

REFERENCES

- (1) Costello M, Sabatini L, Yungbluth P. Herpes simplex virus infections and current methods for laboratory detection. *Clin Microbiol Newsletter*. 2006; 28(24):185-92.
- (2) Whitney RJ, Roizman B. Herpes simplex virus infection. *Lancet*. 2001;357:1513-8.
- (3) Smith JS, Robinson NJ. Age-specific prevalence of infection with herpes simplex virus types 2 and 1: a global review. *J Infectious Diseases*. 2002;186(Suppl 1):S3-28.
- (4) Brady RC, Bernstein DI. Treatment of herpes simplex virus infections. *Antiviral res*. 2004;61:73-81.
- (5) Pereira FA. Herpes simplex: evolving concepts. *J Am Acad Dermatol*. 1996;35(4):503-20.
- (6) Khan MT, Ather A, Thompson KD, Gambari R. Extracts and molecules from medicinal plants against herpes simplex viruses. *Antiviral Res*. 2005;67(2):107-19.
- (7) Lipipun V, Kurokawa M, Suttisri R, Taweechotipatr P, Pramyothin P, Hattori M, Shiraki K. Efficacy of Thai medicinal plant extracts against herpes simplex virus type 1 infection in vitro and in vivo. *Antiviral Res*. 2003;60(3):175-80.
- (8) Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. Estimated Incidence, Mortality and Prevalence Worldwide in 2012. *Globocan* [Internet]. 2012 [cited 2014 Jul 27];1: [about 2 screens]. Available from: http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx
- (9) WHO Media center [Internet]. Geneva: WHO; c1948-. [updated 2014 Feb; cited 2014 Jul 27]. Cancer Fact sheet N°297; [about 6 screens]. Available from: <http://www.who.int/mediacentre/factsheets/fs297/en/>

- (10) Thai Cancer Information Network. The most common cancer in Thailand. Health situation in Thailand. [Internet]. 2005 Oct [cited 2014 Jul 27];1(5): [about 6 p.]. Available from: http://www.hiso.or.th/hiso/brochure/b5_1.php?color=4&title=2&lesson=5&lesson_id=15
- (11) Teiten MH, Gaascht F, Dicato M, Diederich M. Anticancer bioactivity of compounds from medicinal plants used in European medieval traditions. *Biochem Pharmacol.* 2013;86(9):1239-47.
- (12) WHO Media center [Internet]. Geneva: WHO; c1948-. [updated 2014 Mar; cited 2014 Jul 27]. Tuberculosis Fact sheet N°104; [about 6 screens]. Available from: <http://www.who.int/mediacentre/factsheets/fs104/en/>
- (13) Bureau of Tuberculosis. Guidelines for National Tuberculosis Program 2012. Bangkok: The Agricultural Co-operative Federation of Thailand;2012.
- (14) Alvin A, Miller KI, Neilan BA. Exploring the potential of endophytes from medicinal plants as sources of antimycobacterial compounds. *Microbiol Res.* 2014;169:483-95.
- (15) Institute of Thai Traditional Medicine [Internet]. Bangkok: Institute of Thai Traditional Medicine; c1977-. [updated 2013 Mar; cited 2014 Aug 25]. Banana (Traditional herbal medicine); [about 1 screen]. Available from: http://ittm-old.dtam.moph.go.th/Service/herb_data/herb_ssm08.htm
- (16) Institute of Thai Traditional Medicine [Internet]. Bangkok: Institute of Thai Traditional Medicine; c1977-. [updated 2013 Mar; cited 2014 Aug 25]. Galanga (Traditional herbal medicine); [about 1 screen]. Available from: http://ittm-old.dtam.moph.go.th/Service/herb_data/herb_ssm10.htm
- (17) Cragg GM, Newman DJ. Natural products: a continuing source of novel drug leads. *Biochim Biophys Acta.* 2013;1830(6):3670-95.
- (18) David B, Wolfender J-L, Dias DA. The pharmaceutical industry and natural products: historical status and new trends. *Phytochem Rev.* 2014 Jun 3. doi:

10.1007/s11101-014-9367-z. Springer Netherlands. Print ISSN: 1568-7767; Online ISSN: 1572-980X.

- (19) Howe E, Keiwkarnka B, Khan MI. Traditional medicine and medicinal plants: utilization, policy and research in Thailand. J Pub Health Dev. 2004;2(1):101-17.
- (20) USDA, NRCS. The PLANTS Database [Internet]. Greensboro (NC): National Plant Data Team (USA); 2014 [2014 August 28]. Available from: <http://plants.usda.gov>
- (21) Wiart C. Medicinal plants of the asia-pacific: drugs for the future?. Singapore: World scientific publishing; 2006:552.
- (22) Encyclopedia of Life [Internet]. c2011- [cited 2014 Aug 28]; *Graptophyllum pictum*; [about 1 screen]. Available from: http://eol.org/pages/596699/names/common_names
- (23) Weaver RE, Anderson PJ. Botany section. Tri-ology. 2007;46(3):1-12.
- (24) Chuakul W, Saralamp P, Paonil W, Tamsiririrkkul R, Clayton T. Medicinal plants in Thailand. vol 2. Bangkok: Amarin printing and publishing public; 1997:126.
- (25) Na Songkhla B. Samunpaithai part 1. 2 ed. Bangkok: funning publishing; 1982:20-2.
- (26) Jain SK, De Filippis RA. Medicinal plants of India. vol 1. Michigan: Reference publication; 1991:87.
- (27) Roosita K, Kusharto CM, Sekiyama M, Fachrurozi Y, Ohtsuka R. Medicinal plants used by the villagers of a Sundanese community in West Java, Indonesia. J Ethnopharmacol. 2008;115:72-81.
- (28) Bunyaphatsara N. Sumunpaithai maipuenban. vol 2. Bangkok: Prachachon; 1998:539-40.
- (29) Wuttithamawech W. Thai herb encyclopedia: Thai pharmaceutical principles. O. S. printing house. Bangkok:1997:269.

- (30) Nonato MG, Garson MJ, Truscott RJW. Vomifoliol from *Graptophyllum pictum* (L.) Griff. (ACANTHACEAE). ACGC Chem Res Commun. 1996;4:1-4.
- (31) Ozaki Y, Sekita S, Soedigdo S, Harada M. Anti-inflammatory effect of *Graptophyllum pictum* (L.) Griff. Chem Pharm Bull 1989;37(10):2799-802.
- (32) Srinivasan KK, Mathew JE, Joseph K, Vachala SD, Malini S. Effect of ethanol extract of *Graptophyllum pictum* (L.) Griff. on cisplatin induced nephrotoxicity in rats. Herba pol. 2011;57(2):51-65.
- (33) Olagbende-Dada SO, Ukpo GE, Coker HAB, Adesina SA. Oxytocic and anti-implantation activities of the leaf extracts of *Graptophyllum pictum* (Linn.) Griff. (Acanthaceae). Afr J Biotechnol. 2009;8:5979-84.
- (34) Olagbende-Dada SO, Ogonnia SO, Coker HA, Ukpo GE. Blood glucose lowering effect of aqueous extract of *Graptophyllum pictum* (Linn) Griff. on alloxan-induced diabetic rats and its acute toxicity in mice. Afr J Biotechnol. 2011;10(6):1039-43.
- (35) Widyowati R. Alkaline phosphatase activity of *Graptophyllum pictum* and *Sphalanthus acmella* fractions against MC3T3E1 cells as marker of osteoblast differentiation cells. Int J Pharm Pharm Sci. 2011;3(1):34-7.
- (36) Goun E, Cunningham G, Chu D, Nguyen C, Miles D. Antibacterial and antifungal activity of Indonesian ethnomedical plants. Fitoterapia. 2003;74(6):592-6.
- (37) Integrated Taxonomic Information System (ITIS) [Internet]. c2000- [cited 2014 Aug 26]; *Solanum spirale* Roxb.; [about 3 screen]. Available from: <http://www.itis.gov/servlet/SingleRpt/SingleRpt>
- (38) The Global Biodiversity Information Facility: GBIF Backbone Taxonomy [Internet]. c2013- [cited 2014 Aug 26]; *Solanum spirale* Roxb.; [about 2 screen]. Available from: <http://www.gbif.org/species/2930705>http://eol.org/pages/596699/names/common_names

