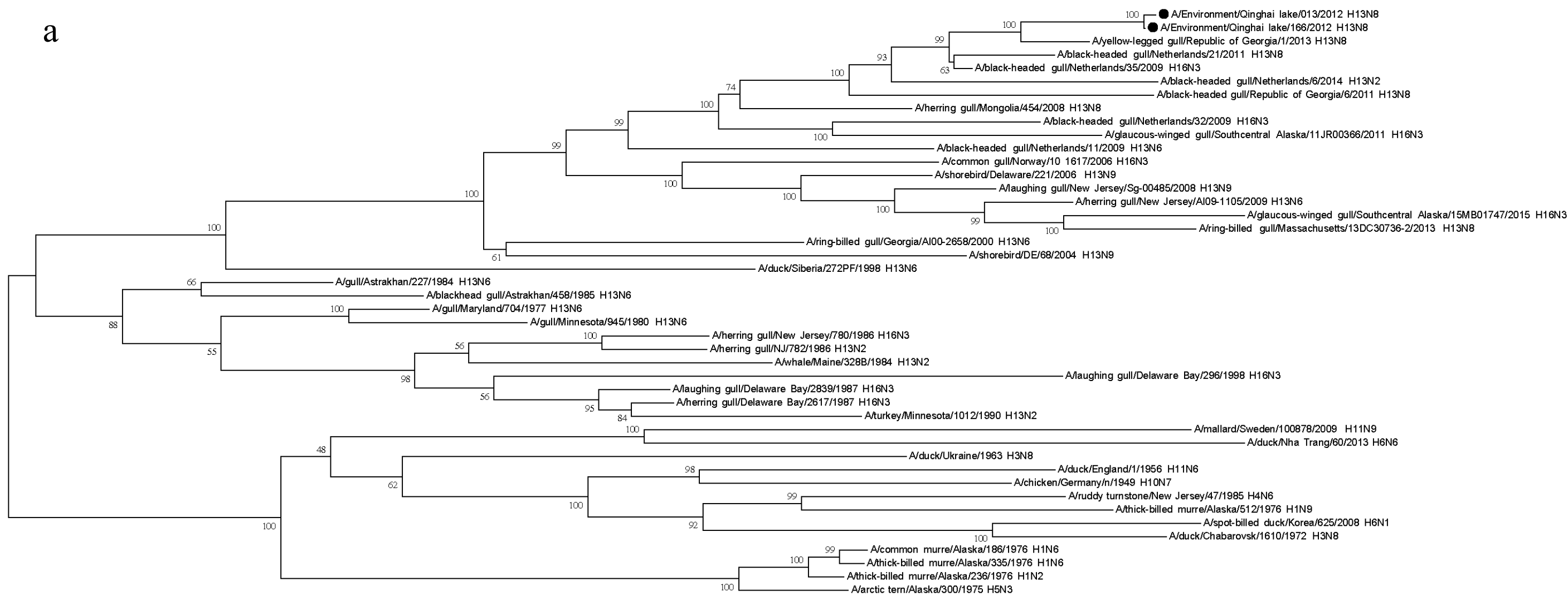
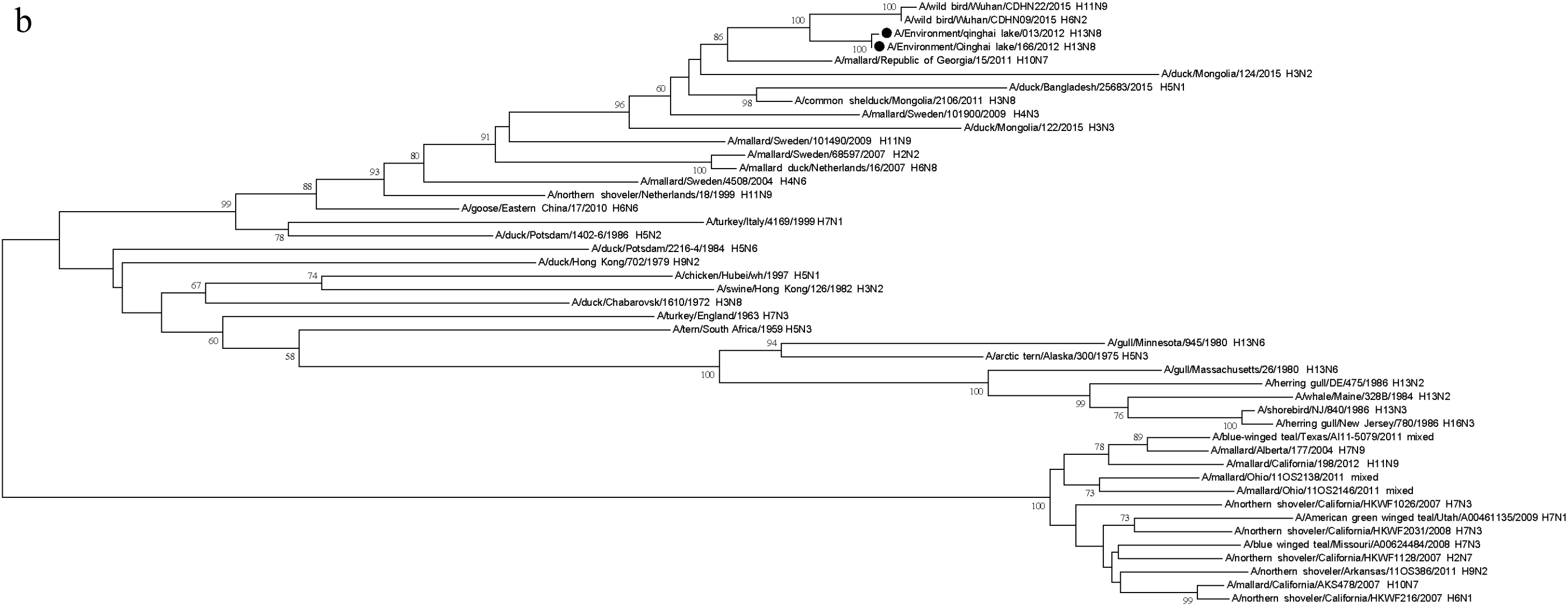


