Ayurveda en de overgang

De uitleg over het effect van ayurvedische kruiden tijdens de menopauze

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De in deze uitgave opgenomen kennis en informatie is voor geïnteresseerden en mag op geen enkele wijze als instructie voor therapie of als diagnose in medische zin worden opgevat zonder advies van het Ayurveda college.

Waarschuwing:
Voor een verantwoorde toepassing en dosering van alle in dit boek genoemde remedies en kruiden dient u zich altijd tot uw arts, erkend therapeut of Ayurveda College te wenden.

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Inhoud

Wat is Ayurveda?

Ayurveda betekent letterlijk "kennis van het leven" en is de oudste nog bestaande vorm van geneeskunde ter wereld.

Ayurveda is 4500 tot 5000 jaar geleden in het noorden van India ontstaan. In deze beschaving ontwikkelde zich een kennis van een lang en gezond leven. Kennis van gezondheid en ziekten, over de werkzaamheid van kruiden en over het belang van goede voeding en hygiëne.

Al deze kennis werd van generatie op generatie doorgegeven. Op het moment dat de schrijfkunst ontdekt werd, werd het op schrift gesteld. Op palmbladeren werd beschreven welke strategieën toegepast moesten worden om bepaalde kwalen te genezen. De teksten waren op rijm en bevatten een compleet geneeskundig systeem.

Ayurveda is zich in India altijd blijven ontwikkelen en heeft een grote invloed gehad op de ontwikkeling van de Griekse en Chinese geneeswijzen. In deze culturen ontwikkelde Ayurveda zich op een eigen manier en vermengde zich met al bestaande kennis. In India wordt Ayurveda op universitair niveau onderwezen. In het Westen wordt Ayurveda nu ook steeds meer toegepast.

Op dit moment maakt ruim 1 miljard mensen (17% van de wereld-bevolking) gebruik van deze -een door de WHO (World Health Organization) erkende- geneeskunde.

Kruiden
"In balans zijn" is kenmerkend voor Ayurveda. Dit evenwicht is op diverse manieren te bewerkstellingen, o.a. door gebruik te maken van massages, therapieën, voeding en kruidenpreparaten.

Ayurveda is de oosterse kruidenleer. Ayurveda kent vele kruiden die in de keuken worden gebruikt, niet vanwege hun lekkere geur, smaak of kleur, maar vanwege de speciale werking die ze op het lichaam hebben: gember en venkel verbeteren de spijsvertering, nootmuskaat is vocht afdrijvend enz. Samenstellingen van verschillende kruidencombinaties worden beschreven in de oude Ayurveda literatuur. Deze preparaten werden en worden gebruikt ter bestrijding en ter preventie van allerlei uiteenlopende kwalen.

Het doel van Ayurveda is om de verstoorde balans in het lichaam te herstellen. In feite geneest het lichaam zichzelf, de kruiden helpen het lichaam in evenwicht te brengen. Ayurveda pakt niet alleen de kwaal aan (symptoom-bestrijding) maar tegelijkertijd wordt gewerkt aan herstel van het evenwicht in het lichaam, zodat toekomstige aanvallen van de kwaal worden voorkomen, minder ernstig zijn en niet zo vaak optreden.

Wat doet het Ayurveda college?

Ayurveda College biedt uiteenlopende opleidingen, trainingen en workshops voor verschillende doelgroepen zoals artsen, therapeuten, voedings-deskundigen en leken.

Ayurveda College biedt opleidingen die in het teken staan van de natuurlijke geneeskunde en met name Ayurveda, de oudste gezondheidsleer op aarde.

Ayurveda College werkt samen met gerenommeerde Internationale Ayurveda Instituten en Ayurveda artsen wereldwijd.

Ayurveda College geeft Monogrammen uit van uiteenlopende ayurvedische preparaten om bij te dragen aan de ontwikkeling van Ayurveda.

Wat is “in de overgang”?

Iedere vrouw heeft vanaf haar geboorte miljoenen eicellen. Tijdens de puberteit zorgt de hormoonhuishouding ervoor dat de eierstokken (hierin zijn de eicellen opgeslagen) oestrogeen aanmaken. Dit hormoon ontwikkelt de vruchtbaarheidskenmerken. Hierdoor vindt er iedere 30 dagen een rijping van een eicel plaats. Indien deze eicel niet bevrucht raakt, wordt deze afgestoten en is de vrouw ongesteld. In de tweede helft van de cyclus maken de eierstokken progesteron aan; dit hormoon houdt de groei van het baarmoederslijmvlies onder controle.

Na verloop van jaren zal dit proces langzaam afnemen. De oestrogeenproductie neemt dan ook af en aan de maandelijkse menstruatie komt een einde. De menstruaties zullen niet abrupt stoppen maar worden vaak in het begin van de overgang wat onregelmatig. De laatste menstruatie noemt men ook wel “menopauze” (Grieks voor meno = maand pauze = ophouden.) Oestrogeen dient niet alleen voor vruchtbaarheid maar heeft nog meer functies, het zorgt ook voor een goede werking van diverse organen en is van groot belang voor de ontwikkeling van de botten en weefsel, zoals de huid. Oestrogeen is en blijft dus een belangrijk hormoon. Daarom zorgt het lichaam ervoor dat oestrogeen op een andere plaats geproduceerd wordt, namelijk in het vetweefsel. Hier wordt veel minder oestrogeen aangemaakt dan in de eierstokken; het lichaam zal hierdoor aanpassingsproblemen krijgen.

Het onregelmatig aanmaken van zowel oestrogeen als progesteron zijn de belangrijkste hormonen die voor de overgang verantwoordelijk zijn.

De overgangsklachten worden dus vaak veroorzaakt door vermindering van de hoeveelheid oestrogenen in het lichaam.

Ook kunnen veranderingen in het leven van de vrouw in de leeftijdscategorie van 40 tot 60 jaar, maar ook al rond 30 en 35 jaar, een rol spelen.

Te denken valt aan het ouder worden op zich met alle lichamelijke ongemakken. Voor sommige vrouwen is het verlies van vruchtbaarheid moeilijk te accepteren. Men wordt vaker geconfronteerd met het ziek worden of overlijden van vrienden en dierbare naasten zoals ouders. Ook het niet meer dagelijks verzorgen van kinderen kan van invloed zijn.

Kunt u zwanger raken tijdens de overgang?
Ja, u kunt gewoon zwanger raken. Pas als u een jaar lang niet meer ongesteld bent geweest, wordt de kans kleiner dat u zwanger raakt.

De wens om geen hormonen te gebruiken:
Er zijn talrijke plantaardige middelen en extracten die de overgangsklachten kunnen reduceren. Het is echter van wezenlijk belang ook hiervan de voor-schriften te lezen en/of advies te vragen aan een erkend drogist, arts of therapeut.

Vaak denkt men “baat het niet dan schaadt het niet”. Niets is minder waar. Ook hier geldt “geen werking zonder bijwerking”. Met het gebruik van plantaardige middelen zal er echter veel minder ernstige schade ontstaan dan met allopathische geneesmiddelen (chemische).

Grofweg kan men de plantaardige middelen in drie categorieën verdelen: homeopathie, westerse fytotherapie en oosterse fytotherapie.

Homeopathie:
Het woord komt uit het Grieks homoios (gelijk) patheia (lijden). Homeopathie is bedacht door een Duitse arts Samuel Hahnemann (1756 - 1843) en gaat uit van het door Hahnemann genoemde principe de ‘similia-wet’ (afgeleid van het Latijns similia similibus curentur, hetgeen betekent ‘het gelijke genezen met het gelijke’). Er wordt in de homeopathie veelal uitgegaan van potentiëring (krachtiger maken door verdunning).

Westerse fytotherapie:
Fytotherapie (phytotherapie, phuton = plant, therapeia = behandeling) wordt ook wel kruidengeneeskunde genoemd. De op het Griekse eiland Kos geboren Hippocrates maakte tussen 370 v.Chr. en 460 v.Chr. melding van deze via China uit India afkomstige therapie en heeft de samenstellingen aangepast aan de in het Westen groeiende kruiden. Fytotherapie (phytotherapie, phuton = plant, therapeia = behandeling) wordt ook wel kruidengeneeskunde genoemd. In tegenstelling tot de oosterse therapie wordt er doorgaans gebruikt gemaakt van het concentraat van een plant.

De fytotherapie dient onderscheiden te worden van de homeopathie.
Het toepassen van plantaardige geneesmiddelen volgens homeopathische begrippen is een fundamenteel andere therapie dan de fytotherapie.
Wel kent de homeopathie een groot aantal preparaten uit de plantenwereld. Deze worden echter veelal gepotentieerd.

Oosterse fytotherapie (Ayurveda):

Dit is ontegenzeggelijk de oudste vorm van kruidengeneeskunde. De oosterse fytotherapie is ontwikkeld in het oude India en Tibet. De naam van deze oervorm van algemene geneeskunde is Ayurveda (Ayur = leven Veda = kennis); ook wel 'Moeder Der Geneeskunde' genoemd. Hoe oud deze geneeskunde is, is niet exact te bepalen. De eerste aanwijzingen dateren van ruim 3000 v.Chr. Reeds 700 jaar v.Chr. werd in India op universitair niveau geneeskunde gedoseerd. Deze universiteiten stonden open voor Griekse, Chinese en Arabische wetenschappers. Later is deze therapie via China naar het Westen overgebracht. Eén van de kenmerken van Ayurveda, dus oosterse fytotherapie, is dat er gebruik gemaakt wordt van meerdere kruiden per product. De samenstelling is dusdanig dat het elkaars werking versterkt; het heeft een synergetische werking. De kennis in het oude India is verbluffend. Al in 550 na Chr. werd de eerste vorm van vaccinatie toegepast. In de 18e eeuw werd dit pas in Europa bekend.

Waarom hebben vrouwen in Aziatische en sommige andere landen veel minder klachten.

Niet alleen overgangsproblemen maar ook andere ziektebeelden komen in het ene land vaker voor dan in andere landen. Dit heeft te maken met zowel de culturele achtergrond als met het voedingspatroon. Voor vrouwen in de oude Maya culturen was de overgang een soort promotie. De vrouwen kregen belangrijkere taken en een hogere status.

In het verre Oosten hebben vrouwen veel minder last van overgangsklachten dan in westerse landen. In het Japans en in veel Aziatische talen is er zelfs geen woord voor 'opvliegers'. Ook is het sterftecijfer van vrouwen met borstkanker in het verre Oosten opvallend lager dan in westerse landen.

De oorzaak hiervan ligt aan het voedingspatroon. In het verre Oosten zijn sinds mensenheugenis soja en peulvruchten een onderdeel van het dagelijks menu. Ook wordt er veel gebruik gemaakt van kruiden en specerijen. Hierdoor krijgen vrouwen in deze landen veel meer zogenaamde isoflavonen binnen. Dit zijn hormoonachtige stoffen die behoren tot de fyto-oestrogenen (plantaardige oestrogenen).

In India en Tibet, de bakermat van de geneeskunde, wordt al duizenden jaren gebruik gemaakt van plantaardige geneesmiddelen. Hier is dan ook veel ervaring op dit gebied. Volgens het Ayurveda principe openbaren ziektes zich als er een disbalans in het lichaam is. Dit principe is later door de Chinese geneeskunde overgenomen. Niets is duidelijker dan de disbalans van het vrouwelijke lichaam tijdens haar overgang. De westerse geneeskunde lost dit probleem eenvoudig op door chemisch gemaakte hormonen toe te dienen om zodoende de hormonale huishouding weer in balans te brengen. Deze therapie kijkt niet naar de gevolgen en de bijwerkingen, o.a. verhoogde kans op het krijgen van kwaadaardige gezwellen in borsten van het medicijn, met alle gevolgen van dien. Dit kan uiteraard op zich een reden voor een vrouw zijn met familiaire aanleg van deze gezwellen om geen hormonen te gebruiken. In principe zijn deze vrouwen onbehandelbaar en biedt de fytotherapie uitkomst.

Helaas is de kennis van kruiden en de natuur bij ons in het Weten in vergetelheid geraakt. Dit in tegenstelling tot de Aziatische landen; de mens staat daar dichterbij de natuur. Zoals eerder genoemd, is met name in India de kennis over natuurgenezing enorm. Men heeft in het Westen nog steeds afkeer van chemische geneesmiddelen. De laatste jaren dringt dit besef in westerse landen steeds meer door. Gelukkig worden er steeds meer plantaardige middelen aangeboden, helaas nog te weinig op basis van Ayurveda.

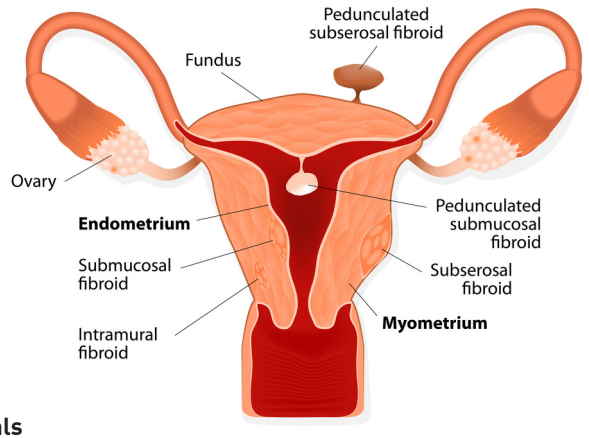
Note:
Hormoonpreparaten zijn geen anticonceptiemiddelen, dus u kunt gewoon zwanger raken.

Bij sterilisatie wordt er voorkomen dat de eitjes of zaadcellen door de eileiders kunnen, de eierstokken en baarmoeder blijven gewoon werken. Sterilisatie heeft dus geen invloed op de overgang.

Kennismaking met het vrouwelijke voortplantingsstelsel

Om de menopauze en de daaraan gerelateerde klachten beter te kunnen begrijpen, beginnen we met een korte kennismaking met het vrouwelijke voortplantingssysteem.

Organen, die tot het vrouwelijke voortplantingssysteem behoren:



- **Baarmoeder**
- **Eileiders**
- **Eierstokken**
- **Baarmoederhals**
- **Vagina**
- **Accessorische geslachtsklieren**
- **Uitwendige geslachtsdelen**
- **Borsten**

Baarmoeder (uterus): De baarmoeder is een hol, peervormig spierorgaan met dikke wanden. De baarmoeder is ongeveer 7.5 cm lang en bevindt zich in de onderbuik in het kleine bekken van de vrouw, tussen haar blaas en de endeldarm (rectum) in. Zij wordt onderverdeeld in het corpus (lichaam), het grootse deel, en de cervix (baarmoederhals).
De baarmoederhals sluit op de vagina aan. Het dak van de baarmoeder wordt de fundus genoemd. Tijdens de zwangerschap groeit de baarmoeder aanzienlijk en wordt 10 tot 20 keer groter dan normaal. Het corpus bestaat uit een stevige spierlaag (myometrium) aan de buitenkant en uit vaten en klieren aan de binnenkant (endometrium).

De Eileiders (tuba): De twee eileiders reiken vanaf beide kanten van de fundus naar de eierstokken. Dicht bij de eierstokken zijn deze buisjes bedekt met trilharen die de eicellen (ova) naar de baarmoeder transporteren. Bevruchting van een eicel vindt meestal in de eileider plaats.

Eierstokken (ovarium): De twee eierstokken, één aan elke kant van de baarmoeder, zijn amandelvormig. Hun hoofdfunctie is om de eieren te laten rijpen en ze dan vrij te geven ter bevruchting (eisprong). Ze scheiden ook de vrouwelijke hormonen oestrogeen en progesteron af, die een rol in de menstruatie spelen.

Baarmoederhals (cervix): Het onderste deel van de baarmoeder heet de baarmoederhals en sluit aan op het boveneinde van de vagina.

De baarmoedermond is een kleine opening in de hals, die naar de baarmoeder leidt. Tijdens de bevalling ontsluit de baarmoederhals om het kind uit te kunnen drijven.

Vagina: Ook bekend als de schede, is een interne holte die vanaf de vulva (uitwendig deel van het vrouwelijk geslachtsorgaan) naar de baarmoeder leidt. De vagina heeft de vorm van een buis en dient om het zaad op te vangen tijdens de geslachtsgemeenschap en ook als doorgang voor het kind bij de bevalling.

Accessorische geslachtsklieren: Twee noemenswaardige soorten klieren zijn de klieren van Bartholin en Skene. Deze klieren scheiden vloeistof af om de vagina te bevochtigen. De klieren van Bartholin, ook bekend als de glandulae vestibulares majores, bevinden zich iets naar achteren aan weerskanten van de opening van de vagina. De klieren van Skene, ook bekend als glandulae vestibulares minores, bevinden zich in het gebied van de vulva en zijn te vergelijken met het mannelijk prostaat.

Uitwendige geslachtsorganen:

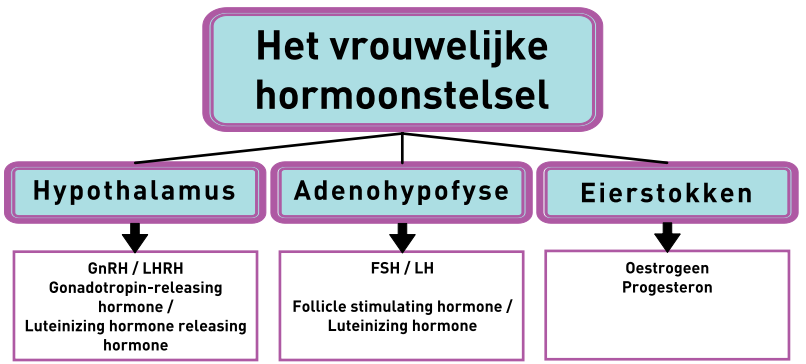
- Mons veneris: ook mons pubis of venusheuvel genoemd, is het zachte v-vormige gebied boven de vulva, die met schaamhaar bedekt is.
- Labia Majora & Labia minora: algemeen bekend als de grote en kleine schaamlippen, de labia zijn vlezige weefselplooien die de opening van de vagina omsluiten. De labia majora komen overeen met het scrotum bij mannen. De labia minora zijn dunne, haarloze randen aan het begin van de vagina. Boven de vagina komen de schaamlippen samen en bedekken de clitoris.
- Clitoris: de clitoris is een uitsteeksel in de vorm van een erwt (komt overeen met de penis bij mannen), dat een belangrijke rol speelt bij seksuele opwinding bij vrouwen.

Borsten: De borsten bestaan hoofdzakelijk uit melkklieren en vetweefsel. Zowel in mannen als in vrouwen zijn deze aanwezig en functioneren meestal alleen bij vrouwen. Het donkere gebied midden op de borst heet de tepelhof of aureool. De aureool bestaat uit de tepel en de klieren van Montgomery. De borst bevat 15 lobben die bij de tepel uitmonden. Iedere lob is verdeeld in kleinere lobben met alveoli, die melk produceren tijdens lactatie.

Menstruatie en de hormonen

Menstruatie, ofwel de menstruatiecyclus, is het wetenschappelijke begrip voor de fysiologische veranderingen die tijdens de vruchtbare levensfase van een vrouw plaatsvinden. De menstruatie is de maandelijkse bloeding tijdens de vruchtbare jaren van een vrouw. Bloed vloeit vanuit de baarmoeder door de baarmoedermond en wordt afgescheiden door de vagina. Tijdens de menstruatie stoot het lichaam het verdikte slijmvlies van de baarmoeder-wand af. Bij de meeste vrouwen duurt de menstruatie drie tot vijf dagen. Gemiddeld duurt de hele cyclus 28 dagen, maar zelfs bij gezonde vrouwen kan de cyclus tussen 20 en 45 dagen duren. Vaak wordt een abnormale cyclus geassocieerd met verminderde vruchtbaarheid.

Om de menstruatie goed te kunnen begrijpen, hebben we inzicht nodig in het vrouwelijke hormoonstelsel. Het stelsel is opgebouwd uit drie hormonale hiërarchieën:



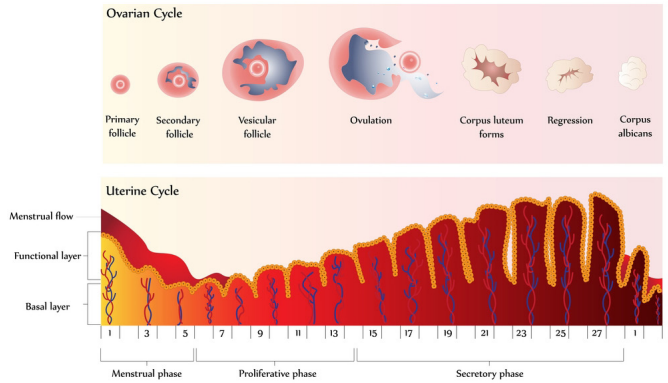
1 **Releasing hormones" geproduceerd door de hypothalamus:** gonadotropin-releasing hormone (GnRH), ook bekend als Luteinizing hormone – releasing hormone (LHRH).

2 **Hormonen geproduceerd door de adenohypofyse:** follikelstimulerend hormoon (FSH) en luteïniserend hormoon (LH), die vrijgegeven worden in reactie op het releasing hormoon.

3 **Hormonen geproduceerd door de eierstokken:** oestrogeen en progesteron, vrijgegeven door de eierstokken als reactie op FSH en LH.

De menstruatiecyclus vindt plaats vanwege veranderingen in de eierstokken die volledig afhankelijk zijn van de gonadotrope hormonen, FSH en LH. Deze hormonen worden afgegeven door de adenohypofyse. Eierstokken die niet gestimuleerd worden, blijven inactief. Dit is het geval tijdens de kindertijd, omdat bijna geen gonadotrope hormonen afgegeven worden. Vanaf het 9de of 10de levensjaar begint de hypofyse FSH en LH af te scheiden. Aan het begin van de maandelijkse cyclus bij meisjes tussen 11 en 16 jaar wordt een piek bereikt. Deze fase wordt Puberteit genoemd en de eerste menstruatiecyclus heet Menarche.

De cyclus verloopt in vier fases:



1 **Folliculaire fase:** In deze fase wordt een hoge hoeveelheid FSHafgegeven. De functie van deze fase is om de follikels in de eierstokken te stimuleren. Een follikel begint dan te groeien en het ei rijpt. In deze fase wordt oestrogeen door de eierstokken afgegeven. Omdat het endometrium in deze fase voor de eisprong (ovulatie) groeit, wordt deze fase ook proliferatieve fase of preovulatoire fase genoemd.

2 **Ovulatie:** In deze fase vindt de eisprong plaats: de follikel springt open en geeft een rijp ei vrij. De eisprong vindt meestal plaats op de 14de dag bij een cyclus van 28 dagen.

3 **Luteale fase:** Na de eisprong overleeft het onbevruchte ei niet langer dan 24 uur. De follikel waaruit het ei kwam, verandert in het corpus luteum, en produceert vervolgens progesteron. Deze fase heet daarom ook secretoire fase of de postovulatoire fase. Onder de invloed van progesteron verandert het endometrium om innesteling van het ei en dus om de zwangerschap mogelijk te maken.

4 **Menstruatie:** In deze fase wordt het endometrium afgestoten en verliest de vrouw bloed. Als het ei zich niet binnen ca. twee weken innestelt, slinkt het corpus luteum. Dit veroorzaakt een sterke daling van het progesteron- en oestrogeenniveau, waardoor de baarmoeder het endometrium en het ei afstoot. Dit proces wordt menstruatie genoemd.

De westerse visie op de Menopauze

De menopauze is het fysiologische proces tijdens het leven van een vrouw dat gekenmerkt wordt door het stoppen van de menstruatie. Dit veroorzaakt veel veranderingen die ervoor zorgen dat zij niet meer zwanger raken kan. De menopauze vindt gemiddeld plaats tussen het 45ste en 55ste levensjaar.

Om deze fase te begrijpen, moeten we het een en ander over de vrouwelijke hormonen weten: oestrogeen en progesteron.

Oestrogeen is verantwoordelijk voor de ontwikkeling en onderhoud van de secondaire vrouwelijke geslachtskenmerken. Het wordt aangemaakt in de eierstokken, bijnieren en vetweefsel. Tot de oestrogene hormonen behoren oestron, oestradiol en oestriol, die een soortgelijke chemische opbouw hebben. Oestrogeen stimuleert de groei van het baarmoederslijmvlies, dat voor de eisprong dikker wordt. Het veroorzaakt ook vascularisatie van de huid, veranderingen in de borsten tijdens de puberteit en zwangerschap, reguleert de botgroei en het cholesterolgehalte van het bloed. Oestrogeen is bijzonder belangrijk voor de gezondheid van botten. Het voorkomt de afname van de botmassa. Samen met kalk, vitamine D en andere stoffen draagt het bij aan de opbouw van de botten.

Progesteron wordt in de eierstokken, placenta en bijnieren geproduceerd. Dit hormoon speelt een rol bij het voldragen van een zwangerschap. Het zorgt ervoor dat de baarmoeder dikker en gevuld wordt met vloeistoffen en voedingsstoffen en het vermindert het samentrekken van de baarmoeder. Hierdoor daalt de kans dat het embryo wordt afgestoten. Progesteron werkt samen met de hypothalamus en de hypofyse om de menstruatiecyclus te reguleren. Het verhoogt de viscositeit van het slijm in de baarmoederhals en beïnvloedt de afscheidingen van het baarmoederslijmvlies.

De periode tussen normale menstruatie en de laatste menstruatiebloeding heet perimenopauze, ook bekend als de overgang. Tijdens de menopauze daalt de productie van oestrogeen en progesteron, waardoor vervelende symptomen kunnen ontstaan. Eerst wordt de menstruatie onregelmatig en uiteindelijk stopt deze. Soms stopt de menstruatie plotseling. Wanneer er in de leeftijd tussen 45 en 55 jaar een jaar lang geen menstruatiebloedingen optreden, wordt dit de menopauze genoemd. De volgende fase, de postmenopauze, begint tussen 24 en 36 maanden na de laatste menstruatie.
Naast de natuurlijke menopauze, kan de menopauze ook veroorzaakt worden door operatief verwijderen van de eierstokken. Dit veroorzaakt het onmiddellijke einde van de menstruatie, wat gepaard gaat met nog extremere symptomen dan bij de natuurlijke menopauze.

