

中国衣藻属研究(I) *

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摘 要: 报道了衣藻属(*Chlamydomonas*)的9个新种:近条纹衣藻、具孔衣藻、顶角衣藻、近环形衣藻、具粒衣藻、近具喙衣藻、不整衣藻、疣突衣藻、倒卵形衣藻,以及4个新变种:阿美衣藻大型变种、似博泡衣藻大型变种、侏儒衣藻陈氏变种和锥形衣藻胶被变种。

关键词: 团藻目; 衣藻属; 新种; 新变种

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Study on the Genus of *Chlamydomonas* in China (I) *

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Abstract: This paper reports 13 species of genus *Chlamydomonas* (Volvocales), including 9 new species: *Chla. subfasciata*, *Chla. punctulata*, *Chla. granumata*, *Chla. subrhinoceros*, *Chla. unregularis*, *Chla. verruculata*, *Chla. apiangulata*, *Chla. subannulata* and *Chla. aboviformis*, as well as 4 new varieties (*Chla. ametastatos* var. *major*, *Chla. pseudopulsatilla* var. *major*, *Chla. pumiliomformormis* var. *chenii* and *Chla. conica* var. *gelatinosa*).

Key words: Volvocales; *Chlamydomonas*; New species; New varieties

团藻目(Volvocales)是绿藻门(Chlorophyta)绿藻纲(Chlorophyceae)最大的类群,种类繁多、分布广。衣藻属(*Chlamydomonas*)是团藻目最大的一个类群,全世界已报道约500种(包括变种)。在武汉和哈尔滨等地采集的标本中,发现了衣藻属9个新种和4个新变种,报道如下。

1 近条纹衣藻 新种 图1:1,图3:12

Chlamydomonas subfasciata H. J. Hu et M. Yang sp. nov.

细胞近球形,细胞壁较厚;细胞前端具1个较大的方形突起,2条等长的、略短于体长的鞭毛从突起两侧伸出;鞭毛基部具2个伸缩泡;色素体杯状,其上部具有穿孔,基部具1个大的、球形的蛋白核;眼点小,逗点状,位于细胞前端1/3处。细胞长16.0~18.5 μm,宽16.5~19.0 μm。

细胞和乳突形态与*Chla. fasciata* Ettl相似,本新种仅色素体上部具穿孔,与后者(具条纹)有明显的区别。

采集地:黑龙江,哈尔滨五常县临时水洼,水温26℃,pH 6.5;时间:2005-06-01;采集人:杨敏,李晶;模式标本号(Type):WC-4。

The cells are sub globose, 16.0 – 18.5 μm in length and 16.5 – 19.0 μm in breadth. Cell wall is thickened; the anterior end bears a broad, truncate papilla, flagella is a little shorter than the cell; two contractile vacuoles located at the base of flagella; Chromatophore cup-shaped, its upper part perforated, its base thickened, where a large spherical pyrenoid is located. The eyespot is small, bean-shaped, in the anterior one third of the cell.

This alga resembles *Chla. fasciata* Ettl, but differs in the structure of the chromatophore.

Habitat: in road side, a small pool.

Cellulae prope globosis, membrana crassa, papilla magna truncate; flagellis 2, aequilibus, cellulis leviter, brevioribus; vacuoles binae, ad basin flagellorum sitae; Chromatophoro ollaeformi, parte basali incrassata, super-

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ficie perforate; prenoide globoso in parte basali Chromatophori; stigmatum fabiformi in parte anteriore sito; Cellulae 16.0 – 18.5 μm longae et 16.5 – 19.0 μm latae.

Holotypus: WC-4, nostra Figurae 1:1, Figurae 3:12.

2 具孔衣藻 新种 图 1:6 ~ 9

Chlamydomonas punctulata H. J. Hu et M. Yang sp. nov.

细胞侧扁,多为卵形、椭圆形或梨形,两端钝圆,前端略窄;细胞前端具2条等长的、约为体长1.5倍的鞭毛,其基部具2个伸缩泡;无乳头状突起;色素体杯状,基部增厚,沿细胞壁边缘几乎达到细胞前端,色素体上具圆形穿孔纹,基部具1个大的球形或少数略为方形的蛋白核;细胞核位于细胞前端的空腔内;无眼点。细胞长12.5 ~ 17.5 μm ,宽7.5 ~ 12.5 μm ,厚4.0 ~ 4.5 μm 。有性生殖为异配。

此种与 *Chla. napocensis* 细胞形态相似,但前者色素体上具穿孔与后者显然不同;此种与 *Chla. gibberula* 色素体上均具穿孔相似,但此种细胞形态与后者显然有别。

采集地:湖北,武汉,中科院武汉植物园水生楼水缸;时间:2005-04-15;采集人:杨敏;模式标本号(Type):SHL-1。

The cells flattened in lateral view. Cells are mostly ovoid, ellipsoidal or pear-shaped with rounded end, anterior slightly narrow in front view, 12.5 – 17.5 μm in length, 7.5 – 12.5 μm in breadth, 4.0 – 4.5 μm in thickness; without papilla; the flagella is to 1.5 body length; two contractile vacuoles at the base of flagella; Chromatophore cup-shaped, filling the whole chloroplast with basal thickening containing the large spherical pyrenoid; smaller pores penetrated the chromatophore; the anterior depression of the chromatophore is relatively narrow and contains the nucleus; sexual reproduction by heterogamy.

