

1 **Ecological dynamics of influenza A viruses:**
2 **cross-species transmission and global migration**

3 Hongguang Ren¹, Yuan jin¹, Mingda Hu¹, Jing Zhou¹, Ting Song¹, Zhisong Huang¹, Beiping Li¹,
4 Kaiwu Li¹, Wei Zhou¹, Hongmei Dai¹, Weifeng Shi^{2†}, Junjie Yue^{1†} & Long Liang^{1†}

5

6 ¹ State Key Laboratory of Pathogen and Biosecurity, Beijing Institute of Biotechnology, Beijing
7 100071, China.

8 ²Institute of Pathogen Biology, Taishan Medical College, Taian 271000, China.

9 [†]Corresponding authors.

10

11 Correspondence and requests for materials should be addressed to W.S. (email: shiwf@ioz.ac.cn),
12 J.Y. (email: yue_junjie@126.com), or L.L. (email: ll@bmi.ac.cn).

13

14 **Supplementary information**

15 **Supplementary Figures**

16 **Supplementary Figures S1-S16.** Detailed amino acid and codon distance between each pair of
17 species on each loci for each segment of the IAVs

18 Distance values were indicated by colors: red bars represent that the value is large than 0.80;

19 orange bars represent that the value is between 0.50 and 0.8; black bars represent the value is

20 smaller than 0.50.

21 **Supplementary Tables**

22 **Supplementary Table 1.** Country classifications at sub-continent level

23 **Supplementary Table 2.** Genomes sampled from avian and detailed avian classifications

24 **Supplementary Table 3.** Detailed regional cross-species transmission events

25 **Supplementary Table 4.** Detailed inter-regional migrations driven by each species

26 **Supplementary Data**

27 **Supplementary Data 1.** Detailed genome Information

28 The information of each genome is included in the line started with symbol '>', and the ten

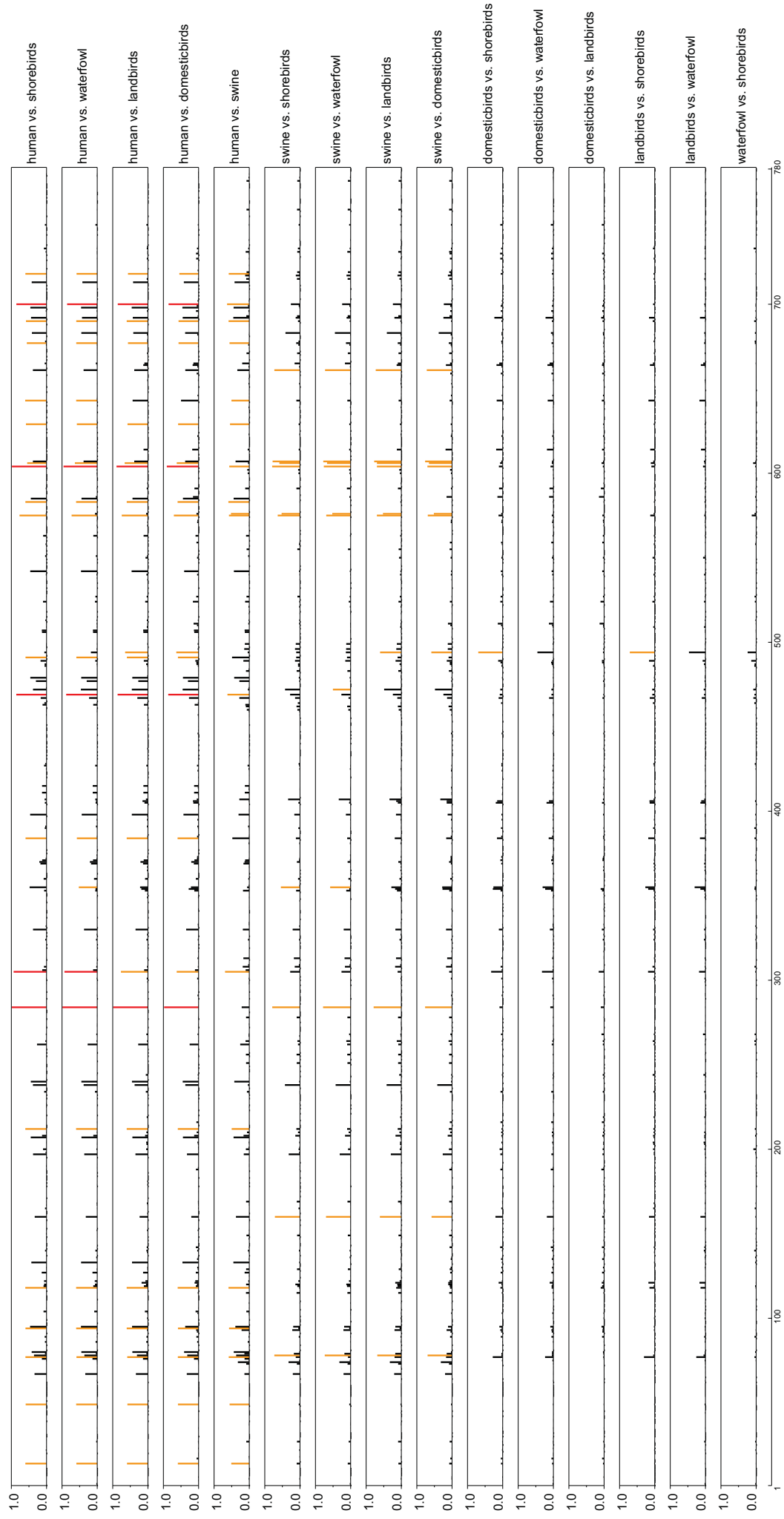
29 segments of each genome were listed under the information line. Accession number of the

