

# Dr. Rizwan Ahmad

Ag-Medal (2005) Best researcher Awards 2017-2018 & 2018-2019 Top 2% World Scientists Recognition 2021 & 2022 1<sup>st</sup> & 4<sup>th</sup> track nomination for President's list of Distinguished researchers (2022) Cell # +966 54 983 183 5 & +92 346 6374347

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Position:	Associate Professor
Nationality:	Pakistani
Languages:	English, Urdu, Pashto, Punjabi

#### **Academic Career**

Ph. D.	2013	1 <sup>st</sup> Division
B. Pharm.	2006	1 <sup>st</sup> Division
H. S. S. C	2001	1 <sup>st</sup> Division
S. S. C	1999	1 <sup>st</sup> Division

University of Antwerp, Belgium and University of Karachi, Pakistan University of Malakand, Pakistan B. I. S. E Swat, K. P. K, Pakistan B. I. S. E Swat, K. P. K, Pakistan

# **Funded Research Projects**

Research Title	Fund & duration	Funder	Role
Novel green extraction and metabolomic analysis for natural products with screening for potential biological activities against emerging diseases using advanced hyphenated techniques	0.1M SAR (2023-2024)	Ministry of Education, Kingdom of Saudi Arabia (#IFP-22-UQU-4280107- DSR-191)	Co-PI
Comparative preclinical studies of different routes of "insulin mimicking herbal novel Nano formulation" in the treatment of diabetes and its stress markers	1M SAR (2021-2023)	Ministry of Health, Kingdom of Saudi Arabia (#IF-2020-035- Pharm)	PI
Cyclopeptide Alkaloids as AGEs (advanced glycation end products) inhibitors.	0.01M € (2012-2013)	IRSIP, HEC & University of Antwerp, Belgium (1-8/HEC/HRD/2011/2162)	PI

**PI:** Principle investigator,

# Publications (https://scholar.google.com/citations?hl=en&user=NgRTj3oAAAAJ) (https://www.researchgate.net/profile/Rizwan\_Ahmad30/publications)

- 1. <u>*Rizwan Ahmad*</u>\*, Riaz M, Aldholmi M, Alsulays A, Alsulais W, et al., Solanum pseudocapsicum vs *Capsicum annum*; comparative phenolics profiling using green ultrasonic extraction and UHPLC analysis. *Ultrasonics Sonochemistry*. 103, 106789. (2024)
- 2. <u>*Rizwan Ahmad*</u>\*, Aldholmi M, Alqathama A, Al Nahab HZ, Almutawah AH et al. A comprehensive LCMS/MS characterization for the green extracted cucurbitane-triterpenoid glycosides from bitter melon (*Momordica charantia*) fruit. *Food Chemistry*.1-138479, (2024)
- **3.** AlQathama A, <u>*Rizwan Ahmad*</u>. Muslim pilgrims' knowledge, attitudes, and practices regarding complementary and alternative medicine (CAM); a study conducted during Hajj season. *Saudi Pharmaceutical Journal*. 32(03) (**2024**)
- 4. Khan I, Khan U, Khan W, Alqathama A, Riaz M, <u>*Rizwan Ahmad*</u>, Alam MM. Antibacterial and antibiofilm potentials of *Rumex dentatus* root extract characterized by HPLC-ESI-Q-TOF-MS. *Saudi Journal of Biological Sciences*. 31(04) (2024)
- Serafi AS, Ahmed M, Shahid I, Azmat A, Bader A, Bafail MA, Alaamri S, <u>Rizwan Ahmad</u>\*. Antihyperglycemic, antiglycation, antihypercholesteremic, and toxicity evaluation with gas chromatography mass spectrometry profiling for *Aloe armatissima* leaves. *Open Chemistry* (*De Gruyter*). 04(2024)
- 6. <u>*Rizwan Ahmad*\*</u>, Alqathama A, Alam MM, Riaz M, et al. biological quality and phytochemical profiling of olive fruits using gas chromatography–mass spectrometry (GCMS) analysis. *Chemical and Biological Technologies in Agriculture*. 10:45 (2023)
- <u>Rizwan Ahmad</u>\*, Alqathama A, Aldholmi M, Riaz M. Ultrasonic-assisted extraction of fenugreek flavonoids and its geographical-based comparative evaluation using green UHPLC-DAD analysis. *Ultrasonics Sonochemistry.* 25; 95: 106382 (2023)
- 8. <u>*Rizwan Ahmad*</u>\*, Alqathama A, Aldholmi M, Riaz M, Abdallah AN, et al., Anti-diabetic and anticancer potentials of *Mangifera indica* L. from different geographical origins. *Pharmaceuticals.* 16(350) (2023)
- **9.** <u>*Rizwan Ahmad*</u>\*, Alqathama A, Aldholmi M, Riaz M. The effect of natural antioxidants, pH, and green solvents upon catechins stability during ultrasonic extraction from green tea leaves (*Camellia sinensis*). *Ultrasonics Sonochemistry*. 94(03) (**2023**)
- <u>Rizwan Ahmad</u>\*, Alqathama A, Aldholmi M, Riaz M, Mukhtar M.H, et al., Biological Screening of *Glycyrrhiza glabra* L. from Different Origins for Antidiabetic and Anticancer Activity. *Pharmaceuticals.* 16, 7 (2023)
- Roheel A, Khan A, Anwar F, Akbar Z, Akhtar MF, Imran Khan M, Sohail MF, <u>*Rizwan*</u> <u>*Ahmad*</u>. Global epidemiology of breast cancer based on risk factors: a systematic review. *Frontiers in Oncology*. 13:1240098. (2023) doi: 10.3389/fonc.2023.1240098
- 12. Khan AU, Khan A, Shal B, Khan S, Khan M, <u>*Rizwan Ahmad*</u>, Riaz M. The critical role of the phytosterols in modulating tumor microenvironment via multiple signaling. A comprehensive molecular approach. *Phytotherapy Research*. 1-18. (2023)
- 13. Shabbir U, Mumtaz S, Riaz M, Khan U, Ilyas N, Nawaz I, <u>*Rizwan Ahmad*</u>, Khan W. Effect of Honey use with *Seriphidium chitralense* podlech on growth and biofilm formation of *Pseudomonas aeruginosa*. *Kuwait Journal of Science*. 50(4); 703-708
- 14. Kangevari Am, Malekpour MR, Masinaei M, Moghaddam SS, <u>*Rizwan Ahmad*</u>, et al. Effect of air pollution on disease burden, mortality, and life expectancy in North Africa and the Middle East: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Planetary Health*. e358-e369:7(5) (2023)

- 15. Ong KL, Stafford LK, <u>*Rizwan Ahmad*</u>, et al. Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*. S0140-6736(23)01287-4 (2023)
- 16. Tran KB, Lang JJ, Compton K, Xu R, Acheson AR, <u>*Rizwan Ahmad*</u>, et al. The global burden of cancer attributable to risk factors, 2010–19: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*. 400(10352); 563-591 (2022)
- Naghavi M, Xu R, Acheson AR, <u>*Rizwan Ahmad*</u>, et al. Global mortality associated with 33 bacterial pathogens in 2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*. S0140-6736(22)02185-7 (2022)
- 18. <u>Rizwan Ahmad</u>\*, Alqathama A, Aldholmi M, Riaz M, Abdalla AN et al. Gas Chromatography-Mass Spectrometry (GC-MS) Metabolites Profiling and Biological Activities of Various Capsicum annum cultivars. *Plants-MDPI*. 11, 1022 (2022)
- Aldholmi M, <u>Rizwan Ahmad</u>, Carretero-Molina D, Wilkinson B, Reyes F, Genilloud O, O'Connell M, Ganesan A. Euglenatides, Potent Antiproliferative Cyclic Peptides Isolated from the Freshwater Photosynthetic Microalga *Euglena gracilis*. Angewandte Chemie. 03 (2022).
- 20. <u>Rizwan Ahmad</u>\*, Aldholmi M, Alqathama A, Aldossary S, Bubshait S, Aljaber M et al., A novel green extraction and analysis technique for the comprehensive characterization of mangiferin in different parts of the fresh mango fruit (*Mangifera indica*). LWT-Food Science and Technology.159(04) (2022)
- 21. <u>Rizwan Ahmad</u>\*, Shabaan H, Issa SY, Alghamdi M, et al., ICP-MS determination of elemental abundance in traditional medicinal plants commonly used in the Kingdom of Saudi Arabia. Food additive and Contaminants: Part B. 15(3) (2022)
- 22. Mostafa A, Shaaban H, Alqarni AM, Alsultan S, Al-Saeed JS, Alsaba S, <u>*Rizwan Ahmad.*</u> Vortex-assisted dispersive liquid–liquid microextraction using thymol based natural deep eutectic solvent for trace analysis of sulfonamides in water samples: Assessment of the greenness profile using AGREE metric, GAPI and analytical eco-scale. *Microchemical Journal*. 183(107976) (2022)
- 23. Abdalla AN, Stefano MD, Poli G, Tuccinardi T, <u>Rizwan Ahmad</u>, Alkahtani HM, El-Azab AS, Alqathama A. Co-inhibition of P-gp and Hsp90 by an isatin-derived com-pound contribute to increasing the chemosensitivity of MCF7/ADR-resistant cells to doxorubicin. *Molecules (MDPI)*. 27, 90 (2022)
- 24. Shabaan H, Issa SY, <u>*Rizwan Ahmad*</u>, Mostafa A, Hussien D, Alqarni AM. Investigation on the elemental profiles of lip cosmetic products: Concentrations, distribution and assessment of potential carcinogenic and non-carcinogenic human health risk for consumer safety. *Saudi Pharmaceutical Journal*. 03 (2022)
- 25. Amir MD, Zafar A, <u>*Rizwan Ahmad*</u>, Ahmad W, Sarafroz M, Khalid M, et al., Quality Control Standardization, Contaminant Detection and *In Vitro* Antioxidant Activity of *Prunus domestica* Linn. Fruit. *Plants-MDPI*. 11;706 (2022).
- 26. Alqathama AA, <u>*Rizwan Ahmad*</u>, Alsaedi RB, Alghamdi RA, Abkar EH, Alrehaly RH, Abdalla AN. The vital role of animal, marine, and microbial natural products against COVID-19. *Pharmaceutical Biology*. 60:1, 509-524 (2022)
- 27. Riaz M, Khan M, <u>*Rizwan Ahmad*</u>, AlLehaibi LH, Rahman N, Deqiang D. Evidence-based anti-viral and immunomodulatory potential of Black cumin (*Nigella sativa* L.) in COVID-19.

