

## Redescription of the Types of *Ischikauia macrolepis* Regan, 1908, an Extinct Cyprinid (Teleostei: Cyprinidae) from Taiwan and the Replacement in the Genus, *Rasborinus* Oshima, 1920

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**I-Shiung Chen and Lee-Shing Fang (2000)** Redescription of the types of *Ischikauia macrolepis* Regan, 1908, an extinct Cyprinid (Teleostei: Cyprinidae) from Taiwan and the replacement in the genus, *Rasborinus* Oshima, 1920. *Zoological Studies* 39(1): 13-17. Three syntypes of *Ischikauia macrolepis* Regan, 1908 in the British Museum (Natural History) have been examined, and they should belong to the genus *Rasborinus* Oshima, 1920. The type species of *Rasborinus*, *R. takakii* Oshima, 1920, should be a junior synonym of *I. macrolepis* Regan, 1908. The species was endemic to Taiwan but is now apparently extinct in Taiwanese fresh waters. This species can be distinguished from the related species, *R. lineatus* (Pellegrin), by differentiation of predorsal scales and fin ray counts, and pectoral fin length.

**Key words:** *Rasborinus*, *Ischikauia macrolepis*, Endemic species, Fish taxonomy, Taiwan.

In an early freshwater fish survey, Regan (1908a, b) described several species of freshwater fishes from Taiwan after Gunther's exploration. Although some of these should be regarded as synonyms or endemic species of Taiwan (Chen and Yu 1986, Tzeng 1986, Shen and Tzeng 1993), Taiwanese ichthyologists have had no chance to examine most of types since publication of those endemic freshwater fishes. As example, *Ischikauia macrolepis*, was described as collected from Kagi (Chiayi), southwestern Taiwan by Regan, and since WWII has been no any further record. Chen and Yu (1986) merely kept this record, based on the original description, but there were no available specimens. Later, Shen and Tzeng (1993) excluded the record from the family Cyprinidae in Fishes of Taiwan. More recently, it has been considered that it should be grouped into the genus, *Hemiculter*, and probably as the junior synonym of *H. kneri* Kreyenberg (Tzeng 1996). However, the taxonomic status of this species is doubtful if based on the limited description of features from Regan, and this problem has never

been resolved until the present study of examined the types. It seems necessary to resolve several problems of synonymy of freshwater fishes of Taiwan by examining the original types held at the British Museum.

Fortunately in the British Museum there are 3 syntypes of *I. macrolepis* which can be located. After re-examination of the types by one of us (ISC), we concluded that this species should be grouped in the genus *Rasborinus* Oshima, 1920, but not the genus *Hemiculter* as recently suggested by Tzeng (1996), nor to *Ischikauia*. The species *I. macrolepis* agrees well with the detailed original description, as well as from a re-examination of the type species of *Rasborinus*, *R. takakii* Oshima except for the anal ray count in the original description (Oshima 1920). *R. takakii* is an apparently extinct, small endemic cyprinid from Taiwan which has never been formally collected since the description by Oshima. However, *R. takakii* has been treated as a junior synonym of *R. lineatus* which was originally described as *Ischikauia lineatus* Pellegrin, 1907, and this species was found

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in southern China and Vietnam during a survey of Cyprinidae done in mainland China by Wu (1977), based on a judgment from the description of *R. takakii* from Oshima (1920). Recently, field collections of freshwater fishes by the 1st author in the summer 1996 yielded some available specimens of *R. lineatus* from southern China. Comparisons with both *R. lineatus* and *R. macrolepis* in this research seem to support the decision they are distinctly discrete species and that *R. macrolepis* would be a senior synonym of *R. takakii*. The detailed redescription, specimen photograph and comparison with the extinct Taiwanese endemic cyprinid, *R. macrolepis* are provided.

## MATERIALS AND METHODS

The type specimens of *Ischikauia macrolepis* were examined from the British Museum (Natural History), London, UK (BMNH), and the type specimen of *Rasborinus takakii* was observed at the Academy of Natural Sciences, Philadelphia, USA (ANSP). The comparative material of *R. lineatus* was collected from the Dong River (Dongjiang) basin, Guangdong (Kwangtong) Province, southern China by electrical fishing by the 1st author in 1996, and it is now deposited in the Museum of Institute of Zoology, Academia Sinica, Taipei, Taiwan, ROC (ASIZP). Specimens were fixed in formalin and then preserved in 70% alcohol. The counts and measurements are based on alcohol-preserved specimens, and methods generally followed those of Oshima (1919) and Wu (1977).

### *Rasborinus* Oshima, 1920

(Type species: *Rasborinus takakii* Oshima, 1920)

### *Rasborinus macrolepis* (Regan, 1908)

(Fig. 1)

*Ischikauia macrolepis* Regan, 1908: 150 (Kagi, Formosa); Oshima, 1919: 228.

*Rasborinus takakii* Oshima, 1920: 130 (Ako, Formosa).

