

Table 5. List of descriptors for *Musa*

Des. #	Descriptor	Descriptor state	Remarks	Remarks	Previous descriptor state*
1	Accession number				
2	Leaf habit	1 Erect			
		2 Intermediate			
		3 Drooping			
		4 Other			
3	Dwarfism	1 Normal: leaves not overlapped and leaf ratio <2.5			
		2 Dwarf: leaves overlap and leaf ratio >2.5			
4	Pseudo stem height (m)	1 <2 m	From ground to emerging point of		
		2 2 - 3 m			
		3 >3 m			
5	Pseudo stem aspect	1 Slender			
		2 Normal	Determined by circumference at 1m		
		3 Robust			
6	Pseudo stem colour	1 Green-yellow			
		2 Medium green	Record without removing the external		
		3 Green			
		4 Dark green			
		5 Green-red			
		6 Red			
		7 Red-purple			
		8 Blue			
		9 Chimerical			
		10 Others			
7	Pigmentation in the pseudostem (outermost sheaths)	1 None			
		2 Brown/rusty brown			
		3 Black			
		4 Other			
8	Pseudo stem appearance	1 Dull (waxy)			
		2 Shiny (not waxy)			
9	Predominant underlying colour of the pseudostem	1 Watery green	Remove the outermost sheath and look at the exposed surface of the underlying		
		2 Light green			
		3 Green			
		4 Cream			
		5 Pink-purple			
		6 Red-purple			
		7 Purple			
		8 Other (specify)			
10	Pigmentation of underlying pseudo stem	1 Pink-purple			
		2 Red			
		3 Purple			
		4 Other (specify)			
11	Sap colour	1 Watery	Note colour of the sap (ooze) after a cut on the external sheath		
		2 Milky			
		3 Red-purple			
		4 Other (specify)			
12	Sap dripping	1 No dripping of sap on cutting the petiole		Modified previous descriptor state* because the sap drips from the	1 No dripping on cutting the leaves
		2 Drips on cutting the petiole			2 Drips on cutting the leaves
13	Wax on leaf sheath	1 Almost not visible			
		2 Very low amount of wax			
		3 Moderately waxy			

		4 Very waxy			
14	Number of suckers	Note number of suckers from soil level to the point of emergence of the last leaf (>30 cm height)			
15	Development of suckers	1 Taller than parent plant	Note on tallest sucker at the harvest time of parent plant		
		2 More than 3/4 of the height of parent plant			
		3 Between 1/4 and 3/4 of the height of parent plant			
		4 Inhibited			
16	Suckers with tubular leaves	1 Sucker with tubular leaves	Enclosed leaves of suckers before sucker is one meter high	New trait added	
		2 Suckers without tubular leaves			
17	Position of suckers	1 Far from parent plant (> 50 cm)			
		2 Close to parent plant (vertical)			
		3 Close to parent plant (growing at an angle)			
18	Blotches at the leaf petiole base	1 Sparse blotching	Blotches = pigmentation		
		2 Small blotches			
		3 Large blotches			
		4 Extensive blotches			
		5 Clean, no blotches			
19	Blotches colour	1 Brown			
		2 Dark brown			
		3 Brown-black			
		4 Black-purple			
		5 Other (specify)			
20	Petiole canal leaf III	1 Open with margin spreading	Of the third leaf from the last leaf (leaf prior to bunch emergence), cut the petiole half way and examine the cross		
		2 wide with erect margins			
		3 Straight with rect margin			
		4 Margins curvrd inward			
		5 Margins overlapping			
21	Petiole margins	1 Winged and undulating	Recording at the petiole starting point		
		2 Winged and not clasping the pseudo stem			
		3 Winged and clasping the pseudo stem			
		4 Not winged and clasping the pseudo stem			
		5 Not winged and not clasping the pseudo stem			
22	Wing type	1 Dry			
		2 Not dry			
23	Petiole margin colour	1 Green			
		2 Pink-purple to red			
		3 Purple to blue			
		4 Other (specify)			
24	Edge of petiole margin	1 No colour line along			
		2 with a colour line along			
25	Petiole margin width (cm)	1 ≤ 1 cm			
		2 > 1 cm			
		3 Can not be defined			
26	Leaf blade length (cm)	1 ≤ 170 cm			
		2 171-220 cm			
		3 221-260 cm			
		4 ≥ 261 cm			
27	Leaf blade width (cm)	1 ≤ 70 cm			
		2 71-80 cm			
		3 81-90 cm			
		4 ≥ 91 cm			
28	Leaf ratio	3 ≤ 2.0			
		5 2.1-2.9			

