

Virulence profiling and integrated pathogenic risk assessment of bacterial isolates from freshwater-farmed Asian seabass (*Lates calcarifer*)

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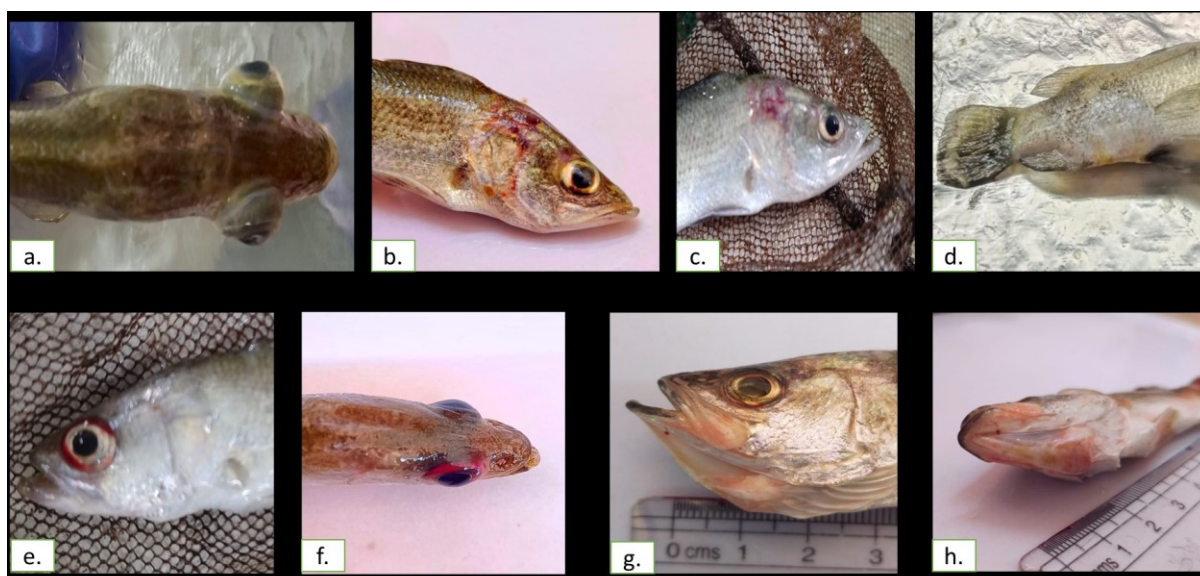


FIGURE S1 Clinical observation of Asian seabass samples. a) exophthalmia in the eye; (b, c) ulcer on head; (d) skin discolouration; (e, f) hemorrhages in eyes; (g, h) hemorrhages on body surface.

