

## Supplementary Material

### **Greater sperm complexity in the Australasian old endemic rodents (Tribe: Hydromyini) is associated with increased levels of inter-male sperm competition**

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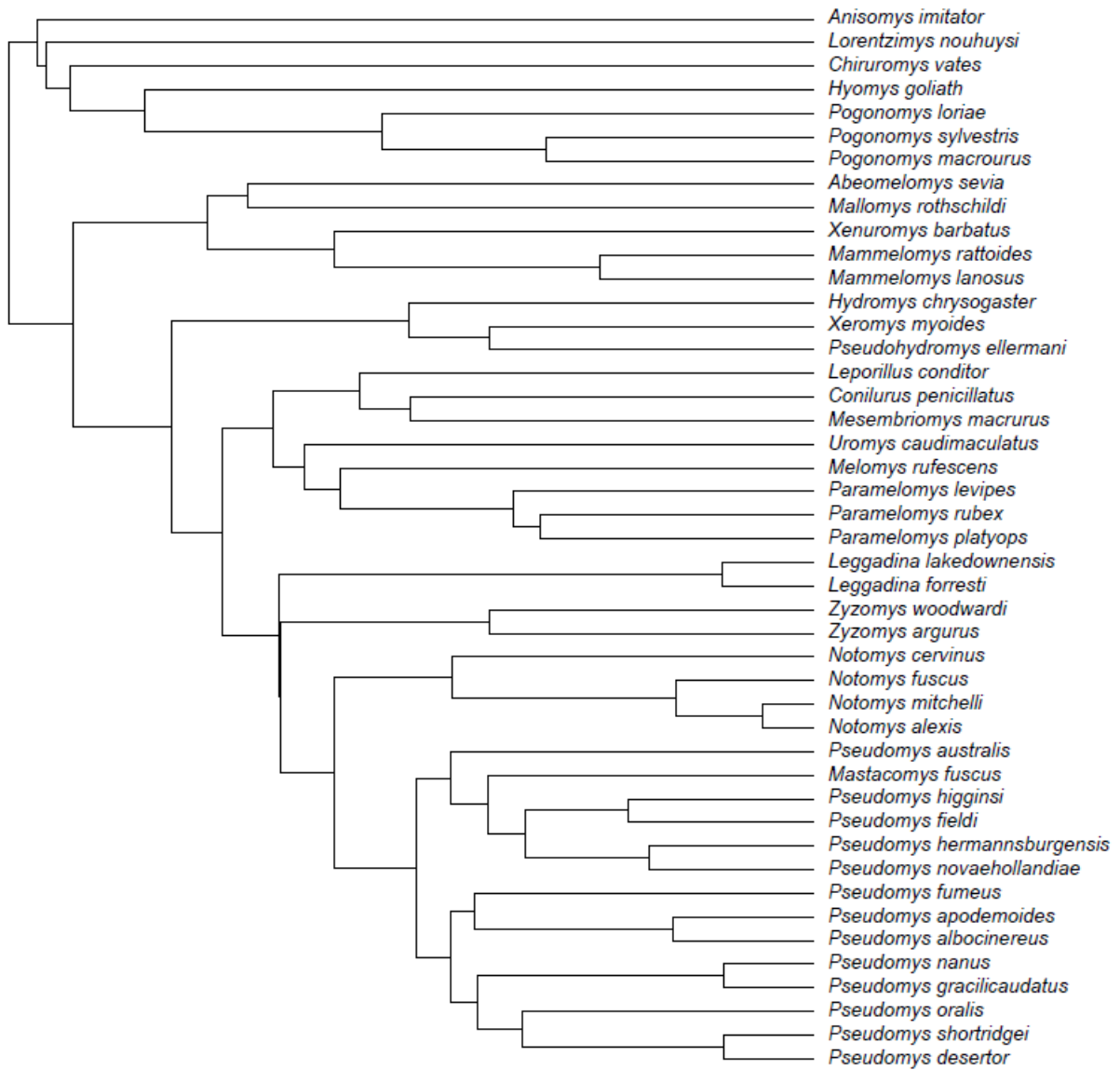
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**Fig. S1.** Phylogeny of the 45 species used in this study.

