Diversity, distribution patterns, and faunogenesis of the millipedes (Diplopoda) of mainland China

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Abstract

Based on all available information, 339 species from 71 genera, 26 families, and eleven orders of Diplopoda have hitherto been recorded from mainland China, the fauna thus being very rich, albeit far from completely known, comprising various zoogeographic elements and populating very different environments. Diplopods mainly occur in various woodlands, in caves, and high in the mountains. Most species (> 90 %, usually highly localised, including 160 cavernicoles), 18 genera, and one family are strictly endemic to continental China. Mapping not only the horizontal, but also the vertical distributions of Diplopoda in China shows the bulk of the fauna to be expectedly restricted to forested lowland and mountain biomes or their remnants. Yet some Chordeumatida, Callipodida, Polydesmida, Julida, and even Spirobolida seem to occur only in the subalpine to alpine environments and thus may provisionally be considered as truly high-montane. The long-acknowledged notions of China being a great biogeographic zone transitional between the Palaearctic and Oriental regions generally find good support in millipede distributions, in particular at the higher taxonomic levels (generic, familial, and ordinal). While the Palaearctic/Holarctic components expectedly dominate the fauna of the northern parts of the country, the Oriental ones prevail in its south and along the Pacific coast. Both realms are increasingly mixed and intermingled towards China's centre. However, in addition to the above traditional views, based on distribution patterns alone, southern China seems to harbour a rather small, but highly peculiar faunal nucleus or origin centre of its own, whence Himalaya, Myanmar, Thailand, Indochina and/or Taiwan could have become populated by younger lineages. The millipede fauna of continental China is thus a tangled mixture of zoogeographic elements of various origins and ages, both relict and more advanced. The few anthropochores must have been the latest faunal “layer” to populate China.
Keywords
continental China, Diplopod fauna, zoogeography

Introduction

Millipedes (Diplopoda) form a highly diverse, yet strongly understudied arthropod class with > 11,000 described species (Minelli 2015). Apparently, only ca. 20 % of the global species diversity of millipedes are currently known, with the actual number of species being estimated between 50,000 and 80,000 species (Minelli and Golovatch 2013). Being mainly represented by mesophilous forest-dwelling detritivores, millipedes have long been recognised as playing important ecological roles, mostly in temperate and tropical land ecosystems where their diversity is especially pronounced (Golovatch and Kime 2009).

The class encompasses 16 extant orders, 140+ families, and ca. 2,000 genera (Minelli and Golovatch 2013), while the distributions of higher taxa fully agree with the major biogeographic divisions of Earth into the Holarctic (Palaearctic + Nearctic), Afrotropical, Oriental, Neotropical and Australian regions which are accepted since Alfred Russel Wallace and Joseph Dalton Hooker. Antarctica is completely devoid of diplopods, whereas the Oriental Region appears to be the sole one to harbour all 16 orders. Being very ancient (Silurian, early Palaeozoic) and diverse taxonomically, widespread (present on all continents except Antarctica), virtually fully terrestrial (even fossils show spiracles), poorly agile (with highly limited dispersal capacities) and highly limited in compensatory ecological faculties (strongly restricted by a single limiting ecological factor even if the others are favourable), Diplopoda have long been considered as an exemplary group for biogeographic studies and reconstructions (e.g. Shelley and Golovatch 2011).

China has long been considered as a huge territory lying between and linking the Palaearctic and Oriental realms, with very considerable areas of southern China representing not only a marked transitional zone (e.g. Wulf 1944; Zherikhin 2003; Holt et al. 2012), but also the largest karst belt of the world particularly rich in cavernicoles, including millipedes (Golovatch 2015a). Continental China as conventionally understood here includes Hainan and Hong Kong but excludes Taiwan. The territory in question covers ca. 9,326 million sq. km, spanning ca. 5,500 km from north to south and ca. 5,200 km from west to east. China’s topography is very complex. The outline descends step by step from west to east: mountains, high plateaus and hilly land prevail and take up nearly 70 % of the total area, with deserts also located in the west, but mostly plains, deltas and hills in the east. The climates are likewise varied, ranging from sharply continental in the north, through temperate in the middle, to monsoon subtropical and tropical in the south, with a warm humid influence along the eastern sea coasts (https://en.wikipedia.org/wiki/Geographic_information_systems_in_China).

China with its highly varied climates and relief (ca. 70 % national land area being mountains or plateaus) is exceptionally rich in ecological conditions and it supports as many as 18 natural latitudinal belts or biomes (Ni et al. 2000). They range from Polar desert and Alpine tundra in Tibet, through grasslands (savanna, steppe) or desert in the northern parts, to various woodlands (scrub, boreal forest, temperate forest, tropi-
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Nature zonation is generally well-expressed, forested biomes prevailing in total area and forming a succession of boreal forest in the north, through temperate (conifer, deciduous and evergreen), to tropical rainforest in the far south. Altitudinal zonation follows the same general pattern which varies depending on location and grows increasingly complex from seven vegetation or eco-geographic belts in the Tianshan Mountains in the northwest or Tibetan Plateau in the southwest to 14 in Yunnan in the south (review by Zhang et al. 2004).

Figure 1. Nature zonation and the main biomes of China (after Ni et al. 2000).
Even though the millipede fauna of China enjoys a very long history of taxonomic study, dating back to 1833 (Wang and Mauriès 1996), it still remains far from well-known. Based on all available information, 339 species from 71 genera, 26 families, and eleven orders of Diplopoda have hitherto been recorded from mainland China (Table 1), but there can be no doubt that our review will soon be out of date.

The present paper is an attempt not only to summarise the Chinese species list (as of the end of 2019), but also to provide an analysis of the distribution patterns revealed, both altitudinal and horizontal, and to hypothesise the main sources, routes and stages of fauno-genesis. A very similar approach has recently been applied to treating the millipedes of the Himalaya (Golovatch and Martens 2018).

**Materials and methods**

Only described species and published records are considered in our paper, while dubious taxa and those not identified to the species level have been omitted from both checklist and bibliography.

Several broken transects have been chosen to grossly reflect the macro relief of mainland China that accompanies the usual mapped distributions (Figs 2–15). The maps and their corresponding transects at the bottom show both horizontal and vertical distributions of all or most species in a number of largely speciose genera from different families and of various origins across China. The species on the maps and along transects are arranged from west to east and/or north to south. The generic level has been chosen as the most suitable to be accepted in historical biogeography (Kryzhansky 2002). The above novel approach to a graphic presentation of faunistic data allows us to combine the horizontal and vertical distributions of millipedes in the easiest and most vivid way on the same map. Mapping largely concerns endemic species and only the territory of mainland China.

The colour maps were generated using Google Earth Pro version 7.3.2.5495 and Adobe Photoshop CS6. The final images were processed with Adobe Photoshop CS6.

**Results**

The diplopod fauna of continental China at any higher level is basically a mixture of various zoogeographic elements. At the species level, most diplopods encountered in China are not only endemic to the country, but they are also more or less narrowly localised. This holds especially true for cave-dwellers which are usually presumed troglobionts restricted to a single or few adjacent caves. Generally, as the real diversity of millipedes in China has been estimated to amount to no less than 1,000 species (Golovatch 2015a), the list in Table 1, however impressive, seems to represent only ca. 1/3 of the fauna. It is thereby noteworthy that epigean Diplopoda remain especially badly understudied, since much of the collecting and taxonomic exploration efforts still focus on cavernicoles (Golovatch 2015a).
As noted above, according to the ordinal and supra-ordinal distributions in the Diplopoda and a purely biogeographic reconstruction of their origins and early evolution by Shelley and Golovatch (2011), the Oriental Region is the only biogeographic realm of the globe that supports all 16 extant orders of the class. Amongst them, eleven orders are known to occur in mainland China, with the distribution patterns of their constituent families and genera available in Table 1. The remaining five orders, albeit formally excluded from consideration, are added to the roster (Table 2), because representatives of the orders Glomeridesmida, Siphonophorida, Siphonocryptida, Siphoniulida, and Stemmiulida occur or occurred in the adjacent parts of East, Southeast and/or Central Asia. Thus, one extant species of Glomeridesmida and Siphonocryptida each is known from northern Thailand and Taiwan, respectively (Shelley and Golovatch 2011, Golovatch 2015a), several Siphonophorida have been recorded from Vietnam, Laos and northern Pakistan (Jeekel 2001), while fossil Siphoniulida have recently been described from northern Myanmar (Liu et al. 2017c). Two very small orders, Siphoniulida and Siphonocryptida, are considered relict, in a stage of evolutionary decline, whereas most if not all of the remaining orders of Diplopoda are far more diverse and currently in an expansive stage of their evolution (Shelley and Golovatch 2011, Shelley 2011, Golovatch 2015a).

The greatest and about equal shares in the diplopod fauna of mainland China expectedly belong to Holarctic/Palaearctic or Oriental elements, with the former naturally dominating the northern, the latter the southern, parts of the country, and both thoroughly mixed and intermingled mainly in the more central parts. The orders Polyxenida, Polyzoniida, Platydesmida, Glomerida, Callipodida, Chordeumatida, and Julida, the families Polydesmidae and Xystodesmidae, as well as certain genera of Paradoxosomatidae seem best to be attributed to Holarctic/Palaearctic components in the fauna of China. In contrast, most of the remaining higher taxa such as the largely tropical orders Sphaerotheriida, Spirobolida, and Spirostreptida, the families Cryptodesmidae, Haplodesmidae, Opisotretidae, and Pyrgodesmidae, as well as several genera of Paradoxosomatidae seem to represent the Oriental stem. Only two families (of 25, or 8%) are endemic or subendemic to China: the monobasic Guizhousomatidae (Chordeumatida), an apparently relict troglobiont from Guizhou Province, and the Paracortinidae (Callipodida) with two genera (maybe just one, see Stoev and Geoffroy 2004) and a handful of species (including two from northern Vietnam). The number of endemic genera is quite high, 16 (of 65, or ca. 25 %): Sinostemmiulus (Julida), Parabilingulus, Agaricogonopus, Junceustreptus, Prominulostreptus (all Spirostreptida), Lipseuma (Chordeumatida), Angulifemur (Callipodida), Belousoviella, Gonobelus, Mandarinopus, Orthomorphella, Sigipinius, Sinomorpha, Wulingina, Yuennanina (all Polydesmida: Paradoxosomatidae), and Kiulinga (Polydesmida: Xystodesmidae). One might think the higher the altitude, the more likely the taxon's Holarctic or Palaearctic origin and, vice versa, the lower the elevation, the more probable a tropical descent. However, the vertical distributions usually fail to provide a clear-cut support to attributing a higher taxon to this or that stem. The following examples can serve to show this.
### Table 1. The millipede fauna of continental China, with data on distributions and basic literature sources.

| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| **Order Polyxenida Verhoeff, 1934** | | |
| **Family Polyxenidae Lucas, 1840** | | |
| Genus *Eudigraphis* Silvestri, 1948 | | |
| 1. *Eudigraphis sinensis* Ishii & Liang, 1990 | ca. 100 | Zhejiang, Hangzhou, Lake Xihu (Ishii and Liang 1990) |
| Genus *Polyxenus* Latreille, 1802–03 | | |
| 2. *Polyxenus hangzoensis* Ishii & Liang, 1990 | ca. 100 | Zhejiang, Hangzhou, Lake Xihu (Ishii and Liang 1990) |
| **Order Glomerida Brandt, 1833** | | |
| **Family Glomeridae Leach, 1816** | | |
| Genus *Hyleoglomeris* Verhoeff, 1910 | 145–2810 | Balkans, Anatolia, Caucasus, Central, E and SE Asia |
| 3. *Hyleoglomeris albicorporis* Zhang & Zhang, 1995 | ca. 1660 | Yunnan, Baoshan City, Cave Shihua Dong (Zhang and Zhang 1995) |
| 4. *H. aschne* Makhan, 2010 | ca. 730 | Chongqing, Beibei, Mt. Jinynushan (Makhan 2010b) |
| 5. *H. baxian* Liu & Tian, 2015 | ca. 145 | Guangxi, Du’an County, Chengjiang Town, Cave Baxian Park Dong (Liu and Tian 2015a) |
| 6. *H. bicolor* (Wood, 1865) | 210 | Hong Kong, Mt. Taimoshan (Golovatch et al. 2006b) |
| 7. *H. curtisiucata* Golovatch, Liu & Geoffroy, 2012 | 420 | Guangxi, Huanjiang County, Mulun, Cave Gang Lai Dong (Golovatch et al. 2012b) |
| 8. *H. emarginata* Golovatch, 1981 | 310 | Jiangsu, Nanjing City, Mt. Zijinshan (Golovatch 1981, Golovatch et al. 2006b) |
| 9. *H. esulcata* Golovatch, Geoffroy & Mauriès, 2006 | ca. 410 | Guizhou, Libo County, caves Latai Dong and Shuijiang Dong (Golovatch et al. 2006b) |
| 10. *H. generalis* Liu & Tian, 2015 | 550 | Guizhou, Cengong County, Shuiwei Town, Cave Jiangjun Dong (Liu and Tian 2015a) |
| 11. *H. getuhensis* Liu & Tian, 2015 | ca. 910 | Guizhou, Ziyun County, Getuhe National Geopark, Cave Miaoting Dong (Liu and Tian 2015a) |
| 12. *H. grandis* Liu & Tian, 2015 | ca. 280 | Guangxi, Dahua County, Qibainong Geopark, Cave Xia Dong (Liu and Tian 2015a) |
| 13. *H. gudu* Golovatch, Liu & Geoffroy, 2012 | 1365 | Guizhou, Anlong County, Cave Hei Dong (Golovatch et al. 2012b) |
| 14. *H. hebang* Golovatch, Liu & Geoffroy, 2012 | ca. 700 | Guangxi, Xilin County, Cave Zhoubang Dong (Golovatch et al. 2012b) |
| 15. *H. kunnan* Golovatch, Liu & Geoffroy, 2012 | 420 | Guangxi, Huanjiang County, Mulun, Cave Ganxiao Dong (Golovatch et al. 2012b) |
| 16. *H. lii* Golovatch, Liu & Geoffroy, 2012 | 190 | Guangxi, Fuchuan County, Cave Baifu Dong (Golovatch et al. 2012b) |
| 17. *H. maculata* Golovatch, Geoffroy & Mauriès, 2006 | ca. 1315 | Yunnan, Mengzi County, Cave Laoshao Dong (Golovatch et al. 2006b) |
| 18. *H. mashanorum* Golovatch, Liu & Geoffroy, 2012 | ca. 210 | Guangxi, Huanjiang County, Mulun, Cave Mashan Dong (Golovatch et al. 2012b) |
| 19. *H. multistriata* Liu & Tian, 2015 | ca. 400 | Guizhou, Jinhong County, Nuxi Town, Cave I Dong (Liu and Tian 2015a) |
| 20. *H. mulunensis* Golovatch, Liu & Geoffroy, 2012 | ca. 210 | Guangxi, Huanjiang County, Mulun, Cave Xia Dong (Golovatch et al. 2012b) |
| 21. *H. nigu* Golovatch, Liu & Geoffroy, 2012 | ca. 1120 | Guizhou, Qianxi County, Cave Luo Sai Dong (Golovatch et al. 2012b) |
| 22. *H. qiyi* Golovatch, Liu & Geoffroy, 2012 | ca. 210 | Guangxi, Huanjiang County, Mulun, Cave MinLi Dong (Golovatch et al. 2012b) |
| 23. *H. reducta* Golovatch, Geoffroy & Mauriès, 2006 | ca. 1315 | Yunnan, Jianshui County, Cave Yan Dong (Golovatch et al. 2006b) |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 24. H. rhinoceros Liu & Tian, 2015 | ca. 1025 | Guizhou, Anlong County, Dushan Town, Cave Xiniu Dong (Liu and Tian 2015a) |
| 25. H. rukouqu Liu & Wynne, 2019 | 190 | Guangxi, Yangshuo County, Cave Shangshuiyan Dong (Liu and Wynne 2019) |
| 26. H. sinensis (Brölemann, 1896) | 1540–2810 | Sichuan, Kangding County, and Tibet (Golovatch et al. 2006b, Liu and Tian 2015a); New record: Sichuan, W of Ningnan County, 3.3 km WSW of Xiaotiancun village |
| 27. H. tiani Golovatch, Liu & Geoffroy, 2012 | ca. 300 | Hunan, Linwu County, Huatang Town, Cave Long Dong (Golovatch et al. 2012b) |
| 28. H. variabilis Liu & Tian, 2015 | 830 | Guizhou, Cengong County, Pingle Town, Cave Wanfuchengchong Dong (Liu and Tian 2015a) |
| 29. H. wuse Golovatch, Liu & Geoffroy, 2012 | ca. 425 | Guizhou, Maolan County, Cave Dongge Dong (Golovatch et al. 2012b) |
| 30. H. xia Golovatch, Liu & Geoffroy, 2012 | ca. 300 | Hunan, Linwu County, Sanhe Town, Tianhe Village, Cave 1 Dong (Golovatch et al. 2012b) |
| 31. H. xueba Golovatch, Liu & Geoffroy, 2012 | ca. 140 | Guangxi, Du’an County, Cave Yaonan Dong (Golovatch et al. 2012b) |
| 32. H. xuxiakui Liu & Wynne, 2019 | 190 | Guangxi, Yangshuo County, Cave Guanshan No. 4 Dong (Liu and Wynne 2019) |
| 33. H. yinshi Golovatch, Liu & Geoffroy, 2012 | 1205 | Hainan, Kaiyang County, Cave Xianyan Dong (Golovatch et al. 2012b) |
| 34. H. youhao Golovatch, Liu & Geoffroy, 2012 | ca. 300 | Hunan, Linwu County, Sanhe Town, near Changshali Village, Cave 2 Dong (Golovatch et al. 2012b) |

**Order Sphaerotheriida Brandt, 1833**

**Family Zephroniidae Gray, in Jones, 1843**

Genus *Prionobelum* Verhoeff, 1924

| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 35. *Prionobelum hainani* (Gressitt, 1941) | 375 | Hainan, Tai-Pin-ts’uen (Dwa Bi), foot of Mt. Loi Mother (Mauriès 2001) |
| 36. *P. jolivetii* Mauriès, 2001 | 145 | Hainan, W of Dazhou (Mauriès 2001) |
| 37. *P. maculosum* (Attems, 1935) | 10 | Fujian, Fuzhou City (Attems 1935, Mauriès 2001, Wesener 2016) |
| 38. *P. majorinum* (Zhang & Li, 1982) | 1200 | Hainan, Mt. Diaoluoshan (Zhang and Li 1982c, Mauriès 2001) |
| 39. *P. multidentata* (Wang & Zhang, 1993) | 1500 | Fujian, Jiangle County, Mt. Longqi (Wang and Zhang 1993b, Wesener 2016) |

Genus *Zephronia* Gray, 1832

| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 40. *Zephronia profuga* Attems, 1936 | ? | Hong Kong (Attems 1936, Wesener 2016) |

