**Supplementary material**

**The traditional uses, phytochemistry and pharmacology of *Gastrodia* *elata Bl*.: A comprehensive review**

**Table S1** Botanical characteristics and distribution of the species of *Gastrodia*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **NO** | **Name** | **Rank** | **Distribution** | **Part of the herb used** | **Medicinal uses** | **Refs** |
| **1** | Gastrodia elata BI. | Species | China: Anhui, Fujian, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang; Bhutan; NE India; Japan; Korea; Nepal; Russia (Far East). | Rhizome | Treating dizziness, limb numbness, infantile convulsion, epilepsy, tetanus, hypertension, etc. | (Sciences, 2009) |
| **2** | Gastrodia elata BI. *f.* glauca S. Chow | Infraspecific taxon | China: Northeastern and northwestern Yunnan, western Guizhou, Sichuan, Chongqing. | Rhizome | Dizziness, numbness, convulsions sedation, sleeping, analgesic anti-inflammatory and antioxidant activity, etc. | (Sciences, 2009; Wong et al., 2016; Wu et al., 2022) |
| **3** | Gastrodia elata BI. *f*. elaata | Infraspecific taxon | China: Anhui, Fujian, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang；Korea; Japan. | Rhizome | Calming, liver, clearing collaterals, convulsions of epilepsy, dizziness and headache, numbness of limbs, etc. | (Li et al., 2016a; Sciences, 2009; Yang et al., 2005) |
| **4** | Gastrodia elata BI.f. flavida S. Chow | Infraspecific taxon | China: Yunnan (Zhaotong), Guizhou (Dafang, Qianxi, Zijin, Nayong, Hezhang）, Hubei, Henan. | Rhizome | Analgesic and anti-inflammatory effects. | (Li et al., 2016a; Sciences, 2009) |
| **5** | Gastrodia fontinalis T. P Lin. | Species | China: Taiwan, Yunnan, Sichuan, Guizhou and Hubei; Japan: Takeshima Island, Ryukyu Islands. | Rhizome | Treating dizziness, limb numbness, epilepsy, tetanus, hypertension, etc. | (Sciences, 2009) |
| **6** | *Gastrodia pubilabiata* Sawa | Species | China: Taiwan, Yunnan, Sichuan, Guizhou and Hubei; Japan | Rhizome | Treating dizziness, limb numbness, infantile convulsion, epilepsy, tetanus, hypertension, etc | (Sciences, 2009; Suetsugu et al., 2018) |
| **7** | Gastrodia elata BI. *f.* Pilifera Tuyama | Infraspecific taxon | China: Taiwan | Not mentioned | Not mentioned | (Sciences, 2009; Zhou and Chen, 1983) |
| **8** | Gastrodia elata BI. *f.* Viridis Mak | Infraspecific taxon | China: Sichuan, Yunnan, Guizhou, Tibet Autonomous Region, Chongqing, Liaoning, TaiwanJilin, and Heilongjiang； Korea; Japan | Not mentioned | Not mentioned | (Sciences, 2009; Wong et al., 2016; Yang et al., 2005) |
| **9** | Gastrodia elata BI. *f*.alba S. Chow | Infraspecific taxon | China: Mongolia Dalam, Hebei, ShanxiNorthwestern Yunnan; India; Jepang; Semenanjung Korea | Not mentioned | Not mentioned | (Li et al., 2016; Sciences, 2009) |
| **10** | Gastrodia elata var. obov ata Y. J. Zhang） | Infraspecific taxon | China: Shaanxi | Rhizome | Analgesic, brightens eyes and increases intelligence, lowers blood pressure, etc. | (Sciences, 2009; Zhang and Ji, 2010) |
| **11** | Gastrodin angusta S.Chow et S.C Chen | Species | China: Yunnan (Wenshan and Honghe), Sichuan, Shanxi | Not mentioned | Not mentioned | (Li et al., 2018; Sciences, 2009) |
| **12** | Gastrodia bawanglingensis | Species | China: Hainan | Not mentioned | Not mentioned | (Sciences, 2009; Zeng, 2023) |
| **13** | Gastrodia damingshanensis A. Q. Hu & T. C. Hsu | Species | China: Guangxi | Not mentioned | Not mentioned | (Hu et al., 2014; Sciences, 2009) |
| **14** | Gastrodia uraiensis T. C. Hsu & C. M. Kuo | Species | China: Taiwan and Guangxi | Not mentioned | Not mentioned | (Qin et al., 2020a; Sciences, 2009) |
| **15** | Gastrodia flexistyla T. C. Hsu & C. M. Kuo | Species | China: Guangxi | Not mentioned | Not mentioned | (Qin et al., 2020; Sciences, 2009) |
| **16** | Gastrodia shimizuana Tuyama | Species | China: Taiwan (New Taipei, Taipei, Keelung), Guangxi; Japan: Iriomote Island | Not mentioned | Not mentioned | (Qin et al., 2020; Sciences, 2009) |
| **17** | Gastrodia confusa Honda et Tuyama | Species | South Korea; Japan; China: Taiwan (Taichung), Yunnan | Not mentioned | Not mentioned | (Sciences, 2009; Yang et al., 2013) |
| **18** | Gastrodia elatoides W.C.Huang, G.W.Hu & Q.F.Wang | Species | India | Not mentioned | Not mentioned | (Sciences, 2009) |
| **19** | Gastrodia confusioides T. C. Hsu, S. W. Chung &amp; C. M. Kuo | Species | China: Taiwan | Not mentioned | Not mentioned | baike.baidu.com |
| **20** | Gastrodia dyeriana King & Pantl. | Species | China: Yunnan and Tibet | Not mentioned | Not mentioned |  |
| **21** | Gastrodia kaoshiungensis T. P. Lin | Species | China: Taiwan | Not mentioned | Not mentioned |  |
| **22** | Gastrodia rubinea T. P. Lin | Species | China: Taiwan | Not mentioned | Not mentioned |  |
| **23** | Gastrodia theana Aver. | Species | China: Taiwan | Not mentioned | Not mentioned |  |
| **24** | Gastrodia albida T.C.Hsu & C.M.Kuo | Species | China: Guangdong and Taiwan | Rhizome | Analgesic effect, Sedative effect, Anticonvulsant， Lowering blood pressure, Dispelling wind and relieving pain, Calming the liver and restraining wind. | (Tong, 2019) |
| **25** | Gastrodia clausa T.C. Hsu, S. W. Chung & C. M. Kuo | Species | Japan; China: Guangdong and Taiwan (New T Taipei City) | Not mentioned | Not mentioned | (Tong and Wu, 2019) |
| **26** | Gastrodia peichatieniana S. S. Ying | Species | China: Northern Taiwan, Guangdong, Hong Kong and Jiangxi | Not mentioned | Not mentioned | (Sciences, 2009; Tian et al., 2010) |
| **27** | Gastrodia wuyishanensis Da M. Li & C. D. Liu | Species | China: Fujian （Wuyi Mountain） | Not mentioned | Not mentioned | (Li and Liu, 2007; Sciences, 2009) |
| **28** | Gastrodia fujianenesis L. Ma, X. Y. Chen & S. P. Chen | Species | China: Fujian (Wuyishan) | Not mentioned | Not mentioned | (Ma et al., 2019) |
| **29** | Gastrodia albidoides Y. H. Tan & T. C. Hsu | Species | China: Southern Yunnan | Not mentioned | Not mentioned | (Tan et al., 2012) |
| **30** | Gastrodia gracilis Bl. | Species | China: Northern Taiwan, Yunnan, Sichuan, Guizhou and Hubei | Not mentioned | Not mentioned | (Chen et al., 2015; Sciences, 2009) |
| **31** | Gastrodia kachinensis X. H. Jin & L. A. Ye | Species | Myanmar: Kachin State (Putao Township) | Not mentioned | Not mentioned | (Aung and Jin, 2018) |
| **32** | Gastrodia huapingensis X. Y. Huang, A. Q. Hu & Yan Liu | Species | China: Guangxi, Hunan | Rhizome | Nervous convulsions, numbness of limbs, epilepsy. relief of angina pectoris, biliary colic effect | (Xin et al., 2015) |
| **33** | Gastrodia punctata Aver | Species | Viet Nam: Lam Dong； China: Hainan | Not mentioned | Not mentioned | (Lu et al., 2017; Sciences, 2009) |
| **34** | Gastrodia tuberculata F. Y . Liu et S. C. Chen | Species | China: Central Yunnan | Not mentioned | Not mentioned | (Liu and Chen, 1983; Sciences, 2009) |
| **35** | Gastrodia pubilabiata *f*. *viridis* | Infraspecific taxon | japen: Toyohashi City (Iwasaki Town) | Not mentioned | Not mentioned | (Suetsugu, 2022) |
| **36** | Gastrodia pubilabiata *f*. *castanea.* | Infraspecific taxon | Japen: Shikoku, Kami-shi, Tosayamada-cho and Machida | Not mentioned | Not mentioned | (Suetsugu, 2022) |
| **37** | Gastrodia pubilabiata *f. pubilabiate* | Species | Japen: Shikoku, Kami-shi, Tosayamada-cho and Machida | Not mentioned | Not mentioned | (Suetsugu, 2022) |
| **38** | Gastrodia menghaiensis Z. H. Tsi et S. C. Chen | Species | China: Yunnan (Menghai) | Not mentioned | Not mentioned | (Jiang et al., 2022; Sciences, 2009) |
| **39** | Gastrodia javanica Bl. Lindl. | Species | China: Southern Taiwan; Philippines；Japan: Ryukyu Islands; Thailand; Malaysia; Indonesia; | Rhizome | Sedation, sleeping, neurasthenia, insomnia, headache relief, etc. | (Sciences, 2009; Yokota, 2017) |
| **40** | Gastrodia flabilabella S. S. Ying） | Species | China: Central Taiwan | Not mentioned | Not mentioned | (Li et al., 2023; Sciences, 2009) |
| **41** | Gastrodia appendiculata C. S. Leou et N. J. Chung | Species | China: Taiwan | Not mentioned | Not mentioned | (Sciences, 2009) |
| **42** | Gastrodia longitubularis Q.W.Meng | Species | China: Hainan | Not mentioned | Not mentioned | (Meng et al., 2007; Sciences, 2009) |
| **43** | Gastrodia longiflora Suetsugu, sp. nov. | Species | Japan: Okinawa prefecture (Hirae) | Not mentioned | Not mentioned | (Suetsugu, 2021) |
| **44** | Gastrodia takeshimensis Suetsugu | Species | Japan: Kagoshima Prefecture (Ishigaki Island), Northern Ryukyus: （Yakushima， Kuroshima and Nakanoshima） | Not mentioned | Not mentioned | (Kenji, 2022) |
| **45** | Gastrodia nipponica Suetsugu | Species | Japan | Not mentioned | Not mentioned | (Suetsugu, 2013) |
| **46** | Gastrodia nipponicoides Suetsugu | Species | Japan: Okinawa Island and Ryukyu Islands | Not mentioned | Not mentioned | (Suetsugu, 2017a) |
| **47** | Gastrodia okinawensis Suetsugu | Species | Japan: Okinawa Island and Ryukyu Islands | Not mentioned | Not mentioned | (Suetsugu, 2017a) |
| **48** | Gastrodia spatula | Species | Indonesia | Not mentioned | Not mentioned | (Bandara et al., 2020) |
| **49** | Gastrodia gunatillekeorum Bandara, Priyankara & Kumar, | Species | Sri Lanka: Southern Province (Matara District) | Not mentioned | Not mentioned | (Bandara et al., 2020) |
| **50** | Gastrodia zeylanica Schltr | Species | Sri Lanka | Not mentioned | Not mentioned | (Schlechter, 1906) |
| **51** | Gastrodia maliauensis Suetsugu, M. Suleiman & Tsukaya, | Species | Malaysian: Sabah (Maliau Basin) | Not mentioned | Not mentioned | (Suetsugu et al., 2018c) |
| **52** | Gastrodia spathulata (Carr) J. J. Wood | Species | Indonesia: West Java; India | Not mentioned | Not mentioned | (Suetsugu et al., 2018a) |
| **53** | Gastrodia callosa | Species | Indonesia: West Java | Not mentioned | Not mentioned | (Suetsugu et al., 2018) |
| **54** | Gastrodia abscondita | Species | Indonesia: West Java | Not mentioned | Not mentioned | (Suetsugu et al., 2018) |
| **55** | Gastrodia crispa | Species | Indonesia: West Java | Not mentioned | Not mentioned | (Suetsugu et al., 2018) |
| **56** | Gastrodia selabintanensis Tsukaya & A.Hidat | Species | Indonesia: West Java | Not mentioned | Not mentioned | (Suetsugu et al., 2018) |
| **57** | Gastrodia putaoensis X. H. Jin | Species | Myanmar: Kachin State (Putao District) | Not mentioned | Not mentioned | (Jin and Kyaw, 2017) |
| **58** | Gastrodia flexistyloides Suetsugu in Phytotaxa | Species | Japan: Prefektur Kagoshima (Kuroshima, Kuroshima and Iojima) | Not mentioned | Not mentioned | (Suetsugu, 2017b) |
| **59** | Gastrodia cajanoae Barcelona & Pelser | Species | Philippines: Mindanao, Bukidnon Province (Mt. Quitamrad Natural Park), Cotabato Province (Mt. Apo Natural Park), Negros (Northern Negros Natural Park), Luzon (forests of Lias) | Not mentioned | Not mentioned | (Pelser et al., 2016) |
| **60** | Gastrodia rwandensis Eb. Fisch. & Killmann | Species | Rwanda | Not mentioned | Not mentioned | (Cribb et al., 2010) |
| **61** | Gastrodia ballii P. J. Cribb & Browning | Species | Western Mozambique; north-eastern Zimbabwe; southern Malawi | Not mentioned | Not mentioned | (Cribb et al., 2010) |
| **62** | Gastrodia africana Kraenzl. | Species | Cameroon | Not mentioned | Not mentioned | (Cribb et al., 2010) |
| **63** | Gastrodia×nippo-uraiensis Suetsugu & T. C. Hsu | Species | Japan: Yakushima Island | Not mentioned | Not mentioned | (Suetsugu et al., 2018b) |
| **64** | Gastrodia maliauensis Suetsugu, M. Suleiman & Tsukaya | Species | Malaysia: Borneo (Sabah) | Not mentioned | Not mentioned | (Suetsugu et al., 2018) |
| **65** | Gastrodia qingyunshanensis J. X. Huang, H. Xu et H. J. Yang | Species | China: Guangdong (Wengyuan County) | Not mentioned | Not mentioned | (Shi et al., 2021) |
| **66** | Gastrodia clausa T. C. Hsu, S. W. Chung & C. M. | Species | Japan: Ryukyu Islands (Okinawa) | Not mentioned | Not mentioned | (Kenji et al., 2013) |
| **67** | Gastrodia amamiana Suetsugu | Species | Japan: Amami-Ohshima Island and Tokunoshima Island | Not mentioned | Not mentioned | (Kenji, 2019) |
| **68** | Gastrodia kuroshimensis Suetsugu | Species | Japan: Kuroshima, Akusekijima and Yakushima Island | Not mentioned | Not mentioned | (Suetsugu, 2016) |
| **69** | Gastrodia verrucosa Blume, Mus. Bot | Species | Jepan; Taiwan, Cina: Taiwan; Semenanjung Malaysia; Indonesia: Jawa dan Sumatra | Not mentioned | Not mentioned | (Suddee and Harwood, 2009) |
| **70** | Gastrodia sui C. S. Leou, T. C. Hsu & C. L. Yeh | Species | China: Taiwan (Pingtung County); Indonesia: (Java) | Not mentioned | Not mentioned | (Yeh et al., 2011) |
| **71** | Gastrodia bambu Metusala | Species | Indonesia: Java (Mount Merapi, Mount Gede Pangrango) | Not mentioned | Not mentioned | (Metusala and Supriatna, 2017) |
| **72** | Gastrodia isabelensis T.C.Hsu | Species | Solomon Islands： Isabel Province (Santa Isabel Island) | Not mentioned | Not mentioned | (Hsu et al., 2016) |
| **73** | Gastrodia solomonensis T.C.Hsu | Species | Solomon Islands: Western Province (Kolombangara Island and Nggatokae Island) | Not mentioned | Not mentioned | (Hsu et al., 2016) |
| **74** | Gastrodia major Averyanov | Species | Vietnam | Not mentioned | Not mentioned | (Ma et al., 2019) |
| **75** | Gastrodia xilis Hook . f. (G. siamensis) | Species | Thailand | Not mentioned | Not mentioned | (Suddee and Harwood, 2009) |
| **76** | Gastrodia fimbriata | Species | Thailand: Phetchaburi Province （Kaeng Krachan National Park） | Not mentioned | Not mentioned | (Suddee and Harwood, 2009) |

**Table S2** Folk uses of *G. elata*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NO | Ethnic  minorities | Name | Attending functions | **Refs** |
| 1 | Achang | *Maozeer* | Treatment of high blood pressure, vertigo, insomnia, headache, pediatric convulsions | (Zhang, 2016) |
| 2 | De'ang | *Tianma* | Treatment of high blood pressure, vertigo, insomnia, headache, pediatric convulsions |  |
| 3 | Bai | *Tianma, Chijian, Ming Tianma* | Treatment of high blood pressure, headache, vertigo |  |
| 4 | Dong | *Tianma, Shuiyangyu* | Treatment of headache, dizziness, limb numbness, hypertension, pediatric convulsions, rheumatic paralysis |  |
| 5 | Dongxiang | *Tianma* | Treatment of migraine headaches |  |
| 6 | Gelao or Klau | *Kelei, Weiwai* | Swallowing its rhizome in warm wine cures stomach aches and headaches. |  |
| 7 | Hani | *Tianma* | Cure stomach ache |  |
| 8 | Jingpo | *Uwunchi* | Treatment of high blood pressure, vertigo, insomnia, headache, pediatric convulsions |  |
| 9 | Lisu | *Guabumen* | Cure of dizziness and black eyes, numbness of limbs, headwind and headache, hemiplegia, pediatric epilepsy |  |
| 10 | Maonan | *Longbunong* | For headache and stomach ache |  |
| 11 | Mongol | *Wulan-Suomo, Naohaiyin-Haorega, Dongbue* | To treat hypertension, headache, dizziness, convulsions, stroke, numbness of limbs, crooked mouth and eyes, hemiplegia, pediatric convulsions, tetanus, rheumatism, and paralysis. |  |
| 12 | Hmong or Miao | *Yangyuyou, Gaolire, Chijian* | It relieved acute and chronic convulsions, tetanus, vertigo, hemiplegia, headache, rheumatism paralysis, high blood pressure, crooked mouth and slanting eyes. |  |
| 13 | Nakhi |  | Cure neurasthenia, migraine, numbness of limbs, dizziness, blackness of eyes, unfavorable speech, hemiplegia |  |
| 14 | Nu | *Changkai, Shuiyangyu* | Treatment of dizziness, rheumatism and numbness |  |
| 15 | Qiang | *Geabarres* | Treatment for dizziness, headache, wind-cold paralysis, stroke, pediatric convulsions. | ) |
| 16 | Tujia | *Xilugatai, Dingfengcao, Zidongcao* | Treatment of headache and dizziness, numbness of limbs, pediatric convulsions, hemiplegia, epileptic convulsions, lopsidedness of the mouth and eyes, tetanus, cramps of hands and feet |  |
| 17 | Yao | *Chijian* | Antihypertensive, headache and dizziness, pediatric convulsions, sores and boils. |  |
| 18 | Tibetan | *Dongpeng, Remuxiaqia, Donpeng* | Treatment of dizziness, hypertension, neurasthenia, pediatric convulsions, headaches caused by hypertension and post-concussion, epilepsy, Delirious, old and infirm | (Zhang, 2016) |

**Table S3** Formulary use of *G.elata*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Formulation name** | **Dosage form** | **Compositions** | **Efficacy and application** | **Refs** |
| 1 | Shi Yi Wei Shen Qi | pill, capsule | *Ginseng*, *Astragalus*, *Gastrodiae Rhizoma*, *Angelica Sinensis*, *Ehmanniae Radix Praeparata*, *Alismatis Rhizoma*, *Cassiae Semen*, *Cuscuta Chinensis Lam*, *Cervi Cornu*, *Lycii Fructus*, *Asari Radix Et Rhizoma*. | Strengthening the spleen and promoting vital energy Suitable for weak spleen and vital energy, weakness of limbs, and breast cancer. | (Committee, 2015) |
| 2 | Shi Xiang Fan Sheng Wan | bolus | *Quilariae Lignum Resinatum*, *Pogostemonis*, *Gastrodiae Rhizom*, *Curcumae Radix*, *artificial musk*, *Bovis Calculus*, *Caryophylli Flos*, *Nelumbinis Plumula*, *Cyrrhizae Radix Et Rhizoma*, *Borntheticum Syntheticum*, *amber*, etc. | Calm the heart, relieve phlegm, for stroke phlegm heart orifice obstruction caused by slurred speech, dizziness, lockjaw. |  |
| 3 | Da Chuan Xiong Kou Fu Ye | oral liquid | *Chuanxiong Rhizoma*, *Gastrodiae Rhizom*. | Promoting blood circulation, removing blood stasis, calming the liver, and extinguishing wind. Indications: headache, dizziness, numbness of the upper and lower limbs, petechiae on the tongue caused by liver yang transforming wind. |  |
| 4 | Ren Shen Zai Zao Wan | pill | *Ginseng*, *Caryophylli Fructus*, *Borneolum, Notoginseng Radix Et Rhizoma*, *Saponshnikoviae Radix*, *Chuanxiong Rhizoma*, *Astragali Radix*, *Ephedrea Herba, amber*, *Amomi Fructus Rotundus*, *Multiflori Radix Praeparata*, *Cyrrhizae Radix Et Rhizoma*, *Poria*, *Odis Macrocephalae Rhizoma*, *Puerariae Lobatae Radix*, *Gastrodiae Rhizom*, *Angelicae Sinensis Radix*, *Clematidis Radix Et Rhizoma*, *Arisaema Cum Bile*, etc. | Benefiting Qi and nourishing Blood, activating Blood circulation. It's used for stroke caused by deficiency of qi and blood stasis, wind-phlegm obstruction of collaterals. |  |
