



University of
Reading

Taxonomy, Phylogeny and DNA Barcoding Strategies for Herbal Medicines

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Case studies

Berberis

- the regulatory context
- the authentication approach



Cistanche

- regulatory need
- research questions



Case study of *Berberis*



Medicinal plant products can be registered and marketed as herbal medicines

Guidance

Herbal medicines granted a traditional herbal registration

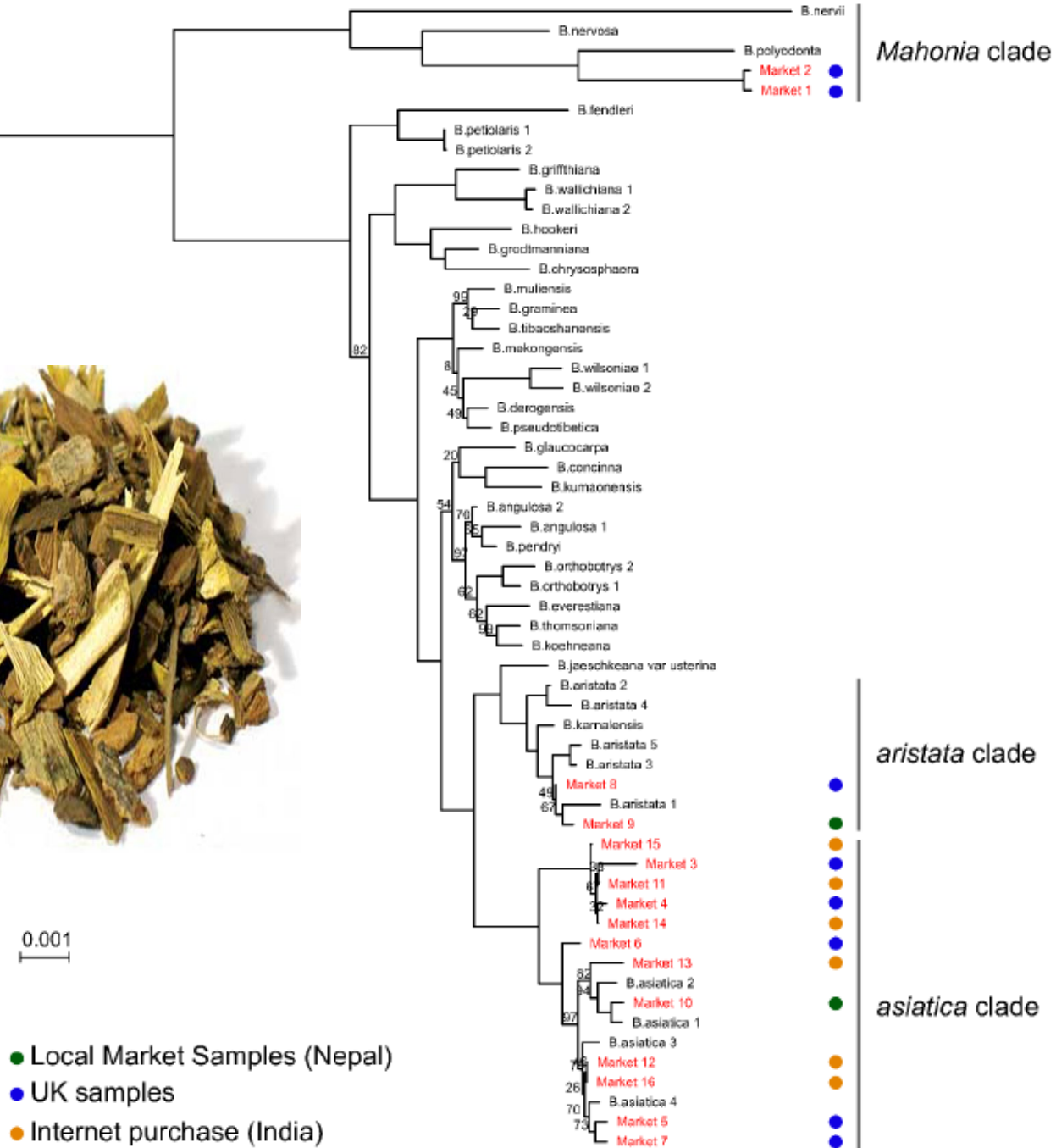
Updated 27 February 2018



THR12297/0013	14/04/2009	Laboratoires Arkopharma (France)	Harpadol Capsules	Devil's Claw Root (Harpagophytum procumbens (Burch.) DC.ex Meissn)	For the relief of backache, rheumatic or muscular pain, and general aches and pains in the muscles and joints, based on traditional use only.
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Phylogenomic approaches to DNA barcoding of herbal medicines: developing clade-specific diagnostic characters for *Berberis*

