

中国马尾藻属的研究

V. 荚托系的6个新种*

曾呈奎 陆保仁

(中国科学院海洋研究所, 青岛 266071)

提要 对历来采集的马尾藻标本进行系统研究。研究发现, 该属的荚托系 Series Siliquosae 有新种6个, 它们是: 上川马尾藻 *Sargassum shangchuanü* sp. nov. 灌丛马尾藻 *S. frutescens* sp. nov., 灌木马尾藻 *S. fruticosum* sp. nov., 广东马尾藻 *S. guangdongü* sp. nov., 龙舌兰马尾藻 *S. agaviforme* sp. nov., 雷州马尾藻 *S. leizhouense* sp. nov.。分类标本于1953年3—12月, 1987年4月分别采集于广东、广西沿海。模式标本均存于中国科学院海洋研究所植物标本室。

关键词 马尾藻属 荚托系 新种

作者在对中国真马尾藻亚属 Subgenus *Sargassum*, 滑托组 Section Malacocarpicae (Abbott et al., 1988), 总状托序亚组 Subsection Racemosae, 荚托系 series Siliquosae 的标本进行系统研究, 发现属于该系的种类中国共有10种, 其中4种已报道 (Agardh, 1889; Grunow, 1916; Setchell, 1931, 1936; Grunow, 1915; Yashida, 1988)。本文报道6个新种, 即上川马尾藻新种 *S. shangchuanü* sp. nov., 灌丛马尾藻新种 *Sargassum frutescens* sp. nov., 灌木马尾藻新种 *S. fruticosum* sp. nov., 广东马尾藻新种 *S. guangdongü* sp. nov., 龙舌兰马尾藻新种 *Sargassum agaviforme* sp. nov., 雷州马尾藻新种 *S. leizhouense* sp. nov.。模式标本均存于中国科学院海洋研究所植物标本室。

1 上川马尾藻新种 *Sargassum shangchuanü* sp. nov. (图1a,b; 图版1:1)

Frons ca. 40 cm alt., haptero discoïdo, 1.5cm diam.; principalis infracompressis et supra cylindricis, 40 cm longis, 2 cm latis; ramis secundariis cylindricis, 20cm longis, foliis, basalibus ca. 4 cm longis, 3mm latis, marginibus integris vel serratis, percurrentibus costis, cryptosomatibus; foliis supra ramulos linearibus, basibus asymmetricis, 2—4cm longis, 1—2 mm latis, marginibus integeris sine cryptosomatibus; vesiculis sphaericis vel ovatis vel rotundatis, 7mm diam., apicibus acuminatis, sine cryptosomatibus.

Plantae dioeciae, receptaculis femineis compressis, 2—3 furcatis, 6 mm longis,

* 中国科学院海洋研究所调查研究报告第1799号。国家自然科学基金资助, 381800号。冷增福先生帮助上墨, 特此志谢。

收稿日期: 1994年1月23日, 接受日期: 1994年5月9日。

1.5—2mm latis, receptaculis maribus cylindricis, simplicibus vel furcatis, 8—10mm longis, 1—1.2mm diam.

Holotypus AST 55-3641(♂), XII 31, 1955, Shangchuan, Guangdong Province.

1.1 特征描述 藻体,深褐色;高约40cm。固着器,盘状;直径为1.5cm;向上生出圆柱形疣状的主干,高约2cm。主枝,粗壮,其下部扁平,向上圆柱形,长约40cm,宽约2mm。次生分枝,圆柱形,长约20—30cm。小枝,长2—3cm,小枝间相隔长2—4cm。基部藻叶,稍厚革质,很狭,长约4cm,宽3mm;边缘全缘或浅齿状,中肋贯顶,毛窠少,散生。中部藻叶为不对称的披针形或形状不规则,长2—3cm,宽4—5mm;叶缘波状或者浅齿状,中肋贯顶,有少许毛窠。小枝上的藻叶,线形,不对称,常常藻叶上部比下部宽,长2—4cm,宽1—2mm;边缘全缘,中肋接近顶端没有毛窠。气囊,球形,卵圆形,顶端圆形或具一细尖,没有毛窠,直径约7mm;囊柄,圆柱形,长5—7mm,有时扁平,叶状,单条,偶有双个气囊。

雌雄异株。雄生殖托,圆柱形,光滑,单条或者叉分,长8—10mm,直径为1—1.2mm。雌生殖托,较短,略扁压,2—3次分叉,常在顶端两叉分,长6mm,宽1.5—2mm,非常复杂。2—3或者更多的雄托或雌托总状排列在生殖托小枝上。

模式标本产地 于1955年12月31日由郑树栋、徐法礼采自广东省上川岛,模式标本号 AST 55-3641(♂)。生长在低潮带岩石上。

1.2 同近缘种的比较 它与近缘种亨氏马尾藻 *S. henslowianum* (Lu Baoren et al., 1983)的不同之处在于,上川马尾藻的主枝下部扁平,生殖托枝没有无限延长,雌托略扁压。为此以采集地点定名为上川马尾藻新种 *Sargassum shangchuanū* sp. nov.

