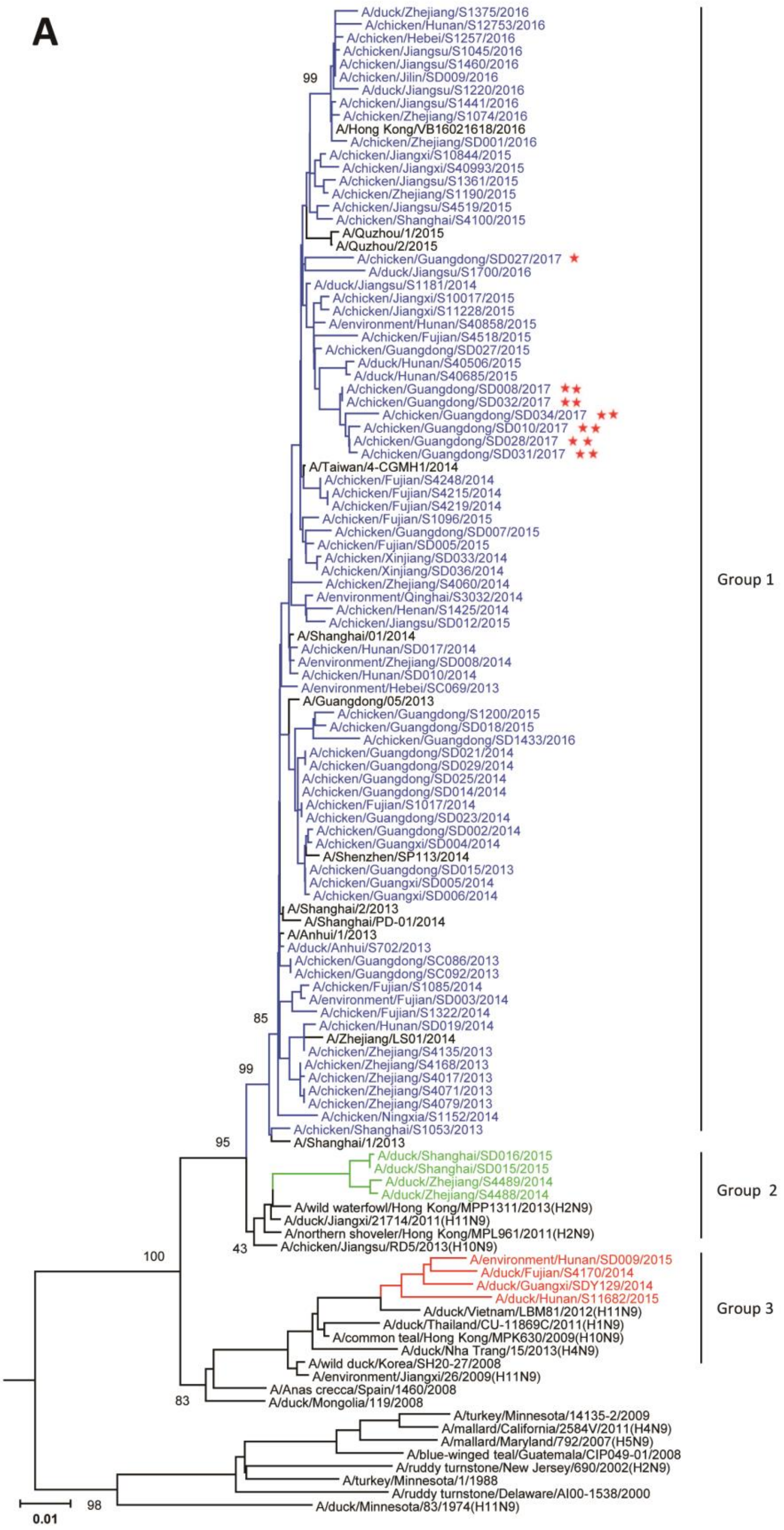
Figure S1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A/chicken/Zhejiang/S1190/2015
A/chicken/Jiangsu/S4519/2015
A/chicken/Shanghai/S4100/2015
A/Quzhou/1/2015
A/Quzhou/2/2015
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A/duck/Hunan/S40685/2015
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A/chicken/Guangdong/SD032/2017 ★★
A/chicken/Guangdong/SD034/2017 ★★
A/chicken/Guangdong/SD010/2017 ★★
A/chicken/Guangdong/SD028/2017 ★★
A/chicken/Guangdong/SD031/2017 ★★
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A/chicken/Guangdong/SD007/2015
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A/chicken/Xinjiang/SD033/2014
A/chicken/Xinjiang/SD036/2014
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A/chicken/Hunan/SD010/2014
A/environment/Hebei/SC069/2013
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A/chicken/Guangdong/S1200/2015
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A/chicken/Guangdong/SD029/2014
A/chicken/Guangdong/SD025/2014
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A/chicken/Guangdong/SD023/2014
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A/Shanghai/PD-01/2014
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A/chicken/Ningxia/S1152/2014
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95
