第17卷 第4期 海 洋 与 湖 沼 Vol. 17, No. 4
1986 年 7 月 OCEANOLOGIA ET LIMNOLOGIA SINICA July, 1986

中国秋吉螺属两新种记述*

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提要 本文报道了觸螺科 (Hydrobiidae) 秋吉螺属 (*Akiyoshia*) 两新种，定名为小口秋吉螺 *Akiyoshia* (*Saganoa*) *microstoma* Kang 和车坝秋吉螺 *Akiyoshia* (*Saganoa*) *chebaensis* Kang，标本分别采自湖南古丈县与湖北恩施县的大山区。文中对这两个新种的外部形态、内部结构以及栖息环境作了详细描述，还讨论了新种和近似种的主要区别。

秋吉螺是隶属觸螺科的微小淡水螺类，首先在日本发现。1952 年 8 月，日本昆虫学家上野俊一(Shun-ichi Ueno)在日本本州山口县(Yamaguchi-Prefecture)秋吉石灰洞(Akiyoshi limestone cave) 找到一种无眼点的微小螺类，经黑田德米 (Tokubei Kuroda) 和波部忠重 (Tadashige Habe) 鉴定，于 1954 年创立新种新属，命名为上野秋吉螺 (*Akiyoshia uenoi* Kuroda et Habe)[5]。1957 年，黑田和波部两氏发表“日本洞窟和地下水产的卷贝类”一文[6]，报告了 5 新种秋吉螺 (*Akiyoshia*) 和 3 新种小豆螺 (*Bythinella*)，并将秋吉螺属分为两个亚属：秋吉螺亚属 (*Akiyoshia* s. str.) 与嵯峨螺亚属 (subgenus *Saganoa*)。秋吉螺亚属的种类孳生在深的石灰洞中，螺壳呈卵圆锥形。此亚属包含两种，即上野秋吉螺 *Akiyoshia* (*Akiyoshia*) *uenoi* Kuroda et Habe 和以小林直正氏 (Naomasa Kobayashi) 名字命名的小林秋吉螺 *Akiyoshia* (*Akiyoshia*) *kobayashii* Kuroda et Habe。嵯峨螺亚属的种类多孳生在饮水井内，螺壳呈卵圆柱形。在此亚属内记载了 4 个新种：岸井秋吉螺 *Akiyoshia* (*Saganoa*) *kishiiana* Kuroda, Habe & Tamu；森本秋吉螺 *Akiyoshia* (*Saganoa*) *morimotoi* Kuroda et Habe；柱形秋吉螺 *Akiyoshia* (*Saganoa*) *cylindrica* Kuroda et Habe 和梯状秋吉螺 *Akiyoshia*(*Saganoa*) *scalaris* Kuroda et Habe。1961 年，波部忠重[3]在“地下水产新卷贝”一文中描述了两新种秋吉螺：一种是由今村泰二教授(Taiji Imamura)采自茨城县水户市家用井水内，称为今村秋吉螺 *Akiyoshia* (*Saganoa*) *imamurai* Habe，另一种是由森田真一教授调查团采自日本九州长崎县西彼杵郡西海村之七釜石灰洞 (Nanatsugama limestone cave)，故称七釜秋吉螺 *Akiyoshia* (*Saganoa*) *nanatsugamaensis* Habe。1965 年，波部忠重[4]又报告一新种秋吉螺，标本采自日本本州岩手县岩泉町元村安家洞 (Akka-do Cave, a limestone cave)，故命名为安家秋吉螺 *Akiyoshia* (*Saganoa*) *akka* Habe[4]。到 1965 年，日本共报告 9 种秋吉螺，属于秋吉螺亚属的两种，属于嵯峨螺亚属的 7 种。此后，久无报告。1979 年，佐野基人等 (Sano, M. et al.)[7] 在日本静冈县调查肺吸虫时，在川根町 (Kawane-cho) 渡岛地区大井川支流的地下水排水沟中发现一种淡水小螺可作为宫崎并殖吸虫 (*Paragonimus miyazakii*) 的第一中间宿主。经检查 648 个螺蛳，查到雷蜘的有 6

* 参加标本采集的除作者外，尚有彭德华、李琰、杨国安、李子元、喻新田、张培喜、张世德、黄春波、冯兴才等同志，文中照片由张培喜同志拍摄，插图由文志英同志覆墨，均此一并致谢。
收稿日期：1983 年 8 月 6 日。

个，感染率为 0.9%（6/648）；查到尾蚴的有 4 个，感染率为 0.6%（4/648）。这种小螺经波部忠重鉴定为一新种，定名为川根嵯峨螺（*Saganoa kawanensis*）[7]，但尚未见正式报告。

