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Appendix 9.0: ETHNOBOTANICAL AND LITERATURE INFORMATION OF MEDICINAL PLANT SPECIES USED TRADITIONALLY FOR TREATING DIARRHOEA IN SOUTH AFRICA

| Family/Plant species | Local names | Part used | Ethnopharmacological information | Biological activities investigated | Bioactive compound(s) isolated |
|--|--|---------------|--|--|--|
| Aizoaceae | | | | | |
| <i>Carpobrotus acinaciformis</i> (L.) L. Bolus | perdevy | Leaf juice | Sore throat, dysentery, mouth infection (van Wyk, 2008) | Antibacterial (Oskay <i>et al.</i> , 2009) | 2-descarboxy-betanidin (Dembitsky, 2005) |
| <i>Carpobrotus edulis</i> (L.) L. Bolus | Ikhambi-lamabulawo. Umgongozi | leaves | Diarrhoea, digestive problems, allergy (Thring and Weitz, 2006); dysentery (van Wyk, 2008) | Antibacterial (Van der Watt <i>et al.</i> , 2001) | Rutin, hyperoside, neohesperidin, catechin, ferulic acid (van der Watt <i>et al.</i> , 2001) |
| <i>Carpobrotus muiirii</i> (L.) L. Bolus | | Leaves | Dysentery, digestive problem, mouth ulcers, thrush (Thring and Weitz, 2006) | Antimicrobial (Springfield <i>et al.</i> , 2003) | - |
| Alliaceae | | | | | |
| <i>Agapanthus praecox</i> Willd. | uMkhondo (X) | Roots | Diarrhoea in sheep and goat (Dold and Cocks, 2001, McGaw and Eloff., 2008) | - | - |
| <i>Tulbaghia alliacea</i> L.f. | Umwelela X, ivimba-mpunzi X, Sikwa Z | bulb | Stomach ache, fever, tuberculosis, influenza (Bisi-Johnson <i>et al.</i> , 2010) | Antimycobacterial (Bamuamba <i>et al.</i> , 2008), Mutagenicity and antimutagenicity (Reid <i>et al.</i> , 2006), anticandidiasis (Thamburan <i>et al.</i> , 2006) | - |
| Amaranthaceae | | | | | |
| <i>Guilleminea densa</i> Moq | Sephatho (S) | Root | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | - | - |
| <i>Hermbstaedtia odorata</i> Wild | Ubuphuphu (X, Z) | leaves | Food and infusion for diarrhoea (Bisi-Johnson <i>et al.</i> , 2010); Root cleansing stomach wash alone or with <i>Acaccia xanthophloea</i> and (Hutchings <i>et al.</i> , 1996). | - | - |
| Amaryllidaceae | | | | | |
| <i>Scadoxus puniceus</i> (L.) Friis and Nordal | Umphompho-wezinja, Isiphompho umgola Z | Bulb and root | Stomach ache, diarrhoea, nausea (Bisi-Johnson <i>et al.</i> , 2010) | Antimicrobial, anti-inflammatory, acetylcholinesterase inhibition and mutagenic activities (Ndhala <i>et al.</i> , 2010) | - |
| Anacardiaceae | | | | | |
| <i>Mangifera indica</i> L. | Umango | Leaves, bark | Diarrhoea (de Wet <i>et al.</i> , 2010) | Antidiarrhoeal (Sairam <i>et al.</i> , 2003), antidiabetic (Aderibigbe <i>et al.</i> , 2001) | Gallotannins (Engels <i>et al.</i> , 2010), mangiferrin (Singh <i>et al.</i> , 2009). |
| <i>Ozoroa insignis</i> Delile | Monoko | Stem bark | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006), vinearal diseases, parasites, kidney | Antibacterial (Mathabe <i>et al.</i> , 2006); antigardial (Johns <i>et al.</i> , 1995), | 6-pentadecylsalicylic acid (antifouling), tirucallane triterpenes (Liu and Abreu, 2006) |

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| | | | trouble (Liu and Abreu, 2006) | antimalarial (Asase <i>et al.</i> , 2005), Cytotoxicity (Rea <i>et al.</i> , 2003), antischistosomiasis (Molgaard <i>et al.</i> , 2001; Ndamba <i>et al.</i> , 1994). | |
| <i>Ozoroa mucronata</i> (Bernh.ex C.Krauss) R.fern & A. Fern | | root | Diarrhoea, intestinal parasites and stomach trouble (Yamagiwa <i>et al.</i> , 1987) | LOX inhibition, PG synthase inhibition (Kubo <i>et al.</i> , 1987) | Anarcadic acid (LOX inhibition) (Ha and Kubo, 2005), Moronic acid (Hotesttmann Kaldas and Nakanishi, 1979) |
| <i>Ozoroa paniculosa</i> (Sond.) R. & A. Fernandes | Mubandulakhali, Mudumbula (V) | Bark, root bark | Abdominal problems in animal (Hutching <i>et al.</i> , 1996), Diarrhoea, sweating sickness (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Antioxidant (Mothanka, 2008), antimicrobial and antimycobacterial | - |
| <i>Ozoroa schaeocarpha</i> R. Fern & A. Fern | Mudumbula (V) | Bark | Infusion for diarrhoea (Sibandze <i>et al.</i> , 2010) | Antiescherichial (Sibandze <i>et al.</i> , 2010) | - |
| <i>Protorhus longifolia</i> (Bernh.ex C. Krauss) Engl. | i(u)Zntlwa, ikubalo, umkupati X | Bark | Heartwater and diarrhoea in cows (Dold and Cocks, 2001, McGaw and Eloff, 2008); Heart burn and stomach bleeding (Hutchings <i>et al.</i> , 1996) | Antimicrobial (Suleiman <i>et al.</i> , 2010) | - |
| <i>Sclerocarya birrea</i> (A. Rich.) Hochst. subsp. <i>caffra</i> (Sond.) | Mufula (V) | Leaves, bark, roots | Diarrhoea and fractures (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Mutagenicity, antimutagenicity (Elgorashi <i>et al.</i> , 2003), Antibacterial, antihelminthic and cytotoxicity (McGaw <i>et al.</i> , 2007), antidiarrhoea (Galvez <i>et al.</i> , 1991), antibacterial (Eloff, 2001), anti-inflammation (Ojewole, 2010), antioxidant (Braca <i>et al.</i> , 2003), anti-diabetic (Ojewole, 2004) | Gallotannin, tannic, mallic, gallic and citric acid, triterpene, flavonoid, coumarins (Ojewole <i>et al.</i> , 2010) |
| <i>Searsia gueinzii</i> Sond (Syn <i>Rhus gueinii</i> Sond) | Mushakaladza (V) | root | Gastrointestinal infections (Elgorashi <i>et al.</i> , 2003) | Mutagenicity, antimutagenicity (Elgorashi <i>et al.</i> , 2003) | - |
| <i>Searsia incisa</i> L.f. | uNongquthu | Root and bark decoction | Shock and diarrhoea (Dold and Cocks, 2001, McGaw <i>et al.</i> , 2008) | | - |
| <i>Searsia lancea</i> L.f. | Mushakaladza (V) | | Diarrhoea and gallsickness (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Antibacterial, antihelminthic and cytotoxicity (McGaw <i>et al.</i> , 2007) | - |
| <i>Searsia leptodictya</i> Diels | Mushakaladza (V) | leaves | Brower, gall sickness in cattle, infectious disease, chest and abdominal pain (Sebothoma, 2010) | Antimicrobial (Sebothoma, 2010) | (-)-leucofisetinidin, (-)-epicatechin and [4,8]-(+)-fisetinidol(-)-epicatechin (Viviers <i>et al.</i> , 1983) |
| <i>Searsia pendulina</i> | - | Leaves | Stomach ailment, enema in children | - | - |

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| Jacq. | | | (Coates-Palgrave, 2002) | | |
| <i>Searsia pentheri</i> Zahlbr. | Muthasiri (V) | leaves | Epilepsy (Svenningsen <i>et al.</i> , 2006) | GABA/benzodiazepine receptor affinity (Svenningsen <i>et al.</i> , 2006) | Apeginin, agathisflavone (Svenningsen <i>et al.</i> , 2006) |
| <i>Searsia rogersii</i> Schonland | Muthasiri (V) | Bark | Pain, watery diarrhoea (Samie <i>et al.</i> , 2010) | Antifungal (Samie <i>et al.</i> , 2010), Antimycobacterium (Green <i>et al.</i> , 2010) | - |
| Annonaceae | | | | | |
| <i>Annona senegalensis</i> Pers. | Muembe (V) | Bark | Toothache, venereal, diarrhoea (Mabogo, 1990; More <i>et al.</i> , 2008) | Antidiarrhoeal (Suleiman <i>et al.</i> , 2008), antivenom (Adzu <i>et al.</i> , 2005), antimalaria (Okokon <i>et al.</i> , 2006) | Annosenegalina (cytotoxic and antiparasitic), Annonacin (cytotoxic agent, insecticidal, mutagenic activity) immunosuppressant, senegalene (cytotoxic agent), 17, 19-kauranediol (ent-16β)-form. Dicarboxylic acid, 19-Methyl ester (toxic to brime shrimp) |
| <i>Uvaria chamae</i> P. Beauv | | Root | Catarrh, dysentery, fever, hematemesis, inflammation, jaundice, wounds, yellow fever (Reid <i>et al.</i> , 2006) | Antimalaria (Okokon <i>et al.</i> , 2006); mutagenic and antimutagenic (Reid <i>et al.</i> , 2006) | - |
| Apiaceae | | | | | |
| <i>Alepidia amatymbica</i> Eckl. & Zeyh. | Iqwili, Ikhathazo (Z) | Root | Decoction for diarrhoea (Appidi <i>et al.</i> , 2008) | Antimicrobial, anti-inflammatory and genotoxicity (Mulaudzi <i>et al.</i> , 2009) | Rosmarinic acid, Dehydrokaurenoic acid, Kaurenoic acid, kaurene lactone, acetoxyl kaurene lactone (Holzapfel <i>et al.</i> , 1995) |
| <i>Centella asiatica</i> (L.) Urb. | | Root | Chronic diarrhoea and dysentery; diaphoretic (van Wyk, 2008) | Modulator of nitric oxide production and TNF- α (Nhiem <i>et al.</i> , 2011), lipid peroxidation (Kumar and Muller, 1999) | Asiaticoside G, asiaticoside, asiaticoside F, asiatic acid, quadranoside IV, 2a,3b,6b-trihydroxyolean-12-en-28-oic acid 28-O-[α -L-rhamnopyranosyl-(1 \rightarrow 4)- β -D-glucopyranosyl-(1 \rightarrow 6)- β -D-glucopyranosyl] ester, kaempferol, quercetin, astragalol, and isoquercetin (Nhiem <i>et al.</i> , 2011) |
| <i>Centella glabrata</i> L. | | Root and stalk | Chronic diarrhoea and dysentery, diaphoretic (van Wyk, 2008b) | - | - |
| <i>Foeniculum vulgare</i> Mill. | | Leaf | Flatulence, cough, diuretic, digestive problem, diarrhoea, stomach ache and cramps (Watt and Breyer-Brandwijk, 1962; van Wyk, 1997) | Antimicrobial (Bacillus cereus, Clostridium botulinum, Salmonella enteritidis, Staphylococcus aureus, Yersinia enterocolitica) (Ceylan and Fung, 2004) | Falcarindiol (antifungal, antibiotic and analgesic, antinociceptive, DNA topoisomerase inhibitor, phytotoxic, allelochemical, antimutagenic and antiproliferative agents), 1-(4-hydroxyphenyl)-1,2-propanediol form, 4' methyl ether (phytotoxin, antiparasitic, nematocidal agent) |
| Apocynaceae | | | | | |
| <i>Acockanthera oblongifolia</i> (Hochst.) Codd | inHlungunyembe Intlungunyembe (X, Z) | leaves | Severe gastrointestinal irritation (Verschaeve and Van Staden, 2008), Decoction for stomach ache, diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | Genotoxicity (Elgorashi <i>et al.</i> , 2003); Epilepsy and convulsion (Risa <i>et al.</i> , 2004) | Acolongifloroside K and H (antineoplastic agent) |
| <i>Catharanthus roseus</i> (L.) G.Don | Imbali, Ikhwinini, Isishushlungu (Z) | Leaves, stem and | Diarrhoea (de Wet <i>et al.</i> , 2010) | Antimicrobial (van Vuuren and Naidoo, 2010) | Serpentine (antitumour activity); apparicine (cytotoxin, weak antibacterial, antiviral agent active against Polio virus, |

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| | | root | | | analeptic properties); β-carboline (induced mutagenicity, antiparasitic, antitrypanosomal agent); Catharanthamine (antitumour); Trichosetin (antibacteria); 16-Epi-2-isositsirikine antineoplastic); Leurosine (antihyperglycaemic); Lochnerinine (antitumour); Pericyclivine (weak cytotoxic activity); 15',20'-anhydroviriblastine (antineoplastic agent); Vindoline (antineoplastic); Vindolinine (antiglycaemic agent, antifungi); Vingamine (cytotoxic); yohimbine (selective α_2 -adrenoceptor antagonist, antidepressant, antihypotensive, antidiuretic activity, aphrodisiac, angiogenic activity in rodent) |
| <i>Sarcostemma viminale</i> (L.) R. Br subsp. <i>viminale</i> | Umbelebele, Ingotshwa | Stem | Infusion for diarrhoea (de Wet <i>et al.</i> , 2010), Increase livestock productivity (Kunene and Fossey, 2006) | Antibacterial, anti-inflammatory and mutagenic effects (Luseba <i>et al.</i> , 2007) | - |
| Aquifoliaceae | | | | | |
| <i>Ilex mitis</i> (L.) Radlk. | Monamane (S), Mutanzwa-khamelo (V) | Root bark | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | Antimalaria and cytotoxicity (Rasoanaivo <i>et al.</i> , 2004) | - |
| Araliaceae | | | | | |
| <i>Cussonia arborea</i> Hochst ex A. Rich | | Root, leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | antimicrobial and antimalarial (De Villiers <i>et al.</i> , 2010) | Arboreaside A, Arboreaside B, Arboreaside C, Arboreaside D, Arboreaside E, ciwujianoside C3 and 23-hydroxyursolic acid 28-O- α -L-rhamnopyranosyl-(1 \rightarrow 4)- β -D-glucopyranosyl-(1 β)- β -D-glucopyranosyl ester (Kougan <i>et al.</i> , 2009) |
| Asclepiadaceae | | | | | |
| <i>Asclepias fruticosa</i> L. | iGwada (X), Mutshulwa (V), Lebegana (S) | Root, leaves | Diarrhoea and stomach pain in children (Lewu and Afolayan, 2009) | Antimycobacterium (Green <i>et al.</i> , 2010), antifungal (Samie <i>et al.</i> , 2010), antimicrobial, anti-inflammatory, anticholinesterase and mutagenic activities (Ndhala <i>et al.</i> , 2010) | - |
| <i>Secamone filiformis</i> (L.f) J. H. Ross | iMbijela | Stem | Diarrhoea in cattle (Dold and Cocks, 2001, McGaw <i>et al.</i> , 2008) | Anthelmintic, antibacterial and cytotoxicity (McGaw <i>et al.</i> , 2007) | - |
| <i>Xysmalobium undulatum</i> (L.) W.T. Aiton | Ishongwe (X, Z) | Roots | Diarrhoea, dysentery, stomach cramps, headache, oedema, dysmenorrhoea (Bisi-Johnson <i>et al.</i> , 2010) | Antibacterial (Rabe and Van Staden, 1997), PG inhibition (Jager <i>et al.</i> , 1996), Serotonin re-uptake modulatory activity (Nielsen <i>et al.</i> , 2004), antidepressant (Pedersen <i>et al.</i> , 2008) | - |

