Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(4): 328-331
Received: 13-05-2017
Accepted: 12-06-2017

Nikhil Deshpande
Department of Botany, R. D. & S. H. National College, Bandra (W), Mumbai, Maharashtra, India

Suchandra Dutta
Department of Botany, R. D. & S. H. National College, Bandra (W), Mumbai, Maharashtra, India

Correspondence
Nikhil Deshpande
Department of Botany, R. D. & S. H. National College, Bandra (W), Mumbai, Maharashtra, India

Characterisation of 'Dalchini': A case study on the market samples

Nikhil Deshpande and Suchandra Dutta

Abstract
'Dalchini' is a commonly used spice obtained from the bark of *Cinnamomum verum L.* and other species of *Cinnamomum*. It is used as spice as well as medicine. It is also recorded that excess use of 'Dalchini' can cause liver damage due to the presence of a compound named 'coumarin' in it. The present study deals with the chemical characterization of the market samples of 'Dalchini' obtained from Mumbai market and compared it with the market sample and authentic samples from Kerala.

Keywords: Dalchini, Market sample, True Cinnamon, Coumarin

Introduction

'Dalchini' is obtained from the inner bark of Cinnamomum verum J. Presl (Family: Lauraceae). It is an evergreen tree, native to SriLanka & Kerala and Karnataka.

The tree attains a height of 10-15 M. Leaves are ovate-oblong in shape and 7-18 cm long.

The flowers, arranged in panicles, have a greenish color and a distinct odor. The fruit is a purple, Icm drupe containing a single seed.

Bark quills from at least four *Cinnamomum* species have been used as cinnamon. The two most important are *Cinnamomum verum* (true cinnamon) from Sri Lanka and southern India and *Cinnamomum aromaticum* (cassia) from Burma and China. Throughout the history of cinna-mon these species have been intentionally, or unintentionally, confused; confusion which is main-tained today.

With the exception of Ceylon Cinnamon, *Cassia, Saigon* and *Korintje* Cinnamon are also classi-fied under the *Cassia Cinnamon* category because they are very similar to each other with only slight variations in color, taste, shape and Coumarin content.

Coumarin a substance known to cause liver damage, while Ceylon Cinnamon is the only soft and brittle Cinnamon with ultra-low Coumarin levels (Mol Nutr Food Res. 2010 Feb) [1].

Methodology

- Sample collection from various sources
- Macroscopic analysis & Photo documentation
- Microscopic analysis of Powder samples
- Characterisation (Fingerprinting) of collected samples using HPTLC

Sample Preparation for HPTLC (Ref. HPTLC Association)