This alga resembles *Chla. napocensis* and *Chla. gibberula* but exhibits some differences. The former may be distinguished by its structure of chloroplast and the latter the cellular shape.

It has been found in abundance in a manure-water bowl in Wuhan Botanical Garden of CAS.

Cellulae a fronte visae ovoideae, ellipsoideales vel

pyriformes, lateraliter pamphplanatae, polis late rotundatis; sine papilla; flagellis cellulae 1.5 plo longioribus; Chromatophoro ollaeformi; cum parvis pori, parte basali incrassata; pyrenoide magna, globoso in parte basali chromatophori; nucleolato antice in excavatione chromatophori; binic vacuoles pulsantibus; cellulae 12.5 – 17.5 μm longae, 7.5 – 12.5 μm latae, 4.0 – 4.5 μm crassae. Propagatio sesualis per Heterogamiam.

Habitat: in stercore aqua (Wuhan botanicus hortus, CAS).

Holotypus: SHL-1, Figurae 1:6 – 9.

3 顶角衣藻 新种 图 2:24

Chlamydomonas apiangulata H. J. Hu sp. nov.

细胞梨形至近椭圆的纺锤形,前端后端略尖,不具乳头状突起,具2条等长的鞭毛,长度约为细胞的2倍,基部具2个伸缩泡,当眼点位于细胞侧面时,细胞前端可见1个明显的大伸缩泡,当眼点位于镜面时即可见一大一小的2个伸缩泡,点状眼点位于细胞前端1/3处,色素体杯状,基部增厚,具1个球形的蛋白核。细胞核位于细胞中部。细胞长10 ~ 13 μm ,宽5 ~ 8 μm 。

此种与 *Chla. ehrenbergii* 相似,但细胞形态明显不同。

采集地:湖北武汉。

The cells are pear-shaped to nearly ellipsoid spindle-shaped, with some attenuate ends. Papilla absent. Flagella is two times of the body length, with two contractile at base. Chromatophore cup-shaped with thickening basal containing one spherical pyrenoid. Eyespot comma-shaped, in 1/3 front part of the cell. Nucleus located in the middle of the cell. Cell 5 – 8 μm wide, 10 – 13 μm long.

This alga resembles *Chla. ehrenbergii* Goroschankin but exhibits marked difference on the cellular shape.

Cellulae pyriformes, or oblongo-fusiformes attenuatae in extremitatibus, sine papilla; aequalibus flagellis 2, cellulis duplo longioribus, basi vacuolis contractis instructis; stigmatum puncto in parte anteriore 1/3 sito; chromatophoro cupulato, basi incrassato, pyrenoide globosa; nucleo in medio cellulae. Cellulae 5 – 8 μm latae, 10 – 13 μm long.

Habitat: Hubei, Wuhan.

Holotypus: H-W-0095-06, Figurae 2:24.

4 近环形衣藻 新种 图 2:23

Chlamydomonas subannulata C. C. Jao et
H. J. Hu sp. nov.¹⁾

细胞黄绿色,圆球形,具较厚的胶被,前端具小的锥形乳头状突起;2条等长的鞭毛约为细胞的1.5倍,基部具2个伸缩泡;色素体薄,环状,环绕细胞上半部分,后半部大部分为无色透明区;1个大的球形蛋白核位于细胞侧边;眼点线形,位于细胞中部;具胶被细胞直径11~16 μm,不具胶被细胞直径9~12 μm。生殖不详。

此种与 *Chla. foveolarum* 相似,但色素体结构和细胞形态不同。

采集地:湖边小水池。

The cells are yellow-green, spherical with thick mucilaginous sheath; the anterior end bears small conical papilla. The flagella is as long as the cell, with two contractile at base. Chromatophore thin, surrounding the upper part of cell, most posterior part transparent. Pyrenoid large, globose, located in lateral of cell. Eyespot linear in middle of cell. Cell with gelatine 11~16 μm in diameter, without gelatine 9~12 μm in diameter.

This alga resembles *Chla. foveolarum* Skuja, but exhibits marked difference structure of chromatophore and the cellular shape.

It has been found in smaller pool nearly lake.

Cellulae globosae flavoirescentes, tunica gelatinosa instructae, papillis conicis in parte anteriore; flagella 2 aequalia, cellulis aequalonga, basi vacuolis contractis instructa; chromatophorum cupulatum tenue, cingens superam partem cellulae, translucens parte postica; pyrenoides globosa magna latere cellulae sita; stigma punctum lineare centrale. Cellulae cum tunica gelatinosa 11~16 μm in diametro, sine tunica gelatinosa 9~12 μm in diametro.