**Order Platydesmida Cook, 1895**

**Family Andrognathidae Cope, 1869**

Genus *Brachycybe* Wood, 1964

| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 41. *Brachycybe cooki* (Loomis, 1942) | ca. 1090 | Jiangxi, S of Jiujiang, Lushan City, Guling Town (Loomis 1942, Shelley et al. 2005) |

**Order Polyzoniida Cook, 1895**

**Family Polyzoniidae Gervais, 1844**

Genus *Angarozonium* Shelley, 1997

| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 42. *Angarozonium amurense* (Gerstfeldt, 1859) | 100–1800 | Heilongjiang, mouth of Songari River; also Siberia and Mongolia (Mikhajlova 2017) |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|--------------------------------------------------|
| **Order Julida Brandt, 1833** | | Holarctic, E and SE Asia |
| **Family Julidae Leach, 1814** | | Holarctic, E and SE Asia |
| Genus *Anaulaciulus* Pocock, 1895 | 10–3350 | Himalaya and E Asia |
| 43. *Anaulaciulus enghoffi* Korsós, 2001 | 2700 | Gansu, Karyn Valley, S wall of La-shi-san Pass (Korsós 2001) |
| 44. *A. ostigonopus* Zhang, 1993 | ca. 200 | Hunan, Changsha City, Mt. Yuelushan (Zhang 1993a) |
| 45. *A. paludicola* (Pocock, 1895) | 10 | Zhejiang, 25 mi of Ningo (Ningbo), Lake Wo-Lee (Causey 1966) |
| 46. *A. tibetanus* Korsós, 2001 | 2700–3350 | Tibet, Dü Chu Valley; Assam, India, 11,000 feet (Korsós 2001) |
| 47. *A. t. tibetanus* Korsós, 2001 | | |
| 48. *A. vallicola* (Pocock, 1895) | | |
| Genus *Nepalmatoiulus* Mauriès, 1983 | 275–3650 | Himalaya and E Asia |
| 49. *Nepalmatoiulus brachymerus* Enghoff, 1987 | 2810 | Sichuan, Kangding (Enghoff 1987b) |
| 50. *N. eulobos* Enghoff, 1987 | 320 | Guangdong, Meizhou City, Mt. Qingliangshan (Enghoff 1987b) |
| 51. *N. fraterdraconis* Enghoff, 1987 | ca. 1045 | Jiangxi, Jiujiang City, Mt. Lushan, road to Guling (Enghoff 1987b) |
| 52. *N. polyakis* Enghoff, 1987 | ca. 275 | Sichuan, Suining City (Enghoff 1987b) |
| 53. *N. rhaphimeritus* Enghoff, 1987 | 2810 | Sichuan, Kangding City (Enghoff 1987b) |
| 54. *N. tibetanus* Enghoff, 1987 | 2750–3650 | SE Tibet, Do-Chu Valley, Pasho Dist., near Rombe Gompa (Enghoff 1987b) |
| 55. *N. yunnanensis* Enghoff, 1987 | ? | Yunnan (Enghoff 1987b) |
| Genus *Pacifiiulus* Mikhaljova, 1982 | | Siberia |
| 56. *Pacifiiulus amurenensis* (Gerstfeldt, 1859) | 100–2500 | Heilongjiang, between mouths of Ussuri and Garyn rivers; also Siberia and the Russian Far East (Mikhaljova 2017) |
| **Family Mongoliulidae Pocock, 1903** | | E Asia |
| Genus *Skleroprotopus* Attems, 1901 | 125–1190 | E Asia |
| 57. *Skleroprotopus confucius* Attems, 1901 | ca. 490 | Hebei, Zhangjiakou City (Attems 1901) |
| 58. *S. laticealci* Takakuwa, 1942 | 395 | Liaoning, Shenyang City (Takakuwa 1942) |
| 59. *S. membranadaulis* Zhang, 1985 | ca. 125–150 | Beijing, Fangshan, caves Shihua and Yunshui (Zhang 1985a, Vagalsini et al. 2018) |
| 60. *S. serratus* Takakuwa & Takashima, 1949 | ca. 1190 | Shanxi, Yantou village (Takakuwa and Takashima 1949) |
| **Family Nemasomatidae Bollman, 1893** | | Nearctic and E Asia |
| Genus *Orinisobates* Lohmander, 1933 | | Holarctic E of Ural Mountains |
| 61. *Orinisobates gracilis* (Verhoeff, 1934) | ? | Xinjiang, Urumqi, Mt. Tian-shan (Verhoeff 1934, Enghoff 1985) |
| Genus *Sinostemmiulus* Chamberlin & Wang, 1953 | | China |
| 62. *Sinostemmiulus simplicior* Chamberlin & Wang, 1953 | ? | Zhejiang, Chenghsien (Cheng County?) (Chamberlin and Wang 1953, Hoffman 1966) |
| **Family Parajulidae Bollman, 1893** | | Nearctic and E Asia |
| Genus *Karteroiulus* Attems, 1909 | | |
| 63. *K. niger* Attems, 1909 | ? | Jiangxi, Tai-an-Long (Enghoff 1987a) |
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| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|--------------------------------------------------|
| **Order Spirobolida Cook, 1895** | | Panropical |
| **Family Spirobolidae Bollman, 1893** | | E Asia |
| Genus *Spirobolus* Brandt, 1833 | | E Asia |
| 64. *Spirobolus hungii* Brandt, 1833 | 305–3350 | North of Beijing (Keeton 1960) |
| 65. *S. cincinnalis* Wang & Zhang, 1993 | 1500 | Fujian, Jiangle County, Mt. Longqi (Wang and Zhang 1993b) |
| 66. *S. grahami* Keeton, 1960 | ca. 305–3350 | Sichuan, Suifu; S of Suifu on the Yunnan border; Mupin; near Yueh-Shi, Granham; Mt. Omeishan; Kweichow; Shih Men Kan (Keeton, 1960); Hubei, Jianshi County (Wang and Zhang 1993b) |
| 67. *S. umbrobrochus* Keeton, 1960 | ca. 915 | Sichuan, Yongshien; Kueichow, Shih Men Kan (Keeton 1960) |
| 68. *S. walkeri* Pocock, 1895 | ca. 150–760 | Zhejiang, Chusan Island, “Da-laen-Saen”, 30 mi SW of Ningpo (Keeton 1960) |
| **Order Spirostreptida Brandt, 1833** | | Pantropical |
| **Family Cambalopsidae Cook, 1895** | | Himalaya, E and SE Asia, Java, Borneo |
| Genus *Glyphiulus* Gervais, 1847 | 105–4150 | E and SE Asia, Java, Borneo |
| 69. *Glyphiulus acutus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | ca. 210 | Guangxi, Huanjiang County, Mulun, caves Ganglai Dong and Huobayan Dong (Golovatch et al. 2011a) |
| 70. *G. adeloglyphus* Zhang & Li, 1982 | ca. 120 | Guangxi, Yangshuo County, Xingping Town (Zhang and Li 1982b) |
| 71. *G. anophthalmus* (Loksa, 1960) | ca. 105 | Guangxi (Loksa 1960) |
| 72. *G. balazsi* (Loksa, 1960) | ca. 990 or 835 | Guizhou, Luodian County or Longping Town (Loksa 1960) |
| 73. *G. basalis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 4150 | Sichuan, Xinlong County, Cave Ganchuan Dong (Golovatch et al. 2007a) |
| 74. *G. beroni* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1315 | Yunnan, Jianshui County, Cave Baguo Dong; and Tonghai County, Cave Xianren Dong (Golovatch et al. 2007a) |
| 75. *G. caeleus* Jiang, Guo, Chen & Xie, 2018 | 900 | Guangxi, Tianjie County, Bala Town, Madong village, Hanyaotun, Cave Xianren Dong (Jiang et al. 2018) |
| 76. *G. deharvengi* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | 730 | Hunan, Longshan County, Huoyan Village, Cave Feihu Dong, Cave Baiyan Dong, Cave Remi Dong (Golovatch et al. 2007a) |
| 77. *G. difficultis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 925 | Guangxi, Leye County, Yachang Town, Huaping, Cave She Dong and Cave Xianren Dong (Golovatch et al. 2011b) |
| 78. *G. echinoides* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | ca. 270 | Guangxi, Fushui County, Bapen village, Cave II Dong (Golovatch et al. 2011b) |
| 79. *G. foetidus* Jiang, Guo, Chen & Xie, 2018 | 690–820 | Guangxi, Xilin County, Zhoubang village, Cave Zhoubang Dong; Yunnan, Guangnan County, Bamei Town, Ake village, Cave Miaopu Dong (Jiang et al. 2018) |
| 80. *G. formosus* (Pocock, 1895) | ca. 135 | Hong Kong (Pocock 1895) |
| 81. *G. granulatus* Gervais, 1847 | 135–440 | Panropical; Guangxi, Longzhou; Hong Kong; Taiwan (Golovatch et al. 2007a) |
| 82. *G. guangnanensis* Jiang, Guo, Chen & Xie, 2018 | 690 | Yunnan, Guangnan County, Bamei Town, Ake village, Cave Miaopu Dong (Jiang et al. 2018) |
| 83. *G. impletus* Jiang, Guo, Chen & Xie, 2018 | 320–830 | Guangxi, Lingyun County, caves (Jiang et al. 2018) |
| 84. *G. intermedius* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 485 | Sichuan, Chengdu, Cave Huanlong Dong (Golovatch et al. 2007b) |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-------------------------------------------------|
| 85. *G. latellai* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1495 | Guizhou, Qianxi County, Honglin village, Cave Hangtu Dong, Cave Xiao Dong, Cave Xixiang Dong, Cave Dayan Dong, Cave Taoxshui Dong, Cave Ludiaoa Dong, Cave Shuhuayan Dong, Cave Shuiluo Dong (Golovatch et al. 2007a) |
| 86. *G. latus* Jiang, Lv, Guo & Chen, 2017 | ca. 410 | Sichuan, Leshan City, Muchuan County, Cave Longgong Dong (Jiang et al. 2017) |
| 87. *G. liangshanensis* Jiang, Lv, Guo & Chen, 2017 | ca. 470–1155 | Sichuan, Liangshan Yi Autonomous Prefecture, Xichang City, Xixi, Xianren Cave; Miyi County, Baima Town, Cave Zhuanxulong Dong (Jiang et al. 2017) |
| 88. *G. liporum* Mauriès & Nguyen Duy-Jacquemin, 1997 | ca. 430 | Hubei, cave (Mauriès and Nguyen Duy-Jacquemin 1997) |
| 89. *G. maocun* Liu & Wynne, 2019 | 180 | Guangxi, Lingchuan County, Maocun Village, Cave Liangfeng Dong (Liu and Wynne 2019) |
| 90. *G. melanoporus* Mauriès & Nguyen Duy-Jacquemin, 1997 | ca. 180 | Guangxi, near Guilin, cave (Mauriès and Nguyen Duy-Jacquemin 1997); Xifeng District, Cave Maomaotou (Liu and Wynne 2019) |
| 91. *G. mulunensis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | ca. 270 | Guangxi, Huanjiang County, Mulun, caves Mashan Dong and Ganglai II Dong (Golovatch et al. 2011a) |
| 92. *G. obliteratoidea* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | 1400 | Guizhou, Anshun City, Liangshuijing, Cave Jianxian Dong (Golovatch et al. 2007b) |
| 93. *G. obliteratus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1315 | Yunnan, Mile County, caves Bailong Dong and Houshan Dong (Golovatch et al. 2007b) |
| 94. *G. paracostulifer* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1495 | Guizhou, Qianxi County, Honglin Town, Cave Laohu Dong (Golovatch et al. 2007a) |
| 95. *G. paragranulatus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1315 | Yunnan, Jianshui County, Cave Yan Dong (Golovatch et al. 2007a) |
| 96. *G. paralunensis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | 211 | Guangxi, Huanjiang County, Mulun, caves Shiui Dong and Xialan Dong (Golovatch et al. 2011a) |
| 97. *G. parabolitatus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 725–860 | Guizhou, Siyang County, Wenchuan Town, Shuanghe, Cave Dafeng Dong (Golovatch et al. 2007b) |
| 98. *G. pergranulatus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1065 | Guizhou, Guanting County, Huajiang, Cave Da Dong and Cave Anjiada Dong (Golovatch et al. 2007a) |
| 99. *G. proximus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 210 | Guangxi, Huanjiang County, Mulun, caves Ganxiao Dong and Dongtu Dong (Golovatch et al. 2011a) |
| 100. *G. pulcher* Loksa, 1960 | ca. 105 | Guangxi, Daxin County, Fulong Town, a cave (Loksa 1960, Jiang et al. 2018) |
| 101. *G. quadrabomatum* Chen & Meng, 1991 | ca. 1110 | Guizhou, Zhenning County, several caves (Chen and Meng 1991) |
| 102. *G. rayrouchi* Mauriès & Nguyen Duy-Jacquemin, 1997 | ca. 390 | Guizhou, Maguan, Cave Heiyan Dong (Mauriès and Nguyen Duy-Jacquemin 1997) |
| 103. *G. reticulatus* Zhang & Li, 1982 | ca. 325 | Zhejiang, Qingyuan County (Zhang and Li 1982b) |
| 104. *G. semigranulatus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1315 | Yunnan, Mile County, Cave Bailong Dong; Jianshui County, Cave Yanzi Dong (Golovatch et al. 2007a) |
| Taxa                                                                 | Altitude (m a.s.l.) | Distribution, province/region (main reference/s)                                                                 |
|----------------------------------------------------------------------|---------------------|********************************************************************************************************************|
| 105. G. septentrionalis Murakami, 1975                              | ca. 170             | Guangxi, Guilin; Japan, Ryukyus, Okinawa Island (Golovatch et al. 2007a)                                        |
| 106. G. sinensis (Meng & Zhang, 1993)                               | ca. 1065            | Guizhou, Guanling County, cave (Meng and Zhang 1993)                                                            |
| 107. G. speobius Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011  | ca. 310             | Guangxi, Huanjiang County, caves Xialan Dong and Shenlong Dong (Golovatch et al. 2011a)                         |
| 108. G. subgranulatus Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | 1313                | Yunnan, Mengzi County, cave near footpath to plateau, Pothole No. 2 (Golovatch et al. 2007a)                    |
| 109. G. subobliteratus Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2007 | ca. 1685            | Yunnan, Shilin County, Cave Zhiyun Dong (Golovatch et al. 2007b)                                                |
| 110. G. tianii Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011    | ca. 210             | Guangxi, Huanjiang County, Mulun, Cave Dongzai Dong (Golovatch et al. 2011a)                                     |
| 111. G. zorani Mauriès & Nguyen Duy-Jacquemin, 1997                 | ca. 1105            | Guizhou, Shuicheng County, Cave Anjia Yan (Mauriès and Nguyen Duy-Jacquemin 1997)                               |
| Genus Hypocambala Silvestri, 1897                                   |                     | SE Asia                                                                                                          |
| 112. Hypocambala polytricha Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2011 | ca. 110             | Guangxi, Longzhou County, Nonggang, Cave Biji Dong (Golovatch et al. 2011c)                                      |
| Family Pericambalidae Silvestri, 1909                               |                     | China, Indochina                                                                                                  |
| Genus Bilingulus Zhang & Li, 1981                                  |                     | China, Vietnam                                                                                                    |
| 113. Bilingulus sinicus Zhang & Li, 1981                            | 165                 | Guangxi, Guilin City, a cave (Zhang and Li 1981a); Yangshuo County, Cave Shangshuiyan; Xiufeng District, Cave Maomaotou; Lingchuan County, Cave Liangfeng Dong (Liu and Wynne 2019) |
| Genus Parabilingulus Zhang & Li, 1981                               | 105–120             | China                                                                                                            |
| 114. Parabilingulus anamulus Zhang & Li, 1981                       | ca. 120             | Guangxi, Yangshuo County, Xingping Town (Zhang and Li 1981a)                                                   |
| 115. P. simplicius Mauriès & Jacqueemin-Nguyen Duy, 1997            | ca. 105             | Guangxi, Gongcheng County, Cave Heiyan Dong (Mauriès and Nguyen Duy-Jacquemin 1997)                             |
| Family Harpagophoridae Attems, 1909                                 |                     | Afrotropical, Himalaya, Sri Lanka, S India, E and SE Asia, Sunda Archipelago                                    |
| Genus Agaricogonopus Zhang & Zhang, 1997                           |                     | China                                                                                                            |
| 116. Agaricogonopus acrorifoliolatus Zhang & Zhang, 1997            | ca. 870             | Yunnan, Xishuangbanna, Mengla County, tropical rainforest (Zhang and Zhang 1997; Pimvichai et al. 2010)         |
| Genus Junceustreptus Demange, 1961                                 | 650–1895            | China                                                                                                            |
| 117. Junceustreptus brevispinus Zhang, 1985                         | ca. 650             | Yunnan, Xishuangbanna, Mengman (Zhang 1985b; Pimvichai et al. 2010)                                            |
| 118. J. browningi Demange, 1962                                     | ca. 1895            | Yunnan (Demange 1962; Pimvichai et al. 2010)                                                                   |
| 119. J. retrorsus Hoffman, 1980                                     | ca. 1890            | Sichuan, Ning Guyen Nfu (Hoffman 1980; Pimvichai et al. 2010)                                                  |
| Genus Prominulostreptus Pimvichai, Enghoff & Panha, 2010           | ?                   | China                                                                                                            |
| 120. Prominulostreptus prominulus (Demange, 1962)                   | ?                   | Yunnan, Lou-Fou-Tsouen (Ing-Ka-Tsoue) (Demange 1962; Pimvichai et al. 2010)                                      |
| Genus Uriunceustreptus Zhang & Chang, 1990                         | 650–1750            | China, Vietnam                                                                                                    |

