Substance	Chemical Class	Source	Mechanism (or Gene Involved)	Mean Lifespan	Maximum Lifespan	Ref.
Acetylsalicylic acid (aspirin)	Organic acid	Analgesic drug (derived from willow bark)	AAK-2/AMPK↑, DAF-16↑, SOD-3↑, ROS↓	+23% (ROS)		[21, 22]
Antcin M	Terpenoid	*Antrodia cinnamomea*	ROS↓	+7%		[47]
Aspalathin	Chalcone glycoside	Rooibos tea	DAF-16↑, ROS↓	+24% (high glucose only)		[48]
Baicalein	Flavonoid	*Scutellaria baicalensis*	SKN-1↑	+45%	+24%	[49, 50]
Betalains	Indole	Opuntia fruit	ROS↓	+34%		[51]
Boeravinone B	Rotenoid	*Boerhaavia diffusa*	DAF-16↑, SKN-1↑	+28%		[52]
Brazilin	Flavonoid	*Caesalpinia sappan*	DAF-16↑, HSP-16.2↓, SOD-3↑, ROS↓	+18%		[53]
Caffeic acid	Polyphenol	Plants	DAF-16↑, Sir-2.1, OSR-1	+15%		[54]
Caffeic acid phenyl ester	Polyphenol	Propolis	DAF-16↑	+9% (median)	+17%	[55]
Caffeine	Alkaloid	Coffee	DAF-16↑, CBP-1	+37%	+52%	[19, 56-58]
Calycosin	Isoflavone	*Astragalus membranaceus*	DAF-2, DAF-16↑	+25%		[59]
Carnosic acid	Terpenoid	*Rosmarinus officinalis*	SOD-3↑, SKN-1↑, HSF-1↑	+16%	+22%	[60]
Carnosol	Terpenoid	*R. officinalis*	SOD-3↑, ROS↓	+19%	+26%	[35]
Catechin	Flavonoid	Green tea	DAF-2	+15%		[61, 62]
Celastrol	Terpenoid	*Tripterygium wilfordii*	ND	+17%		[63]
Chlorogenic acid	Polyphenol	Coffee	DAF-2, DAF-16↑, SKN-1↑	+20%		[34]
Chlorophyll	Chlorin	Vegetables	DAF-16↑	+26%		[64]
Curcumin	Polyphenol	Turmeric	Sir-2.1, OSR-1	+55% (median)		[65, 66]
Damaurone D	Flavonoid	Damask rose	DAF-2, DAF-16↑, SOD-3↑	+17%	+21%	[67]
Dehydroabietic acid	Terpenoid	Conifer resin	Sir-2.1	+16%		[68]
Diallyl trisulfide	Organosulfur	Garlic	SKN-1↑	+13%		[69]
Diosgenin	Terpenoid	Plants	DAF-16↑, SOD-3↑	+20%		[70]
4,4'-Dimethoxychalcone	Chalcone	*Angelica keiskei koidzumi*	Autophagy↑	+20% (median)		[71]
Emodin	Anthraquinone	Rhubarb, buckthorn	Sir-2.1, DAF-16↑	+20%		[77]
Ellagic acid	Phenol	Fruits	DAF-16↑	+11%		[62, 78]
Ferulsinaic acid	Organic acid	Ferula plants	AGEs↓, ROS↓	+18%	+42%	[79]
Fisetin	Flavonoid	Fruits, vegetables	DAF-16↑, ROS↓	+6% (heat)		[80]
Flavonoids	Flavonoid	Onion	ND	+20%		[17]
Fruit extract	Mixture	Apple	ND	+39%	+25%	[81]
Fruit extract	Mixture	Blueberry	DAF-16↑, SKN-1↑, SOD-3↑	+44%	+24%	[82]
Fruit extract	Mixture	Mulberry	DAF-16↑, Sir-2.1	+20%	+9%	[83]
Fruit extract	Mixture	Orange	DAF-16↑, SOD-3↑, ROS↓	+26%	+26%	[84]
Fruit extract	Mixture	Pomegranate	DAF-16↑	+56%	+36%	[78]
Fruit extract	Mixture	Purple pitanga	DAF-16↑	ND		[85]
Fungal extract	Mixture	*Ganoderma lucidum*	GLP-1	+36%	+12%	[86]
Gallic acid	Phenolic acid	*Fruits*	ND	+12%		[62]
Genistein	Isoflavone	*Soybean, coffee*	SOD-3↑, HSP-16.2↑	+28%		[87]

Glucosamine	Amino sugar	*Dietary supplement (can be isolated from wheat or corn)*	AAK-2/AMPK↑, mitochondrial biogenesis↑, autophagy↑	+30%		[30, 88]
Glaucarubinone	Degraded terpenoid	*Simaroubaceae plants*	Cellular respiration↑	+8%	+8%	[89]
Huperzine A	Alkaloid	*Huperzia serrata*	ND	+13%		[90]
10-Hydroxy-2-decenoic acid	Organic acid	*Royal jelly*	ND	+12%	+21%	[91]
Icariin	Flavonoid glycoside	*Epimedium brevicornum*	DAF-16↑	+21%		[92]
Icariside II	Flavonoid glycoside	*E. brevicornum*	DAF-16↑, HSP-12.3↑	+31%		[92]
Isorhamnetin	Flavonoid	*Onion*	ROS↓	+16%	+16%	[93]
Kaempferol	Flavonoid	*Fruits, vegetables*	DAF-16↑, ROS↓	+10% (heat)	+7%	[80, 94]
Laricitrin	Flavonoid	*Red grapes and wine*	DAF-16↑	+55%		[95]
Lignans	Polyphenol	*Arctium lappa*	DAF-16↑	+25%		[96]
Lovastatin	Lactone	*Mushrooms*	DAF-16↑	+25%		[97]
Metformin	Biguanide	*Anti-diabetic drug (derived from French lilac)*	AAK-2/AMPK↑, TOR↓, SKN-1↑, methionine↓, agmatine↑	+40% (median)		[37, 98-100]
Monascin	Azaphilonoid	*Monascus purpureus*	DAF-16↑, SOD-1↑, HSP-16.2↑	+29% (CL2006 strain)		[101]
Myricetin	Flavonoid	*Fruits, vegetables*	DAF-16↑, ROS↓, Sir-2.1	+48%	+22%	[94, 95, 102, 103]
Myricetin-trimethylether	Flavonoid	*Bridelia plant*	DAF-16↑	+54%		[95]
Naphthazarin	Naphthoquinone	*Plants*	SKN-1↑	+13%	+25%	[18]
NDGA	Polyphenol	*Larrea tridentata*	Autophagy↑	+21% (median)		[104]
5'-Octanoyl salicylic acid	Organic acid	*Skin exfoliating drug (aspirin derivative)*	AAK-2/AMPK↑, TOR↓, autophagy↑, UPRmit↑	+19%	+12%	[105]
Oleanolic acid	Terpenoid	*Plants*	DAF-16↑, ROS↓	+17%		[106]
Oxoline	Naphthoquinone	*Plants*	ND	+15%	+10%	[18]
Piceatannol	Stilbenoid	*Red grape, wine*	DAF-2, DAF-16↑, Sir-2.1	+18% (median)		[107]
Plant extract	Mixture	*Alpinia zerumbet*	SOD-3↑, HSP-16.2↑	+23%	+61%	[108]
Plant extract	Mixture	*Anacardium occidentale*	DAF-16↑, SKN-1↑, SOD-3↑	+20%		[109]
Plant extract	Mixture	*Betula utilis*	DAF-16↑, HSF-1↑, SKN-1↑, ROS↓	+36%		[110]
Plant extract	Mixture	*Black tea*	ND	ND		[111]
Plant extract	Mixture	*Caesalpinia mimosoides*	DAF-16↑, ROS↓	+4%		[112]
Plant extract	Mixture	*Damnacanthus officinarum*	ND	+10–30%		[113]
Plant extract	Mixture	*Dioscorea alata*	HSP-16.2↑, SKN-1↑	+28%		[114]
Plant extract	Mixture	*Eleutherococcus senticosus*	DAF-16↑	+16%	+12%	[25]
Plant extract	Mixture	*Garlic*	DAF-16↑	+21%		[115]
Plant extract	Mixture	*Ginkgo biloba*	ROS↓	+8% (median)		[116, 117]
Plant extract	Mixture	*Glochidion zeylanicum*	DAF-16↑, SKN-1↑, SOD-3↑, HSP-16.2↓	+10%		[118]
Plant extract	Mixture	*Green tea*	EAT-2	ND		[111]
Plant extract	Mixture	*Guarana*	DAF-16↑	+14%		[119]

