

Effectiveness of *Amorphophallus paeoniifolius* hydroalcoholic extract in asthma using network pharmacology and OVA–LPS rat model

Heta Patel¹, Usangani Chhalotiya^{1*}, Jinal Tandel¹, Dimal Shah¹, Nilay Solanki² and Prarambh S R Dwivedi³

¹Department of Pharmaceutical Chemistry and Analysis, Indukaka Ipcowala College of Pharmacy, New V. V. Nagar 388121, The Charutar Vidya Mandal (CVM) University, Anand, Gujarat, India

²Department of Pharmacology, Ramanbhai Patel College of Pharmacy, Charotar University of Science and Technology, CHARUSAT Campus, Changa 388421, Gujarat, India

³Department of Pharmacology, NGSM Institute of Pharmaceutical Sciences (NGSMIPS), Nitte (Deemed to be University), Mangalore 575018, Karnataka, India

Received 13 August 2025; revised received 03 March 2026; accepted 13 April 2026

Supplementary Table

Table 1 — The KEGG enriched Pathways modulated via *Amorphophallus paeoniifolius* against Asthma

Pathway (KEGG ID)	OGC/ BGC	strength	signal	FDR	Protein
TNF signalling pathway (hsa04668)	30/111	1.54	6.14	2.74E-33	MAPK1, NFKBIA, NFKB1, MAPK14, LIF, MAPK3, IL1B, ICAM1, VCAM1, CSF2, MMP3, FOS, CASP3, SOCS3, ATF4, CASP8, PTGS2, CASP7, JUN, MMP9, MAPK8, RELA, IL6, MAPK9, TNF, CXCL2, PIK3R1, AKT1, CCL5, FAS
Toll-like receptor signalling pathway (hsa04620)	23/100	1.47	4.69	2.34E-24	MAPK1, NFKBIA, NFKB1, MAPK14, MAPK3, IL1B, FOS, CXCL8, CD86, CASP8, STAT1, JUN, CD40, TLR4, MAPK8, RELA, IL6, MAPK9, TNF, PIK3R1, AKT1, CCL5, MYD88
Th17 cell differentiation (hsa04659)	22/99	1.46	4.48	3.72E-23	MAPK1, NFKBIA, TGFB1, NFKB1, IFNG, MAPK14, IL4, AHR, MAPK3, IL1B, STAT3, FOS, SMAD3, HSP90AA1, TGFB2, STAT1, JUN, MAPK8, RELA, IL6, MAPK9, HIF1A
NOD-like receptor signalling pathway (hsa04621)	23/173	1.23	3.39	6.65E-20	MAPK1, NFKBIA, NFKB1, MAPK14, MAPK3, IL1B, IL18, CXCL8, HSP90AA1, CASP8, STAT1, JUN, TLR4, CYBB, MAPK8, BCL2, RELA, IL6, MAPK9, TNF, CXCL2, CCL5, MYD88
MAPK signalling pathway (hsa04010)	26/286	1.07	2.79	9.23E-19	MAPK1, TGFB1, NFKB1, MAPK14, HSPB1, MAPK3, IL1B, TP53, NTRK2, FOS, CASP3, ATF4, TGFB2, JUN, HSPA1B, MAPK8, RELA, MAPK9, TNF, BDNF, DDIT3, AKT1, MYC, IGF1R, MYD88, FAS
T cell receptor signalling pathway (hsa04660)	18/100	1.37	3.47	9.03E-18	MAPK1, NFKBIA, NFKB1, IFNG, MAPK14, IL4, MAPK3, CSF2, FOS, GSK3B, JUN, MAPK8, RELA, MAPK9, TNF, IL10, PIK3R1, AKT1
NF-kappa B signalling pathway (hsa04064)	16/101	1.31	2.96	3.78E-15	NFKBIA, NFKB1, IL1B, ICAM1, VCAM1, CXCL8, PTGS2, CD40, PLA2, TLR4, CXCL12, BCL2, RELA, TNF, CXCL2, MYD88
Cytokine-cytokine receptor interaction (hsa04060)	22/282	1	2.27	9.74E-15	TGFB1, IFNG, IL4, TNFSF10, LIF, IL1B, IL18, CCR2, CSF2, CCL11, CXCL8, LEP, TGFB2, CD40, CXCL12, IL6, CXCR4, TNF, IL10, CXCL2, CCL5, FAS

(Contd.)

Table 1 — The KEGG enriched Pathways modulated via *Amorphophallus paeoniifolius* against Asthma (Contd.)

Pathway (KEGG ID)	OGC/ BGC	strength	signal	FDR	Protein
Th1 and Th2 cell differentiation (hsa04658)	14/85	1.33	2.75	1.48E-13	MAPK1, NFKBIA, NFKB1, IFNG, MAPK14, IL4, MAPK3, FOS, STAT1, JUN, MAPK8, RELA, MAPK9, NOTCH1
Chemokine signalling pathway (hsa04062)	17/186	1.07	2.18	1.52E-12	MAPK1, NFKBIA, NFKB1, MAPK3, STAT3, CCR2, CCL11, CXCL8, GSK3B, STAT1, CXCL12, RELA, CXCR4, CXCL2, PIK3R1, AKT1, CCL5
Focal adhesion (hsa04510)	16/195	1.02	1.94	3.22E-11	MAPK1, COL1A1, CCND1, MAPK3, GSK3B, CAV1, FN1, JUN, MAPK8, BCL2, MAPK9, PIK3R1, AKT1, ACTB, CTNNA1, IGF1R
B cell receptor signalling pathway (hsa04662)	10/78	1.22	1.86	4.84E-09	MAPK1, NFKBIA, NFKB1, MAPK3, FOS, GSK3B, JUN, RELA, PIK3R1, AKT1
Asthma (hsa05310)	5/27	1.38	1.27	1.10E-05	IL4, CCL11, CD40, TNF, IL10
Antigen processing and presentation (hsa04612)	6/64	1.08	1.04	4.10E-05	IFNG, CALR, HSPA5, HSP90AA1, HSPA1B, TNF
Tight junction (hsa04530)	8/157	0.82	0.85	0.0001	CCND1, OCLN, TJPI, JUN, PCNA, MAPK8, MAPK9, ACTB