

中国近海茗荷亚目五新种*

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在整理鉴定采自我国近海有柄蔓足类(茗荷亚目 Suborder Lepadomorpha)标本中,共发现47种,其中有5新种,本文为新种的描述。模式标本保存在中国科学院海洋研究所。

1. 中华直铠茗荷(新种) *Litoscalpellum sinense* sp. nov. (图1:1—12)

正模标本 V569B-60, 头部长11.0mm, 宽5.7mm; 柄部长7.0mm, 宽3.6mm, 附着于水螅体上。1978年6月10日采自东海26°15'N, 125°00'E, 水深为550米, 底质为软泥。采集者: 唐质灿。

头部呈长方形、顶端尖, 壳板白色14片, 被透明薄膜覆盖, 有细短毛, 板间有窄的间隙。

楯板梯形, 开闭缘拱, 峰缘凹, 基缘和背缘几乎直。背板三角形, 峰缘和开闭缘直, 基缘中间有缺刻。峰板弓弯, 背脊的两侧脊间稍凹, 基缘钝圆, 侧面上部较宽。上侧板呈四边形, 楯缘微凹, 基缘几乎直, 有三角形钙化部分向上方延伸。峰侧板三角形、高大于宽, 峰缘直, 吻缘略拱, 壳顶在基峰角。下中侧板很小, 呈窄三角形, 微弯向吻侧但未达上侧板。吻侧板四边形, 吻缘最短, 壳顶在吻缘上角。吻板小、上部窄, 长度短于吻侧板吻缘。楯板、峰板、上侧板、下中侧板及吻板壳顶都在上端。

柄部略短于头部、圆柱状、末部较粗, 沿所附着的水螅而延伸。鳞窄呈横向延伸, 共8纵列, 每列10—11个, 近头部鳞较密, 下部鳞间有宽的间隙。

上唇膨鼓, 脊缘有小齿, 中部齿两排排列不规则。触须圆三角形, 刚毛稀少。大颚3大齿; 下角分为2尖齿, 下齿较短。小颚切缘缺刻明显, 其上为3粗壮刺和1细小刺, 其下约为9个大小不等的刺。第2小颚略呈四边形; 小颚叶长方形而略扁。各蔓足外、内肢的节数如下:

$$\begin{array}{cccccc} \begin{array}{c} 1 \\ \hline 8 \quad 12 \end{array} & \begin{array}{c} 2 \\ \hline 15 \quad 17 \end{array} & \begin{array}{c} 3 \\ \hline 18 \quad 20 \end{array} & \begin{array}{c} 4 \\ \hline 21 \quad 22 \end{array} & \begin{array}{c} 5 \\ \hline 22 \quad 22 \end{array} & \begin{array}{c} 6 \\ \hline 24 \quad 22 \end{array} \end{array}$$

第1蔓足外肢稍短于内肢, 各分节膨大。第2—6对蔓足两肢长度几乎相等, 各节前缘有刚毛3—6对, 后缘有细短毛, 除后末角有1刚毛外, 后缘有几个小刺和1或2根刚毛。尾附肢基部明显膨大, 每侧分两节, 着生于外侧(图1:5, 10), 长度约为第6蔓足原肢第1节的3/5, 各节末端有刚毛。

无交接器。矮雄附于右楯板开闭缘内侧, 被薄膜覆盖, 体长0.96mm, 宽0.42mm, 囊

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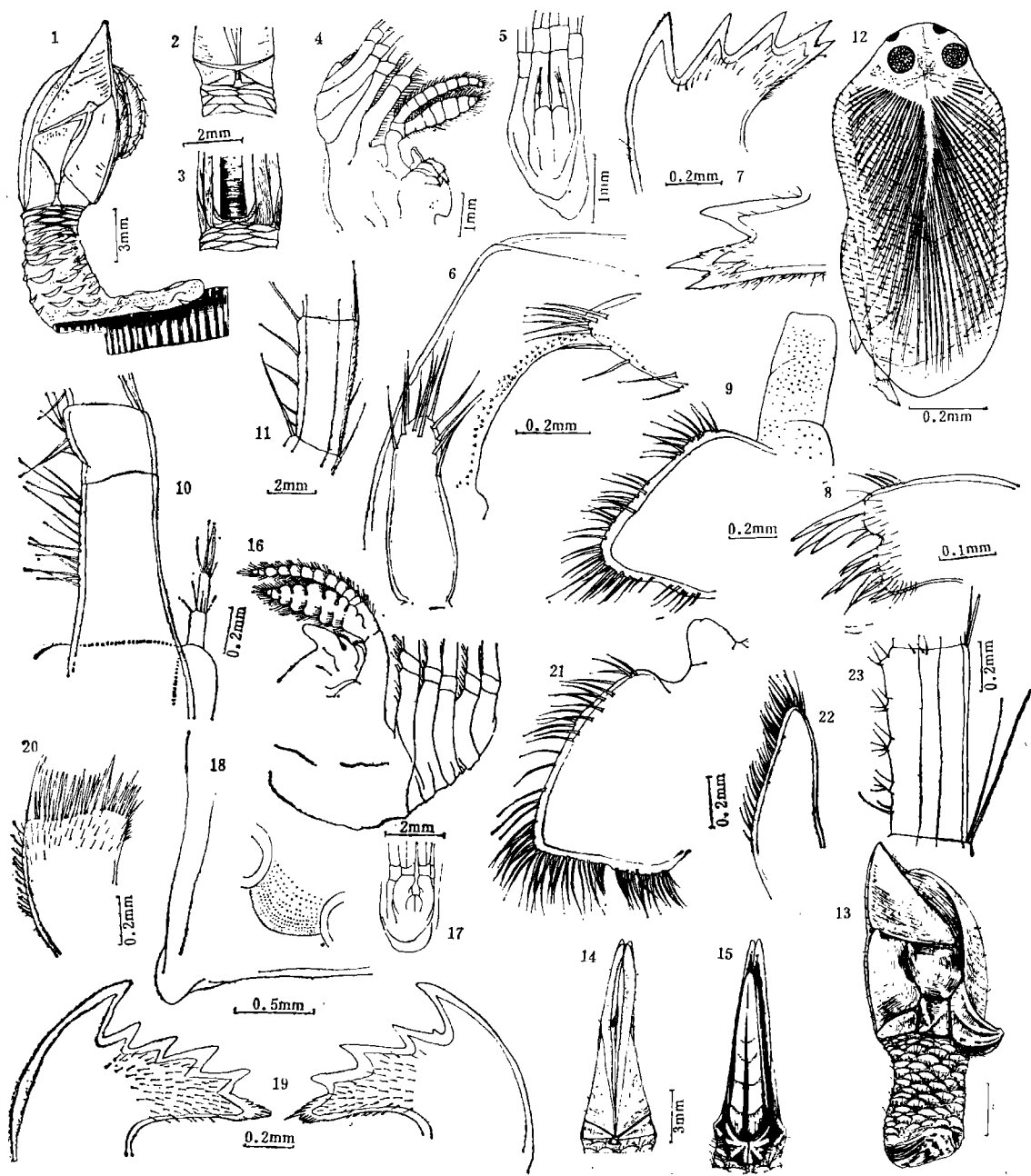


