

Exploring HPLC-mapped variations of marker compounds in commercially cultivated *Withania somnifera* from Andhra Pradesh, India

A. Niranjana Kumar¹, G. Harika², J. Kotes Kumar^{1*}, KVNS Srinivas^{1*}, Channayya Hiremath³, M. Vijay Kumar¹, S. Nagaraju¹, Pramod Kumar¹ and M. Bhagavan Raju²

¹Phytochemistry Division, CSIR-Central Institute of Medicinal and Aromatic Plants, Research Centre, Boduppal, Hyderabad 500092, India

²Sri Venkateshwara College of Pharmacy, Hyderabad 500081, India

³CSIR - Central Institute of Medicinal and Aromatic Plants, Research Centre, Bangalore 560065, India

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Supplementary Tables

Table S1 — Latitude, Longitude of Cultivars

S No	Name of the farmer	Address	GPS Location of the crop
1	K. Lingoji Rao S/o Hanumantha Rao	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 25' 54.8" Longitude: E 77° 18' 14.6" Altitude: 389m
2	N. Naga Raju S/o Dhanunjaya	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 25' 26.3" Longitude: E 77° 16' 12.3" Altitude: 381m
3	K. Ramanjan S/o Naga Raju	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 49.6" Longitude: E 77° 16' 18.7" Altitude: 392m
4	Thalari Venkata Ramudu S/o Venkatappa	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 31.5" Longitude: E 77° 24' 18.9" Altitude: 371m
5	Kurugudu Krishna Murthi S/o Eranna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 31.5" Longitude: E 77° 24' 21.2" Altitude: 367m
6	D. Lalappa S/o Dasthagiri	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 44.8" Longitude: E 77° 23' 30.8" Altitude: 358m
7	Bangari Linganna S/o Naganna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 43.6" Longitude: E 77° 23' 29.4" Altitude: 358m
8	Bangari Eranna S/o Hanumanth	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 40.8" Longitude: E 77° 23' 27.4" Altitude: 357m
9	Bangari Sanjappa S/o Nownapati	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 38.4" Longitude: E 77° 23' 25.7" Altitude: 358m
10	D. Parukulla Shekaranna S/o Husain	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 34.9" Longitude: E 77° 24' 4.5" Altitude: 368m
11	M. Naga Raju S/o Navenipati	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 33.8" Longitude: E 77° 23' 22.4" Altitude: 366m

12	P. Erraswamy S/o Sanjanna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 31.1" Longitude: E 77° 23' 20.5" Altitude: 368m
13	K. Pandari S/o Sanjeeva Raidu	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 27.8" Longitude: E 77° 23' 18.2" Altitude: 372m
14	A. Rajesh S/o Hanuppa	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 62.3" Longitude: E 77° 29' 12.2" Altitude: 365m
15	P. Pakerappa S/o Ramappa	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 68.7" Longitude: E 77° 26' 32.6" Altitude: 362m
16	Bangaru Thimmappa S/o Narayana	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 51.3" Longitude: E 77° 23' 35.1" Altitude: 358m
17	Sigili Ramulu S/o Thayyanna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 52.7" Longitude: E 77° 23' 36.1" Altitude: 355m
18	Pinjari Dasthagiri S/o Dugiri	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 54.7" Longitude: E 77° 23' 37.1" Altitude: 356m
19	Hotel Babu S/o Hussenperry	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 56.6" Longitude: E 77° 23' 37.8" Altitude: 357m
20	Pal Thimmappa S/o Ramanna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 23' 58.5" Longitude: E 77° 23' 38.6" Altitude: 355m
21	D. Shekshavali S/o Zelesaheb	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 1.9" Longitude: E 77° 23' 40.0" Altitude: 359m
22	P. Rama Rao S/o Rangaswamy	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	Latitude: N15° 24' 3.9" Longitude: E 77° 23' 40.9" Altitude: 363m
23	H. Eranna S/o Petanna	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 20.7" Longitude: E 77° 19' 51.9" Altitude: 343m
24	K. Linganna S/o Sunkanna	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 15.8" Longitude: E 77° 19' 51.9" Altitude: 365m
25	Bangaru Ramanna S/o Somalingappa	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 17.4" Longitude: E 77° 19' 52.2" Altitude: 376m
26	Chavitlo Maldanna S/o Hanumanthappa	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 19.1" Longitude: E 77° 19' 51.5" Altitude: 366m
27	C. Laxminarayana S/o Ranganna	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 20.2" Longitude: E 77° 19' 56.2" Altitude: 342m
28	L. Venugopal Reddy S/o L P Hanimi Reddy	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 9' 52.5" Longitude: E 77° 20' 42.8" Altitude: 362m
29	L. Vijaya W/o Venugopal Reddy	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 9' 52.4" Longitude: E 77° 20' 45.0" Altitude: 359m
30	Thammineni Raghavendra S/o Katavanga Naidu	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 10' 13.4" Longitude: E 77° 20' 17.5" Altitude: 349m

31	T. Madhusudhan S/o Sesham Naidu	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 10' 14.6" Longitude: E 77° 20' 17.1" Altitude: 336m
32	G. Gopal Naidu S/o Rangaiah	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 9' 9.1" Longitude: E 77° 19' 46.2" Altitude: 358m
33	Ganne Chaitanya S/o Ramanjaneyulu	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 9' 10.8" Longitude: E 77° 19' 50.5" Altitude: 363m
34	Ganne Ramanjaneyulu S/o Rangaiah	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	Latitude: N15° 9' 9.8" Longitude: E 77° 20' 10.6" Altitude: 354m
35	Uppara Ramudu S/o Narasappa	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 15' 35.7" Longitude: E 77° 24' 54.6" Altitude: 393m
36	Uppara Shiva Kumar S/o Ramudu	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 15' 33.6" Longitude: E 77° 24' 57.5" Altitude: 390m
37	Patthikonda Nagaiah S/o Raja	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 15' 6.5" Longitude: E 77° 24' 59.0" Altitude: 382m
38	M. Srinivasulu Reddy S/o Basi Reddy	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	Latitude: N14° 51' 17.1" Longitude: E 78° 1' 40.8" Altitude: 156m
39	M. Gopal Reddy S/o Bssi Reddy	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	Latitude: N14° 50' 55.8" Longitude: E 78° 1' 36.2" Altitude: 143m
40	Prabhakar Reddy S/o Linga Reddy	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	Latitude: N14° 50' 46.6" Longitude: E 78° 1' 29.9" Altitude: 141m
41	Y. Amarnath Reddy S/o Ankhal Reddy	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 47' 24.0" Longitude: E 78° 1' 57.7" Altitude: 155m
42	T. Savitri W/o Konda Reddy	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 46' 38.9" Longitude: E 78° 2' 13.9" Altitude: 159m
43	G. Venkateshwara Reddy S/o Shiva Reddy	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 46' 34.7" Longitude: E 78° 2' 29.6" Altitude: 157m
44	N. Prasad S/o Venkata Ramana	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 47' 24.6" Longitude: E 78° 2' 28.4" Altitude: 158m
45	Shiva Reddy	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 47' 23.9" Longitude: E 78° 2' 28.5" Altitude: 153m
46	A. Rajagopal Reddy S/o Vengal Reddy	Chinna Poppur (Village) Pedda Poppur (Mandal) Anantapur (Dist), AP.	Latitude: N14° 56' 51.2" Longitude: E 77° 52' 41.8" Altitude: 168m
47	Dr. Nagarjuna	Narapuram (Village) Thadipatri (Mandal) Anantapur (Dist), AP.	Latitude: N14° 57' 4.6" Longitude: E 77° 53' 7.9" Altitude: 165m
48	Y. Rama Maddileti S/o Rama Krishna	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 53.0" Longitude: E 77° 57' 15.0" Altitude: 157m
49	Swamy Krishna S/o Maddileti	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 52.6" Longitude: E 77° 57' 17.2" Altitude: 159m