a



b



C

100

No H13 and H16

100

78

96

A/herring gull/New Jersey/780/1986(H16N3)

A/laughing gull/Delaware Bay/296/1998(H16N3)

North American

A/gull/Maryland/1815/1979(H13N6)

A/gull/Maryland/704/1977(H13N6)

A/Mongolian gull/Mongolia/405/2007(H13N6)

A/blackhead gull/Astrakhan/458/1985(H13N6)

A/gull/Astrakhan/227/1984(H13N6)

A/blackhead gull/Astrakhan/65/1983(H13N6)

A/blackhead gull/Astrakhan/1421/1979(H13N6)

A/duck/Siberia/272/1998(H13N6)

A/glaucous-winged gull/Southcentral Alaska/11JR02017/2011(H16N3)

A/laughing gull/New Jersey/Sg-00559/2008(H13N9)

A/glaucous-winged gull/Southcentral Alaska/14MB01383/2014(H16N3)

A/common gull/Norway/10 1617/2006(H16N3)

A/glaucous-winged gull/Southcentral Alaska/11JR02474/2011(H13N6)

A/glaucous-winged gull/Southcentral Alaska/12NH01647/2008(H16N3)

A/black-headed gull/Iceland/713/2010(H16N3)

Eurasian

A/black-headed gull/Sweden/5/99(H16N3)

A/black-headed gull/Netherlands/13/2011(H16N3)

A/black-headed gull/Netherlands/1/00(H13N8)

A/black-headed gull/Netherlands/8/2007(H16N3)

A/black-headed gull/Netherlands/11/2009(H13N6)

A/glaucous-winged gull/Southcentral Alaska/15MB01610/2015(H13N6)

A/black-headed gull/Netherlands/105/2012(H13N6)

A/black-headed gull/Netherlands/33/2009(H13N2)

● A/Environment/Qinghai lake/166/2012(H13N8)

● A/Environment/Qinghai lake/013/2012(H13N8)