30 corresponding protein and coding region for each segment were also listed.

31 **Supplementary Data 2.** Xml files for BEAST

Supplementary Figure S1

PB2 : amino acide comparison



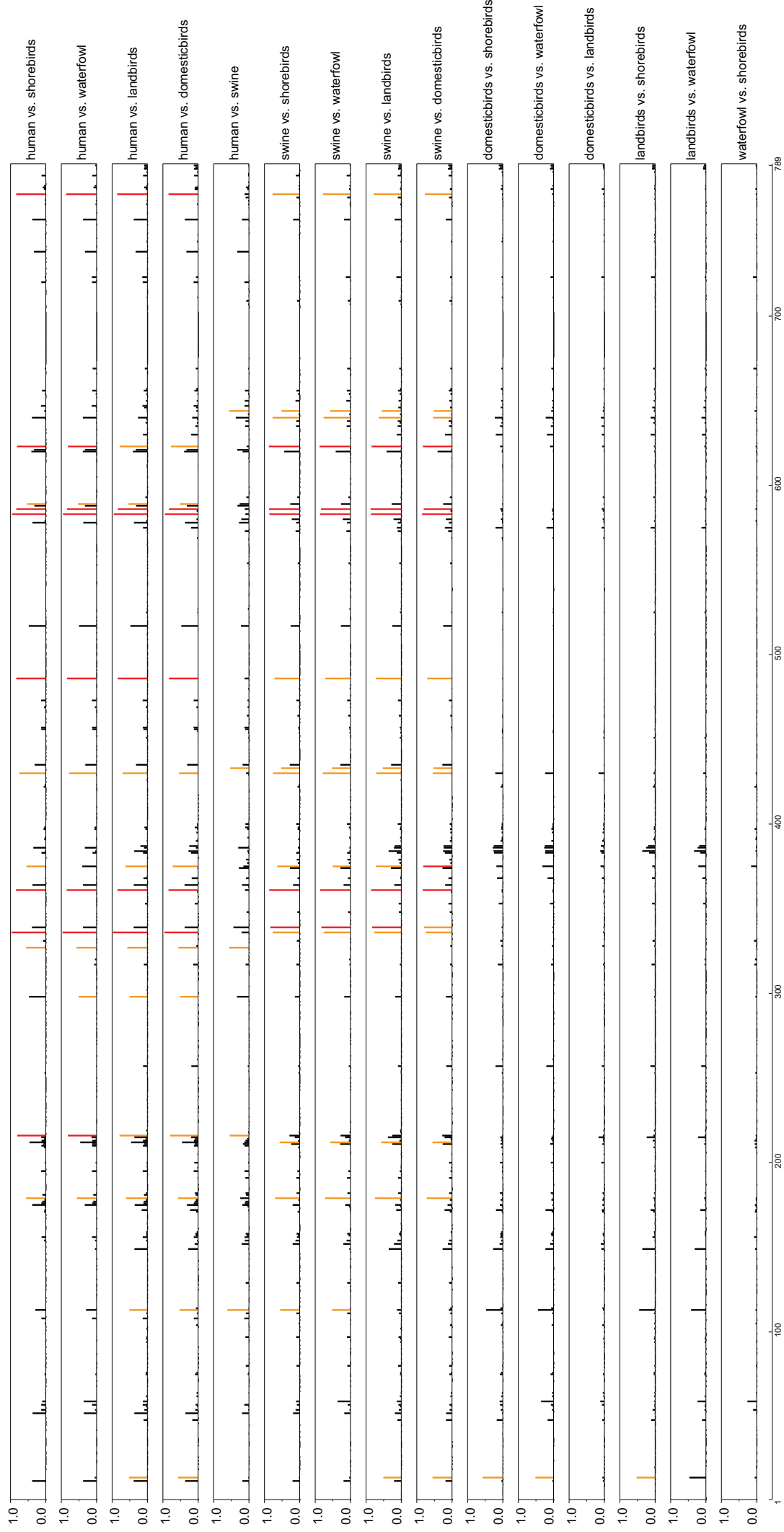
Supplementary Figure S2

PB2 : codon comparison



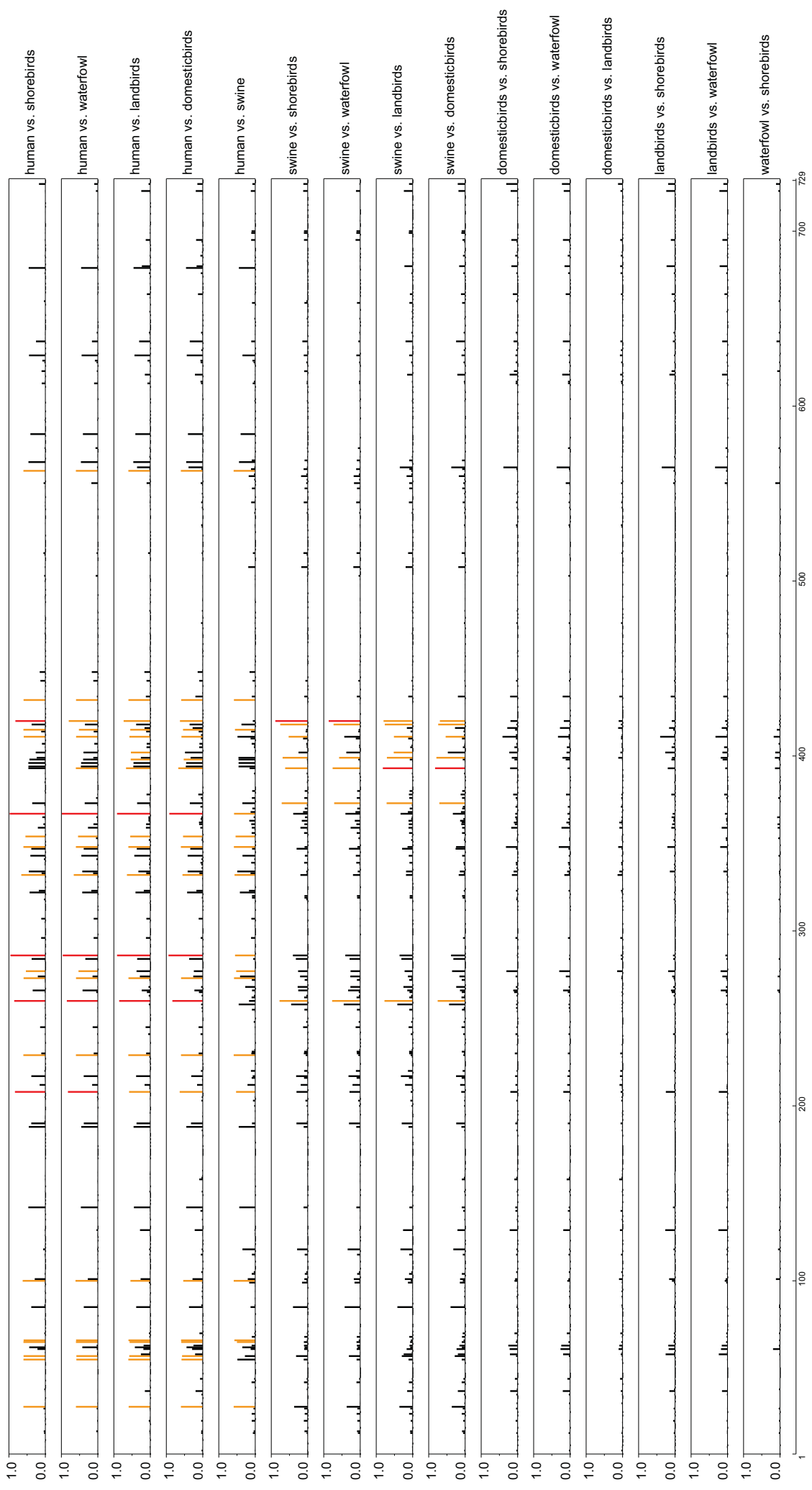