		7 ≥ 3.0			
29	Petiole length (cm)	1 ≤ 50 cm			
		2 51-70 cm			
		3 ≥ 71 cm			
30	Colour of leaf upper surface	1 Green-yellow			
		2 Medium green			
		3 Green			
		4 Dark green			
		5 Dark green with red-purple pigmentation			
		6 Blue			
		7 Other (specify)			
31	Appearance of leaf upper surface	1 Dull			
		2 Shiny			
32	Colour of leaf lower surface	1 Green-yellow	After removing wax		
		2 Medium green			
		3 Green			
		4 Dark green			
		5 Blue			
		6 Red-purple			
		7 Other			
33	Appearance of leaf lower surface	1 Dull			
		2 Shiny			
34	Wax on leaves (lower surface)	1 Almost not visible			
		2 Some wax			
		3 Moderately waxy			
		4 Very waxy			
35	Insertion point of leaf blades on petiole	1 Symmetric			
		2 Asymmetric			
36	Shape of leaf blade base	1 Both sides rounded			
		2 One side rounded another side pointed			
		3 Both sides pointed			
37	Leaf corrugation	1 Even, smooth	Presence of ridges perpendicular to the secondary ribs on the leaf upper surface		
		2 Few stripes			
		3 Very corrugated			
38	Leaf tips	1 Not twisted		New trait added	
		2 Twisted			
39	Colour of midrib dorsal surface	1 Yellow			
		2 Light green			
		3 Green			
		4 Pink-purple			
		5 Red-purple			
		6 Purple to blue			
		7 Other			
40	Colour of midrib ventral surface (refer Colour Chart A)	1 Yellow			
		2 Light green			
		3 Green			
		4 Pink-purple			
		5 Red-purple			
		6 Purple to blue			
		7 Other			
41	Colour of cigar leaf dorsal surface	1 Green	Record at early emergence of cigar (flag)		
		2 Red-purple			
		3 Other (specify)			
42	Blotches on leaves of water suckers	1 Without blotches	Noted on young, non-inhibited water suckers (if lamina is sword shaped, it is not water sucker)		
		2 Narrow blotches			
		3 Large purple blotches			
43	Peduncle length (cm)	1 ≤ 30 cm	Length from leaf crown to the first hand of fruits		

		2 31-60 cm			
		3 ≥61 cm			
44	Empty nodes on peduncle	Number of empty nodes between the last bract-leaf and first hand of			
45	Peduncle width (cm)	1 <6 cm			
		2 7-12 cm			
		3 ≥13 cm			
46	Peduncle colour	1 Light green			
		2 Green			
		3 Dark green			
		4 Red or pink/purple			
		5 Purple-brown to blue			
		6 Other (specify)			
47	Peduncle hairiness	1 Hairless			
		2 Slightly hairy			
		3 Dense and short hairs			
		4 Dense and long hairs (>2 mm)			
48	Bunch position	1 Hanging vertically	Angle from vertical to the general axis		
		2 Slightly angled			
		3 Hanging at angle of 45°			
		4 Horizontal			
		5 Erect			
49	Bunch shape	1 Cylindrical with the bunch length > or equal to twice its diameter		Modified previous descriptor state*	1 Cylindrical
		2 Truncated cone shaped			2 Truncated cone shaped
		3 Asymmetric-bunch axis is nearly straight			3 Asymmetric-bunch axis is nearly
		4 with a curve in the bunch axis			4 with a curve in the bunch axis
		5 Spiral (all fruits are attached to a unique crown coiled around the stalk)			5 Spiral (all fruits are attached to a unique crown coiled around the
		6 Cylindrical with the bunch length < to twice its diameter			
50	Bunch appearance	1 Lax (>2 cm gap between two hands of fruits)			
		2 Compact (ca. 2 cm gap)			
		3 Very compact (< 2 cm gap)			
51	Flowers that form the fruits	1 Female (absence of pollen and pollen sacs)	Record at flowering if the flowers of the first hand bear apparently functional		
		2 Hermaphrodite flowers (male and female parts exist)			
52	Fruit's position on the crown	1 Uniseriate			
		2 Biseriate			
		3 Biseriate and fused			
53	Rachis type	1 truncated, no bract scar	Record between last hand of fruits and male buds		
		2 Present and male buds may be degenerated or persistent			
54	Rachis position	1 Falling vertically			
		2 At an angle			
		3 With a curve			
		4 Horizontal			
		5 Erect			
55	Rachis appearance	1 Bare			
		2 Neutral flowers (one or two hands only)			
		3 Male flowers/bracts above the male bud			
		4 Neutral/male flowers and presence of withered bracts on the			