| Asparagaceae | | | | | |
|---|--|------------------------|--|---|---|
| <i>Asparagus cooperi</i> Bak. | Lefatshana (S) | Whole plant | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | Antibacterial (Mathabe <i>et al.</i> , 2006) | - |
| Asphodelaceae | | | | | |
| <i>Aloe arborescens</i> Miller | Inhlaba, Tshikhopha (V) | leaves | Diarrhoea and sore (Mlambo, 2008) | Anti-inflammatory (Lindsey <i>et al.</i> , 2002); immunomodulator, anti-inflammatory (Imanishi, 1993), | Aloctin A (Imanishi, 1993); aloenin, 2'-O- <i>p</i> -coumaroylaloenin, 2'-O-feruloylaloenin, isobarbaloin, and barbaloin (Beppu <i>et al.</i> , 2003) |
| <i>Aloe candelabrum</i> Berger | Ikhalana Inkalane (X) Uphondonde (Z) | leaves | Decoction for diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| <i>Aloe greatheadii</i> Schonl. | Sekgopha (S) | Leaves | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | antioxidant (Botes <i>et al.</i> , 2008), antiplasmodial and cytotoxicity (Van Dyk <i>et al.</i> , 2009) | - |
| <i>Aloe marlothii</i> Berger | Bindamutsho, Tshikhopha (V) | Leaves | Gallsickness, parasites, diarrhoea, constipation, retain placenta, dystocia maggots (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | antimalaria (Pillay <i>et al.</i> , 2008), antibacterial, antihelminthic, anti-amoebic (McGaw <i>et al.</i> , 2000), antitick (Spickett <i>et al.</i> , 2007) | - |
| <i>Bulbine abyssinica</i> A. Rich | Utswelana Intelezi (X) Ibhucu (Z), Incelwane (X) | Leaves, tubers | Vomiting, diarrhoea, tuberculosis (Bisi-Johnson <i>et al.</i> , 2010) | Antileukemia, antiplasmodial, cytotoxicity (Bringmann <i>et al.</i> , 2002) | Chrysophanol, aloe-emodin, knipholone, isoknipholone, Bulbine-knipholone (Bringmann <i>et al.</i> , 2002) |
| <i>Bulbine asphodeloides</i> (L.) Willd | | tuber and leaves | rashes, sores wounds, dysentery and diarrhoea (Iwalewa <i>et al.</i> , 2007) | - | - |
| <i>Bulbine frutescens</i> Wild | Intelezi (X) | leaf, root and rhizome | Diarrhoea, burns, rashes, blisters, insect bites, cracked lips and mouth ulcers (Coopoosamy, 2011) | Antibacterial (Coopoosamy, 2011), antiplasmodial (Mutanyatta <i>et al.</i> , 2005) | knipholone, 4-O-demethylknipholone-4-β-D-glucopyranoside (Mutanyatta <i>et al.</i> , 2005) |
| <i>Bulbine latifolia</i> (L.f) Roem et Schult | Irooiwater | Root | Decoction for diarrhoea (Appidi <i>et al.</i> , 2008) | Antibacterial (Coopoosamy, 2011) | Knipholone (antiplasmodial activity, cytotoxic agent) |
| <i>Bulbine natalensis</i> (Bak. Cf. roowortel) | Ibhucu (Z) | leaves | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006); vomiting, diarrhoea, convulsion, venereal diseases, diabetes and rheumatism (Pujol, 1990) | Sexuality behaviour (Yakubu and Afolayan, 2008), Toxicity (Afolayan and Yakubu 2008) | - |
| Asteraceae | | | | | |
| <i>Acanthospermum glabratum</i> (DC) Wild | Inamatshela | Whole plant | Diarrhoea (de Wet <i>et al.</i> , 2010) | - | - |
| <i>Acanthospermum australe</i> (Loefl.) O. Kuntze | Umgwaqeni (Z) | Whole plant | Diarrhoea (Mlambo, 2008) | Antiherpesvirus and antipoliavirus (Rocha Martin <i>et al.</i> , 2010) | Acanthoaustralide, quercetin and chrysosplenol (Rocha Martin <i>et al.</i> , 2010) |

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| <i>Artemisia absinthium</i> L. | | leaves | Diarrhoea (Van Wyk <i>et al.</i> , 2008) | Antimycobacterium (Gautam <i>et al.</i> , 2007) | - |
| <i>Bidens bipinnata</i> L. | Uvelemampo ndweni uvelegoli | leaves | Infusion for diarrhoea (Bisi-Johnson <i>et al.</i> , 2010), haemorrhage, reduce cancer, flu, cold, fever (Pooley, 1998) | Antidiarrhoea (Atta and Mouneir, 2005) | - |
| <i>Bidens pilosa</i> L. | iSanama, Mushidzhi (V) | Root or leaves, flowers | Stomach pain (Lewu and Afolayan, 2009); diarrhoea, inflammation, female infertility, excessive menstruation (Dold and Cocks, 2000) | Antidiarrhoeal (Yadav and Tangu, 2009), amoebicidal (Moundipa <i>et al.</i> , 2005), immunomodulator (Chang <i>et al.</i> , 2007, Chiang <i>et al.</i> , 2007) | Centaurein, centaureidin, cytopiloyne (Chang <i>et al.</i> , 2007, Chiang <i>et al.</i> , 2007) |
| <i>Brachylaena ilicifolia</i> (Lam.) Phill. & Schweick | uMgqh | Leaves | Diarrhoea in lambs (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) | - | - |
| <i>Brachylaena transvaalensis</i> E. Philips and Schweick | lphahlalehlathi | Leaves and bark | Diarrhoea (de Wet <i>et al.</i> , 2010) | -- | - |
| <i>Callilepis laureola</i> Hutch | Impila (Z) | Roots | Diarrhoea (Mlambo, 2008) | - | - |
| <i>Chromolaena odorata</i> L. | Usandanezwe (Z) | Leaves | Diarrhoea (Mlambo, 2008) | Anti-inflammatory, antipyretic antispasmodic (Taiwo <i>et al.</i> , 2000), antidiabetic (Wafo <i>et al.</i> , 2011), antimicrobial and cytotoxicity (Vital and Rivera, 2009) | 15-angeloyloxy-16,17-epoxy-19-kauronic acid, 16-kauren-19-oic acid, 6'-hydroxy-2',3',4,4'-tetramethoxychalcone, isosakuranetin, acetin, and kaempferide (Wafo <i>et al.</i> 2011) |
| <i>Conyza scabrida</i> DC. | | Herb | Cold, influenza, inflammation, diarrhoea, fever, diabetes, stomach affliction (Thring <i>et al.</i> , 2007) | Antimicrobial (Thring <i>et al.</i> , 2007) | - |
| <i>Dicoma anomala</i> Sond. | Umuna (Z), Inyongana (X) | Roots | Decoction for diarrhoea, stomach cramp and skin lesion (Shale <i>et al.</i> , 1999) | Antibacterial, antioxidant, fibroblast growth stimulant (Steenkamp <i>et al.</i> , 2004) | - |
| <i>Dicoma capensis</i> Less. | | Herb | Bitter tonic and diuretic; kidney; bladder; back pain; nausea; influenza; colds; cancer; diarrhoea (van Wyk, 2008) | Cytotoxicity (Steenkamp and Gouws, 2006) | - |
| <i>Helichrysum adenocarpum</i> DC | | Root decoction | Diarrhoea and vomiting in children (Lourens <i>et al.</i> , 2008) | | - |
| <i>Helichrysum calophyllum</i> Klatt | | Root | Hyperfunction of lower gastrointestinal tract (Lourens <i>et al.</i> , 2008) | - | - |
| <i>Helichrysum</i> | | Root | Diarrhoea in children (Lourens <i>et al.</i> , | - | - |

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| <i>ecklonis</i> Sond | | decoction | 2008) | | |
| <i>Helichrysum odoratissimum</i> (L.) | Imphepho (Z) | Whole plant | Diarrhoea (Mlambo, 2008) | Antimicrobial (Puyvelde <i>et al.</i> , 1989) | 3,5-dihydroxy-6,7,8-trimethoxyflavone and 3-O-methylquercetin, helichrysetin (Puyvelde <i>et al.</i> , 1989) |
| <i>Pentzia incana</i> (Thunb.) Kuntze | | | Diarrhoea (Van Wyk <i>et al.</i> , 2008) | - | - |
| <i>Schkuhria pinnata</i> (Lam.) Thell. | Unsakansaka (Z) | Aerial parts | Pneumonia, diarrhoea, eye infections, heartwater (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Antibacterial, anti-inflammatory mutagenicity (Luseba <i>et al.</i> , 2007) | - |
| <i>Senecio quinquelobus</i> DC. | Usinini (Z) | Leaves | Diarrhoea (Mlambo, 2008) | - | - |
| <i>Vernonia glaberrima</i> Welw | | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | Antibacterial and antimalaria (De Villiers <i>et al.</i> , 2010) | - |
| <i>Vernonia kotschyana</i> Sch. Bip. ex Walp. (<i>Baccharoides adoensis</i> var. <i>kotschyana</i> (Sch. Bip. ex Walp.) M.A. Isawumi, G.El-Ghazaly & B. Nordenstam) | Inyathelo (Z) | leaves | Diarrhoea (Mlambo, 2008) | Immunomodulating activity (Nergard <i>et al.</i> , 2004); antibacterial activity (Deeni and Hussain, 1994) | pectic arabinogalactan (Nergard <i>et al.</i> , 2004) |
| <i>Vernonia natalensis</i> Sch. Bip. ex Walp. | Uhlambihloshane, Isibhaha | Leaves, stem | Decoction for stomach cramps, nervous spasms of the stomach (Fawole <i>et al.</i> , 2009b); (Hutching <i>et al.</i> , 1996) | Anti-inflammatory (Fawole <i>et al.</i> , 2009a), antimicrobial, mutagenicity (Fawole <i>et al.</i> , 2009b) | - |
| <i>Vernonia oligocephala</i> Sch. Bip | lihlunguhlungu | Roots | Infusion for diarrhoea (Amusan <i>et al.</i> , 2007) | - | - |
| <i>Vernonia myriantha</i> Hook. F (syn <i>Vernonia stipulacea</i> Klatt) | Mululudza (V) | Roots | Diarrhoea, fever, flu, contraceptive (Bessong <i>et al.</i> , 2005; Obi <i>et al.</i> , 2003) | - | - |
| <i>Vernonia tigna</i> Klatt syn <i>V. corymbosa</i> | Uhlunguhlungu (Z), Phathaphathane (V) | Leaves | Diarrhoea (Mlambo, 2008) | - | - |
| Balanitaceae | | | | | |
| <i>Balanites maughanii</i> Sprague | | leaves | Diarrhoea in cattle (Luseba and Van der Merwe, 2006; McGaw <i>et al.</i> , 2008) | Antiplasmodial and cytotoxicity (Prozesky <i>et al.</i> , 2001) | - |

| Balanophoraceae | | | | | |
|---|------------------------------|-------------------------------|--|--|---|
| <i>Sarcophyte sanguine</i> Sparrm | | whole plant | Amenorrhoea, dysentery, diarrhoea and swellings growth (Iwalewa <i>et al.</i> , 2007) | Antibacterial and antifungal (Naidoo <i>et al.</i> , 1992) | Eriodictyol, naringenin, triandrin, n-pinitol (ID-4-O-methyl chiroinositol), trans-p-coumaraldehyde, Exocarpic acid (13E-octadecene-9,11-diyonic acid) |
| Bignoniaceae | | | | | |
| <i>Markhamia sessilis</i> Sprague | | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | Antiplasmodial and cytotoxicity (Mbatchi <i>et al.</i> , 2006), antimicrobial and antimalaria (De Villiers <i>et al.</i> , 2010) | - |
| <i>Kigelia africana</i> (Lam.) Benth. | | Bark | Dysentery and stomach ailments (van Wyk, 2008b) | Antidiarrhoea (Akah, 1996), analgesic and anti-inflammatory (Owolabi and Omogbai, 2007), antifungal and antibacterial (Owolabi <i>et al.</i> 2007) | Verminoside and Verbascoside (Picerno <i>et al.</i> , 2005) |
| <i>Tecomaria capensis</i> Spach | | Bark | fever, diarrhea and dysentery, pains, sleeplessness, stomach and chest pains (Iwalewa <i>et al.</i> , 2007) | Antimicrobial (Saini <i>et al.</i> , 2011) | - |
| Bombacaceae | | | | | |
| <i>Adansonia digitata</i> L. | Muvhuyu (V) | Leaves, bark, root fruit | Fever, diarrhoea, haemoptysis, hiccup remedy (van Wyk, 2008b) | Anti-inflammatory, antiviral (Selvarani and Hudson, 2009), antihyperglycemic and hypolipidemic (Bhargav <i>et al.</i> , 2009), Antimicrobial (Mulaudzi <i>et al.</i> , 2011) | Epicatechin, procyanidin B2, procyanidin B5 (Kinghorn <i>et al.</i> , 2011) |
| Bursareceae | | | | | |
| <i>Commiphora harveyi</i> (Engl.) Engl. | | Leaves | Disinfectant for wound, anthelmintic and snakebite (Watt and Breyer-Brandwijk, 1962) | Antimicrobial (Suleiman <i>et al.</i> , 2010) | - |
| Capparaceae | | | | | |
| <i>Capparis tomentosa</i> | Umqoqolo (Z), Muoba-dali (V) | Root infusions and decoctions | Diarrhoea in cattle, stomach ailments in animals (Watt and Breyer-Brandwijk, 1962, Pujol, 1990, McGaw <i>et al.</i> , 2008) | Antimicrobial (Ramalivhana <i>et al.</i> , 2010), antifungal (Samie <i>et al.</i> , 2010) | Stachydrine L-form (Systolic depressant, rheumatism) |
| Caricaceae | | | | | |
| <i>Carica papaya</i> L. | Papawe (V) | Leaves, seed | Amoebic dysentery, fever, gastric problems, asthma, immune-stimulant (Green <i>et al.</i> , 2010; Aruoma <i>et al.</i> , 2006) | Antiamoebic (Tona <i>et al.</i> , 1998), anthelmintic (Kermanshai <i>et al.</i> , 2001) | Alternariol Carpamine (cardiotonic agent, CNS depressant), Chymopapain ; Glycerol triacetate (antifungal and adjuvant); Papain ; 2,4'-Dihydroxy-3',5'-dimethoxyacetophenone (antifungal), Benyl |

