**Analysis of Kratom (*Mitragyna speciosa*) Extract Using High Resolution UHPLC-MS and UHPLC-MS/MS**

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| Common Botanical Name | CAS No. | Lot No. | Container ID | Net Weight |
| Kratom extractKratom extract | NOCASNOCAS | RK-3-25-1-MSRK-3-25-1-MS | CD | ~250 mg~250 mg |

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| UHPLC conditions | Mass spectrometer conditions |
| System: Shimadzu Nexara UHPLC (LC-30AD)Column: Shimadzu Nexcol C18 (2.1 x 50 mm, 1.8µm)Mobile phase A: Water + 0.1% formic acidMobile phase B: Acetonitrile + 0.1% formic acidFlow rate: 0.5 mL/minColumn temperature: 50 °CGradient:

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| Time (min) | Mobile phase B (%) |
| 0.00 | 5 |
| 0.50 | 5 |
| 23.0 | 100 |
| 26.0 | 100 |
| 27.0 | 5 |
| 30.0 | 5 |

 | System: Shimadzu 9030 triple quadrupole time of flight (QToF)Mode: Electrospray ionizationPolarity: Positive modeMain-Interface: · Interface voltage: 4.0 kV (+), -3.0 kV (-)  · Nebulizing gas flow: 3.0 L/min · Heating gas flow: 10.0 L/min · Interface temperature: 300 °C  · Desolvation temperature: 526 °C Ion guide: · Drying gas flow: 10.0 L/min · DL temperature: 250 °C · Heat block temperature: 400 °C |

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| **Table 1: Proposed identification of constituents of Kratom C extract using UHPLC-HRMS.** |
| Peak No. | RT (min) | Exp. *m/z* | Mass accuracy (ppm) | Proposed ID’s (Confirmed with Std in **green**)(Most probable ID is **yellow**) | Molecular Formula |
| 1 | 2.864 | 291.0863 | -3.73 | **Epicatechin** | C15H14O6 |
| 2 | 4.512 | 415.2227 | -2.98 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 3 | 4.867 | 415.2227 | -3.94 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 4 | 4.916 | 401.2071 | -2.21 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | C22H28N2O5 |
| 5 | 4.972 | 413.2071 | -2.41 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 6 | 4.973 | 383.1965 | -0.22 | Corynoxeine | C22H26N2O4 |
| 7 | 5.014 | 385.2122 | -3.10 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 8 | 5.195 | 385.2122 | -3.16 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 9 | 5.201 | 401.2071 | -2.76 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | C22H28N2O5 |
| 10 | 5.216 | 383.1965 | 2.60 | Corynoxeine | C22H26N2O4 |
| 11 | 5.306 | 413.2071 | -2.07 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 12 | 5.325 | 385.2122 | -3.34 | Corynoxine B | C22H28N2O4 |
| 13 | 5.369 | 415.2227 | -4.66 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 14 | 5.511 | 415.2227 | -2.98 | **7-hydroxymitragynine** | C23H30N2O5 |
| 15 | 5.553 | 385.2122 | -3.31 | **Rhynchophylline** | C22H28N2O4 |
| 16 | 5.601 | 415.2227 | -3.22 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 17 | 5.793 | 385.2122 | -3.39 | Corynoxine A | C22H28N2O4 |
| 18 | 5.836 | 413.2071 | 3.21 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 19 | 5.946 | 415.2227 | -4.16 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 20 | 6.036 | 415.2227 | -3.05 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 21 | 6.052 | 385.2122 | -0.74 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 22 | 6.197 | 415.2227 | -3.58 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 23 | 6.488 | 397.2122 | -3.34 | **Paynantheine** | C23H28N2O4 |
| 24 | 6.539 | 399.2278 | -2.62 | **Mitragynine** | C23H30N2O4 |
| 25 | 6.792 | 399.2278 | -3.14 | **Speciogynine** | C23H30N2O4 |
| 26 | 7.108 | 399.2278 | -3.02 | **Speciociliatine** | C23H30N2O4 |
| 27 | 7.178 | 413.2071 | 2.58 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 28 | 7.26 | 395.1965 | -2.02 | 3,4,5,6-tetradehydromitragynine | C23H27N2O4+ |
| 29 | 7.289 | 397.2122 | -3.06 | Mitraciliatine | C23H28N2O4 |
| 30 | 7.347 | 415.2227 | 0.85 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 31 | 7.468 | 397.2122 | -3.16 | Mitraciliatine | C23H28N2O4 |
| 32 | 7.524 | 395.1965 | -2.71 | 3,4,5,6-tetradehydromitragynine | C23H27N2O4+ |
| 33 | 7.608 | 399.2278 | -4.95 | Unknown | C23H30N2O4 |



Figure 1: UHPLC-HRMS computer reconstructed mass chromatograms for *m/z* 291.0863, 383.1965, 385.2122, 395.1965, 397.2122, 399.2278, 401.2071, 413.2071, and 415.2227 from the Kratom C extract.

