DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Food and Drug Administration

Memorandum

Date: AUG 27 2002

Rec'd 8/30/02 jb

From: Director, Division of Standards and Labeling Regulations, Office of Nutritional Products, Labeling and Dietary Supplements, HFS-820

Subject: 75-Day Premarket Notification of New Dietary Ingredients

To: Dockets Management Branch, HFA-305

New Dietary Ingredient:	Digacid HB™
Firm:	AlphaNatural, Inc.
Date Received by FDA:	November 14, 2001
90-Day Date:	February 12, 2002

In accordance with the requirements of section 413(a) of the Federal Food, Drug, and Cosmetic Act, the attached 75-day premarket notification and related correspondence for the aforementioned new dietary ingredient should be placed on public display in docket number 95S-0316 as soon as possible since it is past the 90-day date. Thank you for your assistance.

Felicia B. Satchell

Felicia B. Satchell

Attachments

95S-0316

RPT105

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Washington, DC 20204

JAN 25 2002

Mr. Amit Guha
Chariman and CEO
AlphaNatural, Inc.
615 Glenview Drive
Horsham, Pennsylvania 19044

Dear Mr. Guha:

This is to inform you that the notification with addendum dated November 1, 2001 and November 14, 2001, respectively, you submitted pursuant to 21 U.S.C. 350b(a)(2) were received and filed by the Food and Drug Administration (FDA) on November 14, 2001. Your notification informs us of your intent to market a dietary supplement under the trade name Digacid HB™, containing the following substances that you assert are new dietary ingredients where we italicized the Latin binomial names you provided for the botanicals:

- *Phyllanthus emblica*
- *Terminalia chebula*
- *Terminalia belerica*
- *Amomum aromaticum*
- *Cuminum cyminum*
- *Curcuma aromatica*
- *Aegle marmelos*
- *Wedelia calendula*
- *Syzygium aromaticum*
- rock salt

Your notification states that 1-2 capsules of Digacid HB™ should be taken twice a day with plenty of water for improved digestive/gastrointestinal health. You also state that Digacid HB™ should not be taken by children under the age of 12 years, persons taking heart medications, pregnant or lactating women, or persons with severe medical problems.

The law at 21 U.S.C. 350b(a)(2) requires that a manufacturer or distributor of a dietary supplement that contains a new dietary ingredient submit certain information to FDA at least 75 days before the dietary ingredient is introduced or delivered for introduction into commerce. This information must include the basis on which the manufacturer or distributor has concluded that a dietary supplement containing such new dietary ingredient will reasonably be expected to be safe. FDA reviews this information to determine whether it provides an adequate basis for such a conclusion. Under section 350b(a)(2), there must be a history of use or other evidence of safety establishing that the dietary ingredient, when used

under the conditions recommended or suggested in the labeling of the dietary supplement, will reasonably be expected to be safe. If this requirement is not met, the new dietary ingredient is deemed to be adulterated under 21 U.S.C. 342(f)(1)(B), because there is inadequate information to provide reasonable assurance that the new dietary ingredient does not present a significant or unreasonable risk of illness and injury.

FDA carefully considered the information in your notification and has significant concerns about the basis upon which you concluded that the Digacid HB™ is safe when used as recommended or suggested in the product's labeling. Your notification included a summary of a toxicity study conducted on Digacid HB™ where 5 mice ranging in body weight from 17-22 gm were orally administered 2.5 mg of the powdered product suspended in 1 ml of water. The summary simply stated that "no toxic symptoms were observed in anyone of the orally fed mice and none of them died during the tests period of 7 days." The toxicity study as presented was poorly designed; no specific parameters were indicated that would serve as a sign of toxicity and no control animals were used. Therefore, this toxicity study does not provide a sound scientific basis for concluding that Digacid HB™ is reasonably expected to be safe for long-term use by humans.

As history of use data on Digacid HB™, you reported the following: as the manufacturer you have been marketing this product through independent distributors in Calcutta, India for 9 years; it has been used by 20,000 people in India and 18 people in the U.S.; and you have not received any reports of side effects. You did not describe the characteristics of the approximately 20,000 people who reportedly took Digacid HB™ (e.g., their ages, gender, and health status), the amount, frequency or duration of Digacid HB™ use, or how these data compare to your indications for use of Digacid HB™ in the U.S. that could result in chronic, long-term use by healthy individuals as young as 12 years of age.

Your notification does not explain whether you, the distributors, or a health agency in India maintains a mandatory or voluntary systematic surveillance system for tracking, investigating, and assessing reports of adverse events that may be associated with using Digacid HB™ or other dietary supplements. You also did not provide any details about how the method you relied upon for receiving any reports of adverse events on Digacid HB™ works, or how you receive feedback from consumers of Digacid HB™. Without these particulars, FDA cannot determine whether your absence of receiving reports of adverse events from persons taking Digacid HB™ provides any credible evidence of its safety.

You did not include any copies of articles from peer-reviewed scientific journals among the references you submitted to support your conclusion that either the individual ingredients or their combination in Digacid HB™ is reasonably expected to be safe when used as directed in the product's labeling. The photocopies of selected pages from other references you submitted on the botanicals cited in your notification mention that different parts of these plants can be used in dried form in powders, as pastes and in decoctions. However, your notification does not clarify what plant parts of each botanical are used as the dietary

ingredients in Digacid HB™ or how they are prepared. Also, in one instance, the information you submitted on botanicals pertains to a different plant species (i.e., *Curcuma longa*) than the one cited in your notification (i.e., *Curcuma aromatica*). In addition, your notification does not provide the name(s) of the author(s) following the Latin binomial name for each of the botanicals cited in your notification in order to definitively identify these plants.

The references you submitted include some summary paragraphs about the use of the botanicals in traditional Chinese or Ayurvedic medicine. However, these references do not identify the amount or duration of use for each of the botanicals discussed. The possible safety of a botanical used short-term in traditional Chinese or Ayurvedic medicine to treat a specific health problem, where a special preparation may be prescribed for the user, does not support safe, chronic long-term use by a healthy population of a dietary supplement containing a standardized preparation of the same botanical. In addition, none of the notification's references address the use of these botanicals by children as young as 12 years of age, who are among the proposed users of Digacid HB™.

For the reasons discussed above, FDA has determined that the information in your notification does not provide an adequate basis to conclude that Digacid HB™ is reasonably expected to be safe when used under the recommended or suggested conditions of use in the labeling of your product. Therefore, your product may be adulterated under 21 U.S.C. 342(f)(1)(B) as a dietary supplement that contains one or more new dietary ingredients at levels for which there is inadequate information to provide reasonable assurance that they will not present a significant or unreasonable risk of illness or injury. Introduction of Digacid HB™ into interstate commerce is prohibited under 21 U.S.C. 331(a) and (v).

For your future reference, we also wanted to point out that the statement in your notification that Digacid HB™ can be used "for improving digestive/gastrointestinal health" implies that you intended to make a claim for this product on how it can affect the structure, function or well-being of the human body. The law [21 U.S.C. 343(r)(6)] requires that you must have substantiation for the claims, they must be truthful and not misleading, they must include a specific disclaimer on the product label, and you must notify FDA about them no later than 30 days after initial marketing of the product. Federal regulations at 21 CFR §101.93 specify the notification requirements for such structure/function claims. The FDA Internet site http://www.cfsan.fda.gov/~dms/ds-labl.html#structure provides additional details on the types of claims that are allowed for dietary supplements, including structure/function, health and nutrient content claims. In addition, the labeling of dietary supplements must comply with requirements of 21 CFR §101.36.

Your notification will be kept confidential for 90 days from the date of its receipt. After February 12, 2002, your notification will be placed on public display at FDA's Dockets Management Branch in docket number 95S-0316. However, any trade secret or otherwise confidential commercial information in the notification will not be disclosed to the public.

For FDA's consideration, prior to February 12, 2002, you may wish to identify in writing specifically what information you believe is proprietary in your current notification or in any amendment or new notification you may send us. Nevertheless, our Center's Freedom of Information Officer has the authority to make the final decision about what information in the notification should be redacted before it is posted at Dockets.

Since the receipt of your notification, we have relocated our office. Our new address and other contact information follows:

Division of Standards and Labeling Regulations (HFS-820)
Office of Nutritional Products, Labeling and Dietary Supplements
Center for Food Safety and Applied Nutrition
Food and Drug Administration
5100 Paint Branch Parkway
College Park, Maryland 20740-3835
Phone: (301) 436-2371
Fax: (301) 436-2639 or (301) 436-2636

If you have any questions concerning this matter, please contact me at (301) 436-2371.

Sincerely yours,

Felicia B. Satchell

Felicia B. Satchell
Director
Division of Standards
and Labeling Regulations
Office of Nutritional Products, Labeling
and Dietary Supplements
Center for Food Safety
and Applied Nutrition

AlphaNATURAL™ INC.

Toll Free: 1-877-81-NATURAL
www.alphanatural.com

November 14, 2001

Office of Nutritional Products, Labeling, & Dietary Supplement (HFS-820)
Center for Food Safety & Applied Nutrition (CFSAN)
200 C Street, SW
Washington D.C. 20204

Attn: Ms. Rhonda Kane Tel. (202) 205 2902 Fax: (202) 205 5295

Dear Ms. Kane:

Re: Pre-market Notification for New Dietary Ingredients contained in Digacid HB™- An addendum

It was nice speaking with you. As discussed, please find below the information requested.

Dosage/ Directions: Take 1-2 capsules at a time. Two times daily. Drink plenty of water.

Storage: Keep the bottle closed at all times except when in use. Keep the product away from sunlight and store in a cool dry place. Store at room temperature (36°– 86°F). Do not freeze. Avoid contact with your eyes. Keep away from the reach of children.

Warnings: Read dosage/ directions very carefully. Do not overdose. Digacid HB ™is a dietary supplement. It is not a substitute for prescribed medication that you may be taking for your gastrointestinal problems. Digacid HB ™ should not be used by children under age 12, people taking heart medications, women who are pregnant or lactating, or people having severe medical problems. Always consult your physician before using Digacid HB ™ or any other dietary supplement.

Concentration of Ingredients: The concentration of ingredients used represents the amount of individual herb used in each capsule. Specifically, it is percentage content of that ingredient in the active ingredients. For example, each capsule weighs 605 mg, out of which active ingredients constitute 500 mg. There are 10 active ingredients, of which Phyllanthus emblica constitute the most (80%). This signifies that the capsule contains 400 mg (80% of 500 mg) of Phyllanthus emblica. Similarly, analyzing Terminalia chebula, it is seen that the capsule contains 30 mg (7% of 500 mg) of Terminalia chebula, 15 mg (3% of 500 mg) of Terminalia belerica etc.

About the herbs used: The herbs used for Digacid HB are all listed in the document (dated October 9, 2001) that was provided earlier. The Latin name for each herb is provided. Each name contains the genus and the species. For example in Phyllanthus emblica, "Phyllanthus" is the genus, and "emblica" represents the name of the species. In some cases, names of the herbs also indicate the discoverer(s) who found the species. However, in case of Digacid HB, the references do not indicate the name of the author or the discoverer responsible for introducing that particular herb(s). The references mentioned also provided regional and English names for the herbs in addition to the Latin names that are already listed.

AlphaNATURAL, INC.

Toll Free: 1-877-81-NATURAL
www.alphanatural.com

Premarket Notification for New Dietary Ingredients/ Addendum
Ref. Digacid HB™
HFS-820/CFSAN/FDA

Toxicity Test Report: As we understand that the toxicity test report by Italab is not legible. We regret for the inconvenience thus caused. Enclosed please find a **re-typed** copy of the same. A legible copy of the test report will be mailed to you shortly.

Meanwhile, if you have any questions, please call me at (215) 542 7950. Thank you for your cooperation.

Sincerely,

Amit Guha
Chairman & CEO

AG:ntk

Ref. PDAPMNDigacidHB01

Encl.

AlphaNATURAL™ INC.

Toll Free: 1-877-81-NATURAL
www.alphanatural.com

RE-TYPED FOR LEGIBILITY

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Telefax 287 4096
Telegram ITALABO
E-mail: balcohind@vsnl.com

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Visakhapatnam, Bellary
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FOUNDER
Late Dr. Homi R. Nanji
Ph.D, B.Pharm (Lond)
F.R.L.C., F.R.S.A.

REGISTERED OFFICE
MEHER HOUSE, 6th FLOOR
15, CAWASJI PATEL STREET
POST BOX No. 1832
FORT, MUMBAI 400 001

MISC. REPORT No. 23412

Date: 21. 09. 2001

CERTIFICATE OF ANALYSIS

PRODUCT	:	DRY POWDER HERBS (DIGACID HB)
PARTY	:	M/s GUHA BIOPHARM (P) LTD. KOLKATA
REFERENCE NO.	:	DT. 29. 03. 2001
BATCH NO	:	--
SAMPLE NO	:	V33
DATE OF RECEIPT	:	10. 09. 2001
QUANTITY	:	2 x 50 GM
MANUFACTURING DATE	:	March 2001

RESULTS OF PART ANALYSIS

TOXICITY TESTS (Human dose: 12.5 mg/ Kg)

Description	:	A light brown coloured powder
Preparation	:	250 mg of the sample is triturated with 100 ml of distilled water
Dose per mouse	:	1.0 ml of above suspension
No. of animals taken	:	5 mice
Weight of animals used	:	17 gms – 22 gms
Route of Administration	:	Oral

No toxic symptoms were observed in anyone of the orally fed mice and none of them died during the tests period of 7 days.