#### Materials examined:

##### *Ischikauia macrolepis*

Lectotype: BMNH 1908.5.27.3, 47.9 mm SL, Kagi (Chiayi County), Taiwan.

Paralectotypes: 2 specimens, BMNH 1908.5.27.4-5; 32.6-44.7 mm SL, Kagi, Taiwan.

##### *Rasborinus takakii*

Holotype: ANSP 49951, 60.6 mm SL, Ako (Pingtung County), Formosa.

##### Comparative materials

*Rasborinus lineatus* (Pellegrin, 1907)- ASIZP 058816, 8

specimens, 35.6- 46.4 mm SL, IS Chen, 6 Aug. 1996, Shuei Ko, Hwei Chou, a small tributary of the Dongjiang River, Guangdong (Kwangtong) Province, China.

**Description:** Dorsal fin rays 3 + 7; anal fin rays 3 + 13-14; pectoral fin rays 14-15; and ventral fin rays 1 + 7. Lateral-line scales 35-37; scales above lateral line 7-8; scales below lateral line 3-4; predorsal scales 14-15; gill-rakers 14; and pharyngeal teeth 4, 4, 2-2, 4, 4. The frequency distribution of selected meristics is shown in table 1.

Head length 3.33-3.68; predorsal length 1.69-1.73; body depth 3.38-3.77; body width 7.37-8.73; caudal peduncle length 6.76-7.01; and caudal peduncle depth 8.57-9.55 all in standard length. Snout length 4.04-4.69; eye diameter 3.23-3.96; interorbital width 2.82-2.96 in head length.

Body elongate rather high and strongly compressed. All proportions of body measurements are shown in table 2. Dorsal profile of trunk highest in the origin of dorsal fin, and dorsal slightly higher than ventral profile. A slight notch between the dorsal profile of head and trunk. Caudal peduncle short and somewhat high. Ventral portion more compressed than dorsal half of body; the preventral belly rounded, postventral region with a well-developed median keel

**Table 1.** Frequency distribution of meristic characters of *Rasborinus macrolepis* and *Rasborinus lineatus*

	Anal fin rays					
	3+13	3+14	3+15	3+16	3+17	X
<i>R. macrolepis</i>						
Regan	1	2				3+13.8
Oshima		1				
<i>R. lineatus</i>			1	4	3	3+16.3

	Predorsal scales							
	14	15	16	17	18	19	20	X
<i>R. macrolepis</i>								
Regan	1	2						14.8
Oshima		1						
<i>R. lineatus</i>					1	5	2	19.1

	Lateral-line scales						
	34	35	36	37	38	39	X
<i>R. macrolepis</i>							
Regan		1	1	1			36.0
Oshima			1				
<i>R. lineatus</i>			2	4	1	1	37.3

Regan: Syntypes of *Ischikauia macrolepis* Regan, 1908.

Oshima: Holotype of *Rasborinus takakii* Oshima, 1920.

toward the anus. Head pointed, interorbital broad and its dorsal profile straight. Snout short, the length less than eye diameter. Mouth small, terminal and oblique, about 45-50° to longitudinal axis of body. Maxillary never extending beyond the vertical of anterior margin of eye. Nostrils close together, the anterior one as a short tube. Lower jaw slightly more projecting than upper one. Lips thin, no barbel.

Dorsal fin with 3 unbranched rays, the 3rd longest and segmented, and its remaining 7 branched rays longest anteriorly. The origin of dorsal fin base inserted above interval between bases of ventral and anal fins. The distance from dorsal fin origin to caudal fin base is shorter than that from dorsal origin to snout tip. Caudal fin deeply forked, tip of each sharply pointed. Pectoral fin long and elongate, rear tip extending to the vertical of the posterior end of vertical fin base. Ventral fin elongate, not extending to anus. Anal fin base longer than other fin bases, with 3 unbranched rays, the 3rd longest and segmented, and anterior branched rays longer than latter one.

Scales moderately cycloid. Predorsal scales about equal size to those of lateral body. Lateral line abruptly downward, above pectoral fin base, then extending along lower half of body almost parallel to ventral profile toward middle of caudal fin base.

Color in preservative. No record or description of fresh material was available for examining before species extinction. Body pale yellowish, dorsal part grayish. A quite dark stripe along the middle of lateral side. All fins whitish and translucent, unmarked.

**Distribution:** So far, *R. macrolepis* (Regan) is only recorded from Kagi (Chiayi County) (Regan 1908b) and Ako (Linlo, Pingtung County) (Oshima 1920 1923) of southern Taiwan.