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| **Table 2: Proposed identification of constituents of Kratom D extract using UHPLC-HRMS.** |
| Peak No. | RT (min) | Exp. *m/z* | Mass accuracy (ppm) | Proposed ID’s (Confirmed with Std in **green**)(Most probable ID is **yellow**) | Molecular Formula |
| 1 | 2.86 | 291.0857 | -2.15 | **Epicatechin** | C15H14O6 |
| 2 | 4.52 | 415.2217 | -2.52 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 3 | 4.86 | 415.2215 | -2.90 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 4 | 4.92 | 401.2066 | -1.23 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | C22H28N2O5 |
| 5 | 4.98 | 413.2064 | -1.73 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 6 | 4.98 | 383.1968 | 0.72 | Corynoxeine | C22H26N2O4 |
| 7 | 5.02 | 385.2113 | -2.32 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 8 | 5.21 | 385.2113 | -2.30 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 9 | 5.21 | 401.2063 | -1.91 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | C22H28N2O5 |
| 10 | 5.23 | 383.1973 | 1.94 | Corynoxeine | C22H26N2O4 |
| 11 | 5.32 | 413.2068 | -0.64 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 12 | 5.34 | 385.2114 | -2.17 | Corynoxine B | C22H28N2O4 |
| 13 | 5.37 | 415.2215 | -2.95 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 14 | 5.53 | 415.2217 | -2.54 | **7-hydroxymitragynine** | C23H30N2O5 |
| 15 | 5.57 | 385.2116 | -1.65 | **Rhynchophylline** | C22H28N2O4 |
| 16 | 5.62 | 415.2218 | -2.18 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 17 | 5.81 | 385.2114 | -2.01 | Corynoxine A | C22H28N2O4 |
| 18 | 5.85 | 413.2064 | -1.71 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 19 | 5.96 | 415.2216 | -2.83 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 20 | 6.06 | 415.2215 | -3.10 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 21 | 6.07 | 385.21347 | 3.33 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | C22H28N2O4 |
| 22 | 6.22 | 415.2218 | -2.37 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 23 | 6.51 | 397.2113 | -2.23 | **Paynantheine** | C23H28N2O4 |
| 24 | 6.56 | 399.2273 | -1.44 | **Mitragynine** | C23H30N2O4 |
| 25 | 6.82 | 399.2269 | -2.24 | **Speciogynine** | C23H30N2O4 |
| 26 | 7.13 | 399.2270 | -2.17 | **Speciociliatine** | C23H30N2O4 |
| 27 | 7.22 | 413.2086 | 3.67 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | C23H28N2O5 |
| 28 | 7.29 | 395.1962 | -0.81 | 3,4,5,6-tetradehydromitragynine | C23H27N2O4+ |
| 29 | 7.31 | 397.2114 | -2.08 | Mitraciliatine | C23H28N2O4 |
| 30 | 7.38 | 415.2223 | -1.00 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | C23H30N2O5 |
| 31 | 7.49 | 397.2113 | -2.33 | Mitraciliatine | C23H28N2O4 |
| 32 | 7.55 | 395.1965 | -0.08 | 3,4,5,6-tetradehydromitragynine | C23H27N2O4+ |
| 33 | 7.63 | 399.2269 | -2.29 | Unknown | C23H30N2O4 |



Figure 2: UHPLC-HRMS computer reconstructed mass chromatograms for *m/z* 291.0863, 383.1965, 385.2122, 395.1965, 397.2122, 399.2278, 401.2071, 413.2071, and 415.2227 from the Kratom D extract.



