

Supplementary Materials:

Table S1: MALDI-TOF mass spectra information (m/z) obtained for secondary metabolites.

Compounds (m/z)	AFB1 (m/z)	AFB2 (m/z)	AFG1 (m/z)	AFG2 (m/z)	CPA (m/z)
[M+Na] ⁺	335,267	337,27	351,263	353,278	359,374
[M+K] ⁺	351,375	353,378	367,371	369,386	375,482
[M+H] ⁺	313,285	315,288	329,281	331,296	337,392

AFB1: Aflatoxin B1; AFB2: Aflatoxin B2; AFG1: Aflatoxin G1; AFG2: Aflatoxin G2; CPA: Cyclopiazonic acid

Table S2: *Aspergillus* sp. isolates used in this study for molecular analyses.

Species	Code	Geographic Code/Synonym	Origin	GenBank Accession number		Reference
				ITS	CaM	
<i>Aspergillus aflatoxiformans</i>	CBS 143679	A. aflatoxiformans_Min_Nig	Nigeria	MG662388	MG518076	[30]
	CBS 135587	A. aflatoxiformans_Vwrang_Nig	Nigeria	MG662387	MG518077	[30]
<i>Aspergillus alliaceus</i>	DTO 363-F1	A. alliaceus_Esp	Spain	MH279432	MG518146	[30]
	DTO 363-E9	A.alliaceus_Pir_Esl	Slovenia	MH279431	MG518147	[30]
<i>Aspergillus arachidicola</i>	DTO 228-H9	A. arachidicola_Buf_AfrSur	South Africa	MG662384	MG518091	[30]
<i>Aspergillus aspearensis</i>	CBS 143672T	A. aspearensis_AspIsl_Ira	Iran	MG662398	MG518040	[30]
<i>Aspergillus austwickii</i>	CBS 143677T	A. austwickii_Abe_Nig	Nigeria	MG662391	MG518072	[30]
<i>Aspergillus caelatus</i>	CBS 763.97T	A. caelatus_EUA	USA	AF004930	MG518018	[30]
<i>Aspergillus caelatus</i>	DTO 276-I2	A.caelatus_Cor_Arg	Argentina	-	MG518108	[30]
<i>Aspergillus cerealis</i>	CBS 143674T	A. cerealis_Sha_Nig_1	Nigeria	MG662394	MG518063	[30]
	DTO 228-F1 = IBT 32070	A. cerealis_Sha_Nig_2	Nigeria	MG662392	MG518066	[30]
<i>Aspergillus flavus</i>	CBS 100927 ^T = NRRL 1957	A. flavus_Isl_Pac	South Pacific Islands	AF027863	EF661508	[30]
<i>Aspergillus flavus</i>	CBS 117637	A. flavus_For_Arg	Argentina	-	MG518010	[30]
<i>Aspergillus flavus</i>	CBS 11055 = ATCC 12073	A. flavus_Bra1	Brazil	FJ491463	MG518005	[30]
<i>Aspergillus flavus</i>	CBS 118.62	A. flavus_Bra2	Brazil	-	MG517996	[30]
<i>Aspergillus flavus</i>	CBS 119368	A. flavus_Chu_CorSur	South Korea	-	MG518002	[30]
<i>Aspergillus flavus</i>	CBS 120.51	A. flavus_Lon_Ing	United Kingdom	EF661549	MG518012	[30]
<i>Aspergillus flavus</i>	CBS 143688	A. flavus_CorSur1	South Korea	-	MG518144	[30]
<i>Aspergillus flavus</i>	CBS 143689	A. flavus_CorSur2	South Korea	-	MG518145	[30]
<i>Aspergillus flavus</i>	CBS 501.65	A. flavus_Ing	England	EF661563	MG518015	[30]
<i>Aspergillus flavus</i>	CBS 542.69	A. flavus_Kan_Jap	Japan	EF661554	MG518016	[30]
<i>Aspergillus flavus</i>	DTO 016-I5	A. flavus_Chi	China	-	MG518003	[30]
<i>Aspergillus flavus</i>	DTO 062-C7	A. flavus_Ind1	Indonesia	-	MG517985	[30]
<i>Aspergillus flavus</i>	DTO 062-C8	A. flavus_Ind2	Indonesia	-	MG517986	[30]
<i>Aspergillus flavus</i>	DTO 062-H7	A. flavus_Ind3	Indonesia	-	MG517987	[30]