Plant extract	Mixture	*Hibiscus sabdariffa*	DAF-16↑, SKN-1↑	+24%		[120]
Plant extract	Mixture	*Lonicera japonica*	DAF-2, DAF-16↑, SOD-3↑, ROS↓	+22%		[121]
Plant extract	Mixture	*Pu-er tea*	ND	ND		[111]
Plant extract	Mixture	*Ribes fasciculatum*	DAF-2, AGE-1, DAF-16↑, Sir-2.1, SOD↑, ROS↓	+16%	+19%	[122]
Plant extract	Mixture	*Rhodiola rosea*	DAF-16↑	+15%	+12%	[25]
Plant extract	Mixture	*Rooibos tea*	HSP-16.2↓	+23% (high glucose only)		[48]
Plant extract	Mixture	*Turkish medicinal plants*	ND	+24%		[123]
Plant extract	Mixture	*Viscum album coloratum*	Sir2	+10%		[26]
Plumbagin	Naphthoquinone	*Plumbago zeylanica*	DAF-16↑, SKN-1↑	+12%	+13%	[18]
Polydatin	Stilbenoid glycoside	*Grape*	DAF-16↑, SOD-3↑	+31%		[124]
Polysaccharides	Polysaccharide	*A. membranaceus*	DAF-16↑	+20% (median)		[125]
Polysaccharides	Polysaccharide	*Auricularia auricular*	DAF-16↑, SKN-1↑, Sir-2.1	-18%	+22%	[126]
Polysaccharides	Polysaccharide	*Chlorophytum borivilianum*	ND	+23% (median)		[127]
Polysaccharides	Polysaccharide	*Cordyceps militaris*	ND	+17%		[128]
Polysaccharides (lentinan)	Polysaccharide	*Lentinula edodes*	ND	+11%		[128]
Polysaccharides	Polysaccharide	*Panax notoginseng*	SOD↑, catalase↑, MDA↓	+21%		[129]
Polysaccharides	Polysaccharide	*G. lucidum*	DAF-16↑, autophagy↑	+44% (median)		[130], unpublished data
Polysaccharides	Polysaccharide	*Rehmannia glutinosa*	DAF-16↑	ND		[131]
Polyphenols	Polyphenol	*Apple*	Sir-2.1	+12%		[132]
Polyphenols	Polyphenol	*Blueberry*	ROS↓, OSR-1, SEK-1↑	+28%	+14%	[133]
Polyphenols	Polyphenol	*Cocoa*	DAF-16↑, Sir-2.1	+17% (median)		[134]
Quercetin	Flavonoid	*Vegetables*	AGE-1, DAF-2, DAF-16↑, SEK-1↑	+15%	+18%	[54, 93,94 , 135-138]
Quercetin-3-O-glucoside	Flavonoid glycoside	*Vegetables*	ND	+23%	+7%	[139]
Quinic acid	Polyol	*Uncaria tomentosa*	DAF-16↑, SOD-3↑	+7%		[140]
Reserpine	Alkaloid	*Indian snakeroot, anti-hypertensive drug*	Stress tolerance↑	+31%		[141]
Resveratrol	Stilbenoid	*Red wine, dietary supplement*	Sir-2.1, autophagy↑	+18%		[142-147]
Rosmarinic acid	Polyphenol	*R. officinalis*	DAF-16↑, OSR-1, SEK-1↑, Sir-2.1	+63%		[54,148]
Royal jelly	Mixture	*Dietary supplement*	DAF-16↑	+9%		[91]
S-allylcysteine	Organosulfur	*Garlic*	SKN-1↑	+17%		[149]
S-allylmercaptocysteine	Organosulfur	*Garlic*	SKN-1↑	+21%		[149]
Spermidine	Polyamine	*Natto, mushrooms*	Autophagy↑	+15%		[150]
Silymarin	Flavonolignan	*Milk thistle*	DAF-16↑, SOD-3↑, ROS↓	+18%		[151]

Simvastatin	Lactone	*Cholesterol-lowering drug (derived from fungi)*	ND	+13%		[97]
Syringetin	Flavonoid	*Sichuan pepper*	DAF-16↑	+36%		[95]
Tamarixetin	Flavonoid	*G. biloba*	ROS↓	+29% (median)		[93,116]
Tambulin	Flavonoid	*Zanthoxyllum aramatum*	DAF-16↑, SOD-1↑, SOD-3↑, ROS↓	+17%		[152]
Tannic acid	Polyphenol	*Plants*	SEK-1↑	+19%		[62,153]
Taurine	Amino sulfonic acid	*Dietary supplement*	ND	+11%		[154]
Theanine	Amino acid	*Tea, dietary supplement*	ND	+14%		[154,155]
Theophylline	Alkaloid	*Coffee*	ROS↓	+21%		[19]
Tocotrienols	Tocopherol	*Fruits, vegetables*	ROS↓	+20%		[156]
Tomatidine	Alkaloid	*Unripe tomatoe*	SKN-1↑	+7%		[157]
Trehalose	Disaccharide	*Vegetables, mushrooms*	DAF-2	+30%		[158]
Triptolide	Terpenoid	*T. wilfordii*	SOD-3↑, HSP-16.2↑, ROS↓	+20%	+16%	[159]
Ursolic acid	Terpenoid	*Plants*	SKN-1↑	+31%		[160]

The "Mechanism" column displays modulation of specific cellular components (e.g., DAF-16↑, SOD-1↑, ROS↓) or involvement of particular genes, proteins and enzymes (e.g., DAF-2, OSR-1, Sir-2.1). In the "Lifespan" column, the parentheses indicate that lifespan assays were performed in the presence of cellular stress such as high glucose, heat or paraquat; in some studies, extension of "median" lifespan was reported. Only the highest increase in mean, median or maximum lifespan is shown. Abbreviations: AAK-2, 5' adenosine-monophosphate-activated protein kinase catalytic subunit alpha 2; AGE-1, phosphatidylinositol 3-kinase age 1; AGEs, advanced glycation endproducts; AMPK, 5'-adenosine-monophosphate-activated protein kinase; CBP-1, calcineurin-binding protein-1; DAF, abnormal dauer formation protein; EGCG, epigallocatechin gallate; FOX, forkhead box; GLP-1, abnormal germ line proliferation; HSF-1, heat shock factor 1; HSP, heat-shock protein; MDA, malondialdehyde; ND, not determined; NDGA, nordihydroguaiaretic acid; OSR-1, odd-skipped-related protein-1; ROS, reactive oxygen species; Sir, sirtuin; SKN-1, skinhead protein 1; SOD, superoxide dismutase; TOR, target of rapamycin; UPR^{mit}, mitochondrial unfolded protein response.