| 5 | Xiao Er Zhi Bao Wan | pill | *Menthae Haplocalyx Briq*, *Citri Reticulate Rericarpium*, *Tillariae Cirrhosae Bulbus*, *amber*, *Gastrodiae Rhizom*, *Scorpio*, *Realgar*, *Pogostemon cablin*, *Trphonii Rhizoma*, *Arecae Semen*, *Poria*, *Cicadae Periostracum*, *Uncariae Ramulus Cum Uncis*,etc. | Dispersing wind and calming alarm, resolving phlegm and inducing stagnation. It's used for children with wind-cold influenza, fever and nasal congestion, stopping food and breastfeeding, cough with excessive phlegm, vomiting and diarrhea. |  |
| 6 | Xiao Er Kang Xian Jiao Nang | capsule | *Rseudostellariae Radix*, *Pinelliae Rhizoma*, *Anemone altaica,amber*, *Massa Medicata Fermentata*, *Chuanxiong Rhizoma*, *Arisaema Cum Bile*, *Gastrodiae Rhizom,Poria,Citri Exocarpium Rubrum*, *Canarii Fructus*, *Aquilariae Lignum Resinatum*, *Notopterygii Rhizoma Et Radix*. | Expelling phlegm and extinguishing wind, strengthening the spleen and regulating Qi. Indications: Convulsions of the limbs, upward movement of the eyes, foaming at the mouth, and even fainting. |  |
| 7 | Xiao Er Jin Dan Pian | pill | *Cinnabaris*, *Tillariae Cirrhosae Bulbus*, *Akebiea Caulis, Schizonepetae Spica*, *Uncariae Ramulus Cum Uncis*, *Cyrrhizae Radix Et Rhizoma*, *Saigae Tataricae Cornu*, *Citri Exocarpium Rubrum*, *Scrophulariae Radix*, *Platycodi Radix*, *Notopterygii Rhizoma Et Radix*, *Rehmanniae Radix*, *Gastrodiae Rhizom*, *Tamaricis Cacumen*, *Paeoniae Radix Rubra*, *Saponshnikoviae Radix*,etc. | Dispelling wind and resolving phlegm, clearing heat and removing toxins. Indications: For colds and flu caused by phlegm-fire externally induced by wind-heat, such as asthma, fever, sore throat, cough, headache, vomiting, and high fever and convulsions. |  |
| 8 | Xiao Er Jie Re Wan | bolus | *Saponshnikoviae Radix*, *Gastrodiae Rhizom*, *Uncariae Ramulus Cum Uncis*, *Bambusae Concretio Silicea*, *Poria, amber*, *Scolopendra*, *artificial musk*, *Arisaema Cum Bile*, *Ephedra Herba*, *Menthae Haplocalyx Briq*, *Citri Reticulatae Rericarpium*, *Cyrrhizae Radix Et Rhizoma*, *Margarita*, *Artificial Cow-Bezoar*, *Borntheticum Syntheticum*. | Clearing away heat and resolving phlegm, calming convulsions and restraining wind. It's used for children with cold and fever, phlegm and saliva congestion, convulsions of hands and feet, vomiting and coughing. |  |
| 9 | Tian Dan Tong Luo Pian | pill, capsule | *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Gastrodiae Rhizom Gastrodiae Rhizom*, *Acorus Tatarinowii Schott*, *Astragali Radix*, *Chuanxiong Rhizoma*, *Hirudo, Sophorae Flos*, *Artificial Cow-Bezoar*, *Achyranthis Bidentatae Radix*, *Siegesbeckiae Herba*. | Promoting blood circulation and opening the channels, quenching wind and resolving phlegm. It's used for unfavorable speech, hemiplegia, crooked mouth and eyes. |  |
| 10 | Tian Ju Nao An Jiao Nang | capsule | *Chuanxiong Rhizoma*, *Chrysanthemi Flos*, *Ligustici Rhizoma Et Radix*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Ligustri lucidi Fructus*, *Gastrodiae Rhizom*, *Viticis Fructus*, *Paeoniae Radix Alba*, *Ecliptae Herba*, *Achyranthis Bidentatae Radix*. | Calming the liver and extinguishing wind, promoting blood circulation and removing blood stasis. Indications: headache, or dizziness, nausea and vomiting, dark red tongue, or petechiae. |  |
| 11 | Tianma Wan | pill | *Gastrodiae Rhizom*, *Angelicae Pubescentis Radix*, *Achyranthis Bidentatae Radix*, *Aconiti Lateralis Radix Praeparata*, *Rehmanniae Radix*, *Notopterygii Phizoma Et Radix*, *Eucommiae Cortex*, *Dioscoreae Hypoglaucae Phizoma*, *Angelicae Sinensis Radix*, *Scrophulariae Radix*. | Dispelling wind and removing dampness, clearing channels and relieving pain. Used for lumbar and leg pain, limb contracture, and numbness of hands and feet. |  |
| 12 | Tianma Tou Tong Pian | pill | *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Angelicae Sinensis Radix*, *Angelicae Dahuricae Radix*, *Schizonepetae Herba*, *Olibanum*. | Nourishing blood, dispelling wind, dispersing cold and relieving pain. For migraine headache, cold, nasal congestion caused by wind-cold, blood stasis or blood deficiency. |  |
| 13 | Tianma Gou Teng Ke Li | pellets | *Gastrodiae Rhizom*, *Haliotidis Concha*, *Scutellariae Radix,Eucommiae Cortex*, *Taxilli Herba*, *Poria*, *Achyranthis Bidentatae Radix*, *Leonuri Herba*, *Polygoni Multiflori Caulis*. | Calming the liver and extinguishing wind, clearing heat and tranquilizing the mind. Suitable for headache, tinnitus, dim vision, and insomnia caused by hyperactivity of liver yang. |  |
| 14 | Tianma Shou Wu Pian | pill | *Gastrodiae Rhizom*, *Polygoni Multiflori Radix, Salviae Miltiorrhizae Rasix Et Rhizoma*, *Angelicae Sinensis Radix*, *Mori Folium, Ligustri lucidi Fructus*, *Polygonati Rhizoma*, *Angelicae Dahuricae Radix*, *Rehmanniae Radix Praeparata*, *Chuanxiong Rhizoma*, *Cyrrhizae Radix Et Rhizoma*, etc. | Nourishing Yin and tonifying the Kidneys, nourishing Blood and calming the wind. For dizziness and vertigo, bitter mouth and dry throat, alopecia, grey hair due to deficiency of yin in the liver and kidney; cerebral arteriosclerosis, early hypertension, etc. |  |
| 15 | Tianma Qu Feng Bu Pian | pill | *Rehmanniae Radix*, *Notopterygii Phizoma Et Radix*, *Gastrodiae Rhizom*, *Cyathulae Radix, Poria*, *Angelicae Sinensis Radix*, *Angelicae Pubescentis Radix*, *Cinnamomi Cortex*, *Eucommiae Cortex*, *Scrophulariae Radix*. | Warming the kidney and nourishing the liver, dispelling wind and relieving pain. Used for dizziness and tinnitus, joint pain, soreness and weakness of the waist and knees, cold and numbness of hands and feet. |  |
| 16 | Tianma Xing Nao Jiao Nang | capsule | *Gastrodiae Rhizom*, *Acorus Tatarinowii Schott*, *Rehmanniae Radix Praeparata*, *Pheretima*, *Polygalae Radix*, *Cistanches Herba*. | Nourishing the liver and kidney, clearing the channels relieving pain, calming the liver and relieving wind. It's used for dizziness, headache, memory loss, insomnia and tinnitus caused by insufficiency of the liver and kidney and disturbance of liver wind. |  |
| 17 | Tian Zhi Ke Li | pellets | *Gastrodiae Rhizom*, *Haliotidis Concha*, *Taxilli Herba*, *Polygoni Multiflori Caulis*, *Cyathulae Radix*, *Uncariae Ramulus Cum Uncis*, *Eucommiae Cortex*, *Sophorae Flos*, *Scutellariae Radix*, *Leonuri Herba*. | Calming the liver and submerging the yang, benefiting the intellect and tranquilizing the mind, tonifying the liver and kidney. It's used for headaches, irritability, bitter mouth and dry throat, and slow thinking caused by a stroke with hyperactivity of the liver yang. |  |
| 18 | Tian Shu Pian | pill | *Chuanxiong Rhizoma*, *Gastrodiae Rhizom*. | Promoting blood circulation calming the liver, clearing the channels and relieving pain. Indications: Long-lasting headache, vascular neuralgia headache, high blood pressure headache. |  |
| 19 | Tian Shu Jiao Nang | capsule | *Chuanxiong Rhizoma*, *Gastrodiae Rhizom*. | Treatment of migraine, vertigo, rheumatoid arthritis pain, numbness in extremities, stiff neck, attention deficit | (Committee, 2015) (Chen et al., 2019a) |
| 20 | Niu Huang Qian Jin San | Powder | *Scorio*, *Bovis Calculus*, *Borntheticum Syntheticum*, *Arisaema Cum Bile*, *Cyrrhizae Radix Et Rhizoma*, *Bombyx Batryticatus*, *Cinnabaris*, *Coptidis Rhizoma*, *Gastrodiae Rhizom*. | Clearing away heat and removing toxins, suppressing spasms and settling convulsions. Indications: Paediatric convulsions with high fever, phlegm and saliva congestion, convulsions of hands and feet, delirium. |  |
| 21 | Niu Huang Zhen Jing Wan | pill | *Bovis Calculus*, *ScorpioScorpio*, *Margarita*, *Cinnabaris*, *Gastrodiae Rhizom*, *Saponshnikoviae Radix*, *Arisaema Cum Bile*, *Borntheticum Syntheticum*, *Cyrrhizae Radix Et Rhizoma*, *Uncariae Ramulus Cum Uncis*, *Amber*,etc. | Calming and tranquilizing the mind, dispelling wind and expelling phlegm. Used for high fever and convulsions, pediatric convulsions, restlessness, and tightness of teeth. |  |
| 22 | Dan Xi Ke Li | pellets | *Gastrodiae Rhizom*, *Rehmanniae Radix*, *Taxilli Herba*, *Cassiae Semen*, *Achyranthis Bidentatae Radix*, *Moutan Cortex*, *Chuanxiong Rhizoma*, *Epimedii Folium*, *Cannabis Fructus*. | Nourishing Yin and calming the liver, clearing heat and removing vexation, extinguishing wind and clearing channels. Indications: Hemiplegia, crooked mouth and tongue, dizziness and vertigo. |  |
| 23 | Ban Xia Tianma Wan | pill | *Pinelliae Rhizoma Praeparatum*, *Gastrodiae Rhizom*, *Ginseng Radix Et Rhizoma*, *Odis Macrocephalae Rhizoma*, *Citri Reticulatae Rericarpium*, *Massa Medicata Fermentata*, *Pinellodendri Chinensis Cortex*, *Atractylodis Phizoma*, *Poria*, etc. | Strengthening the spleen, dispelling dampness, resolving phlegm and calming wind. It's used for vertigo, headache, caused by spleen deficiency and dampness, phlegm and turbid internal obstruction. |  |
| 24 | Zai Zao Wan | pill | *Pheretima*, *Angelicae Sinensis Radix*, *Cinnabaris*, *Notoginseng Radix Et Rhizoma*, *Astragali Radix*, *Poria*, *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Cyrrhizae Radix Et Rhizoma Cyrrhizae Radix Et Rhizoma*, *Rhei Radix Et Rhizoma*, etc. | Dispelling wind and resolving phlegm, promoting blood circulation and opening up the channels. Indications: Hemiplegia, numbness of hands and feet, pain and spasm. |  |
| 25 | Quan Tianma Jiao Nang | capsule | *Gastrodiae Rhizom*. | Calming the liver, calming the wind, and relieving spasms. For vertigo, headache, numbness of limbs, epileptic convulsions due to upward disturbance of liver wind. |  |
| 26 | Qing Yu Pi Wen Dan | pill | *Rhei Radix Et Rhizoma*, *Cinnabaris, Realgar*, *Coptidis Rhizoma*, *Magnoliae Officinalis Cortex*, *Cinnamomi Cortex*, *Poria*, *Lonicerae Japonicae Flos*, *Angelicae Dahuricae Radix*, *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Platycodonis Radix*, *Santali Albi Lignum*, *amberamber*, etc. | Dispelling foul qi and stopping vomiting and diarrhea. Used for abdominal pain, vomiting and diarrhea, dizziness and chest tightness. |  |
| 27 | A Gong Jiang Ya Wan | pill | *Curcumae Radix*, *Gastrodiae Rhizom*, *Astragali Radix*, *Codonopsis Radix*, *Schisandrae Chinensis Fructus*, *Artificial Cow-Bezoar*, *Borntheticum Syntheticum*, *Coptidis Rhizoma*, *Scutellariae Radix*, *Ophiopogonis Radix*. | Clearing heat and calming alarm, calming the liver and submerging the yang. It's used for dizziness and vertigo, tinnitus and deafness caused by hyperactivity of liver yang and inflammation of liver fire. |  |
| 28 | Kang Shuan Zai Zao Wan | pill | *Ginseng Radix Et Rhizoma Rubra*, *Astragali Radix*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Rhei Radix Et Rhizoma*, *Puerariae Lobatae Radix*, *Angelicae Sinensis Radix*, *Polygoni Multiflori Radix*, *Carthami Flos*, *Gastrodiae Rhizom*, *Cyrrhizae Radix Et Rhizoma*, *Notoginseng Radix Et Rhizoma*, *Achyranthis Bidentatae Radix*, *Asari Radix Et Rhizoma*. | Activating blood stasis and removing blood stasis, restraining wind and suppressing spasm, relaxing tendons and collaterals. Indications: numbness of hands and feet, crooked mouth and eyes, slurred speech, etc. |  |
| 29 | Zhui Feng Tou Gu Wan | pill | *Aconiti Radix Cocta*, *Angelicae Dahuricae Radix*, *Cyrrhizae Radix Et Rhizoma*, *Cyrrhizae Radix Et Rhizoma*, *Gastrodiae Rhizom*, *Ephedrea Herba*, *Chuanxiong Rhizoma*, *Pheretima*, *Angelicae Sinensis Radix*, *Foria*, *Gastrodiae Rhizom*, *Paeoniae Radix Rubra*, *Asari Radix Et Rhizoma*, *Saponshnikoviae Radix*, *Nardostachyos Radix Et Rhizoma*,etc. | Dispelling phoenix and dampness, dispersing cold, relieving pain and activating meridians. Used for wind-cold-dampness paralysis, numbness of limbs and pain in joints. |  |
| 30 | Yang Xue Sheng Fa Jiao Nang | capsule | *Rehmanniae Radix Praeparata*, *Notopterygii Rhizoma Et Radix*, *Chuanxiong Rhizoma*, *Cuscutae Semen*, *Multiflori Radix Praeparata*, *Angelicae Sinensis Radix*, *Chaenomelis Fructus*, *Paeoniae Radix Alba*, *Gastrodiae Rhizom*. | Nourishing blood, dispelling wind, benefiting kidneys and filling up essence. For alopecia caused by blood deficiency, windiness and lack of kidney essence, symptoms include loose or thinning hair loss, dry or greasy hair, and itching of the scalp. |  |
| 31 | Jian Nao Wan | pill | *Angelicae Sinensis Radix*, *Cistanches Herba*, *Dioscoreae Rhizoma*, *Schisandrae Chinensis Fructus*, *Alpiniae Oxyphyllae Fructus*, *Arisaema Cum Bile*, *Gastrodiae Rhizom*, *Ginseng*, *Chrysanthemi Flos*, *Lycii Fructus*. | Tonifying the kidney and strengthening the brain, nourishing blood and tranquilizing the mind. Used for memory loss, palpitation and insomnia, dizziness and vertigo caused by deficiency of the heart and kidney. |  |
| 32 | Nao Shuan Tong Jiao Nang | capsule | *Typhae pollen*, *Curcumae Radix*, *Rhapontici Radix*, *Paeoniae Radix Rubra*, *Gastrodiae Rhizom*. | Promoting blood circulation, dispelling wind and resolving phlegm. Indications: hemiplegia, shortness of breath or dizziness, dysarthria or aphasia, hemiplegia. |  |
| 33 | Yi Nao Ning Pian | pill | *Astragali Radix Praeparata Cum Melle*, *Hordei Fructus Germinatus*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Gastrodiae Rhizom*, *Pheretima,amberamber*. | Benefiting vital energy, tonifying the kidney, promoting blood circulation and opening the veins, Indications: hemiplegia, post-stroke, coronary heart disease, angina pectoris and hypertension. |  |
| 34 | Xiao Xuan Zhi Yun Pian | pill | *Polygonum Chinense*, *Pinelliae Rhizoma Praeparatum Cum Zingibere Et Alumine*, *Gastrodiae Rhizom*, *Angelicae Sinensis Radix*, *Poria, Odis Macrocephalae Rhizoma*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Paeoniae Radix Alba*, *Chaenomelis Fructus*, *Amomi Fructus*, *Angelicae Dahuricae Radix*. | Expelling phlegm, resolving blood stasis and calming the liver. For vertigo, cerebral arteriosclerosis |  |
| 35 | Tong Tian Kou Fu Ye | oral liquid | *Chuanxiong Rhizoma*, *Gastrodiae Rhizom*, *Angelicae Dahuricae Radix*, *Chrysanthemi Flos*, *Saponshnikoviae RadixSaponshnikoviae Radix*, *Cyrrhizae Radix Et RhizomaCyrrhizae Radix Et Rhizoma*, *Paeoniae Radix Rubra*, *Notopterygii Rhizoma Et Radix*, *Asari Radix Et Rhizoma*, *Menthae Haplocalyx Briq Teas*. | Promoting blood circulation and removing blood stasis, dispelling wind and relieving pain. For head distension or tingling, dizziness, or nausea and vomiting. |  |
| 36 | Tong Bi Pian | pill | *Strychni Semen*, *Bungarus Parvus*, *Scolopendra*, *Scorpio*, *Pheretima*, *Gastrodiae Rhizom*, *Ginseng*, *Angelicae Sinensis Radix*, *Aconiti Radix Cocta*, etc. | Tonifying Qi and Blood, dispersing cold, relieving pain, and activating blood circulation. Used for joint cold pain, unfavorable flexion and extension, and rheumatic arthritis. |  |
| 37 | Qing Xuan Zhi Tan Wan | pill | *Gastrodiae Rhizom*, *Bombyx Batryticatus, Pheretima*, *Agkistrodon*, *Scorpio*, *Typhonii Rhizoma*, *Achyranthis Bidentatae Radix*, *Chuanxiong Rhizoma*, *Scrophulariae Radix*, *Puerariae Lobatae Radix*, *Ophiopogonis Radix*, *Coptidis Rhizoma*, etc. | Calming the liver and restraining wind, resolving phlegm and clearing collaterals. It's used in treating dizziness of the head and eyes, numbness of the limbs, stuffiness in the chest and hemiplegia caused by hyperactivity of liver yang and internal movement of liver wind. |  |
| 38 | Shu Jin Tong Luo Ke Li | pellets | *Drynariae Rhizoma*, *Chuanxiong Rhizoma*, *Achyranthis Bidentatae Radix*, *Gastrodiae Rhizom*, *Pheretima*, *Olibanum*, *Clematidis Radix Et Rhizoma*, *Puerariae Lobatae Radix*. | Tonifying the liver and benefiting the kidney, invigorating blood circulation and relaxing tendons. For cervical spondylosis due to Yin deficiency of the liver and kidney, Qi stagnation and blood stasis. |  |
| 39 | Sha Yao | pill | *Caryophylli Flos*, *Gastrodiae Rhizom*, *Rhei Radix Et Rhizoma*, *Borntheticum Syntheticum*, *Bufonis Venenum*, *Cinnabaris, Atractylodis Phizoma*, *Ephedrea Herba*, *Cyrrhizae Radix Et Rhizoma Cyrrhizae Radix Et Rhizoma*, *Artificial Musk, Realgar*. | Dispelling summer heat and removing toxins, and opening the orifices to remove the filth. Indications include coldness in the limbs, tightness of the teeth, abdominal pain and diarrhea. |  |
| 40 | Xi Xian Tong Shuan Wan | pill | *Siegesbeckiae Herba*, *Arisaema Cum Bile*, *Pinelliae Rhizoma Praeparatum Cum Alumine*, *Gastrodiae Rhizom, Chuanxiong Rhizoma*, *Persicae Semen*, *Carthami Flos*, *artificial musk*, *Angelicae Sinensis Radix*, *Gentianae Macrophyllae Radix*, *Notoginseng Radix Et Rhizoma*, *Hirudo*, *Borntheticum Syntheticum*. | Relaxing tendons and activating collaterals, activating blood circulation and removing blood stasis, waking up the brain and opening up the mind. It's used for hemiplegia, hemiplegia and numbness, and speech. |  |
| 41 | Zhen Nao Ning Jiao Nang | capsule | *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Chuanxiong Rhizoma*, *Puerariae Lobatae Radix*, *Angelicae Dahuricae Radix*, *Asari Radix Et Rhizoma*, *Powerdered Buffalo Horn Extract*, *Gastrodiae Rhizom*, *Ligustici Rhizoma Et Radix*. | Extinguishing wind and clearing collaterals. Numbness of limbs, tinnitus, angioneurotic headache, hypertension, arteriosclerosis. |  |
| 42 | Xing Nao Zai Zao Jiao Nang | capsule | *Astragali Radix*, *Notoginseng Radix Et Rhizoma*, *Angelicae Sinensis Radix*, *Gastrodiae Rhizom*, *Arisaema Cum Bile*, *Scrophulariae Radix*, *Forsythiae Fructus*, *Chuanxiong Rhizoma*, *Cassiae Semen*, *Ginseng Radix Et Rhizoma Rubra*, *Carthami Flos*, *Agrimoniae Herba*, *Puerariae Lobatae Radix*, *Coptidis Rhizoma*, *Aquilariae Lignum Resinatum*, etc. | Resolving phlegm and waking up the brain, dispelling wind and activating collaterals. It's used in treating confusion, paralysis, and speech difficulty caused by wind-phlegm blockage of the spinal cord. |  |
| 43 | She Xiang Kang Shuan Jiao Nang | capsule | *artificial musk, Scorpio*, *Notoginseng Radix Et Rhizoma*, *Gastrodiae Rhizom*, *Carthami Flos*, *Spatholobi Caulis*, *Astragali Radix*, *Angelicae Sinensis Radix*, *Saigae Tataricae Cornu*, *Chuanxiong Rhizoma*, *Rhei Radix Et Rhizoma*, *Arisaema Cum Bile*, etc. | Promoting blood circulation and activating blood circulation, waking up the brain and dispersing blood stasis. Used for stroke qi deficiency and blood stasis, symptoms include paralysis, slurred speech, dizziness and dizziness. |  |