A/Shanghai/1/2013
Group 1
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43
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Group 2
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83
A/duck/Mongolia/119/2008
Group 3
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A/ruddy turnstone/New Jersey/690/2002(H2N9)
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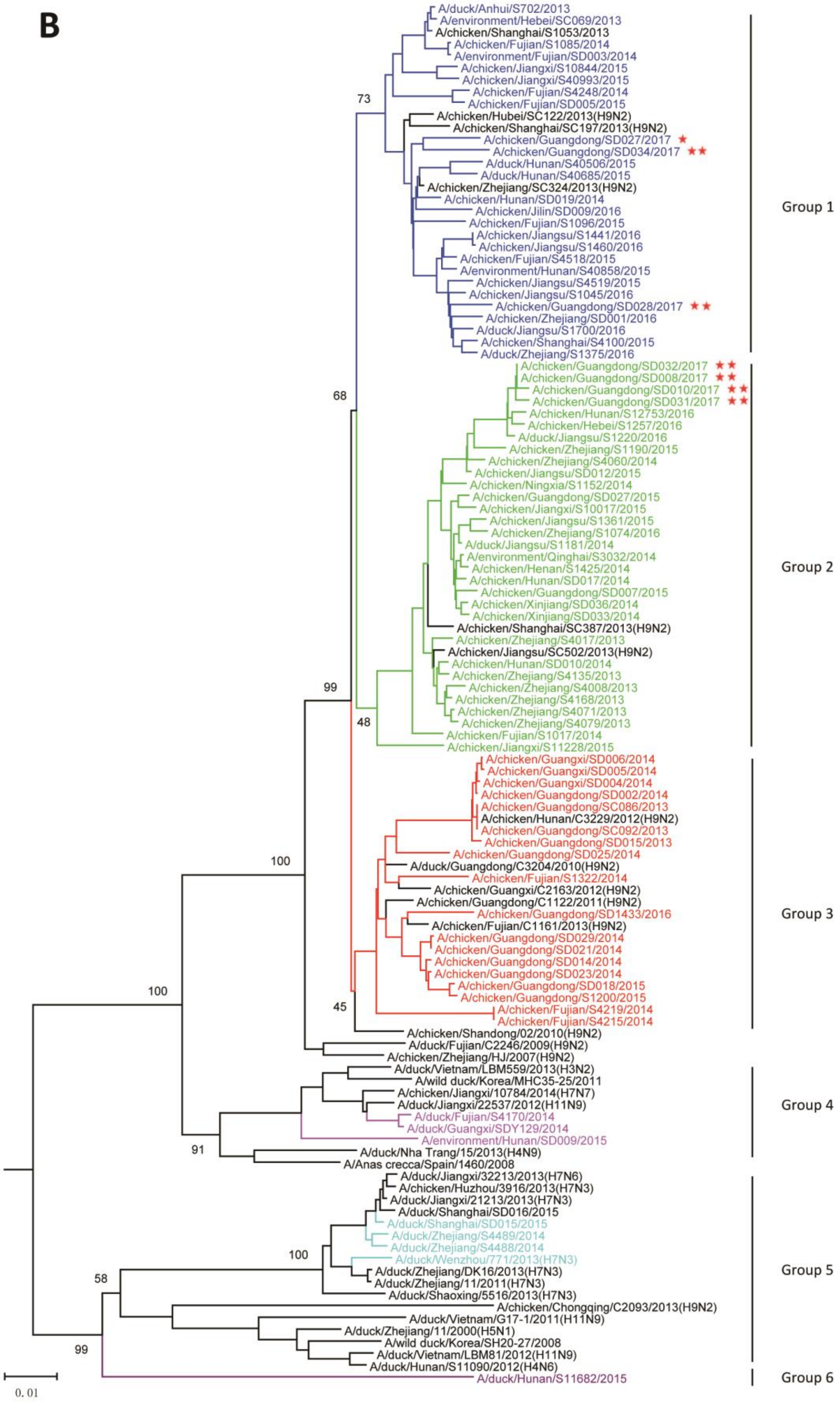
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A/chicken/Fujian/S4248/2014
A/chicken/Fujian/SD005/2015
73
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A/chicken/Shanghai/SC197/2013(H9N2)
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A/chicken/Guangdong/SD034/2017 ★★
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A/chicken/Jilin/SD009/2016
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A/chicken/Jiangsu/S1460/2016
A/chicken/Fujian/S4518/2015
A/environment/Hunan/S40858/2015
A/chicken/Jiangsu/S4519/2015
A/chicken/Jiangsu/S1045/2016
A/chicken/Guangdong/SD028/2017 ★★
A/chicken/Zhejiang/SD001/2016
A/duck/Jiangsu/S1700/2016
A/chicken/Shanghai/S4100/2015
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Group 1
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A/chicken/Guangdong/SD008/2017 ★★
A/chicken/Guangdong/SD010/2017 ★★
A/chicken/Guangdong/SD031/2017 ★★
