**Supplementary materials**

**Chromatographic conditions**

A Shimadzu HPLC system (Kyoto, Japan) comprising of a binary LC-20 AD pump, an SPD-20A diode array detector, CT0-20AC column oven, CBM-20A controller and a Rheodyne 8125 injector was used for HPLC analysis. The chromatographic separation was carried out on Shimadzu Shimpak C18 column (250 x 4.6 mm, 5 µm) using Solvent A (ortho-phosphate buffer, pH 2.4) and solvent B (acetonitrile) as a mobile phase with a gradient flow from pump A as 95% for 0-17 min, 55% for 18-24 min, 20% for 25-34 min, 55% for 35-39 min, 95% for 40-45 min subsequently. The flow rate was kept at 1.5 ml/min with an oven temperature of 300 C. The injection volumes of the samples and the standard solutions were set as 20 µL. The total run time was 45 min. The PDA detector was set at 223 nm for acquiring chromatograms, the UV spectra were recorded between 190-800 nm. Prior to HPLC analysis, the freshly prepared HPLC mobile phase was passed through a 0.45 µm membrane filter and degassed using a sonicator.

**Method validation and Calibration curve**

The method for quantitative analysis was validated in terms of linearity, limits of detection (LOD) and quantiﬁcation (LOQ), precision, stability, repeatability and recovery test as per the guidelines set by International Conference on Harmonization (ICH). The limit of detection (LOD) is the minimum concentration of an analyte at which the peak area of the signal is at least three times greater than signal to noise ratio (S/N ≥ 3). The limit of quantification (LOQ) is the lowest concentration of an analyte at which the peak area is at least ten times greater than the signal by noise ratio (S/N ≥ 10). The precision was determined by injecting the replicate solution of each standard for three times within a day. The stability test of the standard was determined by injecting the same solution of each standard for two consecutive days (0, 24, 48h). Repeatability of each compound was determined by independently preparing three replicates of each reference standard solution. The recovery test was determined by the method of standard addition, which was done by adding known amount of standard to the analysed sample and then reanalysing. The recovery rates of the compounds were found between 97-98%.

