

Why is it best to be German? An investigation of *Ginkgo biloba* and other herbal products

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The European Directive for herbal medicines has significantly increased the quality, safety and reliability of traditionally used herbal medicinal products

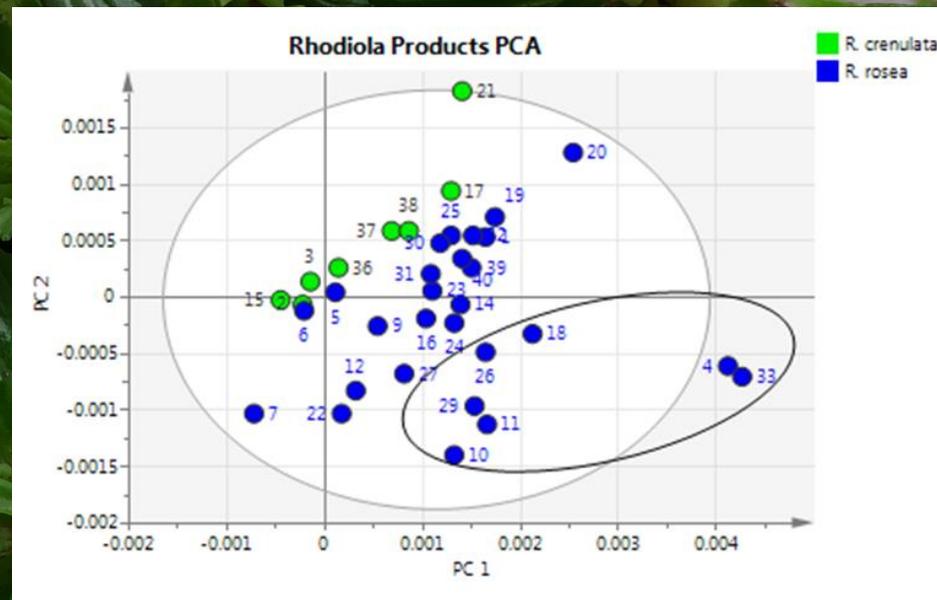
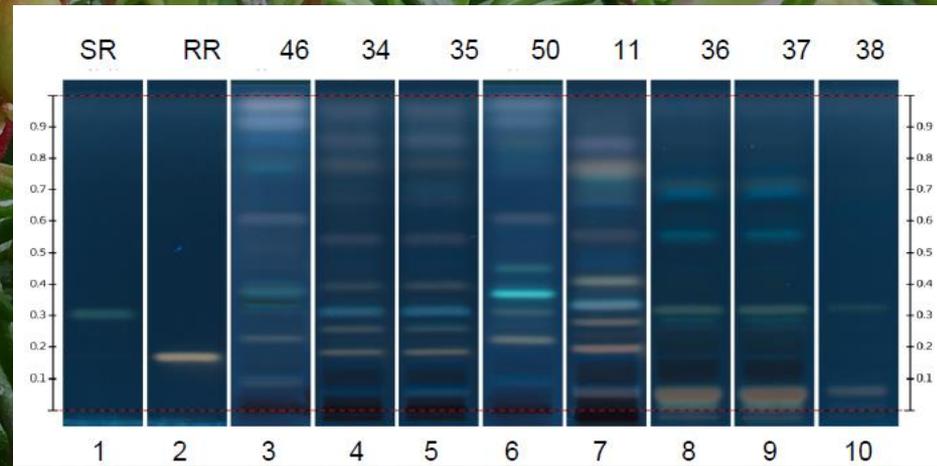




- Since the introduction of a traditional use registration system, the quality (and safety) of herbal medicinal products has improved significantly in the UK.
- However, research conducted at the UCL School of Pharmacy over the last 5 years has repeatedly demonstrated instances of poor quality and adulteration of products classed as herbal food supplements, also known as botanicals. Similar concerns about the various challenges related to adulterated herbs and botanical ingredients in commerce are now raised by professional and trade organisations and have recently been headline news in the USA and the UK.
- The reasons underlying the presence of these poor quality products are complex but appear to be either stemming from a commercial need to use the cheapest starting materials and use inadequate manufacturing processes or a widespread ignorance or misunderstanding of good practices, leading to a breakdown in quality management.



Our analysis of Rhodiola products showed that a quarter of products were adulterated with the wrong species.