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- 28. <u>Rizwan Ahmad</u>\* et al., Development of a Critical Appraisal Tool (AIMRDA) for the Peer-Review of Studies Assessing the Anticancer Activity of Natural Products: A Step towards reproducibility. Asian Pacific Journal of Cancer Prevention. 22(12): 3735-3740 (2022)
- 29. <u>*Rizwan Ahmad*</u>\*, Ahmad N, Aljamea A. Evaluation of solvent and temperature effect on green accelerated solvent extraction (ASE) and UHPLC-DAD quantification of phenolic compounds in fresh olive fruit (*Olea europaea*). *Food chemistry*. 342, 128248 (2021)
- 30. <u>Rizwan Ahmad</u>\*, Riaz M, Khan A, et al., Ganoderma lucidum (Reishi) an edible mushroom; a comprehensive and critical review of its nutritional, cosmeceutical, mycochemical, pharmacological, clinical, and toxicological properties. *Phytotherapy Research*. 35(11);6030-6062 (2021)
- 31. <u>Rizwan Ahmad</u>\*, Aldholmi M, Alqathama A, Aldossary S, Bubshait S, Aljaber M et al., Green and novel Ultrasonic extraction with LC-MSMS analysis of natural sweetener (Glycyrrhizic acid) from *Glycyrrhiza glabra*; a multifactorial mechanistic evaluation based on statistical analysis. *Ultrasonics Sonochemistry.* (2021)
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- 35. <u>Rizwan Ahmad</u>\*, Riaz M, AlLehaibi LH, AlSuwaidan HN, Alraya RA, Zahoor S. The dietary supplement of *Ginkgo biloba*: a comprehensive review of its potential interactions based on pre-clinical and clinical evidences. *Boletin Latinoamericano y del Caribe de Plantas Medicinales y Aromaticas (BLACPMA).* 20 (6): 558-574 (2021)
- 36. Mohiuddin SG, Aziz S, <u>*Rizwan Ahmad*</u>, Ghadzi SMS, et al., Use of Traditional Chinese Medicine in Malaysia: A Knowledge and Practice Study among General Population toward Complementary and Alternative Medicine in Relation to Health and Quality of Life in Malaysia. J Pharmacy and Bio allied Sciences. 12(2021)
- 37. Ahmad N, <u>*Rizwan Ahmad*</u>. Ischemic brain treated with 6-Gingerol loaded mucoadhesive Nano emulsion via intranasal delivery and their comparative pharmacokinetic effect in brain. Journal of drug delivery science and technology. 10(2021)
- 38. <u>Rizwan Ahmad</u>\*, Almubayedh H, Ahmad N, Naqvi AA. Ethnobotany, ethnopharmacology, phytochemistry, biological activities and toxicity of *Pistacia chinensis* subsp. *integerrima*: A comprehensive review. *Phytotherapy Research*. 34(11):2793-2819 (2020)

- **39.** <u>*Rizwan Ahmad*</u>\*, Ahmad N, AlAnaki WS, Ismail FA, AlJishi F. Solvent and temperature effect of accelerated solvent extraction (ASE) coupled with ultra-high-pressure liquid chromatography (UHPLC-PDA) for the determination of methyl xanthines in commercial tea and coffee. *Food Chemistry*. 311(05);126021 (2020)
- 40. <u>Rizwan Ahmad\*</u>, Ahmad N, Shehzad A. Solvent and temperature effects of Accelerated solvent extraction (ASE) coupled with Ultra-high-pressure liquid chromatography (UHPLC-PDA) technique for determination of Thymoquinone in commercial food samples of black seeds (*Nigella sativa*). *Food chemistry*, 309(03);125740 (2020)
- 41. <u>Rizwan Ahmad\*</u>, AlLehaibi LH, Alshammari AK, Alkhaldi SM. Quality Evaluation of the Clinical Trials for Natural Products Used in Cancer: An Evidence-Based Literature Review. *Applied Sciences.* 10(22), 7961 (2020)
- 42. <u>Rizwan Ahmad</u>\*, Ahmad N, Riaz M, et al., Optimization of extraction and quantification technique for phenolics content of garlic (*Allium sativum*); an application for comparative phytochemical evaluation based on cultivar origin. *Biomedical Chromatography.* e4942 (2020)
- **43.** <u>*Rizwan Ahmad*</u>\*, Ahmad N, Amir MD et al., Quality Variation and standardization of black pepper (*Piper nigrum*): A comparative geographical evaluation based on instrumental and metabolomics analysis. *Biomedical Chromatography*. e4772: 34(3) (**2020**)
- 44. <u>Rizwan Ahmad</u>\*, Ahmad N, Amir M, AlJhisi F, et al., Variation in Nigella sativa quality and its standardization via instrumental analysis: A study based on geographical origin. Notulae Botanicae Horti Agrobotanici Cluj-Napoca journal. 48(3):1141-1154 (2020)
- 45. <u>Rizwan Ahmad\*</u>, Ahmad N, AlOthman F, Mohammad H, AlZahrani F. Extraction of methyl xanthines and their UHPLC-DAD determination in consumable beverages used in Eastern province of Saudi Arabia. *Biomedical Chromatography*. e4712: 34(1) (2020)
- 46. <u>Rizwan Ahmad\*</u>, Ahmad N, AlHudaithi N, AlHebshi A, Bukhari A. Extraction and UHPLC– DAD detection of undeclared substances in market-available dietary supplements and slimming products in Eastern region, Saudi Arabia: An application of principal component analysis. *Biomedical Chromatography.* e4698: 34(1) (2020)
- 47. Almubayedh H, <u>Rizwan Ahmad</u>\*. Ethnopharmacology, phytochemistry, biological activities, and therapeutic applications of *Cedrela serrata* Royle: A mini review. Journal of Ethnopharmacology, 246(01), 112206 (2020)
- 48. Riaz M, <u>*Rizwan Ahmad*</u>, Rahman N, Khan Z. Traditional uses, phyto-chemistry and pharmacological activities of *Tagetes patula* L. *Journal of Ethnopharmacology*, 255; 112718, (2020)
- 49. Shehzad A, Rehmat S, Ul-Islam S, <u>*Rizwan Ahmad*</u>, Aljafary M, Alrashid NA, Al-Suhaimi E. Lirioresinol B dimethyl ether inhibits NF-κB and COX-2 and activates IκBα expression in CCl4-induced hepatic fibrosis. *BMC Complementary Medicine and Therapies*. 20:49 (2020)
- 50. Ahmad N, <u>*Rizwan Ahmad*</u>, Alrasheed RA, Almatar HMA. Quantification and Evaluations of Catechin Hydrate Polymeric Nanoparticles Used in Brain Targeting for the Treatment of Epilepsy. *Pharmaceutics*, 12: 203 (2020)

- 51. Mohiuddin SG, Aziz S, Iqbal MZ, Naqvi AA, <u>*Rizwan Ahmed*</u>, et. al., Knowledge, Attitude, and Practice of General Population toward Complementary and Alternative Medicines in Relation to Health and Quality of Life in Sungai Petani, Malaysia. J Pharmacy and Bio allied Sciences. 12(1);57-63 (2020)
- 52. Khan S, Ahmad Z, Aziz S, Hanif M, <u>Rizwan Ahmad</u>, Mohiuddin S. Phytochemical screening and enzymatic and antioxidant activities of *Erythrina suberosa* (Roxb) bark. J Pharmacy and Bio allied Sciences. 12(2):192-200 (2020)
- 53. Ahmad Z, Aziz S, Alauddin S, Mohiuddin SG, Javed A, <u>Rizwan Ahmad</u>, et al. In vitro cytotoxic and antimicrobial activities of *Erythrina suberosa* (Roxb.) bark. J Pharmacy and Bio allied Sciences. 12(2):210-6 (2020)
- 54. <u>Rizwan Ahmad\*</u>, Ahmad N, Shehzad A. Solvent and temperature effects of accelerated solvent extraction (ASE) with Ultra-high-pressure liquid chromatography (UHPLC-PDA) technique for determination of Piperine and its ICP-MS analysis. *Industrial Crops and Products*, 136(15):37-49 (2019)
- 55. <u>Rizwan Ahmad</u>\*, Ahmad N, Alshayban DM, Alamer MA, Alkhalifah A, Al-Momaten H. Pharmacokinetic Interaction Study for Simvastatin and Parsley and Its Plasma Quantification Using LC-MS: A Focus on Drug Metabolic Enzymes. *Iranian red crescent medical journal*, 21(2):e85783 (2019)
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- 57. Shehzad A, Zahid H, <u>*Rizwan Ahmad*</u>, Al-Suhaimi EA. A Natural product Decursin enhances the radio sensitization of ionizing radiation against DMBA-Induced tumour. *International Journal of Applied Pharmaceutics*. 11(3):14-16 (2019)
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- 59. Naqvi AA, Zehra F, Khan N, <u>*Rizwan Ahmad*</u>, McGarry K. Interactions and conflicts of interests between prescribers and medical sales representatives (MSRs) regarding prescribing and drug promotion practices in Karachi, Pakistan. *PJPS* 32(2):687-695 (2019)
- 60. Alsaeed W, Al-Dhamen M, <u>*Rizwan Ahmad\**</u>, Ahmad N, Naqvi AA. Clinical uses and toxicity of *Ephedra sinica*; an evidence based comprehensive retrospective review (2004-2017). *Pharmacognosy Journal* 11(2): 445-450. (2019)
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- 62. Shehzad A, Qureshi M, Jabeen S, <u>*Rizwan Ahmad*</u> et al., Synthesis, characterization and antibacterial activity of silver nanoparticles using *Rhazya stricta*. *PeerJ* 6: e6086 DOI 10.7717/peerj.6086 (2018)