- (39) Tropicos.org. Missouri Botanical Garden. [Internet]. c2008- [cited 2014 Sep 1]; *Solanum spirale* Roxb.; [about 4 screen]. Available from: <http://www.tropicos.org/name/29604542?projectid=15>
- (40) Wuttithamawech W. Thai herb encyclopedia: Thai pharmaceutical principles. O. S. printing house. Bangkok:1997:198.
- (41) Encyclopedia of Life [Internet]. c2011- [cited 2014 Sep 1]; *Solanum spirale*; [about 11 screen]. Available from: <http://eol.org/pages/2894473/details>
- (42) Areekul S, Inthorn J, Takeaw S, Nantakaew A. Knowledge of the utilization of wild plants in Northern Thailand. vol 3. Chiang Mai: Royal Project Foundation. 2008:360-1.
- (43) Somprasong W, Prachasaisoradej V, Triboun P. Collection and botanical studies of *Solanum* L. in northern Thailand. In: Proceedings of 41st Kasetsart University Annual Conference: Plants and Agricultural Extension and Communication; 2003 Feb 3-7; Bangkok, Thailand. Bangkok: Kasetsart University; 2003, p. 335-41.
- (44) Kagyung R, Gajurel PR, Rethy P, Singh B. Ethnomedicinal plants used for gastro-intestinal diseases by Adi tribes of Dehang-Debang Biosphere Reserve in Arunachal Pradesh. Indian J Traditional Knowledge. 2010;9(3): 496-501.
- (45) Inta A, Shengji P, Balslev H, Wangpakapattanawong P, Trisonthi C. A comparative study on medicinal plants used in Akha's traditional medicine in China and Thailand, cultural coherence or ecological divergence?. J ethnopharmacol. 2008;116(3):508-17.
- (46) Teng X, Zhang Y, Yang C. Three steroidal glycosides from the fresh fruits of *Solanum spirale* (Solanaceae). Acta Botanica Yunnanica. 2008;30(2):239-42.
- (47) Gogoi B, Zaman K. Phytochemical constituents of some medicinal plant species used in recipe during 'Bohag Bihu' in Assam. J Pharmacogn Phytochem. 2013;2(2):30-40.

- (48) Chakravarti RN, Datta G. Alkaloids from *Solanum spirale*. Bull Calcutta Sch Trop Med. 1958;6(4):162-3.
- (49) Bird GJ, Collins DJ, Eastwood FW, Swan JM. Structures of the steroidal alkaloids 25-isosolafloridine and solacallinidine isolated from *Solanum callium*. Aust J Chem. 1979;32(3):597-609.
- (50) Goswami BC, Sarmah MC. Determination of solasodine from spineless solanaceous plants. Indian Drugs. 1986;23(12):655-7.
- (51) Quyen LT, Khoi NH; Suong NN, Schreiber K, Ripperger H. Steroid alkaloids and yamogenin from *Solanum spirale*1. Planta med. 1987;53(3):292-3.
- (52) Ripperger H. Steroidal alkaloids from roots of *Solanum spirale*. Phytochemistry. 1996;43(3):705-7.
- (53) Bird GJ, Collins DJ, Eastwood FW, Gatehouse BMKC, Jozsa AJ, Swan JM. New steroidal alkaloids from *Solanum callium*. Tetrahedron Letts. 1976;17(40):3653-6.
- (54) Keawsa-ard S, Natakankitkul S, Liawruangrath S, Teerawutgulrag A, Trisuwan K, Charoenying P, Pyne SG, Liawruangrath B. Anticancer and antibacterial activities of the isolated compounds from *Solanum spirale* Roxb. leaves. Chiang Mai J Sci. 2012;39(3):445-54.
- (55) Keawsa-ard S, Liawruangrath B, Liawruangrath S, Teerawutgulrag A, Pyne SG. Chemical constituents and antioxidant and biological activities of the essential oil from leaves of *Solanum spirale*. Nat Prod Commun. 2012;7(7):955-8.
- (56) Hu K, Dong A, Sun Q, Yao X. Bioactivity of 247 traditional Chinese medicines against *Pyricularia oryzae*. Pharm Biol. 2001;39(1):47-53.
- (57) Keawsa-ard S, Liawruangrath B, Natakankitkul S, Chowwanapoonpohn S, Liawruangrath S, Teerawutgulrag A, Pyne SG. *In vitro* evaluation of the

antioxidant, antibacterial and anticancer activities of *Solanum spirale* Roxb. (Solanaceae). Asian J Tradit Med. 2012;7(2):66-72.

- (58) GU W, Yang J, Yang FM, Sun QY, Wang YH, Long CL. A preliminary study of traditional, wild medicinal, edible plants in Xishuangbanna, Yunnan, China. Plant Diversity and Resource. 2014;36(1):99-108.
- (59) Kalita P, Tag H, Sarma HN, Das AK. Nutritional potential and traditional uses of high altitude wild edible plants in eastern Himalayas, India. Int J Biol Vet Agr Food Eng. 2014;8(3):209-12.
- (60) Encyclopedia of Life [Internet]. c2011- [cited 2014 Sep 12]; *Gynura divaricata*; [about 1 screen]. Available from: <http://eol.org/pages/6242973/names>
- (61) The Global Biodiversity Information Facility: GBIF Backbone Taxonomy [Internet]. c2013- [cited 2014 Sep 12]; *Gynura divaricata* DC.; [about 2 screen]. Available from: <http://www.gbif.org/species/3139895>
- (62) Suan_laksana. Suan_laksana- Jīn jī máo yì (type: ovate) or Khon Gai Thong Kum, miracle grass [Internet]. Bangkok:bloggang; 2013-[cited 2014 Sep 12]. Available from: <http://www.bloggang.com/mainblog.php?id=suanlaksana&month=28-08-2013&group=5&gblog=4>
- (63) Chen L, Wang JJ, Song HT, Zhang GG, Qin LP. New cytotoxic cerebroside from *Gynura divaricata*. Chinese Chem Lett. 2009;20(9):1091-3.
- (64) Global Information Hub On Integrated Medicine: GLOBinMED [Internet]. c2010-2011 [cited 2014 Sep 12]; *Gynura divaricata* (Linn.) DC.; [about 6 screen]. Available from: http://www.globinmed.com/index.php?option=com_content&view=article&id=104433:gynura-divaricata-linn-dc&catid=199&Itemid=139
- (65) Cheng SC, Li NH. Chinese Medicinal Herbs of Hong Kong. vol 3. Commercial press. Kaoloon:1987:172.

- (66) Roeder E, Eckert A, Wiedenfeld H. Pyrrolizidine alkaloids from *Gynura divaricata*. *Planta Med.* 1996;62(4):386.
- (67) Hu Y, Li WL, Lin HW, Zhou M, Ren BR. Method for separation and identification of chemical constituents of *Gynura divaricata*. *Zhongguo Tianran Yaowu.* 2006;4(2):156-8.
- (68) Li L, Li W, Guo Q, Ren B, Zhang H. Chemical constituents from *Gynura divaricata* (L.) DC. *Shizhen Guoyi Guoyao.* 2008;19(1):118-9.
- (69) Chen L, Wang JJ, Zhang GG, Song HT, Qin LP. A new cerebroside from *Gynura divaricata*. *Nat Prod Res.* 2009;23(14):1330-6.
- (70) Chen L, Li HQ, Song HT, Zhang GG. A new cerebroside from *Gynura divaricata*. *Fitoterapia.* 2009;80(8):517-20.
- (71) Chen L, Song Z, Wang JJ, Song HT, Wang JH; Zhang GG, Qin LP. Chemical constituents from aerial parts of *Gynura divaricata*. *Zhongcaoyao.* 2010;41(3):373-5.
- (72) Chen L, Song Z, Wang JJ, Song HT, Zhang GG, Wang JH. Chemical constituents from aerial parts of *Gynura divaricata*. *Zhongyaocai.* 2010;33(3):373-6.
- (73) Wan C, Yu Y, Zhou S, Tian S, Cao S. Isolation and identification of phenolic compounds from *Gynura divaricata* leaves. *Pharmacogn Mag.* 2011;7(26):101-8.
- (74) Chen J, Mangelinckx S, Lu H, Li WL, De Kimpe N, Wang ZT. Chemical constituents in ethyl acetate extract from aerial part of *Gynura divaricata*. *Zhongcaoyao.* 2013;44(5):524-7.
- (75) Zheng XK, Wang Q, Jiang L, Wang XJ, Chen JL. Isolation and identification of the chemical constituents of *Gynura divaricata* (L.) DC. *Xiandai Shipin Keji.* 2013;29(5):1003-5.

