

Supplementary files (Table S1 & S2)

Table S1. List of 16S ribosomal RNA gene sequence of ticks used for phylogenetic tree construction in Figure 2

| Family | Subfamily | Species | Country | Isolate/ strain/ voucher | Accession No. |
|-----------|-----------------|-----------------------------------|--------------|--------------------------|---------------|
| Argasidae | Argasinae | <i>Argas cucumerinus</i> | Chile | Arcu | KX258879 |
| | | <i>Argas miniatus</i> | Brazil | DF2 | KY705381 |
| | | <i>Argas persicus</i> | China | GS | MK555333 |
| | | <i>Argas transgaripepinus</i> | South Africa | Koegas | MG941007 |
| | Ornithodorinae | <i>Ornithodoros huajianensis</i> | China | AMMSC-T-10830 | MK208994 |
| | | <i>Ornithodoros kalahariensis</i> | South Africa | Obra 2_1 | MF415636 |
| | | <i>Ornithodoros phacochoerus</i> | South Africa | Oknp 2_1 | MF415621 |
| | | <i>Ornithodoros savignyi</i> | South Africa | Osud 2GB | MF415646 |
| | Antricolinae | <i>Antricola delacruzi</i> | Brazil | n/a | EU090906 |
| | | <i>Antricola guglielmonei</i> | Brazil | n/a | EU090905 |
| | | <i>Antricola marginatus</i> | USA | n/a | L34324 |
| | | <i>Antricola mexicanus</i> | USA | n/a | L34323 |
| | | <i>Otobius megnini</i> | Argentina | n/a | EF120989 |
| Ixodidae | Amblyomminae | <i>Amblyomma cordiferum</i> | Malaysia | T26 | MK301096 |
| | | <i>Amblyomma hadanii</i> | Argentina | n/a | KJ584370 |
| | | <i>Amblyomma ovale</i> | Argentina | n/a | AF541255 |
| | | <i>Amblyomma lepidum</i> | Israel | n/a | KP987777 |
| | | <i>Amblyomma multipunctum</i> | Ecuador | n/a | KC677673 |
| | Haemaphysalinae | <i>Bothriocroton concolor</i> | Australia | n/a | JN863727 |
| | | <i>Bothriocroton glebopalma</i> | USA | n/a | U95859 |
| | | <i>Bothriocroton hydrosauri</i> | USA | n/a | U95861 |
| | | <i>Bothriocroton undatum</i> | Australia | n/a | AH011488 |
| | | <i>Haemaphysalis bispinosa</i> | India | Chipahikhola | MF946461 |

Pathogens-1201099

| | | | | |
|-----------------|---------------------------------------|--------------|-----------------------|----------|
| Rhipicephalinae | <i>Haemaphysalis cretica</i> | USA | n/a | L34308 |
| | <i>Haemaphysalis douglasi</i> | Japan | HD-B | AB819176 |
| | <i>Haemaphysalis kitaokai</i> | China | Haemaphysalis_T5124-2 | MH208573 |
| | <i>Haemaphysalis longicornis</i> | China | SZ6 | KJ710106 |
| | <i>Hyalomma anatolicum excavatum</i> | India | Z9 | KP210048 |
| | <i>Dermacentor andersoni</i> | Canada | n/a | FM955615 |
| | <i>Dermacentor nuttalli</i> | China | Neimeng | MK032591 |
| | <i>Dermacentor reticulatus</i> | Spain | 1GV09/25 | JF791811 |
| | <i>Dermacentor silvarum</i> | China | NX-guyuan | MK032807 |
| | <i>Dermacentor variabilis</i> | Canada | n/a | FN665384 |
| | <i>Hyalomma asiaticum</i> | China | IM048 | JX051087 |
| | <i>Hyalomma dromedarii</i> | USA | n/a | L34306 |
| | <i>Hyalomma marginatum</i> | USA | n/a | L34307 |
| | <i>Hyalomma rufipes</i> | South Africa | Hrufi9 | KU130464 |
| | <i>Nosomma monstrosum</i> | South Africa | Nmons1 | KU130405 |
| | <i>Nosomma monstrosum</i> | South Africa | Nmons2 | KU130406 |
| | <i>Rhipicentor bicornis</i> | USA | n/a | L34304 |
| | <i>Rhipicephalus appendiculatus</i> | Uganda | UG-3 | KY688462 |
| | <i>Rhipicephalus sanguineus</i> | Taiwan | 16S+1.L | DQ093297 |
| | <i>Rhipicephalus sanguineus</i> | USA | 4981 | MH018842 |
| | <i>Rhipicephalus microplus</i> | India | T44 | KP210071 |
| | <i>Rhipicephalus haemaphysaloides</i> | Thailand | n/a | KC170743 |
| | <i>Ixodes tasmani</i> | Australia | B6 | MH043269 |
| | <i>Ixodes frontalis</i> | Brazil | Z1 | KP769862 |
| | <i>Ixodes ricinus</i> | Canada | CA4 | HG916809 |
| | <i>Ixodes kazakstani</i> | Kyrgyzstan | 481-1987 | MF095803 |

| | | | | | |
|-----------------|--------------|-----------------------------|--------------|-------------|----------|
| | | Pathogens-1201099 | | | |
| Nuttalliellidae | Nuttalliella | <i>Ixodes persulcatus</i> | Sweden | 3TJ | KX384801 |
| | | <i>Ixodes dammini</i> | China | IPS-F8-F | DQ093299 |
| | | <i>Nuttalliella namaqua</i> | South Africa | Nn_Gut_Liz4 | JF729313 |
| | | <i>Nuttalliella namaqua</i> | South Africa | Nn_Gut_Liz8 | JQ739172 |

Table S2. Economic losses

| Country | Cattle (head) | Milk Cow (head) | Financial Loss (USD) | Milk Loss | Potential Milk Loss |
|-----------------|---------------|-----------------|----------------------|------------------------------------|--------------------------|
| | [a] | [b] | [a x 7.3 USD] | (litres) [c] [b x 90.24 litres] | (USD) [c x 0.34 USD*] |
| Brunei | 4,752 | 106 | 34,690 | 9,565 | 3,252 |
| Cambodia | 469,542 | 121,627 | 3,427,657 | 10,975,620 | 3,731,710 |
| Indonesia | 2,498,083 | 561,061 | 18,236,006 | 50,630,145 | 17,214,249 |
| Laos | 280,937 | 44,879 | 2,050,840 | 4,049,881 | 1,376,959 |
| Malaysia | 105,923 | 41,599 | 773,238 | 3,753,894 | 1,276,323 |
| Myanmar | 1,811,211 | 3,900,000 | 13,221,840 | 351,936,000 | 119,658,240 |
| Singapore | 77 | - | 562 | - | - |
| Thailand | 907,093 | 220,000 | 6,621,779 | 19,852,800 | 6,749,952 |
| The Philippines | 881,212 | 5,420 | 6,432,848 | 489,101 | 166,294 |
| Timor-Leste | 11,124 | - | 81,205 | - | - |
| Vietnam | 1,794,421 | 317,729 | 13,099,273 | 28,671,865 | 9,748,434 |
| Total | 8,764,375 | 52,124,21 | 63,979,938 | 470,368,871 | 159,925,416 |

Source: FAOSTAT 2019 (<http://www.fao.org/faostat/en/#data/QL>)

* Milk priced average 0.34 USD/litre in 2019 according to trading on a contract for difference (CFD) that tracks the benchmark market for this commodity (5 March 2021).