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The influence of phosphorus source and the nature of nitrogen substrate on the biomass production and lipid accumulation in oleaginous *Mucoromycota* fungi

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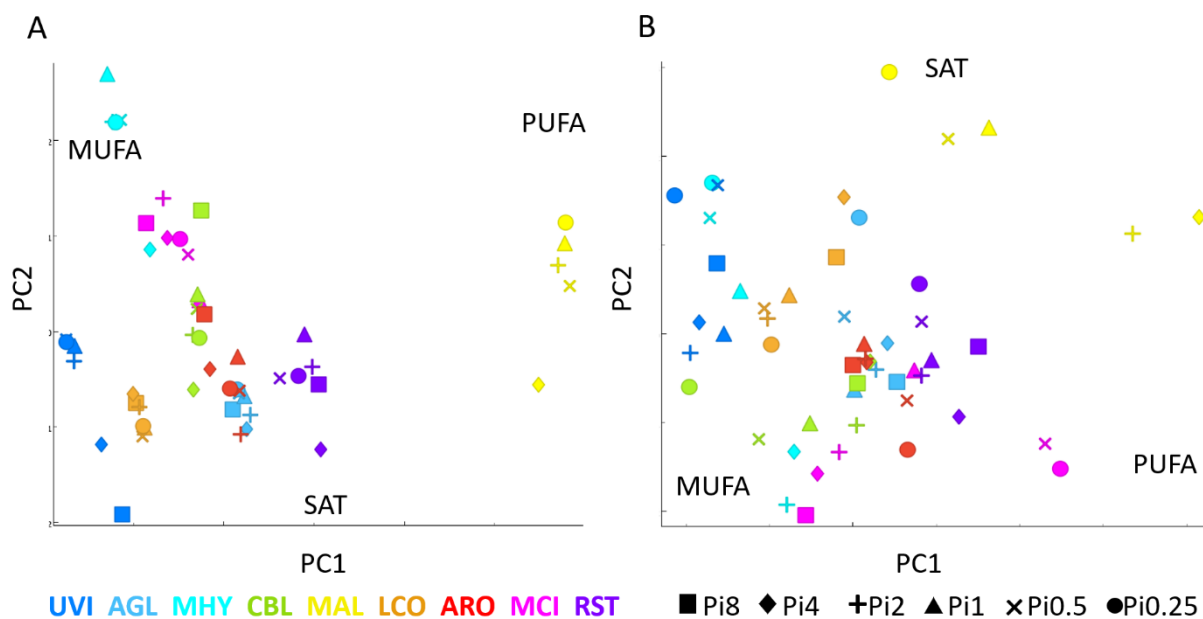


Fig. S1: PCA scatter plot of fatty acid profile of the accumulated TAGs in *Mucoromycota* fungi grown in the presence of different phosphorus amounts in the growth media with YE (A) and AS (B) as nitrogen source.

Table S1: Average pH of culture supernatant

Average pH		Pi 8	Pi 4	Pi 2	Pi 1	Pi 0.5	Pi 0.25
MCI	YE	5.91	5.98	5.95	5.97	5.59	4.30
	AS	5.55	5.38	4.34	2.91	2.34	2.21
AGL	YE	4.59	3.98	3.72	3.61	3.49	3.67
	AS	4.41	3.91	3.65	3.05	2.50	2.28
LCO	YE	5.54	5.59	5.56	5.54	5.33	5.25
	AS	5.61	5.46	4.59	3.03	2.50	2.41
UVI	YE	5.42	5.46	5.44	5.49	5.37	5.26
	AS	5.21	4.76	3.72	2.26	1.78	1.72
CBL	YE	5.72	5.56	5.48	5.19	4.78	4.35
	AS	5.35	4.77	3.96	2.52	2.07	2.94
ARO	YE	5.39	5.32	5.06	4.58	3.95	3.57
	AS	5.42	5.17	4.36	2.40	1.81	1.69
MAL	YE	6.00	5.55	5.59	5.72	5.61	5.51
	AS	5.80	5.49	4.36	3.08	2.97	2.95
RST	YE	5.19	3.97	3.74	3.90	3.26	4.41
	AS	5.02	3.87	3.01	2.32	1.86	1.66
MHY	YE	5.31	5.16	5.37	5.52	5.05	5.21
	AS	5.29	4.91	4.36	2.51	2.35	3.49