Table S1

Quantitative estimation of diterpenoids in 166 different accessions of *A. paniculata*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sl. No. | Acc. No. | Locality | District & State | AG (%) | NAG (%) | 14-DAG (%) | 14-D-11,12-DIAP (%) | Sum of four D (%) |
| 1 | AP-1 | Ekamra Kanan | Khordha, Odisha | 1.33±0.01 | 0.69±0.02 | 0.95±0.01 | 0.98±0.03 | 3.95±0.07 |
| 2 | AP-2 | Nayapalli | Khordha, Odisha | 1.30±0.01 | 0.65±0.01 | 0.93±0.03 | 0.94±0.02 | 3.83±0.07 |
| 3 | AP-3 | Barunei road | Khordha, Odisha | 1.03±0.00 | 0.80±0.03 | 0.27±0.01 | 0.26±0.01 | 2.36±0.05 |
| 4 | AP-4 | Barunei pitha | Khordha, Odisha | 1.69±0.02 | 0.85±0.02 | 0.07±0.00 | 0.29±0.01 | 2.91±0.05 |
| 5 | AP-5 | Baibhava vihar | Khordha, Odisha | 1.95±0.06 | 0.10±0.00 | 0.33±0.01 | 0.33±0.01 | 2.70±0.08 |
| 6 | AP-6 | Brajamohanpur | Khordha, Odisha | 4.93±0.09 | 0.58±0.02 | 1.8±0.09 | 0.71±0.02 | 8.02±0.22 |
| 7 | AP-7 | Barunei pitha | Khordha, Odisha | 2.83±0.07 | 0.28±0.01 | 1.04±0.05 | 0.98±0.03 | 5.13±0.16 |
| 8 | AP-8 | Barunei pitha | Khordha, Odisha | 5.45±0.21 | 0.42±0.01 | 1.59±0.04 | 0.91±0.03 | 8.36±0.29 |
| 9 | AP-9 | Gada Khordha | Khordha, Odisha | 4.37±0.11 | 0.55±0.01 | 1.34±0.08 | 0.76±0.02 | 7.02±0.23 |
| 10 | AP-10 | Gada Khordha | Khordha, Odisha | 2.74±0.01 | 0.32±0.01 | 1.43±0.03 | 0.99±0.02 | 5.49±0.07 |
| 11 | AP-11 | Gada Khordha | Khordha, Odisha | 2.68±0.02 | 0.34±0.01 | 1.91±0.08 | 1.37±0.05 | 6.30±0.16 |
| 12 | AP-12 | Nimapada | Puri, Odisha | 0.65±0.05 | 0.38±0.01 | 0.44±0.01 | 0.32±0.01 | 1.79±0.08 |
| 13 | AP-13 | Balisahi, Gopa | Puri, Odisha | 0.68±0.03 | 0.26±0.01 | 0.58±0.02 | 0.41±0.02 | 1.92±0.08 |
| 14 | AP-14 | Konark | Puri, Odisha | 1.91±0.03 | 0.58±0.01 | 0.9±0.03 | 0.92±0.04 | 4.32±0.12 |
| 15 | AP-15 | Banapur | Puri, Odisha | 3.55±0.08 | 0.91±0.01 | 0.40±0.01 | 0.33±0.01 | 5.19±0.13 |
| 16 | AP-16 | Naraja | Cuttack, Odisha | 0.97±0.01 | 0.40±0.02 | 0.69±0.01 | 0.61±0.02 | 2.68±0.06 |
| 17 | AP-17 | Radhakishorepur | Cuttack, Odisha | 1.82±0.07 | 0.92±0.03 | 0.6±0.02 | 0.83±0.03 | 4.18±0.15 |
| 18 | AP-18 | Chodwar | Cuttack, Odisha | 1.47±0.05 | 0.77±0.02 | 0.82±0.03 | 0.91±0.04 | 3.96±0.14 |
| 19 | AP-19 | Dorada | Cuttack, Odisha | 3.39±0.14 | 1.39±0.05 | 0.13±0.00 | 0.03±0.00 | 4.95±0.19 |
| 20 | AP-20 | Jhadabandha | Dhenkanala, Odisha | 3.54±0.15 | 0.92±0.04 | 0.86±0.02 | 0.32±0.01 | 5.64±0.22 |
| 21 | AP-21 | Saptasajya | Dhenkanala, Odisha | 3.52±0.06 | 0.83±0.03 | 0.84±0.03 | 0.32±0.01 | 5.51±0.13 |
| 22 | AP-22 | Deagaon | Dhenkanala, Odisha | 0.78±0.02 | 0.09±0.00 | 0.31±0.01 | 0.58±0.01 | 1.75±0.04 |
| 23 | AP-23 | Rasol | Dhenkanala, Odisha | 4.22±0.18 | 0.53±0.01 | 1.81±0.09 | 1.37±0.06 | 7.93±0.34 |
| 24 | AP-24 | Hindol | Dhenkanala, Odisha | 1.17±0.04 | 0.85±0.02 | 0.24±0.00 | 0.96±0.03 | 3.22±0.09 |
| 25 | AP-25 | Kamakhyanagar | Dhenkanala, Odisha | 2.03±0.09 | 0.40±0.01 | 0.53±0.02 | 0.30±0.01 | 3.26±0.13 |
| 26 | AP-26 | Bhagirathipur | Dhenkanala, Odisha | 1.67±0.05 | 0.31±0.01 | 0.21±0.01 | 0.21±0.00 | 2.40±0.07 |