100

100

97

100

91

76

85

85

68

97

58

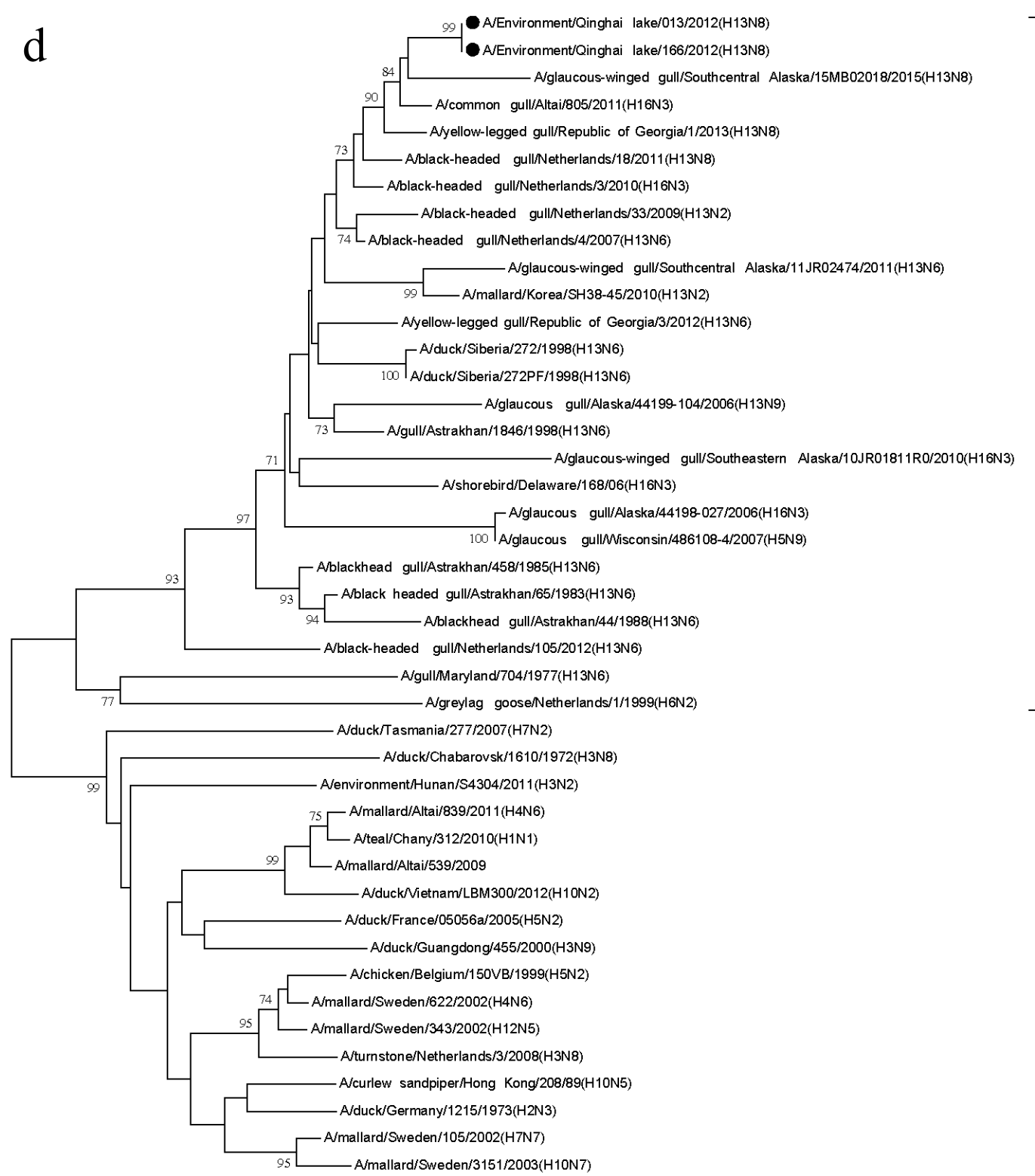
82

99

67

88

d



H13 and H16 relative

e

Phylogenetic tree showing relationships among various gull species and related taxa. Bootstrap values are indicated at the nodes. The tree is rooted on the left and branches out to the right. The taxa are labeled with their species names, locations, and sample IDs. The tree is color-coded: blue for the main clade, red for the North American clade, and green for the Mongolian gull. Two black dots are present on the tree, indicating specific samples.