Marco Kreuzer¹, Caroline Howard², Bhaskar Adhikari³, Colin A. Pendry³ and Julie A. Hawkins¹



Position (bp)	<i>matK</i>				<i>ndhI-ndhG</i>			SSC_ noncoding2	
	755	857	976	1428	151	182	326	47	700
clade. 1	A	G	G	G	C	A	C	A	G
clade. 2	A	G	G	A	C	A	C	A	A
clade. 3	A	G	G	G	A	A	C	A	A
<i>aristata</i> – clade (4)	C	A	G	G	C	A	C	A	A
<i>asiatica</i> – clade (5)	A	G	G	G	C	C	C	A	A
clade. 6	A	G	G	G	C	A	C	A	A
clade. 7	A	G	A	G	C	A	C	A	A
SA clade (8)	A	G	G	G	A	A	C	A	A
<i>Mahonia</i> – clade (9)	A	G	G	G	A	A	A	C	A
	Test Samples								
Market1	A	G	G	G	A	A	N	C	A
Market2	A	G	G	G	A	A	N	C	A
Market11	A	G	G	G	C	C	C	A	A
Mixture1	A C 1:2	A G 1:2.4	G	G	C	A C 1:1.6	C	A	A
Mixture2	A C 1:7.3	A G 1:9.3	G	G	C	A C 1:6.9	C	A	A

Case study of Cistanche



Rou Cong Rong

Chinese Pharmacopoeia:

Cistanche deserticola

Cistanche tubulosa



The questions

1. Can processed material of *Cistanche deserticola* be discriminated from material of other species?
2. Is *Cistanche tubulosa* the right name for the alternative species recognised by the Chinese Pharmacopoeia, the species that is cultivated and traded?