Sample no.	Claim	Findings
2	Rhodiola rosea sourced in China	Not <i>R. rosea</i> , probably <i>R. crenulata</i>
3	Whole dried root of <i>Rhodiola rosea</i>	Not <i>R. rosea</i> , probably <i>R. crenulata</i>
8	<i>Rhodiola rosea</i> extract 2000 mg, wild-sourced from Siberia	Not <i>R. rosea</i> or any other <i>R.</i> species. Determined as 5-HTP and excipients
13	<i>Rhodiola rosea</i> root 1000 mg	Probably not <i>Rhodiola</i> species, appears adulterated
15	<i>Rhodiola rosea</i> plus multivitamins standardised to contain 3% rosavins and 1% salidroside	Not <i>R. rosea</i> , probably <i>R. crenulata</i>
17	<i>Rhodiola rosea</i> standardised to contain 1% salidroside	Not <i>R. rosea</i> , probably <i>R. crenulata</i>
21	<i>Rhodiola rosea</i> standardised to contain 1% salidroside	Not <i>R. rosea</i> , probably <i>R. crenulata</i> . Probable high sugar content

BOOKER, A., JALIL, B., FROMMENWILER, D., REICH, E., ZHAI, L., KULIC, Z. & HEINRICH, M. The authenticity and quality of *Rhodiola rosea* products. *Phytomedicine*.

TWO

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Do herbal supplements contain what they say on the label?

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The use of herbal products has increased dramatically in recent years, and as a nation, we spent over 117 million pounds on them last year alone.

Although herbal products are often perceived as 'natural' and therefore safe, many different side effects have been reported owing to active ingredients, side effects caused by contaminants, or interactions with drugs.

So how do we really know what we are taking? We wanted to find out whether herbal supplements actually contain the herbs they list on the label. Is what's on the bottle, what's in the bottle?

Dr Chris van Tulleken joined forces with Professor Michael Heinrich and Dr Anthony Booker from the University College London School of Pharmacy to test a range of the herbal products on sale in the UK and reveal the shocking truth about what's really in them.



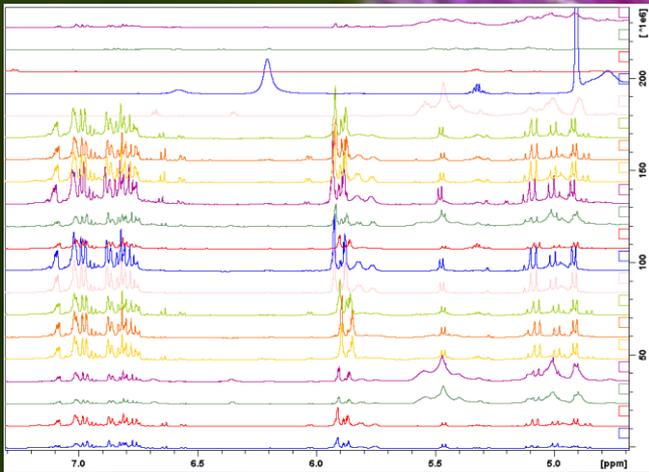
UNIVERSITY OF WESTMINSTER



Milk Thistle Products

36 % of Milk Thistle food supplements were adulterated or of poor quality

Some NMR scans (especially Top 6) show little trace of flavonolignans



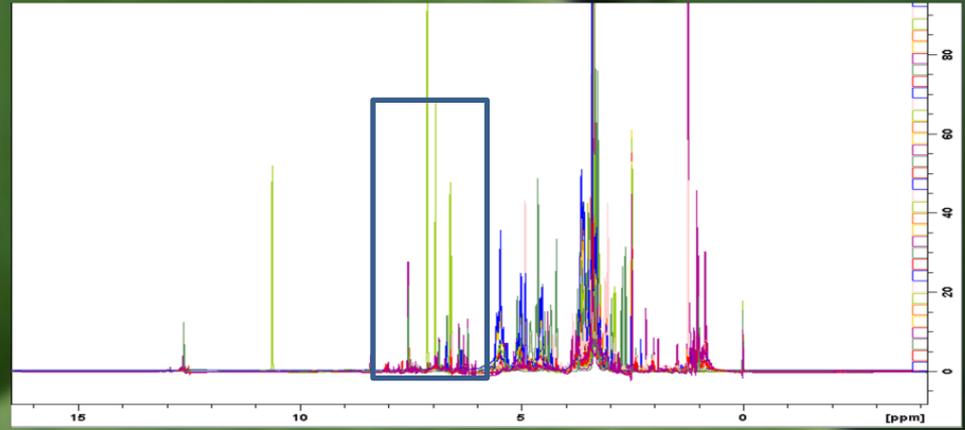
<http://www.bbc.co.uk/programmes/articles/4hX30rMYkMv9YjMTH38MY6/do-herbal-supplements-contain-what-they-say-on-the-label>



