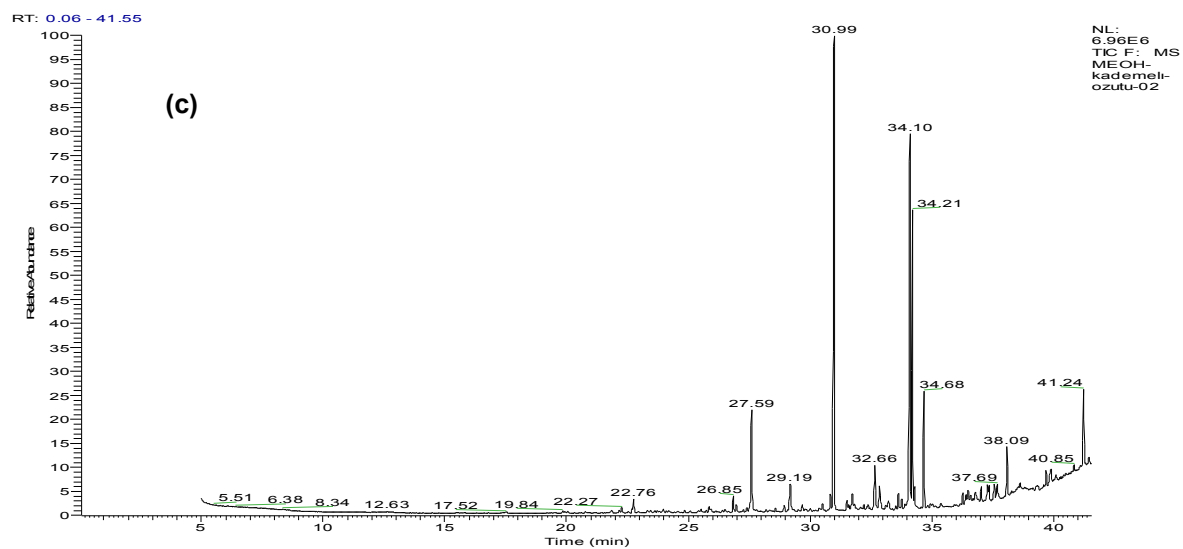
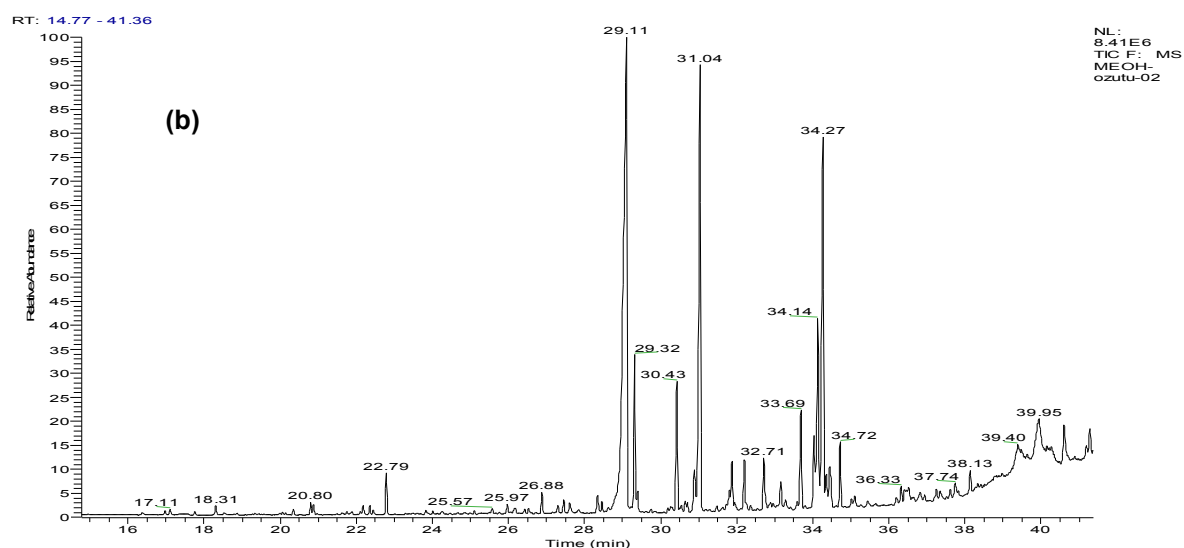
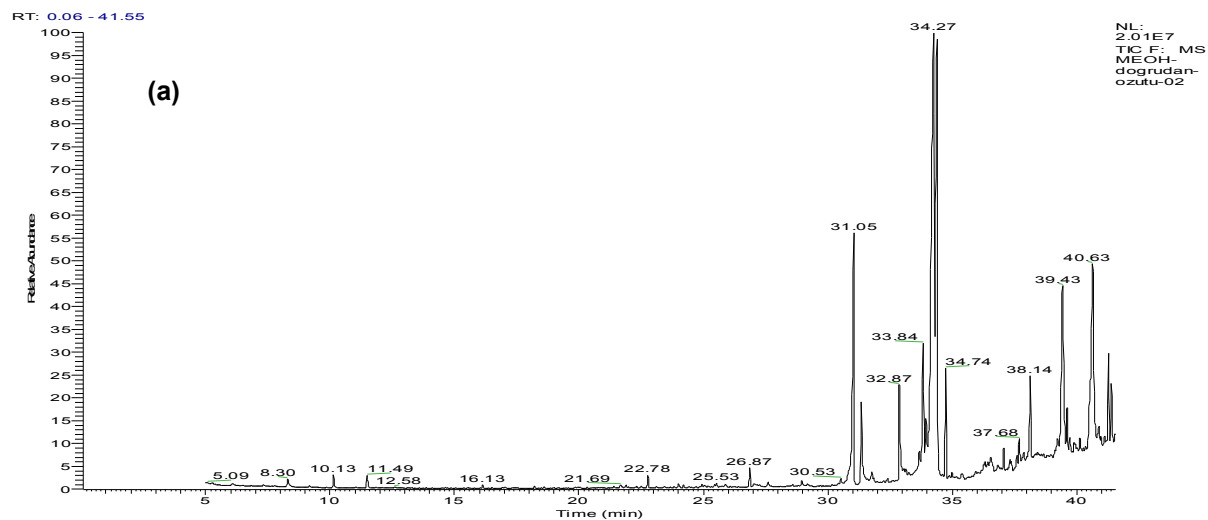


Supplementary data



