**Supplementary Table 1.** Summary of eligible studies included in the meta-analysis on amphistome infections in domestic ruminants in Sub-Saharan Africa from 2002-2023

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| References | Country | Host | No. examined | No. infected | Prevalence (%) | Diagnosis/ identification method | Quality score |
| Abass et al. 2020 | Cameroon | Cattle | 1361 | 174 | 12.78 | Sedimentation | 5 |
| Abebe et al. 2011a | Ethiopia | Cattle | 583 | 313 | 53.69 | Coproscopy and postmortem | 5 |
| Abebe et al. 2011b | Ethiopia | Cattle | 198 | 46 | 23.23 | Sedimentation | 5 |
| Abebe et al. 2011c | Ethiopia | Cattle | 525 | 302 | 57.52 | Postmortem | 5 |
| Abera et al. 2023 | Ethiopia | Cattle | 384 | 28 | 7.29 | Sedimentation | 5 |
| Adedipe et al. 2014 | Nigeria | Cattle | 397 | 61 | 15.37 | Sedimentation | 5 |
| Agba and Agun 2020 | Nigeria | Cattle | 600 | 14 | 2.33 | Sedimentation | 5 |
| Aragaw et al. 2019 | Ethiopia | Cattle | 369 | 179 | 48.51 | Sedimentation | 5 |
| Arowolo et al. 2020 | Nigeria | Cattle | 648 | 383 | 59.10 | Morphology-flattening | 5 |
| Paul et al. 2021 | Nigeria | Sheep | 200 | 17 | 8.50 | Sedimentation | 5 |
| Attindehou et al. 2012 | Benin | Goats | 390 | 30 | 7.69 | Morphology-flattening | 5 |
| Attindehou et al. 2012 | Benin | Sheep | 366 | 78 | 21.31 | Morphology-flattening | 5 |
| Ayalew et al. 2016 | Ethiopia | Cattle | 384 | 199 | 51.82 | Morphology-flattening | 5 |
| Bedasa et al. 2016 | Ethiopia | Cattle | 283 | 51 | 18.02 | Sedimentation | 5 |
| Beyene et al. 2016 | Ethiopia | Cattle | 85 | 27 | 31.76 | Sedimentation | 5 |
| Biu and Oluwafunmilayo 2004 | Nigeria | Sheep | 100 | 28 | 28.00 | Morphology-Histology | 5 |
| Bunza et al. 2008a | Nigeria | Cattle | 100 | 56 | 56.00 | Morphology-flattening | 5 |
| Bunza et al. 2008b | Nigeria | Sheep | 100 | 32 | 32.00 | Morphology-flattening | 5 |
| Bunza et al. 2008c | Nigeria | Goats | 100 | 12 | 12.00 | Morphology-flattening | 5 |
| Dabasa et al. 2017a | Ethiopia | Goats | 343 | 50 | 14.58 | Sedimentation | 5 |
| Dabasa et al. 2017b | Ethiopia | Sheep | 41 | 4 | 9.76 | Sedimentation | 5 |
| Daniel et al. 2014 | Ethiopia | Sheep | 384 | 121 | 31.51 | Coproscopy | 5 |
| Degefu et al. 2011 | Ethiopia | Cattle | 210 | 102 | 48.57 | Sedimentation | 5 |
| Dogo et al. 2017a | Nigeria | Cattle | 556 | 60 | 10.79 | Sedimentation | 5 |
| Dogo et al. 2017b | Nigeria | Goats | 208 | 5 | 2.40 | Sedimentation | 5 |
| Dogo et al. 2017c | Nigeria | Sheep | 85 | 4 | 4.71 | Sedimentation | 5 |
| Dube and Aisien 2005 | Nigeria | Cattle | 2000 | 1004 | 50.20 | Morphology-Histology | 5 |
| Dube and Aisien 2010a | Nigeria | Sheep | 100 | 80 | 80.00 | Morphology-Histology | 5 |
| Dube and Aisien 2010b | Nigeria | Goats | 200 | 60 | 30.00 | Morphology-Histology | 5 |
