Expression and phylogeny of multidrug resistance protein 2 and 4 in African White Backed vulture *(Gyps africanus).*

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Supplementary Table 1: Primers sequences used to amplify OAT1 and OAT2 gene from AWB`s kidney.

MRPs Primers	Predicted amplicon length
MRP2 F(S1): CTGTGTGTCATCAGGGATTTTGTC MRP2-IN-R(S1): ACAAGTTCAGGAATTGGGCAAAG	2754bp
MRP2-IN-F(S2): CAGAGATTGGAGAGAAGGGCATT MRP2 R(S2): AAGGTTAACAGCTCACTCAAGTCC	2550bp
MRP4 F(S1): TATTGGCCATAAACGGAAGCTTGA MRP4-IN-R(S1): GCCACCGTTAAACCTGCATAAAT	2241bp
MRP4 S1: TCCTGTCCAGACCTGCATTG	To cover the sequences that were not covered by the original sequence
MRP4-IN- F(S2): GAACTCCCAACCTGAAGTCTGTC MRP4 R(S2): CACTTGCAAACATTGTCACTGAGT	2136bp
MRP4 S2: ATCCACAACTCGAAGTCCAGT	To cover the sequences that were not covered by the original sequence.

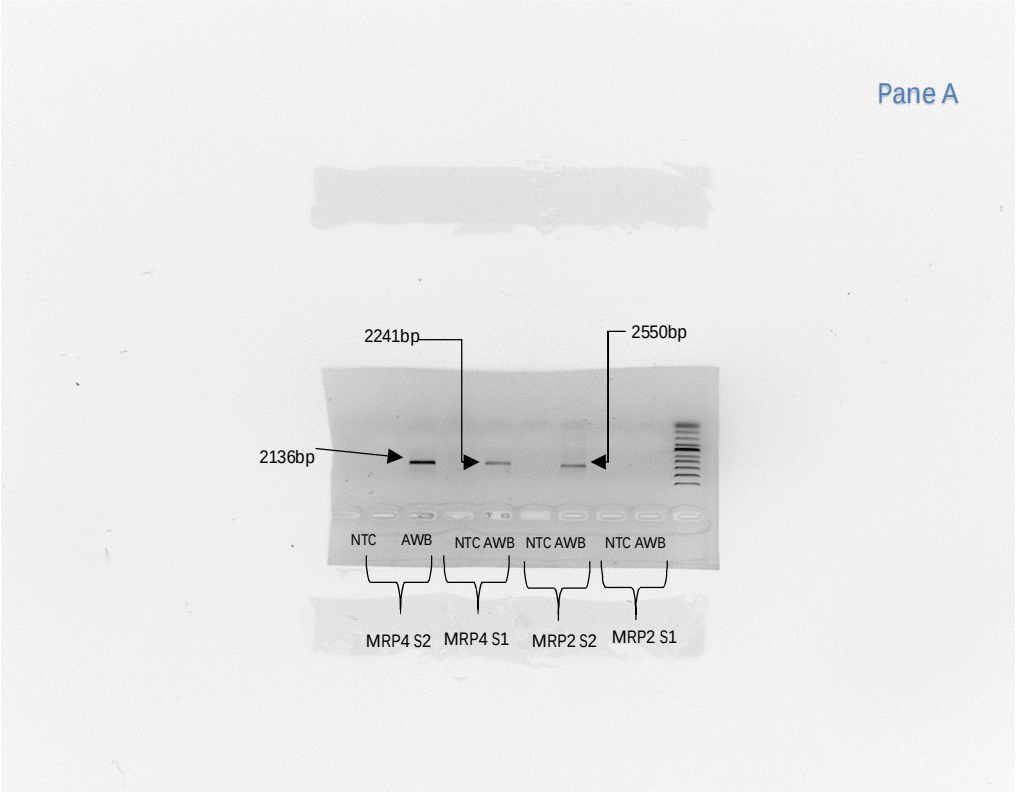
F-forward primer, R- reverse primer, S1-segment 1, S2-segment 2.

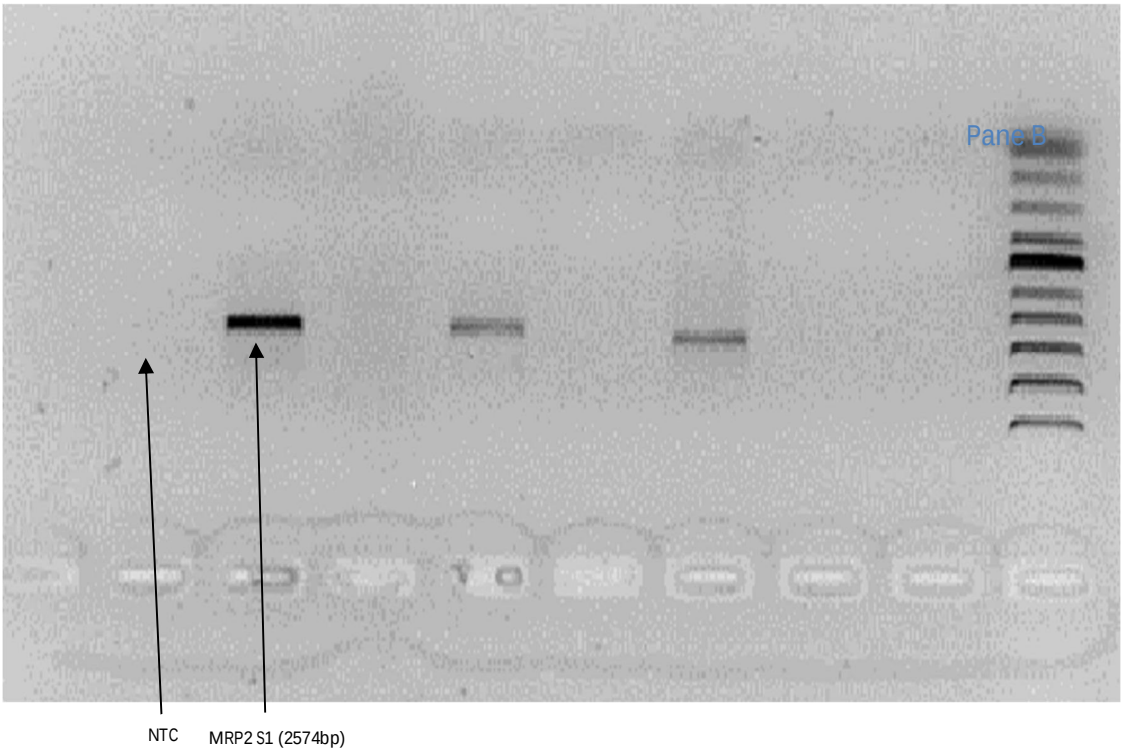
Supplementary Table 2: Avian MRP2 and 4 sequences accession number used for phylogenetic analysis