50	Shiva Laxmammha W/o Rama Krishna	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 50.4" Longitude: E 77° 57' 17.5" Altitude: 157m
51	Rami Reddy S/o Chinna Pulla Reddy	Kandhi Kapula (Village) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 51' 3.8" Longitude: E 77° 57' 27.8" Altitude: 159m
52	Sridhar S/o Chinna Pulla Reddy	Kandhi Kapula (Village) Putluru (Mandal) Anantapur (Dist), AP.	Latitude: N14° 51' 2.3" Longitude: E 77° 57' 22.0" Altitude: 156m
53	Narasammha W/o Bolukonda	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N14° 5' 52.3" Longitude: E 77° 9' 49.8" Altitude: 374m
54	K. Erriswamy S/o Rudhrappa	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N15° 5' 41.8" Longitude: E 77° 10' 12.6" Altitude: 374m
55	K. Venkatesh	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N15° 5' 53.0" Longitude: E 77° 9' 55.5" Altitude: 368m
56	Purushotham	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N15° 6' 3.3" Longitude: E 77° 8' 40.0" Altitude: 379m
57	Mangala Gangadhar S/o Gundappa	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N15° 6' 2.4" Longitude: E 77° 8' 41.0" Altitude: 376m
58	Somannadora Desai S/o Siddaramappa	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	Latitude: N15° 6' 28.4" Longitude: E 77° 9' 40.5" Altitude: 363m
59	N. Suresh S/o Devendharappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 18.1" Longitude: E 77° 8' 34.9" Altitude: 364m
60	G. K. Eerappa S/o Ramanna	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 48' 36.9" Longitude: E 77° 8' 43.2" Altitude: 368m
61	Suggalappari Erriswamy S/o Eerappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 48' 23.2" Longitude: E 77° 12' 48.3" Altitude: 365m
62	Gaduputi Papanna S/o Thippanna	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 19.1" Longitude: E 77° 8' 30.0" Altitude: 367m
63	Gaduputi Lalmohan S/o Chandranna	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 19.8" Longitude: E 77° 8' 28.6" Altitude: 367m
64	G. Venkatesh S/o Ramdas	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 49' 49.1" Longitude: E 77° 7' 49.6" Altitude: 371m
65	G. Rupa W/o Anil Kumar	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 49' 49.0" Longitude: E 77° 7' 48.0" Altitude: 372m
66	G. Venkata Swamy S/o Venkronappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 11.8" Longitude: E 77° 7' 53.4" Altitude: 363m
67	N. Ravi S/o Bhemannna	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 6.6" Longitude: E 77° 8' 22.9" Altitude: 372m
68	N. Ramanna S/o Hummhanna	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 3.5" Longitude: E 77° 8' 22.3" Altitude: 369m

69	N. Senappa S/o Chinna Venkata Ramanappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 9.9" Longitude: E 77° 8' 22.6" Altitude: 367m
70	N. Sai Prasad S/o N C Ramappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 51' 15.5" Longitude: E 77° 9' 15.9" Altitude: 374m
71	G. Ramanjaneyulu S/o G C Hanumanthappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 51' 46.0" Longitude: E 77° 9' 1.3" Altitude: 389m
72	G S Parvathi W/o Lalappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 51' 7.5" Longitude: E 77° 9' 2.3" Altitude: 371m
73	N. Shiva Prasad S/o Chinna Venkata Ramanappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 50' 59.2" Longitude: E 77° 9' 3.6" Altitude: 377m
74	Nallabethu Rama Lingamma W/o Chinna Ramappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 53' 72.6" Longitude: E 77° 14' 36.8" Altitude: 372m
75	N. Chandra Sekhar S/o Chinna Venkata Ramanappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 45' 65.3" Longitude: E 77° 15' 41.2" Altitude: 375m
76	N. Laxmi W/o Srinivasulu	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 37' 35.4" Longitude: E 77° 8' 6.9" Altitude: 375m
77	N. Anuradha W/o Shiva Prasad	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 37' 43.2" Longitude: E 77° 17' 9.6" Altitude: 372m
78	N. Krishna Babu S/o Verappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 15' 37.9" Longitude: E 77° 12' 19.3" Altitude: 370m
79	N. Jeevan Kumar S/o Srinivasulu	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 25' 36.3" Longitude: E 77° 51' 6.8" Altitude: 372m
80	N. Vishwanath S/o Ramappa	N. Hanumapuram (Village) Kaneikal (Mandal) Anantapur (Dist), AP.	Latitude: N14° 32' 51.3" Longitude: E 77° 6' 32.4" Altitude: 377m
81	Boya Pedda Anjaneya S/o Ramanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 22' 6.2" Longitude: E 77° 28' 46.8" Altitude: 363m
82	Done Kesanna S/o Chinna Nagappa	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 22' 5.7" Longitude: E 77° 28' 46.2" Altitude: 368m
83	Gaggi Balappa S/o Govindhappa	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 22' 3.3" Longitude: E 77° 28' 45.8" Altitude: 369m
84	Gorla Adinarayana S/o Muniyappa	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 22' 3.5" Longitude: E 77° 28' 46.5" Altitude: 355m
85	Gorla Hanumantaiah S/o Hanumanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 22' 3.2" Longitude: E 77° 28' 46.2" Altitude: 355m
86	Chintaginjala Rama Krishna S/o Sunkanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 19' 56.9" Longitude: E 77° 28' 42.6" Altitude: 378m
87	Gorla Padmavathi S/o Kesanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 19' 56.4" Longitude: E 77° 28' 42.0" Altitude: 373m

88	Gajji Vannorappa S/o Thimmanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 19' 56.0" Longitude: E 77° 28' 42.1" Altitude: 374m
89	Gorla Venkatesh S/o Moganna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 19' 55.8" Longitude: E 77° 28' 41.5" Altitude: 376 m
90	Gorla Nageshwarappa S/o Kesanna	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 3.8" Longitude: E 77° 28' 43.3" Altitude: 376 m
91	Mandhakal Gaddamida S/o Narayana	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 8.0" Longitude: E 77° 28' 42.9" Altitude: 378 m
92	J. Venkata Narayana S/o Chinna Venkatesh	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 16.7" Longitude: E 77° 28' 41.3" Altitude: 374 m
93	B. Srinivasa Rao S/o Pedda Govindhappa	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 20' 46.3" Longitude: E 77° 28' 42.5" Altitude: 380 m
94	Gosi Sreeramulu S/o Nageshwarappa	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 20' 2.9" Longitude: E 77° 28' 42.8" Altitude: 374 m
95	J. Bhasker S/o Venkatesh	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 20' 31.1" Longitude: E 77° 28' 33.3" Altitude: 377 m
96	J. Ramudu S/o Venkatesh	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 18.7" Longitude: E 77° 28' 40.4" Altitude: 374 m
97	Gajji Pedda Kasinath S/o Venkateshwarlu	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 33.0" Longitude: E 77° 28' 36.6" Altitude: 372 m
98	Hanumanna Ramanjini S/o Mandhakallu	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 36.9" Longitude: E 77° 28' 38.6" Altitude: 370 m
99	Obulapatti S/o Narayana	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 40.7" Longitude: E 77° 28' 39.4" Altitude: 361m
100	Gongala Srinivasulu S/o Venkatesh	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 42.0" Longitude: E 77° 28' 39.8" Altitude: 360 m
101	Kosiga Mallikarjuna S/o Pulikonda	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 43.7" Longitude: E 77° 28' 40.1" Altitude: 357 m
102	Vemuru Chandraiah S/o Thimmappa	Ramachandrapuram (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 0.7" Longitude: E 77° 29' 44.3" Altitude: 380 m
103	Kumma Kistappa S/o Powlappa	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 50' 48.2" Longitude: E 78° 9' 5.2" Altitude: 336 m
104	Sheshadrigari Ramakrishna S/o Mookanna	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 50' 12.2" Longitude: E 77° 9' 13.6" Altitude: 345 m
105	M. Shank Rappa S/o Narasappa	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 50' 35.4" Longitude: E 77° 9' 42.8" Altitude: 339 m
106	Sheshadrigari Siddaramappa S/o Mookanna	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	Latitude: N15° 50' 16.7" Longitude: E 77° 9' 31.5" Altitude: 338 m

107	S. Pandu S/o Ramappa	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 21' 17.6" Longitude: E 77° 9' 0.9" Altitude: 344 m
108	K. Shankarayya S/o Peddabajarappa	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 17' 45.8" Longitude: E 77° 8' 53.9" Altitude: 341 m
109	K. Anand S/o Anjaneyulu	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 17' 48.2" Longitude: E 77° 9' 5.2" Altitude: 336 m
110	Suri Mallapha S/o Gadi Lingappa	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 17' 47.9" Longitude: E 77° 9' 13.3" Altitude: 337 m
111	Suri Madadevi W/o Mallappa	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	Latitude: N15° 16' 36.2" Longitude: E 77° 12' 14.9" Altitude: 335 m
112	K.R Madhusudhan Reddy S/o Ranga Reddy	Kadivelli (Vill) Yemmiganur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 39' 45.6" Longitude: E 77° 36' 65.3" Altitude: 359 m
113	G. Raja Sekhar S/o Basavaraju	Kotakallu (Vill) Yemmiganur (Mandal) Kurnool (Dist), AP.	Latitude: N15° 45' 63.2" Longitude: E 77° 31' 48.3" Altitude: 362 m
114	Mandela Hanumanthayya S/o Mallaiah	Dhone Kurnool (Dist), AP.	Latitude: N15° 24' 2.5" Longitude: E 77° 51' 59.5" Altitude: 327 m