		5 Neutral/male flowers on the whole stalk without persistent			
		6 Small bunch from neutral/hermaphrodite floers just above the male bud			
		7 Other (specify)			
56	Number of nodes on rachis at harvest	1 < 50		New trait added	
		2 50-80			
		3 81-100			
		4 > 100			
57	Male bud type	1 Normal (present)			
		2 Degenerating before maturity			
		3 Like true-horn 'Plantain' (absent)			
58	Male bud shape	Record at harvest time (refer fig.)		Modified previous descriptor state*	Record at harvest
		1 Like a top			1 Like a top
		2 Lanceolate			2 Lanceolate
		3 Intermediate			3 Intermediate
		4 Ovoid			4 Ovoid
		5 Rounded			5 Rounded
		6 Oblong			
		7 Cordate (Heart shaped)			
59	Male bud size (cm) at harvest	1 ≤20 cm			
		2 21-30 cm			
		3 ≥31 cm			
60	First bract base shape	1 Small shoulder			
		2 Medium			
		3 Large shoulder			
61	First bract apex shape	1 Pointed			
		2 Slightly pointed			
		3 Intermediate			
		4 Obtuse			
		5 Obtuse and split			
62	Bracts imbrication	1 Old bracts overlap at apex of bud	Alignment of bracts at the apex of the male bud		
		2 Young bracts slightly overlap			
		3 Young bracts greatly overlap			
63	Colour of the first bract external face	1 Yellow			
		2 Green			
		3 Red			
		4 Red-purple			
		5 Purple-brown			
		6 Purple			
		7 Blue			
		8 Pink-purple			
		9 Orange-red			
		10 Other (specify)			
64	Colour of the first bract internal face	1 Whitish			
		2 Yellowish green			
		3 Orange-red			
		4 Red			
		5 Purple			
		6 Purple-brown			
		7 Pink-purple			
		8 Other (specify)			
65	Colour on the bract (external) apex	1 Tinted with yellow			
		2 Not tinted, uniform colour until			
66	Colour stripes on bract (external surface)	1 No colour stripes on the external surface			
		2 Colour stripes on the external			
67	Bract scars on rachis	1 Very prominent			
		2 Not prominent			
68	Fading of colour on bract	Bract base inside			