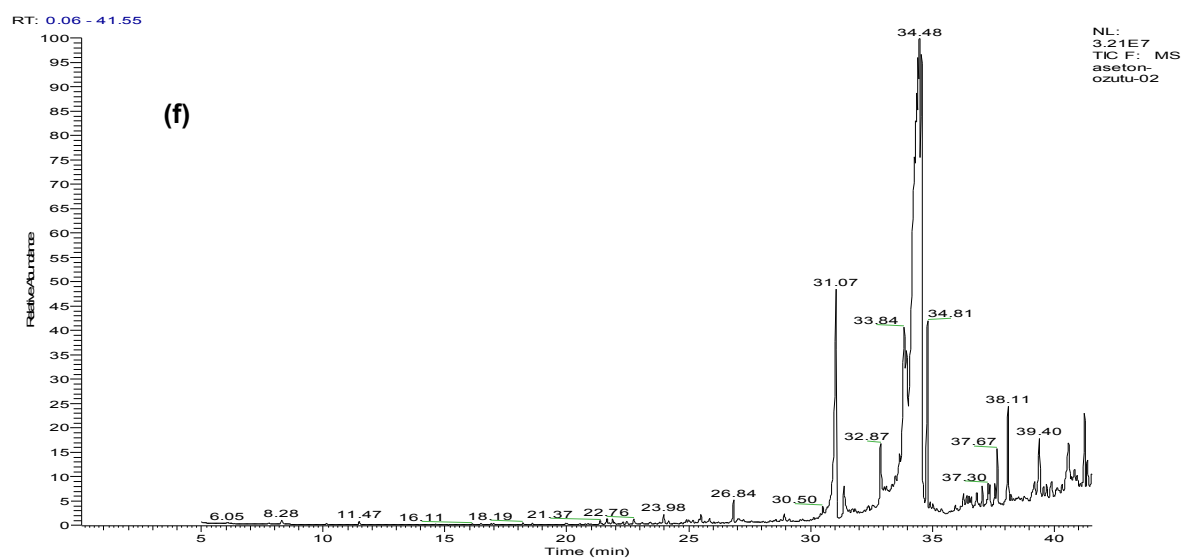
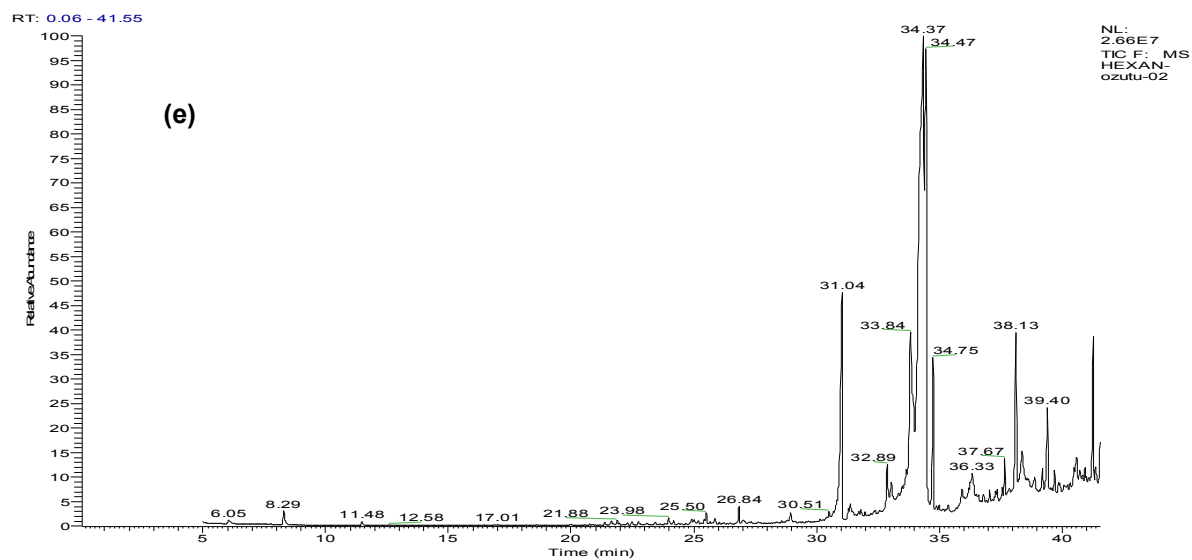
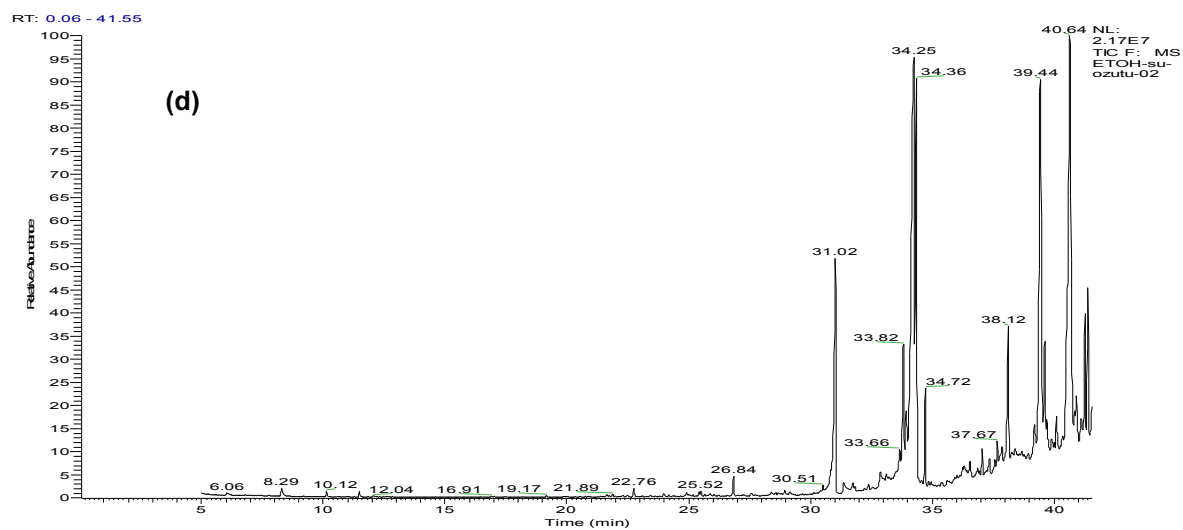


Figure S1. Chromatograms of extracts of *H. lupulus* acquired with GC-MS analysis: (a) methanol-1, (b) methanol-2, (c) methanol-3, (d) ethanolic, (e) *n*-hexane, (f) acetone.