Habitat: Hubei, Wuhan.

Holotypus: Figurae 2:23 (by late Prof. C. C. Jao).

5 具粒衣藻 新种 图 1:2~5

Chlamydomonas granumata H. J. Hu et
M. Yang sp. nov.

细胞近球形,无乳头状突起;前端具2条等长

的、略长于体长的鞭毛,基部具2个伸缩泡;色素体杯状,基部略增厚,占细胞体积的一半或少于一半,也有少数略多于一半的;色素体上具颗粒状突起,基部具1个大的椭圆形的蛋白核;眼点逗点状,位于细胞前端1/3处;细胞核位于细胞前端空腔内。细胞长8.8~13.0 μm,宽7.5~12.5 μm。无性生殖形成静孢子或2~4个动孢子,动孢子椭圆形。

此种细胞及色素体形态与 *Chla. ametastos* 相似,但本种色素体上具颗粒状突起与后者显著不同。

采集地:湖北,武汉,中科院武汉植物园水生楼水缸;时间:2005-04-15;采集人:杨敏;模式标本号(Type):SHL-2.

The cells are nearly spherical, papilla absent; flagella are somewhat longer than the cell, two contractile vacuoles at the base of flagella; chloroplast cup-shaped with a thick posterior, the upper portion reaching to about 1/2 volume of cell or even more little, with granulate; pyrenoid single, large, ellipsoidal, may be located in the basal portion of the cell; eyespot bean-shaped, in the front 1/3 of the cell; nucleus anteriorly located; the cells are 8.8~13.0 μm in length and 7.5~12.5 μm in breadth. Asexual reproduction is by division of the protoplast in 2~4 daughter cells.

This alga resembles *Chla. ametastos*, but the alga sharply differs by its granulate on the chromatophore.

It has been found in a manure-water bowl in Wuhan Botanical Garden of CAS.

Cellulae prope globosis, sine papilla; cellulis leviter longioribus; vacuoles binae, ad basin flagellorum sitae; chromatophoro ollaeformi, parte basali incrassata, attingent circa 1/2 volumem cellulae in parte superiore; pyrenoid magno, ellipsoideo in loco incrassato chromatophori; stigmatum fabiformi in 1/3 parte anterior cellulae; nucleo nucleolato in parte anterior; cellulae 8.8~13.0 μm longae, 7.5~12.5 μm latae. Propagatio asexualis divisione protoplasti in 4 cellulas filiales.

Habitat: in stercore aqua (Wuhan botanicus hortus, CAS).

Typus: SHL-2, Figurae 1:2~5.

6 近具喙衣藻 新种 图 1:10~12, 图 3:13~15

Chlamydomonas subrhinoceros H. J. Hu et
M. Yang sp. nov.

细胞有背腹之分,镜面观长椭圆形,侧面观一侧

1) 本种是根据饶钦止先生在世时的手稿的图和描述重新确定的。

平直,另一侧凸起呈弓形,后端钝圆,前端渐尖,延伸成或长或短的喙状突起,无乳突;细胞前端具2条等长的、约等于体长的鞭毛;色素体片状,位于细胞一侧,1个圆形的蛋白核位于中部;眼点未见;细胞核位于细胞中部。细胞长 $10.0 \sim 11.3 \mu\text{m}$,宽 $5.0 \sim 6.3 \mu\text{m}$ 。

本种细胞形态与 *Chla. rhinoceros* Ettl 1958 相似,但本种细胞前端突出略呈喙状,腹侧平直,与后者显著不同。

采集地:黑龙江,哈尔滨市郊孙花屯,水温 24°C , pH 8.0;时间:2005-06-07;采集人:杨敏,刘文凯;模式标本号(Type):SHT-11。

Cells dorsiventral, with a fairly flat ventral side and with markedly arched dorsal side; cells elongated ellipsoid in the apical view, posterior end rounded, anterior tapering into a beak, papilla absent; flagella are as long as the cell; chloroplast laminate, parietal lateral, with a single lateral pyrenoid in the median; eyespot not seen; the nucleus located in the middle of cell. The cells are $10.0 - 11.3 \mu\text{m}$ in length and $5.0 - 6.3 \mu\text{m}$ in breadth.

This alga resembles *Chla. rhinoceros* Ettl 1958, but exhibits marked differences on the cellular shape.

Habitat: Heilongjiang, Harbin.

Cellulae dorsiventrals, a fronte visae elongato ellipsoidales, ventralis plana, pars dorsalis convexa, apice rostellato, polis late rotundatis; sine papilla; flagella bina, cellulae aequilongae, chromatophorum laminatum, parietale in parte dorsale; pyrenoides dorsaliter in medio cellulae dispositum; sine stigmati; vacuolae binae, ad basin flagellorum; nucleus in medio dispositus; cellulae $10.0 - 11.3 \mu\text{m}$ longae et $5.0 - 6.3 \mu\text{m}$ latae.