- (76) Chen J, Mangelinckx S, Ma L, Wang ZT, Li WL, De Kimpe N. Caffeoylquinic acid derivatives isolated from the aerial parts of *Gynura divaricata* and their yeast α -glucosidase and PTP1B inhibitory activity. *Fitoterapia*. 2014;99:1-6.
- (77) Xian H, Zhou R, Liu W, Qin J. Determination of essential oil from different parts of *Gynura divaricata* by GC-MS. *Shizhen Guoyi Guoyao*. 2008;19:858-9.
- (78) Chen J, Adams A, Mangelinckx S, Ren BR, Li W, Wang ZT, De Kimpe N. Investigation of the volatile constituents of different *Gynura* species from two Chinese origins by SPME/GC-MS. *Nat Prod Commun*. 2012;7:656-7.
- (79) Liu H, Han C, Jiang P, Yang D, Ren Y. Antioxidant activities of five kinds of Hainan wild vegetables. In: *Proceedings of the Biennial Meeting of the Society for Free Radical Research International*, 14th, Oct. 18-22, 2008; Beijing, China, 2008, p. 107-110.
- (80) Wan C, Yu Y, Zhou S, Liu W, Tian S, Cao S. Antioxidant activity and free radical-scavenging capacity of *Gynura divaricata* leaf extracts at different temperatures. *Phcog Mag*. 2011;7(25):40-5.
- (81) Kuspradini H, Mitsunga T, Ohashi H. Antimicrobial activity against *Streptococcus sobrinus* and glucosyltransferase inhibitory activity of taxifolin and some flavanone rhamnosides from kempas (*Koompassia malaccensis*) extracts. *J Wood Sci*. 2009;55:308-13.
- (82) Tong J, Li Xj, Li Dx. Protective effect of *Gynura divaricata* (L.) DC. extract on liver injury induced by carbon tetrachloride in mice. *Jinri Yaoxue*. 2013;23(10):650-3.
- (83) Ma Z, Chen L, Song H, Wei W. Hypoglycemic effects of water extract of *Gynura divaricata* (L.) DC. on rats with type 2 diabetes mellitus and its mechanism. *Zhongcaoyao*. 2010;41:623-6.

- (84) Li WL, Ren BR, Min-Zhuo, Hu Y, Lu CG, Wu JL, Chen J, Sun S. The anti-hyperglycemic effect of plants in genus *Gynura* Cass. *Am J Chin Med*. 2009;37(5):961-6.
- (85) Wu T, Zhou X, Deng Y, Jing Q, Li M, Yuan L. *In vitro* studies of *Gynura divaricata* (L.) DC. extracts as inhibitors of key enzymes relevant for type 2 diabetes and hypertension. *J Ethnopharmacol*. 2011;136:305-8.
- (86) Jiang M, Hu J, Qiu W, Qian Q, Tan M, Wu K, Qiu X. Hypoglycemic and anti-anoxia effect of polysaccharide and flavonoids in *Gynura divaricata* (L.) DC. *Chinese J Hosp Pharm*. 2009;29(13):1074-6.
- (87) Deng YX, Chen YS, Zhang WR, Chen B, Qiu XM, He LH, et al. Polysaccharide from *Gynura divaricata* modulates the activities of intestinal disaccharidases in streptozotocin-induced diabetic rats. *Br J Nutr*. 2011;106(9):1323-9.
- (88) Yu H, Mao Bb, Zhou Gl, Fang Yx. Hypoglycemic effect of total flavonoids from *Gynura divaricata* roots and rhizomes in diabetic rats. *Food Sci*. 2013;34(15):295-8.
- (89) Ochemonline [Internet]. TLC stains. [updated 2011 Feb 12; cited 2013 May 5]. Available from: http://www.ochemonline.com/TLC_stains
- (90) Wagner H, Bladt S, Zgainski EM. *Plant Drug Analysis*. Berlin-Heidelberg-New York-Tokyo: Springer-Verlag; 1984.
- (91) Jiratchariyakul W. Basic chemical screening of the extracts from plants, drugs and natural products. Department of Pharmacognosy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand; 2534.
- (92) Saha S, Subrahmanyam EVS, Kodangala C, Shastry SC. Isolation and characterization of triterpenoids and fatty acid ester of triterpenoid from leaves of *Bauhinia variegata*, *Der Pharma Chemica*. 2011;3(4):28-37.
- (93) Formisano C, Mignola E, Rigano D, Senatore F, Arnold NA, Bruno M, Rosselli S. Constituents of Leaves and Flowers Essential Oils of

Helichrysum pallasii (Spreng.) Ledeb. Growing Wild in Lebanon. J Med Food. 2009;12:203-7.

- (94) Adams RP, Identification of Essential Oil Components by Gas Chromatography/Mass Spectroscopy. Allured publishing Co. Carol Stream, Illinois; 2007.
- (95) Leffingwell JC, Alford ED. Volatile constituents of Perique tobacco. EJEAFChe. 2005;4(2):1-16.
- (96) Tellez MR, Khan IA, Kobaisy M, Schrade KK, Dayan FE, Osbrink W. Composition of the essential oil of *Lepidium meyenii* (Walp.). Phytochemistry. 2002;61:149-55.
- (97) Joshi R, Poonam, Gulati A. Biochemical attributes of tea flowers (*Camellia sinensis*) at different developmental stages in the Kangra region of India. Scientia Horticulturae. 2011;130: 266-74.
- (98) Choi H-S. Character Impact Odorants of *Citrus* Hallabong [(*C. unshiu* Marcov × *C. sinensis* Osbeck) × *C. reticulata* Blanco] Cold-Pressed Peel Oil. J Agric Food Chem. 2003;51:2687-92.
- (99) Acree T, Arn H. [Internet]. Flavonet and human odor space. 2004 [cited 16 Jul 2013]. Available from: <http://www.flavornet.org/>
- (100) Högnadóttir Á, Rouseff RL. Identification of aroma active compounds in orange essence oil using gas chromatography–olfactometry and gas chromatography– mass spectrometry. J Chromatogr A. 2003;998:201-11.
- (101) Southwell IA, Russell MF. Volatile oil comparison of cotyledon leaves of chemotypes of *Melaleuca alternifolia*. Phytochem. 2002;59:391-3.
- (102) Baranauskiene R, Venskutonis RP, Demyttenaere JCR. Sensory and Instrumental Evaluation of Catnip (*Nepeta cataria* L.) Aroma J Agric Food Chem. 2003;51:3840-8.