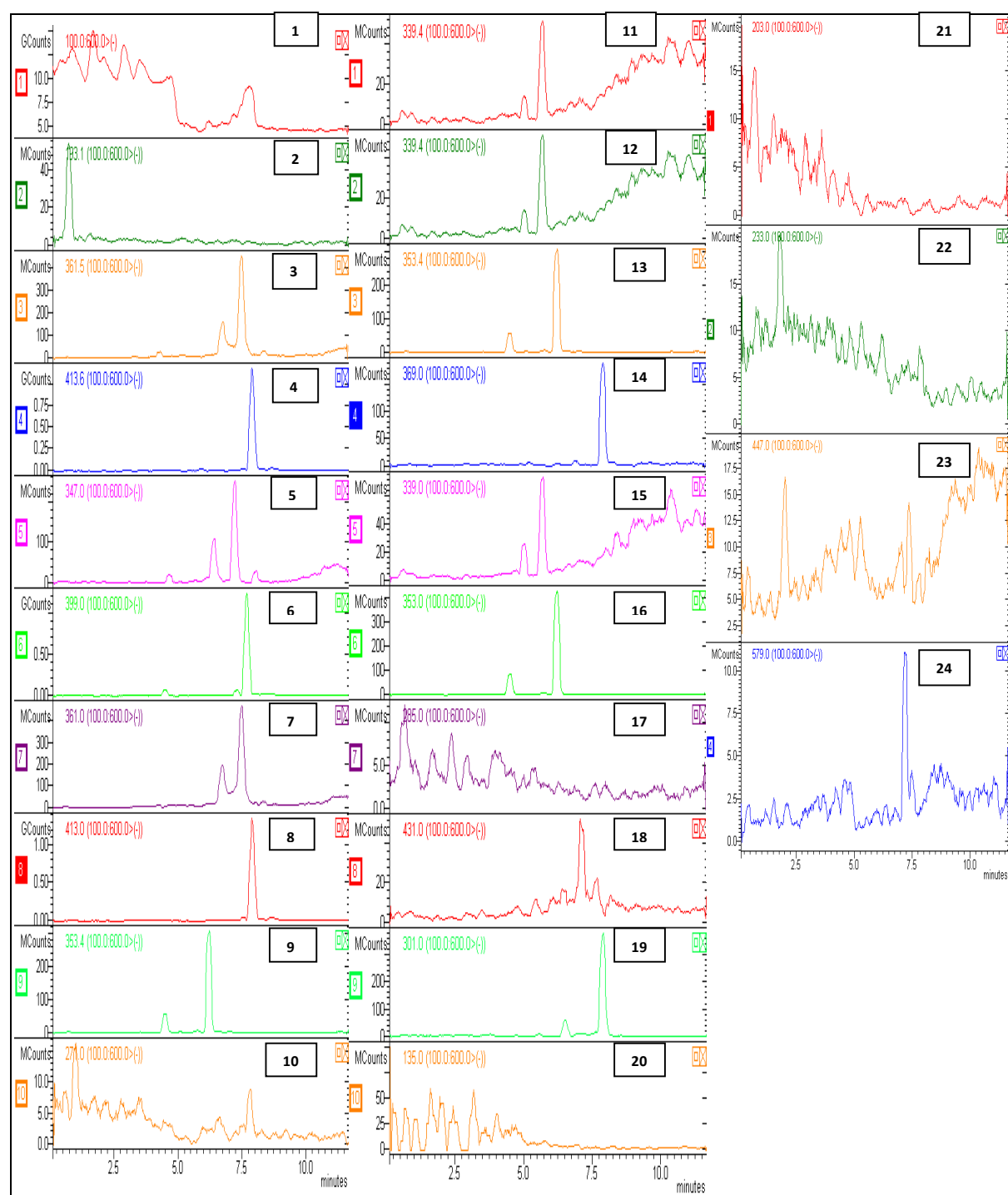
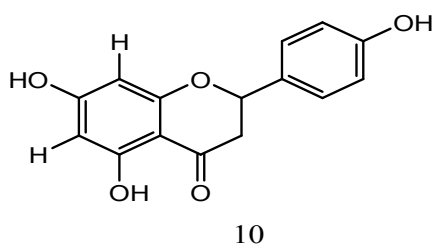
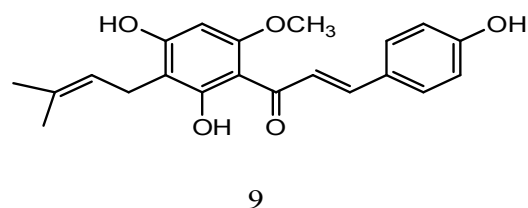
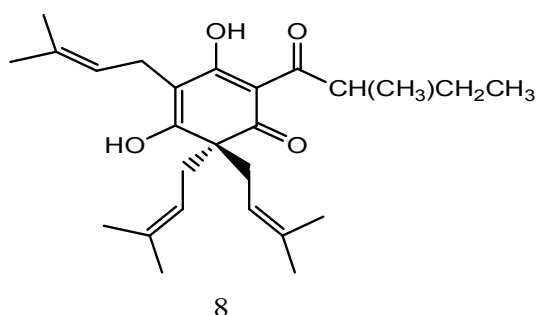
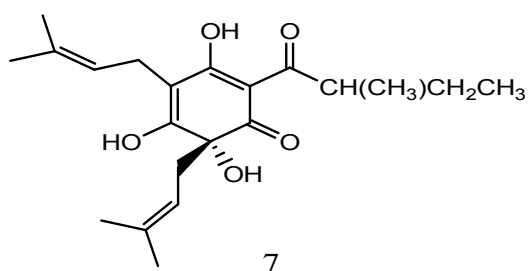
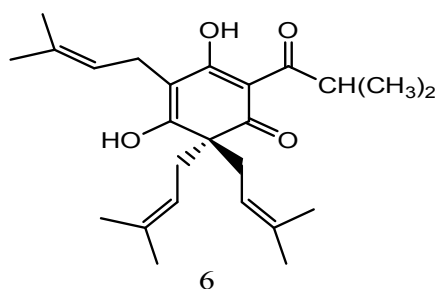
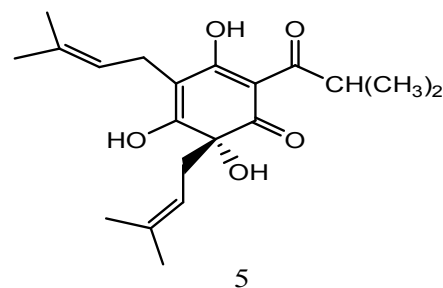
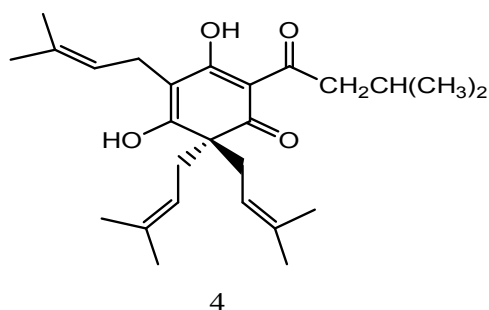
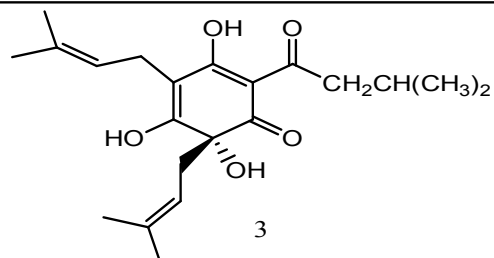
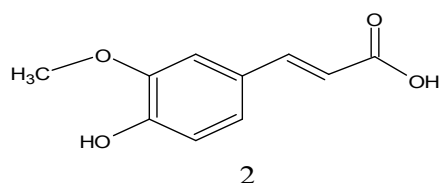
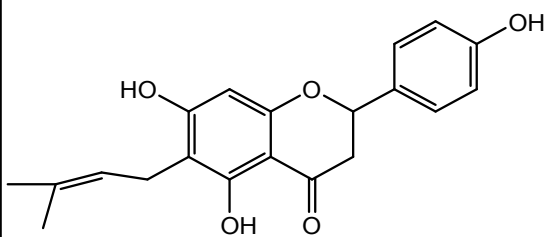


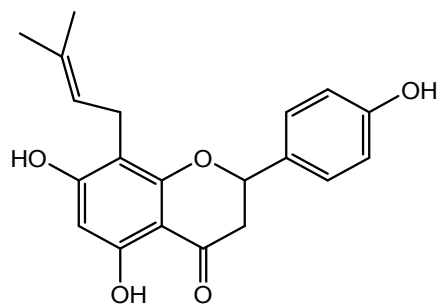