Figure 3: Structures of compounds in Kratom C and D extracts (Tables 1 and 2).

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| **Table 3: HRMS product ions for the peaks of the Kratom C extract.** |
| Peak No. | RT (min) | [M+H]+ *m/z* | Proposed Compounds (Confirmed with Std in **green**)(Probable ID is **yellow**)CAS Number | Product Ions*m/z* Rel. Int.. |
| 1 | 2.864 | 291.0863 | **Epicatechin****490-46-0** | 77.04001 693.03254 4105.0320 4111.0427 7115.0531 8119.0483 19123.0431 100139.0383 93143.0475 9147.0428 30161.0587 14 |
| 2 | 4.512 | 415.2227 | Ciliaphylline (18002-98-7)Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 190.0840 100381.1822 35397.2106 35 |
| 3 | 4.867 | 415.2227 | Ciliaphylline (18002-98-7)Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 190.0845 100 |
| 4 | 4.916 | 401.2071 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | 148.0400 25148.0751 14158.0580 34176.0694 74197.1127 9229.1006 13257.1275 33283.1419 18285.1586 23369.1778 77401.2058 100 |
| 5 | 4.972 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 150.0555 14200.0585 4215.0816 7254.1055 17269.1275 100381.1753 6411.1926 4413.2076 27 |
| 6 | 4.973 | 383.1965 | Corynoxeine6877-32-3 | 118.0650 10132.0811 25142.0642 17160.0755 100267.1461 15351.1726 13383.1979 27 |
| 7 | 5.014 | 385.2122 | 3-Epicorynoxine B, 3-Epirhynchophylline, 9-Hydroxycorynantheidine, Isorhynchophylline | 110.0955 29132.0805 8160.0756 100186.0948 8238.1453 15385.2089 15 |
| 8 | 5.195 | 385.2122 | 3-Epicorynoxine B, 3-Epirhynchophylline, 9-Hydroxycorynantheidine, Isorhynchophylline | 108.0798 37130.0658 33132.0773 21144.0810 29160.0758 100241.1338 94269.1659 25321.1586 30385.2133 60 |
| 9 | 5.201 | 401.2071 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | 110.0964 11122.0957 6123.0792 7130.0663 9148.0375 9148.0746 11158.0616 11168.1018 3176.0697 73229.0990 6257.1275 19285.1588 22337.1518 5369.1665 3369.1802 30401.2057 100 |
| 10 | 5.216 | 383.1965 | Corynoxeine6877-32-3 | 108.0799 67142.0642 60160.0754 100 |
| 11 | 5.306 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 108.0816 12172.0739 6175.0630 8188.0688 6190.0857 41217.0960 18231.1119 11297.1574 5413.2052 100 |
| 12 | 5.325 | 385.2122 | Corynoxine B17391-18-3 | 109.8998 3110.0245 3110.0961 22115.0538 11117.0569 11118.0654 6132.0435 13132.0799 32142.0642 19144.0788 9158.0591 12160.0749 100162.0911 3170.0967 5187.0847 37213.1021 11215.1171 11241.1337 85265.1354 6267.1489 12269.1648 25321.1562 6353.1859 32385.2105 81 |
| 13 | 5.369 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 238.1481 100415.2179 98 |
| 14 | 5.511 | 415.2227 | **7-Hydroxymitragynine****174418-82-7** | 108.0826 6123.0804 6162.0531 11190.0867 26208.1338 7217.1005 8239.1468 9271.1433 43383.1976 9415.2228 100 |
