

BRITISH PHARMACOPOEIA COMMISSION
Panel of Experts DNA: Identification Techniques
SUMMARY MINUTES

A meeting of this Panel was held at 151 Buckingham Palace Road, London, on 8th of June 2016.

Present: Dr K Helliwell (Chairman), Dr E Mee, Prof. A. Slater and Prof. J Hawkins.

In attendance

NIBSC: Dr C Howard, Ms C Lockie-Williams, Ms C Gkouva and Mr L Gibson.

BP Secretariat: Dr P Holland, Dr R Pask-Hughes and Mr M Whaley.

Apologies for absence were received from Dr I Feavers and Prof. E M Williamson.

55 **INTRODUCTORY REMARKS**

Welcome The Chairman welcomed members to the meeting, in particular Ms Gkouva who was attending her first meeting. Ms Gkouva qualified as a pharmacist in Greece before commencing an MSc in Phytochemistry of medicinal plants at University College London.

Declaration of Interests Participants were asked to declare any interest they might have, where appropriate, before the start of the discussion of each paper.

I **MINUTES**

56 The minutes of the meeting held on 28th of January 2016 were confirmed.

II **MATTERS ARISING FROM THE MINUTES**

57 A list of matters arising from the minutes of the meeting of the WP (DNA) held in January 2016 was circulated together with the papers for this meeting. A copy is appended.

58 **WORK IN PROGRESS**

Herbal Project Progress Report Activities to deliver the expanded objectives of the herbal project were noted. A dedicated chemistry Laboratory was to be built and two additional members had joined the team at the BP-NIBSC Laboratory. For the physical testing of herbal drugs, a microwave furnace was in place and the validation work was to follow.

Drimia maritima Members were informed that DNA extraction from samples had been extremely problematic due to the presence of an abundance of polysaccharides. Some success had been achieved with a small number of samples producing PCR products and the plan was to trial different additives in the DNA extraction process and perhaps multiple PVPP steps. It was suggested that perhaps the initial work and the setting up of

the library database could be done using data from leaves and the method optimised for the bulb, which was the item of commerce. The BP-NIBSC Laboratory did not have access to leaf material, so were unable to pursue this. The genus *Drimia* was highly complex taxonomically and as such difficult to find relevant published data. It was commented that the work was necessary in order to improve the identification of the species used in medicines. The target species was that with the lowest levels of cardiac glycosides.

Mentha spicata 16 samples of spearmint aerial parts had been received and 2 seed samples were being germinated. These would be analysed by molecular methods. It was commented that the chloroplast might not be that of *M. spicata* due to complexity in hybridisation. It was advised that National Collections might be a useful source of acquiring the correct species. In acknowledging that the phylogeny would be important members anticipated that the analysis would be challenging. The phytochemistry data from both the BP and the BP-NIBSC Laboratory should help in the identification.

Tribulus terrestris 18 samples had been prepared for analysis by molecular methods. DNA extraction had been successful from all samples with no dilution or purification steps necessary.

III REPORTS AND CORRESPONDENCE

59 Membership *Panel DNA (16) 11

The Chairman acknowledged that this would be his final meeting as both the Chairman and a member of the Panel. He thanked the experts and the BP and NIBSC Herbal team for their hard work and considered that the work-to-date had been a great success. Prof. Slater had accepted an invitation to be the next Chairman of the Panel and he hoped to continue the success and productivity of the Panel. The need to increase the membership was discussed. However the merits of working with a limited number of people were acknowledged. Dr Hawkins considered that a taxonomist might be a useful addition and this was accepted. Both Dr Holland and Dr Howard thanked Dr Helliwell for his hard work and dedication to the work of Panel DNA.