Ginkgo biloba Products



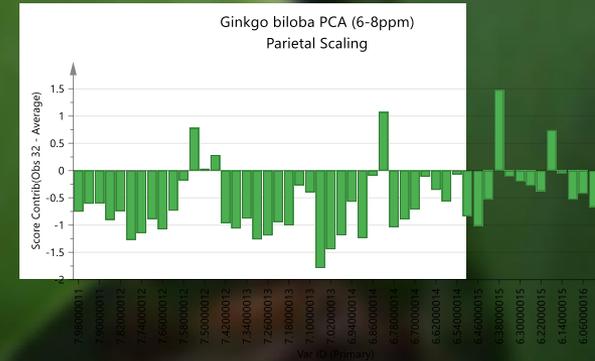
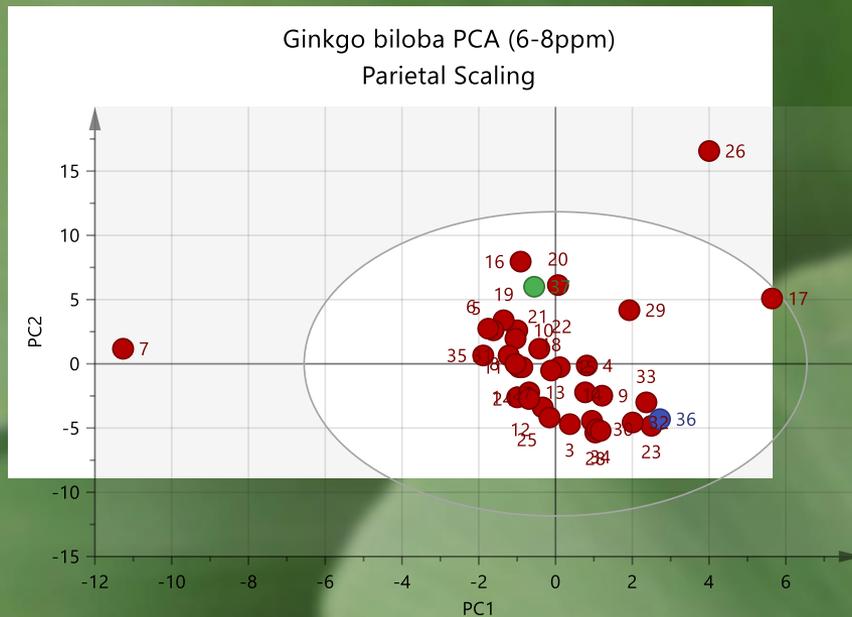
Ginkgo biloba Products



<http://www.bbc.co.uk/programmes/articles/4hX3OrMYkMv9YjMTH38MY6/do-herbal-supplements-contain-what-they-say-on-the-label>

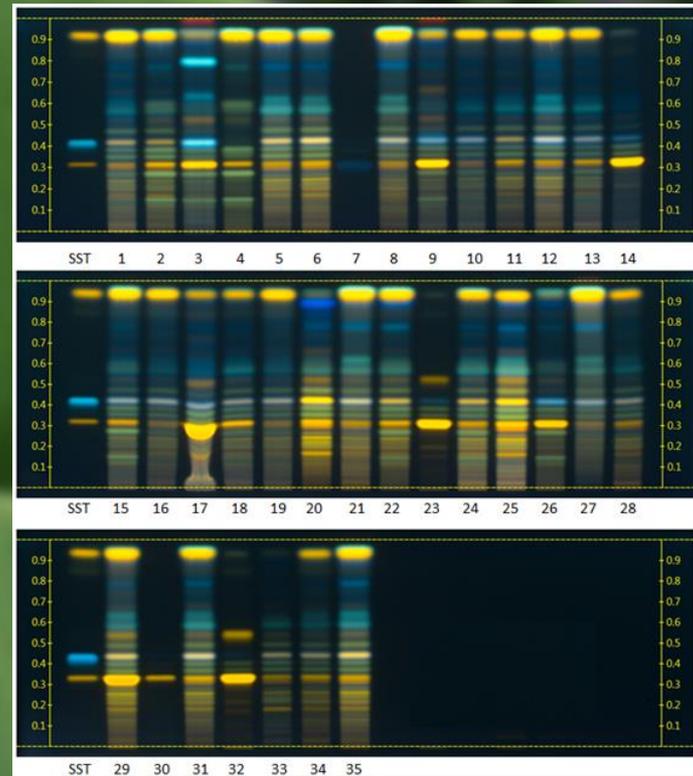
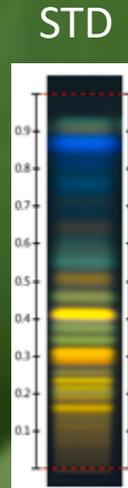