REFERENCES

17. Xue YL, Ahiko T, Miyakawa T, Amino H, Hu F, Furihata K, Kita K, Shirasawa T, Sawano Y, Tanokura M (**2011**). Isolation and *Caenorhabditis elegans* lifespan assay of flavonoids from onion. **J Agric Food Chem** 59(11): 5927–5934. doi: 10.1021/jf104798n

18. Hunt PR, Son TG, Wilson MA, Yu QS, Wood WH, Zhang Y, Becker KG, Greig NH, Mattson MP, Camandola S, Wolkow CA (**2011**). Extension of lifespan in *C. elegans* by naphthoquinones that act through stress hormesis mechanisms. **PLoS ONE** 6(7): e21922. doi: 10.1371/journal.pone.0021922

19. Li H, Roxo M, Cheng X, Zhang S, Cheng H, Wink M (**2019**). Pro-oxidant and lifespan extension effects of caffeine and related methylxanthines in *Caenorhabditis elegans*. **Food Chem X** 1: 100005. doi: 10.1016/j.fochx.2019.100005

21. Wan QL, Zheng SQ, Wu GS, Luo HR (**2013**). Aspirin extends the lifespan of *Caenorhabditis elegans* via AMPK and DAF-16/FOXO in dietary restriction pathway. **Exp Gerontol** 48(5): 499–506. doi: 10.1016/j.exger.2013.02.020

22. Ayyadevara S, Bharill P, Dandapat A, Hu C, Khaidakov M, Mitra S, Shmookler Reis RJ, Mehta JL (**2013**). Aspirin inhibits oxidant stress, reduces age-associated functional declines, and extends lifespan of *Caenorhabditis elegans*. **Antioxid Redox Signal** 18(5): 481–490. doi: 10.1089/ars.2011.4151

25. Wiegant FA, Surinova S, Ytsma E, Langelaar-Makkinje M, Wikman G, Post JA (**2009**). Plant adaptogens increase lifespan and stress resistance in *C. elegans*. **Biogerontology** 10(1): 27–42. doi: 10.1007/s10522-008-9151-9

26. Lee SH, An HS, Jung YW, Lee EJ, Lee HY, Choi ES, An SW, Son H, Lee SJ, Kim JB, Min KJ (**2014**). Korean mistletoe (*Viscum album coloratum*) extract extends the lifespan of nematodes and fruit flies. **Biogerontology** 15(2): 153–164. doi: 10.1007/s10522-013-9487-7

30. Weimer S, Priebs J, Kuhlow D, Groth M, Priebe S, Mansfeld J, Merry TL, Dubuis S, Laube B, Pfeiffer AF, Schulz TJ, Guthke R, Platzer M, Zamboni N, Zarse K, Ristow M (**2014**). D-Glucosamine supplementation extends life span of nematodes and of ageing mice. **Nat Commun** 5: 3563. doi: 10.1038/ncomms4563

34. Zheng SQ, Huang XB, Xing TK, Ding AJ, Wu GS, Luo HR (**2017**). Chlorogenic acid extends the lifespan of *Caenorhabditis elegans* via insulin/IGF-1 signaling pathway. **J Gerontol A Biol Sci Med Sci** 72(4): 464–472. doi: 10.1093/gerona/glw105

35. Lin C, Zhang X, Su Z, Xiao J, Lv M, Cao Y, Chen Y (**2019**). Carnosol improved lifespan and healthspan by promoting antioxidant capacity in *Caenorhabditis elegans*. **Oxid Med Cell Longev** 2019: 5958043. doi: 10.1155/2019/5958043

37. Pryor R, Norvaisas P, Marinos G, Best L, Thingholm LB, Quintaneiro LM, De Haes W, Esser D, Waschina S, Lujan C, Smith RL, Scott TA, Martinez-Martinez D, Woodward O, Bryson K, Laudes M, Lieb W, Houtkooper RH, Franke A, Temmerman L, Bjedov I, Cocheme HM, Kaleta C,

Cabreiro F (**2019**). Host-microbe-drug-nutrient screen identifies bacterial effectors of metformin therapy. **Cell** 178(6): 1299–1312. doi: 10.1016/j.cell.2019.08.003

47. Senthil KK, Gokila VM, Mau JL, Lin CC, Chu FH, Wei CC, Liao VH, Wang SY (**2016**). A steroid like phytochemical Antcin M is an anti-aging reagent that eliminates hyperglycemia-accelerated premature senescence in dermal fibroblasts by direct activation of Nrf2 and SIRT-1. **Oncotarget** 7(39): 62836–62861. doi: 10.18632/oncotarget.11229

48. Chen W, Sudji IR, Wang E, Joubert E, van Wyk BE, Wink M (**2013**). Ameliorative effect of aspalathin from rooibos (*Aspalathus linearis*) on acute oxidative stress in *Caenorhabditis elegans*. **Phytomedicine** 20(3–4): 380–386. doi: 10.1016/j.phymed.2012.10.006

49. Havermann S, Rohrig R, Chovolou Y, Humpf HU, Watjen W (**2013**). Molecular effects of baicalein in Hct116 cells and *Caenorhabditis elegans*: activation of the Nrf2 signaling pathway and prolongation of lifespan. **J Agric Food Chem** 61(9): 2158–2164. doi: 10.1021/jf304553g

50. Havermann S, Humpf HU, Watjen W (**2016**). Baicalein modulates stress-resistance and life span in *C. elegans* via SKN-1 but not DAF-16. **Fitoterapia** 113: 123–127. doi: 10.1016/j.fitote.2016.06.018

51. Guerrero-Rubio MA, Hernandez-Garcia S, Garcia-Carmona F, Gandia-Herrero F (**2019**). Extension of life-span using a RNAi model and in vivo antioxidant effect of Opuntia fruit extracts and pure betalains in *Caenorhabditis elegans*. **Food Chem** 274: 840–847. doi: 10.1016/j.foodchem.2018.09.067

52. Rathor L, Pandey R (**2018**). Age-induced diminution of free radicals by Boeravinone B in *Caenorhabditis elegans*. **Exp Gerontol** 111: 94–106. doi: 10.1016/j.exger.2018.07.005

53. Lee EB, Xing MM, Kim DK (**2017**). Lifespan-extending and stress resistance properties of brazilin from *Caesalpinia sappan* in *Caenorhabditis elegans*. **Arch Pharm Res** 40(7): 825–835. doi: 10.1007/s12272-017-0920-3

54. Pietsch K, Saul N, Chakrabarti S, Sturzenbaum SR, Menzel R, Steinberg CE (**2011**). Hormetins, antioxidants and prooxidants: defining quercetin-, caffeic acid- and rosmarinic acid-mediated life extension in *C. elegans*. **Biogerontology** 12(4): 329–347. doi: 10.1007/s10522-011-9334-7