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| | | | | | isothiocyanate (Kermanshai <i>et al.</i> , 2001) |
| Caryophyllaceae | | | | | |
| <i>Krauseola mossambicina</i> (Moss.) Pax & K. Hoffm. | Isihlaza, Isihlazi | | Diarrhoea (de Wet <i>et al.</i> , 2010) | - | - |
| Celastraceae | | | | | |
| <i>Elaeodendron transvaalense</i> (Burt Davy) R.H. Archer syn <i>Cassine transvaalensis</i> | Mulumanamana Mukuhazwhi, Umgugudo (Z) | Bark | Cough, piles, venereal diseases, diarrhoea, stomach ache, laxative (Samie <i>et al.</i> , 2010) | Antimicrobial (Tshikalange <i>et al.</i> , 2005), hypoglycaemic (Deutschlander <i>et al.</i> , 2009), Cytotoxicity (Tshikalange and Hussein, 2010) | lup-20(30)-ene-3,29-diol, lup-20(29)-ene-30-hydroxy-3-one-(2), ψ - taraxastanonol, β -sitosterol and 4' -O-methylepigallocatechin (Tshikalange and Hussein, 2010) |
| <i>Gomphocarpus fruticosus</i> Dryand. | | Leaf infusion | Diarrhoea and stomach ache in children (Hutchings <i>et al.</i> , 1996; Fouche <i>et al.</i> , 2008) | - | Gomphoside (cardiotonic agent) |
| <i>Gymnosporia senegalensis</i> (Lam.) Loes | Ubuhlangwe | | Diarrhoea (de Wet <i>et al.</i> , 2010) | | - |
| <i>Maytenus heterophylla</i> Eckl. & Zeyh.) Robson | Isibhubu (Z), Tshiphandwa (V) | Bark and leaf infusions | Diarrhoea in stock animals (Watt and Breyer-Brandwijk, 1962; McGaw <i>et al.</i> , 2008) | Antimicrobial (Orabi <i>et al.</i> , 2001), anti-inflammatory and cytotoxicity (Da Silva <i>et al.</i> , 2010), anticytomegalovirus (Murayama <i>et al.</i> , 2007) | 1 β -acetoxy-9 α -benzoyloxy-2 β ,6 α -dinicotinoyloxy- β -dihydroagarofuran, β -amyrin, maytenfolic acid, 3 α -hydroxy-2-oxofriedelane-20 α -carboxylic acid, lup-20(29)-ene-1 β ,3 β -diol, (-)-4'-methylepigallocatechin, and (-)-epicatechin (Da Silva <i>et al.</i> , 2010), pristimerin, lupeol and 2-acetylphenol-1- β -D-glucopyranosyl (1 \rightarrow 6)- β -D-xylpyranoside (acetophenol glycoside) (Murayama <i>et al.</i> , 2007) |
| <i>Maytenus peduncularis</i> (Sond.) Loes. | Mukwatule (V) | root | Backache, pain (Gonzalez <i>et al.</i> , 2000) | - | - |
| <i>Maytenus procumbens</i> (L.f.) Loes. | - | - | - | - | - |
| <i>Maytenus senegalensis</i> (Lam.) Exell | Tshiphandwa (V) | | Root used for chest pain, rheumatism, snakebites, diarrhoea and fever. Leaves for eye infection (Matu and van Staden, 2003) | Antimicrobial and anti-inflammatory (Matu and van Staden, 2003); anti-inflammatory and cytotoxicity (Da Silva <i>et al.</i> , 2010) | Wilforine (insecticidal), β -amyrin, lupenone, maytenoic acid, β -sitosterol, pristimerin (Da Silva <i>et al.</i> , 2010) |
| <i>Maytenus undata</i> | Tshinembane (V) | Leaves | | Antimicrobial, anti-inflammatory and | 3-oxo-11 α -methoxyolean-12-ene-30-oic acid, 3-oxo-11 α - |

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| (Thunb.) Blakelock | | | | antioxidant (Muhammed <i>et al.</i> , 2000), antimalaria (Muthaura <i>et al.</i> , 2007) | hydroxyolean-12-ene-30-oic acid, 3-oxo-olean-9(11),12-diene-30-oic acid, 3,4-seco-olean-4(23),12-diene-3,29-dioic acid (20-epikoetjapic acid), 3,11-dioxoolean-12-ene-30-oic acid (3-oxo-18 β -glycyrrhetic acid), koetjapic acid, 12-oleanene artifact 3-oxo-11 α -ethoxyolean-12-ene-30-oic acid (Muhammed <i>et al.</i> , 2000) |
| Chenopodiaceae | | | | | |
| <i>Atriplex nummularia</i> Lindl. | | Leaves, flower | Diarrhoea (Van Wyk <i>et al.</i> , 2008) | Antitumorigenic activity (Amara <i>et al.</i> , 2008) | - |
| <i>Chenopodium ambrosioides</i> L. | Unakani, Ikhambi | Aerial part | Diarrhoea (de Wet <i>et al.</i> , 2010) | Antisecretory against cholera toxin (Velazquez <i>et al.</i> , 2006), antiameba and antigardia (Calzada <i>et al.</i> , 2006) | Ascaridole, quercetin, kaempferol, isorhamnetin, ambroside, malic acid, succinic acid |
| Clusiaceae | | | | | |
| <i>Garcinia livingstonei</i> T. Anderson | Umphimbi, Muphiphi (V) | leaves | Diarrhoea (de Wet <i>et al.</i> , 2010) | Antibacterial (Kaikabo, 2008) | Amentoflavone (Bradykinin antagonist, anti-HIV activity, inhibitor of human cathepsin B, anti-inflammatory properties), amentoflavone and 4'-methoxy amentoflavone (Kaikabo, 2008) |
| Combretaceae | | | | | |
| <i>Combretum bracteosum</i> (Hochst.) Brandis ex Engl. | | leaves | - | anti-inflammatory, anthelmintic and antischistosomal (McGaw <i>et al.</i> , 2001) | - |
| <i>Combretum imberbe</i> Wawra | Mudzwiri (V) | Root | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | anti-inflammatory, anthelmintic and antischistosomal (McGaw <i>et al.</i> , 2001), antimicrobial (Angeh <i>et al.</i> , 2007) | 1 α , 23 β -Dihydroxyl-12-Oleanen-29-oic acid-23 β -O- α -4-acetylramnopyranoside; 1, 22-Dihydroxyl-12-Oleanen-30-oic acid; Ethyl cholesta-7, 22,25-trien-O- β -D-glucopyranoside (Angeh <i>et al.</i> , 2007), imberbic acid (Katerere <i>et al.</i> , 2003) |
| <i>Combretum molle</i> R. Br. ex G. Don | Mugwiti (V) | Roots | Abdominal pain, fever, snake bite, leprosy and convulsions (Bessong <i>et al.</i> , 2005; Mabogo, 1990) | anti-inflammatory, anthelmintic and antischistosomal (McGaw <i>et al.</i> , 2001) | Punicalgin, 4- <i>epi</i> -sericoside, sericoside (Asres <i>et al.</i> , 2001), β -D-glucopyranosyl 2 α ,3 β ,6 β -trihydroxy-23-galloylolean-12-en-28-oate, combregenin, arjungenin, arjunglucoside I, combreglucoside (Ponou <i>et al.</i> , 2008), mollic acid glucoside (Oyewole, 2008) |
| <i>Combretum padoides</i> Engl. & Diels | | | | anti-inflammatory, anthelmintic and antischistosomal (McGaw <i>et al.</i> , 2001); antifungal (Masoko <i>et al.</i> , 2007); Antibacterial (Angeh <i>et al.</i> , 2007) | 1 α ,23 β -dihydroxy-12-oleanen-29-oic-acid-23 β -O- α -4-acetylramnopyranoside, 1,22-dihydroxy-12-oleanen-30-oic acid, 24-ethylcholesta-7,22,25-trien-O- β -D-glucopyranoside (Angeh <i>et al.</i> , 2007) |
| <i>Combretum vendae</i> A.E. van Wyk | | Leaves | Leprosy, ophthalmic remedy, and blood purification (Watt and Breyer-Brandwijk, | Antimicrobial (Ahmed <i>et al.</i> , 2008; Suleiman <i>et al.</i> , 2010) | apigenin (Eloff <i>et al.</i> , 2008) |

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| <i>Combretum woodii</i> Dummer | | | 1962) | anti-inflammatory, anthelmintic and antischistosomal (McGaw <i>et al.</i> , 2001); antifungal (Masoko <i>et al.</i> , 2007) | Combretastatin B5 (Eloff <i>et al.</i> , 2005) |
| <i>Combretum zeyheri</i> Sond | Mufhatela-thundu, Mufhatela (V) | Root infusion | Bloody diarrhoea (Hutchings <i>et al.</i> , 1996; Fouche <i>et al.</i> , 2008) | Antibacterial (Breytenbach and Malan, 1989) | |
| <i>Terminalia laxiflora</i> Engl. | | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | Antifungal (Batawila <i>et al.</i> , 2005) | |
| <i>Terminalia phanerophlebia</i> Engl. | | Root bark | Diarrhoea and colic (lwalewa <i>et al.</i> , 2007) | Antimicrobial (Shai <i>et al.</i> , 2008a) | |
| <i>Terminalia sericea</i> Burch. ex DC. | Mususu (V), Ikonono | Leaves roots | Wound (Luseba and Van der Merwe, 2006); diarrhoea (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Antimicrobial, antidiabetic, cytotoxicity (Moshi and Mbwambo, 2005), COX-1 and COX-2 assays (Eldeen <i>et al.</i> , 2006). | Anolignan B (Eldeen <i>et al.</i> , 2006), Termilignan B, Arjunic acid (Eldeen <i>et al.</i> , 2008), 3'5'-dihydroxy-4-(2-hydroxy- ethoxy) resveratrol-3-O- β -rutinoside, resveratrol-3- β - rutinoside glycoside, 3',4,5'-Trihydroxystilbene (resveratrol), arjungenin (Joseph <i>et al.</i> , 2007) |
| Convolvulaceae | | | | | |
| <i>Ipomoea batatas</i> (L.) Lam. | Sweet potato | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | | 4,5-Di-transcaffeoyldenoic acid (antioxidant), 6-O- caffeoylsophorose (α -glucosidase inhibitor, antioxidant); 3,5-Di-O-caffeoylquinic acid (active against HIV-1 integrase, antiviral, antihepatotoxic activity); Petrovin B (antibacterial and antitumour) |
| Cornaceae | | | | | |
| <i>Curtisia dentata</i> (Burm.f.) C.A.Sm. = <i>C. faginea</i> Assegaai | Umlaheni (X, Z) Unsirayi (X), Umgxina | Bark, root | Diarrhoea, stomach ailments (Bisi- Johnson <i>et al.</i> , 2010) | Antimicrobial (Shai <i>et al.</i> , 2008a, Shai <i>et al.</i> , 2009) | Lupeol, betulinic acid, ursolic acid, and 2 α -hydroxyursolic acid (Shai <i>et al.</i> , 2008b) |
| Crassulaceae | | | | | |
| <i>Crassula ovata</i> (Mill.) Druce | Karkay, karkey (K) | Fresh leave | Diarrhoea (van Wyk, 2008) | - | - |
| <i>Crassula tetragona</i> L. | Karkay, karkey (K) | Fresh leave | Diarrhoea (van Wyk, 2008) | - | - |
| Cucurbitaceae | | | | | |
| <i>Cucumis hirsutus</i> Sond. | | Leaves, root | Decoction for abdominal pains, diarrhoea (Fawole <i>et al.</i> , 2009a); Hutching <i>et al.</i> , 1996) | - | - |
| <i>Mormodica balsamina</i> L. | Lubavhe (V) | Whole plant | Diabetes, childhood diarrhoea (Samie <i>et al.</i> , 2009) | Shigellocidal (Iwalokun <i>et al.</i> 2001); Cytotoxicity and antiamebic (Samie <i>et al.</i> , 2009) | Balsaminapentaol A, Balsaminol A, Balsaminol B, Cucurbalsaminol A, Cucurbalsaminol B, cucurbita- 5,23(E)-diene-3 β ,7 β ,25-triol, karavilagenin E (Ramalhete |

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| Ebenaceae | | | | | |
| <i>Diospyros lycioides</i> Desf. | Umbulwa (Z) | Bark, root | Decoction for bloody faeces and dysentery (<i>Fawole et al.</i> , 2009a); (<i>Hutching et al.</i> , 1996) | - | Hydroxyisodispyrin (cytotoxic agent) |
| <i>Diospyros mespiliformis</i> | Musuma | Bark and leaves | Dysentery, fever, ringworm, skin infection, wound healing (<i>Samie et al.</i> , 2010) | | Diosquinone, plumbagin (<i>Lajubutu et al.</i> ,1995) |
| <i>Diospyros pallens</i> (Thunb.) F. White | | Root and stem | Stomach arch; diarrhoea (<i>van Wyk</i> , 2008) | - | - |
| <i>Euclea crispa</i> Thunb Gurke | Ungwali (Z), | leaves | Dysmenorrhoea (<i>Steenkamp</i> , 2003) | | |
| <i>Euclea natalensis</i> A. DC | Mutangule-thavha (V), Umzimane (Z) | root | oral health care, for chest complains, bronchitis, pleurisy, chronic asthma, urinary tract infections, venereal diseases (<i>Lall and Meyer</i> , 2001) , Infertility and abortifacient (<i>Arnold and Gulumian</i> , 1984) | Antibacterial (<i>Weigenand et al.</i> , 2004), antimycobacterium (<i>Lall and Meyer</i> , 2001) | Octahydroeuclein, 20(29)-lupene-3 β -isoferulate, shinanolone, lupeol, betulin (<i>Weigenand et al.</i> , 2004); diospyrin (<i>Lall and Meyer</i> , 2001) |
| Euphorbiaceae | | | | | |
| <i>Antidesma venosum</i> E. Mey. ex Tul. | Mupalakhwali (V) | Leaf | Decoction for abdominal cramps and dysentery (<i>Fawole et al.</i> , 2009a; <i>Hutching et al.</i> , 1996) | Antimicrobial (<i>Fawole et al.</i> , 2009b) | - |
| <i>Bridelia micrantha</i> (Hochst.) Baill | Munzere (V) | Bark, leaves, roots | Stomach ache, diarrhoea, abortifacient (<i>Bessong et al.</i> , 2005; <i>Lin et al.</i> , 2002), Gastro-intestinal ailments, painful joints, retained placenta, diabetes mellitus, syphilis prehepatic jaundice, tape worm abdominal pain, conjunctivitis, headache, scabies, bloody diarrhoea, dysentery, emetic, wound infection, coughs, threadworms, tonic for children, sore eyes, epigastric pain, relief of headache, purgative (<i>Ngueyem et al.</i> , 2009), diabetes mellitus (<i>Abo et al.</i> , 2008) | Antidiarrhoea (<i>Lin et al.</i> , 2002), beta-lactamase inhibition (<i>Gangoue-Pieboji et al.</i> , 2007); antimalarial (<i>Abo and Ashidi</i> 1999). <i>n</i> -butanol fraction of methanolextract has IC50 of 7.3_g/ml against the RNA-dependent DNA polymerization (RDDP) function of HIV-1 RT (<i>Bessong et al.</i> , 2006) | Taraxerol, gallic and ellagic acid, friedelin, delphinidin, methyl salicylate (<i>Ngueyem et al.</i> , 2009) |
| <i>Bridelia mollis</i> | Mukumbakumba | Leaves | Dysentery, burning and itching (<i>Samie et al.</i> , 2010) | Antifungal (<i>Samie et al.</i> , 2010) | |
| <i>Euphorbia cooperi</i> N. B. Br. Ex. Berger | Umhlonhlo (X) | Root bark | Diarrhoea, stomach disorder (<i>Bisi-Johnson et al.</i> , 2010) | - | - |
| <i>Euphorbia hirta</i> L. | | Leaves | Decoction for diarrhoea (<i>De Villiers et al.</i> , 2010); dysentery, gonorrhoea, jaundice, | Antiamoebic , spasmolytic (<i>Tona et al.</i> , 2000), Antidiarrhoeal (<i>Galvez et al.</i> , | β -amyrin, 24-methylenecycloartenol, β -Sitosterol, Quercitrin (<i>Galvez et al.</i> , 1993). Quercitol, gallic acid, |