Test carried out by:

Mrs. N.N. Kerkar

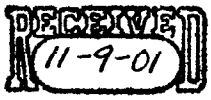
For ITALLAB PRIVATE LIMITED

Signed
DIRECTOR

Alpha

Toll Free: 1-877-81-NATURAL
www.alphanatural.com

November 1, 2001



Office of Nutritional Products, Labeling, & Dietary Supplement (HFS-820)
Center for Food Safety & Applied Nutrition (CFSAN)
200 C Street, SW
Washington D.C. 20204

Attn: Ms. Rhonda Kane

Dear Ms. Kane:

Re: Pre-market Notification for New Dietary Ingredients contained in Digacid HB™

It was nice speaking with you. I am re-sending the documents pertaining to pre-market notification for new dietary supplement, Digacid HB™, as I was informed that my earlier mail did not reach your office.

Enclosed please find the following documents:

1. Information on the company, name and level of new dietary ingredients, and a brief description (intended use) of the dietary supplement (Digacid HB™), and the history of its use to ensure product safety. The document is duly signed.
2. Copy of the certificate of analysis by Italab who conducted toxicity tests (on 5 mice) of the dietary supplement Digacid HB™.
3. Copy of the report by SGS who conducted tests for Aflatoxins.
4. Copy of the report by SGS who conducted microbiological tests on Digacid HB™.
5. Copies of the references on the new ingredients used for Digacid HB™.
6. Copies of the published articles on the new ingredients used for Digacid HB™.

The documents sent are in triplicate (one original and two copies). Should you have any questions, please call me at (215) 542 7950. Thank you for your cooperation.

Sincerely,

Amit Guha
Chairman & CEO

AG:ntk

Ref FDAPMNDigacidHB02

Encl.

615 Glenview Drive • Horsham, PA 19044 • USA
Tel: (215) 542 7950 • Fax: (215) 542 7951

Alpha

Toll Free: 1-877-81-NATURAL
www.alphanatural.com

October 9, 2001

Office of Nutritional Products, Labeling and Dietary Supplement
Center for Food Safety and Applied Nutrition
U.S. Food and Drug Administration
200 C Street SW
Washington D.C. 20204

Attn: Dept. HFS-820

Dear Sir/ Madam:

Re: Premarket Notification for New Dietary Ingredients

In reference to 21 CFR (Code of Federal Regulations) -Article 190.6 relating to the requirement for pre-market notification of new dietary ingredients, we are pleased to present the following information:

Name and complete address of the manufacturer: Alpha Natural, Inc./ Guha Biopharm
615 Glenview Drive, Horsham, PA 19044

Name of the dietary supplement: Digacid HB™

Ingredients: Digacid HB™ contains 100% natural active ingredients, which **are considered new dietary ingredients.** Each capsule weighs 605 mg and contains the following:

a) **Active Ingredients:** 500 mg
b) **Inactive Ingredients:** 10 mg (8.5 mg of Magnesium Stearate, used as an anti-caking agent, and 1.5 mg of Silicon Dioxide, used as lubricant)
c) **Size #1 Capsule Shell:** 95 mg

Rationale: To the best of our knowledge, none of the products relating to digestive health that are currently available at U.S. retail stores contain any or the combination of active ingredients used for Digacid HB™. The ingredients of Digacid HB™ would therefore be considered as new dietary ingredients used for improving digestive/ gastrointestinal health.

October 9, 2001

New Dietary Ingredients: Following is the list of new active ingredients, and their relative concentration (in percent) used for the dietary supplement described herein. Also cited are the sources of information relating to usage of the new ingredients mentioned, and the correspondoing page numbers. **In addition to the photocopies from the said references, copies from other published articles are also enclosed herewith.**

No.	Active Ingredients (Herbs)	Conc. Used	Reference	Page No.
1.	Phyllanthus emblica		Encyclopedia of Herbs	360
2	Terminalia chebula		Encyclopedia of Herbs	62,63, 360-361
3.	Terminalia belerica		Encyclopedia of Herbs	62,63, 360-361
4.	Amomum aromaticum		Encyclopedia of Herbs	237
5.	Cuminum cyminum		Encyclopedia of Herbs	61,114,270
6.	Curcuma aromatica		Encyclopedia of Herbs	114,270
7.	Aegle marmelos (Bael)		Encyclopedia of Medicinal Plants	159
8.	Wedelia calendula		Encyclopedia of Herbs	252
9.	Syzygium aromaticum		Encyclopedia of Herbs	358
10.	Rock salt		NA	NA

Intended Use: For improving digestive/ gastrointestinal health which helps a person experiencing acidity, sour stomach and related symptoms. Not to be taken by children under age 12 and women who are pregnant or contemplating pregnancy.

History of Use:

#Years in the market/ region: 9 years / Calcutta, India
Available form: Powder (in sachet) or in capsules
Any other brand name used? Yes. In Calcutta it is sold under the name "7am-7pm"
Sold by: Guha Biopharm Pvt. Ltd.- Jibak.
Marketing channels used: Independent distributors
No. of people used the product: 20,000 people in Calcutta, India and 18 people in the U.S.
Any side effects reported? None till date

October 9, 2001

Evidence of Safety: In India, the product is sold through independent distributors. Should there been any adverse side effects reported by the end users, distributors would have had informed us. Till date (since 1991) the distributors did not receive any complaints from the end users, and they continue to buy from us.

In the U.S., the product is not commercially available. People who know us at personal level have used the product for their benefits. None of them reported any adverse side effects.

The product has been sold in India for 9 years, and used by 20,000 people. No adverse side effects have been reported till date. Enclosed photocopies of the published articles, references and scientific analyses (toxicity studies) from two laboratories substantiate the safety of the ingredients and of the resulting product (Digacid HB™).

Henceforth, it can be logically stated that Digacid HB™ and its new dietary ingredients are reasonably be expected to be safe and good for the intended use.

Published article or Reference: The table given in Page 2 of this document indicates the references for the herbs used (Encyclopedia of Herbs and Encyclopedia of medicinal Plants) for Digacid HB™ and the corresponding page numbers. The photocopies of the same are enclosed herewith. In addition, photocopies of the published articles are also enclosed with this report.

I, Amit Guha, hereby confirm that the content of this report is true and to the best of our knowledge. Should you have any questions, please contact us at (215) 542 7950. Thank you.

Sincerely,

Amit Guha
Chairman & CEO

AG:ntk

Encl.

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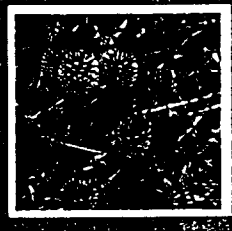

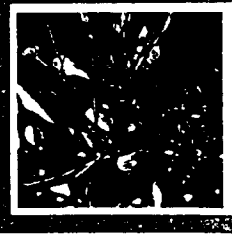

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To PJ, who understands the sense in which this is a life's work, and to our daughters, Anna and Dani, and sons, Will, Robin, and Ben

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Picture Research Anna Lord

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Ph. D., B. Pharm. (Lond.),
F.R.I.C., F.R.S.A.

REGISTERED OFFICE
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16, CAWASJI PATEL STREET,
POST BOX NO. 1892
FORT, MUMBAI 400 001.

MISC. REPORT NO: 23912 Date : 21.09.2001

CERTIFICATE OF ANALYSIS

PRODUCT : DRY POWDER HERBS (DIGACID-HB)

PARTY : M/s. GUHA BIOPHARM (P) LTD. KOLKATA

REFERENCE NO : DT. 29.08.2001

BATCH NO :

SAMPLE NO : 933

DATE OF RECEIPT : 10.09.2001

QUANTITY : 2 x 50 GM

MANUFACTURING DATE : march 2001

RESULTS OF PART ANALYSIS :

TOXICITY TESTS (Human dose = 12.5 mg/Kg)

Description --- A light brown coloured powder.

Preparation --- 250 mg of the sample is triturated with 100 ml of distilled water.

Dose per mouse --- 1.0 ml of above suspension.

No. of animals taken --- 5 mice

Weight of animals used --- 17 gms — 22 gms

Route of Administration --- Oral

No toxic symptoms were observed in anyone of the orally-fed mice and none of them died during the test period of 7 days.

Test carried out by :

Mrs. N. N. Kerkar

For ITALAB PRIVATE LIMITED

DIRECTOR

SGS India Limited

Delta House, 4, Govt. Place North
Calcutta-700 001
Telephone : 91 (033) 242-0720/0722/0725, 248-6955/2461
Fax : 91 (033) 242-0745/0749, 248-1745

General Laboratory:
Behala Industrial Estate
Phase-II, 1st Floor
620, Diamond Harbour Road
Calcutta-700 034
Telefax : 91 (033) 447 0267
Phone : 91 (033) 446 3275/458 3392

TEST REPORT

Serial No. : 19718

Sample Submitted by Party

Date : 13/08/2001

NAME OF CLIENT : M/s. Guha Biopharm (P) LTd., 96B, Ibrahimpur Road, Kolkata 700 032, India

SAMPLE DESCRIBED AS : Herbal Powder

MARKS ON THE SAMPLE : Product Name DIGACID – Hb
Code of Sample 'E' (Experimental)

SAMPLE CONDITION WHEN RECEIVED : Unsealed condition

LABORATORY REFERENCE : LR 4546/01

SAMPLE RECEIVED ON : 20/07/2001

ANALYSIS STARTED ON : 21/07/2001

ANALYSIS COMPLETED ON : 03/08/2001

Test Findings :

Parameters	Results	Methods
Aflatoxin B_1	< 20 ppb	IS SP18(Part VI):1982
Aflatoxin B_2	< 20 ppb	IS SP18(Part VI) 1982

Checked by :

For and on behalf of
SGS India Limited

SGS India Limited

Delta House, 4, Govt. Place North
Calcutta-700 001
Telephone : 91 (033) 242-0720/0722/0725, 248-6955/2461
Fax : 91 (033) 242-0745/0743, 248-1745

General Laboratory :
Behala Industrial Estate
Phase-II, 1st Floor
620, Diamond Harbour Road
Calcutta-700 034
Telefax : 91 (033) 447 0287
Phone : 91 (033) 445 3275/458 3392

TEST REPORT

Serial No. : 19719

Sample Submitted by Party

Date : 18/08/2001

NAME OF CLIENT : M/s. Guna Biopharm (P) LTd., 96B, Ibrahimpur Road, Kolkata 700 032, India

SAMPLE DESCRIBED AS : Herbal Powder

MARKS ON THE SAMPLE : Product Name DIGACID – Hb
Code of Sample 'E' (Experimental)

SAMPLE CONDITION WHEN RECEIVED : Unsealed condition

LABORATORY REFERENCE : LR 4546/01

SAMPLE RECEIVED ON : 20/07/2001

ANALYSIS STARTED ON : 21/07/2001

ANALYSIS COMPLETED ON : 03/08/2001

Test Findings :

Parameters	Results	Methods
Total Plate count at 35°C	10000 cfu/gm	ISO : 4833-1991
Fungus		
Yeast count at 25°C	<10 cfu/gm	FDA-BAM-1995
Mould count at 25°C	60 cfu/gm	FDA-BAM-1995
Detection of *Salmonella sp* in 25gm	Absent	ISO : 6579-1991

For and on behalf of
SGS India Limited

Checked by :

relieves pain, relaxes spasms, dilates
od vessels, lowers fever, improves
gestion, stimulates the uterus,
id has laxative effects.
SES OF THE HERB
IEDICINAL Internally for migraine
used by excess heat, headache,
eumatism, arthritis, minor feverish
nesses, and digestive and menstrual complaints.
xternally for insect bites and bruising. Not given
pregnant women. Fresh leaves may cause
rmatitis and mouth ulcers if consumed.
ARIANTS
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p. **'Golden Ball'**, p.208.
p. **'Golden Moss'**, p.208.
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p. **'Tom Thumb White Stars'**, p.209.
p. **'White Bonnet'**, p.209.

. *vulgare* (tansy) p.209

PARTS USED Whole plant, oil.
PROPERTIES A bitter, acrid, warming herb with a pungent aroma. It expels intestinal parasites, benefits the digestion, and stimulates the uterus.
USES OF THE HERB
CULINARY Leaves are added to a kind of
stard, known as a tansy, and to tansy cakes.
OMATIC Flowers are added to potpourris.
EDICINAL Mainly used as a enema for expelling
rms in children, and topically in lotions for scabies.
e herb is possibly unsafe for internal use, especially
pregnancy, although sometimes recommended for
lure to menstruate and nausea. Tansy oil is highly
ic for both internal and external use, and very
all amounts may prove fatal; excess causes
ortion, venous congestion of abdominal organs,
d convulsions. It is rarely used internally.
ARNING This herb, especially as tansy oil, is
bject to legal restrictions in some countries.
ONOMIC Tansy was once important in preserving
at, and colonists planted it by their front doors to
el ants.
RIANTS
v. var *crispum*, p.209.
v. **'Isla Gold'**, p. 209.
v. **'Silver Lace'**, p.209.

GROWTH AND HARVEST

GROWTH Ornamental. Well-drained to dry,
tony soil in sun. Propagate by seed sown in
pring or autumn (species and some variants
nly), or by division in spring or autumn, or by
asal cuttings in spring, or by semiripe cuttings
n summer Remove dead flower heads of
. parthenium to prevent excessive self-seeding.
. vulgare is invasive.
HARVEST Whole plants (*T. parthenium*,
. vulgare) are cut when flowering, and leaves
re picked as required, and used fresh or dried
or use in infusions, liquid extracts, powders,
nd tinctures. *T. vulgare* is distilled for oil.
eaves (*T. parthenium*) are sometimes eaten
resh, or dried for use in tablets to treat
igraine, rheumatism, and arthritis. Flowers
T. cinerariifolium) are picked as they open and
ied for powder.

