

湖北拟钉螺属三新种*

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拟钉螺属 (Genus *Tricula*) 是 Benson^[6] 于 1843 年根据采自喜马拉雅山西边阿萨姆 (Assam) 的标本创立的新属, 模式种为山拟钉螺 (*Tricula montana* Benson, 1843)。但从那以后, 模式种便未再发现 (Rao, 1928)^[23]; 我国有无山拟钉螺, 尚属疑问。拟钉螺在分类上隶属于腹足纲 (*Gastropoda*), 鼈螺科 (*Hydrobiidae*), 拟钉螺亚科 (*Triculinae*)。这些螺的个体很小, 壳高常在 8mm 以下, 是微小淡水螺类。在已知的种类中, 除格拉氏拟钉螺 (*Tricula gravelyi*) 产于平原外 (Prashad, 1921)^[21], 多孳生在山区的小溪、小沟和沟旁湿地。已报道的拟钉螺种类虽不多, 但地理分布却很广, 主要分布在印度 (Benson, 1843, 1862; Prashad, 1921)^[6,7,21], 缅甸 (Annandale et Rao, 1925; Rao, 1928)^[5,23], 泰国 (Davis, 1968)^[10], 老挝 (Davis, 1979, 1980; Temcharoen, 1971, 1976)^[14,15,24,25], 菲律宾 (Quadras et Moellendorff, 1895)^[22], 琉球群岛 (Habe, 1961; Davis, 1969a, 1969b; 1971)^[11-13,19] 和中国。我国的拟钉螺, 早在 1885 年 Gredler^[16] 就报道了产于湖南衡山的一个新种, 称为 *Bithynia minutoides* (= *Tricula minutoides minutoides*)。以后 Gredler (1887^[17], 1892)^[18] 又报道了产于湖南、江西、湖北的三个新种 (即 *Tricula minutoides fuchsii*, *Tricula cristella* 和 *Tricula utaiensis*)。1890 年 Heude^[20] 报告四川产的一个新种, 称为 *Hypsobia humida*。1924 年 Annandale^[4] 将其移入拟钉螺属, 改称为泥泞拟钉螺 *Tricula humida* (Heude, 1890), 并报告了云南省澜沧江上游的一个新种, 称为格雷氏拟钉螺 (*Tricula gregoriana*)。自此以后, 再无报告。故解放前, 我国的拟钉螺只知六种 (Annandale, 1924; Yen, 1939)^[4,26]。解放后孙振中 (1959)^[2] 对云南省的拟钉螺进行了研究, 共记述了三种, 其中一种即宜良拟钉螺, 认为是新种, 并对其作了形态描述, 但未正式定名。1957—1958 年间, 四川、云南、广西等省在普查日本血吸虫的中间宿主钉螺时, 在许多县市发现了拟钉螺, 而把它当作钉螺, 即称为疑似钉螺。拟钉螺 (*Tricula*) 这个中译名就是这样来的。1963 年以后, 钟惠澜^[8-9]、尹集廷等^[1] 先后在四川的拟钉螺中找到了肺吸虫尾蚴, 因而引起了人们的注意。自 1957 年起, 我们也先后采到了四川、云南、广西、广东、福建、江西和湖南等省许多地方的拟钉螺标本, 将分别予以报道。近几年来, 我们在湖北五峰、兴山、恩施等县进行肺吸虫病调查时, 又采到多批拟钉螺标本, 经研究鉴定, 发现三个新种, 其中两种为斯氏并殖吸虫的第一中间宿主。正模和副模标本均保存在湖北医学院寄生虫学教研室医学贝类研究组。现将新种描述如下。

* 向选森、张培喜、罗光荣三同志参加标本采集, 文志英同志为插图覆墨, 胡武生同志拍摄拟钉螺照片, 在此一并致谢。

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1. 秉氏拟钉螺(新种) *Tricola pingi* sp. nov.¹⁾ (图 1—5)

