

COPULATION DURATION IS RELATED TO AT LEAST EIGHT FACTORS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897

M. I. Cooper
University of Cape Town

Abstract- Eight factors were tested for correlations with copulation duration in red millipedes *Centrobolus*. Lowest relative humidity ($r=-0.9034$, $r^2=0.8161$, Z Score=-2.10804123, $n=5$, $p=0.035733$), month with the highest number of rainy days ($r=-0.9217$, $r^2=0.8495$, $n=4$, $p=0.001118$), minimum temperature ($r=-0.9688$, $r^2=0.9386$, $n=4$, $p=0.000073$), temperature ($r=-0.7237$, $r^2=0.5237$, $n=4$, $p=0.042282$), precipitation ($r=0.9054$, $r^2=0.8197$, $n=4$, $p=0.001969$), curved surface area ($r=0.6704$, $r^2=0.4494$, $n=5$, $p=0.03403$), maximum precipitation (Spearman's $r=0.87208160$, Z score=1.84297608, $n=5$, $p=0.03266619$), and altitude (Kendall's $\tau=0.44721360$, Z score=40000, $p=0$) correlated with copulation duration.

Keywords: Red Millipedes, sunshine, moments.

I. INTRODUCTION

Red millipedes are found in the southern African subregion with northern limits on the east coast being about -17° latitude S and southern limits being -35° latitude S. They are well represented in the littoral forests of the eastern half of the subcontinent [1-287]. It consists of taxonomically important species with 12 species considered threatened and includes nine vulnerable and three endangered species [226]. It occurs in all the forests of the coastal belt from the Cape Peninsula to Beira in Mocambique [225]. These worm-like millipedes have female-biased sexual size dimorphism [57]. Here, eight factors were tested for correlations with copulation duration in *Centrobolus* Cook, 1897.

II. MATERIALS AND METHODS

Copulation durations were recorded in 4 species of southern African *Centrobolus* []. Width measurements (mm) were halved to get radii (r). The surface areas (mm^2) were calculated based on the equation $2 \cdot \pi \cdot r \cdot (r + h)$ for males and females. A correlation between copulation duration and seven climatic factors were generated at <https://www.socscistatistics.com/tests/pearson/default2.aspx> (Appendix 1-9).

Climatic factors were obtained for each locality at <https://en.climate-DATA.ORG..>

III. RESULTS

Lowest relative humidity was correlated with copulation duration (Fig. 1: $r=-0.9034$, $r^2=0.8161$, $n=5$, $p=0.035733$).

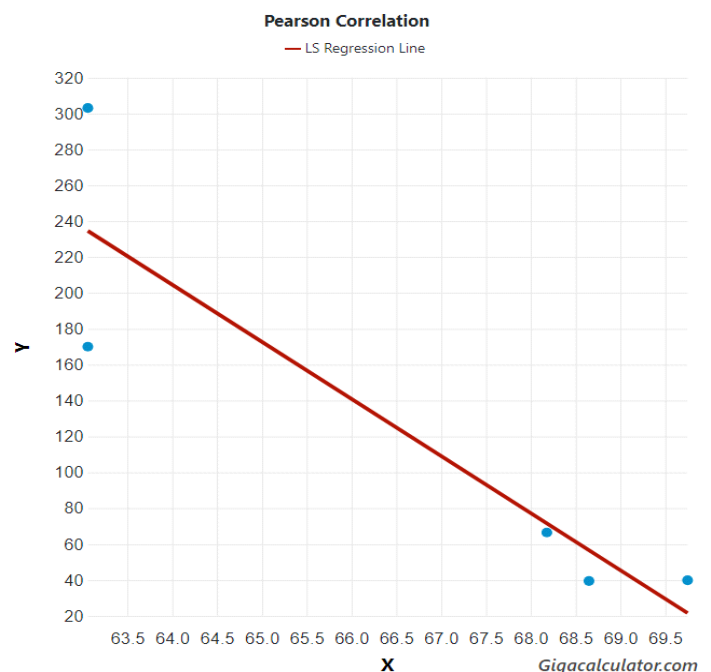


Fig. 1. Correlation between copulation duration (x) and lowest relative humidity (y) across the range of *Centrobolus* Cook, 1897.

Copulation duration was correlated with month with the highest number of rainy days ($r=-0.9217$, $r^2=0.8495$, $n=4$, $p=0.001118$).

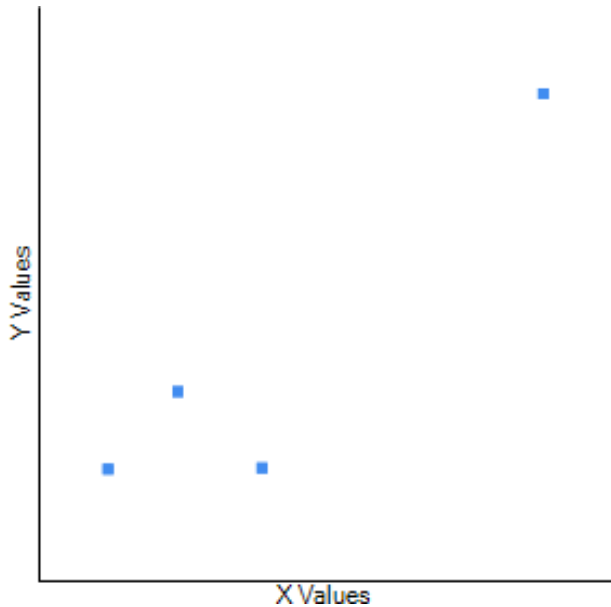


Fig. 2. Correlation between copulation duration (y) and month with the highest number of rainy days (x) across therange of *Centrobolus* Cook, 1897.

The copulation duration was correlated with minimum temperature (Fig. 3: $r=-0.9688$, $r^2=0.9386$, $n=4$, $p=0.000073$).

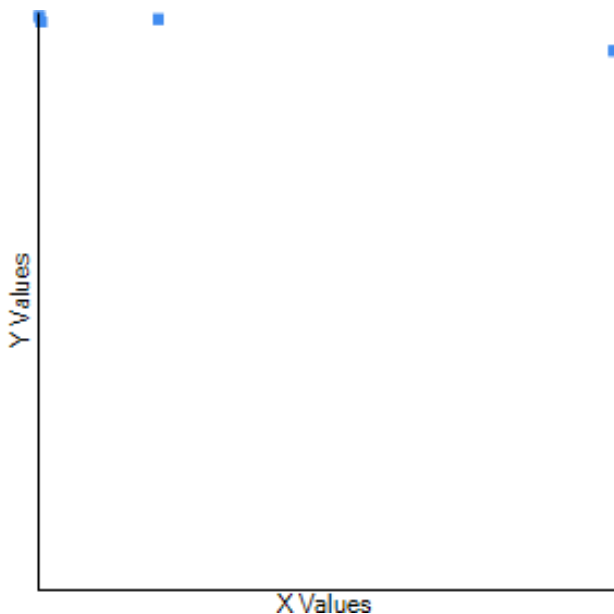


Fig. 3. Correlation between the copulation duration (X) and minimum temperature (Y) across therange of *Centrobolus* Cook, 1897.

The copulation duration was correlated with temperature (Fig. 4: $r=-0.7237$, $r^2=0.5237$, $n=4$, $p=0.042282$).

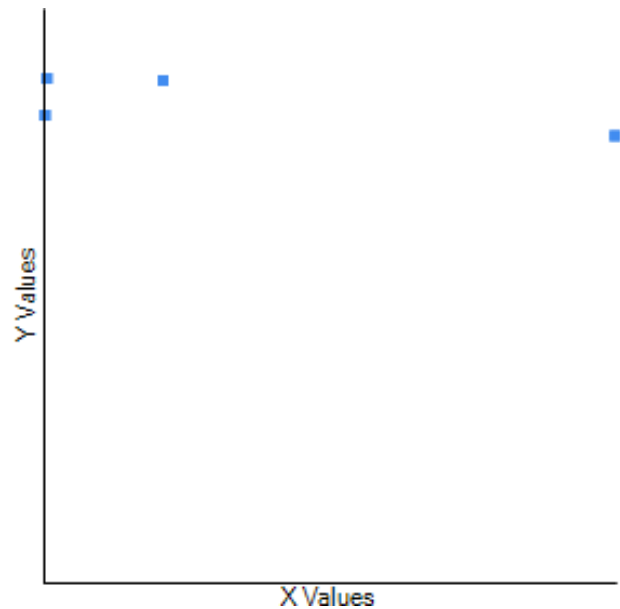


Fig. 4. Correlation between the copulation duration (X) and temperature (Y) across therange of *Centrobolus* Cook, 1897.

The copulation duration was correlated with precipitation (Fig. 5. $r=0.9054$, $r^2=0.8197$, $n=4$, $p=0.001969$).

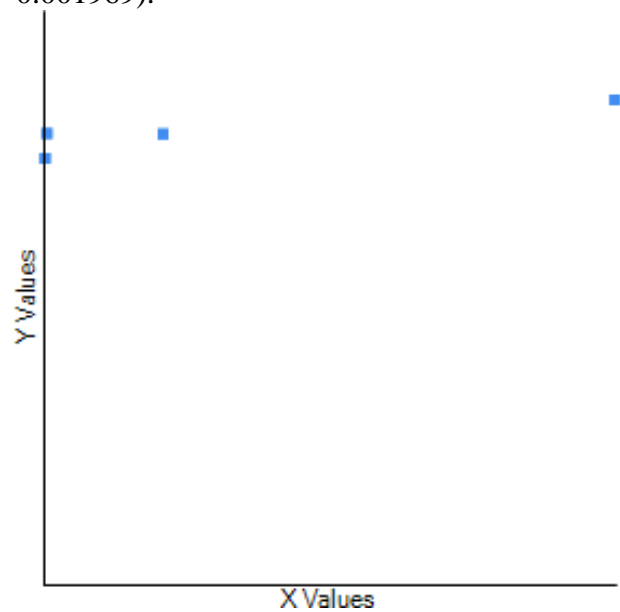


Fig. 5. Correlation between the copulation duration (X) and precipitation (Y) across therange of *Centrobolus* Cook, 1897.

