Bull. Inst. Zood., Academia Sinica **23**(2): 211-218 (1984)

NOTES ON *RHYACICHTHYS ASPRO* FOUND IN TAIWAN

YUN-SHENG LIANG

Department of Zoology, National Taiwan University, Taipei, Taiwan 107, Republic of China

(Received September 1, 1983)

Yun-Sheng Liang (1984) Notes on *Rhyacichthys aspro* found in Taiwan. *Bull. Inst. Zood., Academia Sinica* **23**(2): 211-218. The freshwater fish, *Rhyacichthys aspro* distributes widely throughout the islands in southeast Asia such as Java, East indies, Philippines, and New Guinea etc.. It was not until September 1972 that the first record of this species in Taiwan was documented by Watanabe. His report was based on only a single adult female specimen collected from Kao-ping Chi (高屏溪) near Liu-Kuei (六龜) in the southern part of Taiwan. The present note not only confirms the presence of this gobioid fish in Taiwan but also provides detailed description of some characteristics. The materials examined included five rather young specimens collected from Ma-lan-kou Chi, Fu-yuan (富源，馬蘭鈎溪) and one large adult specimen collected from Nan-tzŭ-hsien Chi, Chia-hsien (甲仙，楠梓仙溪).

Early in 1837, Kuhl and Van Hasselt (Cuvier and Valenciennes, 1837) first reported this fish from the freshwater of Bantam, Java in Historie Naturelles des Poissons. Vol. 12 of Cuvier and Valenciennes using the name of *Platyptera aspro*. In 1861, Günther reported this species based on one specimen collected from Wanderer Bay, Solomons and was deposited in the museum of economic geology (Günther, 1961). Fourty two years later, Boulenger described a new gobiid fish, *Rhiacichthys novae-guineae*, from Dinawa, British New Guinea. (Boulenger, 1903) Although Boulenger pointed out that the eyes of this new species are larger and situated much nearer to the gill-opening than to the end of the snout, it is, however, not true in all cases. So, this "new" species was treated as a synonym of *P. aspro* by all of the later authors. However, *Rhiacichthys*, which was suggested by Boulenger to substitute for *Platyptera* of Cuvier and Valenciennes, was reasonally accepted because the latter name was preoccupied by Meigen, 1803, for a genus of fish. (Boulenger, 1901) And *Rhiacichthys* was also spelt as *Rhyacichthys* by authors. Since then, *Rhyacichthys aspro* has been recorded by authors such as De Beaufort and Weber (1913, New Guinea), (Weber and De Beaufort, 1953) Herre (1927, many provinces of Philippines), (Herre, 1927 and 1953) and Fowler (1928, East indies, Melanesia). It was not until forty four years later that Watanabe documented the first record of the presence of this species in Taiwan based on only a single specimen collected from Kao-ping Chi, Kaohsiung (高雄高屏溪), and deposited in the Zoology Department, Tokyo University. He elaborated a map to show the distribution of *Rhyacichthys aspro* which was limited to the Indo-Pacific region, and the former northermost record of its distribution was in Luzon Island. Watanabe emphasized that his report extended the limit of the family Rhyacichthyidae for some 600 km. farther north. (Watanabe, 1972; Tominaga and Uyeno, 1982) In 1975, Masuda and his coworkers indicated that two specimens of *Rhyacichthys aspro* were collected at the end of July 1975 from Nakama River, Tiomote Is., Yaeyama, and mentioned that the detailed report on this species will be made by Shinsho

Nishijima, University of the Ryukyus. (Masuda, Araga, and Yoshino, 1975) Unfortunitely, the author do not find this report until now.