| 44 | She Xiang Nao Mai Kang Jiao Nang | capsule | *goat horn*, *Persicae Semen*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *pangolin*, *Raphani Semen*, *Gastrodiae Rhizom*, *Rhei Radix Et Rhizoma*, *Notoginseng Radix Et Rhizoma*, *Pheretima*, *Chuanxiong Rhizoma*, *artificial musk*, etc. | Calming the liver and extinguishing wind, opening up the orifices by removing phlegm, resolving blood stasis and opening the channels. It's used for hemiplegia, hemiplegia with numbness, crookedness of mouth and tongue, and speech with difficulty. |  |
| 45 | Tianma Wu She Wan | pill | *Gastrodiae Rhizom*, *Garter Snake*, *Arisaematis Rhzoma*, *Pinelliae Rhizoma*, *Pogostemonis Herba*, *Aconiti Radix*, *Typhonii Rhizoma*, *Epimedium*, *Realgar*, *artificial musk*, *Borneolum*, *Scorpio*, etc. | Indications: Wind and heart pains, convulsions of body heat, clenching of teeth and excessive salivation. | (Zhao, 2018) |
| 46 | Tianma Jiu | Medicinal  liquor | *Cannabis Fructus*, *Bungarus Parvus*, *Gastrodiae Rhizom*, *Turpentine*, *Garter Snake*, *Notopterygii Rhizoma Et Radix*, *Angelicae Pubescentis Radix*, *Angelicae Sinensis Radix*, *Achyranthis Bidentatae Radix*, *Chuanxiong Rhizoma*, *Rehmanniae Radix Praeparata*, *wine*, etc. | Searching for wind and dispelling evil spirits, strengthening muscles and bones, promoting blood circulation and relieving pain. Treating paralysis of limbs and unfavorable movement. | (Zhao, 2018) |
| 47 | Dan Sha Tianma Wan | pill | *Gastrodiae Rhizom*, *Angelicae Dahuricae Radix*, *Typhonii Rhizoma*, *Moschus*, *Arisaematis Rhzoma*. | Wind and phlegm with unfavorable head and eyes, itching and pain in the limbs. | (Zhao, 2018) |
| 48 | Gan Xie Tianma San | Powder | *Scorpio*, *Datura arborea*, *Gastrodiae Rhizom*, *Olibanum*, *Arisaematis Rhzoma*. | For pediatric slow-onset convulsions. | (Zhao, 2018) |
| 49 | Tianma Ban Xia Tang | Decoction | *Gastrodiae Rhizom*, *Pinelliae Rhizoma*, *Orange peel*, *Bupleuri Radix*, *Scutellariae Radix*, *Cyrrhizae Radix Et Rhizoma*, *Poria,Peucedani Radix*, *Coptidis Rhizoma*. | For wind-phlegm internal action, chest and diaphragm unfavorable, dizziness and darkness of the eyes, upper heat and lower cold. | (Luo, 2011) |
| 50 | Tianma Di Long Wan | pill | *Gastrodiae Rhizom*, *Pheretima*, *Notopterygii Rhizoma Et Radix*, *Gui Xin*, *Myrrha*, *Schizonepetae Spica*, *Moschus*. | Suitable for foot qi attacking the heart, with swelling of the legs and stubborn purple skin. | (Zhang, 1987) |
| 51 | Tianma Tang | processing | *Gastrodiae Rhizom*, *Notopterygii Rhizoma Et Radix*, *Ginseng*, *Gui Xin*, *Odis Macrocephalae Rhizoma*, *Ephedrea Herba*, *Armeniacae Semen Amarum*, *Aconiti Lateralis Radix Praeparata*. | Cure wind spasms and body stiffness. | (Dong, 1470) |
| 52 | Tianma Jin Jiu Fang | Medicinal  liquor | *Gastrodiae Rhizom*, *Drynariae Rhizoma*, *Garter Snake*, *Bungarus Parvus*, *Rehmanniae Radix Praeparata*, *Turpentine*, *tortoise plastron*, *Chuanxiong Rhizoma*, *Angelicae Sinensis Radix*, *Cannabis Fructus*, *Excrement*, *Notopterygii Rhizoma Et Radix*, *Angelicae Pubescentis Radix*, *Achyranthis Bidentatae Radix*, etc*.* | Suitable for paralysis and stroke, prolonged illness in bed. | (Dong, 1470) |
| 53 | Tianma Jian Wan | pill | *Gastrodiae Rhizom*, *Saponshnikoviae Radix*, *Ginseng*, *Bombyx Batryticatus*, *Scorpio*, *Cinnabaris*, *Realgar*, *Cyrrhizae Radix Et Rhizoma*, *Moschus*, *Bovis Calculus*. | It's suitable for pediatric convulsions with strong heat in the body, convulsions in the hands and feet, mental fainting and indignation, and unfavorable phlegm and saliva. | (Xu, 1983) |
| 54 | Tianma Shi Hu Jiu | Medicinal  liquor | *Arctii Fructus*, *Aconiti Lateralis Radix Praeparata*, *Garter Snake*, *Epimedium*, *Acanthopanacis Cortex*, *Achyranthis Bidentatae Radix*, *Gui Xin*, *Angelicae Sinensis Radix*, *Eucommiae Cortex*, *Cibotii Rhizoma*, *Salviae Miltiorrhizae Rasix Et Rhizoma*, *Dendrobii Caulis*, *Zanthoxylum*, *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *wine*. | Soothing the tendons and activating the blood, dispelling wind removing dampness, and strengthening the tendons and bones. Indications: stroke, hand and foot failure, bone and joint pain, lumbar and knee pain, leg and foot swelling. | (Wang, 1958) |
| 55 | Tianma Tui Yi San | Decoction | *Angelicae Sinensis Radix*, *Rehmanniae Radix Praeparata*, *Chuanxiong Rhizoma*, *Paeoniae Radix Rubra*, *Notopterygii Rhizoma Et Radix*, *Saponshnikoviae Radix*, *Haliotidis Concha*, *Angelicae Dahuricae Radix*, *Cyrrhizae Radix Et Rhizoma*, *Gastrodiae Rhizom*, *Chrysanthemi Flos*, etc. | Indications: Itching and tearing of the eyes, dimness and uncertainty. | (Sun, 1956) |
| 56 | Tianma Gou Teng Yin | Decoction | *Gastrodiae Rhizom*, *Uncariae Ramulus Cum Uncis*, *Haliotidis Concha*, *Scutellariae Radix*, *Achyranthis Bidentatae Radix*. *Eucommiae Cortex*, *Leonuri Herba*, *Taxilli Herba*, *Polygoni Multiflori Caulis*, *Zhu Fu Shen*. | Calming the liver and extinguishing wind, tonifying the liver and kidney, clearing heat and activating blood circulation. Indications: Heat in the liver meridian, headache and distension, hemiplegia. | (Hu, 1958) |
| 57 | Tianma Fang Feng Wan | pill | *Bombyx Batryticatus*, *Scorpio, Gastrodiae Rhizom*, *Saponshnikoviae Radix*, *Ginseng*, *Cinnabaris*, *Realgar*, *Moschus*, *Cyrrhizae Radix Et Rhizoma*, *Bovis Calculus*. | It treats all kinds of convulsions, intense heat in the body, faintness in the spirit, and unfavorable phlegm and saliva. | (Liu, 2007) |
| 58 | Tai Yi Dan | pill | *Garter Snake*, *Gastrodiae Rhizom*, *Aconiti Lateralis Radix Praeparata*, *Ephedrea Herba*, *Scorpio*, *Typhonii Rhizoma*, *Bombyx Batryticatus*. | Treating children with wind and epilepsy, adverse phlegm and saliva, strong and straight neck and back, and mental drowsiness. | (Liu, 2007) |
| 59 | Tianma Fang Feng Yuan | processing | *Bombyx Batryticatus*, *Scorpio*, *Gastrodiae Rhizom*, *Saponshnikoviae Radix*, *Ginseng, Cinnabaris*, *Realgar*, *Moschus*, *Cyrrhizae Radix Et Rhizoma*, *Bovis Calculus*. | For convulsions, much sleep and palpitations, mental drowsiness, unfavorable phlegm and saliva, and wind-warmth and evil heat. | (Liu, 2007) |
| 60 | Chen Sha Tianma Wan | pill | *Chuanxiong Rhizoma*, *Moschus*, *Angelicae Dahuricae Radix*, *Cinnabaris*, *Typhonii Rhizoma*, *Gastrodiae Rhizom*, *Arisaematis Rhzoma*. | Removing wind and resolving phlegm, clearing the mind, and benefiting the head and eyes. Indications: headache and dizziness, paralysis of hands and feet, swelling and itching of head and face. | (Liu, 2007) |
| 61 | Long Nao Tianma Jian | Decoction | *Melo Semen*, *Aconiti Radix*, *Sanguisorbea Radix*, *Ginseng Radix Et Rhizoma*, *Gastrodiae Rhizom*, *Borneolum*, *Moschus*. | Indications: Half of the body does not follow, mental confusion, paralysis all over the body, phlegm and saliva are not favorable, etc. | (Liu, 2007) |
| 62 | Tianma Chu Shi Tang | Powder | *Odis Macrocephalae Rhizoma*, *Gastrodiae Rhizom*, *Ginseng*, *Zingiberis Rhizoma*, *Scorpio*, *Aconiti Lateralis Radix Praeparata*. | Suitable for body aches and pains, swelling and pain in hands and feet, or numbness at times. | (Yang, 1998) |
| 63 | Tianma Chu Feng Wan | pill | *Gastrodiae Rhizom Gastrodiae Rhizom*, *Saponshnikoviae Radix Saponshnikoviae Radix*, *Asari Radix Et Rhizoma*, *Ligustici Rhizoma Et Radix*, *Chuanxiong Rhizoma*, *Angelicae Dahuricae Radix*, *Dioscoreae Rhizoma*, *Astragalus mongholicus*, *Angelicae Sinensis Radix*, *Cyrrhizae Radix Et Rhizoma*. | Dispelling wind and clearing collaterals. Indications: Wind-air congestion, tiredness of limbs, dizziness and astigmatism, nasal congestion and tinnitus. | (Yang, 1998) |
| 64 | Tianma Bai Zhu Wan | pill | *Gastrodiae Rhizom*, *Odis Macrocephalae Rhizoma*, *Arisaematis Rhzoma*, *Pinelliae Rhizoma*, *Typhonii Rhizoma*, *Chuanxiong Rhizoma*, *Bombyx Batryticatus*, *Menthae Haplocalyx Briq*, *Poria*, *Inula japonica Thunb*. | Indications: Wind dizziness and heavy pain, attacking the head and eyes, swelling of the pharynx. | (Yang, 1998) |
| 65 | Tianma Huang Gao Tang | Decoction | *Gastrodiae Rhizom*, *Raeoniae Radix Alba*, *Massa Medicata Fermentata*, *Notopterygii Rhizoma Et Radix*, *Poria*, *Ginseng*, *Coptidis Rhizoma*, *Angelicae Sinensis Radix*, *Astragalus mongholicus*, *Cyrrhizae Radix Et Rhizoma*, *Puerariae Lobatae Radix*, *Pinellodendri Chinensis Cortex*, *Atractylodis Phizoma*, *Alismatis Rhizoma*, *Bupleuri Radix*. | Indicated for wind syndrome due to sound drinking for DS, with numbness and pain in the left hand, left foot and left leg. | (Li, 1276) |
| 66 | Ban Xia Bai  Zhu Tianma  Tang | Decoction | *Pinelliae Rhizoma*, *Odis Macrocephalae Rhizoma*, *Gastrodiae Rhizom*, *Citri Reticulatae Rericarpium*, *Poria, Cyrrhizae Radix Et Rhizoma*, *Zingiberis Rhizoma Recens*, *Jujubae Fructus*. | Calme liver wind, dry dampness and eliminate phlegm, indicated for wind-phlegm syndrome. | (Cheng, 2006) |
| 67 | Jie Yu Dan | pill | *Trphonii Rhizom*, *Acorus Tatarinowii Schott*, *Polygalae Radix*, *Gastrodiae Rhizom*, *Scorpio*, *Notopterygii Rhizoma Et Radix*, *Arisaema Cum Bile*, *Aucklandiae Radix*, *Cyrrhizae Radix Et Rhizoma*. | Promoting the passage of orifices and clearing collaterals, dispelling wind and removing phlegm. Indications: Stroke in the heart and spleen, phlegm blocking Lianquan, hemiplegia. | (Cheng, 2006) |
| 68 | Ding Xian Wan | pill | *Gastrodiae Rhizom*, *Tillariae Cirrhosae Bulbus*, *Arisaema Cum Bile*, *Pinelliae Rhizoma*, *Acorus Tatarinowii Schott*, *Scorpio*, *Bombyx Batryticatus*, *Citri Reticulatae Rericarpium*, *Polygalae Radix*, *WineSalviae Miltiorrhizae Rasix Et Rhizoma*, *Ophiopogonis Radix*, *Cinnabaris*, *amber*. | Resolving phlegm and extinguishing wind, opening the orifices and tranquilizing the mind. Fainting on the ground, phlegm in the throat, epilepsy. | (Cheng, 2006) |
| 69 | Ban Xia Bai Zhu Tianma Tang | Decoction | *Pinellodendri Chinensis Cortex*, *Zingiberis Rhizoma*, *Gastrodiae Rhizom*, *Atractylodis Phizoma*, *Poria*, *Astragalus mongholicus*, *Alismatis Rhizoma*, *Ginseng*, *Odis Macrocephalae Rhizoma*, *Pinelliae Rhizoma*, *Orange peel*. | Tonifying the spleen and stomach, defining deficiency wind and resolving phlegm-dampness. Indications: Weakness of the spleen and stomach, disturbance of deficiency wind, internal obstruction of phlegm dampness. | (Li, 1976) |
| 70 | Shen Fu Tianma Wan | pill | *Ginseng*, *Aconiti Lateralis Radix Praeparata*, *Gastrodiae Rhizom*, *Polygalae Radix*, *Acori Tatarinowii Rhizoma*, *Curcumae Radix*, *Aquilariae Lignum Resinatum*. | Yin eclampsia. Indications: Spitting out the tongue and shaking the head, reversal of coldness in the limbs, after slow fright. | (Gu, 1982) |
| 71 | Chen Xiang Tianma Jian | Decoction | *Aquilariae Lignum Resinatum*, *Aconiti Radix*, *Alpiniae Oxyphyllae Fructus*, *Cyrrhizae Radix Et Rhizoma*, *Angelicae Pubescentis Radix*, *Notopterygii Rhizoma Et Radix*, *Gastrodiae Rhizom*, *Aconiti Lateralis Radix Praeparata*, *Pinelliae Rhizoma*, *Saponshnikoviae Radix*, *Angelicae Sinensis Radix*. | Indications: Paediatric convulsions, dementia, phlegm and saliva congestion. | (Luo, 2021) |
| 72 | Tianma San | processing | *Pinelliae Rhizoma*, *Zingiberis Rhizoma Recens*, *Poria*, *Odis Macrocephalae Rhizoma*, *Cyrrhizae Radix Et Rhizoma*, *Gastrodiae Rhizom*. | Extinguishing wind and resolving phlegm. Indications: acute and slow convulsions in children, salivation in adults with stroke, hemiplegia, difficulty in official speech, unconsciousness. | (Luo, 2021) |
| 73 | Fang Feng Tianma Gao | Plaster | *Saponshnikoviae Radix*, *Gastrodiae Rhizom*, *Ginseng*, *Cyrrhizae Radix Et Rhizoma*, *Bombyx Batryticatus*, *Scorpio*, *Typhonii Rhizoma*, *Cinnabaris*, *Bovis Calculus*, *Moschus*. | Dispelling wind and calming fright. Treating children with typhoid fever and fright. | (Wu, 2011) |
| 74 | Gan Feng Tianma San | Powder | *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Ginseng*, *Saigae Tataricae Cornu*, *Garter Snake*, *Platycladi Semen*, *Ziziphi Spinosae Semen*, *Uncariae Ramulus Cum Uncis*, *Chrysanthemum lavandulifolium*. | Suitable for hepatic stroke. | (You, 1996) |
| 75 | Jia Jian Tianma Tang | Decoction | *Pinelliae Rhizoma*, *Odis Macrocephalae Rhizoma*, *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Alismatis Rhizoma*, *Citri Reticulatae Rericarpium*, *Saponshnikoviae Radix*, *Poria*, *Atractylodis Phizoma*, *Angelicae Dahuricae Radix*, *Ginseng*, *Cyrrhizae Radix Et Rhizoma*. | For numbness of the limbs, lack of appetite. | (Gon, 2007) |
| 76 | Ku Seng Tianma Jiu | Medicinal  liquor | *Dictamnus dasycarpus Turks*, *Gastrodiae Rhizom*, *Sophorae Flavescentis Radix*. | Clearing heat, dispelling wind, detoxifying and healing sores. It's used for treating white flakes all over the body, which are painful when scratched. | (Man and Yi, 2014) |
| 77 | Xing Pi Wan | pill | *Radix Saposhnikoviae Chinese cinnamon*, *Cortex magnoliae officinalis*, *Atractylodes Macrocephala Koidz*, *Scorpion*, *Gastrodiae Rhizom*, *Brimstone*, *Ginseng*. | Indicated for infantile chronic spleen wind, trapped lethargy after vomit, potentially causing seizures. | (Xu, 1959) |
| 78 | Yu Zhen San | Powder | *Arisaema Cum Bile*, *Saponshnikoviae Radix*, *Angelicae Dahuricae Radix*, *Gastrodiae Rhizom*, *Notopterygii Rhizoma Et Radix*, *Aconiti Radix Cocta*. | It expels wind removes phlegm and prevents convulsions and spasms. Prevents convulsions and spasms, indicated for tetanus. | (Chen, 2007) |
| 79 | Yu Rong Wan | pill | *Nardostachyos Radix Et Rhizoma*, *Asari Radix Et Rhizoma*, *Angelicae Dahuricae Radix*, *Saponshnikoviae Radix*, *Schizonepetae HerbaBombyx Batryticatus*, *Gastrodiae Rhizom*, *Notopterygii Rhizoma Et Radix*, *Angelicae Pubescentis Radix*, *Santali Albi Lignum*, *Zanthoxylum*, *Chrysanthemi Flos*. | Indications: Freckles, wine spurs, rough body skin. | (Chen, 2007) |
| 80 | Tianma Su Zhu She Ye | Injection | *Gastrodin*. | Used for vascular neuralgia headache syndrome, neurasthenia syndrome, vestibular neuritis, traumatic brain injury syndrome, dizziness, vertigo, and sudden deafness. | (Zhan et al., 2016) |
| 81 | Tianma Zhui  Feng Gao | Plaster | *Gastrodiae Rhizom*, *Aconiti Kusnezoffii Radix*, *Aconiti Radix*, *Aconiti Radix Cocta*, *Clematidis Radix Et Rhizoma*, *Ephedrea Herba*, *Saponshnikoviae Radix*, *Turpentine*, *Mori Ramulus*, *Zaocys*, *Carthami Flos*, *Olibanum*, *Borntheticum Syntheticum*. | Dispel wind and eliminate dampness, promote blood circulation to remove the meridian obstruction, eliminate cold to stop pain. | (Zhan et al., 2016) |
| 82 | Ren Sen Tian  Ma Yao Jiu | Medicinal  liquor | *Gastrodiae Rhizom*, *Ginseng,Astragali Radix*, *Cyathulae Radix*, *Dioscoreae Nipponicae Rhizoma*, *Carthami Flos*. | Reducing swelling and relieving pain, benefiting Qi and promoting blood circulation. Suitable for all kinds of joint pain, lumbar and leg pain, and numbness of limbs. | (Zhan et al., 2016) |
| 83 | Qiang Li Tianma Du Zhong Wan | Pill, capuse | *Gastrodiae Rhizom, Eucommiae Cortex*, *Angelicae Sinensis Radix*, *Notopterygii Rhizoma Et Radix*, *Angelicae Dahuricae Radix*, *Rehmanniae Radix*, *Cyathulae Radix*, *Visci Herba*, *Aconiti Kusnezoffii Radix Cocta*, *Aconiti Radix Cocta*, *Ligustici Rhizoma Et Radix*, *Scrophulariae Radix*. | Dispelling wind and activating blood circulation, subduing swelling and relieving pain. It's suitable for a series of symptoms caused by stroke. | (Zhan et al., 2016) |
| 84 | Shen Ying Yang Zhen Dan | pill | *Angelicae Sinensis Radix*, *Gastrodiae Rhizom*, *Chuanxiong Rhizoma*, *Notopterygii Rhizoma Et Radix*, *Paeoniae Radix Alba*, *Rehmanniae Radix Praeparata*. | Nourishing the liver and tonifying the kidneys, nourishing the blood and hair, promoting blood circulation and dispelling wind. Indications: Attacking the liver by the four qi, hemiplegia, head spinning and dizziness, and treating post-partum stroke in women. | (Chen, 1174) |
| 85 | Hua Feng Dan | pill | *Notopterygii Rhizoma Et Radix*, *Angelicae Pubescentis Radix*, *Schizonepetae Herba*, *Menthae Haplocalyx Briq*, *Chuanxiong Rhizoma*, *Cicadae Periostracum*, *Saponshnikoviae Radix*, *Uncariae Ramulus Cum Uncis*, *Gastrodiae Rhizom*, *Cyrrhizae Radix Et Rhizoma*. | Quenching wind and suppressing spasms, expelling phlegm and opening the orifices. Used for wind-phlegm obstruction, hemiplegia, facial nerve paralysis, epilepsy, crooked mouth and eyes. | (Li, 2021) |
| 86 | Gou Teng Yin | Decoction | *Uncariae Ramulus Cum Uncis*, *Cicadae Periostracum*, *Saponshnikoviae Radix*, *Ginseng*, *Ephedrea Herba*, *Bombyx Batryticatus*, *Gastrodiae Rhizom*, *Scorpio*, *Glycyrrhizae Radix Et Rhizoma Praeparata Cum Melle*, *Chuanxiong Rhizoma*. | Flat liver quenching wind, ning god eyes. Treating infantile with weak spleen and stomach qi, vomiting and diarrhea, resulting in dizziness and retardation. | (Yu, 2011) |
| 87 | Tianma Wen Dan Tang | Decoction | *Gastrodiae Rhizom*, *Uncariae Ramulus Cum Uncis*, *Pinelliae Rhizoma Praeparatum*, *Citri Reticulatae Pericarpium*, *Roria*, *Atractyzodis Macrocephalae Rhizoma*, *Bambusae Caulis In Taenias*, *Magnoliae Officinalis Cortex*, *Paeoniae Radix Rubra*, *Chuanxiong Rhizoma*, *Amomi Fructus*, *Glycyrrhizae Radix Et Phizoma*. | It's indicated for wind-phlegm, liver-spleen co-regulation, emphasizing drying dampness and resolving phlegm, calming the liver and extinguishing wind. | (Gao et al., 2019) |
| 88 | KCHO-1 | extracts | *Curcuma longa*, *Salvia miltiorrhiza*, *Gastrodia elata*, *Chaenomeles sinensis*, *Polygala tenuifolia*, *Paeonia japonica*, *Glycyrrhiza uralensis*, *Atractylodes japonica*, *processed Aconitum carmichaeli*. | Treatment of neurodegenerative diseases | (Lee et al., 2016) |
| 89 | F1-2 | extracts | *Gastrodia elata*, *Uncaria rhynchophylla*, *Pueraria thomsonii*, *Panax notoginseng*, *Alisma orientale*. | Vasodilatory effect on blood vessels. | (Loh et al., 2017) |
| 90 | Qingda Granules | granule | *Rhynchophylline*, G*astrodin*, B*aicalin*. | Treatment of hypertension, vascular dysfunction, and vascular smooth muscle cell proliferation. | (Wu et al., 2023) |
| 91 | GPCRAC | extracts | *Gastrodia elata Blume*, *Polygala tenuifolia Willd*, *Cistanche deserticola Ma*, *Rehmannia lutinosa (Gaertn.)DC*, *Acorus gramineus Aiton*, *Curcuma longa L*. | Treating Alzheimer's disease. | (Huang et al., 2022a) |