解放前，我国无秋吉螺的报告。1982 年刘月英等[1]描述过两新种，即云南秋吉螺 *Akiyoshia*（*Saganoa*）*yunnanensis* 与中国秋吉螺 *Akiyoshia*（*Saganoa*）*chinensis*。后者经湖南省湘西土家族苗族自治州卫生防疫站陈绍振等剖检，查出了斯氏并殖吸虫（*Paragonimus skrjabini*）的尾蚴，从而证实是该虫的第一中间宿主。故对秋吉螺的研究，无论在动物分类学上，或在寄生虫病的防治上均具有重要的意义。

1979 年 7 月至 1984 年 10 月，我们在湖南省古丈县和湖北省恩施县的大山区调查并殖吸虫病（*Paragonimiasis*）时，先后采到多批秋吉螺标本，发现两个新种。模式标本保存在湖北医学院寄生虫学教研室医学贝类研究组。

小口秋吉螺（新种）***Akiyoshia*（*Saganoa*）*microstoma*** sp.nov.（图 1—3）

形态描述　螺壳呈长圆柱形，微小，壳薄，易碎，淡黄白色，半透明。壳面很光滑，在高倍解剖镜下观察，生长线仍不明显。螺层 $4\frac{1}{2}$ 个的占 20%，5 个的占 80%，各个螺层略圆凸，缓慢均匀增长。从背腹面观，倒二螺层与倒三螺层皆呈带状。壳顶小而光滑，乳头状。体螺层大呈圆筒状，其高度约为全长的 52.8%，宽度与倒二螺层几相等，或稍大一点。壳高为壳宽的 2.68 倍，壳口高为体螺层高的 51.86%。缝合线浅而明显。壳口很小，为椭圆形，口缘完整，外唇单薄而不外折，内唇紧贴体螺层上。无脐孔。螺厣小，长 0.4 mm，宽 0.3 mm，极薄呈卵圆形，淡黄白色，透明，厣核靠底偏内，从厣核发出稀疏的厣纹。

动物为乳白色。外套缘薄而光滑，无缺刻，无乳突。眼点小，黑色，位于触角基部背侧。活标本的触角细长，基部稍大，末端较尖；酒精固定标本的触角则较粗短，比吻稍长。口吻粗短，其前端中部有一个较深的内凹。肠管细长，透过螺壳可以看见肠内含有许多棕黄色的粪球。雌雄异体。雄螺阴茎小而单一，无附属肢，盘曲于颈部背侧偏右。齿舌带状，中央齿片上缘有 7 个尖齿，中间 1 个较大，下缘两侧各有 1 个基底齿；侧齿片上缘有 8 个尖齿，第 4 个较大；内缘齿片上缘有 18—20 个极细之小齿；外缘齿片上缘有 14—16 个小齿。齿舌公式：$\frac{3\text{-}1\text{-}3}{1\text{-}1}$；3-1-4；18—20；14—16。

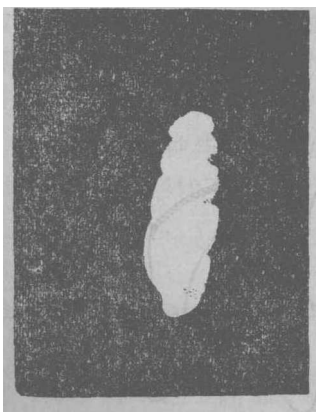

图 1　小口秋吉螺（腹面观）（18 ×）

图 2　小口秋吉螺的齿舌

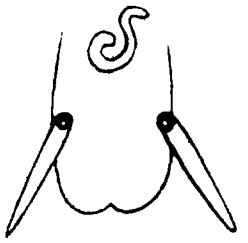

图 3 小口秋吉螺的头颈部，示触角和阴茎

正模标本 壳高 1.61 mm，壳宽 0.565 mm；壳口高 0.52 mm，壳口宽 0.32 mm。1979 年 7 月采自湖南省古丈县茄通区上布尺。

副模标本 壳高 1.56—1.69 mm（平均 1.61 mm），壳宽 0.56—0.65 mm（平均 0.6 mm）；壳口高 0.42—0.56mm（平均 0.52 mm），壳口宽 0.30—0.36mm（平均 0.34 mm）。1979 年 7 月及 1983 年 10 月采自湖南省古丈县茄通区上布尺和东方区下官坪。

