

附录1 小球藻科包含种属名录信息

Appendix 1 Genera and species information in Chlorellaceae

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
小球藻属 <i>Chlorella</i>	53	<i>Chlorella acuminata</i>		—
		<i>Chlorella antarctica</i>		KU291887.1
		<i>Chlorella bacterioidea</i>		—
		<i>Chlorella botryoides</i>		—
		拟绿小球藻 <i>Chlorella chlorelloides</i>		HQ111432
		群体小球藻 <i>Chlorella colonialis</i>	是(宋会银, 2018)	FM205862
		<i>Chlorella conglomerata</i>		—
		长小球藻 <i>Chlorella elongata</i>		FM205858
		<i>Chlorella faginea</i>		—
		<i>Chlorella genevensis</i>		—
		旋动小球藻 <i>Chlorella heliozoae</i>		FM205850.1
		<i>Chlorella infusioinum</i>		—
		<i>Chlorella lewinii</i>	是(李昂, 2017)	FM205861.1
		<i>Chlorella miniata</i>		KU291890
		<i>Chlorella nocturna</i>		—
		<i>Chlorella oocystoides</i>		—
		<i>Chlorella pachyderma</i>		—
		<i>Chlorella peruviana</i>		—
		<i>Chlorella photophila</i>		—
		<i>Chlorella pituita</i>		GQ176853
		美好小球藻 <i>Chlorella pulchelloides</i>	是(宋会银, 2018)	HQ111431
		<i>Chlorella rotunda</i>		HQ111433.1
		<i>Chlorella rugosa</i>		—
		<i>Chlorella salina</i>		KM020042.1
		单体小球藻 <i>Chlorella singularis</i>	是(宋会银, 2018)	HQ111435.1
		索罗金小球藻 <i>Chlorella sorokiniana</i>	是(宋会银, 2018)	FM205834
		<i>Chlorella stigmatophora</i>		KM020186.1
		<i>Chlorella vanniellii</i>		—
		多变小球藻 <i>Chlorella variabilis</i>		FM205849
		<i>Chlorella variegata</i>		—
		<i>Chlorella volutis</i>		HQ111434.1
		普通小球藻 <i>Chlorella vulgaris</i>	是(宋会银, 2018)	FM205832
		<i>Chlorella asymmetrica</i>		—
		<i>Chlorella brasiliensis</i>		—
		<i>Chlorella cladoniae</i>		—
		<i>Chlorella coelastroides</i>		—
		<i>Chlorella desiccata</i>		—
		<i>Chlorella genevensis</i>		—
		<i>Chlorella glucotropha</i>		—
		<i>Chlorella koettlitzii</i>		—
		<i>Chlorella lacustris</i>		—
		<i>Chlorella microscopica</i>		—
		<i>Chlorella nana</i>		—
		<i>Chlorella neustonica</i>		—
		<i>Chlorella pacifica</i>	是(张聪等, 2010)	—
		<i>Chlorella rubescens</i>		—
		<i>Chlorella simplex</i>		—
		<i>Chlorella subsphaerica</i>		—
		<i>Chlorella tetraedrica</i>		—