Figure S2. Chromatograms of identified compounds by LC-MS (SIM mode) of *H. lupulus* methanol-1 extract (1), ferulic acid (2), humulone (3), lupulone (4), cohumulone (5), colupulone (6), adhumulone (7), adlupulone (8), xanthohumol (9), 6-prenylnaringenin (11), 8-prenylnaringenin (12), isoxanthohumol (13), microbial transformation product (14), 2'',3''-

dihydroxanthohumol (15), 2'',2''-dimetil-3'',4''-dihidropiran [2'',3'':3',4'] 2',4-dihidroksi-6'-methoxychalcone or chlorogenic acid (16), unknown (18), myrcene (20), caryophyllene or farnesene (21), valericic acid (22), astragalin or quercitrin (23). Co-injection was just applied to kaempferol (17), quercetin (19), naringenin (10), naringin (24) and epigallol.

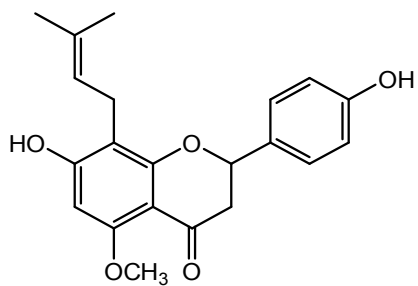




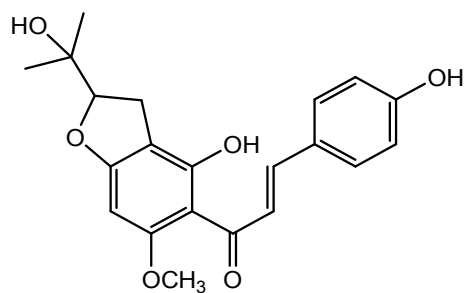
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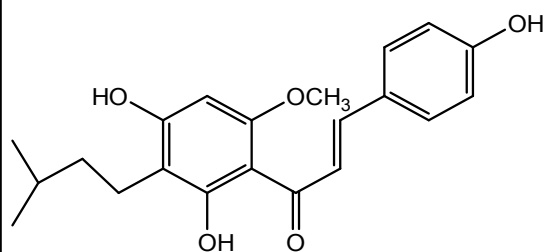
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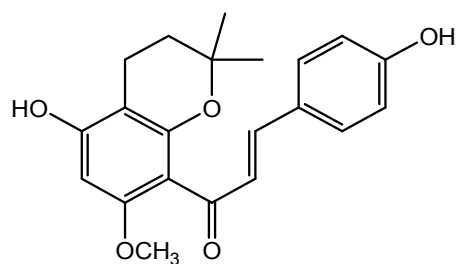