2 灌丛马尾藻新种 *Sargassum frutescens* sp. nov. (图 2a,b; 图版 I:2)

Frons caespes, 26cm alt., haptero conico, 1.5cm diam., axis cylindricis, 1.5—2.5

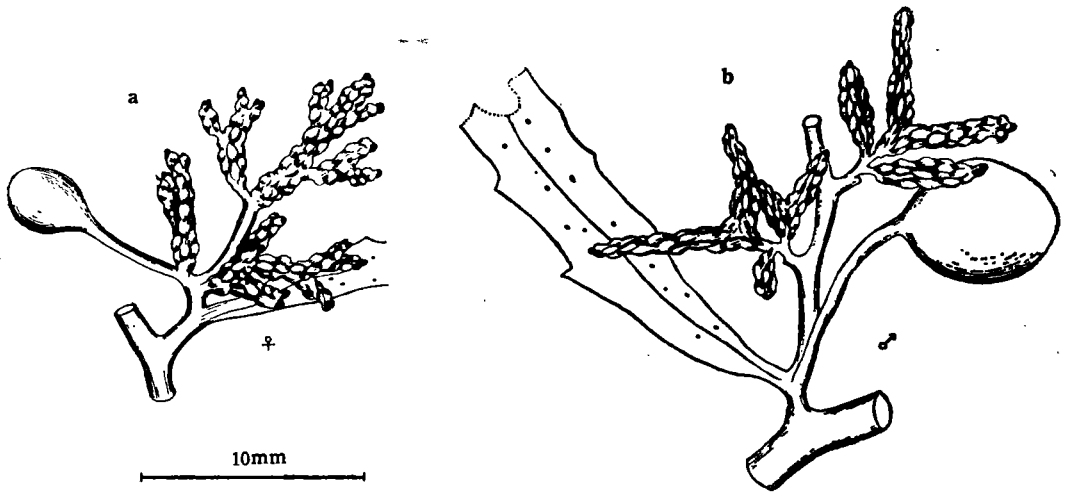


图 1 上川马尾藻新种 *Sargassum shangchuanū* sp. nov.

a. 雌生殖托 (female receptacles) 和气囊 (vesicles); b. 雄生殖托 (male receptacles) 和气囊 (vesicles)。

cm alt., 2mm diam.; ramis primariis cylindricis, 1—2mm diam. densis; ramis secundariis alternis, 4—6 cm longis, 0.5mm diam.; foliis basalibus lanceolatis, 4—5 cm longis, 5—6 mm latis, laevis, marginibus integeris vel undulatis, leviter serrulatis, costatus; vesiculis sphaericis vel ovatis, 3 mm diam., apicibus rotundatis vel acuminatis, cryptosomatibus, percurrente costis.

Plantae dioeciae, receptaculis racemosis, receptaculis maribus cylindricis, 4—5 mm longis, 0.3—0.4 mm diam., receptaculis femineis subcylindricis vel fusiformis, 2—3 mm longis, 0.7—0.8mm diam.

Holotypus AST 55-3069(♂), XI 2, 1955, Fangcheng, Guangxi Province.

2.1 特征描述 藻体,深褐色,灌木状,高至 26cm。固着器,圆锥形,直径约 1.5cm;向上长出数条丛生主干,圆柱形,高 1.5—2.5cm,直径为 2mm,每一主干长出 1—3 条主分枝。主分枝,圆柱形,光滑,高约 24cm,直径在 1—2mm,密集,长短相似。次生分枝,互生,较短,分枝间隔距离 0.5—1cm,长约 4—6cm,直径为 0.5mm。许多气囊和藻叶围绕着生育小枝,整个藻体似灌木状。基部藻叶,较厚,比较大,有时分叉,通常为长披针形,长 4—5cm,宽 5—6mm;叶缘全缘,波状或者浅齿状,中肋明显,贯顶,毛窠不规则排列在中肋两侧;藻叶顶端钝圆,基部楔形。中部和上部的藻叶,与基部藻叶相似,但是比较薄和比较小,边缘具有锯齿,长 2—2.5cm,宽 4—5mm,顶端尖细。气囊,球形或者卵圆形,直径为 3mm,顶端圆形或者具细尖,表面有少数毛窠;囊柄,圆柱形,有时扁平或叶状,具中肋或边缘具少量齿,长约 4—7mm。

雌雄异株。雄生殖托,圆柱形,具有分枝,表面光滑,生殖托上部常有分叉,长 4—5 mm,直径在 0.3—0.4mm。雌生殖托,光滑,亚圆形或纺锤形,较短,长 2—3mm,直径在 0.7—0.8mm。雄生殖托,主要以复总状排列在生殖枝上;雌生殖托,主要以总状排列在生殖枝上。

模式标本产地 于 1955 年 11 月 2 日由郑树栋采自广西壮族自治区防城城市白龙乡。模式标本号 AST 55-3069(♂)。生长在低潮带岩石上。

2.2 同近缘种的比较 灌状马尾藻的近缘种为亨氏马尾藻 *S. kenslowianum* 和锥形马尾藻 *S. paniculatum*。新种的雄生殖托复总状排列,这与锥形马尾藻十分接近;新种的雌生殖托总状排列,这与亨氏马尾藻十分接近。但是,新种的外形特征并不同上述两种相同,它是丛生的密集的灌木状,很容易区分,为此以其外部形态定名为灌状马尾藻新种 *Sargassum frutescens* sp. nov.

3 灌木马尾藻新种 *Sargassum fruticulosum* sp. nov. (图 3a,b; 图版 1:3)

Frons 35 cm alt., haptero, discoïdo, ca. 1 cm diam.; axis cylindricis, verrucosis, 1—1.5 cm alt., 2—3mm diam., ramis primariis compressis, 2 mm diam., supra cylindricis, 1 mm diam.; ramis secundariis ad 15 cm longum, ca. 1 mm diam., glandulis; foliis basalibus lanceolatis cum integeris, 4—5 cm longis, 5—6 mm latis; apicibus acuminatis, basibus cuneatis, percurrente costis, sine cryptosomatibus; vesiculis sphaericis vel ovatis, 3—5mm diam., apicibus rotundatis.