Typus: SHT-11, figurae 1:10-12, figurae 3:13-15.

7 不整衣藻 新种 图 1:13~16, 图 3:5~9

Chlamydomonas unregularis H. J. Hu et M. Yang sp. nov.

细胞侧扁, 镜面观前端广圆形, 顶端平截或略凹入, 后端分叉呈戟形或燕尾形, 具薄膜, 透明; 侧面观楔形, 前端钝圆, 后端渐尖; 无乳突; 2条等长的、略长于体长的鞭毛从前端伸出, 基部具2个伸缩泡; 色素体块状, 几乎充满整个细胞; 蛋白核多个, 大小不一, 分布不规则; 无眼点。细胞长 $17.5 \sim 25.0 \mu\text{m}$, 宽 $15.0 \sim 20.0 \mu\text{m}$, 厚 $7.5 \sim 10.0 \mu\text{m}$ 。

此新种细胞形态十分特殊, 此属中尚无可比较的。

采集地: 湖北, 武汉, 中科院武汉植物园苗圃水缸, 水温 13°C , pH 7.5~8.0; 采集时间: 2005-11-20; 采集人: 胡鸿钧, 杨敏; 模式标本号(Type): MPA-3。

The cells flattened, broadly rounded at anterior end and swallow-tailed at posterior with thin membrane in the apical view; cells lateral view wedge-shaped, posterior end attenuated; without papilla; flagella are somewhat longer than the cell; two contractile vacuoles at the base of flagella; chromophore massive, almost filling the whole protoplast, with more pyrenoids irregularly located; eyespot absent. Dimensions $17.5 - 25.0 \mu\text{m}$ in length and $15.0 - 20.0 \mu\text{m}$ in breadth, $7.5 - 10.0 \mu\text{m}$ in thick.

The cellular shape is very special so that it can't be compared with any species of Genus.

It has been located from water bowl in Wuhan Botanical Garden of CAS. Water temperature 13°C , pH 7.5~8.0.

Type: MPA-3.

Cellulae planae, a fronte visae antice lato-rotundatae, postice seorsum caudatae cum gracilis membrane; lateraliter cuneiforms, antice rotundatae, postice attenuatae; membrane tenuis, hyaline, sine papilla; flagellis cellulae paullo longioribus; vacuolae binae, ad basin flagellorum; chromatophoro massulato, fere impleto in toto, pyrenoidibus multis, sine stigmati; cellulae $17.5 - 25.0 \mu\text{m}$ longae, $15.0 - 20.0 \mu\text{m}$ latae, $7.5 - 10.0 \mu\text{m}$ crassae.

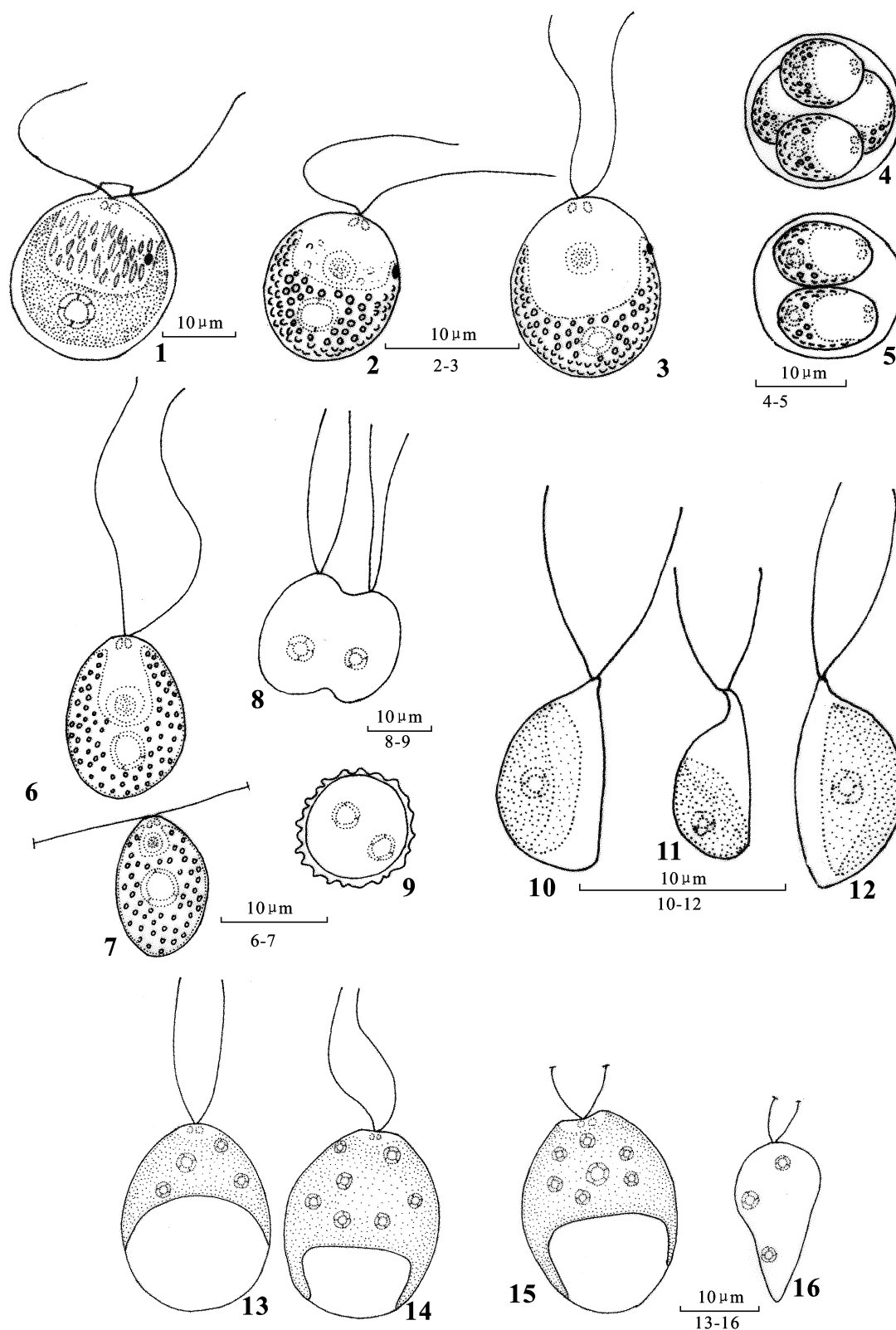
Holotypus: MPA-3, Figurae 1:13-16, Figurae 3:5-9.