Table S2 — Collection of root samples in Kurnool district

S No	Mandals Covered	Villages Covered	Collection Sample Code	Collected sample
1	Alur	Peddahottur and Molagavalli	1, 2, 3, 23, 24, 25, 26 and 27	8
2	Aspiri	Joharapuram	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 116, 117, 118, 119, 120, 121, 122, 123, 124 and 125	30
3	Maddikera	Maddikera	35, 36 and 37	3
4	Patthikonda	Putchakayalamada and Ramachandrapuram	81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101 and 102	22
5	Holagunda	Lingadahalli	103, 104, 105 and 106	4
6	Halaharvi	Halaharvi	107, 108, 109, 110 and 111	5
7	Yemmiganur	Kadivelli and Kotakallu	112 and 113	2
8	Dhone	Dhone	114	1
Total				75

Table S3 — RP-HPLC Analysis Results

S No	Name of the farmer & Phone Number	Address	Percentage (%)				
			Withanoside IV	Withanoside V	Withaferin A	Withanolide A	Withanone
1	K. Lingoji Rao S/o Hanumantha Rao Ph: 9959036450	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0665 (± 0.016)	0.0324 (± 0.013)	0.0190 (± 0.013)	0.0411 (± 0.012)	0.0022 (± 0.002)
2	N. Naga Raju S/o Dhanunjaya Ph: 8790040227	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0625 (± 0.012)	0.0155 (± 0.006)	0.0146 (± 0.011)	0.0435 (± 0.015)	0.0063 (± 0.004)
3	K. Ramanjan S/o Naga Raju Ph: 9666125013	Peddahottur (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0504 (± 0.010)	0.0109 (± 0.010)	0.0096 (± 0.006)	0.0204 (± 0.011)	0.0033 (± 0.002)
4	Thalari Venkata Ramudu S/o Venkatappa Ph: 6304633615	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0685 (± 0.015)	0.0171 (± 0.009)	0.0297 (± 0.012)	0.0390 (± 0.017)	0.0023 (± 0.002)

5	Kurugudu Krishna Murthi S/o Eranna Ph: 7815804541	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0160 (\pm 0.005)	0.0126 (\pm 0.007)	0.0186 (\pm 0.007)	0.0529 (\pm 0.014)	0.0053 (\pm 0.004)
6	D. Lalappa S/o Dasthagiri	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0554 (\pm 0.014)	0.0145 (\pm 0.006)	0.0190 (\pm 0.006)	0.0422 (\pm 0.012)	0.0035 (\pm 0.003)
7	Bangari Linganna S/o Naganna Ph: 9849026635	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0596 (\pm 0.012)	0.0184 (\pm 0.010)	0.0310 (\pm 0.012)	0.0447 (\pm 0.015)	0.0102 (\pm 0.009)
8	Bangari Eranna S/o Hanumanth Ph: 9963322502	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0452 (\pm 0.015)	0.0192 (\pm 0.012)	0.0325 (\pm 0.011)	0.0424 (\pm 0.016)	0.0023 (\pm 0.002)
9	Bangari Sanjappa S/o Nownapati Ph: 9000070906	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0618 (\pm 0.012)	0.0216 (\pm 0.011)	0.0261 (\pm 0.013)	0.0368 (\pm 0.012)	0.0054 (\pm 0.003)
10	D. Parukulla Shekaranna S/o Husain	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0600 (\pm 0.011)	0.0265 (\pm 0.015)	0.0222 (\pm 0.010)	0.0433 (\pm 0.013)	0.0093 (\pm 0.005)
11	M. Naga Raju S/o Navenipati Ph: 6303873514	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0796 (\pm 0.018)	0.0324 (\pm 0.012)	0.0375 (\pm 0.011)	0.0520 (\pm 0.011)	0.0018 (\pm 0.002)
12	P. Erraswamy S/o Sanjanna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0240 (\pm 0.011)	0.0124 (\pm 0.007)	0.0326 (\pm 0.011)	0.0617 (\pm 0.015)	0.0007 (\pm 0.001)
13	K. Pandari S/o Sanjeeva Raidu Ph: 9963254373	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0682 (\pm 0.013)	0.0185 (\pm 0.012)	0.0375 (\pm 0.011)	0.0521 (\pm 0.013)	0.0025 (\pm 0.003)
14	A. Rajesh S/o Hanappa Ph: 9959326009	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0358 (\pm 0.012)	0.0161 (\pm 0.011)	0.0357 (\pm 0.010)	0.0440 (\pm 0.012)	0.0089 (\pm 0.005)
15	P. Pakerappa S/o Ramappa Ph: 8179908734	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0960 (\pm 0.016)	0.0183 (\pm 0.009)	0.0314 (\pm 0.013)	0.0455 (\pm 0.013)	0.0009 (\pm 0.001)
16	Bangaru Thimmappa S/o Narayana	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0612 (\pm 0.012)	0.0161 (\pm 0.011)	0.0371 (\pm 0.011)	0.0419 (\pm 0.011)	0.0123 (\pm 0.006)
17	Sigili Ramulu S/o Thayyanna	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0279 (\pm 0.013)	0.0280 (\pm 0.010)	0.0416 (\pm 0.013)	0.0485 (\pm 0.012)	0.0264 (\pm 0.014)
18	Pinjari Dasthagiri S/o Dusgiri	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0351 (\pm 0.013)	0.0299 (\pm 0.010)	0.0362 (\pm 0.010)	0.0447 (\pm 0.018)	0.0012 (\pm 0.002)
19	Hotel Babu S/o Husseperu	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0843 (\pm 0.015)	0.0352 (\pm 0.012)	0.0347 (\pm 0.012)	0.0468 (\pm 0.012)	0.0020 (\pm 0.002)
20	Pal Thimmappa S/o Ramanna Ph: 6304633615	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0820 (\pm 0.015)	0.0292 (\pm 0.012)	0.0292 (\pm 0.011)	0.0412 (\pm 0.011)	0.0043 (\pm 0.003)
21	D. Shekshavali S/o Zelesaheb Ph: 9908562841	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0575 (\pm 0.015)	0.0233 (\pm 0.009)	0.0325 (\pm 0.012)	0.0403 (\pm 0.012)	0.0098 (\pm 0.005)
22	P. Rama Rao S/o Rangaswamy	Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), AP.	0.0426 (\pm 0.016)	0.0151 (\pm 0.006)	0.0347 (\pm 0.011)	0.0301 (\pm 0.012)	0.0034 (\pm 0.003)
23	H. Eranna S/o Petanna Ph: 9705452017	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0570 (\pm 0.014)	0.0111 (\pm 0.004)	0.0225 (\pm 0.009)	0.0370 (\pm 0.010)	0.0069 (\pm 0.005)
24	K. Linganna S/o Sunkanna Ph: 9010424642	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0484 (\pm 0.013)	0.0154 (\pm 0.007)	0.0205 (\pm 0.011)	0.0285 (\pm 0.012)	0.0018 (\pm 0.002)