图1 中华直铠茗荷(新种) *Litoscalpellum sinense* sp. nov.

1.外形; 2.外形腹面观; 3.外形背面观; 4.软体部分; 5.尾附肢背面观; 6.上唇和触须; 7.大颚; 8.小颚; 9.第2小颚; 10.第6 蔓足原肢和尾附肢; 11.第6 蔓足外肢第10 节; 12.矮雄。

东方方铠茗荷(新种) *Tarasovium orientale* sp. nov.

13.外形; 14.外形腹面观; 15.外形背面观; 16.软体部分; 17.尾附肢; 18.上唇; 19.大颚; 20.小颚; 21.第2小颚; 22.触须; 23.第5 蔓足外肢第11 节。

状,长卵圆形而微扁,顶端有4个圆形钙化壳板。躯体有放射状的细纵肌纤维,角质外膜有短排小棘毛。近另一端有两个明显的触角。

在 *Litoscalpellum* 属中现有 17 种。本新种尾附肢基部膨大, 不同于任何一种。标本外形近似于 *Litoscalpellum intermedium* (Hoek) 和 *Litoscalpellum walleni* Newman & Ross, 但其上侧板基缘无缺刻, 大颚下角分叉, 蔓足各节背缘有小刺毛, 矮雄的形状(钙化壳板圆形, 小棘毛为短排等)都与 *Litoscalpellum intermedium* (Hoek) 不同。标本背板有缺刻, 吻板顶端窄, 柄鳞仅 8 排, 上唇脊缘有齿, 小颚齿不呈双排等与 *Litoscalpellum walleni* Newman & Ross 易于区别。

2. 东方方铠茗荷(新种) *Tarasovium orientale* sp. nov. (图 1:13—23)

正模标本 V472B-83, 头部长 19.3mm, 宽 10.1mm; 柄部长 9.4mm, 宽 6.5mm, 附着于碎贝壳上。1975 年 10 月 10 日采自东海 27°30'N, 124°30'E, 水深 100 米, 底质为细砂。采集者: 唐质灿。

头部呈不等边四边形, 壳板白色 14 片, 彼此无间隙, 有牢固的外膜包被, 表面有细毛。楯板四边形, 有短的顶侧臂, 顶端略覆盖背板下缘, 开闭缘拱, 基缘、峰缘和背缘均凹, 基峰角钝圆。背板三角形, 开闭缘和基缘微拱, 峰缘直。峰板弓弯, 背脊两侧脊较宽, 其间有窄而深的沟, 侧面较窄。吻板小呈三角形, 完全裸露。上侧板大呈五角形, 楯缘最长而稍拱, 基缘与相对的下中侧板上缘长度相等; 壳顶稍凸, 在板中部偏上接近背楯角, 到每角有低肋。吻侧板窄三角形, 宽约为高的两倍, 板面中部略凹。下中侧板大, 呈长方形, 宽为高的 4/5; 壳顶在板中央, 近基缘微偏吻侧, 并有向四角放射的低肋。峰侧板(侧面)角状外突上弯, 超出峰板背缘。两峰侧板在峰板(背面)基部中线下相遇, 形成窦状; 壳顶在基峰角, 并有 4 条低肋向吻缘放射。楯板、背板和峰板的壳顶都在上端。