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| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|--------------------------------------------------|
| 121. *Uriunceustreptus afemorispinus* Zhang & Chang, 1990 | ca. 1750 | Yunnan, Gejiu City (Zhang and Chang 1990; Pimvichai et al. 2010) |
| 122. *U. bilamellatus* Zhang, 1997 | ca. 650 | Sichuan (now Chongqing), Youyang County (Zhang et al. 1997) |
| **Order Chordeumatida Pocock, 1894** | Mostly Holarctic, but also Central and SW South America, Madagascar, Sri Lanka, S India, E and SE Asia, Sunda Archipelago, Philippines, New Guinea, Australia, New Zealand |
| **Family Guizhousomatidae Mauriès, 2005** | China |
| Genus *Guizhousoma* Mauriès, 2005 | ca. 1495 | China |
| 123. *Guizhousoma latellai* Mauriès, 2005 | ca. 1495 | Guizhou, Qianxi County, Honglin, caves Changtu Dong, Shujiayan, Luosai Dong, Taoshui Dong; and Dafang County, Cave Hei Dong (Mauriès 2005) |
| **Family Kashmireumatidae Mauriès, 1982** | Himalaya, E and SE Asia |
| Genus *Lipseuma* Golovatch, Geoffroy & Mauriès, 2006 | 435–1405 | China |
| 124. *Lipseuma bernardi* Golovatch, Geoffroy & Mauriès, 2006 | ca. 435 | Sichuan, Xinlong County, Three Eyes Cave (Golovatch et al. 2006a, 2007) |
| 125. *L. joistanai* Golovatch, Geoffroy & Mauriès, 2006 | 1405 | Hubei, Banjiao Town, Cave ChuanDongZi (Golovatch et al. 2006a) |
| Genus *Vieteuma* Golovatch, 1984 | 2100–2300 | China, Vietnam |
| 126. *Vieteuma hubeiense* Mauriès & Nguyen Duy-Jacquemin, 1997 | ca. 2130 | Hubei, Shennongjia, Yanziya, Cave Yanzi Dong (Mauriès and Nguyen Duy-Jacquemin 1997) |
| 127. *V. longi* Shear, 2002 | 2100–2300 | Yunnan, Baoshan City, Mt. Gaoligongshan, Nankang, 36 air km SE of Tengchong; and LuoshuiDong, 28 air km SE of Teng Chong (Shear 2002) |
| **Family Megalotylidae Golovatch, 1978** | Himalaya, Myanmar, E and SE Asia |
| Genus *Nepalella* Shear, 1979 | 750–4530 | Himalaya, Myanmar, E and SE Asia |
| 128. *N. caeca* Shear, 1999 | 1795 | Guizhou, Shuicheng County, Cave Anjia Yan (Shear 1999, Liu, Wesener et al. 2017c) |
| 129. *N. grandis* Golovatch, Geoffroy & Mauriès, 2006 | ca. 1670 | Yunnan, Zhenxiong County, Cave Baiyin Dong (Golovatch et al. 2006a) |
| 130. *N. grandoides* Golovatch, Geoffroy & Mauriès, 2006 | ca. 750 | Sichuan, Beichuan County, caves Yuan Dong and Black Wind Dong (Golovatch et al. 2006a, Liu, Wesener et al. 2017d) |
| 131. *N. griswoldi* Shear, 2002 | 2100–2300 | Yunnan, Baoshan City, Mt. Gaoligongshan, Luoshuidong, 28 air km of Tengchong (Shear 2002) |
| 132. *N. jinshishan* Liu, in Liu, Wesener et al., 2017 | 1500–2100 | Chongqing, Jinfoshan, Cave Houshan Dong; Cave Lingguan Dong (Liu, Wesener et al. 2017d) |
| 133. *N. kavanaughi* Shear, 2002 | 2500 | Yunnan, Nujiang, Pianma, native forest on Mt. Gaoligongshan (Shear 2002) |
| 134. *N. lobata* Liu, in Liu, Wesener et al., 2017 | 1000 | Sichuan, Mianyang City, Beichuan County, Cave Liangshui Dong (Liu, Wesener et al. 2017d) |
| 135. *N. magna* Shear, 2002 | 2300 | Yunnan, Baoshan City, Mt. Gaoligongshan, Luoshuidong, 28 air-km of Tengchong (Shear 2002) |
| 136. *N. marmornata* Golovatch, Geoffroy & Mauriès, 2006 | ca. 4350 | Sichuan, Xinlong County, caves Snake Mouth Dong and Three Eyes Dong (Golovatch et al. 2006a, 2007) |
| 137. *N. pianma* Shear, 2002 | 2500 | Yunnan, Nujiang, Pianma, Mt. Gaoligongshan, native forest (Shear 2002) |
| 138. *N. troglodytes* Liu, in Liu, Wesener et al., 2017 | 1200–1300 | Guizhou, Guiyang City, Xifeng County, Heijadong village, Cave Hejia Dong; same County, Musan village, Cave Zhangkou Dong; Guizhou, Qiannan, Longli County, Cave Feilong Dong; Guizhou, Qiannan, Fuquan County, Cave Sanlou Dong (Liu, Wesener et al. 2017d) |
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| Taxa | Altitude (m a.s.l.) | Distribution, Province/Region (Main Reference/s) |
|------|---------------------|--------------------------------------------------|
| 139. *N. wangi* Liu, in Liu, Wesener et al., 2017 | 1300 | Chongqing, Wulong County, Huaping Town, Qimenxia, Cave I Dong (Liu, Wesener et al. 2017d) |

**Order Callipodida Pocock, 1894**

**Family Casiopiopetalidae Lohmander, 1931**

**Genus Bollmania Silvestri, 1896**

**140. Bollmania beroni** Stoey & Enghoff, 2005

- Altitude: ca. 1315
- Distribution: Yunnan, Jianshui County, Cave Yan Dong (Stoev and Enghoff 2005)

**Family Paracortinidae Wang & Zhang, 1993**

**Genus Angulifemur Zhang, 1997**

**141. Angulifemur tridigitis** Zhang, 1997

- Altitude: ca. 1315
- Distribution: Yunnan, Mengzi City, Cave Liupeng-yanzhi Dong (Zhang 1997)

**142. A. unidigitis** Zhang, 1997

- Altitude: ca. 1315
- Distribution: Yunnan, Mengzi City, caves Longbaopo Dong and Laoxiao Dong (Zhang 1997)

**Genus Paracortina Wang & Zhang, 1993**

**143. Paracortina carinata** Wang & Zhang, 1993

- Altitude: 3300
- Distribution: Yunnan, Shangrila (= Zhongdian) County (Wang and Zhang 1993a)

**144. *P. chinensis*** Stoey & Geoffroy, 2004

- Altitude: ca. 1670
- Distribution: Yunnan, Zhenxiong County, caves Ke Ma Dong, Da Hei Dong and Liao Jun Dong (Stoev and Geoffroy 2004)

**145. P. leptoclada** Wang & Zhang, 1993

- Altitude: 3300
- Distribution: Yunnan, Shangrila (= Zhongdian) County (Wang and Zhang 1993a); Tibet, Mangkang County (Stoev et al. 2008)

**146. P. serrata** Wang & Zhang, 1993

- Altitude: ca. 1845
- Distribution: Yunnan, Deqin County (Wang and Zhang 1993a)

**147. P. Stimula** Wang & Zhang, 1993

- Altitude: 3300
- Distribution: Yunnan, Shangrila (= Zhongdian) County (Wang and Zhang 1993a)

**148. P. thallina** Wang & Zhang, 1993

- Altitude: 3300
- Distribution: Yunnan, Shangrila (= Zhongdian) County; Sichuan, Batang County (Wang and Zhang 1993a)

**149. P. viriosa** Wang & Zhang, 1993

- Altitude: 3300
- Distribution: Yunnan, Shangrila (= Zhongdian) County; Sichuan, Batang County (Wang and Zhang 1993a); Tibet, Mangkang County (Stoev et al. 2008)

**150. P. voluta** Wang & Zhang, 1993

- Altitude: ca. 2690
- Distribution: Sichuan, Yajiang County (Wang and Zhang 1993a)

**151. P. yiniae** Liu & Tian, 2015

- Altitude: ca. 865
- Distribution: Guangxi, Baise City, Longlin County, Tianshengqiao Town, Yanchang village, Cave I (Liu and Tian 2015c)

**152. P. zhangi** Liu & Tian, 2015

- Altitude: ca. 965
- Distribution: Guizhou, Qianxinan Autonomous Prefecture, Ceheng County, Rongdu village, Cave Qiaoxia Dong (Liu and Tian 2015c)

**Family Sinocallipodidae Zhang, 1993**

**Genus Sinocallipus Zhang, 1993**

**153. Sinocallipus simplopodicus** Zhang, 1993

- Altitude: 1860
- Distribution: China and Indochina

**Order Polydesmida Pocock, 1887**

**Family Cryptodesmidae Karsch, 1880**

**Genus Trichopeltis Pocock, 1894**

**154. Trichopeltis bellii** Liu, Golovatch & Tian, 2017

- Altitude: 165–1890
- Distribution: Himalaya, E and SE Asia, Malaysia, Sunda Archipelago

**155. T. intricata** Liu, Golovatch & Tian, 2017

- Altitude: 1890
- Distribution: Yunnan, Kunming City, Shilin County, Guishan Town, Cave Haiyi I Dong (Liu et al. 2017a)

**156. T. latellai** Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2010

- Altitude: ca. 1495
- Distribution: Guizhou, Qianxi County, Honglin Town, caves Tiaoshui Dong and Changtu Dong (Golovatch et al. 2010c)

**157. T. liangfengdong** Liu & Wynne, 2019

- Altitude: 180
- Distribution: Guangxi, Lingchuan County, Cave Liangfeng Dong (Liu and Wynne 2019)
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|-----------------------------------------------|
| 158. *T. reflexus* Liu, Golovatch & Tian, 2017 | ca. 165 | Hunan, Chenzhou City, Linwu County, Xianghaling Town, II Dong Cave (Liu et al. 2017a) |
| **Family Haplodesmidae Cook, 1895** | | Himalaya, Myanmar, E and SE Asia, Malaysia, Sunda Archipelago, New Guinea, Melanesia, Australia |
| Genus *Doratodesmus* Cook, 1895 | | Sunda Archipelago, China |
| 159. *Doratodesmus grandifoliatus* Zhang, in Zhang & Wang, 1993 | ca. 1315 | Yunnan, Mengxi County, Cave Longbaopo Dong (Zhang and Wang 1993) |
| Genus *Eutrichodesmus* Silvestri, 1910 | 65–1495 | E and SE Asia, Sunda Archipelago, Melanesia |
| 160. *Eutrichodesmus anisodentus* (Zhang, 1995) | ca. 385 | Fujian, Mt. Wuyishan (Zhang 1995b) |
| 161. *E. apicalis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 75 | Hubei, Yichang, Yichang County, Grotte des Araignées (Golovatch et al. 2015) |
| 162. *E. arcicollaris* Zhang, in Zhang & Wang, 1993 | ca. 170 | Yunnan, Hekou County, Cave Huayu Dong (Zhang and Wang 1993, Golovatch et al. 2009a, 2009b) |
| 163. *E. digitatus* Liu & Tian, 2013 | ca. 65 | Guangdong, Qingyuan City, Jintan Town, Cave Mi Dong (Liu and Tian 2013) |
| 164. *E. distinctus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2009 | ca. 105 | Guangxi, Fusui County, Bapen, Cave 4 Dong (Golovatch et al. 2009b) |
| 165. *E. dorisangulatus* (Zhang, in Zhang & Wang, 1993) | ca. 635 | Yunnan, Mengla County, Cave Baoniujiao Dong (Zhang and Wang 1993, Golovatch et al. 2009a, 2009b) |
| 166. *E. incisus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2009 | ca. 1495 | Guizhou, Qianxi County, Honglin, caves Tiaoshui Dong, Cave Liaoqingling Dong, Jiyan Dong, Dakong Dong and Luosai Dong (Golovatch et al. 2009a) |
| 167. *E. jianjia* Liu & Wynne, 2019 | 190 | Guangxi, Yangshuo County, Cave Guanshan No. 4 (Liu and Wynne 2019) |
| 168. *E. latellai* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | 1060 | Guizhou, Zhenfeng County, Beipanjiang Town, Cave Shui Chi Dong (Water Pool Cave) (Golovatch et al. 2015) |
| 169. *E. latus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2009 | ca. 560 | Guangxi, Leye County, Yachang Nature Reserve, caves Yanwu Dong, Xiayan Dong, Xiaoshui Dong and She Dong (Golovatch et al. 2009a) |
| 170. *E. lipsae* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 160 | Guangxi, Guilin, Grotte des Squelettes (Golovatch et al. 2015) |
| 171. *E. monodentus* (Zhang, in Zhang & Wang, 1993) | ca. 650 | Yunnan, Mengla County, Cave Baijucuo Dong (Zhang and Wang 1993, Golovatch et al. 2009a, 2009b) |
| 172. *E. obliteratus* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 1065 | Guizhou, Guanling County, Huajiang Town, Cave Huashiban Dong (Slippery Cave) (Golovatch et al. 2015) |
| 173. *E. pectinatidentis* (Zhang, 1995) | ca. 1010 | Zhejiang, Lin’an County, Mt. Tianmu (Zhang 1995a) |
| 174. *E. planatust* Liu & Tian, 2013 | ca. 550 | Guangxi, Hechi City, Liujia Town, Cave Zhenzhuyan Dong (Liu and Tian 2013) |
| 175. *E. sketi* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | 730 | Hunan, Leshan County, Huoyan, Cave Feihu Dong (Golovatch et al. 2015) |
| 176. *E. similis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2009 | ca. 310–420 | Guangxi, Huanjiang County, Mulun Nature Reserve, caves Gui II Dong and Shenlong Dong (Golovatch et al. 2009a) |
| 177. *E. simplex* Liu & Tian, 2013 | 130 | Jiangxi, Fenyi County, Cave Taoyuan Dong (Liu and Tian 2013) |
| 178. *E. soesilae* Makhan, 2010 | ca. 735 | Chongqing, Beibei, Mt. Jinyunshan (Makhan 2010a) |
| 179. *E. spinatus* Liu & Tian, 2013 | ca. 875 | Hunan, Guidong County, Sidu Town, Sidu Caves (Liu and Tian 2013) |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|-------------------|-----------------------------------------------|
| 180. *E. tenuis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 1065 | Guizhou, Guanling County, Yongning Town, Cave Yun Dong (Cloud Cave) (Golovatch et al. 2015) |
| 181. *E. triangularis* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 750 | Sichuan, Beichuan County, Cave Yan Dong (Golovatch et al. 2015) |
| 182. *E. troglobius* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | 1205 | Guizhou, Kaiyang County, Cave Xianyan Dong (Golovatch et al. 2015) |
| 183. *E. trontelji* Golovatch, Geoffroy, Mauriès & VandenSpiegel, 2015 | ca. 410 | Guizhou, Libo County, caves Shui Jiang Dong, Shuipu Da Dong, Shuipa, Latai Dong, Jia Ban and Feng Dong (Golovatch et al. 2015) |

**Family Paradoxosomatidae**

Daday, 1889

Genus *Anoplodesmus* Pocock, 1895
184. *Anoplodesmus chinenis* Golovatch, 2013 1700–2400 Shaanxi, Mt. Taibaishan, southern slopes, above Houshenzi, primary broadleaved forest (Golovatch 2013a)

Genus *Antheromorpha* Jeekel, 1968
185. *Antheromorpha rosea* Golovatch, 2013 1200–1700 Yunnan, S of Pianma; Baoshan District, near Hemu, Mt. Gaolingongshan, near Cave Bianfu II Dong (Golovatch 2013a, 2013b); also N Thailand and Laos (Likhitrakarn et al. 2019)

Genus *Belousoviella* Golovatch, 2012
186. *Belousoviella kabaki* Golovatch, 2012 3360 Sichuan, SW of Mianning; right tributary of Yalongjiang River canyon (Golovatch 2012)

Genus *Cawjeekelia* Golovatch, 1980
187. *Cawjeekelia nova* Golovatch, 2011 2110 Chongqing, Dabashan Mt. Range, NE of Heyu, Betula forest (Golovatch 2011)
188. *C. pallida* Golovatch, 1996 100–2110 Hong Kong, Tai Po Kau Nature Reserve (Go1ovatch 1996)
189. *C. propria* (Mikhaljova & Korsós, 2003) 500 Jilin, Mt. Changbaishan National Park; also N Korea (Mikhaljova and Korsós 2003, Golovatch 2013a)

Genus *Desmoxytes* Chamberlin, 1923
190. *Desmoxytes planata* (Pocock, 1895) 560 Nearly pantropical; Yunnan, Xishuangbanna, Menglun, Tropical Botanical Garden (Srisonchai et al. 2018; Golovatch 2018)

Genus *Engbaffiosema* Golovatch, 1993
191. *Engbaffiosema longipes* Golovatch, 2011 3150 Yunnan, NW slope of Mt. Yulongxueshan (Golovatch 2011)

Genus *Gonobelus* Attems, 1936
192. *Gonobelus belousovi* Golovatch, 2014 995 Sichuan, NE of Shimian, Xiangshui River, Tianpingzi (Golovatch 2014a)
193. *G. martensi* Golovatch, 2013 1700–2600 Shaanxi, Mt. Taibaishan (Golovatch 2013a)
194. *G. pentaspinus* Golovatch, 2013 2475 Sichuan, NW of Mianning (Golovatch 2013b)
195. *G. sinensis* Attems, 1936 2615 Yunnan, Mt. Laojunshan, 3.7 km ENE of Segengsheng (Golovatch 2017)

Genus *Hedinomorpha* Verhoeff, 1934
196. *Hedinomorpha affinis* Golovatch, 2014 2870 Gansu, Mt. Lianhuashan (Golovatch 2014a)