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
		<i>Chlorella thermophila</i>	是 (Ma et al, 2015)	KF661334+KJ0026 39
		<i>Chlorella ultrasquamata</i>		—
		<i>Chlorella werthii</i>		—
		<i>Chlorella xanthella</i>		—
微芒藻属 <i>Micractinium</i>	25	<i>Micractinium appendiculatum</i>		—
		<i>Micractinium belenophorum</i>	是(毕列爵和胡征宇, 2004)	AY323837.1
		博恩微芒藻 <i>Micractinium bornhemiense</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Micractinium conductrix</i>	是(宋会银, 2018)	FM205851.1
		<i>Micractinium conococcoides</i>		—
		粗刺微芒藻 <i>Micractinium crassisetum</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Micractinium crassispinum</i>		—
		扁球微芒藻 <i>Micractinium depressum</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Micractinium elongatum</i>		—
		<i>Micractinium extremum</i>		—
		<i>Micractinium inermum</i>	是(宋会银, 2018)	AB731604.1
		<i>Micractinium kostikovii</i>		—
		<i>Micractinium octospinum</i>		—
		<i>Micractinium parvisetum</i>		—
		<i>Micractinium parvum</i>		—
		<i>Micractinium paucispinum</i>		—
		<i>Micractinium pusillum</i>	是(宋会银, 2018)	AF364102.1
		四刺微芒藻 <i>Micractinium quadrisetum</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Micractinium simplicissimum</i>		HQ404895.1
		<i>Micractinium singularis</i>		MN414469.1
		<i>Micractinium strigoniense</i>		—
		<i>Micractinium tetrahymenae</i>		MT359915
		<i>Micractinium valkanovii</i>	是(张潇月, 2018)	—
		<i>Micractinium variabile</i>		MN414468.1
		<i>Micractinium viride</i>		—
集星藻属 <i>Actinastrum</i>	16	针状集星藻 <i>Actinastrum aciculare</i>	是(刘国祥和胡征宇, 2012)	—
		<i>Actinastrum bacillare</i>		—
		<i>Actinastrum cerastioides</i>		—
		<i>Actinastrum ellipsoideum</i>		—
		河生集星藻 <i>Actinastrum fluviatile</i>	是(刘国祥和胡征宇, 2012)	—
		小形集星藻 <i>Actinastrum gracillimum</i>	是(刘国祥和胡征宇, 2012)	—
		<i>Actinastrum guttula</i>		—
		汉斯集星藻 <i>Actinastrum hantzschii</i>	是(刘国祥和胡征宇, 2012)	FM205884.1
		<i>Actinastrum indicum</i>		—
		<i>Actinastrum javanicum</i>		—
		<i>Actinastrum mixtum</i>		—
		拟针形集星藻 <i>Actinastrum raphidoides</i>	是(刘国祥和胡征宇, 2012)	—
		<i>Actinastrum raphidioides</i>		—
		<i>Actinastrum schroeteri</i>		—
		近角形集星藻 <i>Actinastrum subcornutum</i>	是(刘国祥和胡征宇, 2012)	—
		<i>Actinastrum tetaniforme</i>		—
黑氏球藻属 <i>Hegewaldia</i>	1	微小黑氏球藻 <i>Hegewaldia parvula</i>	是(毕列爵和胡征宇, 2004)	FM205842.1

