Appendix S3. A summary of the existing literature (93 publications) on the ejaculate traits of the 38 extant felid species. The felid lineages and associated species are based on Johnson et al.(2006). All values are presented as a mean ± SEM unless indicated as a weighted mean (µ), average of mean values (AV.µ), mean and range (MR), or median and interquartile range (MIQ). The male felids used in each of the studies cited are described as either captive (C), wild (W), wild bred but captive (WB,C), or privately owned (P). Males are also categorised according to sperm quality (normospermic (N) or teratospermic (T)), genetic diversity (low genetic diversity (LGD) or high genetic diversity (HGD)), or based on age. The majority of ejaculates were collected by electroejaculation, with artificial vagina (AV), epididymal sperm from castrated testis (EP), urethral catheterisation (UC) also used. These methods are described in detail in Appendix S4, which also describes the assessment of ejaculate and sperm characteristics. A progressive motility (PM) is a measure of the type of movement exhibited by spermatozoa: (0) no movement, (1) poor lateral movement with minimal linear movement, (2) moderate lateral movement with occasional linear movement, (3) slow linear movement, (4) linear movement, and (5) rapid linear movement. The percentage of motile sperm and PM was used to calculate the sperm motility index (SMI): B SMI = (% motile sperm + (20\* progressive motility))/2. Many publications did not report a SMI, thus many of SMIs reported in the table were calculated from reported mean percentage of motile sperm and PM score. Calculated SMI’s are indicated by †. Similarly, some of the sperm concentrations in the table below have been calculated from mean total number of sperm in the ejaculates assessed and the ejaculate volume; these values are indicated by ‡. Primary morphological abnormalities (1º abnorm.) included abnormal mid-piece, acrosomal defects, macro- or micro-cephalic, mitochondrial sheath aplasia, polycephalic, polyflagellate, and tightly coiled flagellum. Secondary morphological abnormalities (2º abnorm.) included bent mid-piece with or without cytoplasmic droplet, bent flagellum with proximal and distal cytoplasmic droplets, bent flagellum without cytoplasmic droplet, detached head, detached flagellum, and spermatids. Other abbreviations used include breeding season (BS), review article (R) and testosterone (T).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Lineage** | **Species** | **No. males** | **No. ejacul-ates** | **Season/time of year** | **pH** | **Testicular volume (cm3)** | **Ejaculate volume (ml)** | **Sperm concentration (x 106/ml)** | **Vitality Or membrane integrity (%)** | **Sperm motility** | | | **Acrosome intactness  (%)** | **Morphologically abnormal sperm** | | | **Reference** |
| **% of motile sperm** | **PM scoreA  (0 – 5)** | **SMIB** | **Total (%)** | **1ºabnorm (%)** | **2ºabnorm (%)** |
| **Domestic Cat** | **Domestic cat** (*Felis catus*) | 5C  16C  3C, N  3C,T  29C 6C,N  6C,T ?AV ?  ?N  ?T  3C,N  3C,N  3C,N  3C,T  3C,N  3C,T  10C,N  10C,T  10C,T  48C  4C  8P  8p  22C  3C,N  3C,T  2C  25P,N  12P,T  4C  13C  8P,N  4P,T | 24AV  16  18  18  29EP  6  6 -  -  45  31  9  9  9  9  3  3  10EP  10EP  10  48  7  8  8UC  22EP  15  19  11AV  25EP  12EP 4  13UC  8EP  4EP | -  -  -  -  -  -  - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  - -  - | 7.4 (7.0 -8.2)  -  -  -  -  -  -  6.6 – 8.8  6.6 – 8.8  -  -  -  -  -  -  -  -  -  -  -  -  -  7.9 ± 0.14  7.0 ± 0.14  -  -  -  -  -  -  -  - -  - | -  -  4.3 ± 0.3  3.7 ± 0.3  -  -  - -  -  -  -  -  -  -  -  -  -  1.3 ± 0.09  1.8 ± 0.1  1.8 ± 0.1  -  -  -  -  -  -  -  -  -  -  -  - 2.8 ± 0.05  3.5 ± 0.06 | 0.04 (0.01-0.12)  -  0.1 ± 0.01 0.1 ± 0.01  N/A  0.2 ± 0.01  0.3 ± 0.01 0.03 - 0.04AV.