

世界今生砂壳纤毛虫名录

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摘要: 砂壳纤毛虫隶属于纤毛门、旋毛纲、环毛亚纲、砂壳目。本文总结了自Kofoid和Campbell(1929)以来的分类学资料, 参照Lynn(2008)的分类系统, 整理成世界砂壳纤毛虫新名录。厘清砂壳纤毛虫共有15科69属954种, 其中海洋种为15科69属925种, 淡水种为3科5属29种。在所有属中, 以拟铃虫属(*Tintinnopsis*)包含物种最多, 为137种, 其中海洋种为118种。我国水体共记录有13科36属164种, 海洋种13科36属144种, 淡水种2科3属20种。除杯形铃壳虫(*Codonella cratera*)、湖泊领细壳虫(*Stenosemella lacustris*)、蜉蝣筒壳虫(*Tintinnidium ephemeridum*)、蝌蚪筒壳虫(*Tintinnidium ranunculi*)、半缘筒壳虫(*Tintinnidium semiciliatum*)、纺锤拟铃虫(*Tintinnopsis fusiformis*)、伊利诺拟铃虫(*Tintinnopsis illinoisensis*)、卵圆拟铃虫(*Tintinnopsis ovalis*)、圆柱拟铃虫(*Tintinnopsis cylindrata*)、这9个种外, 其他淡水种在我国都有记录。该名录中, 除了已有中文名的159种外, 其余的种我们给出了中文译名, 并将部分译为拟铃虫属(*Tintinnopsis*)的中文名统一为拟铃虫属, 部分译为麻铃虫属(*Leprotintinnus*)的中文名统一为薄铃虫属, 将截短角口虫(*Salpingella decurtata*)改为截短号角虫, 将冰生拟铃壳虫(*Codonellopsis glacialis*)改为冰生类铃虫。

关键词: 纤毛虫, 种名录, 砂壳目

Species checklist of contemporary tintinnids (Ciliophora, Spirotrichea, Choreotrichia, Tintinnida) in the world

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Abstract: A species checklist of contemporary living tintinnid (Ciliophora, Spirotrichea, Tintinnida) ciliates around the world was compiled according to references since Kofoid and Campbell (1929). A total of 954 species belonging to 69 genera and 15 families were listed in marine and fresh waters all over the world. Among them, 925 species live in marine habitats and 29 species live in fresh water biotopes. *Tintinnopsis* is the most abundant genus. It has 137 species, of which 118 live in marine habitats. In China, 164 species including 20 species in fresh waters, belonging to 36 genera and 13 families, have been recorded. Of them, 144 species live in the seas. There were 9 species, namely *Codonella cratera*, *Stenosemella lacustris*, *Tintinnidium ephemeridum*, *Tintinnidium ranunculi*, *Tintinnidium semiciliatum*, *Tintinnopsis fusiformis*, *Tintinnopsis illinoisensis*, *Tintinnopsis ovalis*, and *Tintinnopsis cylindrata*, living in fresh waters in the list were not recorded in China. In the list, Chinese species name were given, of which 159 were adopted from the present literature. We also revised Chinese name of *Salpingella decurtata*, *Codonellopsis glacialis* and several species of genera *Tintinnopsis* and *Leprotintinnus*.

Key words: ciliates, species checklist, Tintinnida

收稿日期: 2011-08-05; 接受日期: 2011-11-16

基金项目: 国家自然科学基金(40876085)、国家重点基础研究发展计划(2011CB409804)、国家 863 计划(2006AA09Z179)和公益项目(201005015-1)

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砂壳纤毛虫是单细胞原生动物,属于纤毛门旋毛纲环毛亚纲砂壳目(Lynn, 2008),是一类具壳的纤毛虫,大多营浮游生活。Müller(1776)发现了第一种砂壳纤毛虫客居筒壳虫(*Tintinnus inquilinus*)。Kofoed和Campbell(1929)总结了当时已发现的砂壳纤毛虫,共12科51属1,000余种,随后又于1939年将砂壳纤毛虫重新整理并确认为13科62属726种(Kofoed & Campbell, 1939)。Corliss(1979)估计砂壳纤毛虫有1,200种左右,此后许多研究者(Agatha & Riedel-Lorjé, 2006; Lynn, 2008; Agatha, 2010a)的估计大都在1,200种左右。砂壳纤毛虫是纤毛虫中种类最多的目(Lynn, 2008),但迄今无一份详细的名录。本文搜集了现今的有关文献,整理了世界和我国的砂壳纤毛虫名录,并给出了中文译名。