8 疣突衣藻 新种 图 2:17~20, 图 3:1~4

Chlamydomonas verrucalata H. J. Hu et M. Yang sp. nov.

细胞卵圆形、长椭圆形或近圆形; 细胞表面具不规则疣状突起, 有的细胞后端具一无色透明薄膜(细胞壁与原生质体分离); 细胞前端具2条等长的、略长于体长的鞭毛, 其基部具2个伸缩泡; 无乳突状突起; 色素体块状, 几乎充满整个细胞, 只在细胞前端有一小的空腔; 具3~4个蛋白核; 无眼点。细胞长 $20.0 \sim 23.3 \mu\text{m}$, 宽 $13.8 \sim 17.5 \mu\text{m}$ 。

此种细胞形态和具多个蛋白核与 *Chla. capensis*

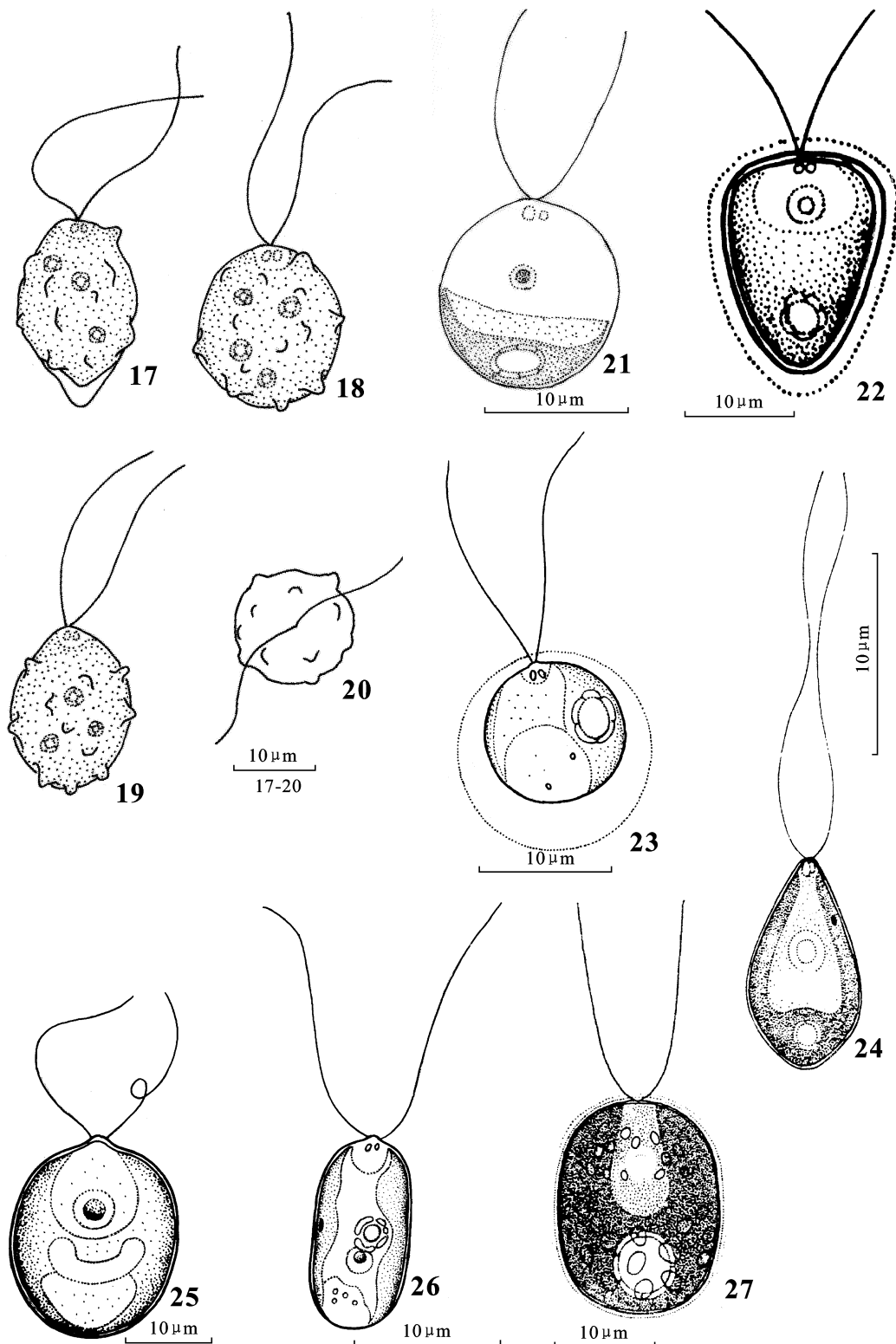


1. 近条纹衣藻; 2~5. 具粒衣藻: 4. 4个动孢子, 5. 2个动孢子; 6~9. 具孔衣藻: 8. 细胞分裂, 9. 合子; 10~12. 近具喙衣藻; 13~16. 不整衣藻: 16. 侧面观

1. *Chlamydomonas subfasciata* H. J. Hu et M. Yang sp. nov.; 2~5. *Chla. granumata* H. J. Hu et M. Yang sp. nov.; 4. 4 Zoospores, 5. 2 zoospores; 6~9. *Chla. punctulata* H. J. Hu et M. Yang sp. nov.; 8. Cell division, 9. Zygote; 10~12. *Chla. subrhinoceros* H. J. Hu et M. Yang sp. nov.; 13~16. *Chla. irregularis* H. J. Hu et M. Yang sp. nov.; 16. Lateral view