| 92 | 9002A | extracts | *salidroside*, *gastrodin*, *niacinamide*, *umbelliferone*. | Treating Alzheimer's disease. | (Tang et al., 2022) |
| 93 | Mecasin | Decoction | *Curcuma longa*, *Salvia miltio rhiza*, *Gastrodia elata*, *Chaenomeles sinensis*, *Polygala tenuifolia*, *Paeonia japonica*, *Glycyrrhiza uralensis*, *Atractylodes japonica*, *processed Aconitum carmichaeli*. | Anti‑inflammatory effects. | (Wang et al., 2021a) |

**Table S4** Chemical composition of *G.elata***.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Classification** | **No** | **Compound Name** | **Molecular Formula** | **Refs** |
| Monobenzyl compounds | 1 | vanillyl alcohol | C8H10O3 | (Kim et al., 2011) |
|  | 2 | vanillin | C8H8O3 | (Lee et al., 2006) |
|  | 3 | 3,4-dihydroxy benzaldehyd | C7H6O3 | (Zhou et al., 1980) |
|  | 4 | 4-hydroxy-3-methoxybenzoic acid | C8H8O4 | (Shim et al., 2017) |
|  | 5 | 4-hydroxy-3-(4-hydroxybenzyl) benzylmethyl ether | C15H16O3 | (Wang et al., 2012a) |
|  | 6 | 3-hydroxybenzoic acid | C7H6O5 | (Gao Bing, 2013) |
|  | 7 | protocatechuic acid | C7H6O4 | (Gao Bing, 2013) |
|  | 8 | 4-(methoxymenthyl)benzene-1, 2-diol | C8H10O3 | (Dung et al., 2013) |
|  | 9 | p-methoxybenzyl alcohol | C8H10O2 | (Rohmann and Meisel, 1961) |
|  | 10 | gastrodin | C13H18O7 | (Ong et al., 2007) |
|  | 11 | 4-hydroxybenzyl methyl ether | C8H10O2 | (Yang et al., 2007) |
|  | 12 | 4-hydroxybenzyl alcohol | C7H8O | (Choi and Lee, 2006) |
|  | 13 | 4-hydroxyphenyl-β-D-galactopyranoside | C13H18O7 | (Wang et al., 2006) |
|  | 14 | 4-(methoxymethyl) phenyl-1-O-β-D-glucopyranoside | C14H20O7 | (Wang et al., 2012a) |
|  | 15 | 4-hydroxybenzyl ethyl ether | C9H12O2 | (Yang et al., 2007) |
|  | 16 | 4-(β-D-glucopyranosyloxy) benzyl 4-hydroxybenzyl ether | C15H22O7 | (Xu et al., 2019) |
|  | 17 | 4-methoxybenzyl ethyl ether | C10H14O2 | (Zhan and Song, 2010) |
|  | 18 | 4-ethoxybenzyl alcohol | C9H12O2 | (Dung et al., 2013) |
|  | 19 | 4-butoxyphenylmethanol | C11H16O2 | (Rohmann and Meisel, 1961) |
|  | 20 | 4-hydroxy-3-methoxybenzyl alcohol | C7H8O2 | (Jang et al., 2010) |
|  | 21 | 4-methylpenyl-1-O-β-D-glucopyranosde | C13H18O6 | (Huang et al., 2006) |
|  | 22 | 4-hydroxybenzyl aldehyde | C7H6O2 | (Ong et al., 2007) |
|  | 23 | 4-(β-D-Glucopyranosyloxy) benzaldehyde | C13H16O7 | (Wang et al., 2009) |
|  | 24 | 4-hydroxybenzoic acid | C7H6O3 | (Yu et al., 2022) |
|  | 25 | 4-methoxybenzyl alcohol | C7H8O2 | (Dai et al., 2017) |
|  | 26 | 4-hydroxybenzaldehyde | C8H8O2 | (Dai et al., 2017) |
|  | 27 | 4-(ethoxymethyl)-glucopyranosyl-phenol | C15H22O7 | (Ma et al., 2015) |
|  | 28 | 4-O-glucopyranosyl-benzaldehyde | C14H18O7 | (Ma et al., 2015) |
|  | 29 | gastrodin A | C19H28O12 | (Li et al., 2007) |
|  | 30 | syringic acid | C9H10O5 | (Gao Bing, 2013) |
|  | 31 | 3, 5-dimethoxy benzoic acid-4-O-β-D-glucopyranoside | C15H20O10 | (Huang et al., 2006) |
|  | 32 | 4-(β-d-glucopyranosyloxy)benzyl 4-hydroxybenzyl ether | C27H30O9 | (Xu et al., 2019) |
|  | 33 | dactylose A | C12H16O6 | (Wang et al., 2009) |
|  | 34 | p-hydroxybenzyl guanosine | C18H20N5O5 | (Wang et al., 2007) |
|  | 35 | 6'-p-hydroxyanisole gastrodia disaccharides | C19H28O12 | (Li, 2004) |
|  | 36 | 6′-O-acetylgastrodin | C16H22O9 | (Xu et al., 2019) |
|  | 37 | 4-(α-D-glucopyranosyl-(1→6)-β-D-glucopyranosyloxy)benzyl alcohol | C20H30O13 | (Xu et al., 2019) |
|  | 38 | vanilloloside | C14H20O8 | (Yu et al., 2022) |
|  | 39 | 4-(β-D-glucopyranosyl-(1→4)-β-D-glucopyranosyloxy)benzyl alcohol | C20H30O13 | (Xu et al., 2019) |
|  | 40 | 4-(β-D-glucopyranosyl-(1→6)-β-D-glucopyranosyloxy)benzyl alcohol | C20H30O13 | (Xu et al., 2019) |
|  | 41 | p-hydroxybenzyl-b-D-glucoside | C13H18O7 | (Wang et al., 2007) |
|  | 42 | P-ethoxymethyl phenyI-O-β-D-glucoside | C15H22O7 | (Huang et al., 2006) |
|  | 43 | 3-O-(4'-hydroxybenzyl)-β-sitosterol | C34H56O2 | (Yun Choi et al., 1998) |
|  | 44 | 3-((4-hydroxybenzyl) oxy) propane-1,2-diol | C10H14O3 | (Gao et al., 2023) |
|  | 45 | ethyl p-hydroxybenzoate | C9H10O3 | (Gao et al., 2023) |
| Parishins | 46 | Parishin A | C45H56O25 | (Taguchi et al., 1981) |
|  | 47 | Parishin B | C32H40O19 | (Lin et al., 1996) |
|  | 48 | Parishin C | C32H40O19 | (Lin et al., 1996) |
|  | 49 | Parishin D | C20H20O9 | (Yang et al., 2007) |
|  | 50 | Parishin E | C19H24O13 | (Yang et al., 2007) |
|  | 51 | Parishin F | C51H66O30 | (Wang et al., 2012) |
|  | 52 | Parishin G | C19H24O13 | (Wang et al., 2012) |
|  | 53 | Parishin H | C33H42O20 | (Li et al., 2015a) |
|  | 54 | Parishin I | C38H50H24 | (Li et al., 2015a) |
|  | 55 | Parishin J | C20H26O13 | (Li et al., 2015a) |
|  | 56 | Parishin K | C33H42O19 | (Li et al., 2015a) |
|  | 57 | Parishin L | C46H58O26 | (Li et al., 2015a) |
|  | 58 | Parishin M | C33H42O20 | (Li et al., 2015a) |
|  | 59 | parishin N | C21H28O13 | (Li et al., 2015a) |
|  | 60 | Parishin O | C21H28O13 | (Li et al., 2015a) |
|  | 61 | Parishin P | C33H48O23 | (Li et al., 2015a) |
|  | 62 | Parishin Q | C33H48O23 | (Li et al., 2015a) |
|  | 63 | Parishin R | C52H62O26 | (Li et al., 2015a) |
|  | 64 | Parishin S | C52H62O26 | (Li et al., 2015a) |
|  | 65 | Parishin T | C39H46O20 | (Li et al., 2015a) |
|  | 66 | Parishin U | C39H46O20 | (Li et al., 2015a) |
|  | 67 | Parishin V | C38H50O24 | (Li et al., 2015a) |
|  | 68 | Parishin W | C26H30O14 | (Li et al., 2015a) |
|  | 69 | Parishin X | C41H46O20 | (Wang et al., 2018a) |
|  | 70 | Parishin Y | C54H62O26 | (Wang et al., 2018a) |
|  | 71 | Parishin Z | C54H62O26 | (Wang et al., 2018a) |
|  | 72 | derivative obtained by adding two glucoses to parishin A | C57H76O35 | (Ye et al., 2019) |
|  | 73 | pentose derivative of isomer of parishin H | C38H50O24 | (Ye et al., 2019) |
| Aromatic substituted glycosides | 74 | 1-O-(4-hydroxymethylphenoxy)-2-O-trans-cinnamoyl-β-D-glucoside. | C22H24O8 | (Wang et al., 2018) |
|  | 75 | 1-O-(4-hydroxymethylphenoxy)-3-O-trans-cinnamoyl-β-D-glucoside | C22H24O8 | (Wang et al., 2018) |
|  | 76 | 1-O-(4-hydroxymethylphenoxy)-4-O-trans-cinnamoyl-β-D-glucoside. | C22H24O8 | (Wang et al., 2018) |
|  | 77 | 1-O-(4-hydroxymethylphenoxy)-6-O-trans-cinnamoyl-β-D-glucoside | C22H24O8 | (Wang et al., 2018) |
|  | 78 | 2′-O-(4″-hydroxybenzyl) gastrodin. | C20H24O8 | (Xu et al., 2019) |
|  | 79 | 3′-O-(4″-hydroxybenzyl) gastrodin | C20H24O8 | (Xu et al., 2019) |
|  | 80 | 4′-O-(4″-hydroxybenzyl)gastrodin, | C20H24O8 | (Xu et al., 2019) |
|  | 81 | 6′-O-(4″-hydroxybenzyl) gastrodin. | C20H24O8 | (Xu et al., 2019) |
|  | 82 | 2′, 6′-di-O-(p-hydroxybenzyl) gastrodin. | C27H30O9 | (Xu et al., 2019) |
|  | 83 | 2′, 7-di-O-(p-hydroxybenzyl) gastrodin | C27H30O9 | (Xu et al., 2019) |
|  | 84 | 6′, 7-di-O-(p-hydroxybenzyl) gastrodin | C27H30O9 | (Xu et al., 2019) |
|  | 85 | 6′-O-acetylgastrodin | C15H20O8 | (Xu et al., 2019) |
|  | 86 | 4-(α-D-glucopyranosyl-(1 → 6)-β-D-glucopyranosyloxy) benzyl alcohol | C19H28O12 | (Xu et al., 2019) |
|  | 87 | 4-(β-D-glucopyranosyloxy) benzyl-4-hydroxybenzyl ether | C20H24O8 | (Xu et al., 2019) |
|  | 88 | 4-(β-D-glucopyranosyl-(1→6)-β-D-glucopyranosyloxy) benzyl alcohol | C19H28O12 | (Xu et al., 2019) |
|  | 89 | 4-(α-D-glucopyranosyl-(1→4)-β-D-glucopyranosyloxy) benzyl alcohol | C19H28O12 | (Xu et al., 2019) |
|  | 90 | 4-(β-D-glucopyranosyl-(1→3)-β-D-glucopyranosyloxy) benzyl alcohol | C19H28O12 | (Xu et al., 2019) |
|  | 91 | 4-(β-D-glucopyranosyl-(1→4)-β-D-glucopyranosyloxy) benzyl alcohol | C19H28O12 | (Xu et al., 2019) |
|  | 92 | p-methylphenyl-1-O-β-D-glucopyranoside | C21H26O10 | (Huang et al., 2005) |
| polybenzyl ethers | 93 | 4-(4'-hydroxybenzyloxy) benzylmethyl ether | C15H16O3 | (Taguchi et al., 1981) |
|  | 94 | 4-hydroxybenzoxybenzyl alcohol | C14H15O3 | (Zhan and Song, 2010) |
|  | 95 | 4-(4′-(4″-hydroxybenzyloxy) benzyloxy) benzyl ether | C16H18O3 | (Zhou, 1981) |
|  | 96 | gastrodibenzen D | C19H24O4 | (Wang et al., 2021c) |
|  | 97 | 4,4'-dihydroxy-dibenzylether | C14H14O3 | (Taguchi et al., 1981) |
|  | 98 | gastrodeoside | C20H24O8 | (Taguchi et al., 1981) |
|  | 99 | gastropolybenzylol H | C17H20O4 | (Chen et al., 2019) |
|  | 100 | 4-hydroxybenzyl vanillyl ether | C15H16O4 | (Han et al., 2011) |
|  | 101 | gastropolybenzylol I | C16H16O4 | (Chen et al., 2019) |
|  | 102 | 4-(((4-ethoxybenzyl)oxy) methyl)-phenol | C16H18O3 | (Gao et al., 2023) |
|  | 103 | 4-((4-(4-(methoxymethyl) phenoxy] benzyl) oxy) benzyl methyl ether | C23H24O4 | (Han et al., 2011) |
|  | 104 | 4-((4-(4-(4-(Hydroxymethyl) phenoxy) methyl) phenoxy) benzenemethanol | C22H22O4 | (Li et al., 2014) |
|  | 105 | 4-(4'-(4"-Hydroxybenzyloxy) benzyloxy) benzylmethyl ether | C15H16O3 | (Yun Choi et al., 1998) |
|  | 106 | 4-(4′-(4″-hydroxybenzyloxy) benzyloxy) benzyl ether | C23H24O4 | (Zhan and Song, 2010) |
|  | 107 | gastrol A | C21H20O4 | (Zhan et al., 2016) |
|  | 108 | 2′, 7-di-O-(p-hydroxybenzyl) gastrodin. | C27H30O9 | (Xu et al., 2019) |
|  | 109 | 6′, 7-di-O-(p-hydroxybenzyl) gastrodin. | C27H30O9 | (Xu et al., 2019) |
|  | 110 | Bis (4-hydroxybenzyl) ether mono-β-L-galactopyranoside | C19H22O8 | (Farooq et al., 2019) |
|  | 111 | bungein A | C16H18O4 | (Gao et al., 2023) |
| polybenzyls compounds | 112 | gastrodin B | C19H22O7 | (Zhang et al., 2013) |
|  | 113 | 4, 4'-methylenediphenol | C13H12O2 | (Zhou, 1981) |
|  | 114 | 4-(4-hydroxybenzyl) -2-methoxyphenol | C14H14O3 | (Kim et al., 2020; Wang et al., 2012a) |
|  | 115 | 4, 4'-methylenebis(2-methoxyphenol) | C15H16O3 | (Li et al., 2007; Wang et al., 2012a) |
|  | 116 | gastropolybenzylol B | C16H18O3 | (Chen et al., 2019) |
|  | 117 | bis(4-hydroxyphenyl) methane | C13H12O4 | (Dung et al., 2013) |
|  | 118 | 4-(4'-hydroxybenzyl)-2-hydroxymethylphenol | C14H14O3 | (Wang et al., 2021c) |
|  | 119 | 4-hydroxy 3-4-hydroxybenzyl) benzyl methyl ether | C15H16O3 | (Wang et al., 2011) |
|  | 120 | gastropolybenzylol C | C16H18O2 | (Chen et al., 2019) |
|  | 121 | 4-hydroxy-3-(4'-hydroxy-3'-hydroxymethylbenzyl) benzyl alcohol | C15H16O4 | (Wang et al., 2021c) |
|  | 122 | 4-hydroxy-3-(4'-hydroxybenzyl) benzyl alcohol | C14H14O3 | (Hayashi et al., 2002) |
|  | 123 | gastropolybenzylol D | C19H24O3 | (Chen et al., 2019) |
|  | 124 | gastrodibezins A | C17H20O4 | (Wang et al., 2021c) |
|  | 125 | gastrodibezins B | C14H12O4 | (Wang et al., 2021c) |
|  | 126 | 4-hydroxy-3-(4-hydroxybenzyl) benzaldehyde | C14H12O3 | (Yu et al., 2022) |
|  | 127 | gastrotribenzins E | C23H24O4 | (Wang et al., 2021c) |
|  | 128 | gastrol B | C21H20O4 | (Zhang et al., 2013) |
|  | 129 | gastrotribenzins A | C22H22O4 | (Wang et al., 2011) |
|  | 130 | gastropolybenzylol E | C23H24O4 | (Chen et al., 2019a) |
|  | 131 | 4-hydroxy-3-(4′-hydroxy-3′-(4″-hydroxybenzyl) benzyl) benzyl alcohol | C21H20O4 | (Wang et al., 2021c) |
|  | 132 | 4-hydroxy-3,5-di-(4-hydroxybenzy) benzyl alcohol | C21H20O4 | (Wang et al., 2021c) |
|  | 133 | gastrotribenzin B | C22H22O4 | (Wang et al., 2021c) |
|  | 134 | gastrotribenzin C | C23H24O4 | (Yu et al., 2022) |
|  | 135 | 2, 4-bis(4-hydroxybenzyl) phenol | C20H18O3 | (Jung et al., 2007) |
|  | 136 | gastrotribenzins D | C23H24O4 | (Wang et al., 2021c) |
|  | 137 | 2-hydroxy-5-(4′-hydroxy-3′-(4″-hydroxybenzyl) benzyl) benzyl alcohol | C21H20O4 | (Wang et al., 2021c) |
|  | 138 | gastrol | C21H20O4 | (Hayashi et al., 2002) |
|  | 139 | 2, 2′ -methylenebis(6-tert-buty-l 4-methylphenl) | C20H30O2 | (Wang et al., 2003) |
|  | 140 | 2-(4-hydroxy-3-(4-hydroxybenzyl) benzyl)-4-(4-hydroxybenzyl) phenol (20C) | C27H24O4 | (Wang et al., 2011) |
|  | 141 | 2-(4-hydroxy-3-(4-hydroxy-3-(4-hydroxybenzyl)benzyl)benzyl)-4-(methoxymethyl) phenol | C29H28O5 | (Chen et al., 2019a) |
|  | 142 | 4, 4'-methylenebis(2-(4-hydroxybenzyl)phenol) | C27H24O4 | (Wang et al., 2011) |
|  | 143 | 4-hydroxy-3-(4-hydroxy-3-(4-hydroxybenzyl)benzyl) benzyl ethyl ether | C23H32O2 | (Guo et al., 2012) |
|  | 144 | 4-((4-(4-hydroxybenzyl)phenoxy)methyl) phenol | C20H18O3 | (Chen et al., 2019a) |
|  | 145 | gastropolybenzylol F | C30H30O5 | (Chen et al., 2019a) |
|  | 146 | gastropolybenzylol G | C34H30O5 | (Chen et al., 2019) |
|  | 147 | gastrodibezins C | C14H12O4 | (Wang et al., 2021c) |
|  | 148 | gastrotribenzins F | C23H24O4 | (Wang et al., 2021c) |
|  | 149 | 2-hydroxy-3,5-di-(4-hydroxybenzyl) benzyl alcohol | C21H20O4 | (Wang et al., 2021c) |
|  | 150 | 2-hydroxy-5-(2'-hydroxy-5'-(4''-hydroxybenzyl) benzyl) benzyl alcohol | C21H20O4 | (Wang et al., 2021c) |
|  | 151 | 4-hydroxy-3-(4'-hydroxybenzyl) benzaldehyde | C14H12O3 | (Wang et al., 2021c) |
|  | 152 | 3, 3'-dihydroxy-2,6-bis(4-hydroxybenzyl) 5-methoxybibenzyl | C29H28O5 | (Yang et al., 2020) |
| heteroatom aromatics compounds | 153 | (−)-γ-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycine | C17H23N3O7S | (Guo et al., 2015a) |
|  | 154 | s-(4-hydroxybenzyl)-glutathione glucoside | C24H35N3O12S | (Li et al., 2015a) |
|  | 155 | ethyl S-(4-hydroxybenzyl) glutathione | C19H26N3O7S | (Kim et al., 2020) |
|  | 156 | methyl (−)-γ-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycinate | C18H25 N3O7S | (Guo et al., 2015a) |
|  | 157 | [S-(gastrodin)-glutathione](http://s.dic.cool/S/uk7tQWsf) | C23H33N3O12S | (Ye et al., 2019) |
|  | 158 | (− )-γ-L-(N-(4-hydroxybenzyl)) glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycine | C24H29N3O8S | (Guo et al., 2015a) |
|  | 159 | p-hydroxybenzyl-S-(4-hydroxybenzyl)-glutathione | C24H29N3O8S | (Chen et al., 2016) |
|  | 160 | methyl(+)-(S)-2-hydroxy-3-((4'-hydroxybenzyl) thio) propanoate | C11H14O4S | (Guo et al., 2015) |
|  | 161 | ethyl(+)-(S)-2-hydroxy-3-((4'-hydroxybenzyl) thio) propanoate | C12H16O4S | (Guo et al., 2015) |
|  | 162 | (+)-(S)-2-hydroxy-3-((4′-hydroxybenzyl)thio) propanoic acid | C10H12O4S | (Guo et al., 2015) |
|  | 163 | 4-(methylsulfinylmethyl) phenol | C8H10O2S | (Wang et al., 2014a) |
|  | 164 | ethyl 4-hydroxybenzylsulfinate | C9H12O3S | (Su et al., 2023) |
|  | 165 | N-(4′-hydroxybenzyl) pyroglutamate | C12H13NO4 | (Guo et al., 2015) |
|  | 166 | N-(4′-hydroxybenzyl) pyroglutamate ethyl ester | C14H17NO4 | (Guo et al., 2015) |
|  | 167 | (−)-(R,S)-γ-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycine sulfoxide | C18H24N3O8S2- | (Guo et al., 2015a) |
|  | 168 | ethyl(−)-(R,S)-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycine sulfoxide | C20H28N3O8S2 | (Guo et al., 2015a) |
|  | 169 | (−)-(S,S)-γ-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycine sulfoxide | C18H24N3O8S2- | (Guo et al., 2015a) |
|  | 170 | (−)-(S,S)-γ-L-glutamyl-L-(S-(4-hydroxybenzyl)) cysteinylglycinate sulfoxide | C20H28N3O8S2- | (Guo et al., 2015a) |
|  | 171 | 4, 4′-dihydroxybenzyl sulfoxide | C14H14SO3 | (Ma et al., 2015) |
|  | 172 | 4-hydroxy-3-methoxybenzyl-4/-hydroxybenzyl sulfoxide | C15H16O4S | (Su et al., 2023) |
|  | 173 | 4-hydroxybenzyl-S-(4-hydroxybenzyl) glutathione | C24H29N3O8S | (Chen et al., 2016) |
|  | 174 | 2-(4'-hydroxybenzoyl)-3-(4ʺ-hydroxybenzyl) indole | C22H17NO3 | (Yang et al., 2020) |
|  | 175 | 2-(4-hydroxybenzoyl)-3-hydroxyethyl indole | C17H15NO3 | (Yang et al., 2020) |
|  | 176 | N6-(4-hydroxybenzyl) adenine | C17H19N5O5 | (Huang et al., 2007) |
|  | 177 | N2-(p-hydroxybenzyl) guanosine | C17H19N5O6 | (Wang et al., 2009) |
|  | 178 | α-acetylamino-phenylpropyl-α-benzoylamino-phenypionate | C27H28N2O4 | (Xiao et al., 2002) |
|  | 179 | grossamide | C36H36N2O8 | (Wang et al., 2018) |
|  | 180 | (+)-(S)-[N-(4'-hydroxy-3'-(4"-hydroxybenzyl)benzyl)) pyroglutamate | C21H23NO5 | (Guo et al., 2015) |
|  | 181 | 2-(4'-Hydroxybenzoyl)-3-hydroxyethyl indole | C17H15NO3 | (Yang et al., 2020) |
|  | 182 | N6-(3-methoxyl-4-hydroxybenzyl) adenine riboside | C18H22N5O6 | (Shi et al., 2014) |
|  | 183 | cyclo(glycine-L-S-(4′-hydroxybenzyl)cysteine) | C12H14N2O3S | (Guo et al., 2015) |
|  | 184 | (+)-L-(S-(4-hydroxybenzyl)) cysteinylglycine | C12H16N2O4S | (Guo et al., 2015a) |
|  | 185 | N6-(4-hydroxybenzyl) adenine riboside | C17H20N5O5 | (Huang et al., 2007) |
|  | 186 | 7, 8-dimethyl benzopteridine-2, 4-(1H,3H)-dione | C20H15O2N4 | (Zhan and Song, 2010) |
|  | 187 | 4, 4'-dihydroxybenzyl sulfone | C14H14O4S | (Pyo et al., 2004) |
|  | 188 | divanillyl sulfone | C16H18O6S | (Su et al., 2023) |
|  | 189 | bis(4-hydroxybenzyl) sulfide | C14H14O2S | (Huang et al., 2007) |
|  | 190 | bis(4-hydroxybenzy1) disulfide | C14H14O2S2 | (Li et al., 2014) |
|  | 191 | methyl(−)-(R)-2-hydroxy-4-((4′-hydroxybenzyl)thio) butyrate | C11H14O4S | (Guo et al., 2015) |
|  | 192 | gastrodamine | C14H15O3N | (Ma et al., 2015) |
|  | 193 | 4-(hydroxymethyl)-5-nitrobenzene-1,2-diol | C7H7O5N | (Guo et al., 2015) |
|  | 194 | 4-hydroxy-3(4'-hydroxybenzyl) benzyl-4ʺ-hydroxybenzyl sulfoxide | C21H20O4S | (Su et al., 2023) |
|  | 195 | n-trans-feruloyltyra-mine | C18H19NO4 | (Yang et al., 2020) |
|  | 196 | 4-(methylamino) benzyl alcohol | C8H11NO | (Yang et al., 2020) |
|  | 197 | o-benzylhydroxylamine | C7H9NO | (Kong, 2016) |
|  | 198 | n-cis-feruloyltyramine | C18H19NO4 | (Yang et al., 2020) |
|  | 199 | 5-((4-O-b-D-glucopyranosylbenzylsulfide)methyl)-furan-2-carbaldehyde | C19H22O8S | (Li et al., 2015b) |
|  | 200 | (+)-L-(S-(4-hydroxybenzyl)) cysteinylglycine | C12H16N2O3S2 | (Guo et al., 2015a) |
|  | 201 | 4-(p-hydroxybenzyl) asparagine | C11H14N2O4 | (Wang, 2007a) |
|  | 202 | p-hydroxybenzyl tyrosine | C16H17NO4 | (Wang, 2007a) |
|  | 203 | p-hydroxybenzyl pyroglutamic acid | C12H13NO4 | (Wang, 2007a) |
|  | 204 | S-(4-hydroxybenzyl)-glutathione glucoside | C24H35N3O12S | (Wang, 2007a) |
|  | 205 | p-hydroxyphenethyl alcohol | C9H13O2N | (Gao et al., 2023) |
| aromatic furans compounds | 206 | 1-furan-2-yl-2-(4-hydroxyphenyl)-ethanone | C12H10O3 | (Lee et al., 2007) |
|  | 207 | 5-(4-hydroxybenzyloxymethyl)-furan2-carbaldehyde | C13H12O4 | (Lee et al., 2007) |
|  | 208 | 1-furan-2-yl-2-(4-hydroxy-phenyl)-ethane-1,2-dione | C12H8O4 | (Zhan et al., 2016) |
|  | 209 | 5-(4'-(4''-hydroxybenzyl)-3'-hydroxybenzyl)-furan-2-carbal-dehyde | C19H16O4 | (Huang et al., 2015) |
|  | 210 | 5-(4'-(4"-hydroxybenzyl)-30-hydroxybenzyloxyme  Thyl)-furan-2-carbaldehyde | C20H18O5 | (Huang et al., 2015) |
|  | 211 | gastradefurphenol | C32H28O5 | (Zhou et al., 2017a) |
|  | 212 | 5-((4-O-β-D-glucopyranosylbenzyloxy) methyl)-furan-2-carbaldehyde | C19H22O9 | (Li et al., 2015b) |
| other aromatics | 213 | 1,4-benzenediol | C6H6O2 | (Huang et al., 2007) |
|  | 214 | trans-3-phenylacrylic acid | G9H12O2 | (Zhan and Song, 2010) |
|  | 215 | ferulic acid glucoside | C16H20O9 | (Wang, 2007a) |