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
海尼球藻属 <i>Heynigia</i>	2	河流海尼球藻 <i>Heynigia riparia</i>		GQ487225.1
		胶网海尼球藻 <i>Heynigia dictyosphaerioides</i>		GQ487221.1
亨氏球藻属 <i>Hindakia</i>	2	虚假亨氏球藻 <i>Hindakia fallax</i>		GQ487223.1
		四叉亨氏球藻 <i>Hindakia tetrachotoma</i>	是(毕列爵和胡征宇, 2004)	GQ487233.1
冠星藻属 <i>Coronastrum</i>	4	<i>Coronastrum aestivale</i>		—
		<i>Coronastrum chodatii</i>		—
		椭圆冠星藻 <i>Coronastrum ellipsoideum</i>	是(刘国祥和胡征宇, 2012)	GQ507370.1
		月形冠星藻 <i>Coronastrum lunatum</i>	是(刘国祥和胡征宇, 2012)	—
<i>Carolibrandtia</i>	1	<i>Carolibrandtia ciliaticola</i>		LC228604.1
对囊藻属 <i>Didymogenes</i>	8	畸形对囊藻 <i>Didymogenes anomala</i>	是(刘国祥和胡征宇, 2012)	FM205839.1
		<i>Didymogenes dubia</i>		—
		<i>Didymogenes granulata</i>		—
		<i>Didymogenes hortobagyii</i>		—
		<i>Didymogenes hungarica</i>		—
		鄂状对囊藻 <i>Didymogenes palatina</i>	是(刘国祥和胡征宇, 2012)	FM205840
		独居对囊藻 <i>Didymogenes soliella</i>		AB731605
		球状对囊藻 <i>Didymogenes sphaerica</i>		AB731603
迈耶球藻属 <i>Meyerella</i>	1	浮游迈耶球藻 <i>Meyerella planktonica</i>		AY543040
类小球藻属 <i>Parachlorella</i>	3	<i>Parachlorella beijerinckii</i>		FM205845.1
		胡斯类小球藻 <i>Parachlorella hussii</i>		HM126550.1
		凯氏类小球藻 <i>Parachlorella kessleri</i>	是(宋会银, 2018)	FM205846.1
卡兰津藻属 <i>Kalenjinia</i>	1	<i>Kalenjinia gelatinosa</i>		GQ477061
马拉球藻属 <i>Marasphaerium</i>	1	<i>Marasphaerium gattermannii</i>		GQ477057
马塞藻属 <i>Masaia</i>	1	<i>Masaia oloidia</i>		GQ477060
霉球藻属 <i>Mucidosphaerium</i>	4	<i>Mucidosphaerium palustre</i>		GQ487216
		<i>Mucidosphaerium planctonicum</i>		GQ487201
		美丽霉球藻 <i>Mucidosphaerium pulchellum</i>	是(毕列爵和胡征宇, 2004)	GQ176861
		<i>Mucidosphaerium sphagnale</i>		GQ487218
胶网藻属 <i>Dictyosphaerium</i>	18	<i>Dictyosphaerium coacervatum</i>		—
		艾伦胶网藻 <i>Dictyosphaerium ehrenbergianum</i>	是(毕列爵和胡征宇, 2004)	GQ487192
		<i>Dictyosphaerium globosum</i>		—
		颗粒胶网藻 <i>Dictyosphaerium granulatum</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Dictyosphaerium indicum</i>		—
		湖生胶网藻 <i>Dictyosphaerium lacustre</i>	是(宋会银, 2018)	GQ487206
		自由胶网藻 <i>Dictyosphaerium libertatis</i>	是(宋会银, 2018)	GQ487211
		<i>Dictyosphaerium oviforme</i>		—
		<i>Dictyosphaerium planctonicum</i>		—
		<i>Dictyosphaerium primum</i>		—
		<i>Dictyosphaerium pusillum</i>		—
		<i>Dictyosphaerium regulare</i>		—
		肾形胶网藻 <i>Dictyosphaerium reniforme</i>	是(毕列爵和胡征宇, 2004)	—
		简单胶网藻 <i>Dictyosphaerium simplex</i>	是(毕列爵和胡征宇, 2004)	—