形态描述 螺壳微小、长圆锥形,壳质薄不透明。壳面光滑无纵肋和唇脊,但常沾有细泥沙等污垢,呈黑褐色。洗净污垢后,在双目解剖镜下放大(7×5倍)观察,可见很细之生长线。有少数标本,体螺层呈黄褐色,螺旋部呈黑褐色。有6—7个缓慢均匀增长的螺层(个别标本,壳顶残缺不全,只有5个螺层),每个螺层皆圆凸。缝合线明显深陷。螺旋部较高,每一螺层约为其前一螺层的 $1\frac{1}{2}$ 倍。原始壳顶呈小乳头状。体螺层稍膨大,其下部收缩。从腹面观,体螺层的长度常等于或稍大于全长之半。从背腹面观,倒二螺层(penultimate)及倒三螺层(antepenultimate)皆呈带状。壳口略呈梨形,口缘完整,具有暗褐色框边。其上缘狭而尖,下缘宽而圆,内外唇均单薄,内唇与体螺层之间有一条较宽的间隙。内唇上部有一明显的小齿。这是本新种的一个突出特点。脐孔明显,沟裂状。螺厝角质,呈卵圆形,两端钝圆,边缘薄,中间厚,深黄棕色,不透明。厝核偏于厝底靠近内缘,从厝核发出细致而呈放射状的厝纹。螺厝长1.17mm,最宽为0.76mm,比壳口小,能缩入壳口。

正模标本 壳高4.35mm、宽1.65mm;壳口高1.56mm、宽0.957mm。1981年10月25日采自湖北五峰县渔关区南三十里的沈家堡。

副模标本 壳高2.89—4.43mm、宽1.2—1.65mm;壳口高0.91—1.65mm、宽0.64—1mm。1979年9月10日,1981年10月25日及12月27日采自湖北五峰县渔关区沈家堡。

内部结构 动物头颈部、外套缘及鳃膈均为蓝黑色。触角细长,活动时长0.913mm,基部宽0.13mm,其长度约等于口吻长的三倍半,末端钝圆,触角边缘透明,中间为灰黑色。70%酒精固定的标本,触角粗扁,末端较细,其长度为0.36mm,宽度为0.24mm,比口吻稍长。触角边缘有10—13个皱褶。活动时,皱褶消失。眼点小、黑色,位于触角基部背侧偏外。外套缘光滑,无突起和缺刻。鳃膈蓝黑色,具28—34列,中间者较长,两端者较短。鳃膈间之空隙清楚可见。雄螺阴茎淡黄色,细而长,无附属肢,盘曲于颈部背侧偏右,末端较尖。在解剖时,发现一个雄螺有两个阴茎(图4),盘曲于颈部,这是罕见的,迄今尚未见有与此类似的报道。这个雄螺壳高3.2mm、宽1.39mm;壳口高1.2mm、宽0.85mm、整个螺壳为黑褐色,有5个螺层,各层皆圆凸。其外形除壳顶残缺不全外,一切都正常,内部器官亦未发现异常现象。本新种之口吻宽短,前端中部微向内凹,但活动时几乎看不见内凹。足趾在仰游时,呈长方形,两前侧角稍圆,两后侧角更圆。齿舌带状,长0.6mm,宽0.1mm,每一横排共有7个齿片:中央齿片上缘有5个尖齿,中间1个最大,其下缘两侧各有3个尖齿;侧齿片上缘有6个尖齿,第2个最大;内缘齿片有9个尖齿;外缘齿片上缘有11个尖齿。齿舌公式: $\frac{2-1-2}{3-3}$; 1-1-4; 9; 11。

栖息环境 生活在海拔750m高的山腰上,在一块耕地旁的小沟里,沟宽30—40cm,沟底多风化石并有黄泥细沙,坡度较陡,沟中水量平常很少,但终年细水长流,从不干涸。沟边杂草常被铲除,阳光充足。秉氏拟钉螺即附着在小石块的底面。由于是耕地旁的小沟,一年中有几次疏通沟道,孳生地常遭破坏,故秉氏拟钉螺的密度有逐年下降的趋势。现在一个人工小时只能捉十多只。从现场采回的秉