As was pointed out by Herre (Herre, 1927) that the Rhyacichthyidae has been grouped by various authors with the gobies, the blennes, and the Callionymidae, but it is now generally agreed to that it belongs to the Gobioidei. Cuvier and Valenciennes saw that their affinities were essentially with the eleotrids, in spite of the fact that the position of their dorsals and ventrals is similar to that of the platycephalids and of the European genus formerly known as *Aspro*. However, the more efficient judgement through investigation was provided by Miller (Miller, 1973) who summarized his study and that of other authors. He emphasized that the non-ossified interspace between symplectic and preoperculum is much more apparent than in percoids in spite of the fact that it is narrower than that in many other gobioids. In addition, the splint-like elements of the caudal skeleton are identified as hypruals 1 and 6, and there is no trace of parietals. *Rhyacichthys* is specialized in comparison with the basal percoids by the presence of edentulous pterygoids, imperforate ceratohyals, reduction in number of branchiostegal rays to six, smooth opercular bones, additional vertebrae, supratemporals reduced to a single element and no median extrascapular, larger second preural neural spine, only one anal spine, and a naked head (except for the nape). All these features of specialization of *Rhyacichthys* fully confirm the inclusion of this genus in the Gobioidei. Furthermore, Miller point out many primitive features in *Rhyacichthys* such as the possession of well-developed body, infraorbital, supratemporal and preopercular lateral line canals; the head lateral-line canals comprise oculoscapular (post-temporal to supraorbital), and preopercular sections with rarely a short supratemporal extension, and at least 30 canaliculi could be counted over the area of the head system as a whole. As to the caudal skeleton, *Rhyacichthys* possessed three epurals, while the eleotrids and some gobioids possessed two and most other gobioids possessed only one, this characteristic of *Rhyacichthys* also expressed that this genus maintained more the primitive features of its percoid ancestor than that of other gobioids.

MATERIALS AND METHODS

As was mentioned by Herre (Herre, 1927, 1953) that *Rhyacichthys* lives in swift mountain streams, clinging to the rocks and slipping around and under them when disturbed, and is very difficult to dislodge or collect. Owing to the above reason, the author and the collectors had asked and got the special permission from the government to use the electric shock for collection of fishes such as gobies, homalopterids, gobiobotia, and some small fishes.

Six specimens were based on this note for descriptions. Of which, five smaller one were collected from Ma-lan-kou Chi, Fu-yuan (富源馬蘭鈎溪) by Mr. Cheng-hsien Tseng (曾晴賢) on February 14, 1981: and the larger one was caught from Nan-tzŭ-hsien Chi, Chia-hsien (甲仙楠梓仙溪) by Mr. Mou-i Liu (劉茂益) on April 15, 1982. These specimens were deposited in the museum of Department of Zoology, National Taiwan University, Republic of China.

DESCRIPTIONS

Rhyacichthys aspro (Kuhl and Van Hasselt)

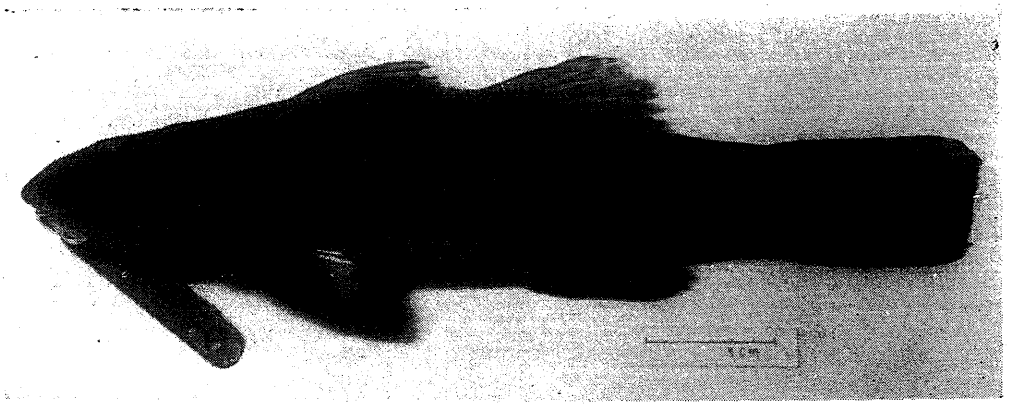
Figs. 1 and 2

Platyptera aspro (Kuhl and Van Hasselt), Cuvier and Valenciennes, 1837: 240 (type locality, freshwaters of Bantam, Java); Günther, 1861: 138.