栖息环境 本新种生活于海拔 720 m 高的小山沟，水源来自山顶泉水，从悬崖峭壁上流下，沟底为细沙及小石块，水质清凉，水流缓慢，pH 为 6.8—7.0。溪沟两旁草木丛生，遮荫良好。小口秋吉螺附着在小石块的底面及侧面，而以底面为多，有时也可在枯枝烂叶上找到。

讨论 本新种与七釜秋吉螺 *Akiyoshia* (*Saganoa*) *nanatsugamaensis* Habe[3] 近似，但本新种个体较大，无脐孔，螺层数较多，螺层的圆凸程度较差，体螺层基部不膨圆，壳口很小。

车坝秋吉螺（新种） ***Akiyoshia* (*Saganoa*) *chebaensis*** sp. nov.（图 4—7）

形态描述 螺壳微小而呈长圆筒形，壳质薄，半透明，淡黄白色。壳面很光滑，在双目解剖镜下放大（7 × 5 倍）观察，生长线也不甚明显。螺层 4 个，各螺层皆圆凸，均匀增长。壳顶矮而钝。体螺层大而呈圆筒状，其长度大于全长的 1/2（56%）。壳宽与高之比为 1:2.33，体螺层高度与壳高之比为 1:1.76，壳口高为体螺层高度的 5/9（56%），体螺层的宽度为倒二螺层的 1.47 倍。缝合线明显，脐孔裂隙状。壳口卵圆形，上端较狭小，下端较宽圆，口缘完整，具有棕色框边。内外唇均单薄，外唇不扩张，内唇微向外翻，其中部贴覆于体螺层。螺厣卵圆形，角质，淡黄白色，薄而透明，长 0.49 mm，宽 0.3 mm，厣核靠底

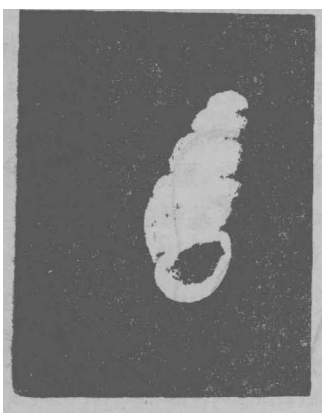

图 4 车坝秋吉螺（腹面观）（18 ×）

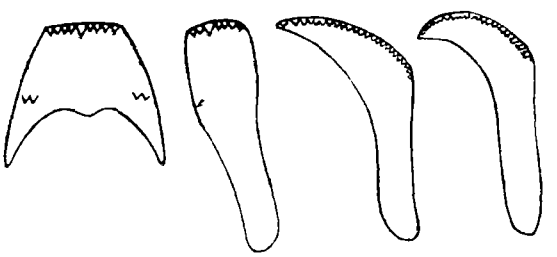

图 5 车坝秋吉螺的齿舌

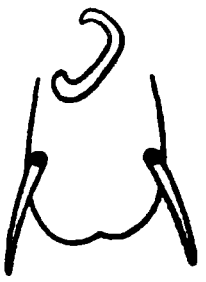

图 6　车坝秋吉螺的头颈部，示触角和阴茎

图 7　车坝秋吉螺的齿 (122×)

偏内，从齿核发出细致的放射状的齿纹。

动物为灰白色，肠管细长，其内充满棕色的梭形粪粒。触角一对，位于头部两侧，活体标本触角细长，酒精固定后则缩短，但比口吻长得多。眼点小而黑，位于触角基部背面。口吻宽短，其前端微向内凹。雄性阴茎位于颈部偏右而单一，无附属肢。酒精固定标本，阴茎长 0.42 mm，基部宽 0.069 mm，系一弯曲、短小、略扁而末端尖的器官，当中有一输精管。齿舌带状，长 0.43 mm，宽 0.06 mm，中央齿片上缘有 9 个小齿，中间 1 个较大，其下缘两侧各有 2 个基底齿；侧齿片上缘有 7 个小齿，第 3 个较大；内缘齿片上缘有 27—30 个小齿；外缘齿片上缘有 25—27 个小齿。齿式为：$\frac{4\text{-}1\text{-}4}{2\text{-}2}$; 2-1-4; 27—30; 25—27。

正模标本　壳高 1.7 mm，壳宽 0.69 mm；壳口高 0.56 mm，壳口宽 0.48mm。1982 年 8 月 5 日采自湖北省恩施县屯堡区车坝水电站附近的柴岭沟。

副模标本　壳高 1.58—1.91 mm (平均 1.74 mm)，壳宽 0.69—0.8 mm (平均 0.748 mm)；壳口高 0.61—0.69mm (平均 0.63mm)，壳口宽 0.435—0.52mm (平均 0.46mm)。1982 年 8 月 5 日、1984 年 8 月18 日和 1984 年 10 月 9 日采自上述地点。