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| | | | pimples, digestive problems and tumours, antibacterial, anti-inflammatory, antimalarial, galactogenic, antiasthmatic, antidiarrheal, anticancer, antioxidant, antifertility, antiamoebic, and antifungal activities (Kumar <i>et al.</i> , 2010) | 1993) | afzelin, quercitrin, myricitrin, rutin, gallic acid, quercetin, euphorbin-A and euphorbin-B, euphorbin-C, euphorbin-D, β -amyrin, 24-methylenecycloartenol, β -sitosterol, heptacosane, n-nonacosane, shikmic acid, tinyatoxin, choline, camphol, and quercitol (Kumar <i>et al.</i> , 2010) |
| <i>Jatropha zeyheri</i> Sond. | Xidomeja | Roots | General ailments, diarrhoea (Luseba and Van der Merwe, 2006; McGaw <i>et al.</i> , 2008) | Antimicrobial and Antifungal (Dekker <i>et al.</i> , 1987) | Jaherin (Dekker <i>et al.</i> , 1987) |
| <i>Ricinus communis</i> L. | Mupfure (T) | leaves | Wound and sores, asthma arthritis, flu, fever, tuberculosis, toothache, diarrhoea, antihelminthic (Bessong <i>et al.</i> , 2005; Grierson and Afolayan, 1999) | - | - |
| <i>Spirostachys africana</i> Sond | Morekhure (S) | Wood | Stomach ulcers, acute gastritis, headache, rashes, boil, emetic, purgative, diarrhoea, dysentery (Verschaeve and Van Staden, 2008) | Antibacterial and cytotoxicity (Mathabe <i>et al.</i> , 2008) | - |
| Fabaceae | | | | | |
| <i>Acacia burkei</i> Benth | umkhaya | | Diarrhoea (de Wet <i>et al.</i> , 2010) | - | - |
| <i>Acacia karoo</i> Hayne | uMnga (X), Umunga (Z) | Bark, leaves | Diarrhoea, intestinal parasites in goats, sheep, poultry and pig (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) fractures and diarrhoea (Van der Merwe <i>et al.</i> , 2001) | Anti-inflammatory (Adedapo <i>et al.</i> , 2008); Acute toxicity (Adedapo <i>et al.</i> , 2008) | - |
| <i>Acacia mearnsii</i> De Wild Blackwood | Ublekwana (X) Udywabasi (X, Z) Indywabasi | Bark | Infusion for diarrhoea and dysentery (Bisi-Johnson <i>et al.</i> , 2010) | Protective against acrolein-induced oxidative damage (Huang <i>et al.</i> , 2010) | Robinetinidol-(4 β →8)-epigallocatechin 3-O-gallate (Huang <i>et al.</i> , 2010) |
| <i>Acacia robusta</i> E. Meyer | Umngamanzi (Z) | leaves | Diarrhoea (Mlambo, 2008) | Antifungal (Hamza <i>et al.</i> , 2006) | |
| <i>Acacia sieberiana</i> DC. var <i>woodii</i> (Burt Davy) Keay & Brenan | Musaunga, Muunga-luselo (V) | Bark | Enemas, antiseptic, fever, stomach ache, tapeworm, astringent, haemostatic, diarrhoea (Verschaeve and Van Staden, 2008) | Mutagenicity, antimutagenicity; antibacterial, antiinflammatory, anticholinesterase and mutagenic effects (Eldeen <i>et al.</i> , 2005) | - |
| <i>Acacia tortilis</i> (Forssk.) Hayne | Muunga-khanga, Muswu (V) | | Diarrhoea (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | | - |
| <i>Bauhinia bowkeri</i> Harv | uMdandlovu | Leaves, bark | Induce vomiting (Ndawonde <i>et al.</i> , 2007) | - | - |
| <i>Bauhinia galpinii</i> N. E. Br | Mutswiriri (V), Umhuwa (Z) | Bark, leaves | Diarrhoea, infertility (Samie <i>et al.</i> , 2010), infertility (Arnold and Gulumian, 1984), | Antimutagenic (Reid <i>et al.</i> , 2006); antioxidant and cytotoxicity of leaf | Quercetin-3-O- β -glactopyranoside, Myricetin-3-O- β -glactopyranoside, 2"-O-rhamnosylvitexin (Aderogba <i>et al.</i> , |

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| | | | amenorrhoea (Van Wyk and Gericke, 2000) | extracts (Aderogba <i>et al.</i> , 2007); Anticampylobacterial, antiamebic and cytotoxicity of root extract (Samie <i>et al.</i> , 2009) | 2007) |
| <i>Bauhinia petersiana</i> Bolle | Mushakule (V) | root | Cold (Coates-Palgrave, 2002); infertility and dysmenorrhoea (Van Wyk and Gericke, 2000) | - | - |
| <i>Bauhinia variegata</i> Linn | | Leaves, bark | Diabetes, goiter, dysentery, diarrhoea (Parekh and Chanda, 2007) | Anti-inflammatory (Rao <i>et al.</i> , 2008); Immunomodulator (Ghaisas <i>et al.</i> , 2009) | kaempferol, ombuin, kaempferol 7,4'-dimethyl ether 3-O- β -D-glucopyranoside, kaempferol 3-O- β -D-glucopyranoside (4), isorhamnetin 3-O- β -D-glucopyranoside, hesperidin, 3 β -trans-(3,4-dihydroxycinnamoyloxy)olean-12-en-28-oic acid (Rao <i>et al.</i> , 2008) |
| <i>Dichrostachys cinerea</i> (L.) Wight and Am. | Murenzhe (V) | Bark | Diarrhoea and steaming to get ride of acne (Mlambo, 2008) | spasmodic in guinea-pig isolated trachea (Aworet-Samseny <i>et al.</i> , 2011) | dichrostachines A-R (Long <i>et al.</i> , 2009) |
| <i>Elephantorrhiza burkei</i> Benth. | Umdabu (Z), Tshisese-thavha, Tshisesevhufa (V) | root | abdominal pains, diarrhoea, coughs, bacterial infections (Iwalewa <i>et al.</i> , 2007) | Antimicrobial (Mathabe <i>et al.</i> , 2006) | Triterpenoids, α -amyrin, β -sitosterol, alkaloids and saponin |
| <i>Elephantorrhiza evoluta</i> (Burch.) Skeels | iNtolwane (X, Z) | Roots, aerial part and bulb | Diarrhoea and dysentery in cattle, horse and humans (Watt and Breyer-Brandwijk, 1962; McGaw <i>et al.</i> , 2008) | - | - |
| <i>Elephantorrhiza elephantina</i> (Burch.) Skeels | Leshitsana | Stem rhizome | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | Antimicrobial (Mathabe <i>et al.</i> , 2006), antiparasitic (Naidoo <i>et al.</i> , 2006), antibabesia (Naidoo <i>et al.</i> , 2005) | |
| <i>Eriosema psoraleoides</i> (Lam.) G. Don | | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | Antimicrobial (Khan <i>et al.</i> , 2000) | |
| <i>Erythrina latissima</i> E. Mey | Muvhale (V) | | Sores (Coates-Palgrave, 2002) | | erysotrine, erysodine, syringaresinol, vanillic acid, (+)-10,11-dioxoerysotrine, 2-(5'-hydroxy-3'-methoxy phenyl)-6-hydroxy-5-methoxybenzofuran, 7,3'-dihydroxy-4'-methoxy-5'-(γ,γ -dimethylallyl)isoflavone (erylatissin A) (Wanjala <i>et al.</i> , 2002), 7,3'-dihydroxy-6",6"-dimethyl-4",5"-dehydroprano [2",3": 4',5']isoflavone (erylatissin B), (-)-7,3'-dihydroxy-4'-methoxy-5'-(γ,γ -dimethylallyl)flavanone (erylatissin C) (Chacha <i>et al.</i> , 2004) |
| <i>Indigofera daleoides</i> | | Whole plant | Decoction for diarrhoea (Mathabe <i>et al.</i> , | Antimicrobial (Mathabe <i>et al.</i> , 2006) | (6,2-O-[3-nitropropanoyl- β -D-glucopyranose]), (6,3',4'- |

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| Benth. ex Harv & Sond | | | 2006) | | trihydroxyflavan 5'-O-glucopyranoside) (Mathabe <i>et al.</i> , 2009) |
| <i>Indigofera jucunda</i> Schrire syn <i>Indigofera cylindrical sensu E. Mey</i> | | Root | Intestinal worm (Coates-Palgrave, 2002) | - | - |
| <i>Indigofera sessilifolia</i> DC. | iKhubalo | Roots | Diarrhoea in calves (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) | - | - |
| <i>Mucuna coriacea</i> Baker | Vhaulada | Roots | Fever, diarrhoea (Bessong <i>et al.</i> , 2005) | Antimicrobial (Samie <i>et al.</i> , 2009) | N.A |
| <i>Peltophorum africanum</i> Sond. | Musese (T) | Bark, root bark | Tonic, diarrhoea (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | Anti parasitic (Bizimenyera <i>et al.</i> , 2006), anti HIV (Bessong <i>et al.</i> , 2005) | Catechin, gallotannin, bergenin (Bessong <i>et al.</i> , 2005) |
| <i>Rhynchosia adenoids</i> E. & Z. | | Roots | Decoction for rheumatic pains, menstrual pains and dysentery (Shale <i>et al.</i> , 1999) | Cyclooxygenase inhibitory (Jager and Van Staden, 2005) | |
| <i>Senna italic</i> Mill. | Ximbangam bangana | Bark, roots | Diarrhoea and gallsickness diarrhoea, (Luseba and Van der Merwe, 2006; McGaw <i>et al.</i> , 2008) | - | -- |
| <i>Senna occidentalis</i> (L) Link | Ikhoshokhosho | Leaves, root | Diarrhoea (de Wet <i>et al.</i> , 2010) | | |
| <i>Schotia brachypetala</i> Sond. | Mulubi (V) | Bark | Diarrhoea (Mathabe <i>et al.</i> , 2006), root for dysentery and diarrhoea (Hutching <i>et al.</i> , 1996) | Antibacterial (McGaw <i>et al.</i> , 2002) | Linolenic acid and methyl-5,11,14,17-eicosatetraenoate (McGaw <i>et al.</i> , 2002) |
| <i>Schotia latifolia</i> Jacq. | Umgxam | bark | Decoction for diarrhoea (Appidi <i>et al.</i> , 2008) | Antibacterial (Masika <i>et al.</i> , 2004) | Epicathechin and catechin (Masika <i>et al.</i> , 2004) |
| <i>Zornia milneana</i> | Lukandulula (V) | Whole plant | Dysentery and diarrhoea (Samie <i>et al.</i> , 2005) | Anticampylobacterial and antiamebic (Samie <i>et al.</i> , 2009) | - |
| Flacourtiaceae | | | | | |
| <i>Oncoba spinosa</i> Lam | | root | Dysentery bladder problem (Verschaeve and Van Staden, 2008) | Mutagenicity, antimutagenicity, Epilepsy and convulsion (Risa <i>et al.</i> , 2004) | - |
| Gentianaceae | | | | | |
| <i>Chironia baccifera</i> L. | | | treat acne, sores and diarrhoea (Watt and Breyer-Brandwijk, 1962; van Wyk <i>et al.</i> , 1997) | Antibacterial (Thring <i>et al.</i> , 2007) | - |
| Geraniaceae | | | | | |
| <i>Geranium incanum</i> Burm. f. | Isikhwali (Z) | leaves | Diarrhoea (Amabeoku, 2009; Van Wyk <i>et al.</i> 1997) | Antidiarrhoeaic (Amabeoku, 2009); antimicrobial and cytotoxicity (Babajide | - |

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| | | | | <i>et al.</i> , 2010) | |
| <i>Monsonia emarginata</i> (L.f.) L'Hér. | | Herb and root | Diarrhoea, dysentery, cold and inflammation (<i>van Wyk, 2008</i>) | - | - |
| <i>Monsonia burkeana</i> Planch. Ex Harv. | | Herb and root | Diarrhoea, dysentery, cold and inflammation (<i>van Wyk, 2008</i>) | Antioxidant (<i>Mamphiswana et al., 2010</i>) | - |
| <i>Pelargonium antidysentericum</i> (Eckl. & Zeyh.) Kostel | | Tubers | Used as astringent, diarrhoea, dysenteric fever (<i>Brendler and van Wyk, 2008</i>) | - | - |
| <i>Pelargonium luridum</i> (Andr.) Sweet | Umsongelo (X) ishwaqa | Leaf, root | Diarrhoea, dysentery, fever and colic (<i>Brendler and van Wyk, 2008</i>) | - | - |
| <i>Pelargonium reniforme</i> Curtis | iNtolwana, uVendle | Tuberous root | Diarrhoea and dysentery (<i>van Wyk, 2008</i>) | Antibacterial, antifungal and antioxidant (<i>Adewusi and Afolayan, 2009a</i>), Acute toxicity (<i>Adewusi and Afolayan, 2009b</i>) | scopoletin, umckalin, 5,6,7-trimethoxycoumarin, 6,8-dihydroxy-5,7-dimethoxycoumarin, (+)-catechin, gallic acid (<i>Kayser and Kolodziej, 1997</i>) |
| <i>Pelargonium sidoides</i> DC. | Umsongelo (X) | | Tuberculosis, diarrhoea (<i>Brendler and van Wyk, 2008</i>) | Immunomodulatory (<i>Kayser et al., 2001</i>), antibacterial, antifungal and antitubercular (<i>Mativandelela et al., 2006</i>) | scopoletin, umckalin, 5,6,7-trimethoxycoumarin, 6,8-dihydroxy-5,7-dimethoxycoumarin, (+)-catechin, gallic acid (<i>Kayser and Kolodziej, 1997</i>) |
| <i>Pelargonium triste</i> (L.) L'Hér. | | Tuberous root | Diarrhoea and dysentery (<i>van Wyk, 2008</i>) | - | - |
| Hyacinthaceae | | | | | |
| <i>Eucomis autumnalis</i> (Mill.) Chitt. | Ubuhlungu beanti Isithithibala (X) Umathunga (Z) | Bulb | Stomach ache, diarrhoea, back pain, healing of fractures (<i>Bisi-Johnson et al., 2010</i>) | Anti-inflammatory (<i>Zschocke et al., 2000</i>) | - |
| <i>E. regia</i> (L.) L'Herit | | | Veneral diseases, lumbago, diarrhoea, respiratory conditions especially coughs, biliousness and to prevent premature childbirth (<i>Watt and Breyer-Brandwijk, 1962</i>) | COX-1 assay (<i>Taylor and van Staden, 2001</i>) | - |
| <i>Ledebouria revoluta</i> (L.f.) Jessop | iKreketsana (X) | Bulb | Bulb infusion for diarrhoea in goat, leaf decoction for gallsickness (<i>Dold and Cocks, 2001; McGaw et al., 2008</i>) | | (3R)-5,7-dihydroxy-3-(4'-methoxybenzyl)-4-chromanone, (3R)-5,7-dihydroxy-3-(4'-hydroxybenzyl)-4-chromanone, (3R)-5-hydroxy-7,8-dimethoxy-3-(4'-hydroxybenzyl)-4-chromanone, (3R)-5,7-dihydroxy-8-methoxy-3-(4'-hydroxybenzyl)-4-chromanone (<i>Moodley et al., 2006</i>) |