Curved surface area was correlated with copulation duration (Fig. 6: $r = 0.6704$, $r^2 = 0.4494$, $n = 5$, $p = 0.03403$).

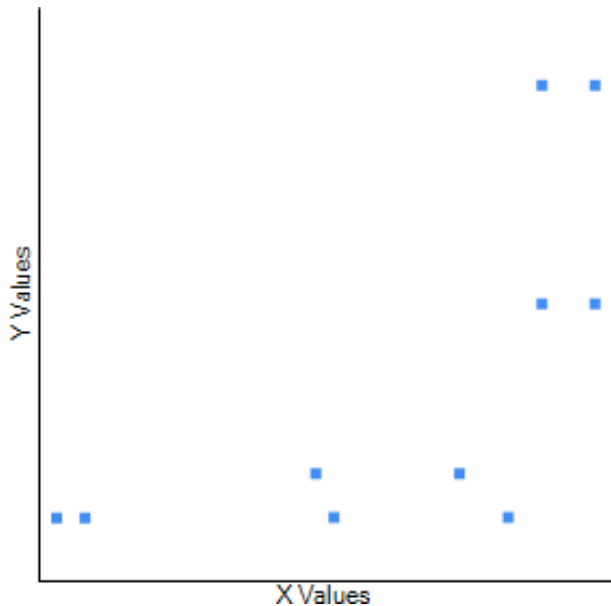


Fig. 6. Correlation between copulation duration (y) and curved surface area (x) across the range of *Centrobolus* Cook, 1897.

Maximum precipitation was correlated with copulation duration (Fig. 7: Spearman's $r = 0.87208160$, Z score = 1.84297608, $n = 5$, $p = 0.03266619$).

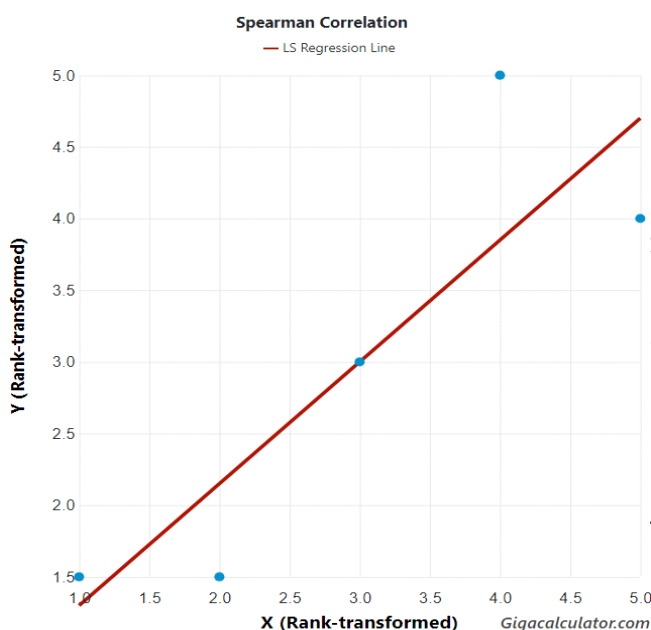


Fig. 7. Correlation between copulation duration (x) and maximum precipitation (y) across the range of *Centrobolus* Cook, 1897.

Altitude was correlated with copulation duration (Fig. 8: Kendall's $\tau = 0.44721360$, Z score = 40000, $p = 0$).

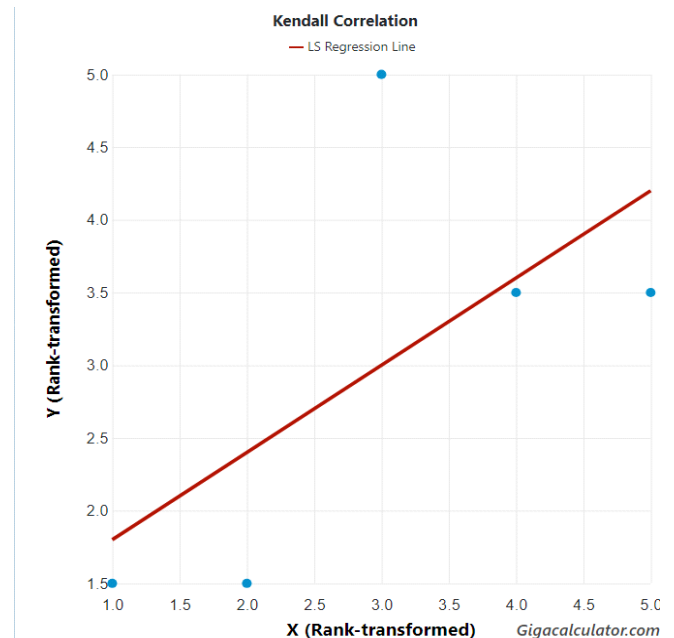


Fig. 8. Correlation between altitude (y) and copulation duration (x) across four species of *Centrobolus* Cook, 1897.

IV. DISCUSSION

There is a correlation between copulation duration with at least eight factors (seven climatic factors) in *Centrobolus*.

REFERENCES

1. O. F. Cook, "New relatives of *Spirobolus giganteus*," *Brandtia* (A series of occasional papers on Diplopoda and other Arthropoda), vol. 18, pp. 73-75, 1897.
2. M. COOPER, "Sperm competition in the millipede *Chersastus ruber* (Diplopoda: Pachybolidae)," *The University of Cape Town*, pp. 1-29, 1995.
3. M. I. Cooper, S. R. Telford, "Sperm competition in three *Chersastus* millipedes (Diplopoda, Trigonulidae)," 26th Symposium of the Zoological Society of Southern Africa (Integrating Zoology: Subdisciplines and the Subcontinent), University of Pretoria, Pretoria, 8-12 July, p. 13, 1996. ISBN: 1-86854-059-6..
4. M. I. Cooper, "Ectoparasite-mediated sexual selection in spirobolid millipedes," In: Robertson, Hamish (ed.) *Proceedings of the joint congress of the Entomological Society of Southern Africa (11th congress) and the African Association of Insect Scientists (12th congress)*, Stellenbosch, 30 June-4 July, pp. 223-224, 1997. ISBN : WISC:89058769605. (poster).
5. M. I. Cooper, "Indiscriminate male mating behaviour in spirobolid millipedes," 27th Symposium of the Zoological

