Electronic Supplementary Information (ESI)

Table 1S. IC_{50} values of inhibition of α–amylase, α–glucosidase, dipeptidyl peptidase IV enzyme, and AGE formation by various AgNPs, controls, and extracts

No.	AgNP reducer/stabilizer and control	IC50, µg/mL				Ref.
		α–amylase ($IC50_{control}/IC50_{sample}$)	α-glucosidase ($IC50_{control}/IC50_{sample}$)	DPP-IV ($IC50_{control}/IC50_{sample}$)	AGE formation	
IC50 OF CONTROL IS LESS OR CLOSE TO IC50 OF AgNPs						
1	AgNPs/*Allium sativum*			61.8 ± 19.4		[1]
	Ascorbic acid			32.6 ± 14.8		
2	AgNPs/*Rosa indica* L. 1	50	40	40		[2]
	AgNPs/*Rosa indica* L. 2	50	40	40		
	AgNPs/*Rosa indica* L. 3	75	60	60		
	Acarbose	<50	<40			
3	AgNPs/*Lonicera japonica*	54.56	37.86	46.70		[3]
	Lonicera japonica			72.58		
	Ascorbic acid	~38	~27	26.45		
4	AgNPs/*Telfairia occidentalis,* leaf	10.74 ± 0.05	16.75 ± 0.11	22.29 ± 0.05		[4]
	Telfairia occidentalis, leaf	13.22 ± 0.21	19.93 ± 0.03	42.47 ± 0.33		
	AgNPs/*Telfairia occidentalis*, stem	12.05 ± 0.01	23.16 ± 0.14	42.99 ± 0.03		
	Telfairia occidentalis, stem	14.74 ± 0.53	26.62 ± 0.36	64.96 ± 0.09		
	Acarbose	Similar				
	Ascorbic acid			Similar		
5	AgNPs/*Avicennia officinalis*	280 ± 0.002	150 ± 0.012	140 ± 0.001		[5]
	AgNPs/*Xylocarpus granatum*	190 ± 0.011	130 ± 0.005	250 ± 0.004		
	Acarbose	150 ± 0.003	110 ± 0.001			
	BHT			40 ± 0.001		
6	AgNPs/*Myristica fragrans*	800 - 1,000	800 - 1,000			[6]
	Acarbose	~400	~600			
7	AgNPs/Culture filtrate of Salmonella enterica (ATCC-14028).	428.60	562.02			[7]
	Acarbose	295.42				
	Voglibose		313.62			
8	AgNPs/grape pomace extracted tannin	43.9	48.5			[8]
	Extracted tannin					
	Acarbose	58.5	64.8			
		39.4	40.2			
9	AgNPs/*Catharanthus roseus*	>500				[9]
	Acarbose	>500				
	IC50 OF CONTROL IS HIGHER THAN IC50 OF AgNPs					
10	AgNPs/PVP-1	355.28 ± 0.73 (1.9)	0.27 ± 0.003 (3,728.5)	5.35 ± 0.58 (1.8)	13.23 ± 1.07	This work
	AgNPs/PVP-2	332.05 ± 8.41 (2.1)	0.489 ± 0.004 (2,058.7)	1.68 ± 0.02 (5.6)	2.77 ± 0.01	
	AgNPs/PVP-3	238.7 ± 4.9 (2.9)	0.648 ± 0.004 (1,556.0)	1.56 ± 0.06 (6.0)	8.40 ± 0.17	
	AgNPs/PVP-4	195.54 ± 1.22 (3.5)	0.26 ± 0.004 (3,871.9)	1.77 ± 0.19 (5.3)	6.14 ± 0.33	
	AgNPs/PVP-5	237.9 ± 2.67 (2.9)	0.28 ± 0.004 (3,595.4)	0.85 ± 0.06 (11.1)	9.07 ± 0.06	
	Acarbose	686.69 ± 11.68 (1.0)	1006.7 ± 15.09 (1.0)			
	Sitaglipin			9.39 ± 0.035 (1.0)		
	Metformin				9.07 ± 0.06	
11	AgNPs/*Annona muricata*	0.90 ± 0.01 (113.3)	3.32 ± 0.32 (183.9)	51.80 ± 3.14 (9.9)		[10]
	Acarbose	10.20 ± 0.05 (1.0)	610.65 ± 4.27 (1.0)			
	Trolox			5.26 ± 0.04		
12	AgNPs/*Nigella sativa*	40-60 (1.0- 0.7)	20-40 (2.0-1.0)	20-40		[11]
	Extract Nigella sativa	60-80 (0.7 -0.5)	40-60 (1.0-0.7)	40-60		
	Acarbose	40 (1.0)	40 (1.0)			
	Ascorbic acid			No data		
13	AgNPs/Dandelion flower		~100 - 300			[12]

	AgNPs-1, chemically synthesized AgNPs-2, chemically synthesized Acarbose		~300 - 600 ~600 ~300 600			
14	AgNPs/*Enicostema axillare* *Extract Enicostema axillare* Acarbose	0.22 (3.4) 10 (0.075) 0.75 (1.0)				[13]
15	AgNPs/bee pollen Bee pollen extract Acarbose	2,560 ± 0.10 (2.9) 6,320 ± 0.10 (1.2) 7,320 ± 0.12 (1.0)	2,130 ± 0.11 6,830 ± 0.10 7,302 ± 0.12			[14]