| 27 | AP-27 | Tirtol | Jagatsighpur, Odisha | 0.76±0.02 | 0.46±0.00 | 0.12±0.00 | 0.06±0.00 | 1.40±0.02 |
| 28 | AP-28 | Jaleswar | Balasore, Odisha | 1.01±0.04 | 0.62±0.02 | 0.67±0.02 | 0.57±0.01 | 2.87±0.09 |
| 29 | AP-29 | Baliapala | Balasore, Odisha | 1.86±0.07 | 0.42±0.01 | 0.97±0.03 | 0.86±0.02 | 4.11±0.13 |
| 30 | AP-30 | Nilagiri | Balasore, Odisha | 1.93±0.07 | 0.51±0.02 | 1.01±0.02 | 1.02±0.03 | 4.46±0.14 |
| 31 | AP-31 | kotsahi | Balasore, Odisha | 1.24±0.05 | 0.91±0.03 | 0.97±0.03 | 0.99±0.02 | 4.10±0.13 |
| 32 | AP-32 | Ambapua | Ganjam, Odisha | 2.87±0.13 | 0.76±0.02 | 0.10±0.00 | 1.12±0.03 | 4.85±0.18 |
| 33 | AP-33 | Badaghati | Ganjam, Odisha | 1.09±0.04 | 0.85±0.03 | 0.96±0.03 | 0.80±0.01 | 3.71±0.11 |
| 34 | AP-34 | Jyoti Vihar | Ganjam, Odisha | 1.47±0.05 | 0.99±0.04 | 0.87±0.02 | 0.98±0.02 | 4.30±0.13 |
| 35 | AP-35 | Kanteipali | Ganjam, Odisha | 3.17±0.12 | 0.67±0.02 | 0.73±0.02 | 0.17±0.00 | 4.74±0.16 |
| 36 | AP-36 | Nirmalajhara | Ganjam, Odisha | 1.22±0.05 | 0.64±0.01 | 0.12±0.00 | 0.12±0.00 | 2.10±0.06 |
| 37 | AP-37 | Kholikot | Ganjam, Odisha | 0.85±0.02 | 0.29±0.01 | 0.32±0.01 | 0.39±0.01 | 1.85±0.05 |
| 38 | AP-38 | Tamana | Ganjam, Odisha | 0.85±0.03 | 0.56±0.02 | 0.11±0.00 | 0.11±0.00 | 1.63±0.05 |
| 39 | AP-39 | Taptapani | Ganjam, Odisha | 0.73±0.01 | 0.19±0.01 | 0.09±0.00 | 0.03±0.00 | 1.05±0.02 |
| 40 | AP-40 | Paralakhemundi | Gajapati, Odisha | 2.81±0.08 | 0.92±0.04 | 0.3±0.01 | 0.87±0.02 | 4.89±0.15 |
| 41 | AP-41 | Talamunda | Gajapati, Odisha | 2.58±0.09 | 0.62±0.02 | 1.86±0.04 | 1.31±0.05 | 6.36±0.20 |
| 42 | AP-42 | Budisila | Gajapati, Odisha | 4.41±0.17 | 0.28±0.01 | 0.15±0.00 | 0.63±0.02 | 5.47±0.20 |
| 43 | AP-43 | Rayagada | Gajapati, Odisha | 2.72±0.12 | 0.97±0.04 | 1.22±0.04 | 1.25±0.03 | 6.16±0.23 |
| 44 | AP-44 | Barghala | Gajapati, Odisha | 3.76±0.08 | 0.22±0.01 | 0.8±0.02 | 0.50±0.01 | 5.27±0.12 |
| 45 | AP-45 | Hatapada | Gajapati, Odisha | 5.23±0.21 | 0.23±0.01 | 1.14±0.01 | 0.52±0.02 | 7.13±0.25 |
| 46 | AP-46 | Mahendragiri | Gajapati, Odisha | 5.39±0.22 | 0.30±0.01 | 1.79±0.02 | 1.08±0.05 | 8.56±0.30 |
| 47 | AP-47 | Budisila | Gajapati, Odisha | 3.97±0.15 | 0.96±0.04 | 1.34±0.02 | 1.11±0.06 | 7.39±0.27 |
| 48 | AP-48 | Budisia | Gajapati, Odisha | 3.74±0.12 | 0.98±0.03 | 0.80±0.01 | 0.74±0.01 | 6.27±0.17 |
| 49 | AP-49 | Karadasigh | Gajapati, Odisha | 4.29±0.09 | 0.25±0.01 | 0.83±0.02 | 0.84±0.02 | 6.21±0.14 |
| 50 | AP-50 | R.Sitapur | Gajapati, Odisha | 3.10±0.07 | 0.68±0.02 | 0.36±0.01 | 0.64±0.01 | 4.78±0.11 |
| 51 | AP-51 | Chitrada | Mayurbhanj, Odisha | 3.64±0.12 | 0.82±0.03 | 0.27±0.00 | 0.91±0.02 | 5.64±0.17 |
| 52 | AP-52 | Betnoti | Mayurbhanj, Odisha | 2.62±0.03 | 0.52±0.01 | 0.91±0.03 | 0.93±0.03 | 4.98±0.10 |
| 53 | AP-53 | Baisingha | Mayurbhanj, Odisha | 1.66±0.06 | 0.43±0.01 | 0.42±0.01 | 0.58±0.01 | 3.10±0.09 |
| 54 | AP-54 | Muruda | Mayurbhanj, Odisha | 2.57±0.08 | 0.96±0.03 | 0.36±0.01 | 0.61±0.02 | 4.50±0.14 |