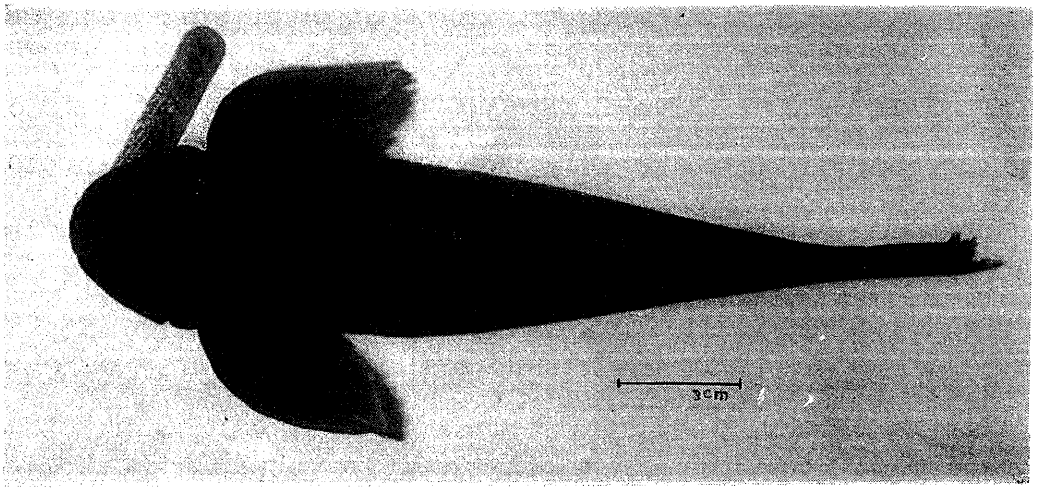
Rhiacichthys novae-guineae, Boulenger, 1903: 124, 125.

Rhyacichthys aspor, Herre, 1927: 21-24, 1953: 719; Fowler, 1928: 388; Watanabe, 1972: 120-124; Masuda *et al.* 1975: 282; Tominaga and Uyeno, 1982:145.

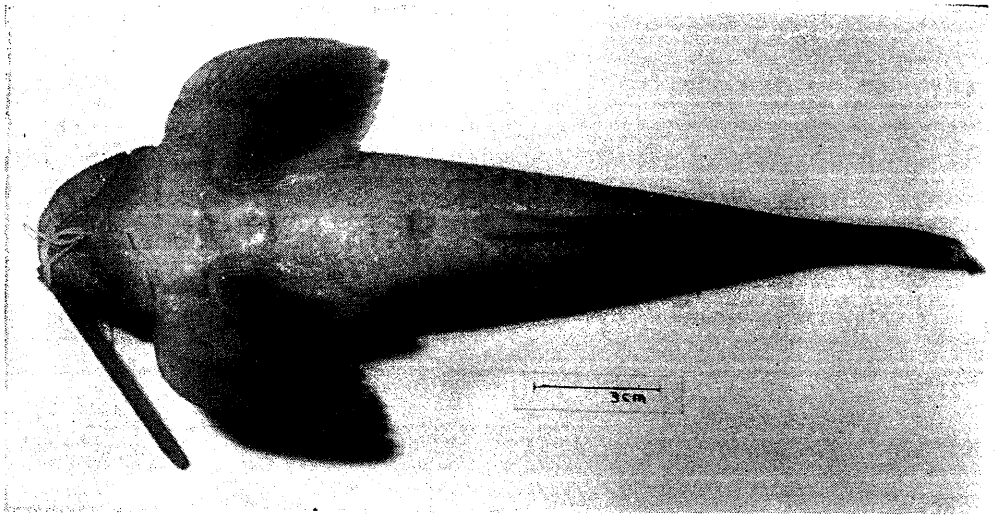
Rhyacichthys aspro (C. V.), De Beaufort and Koumans, 1953: 376-378.