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| <i>Schizocarphus rigidifolius</i> | Ingcino (S) | leaves | Infusion for diarrhoea (Amusan <i>et al.</i> , 2007) | - | - |
| <i>Scilla nervosa</i> (Burch.) Jessop | Umagaqana, magaqana (X) Imbizankulu ingema (Z) | Root, bulb | All purpose herb. Diarrhoea, tuberculosis (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| Hydnoraceae | | | | | |
| <i>Hydnora africana</i> | Ubuklunga (X) Umavumbuka (Z) Umafumbuka (X) | Fruits, tuber leaves | Diarrhoea, dysentery (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| Hypoxidaceae | | | | | |
| <i>Hypoxis latifolia</i> Hook. | Inongwe llabateka (X) | Tuber | Decoction for diarrhoea (Bisi-Johnson <i>et al.</i> , 2011) | Antibacterial, antifungal (Buwa and Van Staden, 2006) | |
| <i>Hypoxis hemerocallidea</i> Fisch. & C. A. Mey | Inongwe llabateka (X) | Tuber | Decoction for diarrhoea (Ojewole <i>et al.</i> , 2009) | Antinociceptive, anti-inflammatory and antidiabetic (Ojewole, 2006), Antidiarrhoeal, acute toxicity test (Ojewole <i>et al.</i> , 2009) | |
| Iridaceae | | | | | |
| <i>Crocoshia paniculata</i> (Klatt.) Goldbl. | Undwendweni (Z) | corms | Diarrhoea in bovine (Watt and Breyer-Brandwijk, 1962; McGaw <i>et al.</i> , 2008) | - | - |
| <i>Gladiolus dalenii</i> van Geel | | corm | Dysentery, diarrhoea, stomach cramps (Fawole <i>et al.</i> , 2009a; Hutching <i>et al.</i> , 1996) | Anti-inflammatory (Fawole <i>et al.</i> , 2009a), amoebicidal (Moundipa <i>et al.</i> , 2005), Antimicrobial and mutagenicity (Fawole <i>et al.</i> , 2009b) | - |
| <i>Gladiolus sericeo-villosus</i> Hook. F | Umnunge (X), Umlunge (Z) | Corm | Decoction fro dysentery, cold, tuberculosis diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| <i>Watsonia densiflora</i> Bak. | | Corm | Diarrhoea in calves (Watt and Breyer-Brandwijk, 1962; McGaw <i>et al.</i> , 2008) | Antibacterial, antifungal, acetylcholinesterase inhibition, mutagenicity, COX 1and 2 (Ndhalala <i>et al.</i> , 2010) | |
| <i>Watsonia tabularis</i> Bak | | corm | Diarrhoea in human and calves (Fawole <i>et al.</i> , 2009a; Hutching <i>et al.</i> , 1996) | Antimicrobial and mutagenicity (Fawole <i>et al.</i> , 2009b) | |
| Lamiaceae | | | | | |
| <i>Ballota africana</i> (L.) Berth. | | herb | Stomach disorders, colds, liver complains (Thring and Weitz, 2006) | | |
| <i>Cissus quadrangularis</i> | Isinwasi (Z), Nyangala (T) | Root, stem | Bums, wounds, gastrointestinal complaints, backache, body- and febrile pain, malaria (Lin <i>et al.</i> , 1999; Hutchings <i>et al.</i> , 1996) | Antibacterial, anti-inflammatory and mutagenicity (Luseba, <i>et al.</i> , 2007) | |

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| (Linn) | | | | | |
| <i>Leonotis leonurus</i> (L.) R.Br | Imunyamunya (Z) | leaves and stem bark | feverish headache, dysentery, coughs and colds, and haemorrhoids (lwalewa et al., 2007) | Anticonvulsant (Bienvenu et al., 2002), antinociceptive, anti-inflammatory and hypoglycaemic activities (Ojewole, 2005) | 1,2,3-trihydroxy-3,7,11,15-tetramethylhexadecan-1-yl-palmitate, succinic acid, uracil, luteolin 7-O-glucoside, acteoside, geniposidic acid (Agnihotri et al., 2009) |
| <i>Leucas capensis</i> (Benth.) Engl. | uPhiphiyo | leaves | Decoction with <i>Aloe forex</i> and <i>Brachylaena ilicifolia</i> for diarrhoea in lambs (Dold and Cocks, 2001) | - | - |
| <i>Mentha longifera</i> (L.) L. | | Leaf | Anti-diarrhoea (Naseri et al., 2008) | Spasmolyte (Naseri et al., 2008) | - |
| <i>Rothea myricoides</i> (Hochst.) Steane & Mabb. | | Root bark | Fever and diarrhoea in cattle (Verschaeve and Van Staden, 2008) | Mutagenicity and antimutagenicity (Verschaeve and Van Staden, 2008) | - |
| <i>Salvia africana-caerulea</i> L. | | Leaf | Coughs, colds, women ailments; diarrhoea (van Wyk, 2008) | Antimicrobial, antioxidant, anti-inflammatory, antiplasmodial, cytotoxicity and antituberculosis (Kamatou et al., 2006) | - |
| <i>Salvia repens</i> Burch. Ex. Benth | | Roots, leaves, whole plant | Sores on the body, stomach problems, diarrhoea (Kamatou et al., 2008) | Antimicrobial, antioxidant, anti-inflammatory, antiplasmodial, cytotoxicity and antituberculosis (Kamatou et al., 2006) | - |
| <i>Tetradenia riparia</i> (Hochst.) Codd | Iboza (Z) | leaves | Cough, sore throats, malaria, dengue, dropsy, fever, diarrhoea, haemoptysis, boils, mumps, induce drowsiness (Verschaeve and Van Staden, 2008) | Mutagenicity , antimutagenicity (Verschaeve and Van Staden, 2008); Antibacterial, antifungal, acetylcholinesterase inhibition, mutagenicity, COX 1 and 2 (Ndhalala et al., 2010) | - |
| <i>Teucrium riparium</i> Hochst | umnunu | Root | Infusion for diarrhoea (Amusan et al., 2007) | - | - |
| Lauraceae | | | | | |
| <i>Ocotea bullata</i> (Burch.) Baill. | | Bark | Headache, infantile diarrhoea, stomach problems, emetic for emotional and nervous disorder (Verschaeve and Van Staden, 2008) | Mutagenicity , antimutagenicity (Verschaeve and Van Staden, 2008), anti-inflammatory (Zschocke et al., 2000) | Ocobullenone, iso-ocobullenone, sibyllenone (Zschocke et al., 2000) |
| Loganiaceae | | | | | |
| <i>Strychnos henningsii</i> Gilg. | uMnonono, Umqalothi (Z) | Bark infusion | Heartwater and diarrhoea in cattle (Dold and Cocks, 2001 ; McGaw et al., 2008) | - | - |
| Loganiaceae | | | | | |

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|---|------------------------------|------------|--|--|---|
| <i>Sida alba</i> Forrsk | | Leaves | Diarrhoea and dysentery (Samie et al., 2005) | Antibacterial (Samie et al., 2005) | - |
| <i>Malva parviflora</i> L. | Ujongilanga | leaves | Decoction for diarrhoea (Appidi et al., 2008) | Antibacterial and anti-inflammatory (Shale et al., 2005) | - |
| Melastomataceae | | | | | |
| <i>Dissotis princeps</i> (Kunth) Triana | | Leaves | Infusion for diarrhoea and dysentery (Fawole et al., 2009a; Hutching et al., 1996) | Anti-inflammatory (Fawole et al., 2009a), Antimicrobial and mutagenicity (Fawole et al., 2009b) | - |
| Meliaceae | | | | | |
| <i>Ekebergia capensis</i> Sparrm | | Root, bark | Stomach and intestinal complaints, dysentery, heart burn, purgative, kidney problem, indigestion (Verschaeve and Van Staden, 2008) | Mutagenicity, antimutagenicity (Verschaeve and Van Staden, 2008), antiplasmodial (Murata et al., 2008) | Ekersenin, 4,6-dimethoxy-5-methylcoumarin, oleanolic acid, 3-epioleanolic acid, oleanolic acid (15), 3,11-dioxolean-12-en-28-oic acid, melliferone, 3-oxo-11,13(18)-oleandien-28-oic acid, ekeberin A, (Z)-volkendousin, ekeberin B, 7-deacetoxy-7-oxogedunin, 7-acetylneotrichilenone, proceranolide, mexicanolide, swietenolide, methylangolensate, ekeberins C1, C2, and C3, 2,3,22,23-tetrahydroxy-2,6,10,15,19,23-hexamethyl-6,10,14,18-tetracosatetraene (3R,22R), 2-hydroxymethyl-2,3,22,23-tetrahydroxy-2,6,10,15,19,23-hexamethyl-6,10,14,18-tetracosatetraene (2R,3R,22R), ekeberins D1, D2, D3, D4, and D5 (Murata et al., 2008) |
| <i>Melia azedarach</i> L. | Umsilinga (Z) | Leaves | Diarrhoea (de Wet et al., 2010) | | |
| <i>Trichilia dregeana</i> Sond. | Umkhuhlu (Z) | Leaves | | antibacterial, antiinflammatory, anti-cholinesterase and mutagenic effects (Eldeen et al., 2005) | cycloart-23-ene-3,25-diol (Eldeen et al., 2007) |
| <i>Trichilia emetica</i> Vahl. | Umkhuhlu (Z) | Leaves | Diarrhoea (de Wet et al., 2010) | Antimicrobial, antioxidant, anti-inflammatory, antimalarial, cytotoxicity (Komane et al., 2011) | sendanin, trichilin, trichilin A, trichilin B, trichilin C, trichilin D, trichilin E, dregeana, nymania 1, rohituka, rohituka, rohituka, Trichilia substance Tr-A, Trichilia substance Tr-B, Trichilia substance Tr-C and seco-A-protolimonoid (Komane et al., 2011) |
| Menispermaceae | | | | | |
| <i>Albertia delagoensis</i> (N.E. Br.) Forman | Umgandanganda, ungandingandi | Root | Diarrhoea, dysentery, cough, colic, bloody stool (De Wet and van Wyk, 2008) | Antiplasmodial and cytotoxicity (De wet et al., 2007) | |
| <i>Antizoma angustifolia</i> (Burch.) Miers ex Harv | | Root | Diarrhoea, dysentery, cough, colic, bloody stool (De Wet and van Wyk, 2008) | - | - |
| <i>Cissampelos</i> | Umbombo (Z) | Root, | Purgative, tincture for dysentery (van Wyk, | - | - |

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| <i>capensis</i> (L.f.) Diels | | rhizome | 2008) | | |
| <i>Cissampelos hirta</i> Klotzch | Umanyokane, khalimelo (Z) | | Diarrhoea (de Wet <i>et al.</i> , 2010) | - | - |
| <i>Cissampelos mucronata</i> A. Rich. | | Root | Diarrhoea (Giess and Snyman, 1986; Von Koenen, 2001) | Anti-ulcer (Akah and Nwafor, 1999), sedative (Akah <i>et al.</i> , 2002), Antiplasmodial (Tshinbagu <i>et al.</i> , 2003) | Bisbenzylisoquinone alkaloid (Tshinbagu <i>et al.</i> , 2003) |
| <i>Cissampelos torulosa</i> E.Mey | Lukandulula (V) | Leaves | Diarrhoea and dysentery, sore throat (Mabogo, 1990; Samie <i>et al.</i> , 2005) | Antiamoebic (Samie <i>et al.</i> , 2009), antibacterial (Samie <i>et al.</i> , 2005) | - |
| Moraceae | | | | | |
| <i>Ficus capensis</i> Thunb. | Infusion | Fruit | Diarrhoea (Pallant and Steenkamp, 2008) | intestinal motility modulation (Ayinde and Owolabi, 2009) | - |
| <i>Ficus craterostoma</i> Mildbr. & Burret | Muumo (V), inTendekwane, umThombe(X) | | Stomach-ache (Bhats and Jacobs , 1995) | - | - |
| <i>Ficus glumosa</i> Delile | | Bark | Decoction for diarrhoea (Venter and Venter , 2002) | - | - |
| <i>Ficus sur</i> Forssk | Umkhiwane (Z) | Leaves | Diarrhoea (Mlambo, 2008) | Spasmolytic and gastrointestinal protection (Kunle <i>et al.</i> , 1999) | - |
| Myrtaceae | | | | | |
| <i>Psidium guajava</i> L. | Ugwava (X, Z) | Leaves | Infusion for bloody diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | Antidiarrhoeal Tona <i>et al.</i> , 1999; Lutterodt, 1992); antispasmodic (Conde <i>et al.</i> , 2003), antirotavirus (Goncalves <i>et al.</i> , 2005), antimicrobial intestinal adhesion (Coutino <i>et al.</i> , 2001) | Limonene, copaene, Asiatic acid, β -carotene, morin-3-O- α -L-arabinopyranoside, avicularin, gaujaverin, quercitin ellargic acid (Gutierrez <i>et al.</i> , 2008) |
| <i>Syzygium cordatum</i> Hochst. Ex. C. Krauss | Umdoni, Mutu (V) | Leaves, bark | Respiratory disorders, tuberculosis, stomach complaints, emetics, diarrhoea, cold, fever (Verschaeve and Van Staden, 2008) | Mutagenicity , antimutagenicity (Verschaeve and Van Staden, 2008); antimycobacterium (Mativandela <i>et al.</i> , 2008); Antiescherichia (Sibandze <i>et al.</i> , 2010) | - |
| <i>Syzygium paniculatum</i> Gaertner | - | - | - | -- | - |
| Oleaceae | | | | | |
| <i>Ximenia caffra</i> Sond | Mutswili (V) | leaves | Diarrhoea and dysentery (Green <i>et al.</i> , 2010; Fabry <i>et al.</i> , 1996) | Antigardial (John <i>et al.</i> , 1995), Antiamoebic (Samie <i>et al.</i> , 2009), antifungal (Samie <i>et al.</i> , 2010) | |