TARAKTOGENOS

T. kurzii. See *Hydnocarpus kurzii.*

TARAXACUM Dandelion

(Compositae/Asteraceae)

The best-known member of the genus is *T. officinale*, which is a potent diuretic, hence the French name, *pissenlit*, "wet-the-bed." It contains high levels of potassium salts, particularly important in a strong diuretic, because large amounts are lost in the urine. It was first described in Chinese medicine c.AD659 and in European medicine in 1485, although there are possible mentions dating back to Pliny (AD23–79). Promoted by Arab physicians in the 11th century, it became an "officinal" drug by the 16th century.

T. officinale (dandelion) p.210

PARTS USED Whole plant (*pu gong ying*), leaves, roots, flowers.
PROPERTIES A bittersweet, cooling herb that has diuretic, laxative, and antirheumatic effects, stimulates liver function, improves digestion, and reduces swelling and inflammation.
USES OF THE HERB
CULINARY Fresh leaves, usually blanched, are eaten in salads or cooked like spinach (often mixed with sorrel). Flower petals are made into wine.
MEDICINAL Internally for gall bladder and urinary disorders, gallstones, jaundice, cirrhosis, dyspepsia with constipation, edema associated with high blood pressure and heart weakness, chronic joint and skin complaints, gout, eczema, and acne. In Chinese medicine, internally for breast and lung tumors, mastitis, and abscesses, and jaundice, hepatitis, and urinary tract infections; externally for snakebite. Combines well *with Veronicastrum virginicum* (see p.368), *Berberis vulgaris* (see p.248), and *Chelone glabra* (see p.259) for gall bladder complaints.
ECONOMIC Leaves and roots flavor herbal beers and soft drinks, such as dandelion and burdock. Roots are roasted and ground as a caffeine-free substitute for coffee.

GROWTH AND HARVEST

GROWTH Crop. Moist to dry, neutral to alkaline soil in sun. Propagate by seed sown in spring. Dandelion crops should be dead-headed to prevent seeding into neighboring land.
HARVEST Plants are cut in early summer and dried for use in decoctions (Chinese medicine only). Leaves are picked in spring and used fresh as a vegetable, juiced, or dried for use in infusions, liquid extracts, and tinctures. They may be blanched, like chicory, to reduce bitterness. Roots are lifted in autumn from 2-year-old plants and pressed for juice, roasted for coffee, or dried for decoctions, infusions, liquid extracts, and tinctures. Stocks of preserved leaves and roots are replaced annually. Flowers for winemaking are picked in spring and all the green parts are removed.

TAXUS Yew

(Taxaceae)

Yew trees were sacred to the Druids, who built their temples nearby – an association continued by the Christian practice of planting yew trees around churches. The wood of *T. baccata* (common yew) is very hard and durable, and was once used for longbows. *T. brevifolia* contains taxol, which, since clinical trials in the US, has been hailed as one of the most promising drugs of the 1990s for treating ovarian and other cancers. However, an enormous number of trees are needed to supply the bark for the drug; in order to provide sufficient taxol to treat a cancer patient, the bark of six trees is required. In the US this exploitation of *T. brevifolia* led to the Pacific Yew Act (1992), which provides for the management of the tree on federal lands, covering both its harvesting and conservation. *T. baccata* also contains taxol but in amounts not worth exploiting, although it is used in research. The bark and twigs of *T. canadensis* (Canadian yew) have been used by several native N American tribes in a tea to treat influenza. Eating the leaves of yews is a common cause of death among livestock, which succumb so quickly that the foliage of the plant is often found still in the mouth of the animal.

T. brevifolia (Pacific yew) p.210

PARTS USED Extracts of leaves, bark.
PROPERTIES A toxic herb that has anticancer effects.
USES OF THE HERB
MEDICINAL Internally mainly for cancers of the lungs, ovaries, and breasts. Side effects include nausea and a reduction in the numbers of white blood cells. For use by qualified practitioners only

GROWTH AND HARVEST

GROWTH Wild-collected. Well-drained soil in sun or shade. Propagate by seed sown in autumn, or by cuttings of lateral shoots with a heel in early autumn.
HARVEST Leaves are picked in early autumn or spring, and bark is collected from autumn to spring, for commercial extraction of taxol
WARNING All parts are extremely toxic if eaten

TERMINALIA Myrobalan

(Combretaceae)

T. chebula is of central importance in Ayurvedic medicine and is sacred to Shiva. The *triphala* ("three fruits"), a rejuvenative, laxative tonic, is based on *T. chebula* (*haritaki*), *Phyllanthus emblica* (*amalaki*, emblic myrobalan, ambal), and *T. belerica* (*bibhitaki*, bastard myrobalan, beleric myrobalan). *T. chebula* was first mentioned in Chinese medicine in 1061. In Tibetan medicine it is known as "king of medicines" and, with *T. belerica* and *T. arjuna*, features in most formulas.

T. chebula (myrobalan, black chebulic, *haritaki*) p.210

PARTS USED Fruits (*he zi*).
PROPERTIES A sweet, astringent, warming herb with an unpleasant taste; it regulates colon function, improves digestion, is expectorant, controls bleeding and discharges, and destroys intestinal parasites. It also has a tonic, rejuvenative effect, especially on the digestive, respiratory, and nervous systems.
USES OF THE HERB
MEDICINAL Internally for constipation, digestive and nervous disorders, diarrhea, dysentery, intestinal worms, hemorrhoids, rectal prolapse, abnormal uterine bleeding and inflammation, vaginal discharge, involuntary ejaculation, coughs, and asthma. Not given to pregnant women or patients with severe exhaustion or dehydration. Externally for ulcers, wounds, mouth inflammation, and gum disease.

GROWTH AND HARVEST
GROWTH Crop. Well-drained soil in sun, minimum 61–64°F (16–18°C). Propagate by seed sown in spring, or by semiripe cuttings in summer.
HARVEST Fruits are collected when ripe and sun-dried for use in decoctions, pastes, and powders.

TETRADIUM
(Rutaceae)

T. ruticarpum was first recorded in Chinese medicine before AD200, during the later Han dynasty. In contrast to its unpleasant-tasting, poisonous fruits, those of the Madagascan tree, *Ravensara aromatica*, to which *Tetradium* is closely related, are clove-scented and used in food flavoring.

T. ruticarpum, syn. *T. officinalis* p.210

PARTS USED Fruits (*wu zhu yu*).
PROPERTIES A pungent, bitter, very warming herb that relieves pain, destroys intestinal parasites, stimulates the uterus, controls vomiting, and is antibacterial. It increases both body temperature and blood pressure.
USES OF THE HERB
MEDICINAL Internally for stomach chills and pains, vomiting and acid regurgitation, diarrhea (especially in early morning), painful menstruation, and threadworm infestations. Usually combined with *Glycyrrhiza glabra* (see p.289) to reduce toxicity and with *Zingiber officinale* (see p.373) for abdominal chills. Excess causes diarrhea, dyspepsia, and delirium.

GROWTH AND HARVEST
GROWTH Crop. Well-drained soil in sun, minimum 41–50°F (5–10°C). Propagate by seed sown in autumn, or by semiripe cuttings in summer, or by root cuttings in late winter. Remove dead or congested growths in early spring.
HARVEST Fruits are collected when ripe and dried for use in decoctions.
WARNING Fruits are poisonous.

TEUCRIUM Germander
(Labiatae/Lamiaceae)

T. chamaedrys has been used medicinally since ancient Greek times, when Dioscorides recommended it for coughs and asthma. The Holy Roman Emperor, Charles V (1500–1558), was apparently cured of gout by taking decoctions of the herb for 60 days. *T. scorodonia* (wood sage, sage-leaved germander) has very bitter, hop-scented leaves that have been used in brewing. In cultivation, *T. chamaedrys* is often confused with *T. divaricatum* and the hybrid *T.* x *lucidrys* (*T. chamaedrys* x *T. lucidum*). Both of these are taller, and more upright, with glossier, more leathery, darker green leaves, and are difficult to tell apart. *Teucrium canadense*, American germander, is often grown in herb gardens. *Teucrium marum*, source of herba mariveri, contains an essential oil, a bitter principle, and resin. Plants in herb gardens are often wrongly labeled, so it is important to establish correct identification when purchasing for medicinal use.

T. chamaedrys (wall germander) p.210

PARTS USED Whole plant, leaves.
PROPERTIES A bitter, astringent, antirheumatic herb that reduces inflammation, stimulates the digestion, and lowers fever. It has antiseptic, diuretic, and decongestant effects.
USES OF THE HERB
MEDICINAL Internally for loss of appetite, gall bladder and digestive disorders, summer diarrhea in children, gout, rheumatoid arthritis, excess nasal mucus, and bronchitis. Externally for gum disease, skin eruptions, and injuries (including snakebite). Combined with *Apium graveolens* (see p.240), *Filipendula ulmaria* (see p.283), and *Guaiacum officinale* (see p.290) for rheumatoid arthritis; and with *Lobelia inflata* (see p.305) and *Marrubium vulgare* (see p.308) for bronchitis. May cause liver damage and is subject to a voluntary ban by practitioners in certain countries, notably in France.
ECONOMIC Leaves are used to flavor liqueurs, vermouths, and tonic wines.

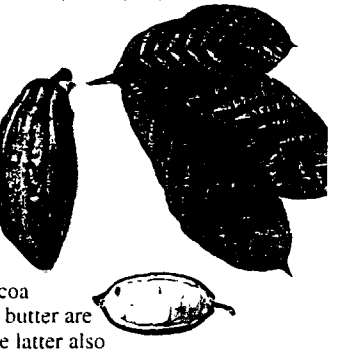
GROWTH AND HARVEST
GROWTH Ornamental. Light, well-drained to dry or stony soil in sun. *T. chamaedrys* is hardy to –20°F (–29°C). Propagate by seed sown in spring, or by division in autumn, or by softwood or semiripe cuttings in spring and summer. Cut off dead flower spikes to encourage bushy new growth.
HARVEST Plants are cut when flowering, and dried for use in infusions and liquid extracts.

THEA
T. sinensis. See *Camellia sinensis.*

THEOBROMA
(Sterculiaceae)

The fermented, dried, and roasted seeds of *T. cacao* produce cocoa butter and cocoa powder, which are used in a range of ways medicinally, and in the preparation of coc beverages and chocolate. Cocoa was the basis of the Aztec drink *chocólatl* and was held in such high esteem by the Incas, Mayas, and Aztecs that the seeds were used as currency. Although cocoa contains caffeine, the stimulant effect is weaker tha that of coffee. Both cocoa powder and pas are bitter and are usually sweetened when used as a food or flavoring. Chocolate will vary greatly in flavor depending upon the type of bean, and the methods of processir and manufacture used: dark chocolate has highest percentage of cocoa solids and low sugar content; milk chocolate contains drie or condensed milk; white chocolate is coc butter with milk and sugar added.

T. cacao (cacao, cocoa, chocolate tree) p



PARTS USED Fruits, seeds, fat, butter.
PROPERTIES A bitter, stimulant, diuretic herb that lowers blood pressure and dilates coronary arteries. Cocoa powder and butter are nutritive; the latter also softens and soothes damaged skin.
USES OF THE HERB
CULINARY As well as being a food, chocolate is used to flavor game, sauces, and milk drinks
MEDICINAL Internally for angina and high blood pressure (cocoa powder) Externally for chappe skin and burns (cocoa butter). Not given intern to patients with irritable bowel syndrome Chocolate may cause allergies or migraine
ECONOMIC Chocolate is used to flavor liqueurs Cocoa butter is used in cosmetics, skin creams, and as a suppository base. By-products from co processing include fertilizer, fodder, fuel (husk jelly, alcohol, and vinegar (pulp).

GROWTH AND HARVEST
GROWTH Crop. Fertile, moist, well-drained so in shade, with high humidity and shelter from wind, minimum 61°F (16°C). Propagate by se sown when ripe, or by air layering in spring o summer, or by semiripe cuttings in summer All methods require a minimum temperature o 79°F (26°C). Cut back to required shape in ea spring to control growth under cover.
HARVEST Fruits are cut all year, especially fro early summer to early winter. Seeds are fermented, dried, roasted, and ground as paste (cocoa mass). Cocoa butter is extracted from cocoa mass, leaving powder

bronchial, urinary, and blood vessels without affecting blood pressure.

USES OF THE HERB

MEDICINAL Internally for asthma, angina, coronary arteriosclerosis, and kidney stones. WARNING This herb is subject to legal restrictions in some countries.

GROWTH AND HARVEST

GROWTH Ornamental (*A. majus*). Crop (*A. visnaga*). Well-drained soil in sun. Propagate by seed sown in spring or autumn.

HARVEST Seeds are gathered when ripe and dried for powders, tinctures, and liquid extracts. Fractions of the fatty oil are extracted for drug formulation.

AMOMUM
(Zingiberaceae)

Several species in this genus are known as cardamom and are used for culinary and medicinal purposes, mainly for gastrointestinal complaints. They have aromatic seeds but are not as pleasant in flavor as the true cardamom (*Elettaria cardamomum*, see p.277). *A. xanthioides* was first mentioned in Chinese medicine during the Ming dynasty (1368–1654). It contains a camphoraceous volatile oil that includes borneol, used for infusions and decoctions.

A. xanthioides (Tavoy cardamom, bastard cardamom, grains of Paradise)

Tender rhizomatous perennial with reedlike stems up to 10ft (3m) tall, and two rows of lanceolate leaves about 14in (35cm) long. Orchidlike flowers are produced in dense spikes on short, leafy stalks near the base of the plant.

PARTS USED Seeds (*sha ren*).

PROPERTIES An aromatic, warming herb that stimulates the appetite, relieves indigestion, and controls nausea and vomiting.

USES OF THE HERB

CULINARY Used as a substitute for true cardamom in flavoring food and liqueurs.

MEDICINAL Internally for digestive disturbances, notably in irritable bowel syndrome and pregnancy.