图 1

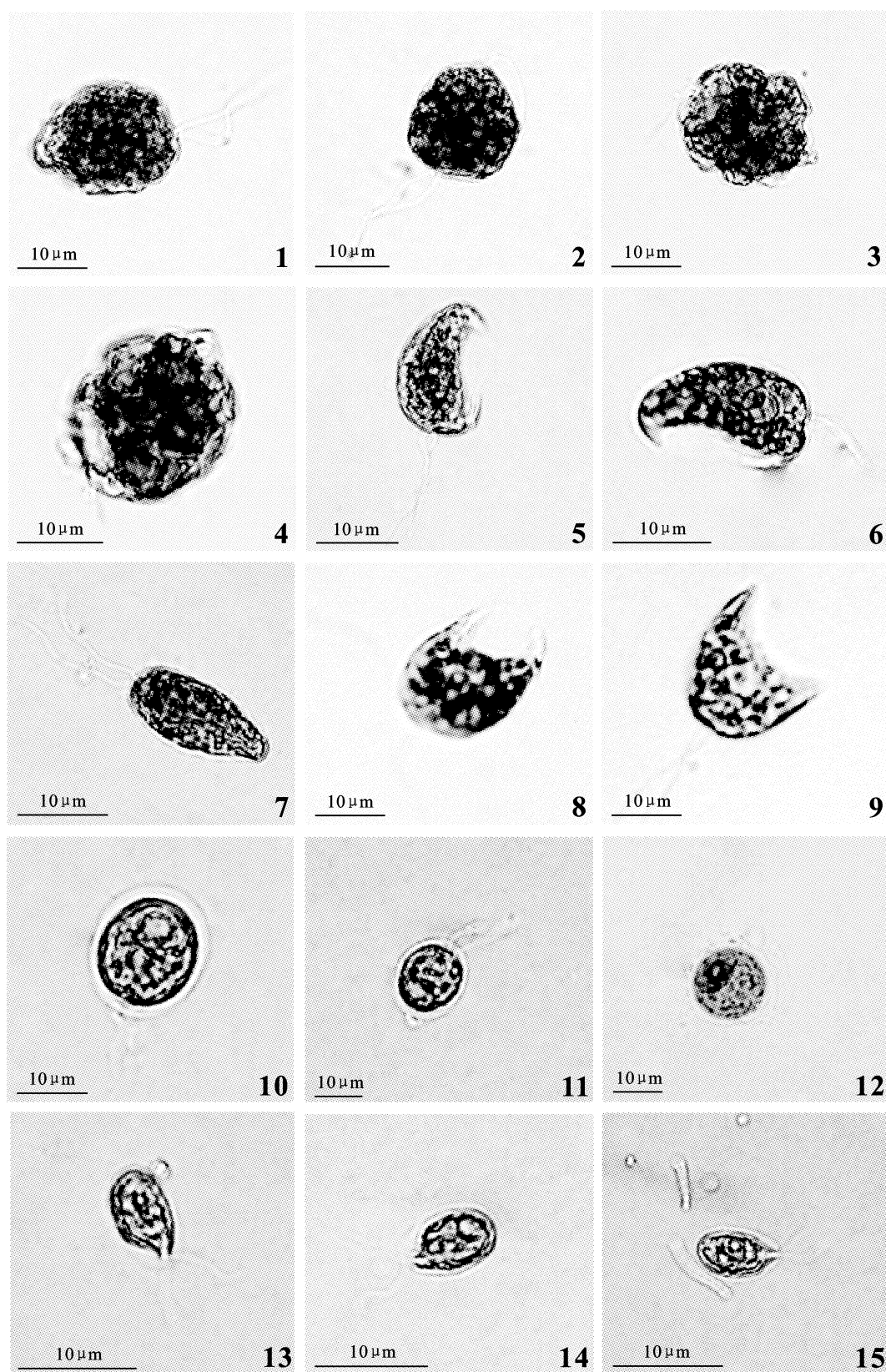
Fig. 1



17 ~ 20. 疣突衣藻; 20. 顶面观; 21. 阿美衣藻大型新变种; 22. 锥形衣藻胶被变种; 23. 近环形衣藻; 24. 顶角衣藻; 25. 倒卵形衣藻; 26. 侏儒衣藻陈氏变种; 27. 似博泡衣藻大型新变种
 17 ~ 20. *Chla. verruculata* H. J. Hu et M. Yang sp. nov; 20. Apical view; 21. *Chla. ametastatos* var. *major* H. J. Hu et M. Yang var. nov; 22. *Chla. conica* var. *gelatinosa* H. J. Hu et L. M. Luo var. nov; 23. *Chla. subannulata* C. C. Jao et H. J. Hu sp. nov; 24. *Chla. apiangulata* H. J. Hu sp. nov; 25. *Chla. aboviformis* H. J. Hu et Y. X. Wei sp. nov; 26. *Chla. pumiliomiformis* var. *chenii* H. J. Hu var. nov; 27. *Chla. pseudopulsatilla* var. *major* H. J. Hu et S. Chen var. nov

图 2

Fig. 2



1~4. 疣突衣藻; 5~9. 不整衣藻; 5, 6. 底面观, 7. 侧面观, 8, 9. 正面观; 10, 11. 阿美衣藻大型新变种; 10. 示色素体形态; 12. 近条纹衣藻; 13~15. 近具喙衣藻; 13, 14. 正面观, 15. 腹面观

1~4. *Chla. verruculata* H. J. Hu et M. Yang sp. nov.; 5~9. *Chla. unregularis* H. J. Hu et M. Yang sp. nov.; 5, 6. Vertical view, 7. Lateral view; 10, 11. *Chla. ametastatos* var. *major* H. J. Hu et M. Yang var. nov.; 10. Show the shape of chromatophore; 12. *Chla. subfascuata* H. J. Hu et M. Yang sp. nov.; 13~15. *Chla. subrhinoceros* H. J. Hu et M. Yang sp. nov.; 13, 14. Frontal view, 15. Lateral view