Supplementary Figure S3

PB1 : amino acide comparison



Supplementary Figure S5

PA : amino acide comparison



HA : amino acid comparison

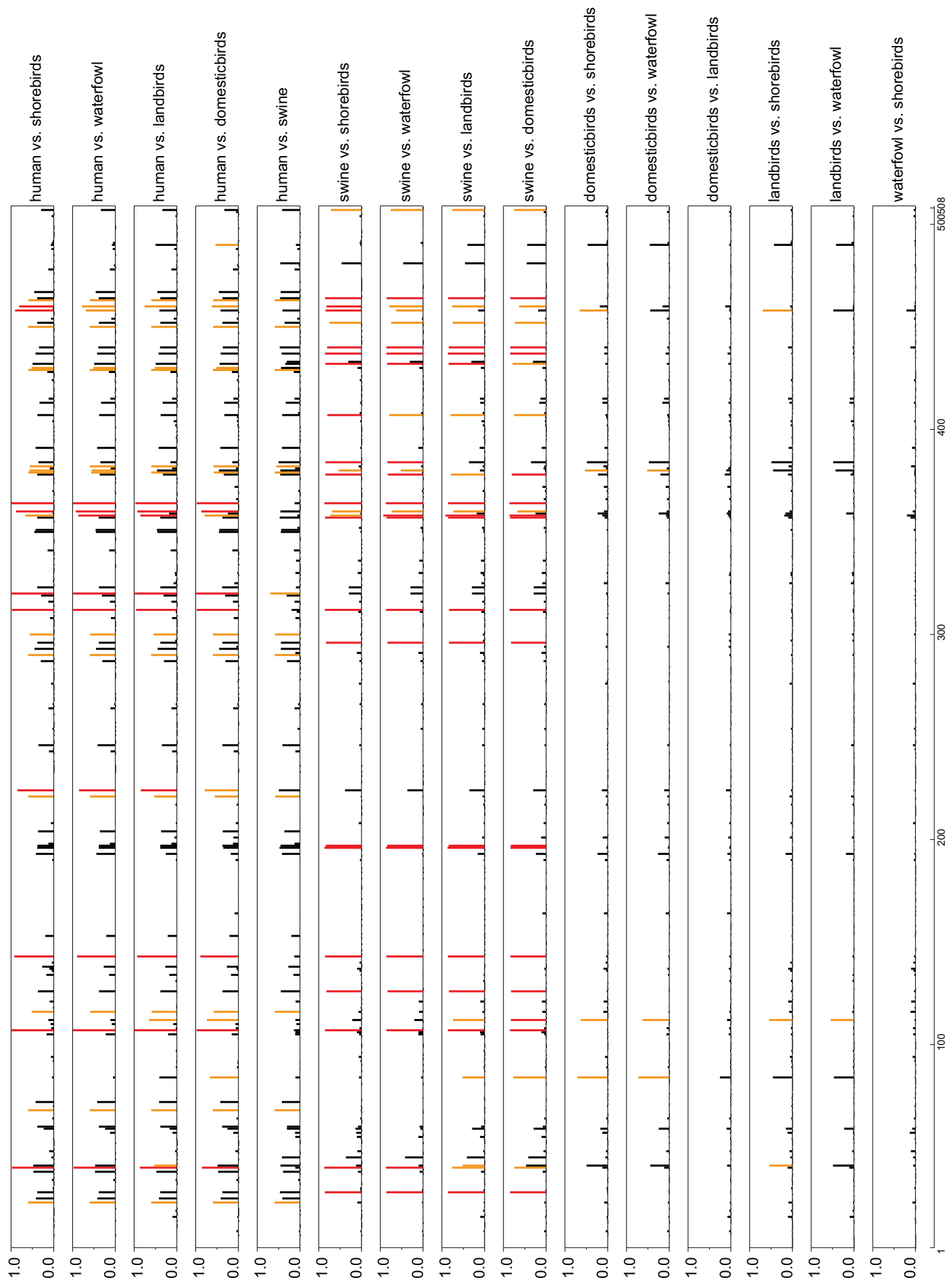


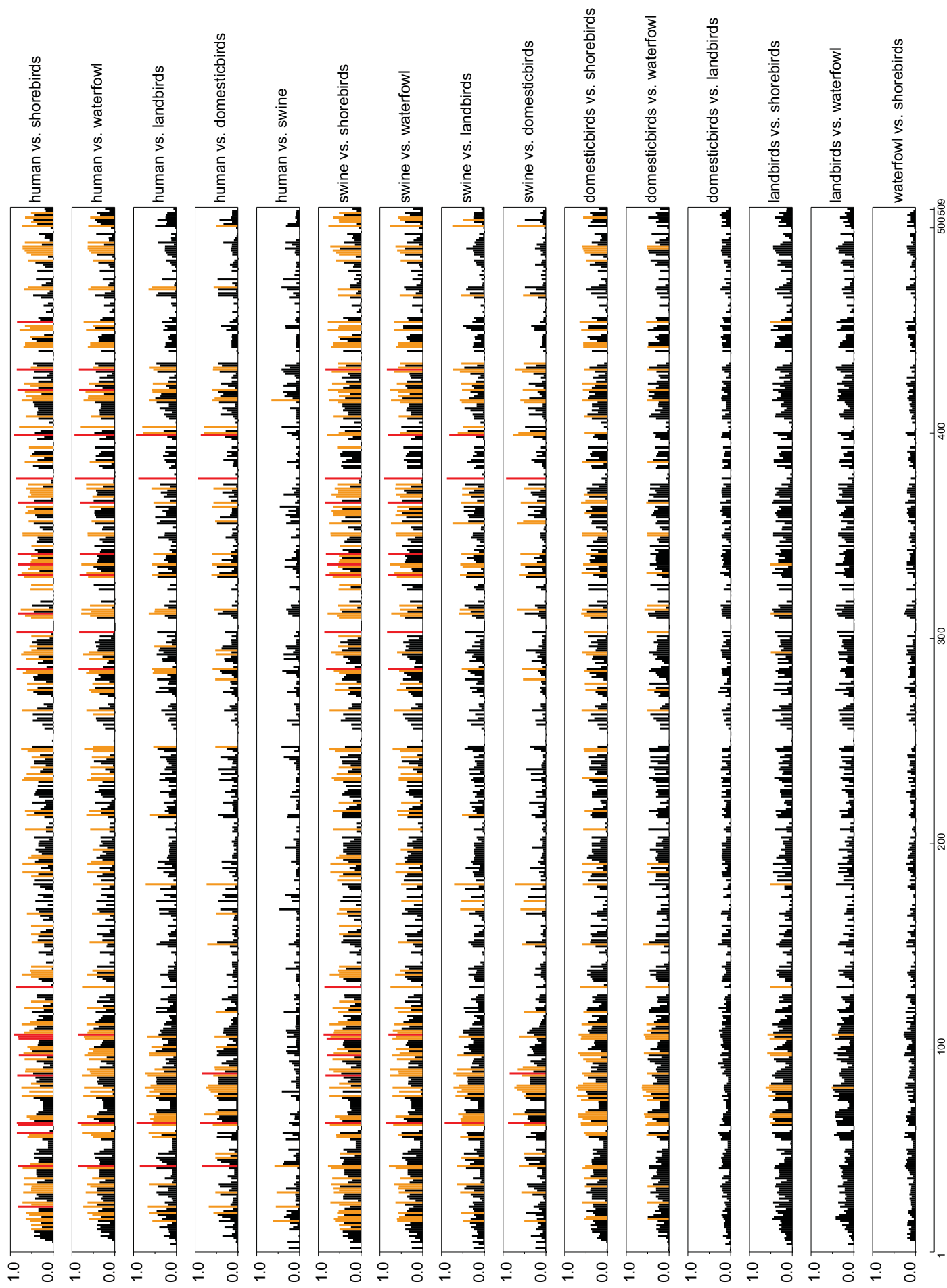
HA : codon comparison



Supplementary Figure S9