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A/chicken/Hunan/S12753/2016
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A/chicken/Jiangsu/SD012/2015
A/chicken/Ningxia/S1152/2014
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A/chicken/Jiangsu/S1361/2015
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A/chicken/Xinjiang/SD036/2014
A/chicken/Xinjiang/SD033/2014
Group 2
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A/chicken/Jiangsu/SC502/2013(H9N2)
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A/chicken/Guangdong/SC086/2013
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A/chicken/Guangdong/SD025/2014
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A/chicken/Guangdong/C1122/2011(H9N2)
Group 3
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45
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A/chicken/Fujian/S4215/2014
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A/duck/Fujian/C2246/2009(H9N2)
A/chicken/Zhejiang/HJ/2007(H9N2)
A/duck/Vietnam/LBM559/2013(H3N2)
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A/chicken/Jiangxi/10784/2014(H7N7)
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91
A/duck/Nha Trang/15/2013(H4N9)
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A/chicken/Huzhou/3916/2013(H7N3)
A/duck/Jiangxi/21213/2013(H7N3)
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A/duck/Shanghai/SD015/2015
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A/duck/Zhejiang/S4488/2014
100
A/duck/Wenzhou/771/2013(H7N3)
Group 5
58
A/duck/Zhejiang/DK16/2013(H7N3)
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A/duck/Shaoxing/5516/2013(H7N3)
A/chicken/Chongqing/C2093/2013(H9N2)
A/duck/Vietnam/G17-1/2011(H11N9)
A/duck/Zhejiang/11/2000(H5N1)
99
A/wild duck/Korea/SH20-27/2008
A/duck/Vietnam/LBM81/2012(H11N9)
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Group 6
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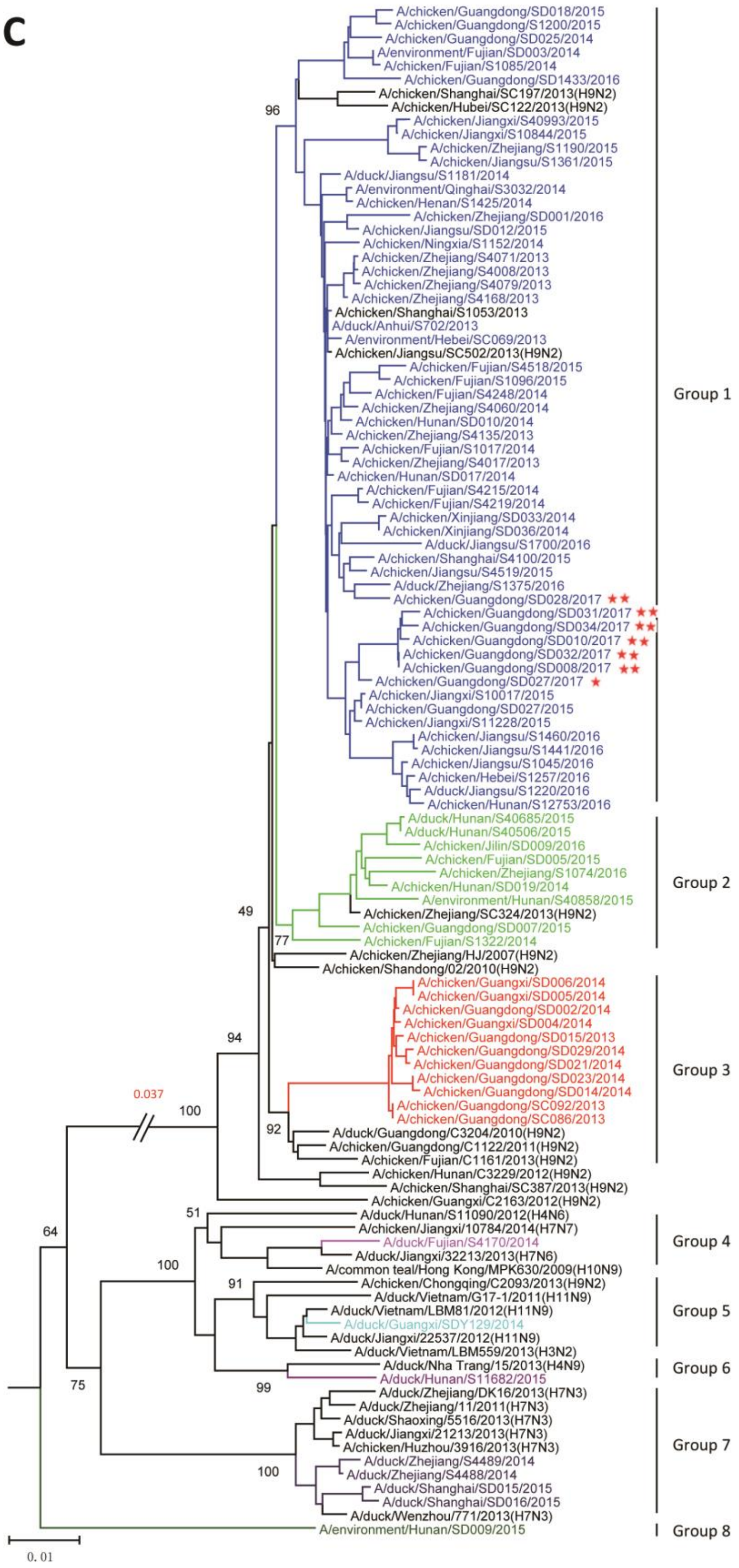
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A/chicken/Guangdong/SD1433/2016
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A/chicken/Jiangxi/S10844/2015
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A/chicken/Jiangsu/S1361/2015
A/duck/Jiangsu/S1181/2014
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A/chicken/Zhejiang/S4008/2013
A/chicken/Zhejiang/S4079/2013
A/chicken/Zhejiang/S4168/2013
A/chicken/Shanghai/S1053/2013
A/duck/Anhui/S702/2013
A/environment/Hebei/SC069/2013
A/chicken/Jiangsu/SC502/2013(H9N2)
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A/chicken/Fujian/S1096/2015
A/chicken/Fujian/S4248/2014
Group 1
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A/chicken/Fujian/S1017/2014