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
		<i>Dictyosphaerium simplex</i>		—
		<i>Dictyosphaerium skujae</i>		—
		<i>Dictyosphaerium subsolitarium</i>		—
		<i>Dictyosphaerium terrestre</i>		—
拟新月藻属 <i>Closteriopsis</i>	5	<i>Closteriopsis acicularis</i>	是(毕列爵和胡征宇, 2004)	FM205847.1
		<i>Closteriopsis drepaniformis</i>		—
		<i>Closteriopsis longissima</i>	是(毕列爵和胡征宇, 2004)	—
		<i>Closteriopsis petkovii</i>		—
		<i>Closteriopsis scoliaomas</i>		—
紧聚球藻属 <i>Compactochlorella</i>	2	<i>Compactochlorella dohrmannii</i>		GQ477058.1
		<i>Compactochlorella kochii</i>		HQ322125
冠球藻属 <i>Coronacoccus</i>	1	<i>Coronacoccus hengyangensis</i>	是 (Song et al, 2018a)	MF086581
双月藻属 <i>Dicloster</i>	1	<i>Dicloster acuatus</i>	是(刘国祥和胡征宇, 2012)	FM205848
浮小球藻属 <i>Planktochlorella</i>	1	努列克浮小球藻 <i>Planktochlorella nurekis</i>		HF677200.1
海球藻属 <i>Marinichlorella</i>	1	<i>Marinichlorella kaistiae</i>		AB176665
微绿球藻属 <i>Nannochloris</i>	2	<i>Nannochloris bacillaris</i>		AB080300
		<i>Nannochloris normandinae</i>		KM020167.1
<i>Marvania Hindák</i>	2	<i>Marvania coccooides</i>		FR865696.1
		<i>Marvania geminata</i>		KM020037.1
假绿藻属 <i>Pseudochloris</i>	1	<i>Pseudochloris wilhelmii</i>		JX235961.1
绿微藻属 <i>Chloroparva</i>	1	潘诺尼亚绿微藻 <i>Chloroparva panonica</i>		FJ013257.1
旋孢藻属 <i>Helicosporidium</i>	1	<i>Helicosporidium parasiticum</i>		—
<i>Pumiliosphaera</i>	1	<i>Pumiliosphaera acidophila</i>		LN610705.1
异养小球藻属 <i>Auxenochlorella</i>	3	<i>Auxenochlorella protothecoides</i>		MK182286
		<i>Auxenochlorella pyrenoidosa</i>		MT951391.1
		共生异养小球藻	是(宋会银, 2018)	FN298932.1
无绿藻属 <i>Prototheca</i>	22	<i>Auxenochlorella symbiontica</i>		AY973041.1
		<i>Prototheca blaschkeae</i>		MK445199.1
		<i>Prototheca bovis</i>		MK445195.1
		<i>Prototheca cerasi</i>		—
		<i>Prototheca chlorelloides</i>		—
		<i>Prototheca ciferrii</i>		AB077049.1
		<i>Prototheca cookeri</i>		MK445223.1
		<i>Prototheca crieana</i>		—
		<i>Prototheca cutis</i>		MT360051.1
		<i>Prototheca kruegeri</i>		—
		<i>Prototheca miyajii</i>		MF163522.1
		<i>Prototheca paracutis</i>		—
		<i>Prototheca pringsheimii</i>		MK445205.1
		<i>Prototheca salmonis</i>		—
		<i>Prototheca segbwema</i>		—
		大型无绿藻 <i>Prototheca stagnorum</i>		AB183196.1
		<i>Prototheca trispora</i>		—
		<i>Prototheca tumulicola</i>		LC090554.1
		<i>Prototheca ulmea</i>		MF163518.1
		<i>Prototheca viscosa</i>		—
		小型无绿藻 <i>Prototheca wickerhamii</i>	是(索继江等, 1999)	X74003.1

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
		<i>Prototheca xanthoriae</i>		MK445211.1
<i>Endolithella</i>	1	中型无绿藻 <i>Prototheca zopfii</i>	是(戴迪等, 2018)	X63519.2
<i>Muriella</i>	4	<i>Endolithella mcmurdoensis</i>		MK682757.1
		<i>Muriella australis</i>		–
		<i>Muriella decolor</i>		JN968587.1
		<i>Muriella magna</i>		–
		<i>Muriella terrestris</i>		AB012845.1
<i>Nanochlorum</i>	1	<i>Nanochlorum eucaryotum</i>		X06425.1
<i>Picochlorum</i>	5	<i>Picochlorum atomus</i>		AB080305.1
		<i>Picochlorum costavermella</i>		–
		<i>Picochlorum eukaryotum</i>		KU561201.1
		<i>Picochlorum maculatum</i>		KU561137.1
		<i>Picochlorum oklahomense</i>		AY422073.1
<i>Laetitia</i>	1	<i>Laetitia sardoa</i>		MZ955362
十字藻 <i>Crucigenia</i>	1	华美十字藻 <i>Crucigenia lauterbornii</i>	是(曹毅等, 2020)	JQ356710.1
分类位置待进一步确认的种属名录 Taxonomic position is to be further confirmed				
<i>Koliella</i>	1	<i>Koliella spiculiformis</i>		AJ306534.1
<i>Catena</i>	2	<i>Catena viridis</i>		GU592792.1
		<i>Catena denatoniana</i>		–
<i>Apodococcus</i>	2	<i>Apodococcus characioides</i>		–
		<i>Apodococcus guanensis</i>		–
<i>Cylindrocelis</i>	1	<i>Cylindrocelis cylindrica</i>		–
双细胞藻属 <i>Dicellula</i>	1	<i>Dicellula geminata</i>	是(彭聪聪等, 2012)	–
<i>Fissuricella</i>	1	<i>Fissuricella filamenta</i>		–
拟多芒藻属 <i>Golenkiniopsis</i>	6	<i>Golenkiniopsis chlorelloides</i>		–
		<i>Golenkiniopsis gujaratensis</i>		–
		<i>Golenkiniopsis longispina</i>		–
		<i>Golenkiniopsis maxima</i>		–
		<i>Golenkiniopsis solitaria</i>	是(彭聪聪等, 2012)	–
		<i>Golenkiniopsis varians</i>		–
角球藻属 <i>Keratococcus</i>	9	<i>Keratococcus angulus</i>		–
		<i>Keratococcus bicaudatus</i>		–
		<i>Keratococcus dispar</i>		–
		<i>Keratococcus mucicola</i>		–
		<i>Keratococcus obtusus</i>		–
		<i>Keratococcus raphidioides</i>		–
		<i>Keratococcus sabulosus</i>		–
		<i>Keratococcus sestonicus</i>		–
		<i>Keratococcus suecicus</i>		–
<i>Palmellochaete</i>	1	<i>Palmellochaete tenerrima</i>		–
<i>Podohedra</i>	6	<i>Podohedra bicaudata</i>		–
		<i>Podohedra distincta</i>		–
		<i>Podohedra georgei</i>		–
		<i>Podohedra longipes</i>		–
		<i>Podohedra saltans</i>		–
		<i>Podohedra tropica</i>		–
<i>Pseudosiderocelopsis</i>	1	<i>Pseudosiderocelopsis antarctica</i>		–
褐孢藻属 <i>Siderocelis</i>	10	<i>Siderocelis colonialis</i>		–
		<i>Siderocelis estheriana</i>		–
		<i>Siderocelis fluviatilis</i>		–