1 文献收集

在Kofoed和Campbell(1929, 1939)的种名录基础上,本文收录所参依的主要文献有: Agatha & Riedel-Lorjé (2006); Agatha & Strüder-Kypke (2007); Agatha & Tsai (2008); Agatha (2008, 2010a, b); Alder (1999); Bakker & Phaff (1976); Balech (1948, 1959, 1962, 1968, 1975); Burns (1983); Campbell (1942); Cai等(2006); Choi等(1992); Cardinal等(1977); Cordeiro & Sassi (1997); Corliss (1979); Cosper (1972); Culverhouse等(1994); Davis (1978); De Pauw (1975); Durán (1957, 1965); Fernandes(1999, 2004a, b); Foissner & Wilbert(1979); Gold & Morales (1975a, b, c, 1976, 1977); Hada(1937, 1961, 1970); Hedin (1976); Hofker (1931); Jörgensen (1924); Kim等(2010); Krishnamurthy & Santhanam(1978); Kršinić & Precali (1997); Kufferath (1950); Lackey & Balech (1966); Laval-Peuto (1981, 1994); Laval-Peuto & Brownlee (1986); Ling (1965); Loeblich & Tappan (1968); Lynn (2008); Marshall (1934); Massuti & Margalef (1950); Müller (1776); Petz等(1995); Pierce (1996); Sassi & Melo (1991); Schwarz (1964); Sharaf & Gibreel (1995); Skryabin & Al-Yamani (2006, 2007); Small & Lynn (1985); Sniezek等(1991); Snyder & Brownlee (1991); Tsai等(2008); Wasik & Mikolajczyk (1992, 1994a, b); Wasik等(1996); Wasik (1998); Williams等(1994); Xu & Song (2005); Yoo &

Kim (1988, 1990); Zeitzschel (1969); 刘瑞玉(2008); 宋微波(1993); 宋微波等(2009); 宋微波和徐奎栋 (1999); 徐大鹏(2007); 徐大鹏和宋微波(2005); 徐奎栋等 (2001)。包括部分淡水种: Foissner & O'donoghue(1990); Foissner & Wilbert (1979); Hilliard (1968); Nie (1933); Wailes (1938); 蒋燮治(1956)。

2 结果

分类系统参照Lynn(2008)。本文共收录世界今生砂壳纤毛虫15科69属954种(表1),其中有纤毛图式砂壳纤毛虫44种。各属中以拟铃虫属(*Tintinnopsis*)包含物种最多,为137种。其中,世界海洋种有15科69属925种,拟铃虫属种类最多,为118种,淡水种共计3科5属29种。

我国水体共记录砂壳纤毛虫13科36属164种,刘瑞玉(2008)收录了以前我国记录的海洋种类128种,本文参考此后的文献(赵楠等, 2007; 张翠霞等, 2009, 2010; 丰美萍等, 2010; 刘华雪等, 2011),整理得出我国海洋种共计13科36属144种。淡水种(Nie, 1933; 蒋燮治, 1956)共计2科3属20种。除杯形铃壳虫(*Codonella cratera*)、湖泊领细壳虫(*Stenosemella lacustris*)、蜉蝣筒壳虫(*Tintinnidium ephemeridum*)、蝌蚪筒壳虫(*Tintinnidium ranunculi*)、半缘筒壳虫(*Tintinnidium semiciliatum*)、纺锤拟铃虫(*Tintinnopsis fusiformis*)、伊利诺拟铃虫(*Tintinnopsis illinoisensis*)、卵圆拟铃虫(*Tintinnopsis ovalis*)、圆柱拟铃虫(*Tintinnopsis cylindrata*)这9种外,其他淡水种在我国都有记录(蒋燮治, 1956)。