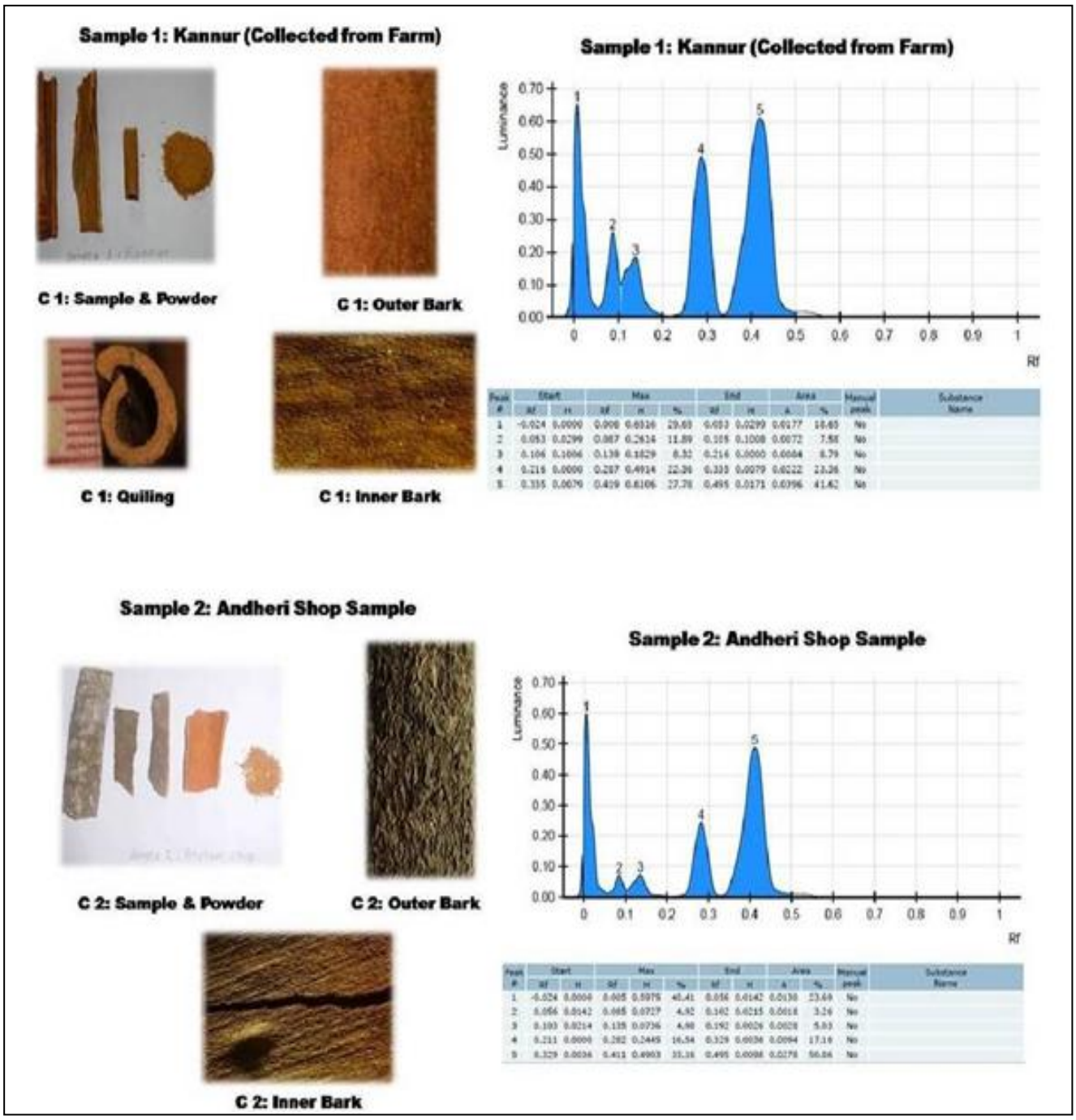
Mix 2 gm of powdered sample with 10 ml. of Methanol and sonicate for 10 min., then centrifuge, withdraw the supernatant, & evaporate to dryness under reduced pressure. Suspend the residue, with sonication, in 2 ml. of toluene, centrifuge, and use the supernatant as test solution.

Stationary phase: HPTLC Si 60 F 254
Application: 5 µL of test Solutions
Mobile Phase: Toluene, Ethyl acetate 19:1 (v/v)
Development: -Saturated chamber
-Developing distance 70 mm from lower edge
-Relative humidity 33%
Derivatization reagent: Anisaldehyde Reagent, & NP (Natural Product) Reagen
Documentation: 1. UV 254 nm
2. UV 366 nm
3. Anisaldehyde, white RT
4. Anisaldehyde, UV 366 nm