µ  0.08 – 0.22 AV.µ  0.23 ± 0.06  0.20 ± 0.09  0.2 ± 0.2  0.2 ± 0.1  0.26 ± 0.1  0.22 ± 0.0  -  -  N/A  N/A  0.1 ± 0.01  0.1 (0.01-0.2)MR  0.08 ± 0.01  0.067 ± 0.01  0.012 ± 0.001  -  0.15 ± 0.1  0.17 ± 0.1  -  N/A  N/A  0.08 ± 0.01  0.08 ± 0.9  N/A  N/A | 1730.0 (513-3740)  147.0 ± 39.5  167.6 ± 43.6  361.3 ± 43.6  80.3 ± 15.2  222.3 ± 13.1  199.0 ± 50.3 1730.0 AV.µ  12.0 - 30.0 AV.µ  199.0 ± 19.3  215.0 ± 10.6  172.0 ± 13.2  196.0 ± 15.3  78.3 ± 11.2  121.3 ± 32.0  -  - -  -  1297.0 ± 252.3  -  13.5 ± 5.4  542.9 ± 204.3  1868.4 ± 353.5  -  345.0 ± 41.0  267.0 ± 37.0  -  -  -  287.7 ± 21.3  1880 (1183-2186)MR  626.9 ± 112.4  952.7 ± 184.3 | -  -  -  -  -  -  - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  81.4 ± 3.4  80.0 ± 3.6  -  -  -  -  -  -  -  70.0 (67-79) MR  75.2 ± 5.1  70.9 ± 4.9 | 78.0 (35-100)  77.0 ± 3.0  84.4 ± 5.9 73.3 ± 5.9  71.2 ± 2.0  82.1 ± 1.1  69.6 ± 8.9 56.0 – 84.0 AV.µ  56.0 – 84.0 AV.µ  86.2 ± 1.7  80.2 ± 1.4  87.5 ± 3.2  83.6 ± 5.1  80.2 ± 11.2  70.2 ± 2.5  63.1 ± 9.6  52.5 ± 4.9  69.0 ± 6.8  74.0 ± 4.9  69.7 ± 3.1  60.0 (0-95) MR  85.0 ± 10.0  78.1 ± 3.6  78.1 ± 3.4  56.8 ± 2.5  - -  82.2 ± 2.4  80.6 ± 1.6  76.7 ± 3.7  84.3 ± 3.3  60.0 (5-70) MR 78.4 ± 5.6  71.2 ± 2.36 | -  -  4.2 ± 0.3 3.7 ± 0.3  2.9 ± 0.1  4.1 ± 0.1  3.7 ± 0.1 -  -  4.2 ± 0.3  3.7 ± 0.2  -  -  3.8 ± 0.2  3.0 ± 0.3  -  -  3.2 ± 0.1  3.3 ± 0.1  3.6 ± 0.1  -  -  4.5 ± 0.2  4.7 ± 0.2  2.8 ± 0.2  -  -  3.6 ± 0.8  3.1 ± 0.1  3.4 ± 0.2  3.8 ± 0.2  4.2 ± 0.2  -  - | -  -  84.4 ± 5.2 73.6 ± 5.2  64.6 †  82.1 †  71.8 † -  -  85.1 †  77.1 †  -  -  78.1 †  65.1 †  -  -  66.5 †  70.0 †  70.9 †  -  -  84.1†  86.1†  55.9 ± 2.0  80.0 ± 1.0  66.0 ± 1.0  77.1 † 76.3 ± 1.4  72.5 ± 3.5  80.2 †  72.0 †  -  - | -  -  -  -  -  -  - -  -  96.5 ± 0.4  98.4 ± 0.1  -  -  100.0 ± 0.0  98.0 ± 0.2  86.9 ± 0.3  20.5 ± 5.2  -  -  -  98.5 (92-100) MR  -  92.4 ± 1.2  93.6 ± 1.0  55.3 ± 3.5  92.0 ± 2.0  84.0 ± 2.0  49.3 ± 2.8 97.5 ± 0.6  90.3 ± 2.0  -  -  -  - | -  29.1 ± 3.7  28.4 ± 6.4 64.2 ± 6.4  49.3 ± 3.2  26.3 ± 1.6  76.0 ± 5.0 <10 – 61.8 AV.µ  <10 – 61.8 AV.µ  23.8 ± 1.3  75.4 ± 2.4  24.8 ± 3.2  73.9 ± 3.5  26.6 ± 3.5  86.1 ± 2.7  31.5 ± 5.5  78.7 ± 1.5  33.9 ± 2.2  88.6 ± 0.8  90.7 ± 2.2  66.0 (9-99) MR  -  -  -  82.2 ± 2.3  37.4 ± 4.0  73.0 ± 4.0  ~63.7µ 25.7 ± 2.0  56.9 ± 1.4  22.7 ± 2.5  -  -  - | -  5.8  2.5  9.0  -  -  - -  -  -  -  -  -  -  -  -  -  -  -  -  ~4.0  -  -  -  -  9.1  21.0  - 6.7 ± 0.9  13.5 ± 1.8  -  -  -  - | -  23.3  25.9  57.2  -  -  - -  -  -  -  -  -  -  -  -  -  -  -  -  ~30.1  -  -  -  -  28.0  52.0  -  19.0 ± 1.8  43.4 ± 2.4  -  -  -  - | Sojka et al. 1970  Wildt et al. 1983  Howard et al. 1990  Howard et al. 1990  Goodrowe & Hay 1993  Long et al. 1996  Long et al. 1996 Axnér & Linde-Forsberg 2002R  Axnér & Linde-Forsberg 2002R  Pukazhenthi et al. 2000bR  Pukazhenthi et al. 2000bR  Pukazhenthi et al. 2000a  Pukazhenthi et al. 2000a  Pukazhenthi et al. 2002 Pukazhenthi et al. 2002  Penfold et al. 2003  Penfold et al. 2003  Neubauer et al. 2004  Neubauer et al. 2004  Neubauer et al. 2004  Axner & Linde Forsberg 2007  Chatdarong et al. 2007  Zambelli et al. 2008  Zambelli et al. 2008  Gañán et al. 2009a Terrell et al. 2010  Terrell et al. 2010  Lambo et al. 2012  Müller et al. 2012  Müller et al. 2012  Vick et al. 2012  Cunto et al. 2015  Gutiérrez-Reinoso & García-Herreros 2016  Gutiérrez-Reinoso & García-Herreros 2016 |
