
Modern Technique for Collection of Medicinal Plant (*Cleistanthus collinus*) and Preparation of Herbarium Specimen

SujataDeo¹, R. D. Utane^{2*}, Rahul Khubalkar¹, Soham Thombre¹

1. Department of Chemistry, Govt. Institute of Science, Nagpur (MS), India.

2. Department of Chemistry, SantGadgeMaharajMahavidyalaya, Hingna. Nagpur (M.S.), India.

Abstract:

Accumulation and prepare herbarium specimen of medicinal plant for investigation of attributes by extraction, isolation. Medical plant (*Cleistanthus collinus*) has remarkable physiochemical activities such as anti-HIV, antioxidant for their presence in lignan. In recent and reference collection to prepare a herbarium specimen which is collected, dried and mounted by modern technology. To avoid a poisoning plant are pretreatment by solvents (alcohol). All the good herbarium specimens which are authenticate and laminate for future reference. The cost, energy and time viable review for identification proof of medical plant throughout an identification and authentication with voucher number. It is essential for research and paper publications.

Key Words: *Cleistanthus collinus*, lignan, herbarium specimen, voucher number, modern technology

1. Introduction:

A Herbarium specimen is the pressed & dried sample of plant that can be stored for future reference. Taking the plant samples for the study of their scientific or medicinal use is done since the era of Vedas. The French person J.P. Tourefort (ca 1700) used the Herbarium specimen for the term for the taxonomic research & serve as the voucher specimen. It represents information that was captured at one point in time and made available for all time. Herbarium specimen provides a permanent record validating the occurrence of the species at a particular locality & time. Specimens & the associated labeled data also provide variable & invaluable information such as distribution, ecological preferences & associated species. The process is used to make the quick drying of the plant with retaining of its color & arrangement. For future reference, the modern technique for a voucher herbarium specimen is a squeezed plant test saved. It bolsters look into work and might be inspected to check the character of the particular plant utilized as a part of a review. The voucher specimen must be saved in a perceived herbarium focused on durable preservation. The herbarium specimen used to discover or confirm the identity of a plant or determine that it is new to science. It is used to provide the information about the plant that, which part of the plant is rich in the contents which are our material of interest. It also provides the information about the locality of the plant for plan the field works of sampling. It provides the base for the illustration of plant. It makes you know the biological importance & information of the plant. Our medicinal plant to be authenticated is *Cleistanthus collinus*. Locally this plant is known as "Garari". The best time to get sample out the parts is at the morning.

2. Experimental:

2.1) Material:

During the collection of sample, there are many materials which has been used for collecting the sample like,

- I) Plant cutter, digger, knife for cutting the useful part of plant
- II) Leather gloves to protect hands from any injuries,
- III) field note book to collect the information about field area and to note the name of location, date & time, smell if present,
- IV) Digital camera to take images of every process,
- V) Plastic bags to carry the sample,
- VI) Herbarium bags, drying table, thermacol sheets, whattman filter paper, pencil,
- VII) Magnifying glass, newspaper, straps, tissue paper,

But for a particular sample proper material should be used for specificity, simplicity and which can help to cut sample easily. First we discuss which material should use and how to use. After that we chose plant cutter to cut the branch of medicinal plant i.e. cleisthanthus Collins.

2.2) Methods:

After selecting the cutting material for sample the branch of plant has been broken in horizontal manner from bud. For this the plant cutter to cut the branch as well as gloves in hand has been used to protect hand from any injuries. Only those branches of plant have been broken which are used for herbarium specimen. The braches of plant have been broken gently to save the tree from any harm. While breaking the sample the special care of tree as well as of ourselves have been taken. The damage samples were avoided.

2.3) Field Visit:

First of all we search the region where the availability of plant is more and can get easily. We asked many people about the availability of Cleistanthus collinus in different region of Maharashtra, India. The information was collected about more availability of plant. After collecting the information, we select the region from where we have to collect the specimen. So for specimen, we do not go far away and plant which we want got easily. The selected region was a field of a small village named Isapur, Post- Pipla (D.B.) which is situated near Koradi in Nagpur District, Vidarbha (Maharashtra) on 15 March 2017 in morning at 8.00 AM (Fig.1).

2.4) Collection of Specimen (COS):

After cutting the specimen collection is the most important part to keep it safe. Specimen is collected in many containers like bucket, jar, plastic bags, tray etc; the collecting material to collect the

specimen is used on the basis the requirement or suitability of the specimen. And so we have used here simple material i.e. plastic bag because it is suitable for collecting the specimen. While collecting the sample first we record its name, family, date, time and location in record book. The part of plant which is already dried has avoided. Total 10 samples have been collected in different plastic bags and on each bag marked number to identify the time for each sample Fig.2 and 3).