*H. altiterga* Golovatch, 2019 1445 Gansu, WWS of Longnan (Wudu), 2.4 km NW of Zhonghaixiang (Golovatch 2019a)
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|-------------------|---------------------------------------------|
| 198. *H. bifida* Golovatch, 2019 | 3665 | Sichuan, 7.3 km S of Ganzi (Golovatch 2019a) |
| 199. *H. biramipedicula* Zhang & Tang, 1985 | ca. 1360 | Shaanxi, Qinling, Mt. Taibaishan (Zhang and Tang 1985) |
| 200. *H. circofera* Golovatch, 2013 | ca. 2735 | Qinghai, Beishan National Park, 120 km N of Xining (Golovatch 2013a) |
| 201. *H. circularis* (Takakuwa & Takahima, 1949) | ? | Shaanxi, Chinkaiji (Takakuwa and Takahima 1949, Golovatch 2019a) |
| 202. *H. crassiterga* Golovatch, 2019 | 4490 | Sichuan, 16.8 km SSW Ganzi (Golovatch 2019a) |
| 203. *H. flavobulbus* Golovatch, 2019 | 3650 | Gansu, WWS of Longnan (Wudu), Yin Duoguosa & Aounang divide (Golovatch 2019a, 2019b) |
| 204. *H. hummelii* Verhoeff, 1934 | ? | Gansu, Tan-Chang (Verhoeff 1934) |
| 205. *H. jeekeli* (Golovatch, 2009) | 1300–2600 | Shaanxi, Foping Nature Reserve, Panda area (Golovatch 2009); Shaanxi, Mt. Taibaishan, S slopes, above Houshenzi, primary and secondary broadleaved forests (Golovatch 2013a) |
| 206. *H. martensi* Golovatch, 2014 | 3510 | Sichuan, Langmusi, remnants of a moist *Abies* forest above town (Golovatch 2014a) |
| 207. *H. montana* Golovatch, 2016 | 3080–3695 | Yunnan, NNE of Weixi City, 8.15 km ESE of Shajiam; N of Weixi City, 2.95 km NW of Xugongqingshing Village; NW of Jianchuan, 4.7 km WNW of Damaid; Mt. Laojunshan, NE of Liming, 4.2 km S of Muzhengdu (Golovatch 2016b, 2017) |
| 208. *H. nigra* Golovatch, 2013 | 3530–4000 | Sichuan, Jiuzhaigou County, N of Dajii (Golovatch 2013b) |
| 209. *H. proxima* Golovatch, 2016 | 3570 | Yunnan, Mt. Tianbaoshan between Shangrila and Mt. Habaxueshan, E slope, NW of Bengla (Golovatch 2016b) |
| 210. *H. reducita* Golovatch, 2012 | 2900 | Sichuan, SW of Mianning, Right tributary of Yalongjiang River canyon, ca. 9 km SW of Mofanggou (Golovatch 2016b) |
| 211. *H. subnigra* Golovatch, 2013 | 3910 | Yunnan, W of Lake Lugu (Golovatch 2013b) |
| 212. *H. yunnanensis* Golovatch, 2016 | 3480 | Yunnan, NNE of Weixi City, right tributary of Lapugon River, 5.2 km ENE of Jizong (Golovatch 2016b) |
| Genus *Helicorthomorpha* Attems, 1914 | | E and SE Asia |
| 213. *Helicorthomorpha holstii* (Pocock, 1895) | 340 | Widespread in SE Asia; Yunnan; Guangdong, Dinghushan Mt., 86 km W of Guangzhou (Attems 1936, Golovatch 1981) |
| Genus *Hirtodrepanum* Golovatch, 1994 | | Himalaya and China |
| 214. *Hirtodrepanum chinense* Golovatch, 2014 | 1990–2015 | Yunnan, Deqin, Dewei Line, E of Aqiku; Mekong Valley, 2 km E of Yezhixiang (Golovatch 2014a, 2019a) |
| Genus *Hylomus* Cook & Loomis, 1924 | ca. 140–910 | E and SE Asia |
| 215. *Hylomus cornutus* (Zhang & Li, 1982) | ca. 140 | Guangxi, Guilin, Yangshuo (Zhang and Li 1982a) |
| 216. *H. draco* Cook & Loomis, 1924 | ca. 400 | Jiangxi, Jiujiang City, Mt. Lushan (Cook and Loomis 1924, Srisonchai et al. 2018) |
| 217. *H. eapterygota* (Golovatch, Li, Liu & Geoffroy, 2012) | ca. 260 | Hunan, Linwu County, Tianhe, Cave I Dong and Changshali Cave I Dong (Golovatch et al. 2012a) |
| 218. *H. getubenis* (Liu, Golovatch & Tian, 2014) | ca. 910 | Guizhou, Ziyun County, Getuhe National Geopark, caves Suidaong and Taiyangdong (Liu et al. 2014) |
| 219. *H. laticollis* (Liu, Golovatch & Tian, 2016) | 450 | Guangdong, Yingde City, Huanghua Town, Yanbei village, Cave Yangyan Dong (Liu et al. 2016) |
| 220. *H. lingulatus* (Liu, Golovatch & Tian, 2014) | ca. 140 | Guangxi, Guilin, Pingle County, Cave Chaotianyan (Liu et al. 2014) |
| 221. *H. longispinus* (Loksa, 1960) | ? | Guangxi, a cave (no exact locality known) (Loksa 1960) |
| 222. *H. lu* (Golovatch, Li, Liu & Geoffroy, 2012) | ca. 155 | Guangxi, Yongfu County, Shangxiao, Cave Dachong Dong (Golovatch et al. 2012a) |
| Taxa                                                                 | Altitude (m a.s.l.) | Distribution, province/region (main reference/s)                                                                 |
|----------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------|
| 223. *H. minutuberculatus* (Zhang, 1986)                             | ca. 295             | Guangxi, Tianlin County (Zhang 1986)                                                                         |
| 224. *H. nodulosus* (Liu, Golovatch & Tian, 2014)                    | ca. 350             | Guangxi, Du’an County, Xia’ao Town, near Xia’ao Middle School, Cave II Dong; same county, Yong’an Town, Yong’an village, Cave I Dong; same town, Anju Village, Cave Suidao Dong; same county, Longwan Town, Quale village, entrance to Cave I Dong (Liu et al. 2014) |
| 225. *H. parvulus* (Liu, Golovatch & Tian, 2014)                    | ca. 350             | Guangxi, Du’an, Xia’ao (Liu et al. 2014)                                                                     |
| 226. *H. phasmoides* (Liu, Golovatch & Tian, 2016)                   | ca. 445             | Guangxi, Lingyun County, Jiayou Town, Yangli village, Cave Fengliu Dong (Liu et al. 2016)                     |
| 227. *H. scolopendroides* (Golovatch, Geoffroy & Mauriès, 2010)      | ca. 210–350         | Guangxi, Huanjiang County, Dacai Town, Cave Shenlong Dong; Du’an County, Gaoling Town, Jinzhu village, Cave I Dong, Cave II Dong; Xia’ao Town, Cave I Dong (Golovatch et al. 2010b, Liu et al. 2014) |
| 228. *H. scutigeroides* (Golovatch, Geoffroy & Mauriès, 2010)        | ca. 310             | Guangxi, Huanjiang County, Cave Ganglai Dong, Cave Mashan II Dong, Cave Gonglu Dong, Cave Shui Dong, and Du’an County, Disu Town, Dading village, Cave II Dong, same county, Longwan Town, Nonggu village, Cave I Dong, (Golovatch et al. 2010b, Liu et al. 2014) |
| 229. *H. similis* (Liu, Golovatch & Tian, 2016)                      | 230                 | Guangdong, Yingde City, Qingkeng Town, Bangjiao village, Cave Bangjiao Dong (Liu et al. 2016)                  |
| 230. *H. simplipodus* (Liu, Golovatch & Tian, 2016)                  | 140                 | Guangdong, Qingyuan City, Yangshan County, Chengjia Town, Dabe Village, Cave Kuangzhanhuan (Liu et al. 2016)    |
| 231. *H. spinissimus* (Golovatch, Li, Liu & Geoffroy, 2012)          | 190                 | Guangxi, Fuchuan County, Guanyuan, Cave Guanyuan Dong (Golovatch et al. 2012a)                                |
| 232. *H. spinitergus* (Liu, Golovatch & Tian, 2016)                  | ca. 210             | Guangxi, Huanjiang County, near Cave Gui Dong II, secondary forest (Liu et al. 2016)                         |
| 233. *H. variabilis* (Liu, Golovatch & Tian, 2016)                   | 500                 | Guangxi, Fengshan County, numerous caves (Liu et al. 2016)                                                 |
| 234. *H. yuani* Liu & Wynne, 2019                                    | 180                 | Guangxi, Lingchuan County, Cave Liangfeng (Liu and Wynne 2019)                                             |
| Genus *Inversispina* Zhang, 1997                                     | 510–4150            | China and Taiwan                                                                                             |
| 235. *Inversispina erectispina* Golovatch, 2012                       | 2400–4150           | Sichuan, SW of right tributary of Yalongjiang River, canyon; Sichuan, NW of Mianning, broadleafed forest; Sichuan, Jiulong County, SW of Wulaxixiang, broadleafed forest; Yunnan, between Tianbaoshan and Luzilashan, between Shuimofang and Xipazi; Yunnan, N of Lijiang, NW of Baoshanxiang, W of Bengluo village (Golovatch 2012, 2013b, 2016a, 2016b) |
| 236. *I. multiplicina* Golovatch, 2016                               | 2360                | Sichuan, SSE of Shimiain, S of Zhuma (Golovatch 2016a)                                                     |
| 237. *I. tortiapicalis* Zhang, 1997                                  | 510                 | Hubei, Heleng Tu jiazu County, Yien (Zhang et al. 1997)                                                    |
| 238. *I. trispina* Golovatch, 2013                                   | 1050                | Sichuan, Mt. Emeishan, Wannian Monastery (Golovatch 2013a)                                                |
| Genus *Kronopolites* Attems, 1914                                     | 35–3600             | Himalaya, E and SE Asia                                                                                     |
| 239. *Kronopolites biagrilectus* Hoffman, 1963                       | 35–3600             | Sichuan, 10 mi S of Jiujiang (oHoffman 1963); Sichuan, SSE of Shimiain, S of Zhuma; Yunnan, Mt. Laojunshan, NE Liming, 2.5 km SE of Yankulu; N of Lanping, 10.3 km SW of Hexi; N of Lanping, 11.3 km SW of Hexi; Yunnan, SE of Deqin City, 3.3 km S of Gejiancun; Yunnan, Mt. Laojunshan, NE Liming, 2.5 km SE of Yankulu; N of Lanping, 10.3 km SW of Hexi; N of Lanping, 11.3 km SW of Hexi (Golovatch 2016a, 2016b, 2017) |
| 240. *K. davidiani* Golovatch, 2014                                  | 3365                | Sichuan, Wenchuan City, 214 National Road, WSW of Edi (Golovatch 2014a)                                    |
| Taxa                              | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|-----------------------------------|---------------------|--------------------------------------------------|
| 241. K. swinhoei (Pocock, 1895)   | 1300–1700           | Shaanxi, Mt. Taibaishan (Hoffman 1963); Shaanxi, Panda area, Foping Nature Reserve; Gansu, WWS of Longnan (Wudu), 2.4 km NW of Zhongzhaixiang (Golovatch 2017, 2019a) |
| Genus Mandarinopus Verhoeff, 1934 | 700–2955            | China                                            |
| 242. Mandarinopus corticinus (Attems, 1936) | ?                   | Yunnan (Attems 1936, Golovatch 2019a)            |
| 243. M. gracilipes Verhoeff, 1934  | 700–2195            | Gansu, Baishui Jiang River; WWS of Longnan (Wudu), 3 km W of Jiefajiaonaocun, Yin Duoguosa (Verhoeff 1934, Golovatch 2019a) |
| 244. M. hirsutus Golovatch, 2019  | 2315                | Yunnan, NW of Lijiang, W of Chang Jiang (= Yangtze) River, NW of Jining, 2.5 km N of Tuozhi village (Golovatch 2019a) |
| 245. M. rugosus (Golovatch, 2013) | 2400                | Yunnan, N of Lijiang (Golovatch 2013a, 2019a)    |
| 246. M. semirugosus (Golovatch, 2013) | 2955              | Sichuan, NW of Mianning (Golovatch 2013b, 2019a) |
| Genus Nedyopus Attems, 1914       | 170–450             | E and SE Asia                                    |
| 247. Nedyopus beroni (Golovatch, 1995) | 350–450          | Jiangsu, Nanjing City, Mt. Zijin (Golovatch 1995) |
| 248. N. picturatus (Golovatch, 1995) | ca. 170            | Guangxi, Guilin (Golovatch 1995)                 |
| Genus Orthomorpha Bollman, 1893   |                     | E and SE Asia, Sunda Archipelago                 |
| 249. Orthomorpha coarctata (de Saussure, 1860) | ca. 20            | Pantropical; Hainan, Sanya (Golovatch 1994)      |
| 250. "Orthomorpha" endeusa Attems, 1898 | ?                   | China (Attems 1898)                             |
| Genus Orthomorphella Hoffman, 1963 |                     | China                                            |
| 251. Orthomorphella pekuensis (Karsch, 1881) | ca. 40–165        | Hebei, Shanlin, 70 km of Peking (Golovatch 1981); Hunan, Yuanling County, Mumaling (Zhang et al. 1997); New record: Jilin, Changchun City. |
| Genus Oxidus Cook, 1911           | 200–1300            | Subcosmopolitan, anthropochore; near Beijing; Shaanxi, Xi’an City; Guangxi, near Guilin; Sichuan, Maoxian County, NE of Shimian (Golovatch 2013a, 2014a) |
| 252. Oxidus gracilis C. L. Koch, 1847 |                     | E and SE Asia                                    |
| Genus Piccola Attems, 1953        | ca. 840             | Guangxi, Base City, Tainlin County, Langping Town, Cave Shizikou Dadang (Liu and Tian 2015b) |
| Genus Polylobosoma Jeekel, 1980   | 10–1600             | China and Vietnam                                |
| 254. Polylobosoma panda (Golovatch, 2009) | 1600                | Shaanxi, Foping Nature Reserve, Panda area (Golovatch 2009, 2014a) |
| 255. P. roseipes (Pocock, 1895)    | 10                  | Zhejiang, Ningpo (Jeekel 1980)                   |
| Genus Sellanucheza Enghoff, Golovatch & Nguyen, 2004 | 995–3155           | E and SE Asia                                    |
| 256. Sellanucheza jaegeri Golovatch, 2013 | 1300–1700         | Shaanxi, Mt. Taibaishan (Golovatch 2013a)        |
| 257. S. tenebra (Hoffman, 1961)    | ?                   | Sichuan, Wushan (Hoffman 1961)                   |
| 258. S. typica Golovatch, 2013     | 995–3155            | Sichuan, Maoxian County, SE of Nanxizhen (Golovatch 2013b); Sichuan, NE of Shimian, Xiangshuigou River, Tianpingzi (Golovatch 2014a) |
| Genus Sigipinius Hoffman, 1961    | 2810–4195           | China                                            |
| 259. Sigipinius campanuliformis Golovatch, 2013 | 3910                | Yunnan, W of Lake Lugu, N of Dajisi (Golovatch 2013b) |
### Diversity, distribution patterns and faunogenesis of the millipedes of China

### Taxa

| Number | Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|--------|------|---------------------|-----------------------------------------------|
| 260.   | S. complex Golovatch, 2013 | 3780–4120 | Sichuan, S of Muli (Golovatch 2013b) |
| 261.   | S. dentiger Golovatch, 2016 | 3570 | Yunnan, Mt. Tianbaoshan between Shangrila and Habaxue Shan, E slope, NW of Bengla (Golovatch 2016b) |
| 262.   | S. graminis Hoffman, 1961 | 2810–4170 | Sichuan, Lixi County, SW of Tonghua; Juzaigou County, N of Daji; Maoxian County, SE of Nanxizhen; Lixian, WNW of Xuecheng, Ertaizi; N of Lixian, Mengdonggou & Lianghekou divide, W of Xing Fanweizi; Gansu, WWS of Longnan (Wudu), Yin Duoguosa & Aounang divide; WWS of Longnan (Wudu), Yin Duoguosa & Xaxi, W of Zhaguzu, WWS of Longnan (Wudu), Wushengguo & Line Chaping divide; NNE Zhugqu, Minjiang Bas, 3 km ENE Xaohuangga, Qinyugou (Golovatch 2013b, 2019a) |
| 263.   | S. kabaki Golovatch, 2013 | 3330–3550 | Xinjiang, Koeksu Basin (Golovatch 2013b) |
| 264.   | S. montanus (Golovatch, 2011) | 3710–4090 | Yunnan, S of Nixi, near upper timber-line of a humid montane Abies forest; WNW of Zhongdian, humid mid-montane Abies forest with admixture of broad-leaved hardwood species (Golovatch 2011, 2013b) |
| 265.   | S. pinnifer Golovatch, 2016 | 3625 | Yunnan, Mt. Gaolinggongshan, S of Pianma (Golovatch 2013a) |
| 266.   | S. simplex Golovatch, 2013 | 3915–4195 | Yunnan, from Lijiang to Shangrila, 214 National Road, WSW of Edi (Golovatch 2014a) |

Genus *Sinomorpha* Golovatch, 2013

| Number | Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|--------|------|---------------------|-----------------------------------------------|
| 268.   | Sinomorpha setosa Golovatch, 2013 | 1050 | Sichuan, Mt. Emeishan, Wannian Monastery (Golovatch 2013a) |

Genus *Tetracentrosternus* Pocock, 1895

| Number | Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|--------|------|---------------------|-----------------------------------------------|
| 269.   | Tetracentrosternus hoffmani Golovatch, 2013 | 1610 | Yunnan, Mt. Gaolinggongshans, S of Pianma (Golovatch 2013a) |

Genus *Tonginosoma* Jeekel, 1953

| Number | Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|--------|------|---------------------|-----------------------------------------------|
| 270.   | Tonginosoma flexipes Jeekel, 1953 | 500 | Guangxi, Hechi City, Fengshan County, Jinya Town, Hangdong village (Liu and Golovatch 2018a); also N Vietnam (Jeekel 1953) |
| 271.   | T. tianii Liu & Golovatch, 2018 | 1250 | Guizhou, Qianxinan, Anlong County, Sayu Town, Ganhan Dong Cave (Liu and Golovatch 2018a) |