Symptomen:
- Vasomotorische symptomen
- Urogenitale symptomen
- Cardiovasculaire symptomen
- Psychologische symptomen
- Algemene symptomen

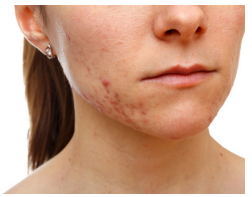
Tot de vasomotorische symptomen behoren klachten zoals:
- Opvliegers
- Nachtzweten
- Slapeloosheid
- Paresthesie (prikkelende, tintelende, brandende, of jeukende gevoels waarnemingen op de huid)
- Hartkloppingen

Tot de urogenitale symptomen behoren klachten zoals:
- Dyspareunie (pijn bij het vrijen)
- Droge vagina, verslapping van de vagina
- Veranderde reactie op seksuele prikkels
- Fibromen (wildvlees of steelwratjes)
- Incontinentie
- Verslapping van de vulva, bleker en dunner worden van de huid tot het bijna doorzichtig is
- Verslapping van de baarmoederhals, verminderde slijmafscheiding
- Verslapping van de baarmoeder

Tot de cardiovasculaire symptomen behoren klachten zoals:
- Hartkloppingen
- Hoge cholesterol
- Hart en vaatziekten

Tot de psychologische symptomen behoren klachten zoals:
- Ongerustheid
- Hoofdpijn
- Prikkelbaarheid
- Depressie
- Wisselende buien
- Stemmingswisselingen
- Concentratieproblemen

Tot de algemene symptomen behoren klachten zoals:
- Rugpijn
- Gewrichts- en spierpijn
- Botontkalking
- Vermoeidheid
- Droge huid
- Verkleuring van de huid
- Broos haar
- Gewichtstoename
- Verstoringen van de spijsvertering



De westerse aanpak van symptoombeheer:
HRT (hormoonvervangende therapie): Deze therapie gaat ervan uit dat vervelende symptomen verlicht kunnen worden door hormonen toe te dienen, omdat de productie van oestrogeen en progesteron voor de menopauze daalt. De voorkeur gaat meestal uit naar oestrogeen, maar progesteron wordt ook als aanvullende therapie gegeven.

Andere aanbevolen therapieën zetten medicijnen in om de vervelendste symptomen te bestrijden, zoals stemmingswisselingen en opvliegers. Hierbij kan men denken aan medicijnen zoals antidepressiva en bloeddrukverlagende medicijnen.

Bijwerkingen/Beperkingen van HRT:
Ondanks het feit dat HRT overgangsklachten verlicht, wordt het gebruik van oestrogeen en progesteron geassocieerd met klachten zoals vocht vasthouden, indigestie, pijnlijke of opgezette borsten, misselijkheid, krampen in de benen, depressie, stemmingswisselingen, acne, enz. Bij vrouwen die HRT volgen, wordt kanker vaker vastgesteld. HRT is ook niet geschikt voor alle vrouwen die aan overgangsklachten lijden. Deze therapie mag bijvoorbeeld niet toegepast worden bij vrouwen met borst- of eierstokkanker, trombose, of zware leverziekten.

In onderstaande omschreven visie worden veel medische Sanskriet-termen gebezigd, deze komen voor ons westerlingen exotisch over maar worden tijdens de universitaire opleidingen als gebruikelijk beschouwd.

De ayurvedische visie op de Menopauze

In Ayurveda wordt de menopauze **Rajonivriti** genoemd. Raja betekent menstruatie en Nivriti betekent overgaan of een einde. Dus het woord betekent de toestand van beëindigde menstruatie. Het wordt niet gezien als een zieke toestand, maar als een natuurlijke fysiologische staat.

De leer van de Tridosha speelt een belangrijke rol in Ayurveda. De Tridosha (biologische energieën) regelen alle lichamelijke functies en zorgen voor goede gezondheid als ze in evenwicht zijn. Als deze krachten uit hun evenwicht raken, veroorzaken ze ziekten.

De doshas en hun functies domineren op verschillende tijdstippen van de dag. Kapha bijvoorbeeld, is dominant tussen 6.00 uur en 10.00 uur. Pitta domineert tussen 10.00 uur en 14.00 uur en Vata heerst tussen 14.00 uur en 18.00 uur. Evenzo worden de verschillende levensfases van een individu door de dosha's beheerst. In het algemeen kunnen de drie levensfases van een mens beschreven worden als jeugd, (jong)volwassenheid en ouderdom. Kapha heerst tijdens de jeugd, Pitta is dominant in de periode van volwassenheid, en het ouderdom wordt beheerst door Vata.

De menopauze vindt dus plaats tijdens de Vata-levensfase van een vrouw. Deze periode wordt gekenmerkt door uitputting. Omdat het lichaam neigt te slijten, moet in deze fase meer aandacht naar dieet en levensstijl uitgaan. Omdat Vata in de laatste levensfase al verhoogd is, kunnen factoren die Vata dosha verhogen een grotere kans op Vata-gerelateerde ziekten geven.

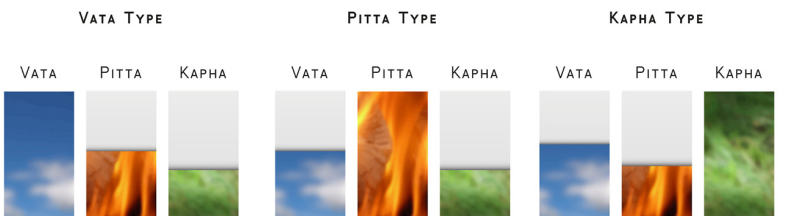
Het is dus duidelijk dat Vata dosha een cruciale rol in de menopauze speelt. Afhankelijk van het dieet en de levensstijl van een vrouw en van bestaande disbalansen die haar lichaam beïnvloeden, kunnen de andere twee dosha's uit balans raken. Dit leidt tot het ontstaan van meerdere klachten, afhankelijk van haar eigen dominante dosha.

De overgang is de periode waarin bepaalde klachten ontstaan die de naderende menopauze aankondigen. Deze symptomen worden veroorzaakt door een disbalans van de dosha's. De meest gangbare klachten kunnen aan de dosha's toegeschreven worden:

Een verstoring van **Vata dosha** kan de volgende symptomen veroorzaken:
- Rugpijn
- Degeneratie van de nekwervels en tussenschijven
- Gewrichts- en spierpijn
- Angst
- Depressie
- Verwarring
- Stemmingswisselingen
- Hartkloppingen
- Rusteloosheid
- Prikkelende sensaties of gevoelloosheid
- Ongerustheid
- Verminderde concentratie
- Vaginale droogheid
- Verslapping van de vagina en / of baarmoeder
- Slapeloosheid

Een verstoring van **Pitta dosha** kan de volgende symptomen veroorzaken:
- Opvliegers
- Nachtelijk zweten
- Boosheid
- Prikkelbaarheid
- Opvliegerig zijn
- Overgevoeligheid voor warmere temperaturen

Een verstoring van **Kapha dosha** kan de volgende symptomen veroorzaken:
- Gewichtstoename
- Slaperigheid (soms)
- Vochtophoping in de gewrichten, in het bijzonder in de enkels
- Tekort aan motivatie
- Een zwaar gevoel
- Sloomheid
- Verhoogde cholesterol



Evenals de leer van de Tridosha is de leer van de Saptadhatus (Sapta = zeven, Dhatus=lichaamsonderdelen) een fundamenteel onderdeel van de ayurvedische filosofie. Zoals de Tridosha de functionele entiteit van het lichaam vertegenwoordigen, kunnen we de Saptadhatus als de fysische entiteiten van het lichaam zien. Met het ouder worden raken deze dhatu's uitgeput, tenzij er maatregelen genomen worden om ze weer aan te vullen.

De zeven entiteiten hebben specifieke functies:

- **Rasa** *(vergelijkbaar met Plasma)*: Voedt andere weefsels.
- **Rakta** *(Bloed)*: Schenkt leven aan het lichaam.
- **Mamsa** *(spierweefsel)*: Omhult het lichaam en geeft het vorm.
- **Meda** *(vet en adipose weefsel)*: Is een smeermiddel en bron van vetten behoeve van de vochthuishouding van de huid.
- **Ashti** *(botweefsel)*: Zorgt voor de stevige structuur van het lichaam en ledematen.
- **Majja** *(botmerg)*: Vult de botten.
- **Shukra / Artava** *(zaadvloeistof en menstruatie vloeistof)*: Voor bevruchting en voortplanting.

Als *Rasa Dhatu* door Vata afneemt, wordt het gezicht dof en ontstaan er ouderdomstekens zoals rimpels. Pigmentvlekken, een vaak voorkomende klacht, worden veroorzaakt door problemen met *Rasa*, *Rakta* en *Mamsa dhatu* en verstoringen van de dosha's. De functie van Meda dhatu (vet en vetweefsel) raakt dan ook verstoord. Gepaard gaande met een verstoring van de dosha resulteert dit in de neiging meer vet op te slaan tijdens en na de overgang.

Vata dosha en *Ashti dhatu* zijn sterk afhankelijk van elkaar. Een verhoging van *Vata dosha* manifesteert zich in een afname van de botweefsels. Deze afname veroorzaakt botontkalking en gewrichtsproblemen bij oudere vrouwen. De verstoring van *Majja dhatu* is verantwoordelijk voor problemen met het zenuwstelsel, bijvoorbeeld slapeloosheid, te veel slaap, en verwarring.
De laatste dhatu, *Artava*, speelt een duidelijke rol bij het beëindigen van de menstruatie.
Het is dus duidelijk hoe de dhatu's en dosha's in deze levensfase beïnvloed worden.

De bovengenoemde feiten geven aan dat de omgang met overgangsklachten hoofdzakelijk vraagt om de vervelende symptomen, zoals opvliegers, nachtzweten enz., te elimineren. Dit houdt in dat men het evenwicht van de dosha's herstelt. Omdat Vata, als heersende dosha in de latere fase van het leven, aan de wortel van de menopauze ligt, is het essentieel om Vata weer in harmonie en in evenwicht te brengen. Daarna kan het evenwicht van de andere dosha's hersteld worden.

Aanvullend is het toepassen van het concept Rasayana (verjonging) van belang.

In deze levensfase, die gekenmerkt wordt door verval en afbraak, wordt Rasayana aanbevolen omdat dit concept het verouderingsproces immers vertraagt of stopt.

We weten ook dat het oestrogeenniveau daalt in deze fase. Volgens westerse geneeskunde is een laag oestrogeenniveau de grote boosdoener die vrouwen voor diverse ziekten vatbaar maakt. Daarom zou het toedienen van kruiden met natuurlijke oestrogenen (fyto-oestrogenen) veel hulp kunnen bieden bij het behandelen van overgangsverschijnselen.

Met oog op de vele behoeftes die een vrouw heeft vanwege de (naderende) menopauze, werd een speciale kruidensamenstelling geformuleerd om deproblemen van perimenopauze, menopauze en postmenopauze aan te pakken.

De samenstelling van deze kruiden is nauwkeurig onderzocht. Veel kruiden in deze traditionele samenstelling versterken elkaars werking (synergie) en hebben bovendien specifieke kenmerken

- **Wat doet deze samenstelling ?**

Veel onderzoek is gedaan naar de kruiden, waardoor er veel wetenschappelijk bewijs is voor hun werking.
De kruiden pakken de vervelende verschijnselen van perimenopauze, menopauze en postmenopauze aan en zorgen ervoor dat de vrouw deze fysiologische veranderingen zo soepel mogelijk ervaart. Het belangrijkste aspect is dat één van de kruiden een krachtige fyto-oestrogenen bevat, die de voordelen van oestrogeen op een natuurlijke manier bieden. De samenstelling is ook een krachtig verjongingsmiddel, waar de vrouw fysiek en emotioneel baat bij heeft.

De Ayurveda kruidensamenstelling

• **Hoe werkt het?**
Door de combinatie van geteste ingrediënten:

- Brengt het een verhoogd Pitta weer in evenwicht, om verlichting te geven van opvliegers en nachtzweten
- Krijgt het Vata onder controle om stemmingswisselingen, depressie en slapeloosheid te verlichten
- Toont het een oestrogeen-achtige werking en herstelt het hormonale evenwicht met behulp van de natuurlijke fyto-oestrogenen
- Vertraagt het begin van osteoporose en hart- en vaatziekten die gerelateerd zijn aan de menopauze
- Helpt hoge suiker- en cholesterolwaardes weer in toom te brengen, die mogelijk geassocieerd zijn met veroudering en de menopauze
- Beschermt tegen hyperpigmentatie, dat een nauw verband heeft met de menopauze.
- Bevordert het fysieke en emotionele welzijn in de fases voor, tijdens en na de menopauze.

s. NO.	Sanskrit Name	Botanical Name
1	Ashoka	Saraca indica
2	Lodhra	Symplocos racemosus
3	Tagar	Valeriana wallichii
4	Nirgundi	Vitex negundo
5	Kumari	Aloe vera
6	Shatavari	Asparagus racemosus

Eigenschappen
De unieke kruidensamenstelling toont de volgende eigenschappen.

- **Fyto-oestrogenen:** Ashoka, Lodhra, Nirgundi, Kumari, en Shatavari zijn krachtige fyto-oestrogenen die de eigenschappen van oestrogeen hebben zonder de nadelen van HRT, die het risico op kanker verhoogt.

- **Pitta-kalmerend:** Ashoka, Lodhra, en Shatavari zijn krachtige kruiden die Pitta kalmeren en die daarom helpen opvliegers en nachtzweten te verminderen.

- **Vata-kalmerend:**Nirgundi, Tagar, en Shatavari kalmeren Vata, de dosha die het meest beïnvloedt wordt door de menopauze.

- **Ontstekingsremmend:** Nirgundi, Tagar en Ashoka zijn planten met een krachtige pijnstillende en ontstekingsremmende werking, waardoor ze gewrichts- en spierpijn in deze levensfase effectief bestrijden.

- **Anxiolytische en antidepressieve werking:**Tagar en Shatavari tonen een angst-verdrijvende werking en zijn daarom effectief in het bestrijden van stemmingswisselingen, depressie en slapeloosheid gerelateerd aan de menopauze.

- **Verbeteren Concentratie en Geheugen:** Nirgundi en Shatavari helpen het geheugen en de mentale capaciteit te verbeteren.

Wat zijn de voordelen?
- Verlicht symptomen zoals opvliegers, nachtzweten, stemmingswisselingen en depressie.
- Bestrijdt doeltreffend slapeloosheid.
- Werkt als oestrogeen en herstelt hormonaal evenwicht, waardoor het fysiek en emotionele welzijn bevorderd wordt in de fases rondom de menopauze.
- Stelt het begin van osteoporose en hart en vaatziekten uit, die geassocieerd worden met de menopauze.
- Helpt diabetes en hypercholesterolemie te reguleren, die ook misschien gerelateerd zijn aan veroudering en menopauze.
- Beschermt tegen hyperpigmentatie, dat een nauw verband heeft met de menopauze.
- Is een bron van de krachtige Rasayana (verjongingsmiddel) Shatavari, een plant met een bewezen positief effect op het welzijn van de vrouw.
- Kan, in tegendeel tot HRT, langdurig gebruikt worden zonder het risico op kanker te verhogen.
- Werkt rustgevend.
- Kan ook bij Menarche gebruikt worden (beginnende menstruatiepijnen).

Beschrijving van de ingrediënten

Ashoka (Ashoka boom)

Geschiedenis:
In één van de mythologische boeken van India wordt deze boom genoemd. Volgens een legende werd Gautama Boeddha onder deze boom geboren. Door heel India heeft deze boom een heilige status. Medicinaal gebruik ervan wordt in de oude ayurvedische schriften beschreven. Ashoka betekent "zonder zorgen" in Sanskriet.

Natuurlijke omgeving:
Ashoka groeit in de oostelijke en centrale delen van de Himalaya, in het West-Ghats gebergte, op de hooglanden van Dekan en Srilanka en op het schiereiland Malakka. Deze boom staat in vele tuinen vanwege zijn decoratieve oranjerode bloemen en mooie bladeren.

Omschrijving:
Ashoka wordt gemiddeld tussen 7.5 en 8.5 meter hoog. De bladeren zijn smal, lancetvormig en ca. 15-25 cm lang. De bloemen zijn geurig en oranje, tussen 7.5 en 10 centimeter in doorsnee. In de lente wordt de bast geoogst van volgroeide wilde of gekweekte bomen.

Synoniemen:

Sanskriet	: Kankeli, Ashoka, Hempushpa, Tamrapallav
Engels	: Ashok tree
Nederland	: Ashok boom
Latijn	: Saraca asoca, Saraca indica
Gebruikte deel	: Bast

Ayurvedische eigenschappen

Rasa(Smaak)	: *Kashaya* (wrang), *Tikta* (bitter)
Guna (eigenschappen)	: *Laghu* (licht), *Ruksha* (droog)
Virya (effect)	: *Sheet* (koud)
Vipaka	: *Katu* (scherp)
Effect op de dosha's	: Kalmeert Kapha en Pitta
Werking	: *Hrdya* (harttonicum), *Vishaghna* (antitoxine, diarree remmend, *Varnya* (verbetert de huid), *Sothahara* (ontstekingsremmend), *Rajtasangrahaka* (hemostyptisch), *Pradarahara* (tegen menorragie en metrorragie)

Fytochemie:
De hoofdbestanddelen zijn tannines, catechol, sterol, kristallijn glycoside, en kalkverbindingen.

Farmacologische werking:
Studies hebben de oxytocische werking van de pure fenolglycosiden van de Ashoka-bast bewezen. In andere studies werd de chemopreventieve werking van flavonoïden op 2-fase cutane carcinogenese bewezen en ook het schimmelwerend en antibacterieel effect van methanol uit de bast.
Nog andere diepgaande studies lieten zien dat Ashoka tegen een aantal bacteriële micro-organismen werkt. Ashoka toonde ook een beduidende pijnstillende en ontstekingsremmende werking. De resultaten van een studie toonden zijn vermogen als immunomodulans en ontstekingsremmer bij het remmen van de degranulatie van mastocyten en lipidenperoxidatie aan.
De geïsoleerde lignaanglycosides toonden een krachtige werking als DNA topoisomerase I remmer. Een studie liet zien dat S. asoca de hoeveelheid ontstekingsbevorderende cytokine verlaagde en dus artritisklachten verminderde.

Therapeutische toepassingen:
Ashoka speelt een sleutelrol bij de behandeling van vrouwspecifieke klachten zoals onregelmatige menstruatie, menorragie, metrorragie, dysmenorroe, leukorroe, niet-functionele bloedingen en klachten in verband met de meno- pauze. Zijn werking wordt veroorzaakt door de fyto-oestrogenen.
Verder wordt Ashoka ingezet bij ontstekingen, paresthesie en bloedziekten.

Lodhra (Symplocos bast)

Geschiedenis:
Lodhra wordt gebruikt in een beroemde samenstelling van tien wortels, Dashmool, die ingezet wordt bij neuromusculaire aandoeningen. Lodhra wordt sinds de oudheid gebruikt om Pitta te bedaren en om de gezondheid van vrouwen te verbeteren. Omdat men met de kleurstof uit deze bast het "Tilaka"-teken op het voorhoofd maakte, wordt het ook weleens Tilaka genoemd.

Natuurlijke omgeving:
Lodhra groeit in India op de vlaktes, in de lagere heuvels en zelfs in het droge bos op de hoogvlakte van Nagpur tot op 7 km hoogte.

Omschrijving:
Lodhra is een groenblijvende boom die 6 tot 8.5 meter hoog wordt. Zijn bladeren zijn donkergroen en leerachtig. De bloemen zijn klein en roomkleurig en groeien in bosjes. De vrucht is paars-zwart en ongeveer 1 cm lang.

Synoniemen:

Sanskriet	: Rodhra, Paittka, Lodhra, Sthulavalkal, Tilaka, Sabara Lodhra, Tirita
Engels	: Symplocos bark
Nederlands	: Symplocos bast
Latijn	: Symplocos racemosa
Gebruikte deel	: Bast

Ayurvedische eigenschappen

Rasa (Smaak)	: Kashaya (wrang)
Guna (eigenschappen)	: Laghu (licht), Ruksha (Droog)
Virya (effect)	: Sheet (koud)
Vipaka	: Katu (scherp)
Effect op de dosha's	: Kalmeert Kapha en Pitta
Werking:	: Chakshushya (goed voor de ogen), Grahi (stopt het vloeien van vloeistoffen, bijv. diarree), Sandhaniya (helend), Shonitasthapan (stabiliseert het bloed, hemostatisch), Shothagna (ontstekingsremmend)

Fytochemie:
De bast bevat alkaloïden (loturine/harmaan, co-loturine) en rode kleurstof. De as bevat natrium bicarbonaat.

Farmacologische werking:
De antimicrobiële en hepatoprotectieve werking van bepaalde delen van de bast werd onderzocht. Eén kristallijndeel bleek de groei van staphylococci, E. Coli en enterische en dysenterische organismen te remmen. Ook wordt het bloedverlies verminderd bij menorragie. In sommige diersoorten verlagen de alcoholfracties B en E de frequentie en intensiteit van samentrekkingen van zowel zwangere als onbevruchte baarmoeders in vitro en verlengen de rustfase tussen de samentrekkingen en blokkeren de kunstmatig opgewekte (acetylcholinebehandeling) samentrekkingen. Volgens studies helpt Lodhra om leukorroe te verminderen.

Therapeutische toepassingen:
Omdat Lodhra een bron van fyto-oestrogenen is, wordt dit kruid ingezet bij menorragie, metrorragie, en leukorroe. Daarnaast wordt het gebruikt tegen aambeien, ontstekingen, diarree, oogziekten, bloedingen, huidontstekingen en om wonden te genezen. Lodhra is een sleutelingrediënt in hemostatische middelen. Meestal wordt een combinatie van Ashoka en Lodhra aanbevolen bij gynaecologische aandoeningen.

Tagara (Indiase valeriaan)

Geschiedenis:
Indiase valeriaan wordt al eeuwen gebruikt in de ayurvedische (Charak Samhita en Sushruta) en Unami geneeskundesystemen als remedie voor obesitas, huidziekten, krankzinnigheid, epilepsie, en slangenvergiftiging. De eenvoudige geneesmiddelen gewonnen uit de wortel en wortelstok en de plantaardige geneesmiddelen op basis van valeriaan worden gebruikt als milde kalmeermiddelen in de farmaceutische industrie. Dit effect wordt toegeschreven aan de valepotriaten, die op het centrale zenuwstelsel werken.

Natuurlijke omgeving:
Tagara komt voor in de milde gebieden van de Himalaya tussen Kasjmir en Bhutan en het Khasi-gebergte tot op 3000 m hoogte.

Omschrijving:
Tagara is een vaste plant. De vrucht is behaard, de bloemen zijn wit of roze en het bloeigestel is schermvormig. De wortelstokken hebben een onregel-matige vorm en worden in de herfst geoogst, gewassen en gedroogd.

Synoniemen:
Sanskriet : Kalanusari, Kalanusarika, Nata, Tagara, Vakra, Kutil, Nahusha
Engels : Indian valerian
Nederlands : Indiase valeriaan
Latijn : Valeriana wallichii
Gebruikte deel : wortelstok

Ayurvedische eigenschappen
Rasa (Smaak) : Katu (scherp), Tikta (bitter), Kashaya (wrang)
Guna (eigenschappen): Laghu (licht), Snigda (smerend)
Virya (effect) : Ushna (heet)
Vipaka : Katu (scherp)
Effect op de dosha's : Tridoshahara
Werking: : Vishagna (antitoxine), Raktadoshahara (zuivert het bloed), Manasadoshahara (antipsychoticum), Sheetaprashamana (verwarmend), Chakshushya (goed voor de ogen), Shoolaghna (pijnstillend)

Fytochemie:
De essentiële olie uit de wortelstok bevat arachidonzuur, valeriaanzuur, acetylvaleriaanzuur, 3-methylbutaanzuur (isovaleriaanzuur), terpene isomeren, coffeïnezuur, chlorogeenzuur, tannines en de alkaloïden valerine en chitine. De kalmerende werking wordt veroorzaakt door valepotriaten (metabolische stoffen).

Farmacologische werking:
Valepotriaten zijn hoofdzakelijk verantwoordelijk voor de neuroleptische en rustgevende eigenschappen van V. wallichii. Valeriaanextract verrijkt met valepotriaten toont de sterkste kalmerende activiteit. Valepotriaten werden ook op Krebs II acites in muizen getest. Valepotriaten remmen de synthese van DNA en eiwit in vitro af. De metabolische stof homobaldrinal toont een bijzonder sterk kalmerend effect. Valeriaan heeft ook een positieve werking op de verschijnselen van de menopauze getoond. Studies hebben uitgewezen dat V. wallichii de kwaliteit van slaap verbetert bij vrouwen die tijdens de menopauze aan slapeloosheid lijden. De krampstillende en hypotensieve werking rechtvaardigen de inzet van V. wallichii bij maag- en darmklachten en bij hart- en vaatziekten. Als antidepressivum is het ook nuttig tijdens de overgang.

Therapeutische toepassingen:
Het gebruik van Indiase valeriaan wordt aanbevolen in gevallen van psychiatrische stoornissen, epilepsie, hoofdpijn, oogkwalen, delirium, slapeloosheid, gedragsstoornissen, angststoornissen en tremoren. Dit kruid wordt ingezet als ontstekingsremmer bij gewrichtsontstekingen. Wegens haar anxiolytische, antidepressieve en ontstekingsremmende effecten speelt Indiase valeriaan een sleutelrol bij de behandeling van klachten gerelateerd aan de menopauze.

Nirgundi (monnikspeper)

Geschiedenis:
Nirgundi is van religieus belang omdat de bladeren geofferd worden in de tempel. Een andere naam van deze plant is "Sinduwarsindu". Dit woord betekent "sap" en deze plant wordt zo genoemd omdat het sap door alle delen van deze plant stroomt. Nirgundi wordt ook wel "Swetapushpi" genoemd vanwege zijn witte bloemen. Deze plant staat al lang bekend om zijn vermogen Vata te kalmeren.

Natuurlijke omgeving:
Nirgundi komt overal in India voor, tot aan de rand van de Himalaya op 1500 meter en groeit vaak op open plekken rondom dorpen, op rivieroevers, in vochtige gebieden en in bossen. In de tuin is Nirgundi geliefd als heg.

Omschrijving:
Nirgundi is een grote, geurende struik of kleine boom, die tot 4.5 m hoog wordt met een onregelmatige stam en takken die met een dunne grijze bast bedekt zijn. De takken zijn vierkant, op een bladsteel zitten 3-5 bladeren als vingers. De bloemen hebben schutblaadjes en zijn blauw tot paars van kleur. De vrucht is een steenvrucht met vier kamers en vier zaden en is rond of eivormig.

