

Thonningianin A

Thonningianins A (1) and B (2), have been isolated from the African medicinal herb Thonningia sanguinea and their structures elucidated by interpretation of spectroscopic data. Both 1 and 2 showed strong free radical scavenging activity against 1,1-diphenyl-2-picrylhydrazyl (DPPH) as shown by ESR analysis ¹⁾.

Results indicate that the antioxidant properties of Th A involve radical scavenging, anti-superoxide formation and metal chelation ²⁾.

Four ellagitannin **flavonoids**, including pinocembrin-7-O-[4",6"-hexahydroxydiphenoyl]-glucoside (PHG), pinocembrin-7-O-[3"-O-galloyl-4",6"-hexahydroxydiphenoyl]-glucoside (PGHG), **thonningianin A** (TA), and thonningianin B (TB), were identified to be **autophagy** enhancers in PCP.

Among these, TA exhibited the strongest autophagy induction effect, and the mechanistic study demonstrated that TA activated autophagy via the AMPK/ULK1 and Raf/MEK/ERK signaling pathways. In addition, TA effectively promoted the autophagic degradation of NLRP3 inflammasome in A β (1-42)-induced microglial cells and ameliorated neuronal damage via autophagy induction. *In vivo*, TA activated autophagy and improved behavioral symptoms in *C. elegans*. Furthermore, TA might penetrate the blood-brain barrier and could improve cognitive function and ameliorate the A β pathology and the NLRP3 inflammasome-mediated neuroinflammation via the AMPK/ULK1 and Raf/MEK/ERK signaling pathways in APP/PS1 mice.

Zhou et al. identified **thonningianin A** as a potent **microglial autophagy** enhancer in *enthorum chinense* Pursh (PCP) that promotes the autophagic degradation of the **NLRP3 inflammasome** to alleviate the pathology of Alzheimer's disease via the **AMPK/ULK1** and **Raf/MEK/ERK** signaling pathways, which provides novel insights for TA in **Alzheimer's disease treatment** ³⁾.

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Ohtani II, Gotoh N, Tanaka J, Higa T, Gyamfi MA, Aniya Y. Thonningianins A and B, new antioxidants from the African medicinal herb Thonningia sanguinea. *J Nat Prod*. 2000 May;63(5):676-9. doi: 10.1021/np990396w. PMID: 10843586.

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