| **European wild cat** (*Felis silvestris*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **African wild cat**  (*Felis libyca*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Chinese mountain cat** (*Felis bieti*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Desert/Sand cat** (*Felis margarita*) | 8C  5C | 23  18 | NS  - | 8.8 ± 0.04  - | 1.6 ± 0.1  - | 0.20 ± 0.02  - | 209.8 ± 38.3  - | -  - | 78.3 ± 1.3  78.6 ± 1.6 | 3.4 ± 0.1  3.4 ± 0.1 | 72.8 ± 1.2  73.5 ± 1.5 | 92.9 ± 1.0  94.0 ± 1.0 | 59.6 ± 3.1  60.0 ± 3.3 | -  - | -  - | Herrick et al. 2010a  Herrick et al. 2010b |
| **Black-footed cat** (*Felis nigripes*) | 5C  3C | 18  12 | NS  - | 8.8 ± 0.06  - | 1.8 ± 0.1 - | 0.25 ± 0.01  - | 130.4 ± 23.6  - | -  - | 82.5 ± 1.9  85.0 ± 1.2 | 3.6 ± 0.1  3.8 ± 0.1 | 77.6 ± 2.0  80.4 ± 1.0 | 90.5 ± 1.9  94.0 ± 0.8 | 53.3 ± 3.0  52.8 ± 4.4 | -  - | -  - | Herrick et al. 2010a  Herrick et al. 2010b |
| **Jungle cat** (*Felis chaus*) | 5C | 5UC | - | 7.1 ± 0.05 | - | 0.07 ± 0.01 | 75.1 ± 7.6 | 60.7 ± 2.3 | 77.1 ± 6.3 | 3.08 ± 0.3 | 69.4 † | - | 26.2 ± 2.7 | - | - | Kheirkhah et al. 2017 |
| **Lineage** | **Species** | **No. males** | **No. ejacul-ates** | **Season/time of year** | **pH** | **Testicular volume (cm3)** | **Ejaculate volume (ml)** | **Sperm concentration (x 106/ml)** | **Vitality Or membrane integrity (%)** | **Sperm motility** | | | **Acrosome intactness  (%)** | **Morphologically abnormal sperm** | | | **Reference** |
| **% of motile sperm** | **PM scoreA  (0 – 5)** | **SMIB** | **Total (%)** | **1ºabnorm (%)** | **2ºabnorm (%)** |
| **Leopard Cat** | **Pallas’ cat** (*Otocolobus manul*) | 1C  1C  4C  3C  4C  3C  4C | 5  5  16  3  4  3  4 | Dec-April(BS)  June-Oct  -  Dec  Feb (^[T])  April  June | -  -  -  -  -  -  - | 2.0 ± 0.2  1.6 ± 0.1  -  2.0 ± 0.2  2.0 ± 0.1  2.5 ± 0.3  2.5 ± 0.3 | 0.2 ± 0.01  0.2 ± 0.01  0.07 ± 0.02  0.05 ± 0.02  0.10 ± 0.02  0.16 ± 0.04  0.07 ± 0.01 | 123.0 ± 16.7  3.8 ± 1.8  4.0 ‡  2.3 ± 2.3  29.0 ± 18.3  51.3 ± 35.5  1.5 ± 0.6 | -  -  -  -  -  -  - | -  -  -  -  -  -  - | -  -  -  -  -  -  - | 78.5 ± 2.7  64.0 ± 1.9  71.6 ± 1.4  -  64.2 ± 12.7  70.8 ± 3.2  57.5 ± 1.8 | -  -  94.8 ± 1.0  -  -  -  - | 36.6 ± 2.0  73.4 ± 4.9  -  68.7 ± 6.8  52.3 ± 8.6  48.0 ± 9.5  75.2 ± 4.3 | -  -  -  -  -  -  - | -  -  -  -  -  -  - | Swanson et al. 1996b  Swanson et al. 1996b  Swanson et al. 2006  Newell-Fugate et al. 2007  Newell-Fugate et al. 2007  Newell-Fugate et al. 2007  Newell-Fugate et al. 2007 |
| **Rusty-spotted cat**  (*Prionailurus rubiginosus*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Asian spotted/leopard cat** (*Prionailurus bengalensis*) | 4C  ?  4C  12C  2C | 24  43  4  12  2 | -  -  -  -  Nov-Jan | -  -  -  -  - | -  -  -  1.9 ± 0.6  - | 0.15 ± 0.02  0.29 ± 0.1  0.5 ± 0.1  0.13 ± 0.02 - | 37.0 ± 5.4  55.6 ± 7.7  53.0 ± 5.8  151.9 ± 34.4 - | -  -  -  70.0 ± 3.5  72.1 ± 2.1 | 73.8 ± 2.6  68.4 ± 2.9  77.5 ± 2.1  73.3 ± 4.7 50.0 ± 15.0 | 3.5 ± 0.1  3.6 ± 0.1  -  - - | 72.3 ± 2.4  70.2 †  -  - - | -  95.7 ± 0.8  -  - - | 34.6 ± 2.0  31.2 ± 4.1  23.6 ± 2.1  ~80.4 ± 3.3 3.2(n = 1) | 4.2  -  -  - - | 30.4  -  -  - - | Howard & Wildt 1990  Pukazhenthi et al. 2000bR  Pukazhenthi et al. 2000a  Thongphakdee et al. 2011  Tajima et al. 2016 |
| **Fishing cat** (*Prionailurus viverrinus*) | 8C  5C | 8  5 | -  - | 8.5 ± 0.2  - | 5.5 ± 0.5  - | 0.5 ± 0.1  - | 108.0 ± 29.0 - | - - | 73.0 ± 3.0 90.0 ± 2.7 | 4.0 ± 0.2 - | 77.0 ± 3.0 - | 90.0 ± 2.0 - | 66.5 ± 6.8 10.4 ± 2.7 | ~41.9 - | ~24.8 - | Thiangtum et al. 2006  Pinyopummin et al. 2011 |