| 55 | AP-55 | Shankarpur | Mayurbhanj, Odisha | 1.50±0.01 | 0.97±0.04 | 0.12±0.00 | 0.01±0.00 | 2.61±0.05 |
| 56 | AP-56 | Phulkong forest | Mayurbhanj, Odisha | 1.74±0.02 | 0.24±0.01 | 0.31±0.01 | 0.08±0.00 | 2.38±0.04 |
| 57 | AP-57 | Jashipur | Mayurbhanj, Odisha | 1.20±0.02 | 0.86±0.02 | 0.14±0.00 | 0.02±0.00 | 2.21±0.04 |
| 58 | AP-58 | Similipala road | Mayurbhanj, Odisha | 3.68±0.13 | 1.97±0.07 | 0.16±0.00 | 0.05±0.00 | 5.86±0.20 |
| 59 | AP-59 | Similipala road | Mayurbhanj, Odisha | 3.02±0.09 | 1.78±0.06 | 0.11±0.00 | 0.06±0.00 | 4.97±0.15 |
| 60 | AP-60 | Similipala road | Mayurbhanj, Odisha | 3.52±0.08 | 1.99±0.08 | 0.10±0.00 | 0.03±0.00 | 5.64±0.16 |
| 61 | AP-61 | Khetrapatana | Mayurbhanj, Odisha | 0.16±0.00 | 0.04±0.00 | 0.12±0.00 | 0.10±0.00 | 0.42±0.00 |
| 62 | AP-62 | Bisoi | Mayurbhanj, Odisha | 3.54±0.07 | 1.34±0.07 | 0.16±0.00 | 0.06±0.00 | 5.11±0.14 |
| 63 | AP-63 | Bisoi | Mayurbhanj, Odisha | 3.52±0.04 | 1.24±0.05 | 0.16±0.00 | 0.04±0.00 | 4.96±0.09 |
| 64 | AP-64 | Gobindapali | Sambalpur, Odisha | 1.73±0.08 | 0.53±0.02 | 0.15±0.00 | 0.64±0.02 | 3.05±0.12 |
| 65 | AP-65 | Burla | Sambalpur, Odisha | 1.68±0.05 | 0.56±0.01 | 0.18±0.00 | 0.76±0.02 | 3.18±0.08 |
| 66 | AP-66 | Dhanupali | Sambalpur, Odisha | 1.39±0.02 | 0.53±0.01 | 0.15±0.00 | 0.31±0.01 | 2.38±0.04 |
| 67 | AP-67 | Khandapada | Nayagargh, Odisha | 2.46±0.07 | 0.55±0.02 | 0.54±0.01 | 0.88±0.03 | 4.43±0.13 |
| 68 | AP-68 | Sampada | Nayagargh, Odisha | 2.46±0.05 | 0.55±0.01 | 0.56±0.01 | 0.88±0.03 | 4.45±0.10 |
| 69 | AP-69 | Nuagaon | Nayagargh, Odisha | 2.82±0.09 | 0.89±0.02 | 1.09±0.04 | 0.40±0.02 | 5.20±0.17 |
| 70 | AP-70 | Pratap prasad | Nayagargh, Odisha | 2.81±0.09 | 0.85±0.01 | 1.08±0.03 | 0.39±0.01 | 5.13±0.14 |
| 71 | AP-71 | Nagamunduli | Nayagargh, Odisha | 2.76±0.11 | 0.76±0.02 | 1.04±0.02 | 0.39±0.01 | 4.95±0.16 |
| 72 | AP-72 | Ratanpur | Nayagargh, Odisha | 2.45±0.08 | 0.48±0.01 | 0.54±0.02 | 0.89±0.03 | 4.37±0.14 |
| 73 | AP-73 | Ranpur | Nayagargh, Odisha | 1.39±0.02 | 0.19±0.00 | 0.98±0.03 | 0.49±0.01 | 3.05±0.06 |
| 74 | AP-74 | Itamati | Nayagargh, Odisha | 1.78±0.06 | 0.23±0.00 | 0.59±0.02 | 0.59±0.02 | 3.19±0.10 |
| 75 | AP-75 | Amarpur | Nayagargh, Odisha | 2.50±0.03 | 0.35±0.01 | 0.85±0.02 | 0.60±0.02 | 4.30±0.08 |
| 76 | AP-76 | Krushnaprasad | Nayagargh, Odisha | 1.28±0.07 | 0.42±0.01 | 0.6±0.01 | 0.86±0.03 | 3.15±0.12 |
| 77 | AP-77 | Sarankula | Nayagargh, Odisha | 3.05±0.02 | 0.31±0.01 | 0.96±0.02 | 0.87±0.03 | 5.19±0.08 |
| 78 | AP-78 | Banigochha | Nayagargh, Odisha | 2.95±0.01 | 0.57±0.01 | 0.14±0.00 | 0.09±0.00 | 3.74±0.02 |
| 79 | AP-79 | Godi Alli | Nayagargh, Odisha | 3.92±0.12 | 0.85±0.02 | 0.32±0.01 | 0.27±0.01 | 5.35±0.16 |
| 80 | AP-80 | Godi Alli | Nayagargh, Odisha | 2.94±0.09 | 1.16±0.07 | 0.01±0.00 | 0.07±0.00 | 4.19±0.16 |
| 81 | AP-81 | Baigunia | Nayagargh, Odisha | 2.96±0.03 | 0.58±0.02 | 0.06±0.00 | 0.04±0.00 | 3.65±0.05 |
| 82 | AP-82 | Chandanpur | Angul, Odisha | 2.25±0.07 | 0.46±0.01 | 0.20±0.00 | 0.10±0.00 | 3.01±0.08 |