Genus *Tylopus* Jeekel, 1968

| Number | Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|--------|------|---------------------|-----------------------------------------------|
| 272.   | Tylopus deharvengi Liu & Luo, 2013 | 350 | Guangxi, Du'an County, Xia’ao Town, Cave I Dong (Liu and Luo 2013) |
| 273.   | T. kabaki Golovatch, 2014 | 3575–4025 | Yunnan, Deqen, Tuoxtia Highway, Mt. Xiaruisuzuxiang & Yezhizhen; same province, NW of Lijiang, W of Chang Jiang (Yangtze River), NW of Jinhuzhang, 6 km of Tuoxtzentha village; N of Lijiang, W of Maguwa, 4.2 km SE of Shanggaoshan village; N of Lijiang, W of Maguwa, 4.4 km NE of Shanggaoshan village; Mekong Valley, ENE of Yezhizhen, 3 km NE of Houqing (Golovatch 2014a, 2019b) |
| 274.   | T. nigromarginatus Golovatch, 2018 | 835 | Chongqing, Mt. Jinjyunshen, secondary forest, stump, trees, small cave (Golovatch 2018) |
| 275.   | T. reductus Golovatch, 2013 | 1600–1800 | Yunnan, Mt. Gaolinggongshans, S of Pianma (Golovatch 2013a) |
| 276.   | T. schautleri Golovatch, 2013 | 2500–2700 | Yunnan, Mt. Dincangshang, above Dali (Golovatch 2013a) |
| 277.   | T. similis Golovatch, 2014 | 1670 | Yunnan, from Lijiang to Shangrila, E of Guojie Luocun (Golovatch 2014a) |
| Taxa                              | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|-----------------------------------|---------------------|-------------------------------------------------|
| 278. *T. sinensis* Golovatch, 1995 | 1315                | Yunnan, Mengzi County, Cave Hafatiao Dong (Golovatch 1995) |
| Genus *Wulingina* Zhang, 1997     |                     | China                                           |
| 279. *Wulingina macroloba* Zhang, 1997 | 510                | Hubei, Hefeng Tu jiazu County (Zhang 1997)       |
| 280. *W. miniloba* Zhang, 1997    | 510                | Hubei, Hefeng Tu jiazu County (Zhang 1997)       |
| Genus *Yuennanina* Attems, 1936   | 1915–1920           | China                                           |
| 281. *Yuennanina aceratogaster* Zhang & Li, 1977 | 1920        | Yunnan, Kunming City (Zhang and Li 1977)       |
| 282. *Y. ceratogaster* Attems, 1936 | 1920                | Yunnan, Kunming City (Attems 1936)              |
| 283. *Y. petalolobodes* Chang & Zhang, 1989 | 1915      | Yunnan, Kunming, Chenggong County (Chang and Zhang 1989) |
| Family Polydesmidae Leach, 1815   |                     | Palaeartic and SE Asia                          |
| Genus *Epanerchodus* Attems, 1901 | 35–3090             | Central and E Asia, marginally N Vietnam        |
| 284. *Epanerchodus belousovi* Golovatch, 2014 | 2810             | Sichuan, Kangding City (Golovatch 2014c)       |
| 285. *E. chutou* Liu & Golovatch, 2018 | 680                | Guizhou, Shiqian County, Cave Feng Dong (Liu and Golovatch 2018b) |
| 286. *E. coniger* Liu & Golovatch, 2018 | ca. 1620           | Guizhou, Bijie City, Zhijin County, Chengguan Town, Dongshan village, Cave Houshan Dong (Liu and Golovatch 2018b) |
| 287. *E. draco* Geoffroy & Golovatch, 2004 | ca. 1670           | Yunnan, Zhenxiong County, a cave; Guizhou, Liupanshui City, Shuicheng County, Cave Shendongmigong Dong (Geoffroy and Golovatch 2004, Liu and Golovatch 2018b) |
| 288. *E. eurycornutus* Zhang & Wang, 1992 | 885                | Zhejiang, Mt. Tianmu (Zhang and Wang 1992)     |
| 289. *E. frater* Geoffroy & Golovatch, 2004 | ca. 1670           | Yunnan, Zhenxiong County, Cave Dahei Dong (Geoffroy and Golovatch 2004) |
| 290. *E. fuscus* Golovatch, 2015 | ca. 2450            | Yunnan, Lanping County (Golovatch 2015b)       |
| 291. *E. gladiatus* Liu & Golovatch, 2018 | 920                | Guizhou, Wuchuan County, Huangdu Town, Gaodong village, Cave Yinshi Dong (Liu and Golovatch 2018b) |
| 292. *E. jaegeri* Golovatch, 2014 | ca. 2345            | Shaanxi, Mt. Taibaishan (Golovatch 2014b)      |
| 293. *E. jiangxensis* Liu & Golovatch, 2018 | 475                | Jiangxi, Lianhua County, Gaotan village, Cave Shuillian Dong (Liu and Golovatch 2018b) |
| 294. *E. koreanus* Verhoeff, 1937 | 2230               | Jilin, Mt. Changbaishan (Golovatch 2014b)       |
| 295. *E. latiss* Liu & Golovatch, 2018 | 1330               | Chongqing, Wushan County, Luoping Town, Qinglong village, Cave Qinglong Dong (Liu and Golovatch 2018b) |
| 296. *E. lipsae* Golovatch & Geoffroy, 2014 | 750                | Sichuan, Beichuan and Jiangyou counties, numerous caves (Golovatch and Geoffroy 2014, Liu and Golovatch 2018b) |
| 297. *E. martensi* Golovatch, 2014 | ca. 2345            | Shaanxi, Mt. Taibaishan (Golovatch 2014b)      |
| 298. *E. orientalis* Attems, 1901 | ca. 205             | Guangxi, Fuchuan County, Cave Banbianshang Dong (Golovatch et al. 2012c), also Japan and Taiwan |
| 299. *E. parvus* Liu & Golovatch, 2018 | 830                | Guizhou, Cengong County, Pingzhuang Town, Cave Wanfuchangcheng Dong (Liu and Golovatch 2018b) |
| 300. *E. potanini* Golovatch, 1991 | ca. 1550            | Sichuan, Gansu and Yunnan provinces (Golovatch 1991a, 2014b) |
| 301. *E. schawalleri* Golovatch, 2014 | ca. 1670           | Sichuan, Mt. Emeishan (Golovatch 2014b)        |
| 302. *E. sopr Geoffroy & Golovatch, 2004 | ca. 1670           | Yunnan, Zhenxiong County, caves Hama Dong, Dahei Dong and Xianren Dong (Geoffroy and Golovatch 2004, Liu and Golovatch 2018b) |
| 303. *E. sphaerisetosus* Zhang & Chen, 1983 | ca. 35              | Zhejiang, 10 mi S of Jinhua City, Gaocun village (Zhang and Chen 1983) |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|-------------------|-----------------------------------------------|
| 304. *E. stylotarseus* Chen & Zhang, 1990 | ca. 1220 | Guizhou, Guanling County, several caves (Chen and Zhang 1990, Golovatch et al. 2007, 2012) |
| 305. *E. tuijaphilus* Liu & Golovatch, 2018 | 730 | Hunan, Longshan County, Huoyan village, Cave Tujiaimei Dong (Liu and Golovatch 2018b) |
| 306. *E. typicus* Golovatch, 2014 | ca. 3030 | Yunnan, Deqin County (Golovatch 2014) |
| 307. *E. varius* (Geoffroy & Golovatch, 2004) | ca. 755–3090 | Numerous caves in Hubei, Banqiao Town; and Sichuan, Xinlong and Beichuan counties (Geoffroy and Golovatch 2004, Golovatch et al. 2007, Golovatch and Geoffroy 2014) |
| 308. *E. yunnanensis* Golovatch, 2014 | 1995 | Yunnan, Dali City (Golovatch 2014b) |
| Genus *Glenniea* Turk, 1945 | 170–1510 | Himalaya and China |
| 309. *Glenniea blanca* Golovatch & Geoffroy, 2014 | 600 | Sichuan, Tongjiang County, Cave Lou Fang Dong (= Grotte de la Maison) (Golovatch and Geoffroy 2014) |
| 310. *G. lagredae* Golovatch & Geoffroy, 2014 | 1360–1510 | Sichuan, Beichuan County, Cave Yuan Dong (= La grotte du Rocher); Sichuan, Huajiaoling County, Cave Zhangjiayankoukeng Dong (Golovatch and Geoffroy 2014) |
| 311. *G. prima* Golovatch, Li, Liu & Geoffroy, 2012 | ca. 170 | Guangxi, Longzhou County, Shanglong Town, Lenglei Nonggang Forest (Golovatch et al. 2012c, Golovatch and Geoffroy 2014) |
| Genus *Pacidesmus* Golovatch, 1991 | ca. 180–1865 | China and N Thailand |
| 312. *Pacidesmus armatus* Golovatch, Geoffroy & Mauriès, 2010 | ca. 310 | Guangxi, Huanjiang County, Cave Xialan Dong, caves Shui Dong and Shenglong Dong (Golovatch et al. 2010a) |
| 313. *P. bedoae* Golovatch, Geoffroy & Mauroiès, 2010 | ca. 310 | Guangxi, Huanjiang County, caves Dongruong Dong, Huoka Dong and Ganzhong Dong (Golovatch et al. 2010a) |
| 314. *P. bifidus* Golovatch & Geoffroy, 2014 | ca. 495 | Guangxi, near Fengshan County, Cave Henglixin Dong (Golovatch and Geoffroy 2014, Liu and Golovatch 2019) |
| 315. *P. martensi* Golovatch & Geoffroy, 2006 | ca. 1495 | Guizhou, Dafang County, Cave Hei Dong; Qianxi County, Honglin Town, caves Luoshui Dong and Luosai Dong (Golovatch and Geoffroy 2006, Golovatch et al. 2007, Liu and Golovatch 2019) |
| 316. *P. sinesis* (Golovatch & Hoffman, 1989) | ca. 1285 | Guizhou, Zhenning County, Cave Kaikou Dong (Loksa 1960, Golovatch and Hoffman 1989, Chen and Meng 1990, Liu and Golovatch 2019) |
| 317. *P. superdraco* Golovatch, Geoffroy & Mauriès, 2007 | ca. 410 | Guizhou, Libo County, Cave Laitai Dong (Golovatch et al. 2007) |
| 318. *P. tiansi* Golovatch, Geoffroy & Mauriès, 2010 | ca. 310 | Guangxi, Huanjiang County, caves Ganglai Dong I and II (Golovatch et al. 2010a) |
| 319. *P. trifidus* Golovatch & Geoffroy, 2014 | ca. 180 | Guangxi, Guilin City, Cave Ku lou Dong (Golovatch and Geoffroy 2014); Yangshuo County, Cave Guanshan No. 4; Xiufeng District, Cave Maomaotou; Yangshuo County, Cave Shangshuiyan (Liu and Wynne 2019) |
| 320. *P. trilobatus* Liu & Golovatch, 2020 | ca. 1315 | Yunnan, Wenshan County, Liujing Town, Laozha village, Cave I Dong (Liu and Golovatch 2020) |
| 321. *P. uncatus* Liu & Golovatch, 2020 | ca. 1865 | Yunnan, Qujing City, Zhanzi County, Cave Tianshengqiao Dong (Liu and Golovatch 2020) |
| 322. *P. whitteni* Liu & Golovatch, 2020 | ca. 755 | Guangxi, Fengshun County, Jinyu Town, Hangdong village, Cave I Dong (Liu and Golovatch 2020) |
| Genus *Polydesmus* Latreille, 1802–03 | | Amphi-Palaearctic |
| 323. *Polydesmus liber* Golovatch, 1991 | ca. 140 | Hong Kong (Golovatch 1991a) |
| Family Pyrgodesmidae Silvestri, 1896 | | Pantropical |
| Taxa | Altitude (m a.s.l.) | Distribution, province/region (main reference/s) |
|------|---------------------|--------------------------------------------------|
| Genus Cryptocorypha Attems, 1907 | | Old World, up to Melanesia in the east |
| 324. Cryptocorypha spinicornata (Zhang & Li, 1981) | ca. 1110 | Guangxi, Tianlin County, Langping Town (Zhang and Li 1981b) |
| **Family Xystodesmidae Cook, 1895** | | Holarctic, E and SE Asia up to N Vietnam in the south |
| Genus Kiulinga Hoffman, 1956 | 10–1080 | China |
| 325. Kiulinga jeekeli Hoffman, 1956 | 1080 | Jiangxi, Jiujiang City, Jiguling (Hoffman 1956, Zhang and Mao 1984) |
| 326. K. lacustris (Pocock, 1895) | 10 | Zhejiang, 25 mi S of Ninghsien, Lake Wo-Lee (Hoffman 1956) |
| 327. K. lobosa Zhang & Mao, 1984 | ca. 30 | Zhejiang, Zhoushan City, Daishan Island (Zhang and Mao 1984) |
| Genus Riukiaria Attems, 1938 | 170–4440 | E Asia up to N Vietnam in the south |
| 328. Riukiaria belousovi Golovatch, 2014 | 4100 | Sichuan, Muli County, SW of Wulaxixiang (Golovatch 2014d) |
| 329. R. capaca Wang & Zhang, 1993 | 170 | Fujian, Jiangle County (Wang and Zhang 1993b) |
| 330. R. chinensis Tanabe, Ishii & Yin, 1996 | 885 | Zhejiang, Mt. Tianmu (Tanabe et al. 1996) |
| 331. R. davidiani Golovatch, 2014 | 2810 | Sichuan, Lixian County, SW of Tonghua (Golovatch 2014d) |
| 332. R. kubaki Golovatch, 2014 | 4440 | Sichuan, Kangding City, NNE of Walaxiang, NE of Yusicun (Golovatch 2014d) |
| 333. R. korolevi Golovatch, 2014 | 2900 | Sichuan, W of Jiuzhaigou (Golovatch 2014d) |
| 334. R. martensi Golovatch, 2014 | 1700 | Shaanxi, Mt. Taibaishan, southern slopes, above Houzhenzi, primary broadleaved forest (Golovatch 2014d) |
| 335. R. spatuliformis Golovatch, 2015 | 2525 | Sichuan, N of Luding City, N of Lanan (Golovatch 2015b) |
| 336. R. tianmu (Tanabe, Ishii & Yin, 1996) | 885 | Zhejiang, Mt. Tianmu (Tanabe et al. 1996, Golovatch 2014d) |
| **Family Opisotretidae Hoffman, 1980** | | Himalaya, Myanmar, Indochina, Indonesia, New Guinea, Ryukyu Islands, Japan and Christmas Island, Australia, Indian Ocean (Golovatch et al. 2013) |
| Genus Carlotretus Hoffman, 1980 | | S China and Sumatra, Indonesia (Golovatch et al. 2013) |
| 337. Carlotretus triramus Golovatch, Geoffroy, Stoev & VandenSpiegel, 2013 | ca. 200 | Guangxi, Chongzuo City, Longzhou County, Shanglong Town, Nonggang Forest (Golovatch et al. 2013) |
| Genus Martensodesmus Golovatch, 1987 | | Himalaya, Indochina and S China (Golovatch et al. 2013) |
| 338. Martensodesmus bedosae Golovatch, Geoffroy, Stoev & VandenSpiegel, 2013 | ca. 150 | Guangxi, Hechi City, Du’an County, Baling karst hill (Golovatch et al. 2013) |
| 339. M. spiniger Golovatch, Geoffroy, Stoev & VandenSpiegel, 2013 | ca. 200 | Guangxi, Chongzuo City, Longzhou County, Shanglong Town, Nonggang Forest (Golovatch et al. 2013) |

The huge, Eurasian, warm-temperate to tropical genus *Hyleoglomeris* (Glomeridae, Glomerida) currently contains 100+ species, including numerous cavernicoles. Unlike the glomerid fauna of the adjacent Indochina which harbours a considerable proportion of endemic genera (60 % in Vietnam), continental China currently supports only 32 species of *Hyleoglomeris*, most of which occur in caves alone (Golovatch 2015a). The genus ranges from the Balkans in the west, though Anatolia, the Caucasus, Central Asia, the Himalaya, Myanmar and Indochina, to Taiwan, the Philippines and Sulawesi,
Indonesia in the east. Importantly, a fossil congener is known from Baltic amber (Eocene, 44 Mya) (Wesener et al. 2019). *Hyleoglomeris* spp. are widespread across China and occur at various elevations, from nearly sea-level to high mountains (Fig. 2), the highest record belonging to *H. sinensis* (2810 m a.s.l.) (Table 1). In the Himalaya of Nepal, one species occurs even higher in the mountains, being high-montane: *H. khumbua* Golovatch, 1987 (3250–3300 m a.s.l.) (Golovatch and Martens 2018).

A very similar pattern is demonstrated by the subendemic genus *Paracortina* (Paracortinidae, Callipodida), with 12 species, of which ten (Fig. 3) are confined to the mountains of southwestern China (Liu and Tian 2015c), mostly high-montane (3300 m a.s.l., Table 1). Only a few are cavernicoles.

*Nepalmatoiulus* (Julidae, Julida) is another very large genus which presently comprises 55 species that span from the central Himalaya in the west, through Bhutan, Myanmar, Indochina, Thailand and West Malaysia, to the Ryukyus, Japan and Taiwan in the east (Enghoff 1987b). Seven species range across the southern parts of China (Fig. 4), including two high-montane ones (2750–3650 m a.s.l., Table 1). Although Beron (2008) reported closer unidentified Diplopoda from up to 5300 m a.s.l. from Nepal, the world’s highest record for a known species belongs to *N. ivanloebli* Enghoff, 1987, also from Nepal: 4800 m a.s.l. (Enghoff 1987b, Shelley and Golovatch 2011). The same general pattern is observed in the similarly speciose (ca. 50 spp.), but more boreal genus *Anaulaciulus* (Julidae), the distribution of which covers northern Pakistan and India, the Himalaya, northern Myanmar, the Far East of Russia, all Japan and Korea, Taiwan, as well as central and eastern China. The highest record belongs to *A. bilineatus* Korsós, 2001 from Nepal: 3600–4300 m a.s.l. (Korsós 2001). Unlike *Nepalmatoiulus*, no *Anaulaciulus* spp. are known to occur in southern China, both these genera being allo- to parapatric. Among the Julidae in China, only very few are cavernicoles.

Particularly clear Palaearctic origins are observed in the large genus *Skleroprotopus* (Mongoliulidae, Julida), most species of which inhabit the Russian Far East, Korea, Japan and China (Table 1), the small Siberian genus *Angarozonium* (Polyzoniidae, Polyzoniidae) only marginally encountered in northern China (Table 1), the rather small Siberio-Nearctic genus *Orinisobates* (Nemasomatidae, Julida) represented in China by a single species endemic to the southern Tianshan Mountains (Table 1) (Mikhajlova 2017). The

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**Table 2.** Distribution patterns of all 16 extant millipede orders, those presently known to occur in mainland China being marked with an asterisk.

| Orders                  | Distribution pattern       | Orders                  | Distribution pattern       |
|-------------------------|---------------------------|-------------------------|---------------------------|
| Polyxenida*             | Cosmopolitan              | Siphonophorida          | Pantropical               |
| Glomeridesmida          | Pantropical               | Chordeumatida*          | Holarctic + Neotropical + Oriental |
| Glomerida*              | Holarctic + Oriental      | Callipodida*            | Holarctic + Oriental      |
| Sphaerotheriida*        | Old World                 | Julida*                 | Holarctic + Oriental      |
| Platydesmida*           | Subcosmopolitan           | Sphoniulida             | Pantropical               |
| Polyzoniiida*           | Subcosmopolitan           | Spirostreptida*         | Pantropical               |
| Siphoniulida            | Neotropical + Oriental    | Spirobolida*            | Pantropical               |
| Siphonocryptida         | Palaearctic + Oriental    | Polydesmida*            | Pantropical               |

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same concerns *Polydesmus* (Polydesmidae, Polydesmida), a very large genus with ca. 80 species, most of which occur in Europe, the Mediterranean area, Anatolia and the western Caucasus, but a few are known from Japan, and one each in northern Vietnam and Hong Kong (Table 1) (Golovatch 1991a, Nguyen 2009).

The large genus *Nepalella* (Megalotylidae, Chordeumatida), with its 27 species spanning from Nepal (10 species) in the west, through Myanmar (two species) and Thailand (two species), to Vietnam (one species) in the south, and southwestern China (12 species, including several presumed troglobionts) in the north (Liu, Wesener et al. 2017d), shows the same general pattern (Fig. 5). Most congeners are mid-montane, but one, *N. marmorata*, has been recorded from ca. 4350 m a.s.l. (Table 1).

Basically the same picture is revealed in the distribution of the huge Central to East Asian genus *Epanerchodus* (Polydesmidae, Polydesmida) which presently encompasses 118 species or subspecies, both epi- and endogeans, including 25 across almost entire continental China (Liu and Golovatch 2018b) (Table 1, Fig. 6). Their vertical distributions range from nearly sea-level to high-montane (3090 m a.s.l.), but a few congeners from the Himalaya occur even up to 4250 m a.s.l. (Golovatch and Martens 2018).

The genus *Pacidesmus* (Polydesmidae, Polydesmida) shows a highly peculiar distribution (Fig. 7), with all of its eleven Chinese species being low- to mid-montane
Figure 3. Distribution of the family Paracortinidae, genus *Paracortina* in mainland China. Red lines show the transect Batang – Shangrila – Yajiang – Zhenxiong – Baise, along which the elevations are crudely indicated below. 1 *P. viriosa* 2 *P. serrata* 3 *P. thallina* 4 *P. carrinata* 5 *P. leptoclada* 6 *P. stimula* 7 *P. voluta* 8 *P. chinensis* 9 *P. yinae* 10 *P. zhangi*.