| Dube et al. 2002 | Zimbabwe | Cattle | 1377 | 429 | 31.15 | Morphology-flattening | 5 |
| Dube et al. 2005 | Nigeria | Cattle | 2000 | 1250 | 62.50 | Morphology-Histology | 5 |
| Dube et al. 2010a | Zimbabwe | Goats | 3000 | 60 | 2.00 | Morphology-flattening | 5 |
| Dube et al. 2010b | Zimbabwe | Sheep | 1000 | 60 | 6.00 | Morphology-flattening | 5 |
| Elele et al. 2013 | Nigeria | Cattle | 251 | 5 | 1.99 | Sedimentation | 5 |
| Elele et al. 2017 | Nigeria | Goats | 213 | 9 | 4.23 | Sedimentation | 5 |
| Elelu et al. 2016 | Nigeria | Cattle | 686 | 110 | 16.03 | Flukefinder | 5 |
| Elemo and Geresu 2017a | Ethiopia | Sheep | 479 | 10 | 2.09 | Sedimentation | 5 |
| Elemo and Geresu 2017b | Ethiopia | Goats | 97 | 2 | 2.06 | Sedimentation | 5 |
| Ferede et al. 2018a | Ethiopia | Cattle | 168 | 10 | 5.95 | Sedimentation | 5 |
| Ferede et al. 2018b | Ethiopia | Cattle | 70 | 9 | 12.86 | Sedimentation | 5 |
| Getahun et al. 2017 | Ethiopia | Cattle | 206 | 21 | 10.19 | Sedimentation | 5 |
| Goria et al. 2018a | Nigeria | Cattle | 296 | 10 | 3.38 | Sedimentation | 5 |
| Goria et al. 2018b | Nigeria | Goats | 147 | 4 | 2.72 | Sedimentation | 5 |
| Hayider et al. 2018 | Ethiopia | Cattle | 387 | 21 | 5.43 | Sedimentation | 5 |
| Ibrahim et al. 2014a | Ethiopia | Sheep | 214 | 48 | 22.43 | Sedimentation | 5 |
| Ibrahim et al. 2014b | Ethiopia | Goats | 170 | 24 | 14.12 | Sedimentation | 5 |
| Ibrahim et al. 2022 | Nigeria | Cattle | 373 | 36 | 9.65 | Sedimentation | 5 |
| Kagenda et al. 2018 | Uganda | Cattle | 205 | 22 | 10.73 | Sedimentation | 5 |
| Kalule et al. 2023 | Uganda | Goats | 200 | 149 | 74.50 | Sedimentation | 5 |
| Kanyari et al. 2009a | Kenya | Goats | 33 | 4 | 12.12 | Sedimentation | 5 |
| Kanyari et al. 2009b | Kenya | Sheep | 54 | 16 | 29.63 | Sedimentation | 5 |
| Kanyari et al. 2010 | Kenya | Cattle | 344 | 113 | 32.85 | Sedimentation | 5 |
| Kebede et al. 2023 | Ethiopia | Cattle | 384 | 20 | 5.21 | Sedimentation | 5 |
| Kemal et al. 2013 | Ethiopia | Cattle | 406 | 16 | 3.94 | Sedimentation | 5 |
| Keno et al. 2017 | Ethiopia | Cattle | 287 | 40 | 13.94 | Sedimentation | 5 |
| Keyyu et al. 2005 | Tanzania | Cattle | 301 | 167 | 55.48 | Sedimentation | 5 |
| Keyyu et al. 2006 | Tanzania | Cattle | 482 | 300 | 62.24 | Sedimentation | 5 |
| Kifleyohannes et al. 2015a | Ethiopia | Cattle | 219 | 143 | 65.30 | Sedimentation | 5 |
| Kifleyohannes et al. 2015b | Ethiopia | Sheep | 135 | 32 | 23.70 | Sedimentation | 5 |
| Luka et al. 2018 | Nigeria | Cattle | 389 | 5 | 1.29 | Sedimentation | 5 |
| Mariam et. al 2014 | Ethiopia | Cattle | 384 | 23 | 5.99 | Sedimentation | 5 |
| Micheal et al. 2020 | Nigeria | Cattle | 101 | 15 | 14.85 | Sedimentation | 5 |
| Mramba et al. 2023 | Tanzania | Cattle | 323 | 40 | 12.38 | Sedimentation | 5 |
| Njoku-Tony 2011 | Nigeria | Goats | 128 | 30 | 23.44 | Sedimentation | 5 |