栖息环境　本新种生活于海拔 750m 高的山上小溪沟，沟宽约 50—70 cm、深 8—12 cm。此沟由山顶延伸到山脚，沟水流入清江河。在山腰一带，有些住屋。沟右边是一大片松林，左边有许多梯田，沿着沟旁有许多杂草和零星的小灌木。有些地段，沟旁还有些大乱石。沟底是细沙及大小石块，平常水量小，水质清凉，水流缓慢，pH 为 7.2。根据 1982 年 8 月 5 日中午的记载，水温为 22℃，气温高达 30℃。车坝秋吉螺主要孳生在小山沟的上段，附着在小石块的底面，在沟的中下段很难找到。本新种和屯堡拟钉螺 (*Tricula tunbaoensis* Kang)[2] 同栖在一条沟中，有时同附着在一个小石块的底面。但屯堡拟钉螺的密度比车坝秋吉螺大得多。

讨论　本新种与今村秋吉螺 *Akiyoshia*(*Saganoa*) *imamurai* Habe[3] 很近似，但本新种个体较大，壳口形状不同以及体螺层基部不圆等可以与之相区别。

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ON TWO NEW SPECIES OF THE GENUS *AKIYOSHIA* (GASTROPODA: HYDROBIIDAE) FROM CHINA

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ABSTRACT

From July, 1979 to October, 1984 we carried out a series of field surveys and epidemiological studies on *paragonimiasis* in the mountainous regions of Guzhang County, Hunan Province and Enshi County, Hubei Province. Many specimens of *Akiyoshia* snails were collected. After careful examination, two species were found to be new to science. They are now kept in the Research Laboratory of Medical Malacology, Department of Parasitology, Hubei Medical College and are described below.

Akiyoshia* (*Saganoa*) *microstoma sp. nov. (Figs. 1—3)

Description: Shell cylindrical, thin, fragile, translucent, and dull white. The shell surface is very smooth, even under high magnification the growth lines are still indistinct. The $4\frac{1}{2}$—5 whorls are only slightly convex and are separated by a shallow but distincted suture; they increase gradually and evenly in size. The penultimate and antepenultimate whorls are band-shaped in both dorsal and ventral views. The mammillated apex is almost smooth. The body whorl is large and cylindrical, it measures about 52.8% of the length of the shell. The shell length is 2.68 times the breadth. The width of the body whorl is equal to or a little more than that of the penultimate whorl. The length of the aperture is about 51.86% of the height of the body whorl. Aperture very small, elliptical, continuous; outer lip simple, thin and not reflected outward; inner lip closely adherent on the surface of the body whorl. No umbilicus. Operculum small, thin, ovate, horny, nearly white, transparent, measuring 0.4 mm long and 0.3 mm wide, and paucispiral with excentric nucleus.

The animal is milky white. The mantle edge is thin and smooth without any kind of papillae. The eyes are small, black, and placed in delicate swellings at the base of the tentacles. In living specimens the tentacles are long and slender, and pointed at ends, but in alcoholic specimens the tentacles are short and thick, only slightly longer than the proboscis. The proboscis is short and thick, with a deep emargination in front. The intestine is long and slender, containing many yellowish-brown spindly fecal pellets which be seen through the translucent shell. The species is dioecious. The verge is small, simple, and coiled on the back of the neck. It shows no appendages and has a single duct.

The radula is in the form of a band. The cutting edge of the central tooth has 7 cusps, a large middle, and three smaller lateral cusps, on either side of it. There is one basal cusp on each side of the plate. The laterals have the formula 3-1-4, the inner marginals have 18—20 cusps, the outer 14—16 cusps.

Holotype Length 1.61 mm, breadth 0.565 mm; length of aperture 0.52 mm, breadth of aperture 0.32 mm; collected in July, 1979 in Shangbuchi, Qietong District, Guzhang County, Hunan Province.

Paratype Length 1.56—1.69 mm (average 1.61 mm), breadth 0.56—0.65 mm (average 0.6 mm); length of aperture 0.42—0.56 mm (average 0.52 mm), breadth of aperture 0.30—0.36 mm (average 0.34 mm); collected in July, 1979, and October, 1983, in Shangbuchi of Qietong District and Xiaguanping of Dongfang District, Guzhang County, Hunan Province.