	base	1 Loss of pigmentation at the base			
		2 Pigmentation not lost			
69	Male bract shape	1 $x/y > 0.28$ (Lanceolate)			
		2 $0.28 < x/y < 0.30$			
		3 $x/y < 0.30$ (Ovate)			
70	Male bract lifting	1 Not lifting from the male bud			
		2 Lifting one at a time			
		3 Lifting two or more at a time			
71	Bract behaviour before falling	1 Revolute (rolling)			
		2 Not revolute (not rolling)			
72	Wax on the bract (external face)	1 Almost no wax			
		2 Very few wax			
		3 Moderately waxy			
		4 Very waxy			
73	Presence of grooves on the bract (external face)	1 Almost smooth			
		2 Moderate grooving (parallel furrows seen)			
		3 Strongly grooved (deep parallel furrows)			
74	Male flower behaviour	1 Falling before the bract	Flowers at the axil of first bract		
		2 Falling with the bract			
		3 Falling after the bract			
		4 Male flowers persistent			
75	Compound tepal basic colour	1 White			
		2 Cream			
		3 Yellow			
		4 Orange			
		5 Pink or pink-purple			
		6 Other (specify)			
76	Basal part of compound tepal	1 Almost no pigmentation			
		2 Rust-coloured spots			
		3 Pink pigments			
77	Lobe colour of compound tepal	1 Cream			
		2 Yellow			
		3 Orange			
		4 Green			
		5 Other (specify)			
78	Lobe development of compound tepal	1 No lobes			
		2 Moderately developed lobes			
		2 Very developed lobes			
79	Free tepal colour	1 Translucent white			
		2 Opaque white			
		3 Tinted with yellow			
		4 Tinted with pink			
80	Free tepal shape	1 Rectangular			
		2 Oval			
		3 Rounded			
		4 Fan-shaped			
81	Free tepal appearance	1 Simple folding under apex			
		2 More or less smooth			
		3 Several folding under apex (corrugated)			
82	Free tepal apex development	1 Little or no visible sign of development			
		2 Moderately developed			
		3 Very developed			
83	Free tepal margins	1 Not serrated			New trait added
		2 Serrated			
84	Free tepal apex shape	1 Thread like			
		2 Triangular			
		3 Obtuse			
85	Anther exertion	1 Exserted	In relation to the base of the lobes on the compound tepal		
		2 Same level			

		3 Inserted			
86	Filament colour	1 White			
		2 Cream			
		3 Yellow			
87	Anther colour	1 White	On dorsal face		
		2 Cream			
		3 Yellow			
		4 Grey			
		5 Brown/rusty brown			
		6 Pink/pink-purple			
		7 Black (anthers aborted)			
		8 Other (specify)			
88	Pollen sac colour	1 White	Recorded at the line where the anther splits to release poller		
		2 Cream			
		3 Yellow			
		4 Brown/rusty brown			
		5 Pink/pink-purple			
		6 Red-purple			
		7 Other (specify)			
89	Pollen viability (%)	Percentage of normal, well formed pollen grains			
90	Style basic colour	1 White			
		2 Cream			
		3 Red-purple			
		4 Other (specify)			
91	Pigmentation on style	1 Pigments absent			
		2 Pigments present			
92	Style exsertion	1 Exserted	In relation to the lobes on the compound		
		2 Same level			
		3 Inserted			
93	Style shape	1 Straight			
		2 Curved under stigma			
		3 Curved at the base			
		4 Curved twice			
		5 Other (specify)			
94	Stigma colour	1 Cream			
		2 Yellow			
		3 Pink/pink-purple			
		4 Bright yellow			
		5 Orange			
		6 Other (specify)			
95	Ovary shape	1 Straight			
		2 Arched			
96	Ovary basic colour	1 White			
		2 Cream			
		3 Yellow			
		4 Green			
		5 Other (specify)			
97	Ovary pigmentation	1 Almost no pimentation			
		2 Red-purple pigments			
98	Dominant colour of male flower	1 White			
		2 Cream			
		3 Yellow			
		4 Pink/pink-purple			
		5 Red-purple			
		6 Other (specify)			
99	Irregular flowers	Record number of flowers per cluster with an abnormal number of stamens, fusion of free and			
100	Arrangement of ovules	1 Two rowed	Observed soon after flowering and before the fruit fills		
		2 Four rowed (more or less)			
101	Fruit position	1 Curved towards stalk			
		2 Parallel to the stalk			