1) 本新种以著名的动物学家秉志教授的名字命名。

氏拟钉螺,放在实验室的平皿内,比小豆螺 (*Bythinella*) 容易养活,我们利用现场带回之水,不加任何饲料,在冬季一般可活一个多月(室温 7—15℃)。在饲养过程中,经常喜欢群集在一起,有时也见个别的仰游水面。

寄生虫 本新种为斯氏并殖吸虫 (*Paragonimus skrjabini* Chen, 1959) 的第一中间宿主,其自然感染率为 2.7%(15/555)。

讨论 本新种具有和本属已知种类相区别的下列特征: (1) 螺壳呈长圆锥形、薄



图1 秉氏拟钉螺(腹面观) 12.5×

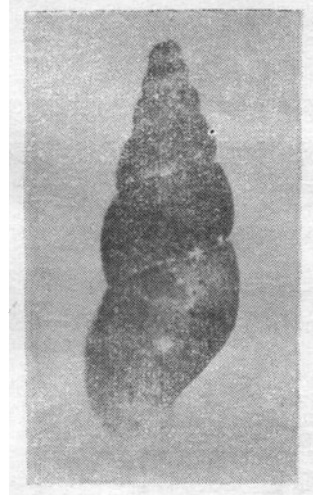


图2 秉氏拟钉螺(背面观) 12.5×

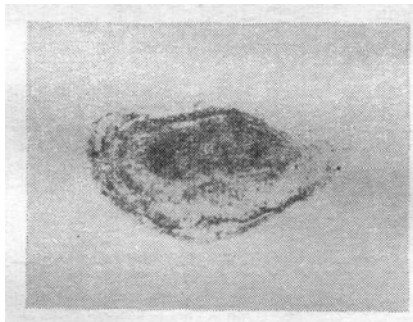


图3 秉氏拟钉螺的唇



图4 一个秉氏拟钉螺有两个阴茎盘
曲于颈部背面(a和b)

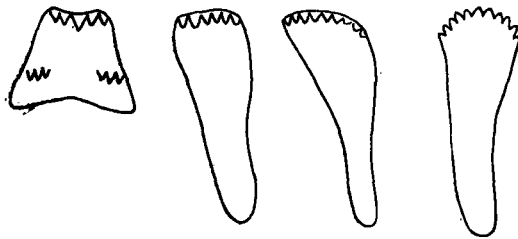


图5 秉氏拟钉螺的舌

而光滑、无唇脊,表面沾有泥垢,呈黑褐色;(2)在壳口的内唇上部有一明显的小齿;(3)根据 20 个螺蛳的测量,壳高 2.89—4.43mm(平均 3.67mm)、宽 1.2—1.65mm(平均 1.45mm),二者比例平均为 1:2.53;(4)体螺层不很膨大,其长度等于或稍大于全长之半,二者的比例平均为 1:1.85;(5)齿舌公式与他种拟钉螺的亦有不同。

2. 向氏拟钉螺(新种) *Tricola hsiangi* sp. nov.¹⁾ (图 6—9)

形态描述 螺壳微小,长卵圆形,塔状。壳面沾有黑色污垢,体螺层为黄褐色,少数为红棕色,螺旋部为黑褐色或黄褐色,洗净污垢后,在双目解剖镜下放大(7×5倍)观察,可见壳面有细小之生长线。螺层 6—7 个,各螺层皆圆凸,螺旋部各螺层长度和宽度均呈均匀缓慢地增长,但到体螺层则突然膨大几成球形,体螺层的长度大于全长之半。根据 20 个螺蛳的测量,体螺层长度与壳高之比为 1:1.64,其宽度为倒二螺层宽度的 1.47 倍。壳顶钝而圆。缝合线深陷。壳口略呈卵圆形,上端狭小,中间较大,内外唇均单薄,外唇背侧无唇脊,内唇下部微向外翻。脐孔小而明显。螺厣角质,卵圆形,边缘薄而透明,中间较厚,淡黄色,半透明,厣核靠近厣底偏于内缘一侧,从厣核发出细致的放射状的厣纹。厣长 0.76—1mm,近厣底处宽 0.52—0.69mm,近厣尖处宽 0.56mm。螺厣比壳口小,能缩入壳口内。