55. Havermann S, Chovolou Y, Humpf HU, Watjen W (**2014**). Caffeic acid phenethylester increases stress resistance and enhances lifespan in *Caenorhabditis elegans* by modulation of the insulin-like DAF-16 signalling pathway. **PLoS ONE** 9(6): e100256. doi: 10.1371/journal.pone.0100256

56. Lublin A, Isoda F, Patel H, Yen K, Nguyen L, Hajje D, Schwartz M, Mobbs C (**2011**). FDA-approved drugs that protect mammalian neurons from glucose toxicity slow aging dependent on cbp and protect against proteotoxicity. **PLoS ONE** 6(11): e27762. doi: 10.1371/journal.pone.0027762

57. Sutphin GL, Bishop E, Yanos ME, Moller RM, Kaeberlein M (**2012**). Caffeine extends life span, improves healthspan, and delays age-associated pathology in *Caenorhabditis elegans*. **Longev Healthspan** 1: 9. doi: 10.1186/2046-2395-1-9

58. Bridi JC, Barros AG, Sampaio LR, Ferreira JC, Antunes Soares FA, Romano-Silva MA (**2015**). Lifespan extension induced by caffeine in Caenorhabditis elegans is partially dependent on adenosine signaling. **Front Aging Neurosci** 7: 220. doi: 10.3389/fnagi.2015.00220

59. Lu L, Zhao X, Zhang J, Li M, Qi Y, Zhou L (**2017**). Calycosin promotes lifespan in *Caenorhabditis elegans* through insulin signaling pathway via daf-16, age-1 and daf-2. **J Biosci Bioeng** 124(1): 1–7. doi: 10.1016/j.jbiosc.2017.02.021

60. Lin C, Zhang X, Xiao J, Zhong Q, Kuang Y, Cao Y, Chen Y (**2019**). Effects on longevity extension and mechanism of action of carnosic acid in *Caenorhabditis elegans*. **Food Funct** 10(3): 1398–1410. doi: 10.1039/c8fo02371a

61. Saul N, Pietsch K, Menzel R, Sturzenbaum SR, Steinberg CE (**2009**). Catechin induced longevity in *C. elegans*: from key regulator genes to disposable soma. **Mech Ageing Dev** 130(8): 477–486. doi: 10.1016/j.mad.2009.05.005

62. Saul N, Pietsch K, Sturzenbaum SR, Menzel R, Steinberg CE (**2011**). Diversity of polyphenol action in *Caenorhabditis elegans*: between toxicity and longevity. **J Nat Prod** 74(8): 1713–1720. doi: 10.1021/np200011a

63. Jung SK, Aleman-Meza B, Riepe C, Zhong W (**2014**). QuantWorm: a comprehensive software package for *Caenorhabditis elegans* phenotypic assays. **PLoS ONE** 9(1): e84830. doi: 10.1371/journal.pone.0084830

64. Wang E, Wink M (**2016**). Chlorophyll enhances oxidative stress tolerance in *Caenorhabditis elegans* and extends its lifespan. **PeerJ** 4: e1879. doi: 10.7717/peerj.1879

65. Alavez S, Vantipalli MC, Zucker DJ, Klang IM, Lithgow GJ (**2011**). Amyloid-binding compounds maintain protein homeostasis during ageing and extend lifespan. **Nature** 472(7342): 226–229. doi: 10.1038/nature09873

66. Liao VH, Yu CW, Chu YJ, Li WH, Hsieh YC, Wang TT (**2011**). Curcumin-mediated lifespan extension in *Caenorhabditis elegans*. **Mech Ageing Dev** 132(10): 480–487. doi: 10.1016/j.mad.2011.07.008

67. Kim YS, Han YT, Jeon H, Cha DS (**2018**). Antiageing properties of Damaurone D in *Caenorhabditis elegans*. **J Pharm Pharmacol** 70(10): 1423–1429. doi: 10.1111/jphp.12979

68. Kim J, Kang YG, Lee JY, Choi DH, Cho YU, Shin JM, Park JS, Lee JH, Kim WG, Seo DB, Lee TR, Miyamoto Y, No KT (**2015**). The natural phytochemical dehydroabietic acid is an anti-aging reagent that mediates the direct activation of SIRT1. **Mol Cell Endocrinol** 412: 216–225. doi: 10.1016/j.mce.2015.05.006

69. Powolny AA, Singh SV, Melov S, Hubbard A, Fisher AL (**2011**). The garlic constituent diallyl trisulfide increases the lifespan of *C. elegans* via skn-1 activation. **Exp Gerontol** 46(6): 441–452. doi: 10.1016/j.exger.2011.01.005

70. Shanmugam G, Mohankumar A, Kalaiselvi D, Nivitha S, Murugesh E, Shanmughavel P, Sundararaj P (**2017**). Diosgenin a phytosterol substitute for cholesterol, prolongs the lifespan and mitigates glucose toxicity via DAF-16/FOXO and GST-4 in *Caenorhabditis elegans*. **Biomed Pharmacother** 95: 1693–1703. doi: 10.1016/j.biopha.2017.09.096

71. Carmona-Gutierrez D, Zimmermann A, Kainz K, Pietrocola F, Chen G, Maglioni S, Schiavi A, Nah J, Mertel S, Beuschel CB, Castoldi F, Sica V, Trausinger G, Raml R, Sommer C, Schroeder S, Hofer SJ, Bauer MA, Pendl T, Tadic J, Dammbrueck C, Hu Z, Ruckenstuhl C, Eisenberg T, Durand S, Bossut N, Aprahamian F, Abdellatif M, Sedej S, Enot DP, et al. (**2019**). The flavonoid 4,4'-dimethoxychalcone promotes autophagy-dependent longevity across species. **Nat Commun** 10(1): 651. doi: 10.1038/s41467-019-08555-w

72. Wang X, Zhang J, Lu L, Zhou L (**2015**). The longevity effect of echinacoside in *Caenorhabditis elegans* mediated through daf-16. **Biosci Biotechnol Biochem** 79(10): 1676–1683. doi: 10.1080/09168451.2015.1046364

73. Chen W, Lin HR, Wei CM, Luo XH, Sun ML, Yang ZZ, Chen XY, Wang HB (**2018**). Echinacoside, a phenylethanoid glycoside from *Cistanche deserticola*, extends lifespan of *Caenorhabditis elegans* and protects from Abeta-induced toxicity. **Biogerontology** 19(1): 47–65. doi: 10.1007/s10522-017-9738-0

74. Abbas S, Wink M (**2009**). Epigallocatechin gallate from green tea (*Camellia sinensis*) increases lifespan and stress resistance in *Caenorhabditis elegans*. **Planta Med** 75(3): 216–221. doi: 10.1055/s-0028-1088378

75. Zhang L, Jie G, Zhang J, Zhao B (**2009**). Significant longevity-extending effects of EGCG on *Caenorhabditis elegans* under stress. **Free Radic Biol Med** 46(3): 414–421. doi: 10.1016/j.freeradbiomed.2008.10.041

76. Bartholome A, Kampkotter A, Tanner S, Sies H, Klotz LO (**2010**). Epigallocatechin gallate-induced modulation of FoxO signaling in mammalian cells and *C. elegans*: FoxO stimulation is masked via PI3K/Akt activation by hydrogen peroxide formed in cell culture. **Arch Biochem Biophys** 501(1): 58–64. doi: 10.1016/j.abb.2010.05.024