A



B



C

Fig. 1

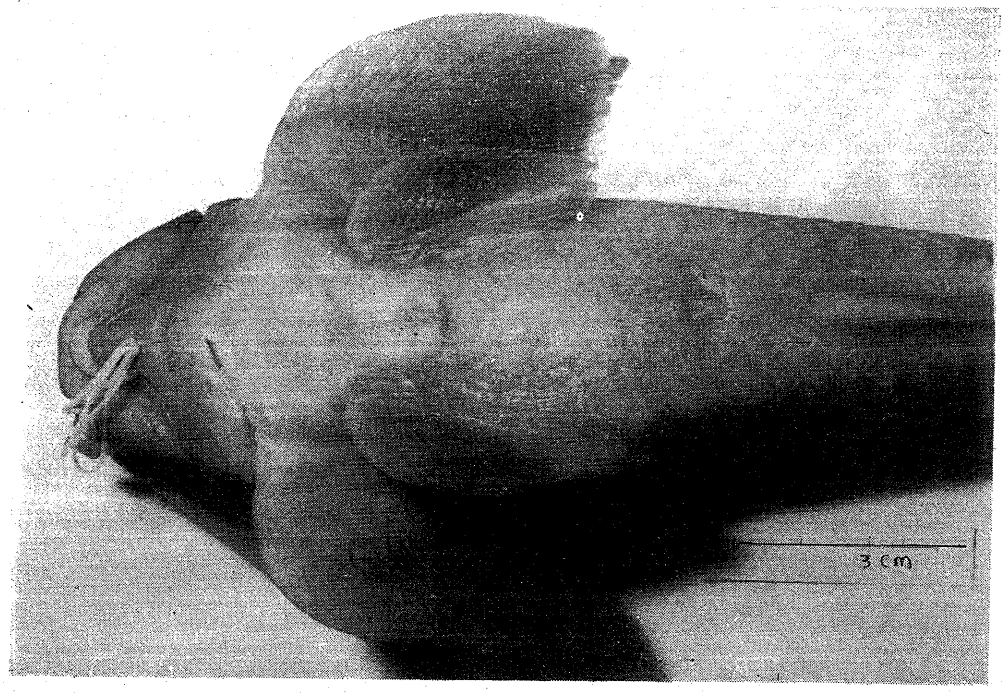


Fig. 1. *Rhyacichthys aspro* (Kuhl and Van Hasselt) (TUMP 51603). A, lateral view; B, dorsal view; C, ventral view; D, ventral view of head and anterior part of body, showing the mouth, preopercular notch, pectoral and ventral fins.

Head depressed, body cylinderical dorsally, and gradually compressed unto caudal peduncle posteriorly; ventral side of head and body before anal fin rather flat. Caudal peduncle rather stout, moderate long. Mouth small, inferior; upper lip fleshy, slightly thick and prominent; eye superior and directed upward; each nostril with a short tube, anterior and posterior nostrils contact closely together, situated between tip of snout and eye but clearly nearer to the latter; preopercle naked, a very distinctly deep notch and continued with a deep groove separating the preopercle from interoprcle, subopercle and opercle; opercle small, partially scaled; gill opening rather small, more or less as wide as the base of pectoral fin; gill membrane does not extend to ventral side, and completely fuse together with the thorax and isthmus.

Two dorsal fins, well separated, the origin of spinous dorsal fin is nearer to the tip of snout than to the base of caudal fin, the soft dorsal fin nearer to the base of caudal fin than to the tip of snout; caudal fin slightly concaved to emarginate; anal fin with a stout and strong spine; pectoral fin large, its distal end extended posteriorly under the midway of spinous dorsal fin, its base thick and broad, covered with small scales, and the proximal portion of the fin covered with the same small scales too; ventral fin under, and a little behind the pectoral fin, and much smaller than the latter. The pelvic spine and the first two branched pelvic rays combined together to form an outer half part of the fin, and the inner half part of the fin includes the remaining three branched pelvic rays. Furthermore, the outer half can be subdivided into two areas, the anterior one is about two-third in size, it consists of as many as 15 to 17 relatively thick simple rays, the rest one-third area also consists of as many as 15 to 17 simple rays but they are thinner and arrange as the leaf of palm. (Fig. 1, D; Fig. 3)