- 63. Naqvi AA, <u>*Rizwan Ahmad*</u>, Elewi AAW, Alawa AH, Alasiri MJ. Dietary supplements use among undergraduate male students in health and non-health clusters colleges of a publicsector University in Dammam, Saudi Arabia. *BMC Complementary and Alternative medicines*. 18:269 (2018)
- 64. Naqvi AA, Naqvi SBS, Zehra F, <u>*Rizwan Ahmad*</u>, Ahmad N. Estimation of the Direct Cost of Poliomyelitis Rehabilitation Treatment to Pakistani Patients: A 53-Year Retrospective Study. *Applied Health Economics and Health Policy*. 1-18 (2018)
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- 66. Al-Mubayedh H, <u>Rizwan Ahmad</u>\*, Naqvi AA, Ahmad N. Ethnopharmacological uses and public knowledge regarding *Cinnamomum zeylanicum* in Khobar, Saudi Arabia. J Pharm Bioall Sci. 10(3):159-65 (2018)
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- 70. Almubayedh H, Albannay R, Aleleq K, <u>*Rizwan Ahmad\**</u>, Ahmad N, Naqvi AA. Clinical uses and toxicity of *Atropa belladonna*; an evidence based comprehensive retrospective review (2003-2017). *Biosci. Biotech. Res. Comm.* 11(1): 41-48 (2018)
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- 73. <u>Rizwan Ahmad\*</u>, Ahmad N, Naqvi AA. "Ziziphus oxyphylla"; Ethnobotanical, Ethnopharmacological and phytochemical review. *Biomedicine & Pharmacotherapy*. 91C; 970–998. (2017)
- 74. <u>*Rizwan Ahmad\**</u>, Naqvi AA, Ahmad N et al., Awareness, Perception, Attitude, and Knowledge Regarding Complementary and Alternative Medicines (CAMs) Among the Pharmacy and Medical Students of a Public University in Saudi Arabia. *Archives of Pharmacy Practice*. 8(02); 51-63 (2017)

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- 76. <u>Rizwan Ahmad\*</u>, Ahmad N, Naqvi AA, Adeeb S, Mastour SA. Role of Traditional Islamic and Arabic plants in Cancer Therapy. *Journal of Traditional and Complementary Medicine*. 7(2); 195-204 (2017)
- 77. Al-Shagawi MA, <u>*Rizwan Ahmad\**</u>, Naqvi AA, Ahmad N. Determinants of academic stress and stress-related self-medication practice among undergraduate male pharmacy and medical students of a tertiary educational institution in Saudi Arabia. *Tropical journal of pharmaceutical research*. 16 (12): 2997-3003. (2017)
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- 79. Al-Laif FZ, <u>Rizwan Ahmad\*</u>, Naqvi AA, Ahmad N. Pharmacist Perceived Barriers to Patient Counselling; A Study in Eastern Region of Saudi Arabia. Journal of Pharmaceutical Research International. 19(6): 1-12, (2017); Article no. JPRI.37705. Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759).
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- **85.** Naqvi AA, Shah A, <u>*Rizwan Ahmad*</u>, Ahmad A. Developing an integrated treatment pathway for a post coronary artery bypass grafting (CABG) geriatric patient with comorbid hypertension and type-1 diabetes mellitus for treating acute hypoglycaemia and electrolyte imbalance emergency. *J Pharm Bioall Sci.* 9(3):216-220; (2017)

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- 91. <u>Rizwan Ahmad\*</u>, Ahmad N, Naqvi AA, Paul C, Louis M, Sandra A, Nina H, Luc P. Antiinfective, Cytotoxic and Antioxidant activity of *Ziziphus oxyphylla* and *Cedrela serrata*. Asian Pacific Journal of Tropical Biomedicine. 6(8); 671-676. (2016)
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- **99.** Samiullah B, M.I Nasiri, Sohail A, <u>*Rizwan Ahmad*</u> Kamran A. Comparative study on resistance pattern of clinical isolates of severe acute pancreatitis against Moxifloxacin and Ciprofloxacin; an *in-vitro* study. *Journal of PharmaSciTech*. 5, (1): 11-13, (**2015**)
- 100. Atul U, Emmy T, <u>*Rizwan Ahmad*</u>, Sandra A, Luc P, Nina H. Kavalactones, a novel class of advanced glycation end-products inhibitors, prevent *in-vitro* protein glycation via metal chelation. *Planta. Med.* 80(12): 1001-1008 (2014)
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- 104. <u>Rizwan Ahmad</u>, Luc P, Najm-ur-Rahman, Muhammad R. Antimicrobial and Antioxidant Activity of Crude Extracts of Two Medicinal Plants *Pistacia integerrima* and *Debregeasia* salicifolia. Int. J. Pharm. Sci. Rev. Res. 18(1), 13-17, (2013)
- 105. Zhani K, Hermans N, <u>Rizwan Ahmad</u>, Hannachi C. Evaluation of salt Tolerance (NaCl) in Tunisian Chili Pepper (*Capsicum frutescens* L.) on Growth, Mineral Analysis and Solute Synthesis. Journal of stress physiology & Biochemistry. 9 (1), 209-228, (2013)
- 106. Najmur R, Mansoor A, Muhammad R, Mehjabeen, Noor J, <u>*Rizwan Ahmad.*</u> Phytochemical, antimicrobial, insecticidal and brine shrimp lethality bioassay of the crude methanolic extract of *A. parviflora*. *Pak. J. Pharm. Sci.*, 26(4): 751-756, (2013)

#### **Books and Chapters published**

- 107. Sharif S, Zahid M, Zia-Ul-Haq M, <u>*Rizwan Ahmad*</u>. Chapter 6 "Face Masks and Hand Sanitizers" in book "The COVID-19 Pandemic, A Multidisciplinary Review of Diagnosis, Prevention and Treatment". ISBN: 9781774910504. Published 7<sup>th</sup> July 2022 (Taylor & Francis). 1<sup>st</sup> Edition, Pages 52. DOI: <u>https://doi.org/10.1201/9781003283607</u>
- Bano N, <u>*Rizwan Ahmad*</u>, Khan Z, Khan M. Chapter 7 "Lockdown as a Strategy to Control COVID-19" in book "The COVID-19 Pandemic, A Multidisciplinary Review of Diagnosis, Prevention and Treatment". ISBN: 9781774910504 Published 7<sup>th</sup> July 2022 (Taylor & Francis). 1<sup>st</sup> Edition, Pages 29. DOI: <u>https://doi.org/10.1201/9781003283607</u>

- 109. Khan M, Faheem M, <u>*Rizwan Ahmad*</u>, Riaz M. Chapter 8 "Vaccines Against COVID-19" in book "The COVID-19 Pandemic, A Multidisciplinary Review of Diagnosis, Prevention and Treatment". ISBN: 9781774910504 Published 7<sup>th</sup> July 2022 (Taylor & Francis). 1<sup>st</sup> Edition, Pages 33. DOI: <u>https://doi.org/10.1201/9781003283607</u>
- 110. Riaz M, *Rizwan Ahmad*, Zia-Ul-Haq M. "Carotenoids as Antiobesity Agents" in book entitled "Carotenoids: Structure and Function in the Human Body". Pages no. 569-584. ISBN: 978-3-030-46458-5 (Springer Publisher). (2021) https://www.springer.com/gp/book/9783030464585
- 111. *Rizwan Ahmad*, Ahmad N, Naqvi AA. Role of traditional Islamic and Arabic plants in Cancer therapy (TAI plants & Cancer). ISBN: 978-3-659-86864-1. LAP LAMBERT Academic Publishing, Germany. (2017)

#### **Distinguished Awards and Achievements**

- "*Top 2% World Scientists Recognition*", for the year 2022, as released by Stanford University on 17<sup>th</sup> October, (**2022**).
- "*The Annual University Award for Student Research* (2<sup>nd</sup> track of Student Research Publication Initiative)" for the year 2022, awarded by Deanship of Scientific research, Imam Abdulrahman Bin Faisal University, Kingdom of Saudi Arabia (**2022**). LWT (Mango)
- Nomination for "*First Track;* researcher with highest number of publications in colleges" at "*IAU University President's List of Distinguished researchers*" for the year **2021**
- Nomination for "*Fourth Track*; Top 10 researchers in the University with highest citations in the last six years" at "*IAU University President's List of Distinguished researchers*" for the year 2021
- "<u>Top Cited Article</u>" certificate by "Wiley Publisher" for the article in "Biomedical Chromatography" journal (2022).
- "*The Annual University Award for Student Research* (2<sup>nd</sup> track of Student Research Publication Initiative)" for the year 2021, awarded by Deanship of Scientific research, Imam Abdulrahman Bin Faisal University, Kingdom of Saudi Arabia (**2021**). Ultrasonic (Liquorice)
- "<u>*Top 2% World Scientists Recognition*</u>", for the year 2021, as released by Stanford University on 19<sup>th</sup> October, (**2021**).
- "*Best Researcher Award*" for more in number of publications in the year 2018-2019, College of Clinical Pharmacy, IAU, Saudi Arabia (**2019**).
- "*Best Researcher Award*" for more in number of publications in the year 2017-2018, College of Clinical Pharmacy, IAU, Saudi Arabia (**2018**).
- "<u>Appreciation letter from Rector</u>, Imam Abdulrahman Bin Faisal University, KSA" for *best teaching and lecturing skills* based on Course (CES) & Lecturing evaluation survey (LES)-2015/2016 (2016).
- Awarded with *Silver medal* (Ag-medal) during B. Pharmacy degree (Session 2001-2005).
- Awarded with *Belgium fellowship*, under IRSIP, by HEC, Pakistan.