|  | 216 | 1-(4'-hydroxyphenyl)propan-1,2-dione | C9H8O3 | (Yu et al., 2022) |
|  | 217 | ethyl(+)-(2S)- 2-hydroxy-3-(4-hydroxyphenyl) propanoate | C11H11O4 | (Yu et al., 2022) |
|  | 218 | β-phenylacrylic acid | C9H8O2 | (Zhan and Song, 2010) |
|  | 219 | L-phenyllactic acid | C9H10O3 | (Wang et al., 2012a) |
|  | 220 | dimethyl phthalate | C10H10O4 | (Yu et al., 2022) |
|  | 221 | dibutyl phthalate | C16H22O4 | (Wang et al., 2003) |
|  | 222 | cymbinodin A | C15H10O4 | (S, 2002) |
|  | 223 | gastrodinol | C42H34O8 | (Yang et al., 2020) |
|  | 224 | 2-ethoxy-4-methylphenol | C9H12O2 | (He et al., 2023) |
|  | 225 | dioctyl phthalate | C24H38O4 | (Wang et al., 2014a) |
|  | 226 | 1-isoferuloyl-β-D-glucopyranoside | C16H20O9 | (Yu et al., 2022) |
|  | 227 | 2,4-bis (4-hydroxybenzal) phenol | C20H18O3 | (Hayashi et al., 2002) |
| steroids | 228 | β-sitosterol | C5H7O3N | (Lee et al., 2007) |
|  | 229 | β-sitosterol glucoside | C7H10O7 | (Lee et al., 2007) |
|  | 230 | 3-O-(4'-Hydroxybenzyl)-β-sitosterol | C36H56O2 | (Choi et al., 1998) |
|  | 231 | 4-hydroxybenzyl β-sitosterol ether | C36H56O2 | (Xiao et al., 2002) |
|  | 232 | stigmastane-3β,5α,6β-triol | C29H52O3 | (Zhan and Song, 2010) |
|  | 233 | β-daucosterol | C33H56O6 | (Fen et al., 1979) |
|  | 234 | diosgenin | C27H42O3 | (Wang et al., 2012a) |
|  | 235 | sitosterol | C29H48O | (Xiong et al., 2014) |
|  | 236 | ergostenol | C28H48O | (Xiong et al., 2014) |
|  | 237 | γ-Sitosterol | C29H50 O | (Xiong et al., 2014) |
|  | 238 | Beta-sitosterol | C29H50 O | (Xiong et al., 2014) |
|  | 239 | stimasterol | C29H48O | (Yun Choi et al., 1998) |
|  | 240 | stigmasta-3,5-diene | C29H48 | (Yu et al., 2022) |
| organic acids and esters | 241 | citric acid | C6H8O7 | (Fen et al., 1979) |
|  | 242 | 6-methyl citrate | C28H50O | (Fen et al., 1979) |
|  | 243 | trimethyl citrata | C9H14O7 | (Huang et al., 2007) |
|  | 244 | 1, 5-dimethyl citrate ester | C8H12O7 | (Hao et al., 2000) |
|  | 245 | trimethylcitryl-β-D-galactopyranoside | C15H24O12 | (Choi and Lee, 2006) |
|  | 246 | dimethyl citrate | C9H14O7 | (Kong, 2016) |
|  | 247 | citric acid monoethyl ester | C9H14O7 | (Wang et al., 2009) |
|  | 248 | succinic acid | C4H6O4 | (Zhou et al., 1979) |
|  | 249 | dotriacontanoic acid | C32H64O2 | (Liu et al., 2002) |
|  | 250 | octadecanoic acid | C18H36O2 | (Liu et al., 2002) |
|  | 251 | palmitic acid | C16H32O2 | (Choi et al., 1998) |
|  | 252 | docosanoic acid oxiranylmethyl ester | C25H48O3 | (Zhan et al., 2016) |
|  | 253 | glyceryl monopalmitate | C19H38O4 | (Su et al., 2023) |
|  | 254 | hentriacotanoic acid | C30H60O2 | (Liu et al., 2002) |
|  | 255 | succinate | C6H6O4 | (Zhou et al., 1979) |
|  | 256 | L-pyroglutamic acid | C5H7O3N | (Hao et al., 2000) |
|  | 257 | 1, 5-dimethyl citrate | C8H12O6 | (Hao et al., 2000) |
|  | 258 | trans-3-phenylacrylic acid | C9H8O2 | (Zhan and Song, 2010) |
|  | 259 | benzoic acid | C7H6O2 | (Liu et al., 2002) |
| saccharides and their glycosides | 260 | 5-(hydroxymethyl)-furfural | C6H6O3 | (Ishida and Seri, 1996) |
|  | 261 | 5-(hydroxymethyl)-2-furaldehyde | C6H6O3 | (Huang et al., 2015) |
|  | 262 | D-glucoside | C6H12O6 | (Fen et al., 1979) |
|  | 263 | sucrose | C12H22O11 | (Zhou et al., 1979) |
|  | 264 | methyl-O-β-D-glucopyranoside | C7H14O6 | (Wang et al., 2012a) |
|  | 265 | adenosine glucoside | C17H24O10N4 | (Wang et al., 2007) |
|  | 266 | gastrodin isomer | C13H24O7 | (Wang et al., 2007) |
|  | 267 | 4-(methoxymethyl)  phenyl-1-O-β-D-glucopyranoside | C14H20O7 |  |
|  | 268 | *G. elata* alkali-extracted crude polysaccharide AG*E*W |  | (Qiu et al., 2007) |
|  | 269 | *G. elat*a water-extracted crude polysaccharide WGEW |  | (Qiu et al., 2007) |
|  | 270 | *G. elata* polysaccharides WGEW’s sulfated derivatives WSS25 |  |  |
|  | 271 | *G. elata* polysaccharides WGEW’s sulfated derivatives WSS45 |  | (Tong et al., 2010) |
|  | 272 | *G. elata* Polysaccharides GEP-3 |  | (Huo et al., 2021a) |
|  | 273 | *G. elata* Polysaccharides GEP-1 |  | (Fen et al., 1979) |
|  | 274 | *G. elata* Polysaccharides GEP-4 |  | (Huo et al., 2021a) |
|  | 275 | *G. elata* Bl. polysaccharides GEB40 |  | (Zhan, 2007) |
|  | 276 | *G. elata* Bl. polysaccharides GEB80 |  | (Zhan, 2007) |
|  | 277 | *Gastrodia elata* Bl. *f. glauca S. Chow* polysaccharides WTM-1 |  | (Chen, 2019) |
|  | 278 | *Gastrodia elata* Bl. *f. glauca S. Chow* polysaccharides WTM-2 |  | (Chen, 2019) |
|  | 279 | *Gastrodia elata* Bl. f*. glauca S. Chow* polysaccharides WTM-3 |  | (Chen, 2019) |
|  | 280 | *Gastrodia elata* Bl. *f. glauca S. Chow* polysaccharides WTM-4 |  | (Chen, 2019) |
|  | 281 | *Gastrodia elata* Bl. *f. glauca S. Chow* polysaccharides WTM-5 |  | (Chen, 2019) |
|  | 282 | *Gastrodia elata* Bl. *f. glauca S. Chow* polysaccharides WTM-6 |  | (Chen, 2019) |
|  | 283 | *G. elata* polysaccharide PGE |  | (Zhu et al., 2019) |
|  | 284 | *G. elata* water soluble polysaccharide WTMA |  | (Chen et al., 2011) |
|  | 285 | *G. elata* water-soluble dextran WTMA acid hydrolysis derivative WTMA-AD-O |  | (Chen et al., 2011) |
|  | 286 | *G. elata* water-soluble dextran WTMA acid hydrolysis derivative WTMA-AD-1 |  | (Chen et al., 2011) |
|  | 287 | *G. elata* Water-soluble dextran WTMA enzymatic hydrolysis derivatives WTMA-DE |  | (Chen et al., 2011) |
|  | 288 | *G. elata* Polysaccharides PGEB-3H |  | (Ming et al., 2012a) |
|  | 289 | *G. elata* polysaccharides GEP I |  | (Liu and Luo, 2011) |
|  | 290 | *G. elata* polysaccharides GEP II |  | (Liu and Luo, 2011) |
|  | 291 | *G. elata* polysaccharides GEP I-G |  | (Chen et al., 2018c) |
|  | 292 | *G. elata* polysaccharides GEP II-G |  | (Chen et al., 2018) |
|  | 293 | *G. elata* polysaccharides GEP |  | (Zhou et al., 2017) |
|  | 294 | Sulphated *G. elata* polysaccharides GEPS |  | (Zhou et al., 2017) |
|  | 295 | Sulphated *G. elata* II polysaccharides GEPIIS |  | (Zhou et al., 2017) |
|  | 296 | *G. elata* polysaccharides WGE |  | (Wang et al., 2022) |
|  | 297 | *G. elata* polysaccharides GB I-1 |  | (Zhu et al., 2010) |
|  | 298 | *G. elata* polysaccharides GB I-2 |  | (Wang et al., 2022) |
|  | 299 | *G. elata* polysaccharides GB I-3 |  | (Wang et al., 2022) |
|  | 300 | *G. elata* polysaccharides GB II |  | (Wang et al., 2022) |
|  | 301 | *G. elata* polysaccharides GB III |  | (Wang et al., 2022) |
|  | 302 | *G. elata* polysaccharides GB IV |  | (Wang et al., 2022) |
|  | 303 | *G. elata* polysaccharides GB V |  | (Wang et al., 2022) |
|  | 304 | *G. elata* polysaccharides GPSa |  | (Zhu et al., 2010) |
|  | 305 | *G. elata* water soluble polysaccharide GBP-WI |  | (Li, 2007) |
|  | 306 | *G. elata* water soluble polysaccharide GBP-WII |  | (Li, 2007) |
|  | 307 | *G. elata* alkali soluble polysaccharide GBP-A |  | (Li, 2007) |
|  | 308 | *G. elata* polysaccharides GBP-Ⅰ |  | (Li et al., 2008) |
|  | 309 | *G. elata* polysaccharides GBP-Ⅱ |  | (Li et al., 2008) |
|  | 310 | *G. elata* polysaccharides GE-I |  | (Jin and Tian, 2000) |
|  | 311 | *G. elata* polysaccharides GE-II |  | (Jin and Tian, 2000) |
|  | 312 | *G. elata* polysaccharides GE-III |  | (Jin and Tian, 2000) |
|  | 313 | *G. elata* water soluble polysaccharide WPGB |  | (Ming et al., 2008) |
|  | 314 | WPGB derivatives WPGB-A-H |  | (Ming et al., 2008) |
|  | 315 | WPGB derivatives WPGB-A-L |  | (Ming et al., 2008) |
|  | 316 | *G. elata* polysaccharides TM1 |  | (Liu, 2007) |
|  | 317 | *G. elata* polysaccharides TM2 |  | (Liu, 2007) |
|  | 318 | *G. elata* polysaccharides TM3 |  | (Liu, 2007) |
|  | 319 | *G. elata* polysaccharides PRG1 |  | (Chao, 2013) |
|  | 320 | *G. elata* polysaccharides PRG2 |  | (Chao, 2013) |
|  | 321 | *G. elata* polysaccharides PRG3 |  | (Chao, 2013) |
|  | 322 | *G. elata* polysaccharides PRG4 |  | (Chao, 2013) |
|  | 323 | *G. elata* polysaccharides PRG5 |  | (Chao, 2013) |
|  | 324 | *G. elata* glycoprotein\_x0002\_PGE2-1 |  | (Shi et al., 2007) |
| amino acids and polypeptides | 325 | threonine | C4H9NO3 | (Wang et al., 1994) |
|  | 326 | valine | C5H11NO2 |  |
|  | 327 | methionine | C5H11NO2S |  |
|  | 328 | leucine | C6H13NO2 |  |
|  | 329 | phenylalanine | C9H11NO2 |  |
|  | 330 | lysine | C6H14N2O2 |  |
|  | 331 | isoleucine | C6H13NO2 |  |
|  | 332 | aspartic acid | C4H7NO4 |  |
|  | 333 | serine | C3H7NO3 |  |
|  | 334 | glutamic acid | C5H9NO4 |  |
|  | 335 | proline | C5H9NO2 |  |
|  | 336 | glycine | C2H5NO2 |  |
|  | 337 | alanine | C3H7NO2 |  |
|  | 338 | tyrosine | C9H11NO3 |  |
|  | 339 | histidine | C6H10ClN3O2 |  |
|  | 340 | arginine | C6H14N4O2 |  |
|  | 341 | L-pyroglutamic acid | C5H7NO3 | (Hao et al., 2000) |
| 0ther | 342 | adenosine | C10H13N5O4 | (Wang et al., 2006) |
|  | 343 | uridine | C9H12N2O6 | (Wang et al., 2009) |
|  | 344 | uracil | C4H4N2O2 | (Wang et al., 2009) |
|  | 345 | guanosine | C10H13N5O5 | (Wang et al., 2007) |
|  | 346 | p-hydroxybenzyl adenosine | C17H20N5O5 | (Wang et al., 2007) |
|  | 347 | 5-hydroxymethyl-2-furancarboxaldehyde | C6H6O3 | (Pyo et al., 2004) |
|  | 348 | cirsiumaldehyde | C12H10O5 | (Pyo et al., 2004) |
|  | 349 | adenine | C5H5N5 | (Wang et al., 2009) |
|  | 350 | vitamin B1 | C12H17ClN4OS | (Kim et al., 2000) |
|  | 351 | vitamin B2 | C17H20N4O6 | (Kim et al., 2000) |
|  | 352 | vitamin A | C20H30O | (Kim et al., 2000) |
|  | 353 | vitamin E | C29H50O2 | (Kim et al., 2000) |
|  | 354 | adenosine glucoside | C16H23N5O10 | (Wang, 2007a) |
|  | 355 | gastronucleoside | C17H19N5O6 | (Yu et al., 2022) |
|  | 356 | N-(p-hydroxybenzyl) adenosine | C17H19N5O5 | (Huang et al., 2006) |
|  | 357 | N6-(4-hydroxybenzyl) adenosine | C17H19N5O5 | (Huang et al., 2006) |
|  | 358 | niacin | C6H5NO2 | (Wang et al., 2018a) |
|  | 359 | N2-(p-hydroxybenzyl) guanosine | C17H20N5O6 | (Wang et al., 2009) |
|  | 360 | 4-ethoxymethylphenol | C9H12O2 | (Jeon et al., 2015) |

**Table S5** Volatile components and Trace elements in *G. elata*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number | Compound Name | Molecular Formula | Appearance | Ref |
| 361 | n-Docosane | C22H46 |  | (Guan et al., 2008) |
| 362 | n-Tricosane | C23H48 |  |  |
| 363 | nonacosane | C29H60 |  | (Xiong et al., 2014) |
| 364 | n-Eicosane | C20H42 |  |  |
| 365 | triacontane | C30H62 | Colorless flake crystals | (Han et al., 2018) |
| 366 | hexadecane | C16H34 |  |  |
| 367 | pentadecane | C15H32 | Colorless liquid |  |
| 368 | 2-methyloctadecane | C19H40 |  |  |
| 369 | undecane | C11H24 | Colorless liquid | (Huang and Li, 2018) |
| 370 | tetradecane | C14H30 | Colorless liquid |  |
| 371 | isopentane | C5H12 | Colorless liquid | (Lu, 2016) |
| 372 | decane | C10H22 | Colorless and clear liquid |  |
| 373 | dodecane | C12H26 | Colorless liquid |  |
| 374 | 2-methylundecane | C12H26 |  |  |
| 375 | 3-methyl-dodecane | C13H28 |  |  |
| 376 | tridecane | C13H28 | Colorless liquid |  |
| 377 | heptadecane | C17H36 | Colorless liquid or white solid | (Zhang et al., 2011) |
| 378 | heneicosane | C21H44 | White waxy solid |  |
| 379 | 1-chloro-Octadecane | C18H37Cl | Clear liquid |  |
| 380 | p-cymene | C10H14 |  | (Guan et al., 2008; Guan et al., 2008) |
| 381 | 2, 6, 10-trimethyldodecane | C15H32 | Colorless liquid | (Han et al., 2018) |
| 382 | squalene | C30H50 | Slightly yellow liquid |  |
| 383 | stigmasta-3,5-diene | C29H48 |  | (Xiong et al., 2014) |
| 384 | styrene | C8H8 | Clear and colourless | (Guan et al., 2008; Guan et al., 2008) |
| 385 | α-pinene | C10H16 |  |  |
| 386 | limonene | C10H16 | Pale yellow liquid |  |
| 387 | α-cedrene | C15H24 |  | (Guan et al., 2008) |
| 388 | p-Xylene | C8H10 | Colorless liquid |  |
| 389 | o-xylene | C8H10 | Colorless liquid |  |
| 390 | 1-methoxy-4-methylbenzene | C8H10 |  |  |
| 391 | cyclohexylmethylsilane | C7H16si |  | (Qiu et al., 2019) |
| 392 | nonyl cyclopropane | C12H24 |  | (Huang and Li, 2018) |
| 393 | (E)-5-decen | C11H22 |  |  |
| 394 | naphthalene | C10H8 | White to off-white crystal |  |
| 395 | phenanthrene | C14H10 | White crystals |  |
| 396 | α-Thujene | C10H16 | Pale yellow liquid | (Lu, 2016) |
| 397 | (+)-alpha-Pinene | C10H16 | Clear liquid |  |
| 398 | β-Pinene | C10H16 | Clear and colourless liquid |  |
| 399 | 4-ethyl-2-methylhexane | C9H20 |  |  |
| 400 | α-terpinene | C10H16 | Clear colorless to light yellow |  |
| 401 | limonene | C10H16 | Clear colorless to light yellow |  |
| 402 | p-mentha-1,4-diene | C10H16 | Colourless to pale yellow liquid |  |
| 403 | α-terpinolene | C10H16 | Clear liquid |  |
| 404 | 6-proply-tridecane | C16H34 |  |  |
| 405 | 7-tetradecene | C16H32 | Colorless to Light yellow clear liquid |  |
| 406 | styrene | C8H8 | Colourless and clear | (Sun et al., 2022) |
| 407 | 2, 6, 10, 14-tetramethyl-Hexadecane | C20H42 | Liquid | (Zhang et al., 2011) |
| 408 | 1-(ethenyloxy)-Octadecane | C20H40O |  |  |
| 409 | 2, 6, 10, 14-tetramethyl-Pentadecane | C19H40 |  |  |
| 410 | 11, 20-didecyl-Triacontane | C50H102 |  |  |
| 411 | 6-protoilludene | C15H24 |  | (Li et al., 2020b) |
| 412 | valeraldehyde | C5H10O | Colorless liquid | (Zhang et al., 2021) |
| 413 | propionaldehyde | C3H6O | Colorless liquid |  |
| 414 | 2-methylbutanal | C5H10O | Clear liquid |  |
| 415 | isobutyraldehyde | C4H8O | Clear liquid |  |
| 416 | heptanal | C7H14O | Clear oily liquid | (Guan et al., 2008) |
| 417 | hexadecanal | C16H32O | White to Almost white powder to crystal | (Huang and Li, 2018) |
| 418 | isovaleraldehyde | C5H10O | Colorless transparent liquid | (Lu, 2016) |
| 419 | hexanal | C6H12O | Colourless liquid |  |
| 420 | octanal | C8H16O | Liquids |  |
| 421 | nonanal | C9H18O | Brown liquid |  |
| 422 | pentadecanal | C15H30O |  |  |
| 423 | tridecanal | C13H26O | Clear pale-yellow liquid | (Zhang et al., 2011) |
| 424 | benzaldehyde | C7H6O | Colorless liquid | (Guan et al., 2008; Guan et al., 2008) |
| 425 | phenylacetaldehyde | C8H8O | Colorless to slightly yellow liquid | (Guan et al., 2008) |
| 426 | 3-Phenylpropanal | C9H10O | Colorless transparent liquid |  |
| 427 | (E)-2-Heptenal | C7H12O | Colorless and non-fixed liquid | (Sun et al., 2022) |
| 428 | (2E)-2-Octenal | C8H14O | Colorless to slightly yellowish liquid |  |
| 429 | (E)-2-Pentenal | C5H8O | Colorless transparent liquid |  |
| 430 | trans-2-Hexenal | C6H10O | Clear colorless to yellowish liquid |  |
| 431 | N-methylpyrrole-2-carboxaldehyde | C6H7NO | Colorless-pale pink-brown liquid | (Zhang et al., 2021) |
| 432 | (2E,4E)-deca-2,4-dienal | C10H16O |  | (Guan et al., 2008) |
| 433 | 2-methoxy-4-methyl-benzaldehyde | C8H8O2 |  |  |
| 434 | 5-methyl-2-phenylhex-2-enal | C13H16O |  |  |
| 435 | 3-furaldehyde | C5H4O2 | Colorless to light yellow liquid | (Qiu et al., 2019) |
| 436 | 5-methylfuranal | C6H6O2 |  |  |
| 437 | N-methylpyrrole-2-carboxaldehyde | C6H7NO | Colorless-pale pink-brown liquid |  |
| 438 | (5-formyl-2-furyl)methyl acetate | C8H8O4 | Grayish-white crystalline solid |  |
| 439 | 2E-4Z-decadienal | C10H16O |  |  |
| 440 | 9-hexadecenal | C16H30O |  | (Zhang et al., 2011) |
| 441 | palmitic acid-13C | C16H32O2 |  | (Guan et al., 2008) |
| 442 | margaric acid | C17H34O2 | Greyish white powder | (Xiong et al., 2014) |
| 443 | 1-hexanoic acid | C6H12O2 | Colorless liquid | (Han et al., 2018) |
| 444 | nonanoic acid | C9H18O2 | Clear oily liquid |  |
| 445 | myristic acid | C14H28O2 | White solid |  |
| 446 | pentadecanoic acid | C15H30 O2 | White powder |  |
| 447 | stearic acid-1-13C | C18H36O2 |  |  |
| 448 | 3-methylbutanoic acid | C5H10O2 | Colorless to pale yellow clear liquid | (Sun et al., 2022) |
| 449 | propionic acid | C3H6O2 | Colorless and transparent liquid |  |
| 450 | 1-hexanoic acid | C6H12O2 | Colorless liquid |  |
| 451 | dodecanoic acid | C12H24O2 |  | (Zhang et al., 2011) |
| 452 | 1-methylether hexadecanoic acid | C18H36O2 |  | (Guan et al., 2008) |
| 453 | linolenic acid | C18H32O2 |  | (Xiong et al., 2014) |
| 454 | acetic acid | C2H4O2 |  | (Han et al., 2018) |
| 455 | α - linolenic acid | C16H30 O2 | Colorless and transparent liquid |  |
| 456 | cis-13-octadecenoic acid | C18H32O2 |  |  |
| 457 | trans-13-13-octadecenoic acid | C18H32O2 |  |  |
| 458 | linolenic acid | C18H30O2 | Clear to pale yellow liquid |  |
| 459 | methoxyacetic anhydride | C6H10O5 | Colorless to Light yellow to Light orange. elata clear liquid | (Qiu et al., 2019) |
| 460 | 2-methylidenecyclopropane-1-carboxylic acid | C5H6O2 |  |  |
| 461 | linolelaidic acid | C18H32O2 | Colorless or light yellow liquid | (Huang and Li, 2018) |
| 462 | (E)-5, 9-dihydroxydodec-6- enoic acid | C12H22O4 |  | (Li et al., 2019a) |
| 463 | xerucitrinic acid A | C26H30O8 |  | (Li et al., 2020a) |
| 464 | citrinin | C13H14O5 |  |  |
| 465 | penctrimertone | C27H32O7 | White amorphous powder |  |
| 466 | epiterenoids A | C18H26O6 | Colorless crystals | (Li et al., 2019) |
| 467 | dihydroxyneogrifolic acid | C23H34O6 | Yellow oil | (Duan et al., 2016) |
| 468 | oxalic acid, isobutyl undecyl ester | C2H2O6 |  | (Zhang et al., 2011) |
| 469 | octadecadienoic acid | C18H32O2 |  |  |
| 470 | erucic acid | C22H42O2 | White waxy solids |  |
| 471 | (Z, Z)-9, 12-octadecadienoic acid | C41H76O5 |  |  |
| 472 | 1-hexadecanol | C16H34O | White leafy crystals | (Huang and Li, 2018) |
| 473 | n-heptadecanol | C17H36O |  |  |
| 474 | 1-henicosanol | C21H44O | White powder to powder to lump |  |
| 475 | n-tetracosanol-1 | C24H51 O |  |  |
| 476 | isobutanol | C4H8O |  | (Lu, 2016) |
| 477 | isoamyl alcohol | C5H12O | Colorless liquid |  |
| 478 | 2-ethyl-1-hexanol | C8H18O |  |  |
| 479 | 1-hexanol | C6H14O | Colorless transparent liquid | (Sun et al., 2022) |
| 480 | isopropanol | C5H13O | Colorless liquid |  |
| 481 | butanol | C4H10O | Colorless liquid |  |
| 482 | 1-hexacosanol | C26H54O |  | (Zhang et al., 2011) |
| 483 | trans-9-hexadecen-1-ol | C16H32O |  | (Huang and Li, 2018) |
| 484 | 1-hexen-3-ol | C6H12O | Amber liquid | (Zhang et al., 2021) |
| 485 | 2, 2, 3 - trimethyl -3 -pentanol | C8H18O |  |  |
| 486 | 5-methyl-2-furanmethanol | C6H8O2 |  |  |
| 487 | oct-1-en-3-ol | C8H16O | Clear colorless to light yellow liquid | (Guan et al., 2008; Guan et al., 2008) |
| 488 | terpinine-4-ol | C10H18O | Colorless or light-yellow liquid |  |
| 489 | α-cedrol | C15H26O |  | (Guan et al., 2008) |
| 490 | 3-hydroxybenzyl alcohol | C7H8O2 | Off-white to yellow-brown crystalline powder | (Xiong et al., 2014) |
| 491 | 9- hexadecenol | C16H33 O |  | (Han et al., 2018) |
| 492 | phytol | C20H40 O |  |  |