| Nwigwe et al. 2013a | Nigeria | Cattle | 569 | 107 | 18.80 | Sedimentation | 5 |
| Nwigwe et al. 2013b | Nigeria | Goats | 370 | 0 | 0.00 | Sedimentation | 5 |
| Nwigwe et al. 2013c | Nigeria | Cattle | 569 | 107 | 18.80 | Sedimentation | 5 |
| Nzalawahe et al. 2014 | Tanzania | Cattle | 241 | 90 | 37.34 | Flukefinder | 5 |
| Nzalawahe et al. 2015 | Tanzania | Cattle | 450 | 283 | 62.89 | Flukefinder | 5 |
| Odeniran et al. 2016a | Nigeria | Sheep | 397 | 9 | 2.27 | Morphometric/ morphology | 5 |
| Odeniran et al. 2016b | Nigeria | Goats | 943 | 5 | 0.53 | Morphometric/ morphology | 5 |
| Ola-Fadunsin et al. 2020 | Nigeria | Cattle | 478 | 26 | 5.44 | Sedimentation | 5 |
| Opara et al. 2022a | Nigeria | Cattle | 154 | 94 | 61.04 | Morphology-flattening | 5 |
| Opara et al. 2022b | Nigeria | Goats | 80 | 27 | 33.75 | Morphology-flattening | 5 |
| Oyewusi et al. 2017 | Nigeria | Cattle | 206 | 1 | 0.49 | Sedimentation | 5 |
| Paguem et al. 2023a | Cameroon | Sheep | 50 | 10 | 20.00 | Morphology and Molecular confirmation | 5 |
| Paguem et al. 2023b | Cameroon | Goats | 50 | 0 | 0.00 | Morphology and Molecular confirmation | 5 |
| Paguem et al. 2023c | Cameroon | Cattle | 175 | 95 | 54.29 | Sedimentation | 5 |
| Pfukenyi et al. 2005 | Zimbabwe | Cattle | 16264 | 4790 | 29.45 | Sedimentation | 5 |
| Phiri et al. 2006 | Zambia | Cattle | 709 | 366 | 51.62 | Sedimentation | 5 |
| Phiri et al. 2007a | Zambia | Cattle | 101 | 33 | 32.67 | Beads technique | 5 |
| Phiri et al. 2007b | Zambia | Cattle | 268 | 96 | 35.82 | Sedimentation | 5 |
| Sebro et al. 2022a | Ethiopia | Sheep | 208 | 5 | 2.40 | Sedimentation | 5 |
| Sebro et al. 2022b | Ethiopia | Goats | 175 | 1 | 0.57 | Sedimentation | 5 |
| Solomon et al. 2016 | Ethiopia | Cattle | 253 | 26 | 10.28 | Sedimentation | 5 |
| Squire et al. 2013 | Ghana | Cattle | 309 | 80 | 25.89 | Sedimentation | 5 |
| Squire et al. 2018a | Ghana | Cattle | 328 | 121 | 36.89 | Sedimentation | 5 |
| Squire et al. 2018b | Ghana | Sheep | 217 | 17 | 7.83 | Sedimentation | 5 |
| Squire et al. 2018c | Ghana | Goats | 285 | 2 | 0.70 | Sedimentation | 5 |
| Tasse 2023 | Ethiopia | Cattle | 384 | 156 | 40.63 | Morphology-flattening | 5 |
| Terefe, et al. 2005 | Ethiopia | Cattle | 200 | 71 | 35.50 | Sedimentation | 5 |
| Tesema et al. 2023 | Ethiopia | Sheep | 384 | 8 | 2.08 | Sedimentation | 5 |
| Tsotetsi et al. 2013a | South Africa | Cattle | 314 | 114 | 36.31 | Pitchford Visser sieve | 5 |
| Tsotetsi et al. 2013b | South Africa | Sheep | 256 | 82 | 32.03 | Pitchford Visser sieve | 5 |
| Tsotetsi et al. 2013c | South Africa | Goats | 311 | 84 | 27.01 | Pitchford Visser sieve | 5 |
| Tulu et al. 2016 | Ethiopia | Cattle | 657 | 14 | 2.13 | Sedimentation | 5 |
| Tumusiime et al. 2023 | Rwanda | Cattle | 100 | 69 | 69.00 | Sedimentation | 5 |