- (103) O'Brien J, Wilson I, Orton T, Pognan F. Investigation of the Alamar Blue (resazurin) fluorescent dye for the assessment of mammalian cell cytotoxicity. *Eur J Biochem.* 2000;267:5421-6.
- (104) Hunt L, Jordan M, De JM, Wurm FM. GFP-expressing mammalian cells for fast, sensitive, noninvasive cell growth assessment in a kinetic mode. *Biotechnol Bioeng.* 1999;65:201-5.
- (105) Changsen C, Franzblau SG, Palittapongarnpim P. Improved green fluorescent protein reporter gene-based microplate screening for antituberculosis compounds by utilizing an acetamidase promoter. *Antimicrob Agents Chemother.* 2003;47:3682-7.
- (106) Collins LA, Torrero MN, Franzblau SG. Green fluorescent protein reporter microplate assay for high-throughput screening of compounds against *Mycobacterium tuberculosis*. *Antimicrob Agents Chemother.* 1998;42:344-7.
- (107) Zaidan MRS, Noor Rain A, Badrul AR, Adlin A, Norazah A, Zakiah I. *In vitro* screening of five local medicinal plants for antibacterial activity using disc diffusion method. *Trop Biomed.* 2005;22:165-70.
- (108) Adeniyi BA, Odelola HA, Osa BA. Antimicrobial potentials of *Diospyros mespiliformis* (Ebenaceae). *Afr J Med Sci.* 1996;25:221-4.
- (109) Re R., Pellegrini N, Proteggente A, Pannala A, Yang M, Rice-Evans C. Antioxidant activity applying an improved ABTS radical cation decolorization assay. *Free Radical Bio Med.* 1999;26:1231-7.
- (110) Brand-Williams W, Cuvelier ME, Berset C. Use of a free radical method to evaluate antioxidant activity. *Lebensmittel-Wissenschaft u-Technol.* 1995;28: 25-30.
- (111) Thongchai W, Liawruangrath B, Liawruangrath S. Flow injection analysis of total curcuminoids in turmeric and total antioxidant capacity using 2,2'-diphenyl-1-picrylhydrazyl assay. *Food Chem.* 2009;112:494-9.

- (112) Deetae P, Parichanon P, Trakunleewatthana P, Chanseetis C, Lertsiri S. Antioxidant and anti-glycation properties of Thai herbal teas in comparison with conventional teas. *Food Chem.* 2012;133:953-9.
- (113) Ramamoorthy PK, Bono A. Antioxidant activity, Total Phenolic and Flavonoid content of *Morinda citrifolia* fruit extracts from various extraction processes. *J. Eng. Sci. Technol.* 2007;2:70-80.
- (114) Keawsa-ard S. Chemical constituents and biological activities of *Solanum spirale* Roxb. [PhD Thesis]. Chiang Mai: Chiang Mai University; 2012.
- (115) Skaltsa HD, Demetzos C, Lazari D, Sokovic M. Essential oil analysis and antimicrobial activity of eight *Stachys* species from Greece. *Phytochem.* 2003;64(3):743-52.
- (116) Saïdana D, Mahjoub MA, Boussaada O, Chriaa J, Chéraif I, Daami M, Mighri Z, Helal AN. Chemical composition and antimicrobial activity of volatile compounds of *Tamarix boveana* (Tamaricaceae). *Microbiol Res.* 2008;163(4):445-55.
- (117) Maia JGS, Andrade EHA, Zoghbi MGB. Aroma volatiles from two fruit varieties of jackfruit (*Artocarpus heterophyllus* Lam.). *Food Chem.* 2004;85:195-7.
- (118) Pino JA, Mesa J, Muñoz Y, Martí MP, Marbot R. Volatile components from mango (*Mangifera indica* L.) cultivars. *J Agric Food Chem.* 2005;53(6):2213-23.
- (119) David F, Scanlan F, Sandra P, Szelewski M. Analysis of the essential oil compounds using retention locked methods and retention time data bases. USA: Agilent technologies; 2002:1-10.
- (120) Fernandes F, Pinho PG, Valentão P, Pereira JA, Andrade PB. Volatile Constituents throughout *Brassica oleracea* L. Var. *acephala* Germination. *J Agric Food Chem.* 2009;57:6795-802.

- (121) Kotowska U, Zalikowski M, Isidorov VA. HS-SPME/GC-MS analysis of volatile and semi-volatile organic compounds emitted from municipal sewage sludge. *Environ Monit Assess.* 2012;184:2893-907.
- (122) Aliero AA, Asekun OT, Grierson DS, Afolayan AJ. Chemical Composition of the Hexane Extract from the Leaves of *Solanum pseudocapsicum*. *Asian J Plant Sci.* 2006;5(6):1054-6.
- (123) Tracy NI, Crunkleton DW, Price GL. Gasoline production from phytol. *Fuel.* 2010;89:3493-7.
- (124) Netscher, T. Synthesis of Vitamin E. In: *Vitamins & Hormones, ed:* Litwack Gerald, Academic Press, Philadelphia, PA, USA; 2007:155-202.
- (125) Daines AM, Payne RJ, Humphries ME, Abell AD. The synthesis of naturally occurring vitamin K and vitamin K analogues. *Curr Org Chem.* 2003;7:1625-34.
- (126) McGinty D, Letizia CS, Api AM. Fragrance material review on phytol. *Food Chem Toxicol* 2010;48:S59-S63.
- (127) McGinty D, Letizia CS, Api AM. Fragrance material review on isophytol. *Food Chem Toxicol.* 2010;48:S76-S81.
- (128) Ulubelen A, Topcu G, Sönmez U, Kartal M, Kurucu S, Bozok-Johansson C. Terpenoids from *Salvia sclarea*. *Phytochemistry.* 1994;36:971-4.
- (129) König GM, Wright AD. Concerted Application of a Shift Reagent and 2D NOESY to the Structure Determination of New Natural Products from the Tropical Brown Alga *Dityopteris Delicatula*. *Magn Reson Chem.* 1995;33:178-83.
- (130) Scrivanti LR, Bernardello G, Anton AM. The foveola of *Bothriochloa alta* (Poaceae: Andropogoneae): Extrafloral nectary or secretory gland of essential oils?. *Flora.* 2008;203:55-9.

- (131) Yuenyongsawad S, Tewtrakul S. Essential oil components and biological activities of *Coleus parvifolius* leaves. *Songklanakarin J Sci Technol.* 2005;27:497-501.
- (132) Takahashi C, Kikuchi N, Katou N, Miki T, Yanagida F, Umeda M. Possible anti-tumor-promoting activity of components in Japanese soybean fermented food, Natto: effect on gap junctional intercellular communication. *Carcinogenesis.* 1995;16(3):471-6.
- (133) Fullas F, Hussain RA, Chai HB, Pezzuto JM, Soejarto DD, Kinghorn D. Cytotoxic constituents of *Baccharis gaudichaudiana*. *J Nat Prod.* 1994;57:801-7.
- (134) Wang G, Li X, Huang F, Zhao J, Ding H, Cunningham C, Coad JE, Flynn DC, Reed E, Li QQ. Antitumor effect of β -elemene in non-small cell lung cancer cells is mediated via induction of cell cycle arrest and apoptotic cell death. *Cell Mol Life Sci.* 2005;62:881-93.
- (135) Legault J, Dahl W, Debiton E, Pichette A, Madelmont JC. Antitumor activity of balsam fir oil: Production of reactive oxygen species induced by α -humulene as possible mechanism of action. *Planta Med.* 2003;69:402-7.
- (136) Harada H, Yamashita U, Kurihara H, Fukushi E, Kawabata J, Kamei Y. Antitumor activity of palmitic acid found as a selective cytotoxic substance in a marine red alga. *Anticancer Res.* 2002;22(5):2587-90.
- (137) Saikia D, Parihar S, Chanda D, Ojha S, Kumar JK, Chanotiya CS, Shanker K, Negi AS. Antitubercular potential of some semisynthetic analogues of phytol. *Bioorg Med Chem Lett.* 2010;20:508-12.
- (138) Chen JJ, Lin WJ, Shieh PC, Chen IS, Peng CF, Sung PJ. A New Long-Chain Alkene and Antituberculosis Constituents from the Leaves of *Pourthiaea lucida*. *Chem Biodivers.* 2010;7(3):717-21.
- (139) Sandoval-Montemayor NE, Garcia A, Elizondo-Trevino E, Garza-Gonzalez E, Alvarez L, Camacho-Corona MR. Chemical composition of hexane

extract of *Citrus aurantifolia* and anti-*Mycobacterium tuberculosis* activity of some of its constituents. *Molecules*. 2012;17:11173-84.