- Society of Southern Africa, University of Cape Town, Cape Town, 7-11 July, p. 105, 1997.
6. M. Cooper, "MILLIPEDES AND THE "MINIATURE FIVE MILLION", " African Wildlife, vol. 52, no. 5, pp. 30-31, 1998.
 7. M. I. COOPER, "MATING DYNAMICS OF SOUTH AFRICAN FOREST MILLIPEDES CENTROBOLUS (DIPLOPODA: PACHYBOLIDAE)," THE UNIVERSITY OF CAPE TOWN, pp. 1-141, 1998. <https://hdl.handle.net/11427/17555>.
 8. M. Cooper, "Sexual selection in sympatric spirobolid millipedes," 28th Symposium of the Zoological Society of Southern Africa, University of Cape Town, 1998. (poster).
 9. M. I. Cooper, M. A. du Plessis, "Biodiversity hotspots in the developing world," Trends in Ecology & Evolution, vol. 13, no. 10, pp. 409, 1998. ISSN 0169-5347.
 10. M. Cooper, "P2 or not P2?" 29th Symposium of the Zoological Society of Southern Africa, University of the North, Limpopo Province, July, 1999. (poster).
 11. M. I. Cooper, S. R. Telford, "Copulatory Sequences and Sexual Struggles in Millipedes," Journal of Insect Behavior vol. 13, pp. 217-230, 2000. <https://doi.org/10.1023/A:1007736214299>.
 12. M. I. Cooper, "Sex ratios, mating frequencies and relative abundance of sympatric millipedes in the genus Chersastus (Diplopoda: Pachybolidae)," Arthropods, vol. 3, no. 4, pp. 174-176, 2014.
 13. M. I. Cooper, "Sexual size dimorphism and corroboration of Rensch's rule in Chersastus millipedes (Diplopoda: Pachybolidae)," J. Entomol. Zool. Stud. vol. 2, no. 6, pp. 264-266, 2014. DOI: 10.22271/j.ento.2014.v2.i6e.452
 14. M. I. Cooper, "Competition affected by re-mating interval in a myriapod," J. Entomol. Zool. Stud. vol. 3, no. 4, pp. 77-78, 2015. DOI: 10.22271/j.ento.2015.v3.i4b.550.
 15. M. I. Cooper, "Elaborate gonopods in the myriapod genus Chersastus (Diplopoda: Trigonulidae)," J. Entomol. Zool. Stud. vol. 3, no. 4, pp. 235-238, 2015. DOI: 10.22271/j.ento.2015.v3.i4d.573 <http://www.entomoljournal.com/archives/2015/vol3issue4/PartD/3-3-110.pdf>.
 16. M. I. Cooper, "Sperm storage in Centrobolus spp. and observational evidence for egg simulation," J. Entomol. Zool. Stud. vol. 4, no. 1, pp. 127-129, 2016. DOI: 10.22271/j.ento.2016.v4.i1b.797.
 17. M. I. Cooper, "Symmetry in ejaculate volumes of Centrobolus inscriptus Attems (Spiroboloidea: Trigonulidae)," International Journal of Entomological Research, vol. 1, no. 2, pp. 14-15, 2016. <http://www.entomologyjournals.com/archives/2016/vol1/issue2>.
 18. M. I. Cooper, "Confirmation of four species of Centrobolus Cook (Spirobolida: Trigonulidae) based on gonopod ultrastructure," Int. J. Entomol. Res. vol. 1, no. 3, pp. 07-09, 2016.
 19. M. I. Cooper, "Fire millipedes obey the female sooner norm in cross mating Centrobolus (Myriapoda)," J. Entomol. Zool. Stud. vol. 4, no. 1, pp. 173-174, 2016. DOI: 10.22271/j.ento.2016.v4.i1c.802 <http://www.entomoljournal.com/archives/2016/vol4issue1/PartC/3-5-82.pdf>.
 20. M. I. Cooper, "Symmetry in ejaculate volumes of Centrobolus inscriptus Attems (Spiroboloidea: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 1, pp. 386-387, 2016. DOI: 10.22271/j.ento.2016.v4.i1f.833.
 21. M. I. Cooper, "Instantaneous insemination in the millipede Centrobolus inscriptus (Spirobolida: Trigonulidae) determined by artificially-terminated mating," J. Entomol. Zool. Stud. vol. 4, no. 1, pp. 487-490, 2016. DOI: 10.22271/j.ento.2016.v4.i1g.847.
 22. M. I. Cooper, "Gonopod mechanics in Centrobolus Cook (Spirobolida: Trigonulidae) II. Images," J. Entomol. Zool. Stud. vol. 4, no. 2, pp. 152-154, 2016. DOI: 10.22271/j.ento.2016.v4.i2c.890 <http://www.entomoljournal.com/archives/2016/vol4issue2/PartC/4-2-55.pdf>.
 23. M. Cooper, "Post-insemination associations between males and females in Diplopoda," J. Entomol. Zool. Stud. vol. 4, no. 2, pp. 283-285, 2016. DOI: 10.22271/j.ento.2016.v4.i2d.908 <http://www.entomoljournal.com/archives/2016/vol4issue2/PartD/4-2-63.pdf>.
 24. M. I. Cooper, "Heavier-shorter-wider females in the millipede Centrobolus inscriptus Attems (Spirobolida: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 2, pp. 509-510, 2016. DOI: 10.22271/j.ento.2016.v4.i2g.937.
 25. M. I. Cooper, "Sexual bimaturism in the millipede Centrobolus inscriptus Attems (Spirobolida: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 3, pp. 86-87, 2016. DOI: 10.22271/j.ento.2016.v4.i3b.961 <http://www.entomoljournal.com/archives/2016/vol4issue3/PartB/4-3-44.pdf>.
 26. M. I. Cooper, "Tarsal pads of Centrobolus Cook (Spiroboloidea: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 3, pp. 385-386, 2016. DOI: 10.22271/j.ento.2016.v4.i3f.1008.
 27. M. I. Cooper, "Confirmation of four species of Centrobolus Cook (Spirobolida: Trigonulidae) based on gonopod ultrastructure," J. Entomol. Zool. Stud. vol. 4, no. 4, pp. 389-391, 2016. DOI: 10.22271/j.ento.2016.v4.i4f.1065 <http://www.entomoljournal.com/archives/2016/vol4issue4/PartF/4-3-118-307.pdf>.
 28. M. I. Cooper, "Sperm storage in Centrobolus inscriptus Attems (Spirobolida: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 4, pp. 392-393, 2016. DOI: 10.22271/j.ento.2016.v4.i4f.1066
 29. M. I. Cooper, "Sperm dumping in Centrobolus inscriptus Attems (Spirobolida: Trigonulidae)," J. Entomol. Zool. Stud. vol. 4, no. 4, pp. 394-395, 2016. DOI: 10.22271/j.ento.2016.v4.i4f.1067.
 30. M. I. Cooper, "Syncopulatory mate-guarding affected by predation in the aposematic millipede Centrobolus inscriptus in a swamp forest," J. Entomol. Zool. Stud. vol. 4, no. 6, pp. 483-484, 2016. DOI: 10.22271/j.ento.2016.v4.i6g.1376

- <http://www.entomoljournal.com/archives/2016/vol4issue6/PartG/4-6-114-767.pdf>.
31. M. I. Cooper, "The relative sexual size dimorphism of *Centrobolus inscriptus* compared to 18 congeners," *J. Entomol. Zool. Stud.* vol. 4, no. 6, pp. 504-505, 2016. DOI: 10.22271/j.ento.2016.v4.i6g.1381.
32. M. I. Cooper, "Do females control the duration of copulation in the aposematic millipede *Centrobolus inscriptus*?" *J. Entomol. Zool. Stud.* vol. 4, no. 6, pp. 623-625, 2016. DOI: 10.22271/j.ento.2016.v4.i6i.1396
<http://www.entomoljournal.com/archives/2016/vol4issue6/PartI/4-6-133-214.pdf>.
33. M. I. Cooper, "The influence of male body mass on copulation duration in *Centrobolus inscriptus* (Attems)," *J. Entomol. Zool. Stud.* vol. 4, no. 6, pp. 804-805, 2016. DOI: 10.22271/j.ento.2016.v4.i6k.08
<http://www.entomoljournal.com/archives/2016/vol4issue6/PartK/4-6-166-899.pdf>.
34. M. I. Cooper, "Sexual conflict over the duration of copulation in *Centrobolus inscriptus* (Attems)," *J. Entomol. Zool. Stud.* vol. 4, no. 6, pp. 852-854, 2016. DOI: 10.22271/j.ento.2016.v4.i6l.04.
35. M. I. Cooper, "The affect of female body width on copulation duration in *Centrobolus inscriptus* (Attems)," *J. Entomol. Zool. Stud.* vol. 5, no. 1, pp. 732-733, 2017. DOI: 10.22271/j.ento.2017.v5.i1j.10
<http://www.entomoljournal.com/archives/2017/vol5issue1/PartJ/5-1-92-221.pdf>.
36. M. I. Cooper, "Size matters in myriapod copulation," *J. Entomol. Zool. Stud.* vol. 5, no. 2, pp. 207-208, 2017. DOI: 10.22271/j.ento.2017.v5.i2c.10
<http://www.entomoljournal.com/archives/2017/vol5issue2/PartC/4-6-108-171.pdf>.
37. M. I. Cooper, "Relative sexual size dimorphism in *Centrobolus digrammus* (Pocock) compared to 18 congeners," *J. Entomol. Zool. Stud.* vol. 5, no. 2, pp. 155-160, 2017. DOI: 10.22271/j.ento.2017.v5.i2u.04
<http://www.entomoljournal.com/archives/2017/vol5issue2/PartU/5-2-199-639.pdf>.
38. M. I. Cooper, "Relative sexual size dimorphism in *Centrobolus fulgidus* (Lawrence) compared to 18 congeners," *J. Entomol. Zool. Stud.* vol. 5, no. 3, pp. 77-79, 2017. DOI: 10.22271/j.ento.2017.v5.i3b.01
<http://www.entomoljournal.com/archives/2017/vol5issue3/PartB/5-2-198-656.pdf>.
39. M. I. Cooper, "Relative sexual size dimorphism *Centrobolus ruber* (Attems) compared to 18 congeners," *J. Entomol. Zool. Stud.* vol. 5, no. 3, pp. 180-182, 2017. DOI: 10.22271/j.ento.2017.v5.i3c.07
<http://www.entomoljournal.com/archives/2017/vol5issue3/PartC/5-2-187-598.pdf>.
40. M. I. Cooper, "Copulation and sexual size dimorphism in worm-like millipedes," *J. Entomol. Zool. Stud.* vol. 5, no. 3, pp. 1264-1266, 2017. DOI: 10.22271/j.ento.2017.v5.i3r.03.
41. M. I. Cooper, "Allometry of copulation in worm-like millipedes," *J. Entomol. Zool. Stud.* vol. 5, no. 3, pp. 1720-1722, 2017. DOI: 10.22271/j.ento.2017.v5.i3x.03
<http://www.entomoljournal.com/archives/2017/vol5issue3/PartX/5-3-233-698.pdf>.
42. M. I. Cooper, "Re-assessment of Rensch's rule in *Centrobolus*," *J. Entomol. Zool. Stud.* vol. 5, no. 6, pp. 2408-2410, 2017. DOI: 10.22271/j.ento.2017.v5.i6ag.04.
43. M. I. Cooper, "Allometry for sexual dimorphism in millipedes (Diplopoda)," *J. Entomol. Zool. Stud.* vol. 6, no. 1, pp. 91-96, 2018. DOI: 10.22271/j.ento.2018.v6.i1b.03
<http://www.entomoljournal.com/archives/2018/vol6issue1/PartB/5-6-327-547.pdf>.
44. M. I. Cooper, "Sexual dimorphism in pill millipedes (Diplopoda)," *J. Entomol. Zool. Stud.* vol. 6, no. 1, pp. 613-616, 2018. DOI: 10.22271/j.ento.2018.v6.i1i.03
<http://www.entomoljournal.com/archives/2018/vol6issue1/PartI/5-6-352-508.pdf>.
45. M. I. Cooper, "Sexual size dimorphism and the rejection of Rensch's rule in Diplopoda (Arthropoda)," *J. Entomol. Zool. Stud.* vol. 6, no. 1, pp. 1582-1587, 2018. DOI: 10.22271/j.ento.2018.v6.i1v.07
<http://www.entomoljournal.com/archives/2018/vol6issue1/PartV/5-6-290-837.pdf>.
46. M. I. Cooper, "Trigoniulid size dimorphism breaks Rensch," *J. Entomol. Zool. Stud.* vol. 6, no. 3, pp. 1232-1234, 2018. DOI: 10.22271/j.ento.2018.v6.i3.9.09
<http://www.entomoljournal.com/archives/2018/vol6issue3/PartQ/6-3-170-722.pdf>.
47. M. I. Cooper, "Volumes of *Centrobolus albitarsus* (Lawrence, 1967)," *Int. J. Entomol. Res.* vol. 3, no. 4, pp. 20-21, 2018.
48. M. I. Cooper, "A review of studies on the fire millipede genus *Centrobolus* (Diplopoda: Trigoniulidae)," *J. Entomol. Zool. Stud.* vol. 6, no. 4, pp. 126-129, 2018. DOI: 10.22271/j.ento.2018.v6.i4.2.06
<http://www.entomoljournal.com/archives/2018/vol6issue4/PartC/6-3-87-275.pdf>.
49. M. I. Cooper, "*Centrobolus anulatus* (Attems, 1934) reversed sexual size dimorphism," *J. Entomol. Zool. Stud.* vol. 6, no. 4, pp. 1569-1572, 2018. DOI: 10.22271/j.ento.2018.v6.i4.13.16.
50. M. I. Cooper, "Allometry in *Centrobolus*," *J. Entomol. Zool. Stud.* vol. 6, no. 6, pp. 284-286, 2018. DOI: 10.22271/j.ento.2018.v6.i6.3.07.
51. M. I. Cooper, "Centrobolus size dimorphism breaks Rensch's rule," *Scholars' Press, Mauritius*. pp. 1-48, 2018. ISBN: 978-3-659-83990-0. <https://www.academia.edu/77887053>.
52. M. I. Cooper, "Centrobolus size dimorphism breaks Rensch's rule," *Arthropod.*, vol. 7, no. 3, pp. 48-52, 2018.
53. M. I. Cooper, "Centrobolus dubius (Schubart, 1966) Monomorphism," *International Journal of Research Studies in Zoology*, vol 4, no. 3, pp. 17-21, 2018.
54. M. I. Cooper, "Centrobolus lawrencei (Schubart, 1966) monomorphism," *Arthropod.*, vol. 7, no.4, pp. 82-86, 2018.
55. M. I. Cooper, "Confirmation of twenty-one species of *Centrobolus* Cook (Diplopoda: Pachybolidae) based on length and width data," 2018.
56. M. I. Cooper, "Centrobolus sagatinus sexual size dimorphism based on differences in horizontal tergite widths," *J. Entomol.*