GROWTH AND HARVEST

GROWTH Crop. Rich soil, with moisture and humidity in partial shade, minimum 64°F (18°C). Propagate by division as new growth begins. Spider mite may attack plants under cover.

HARVEST Seeds of ripe fruits are used in decoctions and for food flavoring.

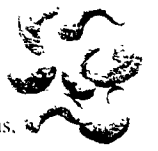
ANACARDIUM
(Anacardiaceae)

The fruits of *A. occidentale*, or cashew apples, yield a pleasantly acidic pulp and juice. Shells contain a caustic oil that is extracted before the nuts are removed. Several species have resinous bark, containing a gum resembling gum arabic, used for making varnish.

A. occidentale (cashew, *marañon*, *acajou*)

p.83

PARTS USED Leaves, bark, fruits, seeds, oil.



PROPERTIES Reduces fever (leaves) and blood sugar levels (bark), and is diuretic (fruits); the nuts (seeds) are a source of nutrients, and the shell oil is toxic to many disease-causing organisms, such as *Staphylococcus* bacteria.

USES OF THE HERB

CULINARY Juice from the fruits is made into drinks and jam. Nuts are eaten roasted and used in a variety of both sweet and savory dishes, and also ground when raw to make cashew milk, a substitute for dairy milk in special diets.

MEDICINAL Internally for diarrhea (bark and leaf extracts, fruit juice), hypoglycemia (bark extract), and influenza (fruit juice), and, in west Africa, for malaria (leaf and bark infusions). Externally for leprosy, ringworm, warts, and corns (fresh extract from shells), and, in west Africa, for toothache and sore gums (leaf and bark infusions). Bark extract is regarded by native Amazonians as having contraceptive properties. WARNING Oil is a skin irritant; oil vapor is irritant if inhaled.

ECONOMIC Shell oil is used in brake linings, synthetic rubbers, and to treat paper and wood against insect attack. Planted in erosion control.

GROWTH AND HARVEST

GROWTH Crop. Well-drained, sandy soil in sun, with ample moisture during the growing season, minimum 64°F (18°C). Propagate by hardwood cuttings at the end of the growing season.

HARVEST Leaves are picked at any time and dried. Bark is removed as required and used fresh or dried. Fruits are harvested when ripe and processed into fresh pulp and juice. Oil is extracted from the shells, and the seeds (nuts) are removed and used fresh or roasted.

ANACYCLUS Mount Atlas daisy
(Compositae/Asteraceae)

A. pyrethrum has been extensively used from medieval times to the present by Arabian, Asian, and European physicians. Culpeper recommended that "the herb or root dried and chewed in the mouth, purges the brain of phlegmatic humours: thereby not only easing pains in the head and teeth, but also hinders the distilling of the brain upon the lungs and eyes, thereby preventing coughs, phthisicks and consumption, the apoplexy and falling sickness" (*The English Physitian Enlarged*, 1653). *A. pyrethrum* should not be confused with the insecticidal pyrethrum, which is from *Tanacetum cinerariifolium* (see p.359).

A. pyrethrum (pellitory, pellitory of Spain)

p.83

PARTS USED Roots.

PROPERTIES A pungent, acrid herb that stimulates the salivary glands and irritates the tissues, thereby increasing blood flow to the area.

USES OF THE HERB

MEDICINAL Externally for toothache, facial neuralgia, and excess mucus.

GROWTH AND HARVEST

GROWTH Ornamental. Well-drained soil in sun. Propagate by seed sown in spring or autumn, or by softwood cuttings in spring.

HARVEST Roots are lifted in autumn and dried for decoctions, lozenges, and tinctures, and as a powder.

ANAGALLIS Pimpernel
(Primulaceae)

Once highly regarded as a medicinal herb, with uses dating back to Pliny (AD23–79) and Dioscorides, *A. arvensis* is no longer recommended. It contains irritant saponins, which recent research shows have antiviral effects, and cucurbitacins (as found in *Bryonia*, see p.251), which are highly toxic.

A. arvensis (scarlet pimpernel, poor man's weatherglass)

p.83

PARTS USED Whole plant.

PROPERTIES An acrid, mucilaginous herb that lowers fever and has diuretic and expectorant effects.

USES OF THE HERB

MEDICINAL Traditionally prescribed internally for depression, tuberculosis, liver complaints, epilepsy, dropsy, and rheumatism. No longer considered safe by most medical herbalists, but of interest to medical researchers. Externally, as pimpernel water, for improving the complexion, especially for freckles.

VARIANT

A. a. var. *caerulea*, p.83

GROWTH AND HARVEST

GROWTH Wild-collected (*A. arvensis*). Ornamental (*A. arvensis* var. *caerulea*). Well-drained to dry or sandy soil in sun. Propagate by seed sown in spring at 61–64°F (16–18°C). Aphids may attack plants under cover.

HARVEST Whole plants are gathered in summer and used fresh, often as expressed juice, or dried for infusions, liquid extracts, tinctures, and powder.

WARNING Harmful if eaten.

ANEMARRHENA
(Liliaceae/Asphodelaceae)

This genus has only one species, found in Japan and northern China. *A. asphodeloides* is a night-flowering member of the lily family, resembling an asphodel in appearance, as its name suggests. This attractive plant has potential as an ornamental but is little known in the West. Though not widespread or common, it has largely been collected in the wild for medicinal use. *Anemarrhena* was first recorded in traditional Chinese medicine c.AD200. It contains steroidal saponins, including asphonin, which has proven antipyretic effects. Studies are currently being carried out in China with the aim of establishing it as a cultivated crop.

aromatic, rather bitter flavor is essential to curries and many spicy dishes. Several kinds of cumin are recognized in India, the most common being *safed* (white) and *kala* (black). Caraway (*Carum carvi*, see p.255) is sometimes confused with it in Indian recipes.

C. cyminum (cumin, *comino*, *jeera*) p.114

PARTS USED Seeds.
PROPERTIES An aromatic, astringent herb that benefits the digestive system and acts as a stimulant to the sexual organs. The oil is antibacterial and larvicidal.
USES OF THE HERB
CULINARY Seeds are an ingredient in spice mixtures such as *garam masala* (India) and in *couscous* (Middle East); they may also be roasted, and give a characteristic flavor to Eastern dishes based on lamb and to side dishes of cucumber and yogurt.
MEDICINAL Internally for minor digestive problems and migraine of digestive origin. Widely used in Ayurvedic medicine to promote the assimilation of other herbs and to improve liver function; also used in veterinary medicine.

GROWTH AND HARVEST

GROWTH Crop Well-drained soil in full sun. Propagate by seed sown in spring. Seeds may not ripen in cold climates.
HARVEST Seeds are collected when ripe and stored whole. They are used whole or ground for culinary use, or distilled for oil as a commercial flavoring and for veterinary use.

CURCUMA
(Zingiberaceae)

C. longa (turmeric) is one of the most common food flavorings and colorings in Asian cuisine. Many medicinal uses are recorded for the plant, especially in China, India, and Indonesia. Recent research has also shown significant anti-inflammatory and liver-protective effects. *C. longa* and *C. aromatica*, both native to India, were described in Chinese medicine in the seventh century. The term *yu jin* is applied to *C. aromatica* on its own and to a mixture of tubers from *C. aromatica*, *C. longa*, and *C. zedoaria*. Next in importance after *C. aromatica* and *C. longa* are *C. amada* (mango ginger), an Indian species that is candied or pickled, and *C. zedoaria* (zedoary), which has similar applications to *Zingiber officinale* (see p.373) and is used in China to treat cervical cancer.

C. aromatica (wild turmeric) p.114

PARTS USED Rhizomes (*yu jin*).
PROPERTIES A pungent, bitter, cooling herb that improves digestion and stimulates the gall bladder and circulatory system, both checking bleeding and dissolving clots.
USES OF THE HERB
MEDICINAL Internally for jaundice, nosebleeds, internal hemorrhage, painful menstruation, shock, chest pains associated with low liver energy, and angina.

C. longa, syn. *C. domestica* (turmeric, *haridra*) p.115

PARTS USED Rhizomes (*jiang huang*).
PROPERTIES A pungent, bitter, astringent herb with a characteristic smell and deep yellow color. It stimulates the digestive, circulatory, and respiratory systems, and uterus, normalizes energy flow, and has anti-inflammatory and antibiotic effects.
USES OF THE HERB
CULINARY An essential ingredient of curries and curry powder.
MEDICINAL Internally for digestive and skin complaints, poor circulation, uterine tumors, jaundice, liver disease, and menstrual problems. Often combined with *Berberis vulgaris* (see p.248) or *Mahonia aquifolium* (see p.308) for liver complaints and diabetes. Externally for injuries, sores, and ringworm.
ECONOMIC Used for piccalilli and as a natural food coloring; it cannot be substituted for saffron or annatto, on account of its strong flavor. A source of orange and yellow dyes for silk and wool, notably as a coloring for the robes of Buddhist monks.

GROWTH AND HARVEST

GROWTH Crop. Well-drained soil in sun, with ample humidity, minimum 59–64°F (15–18°C). Propagate by seed sown in autumn, or by division when dormant.
HARVEST Rhizomes are lifted during the dormant period and steamed or boiled before drying and grinding for use in decoctions, pills, poultices, and powders.

CUSCUTA Dodder
(Convolvulaceae)

About 100 twining, parasitic annuals belong to this genus, which occurs throughout temperate and warm regions. These unusual plants have no roots and no green parts, their leaves being reduced to scales. They obtain nutrients from the host plant, which they penetrate with suckers. Several are used medicinally, including *C. epithymum* (common dodder), which was once popular among European herbalists for "melancholy diseases" and disorders of the spleen, kidneys, and liver. Descriptions of *C. japonica* appeared in Chinese medical literature of the first century AD, based on texts going back to 1500BC.

C. japonica, syn. *C. systyla* (Japanese dodder)

Twining annual, hardy to 5°F (–15°C), 3ft (1m) in height, with thin, much-branched yellow stems, which are striped or spotted red. Numerous pale yellow, bell-shaped flowers are produced in short spikes in late summer. Found at low altitudes in eastern Asia.

PARTS USED Seeds (*tu si zi*).
PROPERTIES A sweet, pungent herb that act mainly as a kidney and liver stimulant
USES OF THE HERB
MEDICINAL Internally for diarrhea, impoten urinary frequency, vaginal discharge, and p eyesight associated with liver and kidney energy weakness.

GROWTH AND HARVEST

GROWTH Wild-collected. Grows only on suitable host plants. Propagates by seed s autumn, lodged among stems of host plan Some species are subject to certain plant controls in parts of Australia.
HARVEST Seeds are collected when ripe i autumn and dried for use in decoctions

CYMBOPOGON
(Gramineae/Poaceae)

These aromatic grasses contain large am of citral and geraniol, which are lemon- rose-scented respectively. The follow in species are important: *C. martinii* (*palma rosha*) from India, source of Turkish ger oil, used to adulterate rose oil and widely in rose perfumes, soaps, and insect repell *C. martinii* var. *sofia* (ginger grass), whic a cruder scent; *C. flexuosus* (East Indian grass), which yields lemon grass oil use food flavoring; and *C. nardus* (citronell grown in Sri Lanka and Java for citronell which is similar in fragrance and proper *Melissa officinalis* (see p.310).

C. citratus (lemon grass)

PARTS USED Leaves, stems, oil.
PROPERTIES A bitter, aromatic, cooling herb increases perspiration and relieves spasms effective against fungal and bacterial infectio
USES OF THE HERB
CULINARY Base of leaves is used fresh, or as powder, in SE Asian cooking, especially with and meat. Leaves are infused for tea.
AROMATIC Oil is used in perfumes.
MEDICINAL Internally for digestive problems children and minor feverish illnesses. Extern for ringworm, lice, athlete's foot, and scabies
ECONOMIC Oil is used in soaps, hair oils, bat baths, and cosmetics, and for flavoring

GROWTH AND HARVEST

GROWTH Crop. Well-drained soil in sun, minimum 45°F (7°C). Propagate by divisio spring.
HARVEST Stems are cut at ground level an used fresh for oil extraction, dried for powd and either fresh or dried for infusions. The l blades may be removed and the lower 3–4in (7–10cm) used as a fresh herb.

CYNARA
(Compositae/Asteraceae)

Globe artichokes (*C. cardunculus*, Scoly Group) and the closely-related cardoons (*C. cardunculus*) were both grown as vegetables by the Greeks and Romans. It

C

CALAMINTHA Calamint
(Labiatae)

Calamints were "officinal" herbs of the pharmacopoeia in medieval times, but are regarded as more ornamental than useful by medical herbalists today. *Calamintha grandiflora* (ornamental savory) produces leaves with a minty aroma and is useful as a seasoning or tea. *C. g.* 'Variegata' maintains its speckled variegation in partial shade but will tolerate full sun. The active constituent is pulegone, as found in *Mentha pulegium* (see p.311), which is known to cause abortion.

C. acinos. See *Acinos arvensis.*

C. nepeta, syn. *C. nepetoides*, *Satureja nepeta* (lesser calamint) p.97

PARTS USED Whole plant.
PROPERTIES An aromatic herb that acts as a nerve tonic, stimulates the uterus, and relieves indigestion.
USES OF THE HERB
MEDICINAL Internally for indigestion, nervous tension, depression, insomnia, and painful menstruation. Not given to pregnant women.
VARIANT
C. nepeta subsp. ***nepeta***, p.97.