Key taxa and bootstrap values (from left to right):

- A/black-headed gull/Netherlands/4/2015(H16N3) (75)
- A/duck/Hokkaido/WZ82/2013(H16N3) (84)
- A/glaucous-winged gull/Southcentral Alaska/15MB01610/2015(H13N6)
- A/sandpiper/Southcentral Alaska/16MB01145/2016(mixed)
- A/glaucous-winged gull/Southcentral Alaska/15MB02016/2015(H13N8)
- A/black-headed gull/Republic of Georgia/1/2012(H13N6)
- A/yellow-legged gull/Republic of Georgia/3/2012(H13N6)
- A/Armenian gull/Republic of Georgia/1/2012(H13N6)
- A/black-headed gull/Republic of Georgia/7/2011(H13N6)
- A/black-headed gull/Republic of Georgia/4/2012(H16N3)
- A/yellow-legged gull/Republic of Georgia/1/2010(N2)
- A/Environment/Qinghai lake/013/2012(H13N8) (52)
- A/Environment/Qinghai Lake/166/2012(H13N8) (58)
- A/black-headed gull/Republic of Georgia/1/2011(H13N8)
- A/black-headed gull/Netherlands/8/2010(H13N2)
- A/black-headed gull/Netherlands/10/2013(H13N8)
- A/black-headed gull/Netherlands/8/2014(H13N2)
- A/black-headed gull/Netherlands/25/2014(H13N2)
- A/common gull/Norway/10 1313/2009(H13N2)
- A/black-headed gull/Netherlands/3/2010(H16N3)
- A/black-headed gull/Netherlands/10/2010(H13N8)
- A/glaucous gull-herring gull hybrid/Iceland/1108/2011(H16N3)
- A/glaucous-winged gull/Southcentral Alaska/15MB01680/2015(H16N3)
- A/black-headed gull/Netherlands/7/2009(H13N2)
- A/mallard/Sweden/101558/2009(mixed)
- A/black-headed gull/Sweden/74342/2008(H13N8)
- A/black-headed gull/Netherlands/17/2009(H13N3)
- A/black-headed gull/Netherlands/29/2009(H13N6)
- A/black-headed gull/Netherlands/4/2007(H13N6)
- A/Mongolian gull/Mongolia/405/2007(H13N6)
- A/black-headed gull/Sweden/1/2005(H13N8)
- A/silver gull/Tasmania/062/2006(H13N6)
- A/black-headed gull/Mongolia/1766/2006(H13N6)
- A/glaucous-winged gull/Southeastern Alaska/10JR01681R0/2010(H16N3)
- A/glaucous-winged gull/Southcentral Alaska/11JR02474/2011(H13N6)
- A/duck/Siberia/272/1998(H13N6)
- A/greylag goose/Netherlands/1/1999(H6N2)
- A/feces/New Jersey/2413/2000(H4N6)
- A/ring-billed gull/Georgia/2658/2000(H11N6)
- A/glaucous gull/Wisconsin/486108-4/2007(H5N9)
- A/black-headed gull/Astrakhan/44/1988(H13N6)
- A/black-headed gull/Astrakhan/458/1985(H13N6)
- A/black-headed gull/Astrakhan/65/1983(H13N6)
- A/blackhead gull/Astrakhan/1421/1979(H13N6)
- A/sabines gull/Alaska/296/1975(H5N3)
- A/gull/Maryland/704/1977(H13N6)
- A/gull/Maryland/1824/1978(H13N9)
- A/gull/Massachusetts/26/1980(H13N6)
- A/whale/Maine/328B/1984(H13N2)
- A/laughing gull/Delaware Bay/2839/1987(H16N3)
- A/laughing gull/Delaware Bay/2838/1987(H13N2)
- A/herring gull/NJ/782/1986(H13N2)
- A/herring gull/New Jersey/780/1986(H16N3)

North American