Synoniemen:

Sanskriet	**:** Sinduvara, Samphalika, Nila, Nirgundi, Swetapushpi
Engels	**:** Five-leaved Chaste Tree
Nederlands	**:** Monnikspeper
Latijn	**:** Vitex negundo
Gebruikte deel	: Bladeren

Ayurvedische eigenschappen

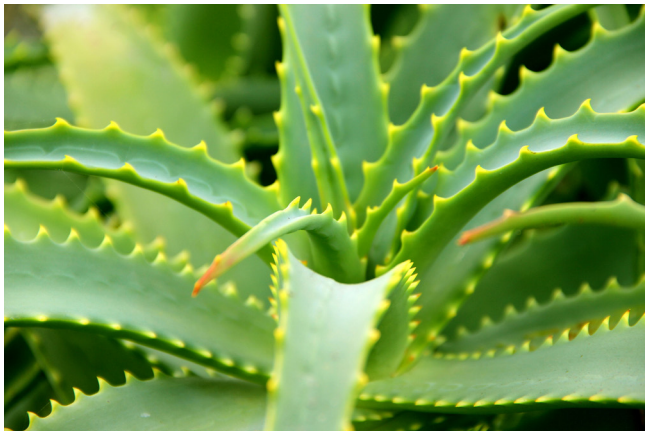
Rasa (Smaak)	**:** Katu (scherp), Tikta (bitter) Kashaya (wrang)
Guna (eigenschappen)	**:** Laghu (licht)
Virya (effect)	**:** Ushna (heet)
Vipaka	**:** Katu (scherp)
Effect op de dosha's	**:** Kalmeert Kapha en Vata
Werking:	**:** Keshya (goed voor het haar), Sophahara (ontstekingsremmer), Chakshushya (goed voor de ogen), Vishaghna (antitoxine), Smritiprada (geheugenversterker), Anuloma (aerminativum)

Fytochemie:
De bladeren bevatten alkaloïden, reducerende suikers, glycosiden, flavonoïden, sterolen, harsen, tannines en essentiële olie.

Farmacologische werking:
Studies hebben uitgewezen dat de essentiële olie gewonnen uit de bladeren een schimmelwerende werking toont. Een onderzoek berichtte haar wezenlijke activiteit tegen carrageen, 5-HT (5-hydroxytryptamine) en tegen ontstekings-oedeem veroorzaakt door bradykinine. Studies hebben de oestrogeen -achtige activiteit geverifieerd. De ontstekingsremmende werking en het anti-artrtis- effect werden in deze studies bewezen. Dit betekent dat Nirgundi ingezet zou kunnen worden bij de gewrichtsverzorging. Daarnaast heeft de iridoïde glucoside een wezenlijke werking op glycoproteïne, een anti-diabetische werking en een anti-hyperlipidemische werking. De ontstekingsremmende activiteit van het actieve bestanddeel werd onderzocht en er werd bewijs gevonden dat het secretorische fosfolipase A (2) remt. Studies hebben laten zien dat de bladeren een antibacteriële werking hebben tegen menselijk pathogene bacteriën. Een stijging in osteoblast differentiatie en mineralisatie werd in een studie ontdekt, hetgeen bewijs levert voor zijn activiteit tegen osteoporose. De hepatoprotectieve en antioxidatieve werking van de bladeren werd bevestigd. Naast de ontstekingsremmende werking werd ook pijnstillende en antihistamine activiteit getoond in klinische proeven. Andere studies lieten anxiolytische en hartbeschermende activiteit zien.

Therapeutische toepassingen:
Nirgundi wordt aanbevolen als remedie voor plaatselijke ontstekingen, reumatische aandoeningen, ischias, rugpijn, huidaandoeningen, jeuk, gas, wonden, sinusitis, hoge cholesterol, oorpijn, koorts, osteoporose en na de bevalling. Wegens de oestrogeen-achtige en anxiolytische effecten en zijn vermogen om Vata te bedaren, wordt het gebruik van Nirgundi tijdens de overgang aangeraden.

Kumari (Aloë)



Geschiedenis:
Aloë is niet alleen in India bekend, maar over de hele wereld. Discorides en Celsus schreven over het nut van deze plant bij de behandeling van vele aandoeningen. In Ayurveda wordt over de therapeutische toepassing ervan gesproken.

Natuurlijke omgeving:
Aloë wordt graag in tuinen aangeplant en groeit overal in het land.
Haar oor- spronkelijke verspreidingsgebied ligt in oost en zuidelijk Afrika, maar vele soorten groeien inmiddels in alle delen van India (van de droge valleien in het westen tot de Himalaya en Kanyakumari).

Omschrijving:
De bladeren van de Aloë-struik zijn groot, dik, vlezig, lancetvormig, met een scherpe punt en stekels langs de bladranden. De kleur hangt van de soort af: grijs tot felgroen, chocoladebruin tot zwart.

Synoniemen:

Sanskriet	: Kumari, Rasasambhava, Sahasara, Ghrihakanya, Ghrit kumarika
Engels	: Indian Aloë
Nederlands	: Echte Aloë
Latijn	: Aloë barbadensis Mill., Aloë vera Tourn. ex. Linn, Aloë indica Royle
Gebruikte deel	: Bladmoes

Ayurvedische eigenschappen

Rasa (Smaak)	: Tikta (bitter)
Guna (eigenschappen)	: Gurú (zwaar), Snigdha (olieachtig), Picchila (kleverig)
Virya (effect)	: Sheet (koud)
Vipaka	: Katu (scherp)
Effect op de dosha's	: Balanceert de drie dosha's
Werking:	: Bhedi (uitdrijvend)

Fytochemie:
De bladeren bevatten anthraquinone en glycoside.

Farmacologische werking:
Studies op honden onder narcose hebben aan het licht gebracht dat Aloë Vera de stroom van gal verhoogt, en dat dit effect behoorlijk lang duurt. Onderzoek naar de effecten op de eierstokken suggereert dat Aloë een angiogenese werking en een soortgelijk effect als het follikelstimulerend hormoon (FSH) op de eierstokken heeft.

Bewezen werd dat Aloë rimpels en de elasticiteit van door zonlicht aangetaste huid verbetert. De huid die tegen het licht beschermd was, maakte meer collageen aan en toonde verminderde expressie van het collageen afbrekende enzym MMP-1. Onderdrukking van zowel oxidatieve schade door vrije radicalen als de leeftijd gerelateerde verhoging van hepatische cholesterol werd geobserveerd.

Studies hebben uitgewezen dat hydroxyanthraquinonen, zoals bijvoorbeeld emodin, fyto-oestrogenen zijn die een affiniteit hebben met oestrogeen receptoren in de mens. Studies suggereerden dat Aloë gel de opbouw van lichaamsvet verlaagde en zou dus nuttig kunnen zijn bij de preventie van obesitas veroorzaakt door dieet.

Onderzoek toonde aan dat Aloë bestanddelen bevat met een anti-hyperlipidemische werking en effectief is bij de behandeling van PCOS (Polycysteus-ovariumsyndroom) en de daaraan gerelateerde metabolische complicaties. Vele studies verifieerden ook het kankerwerend vermogen van Aloë Vera. Voorlopige onderzoeksresultaten laten zien dat het actieve bestanddeel van Aloë extract, aloin, de aggregatie van melanine veroorzaakt en dus de huid verlicht door de adrenerge receptoren te stimuleren.

De fytosterolen in Aloë Vera zijn een anti-diabetische verbinding. De lever beschermende werking van de plant werd ook onderzocht. Studies hebben laten zien dat Aloë-gel misschien veilig ingezet kan worden tegen hyperglycaemie en hypercholesterolemie bij diabetes type-2 patiënten die aan hyperlipidemie lijden. Aloë vertraagt het verouderingsproces.

Studies hebben aangetoond dat Aloë adipogenese vermindert door APMK te activeren en onderdrukt ontstekingen gerelateerd aan obesitas in muizen met obesitas.

Afhankelijk van de dosis toont zij een beschermende werking tegen cardiotoxiciteit. Ze toont ook verbeterde gevoeligheid voor insuline, een immunomodulerend effect, en een schimmelwerende en anti-inflammatoire werking.

Therapeutische toepassingen:
Aloë wordt aanbevolen ter bestrijding van koorts, darmstoornissen, dysmenorroe, onregelmatige menstruatie, amenorroe, verstopping, dyspepsie, obesitas, artritis, algehele zwakte, en leverziekten. In Sanskriet wordt Aloë Kumari (meisje) genoemd, vanwege haar positief effect op alle gynaecologische stoornissen. Zij wordt ook ingezet tegen hypercholesterolemie, diabetes en problemen met de spijsvertering. Wegens haar fyto-oestrogeenachtige werking biedt zij hulp tegen problemen voor, tijdens en na de menopauze.

Shatavari (Indiase Asperge)

Geschiedenis:
Shatavari wordt al eeuwen gebruikt in de Indiase geneeskunde. Haar werking als galactagogum, afrodisiacum en verjongingsmiddel wordt vermeld.

Natuurlijke omgeving:
Shatavari komt in de lagere oerwouden van India voor en wordt ook in tuinen aangeplant en in huis gehouden.

Omschrijving:
Shatavari is een klimplant, die 1-2 meter lang wordt. De kleine, uniforme bladeren hebben de vorm van dennennaalden.

Synoniemen:

Sanskriet	**:** Naranyani, Vari, Abhiru, Atirasa
Engels	**:** Asparagus
Nederlands	**:** Aziatische Asperge
Latijn	**:** Asparagus racemosus
Gebruikte deel	**:**Wortel

Ayurvedische eigenschappen

Rasa (Smaak)	**:** Madhura (zoet), Tikta (bitter)
Guna (eigenschappen)	**:** Guru (zwaar), Snigda (smerend)
Virya (effect)	**:** Sheet (koud)
Vipaka	**:** Madhura (zoet),
Effect op de dosha's	**:** Kalmeert Vata en Pitta
Werking:	**:** Shukrala (afrodisiacum), Balya (bevordert de kracht, versterkt), Hrdya (harttonicum), Medhya (hersentonicum), Pittahara (verlaagt Pitta), Rasayana (verjongend), Stanyakara (galacta gogum), Netrya (goed voor de ogen)

Fytochemie:
Deze plant bevat saponines, glycosiden, alkaloïden, zetmeel en slijmstof.

Farmacologische werking:
Meerdere studies berichten over haar werking als galactagogum. Een studie berichtte dat Shatavari zowel het gewicht van de lobben en alveoli als de melkproductie verhoogde in ratten die met oestrogeen behandeld waren. Over haar anti-oxytocische werking en anti-ADH activiteit in de zeepstofdelen, die geïsoleerd werden in de wortels, wordt beschreven in meerdere studies. In een studie werd haar oestrogeenachtige effect op vrouwelijke melkklieren en genitalia geobserveerd.

Eén van werkzame stoffen van Shatavari heeft een antidepressivum activiteit aangetoond, dat tot dusverre bekend, veroorzaakt wordt door de serotonerge noradrenerge stelsels en heeft een verhoogde bescherming van anti-oxidanten. Studies hebben uitgewezen dat Shatavari oestrogeen nabootst en kan oestrogeen zelfs vervangen. De werking als immunomodulans en de adaptogene activiteit van deze plant zijn bewezen.

Haar doeltreffendheid bij de behandeling van urogenitale ziekten, in het bijzonder candidiasis, is bewezen en een antibacteriële werking werd aangetoond. Haar vermogen om de cholesterolwisseling te reguleren en de status van antioxidanten te verbeteren in ratten met hypercholesterolemie werd bewezen. De apoptose-opwekkende activiteit van de steroïde bestanddelen in Shatavari werd geobserveerd.

Haar activiteit als acetylcholinesteraseremmer veroorzaakt haar werking als noötropicum en tegen amnesie, waardoor Shatavari als neuroprotectivum gezien wordt. Het risico op osteoporose na de menopauze slinkt door gebruik van Shatavari. Ook haar anxiolytische, antistress en anti-ulceratieve effecten werden in een aantal studies aangetoond.

Therapeutische toepassingen:
Omdat Shatavari een krachtige bron van fyto-oestrogenen is, wordt Shatavari aanbevolen als middel tegen gynaecologische aandoeningen zoals onregelmatige menstruatie, premenstrueel syndroom en overgangsklachten.

Ze wordt ook aanbevolen tegen algehele zwakte, urogenitale ontstekingen, angst, stress, hyperaciditeit, aambeien, diarree met of zonder bloedverlies, jicht, herpes, maagzweer, hematurie, heesheid, nachtblindheid, postnatale problemen en problemen met lactatie.

Wegens haar eigenschappen als anxiolyticum, antidepressivum en osteoporose-remmer is Shatavari zeer belangrijk voor vrouwen in de overgang. Shatavari wordt ook ingezet als Rasayana (verjongingsmiddel) om ouderdomsklachten aan te pakken.

Conclusie

De Ayurveda kruidensamenstelling
Een natuurlijke oplossing voor een soepele overgang

- Bevat krachtige fyto-oestrogenen die doeltreffend opvliegers en nachtzweten verminderen.
- Bestrijdt effectief stemmingswisselingen, depressiviteit en slapeloosheid
- Veroorzaakt GEEN verhoogd risico op kanker bij langdurig gebruik (in tegenstelling tot HRT).
- Vertraagt osteoporose en andere gewrichtsaandoeningen.
- Bevordert fysiek en emotioneel welzijn.
- Ondersteunt het reguleren van het bloedsuikergehalte en het gewicht, die beïnvloed kunnen worden door veroudering en menopauze.
- Beschermt tegen urogenitale aandoeningen.
- Helpt het cholesterolgehalte te reguleren en toont een hartbeschermende werking.
- Helpt menopauze-gerelateerde hyperpigmentatie te voorkomen.

Indicaties & Dosering

Indicaties
De kruidencombinatie kan, vanwege haar brede werking, doeltreffend ingezet worden bij klachten in verband met:

- Perimenopauze (de overgang)
- Natuurlijke menopauze en menopauze als gevolg van chirurgische interventie
- Postmenopauze
- Opvliegers
- Wisselende stemmingen
- Overmatige transpiratie
- Menarche (beginnende menstruatie)

Dosering
Inname van minimaal 1 tot 2 gram per dag.

Scientific references of Ingredients

SCIENTIFIC REFERENCES OF SARACA ASHOKA

1. Journal of Chemical and Pharmaceutical Research,2009,1(1):62-71
Saraca asoca (Ashoka): A Review
P. Pradhan, L. Joseph, V. Gupta, R. Chulet, H. Arya, R. Verma , A. Bajpai

Abstract :Ashoka is the most ancient tree of India, generally known as a "ashok briksh", botanist known as a *Saraca asoca* (Roxb.), De.wild or *Saraca indica* belonging family *Caesalpinaceae.* Medicinal herbs are moving from fringe to mainstream use with a great number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals. *Saraca asoca is reported to contain glycoside, flavanoids, tannins and saponins. It is used as spasmogenic, oxytocic, uterotonic, anti-bacterial, anti-implantation, anti-tumour, anti-progestational, antiestrogenic activity against menorrhagia and anti-cancer.* This review contains the Pharmacognostical account of various parts of plant, Phytochemical constituent and different reported pharmacological activity.

2. Indian Drugs 1984; 24: 496- 506.
Ashoka (Saraca indica Willd.) a potential Ayurvedic drug.
Srivastava GN, Bagchi GD, Srivastava AK.

Saraca indica is well known in Ayurvedic medicine for its use as a stimulant of the endometrium and ovarian tissue.

3. IRJP 2012 , Vol 3 (4)
A Review on Sarca Indica Plant
Bhadauria Preeti , Arora Bharti , Alok nath Sharma , Singh Vishwabhan

Abstract: Saraca indica is an important indigenous plant with lots of traditional importance belonging to the family caesalpinaceae. These are the wonderful herb that claims to cure several diseases according to Ayurvedic medicine. It mainly contains glycosides , tannin, saponin , flavonoids , and sterol. *It possess various activities such as analgesic , antipyretic , fungitoxic , anthelmintic, antdiabetic , larvicidal activity, antimicrobial activity, CNS depressant activity, Antiulcer activity, anti-inflammatory activity etc.* This review contains pharmacognistic study of various parts of plant, phytochemical constituents and pharmacological activities of various parts of plant.

4. Proceedings of International Conference on Unani Medicine, 8-11 February, 2005. Central Council for Research in Unani Medicine, New Delhi, p. 501, 2007
Unani Medicine and Geriatric Gynaecology
Raushan Ara, Q.A., S.A. Naaz and Ss. Mustafa

Old age is regarded as a normal inevitable biological phenomenon. Various physical and psychological changes occur due to aging. With the lengthening span of life, a new chapter in gynaecological is fast opening up. Geriatric gynaecology deals with gynaecological conditions encountered in postmenopausal woman at and above 60 years. As age increases there are increasing number of neoplasms and endocrine, metabolic and excretory system disorders. Certain gynaecologic disorders such as menopausal syndrome, postmenopausal osteoporosis, pruritus vulva, carcinoma of vulva, senile vaginitis, carcinoma of vagina, carcinoma of endometrium, uterine sarcoma, dysfunctional uterine bleeding from hyperplastic endomentrium, senile endometritis, tubercular endometritis are prone to develop in atrophic tissues of the aging women. One or all of these disorders may exist simultaneously in a single patient during aging. Menopausal syndrome is an important climactric disturbance. Through proper diet, exercise, counseling, medical treatment, nutritional supplements, many of the unpleasant aspects of menopause can be minimized if not eliminated. Traditional western medicine often limits women with menopausal symptoms to two choices : 1st hormone replacement therapy with medications containing oestrogen and progesterone or 2nd suffer in silence and "live wit it". *In Unani System of Medicine a number of foods and herbs are sources of natural plant oestrogen such as Medico sativa (Alfalfa), Soyabeen, Asparagus racemosus (Satavar), Saraca indica (Ashok), Glycyrrhiza glabra (Aslussoos), Prunus amygdalus (Almond), Anethum sowa (Soya). These phytoestrogens reduce menopausal symptoms without causing oestrogen related problems*

5. Presented at 4th World Ayurveda Congress and Arogya, held on 9-13 December 2010, Bengaluru, Karnataka, India.
Immunomodulatory and antioxidant potential of Saraca asoca (roxb.) de wilde bark in wistar rats.
N M Krishnakumar, P G Latha, S R Suja, S Shyamal, V J Shine, G I Anuja, S Sini, P Shikha, G Sreejith, V Vilash, C S Vimalkumar, and S Rajasekharan

The immuno-modulatory and antioxidant effects of the ethanolic extract of Saraca asoca (SA) bark on rat mesenteric mast cells were studied in Wistar rats sensitized with egg albumin (1 mg per rat) intramuscularly. The results showed that significant immuno-modulatory effects were obtained in egg albumin-sensitized animals as evidenced by the decrease in

antigen-induced degranulation of mesenteric mast cells in both in vivo and in vitro conditions. SA (100 µg/ml) showed significant activity (in vitro) on human red blood cell (HRBC) membrane stabilization. The extract showed potent inhibition of FeCl2-AA-stimulated rat liver lipid peroxidation in vitro by significantly decreasing malondialdehyde (MDA) levels in FeCl2-AA-treated rat liver homogenate, compared to controls with FeCl2-AA. Besides, SA also showed significant DPPH-free radical scavenging activity. *The results of the present study thus reveals for the first time the immuno-modulatory and antioxidant potential of SA in inhibiting mast cell degranulation and lipid peroxidation and stabilizing HRBC membrane.*

6. Dushing Yogesh A. et al. / Journal of Pharmacy Research 2012,5(6),3165-3168

Antioxidant Assessment of Ashokarishta – A Fermented Polyherbal Ayurvedic Formulation

Dushing Yogesh A. and Laware Shankar L.

Abstract : Ashokarishta is an ayurvedic fermented polyherbal formulation with Ashoka (Saraca indica) as the main ingredient. It is mainly used to rejuvenate female reproductive system, purify blood and manage stress. *In present study preliminary phytochemical parameters like total phenols and flavonoids were estimated from the marketed brands of Ashokarishta. Antioxidant potential was assessed by free radical scavenging activity, super oxide radical scavenging activity and reducing power assay.* Results revealed that the Ashokarishta formulated by Vaidyaratnam (Kerla) is a good source of antioxidant compounds followed by Baidyanath, where as samples from Rasashala-Pune and Sandu Brothers showed comparatively lower activities with aforesaid methods. The differences in antioxidant potential may be due to methods of preparation, maturity levels of plants, ecological niche of the plants and types of additional herbs used.

7. Inflammopharmacology. 2011 Dec;19(6):317-25. Epub 2011 Sep 23.

Therapeutic effect of Saraca asoca (Roxb.) Wilde on lysosomal enzymes and collagen metabolism in adjuvant induced arthritis.

Saravanan S, Babu NP, Pandikumar P, Ignacimuthu S.

Rheumatoid arthritis is a chronic, progressive and systemic inflammatory disorder mainly affecting the synovial joints. In the present study, we evaluated the anti-arthritic effect of the methanol extract of Saraca asoca (Roxb.) Wilde., (Fabaceae) on adjuvant induced arthritis by assessing paw swelling, body weight, the levels of lysosomal enzymes, protein bound carbohydrates, serum cytokines, urinary collagen and histopathology of joints. It was found that S. asoca methanol extract at doses of 50, 100 and 200 mg/kg reduced the paw thickness and elevated the mean body weight of arthritic rats. The treatment of S. asoca showed a significant reduction in the levels of both plasma and liver lysosomal enzymes. The protein bound carbohydrates and urinary collagen contents were also decreased at a significant level by the treatment of S. asoca methanol extract. The histopathological study of the joints showed the anti-arthritic property of S. asoca which nearly normalized the histological architecture of the joints. Further, we established the anti-arthritic activity of S. asoca methanol extract by measuring the levels of cytokines in both arthritic and treated rats. *The treatment of S. asoca reduced the levels of pro-inflammatory cytokines. In conclusion, S. asoca methanol extract was capable of ameliorating the conditions of arthritis in adjuvant induced arthritic rats.*

8. Pharmacologyonline 3: 1039-1045 (2011)

Saraca asoca in the management of pain and inflammation

B.Deepti, Santhrani Thaakur, P. Srinivasa babu, T. Priyatamnadh

Abstract : Saraca asoca is one of the most renowned and a religious tree of India. It is mainly used as ueterine tonic and also in the management of burning sensation, piles and in inflammation. The analgesic activity was assessed on rats by tail flick method and hotplate method. The anti-inflammatory activity was estimated by measuring the mean increase in hind paw volume of rat with the help of plethysmometer. *In our present study, it is observed that methanolic extract of Saraca asoca exhibited significant analgesic and anti-inflammatory action.*

9. Integr Cancer Ther. 2011 Jul 19. [Epub ahead of print]

Chemoprevention of Two-Stage Skin Cancer In vivo by Saraca asoca.

Cibin TR, Devi DG, Abraham A.

Saraca asoca (Family Caesalpiniaceae) has been widely used in traditional Indian medicine especially due to its wound-healing property. The present study investigates the chemopreventive property of flavonoids from Saraca asoca (flowers) on 2-stage skin carcinogenesis in mice models. Skin cancer was induced in Swiss albino mice by single topical application of 7,12-dimethyl benzanthracene (100 µg/50 µL of acetone) followed by thrice a week treatment of croton oil for 20 weeks. The topical pretreatment of the flavonoid fraction from S asoca (FF S asoca) was 30 minutes prior to the application of croton oil thrice weekly for 20 weeks. At the end of the experimental period the animals were sacrificed, and the tumor statistics and various marker parameters were studied (enzyme assays, Western

blotting). The pretreatment of the FF of S asoca caused significant reduction in the number of tumors per mouse and the percentage of tumor-bearing mice. Also, the latency period for the appearance of the first tumor was delayed by S asoca pretreatment. In plant-treated animals there was a significant increase in the levels of reduced glutathione, catalase, and protein in skin when compared with the untreated animals. Conversely, there was a significant decrease in the lipid peroxidation levels. A significant reduction in the expression of ornithine decarboxylase, a key enzyme in the promotion stage of 2-stage skin cancer, in the plant-treated group was also observed. *These findings suggest the chemopreventive activity of flavonoids from S asoca on 2-stage skin carcinogenesis.*

10. Phytother Res. 2010 May;24(5):666-72.
Chemoprevention of skin cancer by the flavonoid fraction of Saraca asoka.
Cibin TR, Devi DG, Abraham A.

Saraca asoka (Family - Caesalpiniaceae) has been widely used in the Ayurvedic (traditional Indian) system of medicine especially due to its wound healing property. The present study investigated the chemopreventive property of flavonoids from the flowers of Saraca asoka on 7,12 dimethyl benz(a)anthracene (DMBA) induced skin cancer in mice models. A single topical application of DMBA (100 microg/50 microL of acetone) followed after 2 weeks by three times a week treatment with croton oil (1% in acetone), for 20 weeks resulted in tumor induction. The topical application of the flavonoid fraction of S. asoka (FF S. asoka), 30 min prior to the application of croton oil thrice weekly for 20 weeks, caused a significant reduction in the number of tumors per mouse and the percentage of tumor-bearing mice. Also the latency period for the appearance of the first tumor was delayed by S. asoka pretreatment. In the flavonoid fraction (5 mg and 10 mg/kg body weight) treated animals, the levels of biochemical markers - rhodanese, myeloperoxidase, beta-D-glucuronidase, sialic acid, hexokinase and caspase 3 were significantly restored to near normal levels. *These findings suggest the chemopreventive activity of flavonoids from S. asoka on two stage skin carcinogenesis. Histological data also support the chemopreventive potential of S. asoka.*

11. J Environ Pathol Toxicol Oncol. 2010;29(1):69-79.
Antioxidant and radiation antagonistic effect of Saraca indica.
Rao BS, Rao N, Archana PR, Gayathri P, Shetty P.

The present study was undertaken to investigate the radiation mitigating effect of hydro-alcoholic extract of Saraca indica (SIE) against mice exposed to whole body gamma radiation. Free radical scavenging ability by SIE was demonstrated using hydroxyl, superoxide anion, ABTS*+ and DPPH radicals generated in vitro. A significant increase in the animal survival (dose reduction factor = 1.39), inhibition in the decline of hematological parameters as well as increased number of spleen colony-forming units was observed when SIE was administered prior to radiation. SIE pretreatment increased the levels of glutathione, glutathione S- trans-ferase, catalase and lowered lipid peroxidation. Our findings for the first time demonstrate the protective potential of SIE against radiation induced syndromes with an optimal dose of 400 mg/kg b.wt. *The radiation mitigating effect may be attributed to the mechanisms such as free radical scavenging, elevation in antioxidant status, and reduction in lipid peroxidation.*

12. Eur Rev Med Pharmacol Sci. 2009 Sep-Oct;13(5):371-4.
Antimicrobial properties of the stem bark of Saraca indica (Caesalpiniaceae).
Sainath RS, Prathiba J, Malathi R.