Figure 4. Distribution of the family Julidae, genus *Nepalmatoiulus* in mainland China. Red lines show the transect Linzhi – Kangding – Suining – Jiujiang – Meizhou, along which the elevations are crudely indicated below. 1 *N. tibetanus* 2 *N. brachymeritus* 3 *N. rhaphimeritus* 4 *N. polyakis* 5 *N. fraterdaconis* 6 *N. eulobos*. *Nepalmatoiulus yunnanensis* is not mapped because no exact locality in Yunnan is known.
Figure 5. Distribution of the family Megalotylidae, genus *Nepalella* in mainland China. Red lines show the transect Baoshan – Xinlong – Beichuan – Shuicheng – Guiyang – Jinfoshan, along which the elevations are crudely indicated below. 1 *N. kavanaughi* 2 *N. pianma* 3 *N. magna* 4 *N. griswoldi* 5 *N. marmorata* 6 *N. lobata* 7 *N. grandoides* 8 *N. grandis* 9 *N. caeca* 10 *N. troglodytes* 11 *N. jinfoshan* 12 *N. wangi.*

and restricted to karst caves in the south (Liu and Golovatch in press), whereas the type species, *P. shelleyi* Golovatch, 1991, comes from the summit (2200–2500 m a.s.l.) of Mount Doi Inthanon, northern Thailand (Golovatch 1991a). Similarly, the small genus *Glenniea* (Polydesmidae) contains five lowland to mid-montane epigean species from the Himalaya of India and Bhutan (Golovatch and Martens 2018), as well as another three species (including two cavernicoles) from southern China (Golovatch and Geoffroy 2014) (Table 1, Fig. 8).

The great Holarctic family Xystodesmidae (Polydesmida) presently encompasses 66 genera and ca. 410 species, most of which occur in the Nearctic. Only few genera and species are known from Central and northern South America (to Ecuador in the south), the Antilles, the Mediterranean region and East Asia (Shelley and Smith 2018). The largest East Asian genus *Riukiaria* currently contains 35 species or subspecies from southern Japan, southern Korea, Taiwan and China (Korsós et al. 2011, Golovatch 2014d, 2015b, Nguyen 2016). We disagree with Nguyen (2016), who split *Riukiaria* into two genera and created a new genus, *Parariukiaria* Nguyen, 2016, to accommodate a new species from northern Vietnam and three previously described ones from China. To our mind, *Riukiaria* and *Parariukiaria* show all transitional stages in the reduction of a gonoprefemoral process and, albeit without formal synonymy advanced here, both may well be regarded as representing a single large genus, in which several peripheral, southernmost congeners demonstrate a more or less strongly suppressed process on the
gonopodal prefemur, from relatively small to totally missing. All nine *Riukiaria* species in China are epigean and span across the central and southern parts of the country, occurring in lowland to high-montane habitats (170–4440 m a.s.l., Table 1, Fig. 9).

As noted above, in China the great family Paradoxosomatidae, which is amongst the largest in the class (200+ genera, 1,000+ species), dominates most of the tropical faunas across the world, but is absent from the Nearctic, contains remarkably few troglobionts (Golovatch 2015a) and comprises genera of various origins. Some seem to be rooted in the Palaearctic (including several endemic or subendemic ones), the others are likely to be Oriental. Among the former elements, the following two rather species-rich genera can be taken as examples.

The genus *Hedinomorpha* is subendemic to China, with most of its 17 species known from the country being high-montane (up to 4490 m a.s.l., Table 1, Fig. 10), and only one more restricted to Tajikistan, Central Asia (Golovatch 2019b). The genus *Sigipinius* is strictly endemic to mainland China and contains nine high-montane species (2810–4195 m a.s.l., Table 1, Fig. 11). Such paradoxosomatid genera as *Cawjeekealia*, *Kronopolites*, *Mandarinopus* and *Orthomorphella* likewise seem best to be attributed to Palaearctic elements in the fauna of China.
Figure 7. Distribution of the family Polydesmidae, genus *Pacidesmus* in mainland China. Red lines show the transect Qujing – Wenshan – Dafang – Fengshan – Huanjiang – Guilin, along which the elevations are crudely indicated below. 1 *P. uncatus* 2 *P. trilobatus* 3 *P. martensi* 4 *P. sinensis* 5 *P. whitteni* 6 *P. bifidus* 7 *P. superdraco* 8 *P. tiani* 9 *P. bedosae* 10 *P. armatus* 11 *P. trifidus*.

Figure 8. Distribution of the family Polydesmidae, genus *Glenniea* in mainland China. Red lines show the transect Beichuan – Longzhuan – Tongjiang, along which the elevations are crudely indicated below. 1 *G. lagredae* 2 *G. prima* 3 *G. blanca*. 
In contrast, Paradoxosomatidae also contain a good number of presumed Oriental components, mostly tropical to subtropical. Thus, the genus *Hylomus* presently comprises 36 species from Myanmar, Thailand, Laos, Vietnam and China (Srisonchai et al. 2018, Liu and Wynne 2019, Golovatch 2019b). Many of them are presumed troglobionts. The distributions of all 20 *Hylomus* spp. recorded from China cover much of the southern and eastern parts of the country and are only confined to lowland to mid-montane habitats (ca. 140–910 m a.s.l., Table 1, Fig. 12). At the moment, with its 73 species (Golovatch 2019b) that range from southern China in the north, through most of Indochina, to Myanmar in the south, *Tylopus* remains the largest genus of Paradoxosomatidae globally. However, the altitudinal distributions vary from lowland to high-montane (350–4025 m a.s.l., Table 1), cavernicoles are few, while the Chinese congeners mark the northern range limit of the genus and are confined to the southwestern parts of the country (Fig. 13). Because *Tylopus* and *Hedinomorpha* seem to be particularly similar morphologically and co-occur, albeit probably never strictly sympatric, in southwestern China (at least Yunnan, Figs 10, 13), these areas seem to mark the southern range limit of *Hedinomorpha*.

The relatively large genera *Anoplodesmus*, *Antheromorpha*, *Enghoffosoma*, *Nedyopus* and *Sellanucheza* also seem best to refer to as Oriental components in the fauna of China, because it is southern China that marks their northern range limits. The same concerns the small genera *Hirtodrepanum*, *Inversispina*, *Piccola*, *Polylobosoma* and *Tetracentrosternus*, all of which show one or a few congeners either in the Himalaya and/or Myanmar.
Figure 10. Distribution of the family Paradoxosomatidae, genus *Hedinomorpha* in mainland China. Red lines show the transect Shangrila – Ganzi – Liangshan – Xining – Lanzhou – Jiuzhaigou – Xi’an, along which the elevations are crudely indicated below. 1 *H. montana* 2 *H. yunnanensis* 3 *H. proxima* 4 *H. cras-siterga* 5 *H. bifida* 6 *H. subnigra* 7 *H. reducta* 8 *H. martensi* 9 *H. circofera* 10 *H. affinis* 11 *H. nigra* 12 *H. altiterga* 13 *H. flavobulbus* 14 *H. biramipedicula* 15 *H. jeekeli*; neither *H. circularis* nor *H. hummelii* is mapped because their exact type localities remain unknown.

Figure 11. Distribution of the family Paradoxosomatidae, genus *Sigipinius* in mainland China. Red lines show the transect Aksu – Shangrila – Lijiang – Kangding – Jiuzhaigou, along which the elevations are crudely indicated below. 1 *S. kabaki* 2 *S. montana* 3 *S. spiniger* 4 *S. dentiger* 5 *S. campanuliformis* 6 *S. complex* 7 *S. simplex* 8 *S. pinnifer* 9 *S. grahami*.
Diversity, distribution patterns and faunogenesis of the millipedes of China

Figure 12. Distribution of the family Paradoxosomatidae, genus *Hylomus* in mainland China. Red lines show the transect Tianlin – Ziyun – Du’an – Huanjiang – Guilin – Linwu – Qingyuan – Jiujiang, along which the elevations are crudely indicated below. 1 *H. minutuberculus* 2 *H. getuhensis* 3 *H. phasmoides* 4 *H. variabilis* 5 *H. parvulus* 6 *H. scolopendroides* 7 *H. nodulosus* 8 *H. scutigeroides* 9 *H. spiniger* 10 *H. lui* 11 *H. yuani* 12 *H. cornutus* 13 *H. lingulatus* 14 *H. spinissimus* 15 *H. eupterygotus* 16 *H. laticollis* 17 *H. simplipodus* 18 *H. similis* 19 *H. draco*. *H. longispinus* is not mapped because its exact type locality remains unknown.

Figure 13. Distribution of the family Paradoxosomatidae, genus *Tylopus* in mainland China. Red lines show the transect Shangrila – Dali – Mengzi – Jinyunshan – Du’an, along which the elevations are crudely indicated below. 1 *T. reductus* 2 *T. kabaki* 3 *T. similis* 4 *T. schawalleri* 5 *T. sinensis* 6 *T. nigromarginatus* 7 *T. deharvengi*. 
Figure 14. Distribution of the family Cambalopsidae, genus Glyphiulus in mainland China. Red lines show the transect Xinlong – Liangshan – Honghe – Chengdu – Guiyang – Hechi – Longshan – Guilin – Hong Kong – Qingyuan, along which the elevations are crudely indicated below. 1 G. basalis 2 G. liangshanensis 3 G. beroni 4 G. paragranulatus 5 G. semigranulatus 6 G. subobliteratus 7 G. subgranulatus 8 G. obliterator 9 G. latus 10 G. intermedius 11 G. zorzini 12 G. guangnanensis 13 G. foetidus 14 G. sinensis 15 G. pergranulatus 16 G. quadrohamatus 17 G. paracostulifer 18 G. latellai 19 G. obliteratoroides 20 G. rayrouchi 21 G. difficilis 22 G. impletus 23 G. granulatus 24 G. basazsi 25 G. calcus 26 G. parobliteratus 27 G. pulcher 28 G. echinoides 29 G. acutus 30 G. mulunensis 31 G. proximus 32 G. tiani 33 G. paramulunensis 34 G. speobius 35 G. deharvengi 36 G. melanoporus 37 G. septentrionalis 38 G. adeloglyphus 39 G. maocun 40 G. formosus 41 G. recticulus. G. anophthalum and G. lipsorum are not mapped because their exact type localities remain unknown, whereas G. granulatus is mapped, but it is pantropical.

or northern Vietnam, or Taiwan. The mono- or oligotypic Belousoviella, Gonobelus, Sinomorpha, Wulingina, and Yuennanina are all strictly endemic to China, mostly to its southwestern parts, but their Oriental stem is clear-cut due to their closest affinities.

The immediately above paradoxosomatid genera endemic or subendemic to southern China which all seem to be of Oriental stock, together with some other polydesmidans like Carlotretus and Martensodesmus (both Opisotretidae), Glennia and Pacidesmus (both Polydesmidae, Figs 7, 8), as well as several others (e.g. Cryptodesmidae, Haplodesmidae, Pyrgodesmidae), regardless of whether they are Oriental or Palaearctic in origin, seem to be sufficiently numerous and manifest to warrant the recognition of a separate, albeit secondary, subordinate, southern Chinese diversity and faunogenetic centre which must have seriously contributed to at least the faunas of the adjacent parts of the Himalaya, Myanmar, Thailand, Indochina and Taiwan. The influence of that southern Chinese centre in the Himalaya has recently been emphasized (Golovatch and Martens 2018).
Figure 15. Distribution of the family Haplodesmidae, genus *Eutrichodesmus* in mainland China. Red lines show the transect Mengla – Hekou – Beichuan – Guiyang – Huanjiang – Guilin – Yichang – Qingyuan – Guidong – Fenyi – Wuyishan – Hangzhou, along which the elevations are crudely indicated below. 1 *E. dorsiangulatus* 2 *E. monodentus* 3 *E. arcicollaris* 4 *E. triangularis* 5 *E. tenuis* 6 *E. latellai* 7 *E. obliteratus* 8 *E. incisus* 9 *E. latus* 10 *E. soesilae* 11 *E. triglobius* 12 *E. distinctus* 13 *E. trontelji* 14 *E. planatus* 15 *E. similis* 16 *E. sketi* 17 *E. lipsae* 18 *E. jianjia* 19 *E. apicalis* 20 *E. digitatus* 21 *E. spinatus* 22 *E. simplex* 23 *E. anisodentus* 24 *E. pectinatidentis*.

The Oriental realm as one of the main sources for the formation of the millipede fauna of China can also be exemplified by the basically tropical to subtropical orders Sphaerotheriida, Spirobolida and Spirostreptida, as well as the families Cryptodesmidae, Haplodesmidae, Opisotretidae, Pyrgodesmidae (all Polydesmida) and Sinocallopodidae (Callipodida), some of which often vary a lot in altitudinal distributions just like numerous Holarctic/Palaearctic groups. The often presumed rule “tropical elements for low elevations only” does not always work.

The genus *Glyphiulus*, the largest in the family Cambalopsidae (Spirostreptida), presently comprises 60+ species in East and Southeast Asia (to Borneo in the east), 42 of which are encountered at 105–4150 m a.s.l. across China (Fig. 14). Most of them are cavernicoles (Liu and Wynne 2019). A similarly large and even more widespread genus, *Eutrichodesmus* (Haplodesmidae), presently encompasses 50 species (Liu et al. 2017b, Liu and Wynne 2019) which range from southern Japan and Taiwan in the north, through entire Southeast Asia, to Vanuatu, Melanesia in the south. The distributions of all 24 species that populate continental China seem to be more typical, much better agreeing with the above rule: 65–1495 m a.s.l. (Table 1, Fig. 15). At least half of them are also cavernicoles.
Discussion

The diversity estimates presented in Table 1, i.e. 339 species, 71 genera, 26 families, and eleven orders, are much or significantly higher than those reported from the main adjacent areas. The similarly huge territories of Siberia and the Russian Far East that lie north of China support only ca. 130 species, 46 genera, 18 families and five orders of Diplopoda, while the fauna is reasonably well known (Mikhaljova 2017). This is hardly surprising because the prevailing permafrost and sharply continental climates of Asian Russia are largely too harsh to sustain a rich millipede fauna. The even harsher, mostly arid Mongolia is extremely poor in millipedes, with some nine species, five genera and families, and three orders involved (Mikhaljova 2012, Nefediev et al. 2015).

In contrast, the great Himalayan Range spanning for >2,300 km from northwest to southeast and mostly lying south of China supports >275 species, 53 genera, 23 families and 13 orders of diplopods (Golovatch and Martens 2018). Similarly, the fauna of India presently amounts to >270 species, at least 90 genera, 25 families, and eleven orders (Golovatch and Wesener 2016), vs. 92 species from 34 genera, 13 families, and eight orders recorded from Myanmar (Likhitrakarn et al. 2017) or ca. 230 species in Thailand (Likhitrakarn et al. 2019). A direct correlation between area and latitude is clear: the larger the area and the closer it lies to the equator, the richer the biota, including the diplopod faunas. However, the more southerly, the greater the diversity, and the more incomplete and fragmentary is our knowledge.

Certainly the Chinese millipede fauna still remains strongly understudied, given the country’s great size and habitat diversity, including the globe’s greatest karst areas. It may well amount to 1,000 species (Golovatch 2015a), chiefly due to the still particularly poorly studied micropolydesmidans, as well as cavernicoles. Southern China’s karsts are unique in often harbouring up to 5–6 diplopod species per cave (Golovatch 2015a). At least some of the remaining orders such as Glomeridesmida, Siphonocryptida, Siphonophorida, Siphoniulida, and Stemmiulida that occur in the Oriental Region (Table 2), including areas immediately adjacent to mainland China, may also be expected to populate the country. For example, Jiang et al. (2019) have recently described a fossil Siphonophorida from Cretaceous amber (ca. 99 Mya) in northern Myanmar, and an extant species is long known to occur in northern Pakistan (Golovatch 1991b). In addition, the same Burmese amber contains still undescribed Stemmiulida (Stoev et al. 2019) and two described species of Siphoniulida (Liu et al. 2017c). Likewise, as noted above, an extant species of Siphonocryptida and Glomeridesmida each is known from Taiwan and northern Thailand, respectively (Korsós et al. 2008, Shelley 2011).

While the Palaearctic/Holarctic components expectedly dominate the fauna of the northern parts of the country, the Oriental ones prevail in its south and along the Pacific coast. Both realms are increasingly mixed and intermingled towards China’s centre. However, in addition to the above traditional views, based on millipede distribution patterns alone, southern China seems to harbour a subordinate, but highly peculiar faunal nucleus, or origin centre of its own, whence the adjacent Himalaya, Indochina and/or Taiwan could have become populated by younger lineages. The presence of a family (the monobasic Guizhousomatidae) and numerous genera endemic or subendemic to southern China,
both apparently relict and relatively advanced, seems to be evidence of this. Within the
order Callipodida alone, the family Sinocallipodidae seems to be the basalmost and repre-
senting a suborder of its own, the Paracortinidae is a more advanced subendemic, same as
the mostly Central Asian Caspiopetalidae (Stoev and Geoffroy 2004, Stoev and Enghoff
2011). More importantly, a fossil family representing a separate suborder has recently
been discovered in the Cretaceous Burmese amber, ca. 99 Mya (Stoev et al. 2019).

The millipede fauna of mainland China is thus a tangled mixture of zoogeographic
elements of various origins and ages, apparently both relict and more advanced. The few
anthropochores/introductions must have been the latest faunal “layer” to populate China.

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References

Attems CG (1898) System der Polydesmiden. I. Theil. Denkschriften der Kaiserlichen Akad-
emie der Wissenschaften, Mathematisch-naturwissenschaftliche Classe, Wien 4: 221–482.
https://biodiversitylibrary.org/page/27925127

Attems CG (1901) Neue Polydesmiden des Hamburger Museums. Mitteilungen aus dem Naturhis-
torischen Museum in Hamburg 18: 85–105. https://biodiversitylibrary.org/page/29384863

Attems CG (1935) Myriopoden von Sumatra. Archiv für Hydrobiologie, Supplementum 14:
114–142.

Attems CG (1936) Diplopoda of India. Memoirs of the Indian Museum 11(4): 133–323.

Beron P (2008) High altitude Isopoda, Arachnida and Myriapoda of the old world. Bureschi-
ana 1: 1–556.

Causey NB (1966) Redescription of two Chinese species of *Anaulaciulus* (Diplopoda, Julida,
Nemasomatidae), a genus known also in Taiwan, Korea, and Japan. Proceedings of the
Louisiana Academy of Sciences 29: 63–66.

Chamberlin RV, Wang YM (1953) Records of millipedes from Japan and other oriental areas,
with descriptions of new genera and species. American Museum Novitates 1621: 1–13.
http://digitallibrary.amnh.org/handle/2246/4890

Chang NG, Zhang CZ (1989) A contribution to the knowledge of the genus *Yunnanina* and
a new species in Yunnan Province (Diplopoda, Paradoxosomatidae). Acta Zootaxonomica
Sinica 14(4): 415–419. [In Chinese, English summary]
Chen JX, Meng WX (1991) A new species of the genus *Glyphiulus* (Diplopoda, Spirostreptida, Cambalopsidae). Acta Zootaxonomica Sinica 16(4): 394–397. [In Chinese, English summary]

Chen JX, Zhang CZ (1990) A cave-dwelling new species of the diplopod genus *Epanerchodus* from Guizhou Province (Polydesmida: Polydesmidae). Acta Zootaxonomica Sinica 15(4): 406–409. [In Chinese]

Cook OF, Loomis HF (1924) A new family of spined millipedes from central China. Journal of the Washington Academy of Sciences 14: 103–108.