25	Bangaru Ramanna S/o Somalingappa Ph: 9652835626	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0324 (\pm 0.015)	0.0106 (\pm 0.004)	0.0226 (\pm 0.011)	0.0368 (\pm 0.013)	0.0034 (\pm 0.003)
26	Chavitlo Maldanna S/o Hanumanthappa Ph: 9493115360	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0321 (\pm 0.013)	0.0084 (\pm 0.002)	0.0107 (\pm 0.006)	0.0368 (\pm 0.015)	0.0035 (\pm 0.003)
27	C. Laxminarayana S/o Ranganna	Molagavalli (Village) Alur (Mandal) Kurnool (Dist), AP.	0.0260 (\pm 0.012)	0.0118 (\pm 0.003)	0.0230 (\pm 0.011)	0.0463 (\pm 0.013)	0.0031 (\pm 0.003)
28	L. Venugopal Reddy S/o L P Hanimi Reddy Ph: 9177527991	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0364 (\pm 0.011)	0.0160 (\pm 0.004)	0.0341 (\pm 0.013)	0.0333 (\pm 0.011)	0.0057 (\pm 0.005)
29	L. Vijaya W/o Venugopal Reddy Ph: 7675046342	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0249 (\pm 0.012)	0.0178 (\pm 0.005)	0.0351 (\pm 0.011)	0.0406 (\pm 0.014)	0.0032 (\pm 0.002)
30	Thammineni Raghavendra S/o Katavanga Naidu Ph: 9490013789	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0326 (\pm 0.016)	0.0104 (\pm 0.005)	0.0279 (\pm 0.011)	0.0239 (\pm 0.010)	0.0053 (\pm 0.005)
31	T. Madhusudhan S/o Sesham Naidu Ph: 9963409015	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0479 (\pm 0.013)	0.0141 (\pm 0.005)	0.0246 (\pm 0.009)	0.0369 (\pm 0.013)	0.0056 (\pm 0.004)
32	G. Gopal Naidu S/o Rangaiah Ph: 9666255409	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0595 (\pm 0.012)	0.0144 (\pm 0.005)	0.0327 (\pm 0.012)	0.0425 (\pm 0.015)	0.0072 (\pm 0.004)
33	Ganne Chaitanya S/o Ramanjaneyulu Ph: 9959556044	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0393 (\pm 0.012)	0.0145 (\pm 0.004)	0.0187 (\pm 0.009)	0.0333 (\pm 0.012)	0.0032 (\pm 0.002)
34	Ganne Ramanjaneyulu S/o Rangaiah Ph: 9502683400	G. Kottala (Village) Guntakal (Mandal) Anantapur (Dist), AP.	0.0425 (\pm 0.015)	0.0161 (\pm 0.006)	0.0203 (\pm 0.009)	0.0437 (\pm 0.013)	0.0024 (\pm 0.002)
35	Uppara Ramudu S/o Narasappa Ph: 9398614246	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	0.0661 (\pm 0.015)	0.0187 (\pm 0.005)	0.0319 (\pm 0.014)	0.0416 (\pm 0.012)	0.0024 (\pm 0.002)
36	Uppara Shiva Kumar S/o Ramudu Ph: 9652845165	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	0.0763 (\pm 0.021)	0.0235 (\pm 0.010)	0.0390 (\pm 0.012)	0.0408 (\pm 0.013)	0.0077 (\pm 0.004)
37	Patthikonda Nagaiah S/o Raja	Maddikera (Vill & Mandal) Kurnool (Dist), AP.	0.1240 (\pm 0.099)	0.0268 (\pm 0.010)	0.0584 (\pm 0.013)	0.0568 (\pm 0.015)	0.0046 (\pm 0.004)
38	M. Srinivasulu Reddy S/o Basi Reddy Ph: 9701263515	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	0.0459 (\pm 0.020)	0.0148 (\pm 0.005)	0.0119 (\pm 0.004)	0.0468 (\pm 0.011)	0.0099 (\pm 0.005)
39	M. Gopal Reddy S/o Bssi Reddy Ph: 9505855404	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	0.0374 (\pm 0.013)	0.0053 (\pm 0.004)	0.0108 (\pm 0.003)	0.0400 (\pm 0.013)	0.0077 (\pm 0.004)
40	Prabhakar Reddy S/o Linga Reddy	Gandlapadu (Village) Thadipatri (Taluk) Anantapur (Dist), AP.	0.0927 (\pm 0.016)	0.0191 (\pm 0.009)	0.0473 (\pm 0.015)	0.0637 (\pm 0.015)	0.0008 (\pm 0.001)
41	Y. Amarnath Reddy S/o Ankhali Reddy Ph: 9010843578	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	0.0506 (\pm 0.010)	0.0098 (\pm 0.004)	0.0012 (\pm 0.001)	0.0419 (\pm 0.014)	0.0012 (\pm 0.001)
42	T. Savitri W/o Konda Reddy	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), A.P.	0.0434 (\pm 0.015)	0.0166 (\pm 0.008)	0.0198 (\pm 0.012)	0.0340 (\pm 0.015)	0.0010 (\pm 0.001)
43	G. Venkateshwara Reddy S/o Shiva Reddy Ph: 9440052498	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	0.0348 (\pm 0.014)	0.0143 (\pm 0.007)	0.0207 (\pm 0.010)	0.0319 (\pm 0.015)	0.0039 (\pm 0.002)

44	N. Prasad S/o Venkata Ramana Ph: 6300674249	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	0.0635 (\pm 0.014)	0.0158 (\pm 0.006)	0.0266 (\pm 0.011)	0.0421 (\pm 0.012)	0.0063 (\pm 0.004)
45	Shiva Reddy Ph: 9440052498	C. Venkateshwarpally (Vill) Putluru (Mandal) Anantapur (Dist), AP.	0.0150 (\pm 0.002)	0.0104 (\pm 0.004)	0.0133 (\pm 0.005)	0.0397 (\pm 0.010)	0.0043 (\pm 0.004)
46	A. Rajagopal Reddy S/o Vengal Reddy Ph: 7997027517	Chinna Poppur (Village) Pedda Poppur (Mandal) Anantapur (Dist), AP.	0.0397 (\pm 0.014)	0.0132 (\pm 0.004)	0.0308 (\pm 0.010)	0.0571 (\pm 0.013)	0.0078 (\pm 0.005)
47	Dr. Nagarjuna Ph: 9959891291	Narapuram (Village) Thadipatri (Mandal) Anantapur (Dist), AP.	0.0454 (\pm 0.014)	0.0130 (\pm 0.005)	0.0167 (\pm 0.007)	0.0430 (\pm 0.014)	0.0037 (\pm 0.002)
48	Y. Rama Maddileti S/o Rama Krishna Ph: 9951910042	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	0.0429 (\pm 0.015)	0.0090 (\pm 0.004)	0.0152 (\pm 0.012)	0.0517 (\pm 0.013)	0.0024 (\pm 0.002)
49	Swamy Krishna S/o Maddileti Ph: 8142961074	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	0.0464 (\pm 0.014)	0.0138 (\pm 0.005)	0.325 (\pm 0.043)	0.0519 (\pm 0.016)	0.0054 (\pm 0.004)
50	Shiva Laxmammha W/o Rama Krishna Ph: 9553116646	Gudipadu (Village) Yadiki (Mandal) Anantapur (Dist), AP.	0.0295 (\pm 0.011)	0.0053 (\pm 0.003)	0.0080 (\pm 0.002)	0.0499 (\pm 0.011)	0.0078 (\pm 0.004)
51	Rami Reddy S/o Chinna Pulla Reddy Ph: 9505441166	Kandhi Kapula (Village) Putluru (Mandal) Anantapur (Dist), AP.	0.0219 (\pm 0.011)	0.0087 (\pm 0.003)	0.0141 (\pm 0.011)	0.0387 (\pm 0.014)	0.0033 (\pm 0.003)
52	Sridhar S/o Chinna Pulla Reddy Ph: 9505441166	Kandhi Kapula (Village) Putluru (Mandal) Anantapur (Dist), AP.	0.0235 (\pm 0.012)	0.0078 (\pm 0.004)	0.0096 (\pm 0.002)	0.0411 (\pm 0.013)	0.0068 (\pm 0.004)
53	Narasammha W/o Bolukonda	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0429 (\pm 0.014)	0.0165 (\pm 0.006)	0.0303 (\pm 0.012)	0.0369 (\pm 0.013)	0.0053 (\pm 0.004)
54	K. Erriswamy S/o Rudhrappa Ph: 9908727398	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0176 (\pm 0.004)	0.0112 (\pm 0.005)	0.0170 (\pm 0.004)	0.0473 (\pm 0.011)	0.0033 (\pm 0.003)
55	K. Venkatesh	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0725 (\pm 0.016)	0.0175 (\pm 0.005)	0.0374 (\pm 0.011)	0.0352 (\pm 0.013)	0.0101 (\pm 0.005)
56	Purushotham	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0100 (\pm 0.010)	0.0203 (\pm 0.010)	0.0217 (\pm 0.011)	0.0403 (\pm 0.014)	0.0062 (\pm 0.003)
57	Mangala Gangadhar S/o Gundappa	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0438 (\pm 0.016)	0.0190 (\pm 0.009)	0.0358 (\pm 0.011)	0.0581 (\pm 0.018)	0.0105 (\pm 0.005)
58	Somannadora Desai S/o Siddaramappa Ph: 9908727398	Vidapankal (Vill & Mandal) Uravakonda (Taluk) Anantapur (Dist), AP.	0.0437 (\pm 0.015)	0.0172 (\pm 0.007)	0.0295 (\pm 0.010)	0.0423 (\pm 0.013)	0.0013 (\pm 0.001)
59	N. Suresh S/o Devendharappa Ph: 9000261385	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0445 (\pm 0.016)	0.0062 (\pm 0.004)	0.0255 (\pm 0.011)	0.0532 (\pm 0.014)	0.0014 (\pm 0.001)
60	G. K. Eerappa	N. Hanumapuram	0.0636 (\pm 0.012)	0.0176 (\pm 0.008)	0.0235 (\pm 0.013)	0.0454 (\pm 0.014)	0.0048 (\pm 0.003)