Habitat The new species lives in a rivulet on mountain where the altitude is approximately 720 meters above sea level. The rivulet is supplied with spring water at the top of the mountain that ran down from the rocky cliff into its body. The bottom was formed of sand and small stones. It flowed gently and had clear, cool clean water with a pH of 6.8—7.0. There were overgrown weeds and bushes along the edges of the rivulet, that provided a good shade from the sun. The snails were abundant, attached to the undersides and sides of the stones, with the majority to the undersides. Sometimes they were also found on the dead branches and decayed leaves.

Discussion The new species is closely allied to *Akiyoshia* (*Saganoa*) *nanatsugamaensis* Habe, 1961 but differs from the latter by its larger average size, lack of umbilicus, having more whorls with less convex, body whorl the base of which is not rounded, and by its very small aperture.

Akiyoshia* (*Saganoa*) *chebaensis sp. nov. (Figs. 4—7)

Description Shell minute, cylindrical ovate, thin, translucent, dull white; shell surface rather smooth, even under a strong lens or a binocular microscope, the growth lines are still indistinct. The four whorls increase regularly in size; they are moderately convex and separated by a simple suture. The apex is small and blunt. The body whorl is large and cylindrical, the base of which is not strongly rounded; its height is always longer than half the length of the shell (56%). The ratio of breadth to length is 1: 2.33; the ratio of body whorl to shell is 1: 1.76. The aperture is somewhat oval, rounded anteriorly and narrowed posteriorly. It measures about 5/9 of the height of the body whorl. Peristome continuous, with a brownish margin. Outer and inner lips are simple and thin, outer lip not expanded, inner lip slightly reflected, and attached to the body whorl. The corneous, light yellow and transparent operculum is of ovate shape, measuring 0.49 mm in length and 0.3 mm in width; its nucleus placed near the lower end of the columellar margin.

The animal is greyish white except for the intestine, which is yellowish-brown, full of spindly fecal pellets. The tentacle is situated at each side of the head; in life it is long and thin, in alcohol-fixed specimens the tentacles are thick and short but it is much longer than the snout. The eyes are small and black, and are situated at the base of the dorsal side of the tentacles. The snout is wide and short, and slightly emarginate in front where the mouth is located. The verge of the male is situated on the neck to the right, measuring 0.42 mm long and 0.069 mm wide at the base in alcoholic specimens. It is a bent, short, somewhat compressed organ with pointed tip. There is only a single duct and no appendages. The radula is band-shaped, measuring 0.43 mm in length and 0.06 mm in breadth. Rhachis with 9 cusps on the cutting edge and 2 basal cusps on either side. Laterals with the cusp formula 2-1-4, inner marginals with 27—30 cusps,

outer with 25—27.

Holotype Length 1.7 mm, breadth 0.69 mm; length of aperture 0.56 mm, breadth of aperture 0.48 mm; collected on 5 August 1982 in Chailing gully near Cheba hydropower station of Tunbao District, Enshi County, Hubei Province.

Paratypes Length 1.58—1.91 mm (average 1.74 mm), breadth 0.69--0.8 mm (average 0.748 mm); length of aperture 0.61—0.69 mm (average 0.63 mm), breadth of aperture 0.435—0.52 mm (average 0.46 mm); collected on 5 August 1982, 18 August 1984, and 9 October 1984, at the type locality.

Habitat This new species lives in a small brook on the mountain where the altitude is approximately 750 meters above sea level. The brook was about 50—70 cm wide and 8—12 cm deep at the type locality. The banks were covered with many weeds and scattered bushes. At some sections there were a few large stones on the banks. The bottom was formed of sand and stones. The water in the slowly flowing brooklet was very cool. The temperature of the water near where the snails lived was recorded at noon on 5 August 1982 at 22°C, while the pH was 7.2. The atmospheric temperature on that hot summer day was as high as 30°C. The snails were found attached to the undersides of stones. The distribution of *Akiyoshia* (*Saganoa*) *chebaensis* was limited to the upper portion of the brook. It was very difficult to find them in the middle and lower portions of the brook. This new species was found in company with *Tricula tunbaoensis* Kang [2] at the same brook, sometimes on the same stone. But *Tricula tunbaoensis* was found in much greater density than *Akiyoshia (Saganoa) chebaensis*.

Discussion This new species is allied to *Akiyoshia* (*Saganoa*) *imamurai* Habe, 1961 but differs from the latter by its larger size and aperture shape, and by the body whorl the base of which is not strongly rounded.

Etymology The species name *chebaensis* was given because of the type locality near the Cheba hydropower station of Tunbao District, Enshi County, Hubei Province, China.

更正 本刊 1986 年 17 卷 1 期 92 页第 7 行**模式标本**应为**标本**。