- (140) Radulovic N, Stojanovic G, Palic R. Composition and antimicrobial activity of *Equisetum arvense* L. essential oil. *Phytother Res*. 2006;20:85-8.
- (141) Shobha RP, Agrawal R. Volatile compounds of therapeutic importance produced by *Leuconostoc paramesenteroides*, a native laboratory isolate. *Turk J Biol*. 2007;31:35-40.
- (142) Canas-Rodriguez A, Smith HW. The identification of the antimicrobial factors of the stomach contents of sucking rabbits. *Biochem J*. 1966;100:79-82.
- (143) Inoue Y, Hada T, Shiraishi A, Hirose K, Hamashima H, Kobayashi S. Biphasic effects of geranylgeraniol, teprenone, and phytol on the growth of *Staphylococcus aureus*. *Antimicrob Agents Chemother*. 2005;49(5):1770-4.
- (144) Solís C, Becerra J, Flores C, Robledo J, Silva M. Antibacterial and antifungal terpenes from *Pilgerodendron uviferum* (D. Don) Florin J Chil Chem Soc. 2004;49(2):157-61.
- (145) Blainski A, Lopes GC, De Mello JCP, Application and Analysis of the Folin Ciocalteu Method for the Determination of the Total Phenolic Content from *Limonium Brasiliense* L. *Molecules*. 2013;18:6852-65.
- (146) Kirmizigul S, Sarikahya NB, Sumbul H, Gokturk RS, Yavasoglu NUK, Pekmez M, Arda N. Fatty acid profile and biological data of four endemic *Cephalaria* species grown in Turkey. *Rec Nat Prod*. 2012;6(2):151-5.
- (147) Kalita P, Barman TK, Pal TK, Kalita R. Estimation of Total Flavonoids Content (TFC) and Antioxidant activities of methanolic whole plant extract of *Biophytum sentivum* Linn., *J Drug Deliv Ther*. 2013;3(4):33-7.
- (148) Smith TJ. Squalene: potential chemopreventive agent. *Exp Opin Invest Drugs*. 2000;9(8):1841-8.

- (149) Biswas SM, Chakraborty N. Shedded *Artocarpus* leaves - Good plant sources of natural squalene with potent antioxidant and antimicrobial activity. *J Nat Pharm.* 2013;4:21-7.
- (150) Spanova M, Daum G. Squalene – biochemistry, molecular biology, process biotechnology, and applications. *Eur J Lipid Sci Technol.* 2011;113:1299-320.
- (151) Popa I, Băbeanu NE, Niță S, Popa O. Squalene–natural sources and applications. *Farmacia.* 2014;62(5):840-62.
- (152) Sharma R, Kishore N, Hussein A, Lall N. Antibacterial and anti-inflammatory effects of *Syzygium jambos* L. (Alston) and isolated compounds on acne vulgaris. *BMC Complement Altern Med.* 2013;13:292.
- (153) Sivakumar R, Dhivya A. GC-MS analysis of bioactive compounds on ethyl acetate extract of *Cordia monoica* roxb. leaves. *Int J Res Dev Pharm L Sci.* 2015;4(1):1328-33.
- (154) Venkata Raman B, Samuel LA, Pardha Saradhi M, Narashimha Rao B, Krishna Naga Vamsi A, Sudhakar M, Radhakrishnan TM. Antibacterial, antioxidant activity and GC-MS analysis of *Eupatorium odoratum*. *Asian J Pharm Clin Res.* 2012;5(2):99-106.
- (155) Lanxess. Technical information of triacetin. Leverkusen: Lanxess energizing chemistry; 2010:1-2.
- (156) Drug.com [Internet]. c2000-2015 [cited 2015 Jan 19]; Triacetin; [about 3 screen]. Available from: <http://www.drugs.com/inactive/triacetin-68.html>
- (157) LearnChemistry [Internet]. c2015 [cited 2015 Jan 19]; Triacetin; [about 3 screen]. Available from: <http://www.rsc.org/learn-chemistry/resource/rws13835706/triacetin>
- (158) Saeed NM, El-Demerdash E, Abdel-Rahman HM, Algendaby MM, Al-Abbasi FA, Abdel-Naim AB. Anti-inflammatory activity of methyl

palmitate and ethyl palmitate in different experimental rat models. *Toxicol Appl Pharmacol.* 2012;264(1):84-93.

- (159) Park SY, Seetharaman R, Ko MJ, Kim do Y, Kim TH, Yoon MK, Kwak JH, Lee SJ, Bae YS, Choi YW. Ethyl linoleate from garlic attenuates lipopolysaccharide-induced pro-inflammatory cytokine production by inducing heme oxygenase-1 in RAW264.7 cells. *Int Immunopharmacol.* 2014;19(2):253-61.
- (160) Jelenko C, Wheeler ML. Effects of antioxidants on the long-term utility of ethyl linoleate as a water-holding lipid for topical use postburn. *J Surg Res.* 1972;12(3):161-3.
- (161) Bjerve KS, Fischer S, Alme K. Alpha-linolenic acid deficiency in man: effect of ethyl linolenate on plasma and erythrocyte fatty acid composition and biosynthesis of prostanoids. *Am J Clin Nutr.* 1987;46(4):570-6.
- (162) Pettit GR, Herald CL, Ode RH, Brown P, Gust DJ, Michel C. The isolation of loliolide from an Indian Ocean opisthobranch mollusc. *J Nat Prod.* 1980;43(6):752-5.
- (163) Yang X, Kang MC, Lee KW, Kang SM, Lee WW, Jeon YJ. Antioxidant activity and cell protective effect of loliolide isolated from *Sargassum ringoldianum* subsp. *coreanum*. *Algae.* 2011;26(2):201-8.
- (164) Forgo P, Kövér KE. Gradient enhanced selective experiments in the ¹H NMR chemical shift assignment of the skeleton and side-chain resonances of stigmasterol, a phytosterol derivative. *Steroids.* 2004;69(1):43-50.
- (165) Ahmed S, Rahman A, Muslim T, Sohrab MH, Akbor MA, Siraj S, Sultana N, Al-Mansur MA. Antimicrobial cytotoxicity and phytochemical activities of *Spilanthes acmella*. *Bangladesh J Sci Ind Res.* 2012;47(4):437-40.
- (166) Teh SS, Cheng Lian Ee G, Mah SH, Lim YM, Rahmani M. *Mesua beccariana* (Clusiaceae), a source of potential anti-cancer lead compounds in drug discovery. *Molecules.* 2012;17(9):10791-800.

- (167) Ghosh T, Maity TK, Singh J. Evaluation of antitumor activity of stigmasterol, a constituent isolated from *Bacopa monnieri* Linn aerial parts against Ehrlich Ascites Carcinoma in mice. *Orient Pharm Exp Med*. 2011;11:41-9.
- (168) Yinusa I, George NI, Shuaibu UOA, Ayo RG. Bioactivity of stigmasterol isolated from the aerial part of *Spilanthes acmella* (Murr) on selected microorganism. *Int J Curr Microbiol App Sci*. 2014;3(2):475-9.
- (169) Woyengo TA, Ramprasath VR, Jones PJ. Anticancer effects of phytosterols. *Eur J Clin Nutr*. 2009;63(7):813-20.
- (170) Yoshida Y, Niki E. Antioxidant effects of phytosterol and its components. *J Nutr Sci Vitaminol (Tokyo)*. 2003;49(4):277-80.
- (171) Merkushev EB, Karpitskaya LG, Novosel'tseva GI. Oxidation of arylacetylenes by phenyliodoso trifluoroacetate. *Doklady Akademii Nauk SSSR*. 1979;245(3):607-9 [Chem.].
- (172) Delporte C, Backhouse N, Negrete R, Salinas P, Rivas P, Cassels BK, Feliciano AS. Antipyretic, hypothermic and antiinflammatory activities and metabolites from *Solanum ligustrinum* Lood. *Phytother res*. 1998;12(2):118-22.
- (173) Siddiqui BS, Sattar FA, Ahmad F, Begum S. Isolation and structural elucidation of chemical constituents from the fruits of *Morinda citrifolia* Linn. *Arch Pharm Res*. 2007;30(8):919-23.
- (174) Gnonlonfin GJB, Sanni A, Brimer L. Review scopoletin – a coumarin phytoalexin with medicinal properties. *Crit Rev Plant Sci*. 2012;31:47-56.
- (175) Ragasa CY, Hofilena JG. Antimicrobial coumarin derivative from *Delonix regia*. *The Manila Journal of Science*. 2011;7(1):7-11.
- (176) Goy PA, Signer H, Reist R, Aichholz R, Blum W, Schmidt E, Kessmann H. Accumulation of scopoletin is associated with the high disease resistance of

the hybrid *Nicotiana glutinosa* x *Nicotiana debneyi*. *Planta*. 1993;191(2):200-6.