Plantae dioeciate, receptaculis femineis et maribus cylindricis, verrucosis, pleru-

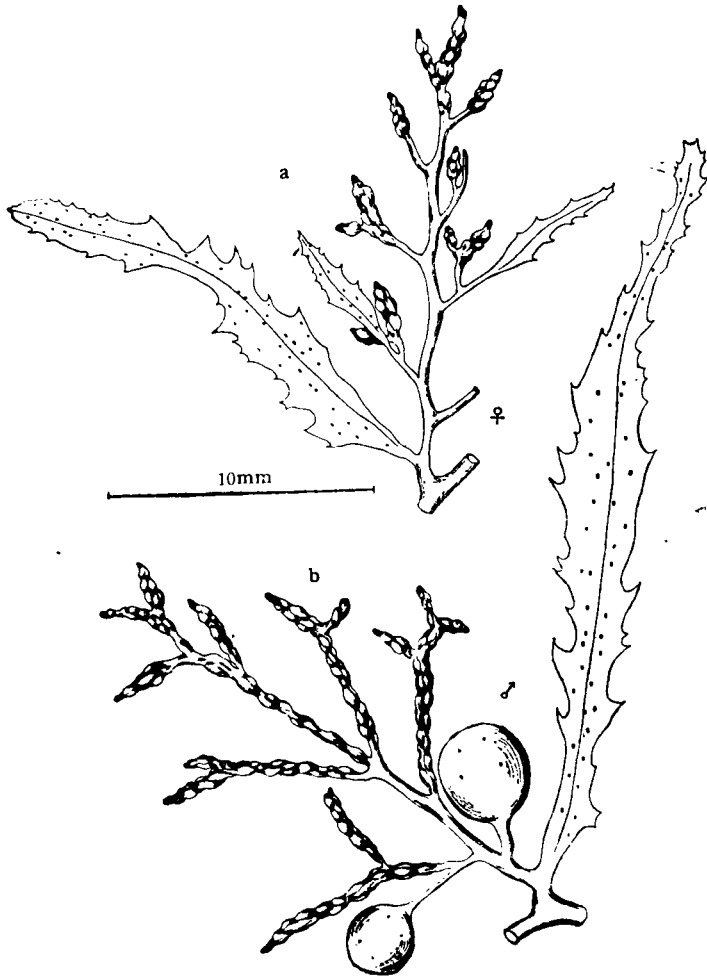


图2 灌丛马尾藻新种 *Sargassum frutescens*. sp. nov.

a. 雌生殖托 (females receptacles) 和藻叶 (leaf); b. 雄生殖托 (male receptacles), 气囊 (vesicles) 和藻叶 (leaf)。

mque furcatis, receptaculis maribus ad 6 mm longis, 0.5 mm diam., receptaculis femineis ad 4 mm longis, 0.5—0.8 mm diam.

Holotypus AST 55-2253 B (♂), V7, 1955, Naozhou Island, Guangdong Province.

3.1 特征描述 藻体,深褐色,高至 35cm。固着器,盘状,直径约 1cm。主干 1—3 条,疣状,圆柱形,高 1—1.5cm,直径在 2—3mm。主枝,光滑,高达 34cm;下部扁平,宽 2mm,上部圆柱状,直径为 1mm。次生分枝,较短,圆柱形,光滑,长约 15cm,直径约 1mm。小枝,分枝多,较密集,具有腺点。基部藻叶,革质,披针形,长 4—5cm,宽 5—6mm;叶缘全缘,基部楔形,顶端小,中肋明显贯顶,没有毛窠。主枝的中部和上部藻叶,比较小,长披针形,有少数毛窠,分散在中肋两侧;叶缘波状或锯齿。次生分枝上的藻叶,很狭窄,线形,长 2.5—3.5cm,宽 2—3mm,具有明显贯顶中肋,有一些毛窠;叶缘全缘或有稀锯齿。气囊,球形或者卵圆

形,直径 3—5mm,顶端圆形,一般没有毛窠,偶有 1—2 个,囊柄,圆柱形,长约 4—5mm。

雌雄异株。雄生殖托和雌生殖托,圆柱形,通常在它们的上部分叉,表面疣状,没有刺;幼期生殖托常常聚伞状排列在生殖枝上,成熟期总状排列在生殖枝上。雌生殖托,长达 4mm,直径在 0.5—0.8mm。雄生殖托长达 6mm,直径为 0.5mm,常常 4—5 个或者更多复总状排列在生殖托小枝上。

模式标本产地 于 1955 年 5 月 7 日由张峻甫采自广东省碓洲岛。模式标本号 AST55-2253B(♂)。生长在低潮带岩石上。

3.2 同近缘种的比较 该种的近缘种为剑形马尾藻 *S. acinaria* (Turn.) C. Ag., 特别与 Grunow(1915) 报道的产于中国海的剑形马尾藻厚叶变种 *S. acinaria* var. *crassiascula* Grun. 更为接近。然而,在生殖托排列上,本种有典型的总状到亚复总状托序,因此,是总状托序亚组的一个成员。因它们的幼期常常是聚散状排列的托序,而成熟期复总状排列,托序很复杂。虽然,这种情况在某些种中也常发现,但新种的小枝分枝密集,故取名为灌木马尾藻新种 *Sargassum fruticosum* sp. nov.