**Table S1. Source of specimens and data on body mass, testes mass and sperm dimensions**

| Division <sup>a</sup> | Species                      | Source type <sup>b</sup> | Location <sup>c</sup>   | Collection <sup>d</sup> | N | Body mass (g)    | Testes mass (g) | Relative testes mass (%) | Head length (µm) | Head width (µm) | Apical hook length (µm) | Apical hook angle (°) | Ventral process length (µm) | Ventral process angle (°) | Midpiece length (µm) | Principal and end piece length (µm) |
|-----------------------|------------------------------|--------------------------|---|-------------------------|---|------------------|-----------------|--------------------------|------------------|-----------------|-------------------------|-----------------------|-----------------------------|---------------------------|----------------------|-------------------------------------|
| Hyd                   | <i>Hydromys chrysogaster</i> | WC                       | River Torrens, Adelaide, SA, AUS  | -                       | 3 | 745 <sup>e</sup> | 14.6            | 2.0                      | 5.0              | 2.3             | 5.6                     | 322                   | 4.1                         | 320                       | 20                   | 92                                  |
| Lor                   | <i>Lorentzimys nouhuysi</i>  | WC                       | Mt. Karamui, Chimbu Province, PNG   | AM                      | 1 | 15               | 0.7             | 4.3                      | 6.2              | 1.9             | 6.9                     | 308                   | 0                           | -                         | 34                   | 101                                 |
| Pog                   | <i>Abeomelomys sevia</i>     | WC                       | Ofekamin, West Sepik Province, PNG  | AM                      | 1 | 52               | 0.9             | 1.7                      | 9.2              | 3.9             | 14.4                    | 315                   | 0                           | -                         | 39                   | 126                                 |
| Pog                   | <i>Anisomys imitator</i>     | WC                       | Sol River, Soudaun Province, PNG  | AM                      | 1 | 508              | 4.2             | 0.8                      | 8.0              | 4.1             | 7.4                     | 321                   | 0                           | -                         | 26                   | 117                                 |
| Pog                   | <i>Chiruromys vates</i>      | WC                       | Mt Sisa, Southern Highlands Province, PNG/Namosado, South Highlands Province, PNG | AM                      | 2 | 45               | 1.5             | 3.3                      | 8.3              | 1.7             | 7.0                     | 337                   | 5.9                         | 336                       | 55                   | 102                                 |