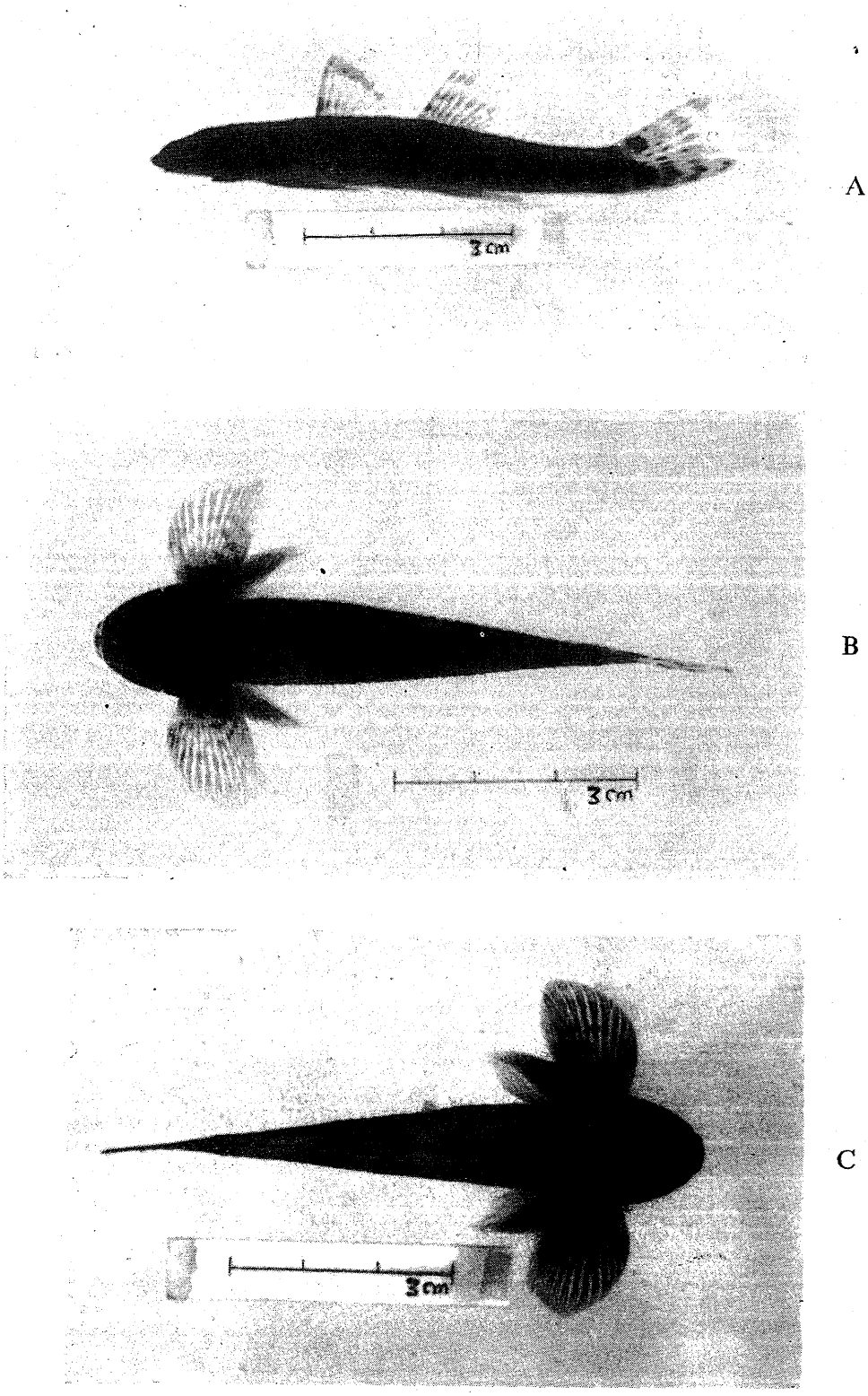


Fig. 2. Young fish of *Rhyacichthys aspro* (Kuhl and Van Hasselt) (TUMP 51242-51246) A, lateral view; B, dorsal view; C, ventral view.