Chloroform, methanol, aqueous and ethanolic extracts of the stem bark of Saraca indica were investigated for their antibacterial and antifungal activity against standard strains of Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Bacillus cereus, Klebsiella pneumoniae, Proteus mirabilis, Salmonella typhimurium and Streptococcus pneumoniae and the fungi: Candida albicans and Cryptococcus albidus. Methanolic and aqueous extract exhibited antimicrobial activity with MIC ranging from 0.5-2% and 1-3% respectively. *Methanolic extract exhibited the strongest activity against both bacteria and fungi.*

13. Can J Microbiol. 2007 Jan;53(1):75-81.
Antibacterial activity of aerial parts as well as in vitro raised calli of the medicinal plant Saraca asoca (Roxb.) de Wilde.
Shahid M, Shahzad A, Malik A, Anis M.

Leaves, stem, and flowers of Saraca asoca, an endangered medicinal plant in India, and young explants cultivated on Murashige & Skoog's medium containing 6-benzylaminopurine were analyzed for antibacterial potential.

Alcoholic and aqueous extracts from parent explants and their in vitro raised calli were tested by an agar well diffusion method. Minimal inhibitory concentrations (MICs) of the extracts were determined by broth microdilution method. Aqueous extracts showed antibacterial activity against limited bacterial species, whereas alcoholic extracts were active against a wider range of bacteria. Although the alcoholic extracts of all the explants and calli showed antibacterial activity, the extracts derived from flowers and their calli showed better results. Extracts derived from calli showed comparable results to the extracts from explants. Overall, the MICs of the extracts ranged from 0.039 to 1.25 mg/mL. MICs against gram-positive bacteria ranged from 0.078 to 1.25 mg/mL, whereas they ranged between 0.039 and 0.625 mg/mL against gram-negative bacteria. A MIC distribution plot showed that gram-negative bacteria were more susceptible to the extracts than gram-positive bacteria. It is concluded that extracts of S. asoca contain antibacterial agent, and as the calli gave good results, in vitro cultivation of the explants may be used to obtain antibacterial compounds. *This is the first report on antibacterial activity of S. asoca, especially through in vitro raised calli.*

14. Afr J Tradit Complement Altern Med. 2007 Feb 16;4(3):313-8.
Antimicrobial activity of some Indian medicinal plants.
Dabur R, Gupta A, Mandal TK, Singh DD, Bajpai V, Gurav AM, Lavekar GS.

The antimicrobial potential of seventy-seven extracts from twenty-four plants was screened against eight bacteria and four pathogenic fungi, using microbroth dilution assay. Lowest concentration of the extract, which inhibits any visual microbial growth after treatment with p-iodonitrotetrazolium violet, was considered to be minimum inhibitory concentration (MIC). *Water extracts of Acacia nilotica, Justicia zelanica, Lantana camara and Saraca asoca exhibited good activity against all the bacteria tested and the MIC was recorded in range of 9.375-37.5 microg/ml and 75.0-300.0 microg/ml against the bacterial and fungal pathogens, respectively. The other extracts of Phyllanthus urinaria, Thevetia nerifolia, Jatropha gossypifolia , Saraca asoca, Tamarindus indica, Aegle marmelos, Acacia nilotica, Chlorophytum borivilianum, Mangifera indica, Woodfordia fruticosa and Phyllanthus emblica showed antimicrobial activity in a range of 75-1200 microg/ml.*

SCIENTIFIC REFERENCES OF SYMPLOCOS RACEMOSA

1. J Ethnopharmacol. 2004 Sep;94(1):197-200.
Effect of Symplocos racemosa Roxb. on gonadotropin release in immature female rats and ovarian histology.
Bhutani KK, Jadhav AN, Kalia V.

In the present study we are reporting in vivo effect of aqueous extracts of Symplocos racemosa Roxb. (Fam. Symplocaceae) on serum FSH and LH levels in immature female Sprague-Dawley rats under basal conditions. Symplocos racemosa is used in Indian System of Medicine (ISM) for various female disorders. Aqueous extract on oral administration significantly stimulated serum FSH level (P ← 0.016) along with the rise in serum LH level (P ← 0.001). Moreover, histopathological studies revealed enhanced folliculogenesis, presence of mature follicles and detached oocytes, which are result of increased FSH and LH levels. Further, an increase in the ovary weight of treated animals was found due to observed FSH surge. *These results are in concordance with the traditional use of the drug for female disorders.*

2. J Asian Nat Prod Res. 2009;11(2):159-67.
An investigation of the kinetic and anti-angiogenic properties of plant glycoside inhibitors of thymidine phosphorylase.
Hussain S, Gaffney J, Ahmed N, Slevin M, Iqbal Choudhary M, Ahmad VU, Qasmi Z, Abbasi MA.

We investigated the potential of symplocomoside (1) and symponoside (2), glycosides isolated from the bark of Symplocos racemosa to inhibit thymidine phosphorylase (TP) activity and associated angiogenesis. Compound 1 was a reversible, noncompetitive inhibitor of deoxythymidine binding to TP (IC(50) = 65.45 +/- 5.08 microM; K(i) = 62.83 +/- 2.10 microM) and 2 was a reversible, uncompetitive inhibitor (IC(50) = 94.17 +/- 4.05 microM; K(i) = 101.95 +/- 1.65 microM). Molecular modeling analysis indicated that both compounds bound at the active site of the enzyme but not solely to amino acid residues involved in catalysis. Both compounds were active in in vitro angiogenic assays inhibiting endothelial cell migration and invasion in Matrigel, but did not inhibit growth factor-induced proliferation and were not cytotoxic. *Compound 1 may have potential as an anti-angiogenic and anti-tumor agent.*

3. "A Clinical study to evaluate efficacy of nyagrodha and lodhra in Shweta pradara" Thesis by Dr. Priya Sharma

Shveta Pradara is one of the most common and burning problems faced by women all around the globe from menarche to menopause. Term Shveta Pradara means excess white discharge per vaginum. Shveta Pradara has various pre disposing causes. Many gynaecological disorders present with Shveta Pradara as a major symptom. Shveta Pradara is a cause of great deal of discomfort to the sufferer.Yoni being a direct route to uterus (or kshetra), if diseased, might affect the entire kshetra, which is nidation of growing embryo and its development. So a condition like Shveta Pradara which might lead to ascending infections, if left untreated, can cause PID, chronic cervicitis, cervical erosion, infertility and may even cause carcinoma of cervix, thereby having serious implications of women's health. The reported prevalence of Shveta Pradara is said to be more than 50% of total women population, which includes women of all age groups. So a more appropriate and effective treatment which is relatively quicker in action with more efficacy is the need of the hour. In the light of the above, the drugs taken for the study in this disease complex are Nyagrodha and Lodhra. Thus, the aim of this study is to find out a precise line of treatment as per our classics which are more potent with long lasting effects.

SCIENTIFIC REFERENCES OF VALERIANA WALLICHII

1. GMS Health Technol Assess. 2012;8:Doc03. Epub 2012 May 7.
Alternative methods for the treatment of post-menopausal troubles.
Aidelsburger P, Schauer S, Grabein K, Wasem J.

Background : Menopause is described as the transition from the reproductive phase of a women to the non reproductive. Changes in hormone levels might lead to complaints and health consequences especially during peri- and postmenopause. Hormone therapy has a potential damaging health risk profile and is recommended for temporal limited therapy for acute vasomotor symptoms only. OBJECTIVE: The present HTA-report aims to assess the effectiveness and the cost-effectiveness of alternative treatment methods for women with postmenopausal symptoms in Germany regarding patient relevant endpoints (reduction of symptoms and frequency of adverse events and improvement of quality of life). METHODS: A systematic literature search was carried out in 33 relevant databases in September 2010. Citations were selected according to pre-defined criteria and were extracted and evaluated. RESULTS: In the systematic research 22 studies are identified for the effectiveness evaluation, 22 primary studies and one review. High doses of isolated genistein reduce the frequency/intensity of hot flashes while low doses of genistein show no significant effect. Intake of isoflavone extract such as genistein, daidzein, glycitein in various combinations does not have an effect on improvement of cognitive function or vaginal dryness. The effect of black cohosh and hop extract for menopausal complaints cannot be determined since results are heterogenous. *The combination of isoflavone, black cohosh, monk's pepper, valerian and vitamin E has a positive effect on menopause symptoms.* Ginkgo biloba shows no significant effect on menopause symptoms and cognitive improvement beside mental flexibility. Acupuncture has a significant influence on hot flashes especially in severe cases. Discussion / conclusion: No final statement can be drawn regarding the effectiveness of alternative treatment methods due to qualitative shortcomings of included studies and a general limited availability of studies in this field. Furthermore, the generalization of the present HTA is limited due to the inclusion of only postmenopausal women.

2. Menopause. 2011 Sep;18(9):951-5.
Effect of valerian on sleep quality in postmenopausal women: a randomized placebo-controlled clinical trial.
Taavoni S, Ekbatani N, Kashaniyan M, Haghani H.

Objective: Sleep disturbances reduce the quality of life. About 50% of postmenopausal women experience sleep disturbances such as insomnia. Complementary and alternative medical therapies may be useful for the management of sleep disturbances among postmenopausal women. The aim of the present study was to evaluate the effects of valerian extract taken nightly on the improvement of sleep quality in postmenopausal women experiencing insomnia. Methods : A randomized, triple-blind, controlled trial design was used for this study. Participants consisted of 100 postmenopausal women aged 50 to 60 years who were experiencing insomnia. A demographic data form and the Pittsburgh Sleep Quality Index were used to collect data. The women were randomly divided into two groups. Each group received either 530 mg of concentrated valerian extract or a placebo twice a day for 4 weeks. Descriptive and inferential statistics were used to analyze the data. Results : A statistically significant change was reported in the quality of sleep of the intervention group in comparison with the placebo group (P ← 0.001). Also, 30% of the participants in the intervention group and 4% in the placebo group showed an improvement in the quality of sleep (P ← 0.001). Conclusions: *Valerian improves the quality of sleep in women with menopause who are experiencing insomnia.* Findings from this study add support to the reported effectiveness of valerian in the clinical management of insomnia.

3. Nepal Med Coll J. 2007 Mar;9(1):36-9.
Initial exploratory observational pharmacology of Valeriana wallichii on stress management: a clinical report.
Bhattacharyya D, Jana U, Debnath PK, Sur TK.

Valeriana wallichii, an Indian medicinal plant, has been on trial for its role in stress disorders in hospital based clinical set-up. Hamilton's Brief Psychiatric Rating Scale (BPRS) was used and thorough clinical investigations were carried out to screen the subjects. Thirty-three subjects (20 male and 13 female; average age 34.2 years) were medicated with the plant extract in a fixed dose regime (500 mg/capsule, twice daily, p.o. after meal). They were thoroughly investigated clinically and using standard questionnaires based on different psychological rating scale at baseline (day 0), mid-term (day 30) and final (day 60). The observations exhibited that, V wallichii not only significantly (p ← 0.001) attenuated stress and anxiety, but also significantly (p ← 0.001) improved

depression and also enhanced the willingness to adjustment. Nevertheless it did not alter memory, concentration or attention of the volunteers. *The results suggest that V wallichii may be useful in the treatment of stress related disorders in human and may be a promising anti-stress agent in near future.*

4. Pharmacol Biochem Behav. 2004 Feb;77(2):399-404.
Sedative and sleep-enhancing properties of linarin, a flavonoid-isolated from Valeriana officinalis.
Fernández S, Wasowski C, Paladini AC, Marder M.

We have recently reported the presence of the anxiolytic flavone 6-methylapigenin (MA) and of the sedative and sleep-enhancing flavanone glycoside 2S (-) hesperidin (HN) in Valeriana officinalis and Valeriana wallichii. MA, in turn, was able to potentiate the sleep-inducing properties of HN. *The present paper reports the identification in V. officinalis of the flavone glycoside linarin (LN) and the discovery that it has, like HN, sedative and sleep-enhancing properties that are potentiated by simultaneous administration of valerenic acid (VA)*. These effects should be taken into account when considering the pharmacological actions of valeriana extracts.

5. Pharmacol Biochem Behav. 2003 Jun;75(3):537-45.
6-methylapigenin and hesperidin: new valeriana flavonoids with activity on the CNS.
Marder M, Viola H, Wasowski C, Fernández S, Medina JH, Paladini AC.

Valerian is an ancient tranquillizing drug obtained from the underground organs of several Valeriana species. Its active principles were assumed to be terpenoids in the form of valepotriates and/or as components of the essential oil. However, unknown active compounds were not discarded and synergic effects were suspected. We have recently isolated 6-methylapigenin (MA) from Valeriana wallichii and proved that it is a benzodiazepine binding site (BDZ-bs) ligand [Planta Med. 68 (2002) 934]. The present paper is the first report of the presence of 2S(-)-hesperidin in valeriana and describes that it has sedative and sleep-enhancing properties. *MA, in turn, was found to have anxiolytic properties and was able to potentiate the sleep-enhancing properties of hesperidin (HN).MA and HN are new members of the growing family of natural flavonoids with activity on the CNS, and their properties suggest that they are promising drug leads in the field*.

6. J Pharm Pharmacol. 2009 Feb;61(2):251-6.
Relaxing effects of Valeriana officinalis extracts on isolated human non-pregnant uterine muscle.
Occhiuto F, Pino A, Palumbo DR, Samperi S, De Pasquale R, Sturlese E, Circosta C.

Objectives: This study investigated the relaxing effects of Valeriana officinalis L. (Valerianaceae) on human uterine muscle. The major uses of this species in Europe are as a sedative and an anxiolytic; it is also used as a spasmolytic to treat gastrointestinal spasm. Methods: We evaluated two valerian extracts (ethanolic and aqueous) in comparison with a natural mixture of valepotriates and nifedipine on spontaneous and agonist-induced contractions in non-pregnant human myometrium in vitro. Qualitative and quantitative chemical analysis was used to correlate the chemical composition of extracts with their spasmolytic effects. Myometrial strips were obtained from hysterectomy specimens of premenopausal women. Longitudinal muscle strips were mounted vertically in tissue baths under physiological conditions to record their isometric contraction. The responses of cumulative concentrations of valerian extracts on spontaneous contractions in the presence and absence of the beta-adrenoceptor blocker atenolol or the cyclooxygenase inhibitor indometacin, and on agonist-induced contractions, were investigated. Key findings : Valerian extracts and valepotriates inhibited uterine contractility in a concentration-dependent manner. Pretreatment with either atenolol or indometacin did not affect the uterine responses to valerian extracts. *Valerian extract reduced the maximal contractile response induced by acetylcholine, phenylephrine and histamine independent of the stimulus.* Conclusions : *Valerian extracts may have direct inhibitory effects on the contractility of the human uterus* and this justifies the traditional use of this plant in the treatment of uterine cramping associated with dysmenorrhoea.

7. BMC Complement Altern Med. 2010 Dec 16;10:77.
Oxidative DNA damage preventive activity and antioxidant potential of plants used in Unani system of medicine.
Kalim MD, Bhattacharyya D, Banerjee A, Chattopadhyay S.

Background : There is increasing recognition that many of today's diseases are due to the "oxidative stress" that results from an imbalance between the formation and neutralization of reactive molecules such as reactive oxygen species (ROS) and reactive nitrogen species (RNS), which can be removed with antioxidants. The main objective of the present study was to evaluate the antioxidant activity of plants routinely used in the Unani system of medicine. Several plants were screened for radical scaven-

ging activity, and the ten that showed promising results were selected for further evaluation. Methods : Methanol (50%) extracts were prepared from ten Unani plants, namely Cleome icosandra, Rosa damascena, Cyperus scariosus, Gardenia gummifera, Abies pindrow, Valeriana wallichii, Holarrhena antidysenterica, Anacyclus pyrethrum, Asphodelus tenuifolius and Cyperus scariosus, and were used to determine their total phenolic, flavonoid and ascorbic acid contents, in vitro scavenging of DPPH(·), ABTS(·+), NO, (·)OH, O□(·-) and ONOO(□), and capacity to prevent oxidative DNA damage. Cytotoxic activity was also determined against the U937 cell line. RESULTS: IC□□ values for scavenging DPPH(·), ABTS(·+), NO, (·)OH, O□(·□) and ONOO(□) were in the ranges 0.007 ± 0.0001 - 2.006 ± 0.002 mg/ml, 2.54 ± 0.04 - 156.94 ± 5.28 µg/ml, 152.23 ± 3.51 - 286.59 ± 3.89 µg/ml, 18.23 ± 0.03 - 50.13 ± 0.04 µg/ml, 28.85 ± 0.23 - 537.87 ± 93 µg/ml and 0.532 ± 0.015 - 3.39 ± 0.032 mg/ml, respectively. The total phenolic, flavonoid and ascorbic acid contents were in the ranges 62.89 ± 0.43 - 166.13 ± 0.56 mg gallic acid equivalent (GAE)/g extract, 38.89 ± 0.52 - 172.23 ± 0.08 mg quercetin equivalent (QEE)/g extract and 0.14 ± 0.09 - 0.98 ± 0.21 mg AA/g extract. The activities of the different plant extracts against oxidative DNA damage were in the range 0.13-1.60 µg/ml. Of the ten selected plant extracts studied here, seven - C. icosandra, R. damascena, C. scariosus, G. gummifera, A. pindrow, *V. wallichii* and H. antidysenterica – *showed moderate antioxidant activity*. Finally, potentially significant oxidative DNA damage preventive activity and antioxidant activity were noted in three plant extracts: C. icosandra, R. damascena and C. scariosus. These three plant extracts showed no cytotoxic activity against U937 cells. Conclusions : The 50% methanolic extracts obtained from different plant parts contained significant amounts of polyphenols with superior antioxidant activity as evidenced by the scavenging of DPPH(·), ABTS(·+), NO, (·)OH, O□(·□) and ONOO(□). C. icosandra, R. damascena and C. scariosus showed significant potential for preventing oxidative DNA damage and radical scavenging activity, and the G. gummifera, A. pindrow, V. wallichii, H. antidysenterica, A. pyrethrum, A. tenuifolius and O. mascula extracts showed moderate activity. The extracts of C. icosandra, R. damascena and C. scariosus showed no cytotoxicity against U937 cells. In conclusion, these routinely used Unani plants, especially C. icosandra, R. damascena and C. scariosus, which are reported to have significant activity against several human ailments, could be exploited as potential sources of natural antioxidants for plant-based pharmaceutical industries.

8. J Ethnopharmacol. 2005 Sep 14;100(3):347-52**.**

Antispasmodic and blood pressure lowering effects of Valeriana wallichii are mediated through K+ channel activation.

Gilani AH, Khan AU, Jabeen Q, Subhan F, Ghafar R.

Crude extract of Valeriana wallichii rhizome (Vw.Cr) and its fractions were studied for possible antispasmodic and blood pressure lowering activities to rationalize some of the folkloric uses. In rabbit jejunum preparations, Vw.Cr (0.1-3.0 mg/mL) caused relaxation of spontaneous contractions. When tested against high K(+) (80 mM)-induced contractions it produced weak inhibitory effect, while caused complete relaxation of the contractions induced by low K(+) (20 mM). In the presence of glibenclamide (3 microM), the inhibitory effect of low K(+) was shifted to the right, similar to that produced by cromakalim while, verapamil caused no differentiation in its inhibitory effect against low and high K(+)-induced contractions. In guinea pig ileum, the plant extract produced similar results as in rabbit jejunum. Intravenous administration of Vw.Cr, produced fall in arterial blood pressure in normotensive anaesthetized rats and this effect was partially blocked by glibenclamide. In rabbit aortic preparations, plant extract also caused a selective and glibenclamide-sensitive relaxation of low K(+) (20 mM)-induced contractions. Activity-directed fractionation studies revealed that the observed activity was distributed both in the chloroform and aqueous fractions. *These results indicate that the antispasmodic and hypotensive effects of Valeriana wallichii are mediated possibly through K(ATP) channel activation, which justify its use in gastrointestinal and cardiovascular disorders.*

9. Indian J Exp Biol. 2010 Mar;48(3):289-93.

Elucidation of possible mechanism of analgesic action of Valeriana wallichii DC chemotype (patchouli alcohol) in experimental animal models.

Sah SP, Mathela CS, Chopra K.

Valeriana wallichii (Family Valerianaceae), popularly named as Indian valerian, exists as three chemotypes. Aim of the study was to evaluate the effect of V. wallichii chemotype (patchouli alcohol) extract (DCME) and essential oil (VPAEO) on experimental models of nociception and to elucidate its possible mechanism of action. Analgesic effect was evaluated using acetic acid induced writhing and tail flick model. DCME and VPAEO (40 and 80 mg/kg, p.o.) significantly inhibited the number of writhings as compared to vehicle treated group. None of the doses of DCME and VPAEO exhibited any effect in tail flick model suggesting only peripheral analgesic activity. When studied for mechanism of action in acetic acid induced writhing, subeffective dose of essential oil significantly potentiated the effect of aspirin while no potentiation was seen in case of extract. *These data suggest that essential oil VPAEO exerted peripheral analgesic via inhibition of prostaglandin synthesis.*

10. Indian Vet J. 1970 Feb;47(2):170-5.
Analgesic studies on Vitex negundo and Valeriana wallichii.
Shrivastava SC, Sisodia CS.

11. Phytother Res. 2010 May;24(5):686-91.
Terpenoid content of Valeriana wallichii extracts and antidepressant-like response profiles.
Subhan F, Karim N, Gilani AH, Sewell RD.

Three extracts of Valeriana wallichii DC (Valerianaceae) rhizome and fluoxetine were studied for antidepressant-like activity in two behavioral models, namely the forced swim test (FST) and the tail suspension test (TST). Fluoxetine as well as methanolic and aqueous extracts of V. wallichii induced monophasic dose-related decrements in immobility times in both tests. However, the aqueous-ethanolic fraction induced a biphasic dose-response profile since it produced a graded effect up to 200 mg/kg but the highest dose (250 mg/kg) was inactive in the FST. This extract also exhibited significantly reduced activity at 200 mg/kg compared to lower doses in the TST. The highest doses of aqueous-ethanolic extract also reduced locomotor activity which will have led to a negative functional interaction with antidepressant-like effects. Qualitative phytochemical analysis revealed that the aqueous-ethanolic extract of V. wallichii was the only separated rhizome fraction containing terpenoids. Furthermore, since the methanolic and aqueous extracts were active in the tests, it is suggested that the antidepressant-like action of this herbal plant is not contingent upon its terpenoid constituents.

12. Indian J Exp Biol. 2007 Sep;45(9):764-9.
Effect of chlorophyll and aqueous extracts of Bacopa monniera and Valeriana wallichii on ischaemia and reperfusion-induced cerebral injury in mice.
Rehni AK, Pantlya HS, Shri R, Singh M.

Bilateral carotid artery occlusion followed by reperfusion produced significant cerebral infarction and impaired short-term memory, motor co-ordination and lateral push response. Individual pretreatments with chlorophyll and aqueous extracts of B. monniera and V. wallichii markedly attenuated ischaemia-reperfusion induced cerebral injury in terms of decreased infarct size, increase in short-term memory, motor in coordination and lateral push response. *The results suggest that chlorophyll and aqueous extracts of B. monniera and V. wallichii prevent ischaemia-reperfusion induced cerebral injury with comparable potency.*

SCIENTIFIC REFERENCES OF VITEX NEGUNDO

1. Pharmazie. 2007 Nov;62(11):872-5.
Estrogen-like activities in Vitex species from China determined by a cell based proliferation assay.
Hu Y, Zhang QY, Hou TT, Xin HL, Zheng HC, Rahman K, Qin LP.

Ethanolic extracts of four Chinese medicinally used Vitex species were selected and tested for their estrogen-like activities, using an ERalpha-positive MCF-7 cell based proliferation assay (E-screen assay) and cell cycle analysis (flow cytometry). *Vitex negundo displayed the highest estrogenic-like activity, and could be useful in hormone replacement therapy (HRT).*

2. Inflamm Res. 2012 Apr;61(4):293-304.
Anti-arthritic activity of agnuside mediated through the down-regulation of inflammatory mediators and cytokines.
Pandey A, Bani S, Satti NK, Gupta BD, Suri KA.

Objective and design: The purpose of this study was to elucidate the probable mechanism for the anti-arthritic activity of agnuside (AGN), a compound isolated from the leaf extract of Vitex negundo. Methodology: The anti-inflammatory activity of AGN within a dose range of 1.56-12.50 mg/kg in normal and adrenalectomized rats was evaluated against different inflammagens. An array of pro-inflammatory mediators (PGE(2) and LTB(4)) and T-cell-mediated cytokines (IL-2, TNF-□, IFN-□, IL-4, IL-10, IL-17) was assayed using flow cytometry, in arthritic paw tissue homogenate and splenocytes of treated animals. Results : Significant anti-arthritic activity was observed in the polyarthritis test in rats and this was associated with significant suppression of inflammatory mediators and T-cell-mediated cytokines (Th1/Th2). The anti-inflammatory activity in adrenalectomized rats confirmed that the effect of AGN is not mediated by the pituitary-adrenal axis. AGN also showed inhibition of vascular permeability and leukocyte migration in vivo. *Conclusion: The study suggests the possible development of AGN as a therapeutic agent in the treatment of arthritis by the modulation of the host immune response.*

3. Bioinformation. 2011;7(4):199-206.
Active compound from the leaves of Vitex negundo L. shows anti-inflammatory activity with evidence of inhibition for secretory Phospholipase A(2) through molecular docking.
Vinuchakkaravarthy T, Kumaravel KP, Ravichandran S, Velmurugan D.
Novel compounds with significant medicinal properties have gained much interest in therapeutic approaches for treating various inflammatory disorders like arthritis, odema and snake bites and the post-envenom (impregnating with venom) consequences. Inflammation is caused by the increased concentration of secretory Phospholipases A(2) (sPLA(2)s) at the site of envenom. A novel compound Tris(2,4-di-tert-butylphenyl) phosphate (TDTBPP) was isolated from the leaves of Vitex negundo and the crystal structure was reported recently. T*he acute anti-inflammatory activity of TDTBPP was assessed by Carrageenan-induced rat paw odema method.* TDTBPP reduced the raw paw odema volume significantly at the tested doses of 50 mg/kg and 70 mg/kg body weight. Molecular docking studies were carried out with the X-ray crystal structures of Daboia russelli pulchella's (Vipera russelli, Indian Russell's viper) venom sPLA(2) and Human non-pancreatic secretory PLA(2) (Hnps PLA(2)) as targets to illustrate the antiinflammatory and antidote activities of TDTBPP. Docking results showed hydrogen bond (H-bond) interaction with Lys69 residue lying in the anti-coagulant loop of D. russelli's venom PLA(2), which is essential in the catalytic activity of the enzyme and hydrophobic interactions with the residues at the binding site (His48, Asp49). Docking of TDTBPP with Hnps PLA(2) structure showed coordination with calcium ion directly as well as through the catalytically important water molecule (HOH1260) located at the binding site.