- Qualified *GRE* (*Subjective*) and *NTS* (*General*) tests conducted by HEC, Pakistan.
- Got 2<sup>nd</sup> position during S.S.C exams under B.I.S.E Swat, Pakistan.
- Got 1<sup>st</sup> Division throughout Academic Career.
- Got *Certificate* for Qualifying Short course "**Different Instrumental techniques**" organized by UVAS (University of Veterinary & Animal Sciences) Lahore, Pakistan.

## **Current Research Projects**

Research Title	Name of Investigator(s)
The use of surfactants to enhance the solubility and extraction of	Rizwan Ahmad
Piperine from <i>Piper nigrum</i>	Kizwan Anniau
Water as a green replacement solvent for extraction of phenolics from	Rizwan Ahmad
different matrices	Kizwan Anniau
The comparative analysis of flavonoids profiling for green and dried	Rizwan Ahmad/MA
fruit of <i>Quercus baloot</i> with its cytotoxic activities	Rizwan Annau/MA
Green accelerated solvent extraction (ASE) with solvent and	
temperature effect on Phenolic yield in pomegranate and its ultra-	<b>Rizwan Ahmad</b>
high-pressure liquid chromatography (UHPLC-DAD) analysis	
MA-Mohammed Al Dholami	

MA=Mohammed Al-Dholami

#### **Research Projects Completed**

Investigator(s) (Supported by)	Research Title	Report Date
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	A comprehensive LC-MSMS characterization of bitter melon cucurbitane-triterpenoid glycosides with its antiviral activity (KVIII, KX, KXII)	Aug, 2023
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	<i>Pseudo capsicum Vs Capsicum annum</i> ; optimization and comparative evaluation for the green extraction and analysis of phenolic compounds	June, 2023
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Green extraction and LCMSMS analysis for Diosgenin from fenugreek samples	Apr, 2023
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	The effect of pH, green solvents, and antioxidants on Ultrasound assisted extraction of green tea Catechins with LCMS/MS analysis	Nov, 2022
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Screening the biological activities for liquorice and mango samples from different geographical origin	Sep, 2022
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Optimization of green accelerated solvent extraction (ASE) and LC-MS/MS analysis of Mangiferin with antioxidant, antidiabetic, and anticancer activity	June, 2021
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Optimization of green Ultrasonication-assisted- extraction (UAE) and LC-MS/MS analysis of Glycyrrhizic acid with antioxidant, antidiabetic, and	Mar, 2021

	anticancer activity	
	Green accelerated solvent extraction (ASE) with solvent	
Dizwon Ahmod		
<b>Rizwan Ahmad</b>	and temperature effect and green UHPLC-DAD analysis	Apr, 2020
(IAU, Saudi Arabia)	of Phenolics in Pepper fruit ( <i>Capsicum annum L</i> ) from	•
	different cultivars	
<b>Rizwan Ahmad</b>	Evaluation of solvent and temperature effect on green	
(IAU, Saudi Arabia)	accelerated solvent extraction (ASE) and UHPLC-DAD	Apr, 2020
( -,	quantification of phenolic compounds in fresh olive fruit	
	Optimization of extraction and quantification technique	
<b>Rizwan Ahmad</b>	for phenolics content of garlic (Allium sativum); an	Feb, 2020
(IAU, Saudi Arabia)	application for comparative phytochemical evaluation	100, 2020
	based on cultivar origin.	
	Solvent and temperature effect of accelerated solvent	
<b>Rizwan Ahmad</b>	extraction (ASE) coupled with ultra-high-pressure liquid	$D_{22}$ 2010
(IAU, Saudi Arabia)	chromatography (UHPLC-PDA) for the determination	Dec, 2019
	of methyl xanthines in commercial tea and coffee	
	Solvent and temperature effects of accelerated solvent	
<b>Rizwan Ahmad</b>	extraction (ASE) with Ultra-high-pressure liquid	N 2010
(IAU, Saudi Arabia)	chromatography (UHPLC-PDA) technique for	Nov, 2019
	determination of Piperine and its ICP-MS analysis	
	Solvent and temperature effects of Accelerated solvent	
	extraction (ASE) coupled with Ultra-high-pressure	
Rizwan Ahmad	liquid chromatography (UHPLC-PDA) technique for	Oct, 2019
(IAU, Saudi Arabia)	determination of Thymoquinone in commercial food	000,2019
	samples of black seeds (Nigella sativa)	
	Quality Variation and standardization of black pepper	
<b>Rizwan Ahmad</b>	( <i>Piper nigrum</i> ): A comparative geographical evaluation	Sep, 2019
(IAU, Saudi Arabia)	based on instrumental and metabolomics analysis	5 <b>0</b> p, <b>2</b> 019
	Quality Variation and standardization of black seeds	
<b>Rizwan Ahmad</b>	( <i>Nigella sativa</i> ): A comparative geographical evaluation	Sep, 2019
(IAU, Saudi Arabia)	based on instrumental and metabolomics analysis	50p, 2017
	Extraction of methyl xanthines and their UHPLC-DAD	
<b>Rizwan Ahmad</b>	determination in consumable beverages used in Eastern	Aug, 2019
(IAU, Saudi Arabia)	province of Saudi Arabia	Aug, 2019
	Extraction and UHPLC–DAD detection of undeclared	
Dizwon Ahmad		
Rizwan Ahmad	substances in market-available dietary supplements and	July, 2019
(IAU, Saudi Arabia)	slimming products in Eastern region, Saudi Arabia: An	-
	application of principal component analysis	
Rizwan Ahmad /NA	Pharmacokinetic Interaction Study for Simvastatin and	A 0010
(IAU, Saudi Arabia)	Parsley and Its Plasma Quantification Using LC-MS: A	Apr, 2018
	Focus on Drug Metabolic Enzymes	
Rizwan Ahmad	Evaluation of Aromatherapy with Lavender oil on	
/AAN	Academic Stress: A Randomized Placebo Controlled	Mar, 2018
(IAU, Saudi Arabia)	Clinical Trial	
NA/Rizwan Ahmad	Determination and quantification of Thymoquinone in	Mar, 2018
(IAU, Saudi Arabia)	Nigella Sativa extract by UHPLC: An application in	, <b>_</b> 010

	black seed cultivation in India, Pakistan and KSA.	
<b>AAN/Rizwan Ahmad</b> (IAU, Saudi Arabia)	Assessing dietary supplements use among undergraduate students of health and non-health colleges of IAU, Saudi Arabia.	Feb, 2018
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Ethno-pharmacological uses and knowledge regarding Cinnamon ( <i>Cinnamomum zeylanicum</i> ) in Eastern province, Saudi Arabia.	Nov, 2017
AAN/Rizwan Ahmad (IAU, Saudi Arabia)	Academic Stress and Prevalence of Stress-Related Self- Medication among Undergraduate Female Students of Health and Non-Health Cluster Colleges of a Public Sector University in Dammam, Saudi Arabia.	May, 2017
AAN/Rizwan Ahmad (IAU, Saudi Arabia)	Prevalence of Self-Medication among Students of Pharmacy and Medicine Colleges of a Public Sector University in Dammam City, Saudi Arabia.	Feb, 2017
<b>Rizwan Ahmad</b> / <b>NA/AAN</b> (IAU, Saudi Arabia)	Awareness, Knowledge and Perception towards Complementary and Alternative Medicines (CAMs) among Medical, Pharmacy and Nursing students of University of Dammam, Kingdom of Saudi Arabia.	Jan, 2017
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Predictors of stress and stress related self-medication among Undergraduate students at IAU, Saudi Arabia.	Jan, 2017
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Pharmacist Perceived barriers to Patient counselling, a study in eastern region KSA.	Dec, 2016
<b>Rizwan Ahmad</b> (IAU, Saudi Arabia)	Pharmacist Perceived responses of Physicians and Patients to suggested alternative drugs. A study in retail and hospital pharmacist Dammam, Saudi Arabia.	Dec, 2016
Rizwan Ahmad (University of Karachi, Pakistan)Phytochemical screening of two medicinal plants 'Z. oxyphylla' & 'C. serrata'.		June, 2013

NA=Niyaz Ahmad, AAN=Atta Abbas Naqvi

#### Experience

#### **Research Experience**

- Worked as *Research Scholar* (2012-2013), at Prof. Dr. Luc Pieter's Lab of Pharmacognosy and Natural product Isolation (Natural Products and Food Research and Analysis (NatuRA) research group), *University of Antwerp, Belgium*.
- Worked as *Research Scholar* since July, 2010 at Research Institute of Pharmaceutical Sciences, Faculty of Pharmacy, *University of Karachi, Pakistan*.