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| <i>Punica granatum</i> L. | iRhamathi (X) | Fruit rind, roots | Diarrhoea and dysentery (van Wyk, 2008; Dold and Cocks, 2000) | Antidiarrhoeal (Pillai, 1992; Qnais <i>et al.</i> , 2007), Anti-inflammatory (Lansky and Newman, 2007) | Ellagitannins, anthocyanins, flavone glucosides, flavones, flavonol, flavonol glucosides, hydroxycinnamic acid, hydroxybenzoic acid, flavan-3-ols, alkaloids, sterol, triterpenoids (Lansky and Newman, 2007) |
| Oleaceae | | | | | |
| <i>Olea europaea</i> L. Subsp africana (Mill.) P.S.Green | Uzintlwa (X), uMnquma (X) | | Anti-hypertensive, diuretic, tonic, diarrhoea, sore throat (Amabeoku and Bamuamba, 2010) | Antidiarrhoeal (Amabeoku and Bamuamba, 2010) | - |
| Orchidaceae | | | | | |
| <i>Polystachya ottoniana</i> Rchb.f. | | | Diarrhoea (Chinsamy <i>et al.</i> , 2010) | - | - |
| Pedaliaceae | | | | | |
| <i>Ceratotheca triloba</i> (Bernh.) Hook | Udonqabathwa (Z) | Leaf | Infusion for diarrhoea and gastrointestinal cramps (Watt and Breyer-Brandwijk, 1962; Roberts, 1990) | 5-lipoxygenase inhibitory and antioxidant (Akula and Odhav, 2008), α -amylase inhibitory (Odhav <i>et al.</i> , 2010). | - |
| Plantaginaceae | | | | | |
| <i>Plantago major</i> L. | | Seed, root | Diarrhoea (van Wyk, 2008) | Antidiarrhoeal (Atta and Mounair, 2005), Hepatoprotective and anti-inflammatory (Turel <i>et al.</i> , 2007), wound healing activity, anti-inflammatory, analgesic, antioxidant, weak antibiotic, immuno modulating and antiulcerogenic activity (Samuelsen, 2000) | Indicain, plantagonin, baicalein, hispidulin, plantagin, aucubin, fumaric acid, syringic acid, vanillic acid, <i>p</i> -hydroxy benzoic acid, ferulic acid, <i>p</i> -coumaric acid, gentisic acid, salicylic acid, benzoic acid, cinnamic acid oleanolic acid, ursolic acid, 18 β -glycyrrhetic acid and sitosterol (Samuelsen, 2000) |
| <i>Plantago lanceolata</i> L. | | Seed | Diarrhoea (van Wyk, 2008) | - | - |
| Plumbaginaceae | | | | | |
| <i>Plumbago auriculata</i> | uTshintshini | Roots | Diarrhoea in cow (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) | Antibacterial and anti cancer (Bisi-Johnson <i>et al.</i> , 2011) | - |
| Polygonaceae | | | | | |
| <i>Rumex lanceolatus</i> Thunb | Idololenkonyane (Z), Idolonyana (X) | Roots | Infantile diarrhoea, tapeworm, wound and sores (Dold and Cocks, 2000) | - | - |
| <i>Rumex obtusifolius</i> | Idololenkonyane (X, Z) | leaves | Diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| Portulacaceae | | | | | |
| <i>Portulacaria afra</i> Jacq. | Umdibili (Z) | Leaves | Diarrhoea (Mlambo, 2008) | - | - |

| Proteaceae | | | | | |
|--|---------------------------------|---------------------|--|---|--|
| <i>Protea caffra</i> Meisn. | Tshidzungu (V) | Root bark decoction | Calves with bloody diarrhoea (Hutching <i>et al.</i> , 1996) | - | - |
| <i>Protea nitida</i> Mill. | | Bark | Astringent for diarrhoea (van Wyk, 2008) | - | - |
| <i>Protea simplex</i> | | Root, bark | Decoction and infusion for diarrhoea, dysentery, stomach pain in human (Fawole <i>et al.</i> , 2009a; Hutching <i>et al.</i> , 1996) | Anti-inflammatory (Fawole <i>et al.</i> , 2009a), Antimicrobial and mutagenicity (Fawole <i>et al.</i> , 2009b) | - |
| <i>Protea welwitschii</i> Engl. | | | Dysentery, diarrhoea in calves and humans (Watt and Breyer-Brandwijk, 1962; McGaw <i>et al.</i> , 2008) | - | - |
| Punicaceae | | | | | |
| <i>Punica granatum</i> L. | Mokgranata | Root | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | - | - |
| Rhamnaceae | | | | | |
| <i>Ziziphus mucronata</i> Willd. | Mukhalu, Mutshetshete (V) | Leaves, bark, roots | Boils, sores, grandular swelling, diarrhoea, dysentery, cough (Verschaeve and Van Staden, 2008; Green <i>et al.</i> , 2010) | Anti-inflammatory (Fawole <i>et al.</i> , 2009a), Antimicrobial and mutagenicity (Fawole <i>et al.</i> , 2009b) | - |
| <i>Ziziphus zeyheriana</i> Sond. | | Root-stock | Diarrhoea, internal parasites, general ailments (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | - | - |
| Rosaceae | | | | | |
| <i>Prunus africana</i> (Hook.f) Kalkman Red Stinkwood | Umkhakhazi (X), Umkakase (X) | Root | Diarrhoea, abdominal ailments (Bisi-Johnson <i>et al.</i> , 2010) | | |
| <i>Prunus persica</i> (L.) Batsch. | Ipesika | Leaf decoctions | Diarrhoea in lamb and kid goats (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) | | |
| Rubiaceae | | | | | |
| <i>Breonadia salicina</i> (Vahl) Hepper & J. R. I. Wood | | Bark decoctions | Diarrhoea, bloody stool, colic (Neuwinger, 1996; Venter and Venter, 2002) | Antiescherichial (Sibandze <i>et al.</i> , 2010) | |
| <i>Nauclea latifolia</i> Smith | | Root | Dysentery, dyspepsia, fever, gastritis, gonorrhoea, malaria, leprosy, measles, piles, toothache (Reid <i>et al.</i> , 2006) | Antiamoebic (Tona <i>et al.</i> , 1998; Moundipa <i>et al.</i> , 2005); antidiarrhoeal (Owolabi <i>et al.</i> , 2010) | |
| <i>Pentanisia prunelloides</i> (Klotzsch ex Eckl. & Zeyh) Walp | Icishamilo, Icimamilo (X, Z) | Root, leaves, bulb | Vomiting, diarrhoea in children (Bisi-Johnson <i>et al.</i> , 2010) | Antibacterial (Yff <i>et al.</i> , 2002) | Palmitic acid (Yff <i>et al.</i> , 2002) |

| | | | | | |
|--|------------------------------------|--------------------|--|--|---|
| <i>Psychotria capensis</i> (Eckl.) Vatke | Ishithitibala (Z), UmGono-gono (X) | Fruits | Diarrhoea and vomiting (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| <i>Rubia petiolaris</i> DC. | | Root | Diarrhoea and dysentery (van Wyk, 2008) | - | - |
| <i>Rubus pinnatus</i> Willd. | iQunube | Roots | Diarrhoea, haemorrhoids, epilepsy (van Wyk, 2008) | - | - |
| <i>Rubus rigidus</i> | | Root | Diarrhoea and dysentery, toothache, coughs and colds (Iwalewa <i>et al.</i> , 2007). | - | - |
| <i>Vangueria infausta</i> Burch. subsp. infausta | Umviyo | | Diarrhoea (de Wet <i>et al.</i> , 2010) | Antibacterial and antifungal (de Boer <i>et al.</i> , 2005) | - |
| Rutaceae | | | | | |
| <i>Agathosma betulina</i> (Bergius) Pillans | | | Antispasmodic, antipyretic, cough, Kidney and urinary tract infection, cholera and stomach ailment (Molla and Viljoen, 2008) | Antidiarrhoea and antibacterial (Lis-Balchin <i>et al.</i> , 2001); anti-inflammatory and antioxidant (Steenkamp <i>et al.</i> , 2006) | - |
| <i>Agathosma crenulata</i> (L.) Pillans | | | Antispasmodic, antipyretic, cough, Kidney and urinary tract infection, cholera and stomach ailment (Molla and Viljoen, 2008) | Antidiarrhoea and antibacterial (Lis-Balchin <i>et al.</i> , 2001) | - |
| Rutaceae | | | | | |
| <i>Clausena anisata</i> (Willd.) Hook.F. Ex Benth. | | Bark infusion | Dysentery in cattle (Hutching <i>et al.</i> , 1996) | - | - |
| <i>Ruta graveolens</i> L. | iVendrit (X) | Leaves | Fever, convulsion, epilepsy, diarrhoea, cardiac asthma, jaundice (Dold and Cocks, 2000) | - | - |
| Sapindaceae | | | | | |
| <i>Hippobromus pauciflorus</i> (L.f.) Radlk. | Ulwathile, iLathile (X) | Bark, root, leaves | Heartwater and diarrhoea in cattle (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008), Diarrhoea and dysentery (Bisi-Johnson <i>et al.</i> , 2010) | Acute toxicity (Pendota <i>et al.</i> , 2010), anti-inflammatory, analgesic antipyretic (Pendota <i>et al.</i> , 2009) | - |
| Scrophulariaceae | | | | | |
| <i>Physalis peruviana</i> L. | Igquzu (X) | Leaves | Stomach disorder (Bisi-Johnson <i>et al.</i> , 2010) | - | - |
| <i>Physalis viscosa</i> L. | Umqumqumu (Z) | Leaves | Diarrhoea (Mlambo, 2008) | Antibacterial (Ovenden <i>et al.</i> , 2004) | Physaloside A (Ovenden <i>et al.</i> , 2004) |
| <i>Jamesbrittenia atropurpurea</i> (Benth.) Hilliard | | Herb | Antispasmodic, stimulant; convulsions; cough; bronchitis (van Wyk, 2008) | - | - |
| <i>Xanthium</i> | | Root | Cancer, dysentery, catarrh, leprosy (Watt) | Anti-inflammatory and analgesic (Han | 1-O-caffeoylquinic acid, 3-O-caffeoylquinic acid, |

| | | | | | |
|---|-----------------------------|---------------------|--|--|--|
| <i>strumarium</i> L. | | | and Breyer-Brandwijk, 1996; Fouche <i>et al.</i> , 2008) | <i>et al.</i> , 2007) | chlorogenic acid, 4-O-caffeoylquinic acid, cynarin, 1,4-O-dicaffeoylquinic acid, 1,5-O-dicaffeoylquinic acid, 1,5-O-dicaffeoylquinic acid, 1,3,5-O-tricaffeoylquinic acid, 3,4,5-O-tricaffeoylquinic acid (Han <i>et al.</i> , 2007) |
| Solanaceae | | | | | |
| <i>Solanum aculeastrum</i> Dun | umthuma (X, Z) | Fruit, root, leaves | Fruit decoction for haemorrhoids, dysentery, fruit as enema for diarrhoea (Bisi-Johnson <i>et al.</i> , 2010) | Antimicrobial (Koduru <i>et al.</i> , 2006); Anticancer (Koduru <i>et al.</i> , 2007) | tomatidine and solasodine (Koduru <i>et al.</i> , 2007) |
| <i>Solanum incanum</i> L. | uMthuma, <i>intfuma</i> (S) | Root | Root infusion for back ache (Amusan, 2007) | - | - |
| <i>Solanum mauritianum</i> | Umtotovane (Z) | Leaf | Infusion for dysentery and diarrhoea (Watt and Breyer-Brandwijk, 1962) | - | - |
| <i>Solanum panduriforme</i> E. Mey | Thuthula | Fruit sap | Diarrhoea (Van der Merwe <i>et al.</i> , 2001; McGaw <i>et al.</i> , 2008) | - | - |
| <i>Solanum supinum</i> Dun. | Thola (S) | Root | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | - | - |
| Sterculiaceae | | | | | |
| <i>Withania somnifera</i> (L.) Dun | uBuvimba | | Fever, cold and flu, abdominal discomfort, diarrhoea, worms sedative and hypnotic (van Wyk and Gericke, 2000; Fouche <i>et al.</i> , 2008) | Anti-inflammatory, antitumor, immunomodulatory (Mishra <i>et al.</i> , 2000); antichorelae (Acharya <i>et al.</i> , 2009) | Isopelletierine, anferine, withanolides, withaferins, sitoindosides (Mishra <i>et al.</i> , 2000) |
| <i>Dombeya rotundifolia</i> (Hochst.) Planch. | Tshiluvhari (V) | Root, bark, wood | Internal ulcers, haemorrhoids, diarrhoea, stomach problems, nausea, chest pain (Verschaeve and Van Staden, 2008) | Mutagenicity, antimutagenicity | - |
| <i>Hermannia incana</i> Cav | Mavulakuvaliwe | leaves | Crushed with cold water and taken orally for diarrhoea (Appidi <i>et al.</i> , 2008) | Toxicological assay (Appidi <i>et al.</i> , 2009); antimicrobial, anti-inflammatory, antioxidant and cytotoxicity (Essop <i>et al.</i> , 2008) | - |
| <i>Waltheria indica</i> L. | | Whole plant | Decoction for diarrhoea (Mathabe <i>et al.</i> , 2006) | Antibacterial, antifungal and antiviral (Maregesi <i>et al.</i> , 2008) | - |
| Strychnaceae | | | | | |
| <i>Strychnos madagascariensis</i> Pior. | Umkwakwa, Mukwakwa (V) | | Diarrhoea (de Wet <i>et al.</i> , 2010) | - | - |
| Urticaceae | | | | | |
| <i>Pouzolzia mixta</i> solms | Muthanzwa | Root, leaves | Dysentery (Verschaeve and Van Staden, 2008); diarrhoea (Samie <i>et al.</i> , 2010) | - | - |

| Verbenaceae | | | | | |
|---|---|-----------------|--|--|----|
| <i>Clerodendrum glabrum</i> E. Mey | Umqangazani Uqangazana (X), iNunkisiqaqa (X) Umqangazane | leaves | Bloody stool, chest infections (Bisi-Johnson <i>et al.</i> , 2010) | - | -- |
| Viscaceae | | | | | |
| <i>Viscum capense</i> L. F. | Iphakama (Z) | | Diarrhoea (Forbes, 1986; Van Wyk <i>et al.</i> , 2008) | - | - |
| Vitaceae | | | | | |
| <i>Lippia javanica</i> (Burm.f.) Spreng | Musudzungwane (V) | Leaf infusion | Prophylactics against dysentery, diarrhoea and malaria (Mabogo, 1990; Fouche <i>et al.</i> , 2008) | - | - |
| <i>Rhoicissus tridentata</i> (L.F.) Wild & Drums. | Umthwazi (Z), Murumbula- mbudzana (V) | Tuber decoction | Diarrhoea in goat and sheep (Dold and Cocks, 2001; McGaw <i>et al.</i> , 2008) | Antispasmodic (Katsoulis <i>et al.</i> , 2000) | - |
| <i>Cyphostemma cirrhosum</i> (Thunb.) | Udekane (Z) | Leaves | Diarrhoea (Mlambo, 2008) | - | - |
| Zingiberaceae | | | | | |
| <i>Aframomum latifolium</i> (Afzel.) K. Schum | | Leaves | Decoction for diarrhoea (De Villiers <i>et al.</i> , 2010) | - | - |
| <i>Elytropappus rhinocerotis</i> (L.f) Less. | | Twigs | Bitter for dyspepsia, indigestion, diarrhoea (van Wyk, 2008) | - | - |