| 15 | 5.553 | 385.2122 | **Rhynchophylline****76-66-4** | 110.0959 23132.0798 32160.0746 100226.1435 16269.1607 11385.2084 25 |
| 16 | 5.601 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 108.0826 3123.0804 3162.0531 5190.0860 20208.1326 7217.0928 5217.1005 4239.1468 4271.1434 34383.1947 14415.2222 100 |
| 17 | 5.793 | 385.2122 | *Corynoxine A**6877-32-3* | 108.0800 9109.9823 2110.0957 35132.0437 13132.0801 34142.0648 27158.0589 5160.0746 100215.1200 4226.1442 6241.1330 25265.1294 9267.1505 10269.1639 29321.1531 5353.1839 30385.2113 63 |
| 18 | 5.836 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 86.2225 6162.0914 9190.0849 66243.1114 12297.1581 31395.1968 100413.2066 97 |
| 19 | 5.946 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 110.0960 21190.0859 100271.1440 29415.2224 65 |
| 20 | 6.036 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 110.0962 10123.0805 8162.0905 7172.0742 5175.0586 5190.0856 25192.1011 6208.1292 9224.1267 6299.1745 4415.2225 100 |
| 21 | 6.052 | 385.2122 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | 160.0755 100 |
| 22 | 6.197 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 108.0811 5110.0238 2110.0957 31116.0477 4129.0532 4130.0633 3138.0520 3144.0796 2147.0669 9160.0387 2162.0541 13162.0911 10168.1025 3171.1006 4172.0716 2172.0752 15174.0916 3175.0626 10188.0702 2190.0855 100217.0959 3226.1450 15245.1280 4271.1434 26295.1439 6297.1599 4299.1745 15383.1958 26415.2214 79 |
| 23 | 6.488 | 397.2122 | **Paynantheine****4697-66-9** | 91.0540 295.0482 2108.0799 8109.0643 3115.0536 3117.0698 5118.0645 3120.0808 3127.0538 2129.0550 3129.0682 2130.0647 2131.0727 3143.0718 5144.0799 10146.0956 2147.0743 2149.0583 2159.0671 29160.0745 3169.0863 2174.0905 100185.0822 2186.0903 4190.0852 2192.1017 5199.0984 2200.1062 6204.1008 4210.0902 2212.1054 3224.1277 11236.1058 2236.1275 8328.1528 3397.2112 5 |
| 24 | 6.539 | 399.2278 | **Mitragynine****4098-40-2** | 75.0435 2108.0802 2110.0958 20115.0537 3117.0692 5118.0645 2122.0958 2127.0534 2129.0542 10130.0645 3131.0723 3139.0746 3143.0722 5144.0800 8146.0956 4152.0698 2159.0671 29160.0749 3166.0856 2168.1011 6171.1009 2174.0906 100184.0749 2185.0828 2186.0906 2188.106 2194.1168 3199.0981 2200.1062 7202.1218 2206.117 2210.0906 3212.1061 2226.143 22238.1429 22255.1483 2367.2005 4399.2266 17 |
| 25 | 6.792 | 399.2278 | **Speciogynine****4697-67-0** | 75.0433 2108.0803 3110.0959 14115.0537 2117.0694 5118.0647 2127.0540 2129.0542 10130.0643 2131.0722 3139.0752 2143.0723 5144.0802 7146.0956 3159.0671 28160.0751 3171.1007 5174.0906 100177.0907 2186.0904 2188.1065 2194.1171 3200.1062 5206.1167 2212.1061 2226.1431 18238.1428 21266.1526 2328.154 2367.2007 2399.2266 12 |