| Turuna and Adugna 2019 | Ethiopia | Cattle | 400 | 166 | 41.50 | Visual morphology | 5 |
| Uwalaka et al. 2019 | Nigeria | Cattle | 396 | 155 | 39.14 | Morphology-flattening | 5 |
| Yabe et al. 2008 | Zambia | Cattle | 100 | 84 | 84.00 | Sedimentation | 5 |
| Yasin et al. 2017 | Ethiopia | Cattle | 400 | 23 | 5.75 | Visual morphology | 5 |
| Yohanna et al. 2019a | Nigeria | Cattle | 78 | 3 | 3.85 | Sedimentation | 5 |
| Yohanna et al. 2019b | Nigeria | Sheep | 68 | 7 | 10.29 | Sedimentation | 5 |
| Yohanna et al. 2019c | Nigeria | Goats | 59 | 3 | 5.08 | Sedimentation | 5 |
| Yohannes et al. 2013 | Ethiopia | Cattle | 500 | 60 | 12.00 | Sedimentation | 5 |
| Zvinorova et al. 2016 | Zimbabwe | Goats | 580 | 42 | 7.24 | Sedimentation | 5 |

**Supplementary Table 2.** Univariate meta-regression of overall and subgroups for individual variables on prevalence of amphistome infections in domestic ruminants in Sub-Saharan Africa from 2002-2023

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model |  | Unstandardized Coefficients | | | | | Standardized Coefficients | | | t | Sig. | | 95.0% Confidence Interval for B | | | |
| R2 | | B | | Std. Error | | Beta | | | Lower Bound | | Upper Bound | |
| Overall | Region | 0.028 | | | -.010 | | .006 | | -.167 | -1.683 | | | 0.096 | | -.021 | | .002 |
| Host | .156 | | | -.030 | | .007 | | -.395 | -4.284 | | | <0.001 | | -.043 | | -.016 |
| Period | 0.148 | | | -.041 | | .010 | | -.385 | -4.151 | | | <0.001 | | -.061 | | -.021 |
| Study type | 0.148 | | | -.017 | | .010 | | -.168 | -1.695 | | | 0.093 | | -.036 | | .003 |
| Age | 0.096 | | | -.033 | | .018 | | -.310 | -1.903 | | | 0.066 | | -.069 | | .002 |
| Sex | 0.081 | | | .038 | | .020 | | .285 | 1.877 | | | 0.068 | | -.003 | | .079 |
| Season | 0.051 | | | .022 | | .033 | | .227 | .658 | | | 0.529 | | -.054 | | .097 |
| Body condition | 0.601 | | | .070 | | .013 | | .775 | 5.347 | | | <0.001 | | .042 | | .097 |
| Central | Host | 0.001 | | | -.001 | | .048 | | -.027 | -.027 | | | 0.983 | | -.612 | | .609 |
| Study type | 0.550 | | | .059 | | .069 | | .650 | .854 | | | 0.550 | | -.822 | | .940 |
| Eastern | Host | 0.080 | | | -.015 | | .008 | | -.283 | -1.914 | | | 0.062 | | -.031 | | .001 |
| Study type | 0.034 | | | .041 | | .033 | | .184 | 1.215 | | | 0.231 | | -.027 | | .108 |
| Period | 0.216 | | | -.005 | | .001 | | -.465 | -3.403 | | | 0.001 | | -.007 | | -.002 |
| Southern | Host | 0.293 | | | -.055 | | .027 | | -.541 | -2.036 | | | 0.069 | | -.114 | | .005 |
| Study type | 0.425 | | | -.084 | | .031 | | -.652 | -2.719 | | | 0.022 | | -.153 | | -.015 |
| Period | 0.035 | | | .001 | | .002 | | .188 | .605 | | | 0.559 | | -.003 | | .006 |
| West | Host | 0.002 | | | .002 | | .007 | | .043 | .273 | | | 0.786 | | -.013 | | .017 |
| Study type | 0.023 | | | .010 | | .011 | | .151 | .966 | | | 0.340 | | -.011 | | .032 |