- Zool. Stud. vol. 6, no. 6, pp. 275-277, 2018. DOI: 10.22271/j.ento.2018.v6.i6.3.05.
57. M. Cooper, "Centrobolus silvanus dimorphism based on tergite width," Glob. J. Zool. vol. 3, no. 1, pp. 003-005, 2018. <https://doi.org/10.17352/gjz.000010>.
58. M. Cooper, "A review on studies of behavioural ecology of Centrobolus (Diplopoda, Spirobolida, Pachybolidae) in southern Africa," Arthropod., vol. 8, no. 1, pp. 38-44, 2019.
59. M. I. Cooper, "Lawrence's red millipede Centrobolus lawrencei shows length-based variability and size dimorphism," J. Entomol. Zool. Stud. vol. 7, no. 2, pp. 1037-1039, 2019. DOI: 10.22271/j.ento.2019.v7.i2.9.07 <http://www.entomoljournal.com/archives/2019/vol7issue2/Par7-2-114-662.pdf>.
60. M. Cooper, "Centrobolus titanophilus size dimorphism shows width-based variability," Arthropod., vol. 8, no. 2, pp. 80-86, 2019.
61. M. Cooper, "Non-significant intersexual differences in millipede mass," J. Entomol. Zool. Stud. vol. 7, no. 3, pp. 763-765, 2019. DOI: 10.22271/j.ento.2019.v7.i3m.52678. <http://www.entomoljournal.com/archives/2019/vol7issue3/Par7-3-90-458.pdf>.
62. M. I Cooper, "Quasi-experimental determination of a mass standard in the forest millipede Centrobolus inscriptus," J. Entomol. Zool. Stud. vol. 7, no. 3, pp. 772-774, 2019. DOI: 10.22271/j.ento.2019.v7.i3m.5269 <http://www.entomoljournal.com/archives/2019/vol7issue3/Par7-3-58-913.pdf>.
63. M. I. Cooper, "Underlying sperm precedence pattern in the millipede Centrobolus inscriptus (Attems, 1928) (Diplopoda, Pachybolidae)," J. Entomol. Zool. Stud. vol. 7, no. 3, pp. 1066-1069, 2019. DOI: 10.22271/j.ento.2019.v7.i3r.53182. <http://www.entomoljournal.com/archives/2019/vol7issue3/Par7-3-106-957.pdf>.
64. M. Cooper, "When is the change in sperm precedence in the millipede Centrobolus inscriptus (Attems, 1928) (Diplopoda, Pachybolidae)?" J. Entomol. Zool. Stud. vol. 7, no. 4, pp. 183-186, 2019. DOI: 10.22271/j.ento.2019.v7.i4c.5439.
65. M. Cooper, "Julid millipede and spirobolid millipede gonopod functional equivalents," J. Entomol. Zool. Stud. vol. 7, no. 4, pp. 333-335, 2019. DOI: 10.22271/j.ento.2019.v7.i4f.5465.
66. M. Cooper, "Size dimorphism and directional selection in forest millipedes," Arthropod., vol.8, no. 3, pp. 102-109, 2019.
67. M. Cooper, "Xylophagous millipede surface area to volume ratios are size dependent in forests," Arthropod., vol. 8, no. 4, pp. 127-136, 2019.
68. M. Cooper, "Size dimorphism in six juliform millipedes," Arthropod., vol. 8, no. 4, pp. 137-142, 2019.
69. M. Cooper, "Year-round correlation between mass and copulation duration in forest millipedes," Arthropod., vol. 9, no. 1, pp. 15-20, 2020.
70. M. Cooper, "Kurtosis and skew show longer males in Centrobolus," Arthropod., vol. 9, no. 1, pp. 21-26, 2020.
71. M. Cooper, "Studies of behavioural ecology of Centrobolus." LAP LAMBERT Academic Publishing, Mauritius. pp. 1-420, 2020. ISBN: 978-620-2-52046-1.
72. M. Cooper, "Mating dynamics of South African forest millipedes," LAP LAMBERT Academic Publishing, Mauritius. pp. 1-164, 2020. ISBN: 978-620-0-58569-1.
74. M. Cooper, "Behavioural ecology of Centrobolus," LAP LAMBERT Academic Publishing, Mauritius. pp. 1-520, 2020. ISBN: 978-620-0-50406-7.
75. M. Cooper, "Zoomorphic variation with copulation duration in Centrobolus," Arthropod., vol.9, no. 2, pp. 63-67, 2020.
76. M. Cooper, "Latitudinal-size trend in eight species of Centrobolus," J. Entomol. Zool. Stud. vol. 8, no. 2, pp. 122-127, 2020. <http://www.entomoljournal.com/archives/2020/vol8issue2/Par8-2-1-381-253.pdf>.
77. M. Cooper, "Longitudinal-size trend in eight species of Centrobolus," Intern. J. Zool. Invest. vol. 6, no. 1, pp. 58-64, 2020.
78. M. Cooper, "Correction: Centrobolus dubius (Schubart, 1966) Monomorphism," Int. J. Res. Stud. Zool. vol. 6, no. 2, pp. 25-28, 2020. <http://www.arcjournals.org/pdfs/ijrsz/v6-i2/3.pdf>.
79. M. Cooper, "Latitudinal and longitudinal gradients in Old World forest millipedes," LAP LAMBERT Academic Publishing: pp. 77, 2021 ISBN: 978-620-3-02454-8.
80. M. Cooper, "Intrasexual and intersexual size variation in Centrobolus Cook, 1897," Scholars' Press, Mauritius. pp. 1-56, 2021. ISBN: 978-613-8-95101-8.
81. M. Cooper, "Size-assortment in Centrobolus Cook, 1897," Scholars' Press, Mauritius. pp. 1-52, 2021. ISBN: 978-613-8-95118-6. <http://www.megabooks.sk/p/18255119>.
82. M. Cooper, "Wewnątrzplciowa i międzyplciowa zmienność wielkości u Centrobolus Cook, 1897," Scienza Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-50733-1.
83. M. Cooper, "Variedade de tamanhos no Centrobolus Cook, 1897," Novas Edições Acadêmicas, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-46650-8.
84. M. Cooper, "Variação de tamanho intrasexual e intersexual no Centrobolus Cook, 1897," Edições Nosso Conhecimento, Scienza Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-50735-5.
85. M. Cooper, "Variazione di taglia intrasessuale e intersessuale in Centrobolus Cook, 1897," Scienza Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-50731-7.
86. M. Cooper, "Variation de taille intrasexuelle et intersexuelle chez Centrobolus Cook, 1897," Scienza Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-50730-0.
87. M. Cooper, "Intrasexuelle und intersexuelle größenvariation bei Centrobolus Cook, 1897," Scienza Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-50729-4.
88. M. Cooper, "Size-assortment in Centrobolus Cook, 1897 (Diplopoda: Pachybolidae)," Scholars' Press, Mauritius. pp. 1-52, 2021. ISBN: 978-613-8-95105-6.
89. M. Cooper, "Variação da duração da cópula em milípedes semelhantes a vermes," Novas Edições Acadêmicas, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-46666-9.
90. M. Cooper, "Surtido de tamaño en Centrobolus Cook, 1897," Editorial Académica Española, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-03960-3.

