

Appendix 2: Detailed cultural characteristics of each isolate collected from mango and citrus field from Ashanti Region of Ghana

No	Crop	Org	Distr.	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/ exudates	Conidial shape	Morpho-group
1	Mango	Fr	Ku	Brown colour and rubbery	suppressed	irregular	zonate	no exudates	cylindrical	G7
2	Mango	L	Ku	deep pink and with /without cottony	sparse	spreading	radiate	deep pink	cylindrical	G4
3	Mango	L	Ku	deep pink and with /without cottony	sparse	spreading	radiate	deep pink	cylindrical	G4
4	Mango	L	Ku	deep pink and with/without cottony	suppressed	spreading	radiate	deep pink	cylindrical	G4
5	Mango	L	Ku	buff and raised cottony	dense	irregular	radiate	honey colour	curved	G1
6	Mango	L	Ku	grey colour and white periphery and coarse	sparse	spreading	radiate	no exudates	cylindrical	G5
7	Mango	L& Fr	Ku	light pink short dense cottony	sparse	spreading	zonate	no exudates	cylindrical	G10
8	Mango	L& Fr	Ku	white raised cottony /grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
9	Mango	P	Eji	orange and rhizoid growth	suppressed	spreading	rhizoid	no exudates	curved	G6
10	Mango	P	Eji	orange and rhizoid growth	sparse	irregular	rhizoid	no exudates	curved	G6

No	Crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
11	Mango	P	Eji	deep pink and with /without cottony	dense	irregular	zonate	deep pink	cylindrical	G4
12	Mango	Fr	Eji	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
13	Mango	Fr	Eji	Brown colour and rubbery surface	suppressed	spreading	zonate	no exudates	cylindrical	G7
14	Mango	L	Eji	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
15	Mango	Fr	Eji	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical and pointed to one end	G9
16	Mango	Fr	Eji	white and bacteria like (sticky) surface	suppressed	restricted	radiate	no exudates	globose	G8
17	Mango	Fr	Eji	white and bacteria like (sticky) surface	suppressed	restricted	radiate	no exudates	globose	G8
18	Mango	Fr	Eji	white and bacteria like (sticky) surface	suppressed	irregular	radiate	white ooze	globose	G8
19	Mango	L	Eji	deep pink and with & without cottony growth	sparse	restricted	radiate	deep pink	cylindrical	G4
20	Mango	L	Eji	orange and rhizoid growth	suppressed	spreading	rhizoid	no exudates	Cylindrical	G6

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
21	Mango	L	Eji	grey colour and white periphery and coarse surface	sparse	spreading	radiate	no exudates	cylindrical	G5
22	Mango	Fr	Eji	grey colour and white periphery and coarse surface	sparse	spreading	zonate	no exudates	cylindrical	G5
23	Mango	L	Aku	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
24	Mango	P	Aku	buff and raised cottony	dense	spreading	flowery	white ooze	curved	G1
25	Mango	L	Aku	sticky orange dot with and without cottony growth	sparse	restricted	radiate	no exudates	cylindrical	G2
26	Mango	L	Aku	orange and rhizoid growth	sparse	restricted	rhizoid	no exudates	cylindrical	G6
27	Mango	L	Aku	grey colour and white periphery and coarse surface	sparse	restricted	radiate	no exudates	cylindrical and pointed to one end	G5
28	Mango	L	Aku	grey colour and white periphery and coarse surface	sparse	restricted	radiate	no exudates	cylindrical and pointed to one end	G5