A/chicken/Zhejiang/S4017/2013
A/chicken/Hunan/SD017/2014
A/chicken/Fujian/S4215/2014
A/chicken/Fujian/S4219/2014
A/chicken/Xinjiang/SD033/2014
A/chicken/Xinjiang/SD036/2014
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A/chicken/Shanghai/S4100/2015
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A/chicken/Hunan/S12753/2016
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A/chicken/Jilin/SD009/2016
A/chicken/Fujian/SD005/2015
A/chicken/Zhejiang/S1074/2016
Group 2
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A/chicken/Zhejiang/SC324/2013(H9N2)
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77
A/chicken/Fujian/S1322/2014
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94
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A/chicken/Guangdong/SD021/2014
Group 3
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92
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A/chicken/Hunan/C3229/2012(H9N2)
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A/chicken/Guangxi/C2163/2012(H9N2)
51
A/duck/Hunan/S11090/2012(H4N6)
64
A/chicken/Jiangxi/10784/2014(H7N7)
A/duck/Fujian/S4170/2014
Group 4
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A/chicken/Chongqing/C2093/2013(H9N2)
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A/duck/Vietnam/LBM81/2012(H11N9)
Group 5
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A/duck/Jiangxi/22537/2012(H11N9)
A/duck/Vietnam/LBM559/2013(H3N2)
A/duck/Nha Trang/15/2013(H4N9)
Group 6
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75
99
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A/duck/Zhejiang/11/2011(H7N3)
A/duck/Shaoxing/5516/2013(H7N3)
A/duck/Jiangxi/21213/2013(H7N3)
Group 7
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A/duck/Zhejiang/S4488/2014
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Group 8
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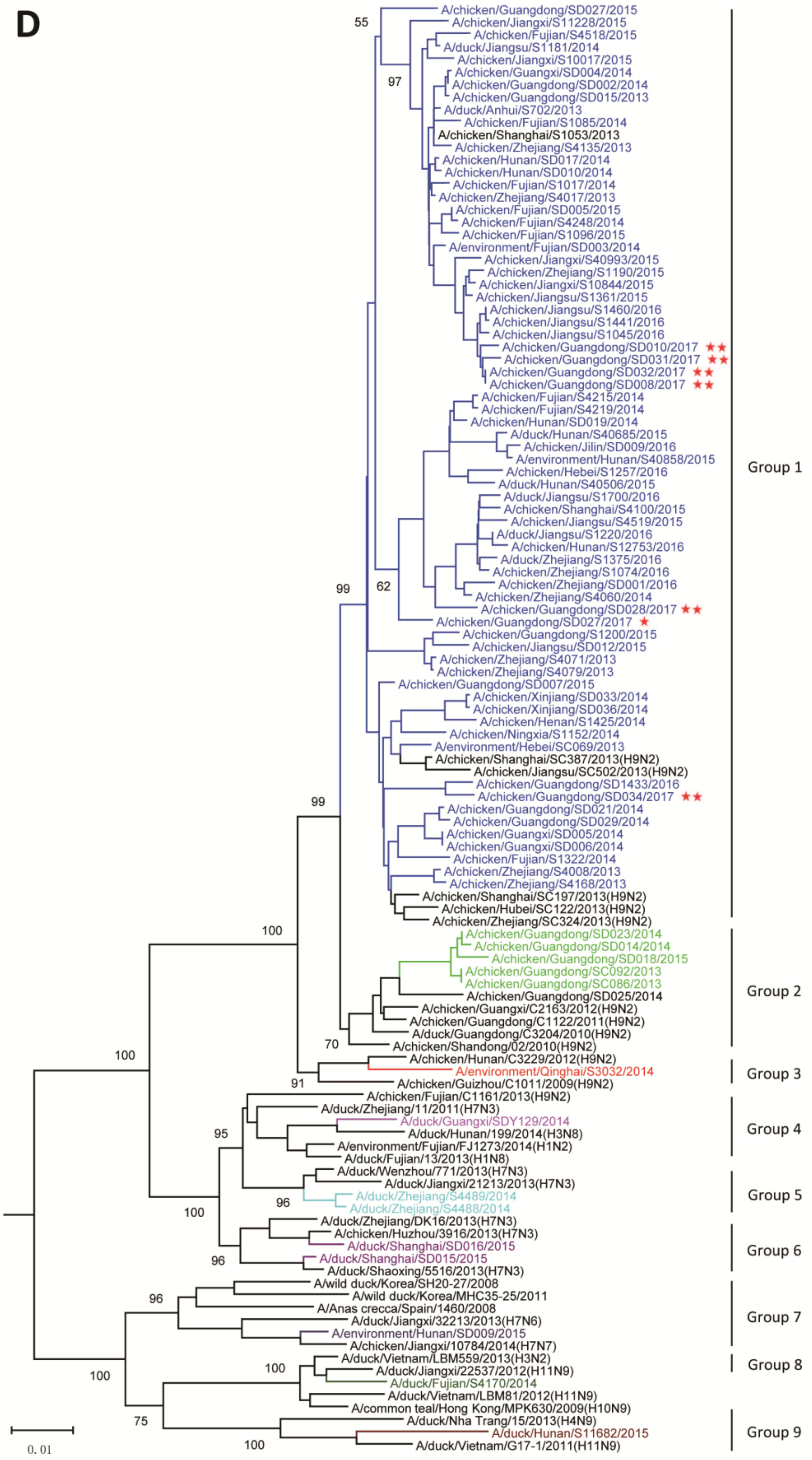
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A/chicken/Guangdong/SD002/2014
A/chicken/Guangdong/SD015/2013
A/duck/Anhui/S702/2013
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A/chicken/Guangdong/SD032/2017 ★★
A/chicken/Guangdong/SD008/2017 ★★
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A/chicken/Hubei/SC122/2013(H9N2)
A/chicken/Zhejiang/SC324/2013(H9N2)
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A/chicken/Guangdong/SD018/2015
A/chicken/Guangdong/SC092/2013
A/chicken/Guangdong/SC086/2013
A/chicken/Guangdong/SD025/2014
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A/duck/Shanghai/SD015/2015
A/duck/Shaoxing/5516/2013(H7N3)