C. sylvatica, syn. *C. ascendens*, *C. officinalis* (common calamint) p.97

PARTS USED Whole plant, leaves.
PROPERTIES Similar to *C. nepeta*, but not as strong.
USES OF THE HERB
CULINARY Used to flavor roasts, especially "gamey" meat.
MEDICINAL As for *C. nepeta.*

GROWTH AND HARVEST
GROWTH Ornamental (*C. nepeta* and subsp.). Wild-collected (*C. sylvatica*). Well-drained to dry, neutral to alkaline soil in sun. Propagate by seed sown under cover in spring or autumn, or by softwood cuttings in early summer, or by division in spring.
HARVEST Flowering plants and leaves are cut in summer and used fresh, or dried for infusions.

CALENDULA Pot marigold
(Compositae)

C. officinalis was used in early Indian and Arabic cultures, and in ancient Greece and Rome, as a medicinal herb and as a colorant for fabrics, foods, and cosmetics. The common name "marigold" is used for various species, notably for *Tagetes* species (see p.358), which are used in very different ways.

C. officinalis (pot marigold) p.97

PARTS USED Flower petals.
PROPERTIES A bittersweet, salty herb that stimulates the liver, gall bladder, and uterus, soothes the digestive system, supports the heart, and clears infections. It benefits the skin especially, reducing inflammation, controlling bleeding, and healing damaged or irritated tissues.
USES OF THE HERB
CULINARY Petals are used as a substitute for saffron in rice and soup, and infused to give color to cheese, butter, milk desserts, and cakes; also added fresh to salads.
MEDICINAL Internally for gastric and duodenal ulcers (with *Geranium maculatum*, see p.288), colitis, diverticulitis, hepatitis, swollen glands, menstrual problems, and pelvic inflammatory disease. Not given during pregnancy. Externally for eczema, conjunctivitis, thrush infections, herpes, gingivitis, athlete's foot, varicose veins (with *Hamamelis virginiana*, see p.291), cysts, minor injuries (with *Ulmus rubra* and *Chondrus crispus*, see p.260), and skin problems. As a general antiseptic, *C. officinalis* is often combined with *Hydrastis canadensis* (see p.294) and *Commiphora myrrha* (p.265). Used internally and externally in homeopathy for injuries where the skin is broken.
VARIANT
C. o. 'Prolifera', p.97.

GROWTH AND HARVEST
GROWTH Ornamental. Well-drained to poor soil in full sun. Propagate by seed sown *in situ* in spring or autumn. *C. officinalis* self-seeds readily. Remove dead flower heads to prolong flowering and prevent excessive self-seeding. Dies out in hot summers. Caterpillars, powdery mildew, rust, or cucumber mosaic virus may attack foliage.
HARVEST Flowers are cut in dry conditions and stripped of petals, for use fresh or dried in infusions, liquid extracts, tinctures, and for culinary purposes; they are also macerated in oil for external use.

CALLUNA Heather
(Ericaceae)

Heather is widely used as a medicinal plant in northern and upland Europe, due to its easy availability. Heather honey is an important product in these areas, also having reputed therapeutic properties. The honey has a pungent flavor, clear, dark amber color, and a thixotropic texture, which makes it difficult to extract, but is excellent for cut honeycomb.

C. vulgaris (heather, ling) p.98

PARTS USED Whole plant.
PROPERTIES An astringent, diuretic, mildly sedative herb that induces perspiration and has antiseptic effects, especially on the urinary system.
USES OF THE HERB
MEDICINAL Internally for coughs and colds, diarrhea, kidney and urinary tract infections, arthritis, rheumatism, and nervous exhaustion. Used in homeopathy for arthritis, rheumatism, and insomnia.

VARIANTS
C. v. 'Alba Plena', p.98
C. v. 'Darkness', p.98.
C. v. 'Multicolor', p.98.
C. v. 'Silver Queen', p.98.

GROWTH AND HARVEST
GROWTH Ornamental (*C. vulgaris*: wild-collected). Well-drained, lime-free soil in an open, sunny position. Best in areas with cool summers. Propagate by cuttings of young sideshoots in summer, or by layering in spring. Trim after flowering. Heather dieback or *Armillaria* root rot may affect plants
HARVEST Flowering shoots are cut in summer and dried for use in infusions.

CAMELLIA
(Theaceae)

Several different products are obtained from *C. sinensis*: green tea, made from leaves that are steamed and then dried; black tea, from fermented, dried leaves; and tea absolute, an essential oil distilled from black tea. Tea has been drunk in China for over 3,000 years. B black and green teas contain antioxidants known as polyphenols, which help protect against heart disease, strokes, and cancer *C. sinensis* contains 10–24 percent tannins which are a possible cause of esophageal cancer. Drinking tea with milk eliminates this risk because the tannins are neutralized

C. sinensis, syn. *Thea sinensis* (tea) p.99

PARTS USED Leaves (shoot tips only), oil.
PROPERTIES An aromatic, slightly bitter, astringent herb that stimulates the nervous system and has diuretic and bactericidal effects.
USES OF THE HERB
CULINARY Occasionally used to flavor food, notably as a soaking liquid for dried fruit and ham.
MEDICINAL Internally for diarrhea, dysentery, hepatitis, and gastroenteritis. Excess causes constipation, indigestion, dizziness, palpitation, irritability, and insomnia. Externally for sore e minor injuries, and insect bites
ECONOMIC Essential oil is used in perfumes, h oil, and commercial food flavoring.

GROWTH AND HARVEST
GROWTH Crop. Rich, moist soil in sun or partial shade. Propagate by seed sown as soo as ripe, or in spring, at 59–64°F (15–18 C) by semiripe cuttings in summer at minimum 64°F (18°C). Dried seeds need chipping. Bushes are normally pruned to 3ft (1m)
HARVEST Leaves are picked during the yea from bushes over three years old, and dried use in infusions.

EDICINAL Internally for chronic bronchial eases, gastric and duodenal ulcers, colitis, and umatism (leaf tea only). Externally for psoriasis, ma, sores, varicose veins and ulcers, arthritis, alais, bunions, hemorrhoids, sore breasts during tation, and injuries, including fractures.
ARNING This herb is subject to legal trictions in some countries

x *uplandicum*, syn. *S. peregrinum*
ussian comfrey) p.206

RTS USED Leaves, roots.
OPERTIES As for *S. officinale*
ES OF THE HERB
LINARY As for *S. officinale*.
DICAL As for *S. officinale*.
ONOMIC Preferred species for livestock fodder
RIANT
u. 'Variegatum', p.206.

GROWTH AND HARVEST

ROWTH Ornamental. Moist to wet soil in sun partial shade. Propagate by seed sown in utumn or spring (species only), or by division spring or autumn. Comfrey is invasive and ep-rooted, and difficult to eradicate when tablished. Plants may be affected by rust.
ARVEST Leaves are picked in early summer fore flowering and dried for infusions, liquid tracts, and poultices. Roots are lifted during rmancy and dried for decoctions, liquid tracts, and ointments.
ARNING Skin irritant.

MPLOCARPUS
ink cabbage
iceae)

roots of *S. foetidus* are known to contain tile oil, resins, and a slightly narcotic loid, 5-hydroxytryptamine, but the macology is poorly understood. Uses ng native N Americans include an lation of crushed leaves for headaches t decoction of root hairs for nal bleeding.

etidus (skunk cabbage,
cat weed) p.206

S USED Rhizomes, roots.
ERTIES A pungent, warming, antispasmodic, ve herb with a fetid odor. It acts as an torant and diuretic, and increases perspiration.
OF THE HERB
INAL Internally for bronchitis, asthma, hay excess mucus, whooping cough, and irritating s. Combines well with *Grindelia camporum* .290) and *Euphorbia hirta* (see p.281) for hitis and asthma. Excess causes vomiting.

GROWTH AND HARVEST

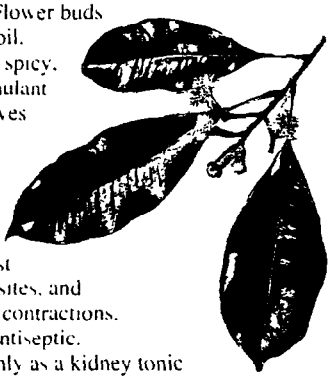
WTH Ornamental. Deep, humus-rich, moist et, acid soil in sun or shade. *S. foetidus* is hardy, tolerating –31°F (–35°C). Propagate ed kept wet until sown in autumn or spring minating in spring), or by division of large s during dormancy. *S. foetidus* does not plant easily

RVEST Rhizomes and roots are lifted dur dormancy and dried for use in decoctions, infusions, liquid extracts, powders, and tinctures.

SYZYGIUM
(Myrtaceae)

Cloves are pink when fresh, turning brown as they dry and exuding oil when squeezed. First known in China, they reached Europe by AD300. Main producers today include Madagascar, Tanzania, Indonesia, and the Comoro Islands. *S. aromaticum* was first mentioned in Chinese medicine c.AD600. The volatile oil contains eugenol, which gives the characteristic aroma, and methyl salicylate. *S. cumini* has equally interesting, although rather different properties, regulating blood sugar levels in diabetes.

S. aromaticum, syn. *Eugenia caryophyllata* (cloves) p.206



PARTS USED Flower buds (*ding xiang*), oil.
PROPERTIES A spicy, warming, stimulant herb that relieves pain, controls nausea and vomiting, improves digestion, protects against intestinal parasites, and causes uterine contractions. It is strongly antiseptic. Regarded mainly as a kidney tonic in Chinese medicine
USES OF THE HERB
CULINARY Whole or ground cloves, and oil, give flavor to preserves, pickles, ham, cooked apples, and cakes

AROMATIC Whole cloves are used in potpourris and pomanders. Oil is used in perfumery.
MEDICINAL Internally for gastroenteritis and intestinal parasites. Externally for toothache and insect bites. In Chinese medicine, internally for nausea, vomiting, hiccups, stomach chills, and impotence.
ECONOMIC Whole or ground cloves, and oil, give flavor to Indian and Indonesian cigarettes. Oil is used in toothpaste.

GROWTH AND HARVEST

GROWTH Crop. Well-drained, fertile soil in sun, minimum 59–64°F (15–18°C). Propagate by seed sown in spring, or by semiripe cuttings in summer.
HARVEST Unopened flower buds are picked as they develop and sun-dried for use in infusions and powders, and for oil extraction.

T

TABEBUIA Trumpet tree
(Bignoniaceae)

The heartwood of *T. impetiginosa* contains lapachol, a naphthoquinone that was shown to have antibiotic properties in 1956 and anti-tumor effects in 1967. Under the common name *ipê*, a number of species have long been used medicinally by native S Americans. Some have a reputation for curing cancer; these include *T. incana* and *T. impetiginosa*, used by the Campas in Peru, *T. rosea* by the Mayas in Mexico (and to treat rabies in Guatemala), and *T. serratifolia* in Colombia. In addition, *T. insignis* var. *monophylla* and *T. neochrysantha* are used to treat stomach ulcers. *T. heptaphylla*, an important lumber species, is reputedly effective against syphilis.

T. impetiginosa, syn. *T. avellanedae* (*lapacho, pau d'arco, ipê-roxa*) p.207

PARTS USED Wood, inner bark.
PROPERTIES A bitter, pungent, cooling herb that lowers fever and reduces inflammation. It suppresses many pathogenic organisms and has anticancer effects.
USES OF THE HERB
MEDICINAL Internally for inflammatory diseases, chronic degenerative diseases, cancers, tumors, ulcers, cysts, fungal infections (especially candidiasis), and venereal, rheumatic, and skin diseases (notably eczema, herpes, and scabies). Combined with other alterative herbs, such as *Echinacea purpurea* (see p.276), *Trifolium pratense* (see p.364), and *Panax ginseng* (see p 321), in formulas to clear toxins, resolve congestion, and strengthen the immune system. Excess may cause nausea, vomiting, dizziness, and diarrhea.
ECONOMIC Lumber, known as *lapacho*, is valued for cabinetmaking.

GROWTH AND HARVEST

GROWTH Crop. Well-drained, fertile soil in sun, minimum 61–64°F (16–18°C). Propagate by seed or air layering in spring, or by semiripe cuttings in summer. Young plants may be trimmed in autumn.
HARVEST Wood and inner bark are dried for decoctions, powder, tablets, and extraction of active constituents.

TAGETES Marigold
(Compositae/Asteraceae)

Marigolds grown as bedding plants come from two main species: *T. patula* (French marigold) and *T. erecta* (African or Aztec marigold, *cempazuchil*). Native to Mexico, these have similar properties. Both are used for severe constipation and colic and, like *T. lucida* and *T. minuta*, are also grown as culinary herbs. *T. lucida* was used to flavor *chocólatl*, the

Search Herbs by Name:

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#1

Phyllanthus emblica

Sanskrit Name	Amalaki
English Name	Emblic myrobalan, Indian gooseberry
Binomial Nomenclature	Phyllanthus emblica, Emblica officinalis Linn.
Family	Euphorbiaceae
Colloquial Indian Names	**Bengali** - Amlaki, **English** - Emblic myrobalan, Indian gooseberry, **Gujarati** - Ambala, **Hindi** - Amala, **Marathi** - Avla, **Punjabi** - Ambul, **Tamil** - Nellikai, **Telugu** - Usrikayi,
Sanskrit Synonyms	Rochani, Kayastha, Gayatrei, Shriphala, Amruta, Amalaki.
Parts Used	bark, dried fruit, flowers, leaves, ripe fruits, roots, seeds.

Habitat

This plant is commonly found growing throughout India; mainly in the Deccan regions, the coastal districts and Kashmir (below 4500ft).

Traditional Therapeutic Uses

This plant is commonly used as tonic for general well being especially in the winter season. It is also an antacid, appetite enhancer and in the effective control of increased bile flow. It is also used in gastric ulcers. The dried powder of the fruit is used to stimulate hair growth, control flaking and as a complexion enhancer. In the treatment of skin diseases, respiratory disorders, cardiac diseases, febrile conditions and haemorrhagic disorders, this plant is used extensively. It is also a refrigerant and hence is used to relieve burning sensations.