# **Professional Experience**

Job Rank	Place and Address of Work	Da	te
Associate	Imam Abdulrahman Bin Faisal University,	31 <sup>st</sup> August,	Continued
Professor	Dammam, Saudi Arabia	2023	Continued
Assistant	Imam Abdulrahman Bin Faisal University,	31 <sup>st</sup> August,	31 <sup>st</sup> August,
Professor	Dammam, Saudi Arabia	2014	2023
Assistant	Hamdard University,	September,	26 <sup>th</sup> August,
Professor	Karachi, Pakistan	2013	2014
Lasturan	Hamdard University,	10 <sup>th</sup> June, 2010	September,
Lecturer	Karachi, Pakistan	10° Julie, 2010	2013
Asst Q.C	Semos Pharmaceuticals, Pvt. Ltd,	1 <sup>st</sup> January,	1 <sup>st</sup> June 2010
In-charge	Karachi, Pakistan	2009	1 <sup>st</sup> June, 2010
Production	Orient Pharmaceuticals, Pvt. Ltd,	18 <sup>th</sup> May, 2006	Lamuarra 2009
In-charge	Lahore, Pakistan	18° May, 2000	January, 2008
Internee	Neomedix Pharmaceuticals, Pvt. Ltd,		17 <sup>th</sup> May,
Pharmacist	Islamabad, Pakistan	3 <sup>rd</sup> April, 2006	2006
Assistant	City clinical Lab, Pvt. Ltd,	3 <sup>rd</sup> January,	1 <sup>st</sup> April,
Pathologist	Mingora, K.P.K, Pakistan	2006	2006
Retail	Arshad Pharmacy,	January,	January,
Pharmacist	Swat, K.P.K, Pakistan	2005	2006
TOTAL EXPER	IENCE:	17 Years, 02 Mo	nths, 29 Days

# Administrative positions held

Administrative Position	Office	Dat	æ
Research committee	College of Clinical Pharmacy, IAU,	15 <sup>th</sup> Sep,	10 <sup>th</sup> Oct,
Coordinator	KSA	2019	2020
Department	College of Clinical Pharmacy, IAU,	31 <sup>st</sup> Aug,	20 <sup>th</sup> Mar,
Coordinator	KSA	2014	2020

## **Posters and Abstract Presentations**

#	Name of Investigator(s)	Research Title and role	Conference and Publication Date
1	<u>Rizwan Ahmad</u> , Hind, Lina	Evaluation of clinical trials for natural products used in diabetes ( <b>Poster presentation</b> )	<ul> <li>1<sup>st</sup> SSCP (Saudi society of Clinical Pharmacy) Annual International Conference,</li> <li>07<sup>th</sup>-09<sup>th</sup> September, 2021 Riyadh, K.S. A</li> </ul>

		Quality variation and standardization	KSAPT
		Quality variation and standardization	
	Rizwan Ahmad,	of black pepper ( <i>Piper nigrum</i> ): A	(Knowledge, Skills, Abilities in
2	Zainab A.	comparative geographical evaluation	pharmacy and toxicology
2	Alsadah, Heba	based on instrumental and	conference)
	R. Al-Shaban	metabolomics analysis	Online Symposium/Workshops
		(10 <sup>th</sup> position in Poster	(5 <sup>th</sup> -10 <sup>th</sup> December, 2020)
		presentation)	At Le Méridien, Al Khobar, KSA
	<u>Rizwan Ahmad</u> ,	Quality variation and standardization	DUPHAT
	Zainab A.	of black pepper (Piper nigrum): A	(Dubai International
3	Alsadah, Heba	comparative geographical evaluation	Pharmaceutical & Technology
5	R. Al-Shaban,	based on instrumental and	Conference & Exhibition)
	Noor A.	metabolomics analysis	25 <sup>th</sup> – 27 <sup>th</sup> February, 2020
	Aldawood	(Poster presentation)	Dubai, UAE
		Solvent and temperature effect of	
		accelerated solvent extraction (ASE)	SIPHA
		coupled with ultra-high-pressure	(Saudi International
4	<u>Rizwan Ahmad</u>	liquid chromatography (UHPLC-	Pharmaceutical Sciences Meeting
4	& Wejdan A	PDA) for	and Workshops)
		the determination of methyl xanthines	21 <sup>st</sup> – 23 <sup>rd</sup> January, 2020
		in commercial tea and coffee	Riyadh, Saudi Arabia
		(Oral presentation)	
		Extraction of methyl xanthine and	SIPHA
		their UHPLC–DAD determination in	(Saudi International
5	<u>Rizwan Ahmad</u>	consumable beverages used in Eastern	Pharmaceutical Sciences Meeting
5	& Al-Othman F	province of Saudi Arabia	and Workshops)
		(Oral presentation)	21 <sup>st</sup> – 23 <sup>rd</sup> January, 2020
		(Oral presentation)	Riyadh, Saudi Arabia
		Extraction of methyl xanthine's and	
	<u>Rizwan Ahmad</u>	their UHPLC–DAD determination in	April, 2019
6	& Al-Othman F	consumable beverages used in Eastern	IAU, Saudi Arabia
		province of Saudi Arabia	110, Suudi Mubiu
		(Poster presentation)	
		Solvent and temperature effect of	
		accelerated solvent extraction (ASE)	
		coupled with ultra-high-pressure	
7	<u>Rizwan Ahmad</u>	liquid chromatography (UHPLC-	April, 2019
'	& Wejdan A	PDA) for	IAU, Saudi Arabia
		the determination of methyl xanthine	
		in commercial tea and coffee	
		(Poster presentation)	
		Extraction and UHPLC–DAD	
		detection of undeclared substances in	
8	<u>Rizwan Ahmad</u>	market available dietary supplements	April, 2019
0	& Al-Hudaithy	and slimming products in Eastern	IAU, Saudi Arabia
		region, Saudi Arabia: An application	
		of principal component analysis	

		(Poster presentation)	
9	<u>Rizwan Ahmad</u> & Hanine A.	Ethnopharmacological uses and public knowledge regarding <i>Cinnamomum</i> <i>zeylanicum</i> in Khobar, Saudi Arabia. ( <b>Poster presentation</b> )	DUPHAT (Dubai International Pharmaceutical & Technology Conference & Exhibition), Dubai, UAE (26 <sup>th</sup> – 28 <sup>th</sup> February, 2019)
10	<u>Rizwan Ahmad</u>	Permanent Development of Deserts. (Student supervision, arrangement and poster presentation)	22 <sup>nd</sup> – 24 <sup>th</sup> January, 2019 IAU, Saudi Arabia
11	<u>Rizwan Ahmad</u> & AlBukhyatan	Clinical effect of aromatherapy on stress; a randomized, placebo- controlled phase-I clinical trial	April, 2018 <b>IAU, Saudi Arabia</b>
112	<u>Rizwan Ahmad</u> & Al-Amer MA	Preclinical studies on drug-herb interactions and its plasma quantification using HPLC/DAD	April, 2018 IAU, Saudi Arabia
13	<u>Rizwan Ahmad</u> & Elewi AA	Dietary supplements use among undergraduate male students in health and non-health clusters colleges of a public-sector University in Dammam, Saudi Arabia.	April, 2018 <b>IAU, Saudi Arabia</b>
14	<u>Rizwan Ahmad</u> & Al-Layly A	Ultra-high-performance liquid chromatography-based identification and quantification of Thymoquinone in <i>Nigella sativa</i> extract from different geographical regions.	April, 2018 <b>IAU, Saudi Arabia</b>
15	<u>Rizwan Ahmad</u> & Wejdan AA.	"Nutraceuticals as potential therapeutic agent; an evidence-based clinical review (2012-2017)". ( <b>Poster presentation</b> )	2 <sup>nd</sup> International research conference, <b>RCSI Bahrain</b> . (23 <sup>rd</sup> November, <b>2017</b> ).
16	<u><i>Rizwan Ahmad</i></u> & Al-Qanbar F	Pharmacist perceived Barriers to Patient counselling in Saudi Arabia	May, 2017 IAU, Saudi Arabia
17	<u>Rizwan Ahmad</u> & Al-Latif F	Physician responses to Pharmacist suggested pharmaceutical alternative	May, 2017 IAU, Saudi Arabia
18	<u>Rizwan Ahmad</u> & Al-Shaqavi	Self-medication in stress among undergraduate health students, UOD, Saudi Arabia	May, 2017 IAU, Saudi Arabia
19	<u>Rizwan Ahmad</u> & Al-Zahrani F	Job satisfaction among Retail pharmacists in Eastern region of Saudi Arabia.	May, 2017 IAU, Saudi Arabia
20	<u>Rizwan Ahmad</u>	Antiplasmodial activity of cyclopeptide alkaloids from <i>Hymenocardia acida</i> and <i>Ziziphus</i> <i>oxyphylla</i> . ( <b>Poster presentation</b> )	9 <sup>th</sup> Joint Natural Products Conference, <b>Copenhagen, Denmark</b> (24 <sup>th</sup> – 27 <sup>th</sup> July, <b>2016</b> ). Planta Med; 81(S01): S1-S381, 2016. DOI: 10.1055/s-0036-1596169