<i>Aspergillus flavus</i>	DTO 066-C3	A. flavus_Ind4	Indonesia	-	MG51798 9	[30]
<i>Aspergillus flavus</i>	DTO 087-A3	A. flavus_Ifa_Mad1	Madagascar	-	MG51799 1	[30]
<i>Aspergillus flavus</i>	DTO 087-A4	A. flavus_Ifa_Mad2	Madagascar	-	MG51799 2	[30]
<i>Aspergillus flavus</i>	DTO 215-E5	A. flavus_Nig	Nigeria	-	MG51805 0	[30]
<i>Aspergillus flavus</i>	DTO 258-C9	A. flavus_Eur1	East. Europe	-	MG51809 5	[30]
<i>Aspergillus flavus</i>	DTO 258-D6	A. flavus_Eur2	East. Europe	-	MG51809 8	[30]
<i>Aspergillus flavus</i>	CBS 117638	A. flavus_Cor_Arg1	Argentina	-	MG51801 1	[30]
<i>Aspergillus flavus</i>	DTO 276-H7	A. flavus_Cor_Arg2	Argentina	-	MG51810 4	[30]
<i>Aspergillus flavus</i>	DTO 276-H8	A. flavus_Cor_Arg3	Argentina	-	MG51810 5	[30]
<i>Aspergillus flavus</i>	DTO 276-H9	A. flavus_Cor_Arg4	Argentina	-	MG51810 6	[30]
<i>Aspergillus flavus</i>	DTO 276-I1	A. flavus_Cor_Arg5	Argentina	-	MG51810 7	[30]
<i>Aspergillus flavus</i>	DTO 276-I3	A. flavus_Cor_Arg6	Argentina	-	MG51810 9	[30]
<i>Aspergillus flavus</i>	DTO 276-I4	A. flavus_Cor_Arg7	Argentina	-	MG51811 0	[30]
<i>Aspergillus flavus</i>	DTO 276-I5	A. flavus_Cor_Arg8	Argentina	-	MG51811 1	[30]
<i>Aspergillus flavus</i>	DTO 276-I6	A. flavus_Cor_Arg9	Argentina	-	MG51811 2	[30]
<i>Aspergillus flavus</i>	DTO 276-I7	A. flavus_Cor_Arg10	Argentina	-	MG51811 3	[30]
<i>Aspergillus flavus</i>	DTO 276-I8	A. flavus_Cor_Arg11	Argentina	-	MG51811 4	[30]
<i>Aspergillus flavus</i>	DTO 281-E2	A. flavus_Tai1	Thailand	-	MG51811 5	[30]
<i>Aspergillus flavus</i>	DTO 281-H8	A. flavus_Tai2	Thailand	-	MG51811 6	[30]
<i>Aspergillus flavus</i>	DTO 285-F6	A. flavus_Tai3	Thailand	-	MG51811 8	[30]
<i>Aspergillus flavus</i>	DTO 285-G3	A. flavus_Tai4	Thailand	-	MG51811 9	[30]
<i>Aspergillus flavus</i>	DTO 285-I4	A. flavus_Tai5	Thailand	-	MG51812 3	[30]
<i>Aspergillus flavus</i>	DTO 300-C7	A. flavus_Imp_Hol1	Netherlands	-	MG51812 4	[30]
<i>Aspergillus flavus</i>	DTO 300-D7	A. flavus_Imp_Hol2	Netherlands	-	MG51812 5	[30]
<i>Aspergillus flavus</i>	DTO 359-D7	A. flavus_CorSur1	South Korea	-	-	[30]
<i>Aspergillus flavus</i>	DTO 359-E1	A. flavus_CorSur2	South Korea	-	-	[30]
<i>Aspergillus flavus</i>	CBS 485.65 = ATCC 16870	A. flavus_Jap1	Japan	EF661563	MG51801 4	[30]
<i>Aspergillus lanosus</i>	CBS 650.74T	A. lanosus_Utt_Ind	Indonesia	FJ491471	MG51801 7	[30]
<i>Aspergillus leporis</i>	CBS 151.66T = ATCC 16490	A. leporis_Wyo_EUA1	USA	MH279391	MG51803 3	[30]
<i>Aspergillus leporis</i>	CBS 132153 = DTO 210-E1	A. leporis_Wyo_EUA2	USA	MH279396	MG51804 8	[30]