- (177) Ćirić A, Karioti A, Glamočlija J, Soković M, Skaltsa H. Antimicrobial activity of secondary metabolites isolated from *Centaurea spruneri* Boiss. & Heldr. *J Serb Chem Soc*. 2011;76(1):27-34.
- (178) Kurdekar RR., Hegde1 G R, Kulkarni MV, Mulgund GS. Isolation and characterization of Scopoletin - an anticancer compound from the bark of *Hymenodictyon Obovatum* Wall. *Int J Pharm Phytopharmacol Res*. 2014;3(6):469-71.
- (179) Darmawan A, Kosela S, Kardono LBS, Syah YM. Scopoletin, a coumarin derivative compound isolated from *Macaranga gigantifolia* Merr. *J App Pharm Sci*. 2012;2(12):175-7.
- (180) Kim EK, Kwon KB, Shin BC, Seo EA, Lee YR, Kim JS, Park JW, Park BH, Ryu DG. Scopoletin induces apoptosis in human promyeloleukemic cells, accompanied by activations of nuclear factor kappaB and caspase-3. *Life Sci*. 2005;77(7):824-36.
- (181) Yi B, Hu L, Mei W, Zhou K, Wang H, Luo Y, Wei X, Dai H. Antioxidant phenolic compounds of cassava (*Manihot esculenta*) from Hainan. *Molecules*. 2011;16(12):10157-67.
- (182) Malik A, Kushnoor A, Saini V, Singhal S, Kumar S, Yadav YC. *In vitro* antioxidant properties of scopoletin. *J Chem Pharm Res*. 2011;3(3):659-65.
- (183) Mogana R, Teng-Jin K, Wiart C. Anti-inflammatory, anticholinesterase, and antioxidant potential of scopoletin isolated from *Canarium patentinervium* Miq. (Burseraceae Kunth),” *Evidence-Based Complementary and Alternative Medicine*. 2013; Article ID 734824:1-7.
- (184) Yao X, Ding Z, Xia Y, Wei Z, Luo Y, Feleder C, Dai Y. Inhibition of monosodium urate crystal-induced inflammation by scopoletin and underlying mechanisms. *Int Immunopharmacol*. 2012;14(4):454-62.

- (185) Kang SY, Sung SH, Park JH, Kim YC. Hepatoprotective activity of scopoletin, a constituent of *Solanum lyratum*. Arch Pharm Res. 1998;21(6):718-22.
- (186) Mishra PK, Singh R, Kumar U, Prakash V. *Stevia Rebaudiana* – a magic sweetener. Global J Biotech & Biochem. 2010;5(1):62-74.
- (187) Leung AY, Foster S. Encyclopedia of common natural ingredients used in food, drugs, and cosmetics. 2nd ed. New York: John Wiley & Sons; 2003. p. 478-80.
- (188) Saralamp P, Chuakul W, Temsiririrkkul R, Clayton T. Medicinal plants in Thailand volume 1. 1 ed. Bangkok: Amarin; 1996. p.178.
- (189) Michalik A, Hollinshead J, Jones L, Fleet GWJ, Yu C-Y, Hu X-G, et al. Steviamine, a new indolizidine alkaloid from *Stevia rebaudiana*. Phytochem Lett. 2010;3:136-8.
- (190) Thompson AL, Michalik A, Nash RJ, Wilson FX, van Well R, Johnson P, et al. Steviamine, a new class of indolizidine alkaloid [(1R,2S,3R,5R,8aR)-3-hydroxymethyl-5-methyloctahydroindolizine-1,2-diol hydrobromide] [Online]. Acta Crystallogr., Sect. E: Struct. Rep. 2009;65:o2904-5.
- (191) Asano N. Glycosidase-inhibiting alkaloids: isolation, structure, and application. In: Fattorusso E, Tagliatela-Scafati O, editors. Modern alkaloids: structure, isolation, synthesis and biology. Weinheim: Wiley-VCH Verlag GmbH & Co. KGaA; 2008. p. 111-38.
- (192) Watson AA, Fleet GWJ, Asano N, Molyneux RJ, Nash RJ. Polyhydroxylated alkaloids—natural occurrence and therapeutic applications. Phytochemistry. 2001;56:265-95.
- (193) Hu X-G, Bartholomew B, Nash RJ, Wilson FX, Fleet GWJ, Nakagawa S, et al. Synthesis and glycosidase inhibition of the enantiomer of (–)-Steviamine, the first example of a new class of indolizidine alkaloid. Org Lett. 2010;12:2562-5.

- (194) Gómez L, Garrabou X, Joglar J, Bujons J, Paralla T, Vilaplana C, et al. Chemoenzymatic synthesis, structural study and biological activity of novel indolizidine and quinolizidine iminocyclitols. *Org Biomol Chem*. 2012;10:6309-21.
- (195) Chronowska A, Gallienne E, Nicolas C, Kato A, Adachi I, Martin OR. An expeditious synthesis of an analogue of (–)-steviamine by way of the 1,3-dipolar cycloaddition of a nitrile oxide with a 1-C-allyl iminosugar. *Tetrahedron Lett*. 2011;52:6399-402.
- (196) USDA, NRCS. The PLANTS Database [Internet]. Greensboro (NC): National Plant Data Team (USA); 2014 [2014 February 11]. Available from: <http://plants.usda.gov>
- (197) Taylor L. Tropical PLANTS Database [Internet]. Milam County (TX): Raintree; c1996-2005 [updated 2012 December 28; cited 2014 February 11]. Available from: <http://www.rain-tree.com/stevia.htm#.Uvnn5fQW24q>
- (198) Madan S, Ahmad S, Singh GN, Kohli K, Kumar Y, Singh R, Garg M. *Stevia rebaudiana* (Bert.) Bertoni –a review. *Indian J Nat Prod Resour*. 2010;1(3):267-86.
- (199) Mishra PK, Singh R, Kumar U, Prakash V. *Stevia Rebaudiana* – a magic sweetener. *Global J Biotech & Biochem*. 2010;5(1):62-74.
- (200) Leung AY, Foster S. *Encyclopedia of common natural ingredients used in food, drugs, and cosmetics*. 2nd ed. New York: John Wiley & Sons; 2003. p. 478-80.
- (201) Gupta E, Purwar S, Sundaram S, Rai GK. Nutritional and therapeutic values of *Stevia rebaudiana*: a review. *J Med Plants Res*. 2013;7(46):3343-53.
- (202) Lemus-Mondaca R, Vega-Gálvez A, Zura-Bravo L, Ah-Hen K. *Stevia rebaudiana* Bertoni, source of a high-potency natural sweetener: a comprehensive review on the biochemical, nutritional and functional aspects. *Food Chemistry*. 2012;132:1121-32.