90. M. Cooper, "Größen-Sortierung bei Centrobolus Cook, 1897," Südwestdeutscher Verlag für Hochschulschriften, Scientia Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-54955-3.
91. M. Cooper, "Cambio en la duración de la cópula en ciempiés gusano," Editorial Académica Española, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-03965-8.
92. M. Cooper, "Размерный ассортимент в Centrobolus Cook, 1897 г.," Scientia Scripts, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59606-9.
93. M. Cooper, "Variation de durée de copulation dans les mille-pattes vermifuges," Presses Académiques Francophones, Mauritius. pp. 1-52, 2021. ISBN: 978-3-8416-3326-2.
94. M. Cooper, "Sortimento de tamanhos em Centrobolus Cook, 1897," Edições Nosso Conhecimento, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59608-3.
95. M. Cooper, "Size assortment in Centrobolus Cook, 1897," Our Knowledge Publishing, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59602-1.
96. M. Cooper, "Größensortierung bei Centrobolus Cook, 1897," Verlag Unser Wissen, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59601-4. <http://www.megabooks.sk/p/18192206>.
97. M. Cooper, "Groottesortering bij Centrobolus Cook, 1897," Uitgeverij Onze Kennis, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59605-2.
98. M. Cooper, "Assortimento di dimensioni in Centrobolus Cook, 1897," Edizioni Sapienza, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59604-5.
99. M. Cooper, "Assortiment de tailles chez Centrobolus Cook, 1897," Editions Notre Savoir, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59603-8.
100. M. Cooper, "Asortyment wielkości u Centrobolus Cook, 1897," Wydawnictwo Nasza Wiedza, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-59607-6.
101. M. Cooper, "Zmiana czasu trwania kopulacji w krocionogach przypominających robaki," Wydawnictwo Nasza Wiedza, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-62161-7.
102. M. Cooper, "Verandering in copulatieuur bij wormduizendpoten: (Juliformes)," Uitgeverij Onze Kennis. pp. 1-56, 2021. ISBN: 978-6203621600.
103. M. Cooper, "Veränderung der Kopulationsdauer bei Wurmtausendfüßern," Verlag Unser Wissen. pp. 1-52, 2021. ISBN: 978-620-3-62156-3. <http://www.megabooks.sk/p/18258985>.
104. M. Cooper, "Modification de la durée de la copulation chez les millepedes vermiformes," Editions Notre Savoir, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-62158-7.
105. M. Cooper, "Modifica della durata della copulazione nei millepiedi vermi," Edizioni Sapienza, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-62159-4.
106. M. Cooper, "Copulation duration variation in worm-like millipedes," Our Knowledge Publishing, Mauritius. pp. 1-52, 2021. ISBN: 978-620-3-62157-0.
107. M. Cooper, "Alteracao na duracao da copula nas centopeias de minhocas," Edicoes Nosso Conhecimento, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-62162-4.
108. M. Cooper, "Zmiana czasu trwania kopulacji w krocionogach przypominających robaki," Globe Edit, Latvia. pp. 1-56, 2021. ISBN: 978-620-0-62248-8.
109. M. Cooper, "Variasjon i kokulasjonsvariasjon i ormlignende millipeder," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62250-1.
110. M. Cooper, "Copulation duration variation in worm-like millipedes," Scholars' Press, Mauritius. pp. 1-52, 2021. ISBN: 978-3-639-66208-5.
111. M. Cooper, "Variatie in copulatieuur in wormachtige duizendpoten," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62258-7.
112. M. Cooper, "Variation i kopulationsvarighed i ormelignende tusindben," Globe Edit, Latvia. pp. 1-56, 2021. ISBN: 978-620-0-62257-0.
113. M. Cooper, "İçeriği Centrobolus Cook boyut aralığı, 1897 (Diplopoda: Pachybolidae)," LAP LAMBERT Academic Publishing, Mauritius. pp. 1-56, 2021. ISBN: 978-620-3-83963-0.
114. M. Cooper, "Kopuleringsstidsvariation i maskliknande millipeder," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62277-8.
115. M. Cooper, "Variation de durée de copulation dans les mille-pattes vermifuges," Blessed Hope Publishing. pp. 1-56, 2021. ISBN: 978-3841633269.
116. M. Cooper, "ワーム様ミリペダスにおける交尾期間変動," Globe Edit, Latvia. pp. 1-56, 2021. ISBN: 978-620-0-62260-0.
117. M. Cooper, "Parittelun keston vaihtelu matomaisten millipedes," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62259-4.
118. M. Cooper, "Variația duratei copulării în milipelele asemănătoare viermilor," Globe Edit, Latvia. pp. 1-56, 2021. ISBN: 978-620-0-62255-6.
119. M. Cooper, "A párzás időtartama a fereg-szerű millipedek változása," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62261-7.
120. M. Cooper, "蠕蟲狀千足蟲的複製持續時間變化," pp. 1-52, 2021. Goldenlight publishing, Republic of Moldova. ISBN: 978-620-2-41290-2.
121. M. Cooper, "웜과 같은 밀리페드의 교화 지속 시간 변화 (줄리포미아)," Globe Edit, Latvia. pp. 1-52, 2021. ISBN: 978-620-0-62533-5.
122. M. Cooper, "Mass covaries with volume in forest millipedes Centrobolus Cook, 1897," J. Entomol. Zool. Stud. vol. 9, no. 6, pp. 190-192, 2021. <http://www.entomoljournal.com/archives/2021/vol9issue6/ParIC/9-6-36-202.pdf>.
123. M. Cooper, "The inverse latitudinal gradient in species richness of forest millipedes: Pentazonia Brandt, 1833," J. Entomol. Zool. Stud. vol. 10, no. 1, pp. 01-04, 2022. <http://www.entomoljournal.com/archives/2022/vol10issue1/ParIA/9-6-47-884.pdf>.

- 125.M. Cooper, "The inverse latitudinal gradient in species richness of forest millipedes: Pachybolidae Cook, 1897," J. Entomol. Zool. Stud. vol. 10, no. 1, pp. 05-08, 2022. <http://www.entomoljournal.com/archives/2022/vol10issue1/P140rtA/9-6-49-906.pdf>.
- 126.M. Cooper, "Longer Males Determined with Positive Skew and Kurtosis in Centrobolus (Diplopoda: Spirobolida: Pachybolidae)," New Visions in Biological Science Vol. 8, pp. 102-106, 2022. <http://doi.org/10.9734/bpi/nvbs/v8/1876A>.
- 127.M. Cooper, "Study on Year-round Correlation between Mass and Copulation Duration in Forest Millipedes," New Visions in Biological Science Vol. 8, pp. 107-112, 2022. <http://doi.org/10.9734/bpi/nvbs/v8/1877A>.
- 128.M. Cooper, "Study on Size Dimorphism in Six Juliform Millipedes," New Visions in Biological Science Vol. 8, pp. 113-119, 2022.
- 129.M. Cooper, "Xylophagous Millipede Surface Area to Volume Ratios are Size-dependent in Forests: A Brief Study," New Visions in Biological Science Vol. 8, pp. 120-128, 2022. <http://doi.org/10.9734/bpi/nvbs/v8/1879A>.
- 130.M. Cooper, "A Study on Centrobolus titanophilus Size Dimorphism Shows Width-Based Variability," New Visions in Biological Science Vol. 8, pp. 129-135, 2022. <http://doi.org/10.9734/bpi/nvbs/v8/1880A>.
- 131.M. Cooper, "Study on Zoomorphic Variation with Copulation Duration in Centrobolus," New Visions in Biological Science Vol. 8, pp. 144-149, 2022. <http://doi.org/10.9734/bpi/nvbs/v8/1882A>.
- 132.M. Cooper, "The copulation duration allometry in Centrobolus (Diplopoda: Spirobolida: Pachybolidae)," J. Entomol. Zool. Stud. vol. 10, no. 1, pp. 63-68, 2022.
- 133.M. Cooper, "Behavioral ecology of Centrobolus (Diplopoda, Spirobolida, Pachybolidae) in Southern Africa," New Visions in Biological Science Vol. 9, pp. 1-6, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1883A>.
- 134.M. Cooper, "Study About Size Dimorphism and Directional Selection in Forest Millipedes," New Visions in Biological Science Vol. 9, pp. 7-13, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1884A>.
- 135.M. Cooper, "The Copulation duration Allometry in Centrobolus (Diplopoda: Spirobolida: Pachybolidae)," New Visions in Biological Science Vol. 9, pp. 21-28, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1891A>.
- 136.M. Cooper, "The Copulation duration Allometry in Worm-like Millipedes (Diplopoda: Chilognatha: Helminthomorpha)," New Visions in Biological Science Vol. 9, pp. 29-38, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1892A>.
- 137.M. Cooper, "Length and Width Correlations in Centrobolus Cook, 1897," New Visions in Biological Science Vol. 9, pp. 39-45, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1893A>.
- 138.M. Cooper, "Mating Order Establishes Male Size Advantage in the Polygynandrous Millipede Centrobolus inscriptus Attems, 1928," New Visions in Biological Science Vol. 9, pp. 46-51, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1894A>.
- 139.M. Cooper, "Why Sexual Size Dimorphism Increases with Longitude, Precipitation and Temperature and Decreases with Latitude in Forest Millipedes Centrobolus Cook, 1897," New Visions in Biological Science Vol. 9, pp. 58-67, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1896A>.
- 140.M. Cooper, "Bergmann's Rule: Size Correlates with Longitude and Temperature in Forest Millipedes Centrobolus Cook, 1897," New Visions in Biological Science Vol. 9, pp. 68-81, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1897A>.
- 141.M. Cooper, "The Inverse Latitudinal Gradient in Species Richness of Forest Millipedes: Centrobolus Cook, 1897," New Visions in Biological Science Vol. 9, pp. 82-88, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1898A>.
- 142.M. Cooper, "Total Body Rings Increase with Latitude and Decrease with Precipitation in Forest Millipedes Centrobolus Cook, 1897," New Visions in Biological Science Vol. 9, pp. 96-101, 2022. <http://doi.org/10.9734/bpi/nvbs/v9/1900A>.
- 143.M. Cooper, "Does sexual size dimorphism vary with longitude in forest millipedes Centrobolus Cook, 1897?" International Journal of Recent Research in Thesis and Dissertation, vol. 3, no. 1, pp. 1-5, 2022. <https://www.paperpublications.org/issue/IJRRTD/Issue-1-January-2022-June-2022>.
- 145.M. Cooper, "Does sexual size dimorphism vary with latitude in forest millipedes Centrobolus Cook, 1897?" Int. J. Re. Res. Thesis Diss., vol. 3, no. 1, pp. 6-11, 2022. <https://www.paperpublications.org/issue/IJRRTD/Issue-1-January-2022-June-2022>.
- 146.M. Cooper, "Does sexual size dimorphism vary with temperature in forest millipedes Centrobolus Cook, 1897?" Acta Entomol. Zool., vol 3, no. 1, pp. 08-11, 2022.
- 147.M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH MONTH WITH THE HIGHEST NUMBER OF RAINY DAYS IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 2, no. 9, pp. 9-14, 2022. <https://www.doi-ds.org/doi/10.2022-63261534/UIJIR>.
- 148.M. Cooper, "PAIR-WISE COMPARISON OF SEXUAL SIZE DIMORPHISM AMONG NINE FACTORS IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 2, no. 9, pp. 31-33, 2022. <https://www.doi-ds.org/doi/10.2022-75935617/UIJIR>.
- 150.M. Cooper, "Does sexual size dimorphism vary with female size in forest millipedes Centrobolus Cook, 1897?" Acta Entomol. Zool., vol. 3, no. 1, pp. 15-18, 2022.
- 151.M. Cooper, "Does sexual size dimorphism vary with hours of sunshine throughout the year in forest millipedes Centrobolus Cook, 1897?" Acta Entomol. Zool., vol. 3, no. 1, pp. 19-25, 2022.
- 152.M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH SPECIES RICHNESS IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897?" Universe Int. J. Interdiscip. Res., vol. 2, no. 10, pp. 25-29, 2022. <https://www.doi-ds.org/doi/10.2022-91496952/UIJIR>.
- 153.M. Cooper, "PAIR-WISE COMPARISON OF SEXUAL SHAPE DIMORPHISM AMONG FIFTEEN FACTORS IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897,"