2.5 To Avoid Poisoning:

Harming slaughters the plants and keeps the development of abscission layer and subsequently the leaves, blossoms and organic products will be in place with the example won't get disengaged from the plant. The harming is by and large done by dunking the entire plant in a soaked arrangement of ethyl alcohol (10%). The plant is again put between the blotting surfaces in the presser till it gets totally dried.

2.6) Drying:

It is very important to dry specimen to prevent from fungal attack. For drying of specimen, a small change has been done here, that is after collecting the sample of *Cleistanthus collinus* it took in home carefully without any damage of sample. For drying process, a hard wooden plate of 14 inches in height and 10 inches in width and 12mm in thickness has used and placed it on table then thermacol sheet of size 14 inches in height, 10 inches and 12 mm in thickness has been cut and like this total 11 sheets have been created for drying process also Whatman paper No. 1 are created of same as thermocol sheet. On wooden plate the thermocol sheet is placed and then Whatman paper No. 1 is placed on sheet and then the sample, on the sample which has been placed on Whatman paper No. 1 again one more whataman paper No.1 has been placed on sample, and on it again thermacol sheet is placed. Similarly, this procedure has been continued for total 10 samples and sample was put on one another and lastly a wooden plate was placed on upper side on assembly and it was tied with the help of belt very tightly for 5 hrs. So that the sample should dry totally without any damages and harms. The drying process of sample has been done soon after collecting it before drying. The papers were changed after every 5 hrs. The paper changed total five times. In whole process there is no use of newspaper because some contaminant of newspaper can attached to sample and can give reaction which affects the sample and herbarium specimen (Fig. 4 and 5).

2.6) Mounting on Herbarium Sheet (MOHS):

Mounting is the process where the specimen is attached or stick to the herbarium sheet. For mounting of specimen the standard size of herbarium sheet is used as well as glue, strips. Specimen is attached on sheet by glue, paste, etc. here we have chosen fevistick to stick specimen on herbarium sheet. After this process it allowed to dry for 10 min & then finally the sample has been mounted on sheet.

A standard herbarium sheet is 28 cm (Breadth) x 42 cm (length) and typically made up of substantial durable white handcrafted paper or thick sheet. The sheet is normally firm and adaptable in order to avoid harm amid the treatment of mounted examples. The basic system is gluing examples to sheet with normal paste and fast stick of specimen on herbarium sheet (Fig. 6).

2.7) Prevention:

After mounting the herbarium specimen it should prevent from damages, bacteria, insects, water sources, chemicals, colors, radiations, animals, some reactive gases, humidity and temperature. So plastic coating or we called lamination of herbarium specimen is much better for permanent herbarium specimen.

2.8) Labeling:






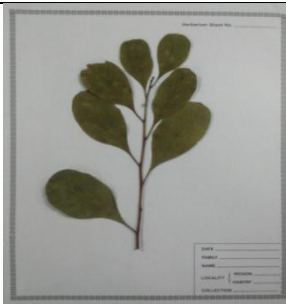
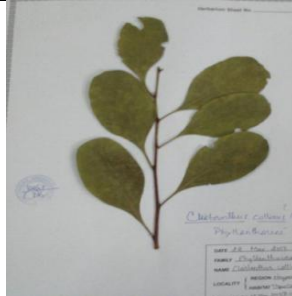
Labeling of herbarium sheet is essential and important part of permanent herbarium specimen. The herbarium specimen sheet should be in proper shape and size and so, we have chosen a herbarium sheet of 34cm in length & 27cm in width size. While applying plastic coating on herbarium specimen, we left the space to write heading, scientific name of sample, family of sample, locality, date and time of collection & name of collector.

2.9) Identification and Authentication (IAA):

All the good herbarium specimens for identification and authentication done by department of Botany, RTM Nagpur University, Nagpur. Give a voucher number 10057 and keep confirmation for fruits Fig.7 .

2.10) Storage:

Mounted specimen is generally stored in cupboard or cabinet to protect from dust and insects. It should insure that the cupboard or cabinet is dry and free from bacteria. We took mounted specimen in cupboard in plastic bag and laminating the herbarium specimen. Mounted specimen stored in such a way that it can be taken out from cupboard easily.