4. Phytomedicine. 2010 Nov;17(13):993-9. Epub 2010 May 31.
Anti-osteoporotic constituents from Indian medicinal plants.
Kumar M, Rawat P, Dixit P, Mishra D, Gautam AK, Pandey R, Singh D, Chattopadhyay N, Maurya R.
The objective of this study was to determine the in vitro osteogenic activities of selected medicinal plants used traditionally in India. The compounds isolated from three plants viz. Allophylus serratus, Cissus quadrangularis and Vitex negundo were evaluated for their in vitro osteogenic activities. Primary cultures of osteoblasts were used to determine the effects of these components on osteoblast functions. *Five of the fourteen compounds isolated led to increase in osteoblast differentiation and mineralization. These findings lend support to the use of Allophylus serratus, Cissus quadrangularis and Vitex negundo in traditional medicine.*

5. Indian J Pharm Sci. 2008 Nov;70(6):838-40.
Antioxidant and Antiinflammatory Activity of Vitex negundo.
Kulkarni RR, Virkar AD, D'mello P.

Reactive oxygen species are implicated in various inflammatory disorders. Vitex negundo is mentioned in Ayurveda as useful in treating arthritic disorders. The present work was undertaken to evaluate the antioxidant potential and anti-inflammatory activity of the plant. The total methanol extract of the plant was standardized in terms of total polyphenols. The standardized extract in a dose of 100 mg/kg caused a comparable reduction in edema with that of diclofenac sodium (25 mg/kg) when evaluated for antiinflammatory activity by carrageenan-induced rat paw edema method. The extract also exhibited a strong free radical scavenging activity by 1,1-diphenyl-2-picrylhydrazyl method and caused a significant reduction in the formation of thiobarbituric acid reacting substances when evaluated for its lipid peroxidation inhibitory activity. *The results strongly suggest that radical quenching may be one of the mechanisms responsible for its antiinflammatory activity.*

6. Indian J Med Res. 2006 Oct;124(4):447-50.
Vitex negundo Linn (VN) leaf extract as an adjuvant therapy to standard anti-inflammatory drugs.
Tandon VR, Gupta RK.

Background and objectives: Leaves of Vitex negundo (VN) have been investigated for their antiinflammatory activity in past, including its mechanism of action. However, nobody has evaluated its potential role as an adjuvant with standard anti-inflammatory therapy. Therefore, the present study was undertaken to investigate interaction of ethanolic leaf extract of VN Linn with standard anti-inflammatory drugs in sub-effective doses per orally (PO) to evaluate its potential role as an adjuvant therapy. Methods : Carrageenin induced hind paw oedema and cotton pellet granuloma test in albino rats were employed to study interaction of Vitex negundo (VN) leaf extract with standard antiinflammatory drugs in sub-effective doses per orally to evaluate its potential role as an adjuvant therapy. Results: The sub-effective dose of VN potentiated anti-inflammatory activity of phenlbutazone and ibuprofen significantly in carrageenin induced hind paw oedema and cotton pellet granuloma models. Interpretation and conclusion: *The potentiation of anti-inflammatory activities phenlbutazone and ibuprofen by VN indicates that it may be useful as an adjuvant therapy along with standard antiinflammatory drugs.*

7. J Ethnopharmacol. 2003 Aug;87(2-3):199-206.
Anti-inflammatory and analgesic activities of mature fresh leaves of Vitex negundo.
Dharmasiri MG, Jayakody JR, Galhena G, Liyanage SS, Ratnasooriya WD.

This study confirmed the oral anti-inflammatory, analgesic and antihistamine properties of mature fresh leaves (MFL) of Vitex negundo L. (Verbenaceae) claimed in the Ayurveda medicine by orally treating a water extract of the leaves to rats. The early phase (2h) of carrageenan-induced rat paw oedema was significantly ($P<0.01$) suppressed in an inversely does-dependent ($r(2)=1$, $P<0.01$) manner by MFL. The EC(50) was 2g/kg of MFL. In the formaldehyde-induced rat paw oedema test, the 2.5 and 5g/kg leaves significantly ($P<0.05$) suppressed the inflammation on days 4-6 of the test. In the hot plate test, 2.5 and 5g/kg of MFL showed a significant ($P<0.05$) and directly dose-dependent analgesic activity at 1h of treatment while the activity was absent in the tail flick test in rats. The EC(50) for the analgesic activity was 4.1g/kg. In the formalin test, 1.25, 2.5 and 5g/kg of MFL significantly ($P<0.05$) suppressed the pain in both the phases of the test like aspirin. The leaves showed an inversely dose-dependent in vivo antihistamine and in vitro prostaglandin (PG) synthesis inhibition, membrane stabilising and antioxidant activities. Naloxone did not abolish the analgesic activity in the hot plate test. A 5g/kg of MFL did not impair muscle strength and co-ordination and did not induce sedation. The treatment of 5g/kg of MFL did not show signs of acute toxicity or stress. Fourteen-day oral treatment of 5g/kg of MFL significantly increased the serum activity of AST. Flowering of the tree did not abolish the analgesic and anti-inflammatory activities of the leaves. *These observations revealed that the fresh leaves of Vitex negundo have anti-inflammatory and pain suppressing activities possibly mediated via PG synthesis inhibition, antihistamine, membrane stabilising and antioxidant activities*. The antihistamine activity can produce the anti-itching effect claimed in Ayurveda medicine.

8. The Journal of Research and Education in Indian Medicine, 1990,Vol 9 (1) 61-63
Analgesic Activity of Vitexin
M.G. Sehuraman, N. Sulochana & S. Ramaswamy

Abstract: From the shade dried leaves of Pleiospermium alatum, a medicinally useful plant belonging to Rutaceae, a flavone C-glucoside viz vitexin has been isolated along with apigenin 7-O-diglucoside and apigenin 7-glncuronide. The identity of these compounds was confirmed by PC, UV and NMR Studies. The analgesic effect of vitexin was studies by acetic acid induced writhing test, tail dip and hot plate methods. The involvement

of opiate receptor in bioflavonoid induced analgesia was investigated by pretreating the animals (mice) with nalaxone. The role of alpha 2-adrenoceptor in the vitexin induced analgesia was also studied. The combined effect of vitexin with morphine was found out. ED50 of the drug was found to be 6.9 mg/kg BW while LD 50 of the drug was found to be more than 1 g/kg BW. All these observations reveal the involvement of opiate receptor in eliciting analgesia. *These studies also show that this drug could very well be developed as a potent analgesic agent.*

9. Hippocratic Journal of Unani Medicine, Vol. 2(2)pp. 69-79, July-Dec 2007
Ethnomedicinal uses of Vitex negundo L. (Sambhalu) from south-eastern India : A potential herb for rheumatism
Aminuddin, R.D. Girach, V.K. Singh and M.K. Siddiqui1.

Based on a series of ethnopharmacological surveys conducted in south-eastern India between 1982-1996, the communication presents 36 folk prescriptions of an important Unani medicinal plant Sambhalu (Vitex negundo L.) widely known for treatment of rheumatism. *The information has been compared with authentic Unani text, revealing that most of the folk uses are already mentioned in the literature. Therefore, inclusion of this drug in the context of its effective use in rheumatism in Unani pharmacopoeia is stressed after studies on its efficacy and safety.* Information on reported chemical constituents and pharmacological activities of the plant are given in an attempt to contradict or support the claims.

10. Phytomedicine. 2012 Feb 15;19(3-4):211-6. Epub 2011 Nov 23.
Antihyperglycemic effect of iridoid glucoside, isolated from the leaves of Vitex negundo in streptozotocin-induced diabetic rats with special reference to glycoprotein components.
Sundaram R, Naresh R, Shanthi P, Sachdanandam P.

The aim of present study was to isolate an iridoid glucoside from the leaves of Vitex negundo and evaluates its effects on dearrangement in plasma and tissues glycoprotein components in streptozotocin-induced diabetic rats. The levels of blood glucose, plasma and tissues glycoproteins such as hexose, hexosamine, fucose and sialic acid were significantly increased whereas plasma insulin levels were significantly decreased in diabetic rats. On oral administration of iridoid glucoside at a concentration of 50 mg/kg b.w. once daily to diabetic rats for the period of 30 days, reversed the above-mentioned hyperglycemia-induced biochemical changes to near normal levels. The anti-hyperglycemic effect of iridoid glucoside was comparable with glibenclamide, a known hypoglycemic drug. *Based on the results obtained from the present study, it may be concluded that iridoid glucoside possesses significant productive effect on glycoprotein metabolism in addition to its antidiabetic effect.*

11. Eur J Pharmacol. 2012 Jan 15;674(2-3):460-7. Epub 2011 Nov 9.

Effect of iridoid glucoside on streptozotocin induced diabetic rats and its role in regulating carbohydrate metabolic enzymes.
Sundaram R, Naresh R, Ranadevan R, Shanthi P, Sachdanandam P.
Vitex negundo is a medicinal plant used to treat many ailments. An active compound of iridoid glucoside was isolated from V. negundo leaves and its efficacy was investigated in streptozotocin induced diabetic rats with special reference to carbohydrate metabolizing enzymes. The optimum dose of iridoid glucoside was determined by oral glucose tolerance test. The effects of iridoid glucoside were compared with glibenclamide Administration of iridoid glucoside (50mg/kg body weight) to diabetic rats for 30 days resulted in significant reduction in the levels of plasma glucose, glycosylated hemoglobin and increase in the levels of insulin and hemoglobin. Administration of iridoid glucoside showed a significant increase in the levels of glycolytic enzymes and glycogen content and decrease in the levels of gluconeogenic enzymes in the liver of diabetic treated rats. Further, iridoid glucoside showed antihyperlipidemic activity as evidenced by significant reduction in serum total cholesterol, triglyceride, low density lipoprotein and very low density lipoprotein coupled together with elevation of high density lipoprotein in diabetic rats. A significant decrease was observed in the activities of aspartate aminotransferase, alanine aminotransferase and decrease in the levels of serum urea and creatinine in diabetic treated rats when compared to diabetic untreated rats. Treatment of iridoid glucoside alleviated body weight loss in diabetic rats. The effect produced by iridoid glucoside on various parameters was comparable to that of glibenclamide. *These results indicate that iridoid glucoside possess antihyperlipidemic effect in addition to its antidiabetic effect*.

12. J Ethnopharmacol. 2006 Mar 8;104(1-2):129-31. Epub 2005 Oct 25.
Comparative anti-hyperglycemic potentials of medicinal plants.
Villaseñor IM, Lamadrid MR.

Validation of the ethnobotanical use of the leaves of Artemisia vulgaris Linn. (Compositae), Eucalyptus tereticornis Sm. (Myrtaceae), Solanum nigrum Linn. (Solanaceae), and Vitex negundo Linn. (Verbenaceae); stems of Nopalea cochinellifera (Linn.) Salm-Dyck (Cactaceae); roots of Imperata cylindrica Beauv. (Gramineae); dried bark of Syzygium cumini (Linn.)

Skeels (Myrtaceae) as anti-diabetic agents using the oral glucose tolerance test showed that only the bark of Syzygium cumini and the leaves of Vitex negundo and Eucalyptus tereticornis exhibited anti-hyperglycemic activities when fed simultaneously with glucose. At the same dosages of 5 mg/20 g mouse, Syzygium cumini-treated mice showed a significant decrease in blood glucose levels (BGLs) at 30 min (alpha=0.10) and from 45 min onwards at alpha=0.05. *Vitex negundo exhibited greater anti-hyperglycemic activity than Eucalyptus tereticornis*. Both showed a significant decrease in BGLs at 60 min but at alpha=0.05 for Vitex negundo and at alpha=0.07 for Eucalyptus tereticornis. There was no significant lowering in BGLs for Imperata cylindrica and Solanum nigrum while there was even an increase in BGLs for Nopalea cochinellifera and Artemisia vulgaris.

13. International Journal of Green Pharmacy, 2009, Vol: 3 (3) 243-247

Anxiolytic cctivity of Vitex Negundo Linn. in experimental models of nnxiety in mice

RS Adnaik, PT Pai, VD Sapakal, NS Naikwade, CS Magdum

The purpose of this study was to characterize the putative anxiolytic-like activity of an ethanolic extract prepared from the roots of Vitex negundo (VN) using the elevated plus maze (EPM) and light-dark exploration test in mice. Male mice were either treated orally with the VN extract or the positive control diazepam, respectively, 1 hour before behavioral evaluation. Oral administration of 100 and 200 mg/kg of VN extract significantly (P → 0.01) increased the percentage time spent on and the number of entries into the open arms of the EPM. The effect was comparable to that of the benzodiazepine diazepam (2 mg/kg p.o.). In light-dark exploration test, diazepam-treated rats significantly increased the time spent in light arena and decreased the duration of immobility, while VN treated rats also showed a significant (P →0.01) increase in the time spent (100 and 200 mg/kg) in light arena. Diazepam and the VN extracts do not produced any overt motor dysfunction. *These results indicate that VN is an effective anxiolytic agent.* In conclusion, the action of extract upon the anxiety models tested are in accord with the traditional use of VN L. and could be useful in primary medical care.

14. International Journal of Green Pharmacy, 2009 , Vo: 3 , 4 , 306-309

Evaluation of Cardiotonic Activity of Leaves of Vitex Negundo Linn

PT Pai, RS Adnaik, SN Mule, NS Naikwade, CS Magdum

The present study was undertaken to evaluate the cardiotonic activity of the aqueous extract of leaves of Vitex negundo Linn. The leaves are believed to contain some antioxidants and hence pose it to be used in the prevention of cardiovascular diseases. The cardiotonic effect of aqueous extract of leaves of V. negundo Linn. was studied by using isolated frog heart perfusion technique (IFHP). Ringer solution without calcium was used as a vehicle for administration of aqueous extract as test and digoxin as standard. A significant increase in the height of force of contraction (positive ionotropic effect) and decrease in heart rate (negative chronotropic effect) was observed at smaller doses (0.4 mg). The effect increased as dose was increased. *The test extract had not produced cardiac arrest even at a dose of 2 mg, a higher concentration as compared to standard, digoxin that showed cardiac arrest at dose of 0.2 mg. Hence, as compared to standard, test drug showed wide therapeutic index.*

15. Asian Pac J Trop Med. 2011 Aug;4(8):645-8.

In vitro antibacterial potential of some Vitex species against human pathogenic bacteria.

Kannathasan K, Senthilkumar A, Venkatesalu V.

Objective : To study the antibacterial activity of the leaf methanol extracts of fie different species of Vitex namely, Vitex altissima (V. altissima), Vitex diversifolia (V. diversifolia), Vitex negundo (V. negundo), Vitex peduncularis (V. peduncularis) and Vitex trifolia (V. trifolia). Methods: Antibacterial assay was carried out by using disc diffusion method, determination of minimum inhibitory concentrations (MIC) and minimum bactericideal concentrations (MBC) against five strains of Gram-positive and seven strains of Gram-negative human pathogenic bacterial strains. Results : The results of antibacterial activity of Vitex species showed that the extracts possessed a broad spectrum of antibacterial activity. The V. peduncularis possessed the highest activity against all the microorganisms screened. It produced a zone of inhibition ranged between (11.000 ± 0.577) and (22.670 ± 0.667) mm and the MIC values were from 62.5 to 1 000.0 µg/mL and the MBC values were from 125.0 to 2 000.0 µg/mL. Conclusions: Based on the present study, V. peduncularis is recommended for the isolation of antibacterial molecule responsible for the activity against the tested human pathogenic bacterial strains.

16. Ancient Science of Life, 2004, Vol: 23(4) 30-32

Antimicrobial Potential of Vitex Trifolia Linn

V.Geetha A, A.Doss And A.Pichai Anthoni Doss

Vitex trifolia (Local name - Nirnocchi, sirunocchi) is well known for its medicinal property. *The present investigation encompasses evaluation of antibacterial potential of Vitex trifolia against certain pathogenic bacterial strains*. Preliminary phytochemical studies were also made and results are given.

17. Food Chemistry, 2007, Vol 100 (3) 1170-1176

Antioxidant Properties of different fractions of Vitex Negundo Linn.
Nidhi Pandey, J.K. Chaurasia, O.P. Tiwari, Yamini B. Tripathi
Abstract: Vitex negundo Linn. (VN), belonging to family Verbenaceae, is an aromatic shrub distributed throughout India. In the ayurvedic system of medicine it is used as a drug of choice to manage pain, inflammation and other related diseases. It contains many polyphenolic compounds, terpenoids, glycosidic iridoids and alkaloids. Since polyphenolic compounds have high antioxidant potential, the antioxidant potency of V. negundo was investigated by employing various established in vitro systems, such as 2,2'-azino-bis 3-ethyl benzothiazoline-6-sulfuric acid (ABTS*+)/Lipid Peroxides (LPO)/Superoxide/Hydroxyl radical scavenging and iron ion chelation. Total antioxidant capacity was determined by the assay based on the preformed radical monocation ABTS*+. Lipid peroxidation was assessed in terms of thiobarbituric acid reactive substances by using egg yolk homogenates as lipid rich media. Superoxide radical scavenging assay was based on the riboflavin-light-Nitro blue tetrazolium (NBT) system. Hydroxyl radical trapping potential was determined by evaluating hydroxyl radical induced deoxyribose degradation using the thiobarbituric acid method. In order to assess the metal chelation properties, hydroxyl radical induced deoxyribose degradation was evaluated in the absence of Ethylenediamine tetra acetic acid (EDTA). All the polar fractions significantly showed trapping of free radicals, and thereby inhibition of lipid peroxidation, and also chelated the iron ion. Interestingly, the hexane fraction did not show any activity against superoxides radicals and it had minimum trapping potential for other free radical (FR) species also. Thus, it may be concluded that the polar fractions of VN possess potent antioxidant properties, which may be mediated through direct trapping of the free radicals and also through metal chelation. *Therefore its reported anti-inflammatory properties, could be through the down regulation of the free radical mediated pathway of inflammation.*

18. Phytother Res. 2001 Sep;15(6):519-23.

Antiradical and antilipoperoxidative effects of some plant extracts used by Sri Lankan traditional medical practitioners for cardioprotection.

J Munasinghe TC, Seneviratne CK, Thabrew MI, Abeysekera AM.

Reactive oxygen species (ROS) are implicated in many pathogenic processes including the cardiovascular system. Detoxification of ROS by antioxidants (AO) therefore affords protection against such diseases. There is a growing body of evidence suggesting that antioxidants contribute to cardioprotection. Therefore, nine plants that are components of Ayurvedic formulations used for the therapy of cardiovascular diseases were investigated to determine whether antioxidant activity is one of the mechanisms by which these plants exert cardioprotection. Initially aqueous freeze dried extracts of the plants were prepared and the antioxidant activity was measured (a) in vitro, by DPPH (1,1-diphenyl-2-picrylhydrazyl) radical scavenging and deoxyribose damage protection assays, and (b) in vivo, by effects on lipid peroxidation. Terminalia arjuna showed significant DPPH radical scavenging activity with EC(50) 8.3 +/- 0.3 microg/mL (similar to L-ascorbic acid). The potency of this activity was much lower in Cassia fistula (EC(50) = 59.0 +/- 2.7 microg/mL). The other seven extracts demonstrated no such activity in the concentration range tested. *In the deoxyribose damage protection assay, T. arjuna> demonstrated no significant effect in the concentration range 0-20 microg/mL, but above -20 microg/mL concentration (20-125 microg/mL), a pro-oxidant activity was observed (although markedly less than demonstrated by L-ascorbic acid). A similar trend was observed with Vitex negundo.* In contrast, C. fistula afforded a 30% protection against such damage at 125 microg/mL concentration. Other plant extracts did not show any activity in this assay. At a dose of 90 mg/kg (single dose) T. arjuna, cardiac lipid peroxidation in male Wistar rats was reduced by 38.8% +/- 2.6% ($p \leftarrow 0.05$) whereas the reduction was only 11.6% +/- 3.5% in the case of C. fistula even at a dose of 120 mg/kg. Of all the plants tested, T. arjuna demonstrated the highest antioxidant activity. Overall results show that only some plants used in the therapy of cardiovascular disease exert their beneficial effects via antioxidant activity.

19. Chem Biol Interact. 2012 Mar 5;196(1-2):30-8. Epub 2012 Feb 8.

Prevention of selenite induced oxidative stress and cataractogenesis by luteolin isolated from Vitex negundo.

Rooban BN, Sasikala V, Gayathri Devi V, Sahasranamam V, Abraham A.

Free radical mediated oxidative stress plays a crucial role in the pathogenesis of cataract and the present study was to determine the efficacy of luteolin in preventing selenite induced oxidative stress and cataractogenesis in vitro. Luteolin is a bioactive flavonoid, isolated and characterized from the leaves of Vitex negundo. Lenses were extracted from Sprague-Dawley strain rats and were organ cultured in DMEM medium. They were divided into three groups with eight lenses in each group as follows: lenses cultured in normal medium (G I), supplemented with 0.1mM sodium selenite (G II) and sodium selenite and 2 μg/ml luteolin (G III). Treatment was from the second to fifth day, while selenite administration was done on the third day. After the experimental period, lenses were taken out and various parameters were studied. The antioxidant potential of luteolin was assessed by 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. In the selenite induced group, morphological examination of the lenses showed dense cortical opacification and vacuolization. Biochemical examinations revealed a significant decrease in activities of antioxidant enzymes and enzymes of the glutathione system. Additionally decreased glutathione level and increased reactive oxygen species (ROS) and thiobarbituric acid reactive substances (TBARS) were observed. Luteolin treatment abated selenite induced oxidative stress and cataractogenesis by maintaining antioxidant status, reducing ROS generation and lipid peroxidation in the lens. *These finding demonstrated the anticataractogenic effect of luteolin by virtue of its antioxidant property, which has been reported in this paper for the first time.*

SCIENTIFIC REFERENCES OF ALOE BARBADENSIS

1. J.Med Food 2009 Dec;12(6):1393-7.
Investigation of the effects of Aloe barbadensis on rat ovaries : a preliminary study.
Kosif R, Aktas RG.

Abstract : Effects of Aloe barbadensis, a type of Aloe vera, on ovaries were investigated during pregnancy. A. vera gel, a commercial and nontherapeutic form of A. barbadensis, was used for this purpose. Three groups (one control and two test groups) of female Wistar albino rats with no prior births were studied. Group I was administered 25 mg (140 mg/kg) of A. barbadensis/day both orally and through gavage. A. barbadensis was contained in capsules with 500 mg of soybean oil; therefore Group II was administered 500 mg of soybean oil. Group III was the control group. All three groups were given normal food and water ad libitum. The substance had been administered for 20 days until birth. Ovaries were examined histologically. Vascular increase and the hyperemic form of ovary in the group administered A. barbadensis were notable. Decrease in primary follicle numbers, increase in secondary follicle numbers, and diminishment of secondary follicle diameters occurred in ovaries. *The histological changes imply an angiogenesis effect of A. barbadensis and an effect like that of follicle-stimulating hormone in ovaries.*

2. Bioorg Med Chem Lett. 2001 Jul 23;11(14):1839-42.
Phytoestrogens from the roots of Polygonum cuspidatum (Polygonaceae): structure-requirement of hydroxyanthraquinones for estrogenic activity.
Matsuda H, Shimoda H, Morikawa T, Yoshikawa M.

The methanolic extract from the roots of Polygonum (P.) cuspidatum was found to enhance cell proliferation at 30 or 100 microg/mL in MCF-7, an estrogen-sensitive cell line. By bioassay-guided separation from P. cuspidatum with the most potent activity, emodin and emodin 8-O-beta-D-glucopyranoside were isolated as active principles. The methanolic extracts from Polygonum, Cassia, Aloe, and Rheum species, which were known to contain anthraquinones, also showed the MCF-7 proliferation. As a result of the evaluation of various anthraquinones from plant sources and synthetic anthraquinones, aloe-emodin, chrysophanol, chrysophanol 8-O-beta-D-glucopyranoside, and 1,8-dihydroxyanthraquinone showed weak activity. On the other hand, alizalin and 2,6-dihydroxyanthraquinone as well as emodin having the 2- and/or 6-hydroxyl groups showed potent activity. These results show that the unchelated hydroxyl group is essential for strong activity. Emodin and 2,6-dihydroxyanthraquinone also inhibited 17beta-estradiol binding to human estrogen receptors (ERs) with K(i) values of 0.77 and 0.31microM for ERalpha and 1.5 and 0.69 microM for ERbeta. *These findings indicate that hydroxyanthraquinones such as emodin are phytoestrogens with an affinity to human estrogen receptors.*

3. Chem Res Toxicol 2010 Aug 16;23(8):1349-55.
Estrogenic activity of anthraquinone derivatives: in vitro and in silico studies.
Li F , Li X , Shao J, Chi P, Chen J, Wang Z

Comprehension of the ligand-receptor interactions is a prerequisite for constructing mechanism based quantitative structure-activity relationship (QSAR) models on xenoestrogenic activity. Molecular docking was performed to simulate the interactions between anthraquinone derivative (AQs) molecules and the estrogen receptor alpha (ERalpha). Hydrogen bonding, hydrophobic, and pi-pi interactions were found to be the dominant interactions between AQs and the receptor, which implied the estrogenic activities of the compounds. The recombinant yeast-based assay was employed to determine the estrogenic activities of 20 AQs. On the basis of the observed interactions between the AQs and ERalpha, appropriate molecular structural parameters were computed to develop a QSAR model. *The polarizability term, the binding energy, the average molecular polarizability, the most negative formal charge in the molecule, and the average of the negative potentials on the molecular surface were significant parameters explaining the estrogenicity.* The developed QSAR model had good robustness, predictive ability, and mechanism interpretability. The interactions between the AQs and ERalpha and the partition ability of the AQs into the biophase are main factors governing the estrogenic activities. Moreover, the applicability domain of the model was described.

4. Ann Dermatol. 2009 Feb;21(1):6-11. Epub 2009 Feb 28.

Dietary Aloe Vera Supplementation Improves Facial Wrinkles and Elasticity and It Increases the Type I Procollagen Gene Expression in Human Skin in vivo.

Cho S, Lee S, Lee MJ, Lee DH, Won CH, Kim SM, Chung JH.

Background: No studies have yet been undertaken to determine the effect of aloe gel on the clinical signs and biochemical changes of aging skin. Objective: We wanted to determine whether dietary aloe vera gel has anti-aging properties on the skin. Methods: Thirty healthy female subjects over the age of 45 were recruited and they received 2 different doses (low-dose: 1,200 mg/d, high-dose: 3,600 mg/d) of aloe vera gel supplementation for 90 days. Their baseline status was used as a control. At baseline and at completion of the study, facial wrinkles were measured using a skin replica, and facial elasticity was measured by an in vivo suction skin elasticity meter. Skin samples were taken before and after aloe intake to compare the type I procollagen and matrix metalloproteinase 1 (MMP-1) mRNA levels by performing real-time RT-PCR. Results: After aloe gel intake, the facial wrinkles improved significantly ($p \leftarrow 0.05$) in both groups, and facial elasticity improved in the lower-dose group. In the photoprotected skin, the type I procollagen mRNA levels were increased in both groups, albeit without significance; the MMP-1 mRNA levels were significantly decreased in the higher-dose group. Type I procollagen immunostaining was substantially increased throughout the dermis in both groups. *Conclusion: Aloe gel significantly improves wrinkles and elasticity in photoaged human skin, with an increase in collagen production in the photoprotected skin and a decrease in the collagen-degrading MMP-1 gene expression.* However, no dose-response relationship was found between the low-dose and high-dose groups.