- Universe Int. J. Interdiscip. Res., vol. 2, no. 10, pp. 9-14, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
154. M. I. Cooper, "Five factors effecting copulation duration in the breeding season in forest millipedes *Centrobolus Cook, 1897*," *Zoological and Entomological Letters*, vol. 2, no. 1, pp. 17-22, 2022. <https://www.zoologicaljournal.com/archives/2022.v2.i1.A.26>.
155. M. Cooper, "Does sexual size dimorphism vary with time in red millipedes *Centrobolus Cook, 1897*?" *Zool. Entomol. Lett.*, vol. 2, no. 1, pp. 30-35, 2022. <https://www.zoologicaljournal.com/archives/2022.v2.i1.A.29>.
156. M. Cooper, "Mating frequencies of sympatric red millipedes differ across substrate due to absolute abundances," *Acta Entomol. Zool.*, vol. 3, no. 1, pp. 34-39, 2022.
157. M. Cooper, "Does sexual size dimorphism vary with maximum and minimum temperatures in red millipedes *Centrobolus Cook, 1897*?" *Zool. Entomol. Lett.*, vol. 2, no. 1, pp. 60-65, 2022. <https://www.zoologicaljournal.com/archives/2022.v2.i1.B.34>.
158. M. Cooper, "Does sexual size dimorphism vary with sex ratio in red millipedes *Centrobolus Cook, 1897*?" *Zool. Entomol. Lett.*, vol. 2, no. 1, pp. 66-68, 2022.
159. M. Cooper, "Millipede mass: Intersexual differences," *Zool. Entomol. Lett.*, vol. 2, no. 1, pp. 69-70, 2022. <https://www.zoologicaljournal.com/archives/2022.v2.i1.B.36>.
160. M. I. Cooper, "Do copulation duration and sexual size dimorphism vary with absolute abundance in red millipedes *Centrobolus Cook, 1897*?" *Acta Entomol. Zool.*, vol. 3, no. 1, pp. 51-54, 2022. <https://www.actajournal.com/archives/2022.v3.i1.A.64>. <https://doi.org/10.33545/27080013.2022.v3.i1.a.64>.
161. M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH FEMALE LENGTH INFOREST MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Universe Int. J. Interdiscip. Res.*, vol. 2, no. 12, pp. 1-7, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
162. M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH PRECIPITATION IN FOREST MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Munis Entomology and Zoology*, vol. 17, no. 2, pp. 1185-1189, 2022.
163. M. I. Cooper, "Do copulation durations of sympatric red millipedes vary seasonally with mating frequencies?" *Int. J. Re. Res. Thesis Diss.*, vol. 3, no. 1, pp. 85-90, 2022.
164. M. I. Cooper, "The inverse latitudinal gradients in species richness of Southern African millipedes," *Int. J. Re. Res. Thesis Diss.*, vol. 3, no. 1, pp. 91-112, 2022.
165. M. I. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH LOG SEXUAL SIZE DIMORPHISM IN RED MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Universe Int. J. Interdiscip. Res.*, vol. 2, no. 12, pp. 52-54, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
166. M. I. Cooper, "Do copulation duration and sexual size dimorphism vary with absolute abundance in red millipedes *Centrobolus Cook, 1897*?" *Acta Entomol. Zool.*, vol. 3, no. 1, pp. 51-54, 2022.
167. M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH FEMALE LENGTH INFOREST MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Universe Int. J. Interdiscip. Res.*, vol. 2, no. 12, pp. 1-7, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
168. M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH PRECIPITATION INFOREST MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Munis Entomology and Zoology*, vol. 17, no. 2, pp. 1185-1189, 2022.
169. M. I. Cooper, "Do copulation durations of sympatric red millipedes vary seasonally with mating frequencies?" *Int. J. Re. Res. Thesis Diss.*, vol. 3, no. 1, pp. 85-90, 2022.
170. M. I. Cooper, "The inverse latitudinal gradients in species richness of Southern African millipedes," *Int. J. Re. Res. Thesis Diss.*, vol. 3, no. 1, pp. 91-112, 2022.
171. M. I. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH LOG SEXUAL SIZE DIMORPHISM IN RED MILLIPEDES *CENTROBOLUS COOK, 1897*?" *Universe Int. J. Interdiscip. Res.*, vol. 2, no. 12, pp. 52-54, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
172. M. Cooper, "THE TIE-IN OF MALE BODY WIDTH ON COPULATION DURATION IN *CENTROBOLUS COOK, 1897*," *Universe Int. J. Interdiscip. Res.*, vol. 3, no. 1, pp. 45-47, 2022. <https://www.doi-ds.org/doi/10.33545/27080013.2022.v3.i1.a.64>.
173. M. I. Cooper, "IS A PROMINENT STERNITE RELATED TO MOMENTS OF INERTIA IN *CENTROBOLUS COOK, 1897*?" *International Journal of Engineering Science Invention Research & Development*, vol. 8, no. 12, pp. 26-28, 2022.
174. M. I. Cooper, "IS COPULATION DURATION RELATED TO MOMENTS OF INERTIA IN *CENTROBOLUS COOK, 1897*?" *International Journal of Engineering Science Invention Research & Development*, vol. 8, no. 12, pp. 29-31, 2022.
175. M. I. Cooper, "COPULATION DURATION IS RELATED TO EJACULATING VOLUME IN *CENTROBOLUS INSCRIPTUS (ATTEMS, 1928)*," *International Journal of Engineering Science Invention Research & Development*, vol. 8, no. 12, pp. 32-40, 2022.
176. M. I. Cooper, "Is a prominent sternite related to mass in *Centrobolus Cook, 1897*?" *International Journal of Engineering Science Invention Research & Development*, vol. 9, no. 1, pp. 1-4, 2022. http://www.ijesird.com/1_jul_22.PDF.
177. M. I. Cooper, "Does sex ratio vary with absolute abundance in red millipedes *Centrobolus Cook, 1897*?" *International Journal of Engineering Science Invention Research & Development*, vol. 9, no. 1, pp. 5-8, 2022. http://www.ijesird.com/2_jul_22.PDF.
178. M. I. Cooper, "Does copulation duration vary with absolute abundance in red millipedes *Centrobolus Cook, 1897*?" *International Journal of Engineering Science Invention Research & Development*, vol. 9, no. 1, pp. 9-11, 2022.
179. M. I. Cooper, "Are a prominent sternite, coleopod spine length, and spine number related to mating frequencies in *Centrobolus Cook, 1897*?" *International Journal of*

- Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 12-15, 2022.
180. M. I. Cooper, "Are coleopod spine length and number related to weather in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 16-23, 2022.
181. M. I. Cooper, "Are coleopod spine length and number related to mass in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 24-26, 2022.
182. M. I. Cooper, "Is mass related to latitude, longitude, and weather in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 27-32, 2022.
183. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO ABSOLUTE ABUNDANCE IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 33-37, 2022.
184. M. I. Cooper, "Does sex ratio vary with absolute abundance in red millipedes *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 5-8, 2022. http://www.ijesird.com/2_jul_22.PDF.
185. M. I. Cooper, "Does copulation duration vary with absolute abundance in red millipedes *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 9-11, 2022. http://www.ijesird.com/3_jul_22.PDF.
186. M. I. Cooper, "Are a prominent sternite, coleopod spine length, and spine number related to mating frequencies in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 12-15, 2022.
188. M. I. Cooper, "Are coleopod spine length and number related to weather in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 16-23, 2022.
189. M. I. Cooper, "Are coleopod spine length and number related to mass in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 24-26, 2022.
190. M. I. Cooper, "Is mass related to latitude, longitude, and weather in *Centrobolus Cook, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 27-32, 2022.
191. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO ABSOLUTE ABUNDANCE IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 33-37, 2022.
192. M. I. Cooper, "DOES COPULATION DURATION VARY WITH SEX RATIO IN THE RED MILLIPEDE *CENTROBOLUS INSCRIPTUS (ATTEMS, 1928)?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 38-40, 2022.
193. M. I. Cooper, "IS A PROMINENT STERNITE RELATED TO WEATHER IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 41-44, 2022.
194. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO SEX RATIO IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 45-48, 2022.
195. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO SEXUAL SIZE DIMORPHISM IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 49-51, 2022.
196. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO MOMENTS OF INERTIA ACROSS THE SEXES IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 1, pp. 52-55, 2022.
197. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO TARSAL PAD LENGTH IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 2, pp. 1-4, 2022.
198. M. I. Cooper, "IS COPULATION DURATION RELATED TO TARSAL PAD LENGTH IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 2, pp. 65-67, 2022.
199. M. I. Cooper, "ARE ABSOLUTE ABUNDANCES RELATED TO TARSAL PAD LENGTH IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 2, pp. 68-70, 2022.
200. M. I. Cooper, "ARE MATING FREQUENCIES RELATED TO MALE AND FEMALE SIZE IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 2, pp. 71-76, 2022.
201. M. I. Cooper, "DOES EJACULATE VOLUME VARY WITH ABSOLUTE ABUNDANCE IN RED MILLIPEDES *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 2, pp. 77-79, 2022.
202. M. I. Cooper, "THE MOMENTS OF INERTIA TIE-UP WITH FEMALE SIZE, HOURS OF SUNSHINE THROUGHOUT THE YEAR, LATITUDE, LONGITUDE, AND MINIMUM TEMPERATURE IN RED MILLIPEDES *CENTROBOLUS COOK, 1897,*" Universe Int. J. Interdiscip. Res., vol. 3, no. 2, pp. 6-12, 2022. <https://www.doi- ds.org/doi/10.21961/2022-76913842/UIJIR>.
203. M. I. COOPER, "ARE MATING FREQUENCIES RELATED TO EJACULATE VOLUMES IN *CENTROBOLUS COOK, 1897?*" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 3, pp. 93-95, 2022.
204. M. I. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH FEMALE WIDTH IN FOREST MILLIPEDES *CENTROBOLUS COOK, 1897?*" Munis Entomol. Zool., vol. 17(supplement), pp. 1562-1565, 2022.
205. M. I. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH THE HIGHEST TOTAL HOURS OF SUNSHINE IN A

- MONTH IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897?" Munis Entomol. Zool., vol. 17(supplement), pp. 1596-1602, 2022.
206. M. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH BODY MASS IN FOREST MILLIPEDES CENTROBOLUS COOK, 1897?" Munis Entomol. Zool. Suppl., vol. 17(supplement), pp. 1621-1624, 2022.
207. M. COOPER, "IS SIZE OR SSD RELATED TO ABUNDANCE IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development., vol. 9, no. 3, pp. 96-102, 2022. https://www.ijesird.com/sep_one.PDF.
208. M. I. COOPER, "IS A PROMINENT STERNITE RELATED TO SEX RATIOS AND ABUNDANCE IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 3, pp. 103-106, 2022. https://www.ijesird.com/sep_two_6.PDF.
209. M. I. Cooper, "DOES SEXUAL SIZE DIMORPHISM VARY WITH FEWEST DAILY HOURS OF SUNSHINE IN RED MILLIPEDES CENTROBOLUS COOK, 1897?" Universe Int. J. Interdiscip. Res., vol. 3, no. 3, pp. 89-92, 2022. <https://www.doi-ds.org/doi/10.2022-94655978/UIJIR>.
210. M. COOPER, "DOES (PREDICTED) MASS CORRELATE WITH MATING FREQUENCIES IN CENTROBOLUS COOK, 1897?" Universe Int. J. Interdiscip. Res., vol. 3, no. 4, pp. 141-149.
211. M. I. COOPER, "IS MASS CORRELATED WITH LENGTH AMONG RED MILLIPEDES CENTROBOLUS COOK, 1897?" Universe Int. J. Interdiscip. Res., vol. 3, no. 5, pp. 190-196, 2022. <https://www.doids.org/doi/10.2022-82684698/UIJIR>. <https://uijir.com/wp-content/uploads/2022/11/20-221012-UIJIR.pdf>.
212. M. I. Cooper, "ABUNDANCE IS RELATED TO SURFACE AREA AND SURFACE- AREA-TO-VOLUME RATIOS IN CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 3, no. 5, pp. 231-240, 2022. <https://www.doi-ds.org/doi/10.2022-99614928/UIJIR>. <http://hdl.handle.net/10019.1/125794>.
213. M. I. COOPER, "ARE SURFACE AREA AND SURFACE-AREA-TO-VOLUME RATIO RELATED TO SEX RATIOS IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 5, pp. 140-145, 2022. <http://www.ijesird.com/DEC4.PDF>.
214. M. I. COOPER, "ARE SURFACE AREA AND SURFACE-AREA-TO-VOLUME RATIO RELATED TO COPULATION DURATION IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 4, pp. 146-151, 2022. <http://www.ijesird.com/DEC5.PDF>.
215. M. I. Cooper, "DOES EJACULATE VOLUME VARY WITH SURFACE AREA AND SURFACE AREA TO VOLUME RATIO IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 152-154, 2022. <http://www.ijesird.com/DEC6.PDF>.
216. M. I. COOPER, "MATING FREQUENCY IS RELATED TO SURFACE AREA AND SURFACE-AREA-TO VOLUME RATIOS IN CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 5, pp. 155-161, 2022.
217. M. I. COOPER, "ARE SURFACE AREA AND SURFACE-AREA-TO-VOLUME RATIO RELATED TO LATITUDE AND LONGITUDE IN CENTROBOLUS COOK, 1897?" International Journal of Engineering Science Invention Research & Development, vol. 9, no. 5, pp. 162-167, 2022. http://www.ijesird.com/nov_5.PDF.
218. M. I. COOPER, "MOMENTS OF INERTIA COVARY WITH SURFACE AREA IN FOREST RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 5, pp. 168-173, 2022.
219. M. Cooper, "TARSAL PAD LENGTHS ARE RELATED TO SURFACE-AREA-TO- VOLUME RATIOS IN CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 3, no. 6, pp. 27-33, 2022.
220. M. I. Cooper, "SURFACE-AREA-TO-VOLUME IS RELATED TO SEXUAL SIZE DIMORPHISM ACROSS CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 3, no. 6, pp. 34-42, 2022.
221. M. Cooper, "SEX RATIO VARIES WITH AVERAGE TEMPERATURE IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 174-178, 2022.
222. M. Cooper, "SEX RATIO VARIES WITH MINIMUM TEMPERATURE IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 179-183, 2022.
223. M. Cooper, "SEX RATIO VARIES WITH MAXIMUM TEMPERATURE IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 184-188, 2022.
224. M. Cooper, "SEX RATIO VARIES WITH PRECIPITATION IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 189-193, 2022. <http://www.ijesird.com/DEC4.PDF>.
225. M. Cooper, "SEX RATIO VARIES WITH HUMIDITY IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 194-198, 2022. <http://www.ijesird.com/DEC5.PDF>.
226. M. Cooper, "SEX RATIO VARIES WITH RAINY DAYS IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 199-203, 2022. <http://www.ijesird.com/DEC6.PDF>.
227. M. Cooper, "SEX RATIO VARIES WITH AVERAGE SUN HOURS IN RED MILLIPEDES CENTROBOLUS COOK, 1897," International Journal of Engineering Science Invention Research & Development, vol. 9, no. 6, pp. 204-207, 2022.

- 229.M. I. Cooper, "VOLUME IS RELATED TO SURFACE-AREA-TO-VOLUME ACROSS CENTROBOLUS COOK, 1897," Universe Int. J. Interdiscip. Res., vol. 3, no. 6, pp. 83-91, 2022.
- 230.M. L. Hamer, "Checklist of Southern African millipedes(Myriapoda: Diplopoda)," Annals of the Natal Museum, vol. 39, no. 1, pp. 11-82, 1998.
- 231.R. F. Lawrence, "The Spiroboloidea (Diplopoda) of the eastern half of Southern Africa*," Annals of the Natal Museum, vol. 18, no. 3, pp. 607-646, 1967.
- 232.R. P. Mailula, "Taxonomic revision and Red List assessment of the red millipede genus Centrobolus (Spirobolida: Pachybolidae) of South Africa," The University of Kwazulu Natal, pp. 289, 2021.
- 233.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MINIMUM OCEAN WATER TEMPERATURES IN COASTAL FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 266-282.
- 234.Cooper Mark. SURFACE AREA-TO-VOLUME RATIO ARE RELATED TO SECOND POLAR MOMENTS OF INERTNESS IN *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 249-265.
- 235.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO HIGHEST TOTAL HOURS OF SUNSHINE IN A MONTH IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 231-248.
- 236.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MEAN OCEAN WATER TEMPERATURES IN COASTAL FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 214-230. https://ijesird.com/sep8_23.pdf.
- 237.Cooper Mark. STERNITE PROMINENCE IS RELATED TO SECOND POLAR MOMENTS OF INERTNESS IN *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 198-213.
- 238.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO LENGTH IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 181-197.
- 239.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO WIDTH IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 164-180.
- 240.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MINIMUM PRECIPITATION IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 147-163. http://www.ijesird.com/sep4_23.pdf.
- 241.Cooper Mark. CURVED SURFACE AREA IS RELATED TO SECOND POLAR MOMENTS OF INERTIA IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 130-146.
- 242.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MINIMUM TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 129-145. http://www.ijesird.com/sep2_23.pdf.
- 243.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO SPECIES RICHNESS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(3): 113-128.
- 244.Cooper Mark. MALE SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO ABUNDANCE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(2): 89-99. http://www.ijesird.com/aug_2023_7.pdf.
- 245.Cooper Mark. MALE SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO COPULATION DURATION IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; (in press). http://www.ijesird.com/aug_2023_6.pdf.
- 246.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MOMENTS OF INERTIA IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; (in press). http://www.ijesird.com/aug_2023_5.pdf.
- 247.Cooper Mark. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO (MALE) MASS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; (in press). http://www.ijesird.com/aug_2023_4.pdf.
- 248.Cooper Mark. SURFACE AREA IS RELATED TO TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(2): 24-36. http://www.ijesird.com/aug_2023_2.pdf.
- 249.http://www.ijesird.com/aug_2023_3.pdf
- 250.Cooper Mark. (FEMALE) SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(2): 24-36. http://www.ijesird.com/aug_2023_2.pdf.
- 251.Cooper Mark. AN INVERSE LATITUDINAL GRADIENT IN SPECIES RICHNESS OF FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(2): 24-36. http://www.ijesird.com/aug_2023_2.pdf.