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
29	Mango	L	Aku	grey colour and white periphery and coarse surface	sparse	restricted	radiate	no exudates	cylindrical and pointed to one end	G5
30	Mango	Fr	Aku	grey colour and white periphery and coarse surface	sparse	spreading	radiate	no exudates	cylindrical and pointed to one end	G5
31	Mango	L	Aku	buff and raised cottony	dense	irregular	zonate	honey color	curved	G1
32	Mango	L	Aku	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
33	Mango	P	Aku	grey colour and white periphery and coarse surface	sparse	restricted	radiate	no exudates	cylindrical	G5
34	Mango	L	Eju	sticky orange dot with and without cottony growth	sparse	spreading	radiate	no exudates	cylindrical	G2
35	Mango	L	Eju	grey colour and white periphery and coarse surface	sparse	irregular	radiate	no exudates	cylindrical	G5
36	Mango	L	Eju	sticky orange dot with and without cottony growth	sparse	restricted	radiate	no exudates	cylindrical	G2

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
37	Mango	Fr	Eju	white raised cottony and sometimes grey and black cottony mix	sparse	restricted	radiate	no exudates	cylindrical	G9
38	Mango	L	Eju	Brown colour and rubbery surface	suppressed	irregular	zonate	no exudates	cylindrical	G7
39	Mango	L	Eju	grey colour and white periphery and coarse surface	sparse	restricted	radiate	no exudates	cylindrical	G5
40	Mango	P	Eju	orange and rhizoid growth	suppressed	spreading	rhizoid	no exudates	Curved	G6
41	Mango	P	Eju	buff and raised cottony	dense	irregular	flowery	white ozz	Curved	G1
42	Mango	L	Kum	buff and raised cottony	dense	spreading	zonate	honey colour	Curved	G1
43	Mango	L	Kum	white raised cottony and sometimes grey and black cottony mix	dense	spreading	zonate	no exudates	cylindrical	G5
44	Mango	L	Kum	orange and rhizoid growth	suppressed	restricted	rhizoid	no exudates	Curved	G6
45	Others	L	Eju	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
46	sweet orange	L	Kum	sticky orange dot with and without cottony growth	sparse	spreading	zonate	no exudates	cylindrical	G2
47	sweet orange	L	Kum	sticky orange dot with and without cottony grth	dense	spreading	zonate	no exudates	cylindrical	G2

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
48	sweet orange	L	Kum	buff and raised cottony	dense	spreading	radiate	honey colour	curved	G1
49	sweet orange	L	Kum	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical and pointed to one end	G9
50	sweet orange	L	Kum	deep pink and with & without cottony growth	dense	restricted	zonate	deep pink	curved	G3
51	sweet orange	Fr	Kum	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
52	sweet orange	Fr	Eji	white and bacteria like(sticky) surface	suppressed	restricted	flowery	no exudates	globose	G8
53	sweet orange	Fr	Eji	white and bacteria like(sticky) surface	sparse	spreading	radiate	no exudates	globose	G8
54	sweet orange	Fr	Eji	sticky orange dot with and without cottony growth	suppressed	spreading	zonate	no exudates	cylindrical	G2
55	sweet orange	Fr	Eji	deep pink and with & without cottony growth	suppressed	restricted	radiate	deep pink	curved	G3
56	sweet orange	L	Eji	white raised cottony and sometimes gray and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
57	sweet orange	Fr	Eji	sticky orange dot with and without cottony growth	dense	spreading	zonate	no exudates	cylindrical	G2

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
58	sweet orange	L	Eji	grey colour and white periphery and coarse surface	dense	spreading	radiate	no exudates	globose	G5
59	sweet orange	Fr	Eji	buff and raised cottony	dense	spreading	radiate	honey colour	curved	G1
60	sweet orange	L	Eji	white raised cottony and sometimes grey and black cottony mix	dense	spreading	radiate	no exudates	cylindrical	G9
61	sweet orange	L	Eji	grey colour and white periphery and coarse surface	sparse	spreading	radiate	no exudates	cylindrical	G5
62	sweet orange	L	Eji	sticky orange dot with and without cottony growth	sparse	restricted	zonate	no exudates	cylindrical	G2
63	sweet orange	Fr	Aku	deep pink and with & without cottony growth	sparse	restricted	radiate	deep pink	curved	G3
64	sweet orange	L	Aku	sticky orange dot with and without cottony growth	sparse	spreading	zonate	no exudates	cylindrical	G2
65	sweet orange	L	Aku	light pink short dense cottony growth	sparse	spreading	zonate	no exudates	cylindrical	G10
66	sweet orange	L & Fr	Aku	sticky orange dot with and without cottony growth	dense	spreading	radiate	no exudates	cylindrical	G2
67	sweet orange	Fr	Aku	sticky orange dot with and without cottony growth	sparse	spreading	radiate	no exudates	cylindrical	G2
68	sweet orange	L	Mank	deep pink and with & without cottony growth	dense	spreading	radiate	deep pink	curved	G3