Ethnopharmacological studies of the plant have indicated that the plant is mainly useful as an anti-hepatitis, anti-cancer, anti-tumour, immunomodulator and anti-stress agent with regulation of gastric functions. It is a plant of prime importance and has a broad spectrum of activities.

Phytochemistry

This plant is one of the richest sources of Vitamin C or ascorbic acid with 10 gm of the fruit containing as much as 600-900 mg of Vitamin C. It also contains ellagic acid, free glucose and fatty acids. Phytochemical studies of the roots have yielded three ester glycosides namely -pyllaembilcins A, B and C, a highly oxygenated norbisabolane, phyllaembilc acid and considerable amounts of tannins.

Pharmacology

The plant extract exhibited a cardio-protective action in the experimental studies carried out in animals. It also showed a

significant antiatherogenic effect but this effect may not be attributed to the presence of Vitamin C alone.

#1 CONT'D

The solvent fractionated aqueous extract of the plant was found to exhibit appreciable protective effect on the cells of the stomach wall primarily attributed to its antioxidant activity. The extract of the plant exhibited anticarcinogenic activity by inhibiting chemically induced hepatocarcinogenesis. This effect may be brought about by an increase in the levels of the marker enzymes.

The leaf extract of the plant extracted with different solvents demonstrated anti-inflammatory and anti-pyretic activity by having an inhibitory effect on the polymorphonuclear leukocyte and platelets. This may possibly because of the presence of unidentified polar compound/s in the leaf extract. The methanolic extract of the fruit yielded a compound, putranjivain, A which was found to have an inhibitory effect on human immunodeficiency virus-1 reverse transcriptase.

The ascorbic acid present in the fruit was found to primarily enhance natural killer cell activity and its antitumour activity is attributed by its ability to alter natural cell mediated cytotoxicity. . The fruits of the plant have been known to prevent chromosomal aberrations caused by environmental pollutants and the effect is because of the interaction of ascorbic acid with other natural ingredients present in the fruits.

Ascorbic acid present in the plant extract was found to protect against chromosomal aberrations induced by a known clastogen (substance inducing chromosomal breaks).

Safety

The drug, even in large doses has been found to be relatively safe. Concurrent administration of atropine has been found to block the hypotension in dogs and the spasmogenic effect on rabbit ileum.

Primary Indications

Aging, hyperacidity, hair loss.

Secondary Indications

General weakness, flatulence, decreased appetite, hyperpigmentation of the skin.

Dosage

Fruit juice - 10 to 12 ml twice or thrice daily: powdered fruit - 3 to 6 gm twice or thrice daily.

Principal Formulations Amlakyadi churna, Bhringamalakadi taila, Brahma rasayana, Chyavanaprasha, Dhatryadi ghrita, Kalyanaka ghrita, Mukkamukkatuvadi gutika, Nilibhringadi talla, Triphala churna, Triphala ghrita, Triphala guggulu, Triphaladi taila.

INDICATIONS AND USAGE

Approved by Commission E:

- Infections of the urinary tract
- Kidney and bladder stones

Unproven Uses: Triticum is used as a flushing-out therapy, for inflammatory diseases of the urinary tract and the prevention of kidney gravel. The drug is also used for cystitis, kidney stones, gout, rheumatic pain and chronic skin disorders. Due to the high mucilage content, the drug is used as a soothing cough remedy. The infusion is used for constipation. It is also used as fructose-containing additive for diabetics.

Homeopathic Uses: Agropyron repens is used to treat urinary tract infections.

CONTRAINDICATIONS

No flushing-out therapy if edema is present due to cardiac or renal insufficiency.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards or side effects are known in conjunction with the proper administration of designated therapeutic dosages. For flushing-out therapy, ensure copious fluid intake.

DOSAGE

Mode of Administration: Comminuted herb decoctions and other galenic preparations for internal use.

Preparation: Liquid extract: 1:1; Tincture: 1:5; Tea: Pour boiling water over the drug and strain after 10 minutes.

Daily Dosage: The average single dose is 3 to 10 gm of drug in 1 cup of boiling water; average daily dose is 6 to 9 gm of drug.

Tea: 12 to 24 gm drunk fresh several times a day; Liquid extract: 4 to 8 ml 3 times daily; Tincture: 5 to 15 ml 3 times daily.

Homeopathic Dosage: 5 drops, 1 tablet, 10 globules every 30 to 60 minutes (acute) or 1 to 3 times a day (chronic); Parenterally: 1 to 2 ml sc acute, 3 times daily; Chronic: once a day (HAB1).

Storage: The drug must be kept in sealed containers, protected from light and moisture.

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Triticum aestivum

See Wheat

Trollius europaeus

See Globe Flower

Tropaeolum majus

See Nasturtium

Tropical Almond

Terminalia chebula

DESCRIPTION

Medicinal Parts: The medicinal part of the tree is the fruit.

Flower and Fruit: The flowers are arranged in 5 to 7 cm long, axillary spikes. The flowers are small and fused. Their structures are arranged in fives. The sepals are almost glabrous and yellowish-white; the calyx tube is 5-tipped. There are no petals, but there are 10 stamens and a single-chambered, inferior ovary. The style is long and projects out of the bud. The fruit is a glabrous, ovoid drupe, yellow to orange-brown when ripe and 2 to 4 cm long.

Leaves, Stem and Root: Tropical Almond is a tree that grows up to 25 m high. The leaves are alternate or opposite, 7 to 18 cm long, 4 to 6 cm wide and coriaceous. The petiole is approximately 2.5 cm long, with 2 glands at the upper end. The lamina is ovate or elliptical, blunt and orbicular at the base. It is finely crenate and woolly pubescent beneath. The branches are rust colored, woolly or glabrous, and the trunk has a brown, longitudinally fissured bark.

Habitat: India

Production: Tropical Almond fruit is the dried ripe fruit of Terminalia chebula.

Not to be Confused With: Can be confused with emblica and Terminalia bellirica.

Other Names: Black Myrobalan, Chebulic Myrobalan, Myrobalan

ACTIONS AND PHARMACOLOGY

COMPOUNDS

Tannins (20 to 45%): gallotannins, including terchebulin, terflavin A, punicalagin, corilagin, chebulic acid, and chebulinic acid

Monosaccharides/oligosaccharides (9%): including D-glucose, D-fructose, saccharose

Fruit acids: including quinic acid (1.5%), shikimic acid (2%)

Fatty oil (in the seeds, to 40%)

EFFECTS

Its high tannin content explains the use of the drug as an astringent. A variety of experiments have demonstrated antibacterial, cardiotonic and antiarteriosclerotic (lowering of cholesterol levels) effects for the drug.

INDICATIONS AND USAGE

Chinese Medicine: Tropical Almond is used for chronic diarrhea, chronic dysentery, rectal prolapse, loss of voice because of chronic coughs, blood in the stool, leucorrhea, night sweats and undesired discharges.

Indian Medicine: The drug is used in the treatment of wounds, ulcers, gingivitis, excitation, gastric complaints, anorexia, worm infestation, flatulence, hemorrhoids, jaundice, for liver and spleen disease, pharyngodynia, hiccups, coughs, epilepsy, eye disease, skin changes, leprosy, intermittent fever, cardiac dysfunction, gastritis and neuropathy.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards are known in conjunction with the proper administration of designated therapeutic dosages, although even therapeutic dosages could lead to constipation, due to the high tannin content (administration as an antidiarrheal).

OVERDOSAGE

The administration of extremely high doses (25% of the fodder) over a period of 4 weeks to rats led to kidney and liver damage; mice developed liver tumors in a related experiment (750 mg/kg body weight of the tannin fraction over a period of 12 weeks).

DOSAGE

Mode of Administration: Whole herb preparations for internal and external use.

Daily Dosage: 3 to 9 gm

Storage: Should be stored in a dry and cool place.

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#3

Terminalia belerica

Sanskrit Name	Bibhitaka
English Name	Belleric myrobalan
Binomial Nomenclature	Terminalia belerica Roxb.
Family	Combretaceae
Colloquial Indian Names	**Bengali** - Bayda, **English** - Belleric myrobalan, **Gujarati** - Baheda, Bhaira, **Hindi** - Baheda, **Marathi** - Beheda, **Tamil** - Akkam, **Telugu** - Tai,
Sanskrit Synonyms	Kalidrum, Telpushpak, Kalivruksha, Karshaphala, Aksha, Bibhitaka.
Parts Used	fruits.

Habitat

Grows wild up to 1000 m, all over India except dry and marshy areas.

Traditional Therapeutic Uses

Fruit is useful in cough, hoarseness of voice, and eye diseases. It is one of the ingredients of *triphala*. Used in the diseases of liver and gastrointestinal tract. Unripe fruit is purgative. Dried ripe fruit is astringent and used in dropsy, piles and diarrhoea. It is also used in fever, applied to eyes and is useful in throat infection and bronchitis. Kernel is narcotic, astringent and is used for topical application on inflamed parts. Oil from the kernel is used for application in hair and as a topical agent in rheumatism.

Phytochemistry

Fruits contain about 30% astringent substances - chebulinic acid, tannic acid, gallic acid, ethyl gallate, galloyl glucose. The stem bark contains oxalic acid.

Pharmacology

Fruits have been reported to show hypotensive, purgative and cholagogue activities. In combination with extracts of *Emblica officinalis*, it has shown protective effect in experimental animals against myocardial necrosis.

The alcoholic extract of the plant has shown antibacterial activity. Gallic acid isolated from the plant has shown hepatoprotective activity against CCl_4 induced physiological and biochemical changes in the liver. The plant has been reported to show hypocholesterolemic activity. It showed significant decrease in liver lipids and heart lipids in drug treated animals.

Safety

No adverse reactions have been reported with the commonly used doses.

Primary Indications

Bronchitis, insomnia.

#3 cont'd

Secondary Indications
Cough, sore throat.
Dosage
Powder - 1 to 3 gm twice daily.
Principal Formulations Brihat phala ghrita, Kaishora guggulu, Mahatriphaladaya ghrita, Mukkamukkatuvadi gutika, Sarasvata ghrita, Tiktika ghrita, Triphala churna, Triphala guggulu, Triphaladi taila.

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Nelumbo nucifera

See Lotus

Nepalese Cardamom

Amomum aromaticum

#4

DESCRIPTION

Medicinal Parts: The medicinal parts of the plant are the bark and fruit.

Flower and Fruit: The flowers are arranged in globose, 4 cm long spikes with single flowers in the axils of the scale-like, stem-clasping bracts. The inner flower bracts are elongate, ribbed and thorn-tipped. The flowers are pale yellow with a tubular, 3-toothed calyx. The corolla petals are tubular. The flower tube is approximately 2.5 cm long. The petals are 2.5 cm long, lanceolate, blunt and somewhat cap-shaped. The lip is twice as long as the petals. The lip is round with a cuneiform base and single stamen. The fruit is 3-chambered and narrow ovoid in shape. It is approximately 3 cm long and has numerous 3 mm long seeds in each chamber.

Leaves, Stem and Root: Amomum aromaticum is a herbaceous perennial, which grows up to 1 m high. The leaves are lanceolate, up to 25 cm long and 6 cm wide. They are pubescent beneath, with a 2 mm long ligule. The rhizome is up to 5 m long with shoots growing in clusters from it.

Habitat: India

Production: The ripe fruit is harvested in autumn [illegible] in the sun at low temperatures. Nepalese cardamom [illegible] dried, ripe fruit of Amomum aromaticum.

Not to be Confused With: Amomum aromaticum [illegible] confused with Amomum subulatum.

ACTIONS AND PHARMACOLOGY

COMPOUNDS

Volatile oil (1%): chief constituent 1.8-cineole, incl[illegible] well, alpha- and beta-pinene, limonene, myrcene, [illegible] p-cymol, terpineol, nerolidol, 1H-indene-2,3-dihyd[illegible] boxyl aldehyde

EFFECTS

The efficacy of the drug in the context of folk-me[illegible] believed to be traceable to the cineole contain[illegible] essential oil, although scientific data regarding thi[illegible] available.

INDICATIONS AND USAGE

Chinese Medicine: Nepalese cardamom is used fo[illegible] diarrhea, vomiting and digestive disturbances.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards are known in conjunction with the [illegible] administration of designated therapeutic dosages.

OVERDOSAGE

Overdoses of the essential oil can lead to life-thr[illegible] poisoning, due to the high levels of cineole. Symp[illegible] include reduced blood pressure, circulatory disorder[illegible] lary collapse and asphyxiation. Vomiting is not to be in[illegible] in the case of poisoning, due to the danger of aspirat[illegible]

Following instillation of activated charcoal, the therapy for poisoning consists of the treatment of spasms with diazepam, of colic with atropine, electrolyte substitution and the countering of any acidosis that may appear with sodium bicarbonate infusions. Intubation and oxygen respiration may also be required.

DOSAGE

Mode of Administration: Whole herb, cut drug and liquid preparations for internal use.

Daily Dosage: As decoction 3-6 gm.

Storage: Should be protected from light and moisture.

LITERATURE

Hänsel R, Keller K, Rimpler H, Schneider G (Ed), Hagers Handbuch der Pharmazeutischen Praxis, 5. Aufl., Bde 4-6 (Drogen), Springer Verlag Berlin, Heidelberg, New York, 1992-1994.

Administration: Liquid extract used as a gargle and

...RE

...List PH, Hörhammer L (Hrsg.), Hagers Handbuch der ...utischen Praxis, 4. Aufl., Bde. 1-8, Springer Verlag ...idelberg, New York, 1969.

...min

...um cyminum

...TION

...l Parts: The medicinal parts are the Cumin oil ... from the ripe fruit and the ripe, dried fruit.