在世界砂壳纤毛虫名录中,已有中文名的种有159种(蒋燮治, 1956; 宋微波和徐奎栋, 1999; 徐奎栋等, 2001; 黄宗国, 2008; 刘瑞玉, 2008; 宋微波等, 2009),本文中我们对已有的中文名进行了订正,其他种的中文名为我们自己翻译(表1)。早期中文文献对属名有多种翻译,我们统一了同一属的中文名。如蒋燮治(1956)将*Tintinnopsis*称为似铃虫属,我们改为多数人所用的拟铃虫,将*Leprotintinnus*称为麻铃虫属,我们改为多数人所用的薄铃虫属。另外,宋微波等(1999)将*Salpingella decurtata*译为截短角口虫,我们改为截短号角虫; 宋微波(1993)将中*Codonellopsis glacialis*译为冰生拟铃壳虫,我们改为冰生类铃虫。

3 讨论

Lynn(2008)列出、而本文没有列入名录的属有: 砂壳科的布施虫属(*Buschiella*)、原瓮虫属(*Proamphorella*)和膜虫属(*Membranicola*), 类杯科的伪杯虫属(*Pseudometacylis*), 囊坎科中未定属潞西虫属(*Luxiella*)、波膜科中微波膜虫属(*Micrundella*)、未定属圆形虫属(*Rotundocylis*)及滑壳科中螺平顶虫属(*Spiroxystonella*)、未定属类网纹虫属(*Parafavelloides*)。这些属有的是被Lynn(2008)自己定为未定种属, 有的是被其他分类系统明确否定过, 且找不到除种名外的其他任何资料, 故此不再列出。

另外, 有些属有明显的特征, 在属的归类上比较确定, 没有异议, 但有些属的分类系统不确定。如瓮虫属(*Amphorella*)和瓮状虫属(*Amphorides*)这两个属, 不同的作者有不同的归类, Lynn(2008)和刘瑞玉(2008)将瓮虫属的种都归到瓮状虫属中, WoRMS网站(<http://www.marinespecies.org>)则保留此两属, 我们根据WoRMS网站仍保留为两个属。丁丁虫属(*Tintinnus*)与真铃虫属(*Eutintinnus*)的分类特征比较相近, 已有文献中对其中有些种的归属有不同意见, 本文中将丁丁虫属中与真铃虫属种名相同的并入后者。

目前, 砂壳纤毛虫种的定名都是以壳的特征为分类依据, 但有些专家(Laval-Peuto, 1981; Gold & Morales, 1976; Alder, 1999)指出, 除口径比较稳定外, 壳的形态和长度变化较大, 因此, 现代分类学建议用纤毛图式作为鉴定种的决定性依据(Agatha & Tsai, 2008; Agatha, 2010a)。但是目前有纤毛图式的砂壳纤毛虫种数太少(只有44种), 所以壳的特征在一段时间内依然是砂壳纤毛虫分类的重要依据。由于上述原因, 在现有已定名的种当中, 很可能有一些隐种和同物异名种。

本研究共列出今生砂壳纤毛虫954种, 而以往的估计是1,200种; 其中拟铃虫属(*Tintinnopsis*) Agatha (2010b)估计有160种, 本文的记录为137种。这种差异可能是由于一些属我们没有查到(见讨论第一段), 且未统计化石种。根据Lynn(2008)的统计, 在今生砂壳纤毛虫中, 有4个科有化石种: 铃壳科(*Codonellidae*)(16属)、类铃科(*Codonellopsidae*)(12属)、类杯科(*Metacylididae*)(3属)和滑壳科(*Xystonellidae*)(1属)。另外还有5个分类地位不确定的化石

科: 它们是柏隆科(*Berounkellidae*)(8属)、喀道科(*Cadosinidae*)(3属)、钙球科(*Calcisphaerulidae*)(2属)、宽帽科(*Causiidae*)(1属)和口球科(*Stomiosphaeridae*)(5属), 还有5个未定科的属(*Aubertiella*, *Daturellina*, *Praecolomiella*, *Spirocystomellites*, *Syringella*)。

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附录I 砂壳纤毛虫种名录(#淡水种, *已有中文名, △我国发现的种, ◇有纤毛图式的种)

Appendix I Species checklist of world tintinnid (# fresh water species; * pre-existing Chinese names; △ species in China waters; ◇ species with ciliary pattern)

<http://www.biodiversity-science.net/fileup/PDF/w2011-136-1.pdf>