| 83 | AP-83 | Bedashasana | Angul, Odisha | 2.25±0.04 | 0.47±0.01 | 0.20±0.00 | 0.10±0.00 | 3.01±0.05 |
| 84 | AP-84 | Tarava | Angul, Odisha | 1.77±0.09 | 0.28±0.01 | 0.24±0.01 | 0.18±0.00 | 2.47±0.11 |
| 85 | AP-85 | Korada | Kandhamala, Odisha | 3.26±0.07 | 0.76±0.02 | 0.63±0.02 | 0.21±0.01 | 4.85±0.12 |
| 86 | AP-86 | Korada ghati | Kandhamala, Odisha | 4.66±0.01 | 0.43±0.01 | 0.51±0.02 | 0.21±0.01 | 5.81±0.05 |
| 87 | AP-87 | Mandasaru | Kandhamala, Odisha | 2.93±0.02 | 0.77±0.02 | 0.27±0.01 | 0.21±0.01 | 4.17±0.06 |
| 88 | AP-88 | Mandasaru | Kandhamala, Odisha | 3.87±0.06 | 0.48±0.01 | 0.51±0.02 | 1.33±0.05 | 6.19±0.14 |
| 89 | AP-89 | Kalinga ghati | Kandhamala, Odisha | 3.77±0.05 | 0.22±0.00 | 0.51±0.02 | 0.28±0.01 | 4.78±0.08 |
| 90 | AP-90 | Khajuripada | Kandhamala, Odisha | 1.05±0.02 | 0.21±0.00 | 0.27±0.01 | 0.38±0.01 | 1.91±0.04 |
| 91 | AP-91 | Phiringia | Kandhamala, Odisha | 1.64±0.08 | 0.57±0.01 | 0.71±0.02 | 0.58±0.02 | 3.50±0.13 |
| 92 | AP-92 | Madhapur | Boudh, Odisha | 2.46±0.09 | 0.26±0.00 | 0.52±0.01 | 0.26±0.01 | 3.50±0.11 |
| 93 | AP-93 | Ranipathara | Boudh, Odisha | 1.63±0.07 | 0.83±0.02 | 0.70±0.01 | 0.57±0.02 | 3.74±0.12 |
| 94 | AP-94 | Phurlijharan | Kalahandi, Odisha | 2.99±0.02 | 0.93±0.03 | 0.77±0.01 | 0.32±0.01 | 5.01±0.07 |
| 95 | AP-95 | Jagasahi | Kalahandi, Odisha | 4.71±0.02 | 0.21±0.01 | 0.13±0.00 | 0.03±0.00 | 5.08±0.03 |
| 96 | AP-96 | Jaraka | Jajpur, Odisha | 1.01±0.01 | 0.60±0.01 | 0.36±0.01 | 0.55±0.02 | 2.52±0.05 |
| 97 | AP-97 | Panikoili | Jajpur, Odisha | 1.54±0.03 | 0.66±0.02 | 0.76±0.02 | 0.83±0.03 | 3.79±0.10 |
| 98 | AP-98 | Ratnagiri | Jajpur, Odisha | 0.86±0.01 | 0.14±0.00 | 0.26±0.01 | 0.36±0.01 | 1.62±0.03 |
| 99 | AP-99 | Magurgadia | Keonjhar, Odisha | 1.96±0.02 | 0.74±0.02 | 0.88±0.02 | 0.91±0.04 | 4.50±0.10 |
| 100 | AP-100 | Judia ghati | Keonjhar, Odisha | 1.04±0.01 | 0.21±0.00 | 0.11±0.00 | 0.05±0.00 | 1.42±0.01 |
| 101 | AP-101 | Hadagargh | Keonjhar, Odisha | 3.76±0.09 | 0.30±0.01 | 1.99±0.09 | 0.33±0.01 | 6.39±0.20 |
| 102 | AP-102 | Therubali | Rayagada, Odisha | 1.14±0.02 | 0.53±0.01 | 0.18±0.00 | 0.23±0.01 | 2.08±0.04 |
| 103 | AP-103 | Kalyansighpur | Rayagada, Odisha | 1.30±0.04 | 0.46±0.02 | 0.14±0.00 | 0.28±0.01 | 2.19±0.07 |
| 104 | AP-104 | Padampur | Rayagada, Odisha | 0.77±0.02 | 0.09±0.00 | 0.03±0.00 | 0.08±0.00 | 0.97±0.02 |
| 105 | AP-105 | Behela | South 24 Parganas, WB | 0.77±0.02 | 0.43±0.01 | 0.6±0.02 | 0.42±0.02 | 2.22±0.07 |
| 106 | AP-106 | Kakadwip | South 24 Parganas, WB | 0.65±0.01 | 0.34±0.01 | 0.21±0.00 | 0.29±0.01 | 1.49±0.03 |
| 107 | AP-107 | Diamondharbour | South 24 Parganas, WB | 0.36±0.00 | 0.20±0.01 | 0.23±0.01 | 0.26±0.01 | 1.04±0.03 |
| 108 | AP-108 | Kulpi | South 24 Parganas, WB | 1.23±0.04 | 0.87±0.03 | 1.21±0.07 | 2.61±0.06 | 5.91±0.20 |
| 109 | AP-109 | Kakadwip | South 24 Parganas, WB | 0.77±0.01 | 0.13±0.00 | 0.23±0.01 | 0.8±0.08 | 1.94±0.06 |
| 110 | AP-110 | Kakadwip | South 24 Parganas, WB | 0.34±0.00 | 0.23±0.01 | 0.13±0.00 | 0.19±0.00 | 0.89±0.01 |