|     |                                |    |   |     |   |                   |                  |     |     |     |      |     |     |     |    |     |
|-----|--------------------------------|----|---|-----|---|-------------------|------------------|-----|-----|-----|------|-----|-----|-----|----|-----|
| Pog | <i>Hyomys goliath</i>          | WC | Mt Sisa, Southern Highlands Province, PNG | AM  | 2 | 1000 <sup>e</sup> | 3.8              | 0.4 | 6.7 | 3.3 | 8.1  | 318 | 0   | -   | 29 | 96  |
| Pog | <i>Mallomys rothschildi</i>    | WC | Miptigin, Sundaun Province, PNG           | AM  | 1 | 1050              | 14.4             | 1.4 | 6.9 | 1.6 | 8.3  | 314 | 5.5 | 335 | 34 | 117 |
| Pog | <i>Mammelomys lanosus</i>      | WC | Star Mountains, Western District, PNG     | AM  | 1 | 123 <sup>e</sup>  | 3.0 <sup>e</sup> | 2.4 | 7.9 | 1.8 | 10.0 | 307 | 0   | -   | 26 | 109 |
| Pog | <i>Mammelomys rattoides</i>    | WC | Mt. Karimui, Sundaun Province, PNG        | AM  | 1 | 215 <sup>f</sup>  | 1.6              | 0.8 | 7.0 | 1.9 | 8.1  | 316 | 0   | -   | 24 | 106 |
| Pog | <i>Pogonomys loriae</i>        | WC | Mt. Karimui, Chimbu Province, PNG         | AM  | 2 | 107               | 3.6              | 3.3 | 6.3 | 2.4 | 4.4  | 310 | 3.0 | 302 | 25 | 86  |
| Pog | <i>Pogonomys macrourus</i>     | WC | Mt. Karimui, Chimbu Province, PNG         | AM  | 2 | 50                | 2.4              | 4.8 | 5.3 | 2.0 | 4.6  | 318 | 3.1 | 316 | 28 | 83  |
| Pog | <i>Pogonomys sylvestris</i>    | WC | Aguan Area, Milne Bay Province, PNG       | AM  | 1 | 50 <sup>g</sup>   | 1.6 <sup>g</sup> | 3.1 | 4.6 | 1.8 | 4.2  | 331 | 3.0 | 329 | 29 | 82  |
| Pog | <i>Xenuromys barbatus</i>      | WC | Mt Boobiari, Sandaun Province, PNG        | AM  | 1 | 900               | 12.8             | 1.4 | 6.3 | 2.2 | 11.1 | 305 | 0   | -   | 32 | 117 |
| Uro | <i>Conilurus penicillatus</i>  | WC | LB, Bingi Waters, NT, AUS                 | EBU | 3 | 177               | 4.2              | 2.4 | 4.8 | 2.6 | 6.0  | 329 | 4.3 | 324 | 22 | 103 |
| Pse | <i>Leggadina forresti</i>      | LB |   | EBU | 3 | 30 <sup>e</sup>   | 0.5 <sup>e</sup> | 1.8 | 5.7 | 2.6 | 5.1  | 300 | 2.5 | 250 | 24 | 96  |
| Pse | <i>Leggadina lakedownensis</i> | WC | Kimberley Ranges, WA, AUS                 | SMS | 1 | 25 <sup>g</sup>   | 0.5              | 1.9 | 4.7 | 2.4 | 5.5  | 312 | 3.8 | 304 | 24 | 97  |
| Uro | <i>Leporillus conditor</i>     | WC | Franklin Island, SA, AUS                  | SAM | 1 | 187               | 4.0              | 2.1 | 5.8 | 2.2 | 8.0  | 319 | 6.1 | 317 | 23 | 78  |