| 493 | 2,3-butanediol | C4H10O2 |  | (Qiu et al., 2019) |
| 494 | oct-1-en-3-ol | C8H16O | Clear colorless to light yellow liquid | (Sun et al., 2022) |
| 495 | 2-naphthalenemethanol | C11H10O | Crystalline white solid | (Zhang et al., 2011) |
| 496 | 2-isopropyl-5-methyl-1-heptanol | C11H24O |  |  |
| 497 | 6, 9-pentadecadien-1-ol | C15H28O |  |  |
| 498 | 8, 10-hexadecadien-1-ol | C16H30 O |  |  |
| 499 | ethyl palmitate | C18H36O2 | White block | (Guan et al., 2008; Zhang et al., 2021) |
| 500 | ethyl pentadecanoate | C17H34O2 |  | (Zhang et al., 2021) |
| 501 | methyl palmitate | C17H34O2 | Colorless solid | (Guan et al., 2008) |
| 502 | methyl stearate | C19H38O2 | Clear liquid | (Huang and Li, 2018) |
| 503 | stearyl acetate | C20H40O2 |  |  |
| 504 | methyl acetate | C4H8O2 | Methyl acetate | (Lu, 2016) |
| 505 | ethyl acetate | C4H8O2 | Colorless liquid | (Sun et al., 2022) |
| 506 | methyl cinnamate | C10H10O2 | White to pale yellow crystals | (Guan et al., 2008) |
| 507 | ethyl cinnamate | C11H12O2 |  |  |
| 508 | ethyl linoleate | C20H36O2 | Pale yellow liquid | (Zhang et al., 2021) |
| 509 | ethyl oleate | C20H38O2 | Light yellow oily liquid | (Guan et al., 2008) |
| 510 | ethyl 3-phenylpropanoate | C11H14O2 | Colorless liquid |  |
| 511 | methyl linoleate | C19H34O2 | Dark yellow liquid | (Guan et al., 2008) |
| 512 | elaidic acid ethyl ester | C20H38O2 | Liquid | (Qiu et al., 2019) |
| 513 | methyl methoxyacetate | C4H8O3 | Clear and colorless liquid |  |
| 514 | diisooctyl phthalate | C24H38O4 | Colorless liquid | (Huang and Li, 2018) |
| 515 | butyl acrylate | C7H12O2 | Clear colorless liquid | (Sun et al., 2022) |
| 516 | methyl isovalerate | C6H12O2 | Slightly yellow liquid |  |
| 517 | ethyl formate | C3H6O2 | Colorless liquid |  |
| 518 | phomesters A | C13H24O4 | Colorless oil | (Li et al., 2019a) |
| 519 | phomesters B | C15H28O6 | Colorless oil |  |
| 520 | phomesters C | C19H35NO5 | Colorless oil |  |
| 521 | armiloid A | C23H24O6 | Pale brown solid | (Li et al., 2019) |
| 522 | epiterenoids B | C19H28O6 | Colorless solid |  |
| 523 | hexanedioic acid, bis(2-methylpropyl) ester | C14H26O4 | Colorless clear liquid | (Zhang et al., 2011) |
| 524 | benzeneacetic acid, 4-methylcyclohexyl ester | C15H20O2 |  |  |
| 525 | phthalic acid, butyl undecyl ester | C23H36O4 |  |  |
| 526 | isopropyl palmitate | C19H38O2 |  |  |
| 527 | 9-octadecenoic acid, methyl ester, (E)- | C19H34O2 | Colorless transparent liquid |  |
| 528 | 1, 2-benzenedicarboxylic acid, bis(2-methylpropyl) ester | C16H22O4 |  |  |
| 529 | 11-eicosenoic acid, methyl ester | C21H40O2 |  |  |
| 530 | armilliphatics A | C23H27ClO5 | Colorless oil | (Li et al., 2020b) |
| 531 | armilliphatics B | C10H10O4 | White amorphous powder |  |
| 532 | armilliphatics C | C14H20O9 | Light yellow oil |  |
| 533 | 14-hydroxydihydromelleolide | C23H30O7 |  |  |
| 534 | 13-hydroxymelleolide K | C23H27ClO7 |  |  |
| 535 | ethyl succinate | C6H10O4 |  | (Gao et al., 2023) |
| 536 | phenol | C6H6O | Clear crystalline solid | (Zhang et al., 2021) |
| 537 | 2, 4, 5(3H)-pyrimidinetrione, dihydro- | C4H4N2O3 |  |  |
| 538 | 4-ethyl-2-methoxyphenol | C9H12O2 | Clear colorless to light yellow liquid | (Guan et al., 2008) |
| 539 | 4-methylphenol | C7H80 |  | (Guan et al., 2008) |
| 540 | 2, 4-di-tert-butylphenol | C14H22O |  | (Xiong et al., 2014) |
| 541 | 1-monolinolein | C21H38O4 |  |  |
| 542 | γ-tocopherol | C28H48O2 |  |  |
| 543 | maltol | C6H6O3 | White crystal powder | (Qiu et al., 2019) |
| 544 | 4, 4'-dimethylmethylenediphenol | C15H16O2 | White to almost white powder to crystal | (Huang and Li, 2018) |
| 545 | 2-tert-butylphenol | C10H14O | Clear liquid |  |
| 546 | eug. elatanol | C10H12O2 | Colorless to light-yellow liquid |  |
| 547 | phexandiols A | C12H18O3 | Pale-yellow oil | (Li et al., 2019a) |
| 548 | phexandiols B | C12H16O3 | Colorless oil |  |
| 549 | (S)-18, 19-dihydroxyneogrifolin | C22H34O4 |  | (Duan et al., 2016) |
| 550 | neogrifolin | C22H32O2 |  |  |
| 551 | asarone | C16H25ClN4O4 |  | (Huang and Li, 2018) |
| 552 | 2-heptanone | C7H14O2 | Colorless liquid | (Guan et al., 2008) |
| 553 | 3-methyl-2-butanone | C5H10 O | Colorless to light-yellow liquid | (Lu, 2016) |
| 554 | acetone | C3H6O |  | (Sun et al., 2022) |
| 555 | 2-butanone | C4H8O |  |  |
| 556 | 3-nonanone | C9H18O |  |  |
| 557 | 4-methyl-2-pentanone | C6H12O | Clear liquid |  |
| 558 | 3-octen-2-one | C8H14O | Clear colorless to pale yellow liquid | (Guan et al., 2008) |
| 559 | 1-furan-2-yl-2-(4-hydroxyphenyl)- ethanone | C12H10O3 |  | (Zhang et al., 2021) |
| 560 | acetophenone | C8H8O | Clear to pale yellow liquid | (Han et al., 2018) |
| 561 | 2-cyclopentene-1,4-dione | C5H4O2 |  | (Qiu et al., 2019) |
| 562 | 2(5H)-furanone | C4H4O2 | Colorless to light oran *G. elata* to a yellow clear liquid |  |
| 563 | 2, 3-dihydro-3,5-dihydroxy-6-methyl-4(H)-pyran-4-one | C6H8O4 |  |  |
| 564 | epiterenoids C | C17H24O5 | Colorless solid | (Li et al., 2019) |
| 565 | cyclohexyl-3-ethoxybutan-2-one | C12H22O2 |  | (Zhang et al., 2011) |
| 566 | 2-hydroxy-cyclopentadecanone | C15H28O2 |  |  |
| 567 | phomretones A | C12H20O5 | Colorless solid | (Li et al., 2020) |
| 568 | phomretones B | C12H20O4 | Colorless solid |  |
| 569 | phomretones C | C12H20O4 | Colorless solid |  |
| 570 | phomretones D | C12H20O4 | Colorless solid |  |
| 571 | phomretones E | C12H20O3 | Colorless solid |  |
| 572 | phomretones F | C12H18O3 | Colorless solid |  |
| 573 | phenetole | C8H10O | Colorless liquid | (Guan et al., 2008) |
| 574 | dimethyl ether | C2H6O | Colorless gas | (Qiu et al., 2019) |
| 575 | dimethyl disulfide | C2H6S2 | Colorless oily liquid | (Lu, 2016) |
| 576 | 1, 3-dioxane, 4-methyl- | C5H10O2 | Colorless transparent liquid | (Zhang et al., 2021) |
| 577 | 2, 3, 5, 6-tetramethylpyrazine | C8H12N2 |  |  |
| 578 | 2, 4, 5 -trimethyl -1.3- dioxolane | C6H12O2 |  |  |
| 579 | 1, 1-diisobutoxybutane | C16H26O2 |  |  |
| 580 | 2, 3-dimethyl-2, 3-dinitrobutane | C6H12N2O4 | White to off-white crystal |  |
| 581 | 2-amylfuran | C9H12O2 | Colorless to light-yellow liquid | (Guan et al., 2008) |
| 582 | n-hydroxyethylphthalimide | C10H9NO3 | White to off-white powder | (Han et al., 2018) |
| 583 | 2, 5-dihydrothiophene | C4H6S |  | (Qiu et al., 2019) |
| 584 | 2, 5-furandicarbaldehyde | C6H4O3 | White to yellow to oran *G. elata* powder to crystal |  |
| 585 | 2, 6-di-tert-butyl-p-benzoquinone | C14H20O2 | Oran *G. elata* powder | (Huang and Li, 2018) |
| 586 | hexadecanenitrile | C16H31N |  |  |
| 587 | heptadecanenitrile | C17H33N |  |  |
| 588 | tetradecanamide | C14H29NO |  |  |
| 589 | N, N-dimethyldodecanamide | C14H29NO |  |  |
| 590 | （Ｚ)-oleamide | C18H35NO |  |  |
| 591 | 1, 2-dimethoxy-4-methylbenzene | C9H12O2 | Clear liquid | (Guan et al., 2008a) |
| 592 | preaustinoid D | C28H42O7 | Colorless needle crystal | (Duan et al., 2016) |
| 593 | preaustinoid A1 | C26H36O7 |  |  |
| 594 | dehydroaustinol | C27H30O9 |  |  |
| 595 | austin | C27H32O9 |  |  |
| 596 | n-phenyl-Benzenamine | C12H11N |  | (Zhang et al., 2011) |
| 597 | epicoterpenes A | C15H22O3 | Colorless oil | (Li et al., 2020b) |
| 598 | epicoterpenes B | C15H24O4 | Colorless oil |  |
| 599 | epicoterpenes C | C15H22O2 | Colorless oil |  |
| 600 | epicoterpenes D | C15H22O3 | Colorless oil |  |
| 601 | epicoterpenes E | C15H24O4 | White amorphous powder |  |
| 602 | melleolides K | C23H27ClO6 |  |  |
| 603 | acetyl sulfide | C4H6O2S |  | (Gao et al., 2023) |
| 604 | Zn |  |  | (Shao et al., 1994; Yu et al., 2022) |
| 605 | Cu |  |  |  |
| 606 | Fe |  |  |  |
| 607 | Mn |  |  |  |
| 608 | Co |  |  |  |
| 609 | Ni |  |  |  |
| 610 | Mo |  |  |  |
| 611 | Cr |  |  |  |
| 612 | Sr |  |  |  |
| 613 | Ti |  |  |  |
| 614 | V |  |  |  |
| 615 | Sn |  |  |  |
| 616 | Sb |  |  |  |
| 617 | Ba |  |  |  |
| 618 | B |  |  |  |
| 619 | K |  |  |  |
| 620 | Na |  |  |  |
| 621 | Ca |  |  |  |
| 622 | Mg |  |  |  |
| 623 | Al |  |  |  |
| 624 | S |  |  |  |
| 625 | P |  |  |  |
| 626 | As |  |  |  |
| 627 | Hg |  |  |  |
| 628 | Pb |  |  |  |
| 629 | Cb |  |  |  |
| 630 | Se |  |  |  |

**Table S6** Bioactivities of the extracts and compounds from *G. elata*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Pharmacological activities** | **Extract/Compounds** | **assays** | **Testing subjects** | **Dose** | **Description** | ***In vivo/In vitro*** | **Refs** |
| Neuroprotective activities |  |  |  |  |  |  |  |
| Neuron protection and regeneration | BIS and NHBA | Adenosine A2A receptor binding assay, MTT assay | PC12 cell ischemic/hypoxic model | 1×10-10-1×10-5 M | Prevents serum deprivation-induced apoptosis in PC12 cells and binds A2A-R. | *In vitro* | (Huang et al., 2007) |
|  | Methanol extracts of *G. elata* | Western blotting assay, MTT assay, ROS assay | HT22 hippocampal cells with glutamate treatment (5 mM) | 0.1-30 g/ml | Upregulation of the PI3K signaling route is associated with BDNF to exert neuroprotective effects. | *In vitro* | (Han et al., 2014) |
|  | Vanillin, 4-HBAL, 4-HBA | MTT assay | Mongolian gerbils | 40 mg/kg | Prevention of hippocampal CA1 cell death after whole cerebral ischemia. | *In vivo* | (Kim et al., 2007) |
|  | Gastrodine, 5-((4-O-β-D-glucopyranosylbenzyloxy) methyl)-furan-2-carbaldehyde | MTT assay | MPP+- and H2O2-induced PC12 cell | 30 mM | The compound at 30 mM was able to offer maximum protection to PC12 cells from MPP+ toxicity, showing potential neuroprotective activity. | *In vitro* | (Li et al., 2015b) |
|  | Gastrodin | Cell culture, Immunoblot analysis | Six-week-old male C57BL/6 mice and human dopaminergic SH-SY5Y cells treated with MPP+ | 10, 30, 60 mg/kg 1, 5, 25 µM | Regulation of free radicals, Bax/Bcl-2 mRNA, caspase-3 and cleaved poly(ADP-ribose) polymerase (PARP) in MPP+-stressed SH-SY5Y cells; prevented the ROS generation; augmented SOD activity. | *In vivo and vitro* | (Kumar et al., 2013) |
|  | Gastrodin | MTT assay, Western blotting assay, qRT-PCR assay | Glutamate-induced HT22 | 1, 5, 25 μM | Protecting against glutamate-induced apoptosis in HT-22 cells through a novel mechanism of the Nrf2/HO-1 signaling pathway. | *In vitro* | (Jiang et al., 2020) |
|  | Gastrodin | Step-down test assay, Biochemical analysis, Western blotting assay | Male ICR mice | 50, 100 mg/kg /d b.w for to 4 weeks | It can increase the expression levels of NR2A and BDNF and decrease the levels of pro-apoptotic proteins Bax and cleaved caspase-3. | *In vivo* | (Liu et al., 2020) |
|  | Gastrodin | CCK8 assay, RT-qPCR assay, Western blotting assay | Human retinal endothelial cells (HRECs) | 0.1, 1, 10, 100 µM | Regulation of the SIRT1/TLR4/NF-κBp65 signaling pathway inhibits HG-induced apoptosis in HRECs. | *In vitro* | (Zhang et al., 2018) |
|  | Gastrodin | Cytotoxicity assay, RT-PCR assay, Western blotting assay | RSC96 Schwann cells | 0, 50, 100, 200 mM | Inhibition of ERK1/2 phosphorylation and activation of Akt phosphorylation in RSC96 Schwann cells affects SCs metabolism. | *In vitro* | (Zuo et al., 2016) |
|  | Gastrodin | Dual-luciferase reporter gene assays, qRT-PCR assay, Western blotting assay | PNI rat model | 20 mg/kg/d for up to 2 weeks i.p. | Promoting PNI recovery by inhibiting oxidative stress and modulating the miR-497/ BDNF axis. | *In vivo* | (Li et al., 2022a) |
| Antioxidant and Anti-Aging | GEP | DPPH method, ABTS method | DPPH, ABTS | 2.6 mg/mL | The clearance rates of DPPH and ABTS were 67.46% and 62.34%. | *In vitro* | (Hou and Hou, 2018) |
|  | GEP, GEP Ⅱ, GEP, GEP IIs | Spectrophotometric methods, Autoxidation of o-benzotriazoles | DPPH, OH, O2-. N | 0.25, 0.5, 1, 2, 4, 8 mg/mL | It has a good scavenging capacity for DPPH, OH andO2-, and has a strong reducing capacity. | *In vitro* | (Zhou et al., 2017) |
|  | Vanillin, Vanillyl alcohol, 4-HBAL and 4-HBA | Lipid peroxidation assay, Spectrophotometric | Male Mongolian gerbils treated with H2O2 | 500 mg/kg/d for 2 weeks p.o. | Reduced auto-peroxidation and H2O2-induced lipid peroxidation. The order of antioxidant capacity is 4-HBA>vanillyl alcohol>vanillin>4-JBAL. | *In vivo* | (Jung et al., 2007) |
|  | Bis | Antioxidative stress assay, RT-PCR analysis | Yeast strain | 0, 1, 3,10 μM | ROS and MDA levels were significantly lower, CAT and GPx activities were significantly higher, Sir2 gene expression was significantly higher, and Uth1 gene expression was significantly lower. | *In vitro* | (Farooq et al., 2019) |
|  | Parishin A | Antioxidative stress assay, RT-PCR analysis | Yeast strain | 0, 3, 10, 30 μM | (1) Significantly elevated Sir2 gene expression and SOD, significantly reduced ROS and MDA. (2) Reduced expression of TOR signalling pathway targets TORC1, RPS26A and RPL9A. (3) Significantly represses the gene for TORC1 in uth1 mutants. | *In vitro* | (Lin et al., 2016) |
|  | GEP | Enzyme linked immunosorbent assay, Western blotting assay | D-Galactose subacute aging mouse model | 0.4, 2.0, 10.0 mg /kg | SOD, CAT and GSH-Px contents increased, while MDA and 8-OHdG contents as well as Caspase-3, mMAFbX and MuRF-1 mRNA expression and protein levels decreased. | *In vivo* | (Wang and Liu, 2019) |
|  | T1-11, Parishins A, Parishins B | 96-well cellular senescence assay, SRB assay | SH-SY5Y and PC12 cells | 10 µM | Generation of D-gal and BeSO4-induced senescence in SH-SY5Y cells. | *In vitro* | (Hsu et al., 2021) |
|  | T1-11, parishins A, parishins B | Western blotting assay, Morris water maze | D-gal-induced juvenile male C57BL/6 mice | 5, 20, 50 mg/kg for up to 8 weeks p.o. | Modulation of the SH2B2-Akt pathway ameliorates d-gal-induced learning memory cells by increasing hippocampal neurogenesis, inhibiting oxidative stress. | *In vivo* |  |
| Protection of neuro-synaptic plasticity | The supernatant of powdered *G. elate* in water | Cell culture, iTPAQ protocol assay | Human neuronal SH-SY5Y cells | 1 mg/ml per well | Control of chaperone/proteasome degradation pathways (e.g. CALR, FKBP3/4, HSP70/90), regulation with various regenerative modalities, and mobilization of neuroprotective genes (e.g. AIP5) and proteins with abilities related to synaptic plasticity (RTN1/4, NCAM, PACSIN2 and PDLIM1/5) to promote the neurodegenerative signaling cascade response. | *In vitro* | (Ramachandran et al., 2012) |
|  | The supernatant of *G. elata* powder in water | Cell culture, iTPAQ protocol assay | Mouse neuronal N2a cells | 1 mg/ml per well | Inhibits stress-related proteins and mobilizes neuroprotective genes such as Nxn, Dbnl, Mobkl3, Clic4, Mki67 and Bax | *In vivo* | (Manavalan et al., 2012a) |
| Treatment of NDG diseases | Chloroform, methanol or ethanol extracts of *G. elate*, gastrodin, 4HBA | MTT assay, Western blotting assay | β-amyloid induced BV2 mouse microglial cells | 1 mg/mL | Protective effect of *G. elata* against β-amyloid-induced cell death, possibly through enhancement of the protein folding mechanism of the representative protein GRP78 and regulation of CHOP in microglia of BV2 mice. | *In vitro* | (Lee et al., 2012) |
|  | Gastrodin | CCK-8 method, Western blotting assay | (Aβ) (1–42)-induced NPCs | 0, 5, 20, 50 μg/mL | Prevention of (Aβ) (1-42)-induced apoptosis in NPCs. | *In vitro* | (Mishra et al., 2011) |
|  | Gastrodin | Immunohistochemistry assay, | 8 week old male C57BL/6 mice | 60 mg/kg/d for up to15 ds i.p. | Increased number of SOX-2 and DCX-positive cells in the DG area, suggesting that hippocampal neurogenesis can be promoted. | *In vivo* |  |
|  | Gastrodin | Water maze experimental test, ELISA assay, Western blotting assay | Aβ1-42 establishes a rat model of dementia | 1, 5, 25 mg /kg for up to 2 weeks p.o | Activation of the GSK-3β signaling pathway improved Aβ1-42-induced dementia. | *In vivo* | (Feng et al., 2018) |
|  | Gastrodin | Behavior analysis, GFP expression analysis | Strains of C. elegans | 0, 25, 50, 100,  200 μM | Reparation of dopaminergic neurons by modulation of the DAF-2/DAF-16-like insulin signaling pathway. | *In vitro* | (Yan et al., 2019) |
|  | Gastrodin | Lifespan analysis, RT-PCR analysis | Drosophila melanogaster model | 0, 0.08, 0.4, 2 mM p.o. | Protective effects against PD were shown by increasing dopamine levels in the brain and restoring the progressive loss of dopaminergic neurons in the posterior lateral 1 area of the original brain. | *In vivo* | (He et al., 2021) |
|  | Gastrodin, 4-HBA | ARE-GFP reporter assay, Immunohistochemical staining, Immunoblotting assay | Fly model of PD carrying the LRRK2-G2019S mutation | 0.5 g/kg/d for 3 months p.o. | Overactivation of the G2019S protein was prevented via the glial Nrf2/Mad signaling pathway. | *In vivo* | (Lin et al., 2021) |
|  | 20C | MTT assay | Extracellular α-Syn aggregates (40 μM) model. Chemical agent rotenone (4.0 mM) and serum free induced cellular model. | 2.5 μM-40 μM | neural cells with 20C can reduce the amounts of α-synuclein inclusions significantly(Peng et al., 2023) | *In vitro* | Peng et al., 2023 |
|  | 20C | Pole, beam walking and rotating rod test etc. Immunofluorescence assay | A53T α-Syn transgenic mice | 50 mg/kg | Significantly reduced toxic alpha-synuclein levels and enhanced functional connectivity between SNc and PD-related brain regions in A53 T alpha-Syn transgenic mice. | *In vivo* |  |
|  | Gastridin | HE staining assay | B6-hHTT130-N transgenic mice | 100 mg/kg. p.o | Increased grip strength and attenuated mHtt aggregates in B6-hHTT130-N transgenic mice. | *In vivo* | Sun et al., 2024 |
|  | Vanillyl alcohol | Cell Culture, Immunoblot analysis for cleaved PARP | MN9D dopaminergic cells treated with MPP+ | 10, 100, 200 µg/mL | Reduced elevated levels of (ROS, reduced Bax/Bcl-2 ratio and poly (ADP-ribose) polymerase protein hydrolysis. | *In vitro* | (Chen et al., 2008) |
|  | 70% MeOH extracts of *G. elata* | MTT assay, Western blotting assay. Proteasome activity assay | Rat PCl2 cells | 100 μg/ml | Inhibition of mutant Htt aggregation by targeting A2A-R via a PKA-dependent pathway. | *In vitro* | (Huang et al., 2011) |
|  | The supernatant of *G. elata* powder in water | iTPAQ protocol assay, LC-MS/MS analysis, SDS-PAGE analysis Western blotting assay | One-year-old male Wistar Kyoto rat's brain tissue | 2.5 g/kg/d for 3 months p.o. | Down-regulation of Gnao1 and Dctn2 and other proteins associated with neuronal growth cone control and synaptic activity. | *In vivo* | (Manavalan et al., 2012) |