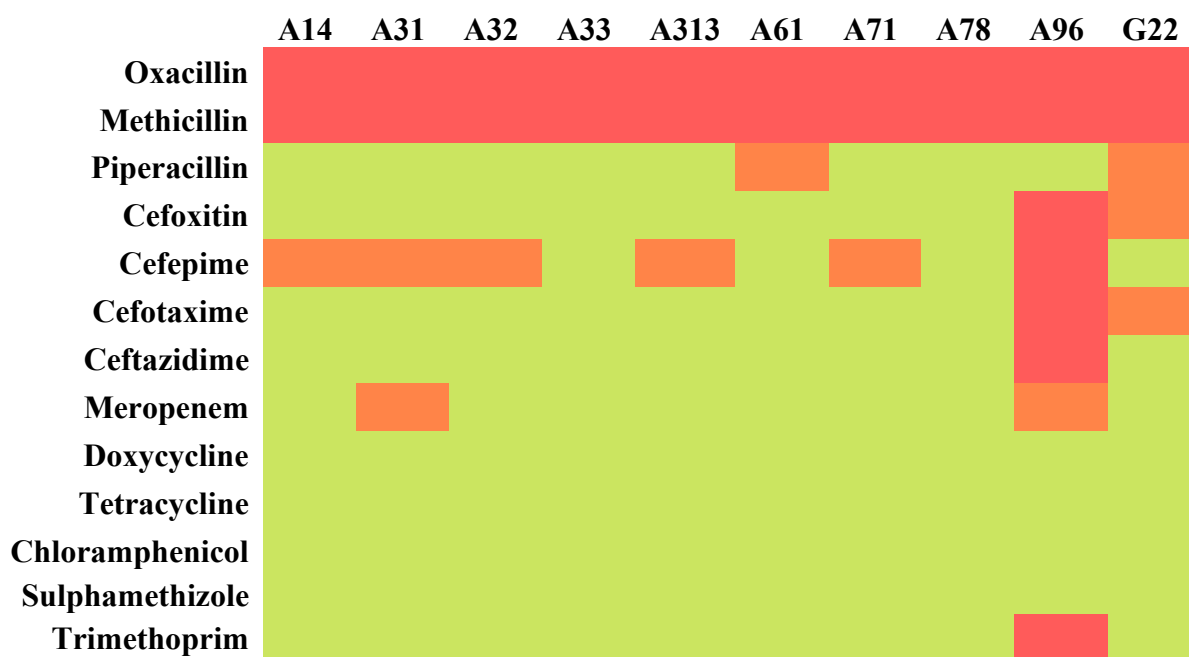


FIGURE S2 Antibiotic sensitivity profile of *Vibrio* isolates.

TABLE S1 Colony morphology of bacterial isolates.

Isolate code	Colony morphology
A11	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.4 cm
A12	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A13	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.4 cm
A14	Off white, convex, circular, smooth edged, transparent, 0.3-0.6 cm
A15	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A21	Off white, convex, circular, smooth edged, translucent, 0.1-0.4 cm
A22	Off white, convex, circular, smooth edged, translucent, 0.1-0.4 cm
A23	Off white, flat, circular, rough edge, opaque, 0.5- 1.0 cm
A24	Off white, flat, circular, rough edge, opaque, 0.5- 1.0 cm
A25	Off white, flat, circular, rough edge, opaque, 0.5-0.7 cm
A26	Off white, flat, circular, rough edge, opaque, 0.5-0.7 cm
A27	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A28	Off white, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A29	Off white, flat, circular, rough edge, opaque, 0.5-0.7 cm
A211	Off white, flat, circular, rough edge, opaque, 0.5-0.7 cm
A31	Off white, convex, circular, smooth edged, opaque, 0.1-0.3 cm
A32	Off white, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A33	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A34	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.4 cm
A311	Off white, convex, circular, smooth edged, opaque, 0.1-0.3 cm
A312	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A313	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A314	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A315	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.4 cm
A316	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.3 cm
A317	Pale yellow, convex, circular, smooth edged, translucent, 0.4-0.5 cm
A318	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A319	Pale yellow, convex, circular, smooth edged, translucent, 0.4-0.5 cm
A41	Pale yellow, convex, circular, smooth edged, transparent, 0.05-0.1 cm
A42	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A43	Off white, convex, circular, smooth edged, opaque, 0.1-0.4 cm
A44	Off white, convex, circular, smooth edged, transparent, 0.1-0.2 cm
A45	Off white, convex, circular, smooth edged, transparent, 0.1-0.2 cm
A46	Off white, convex, circular, smooth edged, transparent, 0.2-0.5 cm
A47	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A48	Off white, convex, circular, smooth edged, opaque, 0.1-0.4 cm
A49	Off white, convex, circular, smooth edged, transparent, 0.1-0.2 cm
A411	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A51	Pale yellow, convex, circular, smooth edged opaque, 0.1-0.2 cm
A52	Orange, convex, circular, smooth edged, opaque, 0.1-0.3 cm
A61	Off white, convex, circular, smooth edged, translucent, 0.1-0.2 cm
A62	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.3 cm
A63	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A64	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A65	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.2 cm
A71	Off white, convex, circular, smooth edged, translucent, 0.1-0.3 cm
A72	Off white, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A73	Off white, convex, circular, smooth edged, translucent, 0.1-0.3 cm
A74	Off white, convex, circular, smooth edged, opaque, 0.2-0.6 cm
A75	Off white, convex, circular, smooth edged, opaque, 0.2-0.5 cm
A76	Off white, convex, circular, smooth edged, translucent, 0.1-0.3 cm
A77	Off white, convex, circular, smooth edged, translucent, 0.2-0.5 cm