| **Flat-headed cat** (*Prionailurus planiceps*) | 4C | 8 | - | 8.0 | - | 0.1 ± 0.02 | 56.7 ± 6.6 | 48.7 ± 5.4 | 56.3 ± 6.7 | 3.1 ± 0.1 | 59.2 † | 30.5 ± 2.5 | >60 | ~47.1 | ~26.2 | Thuwanut et al. 2011 |
| **Puma** | **Puma/mountain lion**  (*Puma concolor*) | 7C  3C  -  30C  31W  16W (LGD)  ?C  ?(LGD) | 7  3  12  30  31  16  9  39 | -  -  -  -  -  -  -  - | -  -  -  -  -  -  -  - | 19.0 ± 0.8  -  -  ~21.3µ  -  9.6 ± 1.2  -  - | 3.4 ± 0.6  1.1 ± 0.4  2.8 ± 0.5  2.9 ± 0.3  ~2.5µ  0.7 ± 0.1  3.3 ± 0.6  1.6 ± 0.2 | 22.0 ± 7.3  10.8 ± 8.2  20.2 ± 4.7  21.5 ± 3.2  ~17.7µ  4.8 ± 1.4  37.9 ± 10.4  9.3 ± 1.9 | -  -  -  -  -  -  -  - | 64.3 ± 6.6  43.3 ± 3.3  52.0 ± 8.0  53.0 ± 3.7  ~66.8µ  38.2 ± 6.7  65.5 ± 2.9  50.3 ± 4.0 | 3.6 ± 0.2  2.7 ± 0.2  3.5 ± 0.2  3.2 ± 0.1  ~3.2µ  2.3 ± 0.3  3.6 ± 0.2  2.7 ± 0.2 | 68.2 †  48.7 †  61.0 †  58.5 †  65.4 †  42.1 †  68.8 †  52.2 † | 98.6 ± 1.2  ~ 96.0  -  -  -  -  -  63.5 ± 2.2 | 73.5 ± 4.9  93.0 ± 5.5  76.6 ± 3.7  83.5 ± 1.9  ~73.2  93.5 ± 0.7  -  91.4 ± 1.1 | 21.7  63.2  -  -  -  -  -  - | 51.8  30.7  -  -  -  -  -  - | Wildt et al. 1988  Miller et al. 1990  Howard 1993  Barone et al. 1994a  Barone et al. 1994a  Barone et al. 1994a  Barone et al. 1994b  Pukazhenthi et al. 2000bR |
| **Jaguarondi**  (*Puma yagouaroundi*) | -  - | 3  21 |  |  |  | 0.1 ± 0.1  0.08 ± 0.02 | 12.5 ± 9.4 7.2 ± 4.0 | -  - | 50.0 ± 9.9  57.8 ± 2.5 | 3.5 ± 0.4  - | 60.0 †  - | -  - | 64.6 ± 14.3  74.3 ± 4.6 | -  - | -  - | Howard 1993 Morais 2001R |
| **Cheetah** (*Acinonyx jubatus*) | 18C  20C  8W  11C  9C  5C  12C  60C  13WB,C  97 WB,C  ?C  8WB,C  22C  ?C(on exhibit)  ?C(off exhibit)  43C  54W | 40  29  8  15  9  5  22  60  23  200  160  21  22  124  58  43  54 | -  -  -  -  -  -  -  -  -  NS  -  -  -  NS  NS  -  - | -  -  -  -  -  -  -  -  -  -  6.4 - 8.0  -  -  -  -  -  - | -  -  -  -  -  -  -  13.9 ± 0.4  9.2 ± 0.4  10.2 ± 0.3  -  11.1 ± 0.7  -  13.4µ  13.1µ  12.5 ± 0.4  13.4 ± 0.5 | ~1.8(n = 15)  1.8 ± 0.3  -  1.8 ± 0.3  1.1 ± 0.2  1.6 ± 0.3  -  1.5 ± 0.1  3.7 ± 0.4  2.1 ± 0.1  0.7 ± 0.04  3.3 ± 0.2  2.0 ± 0.1  1.5µ  1.4µ  -  - | 14.5 ± 1.8  27.3 ± 8.6  26.7 ± 5.8  27.3 ± 8.6  40.6 ± 21.1  13.5 ± 2.5  11.0 ± 2.2  29.3 ± 5.3  20.4 ± 3.1  21.9 ± 1.7  32.7 ± 2.9  36.0 ± 4.9  50.0 ± 34.0  63.8 ± 16.2(n = 8)  19.3 ± 7.6(n = 15)  -  - | -  -  -  -  -  -  -  -  -  65.2 ± 1.5  -  -  -  -  -  - | 54.0 ± 3.0  70.7 ± 3.5  63.1 ± 3.9  69.0 ± 5.8  74.4 ± 3.6  75.0 ± 2.6  42.7 ± 6.7  67.0 ± 2.0  78.0 ± 1.4  69.0 ± 1.1  58.1 ± 1.5  70.7 ± 1.4  -  66.8µ  69.8µ  -  - | -  3.6 ± 0.1 3.8 ± 0.2  3.7 ± 0.2  3.8 ± 0.2  4.0 ± 0.1  2.4 ± 0.3(n =21)  3.6 ± 0.1  3.7 ± 0.1  3.3 ± 0.1  -  3.4 ± 0.1  -  3.2 ± 0.1  3.2 ± 0.1  -  - | -  71.4 †  69.6 †  71.5 †  75.1 ± 3.7  77.5 †  45.4 †  69.5 †  76.0 †  67.5 †  -  70.7 ± 1.4  69.0 ± 1.0  65.4 †  66.9 †  67.0 ± 1.3  68.0 ± 1.2 | -  96.3 ± 1.0  98.3 ± 0.5  98.4 ± 0.5  97.0 ± 0.8  94.5 ± 1.5  -  -  86.3 ± 1.6  73.9 ± 1.4  -  86.6 ± 1.3  92.0 ± 2.0  79.2 ± 4.0(n = 8)  81.7 ± 2.4(n = 15)  -  - | 71.0 ± 3.7  70.6 ± 3.3  75.9 ± 4.4  64.6 ± 4.9  71.6 ± 4.9  74.8 ± 3.9  66.8 ± 3.7(n =18)  78.7 ± 2.0  78.3 ± 2.4  81.6 ± 0.8  59.7 ± 1.4  80.1 ± 2.1  76.0 ± 3.0  79.1µ  75.8µ  75.0 ± 2.0  81.0 ± 1.0 | ~27.4  33.2 39.0  27.5  24.1 ± 4.1  30.5 ± 5.8  -  -  27.5  38.0  -  -  ~26.4  ~34.8(n = 8)  ~36.3(n = 15)  -  - | ~43.6  37.3  37.0  ~ 36.6  47.5 ± 2.9  46.0 ± 6.5  -  -  50.0  ~ 53.8  -  -  ~42.1  ~33.1(n = 8)  ~43.1(n = 15)  -  - | Wildt et al. 1983  Wildt et al. 1987b  Wildt et al. 1987b  Widlt et al. 1988  Donoghue et al. 1992b  Howard et al. 1992  Lindburg et al. 1993  Wildt et al. 1993  Crosier et al. 2006 Crosier et al. 2007  Bertschinger et al. 2008  Crosier et al. 2009  Terrell et al. 2010  Koester et al. 2015  Koester et al. 2015  Terrell et al. 2016  Terrell et al. 2016 |