5. Planta Med. 2012 May;78(8):767-71.

On the novel action of melanolysis by a leaf extract of Aloe vera and its active ingredient aloin, potent skin depigmenting agents.

Ali SA, Galgut JM, Choudhary RK.

The present study was carried out to investigate the effects of an Aloe vera leaf extract, along with its standard active ingredient aloin, on the isolated tail melanophores of Bufo melanostictus tadpoles, which are a type of disguised smooth muscle cells offering excellent in vitro opportunities for studying the effects of pharmacological and pharmaceutical agents. It was found that the leaf extract of A. vera and its active ingredient aloin induced powerful, dose-dependent, physiologically significant melanin aggregating effects in the isolated tail melanophores of B. melanostictus similar to those of adrenaline per se. These preliminary findings clearly demonstrate that the extract of A. vera and its active ingredient aloin cause melanin aggregation leading to skin lightening via alpha adrenergic receptor stimulation. *The present study opens new vistas for the use of A. vera regarding its clinical application as a new nontoxic melanolytic agent for the treatment of hyperpigmentation.*

6. Br J Community Nurs. 2010 Jun;15(6):280-2.

Oral Aloevera as a treatment for osteoarthritis: a summary.

Cowan D.

Abstract: While pain relief is a basic tenet of health care, pain is under-treated in the UK (Davies and Mcvicar, 2000) and this issue remains unresolved. This paper suggests that oral Aloe vera could be used in the treatment of chronic non-cancer pain (CNCP), particularly that caused by osteoarthritis (OA). Despite being used as arthritis treatment for centuries (Yoo et al, 2008), evidence of effectiveness of Aloe vera is anecdotal or from small studies. *The perceived benefits of prescribing Aloe vera for OA may be twofold: it has utility as an anti-inflammatory agent and also as a prophylactic against the gastrointestinal irritant effects of non-steroidal anti-inflammatory drugs (NSAIDs).* Long-term, randomized, controlled studies are still needed to address the lack of evidence informing optimum prescribing of pain medication for people with OA (Cowan, 2007). There is no reason that so called 'nutraceutical' agents should not be subjected to the same rigorous randomized, controlled, double-blind trials as other 'mainstream' drugs. Therefore, it is appropriate to ask whether NSAID treatment and side effects can be improved by the addition of oral Aloe vera. Thus, we may then be in a more informed position to resolve the ongoing 'Pandemonium over Painkillers' .

7. J Ethnopharmacol. 2012 May 7;141(1):542-6. Epub 2012 Mar 15.

In vitro anti inflammatory activity of Aloe vera by down regulation of MMP-9 in peripheral blood mononuclear cells

Vijayalakshmi D, Dhandapani R, Jayaveni S, Jithendra PS, Rose C, Mandal AB.

Aim of the study: *The anti-inflammatory activity of Aloe vera was investigated through MMP inhibition studies. The effect of Aloe vera on MMP-9 inhibition was tested on peripheral blood mononuclear cells (PBMC).* Materials and methods S: Peripheral blood mononuclear cells (PBMC) were isolated from the heparinised venous blood by Ficoll Diatrizoate gradient centrifugation. The cell count and viability was determined using dye exclusion technique. Cytotoxicity was evaluated by MTT assay. Activation of MMP-9 was visualized by gelatin zymography. Inhibition of MMP-9 in the presence of aqueous extract of Aloe vera was detected by gelatin zymography

and confirmed by RT-PCR. Results: Peripheral blood mononuclear cells (PBMC) showed significant inhibition in the activity of MMP-9, indicating the in vitro inhibitory effect of Aloe vera on MMP-9. Zymographic analysis and RT-PCR showed that it caused a significant reduction in the production of MMP-9 in a concentration dependent manner. Conclusion: The inhibition of MMP-9 production in the cells was detected by gelatin zymography and was confirmed by RT-PCR.

8. Int J Biol Macromol. 2011 Jan 1;48(1):38-43. Epub 2010 Oct 1.
Isolation and characterization of novel protein with anti-fungal and anti-inflammatory properties from Aloe vera leaf gel.
Das S, Mishra B, Gill K, Ashraf MS, Singh AK, Sinha M, Sharma S, Xess I , Dalal K, Singh TP, Dey S.

Abstract The Aloe protein of 14 kDa from the Aloe vera leaf gel was isolated by an ion exchange chromatography using DEAE-cellulose and CM-cellulose column. The purified Aloe protein exhibited a potent anti-fungal activity against Candida paraprilosis, Candida krusei and Candida albicans. In addition, the purified Aloe protein also showed an anti-inflammatory property against pure lipoxygenase and cyclooxygenase-2 with 84% and 73% inhibition, respectively, and was verified by binding with these proteins by real time method by the phenomenon of surface plasmon resonance. *This Aloe protein is a novel protein possessing antifungal and anti-inflammatory properties and thus sets a platform to be used as a medicinal plant product.*

9. Planta Med. 2002 Nov;68(11):957-60.
Antioxidant, free radical scavenging and anti-inflammatory effects of aloesin derivatives in Aloe vera.
Yagi A, Kabash A, Okamura N, Haraguchi H, Moustafa SM, Khalifa TI.

Antioxidant components in Aloe vera were examined for lipid peroxidation using rat liver microsomal and mitochondrial enzymes. Among the aloesin derivatives examined, isorabaichromone showed a potent antioxidative activity. The DPPH radical and superoxide anion scavenging activities were determined. As one of the most potent components, isorabaichromone together with feruloylaloesin and p-coumaroylaloesin showed potent DPPH radical and superoxide anion scavenging activities. Electron spin resonance (ESR) using the spin trapping method suggested that the potent superoxide anion scavenging activity of isorabaichromone may have been due to its caffeoyl group. *As A. vera has long been used to promote wound healing, the inhibitory effects of aloesin derivatives for cyclooxygenase(Cox)-2 and thromboxane (Tx) A 2 synthase were examined and the participation of p-coumaroyl and feruloyl ester groups in the aloesin skeleton was demonstrated.* These findings may explain, at least in part, the wound healing effects of A.vera. Abbreviations. ADP:adenosine diphosphate ASA:ascorbic acid BHT:butylated hydroxytoluene BSA:bovine serum albumin DMPO:5,5-dimethyl-1-pyrroline N-oxide DPPH:1,1-diphenyl-2-picrylhydrazyl EDTA:edetic acid HEPES: N-(2-hydroxyethyl)-piperazine- N-2'-ethane-sulfonic acid NADH:reduced nicotinamide adenine dinucleotide NADPH:reduced nicotinamide adenine dinucleotide phosphate NBT:nitroblue tetrazolium Pg:prostaglandin SOD:superoxide dismutase TBA:thiobarbituric acid TCA:trichloroacetic acid XOD:xanthine oxidase.

10. J Nutr Sci Vitaminol (Tokyo). 2003 Aug;49(4):292-6.
Efficacy of dietary aloe vera supplementation on hepatic cholesterol and oxidative status in aged rats.
Lim BO, Seong NS, Choue RW, Kim JD, Lee HY, Kim SY, Yu BP, Jeon TI, Park DK.

In the current study, we show the anti-oxidative and hypocholesterol effects of aloe vera in the liver. Male specific pathogen-free (SPF) Fischer 344 rats were randomly assigned to one of four groups: Group A (control) was fed test chow without aloe supplementation; Group B was fed a diet containing a 1% (per weight basis) freeze-dried aloe filet; Group C was fed a diet containing a 1% (per weight basis) charcoal-processed, freeze-dried aloe filet; and Group D was fed a diet containing a charcoal-processed freeze-dried, whole leaf aloe (0.02% per weight basis) in the drinking water. Our results show that a life-long intake of aloe had superior anti-oxidative action against lipid peroxidation in vivo, as indicated by reduced levels of hepatic phosphatidylcholine hydroperoxide. Additional anti-oxidative action was evidenced by enhanced superoxide dismutase (SOD) and catalase activity in groups B and C. Furthermore, our study revealed that hepatic cholesterol significantly increased in the control group during aging in contrast to the aloe-supplemented groups, which showed approximately 30% lower cholesterol levels, thereby an effective hypocholesteremic efficacy. *In this report, we suggest that life-long dietary aloe supplementation suppresses free radical-induced oxidative damage and age-related increases in hepatic cholesterol*

11. Pharmacognosy Res. 2012 Apr; 4(2):109-15.
Aloe barbadensis Mill. formulation restores lipid profile to normal in a letrozole-induced polycystic ovarian syndrome rat model.
Desai BN, Maharjan RH, Nampoothiri LP.

Polycystic ovarian syndrome (PCOS), characterized by ovulatory infertility and hyperandrogenism, is associated with metabolic complications such as dyslipidemia, insulin resistance and endothelial dysfunction. Almost 70% PCOS women have abnormal serum lipid levels (dyslipidemia) and 50% of these women are obese. Several classes of pharmacological agents have been used to manage dyslipidemia. However, studies have shown adverse effects associated with these drugs. In the light of alternate therapy, many medicinal herbs have been reported to show hypoglycemic, anti-hyperlipidemic potential. Aloe barbadensis Mill. or Aloe vera is reported as one such herb. This study was to evaluate the lipid correcting effect of Aloe vera gel (AVG) in a PCOS rat model. Materials and Methods : PCOS was induced in Charles Foster female rats by oral administration of non-steroidal aromatase inhibitor letrozole (0.5 mg/kg body weight, 21 days). All rats were hyperglycemic and 90% rats also showed elevated plasma triglycerides, elevated LDL cholesterol levels, and lowered plasma HDL cholesterol levels indicative of a dyslipidemic profile. PCOS positive rats with an aberrant lipid profile were selected for treatment. An AVG formulation (1 ml (10 mg)/day, 30 days) was administered orally. Results and conclusion: AVG treated PCOS rats exhibited significant reduction in plasma triglyceride and LDL cholesterol levels, with an increase in HDL cholesterol. The gel treatment also caused reversion of abnormal estrous cyclicity, glucose intolerance, and lipid metabolizing enzyme activities, bringing them to normal. *In conclusion, AVG has phyto components with anti-hyperlipidemic effects and it has shown efficacy in management of not only PCOS but also the associated metabolic complication: dyslipidemia.*

12. Planta Med. 2012 Mar;78(4):311-6. Epub 2011 Dec 23.
Anti-hyperglycemic and anti-hypercholesterolemic effects of Aloe vera leaf gel in hyperlipidemic type 2 diabetic patients: a randomized double-blind placebo-controlled clinical trial.
Huseini HF, Kianbakht S, Hajiaghaee R, Dabaghian FH.

Abstract: Diabetes mellitus type 2 with dyslipidemia is a common disease. Previous studies suggest that aloe (Aloe vera L.) leaf gel may positively affect the blood glucose and lipid levels in dyslipidemic type 2 diabetic patients. Thus, in this randomized double-blind placebo-controlled clinical trial with hyperlipidemic (hypercholesterolemic and/or hypertriglyceridemic) type 2 diabetic patients aged 40 to 60 years not using other anti-hyperlipidemic agents and resistant to daily intake of two 5 mg glyburide tablets and two 500 mg metformin tablets, the efficacy and safety of taking aloe gel (one 300 mg capsule every 12 hours for 2 months) combined with the aforementioned drugs in treatment of 30 patients were evaluated and compared with the placebo group (n = 30). The aloe gel lowered the fasting blood glucose, HbA1c, total cholesterol, and LDL levels significantly ($p = 0.036$, $p = 0.036$, $p = 0.006$, and $p = 0.004$, respectively) without any significant effects on the other blood lipid levels and liver/kidney function tests ($p \rightarrow 0.05$) compared with the placebo at the endpoint. No adverse effects were reported. *The results suggest that aloe gel may be a safe anti-hyperglycemic and anti-hypercholesterolemic agent for hyperlipidemic type 2 diabetic patients.*

13. Phytomedicine 2009 Sep;16(9):856-63. Epub 2009 Mar 19.
Hypoglycemic and hypolipidemic effects of processed Aloe vera gel in a mouse model of non-insulin-dependent diabetes mellitus.
Kim K, Kim H, Kwon J, Lee S, Kong H, Im SA, Lee YH, Lee YR, Oh ST, Jo TH, Park YI, Lee CK, Kim K.

The effects of processed Aloe vera gel (PAG) on the course of established diet-induced non-insulin-dependent diabetes mellitus (NIDDM) were studied in C57BL/6J mice. NIDDM was induced in C57BL/6J mice by feeding them a high-fat diet. Mice exhibiting diet-induced obesity (DIO) with blood glucose levels above 180mg/dl were selected to examine the antidiabetic effects of PAG. Oral administration of PAG for 8 weeks reduced circulating blood glucose concentrations to a normal level in these DIO mice. In addition, the administration of PAG significantly decreased plasma insulin. The antidiabetic effects of PAG were also confirmed by intraperitoneal glucose tolerance testing. PAG appeared to lower blood glucose levels by decreasing insulin resistance. The administration of PAG also lowered triacylglyceride levels in liver and plasma. Histological examinations of periepididymal fat pad showed that PAG reduced the average size of adipocytes. *These results demonstrate that the oral administration of PAG prevents the progression of NIDDM-related symptoms in high-fat diet-fed mice, and suggest that PAG could be useful for treating NIDDM.*

14. Biol Pharm Bull. 2006 Jul;29 (7):1418-22.

Identification of five phytosterols from Aloe vera gel as anti-diabtetic compounds.

Tanaka M, Misawa E, Ito Y, Habara N, Nomaguchi K, Yamada M, Toida T, Hayasawa H, Takase M, Inagaki M, Higuchi R.

Abstract: The genus Aloe in the family Liliaceae is a group of plants including Aloe vera (Aloe barbadensis MILLER) and Aloe arborescens (Aloe arborescens MILLER var. natalensis BERGER) that are empirically known to have various medical efficacies. In the present study, we evaluated the anti-hyperglycemic effect of Aloe vera gel and isolated a number of compounds from the gel. On the basis of spectroscopic data, these compounds were identified as lophenol, 24-methyl-lophenol, 24-ethyl-lophenol, cycloartanol, and 24-methylene-cycloartanol. These five phytosterols were evaluated for their anti-hyperglycemic effects in type 2 diabetic BKS. Cg-m(+/+)Lepr(db/J) (db/db) mice. In comparison with the hemoglobin A1c (HbA1c) levels of vehicle-treated mice, statistically significant decreases of 15 to 18% in HbA1c levels were observed in mice treated with 1 mug of the five phytosterols. Considering the ability to reduce blood glucose in vivo, there were no differences between the five phytosterols. Administration of beta-sitosterol did not reduce the blood glucose levels in db/db mice. After administration of the five phytosterols for 28 d, fasting blood glucose levels decreased to approximately 64%, 28%, 47%, 51%, and 55% of control levels, respectively. Severe diabetic mice treated with phytosterols derived from Aloe vera gel did not suffer weight reduction due to glucose loss in the urine.
These findings suggest that Aloe vera gel and phytosterols derived from Aloe vera gel have a long-term blood glucose level control effect and would be useful for the treatment of type 2 diabetes mellitus.

15. Appl Biochem Biotechnol. 2011 Aug;164(8):1246-56. Epub 2011 Mar 17.

In vivo evaluation of hyglycaemic activity of Aloe spp. And identification of its mode of action on GLUT-4 gene expression in vitro.

Kumar R, Sharma B, Tomar NR, Roy P, Gupta AK , Kumar A.

Abstract : The present study evaluated the hypoglycemic activity of Aloe extract on streptozotocin-induced diabetic mice and focuses its effect on GLUT-4 gene expression under in vitro cell-culture system. Administration of extract at the dosage of 130 mg/kg body weight per day for 4 weeks resulted in significant decrease in blood glucose and total cholesterol in streptozotocin (60 mg/kg body weight) induced diabetic mice.
The hypoglycemic effect was compared with metformin. The activities of carbohydrate metabolizing enzymes were brought back to near normal level after the treatment and glucose homeostasis was maintained. Lyophilized aqueous Aloe extract (1 mg/ml) upregulated the GLUT-4 mRNA synthesis in mouse embryonic NIH/3T3 cells

16. Am J Chin Med. 2007;35(6):1037-46.

Effect of a polyphenol-rich extract from Aloe vera gel on experimentally induced insulin resistance in mice.

Pérez YY, Jiménez-Ferrer E, Zamilpa A, Hernández-Valencia M, Alarcón-Aguilar FJ, Tortoriello J, Román-Ramos R.

Insulin resistance, which precedes type 2 diabetes mellitus (T2DM), is a widespread pathology associated with the metabolic syndrome, myocardial ischemia, and hypertension. Finding an adequate treatment for this pathology is an important goal in medicine. The purpose of the present research was to investigate the effect of an extract from Aloe vera gel containing a high concentration of polyphenols on experimentally induced insulin resistance in mice. A polyphenol-rich Aloe vera extract (350 mg/kg) with known concentrations of aloin (181.7 mg/g) and aloe-emodin (3.6 mg/g) was administered orally for a period of 4 weeks to insulin resistant ICR mice. Pioglitazone (50 mg/kg) and bi-distilled water were used as positive and negative controls respectively. Body weight, food intake, and plasma concentrations of insulin and glucose were measured and insulin tolerance tests were performed. The insulin resistance value was calculated using the homeostasis model assessment for insulin resistance (HOMA-IR) formula. Results showed that the polyphenol-rich extract from Aloe vera was able to decrease significantly both body weight ($p \leftarrow 0.008$) and blood glucose levels ($p \leftarrow 0.005$) and to protect animals against unfavorable results on HOMA-IR, which was observed in the negative control group. The highest glucose levels during the insulin tolerance curve test were in the negative control group when compared to the Aloe vera extract and pioglitazone treated mice ($p \leftarrow 0.05$). *In conclusion, Aloe vera gel could be effective for the control of insulin resistance.*

17. J Nutr Sci Vitaminol (Tokyo) 2012;58(3):195-201.

Administration of Dried Aloe vera Gel Powder Reduced Body Fat Mass in Diet- Induced Obesity (DIO) Rats.

Misawa E, Tanaka M, Nabeshima K , Nomaguchi K, Yamada M, Toida T, Iwatsuki K.

Abstract: The aim of the present study was to investigate the anti-obesity effects of Aloe vera gel administration in male Sprague-Dawley (SD) rats with diet-induced obesity (DIO). SD rats at 7 wk of age were fed either a standard diet (10 kcal% fat) (StdD) or high-fat (60 kcal% fat) diet (HFD) during the experimental period. Four weeks after of HFD-feeding, DIO rats (11 wk of age) were orally administered with two doses of Aloe vera gel powder (20 and 200 mg/kg/d) for 90 d. Body weights (g) and body fat (%) of HFD fed rats were significantly higher than those of StdD-fed rats. Although a modest decrease of body weight (g) was observed with the administration of dried Aloe vera gel powder, both subcutaneous and visceral fat weight (g) and body fat (%) were reduced significantly in Aloe vera gel-treated rats. Serum lipid parameters elevated by HFD were also improved by the Aloe vera gel treatment. The oxygen consumption (VO←inf→2←/inf→), an index of energy expenditure, was decreased in HFD-fed rats compared with that in StdD-fed rats. Administration of Aloe vera gel reversed the change in VO←inf→2←/inf→ in the HFD-fed rats. These results suggest that intake of Aloe vera gel reduced body fat accumulation, in part, by stimulation of energy expenditure. *Aloe vera gel might be beneficial for the prevention and improvement of diet-induced obesity.*

18. Immune Netw. 2011 Apr;11(2):107-13.

Dietary Aloe reduces adipogenesis via the Activation of AMPK and suppresses Obesity-related inflammation in Obese mice.

Shin E, Shin S, Kong H, Lee S, Do SG, Jo TH , Park YI , Lee CK, Hwang IK, Kim K.

Background: Metabolic disorders, including type II diabetes and obesity, present major health risks in industrialized countries. AMP-activated protein kinase (AMPK) has become the focus of a great deal of attention as a novel therapeutic target for the treatment of metabolic syndromes. In this study, we evaluated whether dietary aloe could reduce obesity-induced inflammation and adipogenesis. METHODS: Male C57BL/6 obese mice fed a high-fat diet for 54 days received a supplement of aloe formula (PAG, ALS, Aloe QDM, and Aloe QDM complex) or pioglitazone (PGZ) and were compared with unsupplemented controls (high-fat diet; HFD) or mice fed a regular diet (RD). RT-PCR and western blot analysis were used to quantify the expression of obesity-induced inflammation. RESULTS: Aloe QDM complex down-regulated fat size through suppressed expression of scavenger receptors on adipose tissue macrophages (ATMs) compared with HFD. Both white adipose tissue (WATs) and muscle exhibited increased AMPK activation through aloe supplementation, and in particular, the Aloe QDM complex. Obesity-induced inflammatory cytokines (IL-1β and -6) and HIF1α mRNA and protein were decreased markedly, as was macrophage infiltration by the Aloe QDM complex. Further, the Aloe QDM complex decreased the translocation of NF-κB p65 from the cytosol in the WAT. CONCLUSION: Dietary aloe formula reduced obesity-induced inflammatory responses by activation of AMPK in muscle and suppression of proinflammatory cytokines in the WAT. Additionally, the expression of scavenger receptors in the ATM and activation of AMPK in WAT led to reduction in the percent of body fat. *Thus, we suggest that the effect of the Aloe QDM complex in the WAT and muscle are related to activation of AMPK and its use as a nutritional intervention against T2D and obesity-related inflammation*

19. Immune Netw. 2011 Feb;11(1):59-67. Epub 2011 Feb 28.

Dietary Aloe improves insulin sensitivity via the suppression of Obesity –induced inflammation in Obese mice.

Shin E, Shim KS, Kong H, Lee S, Shin S, Kwon J, Jo TH, Park YI, Lee CK, Kim K

Abstract: Insulin resistance is an integral feature of metabolic syndromes, including obesity, hyperglycemia, and hyperlipidemia. In this study, we evaluated whether the aloe component could reduce obesity-induced inflammation and the occurrence of metabolic disorders such as blood glucose and insulin resistance. Methods : Male C57BL/6 obese mice fed a high-fat diet for 54 days received a supplement of aloe formula (PAG, ALS, Aloe QDM, and Aloe QDM complex) or pioglitazone (PGZ) and were compared with unsupplemented controls (high-fat diet; HFD) or mice fed a regular diet (RD). RT-PCR and western blot analysis were used to quantify the expression of obesity-induced inflammation. Results : Aloe QDM lowered fasting blood glucose and plasma insulin compared with HFD. Obesity-induced inflammatory cytokine (IL-1β, -6, -12, TNF-α) and chemokine (CX3CL1, CCL5) mRNA and protein were decreased markedly, as was macrophage infiltration and hepatic triglycerides by Aloe QDM. At the same time, Aloe QDM decreased the mRNA and protein of PPARγ/LXRα and 11β-HSD1 both in the liver and WAT. Conclusion: Dietary aloe formula reduces obesity-induced glucose tolerance not only by suppressing inflammatory responses but also by inducing anti-inflammatory cytokines in the WAT and liver, both of which are important peripheral tissues affecting insulin resistance. *The effect of Aloe QDM complex in the WAT and liver are related to its dual action on PPARγ and 11β-HSD1 expression and its use as a nutritional intervention against T2D and obesity-related inflammation is suggested.*

20. Oxid Med Cell Longev 2009 Apr-Jun;2(2):99-106.
Implications for degenerative disorders: antioxidative activity, total phenols, flavonoids, ascorbic acid, beta-carotene and beta-tocopherol in Aloe vera .
Ozsoy N, Candoken E, Akev N.

In order to demonstrate whether the known biological effects of Aloe vera (L.) Burm. fil. could correlate with the antioxidant activity of the plant, the antioxidant activity of the aqueous leaf extract was investigated. The present study demonstrated that the aqueous extract from A. vera leaves contained naturally occuring antioxidant components, including total phenols, flavonoids, ascorbic acid, beta-carotene and alpha-tocopherol. The extract exhibited inhibitory capacity against Fe(3+)/ascorbic acid induced phosphatidylcholine liposome oxidation, scavenged stable DPPH(*), ABTS(*+) and superoxide anion radicals, and acted as reductant. In contrast, the leaf inner gel did not show any antioxidant activity. It was concluded that the known beneficial effects of Aloe vera could be attributed to its antioxidant activity and could be related to the presence of phenolic compounds and antioxidant vitamins.

21. Pharmacogn Mag. 2011 Oct;7(28):325-33.
Phytochemical constituents and antioxidant activities of the whole leaf extract of Aloe ferox Mill.
Wintola OA, Afolayan AJ.

Abstract: Background: Aloe ferox Mill. (Asphodelaceae) is used in South Africa for the treatment of constipation among various ailments. Despite the extensive studies conducted on the antioxidant activities of the leaf gel and pulp extract of the plant, there is no information on the antioxidant properties of the whole leaf extract of the species. Materials and Methods : The antioxidant activities of ethanol, acetone, methanol and aqueous extracts of A. ferox were investigated spectrophotometrically against 1,1- diphenyl-2-picrylhydrazyl (DPPH), 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) diammonium salt, hydrogen peroxide (H(2)O(2)), nitric oxide (NO), lipid peroxidation and ferric reducing power. Total phenols, flavonoids, flavonols, proanthocyanidins, tannins, alkaloids and saponins were also determined using the standard methods. RESULTS: The percentage compositions of phenols (70.33), flavonols (35.2), proanthocyanidins (171.06) and alkaloids (60.9) were significantly high in the acetone extract, followed by the ethanol extract with values of 70.24, 12.53, 76.7 and 23.76 respectively, while the least composition was found in the aqueous extract. Moreover, both flavonoids and saponins contents were appreciably high in both methanol and ethanol extracts, while others were very low. Tannins levels were, however, not significantly different (P → 0.05) in all the solvent extracts. At 0.5 mg/ml, the free radical scavenging activity of the methanol, acetone and ethanol extracts showed higher inhibition against ABTS, hydrogen peroxide and nitric oxide radicals. Whereas, scavenging activity of the extracts against DPPH* and lipid peroxidation were observed at a concentration of 0.016 and 0.118 mg/ml respectively in comparison to the butylated hydroxyltoluene (BHT), gallic acid and rutin. The ferric reducing potential of the extracts was concentration dependent and significantly different from that of vitamin C and BHT. CONCLUSION: The present study showed high level of radical scavenging activity by ethanol and methanol whole leaf extracts of A. ferox with higher antioxidant activities than acetone and aqueous extracts. The significant differences show that the whole leaf extract could be used as a potent antioxidant in medicine and food industries.