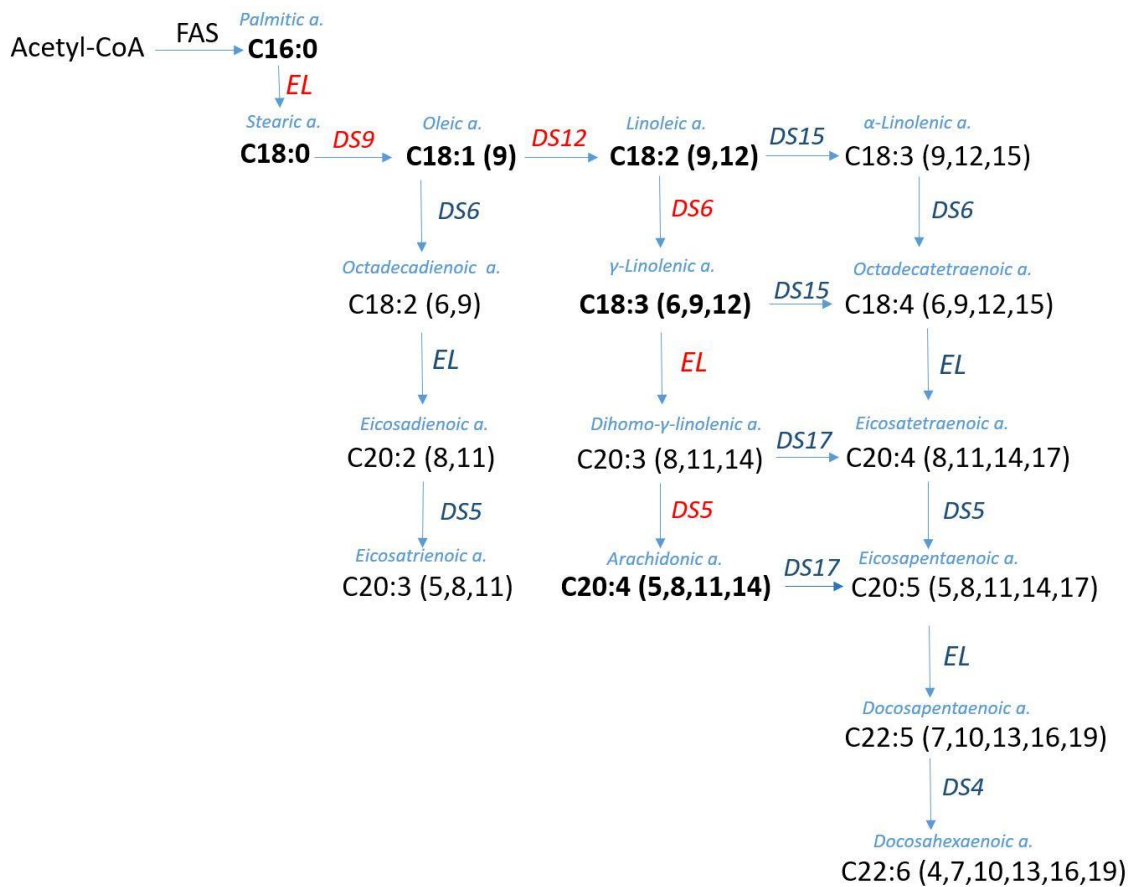


Fig. S2: Fatty acid synthesis in oleaginous microorganisms, adapted from (Ratledge and Wynn 2002). Fatty acids produced by strains used in the study are marked in bold. FAS- fatty acid synthase; DS- desaturase; EL- elongase. Enzymes affected by Pi variation are marked red.