Species	Common name	MRP2	MRP4
Acanthisitta chloris	Rifleman	XM_009079998.1	
Anas platyrhynchos	Mallard		XM_021269067.1
Anser cygnoides domesticus	Domestic geese	XM_013196310.1	XM_013195781.1
Apaloderma vittatum	Bar-toiled trogon		XM_009864407.1
Aptenodytes forsteri	Emperor penguin	XM_009278032.1	
Apteryx australis mantelli	North Island Brown Kiwi		XM_013951288.1
Aquila chrysaetos Canadensis	Golden eagle	XM_030031380.1	XM_030036470.1
Balearica regulorum gibbericeps	East-African grey crowned-crane	XM_010301460.1	
Calidris pugnax	Ruff	XM_014957963.1	XM_014955633.1
Caprimulgus carolinensis	chuck-will`s widow	XM_010175463.1	XM_010169845.1
Cariama cristata	Red-legged seriema	XM_009708646.1	XM_009699864.1
Chaetura pelagica	Chimney Swift		XM_010006355.1
Charadrius vociferous	Killdeer	XM_009880472.1	XM_009891916.1
Chlamydotis macqueenii	Macqueen`s bustard	XM_010129192.1	
Colius striatus	Speckled mousebird		XM_010201078.1
Columba livia	Rock Pigeon	XM_005506981.3	XM_005505863.3
Corvus brachyrhynchos	American crow	XM_017726096.1	XM_017732634.1
Cuculus canorus	Common Cuckoo		XM_009555936.1

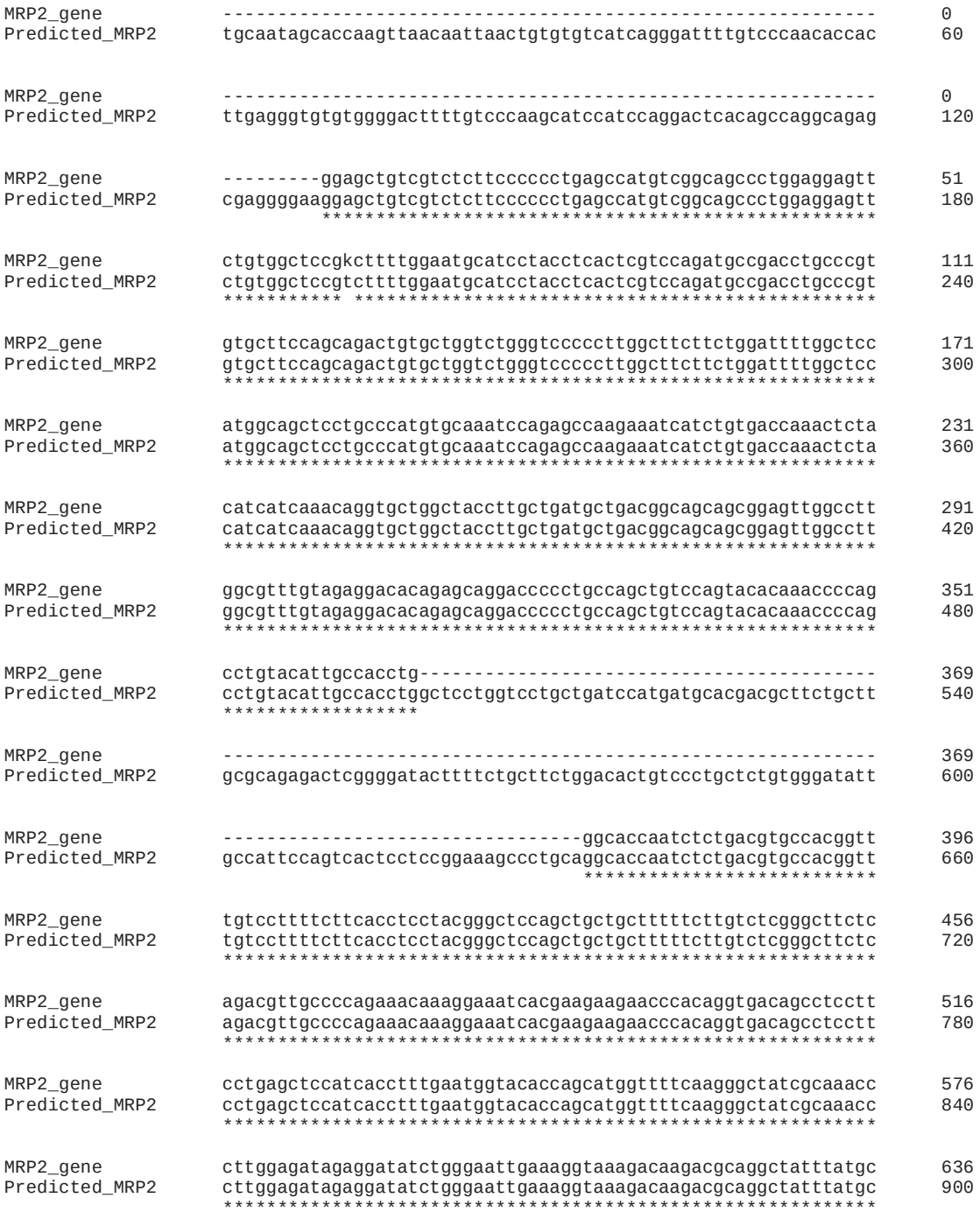
Egretta garzetta	Little egret	XM_009641936.1	XM_009634600.1
Eurypyga helias	Sun bittern	XM_010147273.1	XM_010157385.1
Falco cherrug	Saker falcon	XM_014276741.1	XM_005443961.2
Falco peregrinus	Peregrine falcon	XM_013300438.1	XM_005235621.2
Fulmarus glacialis	Northern Fulmar	XM_009575606.1	
Gallus gallus	Chicken	XM_015288821.1	NM_001030819.1
Gavia stellata	Red-throated loon	XM_009812133.1	
Gyps himalayensis	Himalayan Vulture		KX168697.1
Haliaeetus leucocephalus	Bald eagle	XM_010564882.1	XM_010578329.1
Leptosomus discolor	Cuckoo roller	XM_009958793.1	
Manacus vitellinus	Golden-Collared Manakin		XM_018071273.1
Meleagris gallopavo	Turkey	XM_010714591.2	XM_019612046.1
Melopsittacus undulates	Budgerigar		XM_005144756.1
Nestor notabilis	Kea		XM_010019073.1
Nipponia Nippon	Crested ibis	XM_009465232.1	XM_009467038.1
Numida meleagris	Helmeted guinea fowl	XM_021398589.1	XM_021416653.1
Opisthocomus hoazin	Stinkbird		XM_009942362.1
Parus major	Great tit	XM_015632687.2	XR_001520195.2
Pelecanus crispus	Dalmatian pelican	XM_009485052.1	XM_009488769.1
Phaethon lepturus	White-tailed trophicbird	XM_010294140.1	
Phalacrocorax carbo	Great cormorant	XM_009500518.1	
Pygoscelis adeliae	Adelie Penguin	XM_009323318.1	XM_009325566.1
Struthio camelus	Southern Ostrich	XM_009677757.1	XM_009667376.1

australis			
Sturnus vulgaris	Common starling	XM_014885931.1	XM_014881347.1
Tinamus guttatus	white-throated tinamou	XM_010213115.1	XM_010219632.1
Tyto alba	Barn owl	XM_009971968.1	XM_009963037.1
Zonotrichia albicollis	White-throated sparrow	XM_014275581.1	