<i>Aspergillus luteovirescens</i>	CBS 620.95T	A. luteovirescens_Amz_Bra	Brazil	MG662406	MG51799 8	[30]
<i>Aspergillus minisclerotigenes</i>	CBS 117635T	A. minisclerotigenes_Cor_Arg	Argentina	EF409239	MG51800 9	[30]
	CBS 117633 = DTO 009-F5	A. minisclerotigenes_For_Arg	Argentina	MG662408	MG51800 7	[30]
<i>Aspergillus mottae</i>	CBS 130016T = DTO 223- C8	A. mottae_Brg_Por	Portugal	JF412767	MG51805 8	[30]
<i>Aspergillus neoalliaceus</i>	CBS 143681T = DTO 326-D3	A. neoalliaceus_RepChe1	Czech Republic	MH279420	MG51813 3	[30]
	DTO 326-E7	A. neoalliaceus_RepChe2	Czech Republic	MH279428	MG51814 2	[30]
<i>Aspergillus nomius</i>	CBS 260.88T = NRRL 13137	A.nomius_EUA	USA	AF027860	EF661531	[30]
	CBS 399.93 = DTO 301-I8	A. nomius_Zha_Chi	China	FJ491472	MG51812 7	[30]
<i>Aspergillus novoparasiticus</i>	CBS 126849T = DTO 223-C3	A.novoparasiticus_SP_Bra1	Brazil	MG662397	MG51805 5	[30]
	CBS 126850 = DTO 223- C5	A.novoparasiticus_SP_Bra2	Brazil	MH279415	MG51805 7	[30]
<i>Aspergillus oryzae</i>	CBS 102.07T	A. oryzae_Des1	Unknown source	EF661560	EF661506	[30]
	NRRL 458 = ATCC 10063	A. oryzae_Des2	Unknown source	EF661562	EF661507	[30]
<i>Aspergillus parasiticus</i>	CBS 260.67 = DTO 046- C2	A. parasiticus_Jap	Japan	MG662400	MG51801 3	[30]
<i>Aspergillus pipericola</i>	CBS 143680T	A. pipericola_des	Unknown source	MG662385	MG51808 7	[30]
<i>Aspergillus pseudocaelatus</i>	CBS 117616T	A.pseudocaelatus_Itu_Arg	Argentina	EF409242	MG51799 5	[30]
<i>Aspergillus pseudonomius</i>	IBT 12657 = DTO 303-A4	A. pseudonomius_des	Unknown source	MH279418	MG51812 8	[30]
	DTO 267-H7	A. pseudonomius_Tai	Thailand	MH279417	MG51810 2	[30]
<i>Aspergillus sergii</i>	CBS 130017T = DTO 223- C9	A. sergii_Far_Por	Portugal	JF412769	MG51805 9	[30]
<i>Aspergillus subflavus</i>	CBS 143683T = DTO 326- E8	A. subflavus_Mov_Rum	Rumania	MH279429	MG51814 3	[30]
<i>Aspergillus tamarii</i>	DTO 066-A1	A.tamarii_Ind	Indonesia	-	MG51798 8	[30]