		
1. Field Visit	2. Plant with Fruits	3. Sample on sheet
		
4. Drying process	5. After drying process	6. Mounting process
		
	7. Labeling & Authentication	

Figures: Preparation of herbarium specimen

3. Result and Discussion:

3.1 Effective time (ET):

Preparation of herbarium specimen has laborious process, due to this we specified in five batches (1 batch= 5 hrs). Effective time required for mounting by fevistick, labeling and authentication done by agencies. For long storage a herbarium specimen laminated soon.

3.2 Characteristics and application in pharmaceuticals:

Cleistanthus collinus is a poisonous species, on treatment with liquor removed it. Ingestion of its leaves or a decoction of its leaves causes hypokalemia. Hypokalemia and acidosis most likely additionally incites rhabdomyolysis bringing about myoglobinuric renal disappointment and neuromuscular

weakness. It has numerous uses in pharmaceutical drug industries for anticancer, anti-HIV, antioxidant, etc.

3.3 Herbarium specimen (HS):

Herbarium specimen for identification and authentication done by Department of Botany, RTM Nagpur University, Nagpur. Give a voucher number 10057 (Fig. 7)

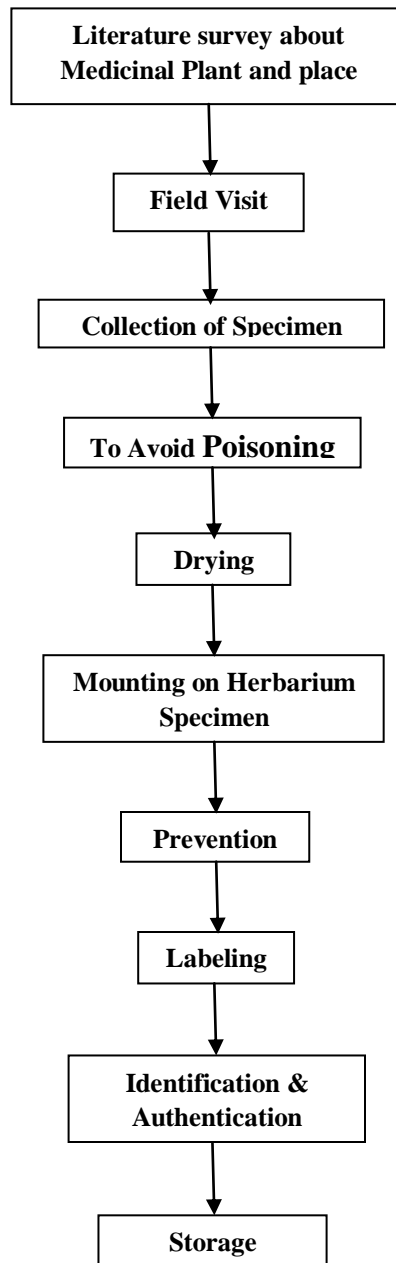


Fig.8 Flow Chart for Preparation for herbarium specimen

3.4 Description of plant:

Kingdom – Plantae

Phyllum – Tracheophyta

Class – Magnoliopsida

Order – Malpighiales

Family – Phyllanthaceae

Genus – *Cleistanthus* Hook (collinus)

4. Conclusion:

The modern technology for herbarium specimen preparation and proper storage by lamination help in medicinal plant research has been done effectively. In the recent study herbarium specimen is a final confirmation for the research journals. A voucher number for herbarium specimen provide a permanent identification and authentication, physical evidence. Less compelling time, energy and cost is viable review for research and paper publications.

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5. References:

1. Argent, G.C.G. (1976). The Wild Bananas of Papua New Guinea. Notes from the Royal Botanic Garden Edinburgh 35: 77–114.
2. Bailey, L.H. (1946). The Palm Herbarium. Gentes Herb. Ithaca 7 (fasc. 2): 153–180.
3. Fosberg, F.R. and Sachet, M. (1965). Manual for Tropical Herbaria. Regnum Vegetabile Vol 39. Harris, W., Morton, J., and Holland,
4. A.E. (eds) (2008). Difficult to collect plants: a manual for Weed Spotters. CRC for Australian Weed Management, Adelaide.
5. McCurrach, J.C. (1960). Palms of the World. Harper & Brothers, New York.
6. Stone, B.C. (1983). A Guide to collecting Pandanaceae (Pandanus, Freycinetia and Sararanga). Annals of the Missouri Botanic Gardens 70: 137–45.
7. Narayanaswamy Tamilselvan, Thirunavukkarasu Thirumalai, Prabakar Shyamala , Ernest David (2014). A review on some poisonous plants and their medicinal values, Journal of Acute Disease 85-89.