|     |                                    |    |                           |         |   |                  |                   |     |     |     |     |     |     |     |    |     |
|-----|------------------------------------|----|---------------------------|---------|---|------------------|-------------------|-----|-----|-----|-----|-----|-----|-----|----|-----|
| Pse | <i>Mastacomys fuscus</i>           | WC | Kosciuszko NP, ACT        | AM      | 1 | 117              | 3.7               | 3.2 | 6.7 | 3.1 | 9.2 | 328 | 7.2 | 327 | 22 | 86  |
| Pse | <i>Notomys alexis</i>              | LB |                           | SMS     | 3 | 30 <sup>e</sup>  | 0.04 <sup>e</sup> | 0.1 | 5.6 | 3.5 | 2.0 | 218 | 0.9 | 204 | 26 | 80  |
| Pse | <i>Notomys cervinus</i>            | LB |                           | SMS     | 3 | 33               | 0.2               | 0.8 | 5.6 | 2.7 | 8.4 | 303 | 6.1 | 301 | 26 | 79  |
| Pse | <i>Notomys fuscus</i>              | LB |                           | EBU     | 2 | 45 <sup>e</sup>  | 0.06 <sup>e</sup> | 0.2 | 6.5 | 4.1 | 4.4 | 262 | 2.5 | 270 | 26 | 70  |
| Pse | <i>Notomys mitchelli</i>           | LB |                           | SMS     | 1 | 51               | 0.1               | 0.2 | 5.5 | 2.1 | 6.2 | 303 | 4.0 | 298 | 25 | 83  |
| Pse | <i>Pseudomys albocinereus</i>      | WC |                           | WAM     | 1 | 35 <sup>g</sup>  | 0.5               | 1.3 | 4.9 | 2.4 | 5.7 | 297 | 3.5 | 294 | 22 | 93  |
| Pse | <i>Pseudomys apodemoides</i>       | WC | Ngarkat National Park, SA | -       | 3 | 17               | 0.1               | 0.7 | 5.0 | 2.6 | 6.2 | 304 | 4.2 | 298 | 22 | 90  |
| Pse | <i>Pseudomys australis</i>         | LB |                           | SMS     | 3 | 59 <sup>e</sup>  | 1.2               | 2.0 | 5.2 | 2.4 | 8.8 | 304 | 6.9 | 301 | 22 | 95  |
| Pse | <i>Pseudomys desertor</i>          | WC | Tanami desert, NT         | SAM     | 1 | 39 <sup>e</sup>  | 0.6 <sup>e</sup>  | 1.4 | 6.0 | 3.3 | 9.3 | 308 | 7.3 | 305 | 22 | 88  |
| Pse | <i>Pseudomys fieldi</i>            | LB |                           | EBU     | 1 | 45 <sup>h</sup>  | 0.6               | 1.4 | 4.7 | 2.9 | 8.8 | 304 | 6.1 | 305 | 20 | 86  |
| Pse | <i>Pseudomys fumeus</i>            | WC | Mt. William, Victoria     | SAM     | 2 | 71 <sup>e</sup>  | 2.4 <sup>e</sup>  | 3.4 | 5.6 | 2.6 | 5.6 | 317 | 3.9 | 313 | 22 | 100 |
| Pse | <i>Pseudomys gracilicaudatus</i>   | WC | Myall Lakes NP., NSW      | SAM     | 1 | 105 <sup>e</sup> | 1.1 <sup>e</sup>  | 1.0 | 7.7 | 3.8 | 9.6 | 334 | 6.4 | 314 | 23 | 105 |
| Pse | <i>Pseudomys hermannsburgensis</i> | LB |                           | SMS     | 3 | 13 <sup>e</sup>  | 0.2               | 1.5 | 5.3 | 2.6 | 8.3 | 304 | 5.5 | 292 | 23 | 92  |
| Pse | <i>Pseudomys higginsi</i>          | WC | Cradle Mountain, TAS,     | SAM     | 1 | 59 <sup>g</sup>  | 1.0 <sup>g</sup>  | 1.7 | 4.7 | 2.6 | 7.7 | 305 | 6.4 | 304 | 20 | 91  |
| Pse | <i>Pseudomys nanus</i>             | LB | Kimberley Ranges, WA, AUS | SAM/SMS | 2 | 74 <sup>e</sup>  | 1.9 <sup>e</sup>  | 2.6 | 6.0 | 2.9 | 8.3 | 318 | 5.4 | 306 | 23 | 89  |