77. Zhao X, Lu L, Qi Y, Li M, Zhou L (**2017**). Emodin extends lifespan of *Caenorhabditis elegans* through insulin/IGF-1 signaling pathway depending on DAF-16 and SIR-2.1. **Biosci Biotechnol Biochem** 81(10): 1908–1916. doi: 10.1080/09168451.2017.1365592

78. Zheng J, Heber D, Wang M, Gao C, Heymsfield SB, Martin RJ, Greenway FL, Finley JW, Burton JH, Johnson WD, Enright FM, Keenan MJ, Li Z (**2017**). Pomegranate juice and extract extended lifespan and reduced intestinal fat deposition in *Caenorhabditis elegans*. **Int J Vitam Nutr Res** 87(3–4): 149–158. doi: 10.1024/0300-9831/a000570

79. Sayed AA (**2011**). Ferulsinaic acid attenuation of advanced glycation end products extends the lifespan of *Caenorhabditis elegans*. **J Pharm Pharmacol** 63(3): 423–428. doi: 10.1111/j.2042-7158.2010.01222.x

80. Kampkötter A, Gombitang Nkwonkam C, Zurawski RF, Timpel C, Chovolou Y, Watjen W, Kahl R (**2007**). Effects of the flavonoids kaempferol and fisetin on thermotolerance, oxidative stress and FoxO transcription factor DAF-16 in the model organism *Caenorhabditis elegans*. **Arch Toxicol** 81(12): 849–858. doi: 10.1007/s00204-007-0215-4

81. Vayndorf EM, Lee SS, Liu RH (**2013**). Whole apple extracts increase lifespan, healthspan and resistance to stress in *Caenorhabditis elegans*. **J Funct Foods** 5(3): 1236–1243. doi: 10.1016/j.jff.2013.04.006

82. Wang H, Liu J, Li T, Liu RH (**2018**). Blueberry extract promotes longevity and stress tolerance via DAF-16 in *Caenorhabditis elegans*. **Food Funct** 9(10): 5273–5282. doi: 10.1039/c8fo01680a

83. Yan F, Chen Y, Azat R, Zheng X (**2017**). Mulberry anthocyanin extract ameliorates oxidative damage in HepG2 cells and prolongs the lifespan of *Caenorhabditis elegans* through MAPK and Nrf2 pathways. **Oxid Med Cell Longev** 2017: 7956158. doi: 10.1155/2017/7956158

84. Wang J, Deng N, Wang H, Li T, Chen L, Zheng B, Liu RH (**2020**). Effects of orange extracts on longevity, healthspan, and stress resistance in *Caenorhabditis elegans*. **Molecules** 25(2): 351. doi: 10.3390/molecules25020351

85. Tambara AL, de Los Santos Moraes L, Dal Forno AH, Boldori JR, Goncalves Soares AT, de Freitas Rodrigues C, Mariutti LRB, Mercadante AZ, de Avila DS, Denardin CC (**2018**). Purple pitanga fruit (*Eugenia uniflora* L.) protects against oxidative stress and increase the lifespan in *Caenorhabditis elegans* via the DAF-16/FOXO pathway. **Food Chem Toxicol** 120: 639–650. doi: 10.1016/j.fct.2018.07.057

86. Cuong VT, Chen W, Shi J, Zhang M, Yang H, Wang N, Yang S, Li J, Yang P, Fei J (**2019**). The anti-oxidation and anti-aging effects of *Ganoderma lucidum* in *Caenorhabditis elegans*. **Exp Gerontol** 117: 99–105. doi: 10.1016/j.exger.2018.11.016

87. Lee EB, Ahn D, Kim BJ, Lee SY, Seo HW, Cha YS, Jeon H, Eun JS, Cha DS, Kim DK (**2015**). Genistein from *Vigna angularis* extends lifespan in *Caenorhabditis elegans*. **Biomol Ther** 23(1): 77–83. doi: 10.4062/biomolther.2014.075

88. Shintani T, Kosuge Y, Ashida H (**2018**). Glucosamine extends the lifespan of *Caenorhabditis elegans* via autophagy induction. **J Appl Glycosci** 65(3): 37–43. doi: 10.5458/jag.jag.JAG-2018_002

89. Zarse K, Bossecker A, Muller-Kuhrt L, Siems K, Hernandez MA, Berendsohn WG, Birringer M, Ristow M (**2011**). The phytochemical glaucarubinone promotes mitochondrial metabolism, reduces body fat, and extends lifespan of *Caenorhabditis elegans*. **Horm Metab Res** 43(4): 241–243. doi: 10.1055/s-0030-1270524

90. Liu H, Liang F, Su W, Wang N, Lv M, Li P, Pei Z, Zhang Y, Xie XQ, Wang L, Wang Y (**2013**). Lifespan extension by n-butanol extract from seed of *Platycladus orientalis* in *Caenorhabditis elegans*. **J Ethnopharmacol** 147(2): 366–372. doi: 10.1016/j.jep.2013.03.019

91. Honda Y, Fujita Y, Maruyama H, Araki Y, Ichihara K, Sato A, Kojima T, Tanaka M, Nozawa Y, Ito M, Honda S (**2011**). Lifespan-extending effects of royal jelly and its related substances on the nematode *Caenorhabditis elegans*. **PLoS ONE** 6(8): e23527. doi: 10.1371/journal.pone.0023527

92. Cai WJ, Huang JH, Zhang SQ, Wu B, Kapahi P, Zhang XM, Shen ZY (**2011**). Icariin and its derivative icariside II extend healthspan via insulin/IGF-1 pathway in *C. elegans*. **PLoS ONE** 6(12): e28835. doi: 10.1371/journal.pone.0028835

93. Surco-Laos F, Cabello J, Gomez-Orte E, Gonzalez-Manzano S, Gonzalez-Paramas AM, Santos-Buelga C, Duenas M (**2011**). Effects of O-methylated metabolites of quercetin on oxidative stress, thermotolerance, lifespan and bioavailability on *Caenorhabditis elegans*. **Food Funct** 2(8): 445–456. doi: 10.1039/c1fo10049a

94. Grünz G, Haas K, Soukup S, Klingenspor M, Kulling SE, Daniel H, Spanier B (**2012**). Structural features and bioavailability of four flavonoids and their implications for lifespan-extending and antioxidant actions in *C. elegans*. **Mech Ageing Dev** 133(1): 1–10. doi: 10.1016/j.mad.2011.11.005

95. Buchter C, Ackermann D, Honnen S, Arnold N, Havermann S, Koch K, Watjen W (**2015**). Methylated derivatives of myricetin enhance life span in *Caenorhabditis elegans* dependent on the transcription factor DAF-16. **Food Funct** 6(10): 3383–3392. doi: 10.1039/c5fo00463b

96. Su S, Wink M (**2015**). Natural lignans from *Arctium lappa* as antiaging agents in *Caenorhabditis elegans*. **Phytochemistry** 117: 340–350. doi: 10.1016/j.phytochem.2015.06.021

97. Jahn A, Scherer B, Fritz G, Honnen S (**2020**). Statins induce a DAF-16/Foxo-dependent longevity phenotype via JNK-1 through mevalonate depletion in *C. elegans*. **Aging Dis** 11(1): 60–72. doi: 10.14336/AD.2019.0416

