**Supplementary Table 3.** Detailed heavy metal, adulterants and toxicology analysis by triple quadruple gas chromatography coupled to mass-spectroscopy of 42 samples of retrieved Ayurvedic and herbal medicines

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CAM sample** | **Au** | **Hg** | **As** | **Pb** | **Ni** | **Al** | **Tl** | **Mn** | **Detected volatile organic and inorganic compounds** | **Other adulterants** |
| 1 | Traditional Ayurvedic tablets | BDR | - | 0.84 | 2.6 | 6.69 | BDR | 0.3 | 136.26 | MuuroleneBenzoic acid | Triacetin(topical antifungal agent) |
| 2 | Proprietary Ayurvedic tablets | BDR | - | 0.04 | 3.54 | 2.24 | BDR | 0.45 | 29.9 |  |  |
| 3 | Proprietary Ayurvedic tablets | BDR | - | 0.25 | 2.05 | 0.90 | BDR | 0.60 | 16.5 | Benzoic acid 2-hydroxy ethyl esterTriacetin | Aspirin (nonsteroidal anti-inflammatory drug) |
| 4 | Proprietary Ayurvedic tablets | BDR | - | 24.1 | 18.17 | 27.9 | BDR | 1.06 | 71.85 | Benzoid acidCarvacrol (natural antimicrobial agent)Eugenol (topical antiseptic)TurmeronePiperine |  |
| 5 | Proprietary Ayurvedic tablets | BDR | - | - | 1.45 | 1.90 | BDR | - | 15.98 | EugenolPalmitin -2-monoCarvacrolBenzoic acid 2-hydroxy ester |  |
| 6 | Proprietary Ayurvedic tablets | BDR | - | 7.02 | 28.15 | 73.29 | BDR | - | 824.17 | EugenolTurmeronePiperine | Ethanol (2.2 % v/v) |
| 7 | Proprietary Ayurvedic tablets | BDR | - | 0.40 | 2.60 | 13.40 | BDR | 0.20 | 152.1 |  |  |
| 8 | Traditional Ayurvedic capsules | BDR | - | 0.04 | 2.61 | 4.83 | BDR | - | 47.53 | Isoborneol (natural insect repellent, toxic if taken internally)Eugenol | Ethanol (3% v/v) |
| 9 | Proprietary Ayurvedic tablets | 0.04 | 0.13 | 0.34 | 0.12 | 0.74 | BDR | 0.28 | 1.25 | Benzoid acid 2-hydroxy ester |  |
| 10 | Proprietary Ayurvedic tablets | - | 0.19 | 0.29 | 0.22 | - | BDR | 0.25 | 0.64 | Palmitic acid ethyl esterPatchouli alcohol (terpene used in perfume industry, precursor for manufacture of chemotherapy drug Paclitaxel)  |  |
| 11 | Proprietary Ayurvedic syrup | 0.05 | 0.15 | 0.32 | 0.38 | 0.20 | BDR | - | 0.72 | Methoxy-phenol (also called Mequinol, used as topical agent in depigmentation diseases/ The National Institute for Occupational Safety and Health has set a recommended exposure limit of 5 mg/m3 over an 8-h workday. Internal use prohibited)Isoeugenol |  |
| 12 | Proprietary Ayurvedic pellets | 0.10 | 0.19 | - | 0.13 | 0.38 | BDR | 0.06 | 1.48 | Palmitic acidMethoxy-phenol (Mequinol) |  |
| 13 | Proprietary Ayurvedic tablets | 0.15 | 0.10 | 0.42 | 0.71 | 19.48 | BDR | 0.06 | 8.39 | PiperinePalmitic acid ethyl-esterCarvacrolThymolp-CymeneTerpinene |  |
| 14 | Traditional Ayurvedic tablets | 0.10 | 0.29 | 0.69 | 0.31 | 1.13 | BDR | 0.12 | 7.58 | ThymolPiperinePalmitic acid ethyl-ester |  |
| 15 | Traditional Ayurvedic tablets | 0.48 | 0.10 | - | 1.20 | 3.84 | BDR | 0.04 | 23.29 | - | - |
| 16 | Traditional Ayurvedic dried herb mixtures | 1.06 | 0.15 | - | 0.98 | 2.61 | BDR | - | 88.74 | EucalyptolThymolTurmeronePiperine |  |
| 17 | Proprietary Ayurvedic tablets | 1.44 | - | 0.19 | 0.14 | BDR | BDR | BDR | BDR | SesquiphellandrenePatchouli alcoholButanone (also called methyl-ethyl-ketone; as of 2010, caution advised in using butanone due to reports of neuropsychological effects. It is listed as a Table II precursor under the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances)CinnamaldehydeCoumarin (anticoagulant agent)ZingibereneRetusineRetrofractamide-A (natural alkaloid that promotes adipogenesis)ShogaolLupenoneIsolongifolen-5-oneCapsaicinn-trans-nerolidolCopaeneCaryophyllene | Vitamin E Asarone (component of pesticide) |