60 Work Programme Panel DNA (16) 12

A provisional work programme of the BP-NIBSC Laboratory was received and members were invited to discuss the species listed. For clarity, it was suggested dividing the list into 2 categories: herbal drugs to be analysed by molecular methods and those to be analysed by chemical methods. It was agreed that molecular data for items scheduled for chemical analysis only would still be of value. As for instance it was intended to include monographs for Capsicum preparations in material for publication in the BP 2018. The tests methods had already been validated and as such generation of molecular data to demonstrate the botanical identification of *Capsicum* used for the preparations was not necessary. However, molecular data on *Capsicum* would be a useful addition to a BP database to be developed at a future date.

- 61 **Order of Reference Barcoding Sequence** Panel DNA (16) 13

Members had previously agreed that reference barcode sequence for herbal drugs generated at the BP-NIBSC Herbal Laboratory would be used in BP publications in one of two ways; either within the monograph as an identification method or presented within a supplementary chapter titled "DNA barcoding as a tool for botanical identification of herbal drugs". The order of presentation would be barcode regions in alphabetical order, and, within the regions the monograph titles would be in alphabetical order. It was noted that BP Supplementary chapters were provided for assistance and information for users of the Pharmacopoeia.

- 62 **Quality System Plan** Panel DNA (16) 14

It was reported that the expansion of the Herbals project had extended the work to cover not only molecular analyses but also phytochemical analyses. With the increased scope and impact of the work, the requirement for the implementation of a recognised Quality System for the BP-NIBSC Herbal Laboratory had come into focus. Work was progressing towards the implementation of the ISO 9001 system within the BP-NIBSC Laboratory. The target date for all the appropriate protocols to be brought into compliance with ISO 9001 was before September 2017. This allowed for the certification to be in-line with the revised ISO 9001 guideline compliance date. Attainment of such a certificate should increase stakeholder confidence in the work of the laboratory. The Chairman endorsed seeking the acquisition of the ISO 9001 certificate. A member commented that he had experience of ISO 17025 and he too endorsed the proposal to work towards compliance with ISO 9001. He suggested consideration should also be given to using the LIMS system at the NIBSC and this was noted.

- 63 **New BP Supplementary Chapter** Panel DNA (16) 15

A copy of the finalised draft text of the new Supplementary chapter titled "DNA Barcoding as a Tool for Botanical Identification of Herbal Drugs" to be published in the BP 2017 was presented. Two editorial amendments were proposed and accepted.

IV **MONOGRAPHS IN PROGRESS (by EAG HCM)**

- 64 ***Galium aparine* (Clivers; Cleavers)** Panel DNA (16) 16

Work was in progress to identify the optimal barcode region for the identification of target species.

- 65 ***Myristica fragrans*** Panel (DNA) (16) 17

Work was in progress to identify the optimal barcode region for the identification of target species.

66 ***Phyllanthus amarus*** Panel DNA (16) 18

Work was in progress to identify the optimal barcode region for the identification of target species.

67 **Appendix XI V Deoxyribonucleic Acid
(DNA) Based Identification Techniques for
Herbal Drugs** Panel (DNA) (16) 19

Revision to Appendix XI V As was agreed at the January 2016 meeting, a worked example for *Anethum graveolens* Sowa based on the *ITS2* barcode region was presented. This was reviewed with the intention of adding it to the *trnH-psbA* example in the published BP Appendix XI V by means of the BP 2018.

Production Plan for ITS2 BPNARM Both the design and the proposed production plan were accepted by members. It was commented that there were areas where optimisation may need to be applied to the proposed method. It was agreed that any further comments on the proposed production plan should be sent to Mrs Lockie-Williams before end of June 2016.

68 **Any Other Business**

Closing remarks Dr Helliwell wished Prof. Slater, the Chair-elect for Panel DNA all the best. Dr Atkinson thanked Dr Helliwell for his contributions in leading the herbal project and also for his wider contributions to the work of the BP.

Date of Next Meeting Wednesday, 22nd of February 2017.

Note:

*At the meeting of the BP Commission held in March 2016, the proposed change in status of the "Working Party" to that of "Panel of Experts" was endorsed with immediate effect. The number sequence in this set of minutes is a continuation from the Minutes of the WP meetings held between June 2014 and January 2016.