属名 Genera	物种数 No. of species	种名 Species	是否在我国报道及参考文献 Whether it has been reported in China, and referenced	GenBank 序列号 GenBank accession (SSU)
		<i>Siderocelis granulata</i>		—
		<i>Siderocelis kolkwitzii</i>		—
		<i>Siderocelis minor</i>		—
		<i>Siderocelis minor</i>		—
		<i>Siderocelis oblonga</i>		—
		<i>Siderocelis ornata</i>		—
		<i>Siderocelis sphaerica</i>		—
粗刺藻属 <i>Acanthosphaera</i>	2	<i>Acanthosphaera castanea</i>		—
		<i>Acanthosphaera zachariasii</i>	是(刘腾腾, 2019)	—
胶丝藻属 <i>Gloeotila</i>	17	<i>Gloeotila antliaria</i>		—
		<i>Gloeotila coronata</i>		AY422074.1
		<i>Gloeotila caldaria</i>		—
		<i>Gloeotila capensis</i>		—
		<i>Gloeotila cateniformis</i>		—
		<i>Gloeotila compacta</i>		—
		<i>Gloeotila curta</i>		—
		<i>Gloeotila fennica</i>		—
		<i>Gloeotila hyalina</i>		—
		<i>Gloeotila longicellularis</i>		—
		<i>Gloeotila monospora</i>		—
		<i>Gloeotila mucosa</i>		—
		<i>Gloeotila oscillarina</i>		—
		<i>Gloeotila pallida</i>		—
		<i>Gloeotila sestonica</i>		—
		<i>Gloeotila subconstricta</i>		—
		<i>Gloeotila subtilis</i>		—