V=Vhavenda, Z=Zulu, X=Xhosa, S=Swazi

Appendix 9.1: 1D and 2D NMR spectra data of Ursolic acid

| Peak number | Hydrogen | ¹³ C/DEPT | HSQC | HMBC | LITERATURE |
|-------------|------------|----------------------|------|--|------------|
| 1 | 1.46-1.6 | CH ₂ | 37 | 15(C25), 27(C2), 56(C5), 78(C3) | 39.2 |
| 2 | 1.38-1.5 | CH ₂ | 27 | 37(C1), 56(C5), 78(C3) | 28.1 |
| 3 | 3.0 | CH | 78 | 16(C23), 27(C2) | 78.2 |
| 4 | - | C | 39 | - | 39.6 |
| 5 | 0.64 | CH | 56 | 16(C23), 18 (C6), 37(C1) | 55.9 |
| 6 | 1.26, 1.44 | CH ₂ | 18 | 56(C5) | 18.8 |
| 7 | 1.24, 1.4 | CH ₂ | 33 | 56(C5) | 33.7 |
| 8 | - | C | 39 | - | 40.1 |
| 9 | 1.42 | CH | 48 | 15(C25), 23(C11), 37 (C1), 38.8(C10), 39(C8) | 48.1 |
| 10 | - | C | 37 | - | 37.5 |
| 11 | 1.76-1.88 | CH ₂ | 23 | 39 (C8), 125(C12), 140(C13) | 23.7 |
| 12 | 5.2 | CH | 125 | 42(C14), 48(C9), 53(C18) | 125.7 |
| 13 | - | C | 140 | - | 139.3 |
| 14 | - | C | 42 | - | 42.6 |
| 15 | 0.95, 1.4 | CH ₂ | 28 | 24(C16), 48(C17) | 28.8 |
| 16 | 1.5, 1.9 | CH ₂ | 24 | 28 (C15), 42(C14), 48(C17), 53(C18), 178(C28) | 25.0 |
| 17 | - | C | 48 | - | 48.1 |
| 18 | 2.08 | CH | 53 | 17.5(29), 24(16), 38.8(19), 42(14), 37(C20), 125(12), 140(13), 178(28) | 53.6 |
| 19 | 0.9 | CH | 38.6 | 39(C19), 37(C20) | 39.5 |
| 20 | 1.29 | CH | 37 | | 39.4 |
| 21 | 1.48-1.58 | CH ₂ | 30 | | 31.0 |
| 22 | 0.87, 1.48 | CH ₂ | 38.9 | 24(C16), 53(C18) | 37.4 |
| 23 | 0.64 | CH ₃ | 16 | 29(C24), 39(C4), 56(C5), 78(C3) | 16.5 |
| 24 | 0.87 | CH ₃ | 29 | 16(C23), 78(C3) | 28.8 |
| 25 | 0.85 | CH ₃ | 15 | 37(C1), 56(C5) | 15.7 |
| 26 | 0.72 | CH ₃ | 17.3 | 33(C7), 39(C8), 42(C14), 48(C9) | 17.5 |
| 27 | 1.02 | CH ₃ | 23.4 | 28(C15), 39(C8), 42(C14), 140(C13) | 24.0 |
| 28 | - | C | 178 | - | 179.7 |
| 29 | 0.78 | CH ₃ | 17.5 | 38.8(C19), 53(C18) | 17.5 |
| 30 | 0.90 | CH ₃ | 22 | 31(C21), 48(C20) | 21.4 |

Appendix 9.2: 1D and 2D NMR spectra data of mixture of corosolic acid and maslinic acid

| Peak number | ¹ H | ¹³ C/DEPT | HSQC (Corosolic acid) | HSQC (Maslinic acid) | HMBC (H→C) | LITERATURE |
|-------------|----------------------|----------------------|-----------------------|--------------------------|---|------------|
| 1 | 1.7-1.8, 0.73-0.79 | CH ₂ | 47.75 | 47.75 | 16.92(C25), 38.27(C10), 55.35(C5), 68(C2), 83.49(C3) | 46.8 |
| 2 | 3.4 | CH | 68.41 | 68.41 | 83.49(C3) | 68.9 |
| 3 | 2.7 | CH | 83.49 | 83.49 | 68.41(C2), 29.87(C24) | 83.8 |
| 4 | - | C | 39.61 | 39.61 | - | 39.1 |
| 5 | 0.68-0.75 | CH | 55.35 | 55.35 | 39.61(C4), 38.25(C10), 29.43(C24) | 55.4 |
| 6 | 1.41-1.47, 1.26-1.33 | CH ₂ | 18.71 | 18.71 | 38.12(C10), 39.61(C4) | 18.4 |
| 7 | 1.36-1.45, 1.56-1.61 | CH ₂ | 33.00 | 33 | 17.49(C26), 55.35(C5), 18.71(C6) | 32.9 |
| 8 | - | C | 39.75 | 39.75 | - | 39.6 |
| 9 | 1.5 | CH | 47.53 | 47.53 | 23.74 (C11) (24.01) | 47.5 |
| 10 | - | C | 38.25 | 38.25 | - | 38.3 |
| 11 | 1.8-1.9, 1.43-1.47 | CH ₂ | 23.74 | 24.01 | 47.53(C9), 125.55(C12) (122.72), 139.43(C13) (145.09) | 23.4 |
| 12 | 5.11 | CH | 125.55 | 122.72 | 23.74(C11) (24.01), 42.19(C14) (41.92), 47.53(C9), 53.05(C18) (41) | 125.3 |
| 13 | - | C | 139.42 | 145.09 | - | 138.1 |
| 14 | - | C | 42.19 | 41.92 | - | 42.1 |
| 15 | 0.92-0.99, 1.75-1.79 | CH ₂ | 28.21 | 28.21 | 39.57(C8), 23.60(C27) (26.8), 42.19(C14) (41.92) | 28.0 |
| 16 | 1.26-1.33, 1.47-1.52 | CH ₂ | 24.51 | 27.94 | 178 (C28) (179.24), 28.21(C15), 53.05(C18), (41), 48.13(C17) | 24.3 |
| 17 | - | C | 48.33 | 48.33 | - | 48.1 |
| 18 | 2.09 (2.7) | CH | 53.05 | 41.00 | 17.75(C29), 24.51(C16) (27.94), 39.10(C19) (27.94), 42.19(C14) (41.92), 48.13(C17), 37(C22), 125.55(C12) (122.72), 139.42(C13) (145.09), 178 (C28) (179.24) | 52.8 |
| 19 | 0.88-0.92 | CH | 39.07 | 27.94 (CH ₂) | | 39.1 |
| 20 | 1.25-1.31 | CH | 39.02 (CH) | 46.13 (C) | | 38.9 |
| 21 | 1.48-1.58 | CH ₂ | 30.60 | 37.00 | 24, 31 | 30.7 |
| 22 | 1.58, 1.00-1.09 | CH | 37.00 | 47.53 | 178(C28) (179.24), 24.51(C16) (27.94) | 36.7 |
| 23 | 0.90 | CH ₃ | 29.20 | 29.2 | 17.76(C24), 55.35(C5), 39.61(C4) | 28.7 |
| 24 | 0.68 | CH ₃ | 17.76 | 17.76 | 29.43(C23), 39.61(C4), 55.35(C5) | 17.0 |
| 25 | 0.88 | CH ₃ | 16.94 | 16.94 | 38.25(C10), 47.53(C9) | 17.0 |
| 26 | 0.72 | CH ₃ | 17.40 | 17.40 | 47.53(C9), 42.19(C14) (41.92), 33.01(C7) | 17.0 |
| 27 | 1.00 | CH ₃ | 23.60 | 26.80 | 28.21(C15), 39.75(C8), 42.19(C14) (41.92), 139.42(C13) (145.09) | 23.7 |
| 28 | - | C | 178.00 | 179.70 | - | 177.9 |
| 29 | 0.79 | CH ₃ | 17.50 | 17.50 | 39.07(C19) (27.94), 53.05(C18) (41) | 17.0 |
| 30 | 0.88 | CH ₃ | 21.60 | 21.60 | 39.02(C20) (46.13) | 21.2 |

Appendix 9.3: 1D and 2D NMR spectra data of mixture of asiatic acid and arjunolic acid

| Peak number | ¹ H | ¹³ C/DEPT | HSQC (Asiatic acid) | HSQC (Arjunolic acid) | HMBC (H→C) | LITERATURE |
|-------------|----------------|----------------------|---------------------|-------------------------|---|------------|
| 1 | 0.69, 1.73 | CH ₂ | 48.31 | 48.31 | 18.04(C25), 68.67(C2), 76.50(C3) | 46.8 |
| 2 | 3.45 | CH | 68.67 | 68.67 | 76.50(C3) | 68.9 |
| 3 | 3.13 | CH | 76.50 | 76.50 | 68.67(C2), 14.30(C24), 65.01(C23), 43.62(5) | 83.8 |
| 4 | - | C | 43.62 | 43.62 | - | 39.1 |
| 5 | 1.14 | CH | 47.27 | 47.27 | 76.50(C3), 47.27(C4), 65.01(C23), 14.30(C24), 33.40(C7), 18.04(C25) | 55.4 |
| 6 | 1.33, 1.18 | CH ₂ | 18.03 | 18.03 | 38.12(C10), 39.61(C4) | 18.4 |
| 7 | 1.44, 1.20 | CH ₂ | 33.40 | 33.40 | 40.49(C8) | 32.9 |
| 8 | - | C | 40.49 | 40.49 | - | 39.6 |
| 9 | 1.5 | CH | 47.51 | 47.54 | 23.74(11) (24.01) | 47.5 |
| 10 | - | C | 38.40 | 38.40 | - | 38.3 |
| 11 | 1.78, 1.42 | CH ₂ | 23.00 | 24.01 | 125.19(C12) (122.72), 138.92(C13) (145.09) | 23.4 |
| 12 | 5.09 (5.12) | CH | 125.19 | 122.28 | 42.21(C14) (41.92), 47.51(C9) (47.54), 52.62(C18) (41.73) | 125.3 |
| 13 | - | C | 138.71 | 144.68 | - | 138.1 |
| 14 | - | C | 42.21 | 41.92 | - | 42.1 |
| 15 | 1.73, 1.58 | CH ₂ | 28.07 | 28.21 | 39.57(C8), 23.60(C27) (26.8), 42.19(C14) (41.92) | 28.0 |
| 16 | 1.88, 1.48 | CH ₂ | 24.31 | 27.94 | 179.13(C28) (179.24), | 24.3 |
| 17 | - | C | 47.99 | 48.33 | - | 48.1 |
| 18 | 2.05 (2.72) | CH | 52.62 | 41.73 | 18.16(C29), 24.31(C16) 39.44(C19) (27.94), 42.21(C14) (42.52), 47.99(C17) (47.01), 125.19(C12) (122.28), 138.92(C13) (144.68), 179.13(C28) (179.24) | 52.8 |
| 19 | 0.88-0.92 | CH | 39.44 | 24.31(CH ₂) | | 39.1 |
| 20 | 1.25-1.31 | CH | 38.90(CH) | 47.27(C) | | 38.9 |
| 21 | 1.38, 1.20 | CH ₂ | 31.42 | 31 | 24, 31 | 30.7 |
| 22 | 1.55, 1.39 | CH ₂ | 33 | 33 | 24.31(C16), 31.61(C21) | 36.7 |
| 23 | 3.25, 3.00 | CH ₂ | 65.01 | 65.01 | 14.91(C24), 43.62(C5), 47.27(C4), 76.50(C3) | 28.7 |
| 24 | 0.50 | CH ₃ | 14.91 | 14.91 | 65.01(C23), 47.27(C4), 43.62(C5) | 17.0 |
| 25 | 0.65 | CH ₃ | 18.04 | 18.04 | 40.49(C10), 43.62(C5), 48.31(C1) | 17.0 |
| 26 | 0.68 | CH ₃ | 17.04 | 17.04 | 47.53(C9), 42.19(C14) (41.92), 33.18(C7) | 17.0 |
| 27 | 0.99 (1.04) | CH ₃ | 23.40 | 26.80 | 28.48(C15), 40.49(C8) (39.96), 42.21(C14) (42.57), 138.92(C13) (144.68) | 23.7 |
| 28 | - | C | 179.13 | 179.24 | - | 177.9 |
| 29 | 0.77 (0.82) | CH ₃ | 18.16 | 26.0 | 39.44(C19) (27.94), 53.05(C18) (41) | 17.0 |
| 30 | 0.87 (0.82) | CH ₃ | 23.00 | 33.000 | 39.02(C20) (46.13) | 21.2 |

Appendix 9.4: 1D and 2D NMR spectra data of combretastatin B5-2'-O- glucopyranoside

| Peak number | ¹ H | ¹³ C/DEPT | HSQC ^a | HMBC (H→C) | LITERATURE DATA HSQC ^a |
|---------------------|----------------|----------------------|-------------------|------------------------|-----------------------------------|
| 1 | | C | 132.72 | | 132.43 |
| 2 | 6.5 | CH | 106.26 | C1, C3, C6, C1a | 105.96 |
| 3 | | C | 144.35 | | 144.77 |
| 4 | | C | 133.79 | | 133.44 |
| 5 | | C | 148.25 | | 147.77 |
| 6 | 6.5 | CH | 106.26 | C1, C5, C2, C1a | 105.96 |
| 1a | 2.7 | CH ₂ | 36.96 | C1, C2, C1a', C1' | 36.58 |
| 1a' | 2.9, 3.0 | CH ₂ | 31.73 | C1, C1', C2', C6', C1a | 31.35 |
| 1'' | | C | 128.55 | | 128.22 |
| 2'' | | C | 144.35 | | 143.95 |
| 3'' | | C | 139.71 | | 139.29 |
| 4'' | | c | 147.26 | | 146.90 |
| 5'' | 6.7 | CH | 109.40 | C1', C3', C4', C6' | 109.10 |
| 6'' | 6.6 | CH | 118.95 | C2', C4', C1a' | 118.68 |
| 1''' | 4.5 | CH ₂ | 106.16 | C2'', C2'', C5'' | 105.79 |
| 2''' | 3.3 | CH | 74.45 | C1'', C3'' | 74.04 |
| 3''' | 3.2 | CH | 76.62 | C4'', C5'' | 76.14 |
| 4''' | 3.2 | C | 70.15 | C3'', C5'' | 69.71 |
| 5''' | 3.2 | CH | 77.85 | C3'' | 77.44 |
| 6''' | 3.5, 3.7 | CH ₂ | 61.34 | C4'', C5'' | 60.89 |
| 3-OCH ₃ | 3.5 | CH ₃ | 56.34 | C3 | 56.00 |
| 4-OCH ₃ | - | CH ₃ | - | - | - |
| 5-OCH ₃ | 3.5 | CH ₃ | 56.34 | C5 | 56.00 |
| 4'-OCH ₃ | 3.5 | CH ₃ | 56.30 | C4' | 56.00 |