| **Lynx** | **Iberian lynx** (*Lynx pardinus*) | 5C  4W  9C  3C  3C | 5  4  9  3  3 | Nov-Dec  Nov-Dec  Nov-Dec  Nov-Dec  Feb–April(BS) | 8.0 ± 0.01  7.4 ± 0.26  7.8 ± 0.12  8.0 ± 0.15  7.7 ± 0.21 | -  -  -  -  - | 0.48 ± 0.06  0.47 ± 0.08  0.34 ± 0.04  0.45 ± 0.07  0.66 ± 0.18 | 7.6 ± 2.2  10.1 ± 4.1  20.5 ± 6.0  8.1 ± 3.9  20.7 ± 7.4 | -  -  -  -  - | 73.5 ± 4.6  58.3 ± 6.3  85.6 ± 2.3  76.7 ± 6.7  62.1 ± 14.3 | 3.1 ± 0.1  2.7 ± 0.32  3.3 ± 0.11  3.1 ± 0.11  2.8 ± 0.12 | 67.3 ± 2.7  55.8 ± 5.8  75.7 ± 2.0  69.1 ± 4.4  59.4 ± 8.2 | 40.7 ± 2.3  49.9 ± 9.5  68.8 ± 4.4  40.1 ± 3.5  33.1 ± 1.2 | 76.3 ± 4.0  74.1 ± 6.0  67.0 ± 4.3  78.3 ± 3.3  79.9 ± 1.8 | -  -  -  -  - | -  -  -  -  - | Gañán et al. 2009b Gañán et al. 2010  Gañán et al. 2010  Gañán et al. 2010  Gañán et al. 2010 |
| **Eurasian lynx** (*Lynx lynx*) | 4C  3C  4C  3C  3C  3C  3C  3C  3C  3C | 4  3  4  3  6  3  6  6  6  6 | March (BS)  June  November  March (BS)  April – June  November  Feb–April(BS)  May-July  Aug-Oct  Nov-Jan | -  -  -  -  -  -  -  -  -  - | 3.0 ± 0.8  2.3 ± 0.7  2.6 ± 0.6  2.8 ± 0.8  -  1.5 ± 0.2  6.2 ± 0.1  5.4 ± 0.09  4.5 ± 0.09  6.3 ± 0.2 | 0.28 ± 0.07  0.02 ± 0.01  0.06 ± 0.03  0.30 ± 0.05  0.02 ± 0.01  0.13 ± 0.02  0.04 ± 0.01  0.01 ± 0.001  0.02 ± 0.002  0.06 ± 0.002 | 7.6 ± 3.6  217.8 ± 164.0  33.8 ± 16.8  8.7 ± 4.8  45.4 ± 19.5  37.5 ± 27.5  40.2 ± 19.1(mln/ml)  490.8 ± 177.7(mln/ml)  -  - | -  -  -  -  -  -  - -  -  - | 57.5 ± 21.4  50.0 ± 10.0  30.0 ± 25.0  60.0 ± 30.0  36.3 ± 11.4  30.0 ± 25.0  29.1 ± 3.0 11.9 ± 2.7  3.8 ± 1.0  21.0 ± 1.1 | -  -  -  -  -  -  - -  -  - | -  -  -  -  -  -  - -  -  - | -  -  -  -  -  -  - -  -  - | 74.2 ± 10.3  98.2 ± 0.3  94.3 ± 3.7  83.2 ± 7.2  95.6 ± 1.8  92.5 ± 5.5  63.2 ± 1.1  68.4 ± 1.4  76.7 ± 1.3  72.0 ± 0.6 | -  -  -  -  -  -  - -  -  - | -  -  -  -  -  -  - -  -  - | Jewgenow et al. 2006  Jewgenow et al. 2006  Jewgenow et al. 2006  Göritz et al. 2006  Göritz et al. 2006  Göritz et al. 2006  Erofeeva et al. 2014  Erofeeva et al. 2014  Erofeeva et al. 2014  Erofeeva et al. 2014 |
| **Canadian lynx** (*Lynx canadensis*) | - | - | - |  | - | - | - | - | - | - | - | - | - | - | - | - |
| **Bobcat** (*Lynx rufus*) | 4C 4C | 4  9 | April(BS)  November | 8.0 ± 0.2  7.7 ± 0.1 | -  - | 0.35 ± 0.08  0.36 ± 0.3 | 60.6 ± 12.4  10.8 ± 2.9 | -  - | 67.9 ± 14.1  50.5 ± 5.3 | 3.3 ± 0.5  2.5 ± 0.2 | 67.0 ± 10.5  49.8 ± 4.4 | 33.6 ± 4.2  48.0 ± 4.2 | 78.2 ± 1.6  88.4 ± 1.9 | -  - | -  - | Gañán et al. 2009c   Gañán et al. 2009c |
| **Lineage** | **Species** | **No. males** | **No. ejacul-ates** | **Season/time of year** | **pH** | **Testicular volume (cm3)** | **Ejaculate volume (ml)** | **Sperm concentration (x 106/ml)** | **Vitality Or membrane integrity (%)** | **Sperm motility** | | | **Acrosome intactness  (%)** | **Morphologically abnormal sperm** | | | **Reference** |
| **% of motile sperm** | **PM scoreA  (0 – 5)** | **SMIB** | **Total (%)** | **1ºabnorm (%)** | **2ºabnorm (%)** |