Pane A
2241bp
2550bp
2136bp
NTC
AWB
NTC AWB
NTC AWB
NTC AWB
MRP4 S2
MRP4 S1
MRP2 S2
MRP2 S1


Pane B
NTC
MRP2 S1 (2574bp)

Supplementary Figure 1: Conventional PCR amplified MRP2 S2, MRP4 S1 and S2 (Pane A) and MRP2 S1 (Pane B) genes from AWB`s kidney, no product was obtained when the template was omitted, Molecular size (100bp) is indicated on the right. NTC= no template control.



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MRP2_gene          tgttttggagaataacatgaagactgcggtgaggaaggcccaagcagaactggagaaacg      696
Predicted_MRP2     tgttttggagaataacatgaagactgcggtgaggaaggcccaagcagaactggagaaacg      960
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MRP2_gene          gaaacgcaagaaaagacgccgggaaggtgacccagaccatgggaacaacatgagcaaggc      756
Predicted_MRP2     gaaacgcaagaaaagacgccgggaaggtgacccagaccatgggaacaacatgagcaaggc      1020
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MRP2_gene          ccagagccaagacatcctggtgctggaggaaaagcagctgaagaggaagaagaaagggag      816
Predicted_MRP2     ccagagccaagacatcctggtgctggaggaaaagcagctgaagaggaagaaga-agggag      1079
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MRP2_gene          acaaaggggactctggccctcacaaggatttcccccggggctggttggtgaaaaccctgt      876
Predicted_MRP2     acaaaggggactctggccctcacaaggatttcccccggggctggttggtgaaaaccctgt      1139
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MRP2_gene          gcaagaccttctggcagaacctcc-----------------------------------      900
Predicted_MRP2     gcaagaccttctggcagaacctcctgctatcggtggctttcaagctggtgcatgacggac      1199
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MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     ttgtgttcgtcagcccccagctgctgaagctgctgatcgcctttgtgtcagatgaggagt      1259

MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     cctttgcctggcaaggctatctgtatgccatcctgctcttcctgacggcactgatccagt      1319

MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     ccctctgcctgcagcagtacttcagcttgtgcttccagcttggcataaatgtgcgtgcca      1379

MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     gtctcattgctgccatctacaagaaggcactcaccatgtccagtgccacccgcaaggagt      1439

MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     ccacggtgggagagactgtgaatctgatgtcagctgatgcccagaggttcatggacacgg      1499

MRP2_gene          ------------------------------------------------------------      900
Predicted_MRP2     ccaacttcgttcaccagctgtggtcatccccccctgcaaattatcctgtccattgtcttcc      1559

MRP2_gene          ----------------------------------------cagttatggtgctgctcatcc      921
Predicted_MRP2     tctggggagagctgggccccctctgttctggctggcatcgcagttatggtgctgctcatcc      1619
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MRP2_gene          cccataaatgggttcctggttgccaaggccaaaaccatccaggtgaggaacatgaagaac      981
Predicted_MRP2     -ccataaatgggttcctggttgccaaggccaaaaccatccaggtgaggaacatgaagaac      1678
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MRP2_gene          aaggatgaacgcatgaaaataatgagtgaaatcctcaatggaatcaagatcctgaagctt      1041
Predicted_MRP2     aaggatgaacgcatgaaaataatgagtgaaatcctcaatggaatcaagatcctgaagctt      1738
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MRP2_gene          tttgcctgggagccctcatttgagaagcgagtcaatgagatccgggcacatgagctcaag      1101
Predicted_MRP2     tttgcctgggagccctcatttgagaagcgagtcaatgagatccgggcacgtgagctcaag      1798
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MRP2_gene          gacttggtgaacttcagttacctgcagtcaatctctatcttcgtgttcacgtgtgcgccc      1161
Predicted_MRP2     gacttggtgaacttcagttacctgcagtcaatctctatcttcgtgttcacgtgtgcgccc      1858
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MRP2_gene          ttcctggtctccttggccagctttgctgtttacatgctggtggatgagaacaacatcctg      1221
Predicted_MRP2     ttcctggtctccttggccagctttgctgtttacatgctggtggatgagaacaacatcctg      1918
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MRP2_gene          gatgcacagaaagcctttactgccatctccctttttcaacgtgctgcgcttccccatggcc      1281
Predicted_MRP2     gatgcacagaaagcctttactgccatctccctttttcaacgtgctgcgcttccccatggcc      1978
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MRP2_gene       atgctgcccttggtcctttcttccttggtgcagaccaacgtgtcgactgcgaggctggag    1341
Predicted_MRP2  atgctgcccttggtcctttcttccttggtgcagaccaacgtgtcgactgcgaggctggag    2038
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MRP2_gene       cgctacctgggcagagaagacctggacacctcggctatccaccacaaccccattgcaggc    1401
Predicted_MRP2  cgctacctgggcagagaagacctggacacctcggctatccaccacaaccccattgcag--    2096
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MRP2_gene       aggcagcgctgtgcgtttctcggaggccacctttgcctgggagcaggacggcaatgctgc    1461
Predicted_MRP2  --gcagcgctgtgcgtttctcggaggccacctttgcctgggagcaggacggcaatgctgc    2154
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MRP2_gene       gataagagatgtcaccctggacatcgcacctgggagcctggtggccgtggtgggggctgt    1521
Predicted_MRP2  gataagagatgtcaccctggacatcgcacctgggagcctggtggccgtggtgggggctgt    2214
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MRP2_gene       gggctcaggcaaatcttcgctggtgtcagccatgctcggggagatggagaatatcaaggg    1581
Predicted_MRP2  gggctcaggcaaatcttcgctggtgtcagccatgctcggggagatggagaatatcaaggg    2274
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MRP2_gene       acacatcaacatccagggctccctggcctatgtaccccagcaggcctggatccagaatgc    1641
Predicted_MRP2  acacatcaacatccagggctccctggcctatgtaccccagcaggcctggatccagaatgc    2334
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MRP2_gene       cacactgaaagacaacatccttttgggtcagaactggatgaagccaggtatcagcaggt    1701
Predicted_MRP2  cacactgaaagacaacatccttttgggtcagaactggatgaagccaggtatcagcaggt    2394
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MRP2_gene       catcaaggcctgcgccctccttccagacctggaactgctgcctkygggtgrccagacaga    1761
Predicted_MRP2  catcaaggcctgcgccctccttccagacctggaactgctgcctgcgggtgaccagacaga    2454
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MRP2_gene       gattggagagaagggcattaacctgagcgggggccagaagcagc----------------    1805
Predicted_MRP2  gattggagagaagggcattaacctgagcgggggccagaagcagcgagtcagcctggcccg    2514
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MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  ggcagtgtacagcaacgcagacatctacatcctggatgacccccctgtctgccgtggatgc    2574