Ratledge C, Wynn JP (2002) The biochemistry and molecular biology of lipid accumulation in oleaginous microorganisms *Adv Appl Microbiol* 51:1-52

Table S2: Fatty acid profiles

			C14:0	C16:0	C16:1	C18:0	C18:1n9c	C18:2n6t	C18:2n6c	C18:3n6	C20:4n6
MCI	YE	Pi8	2.05	16.67	6.03	3.53	45.13	0.75	12.22	9.09	0.04
MCI	YE	Pi4	1.91	17.17	4.94	3.98	44.23	0.66	12.84	10.10	0.04
MCI	YE	Pi2	1.74	16.90	4.07	2.77	45.37	0.61	12.96	10.95	0.05
MCI	YE	Pi1	1.88	17.74	3.69	5.61	42.28	0.52	13.23	10.70	0.04
MCI	YE	Pi0.5	1.98	17.08	3.99	4.66	43.18	0.62	13.10	11.22	0.06
MCI	YE	Pi0.25	2.02	16.39	4.16	4.26	43.53	0.74	12.59	11.38	0.02
MCI	AS	Pi8	1.97	12.89	7.73	2.05	45.71	0.86	13.08	10.04	0.03
MCI	AS	Pi4	1.88	15.05	6.10	2.88	45.34	0.68	12.98	10.23	0.07
MCI	AS	Pi2	1.96	15.47	4.94	3.51	44.10	0.67	13.19	11.32	0.06
MCI	AS	Pi1	1.52	20.71	1.82	4.41	38.37	0.28	15.09	14.24	0.06
MCI	AS	Pi0.5	1.63	15.49	0.92	1.40	32.63	0.68	16.06	27.08	0.07
MCI	AS	Pi0.25	1.67	14.59	2.06	1.51	29.79	0.75	16.07	26.92	0.14
AGL	YE	Pi8	0.55	22.16	0.73	7.36	42.32	0.11	13.95	9.98	0.02
AGL	YE	Pi4	0.52	21.10	0.65	9.04	40.91	0.13	14.57	9.96	0.02
AGL	YE	Pi2	0.48	20.87	0.59	8.97	40.60	0.12	14.59	10.75	0.03
AGL	YE	Pi1	0.51	21.74	0.58	7.64	41.34	0.10	15.08	10.42	0.02
AGL	YE	Pi0.5	0.54	21.81	0.60	7.47	41.83	0.10	14.86	10.15	0.02
AGL	YE	Pi0.25	0.54	21.64	0.58	7.53	42.07	0.10	14.90	10.17	0.02
AGL	AS	Pi8	0.39	17.72	0.75	7.81	41.43	0.25	15.89	12.26	0.04
AGL	AS	Pi4	0.36	18.23	0.71	10.08	40.57	0.23	14.89	11.36	0.04
AGL	AS	Pi2	0.42	18.15	0.76	8.82	42.73	0.24	14.79	11.29	0.03
AGL	AS	Pi1	0.90	15.81	1.32	8.59	44.68	0.42	14.42	10.18	0.02
AGL	AS	Pi0.5	1.98	18.61	2.62	8.06	40.86	0.82	12.49	8.49	0.09
AGL	AS	Pi0.25	2.93	19.67	2.52	10.66	35.53	0.74	11.67	6.91	0.06
MHY	YE	Pi4	2.76	18.88	1.92	2.68	48.24	0.14	5.09	6.07	7.50
MHY	YE	Pi2	2.53	14.93	3.58	2.01	50.31	0.09	6.80	5.02	7.31
MHY	YE	Pi1	2.58	12.93	3.43	2.04	50.74	0.06	7.25	4.81	7.67
MHY	YE	Pi0.5	2.63	13.88	2.69	2.71	50.10	0.06	6.81	4.99	7.73
MHY	YE	Pi0.25	2.70	14.05	2.83	2.46	50.33	0.07	6.54	4.91	7.44
MHY	AS	Pi4	3.24	15.71	1.49	3.37	50.55	0.26	3.89	7.69	7.19
MHY	AS	Pi2	2.89	13.74	3.15	2.03	51.47	0.08	6.36	5.90	7.21
MHY	AS	Pi1	3.78	25.94	1.97	3.43	46.94	0.14	3.64	2.79	4.68
MHY	AS	Pi0.5	4.37	29.13	1.62	4.31	46.29	0.18	2.34	1.62	2.62
MHY	AS	Pi0.25	4.21	30.28	1.78	4.61	44.02	0.10	1.93	1.39	1.86
LCO	YE	Pi8	0.71	25.44	1.72	3.62	51.07	0.06	10.11	4.86	0.02
LCO	YE	Pi4	0.61	24.55	1.29	4.24	51.88	0.06	10.64	4.33	0.02
LCO	YE	Pi2	0.57	24.19	1.05	4.89	51.37	0.05	10.88	4.21	0.02
LCO	YE	Pi1	0.54	24.56	0.96	5.25	50.92	0.06	10.75	4.14	0.02
LCO	YE	Pi0.5	0.59	25.11	1.03	5.26	51.16	0.06	10.49	4.00	0.03
LCO	YE	Pi0.25	0.56	24.76	0.98	5.15	51.11	0.06	10.65	4.17	0.03
LCO	AS	Pi8	2.06	19.53	2.36	9.56	39.20	0.27	10.84	8.24	0.05
LCO	AS	Pi4	2.53	20.11	2.18	11.62	36.20	0.26	10.31	7.82	0.04
LCO	AS	Pi2	0.77	25.75	1.68	5.65	48.10	0.07	11.25	3.97	0.04
LCO	AS	Pi1	1.31	22.93	2.25	7.79	44.69	0.18	11.20	5.15	0.03
LCO	AS	Pi0.5	0.89	23.23	1.39	7.74	48.20	0.16	10.24	4.45	0.04
LCO	AS	Pi0.25	0.37	22.69	0.95	6.95	49.77	0.11	10.64	4.82	0.07