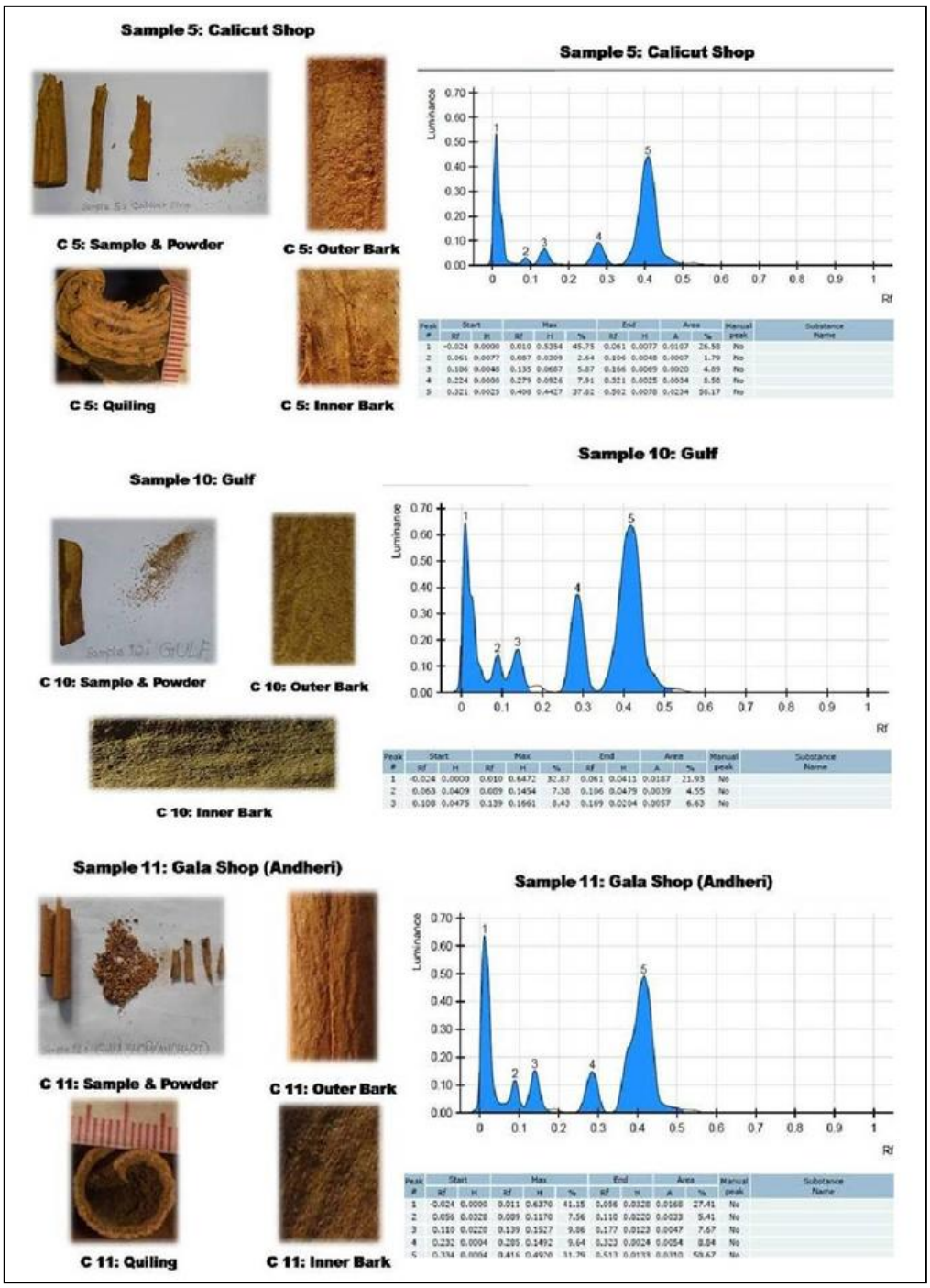
Macroscopy

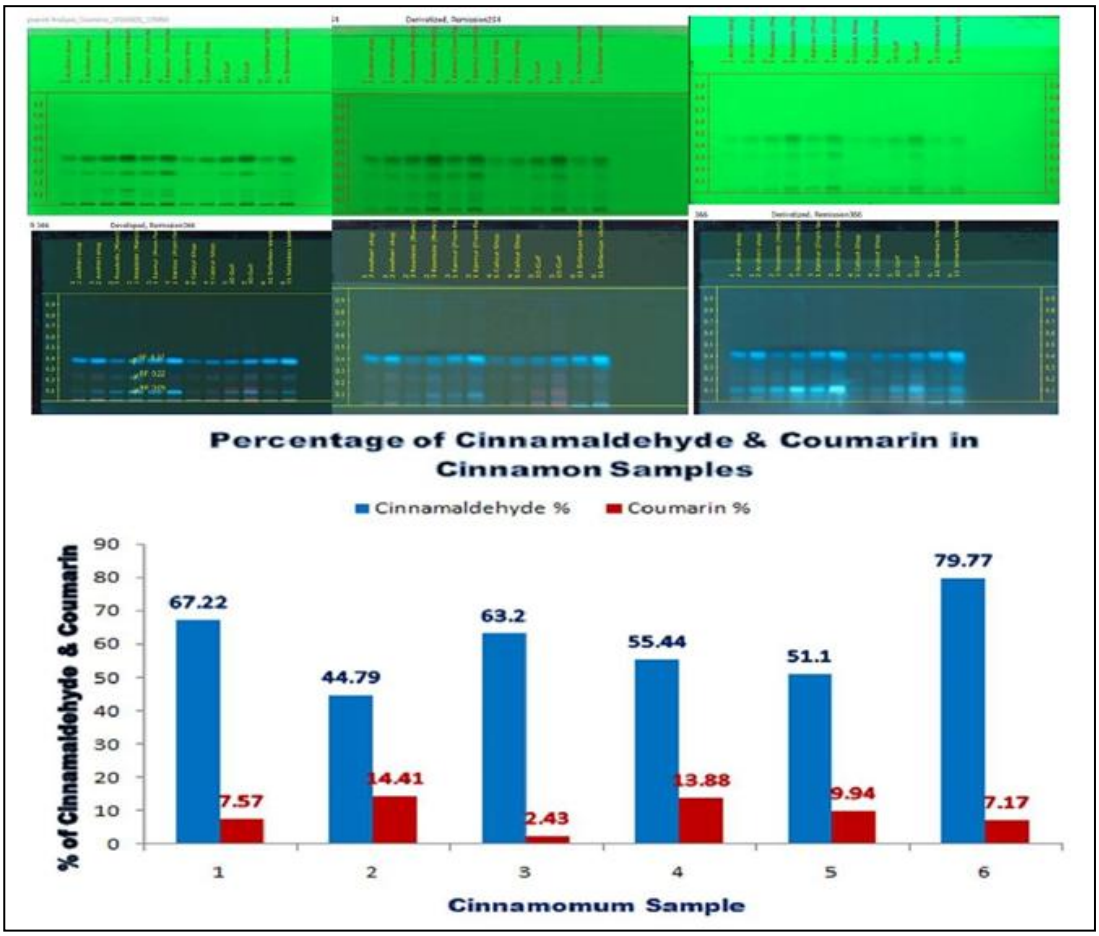
Sample no.	Outer bark		Inner Bark		Quill	Powder
	Color	Texture	Color	Texture		
1(Andheri Shop)	Reddish brown	Thinner than other samples, Comparatively smooth	Yellowish brown	Striated with Longitudinal reticulation	Single	All sample shows Starch granules Medullary rays, Phlo- em fibres, sclereids, oil cells 
2 (Marol)	Greyish brown	Thick, Rough, Worty	Brownish	Striated with longitudinal reticulation	Not seen	
3 (Kannur)	Greyish brown	Thick, Rough	Brownish	Striated with longitudinal reticulation	Double	
5 (Calicut Shop)	Brown	Thinnest of all samples, Comparative-ly smooth	Brown	Striated, pres- ence of flaky fibres	Compound	
10 (Gulf)	Brown	Thick, Worty	Greyish Brown	Striated with longitudinal reticulation	Not seen	
11 (Gala Shop)	Reddish brown	Thinner, Worty	Brown	Striated with longitudinal reticulation	Not Seen	

Fingerprinting of Cinnamon samples using




Sample 3: Marol (Road Side Shop)
C 3: Sample & Powder
C 3: Outer Bark
C 3: Quiling
C 3: Inner Bark
Sample 3: Marol (Road Side Shop)
Luminance
Rf


