

**Title** Determination of Volatile Constituents of Longan Arillus, Epicarpium and Semen by Gas Chromatography-mass Spectrometry Coupled with Solid-phase Microextraction

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### Abstract

Gas chromatography-mass spectrometry combined with solid-phase microextraction (SPME-GC-MS) was developed for the determination of volatile compounds of arillus, epicarpium and semen. The volatile constituents of longan were extracted by SPME with a 100 $\mu$ m polydimethylsiloxane fiber. The fibers were desorbed in a GC injection liner at 250°C for 5 min. With headspace SPME-GC-MS analysis, 74 peaks in longan arillus were separated and identified by mass spectrometry. The principal components were Bicyclo[4.4.0]dec-2-ene-4-ol,2-methyl-9-(prop-1-en-3-ol-2-yl)-(81.69%); 1H Cycloprop[e]azulene,1a,2,3,4,4 a, 5,6,7b-octahydro-1,1,4,7-tetramethyl-,[1aR-(1 $\alpha$ ,4 $\alpha$ ,4a $\beta$ ,7b $\alpha$ )]-(3.16%); Tricyclo[3.3.0.0(2,8)]octan-3-one,7-hydroxy-4-methyl-4-(propan-2-on-1-yl)-(1.91%); 2,6,10-Dodecatricienoic acid, 3,7,11-trimethyl-, methyl ester (1.26%) and Diethyl Phthalate (1.05%). A total of 54 compounds were identified in longan semen. The main components were 1 H-Cycloprop[e]azulene,1a, 2, 3, 4, 5, 6, 7b-octahydro-1,1,4,7-tetramethyl-,[1aR-(1 $\alpha$ ,4 $\alpha$ ,4a $\beta$ ,7b $\alpha$ )]-(30.38%); Caryophyllene(18.04%); Azulene,1,2,3,4,5,6,7,8-octahydro-1,4-dimethyl-7-(1-methylethenyl)-,[1s-(1 $\alpha$ ,4 $\alpha$ ,7 $\alpha$ )]-(5.21%); 3-Nonyne(5.15%), Benzene,cyclohexyloxy(4.92%); Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dimethyl-7-(1-methylethenyl)-,[1R-(1 $\alpha$ ,7 $\beta$ ,8a $\alpha$ )]- (3.79% and 3-Carene (3.13%). Varieties of 90 compounds were identified in the longan epicarpium extracted by SPME. The main components were Gitoxigenin (47.59%);  $\beta$ -D-Galactopyranoside,methyl 2,3-bis-0-(trimethylsilyl)-, cyclicbutylboronate(22.92%); Columbin(7.76%); Benzene,1,1'-[3-(3-cyclopentylpropyl)-1,5-pentanediy]bis-(6.21%) and Resibufogenin(3.39%). This was the first report describing the quantitative and qualitative both differences of volatile composition in longan fruit.