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A/duck/Nha Trang/15/2013(H4N9)
A/duck/Hunan/S11682/2015
A/duck/Vietnam/G17-1/2011(H11N9)
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70
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91
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96
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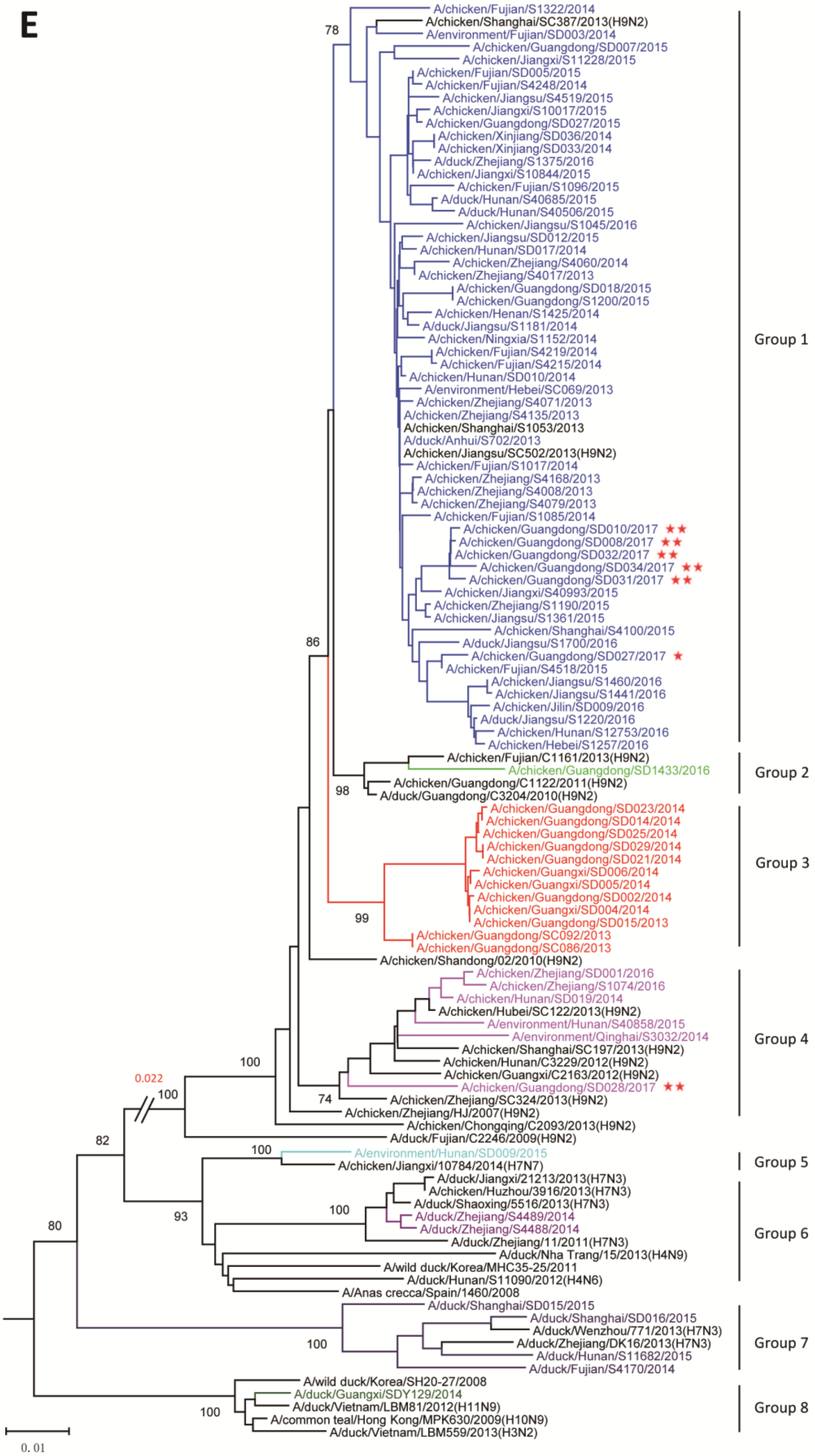
Group 1
Group 2
Group 3
Group 4
Group 5
Group 6
Group 7
Group 8
Group 9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A/chicken/Jiangsu/S1361/2015
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A/chicken/Jiangsu/S1441/2016
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98
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99
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Group 3
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A/chicken/Guangdong/SD028/2017 ★★
100
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A/chicken/Zhejiang/HJ/2007(H9N2)
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80
93
A/duck/Zhejiang/S4488/2014
A/duck/Zhejiang/11/2011(H7N3)
A/duck/Nha Trang/15/2013(H4N9)
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Group 6
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A/duck/Fujian/S4170/2014
Group 7
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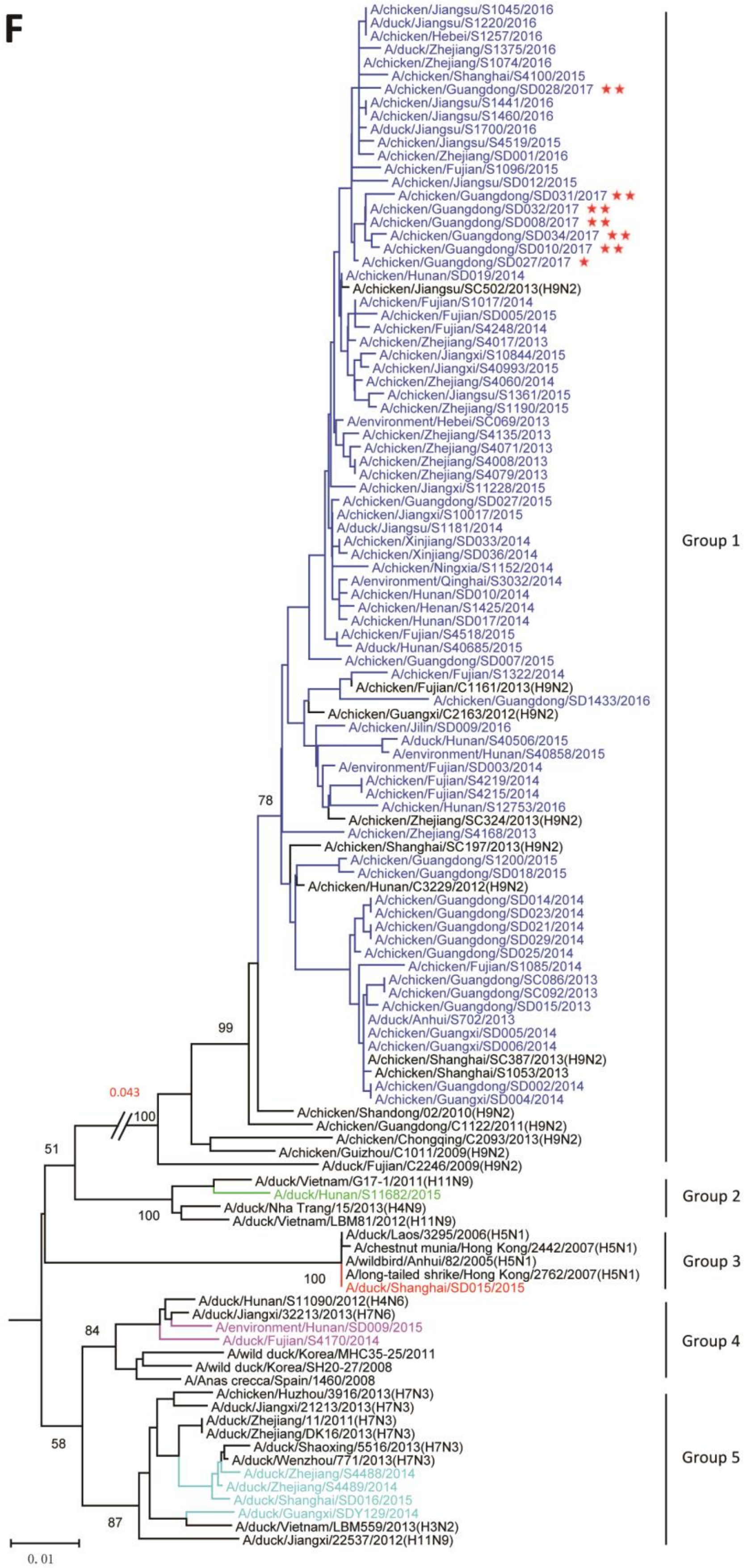