Sample 5: Calicut Shop
C 5: Sample & Powder
C 5: Outer Bark
C 5: Quiling
C 5: Inner Bark
Sample 5: Calicut Shop
Luminance
Rf
Sample 10: Gulf
C 10: Sample & Powder
C 10: Outer Bark
C 10: Inner Bark
Sample 10: Gulf
Luminance
Rf
Sample 11: Gala Shop (Andheri)
C 11: Sample & Powder
C 11: Outer Bark
C 11: Quiling
C 11: Inner Bark
Sample 11: Gala Shop (Andheri)
Luminance
Rf



Sample: 1: Andheri Shop (1), 2: Marol (2), 3: Kannur (3), 4: Calicut Shop (5), 5: Gulf (10) & 6: Gala Shop Andheri (11)

All the samples contain Volatile oil, Mucilage, Starch, Calcium Oxalate and Tannins.

Discussion & Conclusion

1. Except the Cinnamon from Kannur (Sample 3 and Gala Shop (Andheri—Sample No. 11) all other samples have slight pungent and aromatic in addition to sweet taste.
2. The sample from Kannur which was collected from the farm directly (Authentic one) has mod-erately high amount of Cinnamaldehyde but the least amount of Coumarin. Followed by the sample from Gala Shop (Andheri). This sample is supposed to be procured from Sri Lanka. But, both cross the permissible limit of Coumarin. Maximum tolerance limit of 2mg/kg speci-fied EC Directive 88/388/ECC (European Council, 1988).
3. As it is clear from the HPTLC, none of the sample belong to the true cinnamon (as evident from the comparison with the values for the contents of true cinnamon), i.e., Cinnamomum verum J. Presl. All the samples, which are procured from the market as well as collected from Farm in Kerala belong to some other species of Cinnamomum which are known substitute of Cinnamomum verum J. Presl. and are used as 'Dalchini"
4. The Road side samples (Sample 2) & Calicut Shop (Sample 5) are low in Cinnamaldehyde but, high in Coumarin. So, these should be avoided for use as spice on regular basis.

Future Scope

1. Screening of inner bark of the *C. verum* J. Presl. and cinnamon samples from various parts of Kerala & Sri Lanka (As Cinnamon is the native of Kerala , Karnataka and Srilanka) and com- pare with that of other countries for their cinnamaldehyde as well as coumarin content
2. Detailed work on the original *Cinnamomum verum* J. Presl. (The true dalchini) and their culti- vers to find out less poisonous cassia variety which then can be marketed.
3. Then develop their large scale cultivation practices across larger geographical areas thereby reducing the use of Cassia cinnamon which contains more amount of coumarin that harms Liv- er.

Acknowledgement

The authors are thankful to the Principal Dinesh Panjwani and Dr. Vibha Mehra, Head, Depart- ment of Botany, R. D. & S. H. National College, Mumbai for their support in the current project. Our sincere thanks are due to Mr. Prashant Hande & Ms. Shreya Bhide, Anchrom, Mumbai for their help in HPTLC Analysis; Mr. Hensal Rodrigues for his help in photography of the samples.

References

1. Abraham K, *et al.* Toxicology and risk assessment of coumarin: focus on human da-ta. Mol Nutr Food Res. 2010; 54(2):228-39. doi: 10.1002/mnfr.200900281.
2. Pruthi JS. Spice and Condiments. National Book Trust, 2001.
3. Khandelwal KR. Practical Pharmacognosy. Nirali Prakashan, 2008.
4. Sasidharan S, *et al.* (Extraction, Isolation and Characterization of Bioactive Com-pounds From Plants' Extracts. Afr J Tradit Complement Altern. Med. 2011; 8(1):1-10.
5. www.fssai.gov.inhttp://www.fssai.gov.in/Portals/0/FSSAI %20regulations.pdf
6. https://www.food.gov.uk/sites/default/files/final-report-cinnamon-containing%20foods.pdf