<i>Aspergillus vandermerwei</i>	DTO 199-A9 = CBS 129201	A.vandermerwei_Cal_EUA	USA	MH279390	MG51803 2	[30]
<i>Aspergillus muricatus</i>	NRRL 35674	A. muricatus	Unknown source	EF661434.1	EF661377. 1	[30]
<i>Aspergillus flavus</i>	As 2		Paraguay	MN478355	MN44316 0	This study
<i>Aspergillus flavus</i>	As 5		Paraguay	MN478356	MN44316 1	This study
<i>Aspergillus flavus</i>	As 7		Paraguay	MN478357	MN44317 4	This study
<i>Aspergillus flavus</i>	As 8		Paraguay	-	MN44316 2	This study
<i>Aspergillus flavus</i>	As 10		Paraguay	MN478358	MN44317 5	This study
<i>Aspergillus flavus</i>	As 21		Paraguay	-	MN44317 6	This study
<i>Aspergillus flavus</i>	As 32		Paraguay	MN478359	MN44317 7	This study
<i>Aspergillus flavus</i>	As 33		Paraguay	-	MN44317 8	This study
<i>Aspergillus flavus</i>	As 34		Paraguay	-	MN41602 3	This study
<i>Aspergillus flavus</i>	As 38		Paraguay	-	MN44316 3	This study
<i>Aspergillus flavus</i>	As 41		Paraguay	MN478360	MN44316 4	This study
<i>Aspergillus flavus</i>	As 54		Paraguay	-	MN44318 0	This study
<i>Aspergillus flavus</i>	As 69		Paraguay	-	MN44317 9	This study
<i>Aspergillus flavus</i>	As 70		Paraguay	MN478361	MN44316 5	This study
<i>Aspergillus flavus</i>	As 76		Paraguay	-	MN44316 6	This study
<i>Aspergillus flavus</i>	As 78		Paraguay	-	MN44316 7	This study
<i>Aspergillus flavus</i>	As 79		Paraguay	-	MN44316 8	This study
<i>Aspergillus flavus</i>	As 84		Paraguay	MN423342	MN39323 2	This study
<i>Aspergillus flavus</i>	As 88		Paraguay	-	MN39323 3	This study
<i>Aspergillus flavus</i>	As 93		Paraguay	MN423341	MN41602 2	This study
<i>Aspergillus flavus</i>	As 96		Paraguay	MN423340	MN41602 1	This study
<i>Aspergillus flavus</i>	As 101		Paraguay	MN478362	MN44316 9	This study
<i>Aspergillus flavus</i>	As 103		Paraguay	MN478363	MN44317 0	This study
<i>Aspergillus flavus</i>	As 118		Paraguay	MN478364	MN44317 1	This study
<i>Aspergillus flavus</i>	As 138		Paraguay	-	MN44317 2	This study
<i>Aspergillus flavus</i>	As 271		Paraguay	-	MN44317 3	This study

<i>Aspergillus flavus</i>	As 17	Paraguay	MN481409	–	This study
<i>Aspergillus flavus</i>	As 22	Paraguay	MN481410	MN60418 3	This study
<i>Aspergillus flavus</i>	As 25	Paraguay	MN481411	MN60418 4	This study
<i>Aspergillus flavus</i>	As 27	Paraguay	MN481412	MN6041 85	This study
<i>Aspergillus flavus</i>	As 29	Paraguay	MN481413	MN60418 6	This study
<i>Aspergillus flavus</i>	As 35	Paraguay	MN481414	MN6041 87	This study
<i>Aspergillus flavus</i>	As 42	Paraguay	MN481415	–	This study
<i>Aspergillus flavus</i>	As 43	Paraguay	MN481416	MN60418 8	This study
<i>Aspergillus flavus</i>	As 98	Paraguay	MN481417	MN60418 9	This study
<i>Aspergillus luchuensis</i>	As 4	Paraguay	–	MN60419 0	This study
<i>Aspergillus flavus</i>	As 16	Paraguay	–	MN6041 92	This study
<i>Aspergillus flavus</i>	As 67	Paraguay	–	MN60419 3	This study