正模标本 壳高 3.52mm、宽 1.69mm;壳口高 1.32mm、宽 0.69mm。1981 年 10 月 25 日采自湖北五峰县渔关南三十里之沈家堡。

副模标本 壳高 2.68—3.52mm(平均 2.85mm)、宽 1.2—1.69mm(平均 1.24mm);壳口高 1.06—1.32mm,宽 0.68—0.73mm。1979 年 9 月 10 日,1981 年 10 月 25 日及 12 月 27 日先后采自湖北五峰渔关沈家堡。

内部结构 动物头、颈、口吻、外套缘及鳃等均为蓝灰色或淡灰黑色,肝脏为黄棕色。触角在活动时,伸得很细长,长 0.87mm,宽 0.087mm,约等于口吻长的 4 倍。触角边缘透明、中间为灰黑色、末端钝圆,为触觉器官,活动时可向上、下、左、右作试探性摆动。酒精固定的标本,触角则变得粗短,两边有 10—13 个皱褶,长 0.365mm,基部宽 0.104mm,比口吻稍长。口吻前宽后窄,前端中部微向内凹。口吻向前或向左右活动时,则内凹不明显。眼点小、黑色,位于触角基部背侧偏外。外套缘稍厚而光滑。鳃长 0.87mm、宽 0.304mm。鳃隔 22—26 列、两端的较短,中间的较长、间隔清楚、大小均匀。阴茎淡黄色、细而短、稍弯、末端圆钝,位于颈部背侧偏右,宽 0.1mm,长 0.391mm,约等于头颈部长度的一半。仰游时,足趾呈长方形。齿舌带状、长 0.73mm、宽 0.087mm。每一横排共具 7 个齿片:中央齿片略呈梯形,上缘有 5 个尖齿,中间一个最大,下缘两侧各有 3 个尖齿;侧齿片上缘有 5 个尖齿,第 2 个最大;内缘齿片上缘有 10 个尖齿;外缘齿片上缘有 9 个尖齿。齿舌公式: $\frac{2-1-2}{3-3}$; 1-1-3; 10; 9。

栖息环境 本新种与秉氏拟钉螺同栖在一条小沟里,有时同栖在一块小石块的底面,栖息环境完全一样。

寄生虫 本新种为斯氏并殖吸虫 (*Paragonimus skrjabini* Chen, 1959) 的第一中间宿主,其自然感染率为 2%(4/200)。

1) 本新种以著名的微生物学家和病毒学家向近敏教授的名字命名。



图6 向氏拟钉螺(腹面观) 12.5×

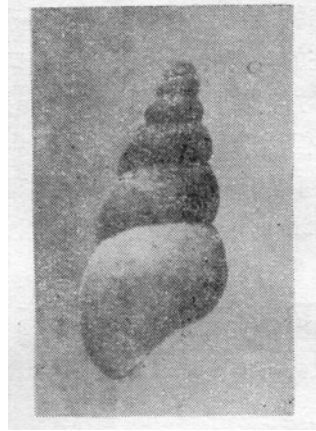


图7 向氏拟钉螺(背面观) 12.5×

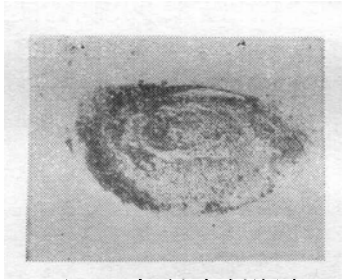


图8 向氏拟钉螺的厣

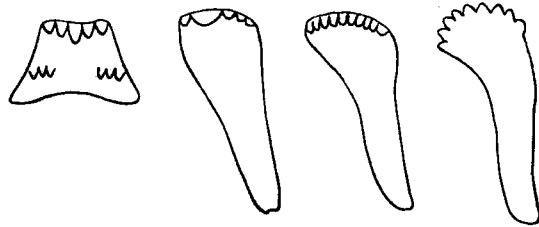


图9 向氏拟钉螺的齿舌

讨论 本新种与马丁氏拟钉螺 (*Tricula martini*)^[23] 近似,但本新种个体较小,各螺层较圆凸,体螺层膨圆,两者的齿式亦有所不同。

3. 屯堡拟钉螺(新种) *Tricula tunbaoensis* sp. nov. (图10—13)