			C14:0	C16:0	C16:1	C18:0	C18:1n9c	C18:2n6t	C18:2n6c	C18:3n6	C20:4n6
CBL	YE	Pi8	0.49	15.09	0.72	5.55	45.06	0.76	14.41	12.49	0.08
CBL	YE	Pi4	0.64	18.29	0.76	9.28	46.03	0.40	13.29	7.25	0.05
CBL	YE	Pi2	0.57	17.24	0.64	7.97	45.95	0.51	13.69	8.48	0.07
CBL	YE	Pi1	0.61	17.09	0.58	7.16	45.73	0.55	14.37	9.59	0.04
CBL	YE	Pi0.5	0.59	16.33	0.54	8.11	45.85	0.62	13.49	9.84	0.03
CBL	YE	Pi0.25	0.59	16.06	0.49	9.04	45.49	0.63	12.91	9.55	0.06
CBL	AS	Pi8	1.09	14.78	1.02	7.59	44.23	0.72	13.53	10.50	0.05
CBL	AS	Pi4	2.02	12.57	2.33	8.85	40.53	0.82	13.69	10.79	0.03
CBL	AS	Pi2	0.60	15.26	0.67	6.32	46.42	0.70	15.48	9.73	0.04
CBL	AS	Pi1	0.49	15.47	0.58	6.78	50.09	0.60	13.41	7.87	0.04
CBL	AS	Pi0.5	0.42	14.43	0.84	5.98	54.21	0.47	11.57	5.79	0.03
CBL	AS	Pi0.25	0.45	15.71	0.91	6.94	56.87	0.37	6.68	2.80	0.09
UVI	YE	Pi8	0.77	30.21	2.57	2.39	51.60	0.12	6.05	3.79	0.04
UVI	YE	Pi4	0.74	27.73	2.59	2.20	53.57	0.16	6.16	3.95	0.04
UVI	YE	Pi2	0.68	24.89	2.21	1.81	56.77	0.14	6.25	4.18	0.03
UVI	YE	Pi1	0.69	24.40	2.05	1.85	56.80	0.15	6.45	4.54	0.03
UVI	YE	Pi0.5	0.69	24.49	2.12	1.73	57.75	0.15	6.25	4.34	0.03
UVI	YE	Pi0.25	0.72	24.60	2.25	1.63	57.49	0.16	6.12	4.27	0.03
UVI	AS	Pi8	0.84	31.82	2.67	3.64	48.96	0.15	5.78	3.68	0.04
UVI	AS	Pi4	0.82	29.51	2.88	2.05	52.56	0.22	5.64	3.84	0.03
UVI	AS	Pi2	0.82	27.25	2.71	1.78	54.62	0.21	5.49	4.05	0.03
UVI	AS	Pi1	0.82	28.81	2.11	1.94	51.92	0.11	8.17	3.93	0.04
UVI	AS	Pi0.5	0.71	32.69	1.30	6.60	46.61	0.12	4.77	2.53	0.04
UVI	AS	Pi0.25	0.79	31.66	1.48	6.90	50.04	0.51	1.66	1.28	0.10
RST	YE	Pi8	0.73	14.88	1.16	10.82	32.91	0.49	14.07	18.22	0.07
RST	YE	Pi4	0.63	16.97	0.51	11.92	33.34	0.99	9.39	20.12	0.06
RST	YE	Pi2	0.66	15.77	0.65	10.33	33.93	0.67	12.60	19.43	0.03
RST	YE	Pi1	0.61	18.06	0.22	8.11	35.41	1.02	9.34	22.90	0.02
RST	YE	Pi0.5	0.61	14.11	0.69	11.97	37.49	0.63	12.10	16.79	0.02
RST	YE	Pi0.25	0.58	16.74	0.30	9.89	35.74	1.07	8.92	21.00	0.07
RST	AS	Pi8	0.92	14.47	1.82	10.05	32.54	0.40	14.38	19.85	0.05
RST	AS	Pi4	0.59	11.90	0.99	7.33	35.51	0.38	15.55	16.27	0.07
RST	AS	Pi2	0.60	13.01	0.76	10.23	39.28	0.41	13.87	16.01	0.04
RST	AS	Pi1	0.62	14.03	0.70	10.42	37.86	0.52	12.98	17.18	0.08
RST	AS	Pi0.5	0.69	15.95	0.83	11.08	36.52	0.49	11.92	15.88	0.04
RST	AS	Pi0.25	0.76	18.14	0.89	11.42	35.52	0.47	11.39	15.68	0.07
ARO	YE	Pi8	1.54	20.59	3.18	4.15	42.57	1.83	7.22	15.54	0.05
ARO	YE	Pi4	0.69	22.27	2.45	5.23	42.65	1.24	7.73	14.30	0.06
ARO	YE	Pi2	2.20	20.91	2.36	5.80	39.37	1.31	7.71	14.82	0.06
ARO	YE	Pi1	1.69	21.43	2.13	5.20	40.33	1.26	8.42	16.67	0.02
ARO	YE	Pi0.5	1.52	21.73	2.00	5.57	40.08	1.21	8.24	15.88	0.06
ARO	YE	Pi0.25	1.77	21.29	2.32	5.26	40.63	1.33	8.05	14.97	0.06
ARO	AS	Pi8	2.10	19.34	4.06	5.48	40.69	2.15	6.54	15.53	0.05
ARO	AS	Pi4	1.55	20.91	2.40	4.70	40.97	1.41	7.62	16.20	0.04
ARO	AS	Pi2	1.50	21.41	1.85	4.78	41.76	1.20	8.09	15.89	0.03
ARO	AS	Pi1	1.75	21.84	1.49	4.70	41.47	0.83	8.51	15.26	0.04
ARO	AS	Pi0.5	1.60	20.87	1.48	2.34	40.44	1.49	8.30	20.12	0.04
ARO	AS	Pi0.25	1.50	18.14	1.67	1.76	41.93	1.94	8.05	21.22	0.05