		3 Curved upward (obliquely, at a 45° angle upward)			
		4 Perpendicular to the stalk			
		5 Pedant			
102	Number of fruits per hand	1 ≤12	At mid-hand of the bunch		
		2 13-16			
		3 ≥17			
103	Fruit length (cm)	1 ≤15 cm	Measured as the internal arc of the fruit without pedicel		
		2 16-20 cm			
		3 21-25 cm			
		4 26-30 cm			
		5 >31 cm			
104	Fruit shape (Longitudinal curvature)	1 Straight (slightly curved)			
		2 Straight in the distal part			
		3 Curved (sharp)			
		4 Curved in 'S' shape (double curvature)			
		5 Other (specify)			
105	General fruit shape	1 Oval		New trait added	
		2 Slender			
		3 Gourd shape			
		4 Other			
106	Transverse section of fruit	1 Pronounced ridges	Recorded on early ripened stage of fruit		
		2 Slightly ridges			
		2 Rounded			
107	Fruit apex	1 Pointed	Noted at the distal end of the fruit		
		2 Lengthily pointed			
		3 Blunt-tipped			
		4 Bottle-necked			
		5 Rounded			
108	Remains of flower relicts at fruit apex	1 Without any flower relicts		Modified previous descriptor state*	1 Without any flower relicts
		2 Persistent style			2 Persistent style
		3 Base of the style prominent			3 Base of the style prominent
		4 Persistent style and staminode			
109	Fruit pedicel length (mm)	1 ≤10 mm			
		2 11-20 mm			
		3 ≥21 mm			
110	Fruit pedicel width (mm)	1 ≤ 5 mm			
		2 6-9 mm			
		3 ≥10 mm			
111	Pedicel surface	1 Hairless			
		2 Hairy			
112	Fusion of pedicels (before joining the crown)	1 Very partially or no visible sign of fusion			
		2 Partially fused			
		3 Totally fused			
113	Immature fruit peel colour	1 Yellow	Recorded on the youngest hand of the bunch before maturity		
		2 Light green			
		3 Green			
		4 Green and pink, red or purple			
		5 Silvery			
		6 Dark green			
		7 Brown/rusty brown			
		8 Pink, red or purple			
		9 Black			
		10 Other			
114	Mature fruit peel colour	1 Yellow	Recorded at optimum maturity		
		2 Bright yellow			
		3 Orange			

		4 Grey spots			
		5 Brown/rusty-brown			
		6 Orange red, red or pink/pink			
		7 Red-purple			
		8 Black			
		9 Other (specify)			
115	Fruit peel thickness (mm)	1 ≤ 2 mm	Recorded at optimum maturity stage		
		2 > 2 mm			
116	Adherence of the fruit peel	1 Fruit peels easily	Recorded at optimum maturity stage		
		2 Fruit does not peel easily			
117	Cracks in fruit peel	1 Without cracks	Recorded at optimum maturity if the peel splits without mechanical damage		
		2 Cracked			
118	Pulp in fruit	1 Without pulp			
		2 With pulp			
119	Pulp colour before maturity	1 White	Recorded on youngest hand of the bunch		
		2 Cream			
		3 Ivory			
		4 Yellow			
		5 Orange			
		6 Beige-pink			
		7 Other (specify)			
120	Pulp colour at maturity	1 White	Recorded at optimum maturity stage		
		2 Cream			
		3 Ivory			
		4 Yellow			
		5 Orange			
		6 Beige-pink			
		7 Other (specify)			
121	Fruit fall from hands	1 Persistent	Recorded at maturity		
		2 Deciduous			
122	Flesh texture	1 Firm	Recorded at optimum maturity stage		
		2 Soft			
123	Predominant taste	1 Astringent (like cooking banana)			
		2 Mild, slightly tasty or tasteless			
		3 Sweet (like Cavendish)			
		4 Sugary (like 'Pisang Mas')			
		5 Sweet and acidic (like apple)			
		6 Other (specify)			
124	Presence of seeds with source of pollen	1 < 5	Record number of seeds only if there exists in the vicinity of the plant a population of wild relatives or male fertile hybrids - pollen sources, or if the female flowers are artificially pollinated		
		2 5-20			
		> 20			
125	Seed surface	1 Smooth			
		2 Wrinkled			
126	Seed shape	1 Flat			
		2 Angular (more or less pyramidal)			
		3 Globular (spherical)			
		4 Rounded (but not completely spherical)			
Abiotic stresses					
127	Low temperature	1 Very low or no visible sign of susceptibility			
		2 Very low to low			
		3 Low			
		4 Low to intermediate			
		5 Intermediate			
		6 Intermediate to high			
		7 High			
		8 High to very high			
		9 Very high			