柄部短于头部, 鳞较大为横梭形, 每列 7—8 个, 共 17 纵列, 外面覆盖膜具长毛。

上唇膨鼓、前部外突而光滑, 脊缘无明显小齿。触须为三角形薄片, 上缘及前缘有刺, 刚毛较短。大颚 4—5 齿, 下角呈栉状, 具 11—13 小齿。小颚切缘缺刻不明显, 下部略突, 有几乎同等大的刺密排。第 2 小颚三角形, 前缘为一小缺刻分为两叶, 小颚叶短呈圆锥形。蔓足外、内肢的节数如下:

$$\begin{array}{cccccc} \begin{array}{c} 1 \\ \hline 10 \quad 12 \end{array} & \begin{array}{c} 2 \\ \hline 20 \quad 21 \end{array} & \begin{array}{c} 3 \\ \hline 21 \quad 21 \end{array} & \begin{array}{c} 4 \\ \hline 23 \quad 23 \end{array} & \begin{array}{c} 5 \\ \hline 25 \quad 23 \end{array} & \begin{array}{c} 6 \\ \hline 24 \quad 25 \end{array} \end{array}$$

第 1 蔓足外肢呈叶片状, 中部分节扁平而宽阔, 其上密生刚毛, 内肢正常。第 2, 3 蔓足外肢稍长, 第 4—6 对蔓足两肢几乎相等, 第 2—6 蔓足中部分节长大于宽, 各节前缘有 4—5 对刚毛。尾附肢 1 节呈疣突状。

无交接器。没有发现矮雄。

Tarasovium 属已知有 6 种。新种外形同 *T. cornutum* (G. O. Sars) 和 *T. multicostatum* (Newman & Ross) 相似, 但两峰侧板延伸在峰板中线相遇形成窦状, 下中侧板矩形, 与 *T. cornutum* 有明显区别(比较 Broch, 1924, p.35, figs. 11a—b)。标本表面光滑, 除上侧板和峰侧板外, 无放射肋, 第 1 蔓足外肢显著扁平而宽阔等, 与 *T. multicostatum* (Newman & Ross) 显著不同。

3. 毛小铠茗荷(新种) *Arcoscalpellum ciliatum* sp. nov. (图 2:1—12)

Scalpellum hirsutum: Utinomi, 1968, p. 163, fig. 2. (not Hoek).

正模标本 V580B-90-1, 头部长 14.5 mm, 宽 8.2mm; 柄部长 6.2mm, 宽 5.0mm。1975 年 7 月 1 日采自东海 30°30'N, 128°00'E, 水深 365—395 米, 底质为泥质砂。采集者: 唐质灿、许界善。

14 片壳板完全覆盖头部,表面有淡黄色的透明膜,沿生长线有细短毛排,峰缘和开闭缘有稀疏长毛。楯板四边形,上端尖,稍超过背板的开闭缘,开闭缘和侧缘几乎平行,背缘和基缘稍凹。背板大呈斜方形,峰缘拱弯。峰板拱弯,上端伸达两背板顶端内面之间;背脊中间平坦,有侧脊;侧边较窄,有细纵条纹,被斜沟纹分割。上侧板梯形,楯缘和峰缘几乎平行,基缘稍凹。下中侧板小呈三角形,宽度小于高度,顶端壳顶达到上侧板末端。吻侧板四边形,向吻缘渐窄。峰侧板较大而不规则;壳顶在峰缘中部呈喙状延伸超出峰板基部边缘,其突出端有两低脊自壳顶向基缘放射;峰缘上部凹、下部拱;板背面呈三角形,左右两者在峰板背中线基部相遇。吻板最小呈三角形,在两吻侧板吻缘之间。背板、峰板、上侧板和下中侧板壳顶都在上端。

柄部短于头部,菱形突出鳞 8 纵列,每列 5—8 个,由具长毛的膜覆盖。

上唇膨鼓、前部突出,脊缘有不规则排列的齿。大颚 3 齿,下角呈栉齿状。小颚切缘有清楚的缺刻,其上有大、小刺各两个,其下有大刺 11 个。第 2 小颚方形,前缘稍凹处无刚毛。小颚叶短呈圆柱状。各蔓足外、内肢的节数如下:

$$\begin{array}{cccccc} \overset{1}{\text{---}} & \overset{2}{\text{---}} & \overset{3}{\text{---}} & \overset{4}{\text{---}} & \overset{5}{\text{---}} & \overset{6}{\text{---}} \\ 7 & 11 & 20 \times & 24 & 25 & 27 & 26 & 27 & 26 & 26 & 26 \end{array}$$

第 1 蔓足远离后 5 对蔓足,外肢短、中部各节较粗。第 2 蔓足外肢略短。第 3—6 对蔓足两肢长度几乎等长,各节长大于宽,中部各节前缘有 5 对刚毛。尾附肢很短,呈卵圆薄片状,末端有几根刚毛。无交接器。在解剖的标本中未发现矮雄。

在 *Arcoscalpellum* 属已知的 28 种中,新种壳板的形状,软体部分与 *Arcoscalpellum longicarinatum* (Pilsbry), *Arcoscalpellum triangular* (Hoek) 和 *Arcoscalpellum sociabile* (Annandale) 三种近似,但其壳板无显著的同心沟纹,柄鳞仅 8 排,与 *A. longicarinatum* 不同。标本峰板背脊有宽纵沟,有侧脊而与 *A. triangular* 不同。标本尾附肢仅 1 节呈片状,无交接器等与 *A. sociabile* 也有明显区别。Uinomi (1968) 报告采自阿拉伏拉海 (Arafura Sea) 的 *Scalpellum hirsutum* 最显著的特征是峰侧板壳顶在峰缘中部,与 *S. hirsutum* Hoek (1883) 的原始描述不符,其外形及软体部分与我们采自东海的标本极为相似,作者认为它就是本新种。

4. 中国刺茗荷(新种) *Oxynaspis sinensis* sp. nov. (图 2:13—25)