NP : amino acid comparison



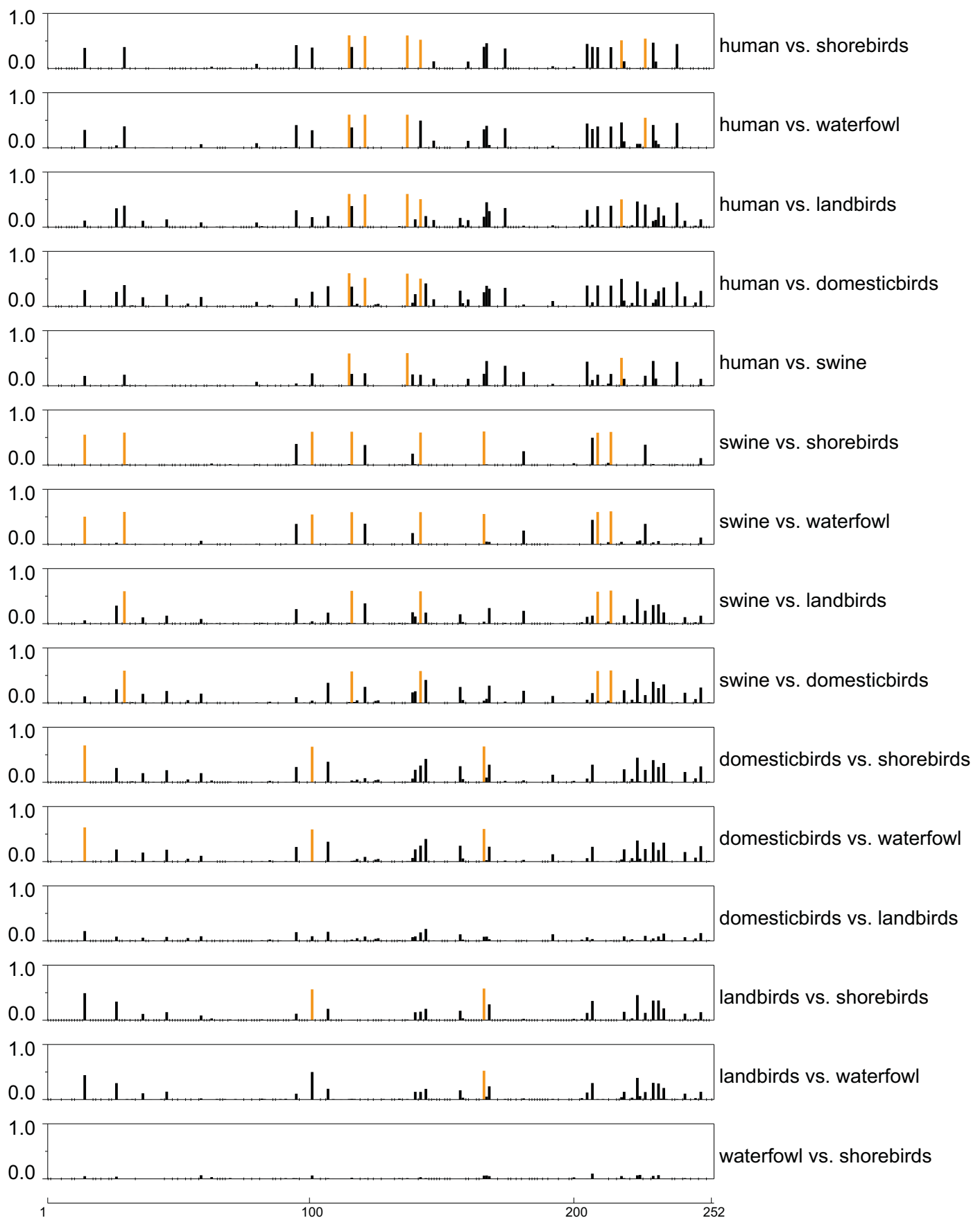


NA : codon comparison



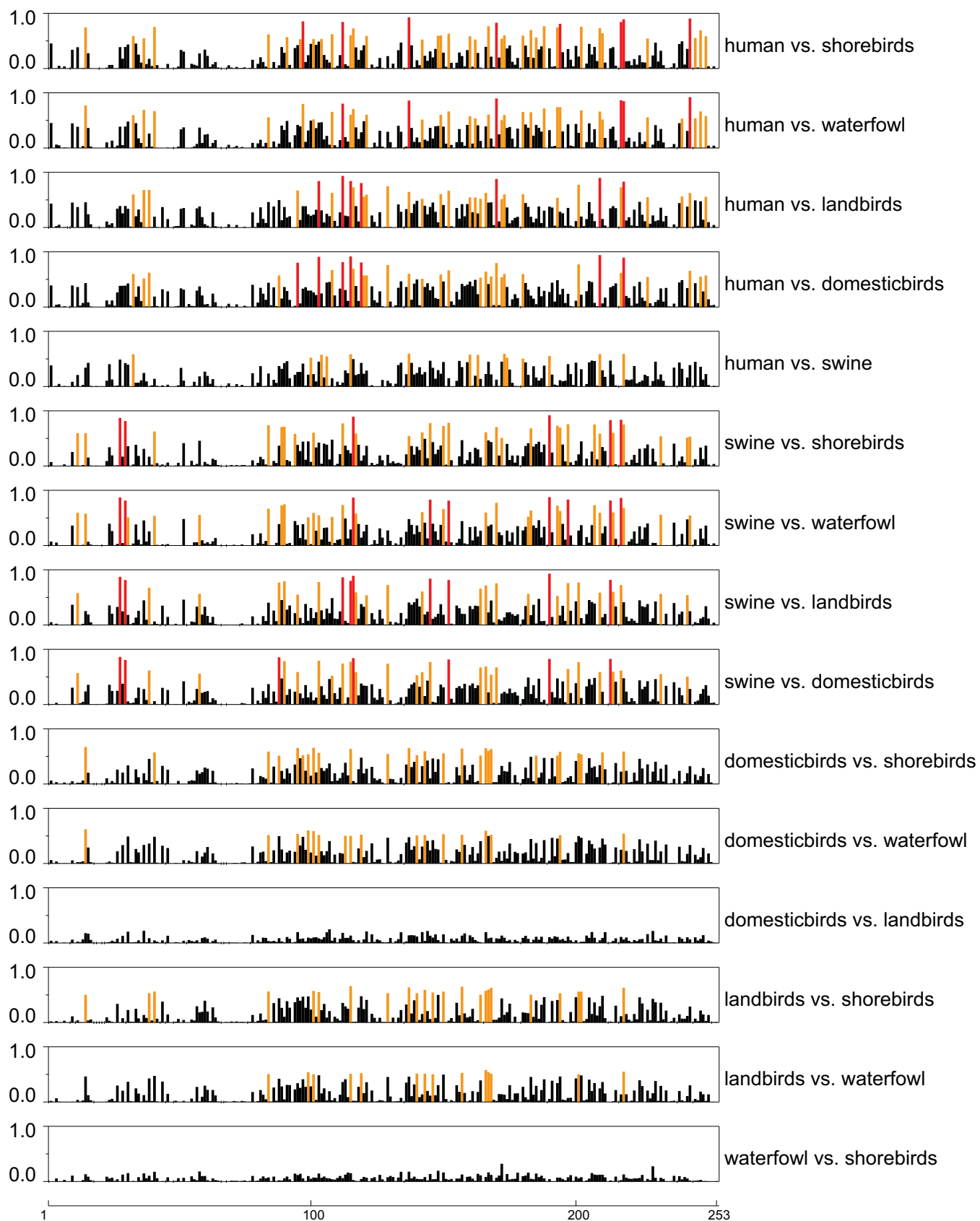
Supplementary Figure S13

M1 : amino acide comparison



Supplementary Figure S14

M1 : codon comparison



Supplementary Figure S15

NS1 : amino acid comparison