21	<u>Rizwan Ahmad</u>	World day for Safety and Health at Work Symposium "Stress at Workplace: A collective Challenge". ( <b>Participant</b> )	28 <sup>th</sup> April, 2016 IAU, Saudi Arabia (Accredited by Saudi Commission of Health specialties) CME/PD Cr. Hr. 7
22	<u>Rizwan Ahmad</u>	"1st Annual Scientific Research Update: Medicine & Biomedical Research 2015". ( <b>Participant</b> )	5 <sup>th</sup> – 7 <sup>th</sup> April, 2015 <b>IAU, Saudi Arabia</b>
23	<u>Rizwan Ahmad</u>	Anti-oxidant and Anti-glycation constituents from <i>Ziziphus oxyphylla</i> and <i>Cedrela serrata</i> . ( <b>Poster presentation</b> )	61 <sup>st</sup> GA conference on Natural Products, <b>Munich, Germany</b> (1 <sup>st</sup> – 5 <sup>th</sup> September, <b>2013</b> ). Planta Med; 79 - PN2: 2013. DOI: 10.1055/s-0033-1352346
24	<u>Rizwan Ahmad</u>	Kavalactones as inhibitors of advanced glycation end products (AGEs) formation. ( <b>Poster presentation</b> )	$61^{st}$ GA conference on Natural Products, <b>Munich, Germany</b> $(1^{st} - 5^{th}$ September, <b>2013</b> ). Planta Med; 79 – PN114: 2013. DOI: 10.1055/s-0033-1352456
25	<u>Rizwan Ahmad</u>	Advance Practices in Pharmacy. (Coordinator and organized Seminar)	29 <sup>th</sup> February, 2012 Faculty of Pharmacy, <b>Hamdard</b> <b>University, Karachi, Pakistan</b>
26	<u>Rizwan Ahmad</u>	"Current Challenges in Medicine and Therapy". (Arranged workshop & Presented Poster)	"5 <sup>th</sup> National Pharmacognosy Conference 2010", 10 <sup>th</sup> July, 2010 Pearl Continental Karachi, Pakistan
27	<u>Rizwan Ahmad</u>	"1st National Pharmacy Conference on Old Plants and New Remedies". ( <b>Participant</b> )	8 <sup>th</sup> -10 <sup>th</sup> June, 2008 University of Malakand, Khyber Pukhtoon Khuwa, <b>Pakistan</b>

#### **Committee participation**

- *Co-ordinator "Research committee"* for college of Clinical Pharmacy, IAU, Saudi Arabia, 15<sup>th</sup> Sep, 2019 to 10<sup>th</sup> Oct, 2020.
- *Member "College Quality and evaluation"* committee for college of Clinical Pharmacy, IAU, Saudi Arabia, since October, (2017).
- *Member "Academic affairs"* committee for college of Clinical Pharmacy, Imam Abdulrahman Bin Faisal University, K.S.A, since **September**, (2017).
- *Member "Quality assessment and examinations"* committee for college of Clinical Pharmacy, IAU, Saudi Arabia, since May, (2017).

- *Member* sub-steering committee "*Self-Evaluation scales for higher education programs*" college of Clinical Pharmacy, IAU, Saudi Arabia, since April, (2017).
- *Member "Research committee"* College of Clinical Pharmacy, IAU, Saudi Arabia, since May, (2016).
- *Member strategic planning committee*, College of Clinical Pharmacy, IAU, Saudi Arabia, since February, (2016).
- *Department Coordinator*, Department of Natural Products & Alternative Medicines, College of Clinical Pharmacy, IAU, Saudi Arabia since (2014).
- *Member Course Curriculum development committee*, College of Clinical Pharmacy, IAU, Saudi Arabia, since, (2014).
- *Founder & Initiator*, Centre of Research Excellence for Bio-Molecular, Pharmaceutical and Nano-Technological studies on Islamic & Arabic Plants, IAU, K.S.A.
- Member BOS and BOF, Department of Pharmacognosy, Hamdard University, Karachi.
- *In charge admission cell* (Pharm-D, M. Phil and Ph. D), Hamdard University, Karachi.
- *Member Academic & student advisory committee* Hamdard University, Karachi.

# **Teaching and Lecturing Skills**

- Audio-Visual sessions
- Traditional class rooms
- Open book exams
- Power point presentation
- Problem based learning (PBL)
- Flipped classrooms (FC)
- Groups discussion and class tasks assignment
- Active learning (High order thinking skills Q&A)
- Research groups and literature-based study

#### **Courses supervised**

- Natural products & alternative medicines.
- Pharmaceutical Microbiology & Immunology I & II.
- Advances in Pharmacognosy I & II.
- Pharmacognosy lab I & II.
- Clinical Pharmacognosy.
- Industrial Pharmacognosy.
- Instrumentation and Analysis, I & II.
- Instrumentation Labs.
- Spectroscopy of natural products.

#### **Editorial member/Reviewer for Journals**

- Reviewer "Industrial Crops and Products", since 2020
- Reviewer "Journal of Integrative Medicines" since 2019
- Reviewer "BMC Complementary and Alternative Medicines" since 2019
- Reviewer "Biomedical Chromatography", since 2019
- Editorial board member "Annual research and review in Biology" SCI, since 2017.
- Editorial board member "EC Pharmacology & Toxicology" since 2017.
- Editorial board member "Asian Journal of Life sciences" since 2016.
- Editorial board member "Applied Clinical Pharmacology and Toxicology" since 2016.
- Editorial board member "International Journal of Applied Pharmaceutical and Biological research" (IJAPBR) since 2016.
- Reviewer "Indian journal of pharmaceutical education and research" since 2016.
- Reviewer "Evidence-based complementary and alternative medicines" since 2015.
- Reviewer "Pure and Applied biology" since 2015.

#### **Students Supervised**

Name of Student	Year	Title of research Project			
Pharm-D Graduation Research Projects					
Deema M. Alaswad Ayat Jaffer Al-Shehab	2023/	The use of surfactants to enhance the solubility and extraction of Piperine from <i>Piper nigrum</i>			
Ahed A. Al-Sulais Wala'a M. Al-Sulais	2023/ 2024	Water as a green replacement solvent for extraction of phenolics from various natural products			
Hassan Alutawah Hassan Zaki	2022/ 2023	A comprehensive LC-MSMS characterization of bitter melon cucurbitane-triterpenoid glycosides with its antiviral activity (KVIII, KX, KXII)			
Muhammad M, Ali Fahmi, Nezar hassan	2021/	Volatile oil profiling using GCMS and comparative yield for different cultivars of essential oil-bearing edible herbs			
Mahdi Alameer, Bukhader H, Alaseel M	2022	Awareness and Knowledge of pharmacists regarding food- drug interactions in KSA			
Alaa Al Darwish, Asma Abuhassan, Leena Alateeq Saeed A. Aldossary,	2020/ 2021	LC-MS/MS quantification of green accelerated solvent extracted (ASE) Mangiferin from <i>Mangifera indica</i> fruit with stability and anticancer studies LC-MS/MS quantification of green accelerated solvent			
Muath A. Aljaber, Salem M. Bubshait	2021	extracted (ASE) <i>Glycyrrhizic acid</i> from <i>Glycyrrhiza</i> <i>glabra</i> with stability and anticancer studies			
Aljamea A Yousef MA Albuthayn SA	2019/ 2020	Evaluation of solvent and temperature effect on green accelerated solvent extraction (ASE) and UHPLC-DAD quantification of phenolic compounds in fresh olive fruit ( <i>Olea europaea</i> )			
Alyousef MM Bukhamsain AH		Green accelerated solvent extraction (ASE) with solvent and temperature effect and green UHPLC-DAD analysis			

Dr. Rizwan Ahmad (B. Pharm, Ph.D)

Alkhars AE Alkhars SA		of Phenolics in Pepper fruit ( <i>Capsicum annum L</i> ) from different cultivars
AlOthman F Mohammad H AlZahrani F		Lipid extraction, total solids and UHPLC-DAD determination of caffeine in consumable beverages used in Eastern province of Saudi Arabia and its toxicity evaluation via ICP-MS
AlAnaki WS Ismail FA		Solvent and temperature effect of Accelerated solvent extraction (ASE) on Methyl xanthine in different tea determined with UHPLC-DAD
AlHudaithy N 20 AlHibshi A 20 AlBukhari A		UHPLC-DAD detection of hazardous weight loss substances as adulterant in market available dietary supplements and slimming products with toxicity determination via ICP-MS.
AlQudaihi A Alaseel SE Fita IZ		Preparation of a novel curcumin nanoemulsion by ultrasonication and its comparative effects in wound healing and the treatment of inflammation
AlQudaihi A Alaseel SE Fita IZ		A novel self-nanoemulsifying drug delivery system for curcumin used in the treatment of wound healing and inflammation
AlEbrahim A AlBukhyatan H AlNasser A		Clinical effect of aromatherapy on stress; a randomized, placebo-controlled phase-I clinical trial
AlMomatten H AlKhalifa A AlAmer MA	2017/	Preclinical studies on drug-herb interactions and its plasma quantification using HPLC/DAD
Elewi AA AlAwa AH Alasiri MJ	2018	Dietary supplements use among undergraduate male students in health and non-health clusters colleges of a public-sector University in Dammam, Saudi Arabia.
Allayly A Alshawi H AlAli A		Ultra-high-performance liquid chromatography-based identification and quantification of Thymoquinone in Nigella sativa extract from different geographical regions.
AlQanbar F		Pharmacist perceived Barriers to Patient counselling in Saudi Arabia
AlLaif F		Physician responses to Pharmacist suggested pharmaceutical alternative
AlShaqavi M		Self-medication in stress among undergraduate health students, UOD, Saudi Arabia
AlZahrani FA 2016/ 2017 AlBusalih FA		Job satisfaction among Retail pharmacists in Eastern region of Saudi Arabia.
		Prevalence of Self-Medication among Students of Pharmacy and Medicine Colleges of a Public Sector University in Dammam City, Saudi Arabia.
AlRasheed FA		Academic Stress and Prevalence of Stress-Related Self- Medication among Undergraduate Female Students of Health and Non-Health Cluster Colleges of a Public Sector University in Dammam, Saudi Arabia.