Isolate code	Colony morphology
A78	Off white, convex, circular, smooth edged, translucent, 0.2-0.5 cm
A81	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.6 cm
A83	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.6 cm
A84	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A84	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.5 cm
A91	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A92	White, convex, circular, wavy edge, opaque, 0.2-0.4 cm
A93	White, convex, circular, wavy edge, opaque, 0.2-0.4 cm
A94	Off white, convex, circular, smooth edged, translucent, 0.1-0.3 cm
A95	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A96	Off white, convex, circular, smooth edged, translucent, 0.1-0.3 cm
A97	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A98	White, convex, circular, wavy edge, opaque, 0.2-0.4 cm
A99	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A911	Off white, convex, circular, smooth edged, translucent, 0.2-0.4 cm
A912	White, convex, circular, wavy edge, opaque, 0.2-0.4 cm
G1	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.4 cm
G2	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G3	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.5 cm
G4	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G5	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.7 cm
G6	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.5 cm
G7	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G8	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.7 cm
G9	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.4 cm
G10	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.4 cm
G11	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.7 cm
G12	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.8 cm
G13	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G14	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G15	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.4 cm
G16	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G17	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.4 cm
G18	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.7 cm
G19	Pale yellow, convex, circular, smooth edged, opaque, 0.1-0.7 cm
G20	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.8 cm
G21	Pale yellow, convex, circular, smooth edged, opaque, 0.2-0.6 cm
G22	Pale yellow, convex, circular, smooth edged, opaque, 0.3-0.7 cm
K1	Pale yellow, convex, circular, smooth edged, translucent, 0.2-0.4 cm
K2	Pale yellow, convex, circular, smooth edged, translucent, 0.2-0.6 cm
K3	Pale yellow, convex, circular, smooth edged, translucent, 0.2-0.6 cm
K4	Pale yellow, convex, circular, smooth edged, translucent, 0.2-0.4 cm
MN4	Pale yellow, convex, circular, smooth edged, translucent, 0.1-0.2 cm
MN5	Pale yellow, convex, circular, smooth edged, translucent, 0.1-0.2 cm

TABLE S2 Biochemical characteristics of bacterial isolates.

Isolate code	Citrate	Indole	Catalase	Oxidase	Glucose	Lactose	Sucrose	H ₂ S	Gas
A11	-	+	-	+	+	-	-	+	+
A12	+	+	-	+	+	-	-	+	+
A13	+	+	-	+	+	-	-	+	+
A14	+	+	+	+	+	-	-	-	-
A15	+	+	-	+	+	-	-	+	+
A21	-	+	+	+	+	-	-	+	-
A22	-	+	-	+	+	-	-	-	-
A23	-	+	+	+	+	-	-	-	-
A24	-	+	+	+	+	-	-	-	-
A25	-	-	+	-	+	-	-	+	-
A26	-	-	+	-	+	-	-	+	-
A27	-	+	+	+	+	-	-	-	-
A28	+	-	-	+	-	-	-	-	-
A29	-	-	+	-	+	-	-	+	-
A211	-	-	+	-	+	-	-	+	-
A31	+	+	-	+	+	-	-	-	-
A32	+	+	+	+	+	-	-	-	-
A33	+	+	-	+	+	-	-	-	-
A34	+	+	-	+	+	-	-	-	-
A311	+	+	+	+	+	-	-	-	-
A312	+	+	-	+	+	-	-	-	-
A313	+	-	-	+	+	-	-	-	-
A314	+	+	-	+	+	-	-	-	-
A315	+	+	-	+	+	+	+	-	+
A316	+	+	-	+	+	-	-	-	-
A317	+	-	-	+	+	-	-	-	+
A318	+	+	-	+	+	-	-	-	-
A319	+	-	-	+	+	-	-	-	+
A41	+	+	-	+	+	-	-	+	+
A42	+	-	-	+	+	-	-	+	+
A43	-	+	-	+	+	-	-	+	+
A44	-	+	-	+	+	-	-	+	+
A45	+	-	+	+	-	-	-	-	-
A46	-	+	-	+	+	-	-	-	+
A47	+	-	-	+	+	-	-	+	+
A48	+	+	-	+	+	-	-	-	+
A49	+	-	+	+	-	-	-	-	-
A411	+	-	-	+	+	-	-	+	+
A51	-	-	+	-	-	-	-	-	+
A52	-	-	-	-	+	-	-	-	-
A6+	-	+	+	+	+	-	-	-	+
A62	-	+	-	+	+	-	-	-	-
A63	-	+	+	+	+	-	-	-	-
A64	-	+	+	+	+	-	-	-	-
A65	-	+	+	+	+	-	-	-	-
A71	+	+	+	-	+	-	-	-	-
A72	+	+	-	+	+	-	-	-	+
A73	+	+	+	-	+	-	-	-	-
A74	+	+	-	+	+	-	-	-	+
A75	+	+	-	+	+	-	-	-	+
A76	+	+	+	-	+	-	-	-	-
A77	+	+	+	-	+	-	-	-	-