22. J Agric Food Chem. 2007 Aug 22;55(17):6891-6. Epub 2007 Jul 28.
Aloe ferox leaf gel phytochemical content, antioxidant capacity, and possible health benefits.
Loots du T , van der Westhuizen FH , Botes L.

This study identified, quantified, and compared the phytochemical contents and antioxidant capacities of Aloe ferox lyophilized leaf gel (LGE) and 95% ethanol leaf gel extracts (ELGE) using GC-MS and spectrophotometric methods. Analytically, 95% ethanol is less effective than ethyl acetate/diethyl ether or hexane (in the case of fatty acids) extractions in separating phytochemicals for characterization purposes. However, although fewer compounds are extracted in the ELGE, they are approximately 345 times more concentrated as compared to the LGE, hence justifying ELGE use in biological efficacy studies in vivo. Individual phytochemicals identified included various phenolic acids/polyphenols, phytosterols, fatty acids, indoles, alkanes, pyrimidines, alkaloids, organic acids, aldehydes, dicarboxylic acids, ketones, and alcohols. Due to the presence of the antioxidant polyphenols, indoles, and alkaloids, the A. ferox leaf gel shows antioxidant capacity as confirmed by ORAC and FRAP analyses. Both analytical methods used show the non-flavonoid polyphenols to contribute to the majority of the total polyphenol content. *Due to its phytochemical composition, A. ferox leaf gel may show promise in alleviating symptoms associated with/or prevention of cardiovascular diseases, cancer, neurodegeneration, and diabetes.*

23. Lipids Heaalth Dis. 2011 Feb 11; 10:30.
In vitro study of the PLA2 inhibition and antioxidant activities of Aloe vera leaf skin extracts.
Kammoun M, Miladi S, Ben Ali Y, Damak M, Gargouri Y, Bezzine S.

Abstract: In the present work we determined the total phenolic content of Aloe vera leaf skin (AVLS) extracts by using various solvents (hexane, chloroform-ethanol (1/1), ethyl acetate, butanol and water). We have also evaluated the antioxidant and the anti-PLA2 properties of these extracts by measuring their inhibition potency on the human pro-inflammatory phospholipase A2 (group IIA). Results : The water extract exhibits the highest inhibitory effect with an IC50 = 0.22 mg/ml and interestingly no effect was observed on the digestive phospholipase A2 (group IB) even at a concentration of 5 mg/ml. Antioxidant activities were also analyzed and the most active extracts were observed when using chloroform ethanol (1/1) and ethyl acetate (IC50 = 0.274 and 0.326 mg/ml, respectively). Analysis of the total phenolic content reveals that the water extract, with the best anti-PLA2 effect, was poor in phenolic molecules (2 mg GAE/g). This latter value has to be compared with the chloroform-ethanol and the ethyl acetate extracts (40 and 23.8 mg GAE/g, respectively), mostly responsible for the antioxidant activity. Conclusion : *A significant correlation was established between the total phenolic content and the antioxidant capacity but not with the anti PLA2 activity. Results from phytochemical screening suggest that the anti PLA2 molecules were probably catechin tannins compounds.*

24. Indian J Exp Biol. 2011 Apr;49(4):260-8.
Effect of aloe vera (Aloe barbadensis Miller) gel on doxorubicin –induced myocardial oxidative stress and calcium overload in albino rats.
Kaithwas G, Dubey K, Pillai KK.

Abstract : Administration of a single dose of doxorubicin (DOX) (7.5 mg/kg, i.v.) produces cardiotoxicity, manifested biochemically by significant decrease in blood glutathione (GSH) and tissue GSH along with elevated levels of serum lactate dehydrogenase (LDH) and serum creatine phosphokinase (CPK). In addition, cardiotoxicity was further confirmed by significant increase in lipid peroxides expressed as malondialdehyde (MDA, secondary indicator of lipid peroxidation), tissue catalase and tissue superoxide dismutase (SOD). Administration ofA. vera gel (100 and 200 mg/kg) orally for 10 days produced a significant protection against cardiotoxicity induced by DOX evidenced by significant reductions in serum LDH, serum CPK, cardiac lipid peroxides, tissue catalase and tissue SOD along with increased levels of blood and tissue GSH. *The results revealed that A. vera gel produced a dose dependent protection against DOX induced cardiotoxiaty.*

25. J Pharm Pharmacol. 2010 Jan;62(1):115-23.
Aloe vera gel alleviates cardiotoxicity in stretozocin –induced diabetes in rats.
Jain N, Vijayaraghavan R, Pant SC, Lomash V , Ali M.

Abstract: Objectives: Persistent hyperglycaemia results in oxidative stress along with the generation of oxygen free radicals and appears to be an important factor in the production of secondary complications in diabetes. The aim of this work was to evaluate markers of oxidative stress in heart tissue along with the protective, antioxidant and antidiabetic activity of 30%Aloe vera gel in diabetic rats. METHODS: Streptozocin was given as a single intravenous injection and 30%Aloe vera gel was given in two doses for 20 days, orally. Blood glucose, glycosylated haemoglobin, blood reduced glutathione, serum lactate dehydrogenase and serum creatine kinase levels were measured on day 21 after drug treatment. Heart rate and mean blood pressure were recorded at the end of the study. Different biochemical variables were evaluated in the heart tissue, including thiobarbituric acid reactive substance (TBARS), reduced glutathione, superoxide dismutase and catalase in diabetic and in Aloe vera-treated diabetic rats. KEY FINDINGS: In streptozocin diabetic rats, the TBARS level was increased significantly, superoxide dismutase and reduced glutathione significantly decreased, and the catalase level was significantly increased. Aloe vera 30% gel (200 mg/kg) treatment in diabetic rats reduced the increased TBARS and maintained the superoxide dismutase and catalase activity up to the normal level. Aloe vera gel increased reduced glutathione by four times in diabetic rats. Conclusions: *Aloe vera gel at 200 mg/kg had significant antidiabetic and cardioprotective activity.*

26) Planta Med. 2001 Nov;67(8):757-60.
Hypotensive effect of chemical constituents from Aloe barbadensis
Saleem R, Faizi S, Siddiqui BS, Ahmed M, Hussain SA, Qazi A, Dar A, Ahmad SI, Qazi MH, Akhtar S, Hasnain SN.

Hypotensive effects of aloeemodin, aloin A, elgonica dimer A and bisbenzopyran from Aloe barbadensis have been studied. Aloeemodin has emerged as a potent hypotensive agent in current pharmacological investigations and caused 26 %, 52 %, and 79 % falls in mean arterial blood pressure at the corresponding doses of 0.5, 1, and 3 mg/kg in rats. The paper also describes the absolute configuration of elgonica dimer A (1).

27. Immunopharmacol Immunotoxicol 2011 Dec;33(4):676-81. Epub 2011 Mar 14.

Immunomodulatory effects of Aloe vera and its fractions on response of macrophages against Candida albicans

Farahnejad Z, Ghazanfari T, Yaraee R.

Abstract: Natural products are important resources in traditional medicine and have been long used for prevention and treatment of many diseases. Medicinal plants have immunomodulatory properties. Aloe is one of the herbal medicines widely used in natural treatment and alternative therapy for various types of diseases. Aloe vera has been shown to modulate the immune response. Macrophages have been shown to play an essential role as the first line of defense against invading pathogen. Candida albicans is a communal and opportunistic pathogen in humans. In this study, we investigated the effect of A. vera extract and its fractions on infected macrophages with C. albicans. Viability of intraperitoneal macrophages was evaluated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) test. Cell viability of infected macrophages was increased by the extract and dose of some isolated fractions dependently. The extract as well as R100, R50, R30, and R10 fractions of A. vera significantly increased cell viability of macrophages in most doses. R5 and F5 fractions showed no significant difference in comparison with control group. *Further studies in animal models and human are necessary to clarify the modulatory effects of A. vera on macrophage function. Isolation and purification of A. vera components are also needed to find out the effective molecules.*

28. Zhongguo Zhong Yao Za Zhi. 2010 Feb; 35(3):364-8.

Protective effects of Aloe vera extract on mitochondria of neuronal cells and rat brain.

Wang Y, Cao L, Du G.

Abstract: Objective : To investigate the effects of Aloe vera extract (AV) on mitochondria in rat pheochromocytoma (PC12) cells and rat brain and to study the mechanism of its neuroprotection. METHOD: After treatment, the morphology of PC12 cells was observed under microscope, the activity of mitochondria in PC12 cells was measured by MTT method, and the mitochondrial membrane potential (MMP) in PC12 cells was detected by JC-1 method. The mitochondrial function in rat brain was detected by resazurin method. The production of malondialdehyd (MDA) in rat brain mitochondria was tested by thiobarbaturic acid (TBA) assay. Result : AV could improve mitochondrial damage induced by azide sodium (NaN3) in PC12 cells. The viability of PC12 cells treated with NaN364 mmol x L(-1) for 4 h decreased by 47.8%, and AV at 1 and 10 mg x L(-1) could respectively increase the viability of NaN3-treated cells by 16.7% (P ← 0.05) and 22.3% (P ← 0.01). MMP in PC12 cells in AV 1 and 10 mg x L(-1) group was significantly higher than that of NaN3-treated group (P ← 0.05). AV also protected the structure and function of mitochondria in rat brain. AV at 10 mg x L(-1) had protective effect on mitochondria function impair induced by NaN3 (P ← 0.01). AV 1 and 10 mg x L(-1) markedly inhibited the lipid peroxidation of brain mitochondria induced by Fe2+ -cysteine (P ← 0.05, P ← 0.01). Conclusion : *AV has protective effects on mitochondria of neuronal cells and rat brain.*

29. Arch Pharm Res. 2010 Mar;33(3):451-6. Epub 2010 Mar 30.

In vivo evidence of the immunomodulatroy activity of orally administered Aloe vera gel.

Im SA, Lee YR, Lee YH, Lee MK, Park YI, Lee S, Kim K, Lee CK.

Abstract: The gels of Aloe species contain immunomodulatory components such as aloctin A and acemannan. Most studies on these gels were performed in in vitro cell culture systems. Although several studies examined their immunomodulatory activity in vivo, the route of administration was intraperitoneal or intramuscular. Here, we evaluated the in vivo immunomodulatory activity of processed Aloe vera gel (PAG) in mice. Oral administration of PAG significantly reduced the growth of C. albicans in the spleen and kidney following intravenous injection of C. albicans in normal mice. PAG administration also reduced the growth of C. albicans in streptozotocin-induced diabetic mice. PAG administration did not increase ovalbumin (OVA)-specific cytotoxic T lymphocyte (CTL) generation in normal mice, but did increase it in high-fat-diet induced diabetic mice. *These findings provide the first clear evidence for the immunomodulatory activity of orally administered Aloe vera gel.*

30. Planta Med. 2012 Jun;78(9):843-52. Epub 2012 Apr 19.
Anticancer potential of aloes: antioxidant, antiproliferative, and immunostimulatory attributes.
Harlev E, Nevo E, Lansky EP, Ofir R, Bishayee A.

Aloe is a genus of medicinal plants with a notable history of medical use. Basic research over the past couple of decades has begun to reveal the extent of Aloe's pharmaceutical potential, particularly against neoplastic disease. This review looks at Aloe, both the genus and the folk medicine, often being called informally "aloes", and delineates their chemistry and anticancer pharmacognosy. Structures of key compounds are provided, and their pharmacological activities reviewed. Particular attention is given to their free radical scavenging, antiproliferative, and immunostimulatory properties. *This review highlights major research directions on aloes, reflecting the enormous potential of natural sources, and of the genus Aloe in particular, in preventing and treating cancer.*

31. Indian J Exp. Biol. 2010 Aug;48(8):837-42.
Effect of Aloe vera gel extract on antioxidant enzymes and azoxymethane-induced oxidative stress in rats.
Anilakumar KR, Sudarshanakrishna KR, Chandramohan G, Ilaiyaraja N, Khanum F, Bawa AS.

Abstract: The present work was undertaken with a view to study the effect of oral feeding of 2% Aloe vera gel extract (AGE) for 30 days on azoxymethane (AOM)-induced oxidative stress in rats. It was observed that AOM administration resulted in a significant increase in malondialdehyde and conjugated dienes, with reduction in hepatic glutathione (GSH), vitamin A and uric acid contents. AOM-induced reduction in hepatic GSH and uric acid was brought back to normal by AGE. There was a significant raise in hepatic catalase, superoxide dismutase and glucose-6-phosphate dehydrogenase (G-6-PD) activities as a result of feeding of the extract. Ingestion of the extract effected reduction in AOM-induced colonic GSH-peroxidase, G-6-PD and glutathione S-transferase and femur bone marrow micronuclei formation. *Hence, it is suggested that Aloe vera gel extract possess the ability to reduce AOM- induced oxidative stress and toxicity in liver.*

SCIENTIFIC REFERENCES OF ASPARAGUS RACEMOSUS

1. Journal of Herbal Medicine and Toxicology 4 (1) 15-20 (2010)
Phytoestrogens of Asparagus racemosus wild
Garima Saxena, Mamta Singh, Maheep Bhatnagar

Abstract: Asparagus racemosus Willd.. also known as Shatawwari is though a common ornamental plant but has very high medicinal value in Ayurveda and Indian traditional medicines. It is not only used in trating reproductive problems in females but is also used for treatment of nervine problems in male. Chemical constituents have been isolated from leaf, root and stem of the plant. *Earlier studies have shown that "Shatavarin " isolated from root mimic like female estrogen hormone and even replace it from its receptors*. In view of above, details of distribution, medicinal value, chemical constituents and its importance in treatment of nervous disorders in particular is discussed.

2. Fitoterapia. 2012 Jul;83(5):947-53. Epub 2012 Apr 21.
Molecular analysis of the genus Asparagus based on matK sequences and its application to identify A. racemosus, a medicinally phytoestrogenic species.
Boonsom T, Waranuch N, Ingkaninan K, Denduangboripant J, Sukrong S.

Abstract: The plant Asparagus racemosus is one of the most widely used sources of phytoestrogens because of its high content of the steroidal saponins, shatavarins I-IV, in roots. The dry root of A. racemosus, known as "Rak-Sam-Sip" in Thai, is one of the most popular herbal medicines, used as an anti-inflammatory, an aphrodisiac and a galactagogue. Recently, the interest in plant-derived estrogens has increased tremendously, making A. racemosus particularly important and a possible target for fraudulent labeling. However, the identification of A. racemosus is generally difficult due to its similar morphology to other Asparagus spp. Thus, accurate authentication of A. racemosus is essential. In this study, 1557-bp nucleotide sequences of the maturase K (matK) gene of eight Asparagus taxa were analyzed. A phylogenetic relationship based on the matK gene was also constructed. Ten polymorphic sites of nucleotide substitutions were found within the matK sequences. A. racemosus showed different nucleotide substitutions to the other species. A polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) analysis of the matK gene was developed to discriminate A. racemosus from others. Only the 650-bp PCR product from A. racemosus could be digested with BssKI into two fragments of 397 and 253-bp while the products of other species remained undigested. Ten commercially crude drugs were analyzed and revealed that eight samples were derived from A. racemosus while two samples of that were not. *Thus, the PCR-RFLP analysis of matK gene was shown to be an effective method for authentication of the medicinally phytoestrogenic species, A. racemosus.*

3. Aryavaidyan, 2008 Aug - Oct , Vol: 22 (1) 28-31
Effect of Rasayan drugs in postmenopausal syndrome – A clinical study
K. Bharathi and K. Gopakumar

Postmenopausal syndrome is commonly seen in women during the post-menopausal phase. According to Ayurveda, Rajokshaya (cessation of menstruation) takes place after the age of 50 and postmenopausal syndrome (PMS) can be correlated with Rajonivrutti lakshana. Modern medical science is having solutions for PMS, with its own risk of development of carcinoma endometrium by means of hormone replacement therapy. *Rasayana therapy is meant to get prasasta dhatus, hence Rasayana.*

4. Pharmacol Biochem Behav. 2009 Jan;91(3):283-90.
Antidepressant activity of Asparagus racemosus in rodent models.
Singh GK, Garabadu D, Muruganandam AV, Joshi VK, Krishnamurthy S.

Abstract: Asparagus racemosus Linn. (AR) is an Ayurvedic rasayana used as an adaptogen. Adaptogenic drugs are those which are useful as anti-stress agents by promoting non-specific resistance of the body. Although, the adaptogenic effect of AR is well documented, its use in psychological disorders like depression is not scientifically evaluated. Hence, the present investigation evaluates the antidepressant effect of methanolic extract of roots of AR (MAR) standardized to saponins (62.2% w/w). Rats were given MAR in the doses of 100, 200 and 400 mg/kg daily for 7 days and then subjected to forced swim test (FST) and learned helplessness test (LH). The results show that MAR decreases immobility in FST and increases avoidance response in LH indicating antidepressant activity. In behavioral experiments, MAR increased the number of head twitches produced by 5-HTP and increased clonidine-induced aggressive behavior indicating facilitatory effect on both serotonergic and adrenergic systems respectively. However, MAR had insignificant effect on l-DOPA-induced aggressive behavior indicating absence of activity on dopaminergic system. MAR also reversed changes to the endogenous antioxidant system induced by FST. *Thus, MAR has significant antidepressant activity and this effect is probably mediated through the serotonergic and the noradrenergic systems and augmentation of antioxidant defenses.*

5. Presented at 4th World Ayurveda Congress and Arogya, held on 9-13 December 2010, Bengaluru, Karnataka, India.

Comparative evaluation of Medhya effects of Ashwagandha and Shatavari in the management of generalised anxiety disorders

Dr Payal Sethi, and 2.Dr Tanuja Nesari

Generalized anxiety disorder (GAD) is a prevalent and disabling disorder with 25% prevalence in primary care patients worldwide. Chittodwega, as per Ayurveda, is a condition which can be closely compared to the symptoms of GAD. The increasing side-effects of the currently available anxiolytic drugs and need to prove Medhya (cognitive enhancement) effects of Ashvagandha and Shatavari lead to the present study. The objectives are to study and compare the effects of Ashvagandha (Withania somnifera Dunal) and Shatavari (Asparagus racemosus Willd) in generalized anxiety disorders and study their adverse effects, side effects if any. A pilot, randomized, controlled, close-labelled, parallel design clinical trial was conducted in 40 patients (age group 25–65 years) of GAD diagnosed as per GCP guidelines and DSM-IV criteria. The parameters used were Hamilton Anxiety Rating scale (HARS), Ayurvedic Self-Assessment Scale (pioneer design done exclusively for the present study), NIMHANS proforma. Setting: Tarachand Charitable Hospital, Tilak Ayurveda Mahavidyalaya, Pune. A total of 40 patients diagnosed with mild-to-moderate symptoms of GAD as per HARS and Ayurvedic Self-Assessment Scale participated in this study. Interventions are three tablets (500 mg) each twice a day for a period of 2 months (dose finalised after dose variation study in all the groups). Follow-up after 30 days. The main outcome measures are as follows: (1) primary end point—reduction in the gradation of the symptoms of GAD as per the Hamilton Anxiety Rating Scale and Ayurvedic Self-Assessment Scale. (2) secondary end point—overall improvement in the symptoms of GAD, improvement in general physical and mental health and improvement in overall health status. Overall results suggest that Shatavari is comparable to Ashvagandha which is a known anxiolytic and has also proven to have Medhya (cognitive enhancer) effect. (1) Shatavari proved as drug of choice in symptoms such as somatomuscular, autonomic, gastrointestinal, somatosensory as per HARS and Abhikshnam Dhyayati, Durmanaha, Chittavibhrama, etc. as per Ayurvedic scale. (2) Ashvagandha proved as drug of choice in symptoms such as Insomnia, respiratory symptoms, insomnia, etc. as per HARS and Manasantapa, Durbalata, etc. as per Ayurvedic scale. (3) Combination group proved as drug of choice in intellectual, depressed mood, etc. as per HARS and Smrutisamplava, Nidranasha, etc. as per Ayurvedic scale. *To conclude, Shatavari proved to be at par with Ashvagandha which is a known anxiolytic in alleviating the symptoms of anxiety without any adverse effects. Both the drugs can act as preventive medicine by boosting the physical, mental and emotional immune status of the individual and also enhance the cognitive functions thus making the individual to adapt to the work stress in modern scenario.*

6. Indian J Exp Biol. 2012 Jun;50(6):419-24.

Antistress activity of ethanolic extract of Asparagus racemosus Willd roots in mice.

Joshi T, Sah SP, Singh A.

Abstract: Ethanolic extract of the roots of A. racemosus improved the stress tolerance in chemical writhing test and swimming endurance test at all the doses as compared to stress control group. Restraint stress induced elevation of blood glucose, triglyceride and cholesterol levels were significantly lowered by pretreatment with extract. Moreover, stress induced variations in levels of lipid peroxidation, nitric oxide, protein and glutathione content in mouse brain were significantly ameliorated by pretreatment with extract. The extract attenuated the elevated weight of adrenal glands and increased the reduced weight of the spleen during stress. *In conclusion, the results suggest antistress property of Asparagus racemosus in different model of stress*.

7. Oxid Med Cell Longev. 2011;2011:160408. doi: 10.1155/2011/160408.

Ameliorative effects of herbal combinations in hyperlipidemia.

Visavadiya NP, Narasimhacharya AV.

The roots of Glycyrrhiza glabra, Withania somnifera, Asparagus racemosus, and Chlorophytum borivilianum and seeds of Sesamum indicum are ayurvedic medicinal plants used in India to treat several ailments. Our previous studies indicated that these plants possess hypolipidemic and antioxidant potential. The present study was aimed at investigating the composite effects of these plants on hypercholesterolemic rats. Three different combinations (5 gm%, given for four weeks) used in this study effectively reduced plasma and hepatic lipid profiles and increased fecal excretion of cholesterol, neutral sterol, and bile acid along with increasing the hepatic HMG-CoA reductase activity and bile acid content in hypercholesterolemic rats. Further, all three combinations also improved the hepatic antioxidant status (catalase, SOD, and ascorbic acid levels) and plasma total antioxidant capacity with reduced hepatic lipid peroxidation. *Overall, combination I had the maximum effect on hypercholesterolemic rats followed by combinations II and III due to varying concentrations of the different classes of phytocomponents.*

8. Evid Based Complement Alternat Med. 2009 Jun;6(2):219-26.
Asparagus root regulates cholesterol metabolism and improves antioxidant status in hypercholesteremic rats.
Visavadiya NP, Narasimhacharya AV.

Hyperlipidemia/hypercholesteremia are major risk factors for atherosclerosis and cardiovascular diseases. Root of Asparagus racemosus (AR) is widely used in Ayurvedic system of medicine in India and is known for its steroidal saponin content. This study was designed to investigate the hypocholesteremic and antioxidant potential of AR root in both normo- and hypercholesteremic animals. Normal and hypercholesteremic male albino rats were administered with root powder of AR (5 and 10 g% dose levels) along with normal and hypercholesteremic diets, respectively, for a duration of 4 weeks. Plasma and hepatic lipid profiles, fecal sterol, bile acid excretion and hepatic antioxidant activity were assessed. Inclusion of AR root powder in diet, resulted in a dose-dependant reduction in plasma and hepatic lipid profiles, increased fecal excretion of cholesterol, neutral sterol and bile acid along with increases in hepatic HMG-CoA reductase activity and bile acid content in hypercholesteremic rats. Further, AR root also improved the hepatic antioxidant status (catalase, SOD and ascorbic acid levels). No significant changes in lipid and antioxidant profiles occurred in the normocholesteremic rats administered with AR root powder. AR root appeared to be useful as a dietary supplement that offers a protection against hyperlipidemia/hypercholesteremia in hypercholesteremic animals. *The results of the present study indicate that the potent therapeutic phyto-components present in AR root i.e. phytosterols, saponins, polyphenols, flavonoids and ascorbic acid, could be responsible for increased bile acid production, elimination of excess cholesterol and elevation of hepatic antioxidant status in hypercholesteremic conditions.*

9. Trop Anim Health Prod. 2012 Apr 29.
Plasma hormones, metabolites, milk production, and cholesterol levels in Murrah buffaloes fed with Asparagus racemosus in transition and postpartum period.
Singh SP, Mehla RK, Singh M.

Ten dry and pregnant Murrah buffaloes were selected to investigate the effect of Asparagus racemosus feeding on hormones, metabolites, milk yield, and plasma cholesterol levels. The treatment groups of buffaloes were fed with A. racemosus (shatavari) @150 g/day/animal during prepartum and @300 g/day/animal during the postpartum period. Blood samples collected on -6, -4, -2-week, day of parturition (0), and +2, +4, and +6-week postpartum were analyzed for plasma total cholesterol, triglycerides, HDL, low-density lipoproteins (LDL), prolactin, cortisol, and blood metabolites.

Milk samples collected at weekly intervals (+1, +3, +5, and 7 weeks) were analyzed for total milk fat cholesterol. Prepartum plasma cholesterol concentrations were significantly higher in treatment group over the control ($P < 0.05$). Mean plasma triglycerides, LDL cholesterol, HDL cholesterol, glucose, and nonesterified fatty acid (NEFA) levels varied nonsignificantly between groups. Plasma prolactin and cortisol concentrations were significantly ($P < 0.01$) more in treatment group than in control group. On day of parturition, plasma prolactin, cortisol, LDL, and plasma total cholesterol were higher ($P < 0.01$) in treatment group buffaloes in comparison to control group. A. racemosus feeding significantly ($P < 0.01$) increased plasma prolactin, cortisol ($P < 0.01$), and milk fat cholesterol ($P < 0.05$) without affecting total cholesterol, HDL, LDL, glucose, and NEFA concentrations. The buffaloes of treatment group produced more milk (@0.526 kg/animal/day) suggesting thereby that A. racemosus is galactopoietic. *It was concluded that feeding of A. racemosus increases plasma prolactin and cortisol and decreased plasma total cholesterol and LDL concentration.*

10. Indian J Exp Biol. 2010 May;48(5):479-85.
Effect of Convolvulus pluricaulis Choisy and Asparagus racemosus Willd on learning and memory in young and old mice: a comparative evaluation.
Sharma K, Bhatnagar M, Kulkarni SK.

