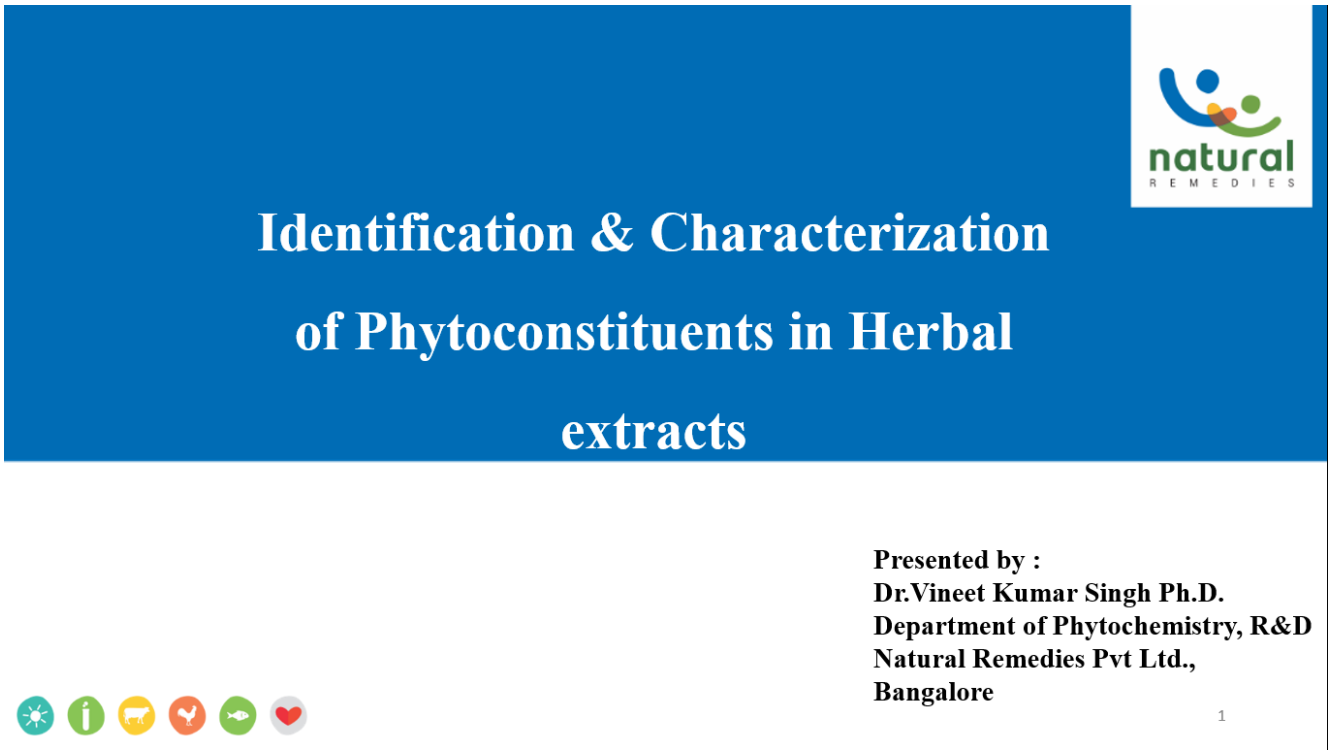
MANIPAL COLLEGE OF PHARMACEUTICAL SCIENCES
MANIPAL
(A constituent institution of MAHE, Manipal)

Department of Pharmacognosy

Guest Lecture pictures

""Identification & Characterization of Phytoconstituents in Herbal extracts" By Dr Vineet Kumar Singh, Senior Manager – Phytochemistry (R&D), Natural Remedies Pvt Ltd. Bengaluru India.



Natural Remedies Pvt Ltd

NRPL

Herbal Animal Health Products (AHP) Division

- The leader in AHP market in India

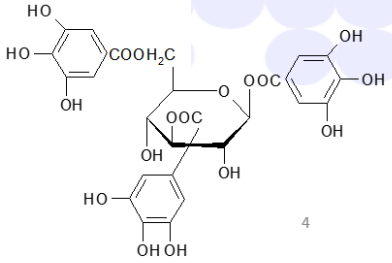
Herbal Human Product Division

- Standardized herbal extracts
- Clinically validated herbal products
- Phytocompounds

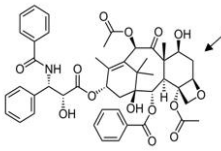
BacoMind® Kalmcold™ Gutgard® OciBest®

Major activities of Phytochemistry department

- Development and Standardization of extraction procedures for herbs
- Isolation and Characterization of phytochemical reference substances (markers/ active marker)
- Bio-activity guided fractionation- Identification of active constituents in the extract