正模标本 V487B-22, 头部长 7.2mm, 宽 5.4mm; 柄部长 4.0mm, 宽 2.7mm。附着于角珊瑚上。1976 年 6 月 27 日采自东海 29°30'N、126°00'E, 水深 96 米,底质为泥质砂。采集者:唐质灿、吴耀泉。

副模标本 V466B-46-1, 附着于角珊瑚上。1975 年 10 月 9 日采自东海 29°30'N、125°30'E, 水深 100 米,底质为细砂。采集者:唐质灿、徐凤山。V466B-46-2, 采集地同副模标本。

头部四边形,高为宽的 1.3—1.7 倍,乳黄色,两侧各有 1 条紫色带纵贯到柄,有时仅出现在柄部。5 片白色半透明的壳板不完全覆盖头部,楯板上端紧接背板,但与峰板间有宽间隙。外表覆盖膜有无数小刺。楯板三叉形,壳顶在板中央、稍凸,开闭缘中部拱,峰缘和基缘有明显的缺刻,将板分为三叶;上叶最宽、顶端尖,峰缘弓弯无小缺刻;下叶最小,似刺状;峰叶呈指状,末端远离峰板基部。背板三角形、较宽,开闭缘光滑或有不清楚的缺刻,长度等于或小于基缘;基缘中部稍突。壳顶在板的中间偏上,有生长纹环绕。峰板窄而

长,弯折成钝角,壳顶在弯折处,上叶顶端尖,为下叶长的 1—2 倍,下叶末端宽圆,基缘由小缺刻分割,生长纹环绕壳顶。

柄部短于头部呈圆柱状,在半透明的外膜内散布着白色小刺,刺尖突出于表面。基部附着盘往往沿峰吻方向延长,附着于角珊瑚上。

上唇膨鼓、前部延伸,前缘有细短毛,脊缘有一列小齿呈弧形排列。触须钝圆而扁平。大颚 4 齿,2—4 齿上缘有附加小齿 1—6 个。下角有 3 小齿而短于第 4 齿,小颚切缘有明显的小缺刻,其上有大刺 2—3 个,缺刻内有 3—5 个小刺;缺刻下的突出部分分为 3 组,两组大刺间有一组细小刺。各蔓足外、内肢的节数如下:

$$\text{V466B-46-1} \quad \begin{array}{ccccccccc} & 1 & & 2 & & 3 & & 4 & & 5 & & 6 \\ & \underbrace{} & & \underbrace{} & & \underbrace{} & & \underbrace{} & & \underbrace{} & & \underbrace{} \\ 8 & 9 & 12 & 13 & 14 & 15 & 16 & 16 & 18 & 17 & 17 & 17 \end{array}$$

第 1 蔓足中部各节呈方形,内肢比外肢长 2—3 节;原肢基部有一粗壮的鞭状突。第 2—6 蔓足内、外肢长度几乎相等,中部各节为长方形,前缘有刚毛 5—6 对。尾附肢很小,仅呈突瘤状,末端有 3—4 根刚毛。交接器为第 6 蔓足长度的 1/3,环纹不清楚,分散有细长毛,末端毛多。

在 *Oxynaspis* 属中,壳板间有宽的间隙,楯板狭窄的类型仅 *Oxynaspis faroni* Totton 一种,其背板的壳顶离开顶端,楯板壳顶离开开闭缘,在板中间,均与本新种近似,但有以下区别:

	<i>Oxynaspis faroni</i> Totton	<i>Oxynaspis sinensis</i> sp. nov.
头部	长为宽的 2.1—2.5 倍,表面刺不明显。	长为宽的 1.3—1.7 倍,有明显刺和褐紫色带。
背板	开闭缘有显著的小齿,基缘直。	开闭缘光滑或有不明显缺刻,基缘中部凸。
楯板	上叶窄,峰叶宽,末端近峰板基底。	上叶宽,峰叶窄,峰叶末端远离峰板基底。
峰板	上叶为基叶长的 4—5 倍。	上叶为基叶长的 1—2 倍。
柄部	基盘短,不向开闭缘方向延伸。	基盘向开闭缘方向延伸。
大颚	下角 2 叉,长度超过第 4 齿。	下角 3 齿,长度短于第 4 齿。

5. 乳突异茗荷(新种) *Heteralepas smilius* sp. nov. (图 3)

正模标本 24-6-1, 头部长 3.0mm, 宽 2.9mm; 柄部长 1.7mm, 宽 1.5mm; 附着于角珊瑚。1959 年 2 月 26 日采自南海 18°30'N、111°30'E, 水深 217 米,底质为中砂。采集者: 唐质灿。

副模标本 24-6-2, 24-6-3, 24-6-4。采集地点、时间和采集者同正模标本。

其他材料 24-6-5, 除正副模标本外,另有 8 个小标本,一起附着于角珊瑚。V469B-232, 两个小标本附着于水螅群体上,1975 年 10 月 10 日采自东海 27°30'N、126°00'E, 水深 162 米,底质为细砂。采集者: 唐质灿。

头部稍侧扁,略为卵圆形,光裸无壳板,黄褐色到乳白色,由透明坚韧的膜包被;峰缘拱,有峰脊,中部有一圆锥形疣突,口上头部顶端略突,为疣状。开闭缘略拱,约为头部长 1/3,有横褶皱,其下稍凹。柄圆柱状略短于头部,横皱折细密,附着盘稍大。透明膜下肌肉发达。