- (203) Ibrahim NA, El-Gengaihi S, Motawe H, Riad SA. Phytochemical and biological investigation of *Stevia rebaudiana* Bertoni; 1-labdane-type diterpene. Eur Food Res Technol. 2007; 224:483-8.
- (204) Agostino DM, De Simone F, Pizza C. Steroli della *Stevia rebaudiana* Bertoni. Boll Soc Ital Biol Sper. 1984;60:2237-40.
- (205) Tadhani M, Subhash R. Preliminary studies on *Stevia rebaudiana* leaves: proximal composition, mineral analysis and phytochemical screening. J Med Sci. 2006;6:321-6.
- (206) Muanda FN, Soulimani R, Diop B, Dicko A. Study on chemical composition and biological activities of essential oil and extracts from *Stevia rebaudiana* Bertoni leaves. LWT - Food Sci Technol. 2011;44: 1865-72.
- (207) Fujita S, Taka K, Fujita Y. Miscellaneous contributions to the essential oils of the plants from various territories, The components of the essential oil of *Stevia rebaudiana*. Yakugaku Zasshi. 1977;97:692-4.
- (208) Tadhani MB, Subhash R. *In vitro* antimicrobial activity of *Stevia Rebaudiana* Bertoni leaves. Trop J Pharm Res. 2006;5(1):557-60.
- (209) Jayaraman S, Manoharan MS, Illanchezian S. *In-vitro* antimicrobial and antitumor activities of *Stevia Rebaudiana* (Asteraceae) leaf extracts. Trop J Pharm Res. 2008;7(4):1143-9.
- (210) Paul S, Sengupta S, Bandyopadhyay TK, Bhattacharyya A. Stevioside induced ROS-mediated apoptosis through mitochondrial pathway in human breast cancer cell line MCF-7. Nutr Cancer. 2012;64(7):1087-94.
- (211) Takahashi K, Takahashi K, Ohashi K, Taniguchi K, Nakagomi O, Abe Y, et al. Analysis of anti-rotavirus activity of extract from *Stevia rebaudiana*. Antiviral Res. 2001;49:15-24.
- (212) Oliveira AJBd, Cordeiro LMC, Gonçalves RAC, Ceole LF, Ueda-Nakamura T, Iacomini M. Structure and antiviral activity of arabinogalactan with

- (1→6)- β -D-galactan core from *Stevia rebaudiana* leaves. Carbohyd Polym. 2013;94:179-84.
- (213) Saravanan R, Vengatash babu K, Ramachandran V. Effect of Rebaudioside A, a diterpenoid on glucose homeostasis in STZ-induced diabetic rats. J Physiol Biochem. 2012;68:421-31.
- (214) Gregersen S, Jeppesen PB, Holst JJ, Hermansen K. Antihyperglycemic effects of stevioside in type 2 diabetic subjects. Metabolism. 2004;53(1):73-6.
- (215) Shivanna N, Naika M, Khanum F, Kaul VK. Antioxidant, anti-diabetic and renal protective properties of *Stevia rebaudiana*. J Diabet Complications. 2013;27:103-13.
- (216) Chan P, Tomlinson B, Chen YJ, Liu JC, Hsieh MH, Cheng JT. A double-blind placebo-controlled study of the effectiveness and tolerability of oral stevioside in human hypertension. Br J Clin Pharmacol. 2000;50(3):215-20.
- (217) Boonkaewwan C, Toskulkao C, Vongsakul M. Anti-inflammatory and immunomodulatory activities of stevioside and its metabolite steviol on THP-1 cells. J Agri Food Chem. 2006;54:785-9.
- (218) Sehar I, Kaul A, Bani S, Pal HC, Saxena AK. Immune up regulatory response of a non-caloric natural sweetener, stevioside, Chem Biol Interact. 2008;173:115-21.
- (219) Shukla S, Mehta A, Bajpai VK, Shukla S. *In vitro* antioxidant activity and total phenolic content of ethanolic leaf extract of *Stevia rebaudiana* Bert. Food Chem Toxicol. 2009;47:2338-43.
- (220) Shukla S, Mehta A, Mehta P, Bajpai VK. Antioxidant ability and total phenolic content of aqueous leaf extract of *Stevia rebaudiana* Bert. Exp Toxicol Pathol. 2012;64:807-11.
- (221) Nunes AP, Ferreira-Machado SC, Nunes RM, Dantas FJ, De Mattos JC, Caldeira A. Analysis of genotoxic potentiality of stevioside by comet assay. Food Chem Toxicol. 2007;45:662-6.

- (222) Michael JP. Indolizidine and quinolizidine alkaloids. *Nat Prod Rep.* 2008;25: 139-65.
- (223) Saxton JE. Indolizidine alkaloids. In Saxton, JE, editors. *The alkaloids: volume 5.* Cambridge: Royal Society of Chemistry; 1972. p. 69-78.
- (224) Saxton JE. Indolizidine alkaloids. In Saxton, JE, editors. *The alkaloids: volume 5.* Cambridge: Royal Society of Chemistry; 1975. p. 87-92.
- (225) Davis D, Schwarz P, Hernandez T, Mitchell M, Warnock B, Elbein AD. Isolation and characterization of swainsonine from Texas locoweed (*Astragalus emoryanus*). *Plant Physiol.* 1984;76:972-5.
- (226) Gardner DR, Molyneux RJ, Ralphs MH. Analysis of swainsonine: extraction methods, detection, and measurement in populations of locoweeds (*Oxytropis* spp.). *J Agric Food Chem.* 2001;49:4573-80.
- (227) Tamerler-Yildir C, Adlard MW, Keshavarz T. Production of swainsonine from *Metarhizium anisopliae* in stirred-tank and air-lift reactors. *Biotechnol Lett.* 1997;19(9):919-22.
- (228) Haraguchi M, Gorniak SL, Ikeda K, Minami Y, Kato A, Watson AA, et al. Alkaloidal components in the poisonous plant, *Ipomoea carnea* (Convolvulaceae). *J Agric Food Chem.* 2003;51:4995-5000.
- (229) Chen TM, George RC, Weir JL, Leapheart T. Thermospray Liquid Chromatographic-Mass Spectrometric Analysis of Castanospermine-Related Alkaloids in *Castanospermum australe*. *J Nat Prod.* 1990;53(2):359-65.
- (230) Asano N. Glycosidase inhibitors: update and perspectives on practical use. *Glycobiology.* 2003;13(10):93-104R.
- (231) Dorling PR, Huxtable CR, Colegate SM. Inhibition of lysosomal alpha-mannosidase by swainsonine, an indolizidine alkaloid isolated from *Swainsona canescens*. *Biochem J.* 1980;191(2):649-51.
- (232) Sun JY, Zhu MZ, Wang SW, Miao S, Xie YH, Wang JB. Inhibition of the growth of human gastric carcinoma in vivo and in vitro by swainsonine. *Phytomedicine.* 2007;14:353-9.

- (233) Goss PE, Reid CL, Bailey D, Dennis JW. Phase IB clinical trial of the oligosaccharide processing inhibitor swainsonine in patients with advanced malignancies. *Clin Cancer Res.* 1997;3:1077-86.
- (234) Cenci di Bello I, Mann D, Nash R, Winchester B. Castanospermine-induced deficiency of lysosomal β -D-glucosidase: a model of Gaucher's disease in fibroblasts. In: Salvayre R, Douste-Blazy L, Gatt S, editors. *Lipid storage disorders: biological and medical aspects*, New York: Plenum; 1988, p. 635-41.
- (235) Schols D, Pauwels R, Witvrouw M, Desmyter J, De Clercq E. Differential activity of polyanionic compounds and castanospermine against HIV replication and HIV-induced syncytium formation depending on virus strain and cell type. *Antivir Chem Chemoth.* 1992;3(1):23-9.
- (236) Whitby K, Pierson T.C, Geiss B, Lane K, Engle M, Zhou Y, Doms RW, Diamond MS. Castanospermine, a potent inhibitor of dengue virus infection in vitro and in vivo. *J. Virol.* 2005;79(14):8698-706.
- (237) Tanaka Y, Kato J, Kohara M, Galinski MS. Antiviral effects of glycosylation and glucose trimming inhibitors on human parainfluenza virus type 3. *Antiviral Res.* 2006;72:1-9.
- (238) Cardona F, Goti A, Brandi A. (+)-Lentiginosine, a potent and selective inhibitor of amyloglucosidase: synthetic efforts and disputes on its absolute configuration. *Eur J Org Chem.* 2007:1551-65.
- (239) Shao J, Yang J-S. A Diastereoselective cyclic imine cycloaddition strategy to access polyhydroxylated indolizidine skeleton: concise syntheses of (+)-/(-)-lentiginosines and (-)-2-*epi*-steviamine. *J Org Chem.* 2012;77:7891-900.
- (240) Rajender A, Rao JP, Rao BV. A divergent and stereoselective approach for the syntheses of some polyhydroxylated indolizidine and pyrrolizidine iminosugars. *Eur J Org Chem.* 2013:1749-57.