| 18 | Proprietary Ayurvedic tablets | 1.32 | - | 0.41 | - | BDR | BDR | BDR | BDR | TurmeroneAsaroneNicotinic acidP-anisaldehyde,3-hydroxyVanillin | Adrafinil - a eugeroic and antidepressant drug used to improve alertness, attention, wakefulness and mood. Off label use in night workers to avoid fatigue; used as an ‘all night party drug’. Marketed in France under the trade name Olmifon until September 2011 when it was voluntarily discontinued |
| 19 | Traditional Ayurvedic tablets | 1.33 | - | 0.53 | - | BDR | BDR | BDR | BDR | Nortrachelogenin (very toxic to aquatic life [Warning] / acute hazard)Ethyl-p-methoxy cinnamateEthanolamine |  |
| 20 | Proprietary Ayurvedic powder | 1.1 | - | 0.36 | - | BDR | BDR | BDR | BDR | Trans-sinapyl alcohol | Adogen 73 also known as oleamide, used to induce drowsiness or sleep or to reduce psychological excitement or anxiety |
| 21 | Traditional Ayurvedic syrup | 1.23 | - | 0.30 | - | BDR | BDR | BDR | BDR | Di-palmitin |  |
| 22 | Traditional Ayurvedic capsules | BDR | - | 0.12 | 3.57 | BDR | BDR | BDR | BDR | Betulin | Vanadium 1.2 mg/kg |
| 23 | Traditional Ayurvedic pellets | BDR | - | 0.38 | 1.48 | BDR | BDR | BDR | BDR | Monobutyrin | Glutaconic acid – can cause neurodegenerative diseases in accumulated dosesVanadium 0.09 mg/kg |
| 24 | Traditional Ayurvedic powder | BDR | 0.08 | - | 0.08 | 32.43 | BDR | BDR | 3.06 | Fagarine (mutagenic)O- methoxy benzyl amineR-LimoneneBenzoylecgonineOxamniquinePhlorizinAmphibine DPiperineDasycarpidoneAdenylosuccinic acidIsolupanineBergininCurcumeneDiaziquoneEthyl-xanthineCopaen-11-olIsoaromadehdrene epoxide 6,7-dimethoxy-4-ethyl coumarin-Tetralone, 2-amino-5,6-dimethoxy-Benzene, 1,2-(methylenedioxy)-4-propenylCubebolCopaene | Salinomycin (antibiotic)Oxymatrine (extracted from a traditional Chinese herb, *Sophora flavescens Ait*, used as antiviral previously, associated with systemic toxicity and is an irritant)Mefluidide (Vistar Herbicide) |
| 25 | Proprietary Ayurvedic powder | BDR | 0.14 | - | - | 1.50 | BDR | BDR | 1.55 | PiperineHexa-hydro-farnesol Carnegine4. 1-[2-[2-Bromo acetamido] ethyl] hypoxanthine6-Hydroxy- 1,2,3,4-tetra-hydro-1-Isoquinoline carboxylic acidBenzaldoximeThymolR-LimoneneCarvacrolBenmoxinBenzamidine2-pyridyl thioamideBavachininThiazole, 4-(4-aminophenyl)-2-amino | Lincomycin (antibiotic) Mefluidide (Vistar Herbicide)Roscovitine (chemotherapeutic agent)Metapramine (tricyclic antidepressant) |
| 26 | Proprietary Ayurvedic powder | BDR | 0.15 | - | - | 19.12 | BDR | BDR | 26.68 | DiaziquoneHexa-hydro-farnesolBenzamidine2-Norpinene-2-carboxaldehyde | Salinomycin (antibiotic)Mefluidide (Vistar Herbicide)Roscovitine (chemotherapeutic agent) |
| 27 | Traditional Ayurvedic syrup | - | - | - | 0.25 | - | - | - | - |  |  |
| 28 | Traditional Ayurvedic powder | 0.20 | 0.35 | - | 2.09 | 7.48 | - | - | 22.94 | TerpineneSqualeneSito-sterolLupeol | Methoxy-phenol (Mequinol)GuanosinePachybiosideTrans-sinapyl alcoholSinapic acid, methyl ester |
| 29 | Traditional Ayurvedic tablets | BDR | 0.01 | 84.9 | 15.1 | 0.87 | 18.56 | 0.07 | BDR | FagarineMarmesinEndoborneol | Chromium (5.39 mg/kg)Ethanol (7.6% v/v)Methoxy-phenol (Mequinol) |
| 30 | Traditional Ayurvedic syrup | BDR | 1.77 | 116.11 | 73.37 | 0.89 | 26.02 | 1.02 | BDR | 1-(4-hydroxy-3- methoxy phenyl)- dec-4-en-3-onep-cymene-2,5-diolVanillin | Ethanol (4.0% v/v)Chromium (8.03 mg/kg) |
