timatic

Report for Timatic Ltd

Analysis of plant extracts generated by Timatic series extractors

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aim

To compare extracts produced by the Timatic series of extractors (manufactured by Tecnolab, Italy, and distributed in the UK by Capix Ltd) to those prepared by current standard extraction methods.

The Timatic Micro 1 Litre Extractor that was used for the trial

results

- PhytoInnovations purchased dried root material from Echinacea purpurea from the Organic Herb Trading Company, UK.
- The material was ground in a basic coffee bean grinder, to simulate how the material might be treated by a Timatic client. This reduced the material to a fine particle size, a significant proportion of this was less than 50 microns.
- One portion of the material was extracted by a traditional method (soaking in 10 volumes of 60% ethanol in water) for the time period of 3 hours. The actual amounts used were 10g Echinacea, 127ml solvent (to match the ratio used in the Timatic, see below).
- The other portion of plant material was extracted using the 1L Timatic. Timatic settings selected were 3 min pressure on, 3 min pressure off for 3 hours (i.e. 30 cycles). Discharge time was set to 9 min but not all this was required as the extract discharged easily. As the Timatic had to be filled completely, with 100g Echinacea in the bag, 1270ml solvent had to be used to fill the extraction chamber.
- After 3 hours, the extracts were both filtered using standard Whatman brand filter paper.
- A 1ml aliquot of equal volume of each was taken for HPLC, and then 40ml of each extract was used to calculate the total dry weight of extracted material. The 40ml aliquots were dried down at 50°c on a Rotary Evaporator to remove all solvent (ethanol and water), and the residue weighed. See table of results overleaf.

The 50 micron Filter Bag containing the solvent saturated Echinacea is removed from the Timatic Extractor

- Each extract was analysed by HPLC, for two marker compounds (vis. American Herbal Pharmacopoeia) of Echinacea purpurea, cichoric and caftaric acid. The yield of marker compounds from basic extraction versus Timatic was compared simply on the basis of relative area of the peaks appearing on the HPLC traces. Cichoric acid was identified by comparison of the retention time with that of a "standard" sample of the compound. Caftaric acid was identified by comparison with its known retention time according to previous literature. See table of results overleaf.
- Photographs taken of the extraction process have been supplied on CD.

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table of results

	Dry weight of extract		Concentration of cichoric acid (arbitrary units – see below)	
	(A)	(B)	(C)	(D)
Standard extraction	0.516g	100	24	100
Timatic extraction	0.508g	98.4	28	108
% increase by Timatic	-1.6		8	

Column (A) represents the dry weight obtained from 40ml of each extract

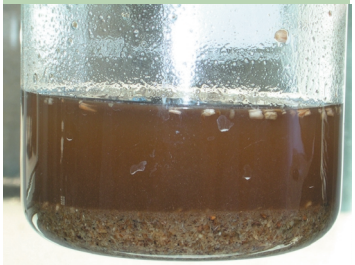
Column (B) represents the dry weights after the values have been "normalized" with respect to the control data (for the standard extraction) i.e. if the standard extraction yields 100%, what does the Timatic extraction represent.

Column (C) represents the actual HPLC peak areas measured (arbitrary units)

Column (D) represents the peak areas after the values have been "normalized" with respect to the control data (for the standard extraction) i.e. if the standard extraction yields 100 %, what does the Timatic extraction represent.

Caftaric acid was present in both extracts, but not in large enough amounts to quantify peak size reliably.

The pre-filtered output from the Timatic Extractor



The unfiltered control sample from the maceration

conclusion

- In this preliminary study, using the materials, methods and Timatic settings specified, the Timatic 1L gave a similar yield of total dry extract to conventional maceration methods. The levels of the marker compound (and possible bioactive), cichoric acid were increased by 8 %.
- Members of the PhytoInnovations group found the Timatic convenient to use, easy to clean, and the spent material was easily disposed of with minimal mess. Furthermore, as the extract was squeezed through the sample bag, it was already partially filtered (and only contained particles < 50 microns).

Timatic series Solvent Extractors offer a modern, economical and production efficient system for extracting substances of interest from plant and other botanical materials.

The extraction cycle is normally made at room temperature and the extract obtained maintains all natural properties of the material used.

This advanced technology from Timatic can use any type of solvent (alcohol, water, glycerine etc) and is based on the double effect of pressure/decompression and forced percolation of the plant or botanical material.

Marketing information from Timatic Ltd

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