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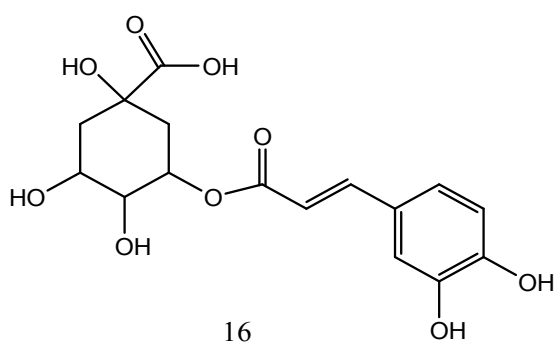
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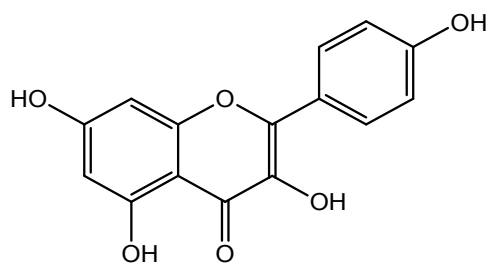
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16



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17

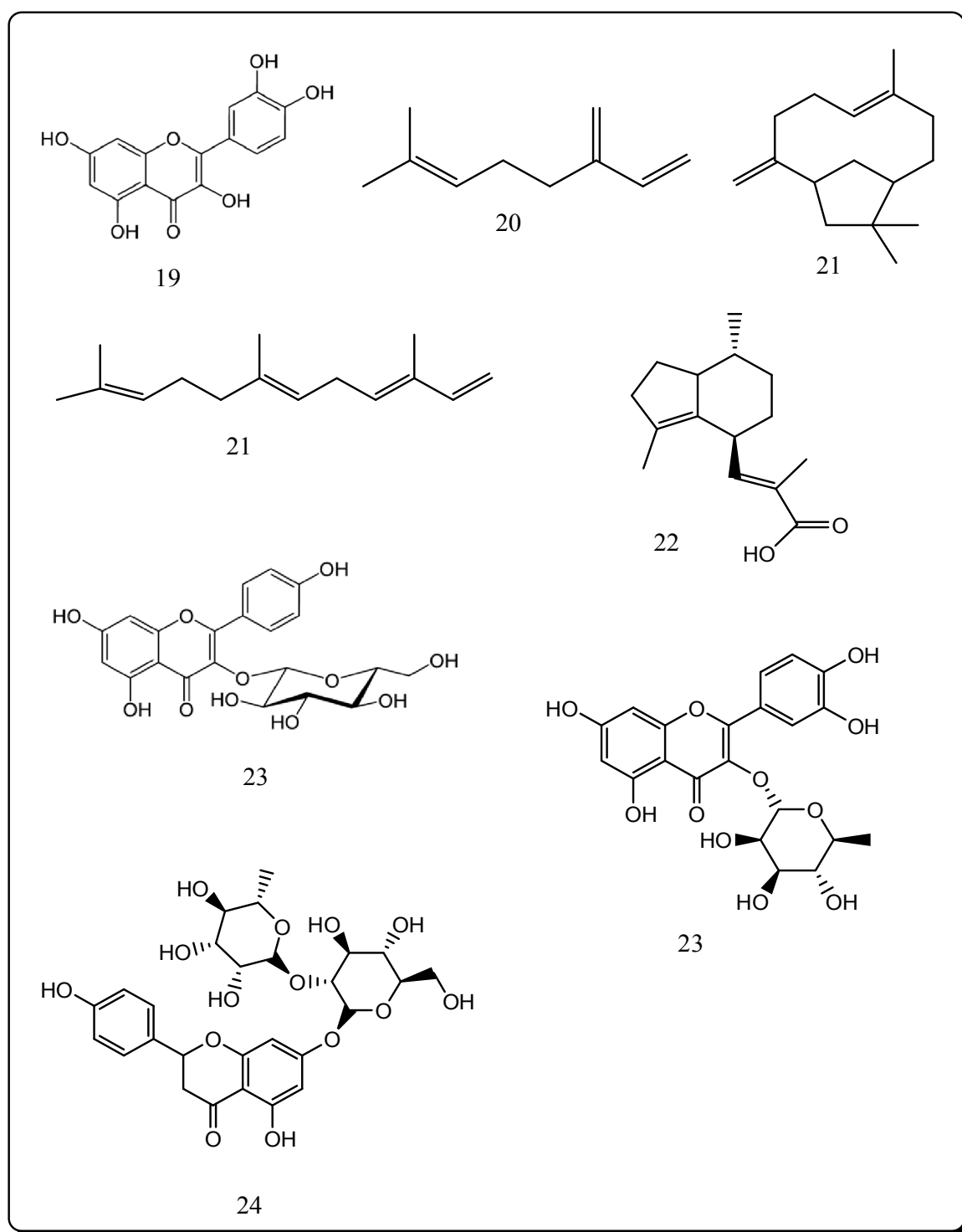


Figure S3. Structures of identified compounds by LC-MS (SIM mode) of *H. lupulus* methanol-1 extract. Names of the compounds were given in **Figure S2**.