...nd Fruit: The flowers are in umbels radiating in ...3 to 5. The petals are white or red, oblong and ...rdered with a long indented tip. The involucral ... long and simple. The style is short and turned ... the end. The ovary is inferior and 3-locular. The ...chizocarp, about 6 mm long and 1.5 mm wide and ...th awl-shaped calyx tips. The mericarp is almost ...ansverse section, with 5 thread-like, bristly main ...istly secondary ribs.

...m and Root: The plant is a delicate, glabrous ... 50 cm high. The stem is bifurcated at the base ...ous. The leaves are glabrous and finely pinnatifid ...g-linear tips, of which the lower are mostly ...oliate.

...e plant is indigenous to Turkestan (Hager) or ...ypt (Grieve), but is cultivated today in the whole ...diterranean region as well as in Iran, Pakistan, ..., the U.S. and South America.

... Cumin is the dried ripe fruit of Cuminum ...

...onfused With: Certain Indian products, such as ... and the fruit of the earth chestnut, Bunium ...um can be mistaken for or confused with ...nthetic coloring is frequently added to Turkish ...

...D PHARMACOLOGY

...

... (2 to 5%): chief components cuminaldehyde, ...penes, beta-pinenes, p-cymene, 1,3-p-menthandial ...

...0 to 15%): chief fatty acids petroselic acid, ...id

...ances (15 to 20%)

EFFECTS

Antimicrobial: The drug contains fatty oil (mainly petroselic acid and oil acid) and has an antimicrobial effect. A powder suspension of the drug has diverse inhibitory effects; it stunts mycelium growth, toxin production or afla-toxin production in *Aspergillus ochraceus*, *C. versicolor*, and *C. flavus*.

Influence on blood-clotting: A dried Cumin ether extract inhibits (in vitro) arachidon acid-induced plate aggregation in platelet-rich human plasma.

Mutagenic effect: In comparison to *Salmonella thyphimurum* TA 100, a mutagenic effect of the polar fractions of chloroform extract and methanol extract of Cumin did appear.

Influence of pharmacological metabolism: An injection of a dried ether extract prolonged the phenobarbituate hypnosis of female albino mice, up to 120%; a higher dose shortened it to 83%.

Estrogenic effect: An acetone extract of cumin, administered to female albino rats (ovariectomised, ovaries have been removed) led, depending on the dosage, to an increase in the weight of the uterus, an increase in the amount of protein in the endometrium and an increase of alkali phosphates.

Other effects (for which there are no experimental results) include the following: obstructive influence on fertility, galactogen, antispasmodic, diuretic and aphrodisiac.

Cumin also has carminative, stimulant and analgesic effects.

INDICATIONS AND USAGE

Unproven Uses: In folk medicine, Cumin is used as a carminative for stomach disorders, diarrhea and colic, particularly in veterinary medicine.

In America, Africa and India the drug is used as an abortive and as an emmenagogue.

In Indonesia, Cumin is used in cases of bloody diarrhea and headache (paste is applied to the forehead). It is also taken orally for rheumatic ailments.

Indian Medicine: In India, Cumin is used as an abortifacient, for kidney and bladder stones, chronic diarrhea, leprosy and eye disease.

PRECAUTIONS AND ADVERSE REACTIONS

Health risks or side effects following the proper administration of designated therapeutic dosages are not recorded.

DOSAGE

Mode of Administration: Cumin is used both internally and externally in ground form and as a pressed oil.

Daily Dosage: The average single dose is 300 to 600 mg of drug (equivalent to 5 - 10 fruits).

THE LAWRENCE REVIEW OF
NATURAL PRODUCTS

TOPIC: TURMERIC

DATE OF ISSUE: FEB 1993

REPLACES MONOGRAPH DATED: N/A

#6

TOPIC: Turmeric

SCIENTIFIC NAME: *Curcuma longa* L. Synonymous with *C. domestica* Val. Family: Zingiberaceae

COMMON NAMES: Turmeric, curcuma, Indian saffron

BOTANY: Turmeric is a perennial member of the ginger family characterized by a thick rhizome. The plant grows to a height of 3 to 5 feet and has large (1.5' x 8") oblong leaves. It bears funnel-shaped yellow flowers.[1] The plant is cultivated widely throughout Asia, India, China and tropical countries. The primary (bulb) and secondary (lateral) rhizomes are collected, cleaned, boiled and dried; and lateral rhizomes contain more yellow coloring material than the bulb.[2] The dried rhizome forms the basis for the culinary spice.

HISTORY: Turmeric has a warm, bitter taste and is a primary component of curry powders and some mustards. The powder and its oleoresins are also used extensively as food flavorings in the culinary industry. The spice has a long history of traditional use in Asian medicine. In Chinese medicine, it has been used to treat problems as diverse as flatulence and hemorrhage. It also has been used topically as a poultice, as an analgesic and to treat ringworms.[3] The spice has been used for the management of jaundice and hepatitis.[2] The oil is sometimes used as a perfume component.

CHEMISTRY: Turmeric rhizome contains up to 7% of an orange-yellow volatile oil composed primarily of tumerone (60%), isomers of atlantone and zingiberene (25%). More than a half-dozen minor components have been identified in the oil.

Turmeric contains about 5% diaryl heptanoids known as curcuminoids (curcumin and related compounds) that impart the yellow color.[2]

PHARMACOLOGY: A number of soluble fractions of turmeric, including curcumin, have been reported to have antioxidant properties. Turmeric inhibits the degradation of polyunsaturated fatty acids.[4] Dietary administration of this compound at a level of 2% to mice reduced the incidence of experimentally-induced colonic hyperplasia, indicating that the antioxidant effects are active in vivo.[5] The curcumins inhibit cancer at initiation, promotion and progression stages of development.[6]

Tumor-preventing activity has been reported in hamsters given turmeric, and the effect was additive to that observed during treatment with betel leaf extract.[7] In smokers, turmeric given at a daily dose of 1.5 g for 30 days significantly reduced the urinary excretion of mutagens compared to controls; turmeric had no effect on hepatic enzyme levels or lipid profiles suggesting that the spice may be an effective antimutagen useful in chemoprevention.[8]

Ukonan-A, a polysaccharide with phagocytosis-activating activity has been isolated from *C. longa*[9] and Ukonan-D has demonostrated strong reticuloendothelial system-potentiating activity.[10] Aqueous extract of *C. longa* has recently been shown to have cytoprotective effects that inhibit chemically-induced carcinogenesis, and this activity may form a basis for the traditional use of turmeric as an anticancer treatment.[11]

A fraction of curcuma oil has been shown to have anti-inflammatory and antiarthritic activity in a rat model.[3] A combination of turmeric and neem (*Azadirachta indica*) applied topically has been shown to effectively eradicate scabies in 97% of 814 people treated within 3 to 15 days.[12] Curcumin has a slight antiedemic effect in rats; other pharmacologic properties of turmeric include choleretic, hypotensive, antibacterial and insecticidal activity.

The choleretic (bile stimulating) activity of curcumin has been recognized for almost 40 years, and these compounds have been shown to possess strong antihepatotoxic properties.[13]

TOXICOLOGY: Acute and chronic (100 mg/kg/day for 90 days) evaluation of *C. longa* ethanolic extracts in mice found the material to be relatively devoid of serious side

effects. No reports of significant toxicity have been reported following the ingestion of turmeric. No significant change in weight was observed following chronic treatment, although significant changes in heart and lung weights were observed; a significant decrease in white and red blood cell levels were observed. Although a gain in weight of sexual organs and an increase in sperm motility was observed, no spermatotoxic effects were found.[14]

SUMMARY: Turmeric is a widely used spice that is a major component of curry powder. The spice has a long history of use in traditional Asian medicine. Recent investigations indicate that the strong antioxidant effects of several components of turmeric result in an inhibition of carcinogenesis, and extracts of the spice may play a role as chemoprotectants, which limit the development of cancers.

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ACTIONS AND PHARMACOLOGY

COMPOUNDS

Fatty oil: chief fatty acids oleic acid, palmitic acid, linoleic acid, palmitoleic acid (tocopherols, vitamin E)

EFFECTS

Avocado oil is an emollient, which improves rough ichtyotic skin.

INDICATIONS AND USAGE

Avocado is a main ingredient in so-called natural cosmetics.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards or side effects are known in conjunction with the proper administration of designated therapeutic dosages.

DOSAGE

Mode of Administration: As an active or inactive ingredient in various preparations (bath oils, ointments, etc.).

Storage: Oils from different batches should not be mixed. The drug should be stored in a sealed container away from light and moisture.

LITERATURE

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Bael

Aegle marmelos

DESCRIPTION

Medicinal Parts: The medicinal parts are the unripe fruit, the root, the leaves and the branches.

Flower and Fruit: The plant has greenish-white flowers. The yellow fruit is globular or ovoid, with a hard shell. The fruit is divided internally like an orange. The flesh is reddish, with numerous seeds covered in a layer of latex.

Characteristics: The taste is mucilaginous and slightly sour.

Habitat: This plant is native to India but has spread over wide areas of southeast Asia.

Other Names: Bel, Bengal Quince

ACTIONS AND PHARMACOLOGY

COMPOUNDS

Tannins

Saccharides

Starch

Fatty oil

Furocoumarins

Furoquinolin alkaloids

EFFECTS

Bael has a digestive and an astringent effect.

INDICATIONS AND USAGE

Indian Medicine: Bael is used, especially in Indian medicin for constipation and diarrhea.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards or side effects are known in conjunctic with the proper administration of designated therapeut dosages.

OVERDOSAGE

Digestive complaints and constipation are possible with t intake of large quantities, due to the constituent tannins.

DOSAGE

Mode of Administration: Available as a liquid extract f internal use.

LITERATURE

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Balloon-Flower (Jie-Geng)

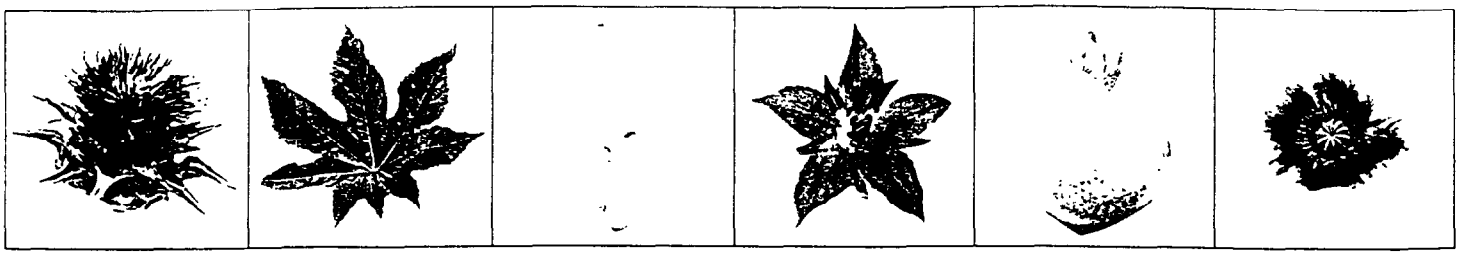
Platycodon grandiflorum

DESCRIPTION

Medicinal Parts: The medicinal parts of the plant are t main and secondary roots.

Flower and Fruit: The flowers are at the tip of the leadi shoot. The flower structures are in fives and are fused. T calyx tube is appressed to the ovary; the corolla is 5-lobe blue, occasionally white with a diameter of approximately cm. The 5 stamens are free and the ovary inferior wi numerous ovules. The fruit is an obovoid, multi-chambere dehiscent capsule. The seeds are ovoid, light to dark brow smooth, 1.7 to 2.2 mm long, 1 to 1.2 mm wide and flattene

ANDREW CHEVALLIER



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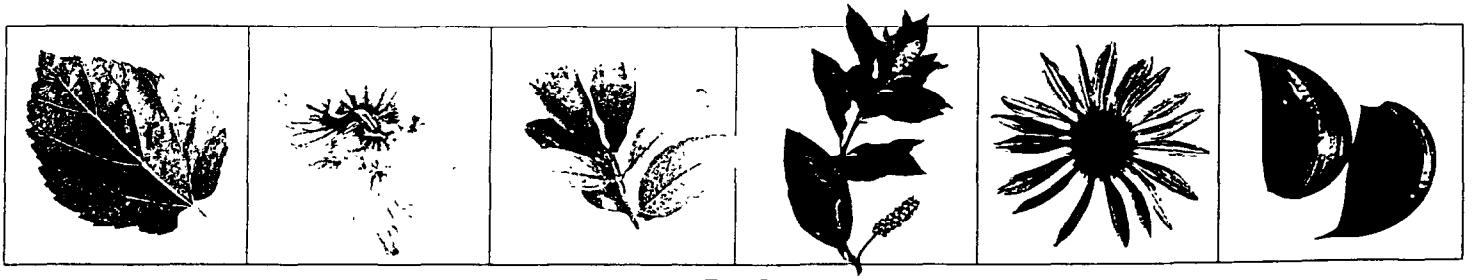

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"First the word, then the plant, lastly the knife."
Aesculapius of Thassaly *c.* 1200 BC

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IMPORTANT NOTICE
Do not try self-diagnosis or attempt self-treatment for serious or long-term problems without first consulting a qualified medical herbalist or doctor. Do not take any herb without first checking the cautions in the relevant herb entry (see pp. 54–281) and the Essential Information on pp. 298–299. Do not exceed any dosages recommended. Always consult a professional if symptoms persist. If taking prescribed medicines, seek professional advice before using herbal remedies. Take care to identify plants correctly, and do not harvest restricted species.