^a Pelizzoni Francesca, 1994: Combretastatin derivatives with antitumoral activity and process for the preparation thereof. Patent Cooperation Treaty (PCT), WO 94/05682, CO7H 15/203, CO7C 43/23, A61K 31/70, 31/085

Appendix 9.5: 1D and 2D NMR spectra data of combretastatin B1-2'-O- glucopyranoside

| Peak number | ¹ H | ¹³ C/DEPT | HSQC ^b | HMBC (H→C) | LITERATURE DATA HSQC ^b |
|---------------------|----------------|----------------------|-------------------|-----------------------|-----------------------------------|
| 1 | | C | 138.54 | | 138.10 |
| 2 | 6.5 | CH | 105.60 | C1, C1a, C3, C4 | 105.63 |
| 3 | | C | 152.69 | | 152.65 |
| 4 | | C | 135.53 | | 135.45 |
| 5 | | C | 152.72 | | 152.65 |
| 6 | 6.5 | CH | 105.60 | C1, C1a, C4, C5 | 105.63 |
| 1a | 2.69, 2.79 | CH ₂ | 36.92 | C1, C1', C2, C6, C1a' | 36.91 |
| 1a' | 2.92, 3.20 | CH ₂ | 31.34 | C1a, C1', C2', C6' | 31.18 |
| 1'' | | C | 128.27 | | 128.03 |
| 2'' | | C | 143.78 | | 143.93 |
| 3'' | | C | 139.13 | | 139.35 |
| 4'' | | c | 147.02 | | 146.95 |
| 5'' | 6.7 | CH | 108.54 | C1', C3', C4', | 108.99 |
| 6'' | 6.6 | CH | 119.24 | C1a', C2', C4' | 118.56 |
| 1''' | 4.5 | CH ₂ | 105.69 | | 105.77 |
| 2''' | 3.3 | CH | 74.21 | | 74.09 |
| 3''' | | CH | 76.63 | | 76.26 |
| 4''' | | C | 69.72 | | 69.76 |
| 5''' | 3.2 | CH | 77.03 | | 77.51 |
| 6''' | 3.5, 3.7 | CH ₂ | 60.97 | | 60.96 |
| 3-OCH ₃ | 3.5 | CH ₃ | 55.14 | C3 | 55.78 |
| 4-OCH ₃ | 3.5 | CH ₃ | 59.69 | C4 | 60.04 |
| 5-OCH ₃ | 3.5 | CH ₃ | 55.34 | C5 | 55.78 |
| 4'-OCH ₃ | 3.5 | CH ₃ | 55.42 | C4' | 55.94 |

^b Pelizzoni Francesca, 1994: Combretastatin derivatives with antitumoral activity and process for the preparation thereof. Patent Cooperation Treaty (PCT), WO 94/05682, CO7H 15/203, CO7C 43/23, A61K 31/70, 31/085

Appendix 9.6: 1D and 2D NMR spectra data of 3 β -ethyl sitosterol

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE |
|---------------------------------|----------------|----------------------|--------|--|------------|
| 1 | 1.036, 1.817 | CH ₂ | 37.47 | | 37.3 |
| 2 | 2.233 | CH ₂ | 31.8 | 36.73 (C10), 72.04 (C3), 121.93 (C6), 140.97 (C5) | 31.9 |
| 3 | 3.502 | CH | 72.04 | | 71.8 |
| 4 | | CH ₂ | 40.00 | | 40.5 |
| 5 | - | C | 140.97 | | 140.7 |
| 6 | 5.33 | CH | 121.93 | 32.12 (C7), 36.73 (C10) | 121.7 |
| 7 | 1.427 | CH ₂ | 32.12 | | 31.9 |
| 8 | | CH | 29.91 | | 31.6 |
| 9 | | CH | 50.35 | | 50.2 |
| 10 | - | C | 36.73 | | 36.5 |
| 11 | | CH ₂ | 21.30 | | 21.1 |
| 12 | 2.194 | CH ₂ | 40.00 | | 39.8 |
| 13 | - | C | 42.54 | | 42.3 |
| 14 | 1.058 | CH | 56.99 | | 56.8 |
| 15 | 0.988 | CH ₂ | 24.52 | | 24.3 |
| 16 | 1.234 | CH ₂ | 28.47 | | 28.3 |
| 17 | 1.058 | CH | 56.27 | | 56.1 |
| 18 | 0.988 | CH ₃ | 12.08 | 140.97 (C5), 37.47 (C1), 50.35 (C9) | 11.9 |
| 19 | 0.659 | CH ₃ | 20.03 | 56.99 (C14), 56.23 (C17), 42.52 (C12), 42.54 (C13), | 19.5 |
| 20 | 1.326 | CH | 36.36 | | 36.2 |
| 21 | 0.904 | CH ₃ | 19.24 | 56.27 (C17), 36.36 (C20), 34.16 (C22) | 18.9 |
| 22 | | CH ₂ | 34.16 | | 33.9 |
| 23 | | CH ₂ | 26.29 | | 26.1 |
| 24 | | CH | 46.05 | | 45.8 |
| 25 | | CH | 29.37 | | 29.1 |
| 26 | 0.988 | CH ₃ | 19.61 | | 19.4 |
| 27 | 0.796 | CH ₃ | 19.00 | 29.37 (C25), 46.05 (C24), 19.61 (C26) | 19.1 |
| 28 | | CH ₂ | 23.28 | | 23.1 |
| 29 | 0.822 | CH ₃ | 12.20 | 23.25 (C28) | 12.0 |
| CH ₃ CH ₂ | | CH ₃ | | | |
| CH ₃ CH ₂ | | CH ₂ | 76.86 | | |

Appendix 9.7: 1D and 2D NMR spectra data of Quercetin

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE |
|-------------|----------------|----------------------|--------|--|------------|
| 2 | | C | 147.96 | - | 146.8 |
| 3 | | C | 137.23 | - | 135.8 |
| 4 | | C | 177.31 | - | 175.9 |
| 5 | | C | 162.50 | - | 160.8 |
| 6 | 6.17 | CH | 99.28 | 162.50 (C5), 104.51 (C10), 94.39 (C8) | 98.2 |
| 7 | | C | 165.55 | - | 163.9 |
| 8 | 6.37 | CH | 94.39 | 165.55 (C7), 158.21 (C9), 104.51 (10), 99.28 (C6) | 93.4 |
| 9 | | C | 158.21 | - | 156.2 |
| 10 | | C | 104.51 | - | 1103.0 |
| 1' | | C | 124.13 | - | 122.0 |
| 2' | 7.87 | CH | 116.30 | 147.94 (C2), 144 (C3'), 121 (C6') | 115.1 |
| 3' | | C | 147.96 | - | 145.1 |
| 4' | | C | 148.75 | - | 147.7 |
| 5' | 6.88 | CH | 116.78 | 144 (C3'), 121 (C6') | 115.6 |
| 6' | 7.72 | CH | 121.65 | | 120.6 |

Appendix 9.8: 1D and 2D NMR spectra data of Myricetin

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE |
|-------------|----------------|----------------------|--------|---|------------|
| 2 | | C | 146.57 | - | 148.2 |
| 3 | | C | 135.92 | - | 137.5 |
| 4 | | C | 175.86 | - | 177.5 |
| 5 | | C | 161.05 | - | 162.6 |
| 6 | 6.17 | CH | 97.80 | 164.17 (C7), 161.05 (C5), 103.06 (C10), 99 (C6) | 99.5 |
| 7 | | C | 164.17 | - | 165.8 |
| 8 | 6.37 | CH | 92.95 | 164.17 (C7), 158 (C9), 103.06 (C10), 99 (C6) | 94.6 |
| 9 | | C | 156.76 | - | 158.4 |
| 10 | | C | 103.06 | - | 104.7 |
| 1' | | C | 121.65 | - | 123.3 |
| 2' | 7.38 | CH | 107.10 | 145.29 (C3'), 135.51 (C4'), 121.65 (C1'), 107.10 (C6') | 108.8 |
| 3' | | C | 145.29 | - | 146.9 |
| 4' | | C | 135.51 | - | 137.1 |
| 5' | | C | 145.29 | - | 146.9 |
| 6' | 7.38 | CH | 107.10 | 145.29 (C5'), 135.51 (C4'), 121.65 (C1'), 107.10 (C2') | 108.8 |

Appendix 9.9: 1D and 2D NMR spectra data of Isoetin 2' methyl ether/ Isoetin 4' methyl ether

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE | |
|------------------|----------------|----------------------|---------------------|-----------------------------|--------------------|---------------------|
| 2 | - | C | 163.09 | C3, C6' | 163.2 ^a | 161.70 ^b |
| 3 | 7.2(s) | CH | 108.85 | C6' | 108.7 | 106.77 |
| 4 | - | C | 184.24 | | 183.5 | 181.74 |
| 5 | - | C | 163.67 | | 162.7 | 161.41 |
| 6 | 6.2(d, J=) | CH | 99.97 | | 99.8 | 98.48 |
| 7 | - | C | 166.22 | | 165.3 | 163.88 |
| 8 | 6.4 (d, J=) | CH | 94.86 | C6 | 95.1 | 93.48 |
| 9 | - | C | 159.43 | | 159 | 157.19 |
| 10 | - | C | 105.09 | C3, C8 | 105.1 | 103.46 |
| 1' | - | C | 110.17 | C3' | 108.9 | 106.97 |
| 2' | - | C | 153.27 | OCH ₃ , C3', C6' | 154.2 | 150.50 |
| 3' | 6.65 (s) | CH | 101.36 | | 105.4 | 104.20 |
| 4' | - | C | 153.27 | OCH ₃ , C3', C6' | 152.8 | 151.60 |
| 5' | - | C | 140.86 | C3', C6' | 142.8 | 138.73 |
| 6' | 7.38 (s) | CH | 114.44 | | 112.6 | 113.44 |
| OCH ₃ | 3.8 (s) | | 56.34 at C2' or C4' | | 57.6 at C5' | - |

^aisoetin 5'methyl ester (AbdurRahman and Moon, 2007), ^b isoetin (Gluchoff-Fiasson *et al.*, 1991)

Appendix 9.10: 1D and 2D NMR spectra data of Quercetin-3-O- β -galactopyranoside

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE |
|-------------|--------------------|----------------------|--------|---|------------|
| 2 | - | C | 156.76 | - | 158.3 |
| 3 | - | C | 133.85 | - | 135.8 |
| 4 | - | C | 177.83 | - | 179.4 |
| 5 | - | C | 161.42 | - | 163.0 |
| 6 | | CH | 99.17 | 162.50 (C5), 104.51 (C10), 94.39 (C8) | 99.8 |
| 7 | - | C | 164.58 | - | 166.0 |
| 8 | | CH | 94.09 | 165.55 (C7), 158.21 (C9), 104.51 (10), 99.28 (C6) | 94.7 |
| 9 | - | C | 156.80 | - | 158.8 |
| 10 | - | C | 102.36 | - | 104.2 |
| 1' | - | C | 122.14 | - | 123.2 |
| 2' | | CH | 115.66 | 147.94 (C2), 144 (C3'), 121 (C6') | 117.8 |
| 3' | - | C | 144.97 | - | 145.8 |
| 4' | - | C | 148.75 | - | 149.9 |
| 5' | | CH | 116.47 | | 116.1 |
| 6' | | CH | 121.42 | | 122.9 |
| 1'' | 5.18 (d) | CH | 104.24 | 133.85(C2) | 105.4 |
| 2'' | 3.83 (t) | CH | 71.55 | 104.12 (C1''), 73.70 (C3'') | 73.2 |
| 3'' | 3.56 (m) | CH | 73.40 | 104.12 (C1''), 71.87 (C2''), | 75.1 |
| 4'' | 3.87 (s) | CH | 68.30 | 144 (C3'), 121 (C6') | 70.0 |
| 5'' | 3.94 (t) | CH | 75.96 | | 77.2 |
| 6'' | 3.66 (dd), 3.5 (m) | CH ₂ | 60.45 | 75.80 (5''), 68.61 (C4'') | 61.9 |

 Appendix 9.11: 1D and 2D NMR spectra data of Myricetin-3-O- β -galactopyranoside

| Peak number | ¹ H | ¹³ C/DEPT | HSQC | HMBC (H→C) | LITERATURE |
|-------------|--------------------|----------------------|--------|---|------------|
| 2 | | C | 156.95 | - | 156.4 |
| 3 | | C | 134.56 | - | 135.4 |
| 4 | | C | 177.97 | - | 177.6 |
| 5 | | C | 161.54 | - | 161.4 |
| 6 | 6.19 | CH | 98.47 | 164.70 (C7), 161.54 (C5), 104.12 (C10), 93.25 (C8) | 98.7 |
| 7 | | C | 164.70 | - | 164.4 |
| 8 | 6.38 | CH | 93.25 | 164.70 (C7), 157.24(C9), 104.12 (C10), 98.47 (C6) | 93.4 |
| 9 | | C | 157.24 | - | 156.4 |
| 10 | | C | 104.14 | - | 103.9 |
| 1' | | C | 120.26 | - | 120.0 |
| 2' | 7.37 | CH | 108.52 | 156.95 (C2), 144.95 (C3'), 136.71 (C4'), 120.26 (C1'), 108.52 (C6') | 108.6 |
| 3' | | C | 144.95 | - | 145.5 |
| 4' | | C | 136.71 | - | 136.8 |
| 5' | | C | 144.95 | - | 145.5 |
| 6' | 7.37 | CH | 108.52 | 156.95 (C2), 144.95 (C5'), 136.71 (C4'), 120.26 (C1'), 108.52 (2') | 108.6 |
| 1'' | 5.18 (d) | CH | 104.12 | 134.56 (C2) | 105.4 |
| 2'' | 3.83 (t) | CH | 71.87 | 104.12 (C1''), 73.70 (C3'') | 73.2 |
| 3'' | 3.56 (m) | CH | 73.70 | 104.12 (C1''), 71.87 (C2''), | 75.1 |
| 4'' | 3.87 (s) | CH | 68.61 | | 70.0 |
| 5'' | 3.94 (t) | CH | 75.80 | | 77.2 |
| 6'' | 3.66 (dd), 3.5 (m) | CH ₂ | 60.52 | 75.80 (5''), 68.61 (C4'') | 61.9 |