II MATTERS ARISING FROM THE MINUTES (*not on the agenda*)

Minute 30:Deoxyribonucleic Acid (DNA)-Based Identification Techniques for Herbal Drug Preparations and Herbal Medicinal Products	The plans for an investigation into the applicability of DNA testing to the variety of herbal preparations on the UK market will be presented at the earliest opportunity.
Minute 31 Operational and Strategic Plans	<p>A target herbal drug for qPCR investigation will be selected at the earliest opportunity.</p> <p>Collaboration to progress the work on Black Cohosh will progressed at the earliest opportunity.</p>
Minute 34 <i>Ocimum gratissimum</i> and <i>Ocimum tenuiflorum</i>	Progress of work is subject to acquisition of requisite number of batches of <i>O. gratissimum</i> .

Acronym/Synonym	Name
APhI	Ayurvedic Pharmacopoeia of India
ATA	Ayurvedic Trade Association
BHomP	British Homoeopathic Pharmacopoeia
BP	British Pharmacopoeia
BP (Vet)	British Pharmacopoeia (Veterinary)
BP Commission	British Pharmacopoeia Commission
BPCx	British Pharmaceutical Codex
BPCRS	British Pharmacopoeia Chemical Reference Substance
BS	British Standard
BHMA	British Herbal Medicine Association
BLAST	Basic Local Alignment Search Tool (an NCBI database-GenBank)
BOLD	Barcode of Life Database
CMPACC	Chinese Medicinal Plants Authentication and Conservation Centre (Kew)
CEP	Certification Procedure for the European Directorate for the Quality of Medicines
CHM	Commission on Human Medicines
CP	Pharmacopoeia of the People's Republic of China
CRS	Chemical Reference Substance
DNA	Deoxyribonucleic Acid
EAG	Expert Advisory Group
EPC	European Pharmacopoeia Commission
EPCRS	European Pharmacopoeia Chemical Reference Substance
EU	European Union
FDA	Food and Drug Administration
FIP	International Pharmaceutical Federation
FoI	Freedom of Information
GC	Gas chromatography
HAB	German Homoeopathic Pharmacopoeia
HCM	Herbal and Complementary Medicines
HKCMMS	Hong Kong Chinese Materia Medica Standards
HMPC	Herbal Medicinal Products Committee
HPTLC	High Performance Thin Layer Chromatography

ICH	International Conference on Harmonisation
ICMM (China)	Institute of Chinese Materia Medica
IR	Infrared
ISO	International Organisation for Standardisation
JP	Japanese Pharmacopoeia
LC	Liquid chromatography
LD	Licensing Division
LGC	Laboratory of the Government Chemist, Teddington
LIMS	Laboratory Information Management System
LR	BP Laboratory Report
MAIL	Medicines Act Information Leaflet
MEGAN	MEtaGenome ANalyzer
MHRA	Medicines and Healthcare products Regulatory Agency
MPNS	Medicinal Plant Names Services - Royal Botanic Gardens, Kew
NGS	Next Generation Sequencing
NIBSC	National Institute for Biological Standards and Control
NPA	National Pharmacopoeial Authority
OMCL	Official Medicines Control Laboratory
qPCR	Quantitative Polymerase Chain Reaction
Ph Eur	European Pharmacopoeia
PMU	Pharmacy Medicines Unit – to be confirmed
PVPP	Polyvinylpyrrolidone
QSIMP	Quality Standards of Indian Medicinal Plants
SOP	Standard Operating Procedure
SPC	Special Product Characteristics
TCM	Traditional Chinese Medicine
TGA	Therapeutic Goods Administration, Australia
THMPD	Traditional Herbal Medicinal Products Directive
TLC	Thin layer chromatography
UK	United Kingdom
UKD	United Kingdom Delegation [to the European Pharmacopoeia]
USP	United States Pharmacopeia
UV	Ultraviolet
WHO	World Health Organization