Abstract: A dose dependent enhancement of memory was observed with A. racemosus and C. pluricaulis treatment as compared to control group when tested on second day. A. racemosus and C. pluricaulis at the dose of 200 mg/kg, po showed significantly higher percent retentions, than piracetam. Multiple treatment with A. racemosus and C. pluricaulis for three days also demonstrated significant dose dependent increase in percent retentions as compared to control group. The effect was more prominent with C. pluricaulis as compared with piracetam and A. racemosus. A significantly lower percent retention in aged mice was observed as compared to young mice. Aged mice (18-20 months) showed higher transfer latency (TL) values on first and second day (after 24 h) as compared to young mice, indicating impairment in learning and memory. Pretreatment with A. racemosus and C. pluricaulis for 7 days enhanced memory in aged mice, as significant increase in percent retention was observed. Significantly higher retention was observed with C. pluricaulis (200 mg/kg; po) as compared with piracetam (10 mg/kg/; po). *Post-trial administration of C. pluricaulis and A. racemosus extract demonstrated significant decrease in latency time during retention trials. Hippocampal regions associated with the learning and memory functions showed dose dependent increase in AChE activity in CA 1 with A. racemosus and CA3 area with C. pluracaulis treatment. The underlying mechanism of these actions of A. racemosus and C. pluricaulis may be attributed to their antioxidant, neuroprotective and cholinergic properties.*

11. Brain Cogn. 2010 Oct;74(1):1-9. Epub 2010 Jul 1.

Asparagus recemosus enhances memory and protects against amnesia in rodent models.

Ojha R, Sahu AN, Muruganandam AV, Singh GK, Krishnamurthy S.

Asparagus Racemosus (AR) is an Ayurvedic rasayana possessing multiple neuropharmacological activities. The adpatogenic and antidepressant activity of AR is well documented. The present study was undertaken to assess nootropic and anti-amnesic activities of MAR in rats. The Morris water maze (MWM) and elevated plus maze (EPM) models were employed to evaluate learning and memory activity. Subsequently, the anti-amnestic activity was evaluated in scopolamine and sodium nitrite (NaNO(2))-induced amnestic models in rats. Rats pre-treated with MAR (50, 100 and 200mg/kg, p.o) for 7 days showed significant decrease in escape latency in the MWM test indicating nootropic activity. MAR also significantly reversed scopolamine and sodium nitrite-induced increase in transfer latency on EPM indicating anti-amnesic activity. Further, MAR dose-dependently inhibited acetylcholinesterase enzyme in specific brain regions (prefrontal cortex, hippocampus and hypothalamus). *Thus, MAR showed nootropic and anti-amnesic activities in the models tested and these effects may probably be mediated through augmentation of cholinergic system due to its anti-cholinesterase activity.*

12. Neurosci Lett. 2011 Sep 26;503(1):6-9. Epub 2011 Aug 6.

Asparagus racemosus competitively inhibits in vitro the acetylcholine and monoamine metabolizing enzymes.

Meena J, Ojha R, Muruganandam AV, Krishnamurthy S.

Asparagus racemosus (AR) has earlier been reported to possess antidepressant activity possibly mediated through the monoaminergic system, and nootropic and anti amnestic activities possibly through the cholinergic system. In the present study to further understand the mechanism of action, we evaluated the kinetics of acetyl (AChE) and butyryl (BuChE) cholinesterases, and monoamine oxidase (MAO-A and B) enzyme inhibitory activities of different fractions of AR. The results showed that methanolic extract of AR (MAR) significantly inhibited cholinesterase and MAO activities as compared to hexane (HAR) and chloroform (CAR) extracts of AR as evident from the IC(50) values. The kinetic analysis of enzyme inhibition of MAR shows that the V(max) does not change with different concentrations of MAR but the K(m) value increases. This indicates that MAR is a non-selective competitive inhibitor for both cholinesterase and monoamine oxidase enzymes. Evaluation of K(i) values show that MAR inhibited these enzymes less potently compared to the respective standard drugs. *There seems to be a positive correlation between the saponin content and, cholinesterase and monoamine inhibitory activities as MAR had 62.20% of saponins, whereas HAR and CAR had no measurable saponin content.* The non-selective competitive inhibitory activity on cholinesterase and monoamine oxidase enzymes can explain many reported neuropharmacological activities of AR. AR apart being used as a drug is also used as a food. As such AR may have potential drug-drug, drug-food and food-food interactions with drugs and foods sharing the cholinergic and monoaminergic pathways.

13. AYU, 2009, Vol: 30 (3) 317

A Comparative study on Shatavari and Kukkutanda twak bhasma in minizing the risk of postmenopausal osteoporosis

Jasmine Japee (Gujarathi), MA Pandya

Postmenopausal period is a very vulnerable time for women, as she has to face inevitable scars of menopause amongst which the most disabling one is Osteoporosis. The present study was aimed to compare the effect of Shatvari and Kukkutanda twak bhasma in minimizing bone loss in menopausal and postmenopausal period. The duration of treatment was 10 weeks along with diet restrictions. *The results of Shatavari were encouraging, as it has shown not only decrease in bone loss, but a significant increase in bone formation.*

14. Phytother Res. 2010 Oct; 24(10):1562-6.

Effects of Chlorophytum arundinaceum, Asparagus adscendens and Asparagus racemosus on pro-inflammatory cytokine and corticosterone levels produced by stress.

Kanwar AS, Bhutani KK.

Chlorophytum arundinaceum, Asparagus adscendens and Asparagus racemosus are used in the Indian traditional system of medicine for improving the general state of health and for stress-related immune disorders. The effects of the methanol and aqueous extracts of the tuberous roots of these plants were examined in an experimental mouse model of stress, induced by swimming. The extracts were shown to exert an inhibitory effect on pro-inflammatory cytokines, namely interleukin 1β and tumour necrosis factor α, and on the production of nitric oxide in mouse macrophage cells RAW 264.7 stimulated by lipopolysaccharide in vitro. Similar inhibition was also observed in the production of interleukin 2 in EL 4 lymphoma cells stimulated by concanavalin A. Corticosterone levels in serum and adrenal glands were measured. The findings suggest that these plants may be beneficial in the management of stress and inflammatory conditions.

15. Int J Food Sci Nutr. 2012 Jul 31. [Epub ahead of print]

Green leafy porridges: how good are they in controlling glycaemic response?

Anuruddhika Subhashinie Senadheera SP, Ekanayake S.

Green leafy porridges made with leaf water extracts, rice and coconut milk are common Sri Lankan dietary remedies for diabetes. Though water and ethanolic extracts of most leaves elicit hypoglycaemic effects, data are not available on the efficacy when leaf extracts are incorporated into porridges. Thus, an effort was made to evaluate the proximate compositions and glycaemic index (GI) of some commonly consumed green leafy porridges. The GI of rice porridge and coconut milk porridge were measured to evaluate the effect of other ingredients other than the leaf extracts. Rice was the main contributor to carbohydrate (56-68% on dry weight) and water was the main component in porridges (89-93%). Fat and total dietary fibre contents ranged between 2.5-27% and 5-10%, respectively. The GI of all porridges was low (GI ↖ 55), except Cassia auriculata which had a high GI of 77 ± 12. The GIs of coconut milk, Aerva lanata, Hemidesmus indicus, Scoparia dulcis, *Asparagus racemosus*, Cephalandra indica, Cardiospermum halicacabum, Murraya koenigii and Aegle marmelos were 31 ± 5, 32 ± 5, 40 ± 8, 39 ± 8, 37 ± 4, 49 ± 8, 46 ± 8, 44 ± 8 and 50 ± 8, respectively. All porridges had a low or medium glycaemic loads (↖ 19). However, peak blood glucose reductions of ↗ 25% were observed in all leafy and coconut milk porridges, except in C. auriculata and Atlantia zeylanica, when compared with the glucose control. *Therefore, green leafy porridges, except Cassia, can be recommended as breakfast meals for diabetics due to their low GI, peak blood glucose reduction and presence of other nutrients in green leaves.*

16. Br J Nutr. 2011 Sep 8:1-8.

Antihyperglycaemic activity of Asparagus racemosus roots is partly mediated by inhibition of carbohydrate digestion and absorption, and enhancement of cellular insulin action.

Hannan JM, Ali L, Khaleque J, Akhter M, Flatt PR, Abdel-Wahab YH.

Asparagus racemosus roots have been shown to enhance insulin secretion in perfused pancreas and isolated islets. The present study investigated the effects of ethanol extracts of A. racemosus roots on glucose homeostasis in diabetic rats, together with the effects on insulin action in 3T3 adipocytes. When administered orally together with glucose, A. racemosus extract improved glucose tolerance in normal as well as in two types of diabetic rats. To investigate the possible effects on carbohydrate absorption, the sucrose content of the gastrointestinal tract was examined in 12 h fasted rats after an oral sucrose load (2·5 g/kg body weight). The extract significantly suppressed postprandial hyperglycaemia after sucrose ingestion and reversibly increased unabsorbed sucrose content throughout the gut. The extract also significantly inhibited the absorption of glucose during in situ gut perfusion with glucose. Furthermore, the extract enhanced glucose transport and insulin action in 3T3-L1 adipocytes. Daily administration of A. racemosus to type 2 diabetic rats for 28 d decreased serum glucose, increased pancreatic insulin, plasma insulin, liver glycogen and total oxidant status. These findings indicate that antihyperglycaemic activity of A. racemosus is partly mediated by inhibition of carbohydrate digestion and absorption, together with enhancement of insulin secretion and action in the peripheral tissue. *Asparagus racemosus may be useful as a source of novel antidiabetic compounds or a dietary adjunct for the management of diabetes.*

17. J Endocrinol. 2007 Jan;192(1):159-68.

Insulin secretory actions of extracts of Asparagus racemosus root in perfused pancreas, isolated islets and clonal pancreatic beta-cells.

Hannan JM, Marenah L, Ali L, Rokeya B, Flatt PR, Abdel-Wahab YH.

Asparagus racemosus root has previously been reported to reduce blood glucose in rats and rabbits. In the present study, the effects of the ethanol extract and five partition fractions of the root of A. racemosus were evaluated on insulin secretion together with exploration of their mechanisms of action. The ethanol extract and each of the hexane, chloroform and ethyl acetate partition fractions
concentration-dependently stimulated insulin secretion in isolated perfused rat pancreas, isolated rat islet cells and clonal beta-cells. The stimulatory effects of the ethanol extract, hexane, chloroform and ethyl acetate partition fractions were potentiated by glucose, 3-isobutyl-1-methyl xanthine IBMX, tolbutamide and depolarizing concentration of KCl. Inhibition of A. racemosus-induced insulin release was observed with diazoxide and verapamil. Ethanol extract and five fractions increased intracellular Ca(2+), consistent with the observed abolition of insulin secretory effects under Ca(2+) -free conditions. *These findings reveal that constituents of A. racemosus root extracts have wide-ranging stimulatory effects on physiological insulinotropic pathways. Future work assessing the use of this plant as a source of active components may provide new opportunities for diabetes therapy.*

18. Int J Biol Macromol. 2012 Jan 1;50(1):77-81. Epub 2011 Oct 6.
Characterization and in vitro immunomodulatory screening of fructo-oligosaccharides of Asparagus racemosus Willd.
Thakur M, Connellan P, Deseo MA, Morris C, Praznik W, Loeppert R, Dixit VK.

Asparagus racemosus Linn. (Fam. Liliaceae) is an ethno-pharmacologically acclaimed Ayurvedic medicinal plant. In the present study, aqueous extract of A. racemosus (ARC) was fractionated and screened for the polysaccharide fraction (ARP). The characterization was done by enzymatic, Size Exclusion, gas chromatography with flame ionization detector (GC-FID), high pressure anion exchange chromatography (HPAEC) and thin layer chromatographic analyses. Phyto-chemical evaluation confirmed the presence of 26.7% of 2□1 linked fructo-oligosaccharides (FOS). They have a degree of polymerization (DP) of nearly 7-8. Cytotoxicity evaluation on P388 cell lines was consistent with low cytotoxicity of the extracts. In vitro Natural Killer (NK) cell activity was evaluated using human peripheral blood mononuclear cells (PBMC) isolated from whole blood on a ficoll-hypaque density gradient. K562 a myeloid leukemia cell line, were used as target cells. ARC, tested over the range 0.2-50 µg/ml, showed a dose-related stimulation of NK cell activity with a peak increase of 16.9±4.4% at 5.6 µg/ml. However, ARP demonstrated a higher stimulatory activity of 51.8±1.2% at 25 µg/ml. The results indicate that the FOS from A. racemosus potentiates the NK cell activity and this could be an important mechanism underpinning the 'Rasayana' properties of this plant.

19. Cell Mol Biol (Noisy-le-grand). 2009 Feb 25;55 Suppl:OL1083-95.
Suppression of reactive oxygen species and nitric oxide by Asparagus racemosus root extract using in vitro studies.
Visavadiya NP, Soni B, Soni B, Madamwar D.

Abstract: Recent clinical and experimental data showed the involvement of reactive oxygen species/nitrogen species (ROS/RNS) in many human pathophysiological conditions. Antioxidant activity of the aqueous (ARA) and ethanolic extracts (ARE) of Asparagus racemosus (AR) root were evaluated in a series of in vitro assays including ROS generation in chemicals and biological model systems. The dose-dependent ARA and ARE extracts showed the scavenging activity against DPPH (IC50 = 60.7 and 52.5 microg/ml), nitric oxide (IC50 = 141.9 and 63.4 microg/ml), superoxide (IC50 = 221 and 89.4 microg/ml), hydroxyl (IC50 = 318.7 and 208.8 microg/ml) and ABTS.+ (IC50 = 134.5 and 71.9 microg/ml) radicals. The antioxidant capacity of ARA and ARE were assessed for their reducing power using FRAP (Ferric Reducing antioxidant power) and potassium ferricyanide reducing methods as well as free radical scavenging capacity by TEAC (Trolox Equivalent Antioxidant Capacity) method. ARA and ARE extracts were also found to be effective at suppressing lipid peroxidation induced by Fe2+/ascorbate system in rat liver mitochondrial preparation (IC50 = 511.7 and 309.2 microg/ml, respectively). Further, ARA and ARE root extracts significantly decreased (P ← 0.05) copper-mediated human LDL oxidation by prolongation of lag phase time with decline in oxidation rate, maximal yield of conjugated dienes, lipid hydroperoxides and malondialdehyde concentrations. The addition of ARA and ARE root extracts to human serum significantly reduced (P ← 0.05) the formation of lipid peroxidation in medium. Trolox, alpha-tocopherol and mannitol were tested similarly to compare their antioxidant activities. In conclusion, antioxidant activity of ARE as compared to ARA extract is more effective which act as hydrogen donors, metal ion chelators, reducing agents, radical scavengers and anti-lipid peroxidative. These effects are attributed to the high amount of lipophilic phenolics content of ARE root extract.

20. J Ethnopharmacol. 2009 Jan 21;121(2):241-7.
Immunomodulatory activity of Asparagus racemosus on systemic Th1/Th2 immunity: implications for immunoadjuvant potential.
Gautam M, Saha S, Bani S, Kaul A, Mishra S, Patil D, Satti NK, Suri KA, Gairola S, Suresh K, Jadhav S, Qazi GN, Patwardhan B.

Abstract: Ethnopharmacological relevance: Roots of Asparagus racemosus Willd (Shatavari in vernacular) are widely used in Ayurveda as Rasayana for immunostimulation, galactogogue as also in treatment of conditions like ulcers and cancer. Various studies have indicated immunomodulatory properties of Shatavari root extracts and formulations. Aim of the study: To study the effect of standardized Asparagus racemosus root aqueous extract (ARE) on systemic Th1/Th2 immunity of SRBC sensitized animals. Materials and methods: We used HPTLC to quantify steroidal saponins (Shatavarin IV, Immunoside) and flow cytometry to study effects of ARE on Th1/Th2 immunity. SRBC specific antibody titres and DTH responses were also monitored as markers of Th2 and Th1 responses, respectively. We also studied lymphocyte proliferation. Cyclosporin, cyclophosphamide and levamisole were used as controls. RESULTS: Treatment with ARE (100mg/(kg b.w.p.o.)) resulted in significant increase of CD3(+) and CD4/CD8(+) percentages suggesting its effect on T cell activation. ARE treated animals showed significant up-regulation of Th1 (IL-2, IFN-g) and Th2 (IL-4) cytokines suggesting its mixed Th1/Th2 adjuvant activity. Consistent to this, ARE also showed higher antibody titres and DTH responses. ARE, in combination with LPS, Con A or SRBC, produced a significant proliferation suggesting effect on activated lymphocytes. Conclusion : *The study suggests mixed Th1/Th2 activity of ARE supports its immunoadjuvant potential.*

21. Phytother Res. 2004 Sep;18(9):771-3.
Identification of antioxidant compound from Asparagus racemosus.
Wiboonpun N, Phuwapraisirisan P, Tip-pyang S.

Roots of Asparagus racemosus were found to possess antioxidant property. DPPH autography-directed separation resulted in the identification of a new antioxidant compound named racemofuran (3) along with two known compounds asparagamine A (1) and racemosol (2). The structure of 3 was fully characterized by spectroscopic data (UV, MS, 1H NMR, 13C NMR, and 2D NMR). Racemofuran revealed antioxidant property against DPPH with IC50 value of 130 microM.

22. J Ethnopharmacol. 2004 Apr;91(2-3):251-5.
Immunoadjuvant potential of Asparagus racemosus aqueous extract in experimental system.
Gautam M, Diwanay S, Gairola S, Shinde Y, Patki P, Patwardhan B.

The immunoadjuvant potential of Asparagus racemosus (Willd.) Family (Liliaceae) aqueous root extract was evaluated in experimental animals immunized with diphtheria, tetanus, pertussis (DTP) vaccine. Immunostimulation was evaluated using serological and hematological parameters. Oral administration of test material at 100 mg/kg per day dose for 15 days resulted significant increase (P = 0.0052) in antibody titers to Bordtella pertussis as compared to untreated (control) animals. Immunized animals (treated and untreated) were challenged with B. pertussis 18323 strain and the animals were observed for 14 days. Results indicate that the treated animals did show significant increase in antibody titers as compared to untreated animals after challenge (P = 0.002). Immunoprotection against intra-cerebral challenge of live B. pertussis cells was evaluated based on degree of sickness, paralysis and subsequent death. Reduced mortality accompanied with overall improved health status was observed in treated animals after intra-cerebral challenge of B. pertussis indicating development of protective immune response. *Present study indicates applications of test material as potential immunoadjuvant that also offers direct therapeutic benefits resulting in less morbidity and mortality.*

23. J Ethnopharmacol. 2004 Jan;90(1):49-55.
Immunoprotection by botanical drugs in cancer chemotherapy.
Diwanay S, Chitre D, Patwardhan B.

Most of the synthetic chemotherapeutic agents available today are immunosuppressants, cytotoxic, and exert variety of side effects that are particularly evident in cancer chemotherapy. Botanical based immunomodulators are often employed as supportive or adjuvant therapy to overcome the undesired effects of cytotoxic chemotherapeutic agents and to restore normal health. Total extract, polar and non-polar extracts, and their formulations, prepared from medicinal plants mentioned in Ayurveda, namely, Withania somnifera (Linn Dunal) (Solanaceae), Tinospora cordifolia (Miers) (Menispermaceae), and Asparagus racemosus (Willd.) (Liliaceae), exhibited various immunopharmacological activities in cyclophosphamide (CP)-treated mouse ascitic sarcoma. Treatment of ascitic sarcoma-bearing mice with a formulation of total extracts of Withania somnifera and Tinospora cordifolia (80:20) and alkaloid-free polar fraction of Withania somnifera resulted in protection towards CP-induced myelo- and immunoprotection as evident by significant increase in white cell counts and hemagglutinating and hemolytic antibody titers. *Treatment with these candidate drugs will be important in development of supportive treatment with cancer chemotherapy.*

24. J Ethnopharmacol. 2000 Aug;71(3):425-35.
Antioxidant properties of Asparagus racemosus against damage induced by gamma-radiation in rat liver mitochondria.
Kamat JP, Boloor KK, Devasagayam TP, Venkatachalam SR.

The possible antioxidant effects of crude extract and a purified aqueous fraction of Asparagus racemosus against membrane damage induced by the free radicals generated during gamma-radiation were examined in rat liver mitochondria. gamma-Radiation, in the dose range of 75-900 Gy, induced lipid peroxidation as assessed by the formation of thiobarbituric acid reactive substances (TBARS) and lipid hydroperoxides (LOOH). Using an effective dose of 450 Gy, antioxidant effects of A. racemosus extract were studied against oxidative damage in terms of protection against lipid peroxidation, protein oxidation, depletion of protein thiols and the levels of the antioxidant enzyme, superoxide dismutase. An active fraction consisting of polysaccharides (termed as P3) was effective even at a low concentration of 10 microg/ml. Both the crude extract as well as the P3 fraction significantly inhibited lipid peroxidation and protein oxidation. The antioxidant effect of P3 fraction was more pronounced against lipid peroxidation, as assessed by TBARS formation, while that of the crude extract was more effective in inhibiting protein oxidation. Both the crude extract and P3 frac-

tion also partly protects against radiation-induced loss of protein thiols and inactivation of superoxide dismutase. The inhibitory effects of these active principles, at the concentration of 10 microg/ml, are comparable to that of the established antioxidants glutathione and ascorbic acid. Hence our results indicate that extracts from A. racemosus have potent antioxidant properties in vitro in mitochondrial membranes of rat liver.

25. West Indian Med J. 2010 Jan;59(1):3-6.
Acute toxicity and diuretic studies of the roots of Asparagus racemosus Willd in rats.
Kumar MC, Udupa AL, Sammodavardhana K, Rathnakar UP, Shvetha U, Kodancha GP.

Objective: Asparagus racemosus Willd has been used as diuretic in Ayurveda but has not been validated by a suitable experimental model. Hence the present study was undertaken. Materials and methods : The study was carried out with an aqueous extract of the roots of Asparagus racemosus utilizing three doses viz 800 mg/kg, 1600 mg/kg and 3200 mg/kg for its diuretic activity in comparison with standard drug (furosemide) and control (normal saline) rats after doing acute toxicity study. Results: Acute toxicity study showed no fatality even with the highest dose and the diuretic study revealed significant diuretic activity ($p \leftarrow 0.05$) in the dose of 3200 mg/kg. Conclusion: *Asparagus racemosus showed diuretic activity at a 3200 mg/kg dose without acute toxicity*.

26. Indian J Pharm Sci. 2009 May;71(3):342-3.
Anticandidal Activity of Asparagus racemosus.
Uma B, Prabhakar K, Rajendran S.

The in vitro anticandidal activity of Asparagus racemosus roots and tubers extract was investigated against Candida albicans, Candida tropicalis, Candida krusei, Candida guillermondii, Candida parapsilosis and Candida stellatoida, which are isolated from vaginal thrush patients. The extract of Asparagus racemosus showed high degree of activity against all the Candida strains. *The inhibitory effect of the extract against all the Candida tested was found comparable with that of standard antibiotics used.*

27. Phytother Res. 2000 Mar;14(2):118-9.
Evaluation of antibacterial activity of Asparagus racemosus willd. root.
Mandal SC, Nandy A, Pal M, Saha BP.

Different concentrations (50, 100, 150 microg/mL) of the methanol extract of the roots of Asparagus racemosus Willd. showed considerable in vitro antibacterial efficacy against Escherichia coli, Shigella dysenteriae, Shigella sonnei, Shigella flexneri, Vibrio cholerae, Salmonella typhi, Salmonella typhimurium, Pseudomonas putida, Bacillus subtilis and Staphylococcus aureus. The effects produced by the methanol extract were compared with chloramphenicol.

28. J Ethnopharmacol. 1997 Sep;58(1):15-20.
Effect of some Indian herbs on macrophage functions in ochratoxin A treated mice.
Dhuley JN.

The effect of Indian herbs namely, Asparagus racemosus, Tinospora cordifolia, Withania somnifera and Picrorhiza kurrooa on the functions of macrophages obtained from mice treated with the carcinogen ochratoxin A (OTA) was investigated. The chemotactic activity of murine macrophages was significantly decreased by 17 weeks of treatment with OTA compared with controls. Production of interleukin-1 (IL-1) and tumor necrosis factor (TNF) was also markedly reduced. Treatment with Asparagus racemosus, Tinospora cordifolia, Withania somnifera and Picrorhiza kurrooa significantly inhibited OTA-induced suppression of chemotactic activity and production of IL-1 and TNF-alpha by macropahges. *Moreover, we found that Withania somnifera treated macrophage chemotaxis and that Asparagus racemosus induced excess production of TNF-alpha when compared with controls.*

29. Anc Sci Life. 1992 Jan;11(3-4):187-92.
Herbal remedies of street vendors for some urino-genital diseases.
Sinha RK.

The herbal vendors are the mobile tribal medicinement seen on the busy streets of many Indian cities selling crude medicinal plants and their products. They prescribe herbal treatment for several diseases, a skill they inherited from their forefathers through several generations of experience. *They claim to have specific herbal remedies for the complete cure of some urino - genital disorders such as dysuria, hematuria, syphilis and gonorrhea. Cocculus villosus, pedalium murex, Tribulus terrestris, Tinospora cordifolia, Withania Somnifera, Asparagus racemosus and Curculigo orchoides are the herbal drugs of choice used in the treatment.*

30. Afr J Tradit Complement Altern Med. 2008 Apr 10;5(3):230-7.
Biological activities of Asparagus racemosus.
Potduang B, Meeploy M, Giwanon R, Benmart Y, Kaewduang M, Supatanakul W.

Cytotoxic, antioxidant, tyrosinase inhibitory, antimicrobial activities of the crude ethanol extract of dry powdered roots of Asparagus racemosus (Liliaceae) were investigated. The LC(50) to brine shrimp was 2189.49 microg/ml; the EC(50) for DPPH radical scavenging was 381.91 microg/ml; the IC(50) for tyrosinase inhibition was 7.98 mg/ml. The extract was active at 5-20 mg/ml against various pathogenic microbial (16 species, 18 strains) using the agar dilution assay, with the minimum inhibitory concentration (MIC) between 10-20 mg/ml for enteropathogens, the MIC between 5-20 mg/ml for dermatopathogens, and MIC = 10 mg/ml for a pneumonia causing bacteria Klebsiella pneumoniae. TLC and HPLC finger printing showed the presence of steroids-terpenes, alkaloids and flavonoids.

31. Phytomedicine. 2010 Aug;17(10):789-93. Epub 2010 Feb 21.
Apoptosis inducing activity of steroidal constituents from Solanum xanthocarpum and Asparagus racemosus.
Bhutani KK, Paul AT, Fayad W, Linder S.

A series of Sarsapogenin and Diosgenin derived steroidal constituents (1-12), isolated from Solanum xanthocarpum and Asparagus racemosus were screened for their ability to induce cell death and apoptosis of colon carcinoma cells. The carbohydrate moieties linked to the steroid backbones were found to strongly influence cytotoxic activity and cell death mode (apoptosis or necrosis). *Compound 10, from A. racemosus was found to be a potent inducer of apoptosis.*