**Fig. 1.** *Rasborinus macrolepis* (Regan, 1908), paralectotype, 44.7 mm SL, Kagi, Taiwan.

## DISCUSSION

Oshima (1919) listed a species record of *I. macrolepis* Regan for his Taiwanese freshwater fishes exploration by citing the original description from Regan (1908) without examination of type specimens; he described the new genus and species, *Rasborinus takakii* Oshima (1920) in the following year. No comparison between *R. takakii* and *I. macrolepis* was made in that study (Oshima 1920). After re-examination of syntypes of *Ischikauia macrolepis* as well as the holotype of *R. takakii* Oshima, we conclude that the species, *I. macrolepis*, should be a member of the genus *Rasborinus*, not *Ischikauria*, and that *Rasborinus macrolepis* (Regan, 1908) should be regarded as a senior synonym of *R. takakii* Oshima, 1920. The Japanese endemic genus, *Ischikauia*, is distinctly different from *Rasborinus* by: (1) higher count of lateral line scales 64-73 in *Ischikauia* (type species: *I. steenackei*) than 35-48 in *Rasborinus* (Chen, unpubl. data); (2) dorsal origin closer to snout tip in *Ischikauia* than to caudal fin base but closer to caudal fin base in *Rasborinus*; and (3) *Ischikauia* with larger standard length in adults reaching 25 cm; but the length of *Rasborinus* in adults always less than 8 cm (Regan 1908a, Oshima 1920, Nakabo 1993, Chen, unpubl. data).

Wu (1977) revised *Rasborinus* in China and placed *Ischikauia lineatus* into *Rasborinus* while considering the generic definition from Oshima (1920) and he summarized *R. takakii* as a junior synonym of the Chinese species, *R. lineatus* but without seeing any types of Taiwanese materials of the genus *Rasborinus*. His decision was probably led by Oshima's original description of the anal fin ray count (3 + 16) of *R. takakii*, which is similar to the meristic counts of



**Fig. 2.** *Rasborinus lineatus* (Pellegrin, 1907), ASIZP-058816, 42.5 mm SL, Shuei Ko, the Dong River, Kwangtung Province, China.

Chinese *R. lineatus*. After examining the holotype of *R. takakii*, the syntypes of *R. macrolepis*, and specimens of *R. lineatus* from China we found that the Taiwanese types of *R. macrolepis* and the *R. takakii* holotype are very similar in anal fin ray count, predorsal scale number, as well as pectoral fin length and should belong to a single species. Oshima's original description of anal fin ray counts was wrong, and the correct number should be 3 + 14. This Taiwanese endemic species can be easily distinguished from *R. lineatus* by the following characters: (1) predorsal scales: 14-15 in *R. macrolepis* but 18-20 (modally 19) in *R. lineatus* (Table 1; Fig. 2); (2) anal fin rays: always 3 + 13 to 3 + 14 in *R. macrolepis* but always 3 + 16 to 3 + 17 in *R. lineatus*; and (3) pectoral fin length: its rear tip reaching posterior end of ventral fin base in *R. macrolepis* but the rear tip never beyond the ventral fin origin in *R. lineatus*.

From the most recently 10 yr of investigation, there is no further record of *R. macrolepis* (Tzeng 1986 1990, Shao and Lin 1991, Shen and Tzeng 1993, Fang et al. 1996). In fact, after our research, there are 2 different species of *Rasborinus* occurring in Taiwan, just like Oshima's discovery, but he had no chance to clarify *R. macrolepis* by examining types in Britain and this led him to make the synonymy problem when describing *R. takakii* (Oshima 1919 1920). At present, only 1 species, *R. formosae* can be found and it is in northern Taiwan, due to the apparent extinction of *R. macrolepis* from southern Taiwan. However, the specific lowland habitat of *R. formosae* is still dramatically declining and has even been seriously destroyed by human activity as well as threats by introduced, aggressive species. It is indeed immediately urgent to proceed with any useful conservation plan to place the last limited habitat surveyed by 1st author (Chen, unpubl. data) under protection. Otherwise we could face the problem of extinction of this whole genus from the Taiwanese freshwater fish fauna within a few years.

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重新記述臺灣已滅絕之鯉科魚類之模式標本：大鱗石川魚  
*Ischikauia macrolepis* Regan, 1908, 並更改屬名為細鰻屬  
*Rasborinus* Oshima, 1920

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本文係報告重新檢視三尾共模標本：大鱗石川魚 *Ischikauia macrolepis* Regan, 1908 之結果，建議將其歸入細鰻屬 *Rasborinus* Oshima, 1920。並重新檢視細鰻屬的模式種：高木氏細鰻 *Rasborinus takakii* Oshima, 1920 之後的研究結果顯示：高木氏細鰻為大鱗石川魚的同種異名，而應修正學名為大鱗細鰻 *R. macrolepis* (Regan)。大鱗細鰻雖為臺灣特有種，但族群極可能已全部滅絕。本種與中國大陸採獲的近緣種，線紋細鰻 *R. lineatus* (Pellegrin, 1907) 之標本，能明顯地以背鰭前鱗、臀鰭鰭條數目及胸鰭長度予以區分，所以大鱗細鰻仍應視為臺灣的有效種。

**關鍵詞：**細鰻屬，大鱗石川魚，特有種，魚類分類，臺灣。

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