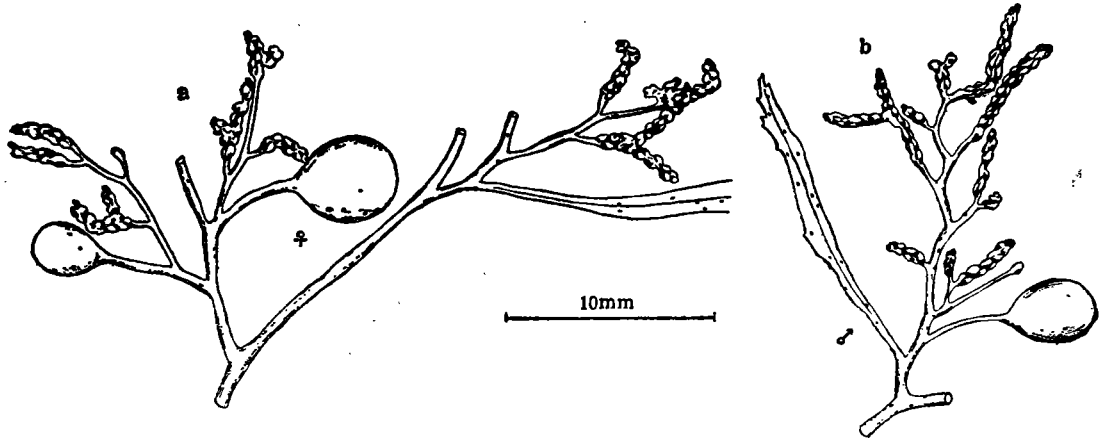


图 3 灌木马尾藻新种 *Sargassum fruticosum* sp. nov.
a. 雌生殖托 (female receptacles)、气囊 (vesicles) 和藻叶 (leaf); b. 雄生殖托 (male receptacles)、气囊 (vesicle) 和藻叶 (leaf)。

4 广东马尾藻新种 *Sargassum guangdongü* sp. nov. (图 4a,b; 图版 I:4)

Frons 1m alt., haptero discoido, 2 cm diam.; axis caespitosis, laevis, 2cm alt., 2 mm diam., complanatis infra axes et cylindricis super axes, ramis secundariis cylindricis, 7—17 cm longis, 1mm diam.; foliis basalibus ad 9 cm longis, 15 mm latis, marginibus irregularis serrulatis, apicibus obtusis, foliis supra angustis, 6—7 cm, longis, 4—6mm diam., marginibus serrulatis, vesiculis sphaericis vel ovatis, apicibus roundatis, 4—7 mm diam.

Plantae dioeciae, receptaculis maribus 10 mm longis, 1 mm diam., receptaculis femineis 5—7 mm longis, 1.2 mm diam.

Holotypus AST 55-1191(♀), Hailing Island, Guangdong Province.

4.1 特征描述 藻体,粗壮,分枝疏散,节间长约 10cm,体高约 1m。固着器,盘状,直径为 2cm。长出若干丛生的圆柱形主干。主干,高达 2cm,直径为 2mm。主枝,光滑,下部扁压,上部圆柱形,宽 2mm。次生分枝,圆柱形,长达 7—17cm,直径为 1mm。藻叶,披针形,边缘具锯齿,基部斜楔形,毛窠较少,中肋贯顶。基部藻叶,长达 9cm;宽 15mm;叶缘波状或不规则锯齿,顶端钝。上部藻叶,较窄,长 6—7cm,宽 4—6mm;叶缘具粗锯齿。在次生分枝上的藻叶,很窄,接近线形,长达 4cm,宽 2—3mm;叶缘浅锯齿状。气囊,球形或卵圆形,幼期顶端尖,直径在 4—7mm,表面有少数毛窠;囊柄圆柱形,长 4—6mm,直径在 0.4—0.5mm,通常单条,但是偶有在同一节生出 2 条。

雌雄异株。生殖托,圆柱形,光滑,在其上部常叉分,总状排列在生殖枝上。雄生殖托,细长,长 10mm,直径为 1mm。雌生殖托,短而宽,长 5—7mm,直径为 1.2mm。

模式标本产地 于 1955 年 3 月 7 日由郑树栋采自广东省海陵岛,模式标本号 AST 55-1191 (♀)。生长在潮下带岩石上。

4.2 同近缘种的比较 新种的近缘种是亨氏马尾藻 *S. henslowianum*, 其不同之处在于,新种系疏散的外形;主枝下部扁压,上部圆柱形;基部藻叶特别大,上部藻叶窄小;生殖托较短,没有继续延长的幼托;与亨氏马尾藻是很容易区别的。为此,以采集地点定名为广东马尾藻新种 *Sargassum guangdongü* sp. nov.



图 4 广东马尾藻新种 *Sargassum guangdongü* sp. nov.
a. 雌生殖托 (female receptacles)、气囊 (vesicles) 和藻叶 (leaf); b. 雄生殖托 (male receptacles)、气囊 (vesicles) 和藻叶 (leaf)。

5 龙舌兰马尾藻新种 *Sargassum agaviforme* sp. nov. (图 5a,b; 图版 II:1)

Frons agaviformis, ad 35 cm alt., axis cylindricis, 5mm diam., ramis primariis laevis, subcylindricis, ca. 35 alt., 1—1.5 mm diam.; foliis basalibus pinnatifidis vel furcatis, ad 6 cm longis, 6 latis, marginibus serrulatis, apicibus obtusis, percurrente costis; foliis in primariis ramis lanceolatis vel linearibus, singularibus vel furcatis, 3—5 cm longis, 1.5—2.5 mm latis, marginibus serrulatis, costatus, cryptosomatibus; foliis linearibus vel filiformis in ramis secunderis et ramulinis, 2—3 cm longis, 1—2 mm latis; vesiculis sphaericis, ad 2.5 mm diam.

Plantae dioeciae. Receptaculis racemosis, receptaculis femineis cylindricis, levis, 3—5 mm longis, 0.6—0.7 mm diam., receptaculis maribus cylindricis, levis, 4—5 mm longis, 0.4—0.5 mm diam.

Holotypus AST 55-1705 (♀), IV. 8, 1955, Naozhou Island Guangdong Province.