| Anti-anxiety and antidepressant activities | Aqueous extracts of *G. elata* | EPM test | EPM in male ICR mice | 50, 100, 200, 400 mg/kg p.o. | Increased time to EPM open arm and percentage of arms. | *In vivo* | (Jung et al., 2006) |
|  | 4-HA, 4-HBA | EPM test | The same as above | 5, 10, 25, 50, 100 mg/kg i.p. | The same as above. | *In vivo* |  |
|  | Parishin C | SIT, SPT, TST and FST | CSDS mouse model | 4, 8 mg/kg p.o | normalization of neurotransmitter and corticosterone levels, inhibition of NLRP3 inflammasome activation | *In vivo* | Jiang et al., 2024 |
|  | *G. elata* extracts | TUNEL , MTT and EdU assay | PC12 cells | 15, 30, 45 μg/mL. | *G. elata* inhibits RTN4R and apoptosis-related targets and improves PC12 cell survival. | *In vitro* | Wang et al., 2022 |
|  | *G. elata* extracts | Immunofluorescence and Western blot assay | Zebrafish model | 25, 50, 100 120,mg/L. treated for 7 consecutive days. P.o | Suppresses the expression of RTN4R-related genes and apoptosis-related genes. | *In vivo* |  |
|  | 75% ethanol extracts of *G. elata* | Forced swimming, Tail suspending and open-field tests | Behavioral model of the male Kunming mouse | 100, 200, 300 mg/kg p.o. | Reduced immobility time for FST and TST. | *In vitro* | (Zhou et al., 2006) |
|  | Aqueous extracts of *G. elata* | Forced swimming test | 6 weeks old male SD rats | 0.5, 1.0 g/kg p.o. | Regulation of serotonergic and dopaminergic systems. | *In vivo* | (Chen et al., 2009) |
|  | 4-HBA, Gastrodin | FST, Open filed test, Western blotting assay | Male SD rats | 100 mg/kg bw | Decreased FST immobility time, decreased hippocampal 5-HT turnover, and decreased DA turnover in the frontal cortex, hippocampus and amygdala. Decreased turnover of DA in the frontal cortex, hippocampus and amygdala. | *In vivo* | (Chen et al., 2016a) |
|  | Aqueous extracts of *G. elata* | Social interactional test, Western blotting assay | Male C57BL/6 mice | 250, 500, 1000 mg/kg for up to 24 ds p.o. | CSDS-induced depressive-like behavior through activation of the BDNF/CREB/Akt pathway and elevation of stress corticosterone. | *In vivo* | (Huang et al., 2021) |
|  | Gastrodin | Sugar water preference experiment, Forced Swimming test | Male SD rats | 50, 100, 200 mg/kg for up to two weeks i.p. | Reduced FST immobility time, and improved sucrose preference (pleasure deficit). Improved GFAP and BDNF protein expression in the hippocampus. | *In vivo* | (Zhang et al., 2014) |
|  | Gastrodin | WST-1 and Western blotting assay | Astrocytes | 20 µg/mL | Both ERK1/2 phosphorylation levels and BDNF protein levels were able to be significantly elevated. | *In vitro* |  |
|  | Gastrodin | Forced Swimming test, Immunohistochemical analyses | Adult male SD rats | 20, 50, 100 mg/kg for up to 2 weeks i.p. | Increased hippocampal NE concentration and tyrosine hydroxylase expression in the blue-spot area. Attenuated SPS-induced hypothalamic neuropeptide Y and hippocampal brain-derived neurotrophic factor mRNA expression. | *In vivo* | (Lee et al., 2016) |
|  | Fermented *G. elata* | SPT assay, OFT assay, TST assay | CUMS-induced mice | 400, 800,1200 mg/kg/d for up to 3 weeks p.o. | Alleviate the depression state in CUMS-induced mice by modulating the BDNF/NMDAR pathway. | *In vivo* | (Gao et al., 2023) |
|  | GEP | CCK-8 method, DAPI staining assay, Western blotting assay | CORT-induced PC12 cells | 250, 500, 1000 µg/ml | Neuroprotective effect on CORT-induced apoptosis in PC12 cells by inhibiting endoplasmic reticulum stress-mediated pathways | *In vitro* | (Zhou et al., 2018) |
| Sedative and  hypnotic activities | NHBA | Cell culture, Binding assays, Cyclic AMP accumulation assay, Behavioral Analyses, Statistical analysis | Adult male ICR mice treated with  sodium pentobarbital | 0.2, 1, 5 mg/kg i.p.. | Demonstrated significant sedative and hypnotic effects by increasing sleep duration and activating sleep centers in the anterior hypothalamus of mice. | *in vivo* | (Zhang et al., 2012) |
|  | B2 | HPLC-ECD assay, Electroencephalogram (EEG) assay | Male ICR mice | 1, 5 mg/kg i.p. | Significantly reduced sleep latency and increased NREM sleep time. | *In vivo* | (Shi et al., 2014) |
|  | 4-hydroxybenzyl alcohol 3-furancarboxylic acid diester(2FHBA) | Locomotor activity test (SLT) assay, Pentobarbital-induced sleep test assay | Mouse insomnia model | 5, 10, 20, 50 mg/kg i.p. | May exert strong sedative-hypnotic effects through serotonergic and GABAergic systems. | *in vivo* | (Zhu et al., 2018) |
|  | Gastrodin | Morris water maze assay, Western blotting assay | SPF-grade adult male SD rats | 100, 150 mg/kg for up to a week p.o. | Significantly improves sleep disorders caused by REM sleep deprivation. | *in vivo* | (Liu et al., 2023) |
| Antiepileptic and anticonvulsive activities | Aqueous extracts of G. elata | Western blotting assay | Male SD rats–treated with KA | 0.5, 1.0 g/kg/d for 2 weeks | Regulated the AP-1 expression via the JNK signaling pathway. | *In vivo* | (Hsieh et al., 2007) |
|  | Water extract of *G. elata* | Immunohistochemistry staining assay | Pilocarpine-induced SE model | Continuous administration for 14d. | mTOR reduction and astrogliosis attenuation. | *In vivo* | Yip et al., 2020 |
|  | 4-HBA | Anticonvulsant activity assay | Male SD rats–treated with PTZ | 500 mg/kg p.o. | Increases the contents of GABA in the brain and inhibits recovery time and severity. | *In vivo* | (Ha et al., 2000) |
|  | Gastrodin | Spectrophotometry assay, qPCR analysis | PTZ induced zebrafish | 600, 800, 1000 µM | Increased c-fos expression and seizure latency. | *in vivo* | (Jin et al., 2018) |
|  | Gastrodin | Western blotting assay, Immunofluorescence assay | PTZ-induced seizure model in C57BL/6 adult male mice | 50, 100, 200 mg/kg | Inhibits mitogen-activated protein kinase and lowers levels of tumor necrosis factor-alpha and pro-inflammatory cytokine interleukin-1b. | *In vivo* | (Chen et al., 2017a) |
|  | Gastrodin | EEG/EMG Recordings assay, Immunohistochemistry assay | Male adult SD rats | 10 mM i.p. | Inhibit Nav1.6 sodium currents. | *In vivo* | (Shao et al., 2017) |
|  | *G. elata* extract | Chromatography-tandem mass spectrometry assay, multiple microdialysis assay | Male SD rats | 1, 3 g/kg/d for 5 ds | Able to significantly increase VPA levels in the brain. | *In vivo* | (Yang et al., 2021) |
| Anti-inflammatory and analgesic effects | 99.0% ethanol extracts of *G. elata* | Real-time qRT-PCR assay, Western blotting assay | Human umbilical vein endothelial cells | 1, 10, 50 µg/ml | Inhibition of oxidative stress and NF-κB activation in human umbilical vein endothelial cells (HUVEC). | *In vivo* | (Hwang et al., 2009) |
|  | Water extract of *G.elata* | Histology assay, immunohistochemistry assay | SD rats with TBI | 505, 1515 mg/kg for 1 week | Reduces levels of the pro-inflammatory cytokines interleukin-6 and TNF-α. | *In vivo* | (Ng et al., 2016) |
|  | 20C | MTT assay, Immunofluorescence analysis, Western blotting assay | LPS-activated BV-2 cells | 0.1, 1, 10 μmol/L | Significantly inhibited the levels of TLR4, Akt and mTOR. | *In vitro* | (Shao et al., 2018) |
|  | P-methoxybenzyl alcohol | ELISA kit assay, Flow cytometry assay, Western blotting assay | LPS-activated BV-3 cells | 0.01, 0.1, 1, 10, 100 μM | Able to significantly down-regulate the expression of M1 marker CD16/32 and up-regulate the expression of M2 marker CD206. Inhibited NF-κB activation and JNK phosphorylation. | *In vitro* | (Xiang et al., 2018) |
|  | Gastrodin | Quantitative PCR assay, Western blotting assay | Vincristine-induced DRG neurons in male SD rats | 30, 100, 200 µM | Significantly reduce the overexpression of NaV1.7 and NaV1.8 on DRG neurons | *In vitro* | (Wang et al., 2021b) |
|  | Gastrodin | Behavioral testing assay, Intact DRG Preparation assay | Rats treated with STZ | 5, 10, 20 mg/kg intraperitoneal injection | Causes a significant reduction in INaT and activates potassium currents | *In vivo* | (Sun et al., 2012) |
|  | Gastrodin | qRT-PCR assay | Spinal cord injured adult male SD rats | 100, 200 mg/kg/d for 5 ds i.p. | Decreases TNF-α and IL-1β | *In vivo* | (Du et al., 2016) |
|  | 95% ethanol extract of *G.elata* | MTT assay, qRT-PCR assay, Western blotting assay | TNF-α-induced RA-FLS | 1, 5, 10, 20 mg/ml | It not only significantly reduced the production of IL-6 and IL-8 in cells, but also inhibited the expression of p-p65, MMP-3 and MMP-13 as well as the degradation of IkBa. | *In vitro* | (Li et al., 2017) |
| Antipsychotic activities | The supernatant of *G. elata* in 0.5% carboxymethylcellulose | Forced swimming tests, social interaction tests | Male C57BL/6J mice or male ICR mice- treated with Phencyclidine | 500, 1000 mg/kg/d p.o. | 5-HT1A activation in mice. | *In vivo* | (Shin et al., 2011) |
|  | Parishin C | Forced swimming tests, Social interaction tests, GTP-γS binding assay | Male C57BL/6J mice or male ICR mice | 25, 50, 100 mg/kg/d i.p. | Activates 5-HT1A and has a high affinity for its receptor. | *In vivo* | (Shin et al., 2010) |
| Anti-vertigo activities | GEP | The Labyrinth assay, Platform Jumping assay | Male mice | 50, 10, 200 mg/kg | It's effective in reducing the time to escape the electric shock in the vertigo model mice. | *In vivo* | (Yu et al., 2006) |
|  | Gastrodin injection | Treatment Efficacy Rate assay, Cerebral blood flow parameters assay | Patients with acute dizziness | 0.1 g/kg/d for 2 weeks i.p. | It's useful for treating acute vertigo. | *In vivo* | (Zhang and Xu, 2023) |
| Improvement of memory activities | The water-soluble polysaccharide of *G. elata* | Morris Water Maze assay, Colorimetric method | Mouse memory damage model | 100, 200, 400 mg/kg | Elevates ACh levels and inhibits MDA production. | *In vivo* | (Ming et al., 2010) |
|  | Parishin C | Whole-cell patch clamp recordings assay | Aβ1-42 oligomer-induced LTP male Wistar rats’ model | 20 mg/kg i.p. or 10 μmol/L i.c.v. | The protective effect against soluble Aβ1-42 oligomer-induced LTP damage may be related to NMDA receptors. | *In vivo* | (Liu et al., 2016b) |
|  | 4-HBA | Passive avoidance task assessment, Fluorescence radioimmunoassay kit assay | CXM-induced male SD rats | 5 mg/kg i.g. | Amelioration of CXM-induced memory deficits in rats by activation of adrenaline. | *In vivo* | (Wu et al., 2016) |
|  | 4-HBA | Morris water maze, IL-1β and TNF-α assay, Western blotting assay | Two-month-old male ICR mice | 5, 15 mg/kg/d for 18 ds p.o. | Not only prevented the decrease in BDNF and GDNF mRNA and protein levels in A42 oligomers-treated mice but also prevented the increase in TNF-α and IL-1 expression levels in A42-treated mice. | *In vivo* | (Ding et al., 2019) |
|  | Gastrodin | Morris water maze tests assay, Flow cytometry assay, Western blotting assay | Male SD rat bilateral common carotid artery occlusion model | 15, 30, 60 mg/kg for 4 weeks p.o. | Amelioration of cognitive deficits by reducing Aβ deposition, excessive autophagy and apoptosis and modulating the P38 MAPK signaling pathway. | *In vivo* | (Liu et al., 2018) |
|  | Fresh 60% ethanol extract of *G. elata* | OLRT and NORT assay, Morris water maze test assay | CRS-induced ICR mice | 0.5, 1 g/kg p.o. | Improvement in spontaneous non-spatial memory and short-term spatial, as well as long-term spatial memory and punitive non-spatial memory | *In vivo* | (Huang et al., 2022) |
|  | Fresh 60% ethanol extract of *G. elata* | ELISA kits assay, Western blotting assay | The hippocampus in the ICR mouse brain | 0.5, 1 g/kg | Significantly inhibited CRS-induced BAX, Drp1 and CytC activation as well as levels of TNF-α and IL-1β in the hippocampus and increased levels of AKT, p-AKT, CREB and p-CREB. | *In vitro* |  |
|  | *G. elata* power+Huperzine A (Hup) | NORT assay, Morris water maze test assay, Western blotting assay | Simulated weightlessness-induced ICR male mice | 1. *elata* (0.5, 1 g/kg/d)+Hup (0.1 mg/kg/d) i.g. | Significantly elevated BDNF, P-AKT/AKT, SYN, and PSD95 protein expression in hippocampal tissue. | *In vivo* | (Chen et al., 2022) |
| Cardiovascular and cerebrovascular system |  |  |  |  |  |  |  |
| Anticoagulant and antithrombotic activities | 4,4'-Dihydroxy-dibenzylether | Turbidimetric method | Epinephrine-induced platelets in rats | IC50=3 µM | The same as above. | *In vitro* |  |
|  | PGE2-1 | Glass method, tail-cutting method | Male Kunming mice and Wistar rats | 10, 20, 40 and 30, 60, 120 mg/kg intraperitoneal injection | Remarkably prolonged CT and BT increased bleeding capacity. | *In vivo and vitro* | (Shi et al., 2007) |
|  | Gastrodin | QCM biosensor analysis, Anticoagulant animal experiments, Molecular modeling | Male Wistar rats | 7.5, 15, 30 mg / kg i.p. | It was able to significantly prolong CT and reduce FG content in rats but had no significant effect on activated KPTT and PT. | *In vivo* | (Liu et al., 2006) |
|  | *G. elata* water extract | Immunoblot analysis, Energy Expenditure analysis | 7-week-old male Sprague-Dawley rats-ORX | 0.3%, 1% *G. elate* o.p. | Completely normalized the time to arterial thrombosis and blood flow in ORX rats, thereby improving impaired blood flow. | *In vivo* | (Kim et al., 2017) |
| Anti-cerebral-vascular diseases activities | Gastrodin | Morris water maze assay, ELISA assay, Western blotting assay | BCCAO model in male C57BL/6J mice | 50, 100 mg/kg/d for to 14 ds p.o. | Stimulation of hippocampal neurogenesis, inhibition of PDE9, activation of cGMP-PKG. | *In vivo* | (Xiao et al., 2021) |
|  | Gastrodin | CCK-8 assay, BrdU immunoblot presence staining assay, Western blotting assay | OGD/R-induced primary hippocampal NSCs | 0.01, 0.1, 1 μmol/L | Improved cell viability and significantly promoted proliferation of OGD/R-induced primary hippocampal NSCs. and further reduced PDE9 activity and upregulated cGMP-PKG levels. | *In vitro* |  |
|  | Gastrodin | RT‑qPCR assay, Western blotting assay | Brain I/R injury model in male SD rats | 15, 30, 60 mg/kg for one week p.o. | The ameliorative effect on cerebral ischemia was demonstrated by inhibiting the I/R-induced up-regulation of the inflammatory cytokine IL-1β, as well as the expression of pro-oxidant enzymes COX-2 and iNOS in the ischaemic brain. | *In vivo* | (Liu et al., 2016) |
|  | Phenolic components of *G.elata* | Lactate dehydrogenase assay, Western blotting assay | Human primary astrocyte HA-1800 and SH-SY5Y cells | 15, 25, 50 μg/ml | Ability to activate Nrf2 in brain cells to reduce H2O2-induced LDH release and upregulate HO-1, NQO-1 and BDNF expression. | *In vitro* | (Shi et al., 2018) |
|  | 4-HBA | Cell culture, RT-PCR analysis | Female SD rats MCAO model | 25 mg/kg p.o. | Regulation of cellular protective genes such as Nrf2 and PDI and neurotrophic factors. | *In vivo and vitro* | (Kam et al., 2011) |
|  | 4-HBA | TTC staining assay, TUNEL assay, Histological analysis Immunohistochemistry assay | Seven-week-old male SD rats | 2.4 mg/ml p.o. | Significantly reduced hippocampal and cortical neuronal cell necrosis, TNF-a and TUNEL-positive cell expression. | *In vivo* | (Seok et al., 2019) |
|  | 4-HBA | MTT assay, Immunoblot analysis, Cyclic enzymatic assay | MCAO stroke model in male SD rats | 20 mg/kg i.p. | Protects neurons and astrocytes from the toxic effects of Zn2+ by inhibiting the induction of PARP-1 and p67 NADPH oxidase subunits. | *In vivo* | (Luo et al., 2018) |
|  | Gastrodin, 4-HBA | Morris water maze test assay, Passive avoidance test assay, Immunohistochemistry assay | Adult male SD rat VD model | 25, 50 mg/kg for up to 4 weeks i.g. | Ameliorates disorders of energy metabolism in rat brain tissue by improving learning memory capacity and neuronal damage, reducing Tau protein phosphorylation and Aβ deposition in brain tissue. | *In vivo* | (Wu et al., 2023a) |
|  | P-hydroxy benzaldehyde | Neurobehavioral tests assay, Immunofluorescence staining assay, Western blotting assay | tMCAO model in male SD rats | 20 mg/kg p.o. | Balancing reactive glial/astrocyte-to-neuron transition and promoting angiogenesis. | *In vivo* | (Yuan et al., 2022) |
|  | 3,4‑Dihydroxybenzaldehyde | TUNEL staining assay, Western blotting assay | Male-specific pathogen-free SD rats | 10 mg/kg for one week p.o. | Up-regulation of OGT, a regulatory enzyme of UDP-GlcNAc, neuronal apoptosis is inhibited, and OGT could be a potential therapeutic target for brain I/R injury. | *In vivo* | (Luo et al., 2023) |
|  | 3,4-Dihydroxybenzaldehyde | Histological staining assay, Immunohistochemistry analysis, qRT-PCR assay | Male SD rat model of middle cerebral artery occlusion/reperfusion | 10 mg/kg p.o. | Significantly decreased infarct volume. | *In vivo* | (Li et al., 2020c) |
|  | 3,4-Dihydroxybenzaldehyde | MTT assay, ELISA assay, Western blotting assay | Lipopolysaccharide-treated BV2 microglial cells | 0.01, 0.1, 1 μM | Inhibition of MAPK and NF-κB activation. | *In vivo* |  |
|  | Parishin C | TCC staining assay, RT-qPCR assay | Male Wistar rats | 25, 50, 100 mg/kg/d for 3 weeks, i.g. | Reduction of oxidative stress and inflammatory response ameliorates brain tissue damage in rat cerebral ischaemia. | *In vivo* | (Wang et al., 2021) |
|  | GEP | Y-shaped labyrinth, TUNEL  assay, RT-PCR assay | The same as above. | 300 mg/kg | Inhibits apoptosis and Bax expression and promotes Bcl-2 expression in neuronal cells. | *In vivo* | (Wang et al., 2019) |
|  | GEP | Nissl staining, SABC assay | CI rats | 100 mg/kg | It promotes BDNF, SCF and VEGF protein expression in the basal nucleus of Meynert and the PVN of the hypothalamus in rats. | *In vivo* | (Liu et al., 2016a) |
|  | Water extracts of *G. elata* | ELISA assay, TTC staining assay, UHPLC-OE-MS assay | Male SD rat CIRI model. | 8.1 g/kg for 8 and 14 ds p.o. | It can effectively reduce the area of brain necrosis, the volume of cerebral infarction and the content of inflammatory factors and regulate the intestinal flora in CIRI rats. | *In vivo* | (Ding et al., 2022) |
| Lipid-lowering effects | Aqueous extracts of *G. elata* | Oral glucose tolerance test, Immunoblot analysis | HFD male SD rats | 0.3, 1 g/d for up to 8 weeks p.o. | Reduces fat accumulation in adipocytes by activating fat oxidation and enhancing leptin signaling pathways. | *In vivo* | (Park et al., 2010) |