| Period | 0.277 | | | -.004 | | .001 | | -.527 | -3.917 | | | <0.001 | | -.006 | | -.002 |
| Cattle | Region | 0.012 | | | -.007 | | .009 | | -.112 | -.864 | | | 0.391 | | -.024 | | .010 |
| Period | 0.547 | | | -.005 | | .001 | | -.739 | -8.433 | | | <0.001 | | -.006 | | -.004 |
| Study type | 0.225 | | | .097 | | .023 | | .474 | 4.139 | | | <0.001 | | .050 | | .143 |
| Goat | Region | 0.046 | | | -.005 | | .006 | | -.214 | -.929 | | | 0.365 | | -.017 | | .007 |
| Period | 0.015 | | | .000 | | .000 | | -.123 | -.525 | | | 0.606 | | -.001 | | .001 |
| Study type | 0.036 | | | -.007 | | .009 | | -.190 | -.823 | | | 0.421 | | -.026 | | .011 |
| Sheep | Region | 0.034 | | | .007 | | .008 | | .185 | .800 | | | 0.434 | | -.011 | | .024 |
| Period | 0.103 | | | -.001 | | .001 | | -.322 | -1.441 | | | 0.167 | | -.003 | | .001 |
| Study type | 0.014 | | | .008 | | .015 | | .117 | .498 | | | 0.624 | | -.024 | | .039 |

**Supplementary Table 3.** Meta-regression for the combined variables on prevalence of amphistome infections in domestic ruminants in Sub-Saharan Africa from 2002-2023

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | | Unstandardized Coefficients | | | | Standardized Coefficients | | | | Sig. | R2 | 95.0% Confidence Interval for B | | |
| B | | | Std. Error | | | Beta | | Lower Bound | | Upper Bound |
| Overall | Region | -.003 | | .005 | | | -.060 | | .518 | |  | -.014 | .007 | |
| Host | -.025 | | .007 | | | -.329 | | <.001 | |  | -.039 | -.011 | |
| Study type | -.016 | | .011 | | | -.162 | | .136 | |  | -.037 | .005 | |
| Period | -.046 | | .010 | | | -.433 | | <.001 | |  | -.066 | -.026 | |
| Combined effect |  | |  | | |  | | <.001 | | 0.344 |  |  | |
| Eastern | Host | -.012 | | .007 | | | -.218 | | .115 | |  | -.026 | .003 | |
| Study type | .035 | | .030 | | | .157 | | .253 | |  | -.026 | .095 | |
| Period | -.005 | | .001 | | | -.456 | | .001 | |  | -.007 | -.002 | |
| Combined effect |  | |  | | |  | | 0.002 | | 0.303 |  |  | |
| Southern | Host | -.011 | | .027 | | | -.107 | | .703 | |  | -.074 | .052 | |
| Study type | -.137 | | .053 | | | -1.065 | | .031 | |  | -.259 | -.016 | |
| Period | -.004 | | .003 | | | -.609 | | .141 | |  | -.010 | .002 | |
| Combined effect |  | |  | | |  | | 0.036 | | 0.638 |  |  | |
| West | Host | -.002 | | .007 | | | -.041 | | .795 | |  | -.016 | .013 | |
| Study type | .000 | | .011 | | | -.004 | | .983 | |  | -.023 | .022 | |
| Period | -.004 | | .001 | | | -.534 | | <.001 | |  | -.006 | -.002 | |
| Combined effect |  | |  | | |  | | 0.006 | | 0.279 |  |  | |
| Age | Region | .033 | | .017 | | | .346 | | .061 | |  | -.002 | .068 | |
| Period | -.002 | | .001 | | | -.332 | | .107 | |  | -.004 | .000 | |
| Study type | -.001 | | .028 | | | -.008 | | .963 | |  | -.059 | .056 | |
| Combined effect |  | |  | | |  | | <.001 | | 0.459 |  |  | |