| 111 | AP-111 | Laxmikantapur | South 24 Parganas, WB | 0.36±0.00 | 0.15±0.00 | 0.26±0.00 | 0.22±0.00 | 0.98±0.00 |
| 112 | AP-112 | Amtola | South 24 Parganas, WB | 2.69±0.05 | 0.14±0.00 | 0.97±0.02 | 1.40±0.05 | 5.20±0.12 |
| 113 | AP-113 | Patharapratima | South 24 Parganas, WB | 0.28±0.00 | 0.02±0.00 | 0.18±0.00 | 0.20±0.01 | 0.68±0.01 |
| 114 | AP-114 | Baharu | South 24 Parganas, WB | 0.35±0.01 | 0.12±0.00 | 0.19±0.00 | 0.23±0.01 | 0.90±0.02 |
| 115 | AP-115 | Raidighi | South 24 Parganas, WB | 1.99±0.03 | 0.30±0.01 | 1.18±0.05 | 1.22±0.05 | 4.69±0.14 |
| 116 | AP-116 | Thakurpukur | South 24 Parganas, WB | 1.58±0.05 | 0.46±0.01 | 0.99±0.03 | 0.67±0.03 | 3.70±0.12 |
| 117 | AP-117 | Garia | South 24 Parganas, WB | 2.25±0.04 | 0.82±0.02 | 1.05±0.04 | 1.21±0.05 | 5.33±0.15 |
| 118 | AP-118 | Narayanpur | South 24 Parganas, WB | 2.63±0.03 | 0.88±0.02 | 0.87±0.02 | 0.94±0.04 | 5.31±0.11 |
| 119 | AP-119 | Nischintapur | South 24 Parganas, WB | 1.56±0.02 | 0.21±0.01 | 0.99±0.03 | 0.96±0.03 | 3.72±0.09 |
| 120 | AP-120 | Dholahat | South 24 Parganas, WB | 1.91±0.04 | 0.24±0.01 | 1.23±0.05 | 1.27±0.04 | 4.64±0.14 |
| 121 | AP-121 | Kalyanpur | South 24 Parganas, WB | 1.54±0.04 | 0.14±0.00 | 0.30±0.01 | 0.29±0.01 | 2.27±0.06 |
| 122 | AP-122 | Kashinagar | South 24 Parganas, WB | 1.86±0.02 | 0.18±0.00 | 0.92±0.03 | 1.02±0.04 | 3.97±0.09 |
| 123 | AP-123 | Koranjali | South 24 Parganas, WB | 1.92±0.01 | 0.13±0.00 | 0.89±0.02 | 0.81±0.03 | 3.75±0.06 |
| 124 | AP-124 | Jaynagar | South 24 Parganas, WB | 1.58±0.03 | 0.15±0.00 | 0.95±0.03 | 0.91±0.03 | 3.59±0.09 |
| 125 | AP-125 | Baruipur | South 24 Parganas, WB | 1.66±0.04 | 0.13±0.00 | 1.06±0.04 | 1.10±0.02 | 3.96±0.10 |
| 126 | AP-126 | Barrackpore | North 24 Parganas, WB | 0.57±0.01 | 0.25±0.01 | 0.25±0.00 | 0.18±0.00 | 1.26±0.02 |
| 127 | AP-127 | Titagargh | North 24 Parganas, WB | 0.65±0.01 | 0.24±0.01 | 0.43±0.02 | 0.29±0.01 | 1.61±0.05 |
| 128 | AP-128 | Khardah | North 24 Parganas, WB | 0.28±0.00 | 0.15±0.00 | 0.20±0.00 | 0.16±0.00 | 0.79±0.00 |
| 129 | AP-129 | Barasat | North 24 Parganas, WB | 0.41±0.01 | 0.21±0.01 | 0.32±0.01 | 0.36±0.01 | 1.30±0.04 |
| 130 | AP-130 | Salt Lake | North 24 Parganas, WB | 0.46±0.01 | 0.29±0.01 | 0.11±0.00 | 0.25±0.01 | 1.10±0.03 |
| 131 | AP-131 | Bandipur | North 24 Parganas, WB | 0.80±0.02 | 0.20±0.00 | 0.23±0.00 | 0.33±0.02 | 1.55±0.04 |
| 132 | AP-132 | Rahara | North 24 Parganas, WB | 0.67±0.01 | 0.36±0.01 | 0.48±0.01 | 0.32±0.01 | 1.82±0.04 |
| 133 | AP-133 | Maslandapur | North 24 Parganas, WB | 1.88±0.02 | 0.26±0.01 | 1.20±0.05 | 1.08±0.05 | 4.42±0.13 |
| 134 | AP-134 | Sworupnagar | North 24 Parganas, WB | 2.01±0.02 | 0.22±0.01 | 1.01±0.09 | 1.28±0.04 | 4.52±0.16 |
| 135 | AP-135 | Madhyamgram | North 24 Parganas, WB | 2.00±0.02 | 0.21±0.01 | 0.90±0.02 | 0.93±0.04 | 4.04±0.09 |
| 136 | AP-136 | Naihat | North 24 Parganas, WB | 2.60±0.00 | 0.24±0.01 | 1.86±0.08 | 1.47±0.05 | 6.18±0.14 |
| 137 | AP-137 | Kanthi | Purba Medinipur, WB | 1.23±0.08 | 0.82±0.01 | 0.81±0.03 | 0.97±0.03 | 3.83±0.16 |