Undergraduate Students Research Projects				
AlMubayedh H		Ethnopharmacological uses, phytochemistry, biological		
Anvidbayedii II		activities of Debregeasia salicifolia: A review.		
AlSaeed W	2018	Clinical uses and toxicity of <i>Ephedra sinica</i> ; an evidence		
AlDhamen M		based comprehensive retrospective review (2004-2017).		
AlJamea AM		Clinical uses and toxicity of <i>Aloe vera</i> ; an evidence-based		
AlSadah HM		comprehensive retrospective review (2007-2017).		
AlMassmoum S				
Balahmar EA		Clinical uses and toxicity of Ergot ( <i>Claviceps purpurea</i> );		
Almutairi SF		a comprehensive retrospective review (2003-2017).		
Albuainain GS				
	2017	Ethnopharmacological uses and public knowledge		
AlMubayedh H		regarding Cinnamomum zeylanicum in Khobar, Saudi		
		Arabia.		
		Clinical uses and toxicity of Atropa belladonna; an		
AlMubayedh H		evidence based comprehensive retrospective review		
		(2003-2017).		

## **Field of Specialization**

- Green novel extraction, isolation, and pharmacological activities for natural products
- Green, shorter, and sensitive analytical method development and validation (LC-MS/MS, LC/UHPLC, GC/MS) for herbal, food, nutraceuticals, and pharmaceuticals products
- Standardization, quality, and toxicity determination (ICP-MS) for marketed products
- Clinical trials (Phase-I & II) for natural products in healthy individuals and patients.
- Use of herbs, its knowledge, interactions, and safety in community and health professional

#### **Research Interests**

#### Green extraction, identification and isolation of natural products

Greener, shorter, and high yield extraction methods are developed and validated using various techniques i.e. Soxhlet, ASE (Accelerated solvent extraction), Soxtec (Advanced semi-automatic Soxhlet method), Ultrahigh sonication, Ultra-pressure homogenizer, Speed-extractor and high-speed homogenizer. Various bioassay-guided-protocols in combination with advanced Chromatographic methods (TLC, FC, and C.C), and Hyphenated techniques (LC/DAD, LC/MS, LC/SPE/NMR, UPLC/MS, NMR and Mass Spectroscopy) are used to isolate and identify these compounds/lead drugs.

#### **Biological / Pharmacological activities**

Isolated pure compounds are evaluated for various Pharmacological activities;

• *Antioxidant activity:* Compounds assessed through DPPH, ABTS, PMS-NADH and FRAP assays for antioxidant as well as Longevity effects/ageing (*Caenorhabditis elegans*).

- Antiglycation activity: Different (*In-vitro*) mechanisms a) Carbonyl entrapment b) Chelating activity, responsible for AGEs activity along with  $\alpha$ -glucosidase enzyme inhibition is evaluated in order to search for novel anti-diabetic drugs.
- *Antimicrobial activity:* Agar well diffusion & serial micro dilution methods are used to find antimicrobial compounds for resistant species of Parasites/Plasmodium/bacteria/fungi.
- *Toxicity studies:* Compounds evaluated through various toxicity studies i.e. Insecticidal, Brine shrimp lethality study (LD<sub>50</sub>) and MRC-5 cell line (CC<sub>50</sub>) toxicity studies.

#### Standardization of Herbal, food, nutraceutical & Pharmaceutical products

• The market available herbal, food, nutraceutical, and pharmaceutical products from various manufacturer/geographical origin are standardized and evaluated for quality determination via novel, greener, shorter, and high yield extraction and analytical method development and validation. The toxicity of these samples is determined using ICP-MS technique.

#### Clinical trials, Herb-drug interactions and Community outreach programs

- Clinical trials in community emerging disease of hypertension, obesity, diabetes etc.
- Knowledge about interactions and use of herbs/herbal products with conventional medication
- Uses, knowledge, and perceptions of community regarding Complementary and Alternative medicines (CAMs) during pregnancy, lactation, hypertension, diabetes etc.

#### **CME Accredited courses/Workshops**

- Certificate of attendance for completing "*Training course for members of local committees of research ethics (IRB)*", held on 20<sup>th</sup> October, 2019, organized by National Committee of Bioethics, KACST (King Abdul Aziz City for Science & Technology) at King Fahad Specialist Hospital, Dammam-K.S.A. Accredited by SCHS, Dated: (15/09/2019) (CME/PD credit hours; 7, Accreditation # 19000057892)
- Certificate of attendance for completing "*Training course for members of local committees of research ethics (IRB)*", held on 22<sup>nd</sup> April, 2018, organized by KACST (King Abdul Aziz City for Science & Technology) at Johns Hopkins Aramco Health Centre, Dhahran-K.S. A (CME/PD credit hours; 6, Accreditation # 18000043645).
- Certificate of attendance about, World day for Safety and Health at Work Symposium "Stress at Workplace: A collective Challenge", held on 28<sup>th</sup> April, 2016 at IAU, Saudi Arabia (Accredited by Saudi Commission of Health specialities: CME/PD cr. hrs; 7).
- Attended Workshop about "Essential Skills of Health Profession Education (Curriculum Development)" at IAU, Saudi Arabia, from 23<sup>rd</sup> 25<sup>th</sup> Feb, 2015 (CME/PD cr. hrs; 24).

#### **Conferences and Training Seminars**

- Certificate of Attendance for a successful MACHEREY-NAGEL Gmbh & Co. KG training seminar, "Latest Techniques for Water and Waste Water Analysis", organized by ADECO group, at Sofitel Hotel Corniche, Al-Khobar, K.S.A, on 10<sup>th</sup> March, 2018.
- Certificate of Attendance for a seminar, "LECO Solutions in Organic & Inorganic Elemental Analysis", organized by Naizak at Aloft Hotel Al-Khobar, K.S.A, on 19<sup>th</sup> February, 2017.
- Certificate of attendance for Thermo Fisher Scientific's seminar on "Chromatography & MS solutions in Food safety, Environment, Forensic, clinical & Toxicology", at Le Meridian Hotel, Al-Khobar, K.S.A on 9<sup>th</sup> October, 2016.
- Attended "THERMO Solutions seminar in X-Ray & FTIR Spectroscopy XRF/XRD; FTIR, RAMAN & Imaging Techniques", at Holiday Inn Hotel, Al-Khobar, K.S.A on 25<sup>th</sup> May, 2016.
- Certificate of Attendance for a seminar, "*Netzsch's Complete Thermal Analysis Solutions*", organized by Naizak at InterContinental Hotel Al-Khobar, K.S.A, on **28<sup>th</sup> February**, **2016**.
- Certificate of Attendance for a seminar. "Anton Paar's Innovative & Economic Solutions for Quality Control", organized by Naizak at Double Tree Hotel by Hilton at Dhahran, K.S.A, on 23<sup>rd</sup> November, 2015.
- Attended "THERMO Solutions seminar in X-Ray & FTIR Spectroscopy XRF/XRD; FTIR, RAMAN & Imaging Techniques", at Sofitel Hotel Corniche, Al-Khobar, K.S.A on 7<sup>th</sup> September, 2015.
- Attended the conference "1<sup>st</sup> Annual Scientific Research Update: Medicine & Biomedical Research 2015", held at IAU, Saudi Arabia from 5<sup>th</sup> 7<sup>th</sup> April, 2015.
- Attended HACH LANGE Seminar on *"Water Testing Solution"* arranged by Naizak, held at Le Meridien Hotel Al-Khobar, Saudi Arabia, **3<sup>rd</sup> December**, **2014**.
- Worked as **Coordinator** and organized Seminar on "*Advance Practices in Pharmacy*", organized by Faculty of Pharmacy, in Faculty of Pharmacy, Hamdard University, Karachi, on **29th February**, **2012**.
- Arranged & Presented Poster at "5<sup>th</sup> National Pharmacognosy Conference 2010" on "Current Challenges in Medicine and Therapy" at Pearl Continental Karachi, Pakistan arranged by Pakistan Society of Pharmacognosy and Natural Therapy, 10<sup>th</sup> July, 2010.
- Participated in Seminar arranged by Merck Pharmaceuticals on "*Water Sanitation Problems*" arranged at University of Karachi, Pakistan, **2009**.
- Attend Workshop "1<sup>st</sup> National Pharmacy Conference on Old Plants and New Remedies" held at University of Malakand, Khyber Pukhtoon Khuwa, Pakistan from 8<sup>th</sup> -10<sup>th</sup> June, 2008.