Isolate code	Citrate	Indole	Catalase	Oxidase	Glucose	Lactose	Sucrose	H ₂ S	Gas
A78	+	+	+	-	+	-	-	-	-
A81	-	+	-	+	+	-	-	-	-
A82	-	+	-	+	+	-	-	-	-
A83	-	+	-	+	+	-	-	-	+
A84	-	+	-	+	+	-	-	-	+
A91	-	+	-	+	+	-	-	-	-
A92	-	+	+	+	+	-	-	-	-
A93	-	+	+	+	+	-	-	-	-
A94	-	+	-	+	+	-	-	-	-
A95	+	-	-	+	+	-	-	-	-
A96	-	+	-	+	+	-	-	-	-
A97	+	+	-	+	+	+	+	-	-
A98	-	+	+	+	+	-	-	-	-
A99	+	+	-	+	+	+	+	-	-
A911	+	+	-	+	+	+	+	-	-
A912	-	+	+	+	+	-	-	-	-
G1	+	-	-	+	+	-	-	-	+
G2	+	-	-	+	+	-	-	-	+
G3	+	-	-	+	+	+	+	-	+
G4	+	-	+	+	+	-	-	-	-
G5	+	+	+	+	+	-	-	-	+
G6	+	-	-	+	+	+	+	-	+
G7	+	-	+	+	+	-	-	-	-
G8	+	+	+	+	+	-	-	-	+
G9	+	+	-	+	+	-	-	-	+
G10	+	+	+	+	+	-	-	-	+
G11	+	+	+	+	+	-	-	-	+
G12	+	+	+	+	+	-	-	-	+
G13	-	+	-	+	+	-	-	-	-
G14	-	+	-	+	+	-	-	-	-
G15	+	+	+	+	+	-	-	-	+
G16	-	+	-	+	+	-	-	-	-
G17	+	+	+	+	+	-	-	-	+
G18	-	+	-	+	+	-	-	-	-
G19	+	+	+	+	+	-	-	-	+
G20	+	+	+	+	+	-	-	-	+
G2+1	-	+	-	+	+	-	-	-	-
G22	+	-	+	+	+	-	-	-	-
K1	+	+	-	+	+	-	-	-	-
K2	+	-	-	+	+	-	-	-	+
K3	+	-	-	+	+	-	-	-	+
K4	+	+	-	+	+	-	-	-	-
MN4	+	+	-	+	+	-	-	-	-
MN5	+	+	+	+	+	-	-	-	-

“+” indicates a positive result and “-” indicates a negative result.

TABLE S3 MAR index of bacterial isolates.

Genus	Isolate code	MAR index
Aeromonas	A11	0.18
	A12	0.18
	A315	0.21
	A317	0.25
	A41	0.25
	A43	0.36
	A44	0.25
	A47	0.25
	A48	0.21
	A72	0.21
	A81	0.11
	A84	0.18
	G1	0.32
	G2	0.50
	G3	0.25
	G5	0.18
	G9	0.25
	G15	0.32
	K1	0.43
	K2	0.29
	MN4	0.18
Vibrio	A14	0.15
	A31	0.15
	A32	0.15
	A33	0.15
	A313	0.15
	A61	0.15
	A71	0.15
	A78	0.15
	A96	0.53
	G22	0.15