| Goat | Region | -.001 | | .008 | | | -.053 | | .872 | |  | -.018 | .016 | |
| Period | .000 | | .001 | | | -.210 | | .549 | |  | -.002 | .001 | |
| Study type | -.010 | | .012 | | | -.266 | | .408 | |  | -.035 | .015 | |
| Combined effect |  | |  | | |  | | 0.0679 | | 0.088 |  |  | |
| Sheep | Region | .016 | | .012 | | | .435 | | .215 | |  | -.010 | .041 | |
| Study type | -.036 | | .028 | | | -.556 | | .212 | |  | -.095 | .023 | |
| Period | -.002 | | .001 | | | -.574 | | .087 | |  | -.005 | .000 | |
| Combined effect |  | |  | | |  | | 0.200 | | 0.298 |  |  | |
| Sex | Region | .051 | | .014 | | | .579 | | <.001 | |  | .023 | .078 | |
| Host | -.011 | | .027 | | | -.056 | | .690 | |  | -.064 | .043 | |
| period | -.008 | | .043 | | | -.029 | | .857 | |  | -.096 | .080 | |
| Combined effect |  | |  | | |  | | 0.001 | | 0.340 |  |  | |
| Female | Region | .034 | | .019 | | | .427 | | .103 | |  | -.007 | .075 | |
| Host | -.010 | | .030 | | | -.082 | | .752 | |  | -.072 | .053 | |
| period | .047 | | .056 | | | .224 | | .412 | |  | -.071 | .165 | |
| Combined effect |  | |  | | |  | | 0.399 | | 0.155 |  |  | |
| Male | Region | .035 | | .023 | | | .440 | | .143 | |  | -.013 | .083 | |
| Host | -.025 | | .033 | | | -.156 | | .466 | |  | -.094 | .045 | |
| period | -.031 | | .058 | | | -.150 | | .604 | |  | -.152 | .091 | |
| Combined effect |  | |  | | |  | | 0.109 | | .293 |  |  | |
| Age | Region | .032 | | .019 | | | .331 | | .105 | |  | -.007 | .070 | |
| Period | -.002 | | .001 | | | -.306 | | .179 | |  | -.004 | .001 | |
| T Study type | .020 | | .030 | | | .114 | | .522 | |  | -.042 | .081 | |
| Combined effect |  | |  | | |  | | 0.008 | | 0.306 |  |  | |
| Adult | Period | .042 | | .024 | | | .427 | | .098 | |  | -.009 | .094 | |
| Region | -.002 | | .002 | | | -.286 | | .341 | |  | -.005 | .002 | |
| Study type | -.008 | | .040 | | | -.051 | | .848 | |  | -.093 | .077 | |
| Combined effect |  | |  | | |  | | 0.069 | | 0.388 |  |  | |
| Young | Region | .010 | | .027 | | | .126 | | .713 | |  | -.049 | .069 | |
| Period | -.003 | | .001 | | | -.610 | | .102 | |  | -.006 | .001 | |
| Study type | .040 | | .052 | | | .166 | | .456 | |  | -.072 | .153 | |
| Combined effect |  | |  | | |  | | 0.023 | | 0.481 |  |  | |
| 2002 to 2012 | Region | .031 | | .024 | | | .349 | | .217 | |  | -.019 | .081 | |
| Host | -.037 | | .018 | | | -.408 | | .057 | |  | -.074 | .001 | |
| Study type | -.056 | | .043 | | | -.381 | | .202 | |  | -.144 | .032 | |
| Combined effect |  | |  | | |  | | <.001 | | 0.685 |  |  | |
| 2013 to 2023 | Region | -.011 | | .004 | | | -.300 | | .016 | |  | -.019 | -.002 | |
| Host | -.013 | | .006 | | | -.260 | | .030 | |  | -.025 | -.001 | |
| Study type | .006 | | .009 | | | .075 | | .560 | |  | -.013 | .024 | |
| Combined effect |  |  | | |  | | | | 0.017 | 0.134 |  | |  |