^{1}H and ^{13}C chemical shifts of studied species

Artemisinin
1H NMR (CD3OD, 700 MHz) δ 0.99 (3H, d, J= 6.2 Hz, 6-CH3), 1.16 (3H, d,J= 7.2 Hz, 9-CH3),1.38 (3H, s, 3-CH3), 2.08 (1H, ddd, H4), 2.40 (1H, ddd, H4), 2.01 (1H, m, H5),1.47 (1H, m, H5), 1.38 (1H, m, H5a), 1.52 (1H, m, H6), 1.09 (1H, m, H7), 1.77(1H, m, H7), 1.17 (1H, m, H8), 1.86 (1H, m, H8), 1.82 (1H, m, H8a), 3.31 (1H, dq, H9), 6.03 (1H, dq, H12), 13C NMR (CD3OD, 700 MHz) δ 106.7 (C, C3), 25.2 (CH3, C3), 36.6 (CH2, C4), 25.7 (CH2, C5), 51.2 (CH, C5a), 38.1 (CH, C6), 19.9 (CH3, C6), 34.6 (CH2, C7), 24.0 (CH2, C8), 45.6 (CH, C8a), 34.0 (CH, C9), 12.7 (CH3, C9), 81.0 (CH, C12a), 95.5 (CH, C12).

Quinine: 1H NMR (CD3OD, 700 MHz): δ 8.82 (1H, d, J=5.1Hz, H2'), 8.00 (1H, d, J=5.1 Hz, H3'), 7.61 (1H, d, J=2.7 Hz, H5'), 4.09 (3H, s, 6'-OCH3), 7.54 (1H, dd, J1=9.3 Hz, J2=5,6 Hz, H7'), 8.06 (1H, d, J=9.2 Hz, H8'), 3.34 (2H, m, H2a), 3.64 (2H, m, H2b), 2.81 (1H, m, H3), 2.10 (1H, m, H4), 1.95 (1H, m, H5a), 2.19 (2H, m, H5b), 3.34 (2H, m, H6a), 4.30 (1H, m, H6b), 1.52 (1H, m, H7a), 2.19 (2H, m, H7b), 3.64 (2H, m, H8), 6.25 (1H, s, H9), 5.76 (1H, ddd, J1=9.3 Hz, J2=2.6 Hz, H10), 5.02 (1H, dt, J1=10.5 Hz, J2=1.1 Hz, H11a), 5.12 (1H, dt, J1=17.2 Hz, J2=1.2 Hz, H11b), 13C NMR (CD3OD, 700 MHz): δ145.4 (-4.5, CH, C2'), 121.0 (CH, C3'), 102.9 (CH, C5'), 57.9 (CH3, C6'), 126.5(CH, C7'), 128.6 (CH, C8'), 55.8 (CH2, C2), 38.6 (CH, C3), 28.4 (CH, C4), 25.3 (CH2, C5), 45.6 (CH2, C6), 19.5 (CH2, C7).61.3 (CH, C8), 68.4 (CH, C9), 139.4 (-10.5, CH, C10), 117.3 (CH2, C11).

Quinidine: 1H NMR (CD3OD, 700 MHz): δ 8.68 (1H, d, J=4.4Hz, H2'), 7.77 (1H, d, J=4.7 Hz, H3'), 7.51 (1H, d, J=2.6 Hz, H5'), 4.03 (3H, s, 6'-OCH3), 7.39 (1H, dd, J1=9.1 Hz, J2=2,7 Hz, H7'), 7.93 (1H, d, J=9.2 Hz, H8'), 3.52 (2H, m, H2a), 3.31 (1H, m, H2b), 2.69 (1H, q, J=8.6 Hz, H3), 1.97 (1H, m, H4), 1.82 (1H, m, H5a), 1.91 (1H, m, H5b), 3.52 (2H, m, H6a), 4.26 (1H, m, H6b), 1.14 (1H, m, H7a); 2.43 (1H, m, H7b), 3.59 (1H, m, H8), 6.31 (1H, s, H9), 6.10 (1H, ddd, J1=9.3 Hz, J2=2.6 Hz, H10), 5.25 (1H, dt, J1=10.4 Hz, J2=1.2 Hz, H11a), 5.22 (1H, dt, J1=17.2 Hz, J2=1.3 Hz, H11b), 13C NMR (CD3OD, 700 MHz): δ148.0 (-1.9, CH, C2'), 120.5 (CH, C3'), 102.6 (CH, C5'), 57.3 (CH3, C6'), 124.0 (CH, C7'), 131.4 (CH, C8'), 50.6 (CH2, C2), 38.5 (CH, C3), 29.2 (CH, C4), 24.3 (CH2, C5), 50.0 (CH2, C6), 19.2 (CH2, C7), 61.3 (CH, C8), 68.5 (CH, C9), 138.6 (-11.3, CH, C10), 117.8 (CH2, C11).