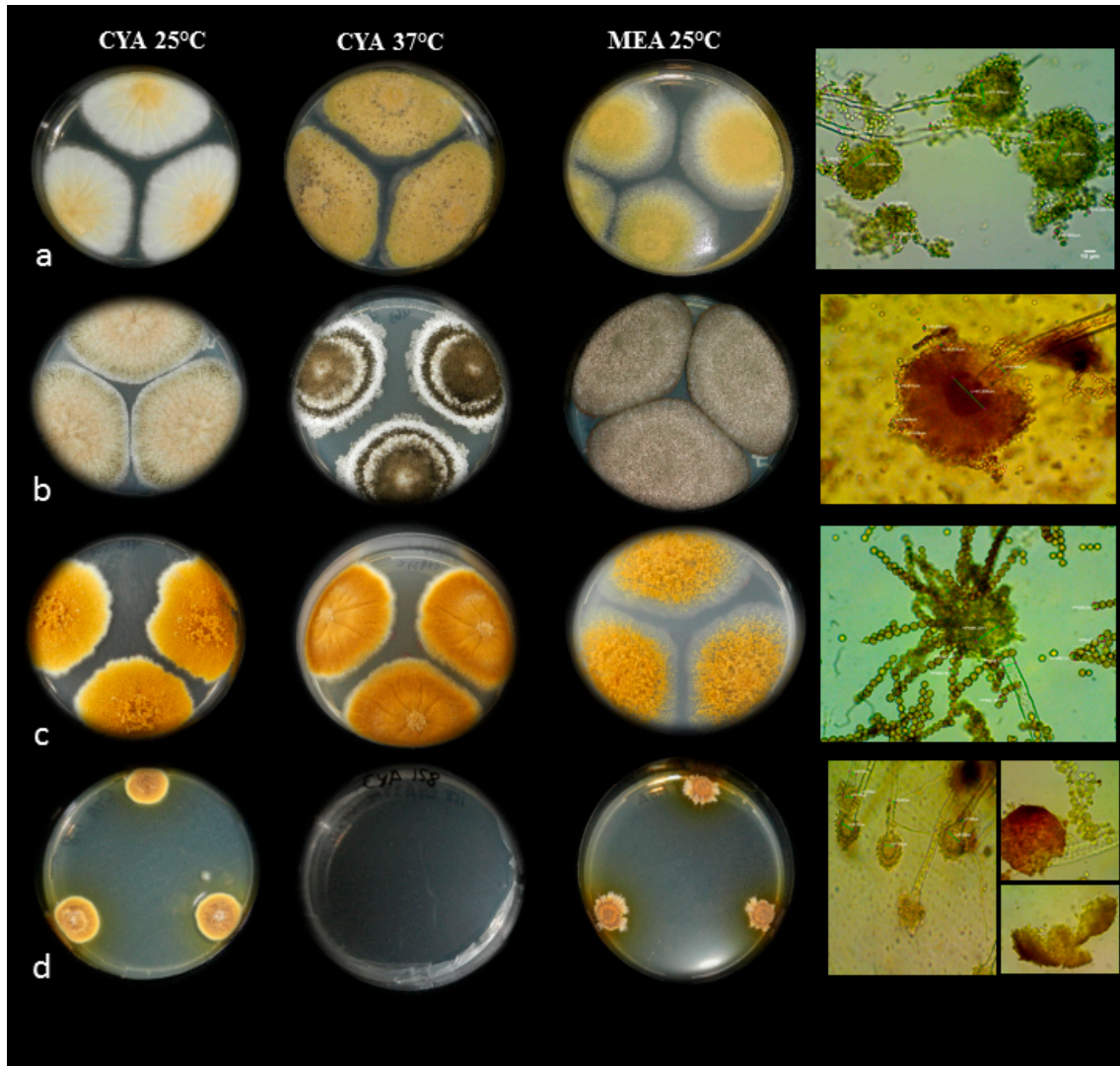


Figure S1: Morphological characteristics (macro- and microscopic) of *Aspergillus* morphotypes. a) *A. flavus* section *Flavi*; b) morphotype *A. awamori* section *Nigri*; c) morphotype *A. tamarii* section *Flavi*; d) morphotype *Aspergillus* section *Aspergillus*. First row: growth in CYA medium at 25 °C, second row: growth in CYA at 37 °C, third row: growth in MEA at 25 °C, fourth row: light microscope image at 40X magnification.