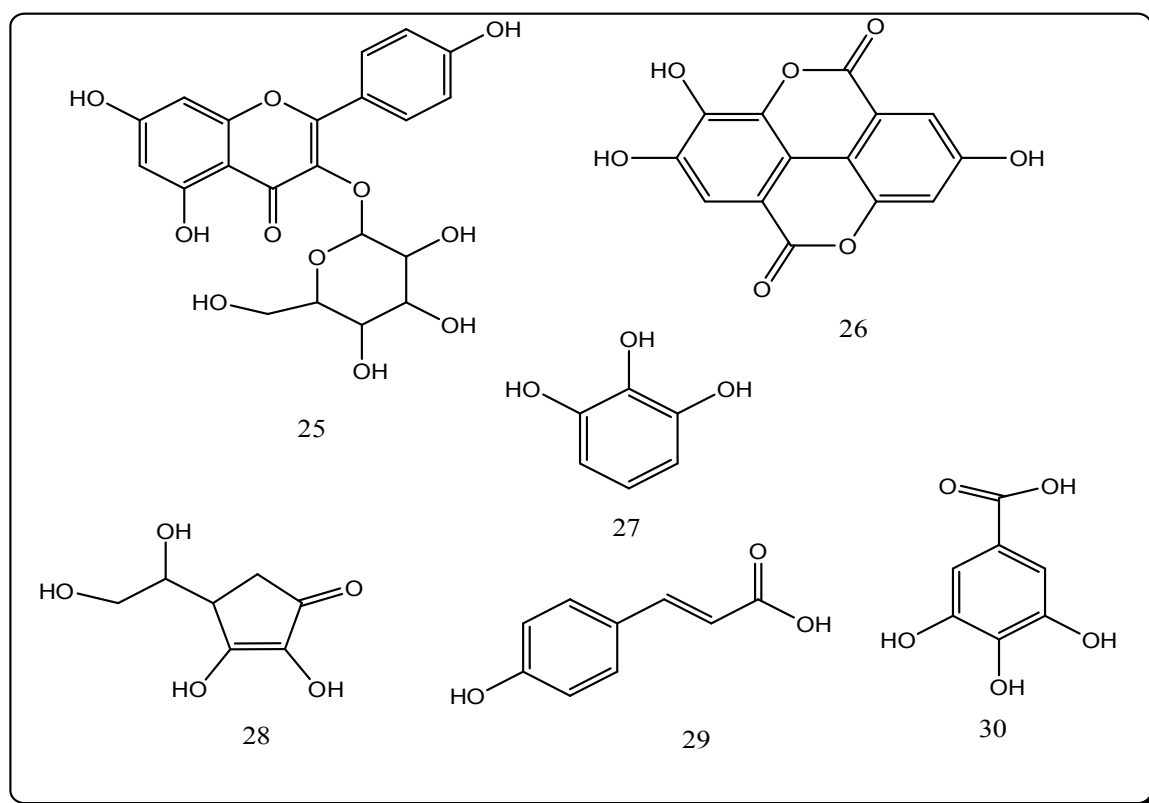


Figure S4. Structures of quantitatively identified compounds by LC-MS/MS of *H. lupulus*. Kaempferol-3-O-glucoside (25), ellagic acid (26), pyrogallol (27), ascorbic acid (28), p-coumaric acid (29), gallic acid (30). Ferulic acid (2) and quercetin (19) were shown in **Figure S3**.