128	Drought	Susceptibility score as for 'low temperature'			
129	Flooding	Susceptibility score as for 'low temperature'			
130	Mineral deficiencies	Susceptibility score as for 'low temperature'			
131	Winds	Susceptibility score as for 'low temperature'			
132	Soil acidity	Susceptibility score as for 'low temperature'			
133	Manganese toxicity	Susceptibility score as for 'low temperature'			
134	High temperature	Susceptibility score as for 'low temperature'			
	Biotic stresses				
135	Sigatoka (<i>Mycosphaerella musicola</i>)	Susceptibility score on 1-9 scale, where 1 Very low or no visible sign of susceptibility 2 Very low to low 3 Low 4 Low to intermediate 5 Intermediate 6 Intermediate to high 7 High 8 High to very high 9 Very high			
136	Black Leaf streak (<i>Mycosphaerella fijiensis</i>)	Susceptibility score as for 'Disease-Sigatoka'			
137	<i>Fusarium</i> wilt/Panama disease (<i>Fusarium oxysporum</i> f.sp. <i>cubense</i>)	Susceptibility score as for 'Disease-Sigatoka'			
138	Moko/ Bugtok (<i>Pseudomonas solanacearum</i>)	Susceptibility score as for 'Disease-Sigatoka'			
139	Pest - Burrowing nematode (<i>Radopholus similis</i>)	Susceptibility score as for 'Disease-Sigatoka'			
140	Pest - Root lesion nematode (<i>Pratylenchus coffeae</i>)	Susceptibility score as for 'Disease-Sigatoka'			
141	Root lesion nematode (<i>Pratylenchus goodeyi</i>)	Susceptibility score as for 'Disease-Sigatoka'			
142	Weevil borer (<i>Cosmopolites sordidus</i>)	Susceptibility score as for 'Disease-Sigatoka'			
143	<i>Meloidogyne</i> sp.	Susceptibility score as for 'Disease-Sigatoka'			
144	<i>Helicotylenchus multicinctus</i>	Susceptibility score as for 'Disease-Sigatoka'			
145	Molecular markers - RFLP				
	Molecular markers- RAPD				
	Molecular markers-SAP				
	Microsatellites				
146	Chromosome number				
147	Flow cytometry- Ploidy				
148	Cycle under evaluation	1 Cycle 1 2 Cycle 2 and following			
149	Number of plant evaluated				
150	Planting to shooting	Number of days	From planting until the emergence of the first bract		
151	Plant crop cycle	Number of days	From planting to harvest		
152	Ratoon cycle 2	Number of days	Between two successive harvests		
153	Height of following ratoon	Recorded in cm	From base of pseudostem to last leaf axil		
154	Bunch weight	Recorded in Kg			
155	Number of hands				
156	Fruit diameter	Recorded in mm	Recorded on the central external fruit of the middle hand		

157	Fruit weight	Recorded in g	Divide the collective weight of the hands (cut from the peduncle) by the number of		
158	Number living (functional) leaves at harvest				
159	Number living (functional) leaves at flowering				
For characterization					
160	Brown exudates in the fruit pulp	0 Absent	At maturity	New trait added	
		1 present			
161	Molecular markers - DArT			New trait added	
162	DNA sequence data			New trait added	
For evaluation					
163	Banana Xanthomonas Wilt (<i>Xanthomonas vasicola</i> pv. <i>musacearum</i>)			New trait added	
Nutritional traits to be added but no yet validated descriptors					
164	Carotenoids Content			New trait added	
165	Zinc Content			New trait added	
166	Iron Content			New trait added	
Post Harvest descriptors					
167	Time to rotting			New trait added	
168	Ripening response to ethylene			New trait added	
169	Bruising of fruit			New trait added	
170	Temperature sensitivity			New trait added	
171	Brix (sugar)			New trait added	
172	Starch content and nature,			New trait added	
173	Uses: e.g. ships, beer, etc			New trait added	
174	Colour of flesh when fruit is boiled			New trait added	