上唇微膨鼓,中部向前突出,脊缘有一排(约 16 个)小齿。触须钝圆。大颚较窄,有 3

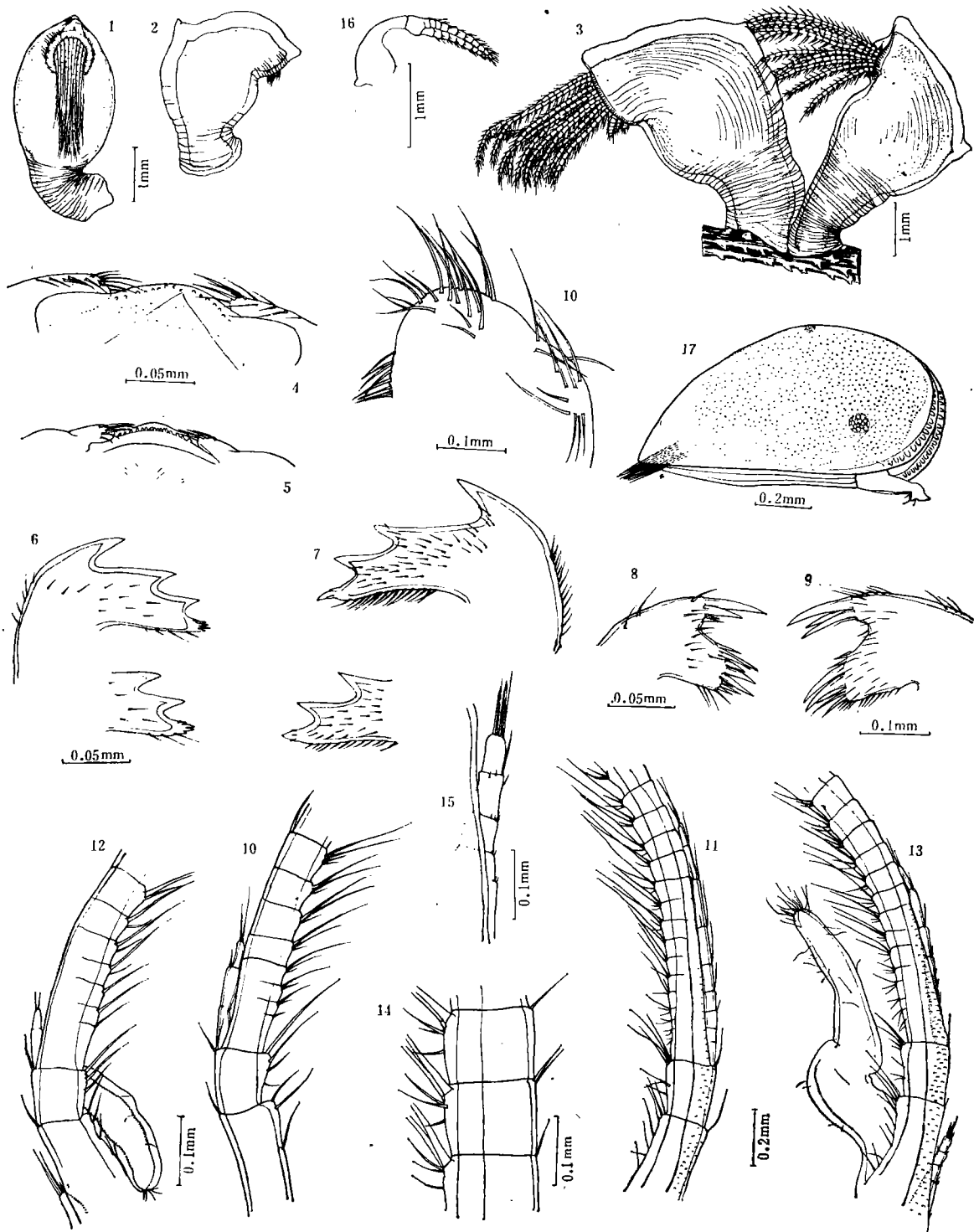


图3 乳突异茗荷(新种) *Heteralepas smilium* sp. nov.

1, 2, 3. 外形; 4, 5. 上唇和触须; 6, 7. 大颚; 8, 9. 小颚; 10, 11. 第5 蔓足;
12, 13. 第6 蔓足, 尾附肢和交接器; 14. 第6 蔓足外肢第19—21 节; 15. 尾附肢;
16. 第1 蔓足及鞭状突; 17. 金星幼虫。(2, 5, 6, 8, 10, 12 为东海标本)。

大齿;下角尖,具几个附加小齿。小颚切缘缺刻宽,其上有3强刺,缺刻下有4—9个粗壮刺。第2小颚卵圆形。蔓足较长,多伸出口外。各蔓足外、内肢的节数如下:

	1	2	3	4	5	6	尾附肢
24-6-3:	8 10	26 29	32 34	35 37	39 9	38 7	4
V469-232-1:	9 7	15 16	17 17	17 20	20 3	21 2	1

第1蔓足与其后各蔓足距离较远,外肢短于或长于内肢,基部后侧的鞭状突仅为小突起。中部各节前缘有1对强刚毛和1,2对细短刚毛。第5,6蔓足内肢特别细小,刚毛发育不全。尾附肢1—4节,明显短于第6蔓足原肢第1节,末端有几根刚毛,各节背缘偶有小刺。