98. Onken B, Driscoll M (**2010**). Metformin induces a dietary restriction-like state and the oxidative stress response to extend *C. elegans* healthspan via AMPK, LKB1, and SKN-1. **PLoS ONE** 5(1): e8758. doi: 10.1371/journal.pone.0008758

99. Cabreiro F, Au C, Leung KY, Vergara-Irigaray N, Cocheme HM, Noori T, Weinkove D, Schuster E, Greene ND, Gems D (**2013**). Metformin retards aging in *C. elegans* by altering microbial folate and methionine metabolism. **Cell** 153(1): 228–239. doi: 10.1016/j.cell.2013.02.035

100. Chen J, Ou Y, Li Y, Hu S, Shao LW, Liu Y (**2017**). Metformin extends *C. elegans* lifespan through lysosomal pathway. **Elife** 6. doi: 10.7554/eLife.31268

101. Shi YC, Pan TM, Liao VH (**2016**). Monascin from monascus-fermented products reduces oxidative stress and amyloid-beta toxicity via DAF-16/FOXO in *Caenorhabditis elegans*. **J Agric Food Chem** 64(38): 7114–7120. doi: 10.1021/acs.jafc.6b02779

102. Büchter C, Ackermann D, Havermann S, Honnen S, Chovolou Y, Fritz G, Kampkötter A, Watjen W (**2013**). Myricetin-mediated lifespan extension in *Caenorhabditis elegans* is modulated by DAF-16. **Int J Mol Sci** 14(6): 11895–11914. doi: 10.3390/ijms140611895

103. Jung HY, Lee D, Ryu HG, Choi BH, Go Y, Lee N, Son HG, Jeon J, Kim SH, Yoon JH, Park SM, Lee SV, Lee IK, Choi KY, Ryu SH, Nohara K, Yoo SH, Chen Z, Kim KT (**2017**). Myricetin improves endurance capacity and mitochondrial density by activating SIRT1 and PGC-1alpha. **Sci Rep** 7(1): 6237. doi: 10.1038/s41598-017-05303-2

104. Tezil T, Chamoli M, Ng CP, Simon RP, Butler VJ, Jung M, Andersen J, Kao AW, Verdin E (**2019**). Lifespan-increasing drug nordihydroguaiaretic acid inhibits p300 and activates autophagy. **NPJ Aging Mech Dis** 5: 7. doi: 10.1038/s41514-019-0037-7

105. Shamalnasab M, Gravel SP, St-Pierre J, Breton L, Jager S, Aguilaniu H (**2018**). A salicylic acid derivative extends the lifespan of *Caenorhabditis elegans* by activating autophagy and the mitochondrial unfolded protein response. **Aging Cell** 17(6): e12830. doi: 10.1111/acel.12830

106. Zhang J, Lu L, Zhou L (**2015**). Oleanolic acid activates daf-16 to increase lifespan in *Caenorhabditis elegans*. **Biochem Biophys Res Commun** 468(4): 843–849. doi: 10.1016/j.bbrc.2015.11.042

107. Shen P, Yue Y, Sun Q, Kasireddy N, Kim KH, Park Y (**2017**). Piceatannol extends the lifespan of *Caenorhabditis elegans* via DAF-16. **Biofactors** 43(3): 379–387. doi: 10.1002/biof.1346

108. Upadhyay A, Chompoo J, Taira N, Fukuta M, Tawata S (**2013**). Significant longevity-extending effects of *Alpinia zerumbet* leaf extract on the life span of *Caenorhabditis elegans*. **Biosci Biotechnol Biochem** 77(2): 217–223. doi: 10.1271/bbb.120351

109. Duangjan C, Rangsinth P, Gu X, Wink M, Tencomnao T (**2019**). Lifespan extending and oxidative stress resistance properties of a leaf extracts from *Anacardium occidentale* L. in *Caenorhabditis elegans*. **Oxid Med Cell Longev** 2019: 9012396. doi: 10.1155/2019/9012396

110. Pandey S, Phulara SC, Mishra SK, Bajpai R, Kumar A, Niranjan A, Lehri A, Upreti DK, Chauhan PS (**2020**). *Betula utilis* extract prolongs life expectancy, protects against amyloid-beta toxicity and reduces alpha synuclien in *Caenorhabditis elegans* via DAF-16 and SKN-1. **Comp Biochem Physiol C Toxicol Pharmacol** 228: 108647. doi: 10.1016/j.cbpc.2019.108647

111. Fei T, Fei J, Huang F, Xie T, Xu J, Zhou Y, Yang P (**2017**). The anti-aging and anti-oxidation effects of tea water extract in *Caenorhabditis elegans*. **Exp Gerontol** 97: 89–96. doi: 10.1016/j.exger.2017.07.015

112. Rangsinth P, Prasansuklab A, Duangjan C, Gu X, Meemon K, Wink M, Tencomnao T (**2019**). Leaf extract of *Caesalpinia mimosoides* enhances oxidative stress resistance and prolongs lifespan in *Caenorhabditis elegans*. **BMC Complement Altern Med** 19(1): 164. doi: 10.1186/s12906-019-2578-5

113. Yang X, Zhang P, Wu J, Xiong S, Jin N, Huang Z (**2012**). The neuroprotective and lifespan-extension activities of *Damnacanthus officinarum* extracts in *Caenorhabditis elegans*. **J Ethnopharmacol** 141(1): 41–47. doi: 10.1016/j.jep.2012.01.025

114. Govindan S, Amirthalingam M, Duraisamy K, Govindhan T, Sundararaj N, Palanisamy S (**2018**). Phytochemicals-induced hormesis protects *Caenorhabditis elegans* against alpha-synuclein protein aggregation and stress through modulating HSF-1 and SKN-1/Nrf2 signaling pathways. **Biomed Pharmacother** 102: 812–822. doi: 10.1016/j.biopha.2018.03.128

115. Huang CH, Hsu FY, Wu YH, Zhong L, Tseng MY, Kuo CJ, Hsu AL, Liang SS, Chiou SH (**2015**). Analysis of lifespan-promoting effect of garlic extract by an integrated metabolo-proteomics approach. **J Nutr Biochem** 26(8): 808–817. doi: 10.1016/j.jnutbio.2015.02.010

116. Wu Z, Smith JV, Paramasivam V, Butko P, Khan I, Cypser JR, Luo Y (**2002**). *Ginkgo biloba* extract EGb 761 increases stress resistance and extends life span of *Caenorhabditis elegans*. **Cell Mol Biol** 48(6): 725–731. PMID: 12396085

117. Kampkötter A, Pielarski T, Rohrig R, Timpel C, Chovolou Y, Watjen W, Kahl R (**2007**). The *Ginkgo biloba* extract EGb761 reduces stress sensitivity, ROS accumulation and expression of catalase and glutathione S-transferase 4 in *Caenorhabditis elegans*. **Pharmacol Res** 55(2): 139–147. doi: 10.1016/j.phrs.2006.11.006

118. Duangjan C, Rangsinth P, Gu X, Zhang S, Wink M, Tencomnao T (**2019**). *Glochidion zeylanicum* leaf extracts exhibit lifespan extending and oxidative stress resistance properties in *Caenorhabditis elegans* via DAF-16/FoxO and SKN-1/Nrf-2 signaling pathways. **Phytomedicine** 64: 153061. doi: 10.1016/j.phymed.2019.153061