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  tcatgtcggcaagtacctcttcgagcatgtgctggggccaaaagggctgctgcaaaagaa    2634

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  gacacggatcttggtgacgcacagtatcagtttcctgccccaggtcgataacatcgtggt    2694

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  gctggtggcaggaacagtgtctgagcatggctcctacagcaccctgcttgcaaacagggg    2754

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  ggcctttgcccaattcctgaacttgtacggcagccaggaggaggatgcttcagagaagaa    2814

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  taccacagctgttgctttagctggggatgaagagcagggtgatgaagacattgagccttg    2874

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  tgtggaggagggtcctgatgatgtggtgaccatgaccctgaagcgcgacgccagcatccg    2934

MRP2_gene       ------------------------------------------------------------    1805
Predicted_MRP2  tcagagagagttcagtcgcagccttagtaaaagcagcaccaattcctggaagaaggccca    2994

MRP2_gene       ------------------------------------------------------------    1805
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Predicted_MRP2      ggaggagccccccaagaagctgaaaggccagcagctgattgagaaagaagctgtggaaac      3054


MRP2_gene           -----aggtgaagttctccatgtacctgcggtacctgcatgccgttggcttgtggtattc      1860
Predicted_MRP2      cggcaaggtgaagttctccatgtacctgcggtacctgcatgccgttggcttgtggtattc      3114
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MRP2_gene           tttctgggttgccatgggctacgttggacagtacgtcgccttcgtggggactaacctgtg      1920
Predicted_MRP2      tttctgggttgccatgggctacgttggacagtacgtcgccttcgtggggactaacctgtg      3174
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MRP2_gene           gctcagtgcctggactgacgatgcgcagcactacctgaaccagacctatcccacagagca      1980
Predicted_MRP2      gctcagtgcctggactgacgatgcgcagcactacctgaaccagacctatcccacagagca      3234
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MRP2_gene           gcgggacctgcggatcggtgtctttggggcactgggggtgtcacaagctctcttcctgct      2040
Predicted_MRP2      gcgggacctgcggatcggtgtctttggggcactgggagtgtcacaagctctcttcctgct      3294
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MRP2_gene           ccttgcaaccctcctgtctgctcgtggtgccatgcgagcctcgcgggttatgcatcagca      2100
Predicted_MRP2      ccttgcaaccctcctgtctgctcgtggtgccatgcgagcctcgcgggttatgcatcagca      3354
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MRP2_gene           actgctcagcaacatcctgcgtgtgcccatgagctttttgacacaaccccgactggccg      2160
Predicted_MRP2      actgctcagcaacatcctgcgtgtgcccatgagctttttgacacaaccccgactggccg      3414
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MRP2_gene           cattgtgaataggtttgccaaggacatcttcacgatagatgagaccattcctatgtcctt      2220
Predicted_MRP2      cattgtgaataggtttgccaaggacatcttcacgatagatgagaccattcccatgtcctt      3474
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MRP2_gene           ccgcagctggctctcctgtttcatggccatcattagcacattgctcatgatctccctggc      2280
Predicted_MRP2      ccgcagctggctctcctgtttcatggccatcattagcacattgctcatgatctccctggc      3534
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MRP2_gene           caccccattcttcactctcgttatcattcccttgagcatcttctactattttgtgctgcg      2340
Predicted_MRP2      caccccattcttcactctcgttatcattcccttgagcatcttctactattttgtgctgcg      3594
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MRP2_gene           cttctatgtctccacatcacgccagctaaggcgtctggactctgtaactaggtctcccat      2400
Predicted_MRP2      cttctatgtctccacatcacgccagctaaggcgtctggactctgtaactaggtctcccat      3654
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MRP2_gene           ctactcccactttggcgagacagtgtcagggctttctgtgatccgtgccttcggacacca      2460
Predicted_MRP2      ctactcccactttggcgagacagtgtcagggctttctgtgatccgtgccttcggacacca      3714
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MRP2_gene           agaacgattcctgcagcagaatgagagcaccatggacgtcaatcaaaaaagtgtttactc      2520
Predicted_MRP2      agaacgattcctgcagcagaatgagagcaccatggacgtcaatcaaaaaagtgtttactc      3774
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MRP2_gene           ctggatagtctcaaataggtggctggccatccgtctggagttcgttgggagcctggtggt      2580
Predicted_MRP2      ctggatagtctcaaataggtggctggccatccgtctggagttcgttgggagcctggtggt      3834
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MRP2_gene           cttcttctctgcgcttctagctgtgatttcaaagggcactttggagggcggcatcgtggg      2640
Predicted_MRP2      cttcttctctgcgcttctagctgtgatttcaaagggcactttggagggcggcatcgtggg      3894
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MRP2_gene           tctttctgtctcctctgccctcaatgtgacccagacactgaactggctggtgcggacgtc      2700
Predicted_MRP2      tctttctgtctcctctgccctcaatgtgacccagacactgaactggctggtgcggacgtc      3954
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MRP2_gene           ttcggagctggagacaaacattgtggctgtggagcgggtacatgagtacacgaaggtgaa      2760
Predicted_MRP2      ttcggagctggagacaaacattgtggctgtggagcgggtacatgagtacacgaaggtgaa      4014
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MRP2_gene           gaatgaggctccgtgggtgacagaaaagcgtccaccccatggctggcccagcaaaggtga      2820
Predicted_MRP2      gaatgaggctccgtgggtgacagaaaagcgtccaccccatggctggcccagcaaaggtga      4074
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MRP2_gene          gatccagtttgttgactacaaagttcgttaccgacctgaactggagctggttcttcaggg     2880
Predicted_MRP2     gatccagtttgttgactacaaagttcgttaccgacctgaactggagctggttcttcaggg     4134
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MRP2_gene          gatcacctgcaatattgggagcacggagaaggttggggttgtgggccggactggggctgg     2940
Predicted_MRP2     gatcacctgcaatattgggagcacggagaaggttggggttgtgggccggactggggctgg     4194
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MRP2_gene          aaaatcttccctcaccaactgcctcttccgggtgctggaggccgctggagggacgatcat     3000
Predicted_MRP2     aaaatcttccctcaccaactgcctcttccgggtgctggaggccgctggagggacgatcat     4254
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MRP2_gene          catcgacgaagtggatatagcaacgatcggcctccatgacctgcgccagaacctcaccat     3060
Predicted_MRP2     catcgacgaggtggatatagcaacgatcggcctccatgacctgcgccagaacctcaccat     4314
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MRP2_gene          catccctcaggaccccgtgctctttactggcaccctgcggatgaacctggatccctttga     3120
Predicted_MRP2     catccctcaggaccccgtgctctttactggcaccctgcggatgaacctggatccctttga     4374
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MRP2_gene          ccagtacatggatgaggaggtctggaaggcccttgagctggcccacctgaagacatatgt     3180
Predicted_MRP2     ccagtacatggatgaggaggtctggaaggcccttgagctggcccacctgaagacatatgt     4434
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MRP2_gene          gcaagaccttcccgaggggctgctgcatcttgtgagcgaggcgggggagaacctgagtgt     3240
Predicted_MRP2     gcaagaccttcccgaggggctgctgcatcttgtgagcgaggcgggggagaacctgagtgt     4494
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MRP2_gene          tgggcagaggcagctggtgtgcctggcccgggcncctccttcgcaaagccaagatcctca     3300
Predicted_MRP2     tgggcagaggcagctggtgtgcctggcccgggc-cctccttcgcaaagccaagatcctca     4553
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MRP2_gene          tcctggacgaagcgacagcagccgtagat------------------------------     3329
Predicted_MRP2     tcctggacgaagcgacagcagccgtagatctagaaactgatcatttaatccagacaacga     4613
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MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     tccggagtgagtttgctgactgcactgtccttactattgcccaccgcctccacaccatca     4673