	S/o Ramanna Ph: 8008762958	(Village) Kanekal (Mandal) Anantapur (Dist), AP.						
61	Suggalappari Erriswamy S/o Eerappa Ph: 9963424012	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0163 (\pm 0.003)	0.0116 (\pm 0.006)	0.0153 (\pm 0.007)	0.0377 (\pm 0.013)	0.0068 (\pm 0.004)	
62	Gaduputi Papanna S/o Thippanna Ph: 9440058559	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0208 (\pm 0.011)	0.0076 (\pm 0.004)	0.0073 (\pm 0.003)	0.0451 (\pm 0.016)	0.0050 (\pm 0.003)	
63	Gaduputi Lalmohan S/o Chandranna Ph: 8328593150	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0497 (\pm 0.012)	0.0098 (\pm 0.004)	0.0147 (\pm 0.004)	0.0287 (\pm 0.012)	0.0088 (\pm 0.004)	
64	G. Venkatesh S/o Ramdas Ph: 9676430115	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0202 (\pm 0.010)	0.0039 (\pm 0.002)	0.0069 (\pm 0.003)	0.0402 (\pm 0.011)	0.0065 (\pm 0.003)	
65	G. Rupa W/o Anil Kumar Ph: 9353099993	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0269 (\pm 0.010)	0.0081 (\pm 0.004)	0.0126 (\pm 0.004)	0.0410 (\pm 0.010)	0.0038 (\pm 0.003)	
66	G. Venkata Swamy S/o Venkronappa Ph: 9989522664	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0378 (\pm 0.013)	0.0075 (\pm 0.003)	0.0142 (\pm 0.004)	0.0247 (\pm 0.011)	0.0012 (\pm 0.001)	
67	N. Ravi S/o Bhemanna Ph: 7780635412	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0730 (\pm 0.015)	0.0109 (\pm 0.006)	0.0252 (\pm 0.011)	0.0518 (\pm 0.014)	0.0099 (\pm 0.004)	
68	N. Ramanna S/o Hummhanna Ph: 6304686806	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0223 (\pm 0.013)	0.0157 (\pm 0.005)	0.0188 (\pm 0.005)	0.0467 (\pm 0.015)	0.0088 (\pm 0.007)	
69	N. Senappa S/o Chinna Venkata Ramanappa Ph: 9908627299	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0229 (\pm 0.011)	0.0163 (\pm 0.005)	0.0186 (\pm 0.006)	0.0413 (\pm 0.013)	0.0038 (\pm 0.002)	
70	N. Sai Prasad S/o N C Ramappa Ph: 9182486772	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0913 (\pm 0.014)	0.0391 (\pm 0.014)	0.0397 (\pm 0.010)	0.0578 (\pm 0.017)	0.0120 (\pm 0.005)	
71	G. Ramanjaneyulu S/o G C Hanumanthappa Ph: 9533965739	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0249 (\pm 0.012)	0.0116 (\pm 0.005)	0.0147 (\pm 0.004)	0.0458 (\pm 0.014)	0.0030 (\pm 0.001)	
72	G S Parvathi W/o Lalappa Ph: 8897498528	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0534 (\pm 0.014)	0.0116 (\pm 0.005)	0.0301 (\pm 0.011)	0.0604 (\pm 0.014)	0.0111 (\pm 0.005)	
73	N. Shiva Prasad S/o Chinna Venkata Ramanappa Ph: 8074114690	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0449 (\pm 0.015)	0.0181 (\pm 0.006)	0.0136 (\pm 0.005)	0.0446 (\pm 0.014)	0.0050 (\pm 0.003)	
74	Nallabethu Rama Lingamma W/o Chinna Ramappa Ph: 9963769909	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0445 (\pm 0.017)	0.0162 (\pm 0.004)	0.0165 (\pm 0.004)	0.0409 (\pm 0.010)	0.0020 (\pm 0.001)	
75	N. Chandra Sekhar S/o Chinna Venkata	N. Hanumapuram (Village)	0.0383 (\pm 0.013)	0.0101 (\pm 0.004)	0.0237 (\pm 0.012)	0.0468 (\pm 0.013)	0.0065 (\pm 0.003)	

	Ramanappa Ph: 9972470294	Kanekal (Mandal) Anantapur (Dist), AP.						
76	N. Laxmi W/o Srinivasulu Ph: 9908627299	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0248 (\pm 0.011)	0.0152 (\pm 0.005)	0.0110 (\pm 0.010)	0.0515 (\pm 0.014)	0.0089 (\pm 0.005)	
77	N. Anuradha W/o Shiva Prasad Ph: 9908627299	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0270 (\pm 0.011)	0.0094 (\pm 0.003)	0.0198 (\pm 0.009)	0.0471 (\pm 0.012)	0.0090 (\pm 0.007)	
78	N. Krishna Babu S/o Verappa Ph: 9652552031	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0649 (\pm 0.014)	0.0188 (\pm 0.005)	0.0245 (\pm 0.011)	0.0424 (\pm 0.014)	0.0033 (\pm 0.002)	
79	N. Jeevan Kumar S/o Srinivasulu Ph: 9640848504	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0497 (\pm 0.013)	0.0128 (\pm 0.005)	0.0132 (\pm 0.005)	0.0519 (\pm 0.011)	0.0049 (\pm 0.004)	
80	N. Vishwanath S/o Ramappa Ph: 9182486772	N. Hanumapuram (Village) Kanekal (Mandal) Anantapur (Dist), AP.	0.0420 (\pm 0.012)	0.0140 (\pm 0.005)	0.0296 (\pm 0.013)	0.0568 (\pm 0.015)	0.0015 (\pm 0.001)	
81	Boya Pedda Anjaneya S/o Ramanna Ph: 9347844909	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.2597 (\pm 0.108)	0.0453 (\pm 0.014)	0.0240 (\pm 0.012)	0.0295 (\pm 0.013)	0.0030 (\pm 0.002)	
82	Done Kesanna S/o Chinna Nagappa Ph: 7981048705	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1032 (\pm 0.042)	0.0258 (\pm 0.011)	0.0336 (\pm 0.011)	0.0549 (\pm 0.013)	0.0078 (\pm 0.004)	
83	Gaggi Balappa S/o Govindhappa Ph: 7095171411	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1028 (\pm 0.045)	0.0194 (\pm 0.011)	0.0282 (\pm 0.010)	0.0358 (\pm 0.012)	0.0050 (\pm 0.004)	
84	Gorla Adinarayana S/o Muniyappa Ph: 7330673373	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1280 (\pm 0.028)	0.0281 (\pm 0.011)	0.0261 (\pm 0.010)	0.0429 (\pm 0.014)	0.0056 (\pm 0.002)	
85	Gorla Hanumantiah S/o Hanumanna Ph: 9014010254	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0815 (\pm 0.016)	0.0157 (\pm 0.013)	0.0145 (\pm 0.005)	0.0363 (\pm 0.011)	0.0078 (\pm 0.003)	
86	Chintaginjala Rama Krishna S/o Sunkanna Ph: 9492946012	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0707 (\pm 0.013)	0.0140 (\pm 0.006)	0.0256 (\pm 0.011)	0.0373 (\pm 0.014)	0.0009 (\pm 0.001)	
87	Gorla Padmavathi S/o Kesanna Ph: 9949521812	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0743 (\pm 0.014)	0.0186 (\pm 0.006)	0.0182 (\pm 0.011)	0.0374 (\pm 0.016)	0.0082 (\pm 0.005)	
88	Gajji Vannorappa S/o Thimmanna Ph: 9963019625	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1326 (\pm 0.045)	0.0226 (\pm 0.013)	0.0142 (\pm 0.007)	0.0316 (\pm 0.013)	0.0048 (\pm 0.003)	
89	Gorla Venkatesh S/o Moganna Ph: 9000736350	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1051 (\pm 0.046)	0.0240 (\pm 0.010)	0.0340 (\pm 0.011)	0.0575 (\pm 0.016)	0.0023 (\pm 0.001)	
90	Gorla Nageshwarappa S/o Kesanna Ph: 8897887010	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0519 (\pm 0.015)	0.0176 (\pm 0.007)	0.0199 (\pm 0.011)	0.0492 (\pm 0.012)	0.0056 (\pm 0.004)	