| 138 | AP-138 | Marishda | Purba Medinipur, WB | 0.99±0.03 | 0.45±0.01 | 0.15±0.00 | 0.55±0.02 | 2.14±0.06 |
| 139 | AP-139 | Tamluk | Purba Medinipur, WB | 0.91±0.02 | 0.45±0.01 | 0.17±0.00 | 0.75±0.02 | 2.28±0.05 |
| 140 | AP-140 | Haldia | Purba Medinipur, WB | 0.48±0.01 | 0.24±0.01 | 0.43±0.02 | 0.94±0.03 | 2.09±0.07 |
| 141 | AP-141 | Ramnagar | Purba Medinipur, WB | 3.58±0.11 | 0.44±0.02 | 1.38±0.07 | 1.50±0.06 | 6.90±0.26 |
| 142 | AP-142 | Salboni | Paschim Medinipur, WB | 0.80±0.03 | 0.69±0.03 | 0.10±0.00 | 0.19±0.00 | 1.78±0.06 |
| 143 | AP-143 | Gangipora | Hooghly, WB | 0.28±0.00 | 0.16±0.00 | 0.20±0.00 | 0.11±0.00 | 0.75±0.00 |
| 144 | AP-144 | Shrirampur | Hooghly, WB | 1.44±0.08 | 0.25±0.01 | 0.99±0.04 | 0.94±0.03 | 3.63±0.16 |
| 145 | AP-145 | Howrah | Howrah, WB | 1.28±0.04 | 0.72±0.02 | 0.16±0.00 | 0.92±0.03 | 3.07±0.09 |
| 146 | AP-146 | Chowbaria | Kolkata, WB | 0.38±0.01 | 0.19±0.00 | 0.23±0.00 | 0.26±0.01 | 1.06±0.02 |
| 147 | AP-147 | Jadavpur | Kolkata, WB | 1.93±0.07 | 0.33±0.01 | 1.15±0.05 | 1.24±0.05 | 4.65±0.18 |
| 148 | AP-148 | Bankura | Bankura, WB | 0.32±0.02 | 0.12±0.00 | 0.20±0.00 | 0.19±0.00 | 0.83±0.02 |
| 149 | AP-149 | Bankura | Bankura, WB | 0.34±0.01 | 0.11±0.00 | 0.20±0.00 | 0.18±0.00 | 0.82±0.01 |
| 150 | AP-150 | Bankura | Bankura, WB | 1.35±0.07 | 0.53±0.02 | 0.24±0.00 | 0.67±0.02 | 2.79±0.11 |
| 151 | AP-151 | Khatra | Bankura, WB | 1.95±0.08 | 0.21±0.01 | 0.9±0.03 | 0.81±0.03 | 3.88±0.15 |
| 152 | AP-152 | Kashipur | Purulia, WB | 1.99±0.05 | 0.63±0.02 | 1.02±0.05 | 1.03±0.04 | 4.68±0.16 |
| 153 | AP-153 | Kulera | Birbhum, WB | 1.02±0.03 | 0.31±0.01 | 0.06±0.00 | 0.62±0.03 | 2.02±0.07 |
| 154 | AP-154 | RK mission | Birbhum, WB | 0.80±0.01 | 0.33±0.01 | 0.15±0.00 | 0.69±0.02 | 1.97±0.04 |
| 155 | AP-155 | Suri | Birbhum, WB | 2.03±0.09 | 0.33±0.01 | 0.09±0.00 | 1.58±0.05 | 4.03±0.15 |
| 156 | AP-156 | Shantiniketan | Birbhum, WB | 1.50±0.08 | 0.35±0.01 | 0.93±0.03 | 0.87±0.02 | 3.65±0.14 |
| 157 | AP-157 | Nabadwip | Nadia, WB | 1.40±0.04 | 0.07±0.00 | 0.95±0.02 | 0.37±0.02 | 2.78±0.08 |
| 158 | AP-158 | Kalyani | Nadia, WB | 1.45±0.03 | 0.12±0.00 | 0.99±0.04 | 0.39±0.01 | 2.96±0.08 |
| 159 | AP-159 | Debagram | Nadia, WB | 1.91±0.03 | 0.47±0.02 | 1.03±0.05 | 1.09±0.04 | 4.50±0.14 |
| 160 | AP-160 | Krishnanagar | Nadia, WB | 0.66±0.02 | 0.25±0.01 | 0.32±0.01 | 0.46±0.02 | 1.69±0.06 |
| 161 | AP-161 | Maldah | Maldah, WB | 1.49±0.04 | 0.16±0.00 | 0.77±0.02 | 0.34±0.01 | 2.75±0.07 |
| 162 | AP-162 | Taktipur | Murshidabad, WB | 0.54±0.02 | 0.10±0.00 | 0.35±0.01 | 0.32±0.01 | 1.31±0.04 |
| 163 | AP-163 | Asansol | Paschim Bardhaman, WB | 1.35±0.01 | 0.43±0.01 | 0.55±0.02 | 1.00±0.04 | 3.33±0.08 |
| 164 | AP-164 | Bardhaman | Purba Bardhaman, WB | 2.48±0.11 | 0.34±0.01 | 0.55±0.01 | 1.15±0.05 | 4.52±0.18 |
| 165 | AP-165 | Kaliaganj | Uttar Dinajpur, WB | 0.74±0.03 | 0.32±0.01 | 0.40±0.01 | 0.56±0.02 | 2.02±0.07 |
| 166 | AP-166 | Siliguri | Darjeeling, WB | 0.60±0.02 | 0.43±0.01 | 0.06±0.00 | 0.38±0.01 | 1.47±0.05 |