交接器较短,环纹不明显,表面有稀疏细毛。解剖的标本体腔中充满即将孵化的卵,卵内已见无节幼体,长0.27mm,宽0.12mm。还有两个金星幼虫(Cypris larva)同正副模式标本一起附着于角珊瑚上,长1.15mm,宽0.60mm,介壳前部边缘有一排小突起。

在 *Heteralepas* 属中所知的19种内,本种与 *Heteralepas cornuta* (Darwin) 和 *H. japonica* (Aurivillius) 相似,但有如下的主要区别:

	<i>H. cornuta</i> (Darwin)	<i>H. japonica</i> (Aurivillius)	<i>H. smilius</i> sp. nov.
整体大小	中型(13mm左右)	大型(30mm左右)	小型(4.7mm)
峰脊疣突	3个	3—4个	2个
大颚	第3齿有附加齿	第3齿有或无附加齿	无附加齿
蔓足	第5,6蔓足内肢分别为15,12—13节	第5,6蔓足内肢分别为10—19,9—16节	第5,6蔓足内肢分别为3—9,2—7节
尾附肢	9节,长于第6蔓足原肢第1节	5—11节,长于第6蔓足原肢第1节	1—4节,短于第6蔓足原肢第1节

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FIVE NEW SPECIES OF SUBORDER LEPADOMORPHA (CIRRIPEDIA THORACICA) FROM CHINESE WATERS*

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ABSTRACT

The present paper deals with five new species of the Suborder Lepadomorpha (Crustacea, Cirripedia) from Chinese waters. The type materials of new species are deposited in the Institute of Oceanology, Academia Sinica, Qingdao.

1. *Litoscalpellum sinense* sp. nov. (Text-fig. 1: 1—12)

Holotype V569B-60. Capitulum: Length 11.0 mm, width 5.7 mm; Peduncle: Length 7.0 mm width 3.6 mm. East China Sea, 26°15'N, 125°00'E, depth 550 m; Bottom muddy. Aggassiz trawl. Attached on hydroid polyp. 1978, VI, 10. Tang Zhiean coll.

Female-Capitulum oblong, covered by transparent and hirsute cuticle with 14 whitish plates. Scutum trapezoidal, occludent margin arched, carinal margin concave, basal and tergal margins straight, without apicolateral arm. Tergum triangular, middle of basal margin with a small notch. Carina evenly arched, umbo apical, roof somewhat concave between two lateral ribs; sides narrow, but wider on upper part. Upper latus trapezoidal, scutal margin slightly concave, basal margin almost straight, umbo apical; apex produced into a calcified triangle. Carinal latus triangular, longer than wide, scutal margin straight, rostral margin slightly arched, umbo at basi-carinal angle. Inframedian latus very small, triangular and narrow. Rostral latus quadrangular, rostral margin shortest, umbo on upper angle of rostral margin. Rostrum small, narrower on upper part, shorter than rostral margin of rostral latus; umbo apical.

Peduncle shorter than capitulum, pillar-shaped, extended along the axis of the attached hydroid. Scales narrow, transversely broadened, arranged in eight rows, ten or eleven scales in 1 row.

Labrum bullate, crest armed with small teeth arranged in two rows at the middle. Palp ovoid triangular. Mandible with three large teeth, inferior angle bifurcated, the

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lower tooth shorter. Maxilla I with a notch on cutting edge, armed with 3 stout spines and one slender spine on margin above the notch, with about 9 spines below the notch. Maxilla II subquadrate, maxillary lobe large, erect, truncated apically.

Number of segments of anterior and posterior rami of cirrus I—VI are as follows:

I	II	III	IV	V	VI
8 — 12	15 — 17	18 — 20	21 — 22	22 — 22	24 — 22

Anterior ramus of cirrus I bullate, slightly shorter than posterior. The two rami of cirrus II—VI almost equal in length, each segment bears 3—6 pairs of setae on anterior margin; Excepting 1 seta on postero-distal angle, the posterior margin of each segment has several small spines and 1—2 setae.

Caudal appendage very short, about $3/5$ as long as proximal segment of protopodite of cirrus VI, consisting of a broad basal segment and two minute segments on the outer flank, bearing setae at distal end of each segment.

Penis absent.

Dwarf male was found on inner side of the right scutum. Body sac-shaped (length 0.96 mm, width 0.42 mm), covered by chitinous mantle bearing transverse lines of minute hairs on external surface, and with muscular fibres running toward the pole. The pole has four circular calcified plates, prehensile antennae are found near other pole.

The present species differs from any other species of the Genus *Litoscalpellum* in having a broad basal segment of the caudal appendage. It is similar to *Litoscalpellum intermedium* (Hoek) and *Litoscalpellum walleni* Newman & Ross in the shape of the capitulum, but may easily be distinguished from the former by its upper latus being without notch, the mandible being armed with two teeth on inferior angle, by the posterior margin of segments of cirri being armed with spinules and by its dwarf male having four circular calcified plates; distinguished from the latter by its notched tergum, the narrowed upper part of the rostrum, by the scales on the peduncle being only in 8 rows, the crest of the labrum being armed with teeth, and the maxilla I without two parallel rows of spines at base.

2. *Tarasovium orientale* sp. nov. (Text-fig. 1:13—23)

Holotype V472B-83 Capitulum: Length 19.3 mm, width 10.1 mm; Peduncle: Length 9.4 mm, width 6.5 mm. East China Sea, 27°30'N, 124°30'E, 100m depth; bottom sand. Aggassiz trawl. On broken stettl. 1975, X, 10. Tang Zhican Coll.