|  | Aqueous extracts of *G. elata* | Western blotting assay, Glucose tolerance testing, Insulin tolerance testing | Induced obese T2D mice using HFD | 200 mg/kg for up to 12 weeks p.o. | Altered serum bile acid concentration and gut microbiota. Increased GLUT4 expression in WAT. | *In vivo* | (Wang et al., 2022a) |
|  | PGEB-3H | Animal test | Rats | 100, 200, 400 mg/kg/d p.o. | Increase in HDL-C content and decrease in LDL-C content at moderate doses. | *In vivo* | (Ming et al., 2012b) |
| Anti-AS activities | Ethanol extract of *G. elate* | real-time RT-qPCR assay, Gelatin zymography, MTT assay | Tumor necrosis factor-induced endothelial cells | 1–50 µg/ml | TNF -a-induced reduction in MMP-2/-9 mRNA expression levels | *In vitro* | (Lee et al., 2009) |
|  | Gastrodin | WST assay, BrdU incorporation assay, Western blotting assay | 8-week-old C57BL/6 mice, VSMC isolated from rat aorta | 150 mg/kg/d for 2 weeks p.o., 50-200 µg/ml | PDGF-BB-induced VSMC proliferation in vitro and injury-induced neointimal formation in vivo were attenuated. | *In vivo and vitro* | (Zhu et al., 2012) |
|  | *G. elat*e extract and gastrodin | UHPLC-QTOF-MS analysis, Western blotting assay | Male C57BL/6J mice | 50, 100, 200 mg/kg/d for 20 weeks p.o | Increasing the number of probiotics reduces the bacteria that cause fat push-ups and lowers peripheral blood concentrations of TC and LDL-C as well as LPS entering the circulation. | *In vivo* | (Liu et al., 2021) |
|  | Gastrodin | RT-PCR analysis, Immunofluorescence analysis, Western blotting assay | A model of foam cell formation induced by treatment of mouse macrophages with ox-LDL | 20 μmol/L | Activation of AMPK and FoxO1 phosphorylation and nuclear translocation leads to increased expression of TFEB. | *In vitro* | (Tao et al., 2021) |
|  | 95% ethanol extract of *G. elata* | Gray correlation analysis | Zebrafish model | 0.1, 1, and 100 μg/mL | Has an angiogenesis-promoting effect. | *In vitro* | (Liu et al., 2020a) |
| Antihypertensive activities | GEP | colorimetric method, RIA assay | RHR Rats | 50, 100, 200 mg/kg p.o. | Blood pressure, ET and Ang II levels. were reduced and NO levels were increased. | *In vivo* | (Miao and Shen, 2006) |
|  | Acidic polysaccharides | Blood Chemistry assay, Animal Experiments | Spontaneously hypertensive rats model | 6 mg/kg bw/d for five weeks p.o. | Improves blood lipid levels and lowers blood pressure. | *In vivo* | (Lee et al., 2012a) |
|  | Gastrodin | Statistical analysis | Rat isolated thoracic aortic ring perfusion model. | 5, 50, 100, 150, 200, 250 μmol/L | Inhibition of arterial smooth muscle sarcoplasmic reticulum inositol 1, 4, 5 -triphosphate receptors. | *In vitro* | (Xie et al., 2015) |
|  | Gastrodin | Statistical analysis | SD male rat | 0.04, 0.08, 0.16, 0.32, 0.64 g/L | Exhibited concentration-dependent vasodilatory effects. | *In vitro* | (Zhang et al., 2012a) |
|  | Gastrodin | Tension experiments, Patch clamp experiments assay | Smooth muscle cells from rats | 100 µM | Activation of KATP channels in the vascular smooth muscle through a PKA-dependent signaling pathway. | *In vitro* | (Chen et al., 2017b) |
|  | Gastrodin | Noninvasive tail-cuff method, Western blotting assay, qRT-PCR analysis | 10-week-old male Wistar Kyoto (WKY) and SHRs | 100 mg/kg/d for four weeks i.p. | Ang II and ALD levels were significantly reduced, and AT1R expression was significantly down-regulated, in addition to myocardial mRNA and protein levels. | *In vivo* | (Liu et al., 2015) |
|  | 3,4-dihydroxybenzaldehyde | Chromatographic analysis, Statistical analysis | Thoracic aorta in male Sprague-Dawley rats | 0.75, 1.5, 3, 6, 9 mg/mL | Enhanced NO production and endothelial NO synthase activity in aortic and endothelial cells. | *In vitro* | (Dai et al., 2017) |
|  | 4-hydroxybenzaldehyd,4-methoxybenzyl alcohol, 4,4'-dihydroxydiphenyl methane | Chromatographic analysis, Statistical analysis | Thoracic aorta in male Sprague-Dawley rats | 3, 6, 9, 12, 18 mg/mL | Inhibition of rat aortic contraction induced by ca2+ in-flow and intracellular Ca2+ release. | *In vitro* |  |
| Anti-MIRI | Gastrodin | Electrocardiographic, Kit assay | In vivo rat MIRI model | 100, 200, 400 mg/kg | Increased SOD content and inhibited extracellular Ca2+ inward flow. | *In vivo* | (Wang, 2013) |
|  | Gastrodin | Ells culture Hypoxia assay, TUNEL assay | Cardiac microvascular Endothelial cell and myocardial I/R models in adult male C57BL/6J mice | 100 mg/kg i.p.; 20, 40, 80, 100 μM | Inhibition of the NLRP3/caspase-1 pathway blocks the focal death of cardiac microvascular endothelial cells. | *In vivo and vitro* | (Chen et al., 2017b) |
|  | Gastrodin | RT-PCR analysis, Western blotting assay | Rat cardiomyoblasts H9c2 cells | 5, 10, 20 mM | Inhibits the activation of NF-kB and MAPK. Upregulated the expression of iNOS, COX-2, TNF-a and IL-6 in LPS-stimulated H9c2 cardiomyocytes. | *In vitro* | (Yang et al., 2013a) |
|  | Gastrodin | TTC assay | Reversible left coronary artery ligation in male C57BL/6 mice; H/R model | 100 mg/kg i.p.;5, 10, 20 mM | Activation of the AMPK-mTOR signalling pathway, autophagy was promoted (inhibiting P62 expression and increasing LC311) and apoptosis was reduced. | *In vivo and vitro* | (Fu et al., 2018) |
|  | Gastrodin | MTS assay, TUNEL assay, Western blotting assay | H9c2 cells | 20 mg/L | Cardiomyocyte protection by up-regulation of 14-3-3η protein. | *In vitro* | (Zhu et al., 2018a) |
|  | Gastrodin | CCK-8 assay, Western blotting assay | Cardiomyocytes | 10 μg/ml | The miR-30a-5p/ATG5 pathway plays an important role in gastrodin-mediated regulation of autophagy and protection against ischaemic myocardial injury. | *In vitro* | (Yin et al., 2023) |
|  | Gastrodin | Hemodynamic measurements assay, Histological examinations assay | Myocardial infarction model in male Wistar rats | 50, 100 mg/kg/d for up to two weeks p.o. | The same as above. | *In vivo* | (Wang et al., 2020) |
|  | Parishin J | MTT assay, ﬂow cytometry, Western blotting assay | Rat H9c2 cardiomyocyte H/R model | 25 µM | Inhibits JNK1 phosphorylation and 14-3-3 phosphorylation levels, downregulates c-jun and ATF-2 phosphorylation levels, and increases 14-3-3 phosphorylation binding to Bax. | *In vitro* | (Wang et al., 2020) |
|  | Gastrodin | Biomechanical analysis, Hoechst staining assay, | Glucocorticoid-induced osteoporosis male SD rat model | 1, 5 mg/kg/d for 60 days p.o | Protection of osteoblasts through Nrf2-regulated mitochondrial and endoplasmic reticulum stress-related signalling pathways (GRP78, CHOP and eIF2α) ameliorates osteoporosis in rats. | *In vivo* | Liu et al., 2018 |
|  | Gastrodin | CCK-8 assay, Western blotting assay, | Phenylephrine-induced cardiomyocyte | 0, 10, 50, 100, 500, 1000 μM | Glucose transporter-mediated gastrodin is protective against cardiac hypertrophy. | In vitro | (Zhang et al., 2023) |
|  | Gastrodin | Immunostaining assay, Western blotting assay, Histological analysis | Transverse aortic constriction in male C57BL/6 J mice | 50 mg/kg/d for 6 weeks i.g. | The same as above. | In vivo |  |
| Anti-osteoporosis effect | Gastrodin | Western blotting assay, RT-PCR assay, Immunofluorescence staining assay | IL-1β-induced chondrocytes | 0.1, 1, 5, 10, 50, 100 μM | Improvement of osteoporosis by inhibiting the NF-κB pathway and reducing the release of inflammatory mediators (IL-6, TNF-α). | *In vitro* | (Chen et al., 2017) |
|  | Gastrodin | Histological analysis, Immunohistochemical analysis | Male SD rat knee osteoarthritis model | 100 μg/kg i.p. | Improvement of cartilage degeneration. | *In vivo* |  |
|  | Gastrodin | Flow cytometry assay, and Western blotting assay | Primary osteoblasts | 0, 0.1, 1, 5, 10, 50 μM | The same as above. | *In vitro* |  |
|  | Gastrodin | CCK-8 assay, Quantitative polymerase chain reaction analysis, Western blotting assay | Glucocorticoid-treated MC3T3-E1 mouse osteoblasts | 0, 0.1, 1, 5, 10, 50, 100 μM | Activation of Nrf2 and downstream effector protein expression upregulates osteogenic genes osterix, Runx2, bone morphogenetic protein-2 and osteocalcin mRNA levels. | *In vitro* | (Liu et al., 2018a) |
| Intestinal protection effect | parishin | RT-PCR assay, Western blotting assay, Immunohistochemical analysis, | D-Gal-induced aging mice. | 420 mg/kg/d for 8 weeks p.o. | Reversed the translocation of microbial toxins and systemic inflammation as well as the reduction or increase in the expression of aging-related biomarkers (e.g., CASPASE3, P21, FOXO3a and SIRT1) in the gut. | In vivo | (Gong et al., 2023) |
|  | The EtOAc fraction was obtained from the MeOH extract | Statistical analysis | Male albino guinea-pigs | 3 mg/ml | Showed weak inhibition of acetylcholine-induced contractions and significant inhibition of serotonin-induced contractions. | *In vitro* | (Hayashi et al., 2002) |
|  | GEP-1 | Cell culture | human gut probiotic A. muciniphila and L. paracasei | 1 mg/mL | Enhances beneficial intestinal flora growth for humans. | *In vitro* | (Huo et al., 2021) |
|  | *G.elata* | histopathological examination assay, 1H NMR test, biochemical assays | Auto-immune induced CAG model in Male SD rat | 0.1, 0.4 g/kg for 2 weeks p.o. | Improve the gastric gland damage and biochemical indexes of MDA, XOD, SOD, etc. in rats, promote gastric acid secretion, and significantly alleviate gastric inflammation. | *In vivo* | (Chen et al., 2018) |
| Antivirus and antitumor activities | WGEW and AGEW Sulphuric Acid Derivatives | NMR spectra assay, real-time RT-PCR assay, MTT Assay | C6/36 cells | 0.6 g WGEW, 1.8 g AGEW | The higher the DS, the greater the effect on dengue virus infection. | *In vitro* | (Qiu et al., 2007) |
|  | WSS45 | qRT-PCR assay, Plaque reduction assay, Flow cytometry assay, | BHK cells-treated  with DV2 infection | 0.1, 1, 10 µg/ml | WSS45 effectively inhibited DV2 infection in BHK cells with an EC50 value of 0.68±0.17 μg/mL. | *In vitro* | (Tong et al., 2010) |
|  | WSS25 | Migration assay, MTT assay | C57BL6 mice | 25 µg/ml | The expression of Id1 in HMEC-1 cells was almost completely blocked. | *In vitro* | (Hong et al., 2010) |
|  | WTM-2, WTM-3, WTM-5, WTM-6 | MTT assay | HepG 2, Hela, A549 cells | 7.5 µg/ml | It has an inhibitory effect on three types of tumor cells | *In vitro* | (Chen, 2019) |
|  | GEP | MTT assay | Mouse H22 tumour model | 30, 60, 90 mg/kg | The proliferation of hepatocellular carcinoma H22 cells was significantly inhibited by GE polysaccharide. | *In vitro* | (Wang et al., 2014) |
|  | GEP | Reagent kit assay, Flow cytometric assay | H22 tumor-bearing mice | 80, 160, 320 mg/kg p.o. | It has a significant tumor-suppressive effect on H22 tumor-bearing mice, with increased levels of caspase-3，caspase-8, and caspase-9. | *In vivo* | (Liu et al., 2015a) |
|  | Methanol extracts of *G. elata* | Western blotting assay, MTT assay, Invasion assay | Murine melanoma cell line B16-F1 and HUVECs | 30, 100 μg/ml | Trans-GTP-ras-dependent pathway to alleviate tumorigenesis. | *In vitro* | (Heo et al., 2007) |
|  | Water extracts of extruded *G. elata* | ELISA set assay, Western blotting assay | Human colon carcinoma HT29 cells and mouse colon carcinoma CT26 cells | 5, 20, 100 μg/mL | Reduced HT29 cell viability and induced caspase-3 and Bax expression (p<0.05). | *In vitro* | (Kim et al., 2017) |
|  | Water extracts of extruded *G. elata* | Flow Cytometric analysis | Carcinoma bearing mice | 50, 200 mg/kg p.o. | Reduced tumor growth and expression of Ki-67 or β-catenin in mice (p <0.05) | *In vivo* |  |
|  | Gastrodin | qRT-PCR analysis, ELISA analysis | Primary peritoneal macrophages | 10, 100 mg/kg | Inhibition of VSV and HSV-1 infection by promoting IFN-I production in macrophages. | *In vivo* | (Zhou et al., 2021) |
|  | Gastrodin | qRT-PCR analysis, Western blotting assay | C57BL/6J mice intraperitoneally injected with VSV or HSV-1 virus | 10, 100 µM | The same as above. | *In vitro* |  |
| Anti-bacterial | Gastrodinol | Antibacterial assay | Staphylococcus, Streptococcus Vibrio, etc. | MIC=1 μg/mL | Gastrodinol has strong antibacterial activity against Streptococcus. | *In vitro* | (Yang et al., 2020) |
|  | GEP | Thin-layer plate agarose pore diffusion method, Micro-Broth dilution method | G+, G-, Fungi | 120 mg/mL | GE polysaccharides inhibit G-, G+ and fungal activity. | *In vitro* | (Chen et al., 2018b) |
|  | GeB40, GeB80 | Antibacterial test | Bacteria, Fungi | 50 mg/mL | Inhibits both bacteria and fungi. | *In vitro* | (Zhan, 2007) |
|  | Volatile components of *G. elate* | Antibacterial assay | Strains of bacteria | 125 mg/mL | Volatile Components from *G. elata* have a more pronounced inhibitory effect on some fungi. | *In vitro* | (Guan et al., 2008) |
| Immune regulation | PGE | ELISA assay, Statistical analysis | Mice-Cyclophosphamide treated | 100, 200, 400 mg/kg | IgG, IgA, IgM, hemolysin, thymic and splenic indices are all at elevated levels. | *In vivo* | (Li et al., 2016) |
|  | PGE | MTT assay, Enzyme-linked immunosorbent assay | BCG and LPS cause immune liver injury models in mice | 25, 50, 100 mg /kg | It was all at decreasing levels as a result that The indices of AST, ALT, NO, SOD, MDA, TNF-α and IL-1. | *In vivo* | (Li et al., 2015) |
|  | GEP-1 | RT-qPCR assay, RT-qPCR assay, ELISA assay, Kit assay | Macrophage RAW264.7 cells | 50, 100, 200, 300, 400 µg/mL | It induces the release of macrophage cytokines (TNF-α, lL-1β) and NO through up-regulation of the expression of relevant genes, resulting in enhanced cell proliferation and phagocytic activity. And exerts immunomodulatory effects by activating the NF-κB signaling pathway. | *In vitro* | (Guan et al., 2022) |
| Anti-Cancer Effects | WTMA | MTT assay | PANC-1 | 2.6 mg/ml | It has a significant inhibitory effect on the value-added of pancreatic cancer cells and has no toxic effect on LO2. | *In vitro* | (Chen et al., 2011) |
|  | GEP-3, GEP-4 | Microbiological experimental assay | Muciniphila strain ATCC BAA-835 | 1 mg/mL | Promotes the growth of AKK, a promoter of muciniphila growth. | *In vitro* | (Huo et al., 2021a) |
| Hepatic and renal protective effects | Gastrodin | Liver histology assay, immunohistochemical assay, | BDL Male adult SD rats | 5 mg /ml for 2 weeks p.o. | Significantly attenuated BDL-induced hepatic and fibrotic injury by attenuating oxidative stress and inflammation. | *In vivo* | (Zhao et al., 2015) |
|  | Aqueous extract of *G. elata* | TUNEL assay, Western blotting assay | Male SD rats injected with acetaminophen | 10 mL/ kg for 2 weeks i.g. | Decreased necrosis and the expression of pro-inflammatory cytokines in the liver and kidney. | *In vivo* | (Seok et al., 2018) |
|  | Gastrodin | qRT-PCR analysis, | High cholesterol diet-induced NAFLD juvenile model in zebrafish | 10, 25, 50 mg/L i.g. | Inhibition il1b, srebp1, il6, fans, tnfa, tgfb sum keap1. | *In vivo* | (Ahmad et al., 2019) |
|  | 4-HBA | qRT-Polymerase Chain Reaction analysis, | High cholesterol diet-induced NAFLD in larval zebrafish | 20 mg/L for 2 weeks i.g. | Hepatoprotective effects through activation of the Nrf2/HO-1 signaling pathway. | *In vivo* | (An et al., 2021) |
|  | 4-HBA | BCA protein Quantitative Kit assay, Immunofluorescence Staining assay | Free fatty acid-induced BRL-3A hepatocytes | 20 μM | The same as above. | *In vitro* |  |
|  | Gastrodin | Histological evaluation assay, Western blotting assay | CCl4-induced male ICR mice | 200, 400 mg/kg/d for 4 weeks p.o. | With renal protective effects through modulation of nuclear factor Nrf2-mediated antioxidant signaling and increased activation of AMPK. | *In vivo* | (Ma et al., 2020) |
|  | Gastrodin | CCK-8 assy, Immunohistochemistry assay, Western-blotting analyses | Rat kidney fibroblast cell | 25-100 μM | Downregulated expression of p-Smad2, p-Smad3 proteins, fibronectin, and α-SMA and collagen I. | In vitro | (Wen et al., 2023) |
|  | Gastrodin | Hematoxylin-eosin staining assay, Masson’s trichrome staining assay, Sirius red staining assay | Female SHRs | 3.5 mg/kg/d for 10 weeks | Downregulated α-SMA, collagen I and collagen III expression in SHR kidney tissues. | In vivo |  |
| Other pharmacological activities | Water Extract of *G. elata* | Biochemical test assay, Fecal metagenome analysis | Male ICR mice with UV-induced skin damage | 0.3 g/kg i.g. | Significant therapeutic effect on acute UV-induced skin damage. | *In vivo* | (Zhang et al., 2022) |
|  | 4-hydroxy-3-methoxy benzyl alcohol | Histamine assay, PLA2 activity assays, EPO assay | Male Dunkin- Hartley guinea pigs | 12.5, 25, 50 mg/kg p.o.. | The C4 hydroxyl and C3 methoxy radicals in benzyl alcohol and aldehydes play an important part in mediating asthma activity. | *In vivo* | (Jang et al., 2010) |
|  | Gastrodin | Positron emission tomography assay, micro-PET assay | 3,3'-iminodipropionitrile Treated male Wistar rats | 20 mg/kg/d for 8 weeks p.o. | Decreasing the number of D2Rs and increasing the number of DATs was shown to be useful for treating stereotyped TS-like behavior in the rat model system. | *In vivo* | (Wang et al., 2021d) |
|  | Parishin A | Western blotting assay, Immunofluorescence assay | Isolation of Bone marrow-derived macrophages from SD rats | 20 μM | Inhibits chondrogenic and osteogenic differentiation of TSPCs by affecting macrophage inflammatory cytokine secretion and thereby inhibiting chondrogenic and osteogenic differentiation. | In vitro | (Zhu et al., 2023) |
|  | Gastrodin | CCK-8 analysis, RT-qPCR test assay, Western blotting assay | OGD/R to induce R28 cells | 10, 25, 50, 100 µM | Protection of retinal ganglion cells from hypoxia/reoxygenation injury by activation of the PI3K/AKT/Nrf2 signaling pathway. | In vitro | (Li et al., 2022) |
|  | N6-(4-Hydroxybenzyl)-Adenosine | Two-bottle choice test assay, Reward-Seeking Behavior test assay, Y-Maze assay. | Male C57BL/6J mice exhibiting high ethanol drinking behavior | 0.1 mg/kg, i.p.. | Suppression of ethanol drinking and seeking behavior through activation of A2AR and modulation of ENT1. | *In vivo* | (Hong et al., 2019) |
|  | BIS | MTT assay, Image capturing and pixel measurement analysis | Zebrafish | 5, 50 μM | Molecular modeling suggests that the coordination of the sulfur atom of BIS with the copper ion at the active site of tyrosinase is required to inhibit mushroom tyrosinase and reduce the ability of human melanin synthesis. | *In vivo* | (Chen et al., 2015a) |

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