91	Mandhakal Gaddamida S/o Narayana Ph: 7095880095	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0546 (\pm 0.012)	0.0122 (\pm 0.006)	0.0222 (\pm 0.012)	0.0413 (\pm 0.011)	0.0049 (\pm 0.004)
92	J. Venkata Narayana S/o Chinna Venkatesh Ph: 9959024977	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0543 (\pm 0.011)	0.0066 (\pm 0.003)	0.0117 (\pm 0.003)	0.0387 (\pm 0.011)	0.0074 (\pm 0.005)
93	B. Srinivasa Rao S/o Pedda Govindhappa Ph: 8106542302	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	----	0.0013 (\pm 0.005)	0.0237 (\pm 0.011)	0.0392 (\pm 0.013)	0.0047 (\pm 0.003)
94	Gosi Sreeramulu S/o Nageshwarappa Ph: 8897887010	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0343 (\pm 0.013)	0.0096 (\pm 0.004)	0.0223 (\pm 0.011)	0.0321 (\pm 0.014)	0.0011 (\pm 0.001)
95	J. Bhasker S/o Venkatesh Ph: 9652228050	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1203 (\pm 0.034)	0.0311 (\pm 0.012)	0.0231 (\pm 0.011)	0.0253 (\pm 0.011)	0.0042 (\pm 0.003)
96	J. Ramudu S/o Venkatesh Ph: 8897878025	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0196 (\pm 0.011)	0.0234 (\pm 0.011)	0.0308 (\pm 0.012)	0.0418 (\pm 0.012)	0.0079 (\pm 0.003)
97	Gajji Pedda Kasinath S/o Venkateshwarlu Ph: 9701031478	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0654 (\pm 0.013)	0.0381 (\pm 0.012)	0.0232 (\pm 0.010)	0.0447 (\pm 0.013)	0.0066 (\pm 0.004)
98	Hanumanna Ramanjini S/o Mandhakallu Ph: 8096516445	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0282 (\pm 0.012)	0.0153 (\pm 0.008)	0.0204 (\pm 0.009)	0.0401 (\pm 0.012)	0.0034 (\pm 0.002)
99	Obulapatti S/o Narayana Ph: 8247293222	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0989 (\pm 0.022)	0.0185 (\pm 0.007)	0.0222 (\pm 0.013)	0.0350 (\pm 0.014)	0.0052 (\pm 0.004)
100	Gongala Srinivasulu S/o Venkatesh Ph: 9642547958	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.1020 (\pm 0.042)	0.0076 (\pm 0.003)	0.0245 (\pm 0.011)	0.0502 (\pm 0.013)	0.0070 (\pm 0.003)
101	Kosiga Mallikarjuna S/o Pulikonda Ph: 8897887010	Putchakayalamada (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0472 (\pm 0.014)	0.0117 (\pm 0.005)	0.0132 (\pm 0.005)	0.0414 (\pm 0.013)	0.0043 (\pm 0.004)
102	Vemuru Chandraiah S/o Thimmappa Ph: 9912416541	Ramachandrapuram (Vill) Patthikonda (Mandal) Kurnool (Dist), AP.	0.0371 (\pm 0.013)	0.0184 (\pm 0.007)	0.0197 (\pm 0.011)	0.0502 (\pm 0.013)	0.0033 (\pm 0.002)
103	Kumma Kistappa S/o Powlappa Ph: 8106968304	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	0.0844 (\pm 0.012)	0.0113 (\pm 0.005)	0.0423 (\pm 0.014)	0.0483 (\pm 0.016)	0.0019 (\pm 0.001)
104	Sheshadrigari Ramakrishna S/o Mookanna Ph: 6301191491	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	0.0593 (\pm 0.011)	0.0118 (\pm 0.005)	0.0428 (\pm 0.013)	0.0527 (\pm 0.011)	0.0042 (\pm 0.005)
105	M. Shank Rappa S/o Narasappa Ph: 8374287633	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	0.0652 (\pm 0.015)	0.0185 (\pm 0.008)	0.0656 (\pm 0.013)	0.0623 (\pm 0.011)	0.0071 (\pm 0.003)
106	Sheshadrigari Siddaramappa S/o Mookanna Ph: 8501021165	Lingadahalli (Vill) Holagunda (Mandal) Kurnool (Dist), AP.	0.0537 (\pm 0.012)	0.0099 (\pm 0.003)	0.0378 (\pm 0.013)	0.0516 (\pm 0.012)	0.0077 (\pm 0.004)

107	S. Pandu S/o Ramappa Ph: 9121101636	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	0.1140 (\pm 0.030)	0.0895 (\pm 0.026)	0.1912 (\pm 0.066)	0.0866 (\pm 0.012)	0.0253 (\pm 0.013)
108	K. Shankarayya S/o Peddabajarappa Ph: 6301383936	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	0.0295 (\pm 0.011)	0.0264 (\pm 0.012)	0.0431 (\pm 0.013)	0.0762 (\pm 0.016)	0.0086 (\pm 0.004)
109	K. Anand S/o Anjaneyulu Ph: 9666022302	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	0.0219 (\pm 0.011)	0.0321 (\pm 0.014)	0.0467 (\pm 0.015)	0.0772 (\pm 0.015)	0.0099 (\pm 0.005)
110	Suri Mallappa S/o Gadi Lingappa Ph: 9703615543	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	0.0467 (\pm 0.013)	0.0477 (\pm 0.011)	0.1300 (\pm 0.045)	0.0768 (\pm 0.019)	0.0198 (\pm 0.011)
111	Suri Madadevi W/o Mallappa Ph: 9703615543	Halaharvi (Vill & Mandal) Kurnool (Dist), AP.	0.0514 (\pm 0.011)	0.0279 (\pm 0.014)	0.0745 (\pm 0.012)	0.0507 (\pm 0.013)	0.0009 (\pm 0.001)
112	K.R Madhusudhan Reddy S/o Ranga Reddy Ph: 9912024379	Kadivelli (Vill) Yemmiganur (Mandal) Kurnool (Dist), AP.	0.0532 (\pm 0.012)	0.0224 (\pm 0.012)	0.0210 (\pm 0.012)	0.0504 (\pm 0.013)	0.0008 (\pm 0.001)
113	G. Raja Sekhar S/o Basavaraju Ph: 9949237263	Kotakallu (Vill) Yemmiganur (Mandal) Kurnool (Dist), AP.	0.0541 (\pm 0.011)	0.0115 (\pm 0.005)	0.0243 (\pm 0.013)	0.0414 (\pm 0.013)	0.0019 (\pm 0.001)
114	Mandela Hanumanthayya S/o Malliah Ph: 9959113577	Dhone Kurnool (Dist), AP.	0.0367 (\pm 0.011)	0.0189 (\pm 0.006)	0.0198 (\pm 0.012)	0.0685 (\pm 0.011)	0.0018 (\pm 0.001)
115	Navanepati, S/O. Chinna Sunkann, Joharapuram.	Kurnool (Dist), AP.	0.0657 (\pm 0.015)	0.0203 (\pm 0.011)	0.0163 (\pm 0.005)	0.0172 (\pm 0.005)	0.0033 (\pm 0.002)
116	Sudarshan, S/O. Lobadhri Joharapuram	Kurnool (Dist), AP.	0.0713 (\pm 0.013)	0.0142 (\pm 0.006)	0.0178 (\pm 0.007)	0.0219 (\pm 0.012)	0.0019 (\pm 0.001)
117	P. Guru Swamy, S/O. Kistappa Joharapuram, Kurnol district	Kurnool (Dist), AP.	0.0415 (\pm 0.013)	0.0186 (\pm 0.011)	0.0213 (\pm 0.011)	0.0192 (\pm 0.008)	0.0039 (\pm 0.003)
118	L.Navanepati, S/O. Bheemanna Jojarapuram	Kurnool (Dist), AP.	0.0803 (\pm 0.019)	0.0248 (\pm 0.011)	0.0183 (\pm 0.010)	0.0180 (\pm 0.008)	0.0032 (\pm 0.002)
119	P. Rama Chandrappa, S/O. Navanepatappa Joharapuram	Kurnool (Dist), AP.	0.0627 (\pm 0.013)	0.0246 (\pm 0.011)	0.0209 (\pm 0.013)	0.0223 (\pm 0.011)	0.0030 (\pm 0.002)
120	Lobadhri. S/O. Sukalappa Joharapuram	Kurnool (Dist), AP.	1.0016 (\pm 0.196)	0.0364 (\pm 0.013)	0.0244 (\pm 0.011)	0.0202 (\pm 0.008)	0.0036 (\pm 0.003)
121	B. Soma Sundher, S/O. Chinna Veeranna Joharapuram	Kurnool (Dist), AP.	0.0817 (\pm 0.014)	0.0354 (\pm 0.013)	0.0274 (\pm 0.012)	0.0203 (\pm 0.012)	0.0052 (\pm 0.003)
122	B. Chandra Shekar, S/O. Chinna Sunkanna Joharapuram	Kurnool (Dist), AP.	0.1817 (\pm 0.040)	0.1097 (\pm 0.042)	0.0474 (\pm 0.011)	0.0163 (\pm 0.006)	0.0067 (\pm 0.004)
123	K. Rangappa S/O. Malliah Joharapuram	Kurnool (Dist), AP.	0.0625 (\pm 0.016)	0.0195 (\pm 0.011)	0.0146 (\pm 0.005)	0.0171 (\pm 0.006)	0.0020 (\pm 0.002)
124	Beerappagari Beerappa S/O. Chinna Sunkanna Joharapuram	Kurnool (Dist), AP.	0.0600 (\pm 0.011)	0.0217 (\pm 0.011)	0.0144 (\pm 0.005)	0.0172 (\pm 0.009)	0.0027 (\pm 0.002)
125	G. Venkatesh , S/O. Kasanna Joharapuram	Kurnool (Dist), AP.	0.0341 (\pm 0.011)	0.0143 (\pm 0.006)	0.0127 (\pm 0.004)	0.0202 (\pm 0.009)	0.0026 (\pm 0.002)