- MILLIPEDES CHERSASTUS ATTEMS, 1926 AND CENTROBOLUS COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(2): 5-23. http://www.ijesird.com/aug_2023_1.pdf
- 254.COOPER, MARK. THE INVERSE LATITUDINAL GRADIENT IN SPECIES RICHNESS OF FOREST MILLIPEDES: PACHYBOLIDAE COOK, 1897. International Journal of Scientific Research, Technology & Innovation in Multidisciplinary Studies. 9th April 2023. Volume 4, pp. 80-89.
- 255.COOPER, MARK. MATING FREQUENCIES VARY WITH RAINY DAYS IN RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development.
- 256.COOPER, MARK. ABUNDANCE VARIES WITH MINIMUM TEMPERATURE IN RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 9(8): 258-262.
- 257.Cooper, Mark I. SEXUAL SIZE DIMORPHISM MAY BE RELATED TO SEX RATIOS IN *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 9(8): 252-257. http://www.ijesird.com/FAB_1_23.PDF.
- 258.Cooper, Mark I. CURVED SURFACE AREAS IN *CENTROBOLUS* COOK, 1897. Universe Int. J. Interdiscip. Res. 2023; 3(8): 81-116. <http://www.doi-ds.org/doi/10.2023-92114597/UIJIR>.
- 259.Cooper M. SECOND POLAR MOMENTS OF INERTNESS WITH TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. Universe Int. J. Interdiscip. Res. 2023; 3(8): 11-32. <http://www.doi-ds.org/doi/10.2023-86516136/UIJIR>.
- 260.Cooper, Mark I. 2023. SECOND POLAR MOMENTS OF AREA IN MALE AND FEMALE *CENTROBOLUS* COOK, 1897. *Munis Entomology & Zoology*, 18(1): 643-646.
- 261.Cooper, Mark I. 2023. QUASIPROBABLE SOLUTION OF RAINY DAY VARIATIONS FOR SET MATING FREQUENCIES AND MALE AND FEMALE LENGTHS IN *CENTROBOLUS* COOK, 1897. *Munis Entomology & Zoology*, 18(1): 620-624.
- 262.Cooper Mark I. 2023. IS MASS CORRELATED WITH LENGTH AMONG RED MILLIPEDES *CENTROBOLUS* COOK, 1897? *Munis Entomology & Zoology*, 18(1): 404-408.
- 263.Cooper Mark I. 2023. THE HIGHEST DAILY HOURS OF SUNSHINE ARE RELATED TO LONGITUDE ACROSS THE DISTRIBUTION OF RED MILLIPEDES *SPHAEROTHERIUM* BRANDT, 1833. *Munis Entomology & Zoology*, 18(1): 385-387.
- 264.Cooper Mark I. 2023. DOES SEXUAL SIZE DIMORPHISM VARY WITH THE FEWEST DAILY HOURS OF SUNSHINE IN RED MILLIPEDES *CENTROBOLUS* COOK, 1897? *Munis Entomology & Zoology*, 18(1): 373-375.
- 265.Cooper Mark I. 2023. PRECIPITATION DURING THE DRIEST MONTH IS marginally RELATED TO LONGITUDE ACROSS THE DISTRIBUTION OF RED MILLIPEDES *CENTROBOLUS* COOK, 1897. *Munis Entomology & Zoology*, 18(1): 339-341.
- 266.Cooper M. CURVED SURFACE AREA IS RELATED TO SPECIES RICHNESS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 330-348. http://www.ijesird.com/oct1_23.pdf.
- 267.Cooper M. SPECIES RICHNESS IS RELATED TO PRECIPITATION IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 349-367. http://www.ijesird.com/oct2_23.pdf.
- 268.Cooper M. SPECIES RICHNESS IS RELATED TO MINIMUM OCEAN WATER TEMPERATURE IN COASTAL FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 368-385. http://www.ijesird.com/oct3_23.pdf.
- 269.Cooper M. SPECIES RICHNESS IS RELATED TO MEAN OCEAN WATER TEMPERATURE NEAR FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 386-402. http://www.ijesird.com/oct4_23.pdf.
- 270.Cooper M. SPECIES RICHNESS IS RELATED TO MAXIMUM TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 403-420. http://www.ijesird.com/oct5_23.pdf.
- 271.Cooper M. SPECIES RICHNESS IS RELATED TO LOWEST RELATIVE HUMIDITY IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 421-438. http://www.ijesird.com/oct6_23.pdf.
- 272.Cooper M. SPECIES RICHNESS IS RELATED TO HIGHEST OCEAN WATER TEMPERATURES IN COASTAL FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 439-455. http://www.ijesird.com/oct7_23.pdf.
- 273.Cooper M. SPECIES RICHNESS IS RELATED TO ALTITUDE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 456-472. http://www.ijesird.com/oct8_23.pdf.
- 274.Cooper M. SPECIES RICHNESS IS marginally RELATED TO LENGTH IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 473-490. http://www.ijesird.com/oct9_23.pdf.
- 275.Cooper M. SURFACE AREA-TO-VOLUME RATIO IS RELATED TO SPECIES RICHNESS IN *CENTROBOLUS*

- COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 491-508. http://www.ijesird.com/oct10_23.pdf.
276. Cooper M. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO AVERAGE TEMPERATURE VARIATION IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 515-534. http://www.ijesird.com/oct_12_23.pdf.
277. Cooper M. MALE SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO ALTITUDE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 535-553. http://www.ijesird.com/oct_13_23.pdf.
278. Cooper M. SEXUAL SIZE DIMORPHISM IS CORRELATED TO MEAN OCEAN WATER TEMPERATURE IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(4): 554-572. http://www.ijesird.com/oct_14_23.pdf.
279. Cooper M. SECOND POLAR MOMENTS OF INERTNESS ARE DIFFERENT IN AND BETWEEN TWO PAIRS OF FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 573-592. http://www.ijesird.com/nov_1_23.pdf.
280. Cooper M. SECOND POLAR MOMENTS OF INERTNESS ARE RELATED TO MATING FREQUENCIES, SPECIES VOLUME AND SURFACE AREA IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 593-620. http://www.ijesird.com/nov_2_23.pdf.
281. Cooper M. HIGHEST DURATION OF SUNSHINE IS RELATED TO MALE SECOND POLAR MOMENTS OF INERTNESS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 621-641. http://www.ijesird.com/nov_3_23.pdf.
282. Cooper M. I. MATING FREQUENCY MAY BE RELATED TO AT LEAST SIXTEEN FACTORS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 646-672. http://www.ijesird.com/nov_5_23.pdf.
283. Cooper M. SEXUAL SIZE DIMORPHISM IS CORRELATED TO MAXIMUM PRECIPITATION IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 673-699. http://www.ijesird.com/nov_6_23.pdf.
284. Cooper M. AVERAGE TEMPERATURE, MINIMUM TEMPERATURE, MAXIMUM TEMPERATURE, PRECIPITATION, HUMIDITY, RAINY DAYS, AND AVERAGE SUN HOURS ACROSS THE DISTRIBUTION OF *CENTROBOLUS* IN SOUTHERN AFRICA. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 700-726. http://www.ijesird.com/nov_7_23.pdf.
285. COOPER M. LENGTH IS RELATED TO AT LEAST THIRTEEN FACTORS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 727-758. http://www.ijesird.com/nov_8_23.pdf.
286. COOPER M. I. WIDTH IS RELATED TO AT LEAST ELEVEN FACTORS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 759-791. http://www.ijesird.com/nov_9_23.pdf.
287. COOPER M. I. SURFACE AREA IS RELATED TO AT LEAST TEN FACTORS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897. International Journal of Engineering Science Invention Research & Development. 2023; 10(5): 792-819. http://www.ijesird.com/nov_10_23.pdf.
- APPENDIX 1.** The copulation durations (minutes) in *Centrobolus* Cook, 1897.
- 170
66.4
39.8
303
39.4
- APPENDIX 2.** Lowest relative humidity (%) across the range of *Centrobolus* Cook, 1897 for which mass were recorded.
- 63.06
68.18
69.75
63.06
68.65
- APPENDIX 3.** Month with the highest number of rainy days in *Centrobolus* Cook, 1897 where copulation durations were recorded.
- 13.73
13.97
15.23
14.26
13.73
13.97
15.23
14.26
- APPENDIX 4.** Minimum temperature (degrees Celsius) for four species of

Centrobolus Cook, 1897.

19.9

19.8

18.7

19.7

19.9

19.8

18.7

19.7

APPENDIX 5. Temperature (degrees Celsius) for four species of

Centrobolus Cook, 1897.

20.4

21.9

19.5

22.0

20.4

21.9

19.5

22.0

APPENDIX 6. Precipitation (mm) for four species of *Centrobolus* Cook, 1897.

893

944

1015

945

APPENDIX 7. Curved surface area across four species (male then female) of *Centrobolus* Cook, 1897 for which mass were recorded.

1764.318

2221.734

2483.743

2652.133

2483.743

2652.133

1822.124

2376.301

1030.442

939.965

APPENDIX 8. The copulation durations (minutes) followed by maximum precipitation (mm) *Centrobolus* Cook, 1897.

170, 119

66.4, 113

39.8, 103

303, 119

39.4, 109

APPENDIX 9. Altitude across four species (male then female) of

Centrobolus Cook, 1897 for which mass were recorded.

38

9

48

38