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     tggacagcaacagggtgatggtgctgcaggctgggaggattgtggaatacgacagccctg     4733

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     aggagctgctcaagaagcacggtgtcttctccgcaatggcaaaggacgctggcatcacga     4793

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     atatagaaaccactgtgctgtaggtggagcagagcagtgtgcgggtgtgtgcgttggcag     4853

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     ctccctcccactggcactcaccaagcaggcagcagcttctccctgctgccgggctgccca     4913

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     ggaaattctctctgcagctgggaagcagagagagtggcttctctggccaggacagaggat     4973

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     ctggacttgagtgagctgttaaccttgctaccccaccctgcttgctgtgcgcatgagggt     5033

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     ctggagctgcataatttattccagtatagaggtgaaaagtctgccatgggagaccatgac     5093

MRP2_gene          ------------------------------------------------------------     3329
Predicted_MRP2     ccccgtgggggtcttagtttttgtacttcaccatgccaggggaacctagctgagatatgc     5153
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MRP2_gene          ------------------------------------------------------------      3329
Predicted_MRP2     tttagcactacggaatgaaatttacagtttaatctaagagtgttataaacttttgtaac      5212
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Supplementary Figure 2: Alignment of MRP2 gene of AWB vulture using Sanger and next generation sequencing revealing similarity of 99.76% with clusta omega software. MRP2_gene = Sanger; Predicted_MRP2 = NGS

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 MRP4_gene          ------------------------------------------------------------     0
Predicted_MRP4     ggtggttgaatcctttatttattattggccataaacggaagcttgaagaagatgatatgt     60


MRP4_gene          --------------GAAGATTCCTCAGAGAAGCTTGGAGAGGAATTGCAGTGGTACTGGG     46
Predicted_MRP4     ataaagtgctgccagaagattcctcagagaagcttggagaggaattgcagtggtactggg     120
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MRP4_gene          MTAAARAGGTGCAAAWAGCAWAAAAKAGAGGAAAAACGCCACGTTTAACAAAAGCCATTA     106
Predicted_MRP4     ataaagaggtgcaaaaagcaaaaaagagaggaaaaacgccacatttaacaaaagccatta     180
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MRP4_gene          TTCTTTGTTACTGGAAATCCTATTTAKTTTTTGGAATTTTCACAATGATTGAGGAAACCC     166
Predicted_MRP4     ttctttgttactggaaatcctatttagtttttggaattttcacaatgattgaggaaaccc     240
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MRP4_gene          TCAAAATAATTCAGCCAATATTTTTGGGAAAAATTATTAATTATTTTGAAAACTATGAT-     225
Predicted_MRP4     tcaaaataattcagccaatatttttgggaaaaattattaattattttgaaaactatgatt     300
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MRP4_gene          CCTCAGATGAGGTAGCTTTGAATTTTGCATATTTCTACGCAGCTGCTCTGTCTGTGTGCA     285
Predicted_MRP4     cctcagatgaggtagctttgaattttgcatatttctacgcagctgctctgtctgtgtgca     360
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MRP4_gene          CGCTTATTCTAGCTATAATGCACCACTTATACTTCTATCATGTACAGCGGGCTGGCATGA     345
Predicted_MRP4     cgcttattctagctataatgcaccacttatacttctatcatgtacagcgggctggcatga     420
                   ************************************************************


MRP4_gene          AGCTGAGGGTAGCTATGTGTCACATGATTTATCGRAAGGCACTTCGTCTCAGTAACGTAG     405
Predicted_MRP4     agctgagggtagctatgtgtcacatgatttatcggaaggcacttcgtctcagtaacgtag     480
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MRP4_gene          CTATGGCAAAAACTACCACTGGKCAAATAGTGAATCTTCTGTCAAATGATGTGAACAAAT     465
Predicted_MRP4     ctatggcaaaaactaccactggtcaaatagtgaatcttctgtcaaatgatgtgaacaaat     540
                   ********************** ************************************


MRP4_gene          TTGATCAGGTAACAATCTTCTTGCACTTCTTGTGGGCTGGACCAATTCAAGCTGTARCAG     525
Predicted_MRP4     ttgatcaggtaacaatcttcttgcacttcttgtgggctggaccaattcaagctgtagcag     600
                   ************************************************************ ***


MRP4_gene          TAACAGTACTTCTCTGGATGGAGATAGGCCCATCATGTCTTGCAGGAATGGCAGYTCTGA     585
Predicted_MRP4     taacagtacttctctggatggagataggcccatcatgtcttgcaggaatggcagttctga     660
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MRP4_gene          TTATTCTTCTTCCTGTCCAGACCTGCATTGGGAGGCTTTTTTCTTCCCTAAGAAGCAAGA     645
Predicted_MRP4     ttattcttcttcctgtccagacctgcattgggaggctttttttcttccctaagaagcaaga     720
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MRP4_gene          CAGCTGCCTTARCAGATGTCAGGATTAGGACCATGAATGAAGTCATAAGTGGTATGAAGA     705
Predicted_MRP4     cagctgccttaacagatgtcaggattaggaccatgaatgaagtcataagtggtatgaaga     780
                   *********** **************************************************


MRP4_gene          TAAATAAAAGATGTATGCTTGGGAAAAATCATTTGCGGAACTTGTGAATGGTTTAAGAAG     765
Predicted_MRP4     taat--aaagatgtatgcttgggaaaaatcatttgcggaacttgtgaatggtttaagaag     838
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MRP4_gene          GAAGGAGATTTGCCATGGTTATGAAAAAGCTCCTACCTTCGAGGACTGAACTTAACCTCA     825
Predicted_MRP4     gaaggagat-tgccatggttatgaa-aagctcctaccttcgaggactgaacttagcctca     896
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MRP4_gene           TTTTTTGTGGCAAGCAAAATAACAGTGTTCATGACTTTCATGGCATATGTACTACTTGGC      885
Predicted_MRP4      ttttttgtggcaagcaaaataacagtgttcatgactttcatggcatatgtactacttggc      956
                    ************************************************************