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CONTENTS

Aegle marmelos
(Rutaceae)
BAEL, BENGAL QUINCE

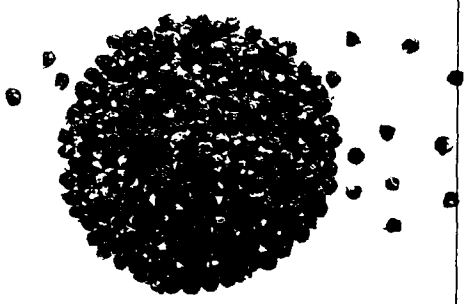
DESCRIPTION Thorny deciduous tree growing to 25 ft (8 m). Has aromatic oval- to lance-shaped leaves, greenish white flowers, and yellow plum-shaped fruit.
HABITAT & CULTIVATION Native to India, bael grows throughout much of Southeast Asia in dry forests. It is also cultivated throughout the region.
PARTS USED Fruit, leaves, root, twigs.
CONSTITUENTS Bael contains coumarins, flavonoids, alkaloids, tannins, and fixed oil.
HISTORY & FOLKLORE The bael tree is sacred to the Hindu deities Lakshmi (the goddess of wealth and good fortune) and Shiva (the god of health). It is commonly planted near temples. Its medicinal virtues are described in the *Charaka Samhita*, an herbal text written *c.* 700 BC.
MEDICINAL ACTIONS & USES The astringent half-ripe bael fruit reduces irritation in the digestive tract and is excellent for diarrhea and dysentery. The ripe fruit is a demulcent and laxative, with a significant vitamin C content. It eases stomach pain and supports the healthy function of this organ. Bael's astringent leaves are taken to treat peptic ulcers. The tree's most unusual application is for earache. A piece of dried root is dipped in the oil of the neem tree (*Azadirachta indica*, p. 173) and set on fire. Oil from the burning end is dripped into the ear. (This is not a recommended practice.)
SELF-HELP USE Diarrhea, p. 307.

Aesculus hippocastanum
(Hippocastanaceae)
HORSE CHESTNUT

DESCRIPTION Sturdy deciduous tree growing to 80 ft (25 m), with a large domed crown. Has leaves with 5–7 narrowly oval leaflets, clusters of white and pink flowers, and spiny green fruit with up to 3 rounded, shiny brown seeds about 1½ in (4 cm) across.
HABITAT & CULTIVATION Native to mountain woods in the Balkans and western Asia, this tree is cultivated in temperate regions worldwide. The bark and seeds are collected in autumn.
PARTS USED Seeds, leaves, bark.
CONSTITUENTS Horse chestnut contains triterpenoid saponins (notably aescin), coumarins, and flavonoids. Aescin, the main active constituent, has anti-inflammatory properties. In Germany and other European countries, specialized aescin preparations are used because aescin is not easily absorbed from the gut.
HISTORY & FOLKLORE Horse chestnut was first documented as a medicinal plant in 1565, in Pierandrea Matthioli's translation of Dioscorides' *Materia Medica*.
MEDICINAL ACTIONS & USES Horse chestnut is astringent, an anti-inflammatory, and an aid to toning the vein walls, which, when slack or distended, may become varicose, hemorrhoidal, or otherwise problematic. Horse chestnut also reduces fluid retention by increasing the permeability of the capillaries and allowing the reabsorption of excess fluid back into the circulatory system. The bark can be used to reduce fever. The herb has been taken internally in small to moderate doses for leg ulcers, varicose veins, hemorrhoids, and frostbite, and applied externally as a lotion, ointment, or gel. In France, an oil extracted from the seeds has been used externally for rheumatism. In the US, a decoction of the leaves has been given for whooping cough
CAUTIONS Potentially toxic if ingested. Do not use for self-treatment except as a lotion, ointment, or gel applied to unbroken skin.

Aframomum melegueta
(Zingiberaceae)
GRAINS OF PARADISE

DESCRIPTION Perennial growing to 8 ft (2.5 m), with reedlike stems and narrow leaves. Single mauve flowers bear scarlet fruits growing to 4 in (10 cm) across. Seeds are small, reddish brown, and oyster-shaped, with a distinctly pungent, aromatic taste.
HABITAT & CULTIVATION This plant grows in tropical West Africa and is gathered when ripe.



GRAINS OF PARADISE have been traded as a spice since the Middle Ages

PARTS USED Seeds.
CONSTITUENTS The seeds contain a volatile oil (0.3 to 0.5%), a pungent principle called paradol (related to gingerol in ginger, *Zingiber officinale*, p. 153), and tannins.
MEDICINAL ACTIONS & USES Principally used as a condiment, the seeds also are a stimulant that strengthens and warms the stomach. Like other members of the ginger family, this plant is used to alleviate indigestion, gas, and bloating (the latter more commonly in livestock). Grains of paradise also ease abdominal discomfort due to colic or cramps. The seeds can help to reduce or prevent vomiting and to bring relief from nausea. The plant's stimulant properties make it an invigorating herb, especially helpful for those with weak digestions.
RELATED SPECIES *Sha ren*, the seeds of the closely related *A. villosum*, are used in Chinese medicine for similar complaints.

Agastache rugosa
(Labiatae)
HUO XIANG (CHINESE), GIANT HYSSOP

DESCRIPTION Aromatic perennial or biennial herb growing to 4 ft (1.2 m). Has a square stem, triangular leaves, and purple flowers growing in dense spikes.
HABITAT & CULTIVATION Native to China and also found in Japan, Korea, Laos, and Russia, *huo xiang* grows wild on slopes and along roadsides. It is cultivated throughout China and gathered in summer.
PARTS USED Aerial parts.
CONSTITUENTS *Huo xiang* contains a volatile oil, including methyl chavicol, anethole, anisaldehyde, and limonene.
HISTORY & FOLKLORE *Huo xiang* was first mentioned in a Chinese medicinal text in Tao Hongjing's revision of the *Divine Husbandman's Classic (Shen'nong Bencaojing)*, which he wrote in about AD 500.
MEDICINAL ACTIONS & USES The acrid *huo xiang* is considered a slightly warming herb in Chinese herbal medicine (*see* pp. 38–41). It is employed in situations where there is excessive "dampness" within the digestive system, resulting in poor digestion and reduced vitality. The herb stimulates and warms the digestive tract, relieving symptoms such as abdominal bloating, nausea, indigestion, and vomiting. It is commonly used to relieve or prevent vomiting and morning sickness. *Huo xiang* is used to treat the early stages of viral infections that feature symptoms such as stomachache and nausea. *Huo xiang* is combined with Baical skullcap (*Scutellaria baicalensis*, p. 133) and other herbs for symptoms such as malaise, fever, aching muscles, and lethargy. A lotion containing *huo xiang* may be used externally to treat fungal conditions such as ringworm.
RESEARCH Laboratory experiments indicate that *huo xiang* is indeed effective against fungal infections.
OTHER SPECIES In southern China and Taiwan, *Pogostemon cablin* is used interchangeably with *huo xiang*. *P. cablin* is a close relative of the Indian plant *P. patchouli*, from which patchouli is produced.

#8

Wedelia calandulaceae

Sanskrit Name	Pitabhringi
Binomial Nomenclature	Wedelia calendulaceae Less.
Family	Compositae, Asteraceae
Colloquial Indian Names	**Bengali** - Kesaraja, Bhimraja, **Gujarati** - Pilo bhangro, **Hindi** - Bhanra, Bhangra, **Marathi** - Piwala maka, **Tamil** - Patalai kalantakeral.
Sanskrit Synonyms	Pitabhringi, Pitabhringi.
Parts Used	entire plant, particularly leaves.

Habitat

West Bengal, Assam, Penninsular India, Sri Lnka, China and Japan.

Traditional Therapeutic Uses

The herb is used as tonic, in hepato and splenomegaly and in skin diseases. Juice of leaves is used in alopecia, to dye hair and promote hair growth. The plant is also used in uterine haemorrhage, menorrhagia and ascites. Fresh plant is also rubbed on the gums in toothache and applied with a little oil for relieving headache.

Phytochemistry

Wedelolactone, norwedelolactone, benzofuran and norwedelic acid have been reported from the plant.

Pharmacology

Extract of shoots exhibited antibacterial activity against *Staphylococcus aureus* and *E.coli*. The plant has also shown hepatoprotective activity and is used as cholagogue, wedelolactone and norwedelolactone being the active principles.

It has shown hepatoprotective effect in rats and mice against hepatotoxin induced acute liver damage. It has been shown to lower the high levels of liver enzymes caused by liver damage.

Safety

No adverse reactions have been reported so far.

Primary Indications

Viral hepatitis, cuts and wounds.

Secondary Indications

Indigestion.

Dosage

Juice of the whole plant - 15 to 30 ml twice daily; pulp for topical use.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards or side effects are known in conjunction with the proper administration of designated therapeutic dosages of the dehydrated drug. Extended skin contact with the freshly harvested, bruised plant can lead to blister formation and cauterizations that heal poorly, due to the released protoanemonine, which is severely irritating to the skin and mucous membranes. If taken internally, severe irritation to the gastrointestinal tract, combined with colic and diarrhea, as well as irritation of the urinary drainage passages, are possible.

Symptomatic treatment for external contact consists of mucilaginosa, after irrigation with diluted potassium permanganate solution. In case of internal contact, administration of activated charcoal should follow gastric lavage.

OVERDOSAGE

Death by asphyxiation following the intake of large quantities of protoanemonine-forming plants has been observed in animal experiments. The risk associated with use of this plant is less than that of many other Ranunculaceae (e.g., Anemones nemorosae) due to the relatively low levels of protoanemonine-forming agents.

DOSAGE

Mode of Administration: The drug is seldom used today. It is available in the form of decoctions, which are used for poultices, as well as extracts and drops.

Homeopathic Dosage: Clematis is used in homeopathic dilutions D3 and D4.

Storage: The herb should be stored in tightly sealed containers.

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Clematis recta

See Clematis

Clematis vitalba

See Traveller's Joy

Clove

Syzygium aromaticum

DESCRIPTION

Medicinal Parts: The medicinal parts are the oil extracted from the whole or macerated flower buds, the pedicles and leaves, the dried flower buds and the not quite ripe fruit.

Flower and Fruit: The flowers are in triply-triple-branched cymes. They are short-pedicled, whitish-pink, approximately 6 mm wide and have 2 scale-like bracteoles. The calyx tube is 1 to 1.5 cm long and cylindrical. The 4 sepals are fleshy and there are 4 petals. The fruit is 2 to 2.5 cm long, 1.3 to 1.5 cm wide and is crowned by 4 curved sepals. The fruit is 1-seeded.

Leaves, Stem and Root: The plant is a 20 m high, pyramid-shaped evergreen tree. The diameter of the trunk is 40 cm. The branches are almost round. The leaves are 9 to 12 cm long and 3.5 cm wide. They are coriaceous, elliptical to lanceolate, short, obtusely tipped and narrowing in a cuneate form to the petiole, which is 2.5 cm long. There is 1 main rib and more than 20 lateral ones.

Characteristics: The taste and odor are characteristic.

Habitat: The plant is indigenous to the Molucca Islands and is cultivated there and in Tanzania, Madagascar, Brazil and other tropical regions.

Production: Cloves consist of the hand-picked and dried flower buds of Syzygium aromaticum (syn. Jambosa caryophyllus, Eugenia caryophyllata).

ACTIONS AND PHARMACOLOGY

COMPOUNDS

Volatile oil (15-21%): chief components eugenol (70-90%), eugenyl acetate (aceteugenol, up to 17%), beta-caryophyllene (5-12%)

Flavonoids: including astragalin, isoquercitrin, hyperoside, quercetin-3,4'-di-O-glycoside

Tannins (10%): ellagitannins, including eugenin

Triterpenes: oleanolic acid (1%), crataegolic acid (maslic acid, 0.15%)

Steroids: sterols, including beta-sitosterol

EFFECTS

Clove is antiseptic, antibacterial, antifungal, antiviral, spasmolytic and a local anaesthetic.

INDICATIONS AND USAGE

Approved by Commission E:

- Dental analgesic
- Inflammation of the mouth and pharynx

Unproven Uses: Clove oil is used internally for stomach ulcers and externally for colds and headaches. It is also used externally as a local analgesic and dental antiseptic.

Indian Medicine: The drug is used for halitosis, toothache, eye disease, flatulence, colic, gastropathy, and anorexia.

PRECAUTIONS AND ADVERSE REACTIONS

No health hazards or side effects are known in conjunction with the proper administration of designated therapeutic dosages. Allergic reactions to eugenol occur rarely. In concentrated form, oil of clove may be irritating to mucosa.

DOSAGE

Mode of Administration: As a powdered, ground, or whole herb for the recovery of the essential oil, and other galenic preparations for topical use.

Daily Dosage: Aqueous solutions corresponding to 1 to 5% essential oil are used externally for mouthwashes. In dentistry, the undiluted essential oil is used.

Storage: Do not store the drug in plastic containers, and protect it from light.

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Club Moss

Lycopodium clavatum

DESCRIPTION

Medicinal Parts: The medicinal parts are the spores and the fresh plant.

Flower and Fruit: Sulfur yellow, minute spores, carried in large numbers in 2 to 3 cylindrical yellow-green cones, develop in August at the ends of leafy, 15 cm high stalks extending from aerial branches.

Leaves, Stem and Root: The plant has a 1 m long, procumbent stem with only a few roots. It is covered with yellowish-green leaves, densely arranged in spirals, which are entire-margined, linear, smooth and end in a long, white, upwardly bent hair tip. There are numerous erect, circular, 5 cm high branches on the mainstem.

Habitat: The plant is found worldwide, but it originated in China and Eastern Europe.

Production: Club Moss is the aerial part Lycopodium clavatum. It is collected in the uncultivated regions and air-dried or dried artificially at a maximum of 40° C.