Demange LJ (1962) Matériaux pour servir à une révision des Harpagophoridae (Myriapodes–Diplopodes). Mémoires du Muséum national d’Histoire naturelle, sér. A, Zoologie 24: 1–274 (for 1961).

Enghoff H (1985) The millipede family Nemasomatidae. With the description of a new genus and a revision of *Orinisobates* (Diplopoda: Julida). Entomologica Scandinavica 16: 27–67. https://doi.org/10.1163/187631285X00045

Enghoff H (1987a) *Karteroiulus niger* Attems, 1909, in China (Diplopoda, Julida, Paraiulidae). Entomologist’s Monthly Magazine 123: 207–208.

Enghoff H (1987b) Revision of *Nepalmatoiulus* Mauriès 1983, a southeast Asiatic genus of millipedes (Diplopoda: Julidae). Courier Forschorschings-Institut Senckenberg 93: 241–331.

Geoffroy JJ, Golovatch SI (2004) Some polydesmidan millipedes from caves in southern China (Diplopoda: Polydesmida), with descriptions of four new species. Arthropoda Selecta 13(1/2): 19–28. http://zmmu.msu.ru/files/images/spec/journals/13_1%20019_028%20Geoffr%20Golov.pdf

Golovatch SI (1981) Some East-Asiatic millipedes (Diplopoda) in the collection of the Institute of Zoology of the Polish Academy of Sciences. Annales Zoologici 36(8): 161–168.

Golovatch SI (1991a) The millipede family Polydesmidae in Southeast Asia, with notes on phylogeny (Diplopoda: Polydesmida). Steenstrupia 17(4): 141–159.

Golovatch SI (1991b) On a small collection of millipedes (Diplopoda) from northern Pakistan and its zoogeographic significance. Revue Suisse de Zoologie 98(4): 865–878. https://doi.org/10.5962/bhl.part.79815

Golovatch SI (1994) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), II. Arthropoda Selecta 3(3–4): 127–137.

Golovatch SI (1995) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), III. Arthropoda Selecta 4(2): 89–97.

Golovatch SI (1996) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), IV. Arthropoda Selecta 4(3–4): 71–78.

Golovatch SI (2009) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), VIII. Arthropoda Selecta 18(1–2): 1–7. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/18/18_1_001_007_Golovatch.pdf

Golovatch SI (2011) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XI. Arthropoda Selecta 20(4): 259–266. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/20/20_4%20259%266%20Golovatch%20Orient.pdf

Golovatch SI (2012) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XII. Arthropoda Selecta 21(1): 1–12. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/21/21_1%20001_012%20Golovatch%20for%20Inet.pdf
Diversity, distribution patterns and faunogenesis of the millipedes of China

Golovatch SI (2013a) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XIII. Arthropoda Selecta 22(1): 1–31. http://zmmu.msu.ru/files/images/spec/journals/22_1%20001_031%20Golovatch%20for%20Inet%20low%20res.pdf

Golovatch SI (2013b) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XIV. Arthropoda Selecta 22(4): 307–332. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/22/22_4%20307_332%20Golovatch%20for%20Inet.pdf

Golovatch SI (2014a) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XV. Arthropoda Selecta 23(1): 1–19. https://doi.org/10.15298/arthsel.23.1.01

Golovatch SI (2014b) Review of the millipede genus Epanerchodus Attems, 1901 in continental China, with descriptions of new species (Diplopoda: Polydesmidae). Zootaxa 3760(2): 275–288. https://doi.org/10.11646/zootaxa.3760.2.7

Golovatch SI (2014c) Two new and one little-known species of the millipede genus Epanerchodus Attems, 1901 from southern China (Diplopoda, Polydesmida, Polydesmidae). Fragmenta Faunistica 56(2): 157–166. https://doi.org/10.3161/00159301FF2013.56.2.157

Golovatch SI (2014d) The millipede genus Riukiaria Attems, 1938 in continental China, with descriptions of new species (Diplopoda: Polydesmida: Xystodesmidae). Zootaxa 3793(1): 188–200. https://doi.org/10.11646/zootaxa.3793.1.9

Golovatch SI (2015a) Cave Diplopoda of southern China with reference to millipede diversity in Southeast Asia. ZooKeys 510: 79–94. https://doi.org/10.3897/zookeys.510.8640

Golovatch SI (2015b) Two new species of the millipede order Polydesmida from southern China (Diplopoda). Zoologicheskii zhurnal 64(9): 1023–1028.

Golovatch SI (2016a) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XIX. Arthropoda Selecta 25(2): 131–152. https://doi.org/10.15298/arthsel.25.2.01

Golovatch SI (2016b) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XX. Arthropoda Selecta 25(3): 219–240. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/25/25_3_219_240_Golovatch_for_Inet.pdf

Golovatch SI (2017) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XXII. Arthropoda Selecta 26(2): 87–102. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/26/26_2_087_102_Golovatch_for_Inet.pdf

Golovatch SI (2018) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XXV. Arthropoda Selecta 27(4): 261–277. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/27/27_4_261_277_Golovatch.pdf

Golovatch SI (2019a) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XXVI. Arthropoda Selecta 28(3): 347–367. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/28/28_3_347_367_Golovatch_for_Inet.pdf

Golovatch SI (2019b) On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda: Polydesmida), XXVII. Arthropoda Selecta 28(4): 459–478 kmkjournals.com/upload/PDF/ArthropodaSelecta/28/28_4_459_478_Golovatch_for_Inet.pdf

Golovatch SI, Geoffroy JJ (2006) Review of the Southeast Asian millipede genus Paechesmus Golovatch, with the description of a new troglobitic species from southern China (Diplopoda: Polydesmidae: Polydesmidae). Zootaxa, 1325: 363–368. https://doi.org/10.11646/zootaxa.1325.1.24
Golovatch SI, Geoffroy JJ (2014) On some new or poorly-known species of the millipede family Polydesmidae from southern China (Diplopoda: Polydesmida). Russian Entomological Journal 23(2): 91–105. https://doi.org/10.15298/rusentj.23.2.01

Golovatch SI, Hoffman RL (1989) Identity of Polydesmus hamatus Brandt 1841, a Malagasy millipede (Diplopoda Polydesmida Dalodesmidae). Tropical Zoology 2: 159–164. https://doi.org/10.1080/03946975.1989.10539436

Golovatch SI, Kime RD (2009) Millipede (Diplopoda) distributions: A review. Soil Organisms 81(3): 565–597.

Golovatch SI, Martens J (2018) Distribution, diversity patterns and faunogenesis of the millipedes (Diplopoda) of the Himalayas. ZooKeys 741: 3–34. https://doi.org/10.3897/zook.eys.741.20041

Golovatch SI, Wesener T (2016) A species checklist of the millipedes (Myriapoda, Diplopoda) of India. Zootaxa 4129(1): 001–075. https://doi.org/10.11646/zootaxa.4129.1.1

Golovatch SI, Geoffroy JJ, Mauriès JP (2006a) Four new Chordeumatida (Diplopoda) from caves in China. Zoosystema 28(1): 75–92. http://sciencepress.mnhn.fr/en/periodiques/zosystema/28/1/quatre-nouveaux-chordeumatida-diplopoda-de-grottes-de-chine

Golovatch SI, Geoffroy JJ, Mauriès JP (2006b) Review of the millipede genus Hyleoglomeris Verhoeff, 1910 (Diplopoda, Glomerida, Glomeridae), with descriptions of new species from caves in Southeast Asia. Zoosystema 28(4): 887–915.

Golovatch SI, Geoffroy JJ, Mauriès JP (2007) Several new or poorly-known cavernicolous millipedes (Diplopoda) from southern China. Arthropoda Selecta 15(2): 81–89. https://kmkjournals.com/upload/PDF/ArthropodaSelecta/15/15_2_081_089_Golovatch.pdf

Golovatch SI, Geoffroy JJ, Mauriès JP (2010a) Review of the millipede genus Pacidesmus Golovatch, 1991, with descriptions of three new species from caves in southern China (Diplopoda: Polydesmidae). Tropical Natural History 10(2): 159–169. https://www.tci-thaijo.org/index.php/tnh/article/view/103016

Golovatch SI, Geoffroy JJ, Mauriès JP (2010b) Two new species of the millipede genus Desmoxystes Chamberlin, 1923 (Diplopoda: Polydesmida: Paradoxosomatidae) from caves in southern China. Arthropoda Selecta 19(2): 57–61. https://doi.org/10.15298/arthsel.19.2.01

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2007a) Review of the millipede genus Glyphiulus Gervais, 1847, with descriptions of new species from Southeast Asia (Diplopoda: Spirostreptida: Cambalopsidae). Part 1. The granulatus-group. Zoosystema 29(1): 7–49.

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2007b) Review of the millipede genus Glyphiulus Gervais, 1847, with descriptions of new species from Southeast Asia (Diplopoda: Spirostreptida: Cambalopsidae). Part 2. The javanicus-group. Zoosystema 29(3): 417–456. http://sciencepress.mnhn.fr/en/periodiques/zosystema/29/3/revision-des-diplopodes-du-genre-glyphiulus-gervais-1847-et-description-de-nouvelles-especes-d-asie-du-sud-est-diplopoda-spirostreptida-cambalopsidae-partie-2-le-groupe-javanicus

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2009a) Review of the millipede family Haplodesmidae Cook, 1895, with descriptions of some new or poorly-known species (Diplopoda, Polydesmida). ZooKeys 12: 1–53. https://doi.org/10.3897/zookeys.7.117

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2009b) Review of the millipede genus Eutrichodesmus Silvestri, 1910 (Diplopoda, Polydesmida, Haplodesmidae), with descriptions of new species. ZooKeys 7: 1–46. https://doi.org/10.3897/zookeys.12.167
Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2010c) Two new species of the millipede genus *Trichopeltis* Pocock, 1894 (Diplopoda: Polydesmida: Cryptodesmidae) from Vietnam and China. Arthropoda Selecta 19(2): 63–72. https://doi.org/10.15298/arthsel.19.2.02

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2011a) New species of the millipede genus *Glyphiulus* Gervais, 1847 from the *granulatus*-group (Diplopoda: Spirostreptida: Cambalopsidae). Arthropoda Selecta 20(2): 65–114. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/20/20_2%20065_114%20Golovatch%20for%20Inet.pdf

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2011b) New species of the millipede genus *Glyphiulus* Gervais, 1847 from the *javanicus*-group (Diplopoda: Spirostreptida: Cambalopsidae). Arthropoda Selecta 20(3): 149–165. http://kmkjournals.com/upload/PDF/ArthropodaSelecta/20/20_3%20149_165%20Golovatch%20for%20Inet.pdf

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2011c) Two new species of the millipede genus *Hypocambala* Silvestri, 1895 from China and Vietnam (Diplopoda: Spirostreptida: Cambalopsidae). Arthropoda Selecta 20(3): 167–174. https://doi.org/10.15298/arthsel.20.3.03

Golovatch SI, Geoffroy JJ, Mauriès JP, VandenSpiegel D (2015) Review of the millipede genus *Eutrichodesmus* Silvestri, 1910, in China, with descriptions of new cavernicolous species (Diplopoda, Polydesmida, Haplodesmidae). ZooKeys 505: 1–34. https://doi.org/10.3897/zookeys.505.9862

Golovatch SI, Geoffroy JJ, Stoew P, VandenSpiegel D (2013) Review of the millipede family Opisotretidae (Diplopoda, Polydesmida), with descriptions of new species. ZooKeys 302: 13–77. https://doi.org/10.3897/zookeys.302.5357

Golovatch SI, Li Y, Liu W, Geoffroy JJ (2012a) Three new cavernicolous species of dragon millipedes, genus *Desmoxytes* Chamberlin, 1923, from southern China, with notes on a formal congener from the Philippines (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys 185: 1–17. https://doi.org/10.3897/zookeys.185.3082

Hoffman RL (1956) Studies on some oriental xystodesmine millipedes. Proceedings of the Entomological Society of Washington 58(2): 95–104.

Hoffman RL (1961) Two new Diplopoda genera from western China (Polydesmida, Strongylosomidae). Annals and Magazine of Natural History 13(3): 533–543. https://doi.org/10.1080/00222936008651054

Hoffman RL (1966) The ordinal position of the generic name *Sinostemmiulus* Chamberlin & Wang, 1953. Proceedings of the Entomological Society of Washington 68: 322–325.

Hoffman RL (1980) Studies on spirostreptoid millipedes. XV. On some new or poorly known harpagophorid genera and species from China and the East Indies. Journal of Natural History 14: 589–596. https://doi.org/10.1080/00222938000770481
Holt BG, Lessard JP, Borregaard MK, Fritz SA, Araújo MB, Dimitrov D, Fabre PH, Graham CH, Graves GR, Jønsson KA, Nogués-Bravo D, Wang ZH, Whittaker RJ, Fjeldså J, Rahbek C (2012) An update of Wallace’s zoogeographic regions of the world. Science Express: 1–191. https://doi.org/10.1126/science.1228282

Ishii K, Liang L (1990) Two new species of penicillate diplopods of the family Polyxenidae from China. Canadian Entomologist 122: 1239–1246. https://doi.org/10.4039/Ent1221239-11

Jeekel CAW (1953) Two new Strongylosomidae from Indochina (Diplopoda, Polydesmida). Beaufortia 2(29): 1–8.

Jeekel CAW (1980) The genetic allocation of some little-known Paradoxosomatidae from South-East Asia (Diplopoda, Polydesmida). Revue Suisse de Zoolgie 87: 651–670. https://doi.org/10.5962/bhl.part.85538

Jeekel CAW (2001) A bibliographic catalogue of the Siphonophorida (Diplopoda). Myriapod Memoranda 3: 44–71.

Jiang XK, Guo X, Chen HM, Xie ZC (2018) Four new species of the Glyphiulus javanicus group from southern China (Diplopoda, Spirostreptida, Cambalopsidae). ZooKeys 741: 155–179. https://doi.org/10.3897/zookeys.741.23223

Jiang XK, Lv JC, Guo X, Yu ZG, Chen HM (2017) Two new species of the millipede genus Glyphiulus Gervais, 1847 from Southwest China (Diplopoda: Spirostreptida: Cambalopsidae). Zootaxa 4323(2): 197–208. https://doi.org/10.11646/zootaxa.4323.2.3

Jiang XK, Shear WA, Hennen DA, Chen HM, Xie ZC (2019) One hundred million years of stasis: Siphonophora hui sp. nov., the first Mesozoic sucking millipede (Diplopoda: Siphonophorida) from mid-Cretaceous Burmese amber. Cretaceous Research 97: 34–39. https://doi.org/10.1016/j.cretres.2019.01.011

Keeton WT (1960) A taxonomic study of the millipede family Spirobolidae (Diplopoda, Spirobolida). Memoirs of the American Entomological Society 17: 1–146.

Korsós Z (1994) Redescription of Anaulaciulus tonginus (Karsch, 1881) (Diplopoda, Julida, Julidae). Steenstrupia 20(7): 177–183. http://www.zmuc.dk/commonweb/JOURNALS/PDF/Vol29-1/Korsos.pdf

Korsós Z (2001) Diplopoda from the Nepal Himalaya: Towards the clarification of the genus Anaulaciulus Pocock 1895 (Diplopoda, Julida, Julidace, Brachyiulini). Senckenbergiana Biologica 81(1/2): 61–86.

Korsós Z, Enghoff H, Chang HW (2008) A most unusual distribution pattern: A new siphonocryptid millipede from Taiwan (Diplopoda, Siphonocryptida). Acta Zoologica Academiae Scientiarum Hungaricae 54(2):151–157.

Korsós Z, Nakamura Y, Tanabe T (2011) Two new millipede species of the genus Riukiaria (Diplopoda, Polydesmida, Xystodesmidae) endemic to the Ryukyu Archipelago, Japan. Zootaxa 2877: 55–68. https://doi.org/10.11646/zootaxa.2877.1.3

Kryzanovsky OL (2002) The composition and distribution of the entomofaunas of the globe. Moscow, KMK Scientific Press, 237 pp. https://www.zin.ru/ANIMALiA/COLEOPTERA/RUS/kryz2002.htm [in Russian]

Likhitrakarn N, Golovatch SI, Semenyuk I, Panha S (2019) A new species and a new record of the Southeast Asian millipede genus Antheromorpha Jeekel, 1968 (Polydesmida: Paradoxosomatidae) from Vietnam. ZooKeys 832: 77–89. https://doi.org/10.3897/zookeys.832.32596
Diversity, distribution patterns and faunogenesis of the millipedes of China

Likhitrakarn N, Jirapatrasilp P, Golovatch SI, Panha S (2017) A checklist of the millipedes (Diplopoda) of Myanmar, with an updated list of Leonardo Fea’s collecting localities. Zootaxa 4350(1): 001–046. https://doi.org/10.11646/zootaxa.4350.1.1

Liu WX, Golovatch SI (2018a) Occurrence of the millipede genus Tonkinosoma Jeekel, 1953 in China, with the description of the first presumed troglobitic species of this genus (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys 742: 23–34. https://doi.org/10.3897/zookeys.742.23471

Liu WX, Golovatch SI (2018b) The millipede genus Epanerchodus Attems, 1901 in continental China, with descriptions of seven new cavernicolous species (Diplopoda, Polydesmida, Polydesmidae). Zootaxa 4459(1): 001–046. https://doi.org/10.11646/zootaxa.4459.1.2

Liu WX, Golovatch SI (in press) Three new cavernicolous species and three new records of the millipede genus Pacidesmus from southern China (Diplopoda, Polydesmida, Polydesmidae). Raffles Bulletin of Zoology.

Liu WX, Golovatch SI, Tian MY (2014) A review of the dragon millipede genus Desmoxytes Chamberlin, 1923 in China, with descriptions of four new species (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys (448): 9–26. https://doi.org/10.3897/zookeys.448.8081

Liu WX, Golovatch SI, Tian MY (2016) Six new species of dragon millipedes, genus Desmoxytes Chamberlin, 1923, mostly from caves in China (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys 577(577): 1–24. https://doi.org/10.3897/zookeys.577.7825

Liu WX, Golovatch SI, Tian MY (2017a) Three new cavernicolous species of the millipede genus Trichopeltis Pocock, 1894 from southern China (Diplopoda, Polydesmida, Cryptodesmidae). ZooKeys 710: 1–14. https://doi.org/10.3897/zookeys.710.20025

Liu WX, Luo XZ (2013) A new species of the millipede genus Tylopus from southern China (Diplopoda: Polydesmida, Paradoxosomatidae). Acta Zootaxonomica Sinica 38(1): 50–52.