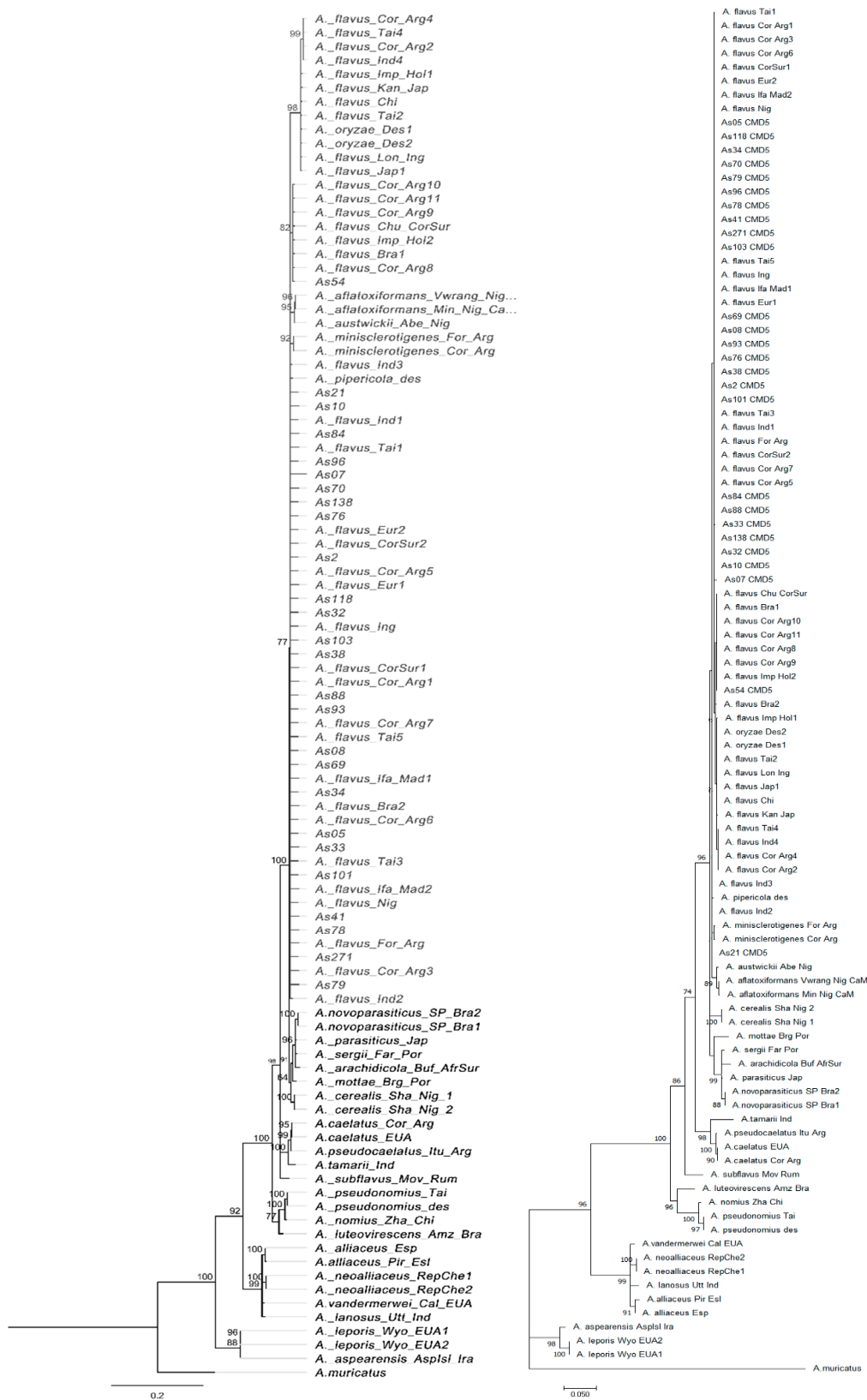


Figure S2. Phylogenetic tree inferred from the partial CaM sequences showing the relationships among members of *Aspergillus flavus*. On the left: phylogenetic tree using the Bayesian Inference based on the Bayesian Markov Chain Monte Carlo (MCMC) or Metropolis-coupled Markov chain Monte Carlo (MCMCMC) model. On the right: maximum likelihood (ML) tree. ML bootstrap support values over 75%, and Bayesian posterior predictive values over 75% are shown above the branches. The tree is rooted with *Aspergillus muricatus* EF661434.1.