Data are presented as Mean ±SD (n=3), WB-West Bengal, AG=Andrographolide, NAG=Neoandrographolide, 14-DAG=14-deoxyandrographolide, 14-D-11,12-DIAP=14-deoxy-11,12-didehydroandrographolide, D=Diterpenoids, Sum of four D=(AG+NAG+14-DAG+14-D-11,12-DIAP)

Table S2

Linear range, regression equation, R2, LOD and LOQ of four standard bioactive compounds.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Component | Linear range (mg/L) | Regression equation | R2 | LOD (mg/L) | LOQ (mg/L) |
| Andrographolide | 10-80 | y = 38.07x + 0.12 | 0.999 | 1.99 | 6.03 |
| Neoandrographolide | 3.75-60 | y = 3.76x + 0.01 | 0.999 | 13.41 | 40.66 |
| 14-deoxyandrographolide | 6-48 | y = 8.99x + 0.02 | 0.999 | 4.75 | 14.41 |
| 14-deoxy-11,12-DIAP\* | 6-96 | y = 16.05x + 0.06 | 0.998 | 0.12 | 0.38 |

**\***14-deoxy-11,12-didehydroandrographolide.

y=Peak area, x= Concentration of the compound (mg/L).

R2 - Coefficient of determination

LOD-Limit of Detection

LOQ-Limit of Quantification

Table S3

Precision, stability and repeatability study of four bioactive compounds for method validation.

|  |  |  |  |
| --- | --- | --- | --- |
| Component | Precision (n=3) | Stability (n=3) | Repeatability (n=3) |
| RSD (%) | RSD (%) | RSD (%) |
| Andrographolide | 1.75 | 1.58 | 1.60 |
| Neoandrographolide | 1.43 | 1.88 | 1.10 |
| 14-deoxyandrographolide | 1.49 | 1.26 | 1.09 |
| 14-deoxy-11,12-DIAP\* | 1.85 | 1.16 | 0.98 |

**\***14-deoxy-11,12-didehydroandrographolide.

RSD-Relative Standard Deviation