Table S4 — Collection of root samples in Annathapur district

S No	Mandals Covered	Villages Covered	Collection Sample Code	Collected sample
1	Guntakal	G. Kottala	28, 29, 30, 31, 32, 33 and 34	7
2	Thadipatri	Gandlapadu and Narapuram	38,39,40 and 47	4
3	Putluru	Kandhi Kapula and C. Venkateshwarpally	41, 42, 43, 44, 45, 51 and 52	7
4	Pedda Poppur	Chinna Poppur	46	1
5	Yadiki	Gudipadu	48, 49 and 50	3
6	Uravakonda	Vidapankal	53, 54, 55, 56, 57 and 58	6
7	Kanekal	N. Hanumapuram	59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 and 80	22
Total				50

Table S5 — Correlation data of marker compounds

	Withanoside IV	Withanoside V	Withaferin A	Withanolide A	Withanone
Withanoside IV	1				
Withanoside V	0.3204	1			
Withaferin A	0.0362	0.3583	1		
Withanolide A	-0.1875	0.1167	0.3757	1	
Withanone	-0.0306	0.3367	0.3243	0.3769	1

Supplementary Figures

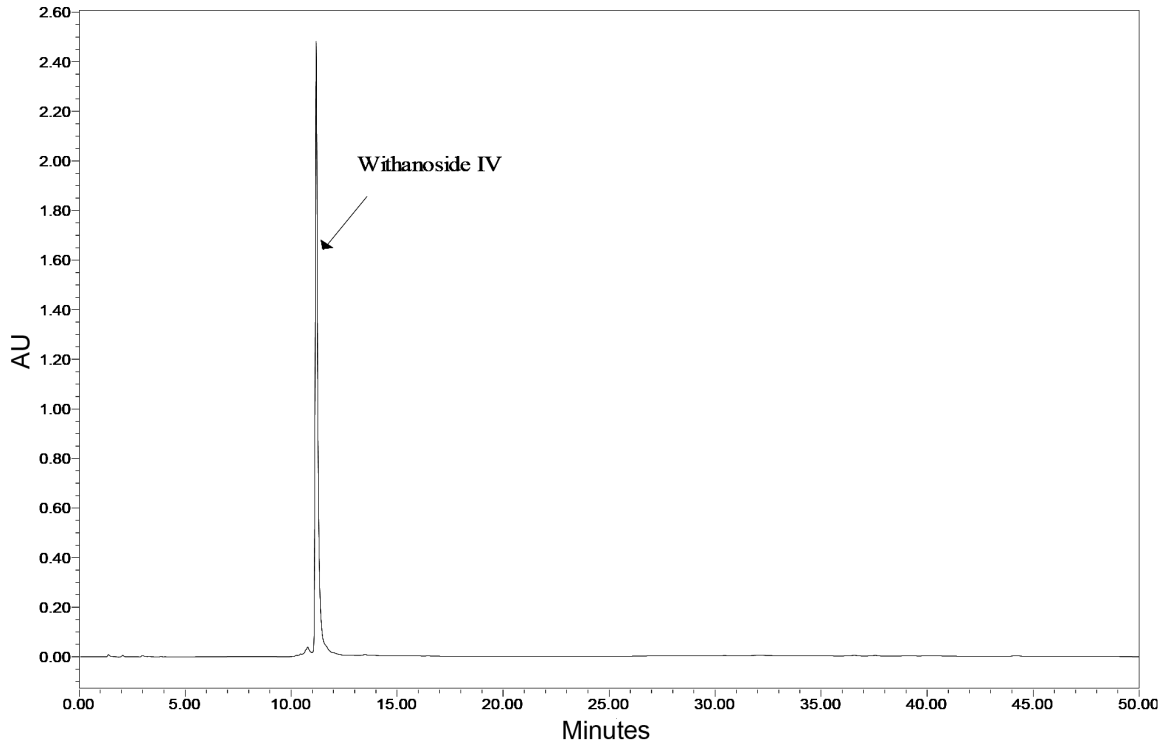


Fig. S1 — HPLC Chromatogram of Standard Withanoside IV.