MRP4_gene           AATGTTATCTCTGCAAGTCGGGTGTTTGTTGCAGTGTCCCTGTATGGTGCAGTAAGACTG      945
Predicted_MRP4      aatgttatctctgcaagtcgggtgtttgttgcagtgtccctgtatggtgcagtaagactg      1016
                    ************************************************************

MRP4_gene           ACAGTAACTCTGTTCTTCCCTTCGGCTATTGAGAGAGTATCCGAGGCAGTGGTTAGCATA      1005
Predicted_MRP4      acagtaactctgttcttcccttcggctattgagagagtatccgaggcagtggttagcata      1076
                    ************************************************************

MRP4_gene           CGACGAATCAAGAACTTTCTGATACTTGATGAGATCTCACCCTTCAAGCCACAACTGCAT      1065
Predicted_MRP4      cgacgaatcaagaactttctgatacttgatgagatctcacccttcaagccacaactgcat      1136
                    ************************************************************

MRP4_gene           GGTAATAATGAGAATGTCATTCTTCATGTTCAGGATTTGACTTGCTATTGGGATAAGAGT      1125
Predicted_MRP4      ggtaataatgagaatgtcattcttcatgttcaggatttgacttgctattgggataagagt      1196
                    ************************************************************

MRP4_gene           TTAGAAAGCCCAGCACTTCAACAACTTTCATTTACTGTCAGACGAGGGGAATTATTGGCT      1185
Predicted_MRP4      ttagaaagcccagcacttcaacaactttcatttactgtcagacgaggggaattattggct      1256
                    ************************************************************

MRP4_gene           GTGATTGGTCCTGTAGGAGCTGGCAAATCTTCACTCTTAAGTGCTGTGCTTGGTGAGCTA      1245
Predicted_MRP4      gtgattggtcctgtaggagctggcaaatcttcactcttaagtgctgtgcttggtgagcta      1316
                    ************************************************************

MRP4_gene           CCTAAAGACAAAGGTTTGATAAATGTTACTGGAAGAATTGCCTATGTTTCTCAGCAGCCT      1305
Predicted_MRP4      cctaaagacaaaggtttgataaatgttactggaagaattgcctatgtttctcagcagcct      1376
                    ************************************************************

MRP4_gene           TGGGTGTTTTCTGGTACAGTAAGAAGTAATATACTGTTTGACAAGGNAATATGAAAAAGA      1365
Predicted_MRP4      tgggtgttttctggtacagtaagaagtaatatactgtttgacaagg-aatatgaaaaaga      1435
                    ******************************************** *************

MRP4_gene           AAAATACGAAAAAGTTTTAAAAGTCTGTGCTCTTAAAAAGGACTTGGAATTATTAGCRAA      1425
Predicted_MRP4      aaaatacgaaaaagttttaaaagtctgtgctcttaaaaaggacttggaattattagcaaa      1495
                    ************************************************************ **

MRP4_gene           TGGTGACCTAACAGTAATAGGAGATCGTGGAGCTACGCTGAGTGGGGGACAGAAAGCCCG      1485
Predicted_MRP4      tggtgacctaacagtaataggagatcgtggagctacgctgagtgggggacagaaagcccg      1555
                    ************************************************************

MRP4_gene           TGTAAATCTGGCCAGAGCTGTGTATCAAGATGCAGACATCTATCTTTTTGGATGATCCAC      1545
Predicted_MRP4      tgtaaatctggccagagctgtgtatcaagatgcagacatctatctt-ttggatgatccac      1614
                    ********************************************* *************

MRP4_gene           TGAGTGCAGTAGATGCTGAAGTTGGAAGACATTTGTTTGAAAAATGTATTTGTCAGGCCT      1605
Predicted_MRP4      tgagtgcagtagatgctgaagttggaagacatttgtttgaaaaatgtatttgtcaggcct      1674
                    ************************************************************

MRP4_gene           TWCATCAGAAGATCTCTGTTTTGGTTACTCACCAGTTGCAGTATCTCCGTGCTGCAAATC      1665
Predicted_MRP4      tacatcagaagatctctgttttggttactcaccagttgcagtatctccgtgctgcaaatc      1734
                    * ************************************************************

MRP4_gene           AGATTCTAATTTTAAAAGATGGTAAAATGGTGGGGAAAGGTACCTATTCAGAGTTCCTGA      1725
Predicted_MRP4      agattctaattttaaaagatggtaaaatggtggggaaaggtacctattcagagttcctga      1794
                    ************************************************************

MRP4_gene           GATCTGGCATCGACTTTGCTTCCCTTTTGAAAAAAGATGAGGAGGTAGAACAGCCGTCAG      1785
Predicted_MRP4      gatctggcatcgactttgcttccctttgaaaaaagatgaggaggtagaacagctgtcag      1854
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MRP4_gene           TTCCAGGAACTCCCAACCTGAAGTCTGTCCGGAGCCGAACCTTCTCAGAGTCCTCTGTCT      1845
Predicted_MRP4      ttccaggaactcccaacctgaagtctgtccggagccgaaccttctcagagtcctctgtct      1914
                    ************************************************************

MRP4_gene           GGTCCCAGGATTCTTCTGCCCACTCACAGAAAGATGGAGCAGTGGAGCAACCACCTGCTG      1905
Predicted_MRP4      ggtcccaggattcttctgcccactcacagaaagatggagcagtggagcaaccacctgctg      1974
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MRP4_gene          AAAACGCACTGGCTGCAGTGCCAGAGGAGAGTCGCTCTGAGGGAAAAATAAACTTTAAGG     1965
Predicted_MRP4     aaaacgcactggctgcagtgccagaggagagtcgctctgagggaaaaataaactttaagg     2034
                   ************************************************************

MRP4_gene          TTTACAGAAAATATTTCACTGCAGGAGCAAACTACTTTGTGATTTTCATACTTCTAGTAT     2025
Predicted_MRP4     tttacagaaaatatttcactgcaggagcaaactactttgtgattttcatacttctagtat     2094
                   ************************************************************

MRP4_gene          TCAATATTTTGGCACAGGTGGCATACGTGCTCCAGGACTGGTGGCTTTCTTACTGGGCAA     2085
Predicted_MRP4     tcaatattttggcacaggtggcatacgtgctccaggactggtggctttcttactgggcaa     2154
                   ************************************************************