Liu WX, Tian MY (2013) Four new cavernicolous species of the millipede genus Eutrichodesmus Silvestri, 1910 from southern China (Diplopoda: Polydesmida, Paradoxosomatidae). Zootaxa 3734(2): 281–291. https://doi.org/10.11646/zootaxa.3734.2.11

Liu WX, Tian MY (2015a) A checklist of millipede genus Hyleoglomeris Verhoeff, 1910 in mainland China, with descriptions of seven new species (Diplopoda, Glomerida, Glomeridae). Zootaxa 4032(1): 103–116. https://doi.org/10.11646/zootaxa.4032.1.5

Liu WX, Tian MY (2015b) Occurrence of the millipede genus Piccola Attems, 1953 in China (Diplopoda: Polydesmida: Paradoxosomatidae). Zootaxa 3904(3): 403–408. https://doi.org/10.11646/zootaxa.3904.3.5

Liu WX, Tian MY (2015c) Two new cave-dwelling species of the millipede genus Paracortina Wang & Zhang, 1993 from southern China (Diplopoda, Callipodida, Paracortinidae). ZooKeys 517: 123–140. https://doi.org/10.3897/zookeys.517.9949

Liu WX, Golovatch SI, Wesener T (2017b) Four new species of the millipede genus Eutrichodesmus Silvestri, 1910 from Laos, including two with reduced ozopores (Diplopoda, Polydesmida, Haplodesmidae). ZooKeys 660: 43–65. https://doi.org/10.3897/zookeys.660.11780

Liu WX, Rühr PT, Wesener T (2017c) A look with mCT technology into a treasure trove of fossils: The first two fossils of the millipede order Siphoniulida discovered in Cretaceous Burmese amber (Myriapoda, Diplopoda). Cretaceous Research 74: 100–108. https://doi.org/10.1016/j.cretres.2017.01.009
Liu WX, Wesener T, Golovatch SI, Tian MY (2017d) Contributions to the millipede genus *Nepalella* Shear, 1979 from China, with four new species and first results on phylogeny based on DNA-barcoding (Diplopoda, Chordeumatida, Megalotylidae). Zootaxa 4243(3): 455–482. https://doi.org/10.11646/zootaxa.4243.3.3

Liu WX, Wynne JJ (2019) Cave millipede diversity with the description of six new species from Guangxi, China. Subterranean Biology 30: 57–94. https://doi.org/10.3897/subtbiol.30.35559

Loksa I (1960) Einige neue Diplopoden- und Chilopoden-Arten aus chinesischen Höhlen. Acta Zoologica Academiae Scientiarum Hungaricae 6(1–2):135–148.

Loomis HF (1942) *Sinocybe*, a new genus of colobognath millipedes from China. Journal of the Academy of Sciences 32: 270–273.

Makhan D (2010a) *Eutrichodesmus soesilae* sp. nov., a new millipede from Mt. Jinyun, Beibei, Chongqing, China (Diplopoda, Polydesmida, Haplodesmidae). Calodema 110: 1–5. https://www.researchgate.net/publication/320991928_Eutrichodesmus_soesilae_sp_nov_a_new_millipede_from_Mt

Makhan D (2010b) *Hyleoglomeris aschnae* sp. nov., a new millipede from Mt. Jinyun, Beibei, Chongqing, China (Diplopoda, Glomerida, Glomeridae). Calodema 113: 1–3.

Mauriès JP (2001) Sur l’identité de *Zephronia hainani* Gressitt, 1941, à propos de la description d’un nouveau *Prionobelum* (Diplopoda, Sphaerotheriida, Sphaeropoeidae) de Haïnan, Chine. Zoosystema 23(1): 131–142.

Mauriès JP (2005) *Guizhousoma latellai* gen.n., sp.n., de Chine continentale, type d’une nouvelle famille de la superfamille des Neoactrosomatoidea (Diplopoda: Chordeumatida). Arthropoda Selecta 14(1): 11–17. https://kmkjournals.com/upload/PDF/ArthropodaSelecta/14/14_1%20011_017%20Mauries.pdf

Mauriès JP, Nguyen Duy-Jacquemin M (1997) Nouveaux craspedosomides et glyphiulides cavernicoles de Chine (Diplopoda). Mémoires de Biospéologie 24: 49–62.

Meng WX, Zhang CZ (1993) A new troglobitic millipede, *Podoglyphiulus sinensis*, sp. nov. from Guizhou Province (Diplopoda, Spirostreptida, Cambalopsidae). Proceedings of the 11th International Congress of Speleology, August 2003, Beijing, 130–131.

Mikhaljova EV (2012) The class Diplopoda in Mongolia, with description of a new species. Zootaxa 3418: 41–50. https://doi.org/10.11646/zootaxa.3418.1.3

Mikhaljova EV (2017) The millipede fauna (Diplopoda) of the Asian part of Russia. Vladivostok, Dalnauka. 336 pp. [In Russian, English abstract]

Mikhaljova EV, Korsós Z (2003) Millipedes (Diplopoda) from Korea, the Russian Far East, and China in the collection of the Hungarian Natural History Museum. Acta Zoologica Academiae Scientiarum Hungaricae 49(3): 215–242.

Minelli A (2015) The Myriapoda. Volume 2. Treatise of Zoology – Anatomy, Taxonomy, Biology. Brill: Leiden & Boston, 482 pp. https://doi.org/10.1163/9789004188273

Minelli A, Golovatch SI (2013) Myriapods. In: Levin SA (Ed.) Encyclopedia of Biodiversity, Vol. 5. Academic Press, Waltham, 421–432. https://doi.org/10.1016/B978-0-12-384719-5.00208-2

Nefediev P, Nefedieva JS, Jankowski K (2015) The first record of a julid millipede (Diplopoda: Julida: Julidae) from the Altai Mountains of Mongolia. Invertebrate Zoology 12(2): 213–214. https://doi.org/10.15298/invertzool.12.2.07
Nguyen DA (2009) A new species of the family Polydesmidae (Diplopoda: Polydesmida) from Vietnam. International Journal of Myriapodology 1: 63–68. https://doi.org/10.1163/187525409X462421

Nguyen DA (2016) Discovery of a new millipede species in northern Vietnam, and the proposal of a new genus, Parariukiaria (Diplopoda, Polydesmida, Xystodesmidae). Zootaxa 4121(3): 331–336. https://doi.org/10.1163/zootaxa.4121.3.7

Ni J, Sykes MT, Prentice C, Cramer W (2000) Modelling the vegetation of China using the process-based equilibrium terrestrial biosphere model BIOME3. Global Ecology & Biogeography 9: 463–479. https://doi.org/10.1046/j.1365-2699.2000.00206.x

Pimvichai P, Enghoff H, Panha S (2010) The Rhynchoproctinae, a south-east Asiatic subfamily of giant millipedes: cladistic analysis, classification, four new genera and a deviating new species from north-west Thailand (Diplopoda: Spirostreptida: Harpagophoridae). Invertebrate Systematics 24: 51–80. https://doi.org/10.1071/IS09052

Pocock RI (1895) Report upon the Chilopoda and Diplopoda obtained by P. W. Basset-Smith, Esq., Surgeon R. N., during the cruise in the Chinese seas of H.M.S. “Penguin”, Commander W. U. Moore commanding. Annals and Magazine of Natural History (6)15: 121–142. https://doi.org/10.1080/00222939508677895

Shear WA (1999) A new troglobitic millipede of the genus Nepalella from China (Diplopoda, Chordeumatida, Megalotylidae). Myriapodologica 6(1): 1–10.

Shear WA (2002) Five new chordeumatidan millipedes from China: new species of Vieteuma (Kashmirumatidae) and Nepalella (Megalotylidae). Proceedings of the California Academy of Sciences 53(6): 62–72.

Shelley RM (2011) The milliped order Glomeridesmida (Diplopoda: Pentazonia: Limacomorpha) in Oceania, the East Indies, and southeastern Asia; first records from Palau, the Philippines, Vanuatu, New Britain, the Island of New Guinea, Cambodia, Thailand, and Borneo and Sulawesi, Indonesia. Insecta Mundi 0196: 1–11. https://journals.flvc.org/mundi/issue/view/3638

Shelley RM, Golovatch SI (2011) Atlas of myriapod biogeography. I. Indigenous ordinal and supra-ordinal distributions in the Diplopoda: perspectives on taxon origins and ages, and a hypothesis on the origin and early evolution of the class. Insecta Mundi 0158: 1–134. https://journals.flvc.org/mundi/article/view/0158

Shelley RM, Smith JM (2018) Expanded concept and revised taxonomy of the milliped family Xystodesmidae Cook, 1895 (Polydesmida: Leptodesmidea: Xystodesmoidea): incorporations of Euryuridae Pocock, 1909 and Eurymerodesmidae Causey, 1951, taxonrevivals/proposals/transferrals, and a distributional update. Insecta Mundi 0660: 1–41. https://journals.flvc.org/mundi/article/view/0660

Shelley RM, McAllister CT, Tanabe T (2005) A synopsis of the millipede genus Brachycybe Wood, 1864 (Platydesmida: Andrognathidae). Fragmenta Faunistica 48(2): 137–166. https://doi.org/10.3161/00159301FF2005.48.2.137

Srisonchai R, Enghoff H, Likhittrakarn N, Panha S (2018) A revision of dragon millipedes I: genus Desmoxytes Chamberlin, 1923, with the description of eight new species (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys 761: 1–177. https://doi.org/10.3897/zookeys.761.24214
Stoev P, Enghoff H (2005) A new cave-dwelling millipede of the genus *Bollmania* Silvestri, 1896 from Yunnan, China, with remarks on the reduction of the second female leg-pair (Diplopoda: Callipodida: Caspiopetalidae). Journal of Natural History 39(21): 1875–1891. https://doi.org/10.1080/00222930400025896

Stoev P, Enghoff H (2011) A review of the millipede genus *Sinocallipus* Zhang, 1993 (Diplopoda, Callipodida, Sinocallipodidae), with notes on gonopods monotony vs. peripheral diversity in millipedes. ZooKeys 90: 13–34. https://doi.org/10.3897/zookeys.90.1291

Stoev P, Geoffroy JJ (2004) Review of the millipede family Paracortinidae Wang & Zhang 1993 (Diplopoda: Callipodida). Acta Arachnologica 53(2): 93–103. https://doi.org/10.2476/asjaa.53.93

Stoev P, Moritz L, Wesener T (2019) Dwarfs under dinosaur legs: a new millipede of the order Callipodida (Diplopoda) from Cretaceous amber of Burma. ZooKeys 841: 79–96. https://doi.org/10.3897/zookeys.841.34991

Stoev P, Sierwald P, Billey A (2008) An annotated world catalogue of the millipede order Callipodida (Arthropoda: Diplopoda). Zootaxa 1706: 1–50. https://doi.org/10.11646/zootaxa.1706.1.1

Takakuwa Y (1942) Zur Kenntnis der japanischen Diplopoden. Annotationes Zoologicae Japonenses 21(1): 39–47.

Takakuwa Y, Takashima H (1949) Myriapods collected in Shansi, North China. Acta Arachnologica 9(314): 51–69. https://doi.org/10.2476/asjaa.11.51

Tanabe T, Ishii K, Yin WY (1996) Two new xystodesmid millipedes from the Tian-mu Mountains, Zhejiang Province, China. Edaphologia 57: 13–19.

Vagalinski B, Meng K, Bachvarova D, Stoev P (2018) A redescription of the poorly known cave millipede *Skleroprotopus membranipedalis* Zhang, 1985 (Diplopoda, Julida, Mongoliulidae), with an overview of the genus *Skleroprotopus* Attems, 1901. Subterranean Biology 26: 55–66. https://doi.org/10.3897/subtbiol.26.26225

Verhoeff KW (1934) Schwedisch-chinesische wissenschaftlich Expedition nach den nordwestlichen Provinzen Chinas, unter Leitung von Dr. Sven Hedin und Prof. Su Ping-chang. Arkiv för zoologi 26: 1–41.

Wang DQ, Mauriès JP (1996) Review and perspective of study on myriapodology of China. In: Geoffroy JJ, Mauriès JP, Nguyen Duy-Jacquemin M (Eds) Acta Myriapodologica. Mémoires du Muséum national d’Histoire naturelle 169: 81–99.

Wang DQ, Zhang CZ (1993a) A new family of millipedes (Diplopoda: Callipodida) from southwestern China. Peking Natural History Museum 53: 395–390.

Wang DQ, Zhang CZ (1993b) Diplopoda: Chilopoda. Animals of Longqi Mountain: 845–851.

Wesener T (2016) The Giant Pill-Millipedes, order Sphaerotheriida – An annotated species catalogue with morphological atlas and list of apomorphies (Arthropoda: Diplopoda). Bonn zoological Bulletin, Supplementum 63: 1–104.

Wesener T (2019) The oldest fossil pill millipede: A species of the Asiatic pill millipede genus *Hyleoglomeris* in Baltic amber (Diplopoda: Glomerida: Glomeridae). Zoologischer Anzeiger 283: 40–45. https://doi.org/10.1016/j.jcz.2019.08.009

Wulf EW (1944) A historical geography of plants. USSR Academy of Sciences Publishers, Moscow – Leningrad, 546 pp. [In Russian]
Diversity, distribution patterns and faunogenesis of the millipedes of China

Zhang BP, Mo SG, Wu HZ, Xiao F (2004) Digital spectra and analysis of altitudinal belts in Tianshan Mountains, China. Journal of Mountain Science 1(1): 18–28. https://doi.org/10.1007/BF02919356

Zhang CZ (1985a) A new species of millipeds of the genus Skleroprotopus in Stone Buddha Cave, Fangshang County, Beijing. In: Karst geomorphology and speleology. Science Press, Beijing, 154–156. [In Chinese]

Zhang CZ (1985b) A new species of millipede of the genus junceustreptus in southwestern China (Diplopoidea: Harpagophoridae). Acta Zootaxonomica Sinica 10(2): 137–139. [In Chinese]

Zhang CZ (1986) On the genus Pratinus and its two new species from China (Diplopoidea: Paradoxosomatidae). Acta Zootaxonomica Sinica 11(3): 253–257. [In Chinese]

Zhang CZ (1993a) Small Myriapoda in soil from China I. A new julidan species Anaulaciulus otigonopus (Julida: Julidae). Acta Zootaxonomica Sinica 18(1): 18–21. [In Chinese]

Zhang CZ (1993b) Diplopoidea from Yunnan caves II. Contribution to the study of a new cavernous taxon of the nematophoran millipedes (Diplopoidea: Coelocheta: Callipodida). International Union of Speleology. Proceedings of the XI International Congress of Speleology: 128–130. [In Chinese]

Zhang CZ (1995a) Small Myriapoda in soil from China II. A new genus and species of the family Doratodesmidae from Zhejiang Province (Diplopoidea: Polydesmida). Acta Zootaxonomica Sinica 20(4): 411–415. [In Chinese, English summary]

Zhang CZ (1995b) Small Myriapoda in soil from China III. A new species of the millipede genus Nanocondylodesmus Zhang (Diplopoidea: Polydesmida: Doratodesmidae). Acta Zootaxonomica Sinica 20(4): 416–419. [In Chinese, English summary]

Zhang CZ (1997) Diplopoidea from Yunnan Caves III. A new genus Angulifemur, including two new species of the cave-dwelling callipodid millipedes (Diplopoidea, Callipodida, Paracortinidae). Thesis Compilation of Tianjin Natural History Museum 14: 1–5.

Zhang CZ, Chang NG (1990) A new genus and new species of the family Harpagophoridae from Yunnan, China (Diplopoidea: Spirostreptida). Acta Zootaxonomica Sinica 15(1): 32–35. [In Chinese, English abstract]

Zhang CZ, Chen ZP (1983) A new species of the genus Epanerchodus (Diplopoidea: Polydesmidae) from Zhejiang Province. Journal of Zhejiang Teacher's College (Natural Sciences Edition) 6: 87–89. [In Chinese, English abstract]

Zhang CZ, Li ZY (1977) Eine neue Yunnanina-Art (Diplopoidea) aus China. Acta Zoologica Sinica 23(4): 357–359. [In Chinese, German abstract]

Zhang CZ, Li ZY (1981a) Über Bilinguidae fam. nov. (Diplopoidea: Spirostreptida) aus dem südchinesischen Karstgebiete. Acta Zootaxonomica Sinica 6(4): 373–377. [In Chinese, German abstract]

Zhang CZ, Li ZY (1981b) Eine neue Art vom Archandrodesmus (Cryptodesmidae, Diplopoidea) aus China. Acta Zootaxonomica Sinica 6(3): 250–252. [In Chinese, German abstract]

Zhang CZ, Li ZY (1982a) Centralodesmus cornutus sp. nov., eine neue Diplopoden-Art aus dem Süd-China (Paradoxosomatidae: Polydesmida). Acta Zootaxonomica Sinica 7(1): 37–39. [In Chinese, German abstract]
Zhang CZ, Li ZY (1982b) Die Gattung *Glyphiulus* (Diplopoda: Cambalidea) von China. *Sinozooologia* (2): 85–93. [In Chinese, German abstract]
Zhang CZ, Li ZY (1982c) Eine neue Art vom *Chinosphaera* (Sphaerotheriida, Diplopoda) aus China. *Acta Zootaxonomica Sinica* 7(2): 152–154. [In Chinese, German abstract]
Zhang CZ, Mao JR (1984) A new species of the genus *Kiulinga* (Diplopoda: Xystodesmidae). *Acta Zootaxonomica Sinica* 9(2): 135–137. [In Chinese, English abstract]
Zhang CZ, Tang HG (1985) Eine neue Art der Gattung *Hedinomorpha* (Diplopoda: Paradoxosomatidae) aus China. *Sinozooologia* 3: 35–38. [In Chinese, German abstract]
Zhang CZ, Wang DQ (1992) Chilopoda, Diplopoda, Pauropoda and Symphyla. In: Yin WY (Ed.) *Subtropical Soil Animals of China*. Beijing, Science Press: 365–392. [In Chinese]
Zhang CZ, Wang DQ (1993) Diplopoda in caves of Yunnan I. A study of new genera and species of the millipede family Doratodesmidae. In: Song LH, Ting HY (Eds) *Karst Landscape and Cave Tourism*. China Environmental Science Press, Beijing, 205–215. [In Chinese, English abstract]
Zhang CZ, Wang DQ, Zhang FX (1997) Two new genera and four new species of Diplopoda from Wuling mountains area. In: Song DX (Ed.) *Invertebrates of Wuling Mountains area, southwestern China*. Beijing: Science Press: 508–522. [In Chinese, English abstract]
Zhang CZ, Zhang NG (1997) An interesting new millipede, *Agaricogonopus acrotrifoliolatus* gen. et sp. nov., from the tropical rain-forest region of Xishuangbanna, Yunnan (Diplopoda: Sirostreptida: Harpagophoridae). *Acta Zootaxonomica Sinica* 22(4): 349–352.
Zhang F, Zhang CZ (1995) A new troglobitic species of glomerid millipeds from Yunnan (Diplopoda, Glomerida, Glomeridae). *Zoological Research* 16(1): 17–21. [In Chinese, English abstract]
Zherikhin VV (2003) A history of biomes. Selected Works. KMK Scientific Press, Moscow, 98–188. [In Russian]