图3

Fig. 3

相似,但此种细胞表面具不规则疣状突起与后者明显不同。

采集地:湖北,武汉,中科院武汉植物园苗圃水缸,水温 13℃,pH 7.5 ~ 8.0;时间:2005-11-20;采集人:胡鸿钧,杨敏;模式标本号(Type):MPA-3。

The cells are ovoid, elongated ellipsoidal or nearly spherical, with both end rounded; the projection of verrucas are on the cell surface; flagella are as long as the cell or somewhat longer; two contractile vacuoles at the base of flagella; papilla absent; chloroplast is massive, almost filling whole the cell, containing 3 - 4 pyrenoids. The cells are 20.0 - 23.3 μm in length, 13.8 - 17.5 μm in breadth.

This alga resembles *Chla. capensis*, but differs in the verrucas on the cell surface.

It has been located from water bowl in Wuhan Botanical Garden of CAS. Water temperature 13℃, pH 7.5 - 8.0.

Type: MPA-3.

Cellulae ovoideae, elongato-ellipsoidales vel proxime globosae, apicibus rotundatis, cellulose pagina verruca; flagella binae, cellulae $\pm$ aequilongae; vacuolae contractiles binae, ad basin flagellorum; sine papilla; chromatophorum mass ulatus, fere plenus protoplasto; sine stigmate; 3 - 4 pyrenoides globosa irregulariter disposita; cellulae 20.0 - 23.3 μm longae, 13.8 - 17.5 μm latae.