MRP4_gene          ATCATCAAGAAAAGTTGAACGTCACAACAAATGGAAATAATGGAGCAAATGAGAGTGAAC     2145
Predicted_MRP4     atcatcaagaaaagttgaacgtcacaacaaatggaaataatggagcaaatgagagtgaac     2214
                   ************************************************************

MRP4_gene          ATCTAGACCTTAACTTTTATTTGGGAATTTATGCAGGTTTAACGGTGGCTACAATACTGT     2205
Predicted_MRP4     atctagaccttaacttttatttgggaatttatgcaggtttaacggtggctacaatactgt     2274
                   ************************************************************

MRP4_gene          TTGGCATAGTAAGAAGTCTTTTGGTGTTTCAAGTTCTTGTTAATTCTGGTCAGACTTTGC     2265
Predicted_MRP4     ttggcatagtaagaagtcttttggtgtttcaagttcttgttaattctggtcagactttgc     2334
                   ************************************************************

MRP4_gene          ACAACAAAATGTTTCAATCCATTTTGAAAGCTCCCGTCTTGTTTTTTGACAGAAATCCTA     2325
Predicted_MRP4     acaacaaaatgtttcaatccattttgaaagctcccgtcttgtttttgacagaaatccta     2394
                   ************************************************************

MRP4_gene          TAGGAAGAATCTTAAATCGTTTCTCCAAAGATATTGGCCACCTGGATGACTTGCTTCCAT     2385
Predicted_MRP4     taggaagaatcttaaatcgtttctccaaagatattggccacctggatgacttgcttccat     2454
                   ************************************************************

MRP4_gene          TGACATTTTTGGACTTCATGCAGACTCTCCTACAGATTTTTGGTGTGGTGGCTGTGGCTG     2445
Predicted_MRP4     tgacatttttggacttcatgcagactctcctacagatttttggtgtggtggctgtggctg     2514
                   ************************************************************

MRP4_gene          TGGCAGTGATTCCTTGGATACTCCTCCCCTTAATTCCACTATTTATTCTTTTCATTTTCC     2505
Predicted_MRP4     tggcagtgattccttggatactcctcccctaattccactatttattcttttcattttcc     2574
                   ************************************************************

MRP4_gene          TTCGACGATATTTCTTAGACACTTCAAGAGATATTAAACGTCTAGAATCCACAACTCGAA     2565
Predicted_MRP4     ttcgacgatatttcttagacacttcaagagatattaaacgtctagaatccacaactcgaa     2634
                   ************************************************************

MRP4_gene          GTCCAGTGTTCTCCCACTTGTCGTCATCCCTCCAGGGACTTTGGACTATTCGGGCTTTGA     2625
Predicted_MRP4     gtccagtgttctcccacttgtcgtcatccctccagggactttggactattcgggctttga     2694
                   ************************************************************

MRP4_gene          AAGCAGAGGAAAGATTTCAAAAATTATTTGATGCACACCAAGACCTCCACTCAGAGGCCT     2685
Predicted_MRP4     aagcagaggaaagatttcaaaaattatttgatgcacaccaagacctccactcagaggcct     2754
                   ************************************************************

MRP4_gene          GGTTTCTATTTTTGACGACCTCGAGGTGGTTTGCTGTGCGTCTGGATGCCATCTGTGCCA     2745
Predicted_MRP4     ggtttctatttttgacgacctcgaggtggtttgctgtgcgtctggatgccatctgtgcca     2814
                   ************************************************************

MRP4_gene          TTTTTGTTATAGTGGTTGCTTTTGGTTCCCTGCTTCTCKCCAAGACTTTGAATGCAGGGC     2805
Predicted_MRP4     tttttgttatagtggttgcttttggttccctgcttctctccaagactttgaatgcagggc     2874
                   ************************************ ********************

MRP4_gene          AGGTTGGTTTGGCACTATCCTATGCAATCACCCTCATGGGAACATTCCAGTGGGGTGTTA     2865
Predicted_MRP4     aggttggtttggcactatcctatgcaatcaccctcatgggaacattccagtggggtgtta     2934
                   ************************************************************

MRP4_gene          GACAAAGTGCTGAAGTTGAAAACCTGATGATATCAGTAGAAAGAGTAATGGAATACACAG     2925
Predicted_MRP4     gacaaagtgctgaagttgaaaacctgatgatatcagtagaaagagtaatggaatacacag     2994
                   ************************************************************

MRP4_gene          AACTTGAAAAAGAAGCTCCTTGGGAGACCAACAAGCATCCACCACCTGAATGGCCAAGCC     2985
Predicted_MRP4     aacttgaaaaagaagctccttgggagaccaacaagcatccaccacctgaatggccaagcc     3054
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MRP4_gene       AAGGAATGATAGCATTTGAAAATGTTAACTTCACTTACAGTCTAGATGGACCTTTGGTGT    3045
Predicted_MRP4  aaggaatgatagcatttgaaaatgttaacttcacttacagtctagatggacctttggtgt    3114
                ************************************************************

MRP4_gene       TAAGACATTTGTCTGTTTTAATTAAACCAAAAGAAAAGGTTGGAATAGTGGGAAGAACTG    3105
Predicted_MRP4  taagacatttgtctgttttaattaaaccaaaagaaaaggttggaatagtgggaagaactg    3174
                ************************************************************

MRP4_gene       GAGCTGGGAAAAGCTCTCTGATAGCAGCCCTCTTTCGCTTGGCGGAACCCGAAGGAAGGA    3165
Predicted_MRP4  gagctgggaaaagctctctgatagcagccctcttccgcttggcggaacccgaaggaagga    3234
                ********************************** ************************

MRP4_gene       TTTGGATTGATAAGTACTTGACGTCAGAGCTAGGACTCCATGACTTGCGGAAGAAAATTT    3225
Predicted_MRP4  tttggattgataagtacttgacgtcagagctaggactccatgacttgcggaagaaaattt    3294
                ************************************************************

MRP4_gene       CAATTATACCTCAGGAGCCTGTTTTATTCACTGGAACTATGAGGAAAAACTTAGATCCTT    3285
Predicted_MRP4  caattatacctcaggagcctgttttattcactggaactatgaggaaaaacttagatccttt    3354
                ************************************************************

MRP4_gene       TCAATGAATACACTGATGAGGAGCTGTGGAATGCCTTGGAAGAGGTGCAACTGAAGGAGG    3345
Predicted_MRP4  tcaatgaatacactgatgaggagctgtggaatgccttggaagaggtgcaactgaaggagg    3414
                ************************************************************

MRP4_gene       TTGTGGAAGATCTACCTAATAAAATGGAGATGCAGCTGGCAGAAATCTGGGTCTAATTTT    3405
Predicted_MRP4  ttgtggaagatctacctaataaaatggagatgcagctggcaga-atctgggtctaatttt    3473
                ****************************************** ****************

MRP4_gene       AGTGTTGGTCAGAGACAGCTGGTGTGTCTTGCCAGAGCAGTTCTAAAAAAAAAAATCGGAT    3465
Predicted_MRP4  agtgttggtcagagacagctggtgtgtcttgccagagcagttctaaaa-aaaaatcggat    3532
                ************************************************ ************