形态描述 螺壳微小、长圆锥形,壳质较薄、淡黄褐色、半透明。肉眼观察壳面光滑、无纵肋和唇脊,但在双目解剖镜下放大(7×5倍)观察,可见极细之生长线。螺层6—7层,各螺层缓慢均匀增长,呈螺旋楼梯状排列。壳顶钝而圆。缝合线浅而明显,其下各有一条阴影,这是本新种的一个突出特点。各螺层毫不凸出,而体螺层则稍膨大。从腹面观,体螺层的长度大于全长之半。从背面观,倒二螺层及其以前各层皆呈带状。倒二螺层(penultimate)的高度约为倒三螺层(antepenultimate)高度的1.8—2倍。壳口形状很特殊,口缘有暗褐色框边。壳口上缘甚狭,象一小沟,下缘较宽,象一大缺口。外唇高起且略扩张,内唇边缘稍增厚,微向外翻,其上部具有一极细之小齿。内唇与体螺层之间有一条较宽的沟状间隙。螺厣角质、卵圆形,边缘薄为白色透明,中间稍厚为淡黄色,半透明。厣核位近厣底偏于内缘一侧,从厣核发出细致的放射状厣纹。厣长0.87mm,近厣底处宽0.47mm,近厣尖处宽0.43mm。螺厣比壳口小,能缩入壳口。

正模标本 壳高3.3mm、宽1.2mm;壳口高0.87mm、宽0.51mm。1981年11月5日采自湖北恩施县屯堡公社红星大队柴岭沟(东坝水电站附近)。

副模标本 壳高2.5—3.3mm、宽1—1.3mm;壳口高0.84—1mm、宽0.51—0.77mm。采集时间和地点与正模标本相同。

内部结构 活的标本,从螺壳取出软体后,螺壳为淡黄色,动物头足部为黑色,从外套缘至肝脏的全部背面为灰黑色。口吻粗钝,前端中部微凹,口即在其下。触角位于头之两侧,活动时伸得很细长(长 0.86mm),末端钝圆,基部较粗大,边缘较透明,明显地分为 10 个皱褶,但活动时这些皱褶看不见。眼点小、黑色,位于触角基部背侧,两眼点距离为 0.53mm。鳃隔 18—24 列、灰褐色,有黑点。肠管细长,其中粪粒为淡黄色、梭形,长 0.41mm、宽 0.12mm,脑足神经节都较粗大,脑神经节略似萝卜形。阴茎细而长,盘曲于颈部,末端较尖。齿舌带状,长 0.567mm、宽 0.077mm,共 68 排,每一横排有 7 个齿片:中央齿片上缘有 7 个尖齿,中间 1 个最大,下缘两侧各有 3 个尖齿;侧齿片有 6 个尖齿,第 3 个最大;内缘齿片有 13—14 个尖齿;外缘齿片有 8—9 个尖齿。齿舌公式: $\frac{3-1-3}{3-3}$; 2-1-3; 13—14; 8—9。

栖息环境 生活在海拔 750m 高的山上小沟里,其右边为一片松树,左边中下段为梯田,沟水可以引入梯田中,在沟旁有杂草,沟宽 1/2—2/3m,坡度较陡,在沟底有大小石块和细沙,沟中水量平常很少,但终年不干,水质清凉;在夏天气温 30℃ 时,测量水温仅 22℃,水的 pH 为 7.2。屯堡拟钉螺主要栖息于沟的中上段,附着在小石块的底面,少数长有青苔的小石块,亦可在青苔上找到。另外,在同一沟中还检获秋吉螺。从孳生地采回的屯堡拟钉螺,由飞机运到武汉,用原产地水,在实验室里培养,未加任何饲料,在室温 7—15℃ 下,大多可活一个多月。