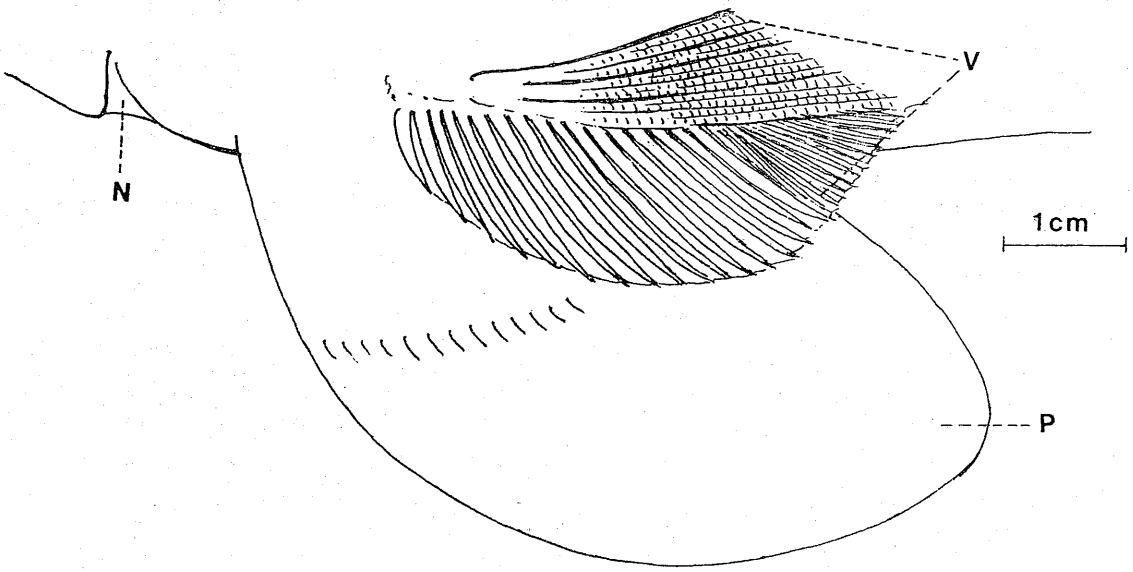


Fig. 3. Ventral view of the right Ventral fin of *Rhyacichthys aspero* Kuhl and Van Hasselt. N, notch between preopercle and interopercle, etc.; P, pectoral fin; V, ventral fin.

Scales ctenoid. Lateral line complete, commenced from a few scales behind the eye, and then gradually curved down to the middle of side body extending to the base of caudal fin, 33 or 25+8, transverse row of scales 6-8/4-6-A.

Color silvery white on ground color. Dorsal side of head and predorsal portion with vermiform dark grayish blotches, becoming uniformly darker since the fish grows up; body side with dark irregular spreaded grayish spots and blotches, but gradually disappear in fully grown adults. Each scale with a central darker grayish dot and darker grayish margin. Ventral side of body whitish. Dorsal fins, caudal and pectorals with irregular cross bars; in the younger one the cross bars in dorsal fins only present on the proximal and distal portions of the fins, while in the mature one, the cross bars in the pectorals becoming obscured, but darker color on the fin rays similar to the condition in the ventral fins; anal fin slightly dusky.

Habitats: Bantam, Java; Celebes (Kuhl and Van Hasselt, 1837); Java; Celebes; Buru, Ceram; Ambon, New Guinea (Koumans, 1953); Wanderer Bay, Solomon Islands (Günther, 1961, 1877-81); Santa Gruz, Luzon (Meyer, 1885); Philippines (Herre, 1927, 1941, 1953); Begowre River, North New Guinea (Weber, 1913); Kao-ping Chi, Taiwan (Watanabe, 1972).

Acknowledgements: The author should like to express his gratitude to National Science Council of the Republic of China (NSC-673-0201-02((18)) for financial support. The author also expresses his hearty acknowledgements to Drs. Sin-Che Lee and Miller, P. J. who read the manuscript and gave many most valuable criticisms and corrections. He also wishes to show his sincere thankfulness to Messrs, C. H. Tseng and M. I. Liu for their fish collections, and to Mrs. T. W. Liang-Chen for her careful technical assistance.

After the completion of the present report, the author recieved two additional specimens of this species (180 and 134 milimeters in total length, and 147 and 109 milimeters in standard length respectively).