| **Ocelot** | **Ocelot** (*Leopardus pardalis*) | ?  2C  -  3C  3C  10C  3C | 5  3  42  42  7  10  8 | -  -  -  -  -  -  - | -  -  7.5 ± 0.1  -  7.9µ  - | -  -  32.0 ± 1.3  -  55.6µ - | 0.3 ± 0.1  1.8 ± 1.5  0.6 ± 0.1  1.4 ± 0.1  0.7 ± 0.1  1.0µ  - | 28.0 ± 17.0  187.0 ± 143.5  53.8 ± 17.8  101.2 ± 10.6  190.2 ± 73.2  129.4µ  - | -  -  -  -  -  -  48.9 ± 5.5 | 72.0 ± 12.5  85.0 ± 2.9  70.4 ± 2.3  81.4 ± 1.2  81.0 ± 3.2  77.1µ  85.0 ± 2.3 | 4.0 ± 0.5  4.0 ± 2.9  -  3.7 ± 0.1  3.7 ± 0.2  3.1µ 4.3 ± 0.1 | 76.0 †  82.5 †  -  77.5 ± 1.3  76.0 ± 8.5  69.6 †  85.5 † | -  -  -  99.2 ± 0.2  94.0 ± 0.7  - 99.4 | 19.2 ± 0.9  32.3 ± 8.8  41.6 ± 5.8  17.6 ± 1.2  22.0 ± 02.7  32.9µ 52.5 ± 4.9 | -  -  -  4.0 ± 0.4  4.3 ± 0.7  - 14.4 ± 2.4 | -  -  -  12.7 ± 1.1  18.7 ± 0.7  - 38.1 ± 3.0 | Howard 1993 R Swanson et al. 1996a  Morais 2001R Morais et al. 2002  Baudi et al. 2008  Stoops et al. 2007  de Araujo et al. 2015 |
| **Margay** (*Leopardus wiedii*) | -  -  3C | 11  27  41 | -  -  - | -  -  8.3 ± 0.1 | -  -  6.2 ± 0.2 | 0.2 ± 0.1  0.3 ± 0.05  0.5 ± 0.01 | 79.9 ± 28.1  14.2 ± 5.3  75.6 ± 11.0 | -  -  - | 86.0 ± 3.3  62.8 ± 5.3  73.5 ± 1.3 | 4.6 ± 0.2  -  3.4 ± 0.1 | 89.0  -  70.5 ± 1.3 | -  -  95.0 ± 0.9 | 51.5 ± 6.0  60.5 ± 4.6  42.6 ± 2.8 | -  -  15.8 ± 1.5 | -  -  26.8 ± 2.0 | Howard 1993 R Morais 2001R  Morais et al. 2002 R |
| **Andean mountain cat** (*Leopardus jacobita*) | - | - | - |  | - | - | - | - | - | - | - | - | - | - | - | - |
| **Pampas cat/ Colocolo/Pantanal cat** (*Leopardus colocolo*) | -  - | 5  2 | -  - | -  - | -  - | 0.3 ± 0.1  0.08 ± 0.01 | 10.8 ± 5.7 364.0 ± 326.0 | -  - | 36.7 ± 6.6  81.3 ± 6.3 | 2.8 ± 0.2  - | 26.4 †  - | -  - | 34.1 ± 23.8  43.5 ± 0.5 | -  - | -  - | Howard 1993 R Morais 2001R |
| **Geoffroy’s cat** (*Leopardus*/*Oncifelis geoffroyi*) | -  - | 8  24 | -  - | -  - | -  - | 0.2 ± 0.1  0.2 ± 0.03 | 300.0 ± 233.2  66.5 ± 24.4 | -  - | 73.0 ± 4.4  64.0 ± 4.7 | 4.0 ± 0.3  - | 76.5 †  - | -  - | 71.0 ± 11.5  53.1 ± 5.0 | -  - | -  - | Howard 1993R Morais 2001R |
| **Güiña/Kodkod**  (*Leopardus guigna*) | - | - | - |  | - | - | - | - | - | - | - | - | - | - | - | - |
| **Tigrina/Oncilla** (*Leopardus tigrinus*) | -  4C  4C  1C | 18  52  4  3 | -  -  -  - | -  7.6 ± 0.1  -  - | -  4.2 ± 0.2  -  - | 0.1 ± 0.02  0.3 ± 0.1  0.4 ± 0.1  - | 78.5 ± 33.8  411.9 ± 46.3  242.8 ± 85.2  - | -  -  -  71.7 ± 4.2 | 62.1 ± 5.7  71.4 ± 2.3  78.9 ± 1.5  80.0 ± 0.0 | -  3.8 ± 0.1  3.9 ± 0.1  4.3 ± 0.3 | -  74.1 ± 1.8  80.0 ± 2.0  83.0 † | -  97.5 ± 0.3  91.0 ± 5.0  93.4 | 64.4 ± 6.0  40.8 ± 3.5  23.2 ± 0.9  19.0 ± 1.5 | -  8.6 ± 1.6  5.9 ± 0.7 5.6 ± 1.8 | -  32.2 ± 2.9  17.3 ± 6.5  13.3 ± 1.4 | Morais 2001 Morais et al. 2002  Baudi et al. 2008  de Araujo et al. 2015 |
| **Caracal** | **Caracal** (*Caracal caracal*) | 2C | 2 | - | - | - | 0.24 ± 0.04 | 122.0 ± 114.0 | 85.5 ± 2.5 | - | - | - | - | 12.0 ± 7.0 | - | - | De Schepper 2016 |
| **African golden cat** (*Profelis/Caracal aurata*) | - | - | - |  | - | - | - | - | - | - | - | - | - | - | - | - |
| **Serval** (*Leptailurus/Caracal serval*) | 5C | 5 | - | - | - | 0.43 ± 0.1 | 236.0 ± 55.0 | - | 73.0 ± 1.8 | 3.7 ± 0.2 | 73.5 † | 93.6 ± 1.4 | 36.4 ± 1.4 | - | - | Pukazhenthi et al. 2002 |
| **Bay Cat** | **Bay cat** (*Pardofelis/Catopuma badia*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Timminck’s/Asiatic golden cat** (*Pardofelis temminckii*) | 1C | 1UC | - | - | - | 0.096 | 88.4 | - | 70.0 | - | - | - | 62.0 | - | - | Lueders et al. 2014 |