| 31 | Liv. 52 tablets (Himalaya® proprietary ayurvedic product) | BDR | 0.28 | 119.43 | 13.45 | 0.82 | - | - | BDR | Propyl parabenMethyl parabenEugenolp-Cymene-2,5-diol | Spirono Lactone (diuretic drug)Chromium (7.38 mg/kg) |
| 32 | Liv 52. DS (Himalaya® proprietary ayurvedic product) | BDR | 0.52 | 33.28 | 18.56 | 2.94 | - | - | - | SitosterolStigma sterolCamphesterold-SesaminCholesta-5,7-dien-3-olMethyl eugenolMethyl parabenPoly parabenCurlone | Zolmitriptan (drug used in the acute treatment of migraine attacks and is a selective serotonin receptor agonist of the 1B and 1D subtypes)Clonazepam (medication used to prevent and treat seizures, panic disorder, and movement disorder. Also used a tranquilizer/sedative and belong to the class of the benzodiazepine)Vitamin EMetapramine (antidepressant medication with analgesic property)Chromium (9.92 mg/kg) |
| 33 | Unknown capsules | BDR | 0.32 | 10.61 | 22.47 | 2.15 | - | - | - | SitosterolStigma sterolCamphesterolBetullinPhorbolCorymboloneLevoverbenoneα-Cyclocostunolide | Chromium (9.93 mg/kg) Vitamin EAmoxicillin (antibiotic) |
| 34 | Proprietary Ayurvedic tablet | - | 8.01 | 2.56 | 23.17 | 6.11 | 68.85 | - | BDR | Methyl parabenApocynind-SesaminSitosterol | Vitamin E Metapramine (tricyclic antidepressant) |
| 35 | Traditional Ayurvedic powder | - | 1.0 | - | 0.41 | 0.75 | 108.69 | - | BDR | m-Guaicol2-Methoxy hydroquinone EudesmolBisabololHomopterocarpinSqualene | Vitamin E |
| 36 | Unknown Ayurvedic powder | - | - | - | 0.29 | 0.97 | 209.2 | 0.08 | BDR | Patchouli alcohol2-Chloroethyl palmitateCubebene |  |
| 37 | Ayurvedic syrup | - | 0.64 | 0.53 | 0.39 | 0.63 | 62.94 | 0.25 | BDR | ScopoletinSyringic acidPropyl parabenMethyl paraben  | Piracetam (cyclic derivative of gamma-aminobutyric acid, is an anticonvulsant and mood enhaBDRer drugChlorambucil (a nitrogen mustard alkylating agent used as antineoplastic agent for the treatment of various malignant and non-malignant diseases)Oxymetazoline (selective α1 adrenergic receptor agonist and α2 adrenergic receptor partial agonist used as a topical decongestant and is a local vasoconstrictor)  |
| 38 | Ayurvedic tablets | - | 0.85 | - | 10.1 | 4.29 | 418.4 | 2.40 | BDR | NeoisopulegolPogostolePalustric acidPimaric acidAcorenolLedol(A poisonous sesquiterpene that can cause cramps, paralysis, and delirium. Ledol containing Rhododendron plants were used by Caucasian peasants. These effects in shamanistic rituals) | Cadmium (4.2 mg/kg)Methyl abietate and abietic acid(Component of all forms of cleaning/washing, including cleaning products used in the home, laundry detergents, soaps, de-greasers, spot removers, etc., highly irritant and hazardous, toxic) |
| 39 | Ayurvedic tablets | - | 1.15 | - | 4.36 | 3.87 | BDR | 0.01 | BDR | RetrofractamidePropyl parabenHydrocinnamic acidAnethole |  |
| 40 | Unknown tablet | BDR | 0.05 | 0.30 | 0.42 | 0.54 | BDR | - | BDR | CamphorCurcuphenolIsoetharineElemenone | Diclofenac (nonsteroidal anti-inflammatory drug) |
| 41 | Unknown capsule | BDR | 0.17 | 0.01 | 1.17 | 0.82 | BDR | - | BDR | Terpinen-4-olSafrole Myristic acidThunbergolLicarin-BSqualeneChenodiol | 2-Methoxy-4-vinyl phenol (industrial solvent) |
| 42 | Unknown liquid | BDR | 0.03 | 0.16 | 0.57 | 0.50 | BDR | 0.52 | BDR | CarveolEthyl-p-methoxy cinnamateLupeol | Prostaglandin A1Biotin |

Abbreviation: BDR, below detectable range.

Heavy metals quantification in mg/kg.