参考文献

- Bi LJ, Hu ZY (2004) Flora Algarum Sinicarum Aquae Dulcis (Tomus 8). Chlorophyta: Chlorococcales (I). Science Press, Beijing. (in Chinese) [毕列爵, 胡征宇 (2004) 中国淡水藻志(第八卷)·绿藻门: 绿球藻目(上). 科学出版社, 北京.]
- Cao Y, Li L, Chen LP, Liu QG, Hu ZJ (2020) Structural characteristics of phytoplankton community in suburb rivers for leisure located in Green belt around City of Shanghai, China. Journal of Shanghai Ocean University, 29, 734–745. (in Chinese with English abstract) [曹毅, 李丽, 陈丽平, 刘其根, 胡忠军 (2020) 上海市环城绿带休憩型河道浮游植物群落结构特征. 上海海洋大学学报, 29, 734–745.]
- Dai D, Liao J, Lin WD, Feng Q, Huang P, Liang XH, Wang J, Qin AJ, Jin WJ (2018) Isolation and identification of 4 *Prototheca zopfii* sourced from cow. Journal of Anhui Agricultural Sciences, 46, 78–79, 86. (in Chinese with English abstract) [戴迪, 廖俊, 林伟东, 冯清, 黄攀, 梁祥焕, 王建, 秦爱建, 金文杰 (2018) 4株奶牛源左氏无绿藻的分离与鉴定. 安徽农业科学, 46, 78–79, 86.]
- Li A (2017) Screening of Microalgae Strains for Sewage Treatment and The Study on Enlarge Culture Technology, Biomass Utilization of *Desmodesmus* sp. PhD dissertation, Hainan University, Haikou. (in Chinese with English abstract) [李昂 (2017) 污水处理优势微藻株的筛选及 *Desmodesmus* sp. WC08 扩培工艺与产物利用研究. 博士学位论文, 海南大学, 海口.]
- Liu GX, Hu ZY (2012) Flora Algarum Sinicarum Aquae Dulcis (Tomus 15) · Chlorophyta: Chlorococcales (II), Tetrasporales, Dichotomosiphonales, Cladophorales. Science Press, Beijing. (in Chinese) [刘国祥, 胡征宇 (2012) 中国淡水藻志 (第十五卷) · 绿藻门: 绿球藻目(下), 四胞藻目, 叉管藻目, 刚毛藻目. 科学出版社, 北京.]
- Liu TT (2019) Community Structure of Phytoplankton and Its Relation with Environmental Factors in Taihu Lake, China. Master's thesis, Shanghai Normal University, Shanghai. (in Chinese with English abstract) [刘腾腾 (2019) 太湖浮游植物群落结构及与环境因子的相关性. 硕士学位论文, 上海师范大学, 武汉.]
- Ma S, Han BY, Huss VAR, Hu XW, Sun XP, Zhang JM (2015) *Chlorella thermophila* (Trebouxiophyceae, Chlorophyta), a novel thermo-tolerant *Chlorella* species isolated from an occupied rooftop incubator. Hydrobiologia, 760, 81–89.
- Peng CC, Li ZJ, Cao YC, Wen GL, Liu XZ, Hu XJ (2012) The community characteristics of planktonic microalgae in Tilapai's

culture ponds near the Pearl River estuary. *Journal of Agro-Environment Science*, 31, 2019–2030. (in Chinese with English abstract) [彭聪聪, 李卓佳, 曹煜成, 文国樑, 刘孝竹, 胡晓娟 (2012) 珠江河口区罗非鱼养殖池塘中浮游微藻的群落特征. 农业环境科学学报, 31, 2019–2030.]

Song HY (2018) Taxonomic and Phylogenetic Studies of the Chlorellaceae from China. PhD dissertation, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan. (in Chinese with English abstract) [宋会银 (2018) 中国小球藻科的分类及系统发育研究. 博士学位论文, 中国科学院水生生物研究所, 武汉.]

Song HY, Liu XD, Hu YX, Wang QH, Long JJ, Liu GX, Hu ZY (2018a) *Coronacoccus hengyangensis* gen. et sp. nov., a new member of Chlorellaceae (Trebouxiophyceae, Chlorophyta) with radiococcacean morphology. *Phycologia*, 57, 363–373.

Suo JJ, Chen SP, Yu RY, Hu DM, Feng Z, Xie L, Xing YB (1999) Micro-structural investigation on *Prototheca wickerhamii*. *Academic Journal of Chinese PLA Medical School*, 20, 123–125. (in Chinese with English abstract) [索继江, 陈世平, 虞瑞尧等 (1999) 小型无绿藻的形态与显微结构观察. 军医进修学院学报, 20, 45–47.]

Zhang C, Xie S, Meng FP (2010) Study on *Chlorella pacifica* cultivation based on municipal sewage sludge. *Chinese Journal of Environmental Engineering*, 4, 1186–1190. (in Chinese with English abstract) [张聪, 谢爽, 孟范平 (2010) 城市污水厂污泥替代营养盐培养海水小球藻的研究. 环境工程学报, 4, 1186–1190.]