#### Workshops & Lectures

- Certificate of Attendance for training program *"Facilitating Metacognitive Strategies in the Classroom"*, organized by Deanship of Academic Development at IAU, Saudi Arabia, on 28<sup>th</sup> Sep, 2021
- Certificate of Attendance for training program *"Developing (SC) items"*, organized by The Centre for Quality of Assessment and Examinations, Vice Presidency for Academic Affairs at IAU, Saudi Arabia, on 14<sup>th</sup> Sep, 2021
- Certificate of Attendance for training program "21<sup>st</sup> Century Skills in the Classroom", organized by Deanship of Academic Development at IAU, Saudi Arabia, on 28<sup>th</sup> Jan, 2020
- Certificate of Attendance for training program *"Attract Students with your PowerPoint"*, organized by Deanship of Academic Development at IAU, Saudi Arabia, on 24<sup>th</sup> Sep, 2019
- Certificate of attendance for workshop "Using Action Research in Teaching and Assessment" held at IAU, Saudi Arabia, on 26<sup>th</sup> September, 2018
- Certificate of attendance for workshop *"Enhancing Learning through the Use of Technology"* held at IAU, Saudi Arabia, on 12<sup>th</sup> September, 2018
- Certificate of attendance for workshop *"Effective Strategies for Team Based Learning"* held at IAU, Saudi Arabia, on 1<sup>st</sup> March, 2018
- Certificate of attendance for workshop *"Effective Strategies for Team Based Learning"* held at IAU, Saudi Arabia, on **28<sup>th</sup> February**, **2018**.
- Certificate of attendance for workshop *"Flipped Classrooms"* held at IAU, Saudi Arabia, on 31<sup>st</sup> October, 2017.
- Certificate of attendance for workshop *"Using and Creating Effective Rubrics"* held at IAU, Saudi Arabia, on **21**<sup>st</sup> November, 2017.
- Certificate of attendance for workshop "*Attract students with your power point*" held at IAU, Saudi Arabia, on 16<sup>th</sup> March, 2017.
- Certificate of attendance for workshop "*Using social media channels*" held at IAU, Saudi Arabia, on **09<sup>th</sup> March**, **2017**.
- Certificate of attendance for workshop "*Publishing your Research*" held at IAU, Saudi Arabia, on **04**<sup>th</sup> January, 2017.
- Certificate of attendance for workshop "*Writing Research Article*" held at IAU, Saudi Arabia, on 27<sup>th</sup> December, 2016.
- Certificate of attendance for workshop "*Communication Skills as a Domain of Learning in National Qualification Framework*" held at IAU, Saudi Arabia, on 10<sup>th</sup> November, 2016.
- Attended a workshop on "Alternative & Effective Assessment methods (Performance Assessment, Portfolio & Projects)" held at IAU, Saudi Arabia, on 27<sup>th</sup> October, 2016.
- Certificate of attendance for workshop "*The Pursuit of Excellence in Mentoring in Higher Education*" held at IAU, Saudi Arabia, on 20<sup>th</sup> October, 2016.

- Certificate of attendance for attending **British Medical Journal Training** on *"BMJ best practice and Journal from BMJ"*, held at Central Library, IAU, Saudi Arabia, on 18<sup>th</sup> October, 2016.
- Attended a workshop entitled as *"Research Methodology"* held on 12<sup>th</sup> October, 2016 arranged under Imam Abdulrahman Bin Faisal University and Thomson Reuters Strategic Partnership at IAU, Saudi Arabia.
- Attended a workshop entitled as *"How to Prepare for a Conference"* held on 5<sup>th</sup> October, 2016 arranged under Imam Abdulrahman Bin Faisal University and Thomson Reuters Strategic Partnership at IAU, Saudi Arabia.
- Attended a workshop entitled as "Bibliographic search, Management and Publishing Methodology" held on 5<sup>th</sup> May, 2016 arranged under Imam Abdulrahman Bin Faisal University and Thomson Reuters Strategic Partnership at IAU, Saudi Arabia.
- Attended a workshop entitled as "InCites: Performance Evaluation: Reports generation" held on 4<sup>th</sup> May, 2016 arranged under Imam Abdulrahman Bin Faisal University and Thomson Reuters Strategic Partnership at IAU, Saudi Arabia.
- Certificate of Participation for a workshop, *"Increasing Efficiency of Pharmaceutical Tablets Testing"*, organized by Restech (Sotax, AG, Switzerland) at Dhahran International Hotel, Dhahran, Dammam, K.S.A, on 10<sup>th</sup> November, 2015.
- Certificate of attendance for a workshop, *"Providing a Constructive Feedback"*, held at IAU, Saudi Arabia, on 8<sup>th</sup> October, 2015.
- Certificate of attendance for a workshop, *"Avoiding Common Teaching Mistakes- A Discussion"*, held at IAU, Saudi Arabia, on **10<sup>th</sup> September**, **2015**.
- Attended workshop on *"Interactive Teaching & Students Engagement"*, held at IAU, Saudi Arabia, on 7<sup>th</sup> May, 2015.
- Attended workshop on *"Enhancing learning through the use of Technology"*, held at IAU, Saudi Arabia, on 23<sup>rd</sup> April, 2015.
- Participated in *"Elsevier ScienceDirect, Scopus & Mendeley training program"* held at IAU, Saudi Arabia, on **03<sup>rd</sup> April, 2015**.
- Attended workshop on *"Motivating students learning"*, held at IAU, Saudi Arabia, on 5<sup>th</sup> February, 2015.
- Attended a Lecture "*Analysing & Reading Test Results*" at IAU, Saudi Arabia, on 5<sup>th</sup> January, 2015.
- Attended the Workshop titled "Optimize the Use of Web of Science's Services" "Learn how to use End Note" organized by Thomson Reuters at IAU, Saudi Arabia, on 17<sup>th</sup> December, 2014.
- Attended Workshop about "Essential Skills of Health Profession Education (Teaching & Learning)" at IAU, Saudi Arabia, from 18<sup>th</sup> November 20<sup>th</sup> November, 2014.
- Attended a Lecture "Using MCQs to test Higher-Order Thinking Skills" at IAU, Saudi Arabia on 23<sup>rd</sup> October, 2014.

- Attended *"Taylor & Francis Publishing in Academics Journals"* Workshop held at IAU, Saudi Arabia, on **21**<sup>st</sup> October, 2014.
- Attended Workshop about "*Course Portfolio*" at IAU, Saudi Arabia, on 18<sup>th</sup> September, 2014.
- Attended Workshop *"Introduction to NCAAA & Checklist of Activities"* arranged by IAU, Saudi Arabia, on 16<sup>th</sup> September, 2014.
- Participated in Workshop on "*Purification of Water by the Use of Energy obtained from Wind Mills*" held at Hamdard University, Karachi, Pakistan, **2011**.

# **Community service & Students Campaigns Supervision**

- Supervised students, arranged and participated in symposium "Permanent development of Deserts", at IAU, arranged from 22<sup>nd</sup> 24<sup>th</sup> January, 2019.
- Supervised students at "World pharmacist day" campaign at Al-Othaim mall, K.S.A, 25<sup>th</sup> September, 2017.
- Supervised students at Ministry of health program about "Adulteration and safe Use of Herbs" organized by Saudi Food & Drug Authority at Al-Othaim Mall, Dammam, K.S.A, November, 2016.

#### Instruments / Technical Skills

- UV Vis Spectroscopy (Single beam, double beam & multiple cell spectrophotometer) (Shimadzu, Thermo scientific)
- HPLC (LC/DAD, LC/MS, LC/MS/DAD with DAD and Auto sampler) (Beckman, Agilent-1200, Waters (Mass lynx, Milford, MA, USA), Shimadzu)
- ICPMS (Thermo Scientific<sup>TM</sup> iCAP<sup>TM</sup> RQ ICP-MS) Qnova series (Omaha, Nebraska 68144 USA) coupled with Cetac auto sampler (ASX-260)
- Accelerated solvent Extractor (Dionex ASE 350) 350 Model with DIONIUM<sup>™</sup> Components SMARTRUN<sup>™</sup> system & Solvent saver system
- Soxtec (Advanced Semi-automatic Soxhlet instruments), Ultrasonication using different probes, Microwave assisted extraction, High speed homogenizer (Ultra-Turrax), SPE, SPME and Deep Eutectic Solvents (DES) extractions
- LC/SPE/NMR (LC/DAD hyphenated instrument with SPE-Cartridges & NMR tubes), LC (Agilent), SPE and TT (Bruker))
- UPLC/MS/DAD (UPLC/MS with Triple Quadruple Mass Detector (TQD)) (UPLC/MS with TQD by Waters, Milford, MA, USA & Thermo Scientific<sup>™</sup> Vanquish<sup>™</sup> UHPLC (Thermo Scientific, Germany), software (Chromeleon (c) Dionex V. 7.2.2.6890)
- Flash Chromatography (Automated system with Silica columns-10 g to 120 g) (Reveleris)
- Column Chromatography (Open tube columns of different Sizes and Silica polarity)
- TLC, Analytical TLC: (Normal phase 0.2 mm Thickness, HPTLC, RPTLC)

Preparative TLC: (0.5 mm/1 mm Thickness for Isolation of compounds, Merck)

- Fluoro-spectrophotometer (Micro plate reader/fluorescence) (Tecan M-200 Infinite)
- Atomic Absorption Spectroscopy (A. A. S) (By Lumex)
- **FT-IR Spectrophotometer** (By Thermo scientific)
- Basic knowledge and Qualified a Short course of following techniques. Molecular Techniques: SDS phage, Electrophoresis, Restriction Analysis, P.C.R, E.L.I.S.A Microbiological Tests: C.F.T, H.A & H.I Tests, Various Types of Media Preparations and growth of Micro Organisms, Sensitivity Tests for Anti-Microbial.

## References

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 Natural Products & Food - Research and Analysis, Department of Pharmaceutical Sciences, University of Antwerp, Belgium.
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