Female-Capitulum irregular quadrilateral, with 14 fully calcified plates covered with hirsute cuticle. Scutum trapezoidal, with short apicolateral arm; umbo apical and projected; ocludent margin arched; basal, lateral and tergal margins slightly concave; basi-carinal angle rounded. Tergum triangular, umbo apical, ocludent and basal margins slightly convex; carinal margin straight. Carina evenly arched, umbo apical; roof deeply channeled between two wider lateral ribs; sides narrow. Rostrum small, triangular, fully exposed. Upper latus pentagonal, scutal margin longest and slightly arched; margin against inframedian latus equal in length with upper margin of the latter; umbo submedial close to tergo-scutal angle, with radiating ribs from umbo to each angle. Rostral latus very narrow, triangular. Inframedian latus large, rectangular, about $4/5$ as wide as long; umbo raised, submedial, close to basal margin; with

radial ribs from umbo toward each angle. Carinal latus irregularly triangular, with umbo curved upwards horn-like, and projected beyond base of carina; two carino-latus meet below basal margin of carina forming a pocket, with 4 low radial ribs from umbo toward rostral margin.

Peduncle short, with about 17 rows of dilated scales, about 7—8 in each row, cuticle covered with long hairs.

Labrum bullate, crest without tooth. Palp triangular and thin, with spines on its superior and anterior margins. Mandible with 4—5 teeth, inferior angle pectinate with 11—13 small teeth. Notch on Maxilla indistinct.

Numbers of segments of two rami of cirri are as follows:

I	II	III	IV	V	VI
10 12	20 21	21 21	23 23	25 23	24 25

Cirrus I widely separated from the others; segments of anterior ramus middle portion flattened and broadened; those of posterior ramus normal. Cirri II—VI with 4—5 pairs of setae on anterior margin of each segment. Caudal appendage uniarticulate.

Penis absent.

Dwarf male not known.

This new species resembles *Tarasovium cornutum* (G. O. Sars) and *T. multicostatum* (Newman & Ross). It differs from *T. cornutum* in its two carinal latus meeting below basal margin of carina forming a pocket, and in its inframedian latus being rectangular. It differs from *T. multicostatum* (Newman & Ross) in its intermediate segments of anterior ramus of cirrus I being very broad and without radial ribs on the plates (excepting upper latus and carinal latus).

3. *Arcoscalpellum ciliatum* sp. nov. (Text-fig. 2: 1—12)

Scalpellum hirsutum: Utinomi, 1968, p. 163, fig. 2(not Hoek)

Holotype V580B-90-1. Capitulum: Length 14.5 mm, width 8.2 mm; Peduncle: Length 6.2 mm, width 5.0 mm. East China Sea 30°30'N, 128°00'E, depth 365—395 m; bottom mud with sand; 1975, VII, I. Tang Zhican & Xu Jieshan Coll.

Paratypes V580B-90-2. 3 specimens. Same as holotype.

Female-Capitulum covered with 14 calcified plates, with thin and transparent cuticle, hirsute along growth lines, hairs on carinal and occludent margin longer.

Scutum trapezoidal, tip acute, slightly exceeding occludent margin of tergum; occludent and lateral margins almost parallel; tergal and basal margins slightly concave. Tergum large, rhomboidal, umbo apical. Carina evenly arched, its apex extended between two tergums, umbo apical; roof flat, with lateral ribs; sides narrow, with longitudinal ridges crossed by oblique furrows. Upper latus trapezoidal, carinal and scutal margins almost parallel, basal margin slightly concave, umbo apical. Inframedian latus small, triangular, longer than wide, umbo apical, extended to lower end of upper latus. Rostral latus quadrilateral, narrowed gradually towards rostral margin. Carinal latus larger and irregular; umbo situated at the middle of carinal margin and projected beyond basal margin of carina, two carino-latus meet at basal portion of carina. Rostrum very small and triangular.

Peduncle shorter than capitulum, with 8 rows of rhomboid scales, 5—8 in a row, covered by cuticle with longer hairs.

Labrum bullate, anterior portion projected; crest with irregularly arranged small teeth. Palp small, conical. Mandible with 3 teeth, inferior angle pectinate. Cutting edge of Maxilla I with notch, above which are 2 large and 2 small spines, 11 spines below it. Maxilla II subquadrangular, maxillary lobe short.

Number of segments of cirrus I—VI of paratype are as follows:

I	II	III	IV	V	VI
7 — 11	20 — X	24 — 25	27 — 26	27 — 26	26 — 26

Cirrus I separated from cirrus II, anterior ramus slightly shorter than posterior, intermediate segments bullate. Anterior ramus of cirrus II somewhat shorter. Anterior and posterior rami in Cirrus III—VI are equal in length, each of the intermediate segment bears 5 pairs of setae on anterior margin.

Caudal appendage short, uniarticulate, oval and lamina shaped, distal portion with short setae.

Penis absent.

Dwarf male not known.

The present species is closely allied to *Arcoscalpellum longicarinatum* (Pilsbry), *A. triangular* (Hoek) and *A. sociabile* (Annandale). It differs from *A. longicarinatum* in being without the unusually concentric sculpture of striae and with only 8 rows of scales on peduncle. It may be distinguished from *A. triangular* by its wide and flat furrow on the roof bounded by lateral ribs. It also differs from *A. sociabile* in its caudal appendage being uniaarticulate and lamina-shaped and being without penis.

4. *Oxynaspis sinensis* sp. nov. (Text-fig. 2: 13—25).