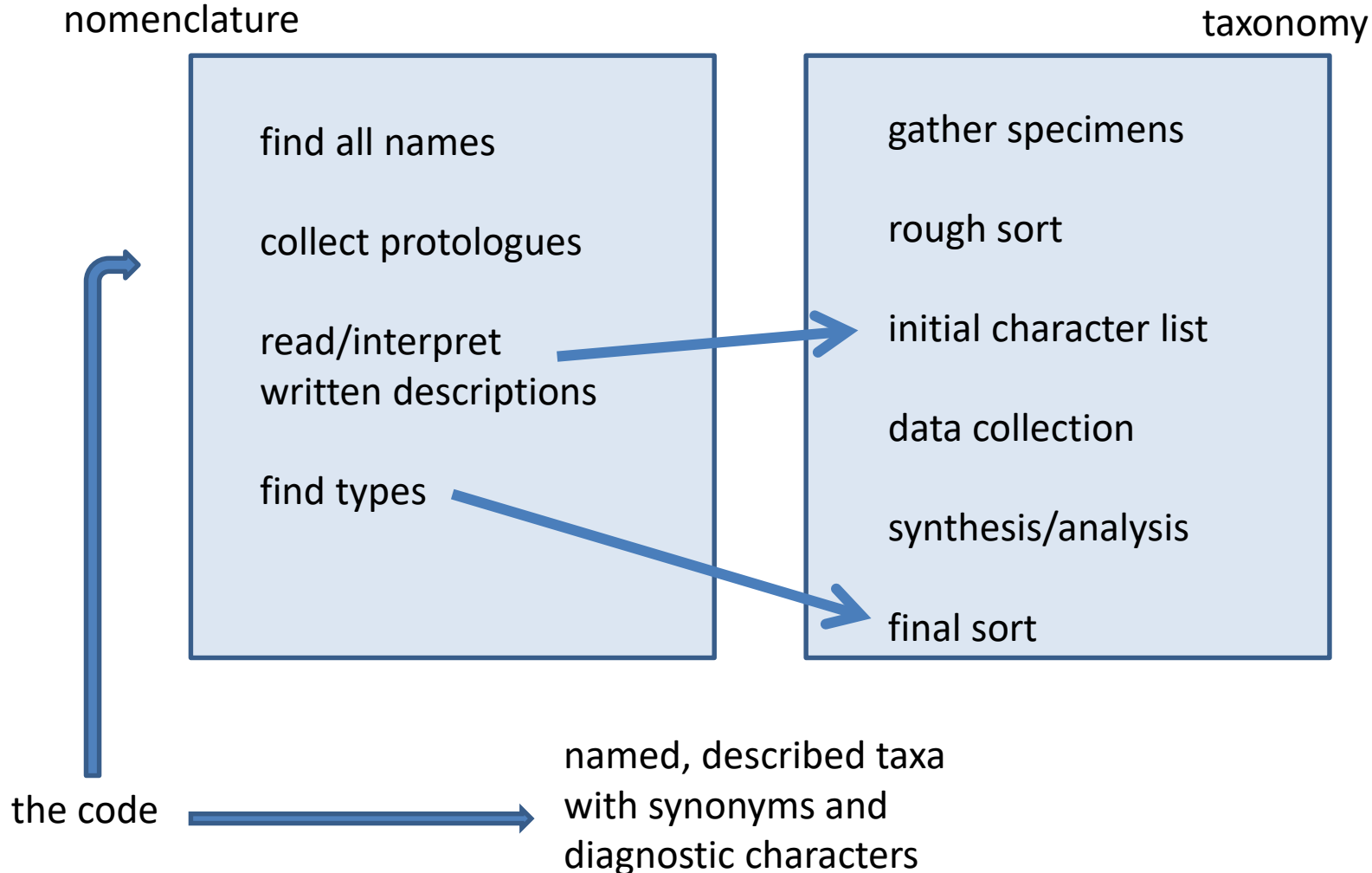
The questions

1. Can processed material of *Cistanche deserticola* be discriminated from material of other species? **PHYLOGENOMIC; BARCODING**
2. Is *Cistanche tubulosa* the right name for the alternative species recognised by the Chinese Pharmacopoeia, the species that is cultivated and traded? **TAXONOMIC**

Taxonomy

- Process of taxonomy – grouping, naming, describing, mapping, creating tools for identification
- Outputs of taxonomy - taxonomic monographs, flora treatments

Taxonomic approach





The questions

1. Can processed material of *Cistanche deserticola* be discriminated from material of other species?
**TAXONOMIC, PHYLOGENOMIC;
BARCODING**
2. Is *Cistanche tubulosa* the right name for the alternative species recognised by the Chinese Pharmacopoeia, the species that is cultivated and traded?
TAXONOMIC

Conclusions

- If there is a good taxonomy in place we can meet regulatory needs by
 - identifying traded plants
 - developing barcoding tools for authentication
- In the absence of a good taxonomy
 - Species limits need to be revised before traded plants can be identified and barcoding tools identified

Acknowledgements



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Dr Christine Leon, Royal Botanic Gardens Kew

Dr Chris Thorogood, Oxford Botanic Garden

University of Reading students: Charlotte Liu, Di Lei, Majed Aldughayman

Professor Lin-fang Huang, The Institute of Medicinal Plant Development (IMPLAD)

Professor Chen Liu, IMPLAD