讨论 本新种与泰勒氏拟钉螺 (*Tricula taylori*)^[23] 相似,但本新种个体较小,壳口

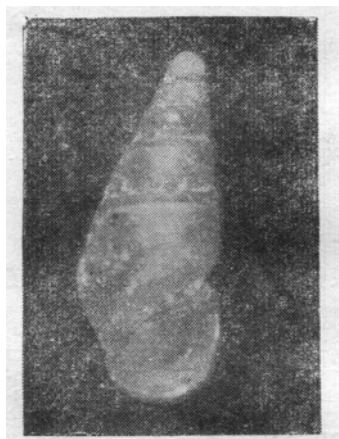


图 10 屯堡拟钉螺(腹面观)(×14)



图 11 屯堡拟钉螺(背面观)(×14)

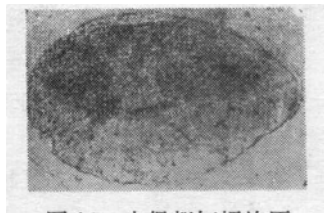


图 12 屯堡拟钉螺的壳口

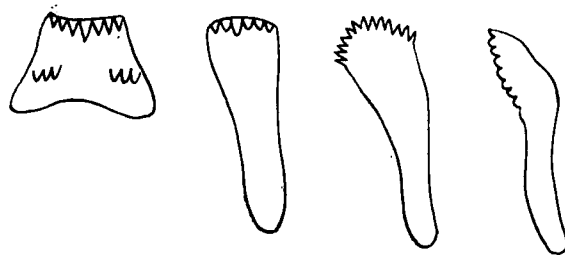


图 13 屯堡拟钉螺的齿舌

形态特殊,各螺层呈旋梯状排列,在缝合线下各有一条阴影,以及齿式均不同。

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DESCRIPTIONS OF THREE NEW SPECIES OF THE GENUS *TRICULA* FROM HUBEI PROVINCE, CHINA

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ABSTRACT

During the years 1979 to 1981 surveys on paragonimiasis were carried out in Wufeng County, Xingshan County and Enshi County, Hubei Province, and lots of freshwater minute snails were collected. Among the collections, we come across three new species belonging to the genus *Tricula* of *Hydrobiidae*. Of which, two are found to be the first intermediate hosts of *Paragonimus skrjabini* Chen, 1959. The diagnostic features of these new taxa are given as follows. The types are preserved in the Department of Parasitology, Hubei Medical College, Wuchang, China.

Tricula pingi sp. nov. (Figs. 1—5)

Diagnosis The shell is minute, elongate-conical, thin and opaque. The shell surface is smooth and without ribs, but stained with dirt. The color in life is darkish brown, and sometimes the body whorl is tinged with yellowish-brown. There are 6—7 gradually and evenly growing whorls, each of which is well convex, so that sutures are quite impressed. The spire is rather high, consisting of 5—6 whorls, each nearly $1\frac{1}{2}$ times its preceding one in length. The apex of the spire is blunt and rounded, and the protoconch is minutely mamillate. The body whorl is not very tumid, its lower portion reduced, whose length is about equal to, or a little longer than half the length of the shell in ventral view. The penultimate and antepenultimate are band-shaped in both dorsal and ventral views. The aperture is pyriform, continuous, with dark margin, its upper portion is very narrow but lower portion is wide and rounded. The outer and inner lips are thin and simple. There is a wide rift between inner lip and body whorl. The upper portion of inner lip is with a small tooth, which is the most charac-

teristic feature of this species. The umbilicus is narrow and chink-like. The operculum is yellowish-brown, corneous, opaque, ovate, blunt and rounded at both ends, and slightly thickened from the edge to the nucleus, and is capable of retraction within the mouth.