			C14:0	C16:0	C16:1	C18:0	C18:1n9c	C18:2n6t	C18:2n6c	C18:3n6	C20:4n6
MAL	YE	Pi4	0.96	16.01	0.14	13.54	11.18	0.09	9.96	4.27	37.75
MAL	YE	Pi2	0.57	12.02	0.10	13.86	9.40	0.09	9.75	4.42	43.54
MAL	YE	Pi1	0.61	12.02	0.10	12.65	8.68	0.08	8.72	4.99	45.58
MAL	YE	Pi0.5	0.76	13.95	0.12	12.52	8.22	0.08	7.77	5.69	45.07
MAL	YE	Pi0.25	0.46	10.73	0.08	13.35	8.61	0.07	8.45	4.47	47.00
MAL	AS	Pi4	1.87	18.60	0.16	13.50	10.86	0.18	8.23	4.26	34.30
MAL	AS	Pi2	1.72	17.00	0.19	14.13	15.84	0.07	7.88	4.28	27.12
MAL	AS	Pi1	2.05	23.73	0.26	13.10	23.25	0.05	6.07	2.41	17.47
MAL	AS	Pi0.5	1.73	21.98	0.28	11.53	25.07	0.11	5.13	1.69	15.57
MAL	AS	Pi0.25	2.06	24.52	0.41	10.34	24.53	0.36	3.53	1.39	8.75