References

[1] Jini, D., Sharmila, S., Anitha, A., Pandian, M., & Rajapaksha, R. M. H. (2022). In vitro and in silico studies of silver nanoparticles (AgNPs) from Allium sativum against diabetes. *Scientific Reports*, *12*(1). https://doi.org/10.1038/s41598-022-24818-x

[2] Balu SK, Andra S, Damiri F *et al.* Size-Dependent Antibacterial, Antidiabetic, and Toxicity of Silver Nanoparticles Synthesized Using Solvent Extraction of Rosa indica L. Petals. *Pharmaceuticals* 15(6), 689 (2022). https://doi.org/10.3390/ph15060689

[3] Balan K, Qing W, Wang Y *et al.* Antidiabetic activity of silver nanoparticles from green synthesis using Lonicera japonica leaf extract. *RSC Adv* 6(46), 40162–40168 (2016). https://doi.org/10.1039/C5RA24391B

[4] Kayode Awote O, Ojekale AB, Kazeem MI. Antidiabetic, Antioxidant, Antiglycation and Anti-inflammatory potentials of green-synthesized silver nanoparticles using fresh leaf and stem aqueous extracts of Telfairia occidentalis: an in-vitro approach. 13(1), 41 (2024). https://doi.org/10.33263/LIANBS131.041

[5] Das SK, Behera S, Patra JK, Thatoi H. Green Synthesis of Sliver Nanoparticles Using *Avicennia officinalis* and *Xylocarpus granatum* Extracts and In vitro Evaluation of Antioxidant, Antidiabetic and Anti-inflammatory Activities. *J Clust Sci* 30(4), 1103–1113 (2019). https://doi.org/10.1007/s10876-019-01571-2

[6] Perumalsamy R, Krishnadhas L. Anti-Diabetic Activity of Silver Nanoparticles Synthesized from the Hydroethanolic Extract of *Myristica fragrans* Seeds. *Appl Biochem Biotechnol* 194(3), 1136–1148 (2022). https://doi.org/10.1007/s12010-022-03825-8

[7] Majeed S, Danish M, Zakariya NA *et al. In Vitro* Evaluation of Antibacterial, Antioxidant, and Antidiabetic Activities and Glucose Uptake through 2-NBDG by Hep-2 Liver Cancer Cells Treated with Green Synthesized Silver Nanoparticles. *Oxid Med Cell Longev* 2022, 1–14 (2022). https://doi.org/10.1155/2022/1646687

[8] Saratale RG, Saratale GD, Ahn S, Shin H-S. Grape Pomace Extracted Tannin for Green Synthesis of Silver Nanoparticles: Assessment of Their Antidiabetic, Antioxidant Potential and Antimicrobial Activity. *Polymers (Basel)* 13(24), 4355 (2021). https://doi.org/10.3390/polym13244355

[9] Deepika E, Santhy K. In vitro Antioxidant and Antidiabetic activity of Silver Nanoparticles Synthesized using *Catharanthus roseus* leaves. *Res J Pharm Technol* 989–997 (2022). https://doi.org/10.52711/0974-360x.2022.00165

[10] Badmus JA, Oyemomi SA, Adedosu OT *et al.* Photo-assisted bio-fabrication of silver nanoparticles using Annona muricata leaf extract: exploring the antioxidant, anti-diabetic, antimicrobial, and cytotoxic activities. *Heliyon* 6(11), e05413 (2020). http://dx.doi.org/10.1016/j.heliyon.2020.e05413

[11] Vijayakumar S, Divya M, Vaseeharan B, Biruntha M, Silva L, Esteban L, et al. Biological Compound Capping of Silver Nanoparticle with the Seed Extracts of Blackcumin (*Nigella sativa*): A Potential Antibacterial, Antidiabetic, Anti-inflammatory, and Antioxidant. *J Inorg Organomet Polym Mater* 31(2), 624–635 (2021). https://doi.org/10.1007/s10904-020-01713-4

[12] Yousefzadeh-Valendeh S, Fattahi M, Asghari B, Alizadeh Z. Dandelion flower-fabricated Ag nanoparticles versus synthetic ones with characterization and determination of photocatalytic, antioxidant, antibacterial, and α-glucosidase inhibitory activities. *Sci Rep* 13(1), 15444 (2023). https://doi.org/10.1038/s41598-023-42756-0

[13] Patel DA, Ishnava KB. Biogenic synthesis of silver nanoparticles from the leaf extract of *Enicostema axillare* (Poir. ex Lam.) A. Raynal and its alpha amylase inhibition activity. *Food Chemistry Advances* 4, 100624 (2024). https://doi.org/10.1016/j.focha.2024.100624

[14] Keskin M. Synthesis, Characterization and Antidiabetic Potential of Bee Pollen Based Silver Nanoparticles. *El-Cezeri Fen ve Mühendislik Dergisi* (2021).