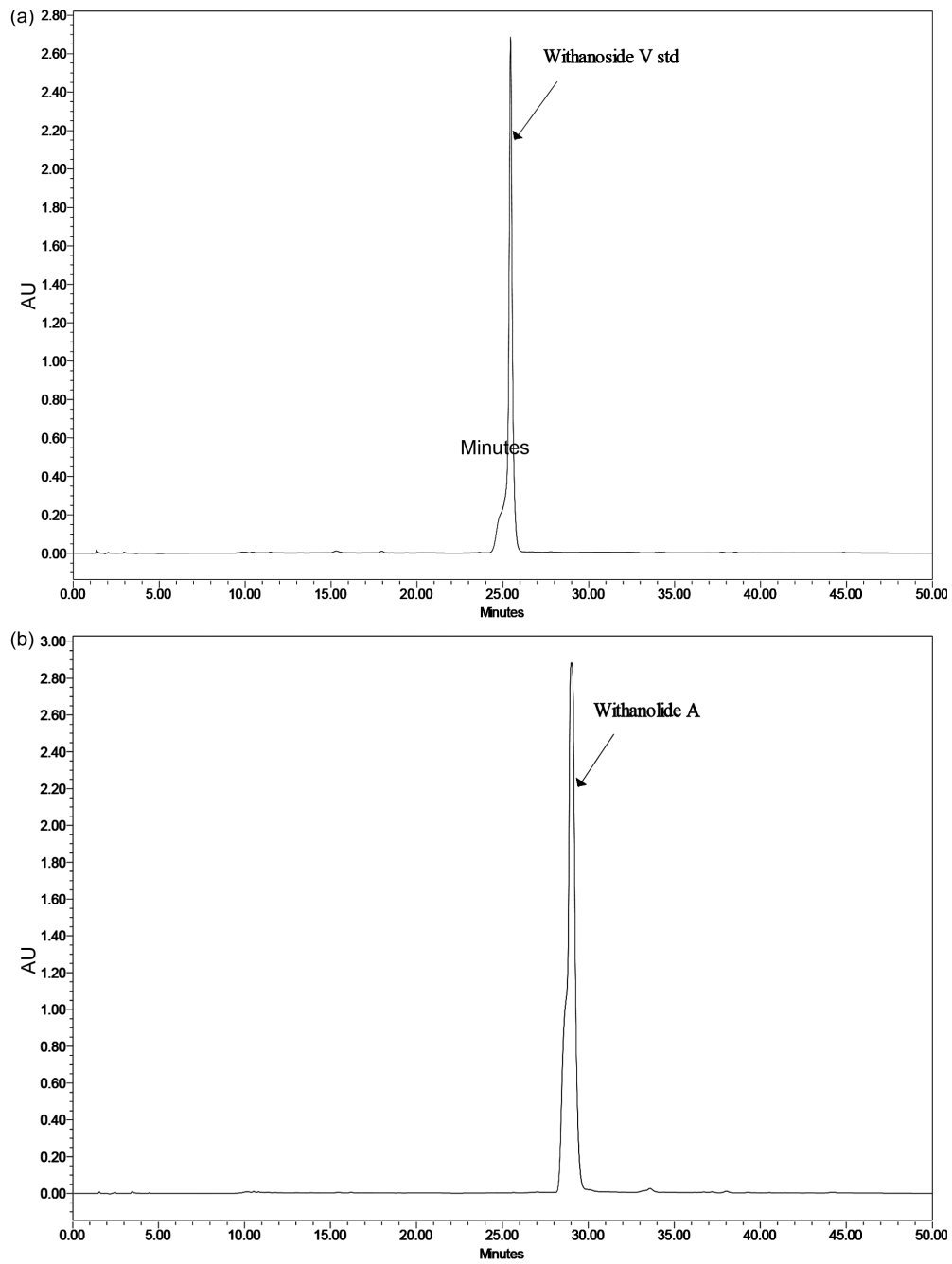


Fig. S2 — HPLC Chromatogram of Standard (a) Withanoside V, and (b) Withanolide A.

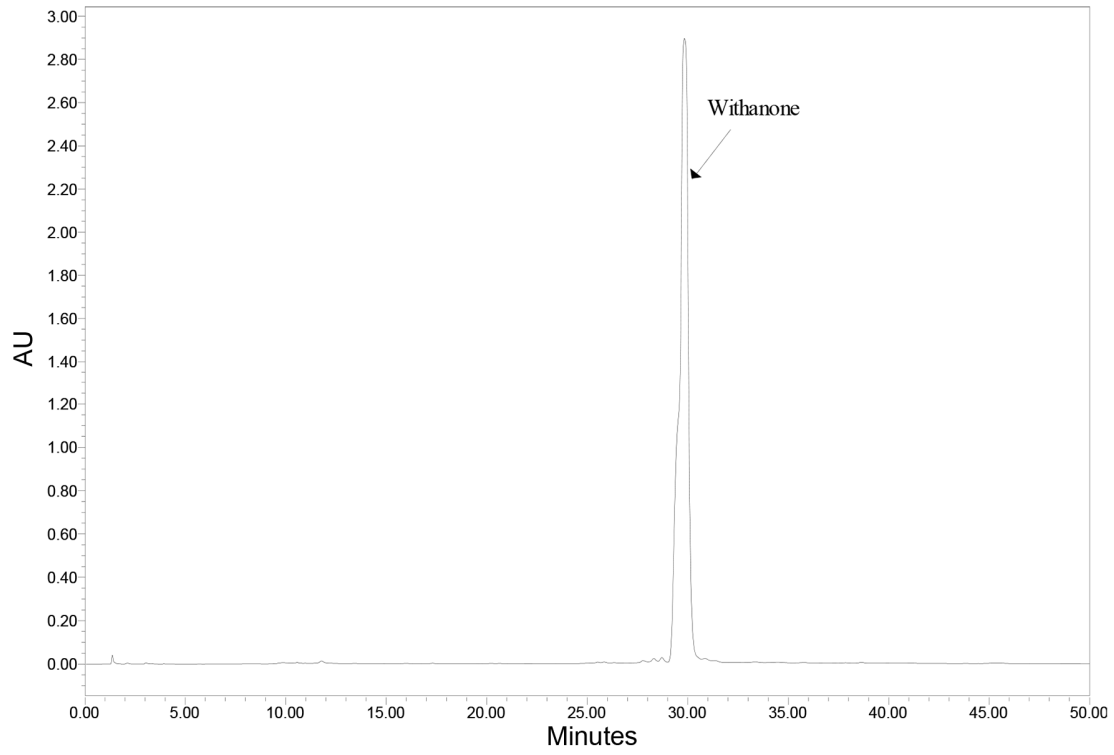


Fig. S3 — HPLC Chromatogram of Standard Withanone.

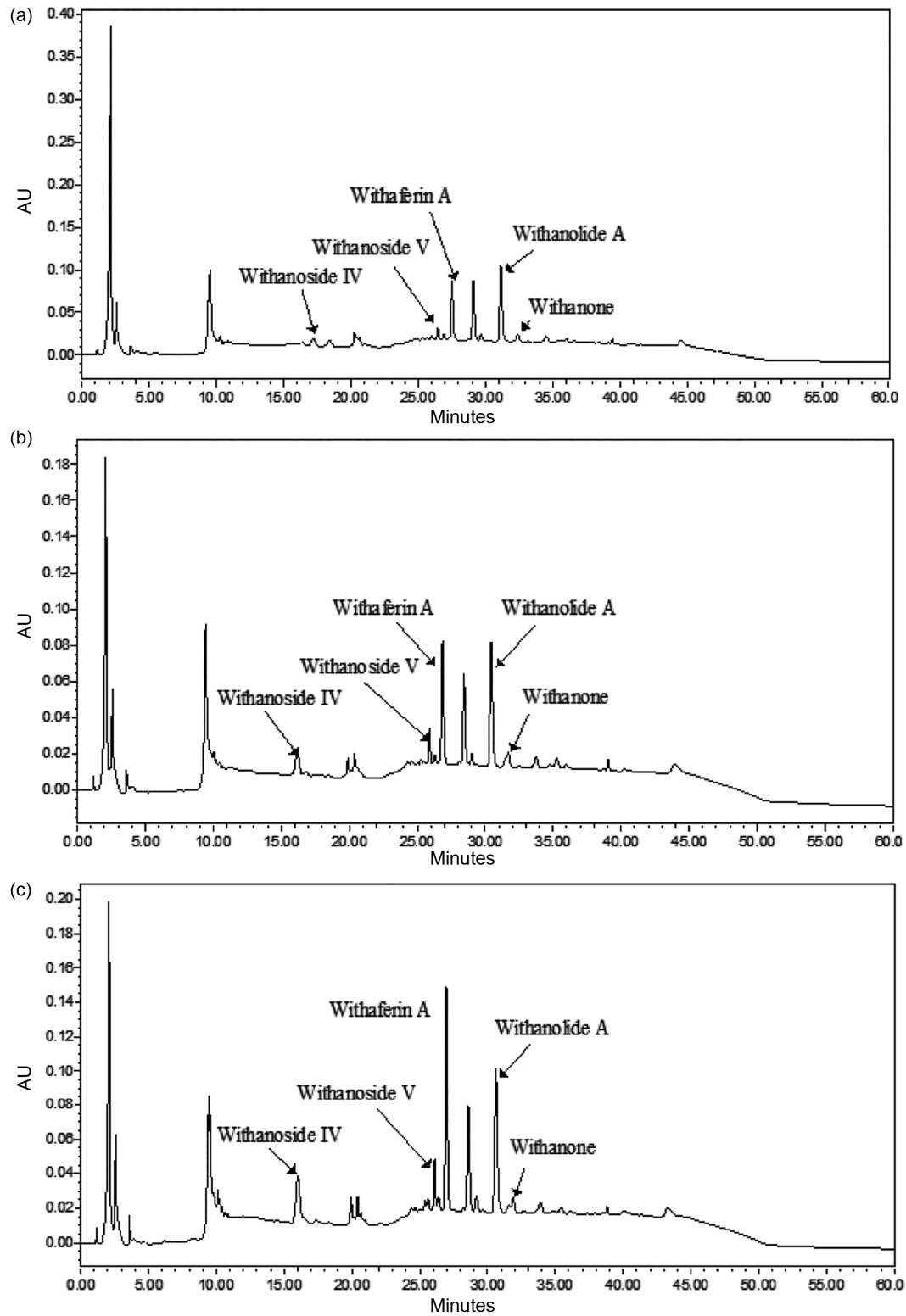


Fig. S4 — HPLC chromatograms of (a) Sample-46: Chinna Poppur (Village) Pedda Poppur (Mandal) Anantapur (Dist), (b) Sample-7: Joharapuram (Village) Aspiri (Mandal) Kurnool (Dist), and (c) Sample-37: Maddikera (Vill & Mandal) Kurnool (Dist), roots respectively.