| 26 | 7.108 | 399.2278 | **Speciociliatine****14382-79-7** | 75.0436 295.0486 2108.0802 2110.0959 16115.0537 2117.0695 6118.0647 2122.0959 2127.0537 2129.0541 11130.0641 2131.0726 2139.0745 2143.0721 4144.0801 8146.0954 4152.0699 2159.0673 26160.075 4162.0905 2168.1012 5171.1006 2174.0906 100177.0902 2180.1015 2182.1168 2184.0748 2185.0831 2186.0908 4188.1061 5194.1167 3198.0907 2199.0984 3200.1063 7206.1169 2210.0904 4212.1063 4224.1067 2226.1429 19236.1063 3238.0858 2238.1428 20255.1484 2264.1013 2266.1529 3270.1117 2296.1275 3328.1533 5335.1739 2367.2007 7399.2268 18 |
| 27 | 7.178 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 190.0837 26199.0852 35200.0979 36214.1086 100381.1806 95395.1920 38 |
| 28 | 7.26 | 395.1965 | 3,4,5,6-Tetradehydromitragynine | 172.0765 7186.0902 14198.0904 13199.0860 6211.0858 26212.0952 10227.1164 100235.0838 4237.1031 5239.1167 6250.1130 4250.1236 4251.1170 10263.1165 11264.1225 5279.1487 50293.0899 11309.12 7379.1641 78395.1951 93 |
| 29 | 7.289 | 397.2122 | Mitraciliatine14509-92-3 | 91.0541 495.0484 2108.0803 6109.0638 6115.0539 2117.0563 2117.0690 3118.0644 3120.0792 3121.0640 5123.0435 2126.0905 3129.0547 2130.0644 2131.0726 3143.0718 3144.0799 9146.0592 2146.096 3148.0742 2149.0588 4155.0702 2159.0674 26160.075 7169.0867 3172.0755 2173.0824 2174.0905 100178.0847 3180.0993 2181.0855 2184.0757 2185.0827 5186.0894 5188.1053 4192.101 4198.0906 3199.0961 3200.1064 19202.122 2210.0901 3210.111 3212.1062 7224.1273 8229.1334 2236.1276 8328.1525 4365.186 2397.2112 11 |
| 30 | 7.347 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 158.0597 18174.0889 34186.0904 14214.1084 100255.1437 18269.1643 30383.1977 48397.2101 72 |
| 31 | 7.468 | 397.2122 | Mitraciliatine14509-92-3 | 172.0750 4174.0906 2184.0628 2186.0906 6187.0987 2198.0780 2198.0911 4199.0860 5211.0863 9212.0936 7214.1094 2223.0841 2227.1172 42237.1020 2238.1091 2239.1167 4251.1175 9252.1332 4253.133 5265.1332 10266.1412 2279.1472 3281.164 43293.0913 2309.1218 2321.1216 2365.1838 2381.1799 71382.1871 6397.2109 100 |
| 32 | 7.524 | 395.1965 | 3,4,5,6-Tetradehydromitragynine | 169.0742 2197.0711 3210.0756 2211.0849 7212.0938 13236.0926 3237.1013 12249.0974 3250.1131 2251.1165 12263.1144 2264.1243 11279.1474 20291.1094 3291.1484 2292.088 6303.1482 2320.1111 2320.1513 3380.1714 42395.1957 100 |
| 33 | 7.608 | 399.2278 | Unknown | 110.0963 11115.0541 2117.0691 6118.0641 3122.0952 2129.0539 10130.0655 2131.0713 2139.0748 2143.0736 3144.0795 8146.0962 4159.0674 25160.0744 5166.0861 2171.1010 3172.0741 2174.0906 100177.0906 5184.0746 2185.0837 2186.0904 3188.1053 6194.1158 3198.0919 2199.0986 2200.1066 15202.1209 2206.1155 2210.0892 2212.106 2224.1258 2226.1434 15238.1428 24266.1524 3281.1629 3283.1781 2328.1531 2367.1998 4399.2253 28 |

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| **Table 4: HRMS product ion *m/z*’s for the identified peaks of the Kratom C extract.** |