Holotype V487B-22. Capitulum: Length 7.2mm, width 5.4mm; Peduncle: Length 4.0mm, East China Sea, 29°30'N, 126°00'E, 96m depth, bottom muddy sand. Aggassiz trawl. Attach on Antipatharia. 1976, VI, 27. Tang-Zhican Coll.

Paratype V466B-46-1, 2. 2 specimens 29°30'N, 125°30'E, 100 m depth, bottom sand. Attached on Antipatharia, 1975, X, 9. Tang Zhican coll.

Body covered with numerous minute spinules.

Capitulum trapezoidal, about 1.3—1.7 times as long as wide, cream-yellowish tinted, lateral surface with a longitudinal purple stripe from capitulum to peduncle; capitulum with 5 white plates, and wide membranous interspace between carina and scutum.

Scutum trifurcate shape, umbo central, occludent margin arched in middle, upper lobe broadest, without small notches on occludent margin; carinal lobe widely separated from the basal portion of carina. Tergum triangular, broad, basal margin slightly convex in middle; occludent margin smooth or with indistinct notches; umbo subterminal. Carina slender, angular, distal limb 1—2 times as long as basal one, two limbs forming obtuse angle; basal margin with notch.

Peduncle short, covered by cuticle with scattered spinules; basal disc elongated along in carino-rostral direction, and attached on Antipatharia.

Labrum bullate, forwardly prolonged; crist armed with a series of small denticles. Mandible with 4 teeth; upper margin of 2nd—4th teeth serrate with 1—6 additional denticles; inferior angle shorter than fourth tooth. Maxilla I with a well defined notch on cutting edge. In cirrus I, anterior ramus shorter than posterior, with small thick filamentary appendage at base of protopodite. Cirrus II—VI with 5 or 6 pairs of setae on anterior margin of each segment in middle portion.

Caudal appendage uniarticulate, tumour-shaped, 3—4 setae on tip.

Penis indistinctly annulated and hairy.

This new species is similar to *Oxynaspis faroni* Totton in general feature, they may be distinguished by the following characters:

	<i>Oxynaspis faroni</i> Totton	<i>Oxynaspis sinensis</i> sp. nov.
Capitulum	2.1—2.5 times as long as wide	1.3—1.7 times as long as wide
Tergum	occludent margin with indentations, basal margin straight	occludent margin without or with indistinct notches, basal margin slightly convex at middle
Scutum	carinal lobe broadest, close to base of carina	upper lobe broadest, carinal lobe narrower, separated from carina
Carina	distal limb 4—5 times as long as basal	distal limb 1—2 times as long as basal
Peduncle	basal disc short	basal disc elongated
Mandible	inferior angle bifurcated, longer than fourth teeth	inferior angle tridenticulated, shorter than fourth teeth

5. *Heteralepas smilius* sp. nov. (Text-fig. 3)

Holotype V24-6-1. Capitulum: Length 3.0 mm, width 2.9 mm; Peduncle: Length 1.7 mm, width 1.5 mm. South China Sea 18°30'N, 111°30'E, depth 217 m; bottom sandy. Aggassiz trawl. Attached on Antipatharia. 1959, II, 26, Tang Zhican Coll.

Paratype V24-6-2, 3, 4. 3 specimens. Same as holotype.

Other materials examined 8 specimens same as holotype V469B-232. East China Sea. 27°30'N, 126°00'E, depth 162 m, bottom sand. Aggassiz trawl. Attached on hydroid. 1975, X, 10. Tang Zhican coll.

Capitulum ovoid, slightly compressed, lacking valves, brownish-yellow or cream-white; cuticle smooth; carina margin convex, with dorsal ridge, a horny prominence projected at middle of the latter and a tumour at the edge above the orifice; occludent margin curved, about 1/3 as long as capitulum, with wrinkle.

Peduncle shorter than capitulum, with wrinkle.

Labrum slightly bullate, the crest armed with a series about 16 small teeth. Mandible with 3 teeth, inferior angle acute or pectinate. Maxilla with wide notch on cutting edge.

Number of segments of Cirrus I—VI:

	I	II	III	IV	V	VI
24-6-3:	8 10	26 29	32 34	35 37	39 9	38 7
V469B-232-1:	9 7	15 16	17 17	17 20	20 3	21 2

Cirrus I widely separated from the others, inner ramus of cirrus V and VI short and slender. Filamentary appendage a small protuberance at base of cirrus I.

Caudal appendage with 1—4 articles, shorter than proximal segment of protopodite of cirrus VI.

Penis relatively short with scattered soft hairs.

Nauplii eggs (0.27 mm × 0.12 mm) are found in the mantle cavity of some dissected specimens.

This new species resembles *Heteralepas cornuta* (Darwin) and *H. japonica* (Aurivillius). They may be distinguished as follows:

	<i>H. cornuta</i> (Darwin)	<i>H. japonica</i> (Aurivillius)	<i>H. smilius</i> sp. nov.
Size(length)	about 13 mm	about 30 mm	4.7 mm
Mandible	3rd and 4th teeth with additional denticles	with or without additional denticles	without additional denticles
Number of segments of inner ramus of cirri V and VI.	15, 12—13 respectively	10—19, 9—16 respectively	3—9, 2—7 respectively
Caudal appendage	with 9 articles, longer than first article of pedicle of cirrus VI.	with 5—11 articles longer than first article of pedicle of cirrus VI.	with 1—4 articles, shorter than first article of pedicle of cirrus VI.
Number of prominences on dorsal ridge	3	3—4	2