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/ exudates	Conidial shape	Morpho-group
69	mandarin	L	Mank	white raised cottony and sometimes grey and black cottony mix	sparse	restricted	radiate	honey colour	globose	G9
70	blood orange	Fr	Mank	sticky orange dot with and without cottony growth	sparse	restricted	radiate	no exudates	cylindrical	G2
71	lime	Fr	Mank	sticky orange dot with and without cottony growth	sparse	restricted	zonate	no exudates	cylindrical	G2
72	sweet orange	Fr	Mank	sticky orange dot with and without cottony growth	sparse	spreading	zonate	no exudates	cylindrical	G2
73	sweet orange	Fr	Mank	sticky orange dot with and without cottony growth	dense	spreading	zonate	no exudates	cylindrical	G2
74	sweet orange	Fr	Mank	sticky orange dot with and without cottony growth	dense	spreading	zonate	no exudates	cylindrical	G2
75	sweet orange	L	Mank	sticky orange dot with and without cottony growth	dense	spreading	zonate	no exudates	cylindrical	G2
76	lime	Fr	Mank	deep pink and with & without cottony growth	dense	restricted	zonate	deep pink	curved	G3
77	blood orange	Fr	Mank	white and bacteria like(sticky) surface	suppressed	restricted	radiate	no exudates	globose	G8
78	sweet orange	L	Mank	orange and rhizoid growth	suppressed	restricted	rhizoid	no exudates	curved	G6
79	mandarin	Fr	Mank	buff and raised cottony	dense	spreading	radiate	honey colour	curved	G1

no	crop	Org	Distr	Culture colour and texture	Quantity of areal hyphae	Colony margin	Colony pattern	Pigment/exudates	Conidial shape	Morpho-group
80	mandarin	P	Mank	sticky orange dot with and without cottony growth	sparse	spreading	radiate	no exudates	cylindrical	G2
81	sweet orange	L	Mank	sticky orange dot with and without cottony	sparse	spreading	radiate	no exudates	cylindrical	G2
82	lime	Fr	Mank	grey colour and white periphery and coarse	sparse	restricted	radiate	no exudates	cylindrical	G5
83	others	L	Mank	sticky orange dot with and without cottony	dense	spreading	radiate	no exudates	cylindrical	G2
84	others	L	Mank	sticky orange dot with and without cottony	sparse	spreading	radiate	no exudates	cylindrical	G2
85	others	L	Mank	grey colour and white periphery and coarse	dense	restricted	radiate	no exudates	cylindrical	G5
86	others	L	Mank	buff and raised cottony	dense	spreading	zonate	honey colour	curved	G1
87	others	L	Mank	grey colour and white periphery and coarse	dense	spreading	radiate	no exudates	cylindrical	G5
88	others	L	Aku	sticky orange dot with and without cotton	dense	spreading	zonate	no exudates	cylindrical	G2

*Dis= District, KU=Kumasi, Aku= Akumadan, Eji= Ejisu, Eju= Ejura

Mank= Mankranso

* Org= organ, L= leaf,Fr= fruit, P= panicle

* G1-G10 = Designate Morpho group one to morphogroup ten