Chemicals, Biologics and Botanicals



Biotechnology products
Proteins, Peptides, Hormones

98-100%
chemistry known

Typically, single
chemical entities

Different challenges

2 to 40%
chemistry known

Complex mixtures (typically >1000)

Primary metabolites
(Ex: polysaccharides)

Secondary metabolites
Ex: Flavonoids

Different challenges

General scheme of Isolation of phytoconstituents

Steps involved in generation of reference standards

- **Isolation of phytoconstituents**
- **Structure determination / confirmation**
- **Chromatographic purity determination**
- **Certificate of analysis**

Herb (Kg)

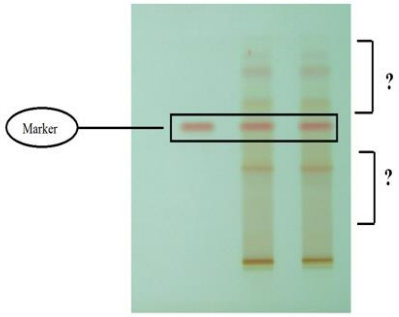
Preparation of extract (g)

Broad fractionation (liquid / liquid etc.)

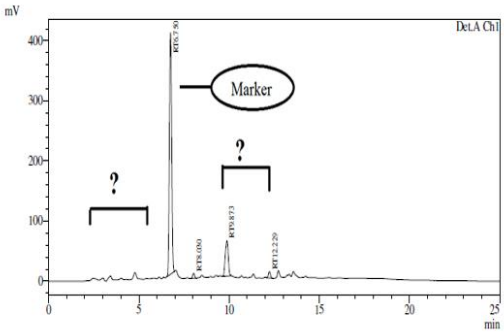
Preparative chromatography (column, HPLC etc.)

Final Purifications (Prep. HPLC etc,.)

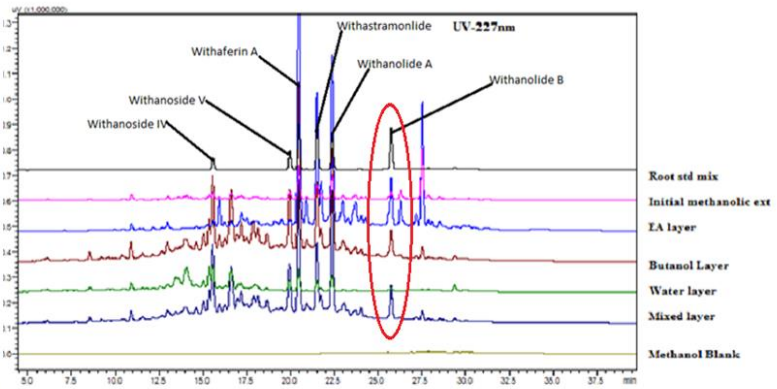
Pure compound (mg)



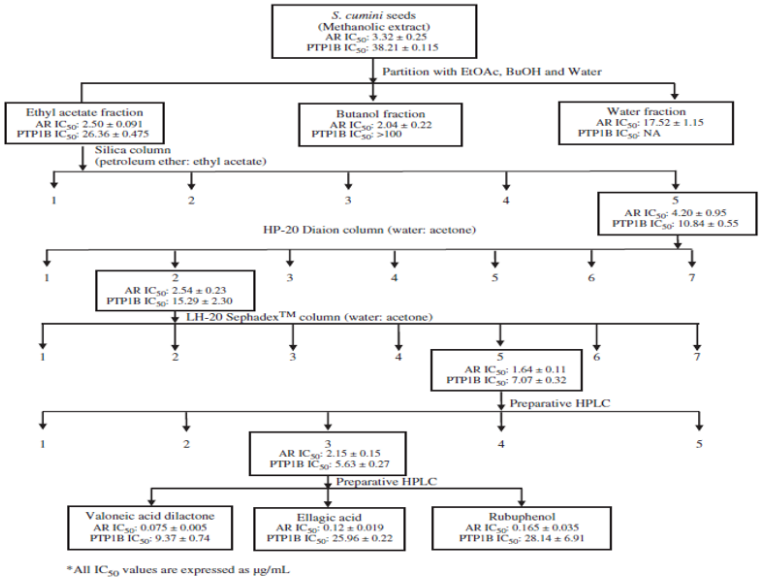
TLC profile of fractions



HPLC profile of fractions



Bioactivity Guided Fractionation of *Syzygium cumini* seeds



*All IC_{50} values are expressed as µg/mL

Reference:- Laxman Sawant *et al.*, "Aldose reductase and protein tyrosine phosphatase 1B inhibitory active compounds from *Syzygium cumini* seeds" Pharm Biol, 2015; 53(8): 1176–1182.

HPLC Fingerprint of *Withania somnifera* commercial extracts