The animal is of a bluish-black, and has long tapering tentacles, which when fully stretched are about $3\frac{1}{2}$ times as long as the snout. The eyes are small and black, situated at the outer base of dorsal side of the tentacles. The mantle edge is smooth and without papillae. The verge is simple, light yellow, slender and long, and is coiled up at the back of the neck near the right, and its end is pointed. On examination of the soft parts, I have discovered a snail with two penes twined on the back of the neck. I look upon that as most unusual and so far unrecorded. Both shell and soft parts of this snail are normal, and only the apex is decollate. The snout is wide and short, and slightly emarginate in front. The sole of the foot is rectangular when backstroke, but its antero-lateral angles are not acute and the postero-lateral angles more rounded. The radula is band-form, 0.6 mm in length, 0.1 mm in breadth. The central tooth has 5 denticles, a larger median with a smaller one adjacent to this and the outer still smaller. The basals in the central tooth are 3 on each side; the formula thus becomes $\frac{2-1-2}{3-3}$.

The lateral tooth has a strong cusp and one minute cusp on the inside of this and 4 on the outside. The inner marginal bears 9 denticles and the outer 11.

Holotype Length 4.35 mm, breadth 1.65 mm; length of aperture 1.56 mm, breadth of aperture 0.95 mm; collected on October 25, 1981 at Shenjiabao about 30 miles south of Yuguan, Wufeng, Hubei.

Paratypes Length 2.89—4.43 mm, breadth 1.2—1.65 mm; length of aperture 0.91—1.65 mm, breadth of aperture 0.64—1 mm; collected on September 10, 1979 and in October to December, 1981 from Shenjiabao, Wufeng, Hubei.

Parasite *Paragonimus skrjabini* Chen, 1959.

Discussion This new species may be easily distinguished from its congeners by the following characteristics: (1) The adult shells are elongate-conical, thin, smooth, without varix, darkish-brown, and covered with dirt; (2) The upper portion of the inner lip with a small and distinct tooth; (3) Based upon the measurements of 20 shells, the length is 2.89—4.43 mm, the width is 1.2—1.65 mm; the ratio of width to length with an average value is 1:2.53; (4) Body whorl is not very tumid, its length is equal to, or a little longer than half the length of the shell in ventral view, the ratio of body whorl to shell being 1: 1.85; (5) The radula formula is also different.

Etymology The new species is named in honor of Prof. C. Ping, the famous zoologist and pioneer conchologist who was one of the founders of biology in China, to whom I am greatly appreciative for his constant help and encouragement in my malacology studies from 1954 to 1955 at the Institute of Hydrobiology, Academia Sinica.

Tricula hsiangi sp. nov. (Figs. 6—9)

Diagnosis The shell of this species is minute, elongate-ovate, turreted. The color of the spire in life is dark-brown to yellowish-brown but is sometimes covered with a thin black encrusting of mud-slime, the body whorl is always tinged with yellowish-brown, sometimes reddish-brown. Whorls 6—7, convex. Each of the spire whorls with a gradual increase in length; the body whorl with a rapid increase, fairly tumid, whose

length is always longer than that of the remaining whorls in the spire, based upon the measurements of 20 shells, the ratio of body whorl to shell being 1: 1.64; the ratio of penultimate to body whorl being 1: 1.47. The apex is blunt and rounded. The sutures between each of the two whorls are well impressed, and more or less transverse. The aperture is narrow, oblique, ovoid, pointed above. The outer lip is thin, simple, longer than the inner one. The inner lip is short, its lower part is slightly reflected. The umbilicus is narrow and distinct. The operculum is ovate, horny, thin, translucent, light yellow, paucispiral, with the nucleus excentrically situated on the inner side near the broader end. The operculum is capable of withdrawing into the shell.