119. Peixoto H, Roxo M, Rohrig T, Richling E, Wang X, Wink M (**2017**). Anti-aging and antioxidant potential of *Paullinia cupana* var. *sorbilis*: Findings in *Caenorhabditis elegans* indicate a new utilization for roasted seeds of guarana. **Medicines** 4(3). doi: 10.3390/medicines4030061

120. Koch K, Weldle N, Baier S, Buchter C, Watjen W (**2020**). *Hibiscus sabdariffa* L. extract prolongs lifespan and protects against amyloid-beta toxicity in *Caenorhabditis elegans*: involvement of the FoxO and Nrf2 orthologues DAF-16 and SKN-1. **Eur J Nutr** 59(1): 137–150. doi: 10.1007/s00394-019-01894-w

121. Yang ZZ, Yu YT, Lin HR, Liao DC, Cui XH, Wang HB (**2018**). *Lonicera japonica* extends lifespan and healthspan in *Caenorhabditis elegans*. **Free Radic Biol Med** 129: 310–322. doi: 10.1016/j.freeradbiomed.2018.09.035

122. Jeon H, Cha DS (**2016**). Anti-aging properties of *Ribes fasciculatum* in *Caenorhabditis elegans*. **Chin J Nat Med** 14(5): 335–342. doi: 10.3724/SP.J.1009.2016.00335

123. Ergen N, Hosbas S, Deliorman Orhan D, Aslan M, Sezik E, Atalay A (**2018**). Evaluation of the lifespan extension effects of several Turkish medicinal plants in *Caenorhabditis elegans*. **Turk J Biol** 42(2): 163–173. doi: 10.3906/biy-1711-5

124. Wen H, Gao X, Qin J (**2014**). Probing the anti-aging role of polydatin in *Caenorhabditis elegans* on a chip. **Integr Biol** 6(1): 35–43. doi: 10.1039/c3ib40191j

125. Zhang H, Pan N, Xiong S, Zou S, Li H, Xiao L, Cao Z, Tunnacliffe A, Huang Z (**2012**). Inhibition of polyglutamine-mediated proteotoxicity by *Astragalus membranaceus* polysaccharide through the DAF-16/FOXO transcription factor in *Caenorhabditis elegans*. **Biochem J** 441(1): 417–424. doi: 10.1042/BJ20110621

126. Fang Z, Chen Y, Wang G, Feng T, Shen M, Xiao B, Gu J, Wang W, Li J, Zhang Y (**2019**). Evaluation of the antioxidant effects of acid hydrolysates from *Auricularia auricular* polysaccharides using a *Caenorhabditis elegans* model. **Food Funct** 10(9): 5531–5543. doi: 10.1039/c8fo02589d

127. Pannakal ST, Jager S, Duranton A, Tewari A, Saha S, Radhakrishnan A, Roy N, Kuntz JF, Fermas S, James D, Mellor J, Misra N, Breton L (**2017**). Longevity effect of a polysaccharide from *Chlorophytum borivilianum* on *Caenorhabditis elegans* and *Saccharomyces cerevisiae*. **PLoS ONE** 12(7): e0179813. doi: 10.1371/journal.pone.0179813

128. Liu X, Huang Y, Chen Y, Cao Y (**2016**). Partial structural characterization, as well as immunomodulatory and anti-aging activities of CP2-c2-s2 polysaccharide from *Cordyceps militaris*. **RSC Adv** 6(106): 104094. doi: 10.1039/C6RA23612J

129. Feng S, Cheng H, Xu Z, Shen S, Yuan M, Liu J, Ding C (**2015**). Thermal stress resistance and aging effects of *Panax notoginseng* polysaccharides on *Caenorhabditis elegans*. **Int J Biol Macromol** 81: 188–194. doi: 10.1016/j.ijbiomac.2015.07.057

130. Chuang MH, Chiou SH, Huang CH, Yang WB, Wong CH (**2009**). The lifespan-promoting effect of acetic acid and Reishi polysaccharide. **Bioorg Med Chem** 17(22): 7831–7840. doi: 10.1016/j.bmc.2009.09.002

131. Yuan Y, Kang N, Li Q, Zhang Y, Liu Y, Tan P (**2019**). Study of the effect of neutral polysaccharides from *Rehmannia glutinosa* on lifespan of *Caenorhabditis elegans*. **Molecules** 24(24): 4592. doi: 10.3390/molecules24244592

132. Sunagawa T, Shimizu T, Kanda T, Tagashira M, Sami M, Shirasawa T (**2011**). Procyanidins from apples (*Malus pumila* Mill.) extend the lifespan of *Caenorhabditis elegans*. **Planta Med** 77(2): 122–127. doi: 10.1055/s-0030-1250204

133. Wilson MA, Shukitt-Hale B, Kalt W, Ingram DK, Joseph JA, Wolkow CA (**2006**). Blueberry polyphenols increase lifespan and thermotolerance in *Caenorhabditis elegans*. **Aging Cell** 5(1): 59–68. doi: 10.1111/j.1474-9726.2006.00192.x

134. Martorell P, Forment JV, de Llanos R, Monton F, Llopis S, Gonzalez N, Genoves S, Cienfuegos E, Monzo H, Ramon D (**2011**). Use of *Saccharomyces cerevisiae* and *Caenorhabditis elegans* as model organisms to study the effect of cocoa polyphenols in the resistance to oxidative stress. **J Agric Food Chem** 59(5): 2077–2085. doi: 10.1021/jf104217g

135. Kampkötter A, Nkwonkam CG, Zurawski RF, Timpel C, Chovolou Y, Watjen W, Kahl R (**2007**). Investigations of protective effects of the flavonoids quercetin and rutin on stress resistance in the model organism *Caenorhabditis elegans*. **Toxicol** 234(1–2): 113–123. doi: 10.1016/j.tox.2007.02.006

136. Kampkötter A, Timpel C, Zurawski RF, Ruhl S, Chovolou Y, Proksch P, Watjen W (**2008**). Increase of stress resistance and lifespan of *Caenorhabditis elegans* by quercetin. **Comp Biochem Physiol B Biochem Mol Biol** 149(2): 314–323. doi: 10.1016/j.cbpb.2007.10.004

137. Saul N, Pietsch K, Menzel R, Steinberg CE (**2008**). Quercetin-mediated longevity in *Caenorhabditis elegans*: is DAF-16 involved? **Mech Ageing Dev** 129(10): 611–613. doi: 10.1016/j.mad.2008.07.001

138. Pietsch K, Saul N, Menzel R, Sturzenbaum SR, Steinberg CE (**2009**). Quercetin mediated lifespan extension in *Caenorhabditis elegans* is modulated by age-1, daf-2, sek-1 and unc-43. **Biogerontol** 10(5): 565–578. doi: 10.1007/s10522-008-9199-6

139. Duenas M, Surco-Laos F, Gonzalez-Manzano S, Gonzalez-Paramas AM, Gomez-Orte E, Cabello J, Santos-Buelga C (**2013**). Deglycosylation is a key step in biotransformation and lifespan effects of quercetin-3-O-glucoside in *Caenorhabditis elegans*. **Pharmacol Res** 76: 41–48. doi: 10.1016/j.phrs.2013.07.001

140. Zhang L, Zhang J, Zhao B, Zhao-Wilson X (**2012**). Quinic acid could be a potential rejuvenating natural compound by improving survival of *Caenorhabditis elegans* under deleterious conditions. **Rejuvenation Res** 15(6): 573–583. doi: 10.1089/rej.2012.1342