| Peak No. | RT (min) | [M+H]+*m/z* | Proposed Compounds (Confirmed with Std in **green**)(Probable ID is **yellow**) | Product Ions*m/z* Rel. Int.. |
| 1 | 2.864 | 291.0863 | **Epicatechin****490-46-0** | 77.0384 1191.0536 1493.0326 595.0477 6105.0312 4111.0430 6115.0545 7119.0489 13123.0432 100139.0379 62142.7416 2147.0440 27 |
| 2 | 4.512 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 110.0956 5147.0677 12162.0554 5175.0616 38190.0853 100226.1437 8238.1419 16281.1629 12381.1796 9397.2123 29415.2178 11 |
| 3 | 4.867 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 190.0850 100 |
| 4 | 4.916 | 401.2071 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | 110.0962 17130.0655 9158.0618 8176.0695 100229.0953 18257.1266 41283.1055 7283.1434 23285.1608 10369.1800 52401.2070 93 |
| 5 | 4.972 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 150.0529 30212.0649 7215.0814 11226.0734 5241.0926 4251.0810 4254.1053 27269.1276 100295.1429 5297.1582 11381.1786 20411.1917 7413.2078 31 |
| 6 | 4.973 | 383.1965 | Corynoxeine6877-32-3 | 108.0808 12117.0564 7132.0791 22142.0644 10158.0593 14160.0751 100201.1004 33267.1514 18 |
| 7 | 5.014 | 385.2122 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | 160.0743 100226.1421 30385.2091 22 |
| 8 | 5.195 | 385.2122 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | 108.0793 7130.0643 7132.0806 19158.0583 9160.0748 100187.0863 16226.1466 9241.1332 90265.1285 10269.1611 28353.1859 40385.2132 63 |
| 9 | 5.201 | 401.2071 | Isomitrafoline, Isospeciofoline, Mitrafoline, Stipulatine | 108.0790 4110.0954 20130.0672 3134.0595 5148.0391 8148.0744 19158.0590 8168.1035 2171.1007 4176.0703 85194.1174 4203.0813 2226.1435 3229.0973 4231.1139 5257.1281 18283.1454 8285.1596 18337.1572 3369.181 23401.2062 100 |
| 10 | 5.216 | 383.1965 | Corynoxeine | 115.0528 39132.0801 30160.0747 100 |
| 11 | 5.306 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 99.2115 2108.0812 11115.0507 3160.0392 5190.0862 33217.0957 27231.1126 16297.1584 15413.2058 100 |
| 12 | 5.325 | 385.2122 | Corynoxine B17391-18-3 | 91.0545 3108.0792 4110.0954 24115.0543 5118.0636 7123.0797 9124.1115 3130.0638 5132.0440 14132.0806 26140.0495 3142.0646 18144.0799 12158.0583 6160.0751 100168.1004 10172.0753 3187.0855 27215.1164 6226.1411 9241.1326 72265.135 4267.1479 16269.1635 26353.1855 30385.211 86 |
| 13 | 5.369 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 190.0844 100238.1417 55 |
| 14 | 5.511 | 415.2227 | **7-Hydroxymitragynine****174418-82-7** | 190.0845 31208.1316 6217.0985 19271.1442 83415.2219 100 |
| 15 | 5.553 | 385.2122 | **Rhynchophylline****76-66-4** | 110.0950 15110.0974 7132.0427 12132.0807 36142.0652 13160.0749 100174.0893 27186.0892 15200.0834 4226.1420 9269.1638 18385.2133 30 |
| 16 | 5.601 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 209.0791 26415.2214 100 |