Cinchonine: 1H NMR (CD3OD, 700 MHz): δ 8.82 (1H, d, J=5.1 Hz, H2'), 7.73 (1H, d, J=4.1 Hz, H3'), 8.06 (1H, d, J=2.7 Hz, H5'), 7.66 (1H, t, J=7.2 Hz, H6'), 7.77 (1H, t, J=7.7 Hz, H7'), 8.19 (1H, d, J=8.2 Hz, H8'), 2.78 (1H, m, H2a), 2.88 (2H, m, H2b), 2.31 (1H, m, H3), 1.73 (1H, m, H4), 1.54 (1H, m, H5a), 1.59 (1H, m, H5b), 2.88 (2H, m, H6a), 3.51 (1H, m, H6b), 1.13 (1H, m, H7a), 2.20 (1H, m, H7b), 3.08 (1H, m, H8), 5.70 (1H, d, J=4.1 Hz, H9), 6.16 (1H, m, H10), 5.07 (1H, d, J1=10.3 Hz, H11a), 5.11 (1H, d, J=17.8 Hz, H11b); 13C NMR (CD3OD, 700 MHz): δ151.3 (1.4, CH, C2'), 119.8 (CH, C3'), 130.3 (CH, C5'), 128.4 (CH, C6'), 130.9 (CH, C7'), 124.8 (CH, C8'), 50.9 (CH2, C2), 41.5 (CH, C3), 29.8 (CH, C4), 27.2 (CH2, C5), 50.9 (CH2, C6), 21.9 (CH2, C7), 61.4 (CH, C8), 72.5 (CH, C9), 141.8 (-8.1, CH, C10), 115.4 (CH2, C11).

Cinchonidine: 1H NMR (CD3OD, 700 MHz): δ 8.82 (1H, d, J=4.6 Hz, H2'), 7.72 (1H, d, J=4.6 Hz, H3'), 8.05 (1H, d, J=2.7 Hz, H5'), 7.66 (1H, t, J=7.2 Hz, H6'), 7.77 (1H, t, J=7.8 Hz, H7'), 8.23 (1H, d, J=8.2 Hz, H8'), 2.64 (1H, m, H2a), 3.08 (2H, m, H2b), 2.34 (1H, m, H3), 1.79 (1H, m,

H4), 1.57 (1H, m, H5a), 1.86 (2H, m, H5b), 2.68 (1H, m, H6a), 3.61 (1H, m, H6b), 1.51 (1H, m, H7a), 1.86 (2H, m, H7b), 3.12 (1H, m, H8), 5.64 (1H, d, J=3.9 Hz, H9), 5.76 (1H, m, H10), 4.89 (1H, m, H11a), 4.97 (1H, m, H11b); 13C NMR (CD3OD, 700 MHz): δ151.3 (1.4, CH, C2'), 119.2 (CH, C3'), 130.3 (CH, C5'), 128.4 (CH, C6'), 130.8 (CH, C7'), 124.9 (CH, C8'), 57.2 (CH2, C2), 41.1 (CH, C3), 29.5 (CH, C4), 28.3 (CH2, C5), 44.1 (CH2, C6), 22.3 (CH2, C7), 61.8 (CH, C8), 72.4 (CH, C9), 142.9 (-7.0, CH, C10), 115.2 (CH2, C11).