5.1 特征描述 藻体,外形像龙舌兰,深褐色,高约 35cm,具有几根主干,从一小的盘状固着器生出,其直径为 5mm。主干,圆柱形,疣状,高 12mm,直径 2mm。主枝,光滑,亚圆柱形,高约 35cm;下部直径 1—1.5mm,上部圆柱形,直径小于 1mm。次生分枝,光滑,互生,较短,长约 10cm,围绕着形态相似的小枝,枝间距离 1—2cm。基部藻叶,羽状或分叉,长约 6cm,宽 6mm,边缘具锯齿;藻叶基部楔形,顶端钝圆,中肋明显,一般贯顶,毛窠不规则的分散在中肋的两侧。主枝藻叶,披针形或线形,单条或者叉分,长 3—5cm,宽 1.5—2.5mm;边缘具尖齿;基部楔形,中肋贯顶,毛窠不规则分散在中肋两侧。次生分枝和小枝上的藻叶,线形或丝状,长 2—3cm,宽 1—2mm;中肋纤细;边缘尖齿状。气囊,球形,直径约 2.5mm,顶端圆形,囊柄,圆柱形,长约 4—5mm。

雌雄异株。雄生殖托,细长,圆柱形,光滑;常常在生殖托上部 1 或 2 次分裂;有时顶端叉分,长 4—5mm,直径为 0.4—0.5mm;每一生殖托具有一个短柄。雌生殖托,圆柱形或圆锥形,光滑;1—2 次分枝,长 3—5mm,直径在 0.6—0.7mm;在其顶端常叉分。雄、雌生殖托常常是总状或复总状排列在生殖小枝上。

模式标本产地 于 1955 年 4 月 8 日由张峻甫、徐法礼采自广东省硇州岛。模式标本号 AST 55-1705(♀)。生长在低潮带和潮下带岩石上。

5.2 同近缘种的比较 新种的近缘种为弱枝马尾藻 *S. kuetsingü*, 它们的不同之处在于,新种成熟藻体的外型像高等植物龙舌兰一样;幼期基部藻叶常是羽状半裂或者叉分;囊柄尽管纤细、较长,但比弱枝马尾藻略短。根据上述的 3 个特征很容易把它们区分开来。为此,依据新种具龙舌兰的外型特征,定名为龙舌兰马尾藻新种 *Sargassum agaviforme* sp. nov.

6 雷州马尾藻新种 *Sargassum leizkouense* sp nov (图 6a,b; 图版 II:2)

Frons muricatis, ad 50 cm alt., haptero discoïdo vel subconico, 1—1.5cm diam., axis tuberculatis, cylindricis, ad 2 cm alt., 1—2 mm diam., ramis primariis et gemmiformis structurae e axe, infra compressis et super cylindricis, laevis, 1.5—2mm diam., foliis lanceolatis, percurrente costalis, foliis basium 5—7 cm longis, 9—10mm latis,

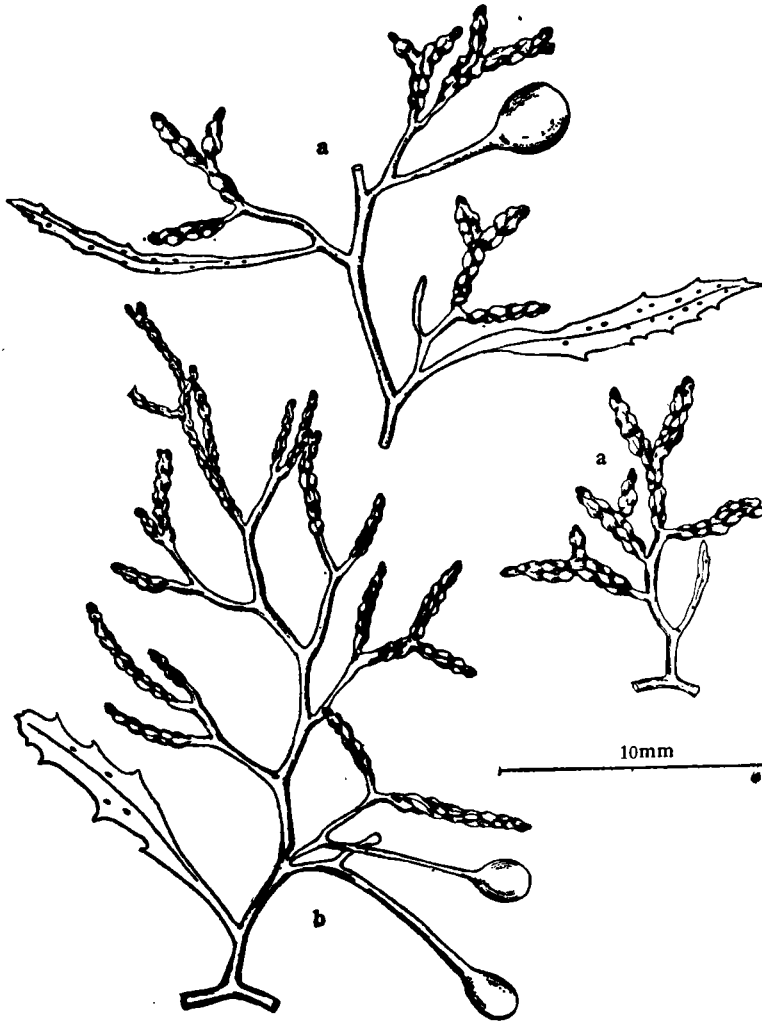


图5 龙舌兰马尾藻新种 *Sargassum agaviforme* sp. nov.

- a. 雌生殖托 (female receptacles)、气囊 (vesicle) 和藻叶 (leaves);
 b. 雄生殖托 (male receptacles)、气囊 (vesicles) 和藻叶 (leaf)。

lobatis, foliis super 4—5cm longis, 4—5mm latis, sine lobatis, vesiculis sphaericis, laevis, apicibus rotundatis, 3—4 mm diam., rarior cryptosomatibus.