MRP4_gene       CCTTATCATTGATGAAGCAACAGCAAATGTGGACCCAAGAACAGATGAGTTYATTCAAAA    3525
Predicted_MRP4  ccttatcattgatgaagcaacagcaaatgtggacccaagaacagatgagtttattcaaaa    3592
                ************************************************** ********

MRP4_gene       GACGATCCGTGAAAAGTTTGCTCACTGCACAGTGCTGACCATTGCACACCGCTTGAACAC    3585
Predicted_MRP4  gacgatccgtgaaaagtttgctcactgcacagtgctgaccattgcacaccgcttgaacac    3652
                ************************************************************

MRP4_gene       CATTATTGACAGTGACAGGATTATGGTTTTAGATGAAGGAAGAGTGAAAGAATATGGTGA    3645
Predicted_MRP4  cattattgacagtgacaggattatggttttagatgaaggaagagtgaaagaatatggtga    3712
                ************************************************************

MRP4_gene       ACCTTACATTTTGCTGCAAGAACAAGATGGCTTGTTTTACAAAATGGTGCAACAAGTGGG    3705
Predicted_MRP4  accttacattttgctgcaagaacaagatggcttgttttacaaaatggtgcaacaagtggg    3772
                ************************************************************

MRP4_gene       CAAGACTGAAGCAGCTTCTYTGATTGAAACAGCAAAACGGGTGTACTTCAGTAAGAATTA    3765
Predicted_MRP4  caagactgaagcagcttctctgattgaaacagcaaaacgggtgtacttcagtaagaatta    3832
                ******************* ****************************************

MRP4_gene       CCCAGAAGTTGTTCAGAATGGTCAACTTGCCACAGACTCCTCCTTGGATCCTTCCTCAGG    3825
Predicted_MRP4  cccagaagttgttcagaatggtcaacttgccacagactcctccttggatccttcctcagg    3892
                ************************************************************

MRP4_gene       ATTAKGCATAACCGAAACTGCACTGTGATTCCTAATAA----------------------    3863
Predicted_MRP4  attatgcataaccgaaactgcactgtgattcctaataaccttaactgttttccattgaat    3952
                **** *********************************

MRP4_gene       ------------------------------------------------------------    3863
Predicted_MRP4  gtaaacctgagatcatctaaactcagtgacaatgtttgcaagtgtcagcaggagaggaaa    4012


MRP4_gene       ------------------------------------------------    3863
Predicted_MRP4  gggaggggcgattctttgcactggacatccttcctatttaatactgag    4061
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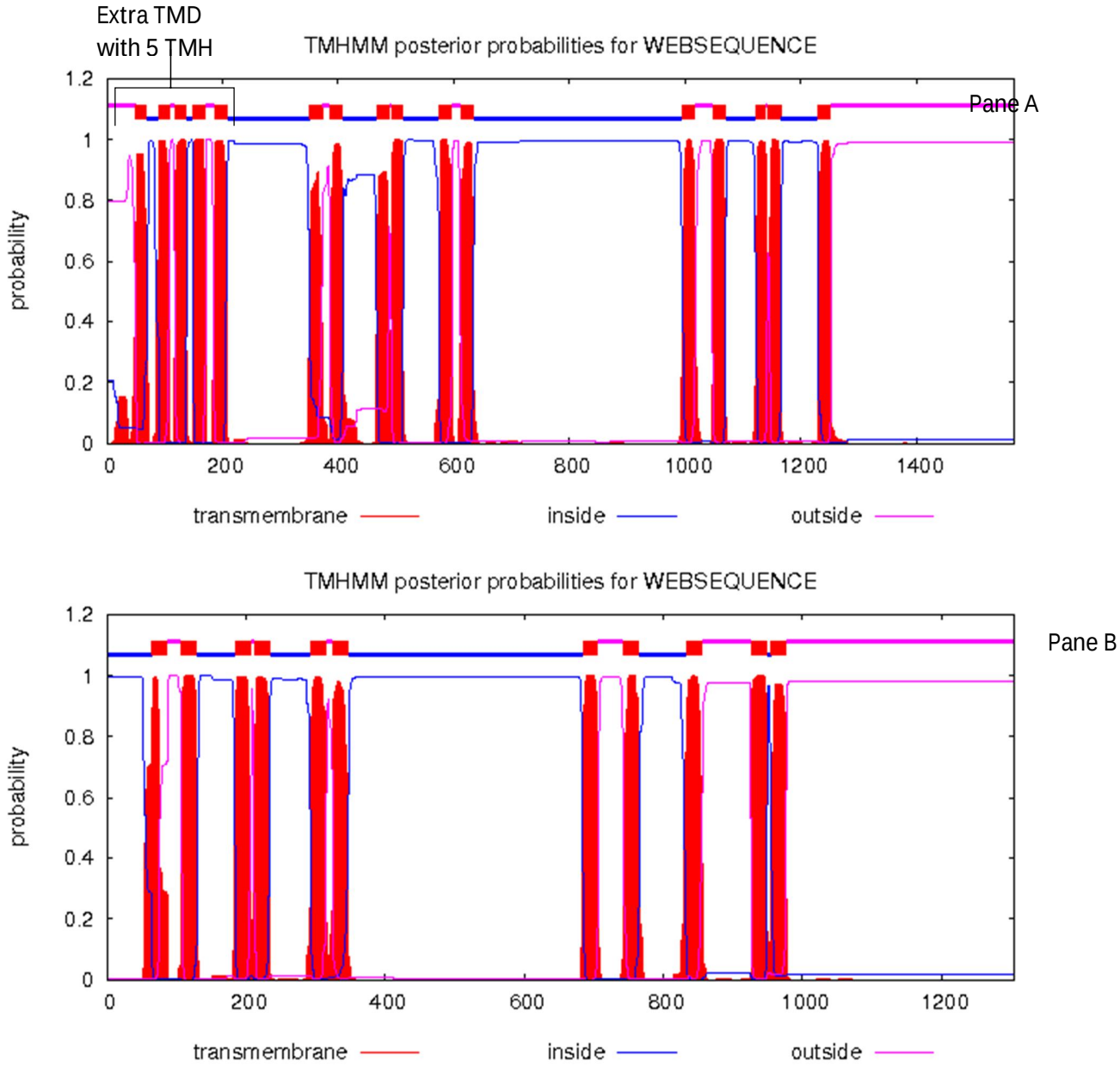
Supplementary Figure 3: Alignment of MRP4 gene of AWB vulture using Sanger and next generation sequencing revealing similarity of 99.43% with clusta omega software. . MRP4_gene = Sanger; Predicted_MRP4 = NGS



Supplementary Figure 4: Prediction of transmembrane helices in A) MRP2 revealing the presence of 16 TMH and B) MRP4 showing the presence of 11 TMH.