| 17 | 5.793 | 385.2122 | *Corynoxine A**6877-32-3* | 108.0794 4110.0234 3110.0969 30110.1458 2115.0547 5118.0649 7132.0433 10132.0798 24142.0651 22144.0795 9158.0560 3160.0750 100174.0922 8187.0844 4213.0982 4226.1423 8241.1344 20265.1346 2267.1479 6269.1632 22353.1836 23385.2119 40 |
| 18 | 5.836 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 108.0806 10162.0496 9162.0912 10172.0713 9190.0852 72198.0727 9279.1520 14297.1592 18299.2011 4365.1426 9395.1957 66413.2063 100 |
| 19 | 5.946 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 110.0969 22162.0893 21168.1014 4190.0855 100271.1420 12383.1962 17415.2196 90 |
| 20 | 6.036 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 110.0951 4123.0797 8127.0376 2139.0384 3189.0776 3190.0852 16192.1024 2208.1341 3210.1129 7217.0948 3239.1515 3271.1413 9383.1940 3415.2215 100 |
| 21 | 6.052 | 385.2122 | 3-epicorynoxine B, 3-epirhynchophylline, 9-hydroxycorynantheidine, Isorhynchophylline | 144.0785 37174.0901 100 |
| 22 | 6.197 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 93.0697 298.0970 3108.0809 5110.0228 2110.0961 30116.0474 2117.0697 2124.1125 4132.0816 2139.0744 2147.0665 3147.0735 2148.0752 2160.0378 2162.0551 10162.0903 20168.1008 5171.1022 3172.0742 14174.0896 2175.0617 18188.0713 2190.0853 100194.1169 2217.0989 4226.143 16243.1135 3245.1281 3271.1433 24295.1423 3297.1591 5299.1753 20383.1957 37415.2225 90 |
| 23 | 6.488 | 397.2122 | **Paynantheine****4697-66-9** | 91.0536 295.0490 2106.0645 2108.0802 8109.0640 3115.0538 2117.0696 5118.0646 3120.0805 2121.0645 2127.0540 2129.0544 3130.0646 2131.0725 3132.0798 2137.0590 2143.0724 5144.0802 9146.096 3149.0592 3159.0672 29160.0749 4169.0859 3174.0908 100184.0751 2185.0832 2186.0906 4192.1015 6199.0982 2200.1064 7204.1011 5212.106 3224.1277 11236.1273 9281.1641 2328.1537 2397.2112 8 |
| 24 | 6.539 | 399.2278 | **Mitragynine****4098-40-2** | 75.0436 2108.0803 2110.0959 20115.0538 3117.0694 5118.0646 2122.0959 2127.0536 2129.0543 10130.0647 3131.0724 3139.0747 3143.0723 5144.0802 8146.0957 4152.0699 2159.0673 28160.0751 3166.0857 2168.1013 6171.101 2174.0908 100185.0829 2186.0909 2188.1064 3194.117 3199.0983 2200.1064 7202.1219 2206.1171 2210.0908 3212.1065 2226.1431 22236.1065 2238.1431 22255.1485 2367.2009 4399.2271 17 |
| 25 | 6.792 | 399.2278 | **Speciogynine****4697-67-0** | 75.0436 2108.0805 3110.0959 13115.0538 2117.0693 5118.0646 2127.0541 2129.0542 10130.0648 2131.0726 3139.0743 2143.0723 4144.0801 7146.0956 3154.1224 2159.0673 27160.0753 3168.1013 2171.101 5174.0907 100177.0906 2185.083 2186.0904 3188.1062 2194.1169 3200.1062 5206.1177 2212.1066 2226.143 18238.143 22266.1529 2328.1538 2399.2265 12 |