Ginkgo biloba Products



Ginkgo biloba Products

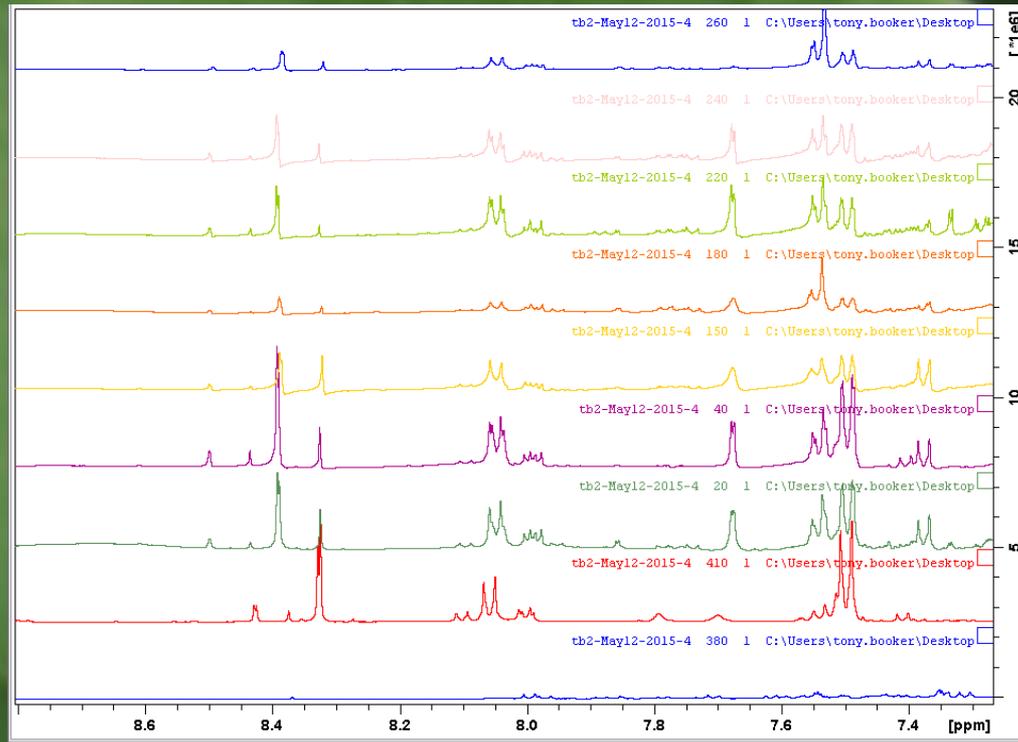
Out of the 35 samples analysed, only two samples - one from Germany (20) and one from Switzerland (33) can be regarded as satisfactory and many were found to contain elevated levels of rutin and quercetin and/or low ginkgo metabolite content when compared with the reference samples.



HPTLC chromatograms of products 1-35 under UV 366 nm after derivatisation. Evaluated with flavonoids method. SST: rutin, chlorogenic acid and quercetin with increasing RF values



Ginkgo biloba Products



We have started running the ginkgo samples against Sophora species – these samples tested positive for sophora (Fruit - 410), the bottom one 380 is the EGB 761 standard extract



Ginkgo biloba Products



Conclusions

33 of 35 samples were found to be adulterated, contain elevated levels of rutin, quercetin, (Incorrect species, e.g. *Sophora japonica*) or have low ginkgo metabolite content when compared with the reference samples. We propose that these samples have either been adulterated or have been produced using poor extraction techniques.



Conclusions:



- Many products appear to contain little of what is declared on the label and some appear to be adulterated – either through poor manufacture or deliberately.
- Herbal medicines and especially food supplements vary greatly in their phytochemical composition. The quality of herbal medicines are better controlled when part of a regulatory licensing strategy as implemented by The European Union.
- Herbal products originating in Germany (and Switzerland) appear to be of superior quality to many food supplements manufactured and sourced within the UK.

Thank You for Your Attention



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