TABLE 1
Morphometric and meristic measurements of *Rhyacichthys aspro*

Collecting No. TUMP	51242-51246	51603
Locality	Ma-lan-kou Chi	Nan-tzŭ-hsien Chi
Total length	69-79 mm.	215 mm.
Standard length	55.5-62.5 mm.	174.3 mm.
D.	VII-1, 9	VII-2, 8
A.	I, 8-9	I, 6
P.	22-23	1, 19
C.	14	13
Lat. l.	6-8/33/4-6-a	6/25+8/6-a.
Predorsal scales	11-12	12
Greatest depth in S. L.	6.61-7.63	4.70
Head	4.46-4.67	7.76
Height of head	8.07-8.71	6.48
Snout in head	2.06-2.20	1.82
Eye	4.58-5.19	7.18
Maxillary	3.87-4.35	4.00
Interorbital space	5.19-6.61	3.45
Postocular length	2.90-3.11	3.21
Length of caud. ped.	0.67-0.71	0.72
Least depth of caud. ped.	2.29-2.38	1.73
Longest dorsal spine	1.49-1.65	1.24
Longest dorsal ray	1.40-1.57	1.18
Anal spine	2.11-3.09	1.24
Longest anal ray	1.19-1,31	1.05
Longest pectoral ray	0.86-0.89	0.82
Longest ventral ray	0.97-1.17	1.06
Caudal	0.94-0.98	0.90
Gill rakers	—	10+1+4
Branchiostegals	—	6

REFERENCES

BOULENGER, G. A. (1901) Notes on the classification of teleostean fishes. 1. On the Trachinidae and their allies. *Ann. Mag. Nat. Hist.* **8**(7): 267.

BOULENGER, G. A. (1903) Description of a new fish of the gobiid Genus *Rhiacichthys* from British New Guinea. *Proc. Zool. Soc. Lond.* **2**: 124, 125.

CUVIER, G. and A. VALENCIENNES (1837) Historie naturelles des poissons. **12**: 320-326.

FOWLER, H. W. (1928) The fishes of oceania. *Mem. Bernice P. Bishop Mus.* **10**: 388.

GÜNTHER, A. (1861) Catologue on the acanthopterygian fishes in the collection of the British museum. **3**: 138.

HERRE, A. W. (1927) Gobies of the Philippines and the China sea. *Bearu. Sci. Mongr.* **23**: 21-24.

HERRE, A. W. (1953) Check list of Philippine fishes. *U. S. Fish Wild. Serv. Res. Rept.* **20**: 719.

MASUDA, H., ARAGA, C. and T. YOSHINO (1975) Coastal fishes of southern Japan. (in English and Japanese) 282.

MILLER, P. J. (1973) The osteology and adaptive features of *Rhyacichthys aspro* (Teleostei: Gobioidei) and the classification of gobioid fishes. *J. Zool.* **171**: 397-434.

TOMINAGA, Y. and T. UYENO (1982) Working material for a checklist of Japanese fishes (Revised edition). (with Japanese names) 145.

WATNABE, M. (1972) First record of the gobioid fish, *Rhyacichthys aspro*, from Formosa. *Jap. J. Ichthyol.* **19**(2): 120-124.

WEBER, M. and L. F. DE BEAUFORT (1953) The fishe of the Indo-Austra-lian Archipelago. **10**: 376-378.

記臺灣產溪鱧 (*Rhyacichthys aspro*)

梁 潤 生

溪鱧首先由 Kuhl 與 Van Hasselt 發現於爪哇 Bantom (1837)，距今幾達一百五十年，其後相隔二、三十年，甚至四、五十年， 始再發現於其他地區， 但都局限於東南亞島嶼內陸之淡水激流中，爲底棲貼附於石塊之機警魚類，採集不易， 個體數目不多， 以非律賓採集保存之標本較爲豐富。本省產溪鱧在十一年前 (1972) 由渡部正雄在日本魚類學雜誌發表，彼在本省南部高屏溪採得標本一尾，現保存在東京大學動物學系標本室中， 此一發現， 使本種魚類分佈， 向北伸展 600 公里之遙， 去年與前年 (1981, 1982)， 著者分別在馬蘭鈎溪及楠梓仙溪共獲小標本五尾、大標本一尾，完稿之後，又收到去年底採自楠梓仙溪之大標本二尾，此不獨可以確證溪鱧產於本省，且將其分佈更向北移。

依據各有關魚類學之研究，溪鱧在分類上應屬於鰕虎類， 不過却具有若干較原始之特徵， 仍接近於鱸形類，有關溪鱧之形態特徵，除前人已記載並討論者外， 本文擬就所有特大與特小之標本， 按實際觀察與測量，加以報告，而對其腹鰭形態構造， 尤爲刻意描述， 至於其鼻孔位置形狀、體色花紋，亦加以較詳盡記載。