| **Marbled cat** (*Pardofelis marmorata*) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Panthera** | **Lion** (*Panthera leo*) | 8C (LGD)  8W (HGD)  9W (LGD)  10W (HGD)  6W (LGD)  7C  7C  16C | 8  8  9  10  6  7  7UC  17 | -  -  -  -  -  -  -  - | -  -  -  -  -  7.9 ± 0.3  7.2 ± 0.17(n =3)  - | -  -  -  87.8 ± 6.4  69.8 ± 14.9  -  -  - | 5.9 ± 0.7  9.4 ± 1.4  8.5 ± 0.8  6.0 ± 0.9  3.4 ± 1.2  3.9 ± 2.4  0.42 ± 0.11  - | 13.3 ± 2.8  34.4 ± 12.8  25.8 ± 11.0  12.3 ± 3.8  11.8 ± 9.0  52.1 ± 9.5  1940.0 ± 610.9  - | -  -  -  -  -  -  66.3 ± 5.8  - | 61.0 ± 3.7  91.0 ± 4.2  83.0 ± 4.6  89.0 ± 2.1  59.0 ± 8.0  63.1 ± 3.8  84.1 ± 7.7  60.0(20-95)MR | -  -  -  4.1 ± 0.3  2.9 ± 0.4  -  3.5 ± 0.4(n =3)  1.1(0.3 – 3)MR | -  -  -  85.5 †  58.5 †  -  77.1 † 41.0 † | 96.4 ± 0.7  98.9 ± 0.3  90.1 ± 0.1  99.2 ± 0.4  97.3 ± 0.7  -  -  - | 66.2 ± 3.6  24.8 ± 4.0  50.5 ± 6.8  28.5 ± 4.8  66.1 ± 7.8  22.9 ± 3.9  54.0 ± 17.4  66.0 (36-89)MR | ~25.0  ~6.3  ~14.4  ~9.0  ~23.1  ~15.7  -  - | ~41.2  ~18.5  ~36.1  ~19.6  ~42.6  ~ 6.9  -  - | Wildt et al. 1987a  Wildt et al. 1987a  Wildt et al. 1987a  Brown et al. 1991  Brown et al. 1991  Shivaji et al. 1998  Lueders et al. 2012  Luther et al. 2017 |
| **Jaguar** (*Panthera onca*) | ?C  10C  4C  ?C  8C 6W  10C  8C | 5  10  28  38  47 7  10  40 | -  -  NS  -  -  -  -  - | -  -  -  -  -  -  -  - | -  -  40.4µ(30-61)  -  41.6 ± 0.6  52.4 ± 3.4  44.4 ± 2.0  51.4 ± 2.4 | 2.7 ± 0.6  7.4 ± 3.7  8.6 ± 1.3  5.7 ± 1.7  8.3 ± 0.7 4.1 ± 0.7  6.6 ± 1.9  5.3 ± 0.6 | 12.0 ± 1.9  6.2 ± 3.0  3.9 ± 0.7  13.2 ± 10.8  8.0 ± 1.7 35.0 ± 21.3  6.3 ± 2.4 13.8 ± 4.2 | -  -  -  -  -  -  -  - | 82.0 ± 5.8  62.6 ± 11.0  50.6 ± 5.8  56.9 ± 9.4  64.0 ± 2.4 73.0 ± 6.1  57.0 ± 4.5 60.0 ± 7.1 | 4.1 ± 0.3  2.7 ± 0.5  2.2 ± 0.3  3.0 ± 0.8  2.8 ± 0.1 3.5 ± 0.2  2.8 ± 0.2 3.0 ± 0.1 | 82.0 †  58.4 †  47.3 †  58.5 †  61.0 ± 2.2 72.0 ± 5.0  56.5 ± 4.5 60.0 † | -  96.4 ± 2.0  96.2  -  95.5 ± 0.4  98.9 ± 0.4  -  - | 41.8 ± 11.1  53.3 ± 5.8  51.0  34.3 ± 6.7  50.0 ± 1.1 26.5 ± 3.9  39.2 ± 3.1  ~76.3 | -  ~35.1  ~33.3  -  30.0 ± 09  10.0 ± 2.6  -  53.0 ± 5.1 | -  ~18.2  ~17.7  -  20.1 ± 0.9  16.0 ± 2.6  -  23.3 ± 8.9 | Howard 1993 R Morato et al. 1998  Morato et al. 1999  Rodrigues da Paz, 2000  Morato et al. 2001  Morato et al. 2001  Morato et al. 2004  Rodrigues da Paz et al. 2006 |
| **Leopard** (*Panthera pardus*) | 4C  8C  ?C  8C  8C  ?(Aged 2)  ?(Aged 3-7)  ?(Aged 8-16)  1C  6C | 14  8  11  37  16  5  29  19  1UC  6EE | -  -  -  Dec-Feb  July-Sep  -  -  -  -  - | -  -  7.4 ± 0.07  -  -  -  -  -  8.0  7.7 ± 0.1 | -  -  -  -  -  -  -  -  15.9 - | 5.1 ± 0.6  -  1.6 ± 1.3  0.3 (0.2-0.5)MIQ  0.6 (0.3-0.8)MIQ  0.3 (0.2-0.6)MIQ  0.4 (0.3-0.6)MIQ  0.3 (0.1-0.6)MIQ  0.55 2.0 ± 0.5 | 46.2 ± 9.8  12.2µ  55.8 ± 38.7  81.3 (30-237)MIQ  12.0 (2-67)MIQ  2.1 (0.9-8.7)MIQ  90.8 (41-237)MIQ  33.6 (7-87)MIQ 48.5 84.7 ± 22.0 | -  -  -  77.0 (72-89)MIQ  69.0 (50-83)MIQ  75.0 (55-77)MIQ  76.0 (69-90)MIQ  74.0 (63-80)MIQ  - 52.2 ± 3.8 | 43.8 ± 5.7  54.4µ  57.1 ± 17.0  64.0 (50-71)MIQ  44.0 (18-58)MIQ 50.0 (22-56)MIQ 62.0 (47-69)MIQ 67.0 (20-77)MIQ  70 61.0 ± 5.8 | 3.0 ± 0.3  3.2µ  -  -  -  -  -  -  3.3 - | 51.9 †  59.2 †  -  -  -  -  -  -  67.5 - | 94.5 ± 2.1  87.6  -  87.0 (75-91)MIQ  72.0 (30-88)MIQ  74.0 (30-84)MIQ  88.0 (76-90)MIQ  76.0 (58-89)MIQ  - 65.1 ± 5.8 | 79.5 ± 2.0  80.0µ  28.1 ± 15.3  41.0 (33-56)MIQ  71.5 (42-83)MIQ  71.0(56-82)MIQ  42.0 (24-58)MIQ  59.0 (23-68)MIQ 32.8 33.4 – 53.2 | ~43.6  ~40.2µ  ~18.2  ~19.0  ~48.0  ~61.0  ~18.0  ~33.5 20.8 - | ~35.6  ~38.5µ  ~7.6  ~19.5  ~27.8  ~28.0  ~25.0  ~18.0 12.0 - | Wildt et al. 1988  Brown et al. 1989  Jayaprakash et al. 2001  van Dorsser & Strick 2005  van Dorsser & Strick 2005  van Dorsser & Strick 2005  van Dorsser & Strick 2005  van Dorsser & Strick 2005  Baqir et al. 2015  Thuwanut et al. 2017 |