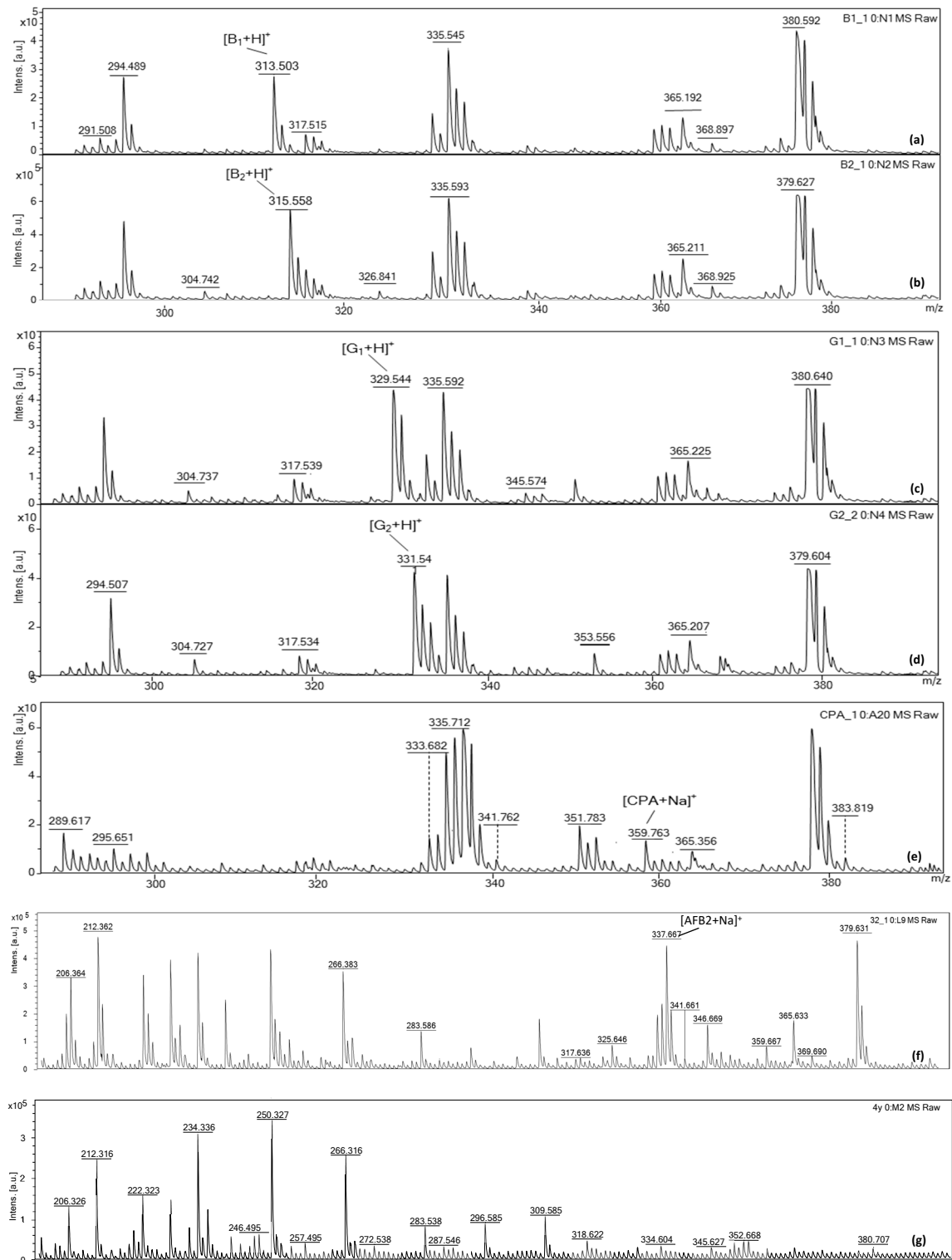


Figure S3: MALDI-TOF MS spectra with standards for aflatoxins B1 (a), B2 (b), G1 (c), G2 (d); Cyclopiazonic Acid (e) and samples positive for AFB2, AS 36 (f) and negative AS 10 (g).