change 3-4 times; each wet blotting surface evacuated must be dried, more often than not by setting in the sun and reused. About seven days is required for fulfillment of drying. Dried specimens are stuffed with much care. Organisms just as creepy crawlies harm if legitimate care isn't given till the lasting stockpiling.

CONCLUSION

In India the utilization of a few species of plants as known from the remote vedic period and numerous treatises are accessible on their medicinal ideals and therapeutics. Out of around 2000 things recorded in Indian medicinal literature, under 200 are of creature and mineral root and rest are gotten from vegetable sources. The portrayals of drugs accessible in the old literature are not adequate to distinguish a large number of the drugs being sold in market. This has delivered debasement of drugs. Since no legitimate strategies for identification of such drugs have been created it is in this manner hard to control it. For the institutionalization and other logical work on the drug it is important to keep up cutting-edge herbarium and exhibition hall of medicinal plants. The plant example of the drug source to be identified botanically and afterward the applicable vernacular names might be held along with them. A total and entrenched herbarium and exhibition hall of medicinal plants can be of extraordinary to brokers, pharmaceutical concerns, and understudies and research specialists. It can likewise play an essential part in the foundation of different questionable and vernacular names.

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