141. Srivastava D, Arya U, SoundaraRajan T, Dwivedi H, Kumar S, Subramaniam JR (**2008**). Reserpine can confer stress tolerance and lifespan extension in the nematode *C. elegans*. **Biogerontology** 9(5): 309–316. doi: 10.1007/s10522-008-9139-5

142. Wood JG, Rogina B, Lavu S, Howitz K, Helfand SL, Tatar M, Sinclair D (**2004**). Sirtuin activators mimic caloric restriction and delay ageing in metazoans. **Nature** 430(7000): 686–689. doi: 10.1038/nature02789

143. Viswanathan M, Kim SK, Berdichevsky A, Guarente L (**2005**). A role for SIR-2.1 regulation of ER stress response genes in determining *C. elegans* life span. **Dev Cell** 9(5): 605–615. doi: 10.1016/j.devcel.2005.09.017

144. Bass TM, Weinkove D, Houthoofd K, Gems D, Partridge L (**2007**). Effects of resveratrol on lifespan in *Drosophila melanogaster* and *Caenorhabditis elegans*. **Mech Ageing Dev** 128(10): 546–552. doi: 10.1016/j.mad.2007.07.007

145. Gruber J, Tang SY, Halliwell B (**2007**). Evidence for a trade-off between survival and fitness caused by resveratrol treatment of *Caenorhabditis elegans*. **Ann N Y Acad Sci** 1100: 530–542. doi: 10.1196/annals.1395.059

146. Morselli E, Maiuri MC, Markaki M, Megalou E, Pasparaki A, Palikaras K, Criollo A, Galluzzi L, Malik SA, Vitale I, Michaud M, Madeo F, Tavernarakis N, Kroemer G (**2010**). Caloric restriction and resveratrol promote longevity through the Sirtuin-1-dependent induction of autophagy. **Cell Death Dis** 1(1): e10. doi: 10.1038/cddis.2009.8

147. Banse SA, Lucanic M, Sedore CA, Coleman-Hulbert AL, Plummer WT, Chen E, Kish JL, Hall D, Onken B, Presley MP, Jones EG, Blue BW, Garrett T, Abbott M, Xue J, Guo S, Johnson E, Foulger AC, Chamoli M, Falkowski R, Melentijevic I, Harinath G, Huynh P, Patel S, Edgar D, Jarrett CM, Guo M, Kapahi P, Lithgow GJ, Driscoll M, et al. (**2019**). Automated lifespan determination across *Caenorhabditis strains* and species reveals assay-specific effects of chemical interventions. **Geroscience** 41(6): 945–960. doi: 10.1007/s11357-019-00108-9

148. Lin C, Xiao J, Xi Y, Zhang X, Zhong Q, Zheng H, Cao Y, Chen Y (**2019**). Rosmarinic acid improved antioxidant properties and healthspan via the IIS and MAPK pathways in *Caenorhabditis elegans*. **Biofactors** 45(5): 774–787. doi: 10.1002/biof.1536

149. Ogawa T, Kodera Y, Hirata D, Blackwell TK, Mizunuma M (**2016**). Natural thioallyl compounds increase oxidative stress resistance and lifespan in *Caenorhabditis elegans* by modulating SKN-1/Nrf. **Sci Rep** 6: 21611. doi: 10.1038/srep21611

150. Eisenberg T, Knauer H, Schauer A, Buttner S, Ruckenstuhl C, Carmona-Gutierrez D, Ring J, Schroeder S, Magnes C, Antonacci L, Fussi H, Deszcz L, Hartl R, Schraml E, Criollo A, Megalou E, Weiskopf D, Laun P, Heeren G, Breitenbach M, Grubeck-Loebenstein B, Herker E, Fahrenkrog B, Frohlich KU, Sinner F, Tavernarakis N, Minois N, Kroemer G, Madeo F (**2009**). Induction of autophagy by spermidine promotes longevity. **Nat Cell Biol** 11(11): 1305–1314. doi: 10.1038/ncb1975

151. Srivastava S, Sammi SR, Laxman TS, Pant A, Nagar A, Trivedi S, Bhatta RS, Tandon S, Pandey R (**2017**). Silymarin promotes longevity and alleviates Parkinson's associated pathologies in *Caenorhabditis elegans*. **J Funct Foods** 31: 32–43. doi: 10.1016/j.jff.2017.01.029

152. Pandey T, Sammi SR, Nooreen Z, Mishra A, Ahmad A, Bhatta RS, Pandey R (**2019**). Anti-ageing and anti-Parkinsonian effects of natural flavonol, tambulin from *Zanthoxyllum aramatum* promotes longevity in *Caenorhabditis elegans*. **Exp Gerontol** 120: 50–61. doi: 10.1016/j.exger.2019.02.016

153. Saul N, Pietsch K, Menzel R, Sturzenbaum SR, Steinberg CE (**2010**). The longevity effect of tannic acid in *Caenorhabditis elegans*: disposable soma meets hormesis. **J Gerontol A Biol Sci Med Sci** 65(6): 626–635. doi: 10.1093/gerona/glq051

154. Edwards C, Canfield J, Copes N, Brito A, Rehan M, Lipps D, Brunquell J, Westerheide SD, Bradshaw PC (**2015**). Mechanisms of amino acid-mediated lifespan extension in *Caenorhabditis elegans*. **BMC Genet** 16: 8. doi: 10.1186/s12863-015-0167-2

155. Zarse K, Jabin S, Ristow M (**2012**). L-Theanine extends lifespan of adult *Caenorhabditis elegans*. **Eur J Nutr** 51(6): 765–768. doi: 10.1007/s00394-012-0341-5

156. Adachi H, Ishii N (**2000**). Effects of tocotrienols on life span and protein carbonylation in *Caenorhabditis elegans*. **J Gerontol A Biol Sci Med Sci** 55(6): B280–285. doi: 10.1093/gerona/55.6.b280

157. Fang EF, Waltz TB, Kassahun H, Lu Q, Kerr JS, Morevati M, Fivenson EM, Wollman BN, Marosi K, Wilson MA, Iser WB, Eckley DM, Zhang Y, Lehrmann E, Goldberg IG, Scheibye-Knudsen M, Mattson MP, Nilsen H, Bohr VA, Becker KG (**2017**). Tomatidine enhances lifespan and healthspan in *C. elegans* through mitophagy induction via the SKN-1/Nrf2 pathway. **Sci Rep** 7: 46208. doi: 10.1038/srep46208

158. Honda Y, Tanaka M, Honda S (**2010**). Trehalose extends longevity in the nematode *Caenorhabditis elegans*. **Aging Cell** 9(4): 558–569. doi: 10.1111/j.1474-9726.2010.00582.x

159. Kim SJ, Beak SM, Park SK (**2017**). Supplementation with triptolide increases resistance to environmental stressors and lifespan in *C. elegans*. **J Food Sci** 82(6): 1484–1490. doi: 10.1111/1750-3841.13720

160. Negi H, Saikia SK, Pandey R (**2017**). 3beta-Hydroxy-urs-12-en-28-oic acid modulates dietary restriction mediated longevity and ameliorates toxic protein aggregation in *C. elegans*. **J Gerontol A Biol Sci Med Sci** 72(12): 1614–1619. doi: 10.1093/gerona/glx118