|     |                                  |    |  |            |   |                 |                  |     |     |     |     |     |     |     |    |     |
|-----|----------------------------------|----|--|------------|---|-----------------|------------------|-----|-----|-----|-----|-----|-----|-----|----|-----|
| Pse | <i>Pseudomys novaehollandiae</i> | WC | Pt. Stephans, NSW  | SAM        | 1 | 19              | 0.1              | 0.4 | 4.5 | 3.3 | 4.5 | 274 | 0   | -   | 21 | 77  |
| Pse | <i>Pseudomys oralis</i>          | LB |  | EBU        | 1 | 95              | 2.8              | 3.0 | 6.4 | 2.7 | 8.3 | 322 | 5.2 | 307 | 22 | 94  |
| Pse | <i>Pseudomys shortridgei</i>     | WC | Dartmoor, western Victoria   | SAM        | 1 | 78 <sup>e</sup> | 0.3 <sup>e</sup> | 0.4 | 5.1 | 3.3 | 0   | -   | 0   | -   | 22 | 67  |
| Pse | <i>Zyzomys argurus</i>           | LB |  | EBU        | 2 | 45 <sup>e</sup> | 0.4 <sup>e</sup> | 0.9 | 5.5 | 2.4 | 6.1 | 311 | 4.4 | 312 | 24 | 119 |
| Pse | <i>Zyzomys woodwardi</i>         | WC | Nourlangie Rock, NT, AUS   | SAM        | 1 | 102             | 1.7              | 1.7 | 5.0 | 2.6 | 5.9 | 318 | 4.1 | 317 | 21 | 110 |
| Uro | <i>Melomys rufescens</i>         | WC | Kevisob, Karkar Island, Madang Province, PNG                           | AM/S<br>AM | 2 | 72              | 1.7              | 2.5 | 5.7 | 2.3 | 6.6 | 327 | 5.0 | 326 | 24 | 88  |
| Uro | <i>Mesembriomys macrurus</i>     | WC | Mitchell Plateau, WA   | EBU        | 3 | 341             | 8.3              | 2.4 | 5.7 | 2.8 | 6.5 | 332 | 4.9 | 325 | 21 | 92  |
| Uro | <i>Paramelomys levipes</i>       | WC | Bobole, Southern Highlands Province, PNG                               | AM         | 1 | 83 <sup>i</sup> | 3.2              | 3.9 | 5.3 | 2.7 | 6.0 | 368 | 4.0 | 367 | 24 | 92  |
| Uro | <i>Paramelomys platyops</i>      | WC | Namosido, Southern Highlands Province, PNG/Doido, Chimbu Province, PNG | AM         | 3 | 97              | 1.7              | 1.8 | 5.8 | 2.8 | 7.2 | 343 | 5.5 | 344 | 21 | 79  |
| Uro | <i>Paramelomys rubex</i>         | WC | Mt. Sisa, Namosado, Southern Hldgs. Province                           | AM         | 1 | 50 <sup>e</sup> | 1.9              | 3.7 | 5.1 | 2.6 | 6.3 | 335 | 4.8 | 321 | 23 | 88  |
| Uro | <i>Uromys caudimaculatus</i>     | WC | Namosado, Southern Highland Province,                                  | AM/S<br>AM | 3 | 677             | 7.1              | 1.1 | 7.0 | 3.0 | 8.1 | 322 | 6.7 | 322 | 21 | 71  |

|     |                                     |    |   |     |   |                 |     |     |     |     |     |     |     |     |    |    |
|-----|-------------------------------------|----|---|-----|---|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
|     |                                     |    | PNG/Thornton Park,<br>QLD, AUS  |     |   |                 |     |     |     |     |     |     |     |     |    |    |
| Xer | <i>Pseudohydromys<br/>ellermani</i> | WC | Milne Bay, Auguan<br>Area, PNG/Mt<br>Karimui, Chimbu<br>Province, PNG | AM  | 2 | 19              | 0.5 | 2.9 | 5.7 | 2.8 | 6.7 | 329 | 5.0 | 329 | 23 | 87 |
| Xer | <i>Xeromys myoides</i>              | WC | Goyder river, NT  | EBU | 1 | 42 <sup>h</sup> | 0.5 | 1.2 | 5.6 | 2.6 | 6.4 | 299 | 4.6 | 296 | 23 | 79 |

<sup>a</sup>**Division:** (as defined by Musser and Carleton 2005): Hyd = Hydromys Division, Lor = Lorentzimys Division, Pog = Pogonomys Division, Pse = Pseudomys Division, Uro = Uromys Division, Xer = Xeromys Division.

<sup>b</sup>**Type:** WC = Wild caught, LB = Laboratory bred.

<sup>c</sup>**Location:** AUS = Australia, SA = South Australia, WA = Western Australia, NT = Northern Territory, TAS = Tasmania, VIC = Victoria, PNG = Papua New Guinea.

<sup>d</sup>**Institution from which animal came:** SMS = School of Medical Sciences, The University of Adelaide, AM = Australian Museum, SAM = South Australian Museum, EBU = Evolutionary Biology Unit at the South Australian Museum (for details of location from which specimens see Baverstock et al 1977, 1981; Watts et al 1992), WAM = Western Australian Museum.

<sup>e</sup>data from Breed and Taylor (2000)

<sup>f</sup>data from Flannery (1995)

<sup>g</sup>data from averages in archival laboratory data

<sup>h</sup>data from Van Dyck et al. (2013)

<sup>i</sup>data from The Encyclopedia of Life (<http://eol.org/>); search genus and species name.

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