Plantae dioeciate. Receptaculis ramis cylindricis, laevis; receptaculis femineis 4—5mm longis, 0.8—1 mm diam.; receptaculis maribus 7—15 mm longis, 0.7—0.8 mm diam.

Holotypus AST 87-1358(♀), IV. 27, 1987, Naozhou Island, Guangdong Province.

6.1 特征描述 藻体,深褐色,比较粗壮,高至 50cm。固着器,盘状,亚圆锥形,直径为 1—1.5cm,从一固着器上有时生出 2—3 主干。主干,疣状,圆柱形,高达 2cm,直径在 1—2mm。主枝和一些芽常常从主干上部生出,芽较短,高约 1cm,直径为 3—5mm。主枝光

滑,下部扁压,上部圆柱形,高约 48cm,直径在 1.5—2mm。次生分枝,较短,高约 5—10 cm,在外形上与主枝相似;互生,相互间隔 2—4cm,围绕着藻叶和生殖托小枝。藻叶,中肋贯顶,毛窠分散,边缘齿状,叶顶钝圆,基部楔形。基部藻叶,厚而大,常常复裂,披针形,长 5—7cm,宽 9—10mm。上部藻叶,披针形,大小相似,长 4—5cm,宽 4—5mm,常常不裂。气囊,球形,光滑,顶端圆形,直径在 3—4mm,毛窠稀少;囊柄,圆柱形,长 2—3mm,通常比气囊短。

雌雄异株。生殖托,圆柱形,光滑,亚复总状排列在生殖小枝上。雄生殖托,延长,有时分叉,顶端常二叉分,长 7—15mm,直径在 0.7—0.8mm。雌生殖托,分叉,长 4—5mm,直径在 0.8—1mm;顶端时常两叉分,偶有 3—4 次叉分。

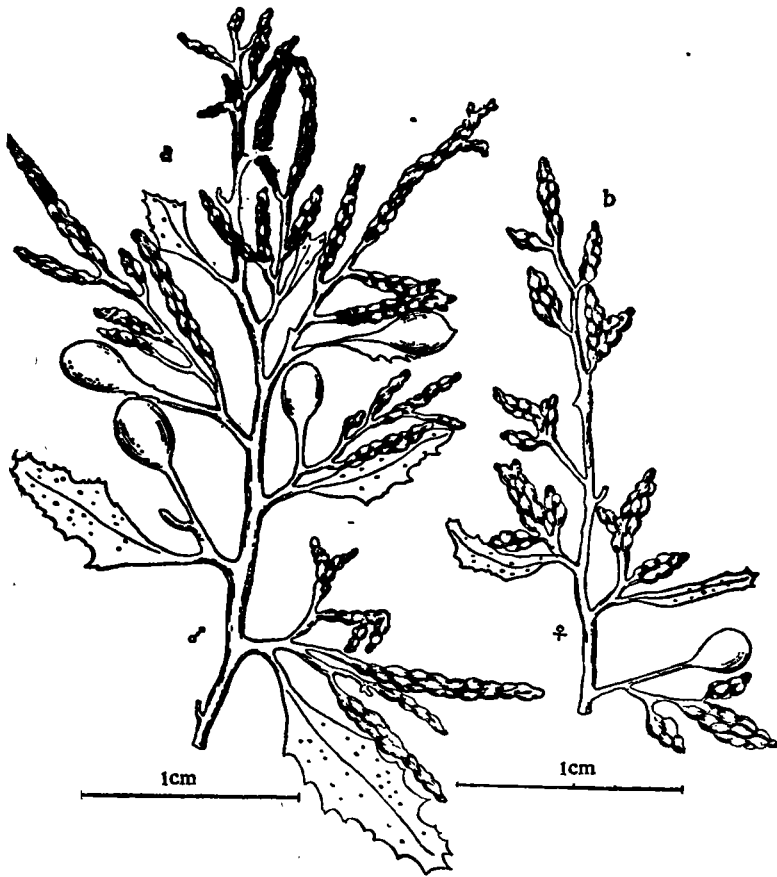


图 6 雷州马尾藻新种 *S. laizhouense* sp. nov.

- a. 雄生殖托 (male receptacles)、气囊 (vesicles) 和藻叶 (leaves);
b. 雌生殖托 (female receptacles)、气囊 (vesicle) 和藻叶 (leaves)。

模式标本产地 于 1987 年 4 月 27 日由陆保仁、董美玲采自广东省硇洲岛。模式标本号 AST 87-1358(♀)。生长在低潮带和潮下带岩石上。

6.2 同近种的比较 本种的近缘种为锥形马尾藻 *S. paniculatum* (Yashida, 1988) 与它的不同之处在于,新种基部藻叶较大,多裂;上部藻叶较小;藻体具有很多分枝;芽从

主干的上部生出;主枝下部扁压:与近缘种比较容易区分。为此,依据采集地点定名为雷州马尾藻新种 *Sargassum laizhouense* sp. nov.