Holotypus: MPA-3, nostra Figurae 2:17 - 20, Figurae 3:1 - 4.

9 倒卵形衣藻 新种 图 2:25

Chlamydomonas aboviformis H. J. Hu et Y. X. Wei sp. nov.

细胞倒卵形、近球形,壁厚,有时后端增厚;前端具大的、顶端平的楔形乳头状突起;具2条与细胞长度近等长的鞭毛,基部具2个伸缩泡;色素体周位,镜面观为“H”形,1个马蹄形的大蛋白核位于“H”形色素体中部的连接处,无眼点;细胞核位于细胞上半部原生质腔内;细胞上部宽达 18 μm ,长 26 μm ;生殖不详。

本新种与 *Chla. bella* 和 *Chla. pseudomutakilis* 有些相似,但蛋白核形态明显不同。

采集地:湖北武汉东湖茶港。

The cells are obovoid, nearly spherical, cell wall is thickened; The anterior end bears a broad, truncate pa-

pilla; flagella is as long as the cell; two contractile vacuoles located at the base of flagella; chromatophore is “H”-shaped in optical view, with a large horseshoe like pyrenoid in the middle; eyespot absent; nucleus is in upper portion between the lobes of chloroplast; the upper portion of cell is to 18 μm in breadth; the lower portion of cell is 17 μm in breadth; the diameter of nearly spherical cell is 26 μm ; reproduction unknown.

This alga resembles *Chla. conjungens* Pascher and *Chla. pseudomutakilis*, but differs in the shape of pyrenoid.

Cellulae obovideae, prope globosae, membrana crassa, papilla magna truncata; flagella bina, cellulae aequilonga; vacuoles binae, ad basin flagellorum sitae; chromatophoro Agloe-formi, parte transversa incrassata, quo loco pyrenoide magno hypocrepico; sine stigmate; nucleo in excavatione antice chromatophori; cellulae infra 18 μm latae, super 17 μm latae; cellulae prope globosae 26 μm diametro. Propagatio ignota.

10 阿美衣藻大型变种 新变种 图 2:21, 图 3:10, 11

Chlamydomonas ametastatos var. *major*

H. J. Hu et M. Y. var. nov.

本变种与原变种不同为细胞明显大,长 12.4 ~ 13.4 μm ,宽 11.3 ~ 12.5 μm ,鞭毛与体长相等等。

采集地:黑龙江,哈尔滨市郊孙华屯,水温 27℃,pH 7.0 - 8.0,时间:2005-06-07;采集人:杨敏,刘文凯;模式标本号(Type):SHT-10。

The new variation is 12.4 - 13.4 μm long, 11.3 - 12.5 μm wide, obviously larger than the type. The flagella is as long as the body.

Habitat: loblolly in Sunhua Village, Harbin, Heilongjiang, water temperature 27℃, pH 7.0 - 8.0, 2005-06-07, Yang et Liu, SHT-10(Type).

Differt a typo per cellularum dimensionibus manifesto majus 12.4 - 13.4 μm longae, 11.3 - 12.5 μm latae, et flagellis cellulae aequilongae.

11 似博泡衣藻大型变种 图 2:27

Chla. pseudopulsatilla var. *major* H. J.

Hu et S. Chen var. nov.

此变种与原变种不同为细胞壁较厚,细胞壁外

具 2~3 层极薄的胶被,细胞明显大于原变种。细胞长 15~19 μm ,宽 12~17 μm 。

采集地:四川成都。

Differt to type on the wall of cell is thicker.

Differt a typo per parietem crassum, gelatina tenui. Cellulae 15–19 μm longae, 12–17 μm latae.

Habitat: in lacu ad Sichuan, Chengdu.

12 侏儒衣藻陈氏变种 图 2:26

Chla. pumiliomformormis var. *chenii* H. J. Hu var. nov.

此变种与原变种的区别在于前者的细胞较小,不侧扁,无背腹之分,细胞长 6.6 μm ,宽 3.8 μm 。

采集地:青海。

Differt a typo cellularum dimensionibus minoribus, ne dorsiventral, cellulae 6.6 μm longae, 3.8 μm latae.

Habitat: aqua stagnant ad Qinghai.

13 锥形衣藻胶被变种 图 2:22

Chlamydomonas conica var. *gelatinosa* H. J. Hu et L. M. Luo var. nov.

此变种与原变种不同为此变种具厚的胶被,且细胞明显小于后者。

采集地:广西河池。

The new variation comes near *Chla. conica*. The differences are as follows: 1. the cell is obviously lager, 8.8–10 μm long, 6.3–7.5 μm wide; 2. the cell is surrounded by thicker mucilaginous.

Differt a typo gelatina crassa, cellula 8.8–10 μm longa, 6.3–7.5 μm lata.

Habitat: Hechi, Guangxi Zhuang Autonomous Region.

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