- (241) Ansari AA, Vankar YD. Synthesis of dihydroxymethyl dihydroxypyrrolidines and steviamine analogues from C-2 formyl glycals. *J Org Chem.* 2013;78:9383-95.
- (242) More JD, Campbell MG. Reaction of acetylated carbohydrates with trimethylaluminium: concise synthesis of 1,2-*O*-isopropylidene *D*-ribofuranose. *Tetrahedron Lett.* 2009;50(22):2617-9.
- (243) Chittenden GJF. Rearrangement of some *D*-ribose and *D*-lyxose derivatives under acetolysis conditions. *Carbohydr Res.* 1972;22:491-3.
- (244) Kim IS, Kim SJ, Lee JK, Li QR, Jung YH. Synthesis of (2*R*,5*S*)-dihydroxymethyl-(3*R*,4*R*)-dihydroxypyrrolidine (DGDP) via stereoselective amination using chlorosulfonyl isocyanate. *Carbohydr Res.* 2007;342:1502-9.
- (245) Ma T, Pai SB, Zhu YL, Lin JS, Shanmuganathan K, Du J, et al. Structure-activity relationships of 1-(2-deoxy-2-fluoro- β -*L*-arabino-furanosyl) pyridimidine nucleosides as anti-hepatitis B virus agents. *J Med Chem.* 1996;39:2835-43.
- (246) Matsuda F, Kawasaki M, Terashima S. Efficient synthesis and antitumor activity of an enantiomeric pair of the sesbanimide AB-ring systems. *Tetrahedron Lett.* 1985;26(38):4639-42.
- (247) Witty DR, Fleet GWJ, Vogt K, Wilson FX, Wang Y, Storer R, et al. Ring contraction of 2-*O*-trifluoromethanesulphonates of α -hydroxy- γ -lactones to oxetene carboxylic esters. *Tetrahedron Lett.* 1990;31(33):4787-90.
- (248) Lafont D, Gross B, Kleinegesse R, Dumoulin F, Boullanger P. Syntheses of neoglycolipids with hexitol spacers between the saccharidic and the lipidic parts. *Carbohydr Res.* 2001;331:107-17.
- (249) Lucas SD, Rauter AP, Schneider J, Wessel HP. Synthesis of 3-fluoro-oxetene δ -amino acids. *J Carbohydr Chem.* 2009;28(7&8):431-46.

- (250) Bachir-Lesage S, Gode' P, Goethals G, Villa P, Martin P. Synthesis of enantiomerically pure alkylated D-erythritols and D-threitols from D-xylose—structural influences on their mesophasic behavior. *J. Carbohydr Chem.* 2003;22(1):35-46.
- (251) Yazici A, Pyne SG. Sequential 1,4- and 1,2-addition reactions to α,β -unsaturated N-acyliminium ions: a new strategy for the synthesis of spiro and bridged heterocycles. *Org Lett.* 2013;15(22): 5878-81.
- (252) Moosophon P, Baird MC, Kanokmedhakul S, Pyne SG. Total synthesis of calystegine B₄. *Eur J Org Chem.* 2010:3337-44.
- (253) Au CWG, Nash RJ, Pyne SG. Synthesis of Hyacinthacine B₃ and purported Hyacinthacine B₇. *Chem Commun.* 2010;46(5):713-5.
- (254) Bouillon ME, Pyne SG. Diastereoselective concise syntheses of the polyhydroxylated alkaloids DMDP and DAB. *Tetrahedron Lett.* 2014;55:475-8.
- (255) Au CWG, Pyne SG. Asymmetric synthesis of *anti*-1,2-amino alcohols via the Borono-Mannich reaction: a formal synthesis of (-)-swainsonine. *J Org Chem.* 2006;71:7097-9.
- (256) Ritthiwigrom T, Willis AC, Pyne SG. Total synthesis of uniflorine A, casuarine, australine, 3-*epi*-australine, and 3,7-di-*epi*-australine from a common precursor. *J Org Chem.* 2010;75:815-24.
- (257) Davis AS, Pyne SG, Skelton BW, White AH. Synthesis of putative uniflorine A. *J Org Chem.* 2004;69:3139-43.
- (258) Watson AA, Nash RJ, Wormald MR, Harvey DJ, Dealler S, Lees E, et al. Glycosidase-inhibiting pyrrolidine alkaloids from *Hyacinthoides non-scripta*. *Phytochemistry.* 1997;46(2):255-9.
- (259) Comstock LR, Denu JM. Synthesis and biochemical evaluation of *O*-acetyl-ADP-ribose and *N*-acetyl analogs. *Org Biomol Chem.* 2007;5:3087-91.

- (260) Pyne SG, Davis AS, Ritthiwigrom T, Au CWG, Savasapun K, Wotherspoon M. The boronic acid Mannich reaction in alkaloid synthesis. *Pure Appl Chem.* 2013;85(6):1215-25.
- (261) Pyne SG, Tang M. The boronic acid Mannich reaction. In: Denmark, SE, editor. *Organic Reactions.* New Jersey: John Wiley&Sons; 2014. Vol 83. p. 211-498.
- (262) Pyne SG, Au CWG, Davis AS, Morgan IR, Ritthiwigrom T, Yazici A. Exploiting the borono-Mannich reaction in bioactive alkaloid synthesis. *Pure Appl Chem.* 2008;80(4):751-62.
- (263) Dias EL, Nguyen ST, Grubbs RH. Well-Defined Ruthenium Olefin Metathesis Catalysts: Mechanism and Activity. *J Am Chem Soc.* 1997;119(17): 3887-97.
- (264) Yang Q, Xiao W-J, Yu Z. Lewis acid assisted ring-closing metathesis of chiral diallylamines: an efficient approach to enantiopure pyrrolidine derivatives. *Org Lett.* 2005;7(5):871-4.
- (265) Ritthiwigrom T, Pyne SG. Synthesis of (+)-Uniflorine A: A Structural Reassignment and a Configurational Assignment. *Org Lett.* 2008;10(13):2769-71.
- (266) Nash RJ, Kato A, Yu CY, Fleet GWJ. Iminosugars as therapeutic agents: recent advances and promising trends. *Future Med Chem.* 2011;3(12):1513-21.

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LIST OF PUBLICATIONS

- 1) Jiangseubchatveera N, Bouillon ME, Liawruangrath B, Liawruangrath S, Nash RJ, Pyne SG. Concise synthesis of (–)-steviamine and analogues and their glycosidase inhibitory activities. *Org Biomol Chem*. 2013;11(23):3826-33.
- 2) Jiangseubchatveera N, Liawruangrath B, Liawruangrath S, Teerawutgulrag A, Santiarworn D, Korth J, Pyne SG. The chemical constituents and the cytotoxicity, antioxidant and antibacterial activities of the essential oil of *Graptophyllum pictum* (L.) Griff. *TEOP*. 2015;18(1):11-7.
- 3) Jiangseubchatveera N, Liawruangrath S, Teerawutgulrag A, Santiarworn D, Pyne SG, Liawruangrath B. Phytochemical screening, phenolic and flavonoid contents, antioxidant and cytotoxic activities of *Graptophyllum pictum* (L.) Griff. *Chiang Mai J Sci*. 2015;42(x):1-11.
- 4) Jiangseubchatveera N, Liawruangrath B, Liawruangrath S, Korth J, Pyne SG. The chemical constituents and biological activities of the essential oil and the extracts from leaves of *Gynura divaricata* (L.) DC. growing in Thailand. *TEOP*. 2015;18(3):543-55.

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