参 考 文 献

- Abbott, I.A., Tseng, C.K. and Lu Baoren, 1988, Clarification of some subgeneric nomenclature in *Sargassum* subgenus *Sargassum*, In *Taxonomy of Economic Seaweeds: With reference to Some Pacific and Caribbean Species*, Vol. 2. ed. by Abbott, I.A., A Publication of the California Sea Grant College Program (La Jolla, Calif.), pp. 55—58.
- Agardh, J.G., 1889, Species Sargassorum Australiae, descriptae et dispositae, *Kgl. Svenska Vet.-Akad. Handl.*, **23**: 1—133, pls. 1—31.
- Grunow, A., 1915, Additamenta ad cognitionem Sargassorum, *Verh. Zool. Bot. Ges. Wien*, **65**: 329—448.
- Grunow, A., 1916, Additamenta ad cognitionem Sargassorum, *Verh. Zool. Bot. Ges. Wien*, **66**: 1—48.
- Lu Baoren and Tseng C.K., 1983, Phaeophyta, In *Common Seaweeds of China*, ed. by Tseng C.K., Science Press (Beijing), pp. 168—243, pls. 85—122.
- Setchell, W.A., 1931, Hong Kong Seaweeds II. *Hong Kong Nat.*, **2**: 237—253.
- Setchell, W.A., 1936, Hong Kong Seaweeds V. *Hong Kong Nat. Suppl.*, **5**: 1—20, pls. 1—8.
- Yoshida, T., 1988, Japanese and Taiwanese species of *Sargassum* subgenus *Sargassum*, In *Taxonomy of Economic Seaweeds: with Reference to Some Pacific and Caribbean Species*, Vol. 2. ed. by Abbott, I. A., A Publication of the California Sea Grant College Program (La Jolla, Calif.), pp. 5—21, figs. 1—18.

STUDIES ON THE CHINESE SARGASSUM V. SIX NEW SPECIES IN THE SERIES SILIQUOSAE

Tseng C.K., Lu Baoren

(Institute of Oceanology, Academia Sinica, Qingdao 266071)

ABSTRACT

In the present study, a taxonomic study are made of six new species of the Chinese *Sargassum* belonging to the series Siliquosae of the subsection Racemosae, namely: *S. shangchuanü* sp. nov., *S. frutescens* sp. nov., *S. fruticosum* sp. nov., *S. guangdongü* sp. nov., *S. agaviforme* sp. nov., *S. laizhouense* sp. nov., collected in Guangdong and Guangxi Province in 1955, 1987. The type specimens are all deposited in the Herbarium of the Institute of Oceanology Academia Sinica at Qingdao.

S. shangchuanü sp. nov. is characterized by its stout primary branches, flattened below and cylindrical above, very narrow leaves, generally entire at the margins, female receptacles compressed and two to three times bifurcate. This species is closely related to *S. henlowianum*, differing in its primary branches flattened below its receptacular branchlets not indefinitely elongated, and its slightly compressed female receptacle.

S. frutescens sp. nov. is characterized by its conical holdfast, giving rise to four to eight caespitose main axes, each of which gives rise to one to three primary branches, each primary branch gives rise to numerous nearly equal secondary branches, thus giving the whole frond a characteristic bushy appearance; its small race-

mosely arranged receptacles are also characteristic. It is closely related to *S. henslowianum* and *S. paniculatum* differing in its female receptacles racemosely arranged similar to *S. henslowianum*, its male receptacles paniculately arranged on the fructiferous branchlets, similar to *S. paniculatum*, but its bushy habit differs with the two species.

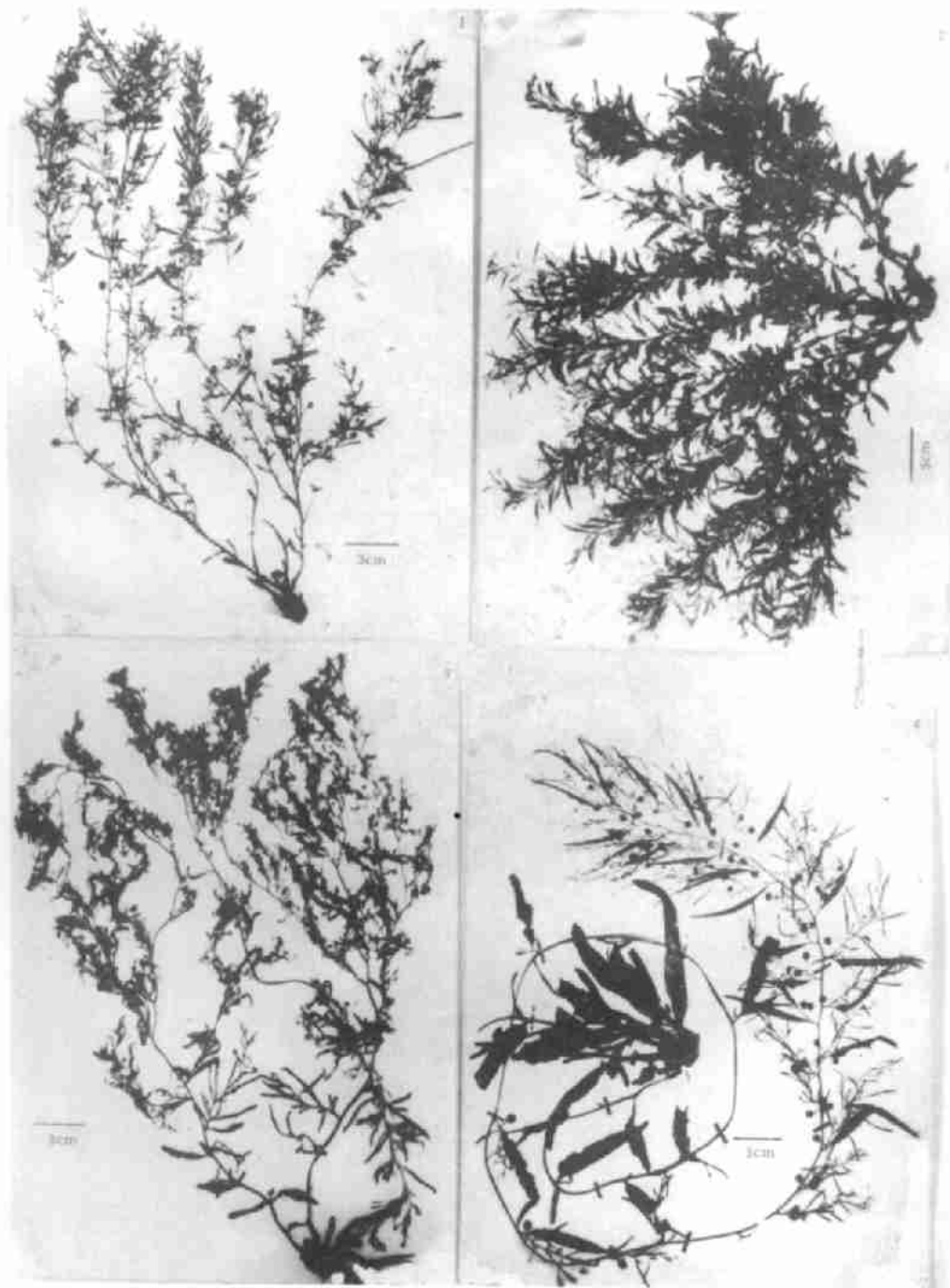
S. fruticosum sp. nov. is characterized by its flattened primary branches, glandular branchlets, and receptacles that are warty, cylindrical, and profusely paniculately arranged on the branchlets. This new species appears to be related to *S. acinaria* (Turn.) C. Agardh, especially in the report by Grunow of *S. acinaria* var. *crassiuscula* Grunow in the China Sea (Grunow 1915). In the arrangement of the receptacles, however, the present species has a typical racemose to subpaniculate inflorescence and is thus a member of siliquosae. These are complicated by the inflorescence, somewhat cymosely arranged in its younger stage.