| 26 | 7.108 | 399.2278 | **Speciociliatine****14382-79-7** | 75.0435 295.0487 3108.0804 2110.0959 16115.0537 3117.0692 5118.0647 2122.0959 2127.0538 2129.0545 10130.0648 2131.0723 3139.0748 2143.0724 5144.0802 8146.0961 4152.0701 2159.0673 26160.0752 4162.0906 2168.1013 5171.1014 2174.0907 100182.1168 2184.0748 2185.0835 2186.0909 4188.1059 4194.1172 3198.0913 2199.0981 3200.1064 7206.1169 2210.0907 4212.1066 3224.1063 2226.1432 18236.1064 3238.0858 2238.143 19264.1013 2266.1531 3270.1126 2284.1269 2296.1283 3328.1541 5367.2007 7399.2272 16 |
| 27 | 7.178 | 413.2071 | Epiallo-isopaynantheine-N-(4)-oxide, Isopaynantheine-N-(4)-oxide | 97.0639 8175.0600 33190.0868 21199.0833 14200.0943 38214.1092 100253.1296 17267.1483 19381.1747 24381.1828 40395.1942 54 |
| 28 | 7.26 | 395.1965 | 3,4,5,6-Tetradehydromitragynine | 184.0632 4186.0908 17187.0976 7198.0926 4211.0863 22212.0926 11227.1170 74237.1025 5263.1190 9277.1345 6279.1487 52293.0891 11309.1218 8379.1646 85380.1727 6395.1954 100 |
| 29 | 7.289 | 397.2122 | Mitraciliatine14509-92-3 | 91.0538 395.0484 2108.0804 6109.0645 3115.0546 2117.0697 4118.0650 3120.0801 3121.0639 4126.0910 4129.0543 2130.0645 3131.0728 3132.0804 2137.0586 2143.0723 4144.0801 9146.0591 2146.0961 3149.0593 3159.067 22160.0752 7162.0904 2163.075 2169.0852 3171.0661 2172.0758 2173.0823 2174.0909 100178.0852 2180.1021 2181.0857 2184.0754 3185.0833 5186.0907 7188.1062 4192.1018 5197.0838 3198.0912 3199.0982 3200.1063 20204.1013 5210.0907 2210.1122 4212.1069 7222.112 2224.1061 2224.1279 10226.1226 2229.1331 2236.107 2236.1282 8238.1225 2264.1028 2268.1321 2281.1648 2296.128 2328.1532 4365.1848 4397.2113 16 |
| 30 | 7.347 | 415.2227 | Ciliaphylline, Mitragynine-N-(4)-oxide, Speciociliatine-N-(4)-oxide | 186.0943 19199.0868 20214.1097 100269.1653 47383.1983 80397.2111 78 |
| 31 | 7.468 | 397.2122 | Mitraciliatine14509-92-3 | 172.0750 4174.0908 2184.0627 2186.0908 7198.0901 6199.0869 5211.0860 8212.0940 8214.1088 2223.0867 2227.1174 36237.1016 2238.1098 2239.1178 5251.1174 10252.1367 3253.1334 5265.1332 10266.1415 3279.149 2281.1641 46293.0903 2309.1228 3349.1532 2365.185 2381.1802 72382.1888 5397.2111 100 |
| 32 | 7.524 | 395.1965 | 3,4,5,6-Tetradehydromitragynine | 123.0799 5169.0765 4197.0689 4198.0777 2210.0726 2211.0881 8212.0939 14222.0786 3236.0950 4237.1014 16248.0923 3249.1004 5250.1084 3251.1181 17264.0904 2264.1274 5279.1484 23288.1244 3292.0823 5293.164 2319.1058 4320.1507 2348.1486 3351.1692 3363.1733 4380.1735 50395.195 100 |
| 33 | 7.608 | 399.2278 | Unknown | 75.0440 291.0531 2108.0800 2110.0966 10117.0689 6118.0648 2129.0543 10131.0719 2143.0724 6144.0802 7146.0953 4159.0672 26160.0761 6171.1019 3172.0744 2174.0907 100177.0889 5185.0835 2186.0902 4188.1065 5194.1167 2199.0971 3200.1063 12202.1212 2210.0923 3212.1065 3226.1431 17227.1172 2229.1213 2236.1057 2238.1427 23254.1526 2266.1534 3281.1632 3283.1717 3296.1275 2328.1533 4367.201 4383.1852 4399.225 33 |