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Group 1
51
A/duck/Vietnam/G17-1/2011(H11N9)
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A/Anas crecca/Spain/1460/2008
84
Group 4
A/chicken/Huzhou/3916/2013(H7N3)
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A/duck/Shanghai/SD016/2015
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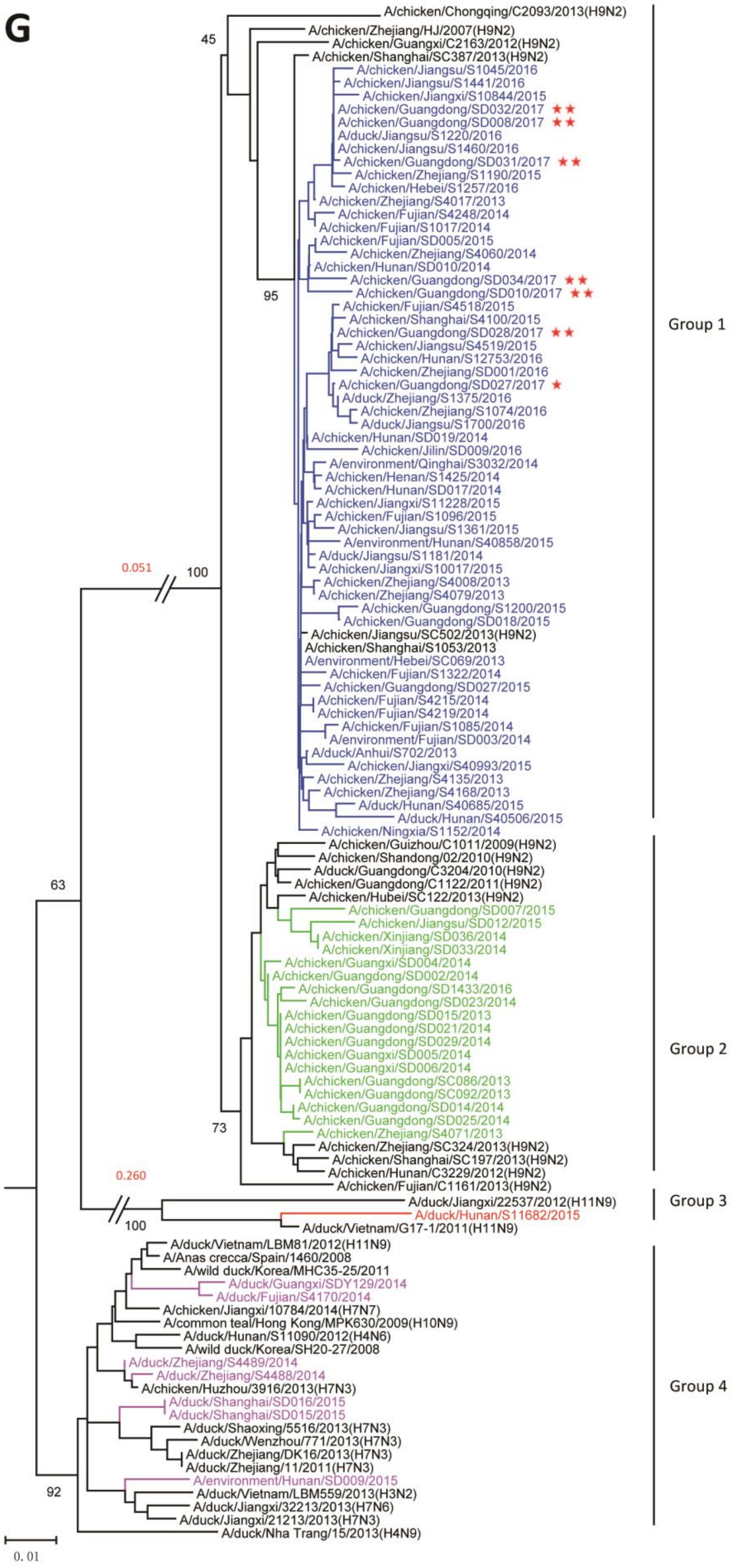
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Group 2
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A/duck/Jiangxi/21213/2013(H7N3)
A/duck/Nha Trang/15/2013(H4N9)
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Figure S1. Phylogenetic trees of the NA and internal genes of H7N9 influenza viruses. (**A**) Phylogenetic tree of NA. The tree was rooted to A/chicken/Italy/22A/1998(H5N9) virus and based on nucleotides (nt) 19 to 1416. The phylogenetic trees of PB2 (B), PB1(C), PA (D), NP (E), M (F), and NS (G) were based on nt 28–2307, 25–2298, 25–2175, 46–1542, 26–1007, and 27–864, respectively, and rooted to A/chicken/Rostock/45/1934(H7N1) virus. Sequences of viruses with names in black were downloaded from available databases; viruses with names in colors were sequenced in this study. Viruses labelled with stars contain the four amino acid (-KRTA-) insertion in their HA gene cleavage sites.