S. guangdongu sp. nov. is characterized by its coarse frond, its loosely branched, primary branches compressed below and cylindrical above, its very much larger basal leaves, and its shorter receptacular branchlets and absence of young receptacles on elongated axes. These characteristics make it easy to differentiate from other closely related species such as *S. kenslowianum* C. Agardh.

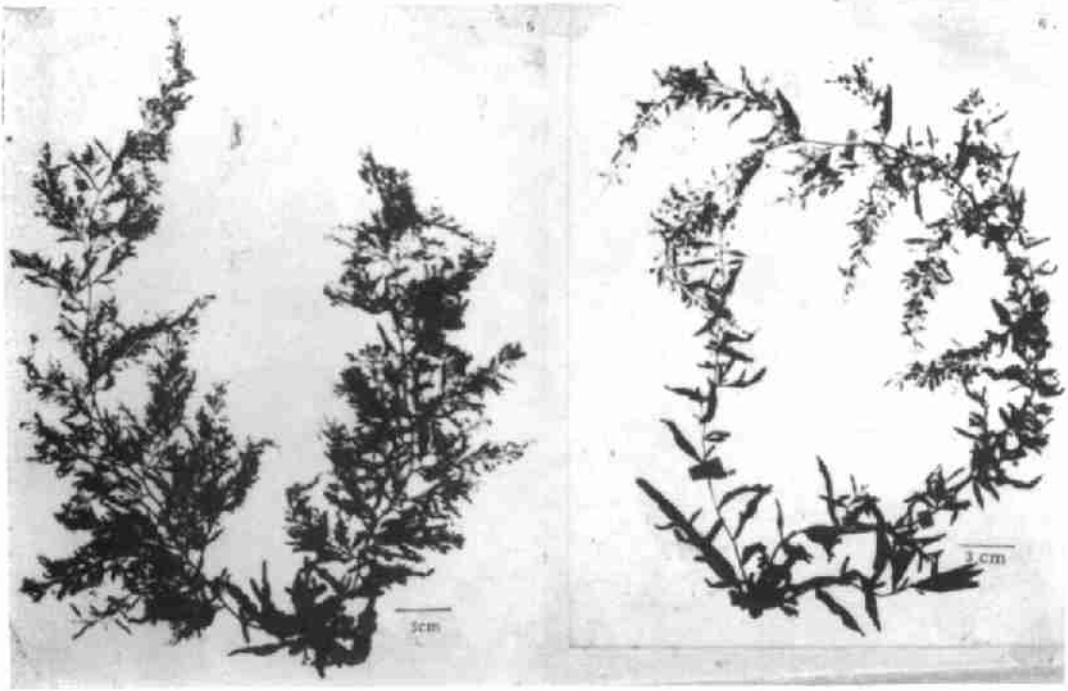
S. agaviforme sp. nov. is characterized by its primary branch arising from the axes and full of receptacular branchlets reminding one of the land plant agave with its flowering branches, hence the name "agaviforme". The young basal leaves are commonly pinnatifid or forked. Each of the leaves has a slender, long stalk similar to that of *S. kuetzingu* but shorter; these characteristics make it easy to differentiate from closely related species such as *S. kuetzingu*.

S. leizhouense sp. nov. is characterized by its large basal dissected leaves, with upper leaves usually equal in length; the receptacles are subpaniculately arranged, the male ones elongated and warty, and the budlike structures arising from the upper parts on the main axes. It is close to *S. paniculatum* but differs in its dissected lower leaves, its copiously branched frond, and its compressed lower parts of the primary branches.

Key words *Sargassum* Series Siliquosae New species



图版 1 上川马尾藻新种 *S. shangchuanu* sp. nov.(1)、灌丛马尾藻新种 *S. frutescens* sp. nov.(2)、灌木马尾藻新种 *S. fruticosum* sp. nov.(3) 和广东马尾藻新种 *S. guangdongu* sp. nov.(4)



图版 II 龙舌兰马尾藻新种 *S. agaviforme* sp. nov. (1) 和雷州马尾藻新种 *S. leixhouense* sp. nov. (2)