The animals are usually dark bluish gray or light grayish black except the liver, which is yellowish-brown. The tentacles in life are about four times as long as the proboscis, its edge is transparent, and the center is grayish black. The proboscis is wide in anterior, narrow in posterior, and slightly emarginate in front. The eyes are small and black, and are situated at the outer base of the dorsal side of the tentacles. The verge of the male is very small, short, curved on the right of the neck. The sole of the foot is rectangular when backstroke. In the radula the central has five cusps on its upper margin, the median one being larger and sharper. On the anterior face of the tooth there are usually three pointed denticles at the base on each side. The lateral has five teeth, of which the second from the inside is much enlarged. The inner marginal has 10 cusps, the outer 9.

Holotype Length 3.52 mm, breadth 1.69 mm; length of aperture 1.32 mm, breadth of aperture 0.69 mm; collected on October 25, 1981 at Shenjiabao about 30 miles south of Yuguan, Wufeng, Hubei.

Paratypes Length 2.68—3.52 mm (average 2.85 mm), breadth 1.2—1.69 mm (average 1.24 mm); length of aperture 1.06—1.32 mm, breadth of aperture 0.68—0.73 mm; collected on September 10, 1979 and in October to December, 1981 from Shenjiabao, Wufeng, Hubei.

Parasite *Paragonimus skrjabini* Chen, 1959.

Discussion This new species is closely allied to *Tricula martini* Rao, 1928 but it is smaller in size, its whorls more convex, body whorl very inflated, and radula formula is also different.

Etymology The species is named in honour of Prof. Chin-min Hsiang, the distinguished microbiologist, virologist and director of the Virus Research Institute, Hubei Medical College, Wuhan, China.

Tricula tunbaoensis sp. nov. (Figs. 10—13)

Diagnosis The adult shells are minute, elongate-conic, thin, light yellowish-brown, translucent. To the naked eye the shells present a smooth appearance, but when examined under a strong lens or a binocular microscope the surface shows very minute longitudinal striae. It has 6—7 whorls which increase gradually in size and arrange in corkscrew staircase. The apex of the spire is blunt and rounded. The suture between each two whorls is shallow but very distinct. There is a line of shadow under each suture, which is an outstanding character of this species. The whorls are not at all swollen. The body whorl is, however, more convex than the one above it, and its length in ventral view is greater than half the length of the entire shell. The aperture has a peculiar structure, the peristome with dark brown margin, its upper portion is very narrow like a small canal but the lower portion is more wide like a large breach. The outer lip is elevated and slightly expanded. The inner lip is thickened and slightly reflected outward, its upper part with a small tooth. There is a wide rift between the

body whorl and inner lip. The operculum is ovate, 0.87 mm in length, and 0.47 mm in breadth, horny, thin, light yellow and paucispiral with the nucleus excentrically situated on the inner side near the broader end. The operculum is capable of withdrawing into the mouth of the shell.

The animals are usually grayish black or black. The proboscis is blunt, slightly bilobed in front where the mouth is located. The single tentacle on each side of the head is fairly slender, round with swelling at their base where the small black eye is situated. The verge is simple, slender and long, and is twined on the back of the neck. In the radula the central tooth has a strong median cusp, a lesser one adjoining this and two feeble ones outside of it. The basals are 3 in number on each side, the formula being $\frac{3-1-3}{3-3}$. The lateral has a large cusp and 2 lesser ones on the inside of this,

and 3 on the outside, the third being feebly developed. The inner marginal bears 13—14 denticles and the outer 8—9.

Holotype Length 3.3 mm, breadth 1.2 mm; length of aperture 0.87 mm, breadth of aperture 0.51 mm; collected on November 5, 1981 at Tunbao, Enshi County, Hubei Province.

Paratypes Length 2.5—3.3 mm, breadth 1—1.3 mm; length of aperture 0.84—1 mm, breadth of aperture 0.51—0.77 mm; collected with the holotype.

Discussion The present species is near to *Tricola taylori* Rao, 1928 but differs from the latter by its smaller size, peculiar form of aperture, whorls arranged in spiral staircase, a line of shadow under each suture, and by its radula formula: $\frac{3-1-3}{3-3}$
2-1-3; 13-14; 8-9.

Etymology Named for the Tunbao Commune in which it was found.