| **Lineage** | **Species** | **No. males** | **No. ejacul-ates** | **Season/time of year** | **pH** | **Testicular volume (cm3)** | **Ejaculate volume (ml)** | **Sperm concentration (x 106/ml)** | **Vitality Or membrane integrity (%)** | **Sperm motility** | | | **Acrosome intactness  (%)** | **Morphologically abnormal sperm** | | | **Reference** |
| **% of motile sperm** | **PM scoreA  (0 – 5)** | **SMIB** | **Total (%)** | **1ºabnorm (%)** | **2ºabnorm (%)** |
| **Panthera** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Tigers** (*Panthera tigris*) | 11C  7C  5C  4C  16C  ?  1C  5C | 13  11  -  4  16  32  17  5 | -  -  -  -  -  -  -  - | -  -  -  -  7.7 ± 0.02  -  7.5 ± 0.05  - | -  -  -  -  -  -  -  - | 7.0 ± 1.3  7.5 ± 0.8  10.3 ± 0.6(n = 46)  5.8 ± 0.7  1.4 ± 0.2  6.5 ± 0.4  -  1.5 ± 0.4 | 31.9 ± 8.6  17.3 ± 3.9  57.0 ± 7.8(n = 49)  112.0 ± 22.5  41.1 ± 5.1  38.8 ± 6.7  ~50.7‡  11.4 ± 45.3 | -  -  57.4 ± 2.3(n =40)  -  -  -  86.3 ± 2.7  86.9 ± 4.1 | 81.5 ± 3.7  85.5 ± 2.1  59.3 ± 2.3(n = 45)  87.5 ± 1.4  46.9 ± 3.7  70.8 ± 3.1  82.4 ± 2.8  72.5 ± 1.6 | 4.0 ± 0.2  -  -  4.6 ± 0.1  -  3.5 ± 0.6  -  - | 80.8 †  -  -  89.5 ± 1.9  -  70.4 †  -  - | 96.9 ± 1.8  -  -  -  -  93.8 ± 0.1  -  - | 37.5 ± 6.9  18.6 ± 2.0  21.7 ± 1.7(n = 38)  13.7 ± 3.1  25.2 ± 2.9  37.9 ± 2.1  8.8 ± 0.8  - | ~11.0  -  ~18.2  -  ~19.0  - -  - | ~26.8  -  ~3.7  -  ~3.1  - -  - | Wildt et al. 1988  Donoghue et al. 1990  Byers et al. 1990  Donoghue et al. 1992a  Shivaji et al. 1998  Pukazhenthi et al. 2000bR  Fukui et al. 2013  Kurniani Karja et al. 2016 |
| **Snow leopard**  (*Panthera uncia*) | 3C  3C  3C  3C  8C  14C  ?C | 9  9  9  9  8  17? | Dec – Feb(BS)  Mar-May  Jun-Aug  Sep-Nov  -  -  - | -  -  -  -  8.6 ± 0.1  8.4 ± 0.1  - | 11.4 ± 1.1  9.5 ± 0.5  8.9 ± 0.5  8.8 ± 0.6  -  -  - | 1.8 ± 0.5  2.0 ± 0.2  1.3 ± 0.1  1.3 ± 0.1  2.6 ± 0.3  2.7 ± 0.2  1.4 - 5.0 | 36.3 ± 7.7  38.7 ± 5.3  14.2 ± 3.1  6.9 ± 1.3  106.7‡  12.2 - 138.1‡  4.4 - 132.1‡ | -  -  -  -  -  - - | -  -  -  -  78.1 ± 2.1  76.3 ± 2.1  70.0 - 90.0 | -  -  -  -  4.3 ± 0.1  3.8 ± 0.1  - | 77.5 ± 5.5  86.9 ± 1.1  69.2 ± 0.3  72.2 ± 0.2  81.6 ± 1.9  76.2 †  - | 89.1 ± 1.5  91.7 ± 0.9  89.7 ± 1.2  90.9 ± 1.3 94.3 ± 2.5  -  - | 58.7 ± 4.8  60.6 ± 2.6  73.6 ± 2.3  67.1 ± 2.4 76.3 ± 0.3  43.3 ± 2.8  49.0 - 67.0 | ~24.3  ~21.2  ~32.2  ~30.1 ~10.8  -  - | ~26.8  ~33.4  ~38.2  ~34.7 ~26.8  -  - | Johnston et al. 1994  Johnston et al. 1994  Johnston et al. 1994  Johnston et al. 1994  Roth et al. 1994  Roth et al. 1996  Roth et al. 1997 |
| **Clouded leopards** (*Neofelis nebulosa*) | 4C  5C  ?  4C  4C  5C  11C | 48  5  147  4  4  5  22 | -  -  -  - -  NS  - | -  -  -  -  -  -  7.6 ± 0.1 | -  -  -  -  -  -  20.8 ± 0.7 | 0.64 ± 0.03  1.2 ± 0.07  1.0 ± 0.1  1.5 ± 0.8  1.05 ± 0.3  1.02 ± 0.1  0.4 ± 0.05 | 27.5 ± 2.3  43.8 ± 16.7  37.6 ± 3.3  58.3 ± 9.3  59.4 ± 2.7  43.0 ± 2.1 178.8 ± 35.5 | -  -  -  -  -  -  82.5 ± 1.5 | 71.0 ± 2.1  72.0 ± 3.4  66.1 ± 1.4  74.3 ± 2.2  71.7 ± 6.0  73.2 ± 4.0 76.8 ± 2.0 | 3.9 ± 0.1  3.9 ± 0.3  3.4 ± 0.1  -  3.3 ± 0.2  -  3.4 ± 0.1 | 74.5 †  75.0 †  67.1 †  -  69.5 †  - 72.5 ± 1.7 | 99.5 ± 0.4  81.4 ± 3.5  63.3 ± 2.3  -  59.9 ± 3.2  31.3 ± 2.7 41.9 ± 2.3 | 38.9 ± 1.7  84.6 ± 4.5  84.1 ± 1.3  84.7 ± 2.3  79.7 ± 3.2  81.5 ± 2.3 63.9 ± 2.0 | ~14.1  42.7 ± 3.8  -  -  -  - 32.8 | ~25.1  37.8 ± 5.4  -  -  - - 31.2 | Wildt et al. 1986  Howard et al. 1996  Pukazhenthi et al. 2000bR  Pukazhenthi et al. 2000a  Pukazhenthi et al. 2002 Pukazhenthi et al. 2006  Tipkantha et al. 2016 |

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