

Short Note

Two freshwater bivalve species new to the fauna of Vietnam (Mollusca: Bivalvia: Arcidae and Unionidae)

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Surveys of the freshwater mussels of Vietnam are being conducted by the authors to update and expand the historical work of Đăng^{1,2,3}. During the authors' third trip [19 March to 5 April, 2014] a paired, fresh dead specimen of *Hyriopsis delaportei* (Crosse and Fischer, 1876) was collected from a spoil heap of a mussel processing facility in Binh Long Commune outside Cái Dầu, Châu Phú District, An Giang Province, southwestern Vietnam, in the Mekong River delta³ (Figures 1a, b). This specimen was recovered along with shells of *Ensidens*

ingallsianus (Lea, 1852), *Hyriopsis bialatus* Simpson, 1900 and *Uniandra contradens* (Lea, 1838). Some of the valves of these other species had specimens of *Limnoperna fortunei* (Dunker, 1856) attached to the posterior end of the valves⁴. The specimen of *Hyriopsis delaportei* was immediately recognized at the site as unique and very different from the associated and abundant shells of *Hyriopsis bialatus*. The identification of the specimen as *Hyriopsis delaportei* was initially based on Brandt⁵ and confirmed by comparison with

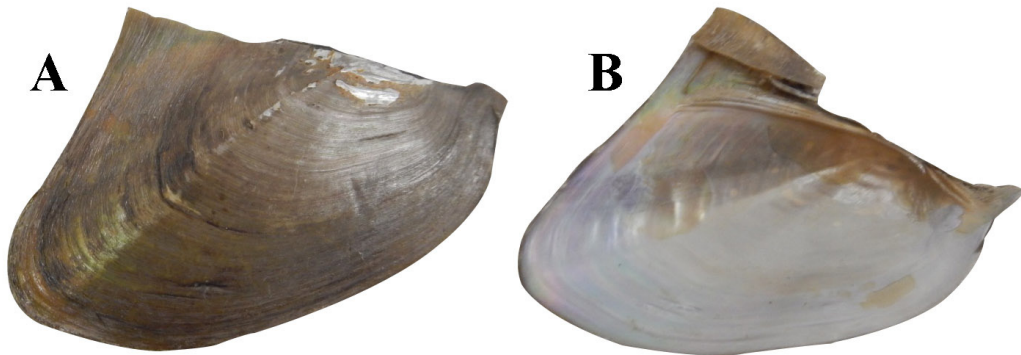


FIGURE 1. *Hyriopsis delaportei*. NCSM 85733 from Binh Long Commune outside Cái Dầu, Châu Phú District, An Giang Province, Vietnam. Total shell length is 75.1 mm. (A) Outside of the right valve. (B) Inside of left valve.

Hyriopsis specimens in the Mollusk Collection of the North Carolina Museum of Natural Sciences (NCSM). The specimen was also compared to the original figure⁶ for verification and is a very good match to Haas' figure⁷. *Hyriopsis delaportei* was reported only from Thailand and Cambodia⁸. This species has been documented from the Mekong River basin in the Lao Peoples Republic, Thailand and Cambodia⁵. Three recent volumes on the mollusks of Vietnam reported on some freshwater bivalves but did not include *H. delaportei* from Vietnam^{9,10,11}. This is the first record of this species from Vietnam, although this species is widespread in the Mekong River basin in Cambodia, Lao Peoples Republic and Thailand⁵. *Hyriopsis delaportei* is listed by the IUCN Red List as a species of Least Concern¹².

Freshwater bivalve taxa reported from the lower Mekong River basin in Thailand,

Cambodia and the Lao Peoples Republic should be expected to occur in the distributaries of the Mekong River in southern Vietnam. Continued fieldwork in Southern Vietnam should continue to add additional species to the freshwater bivalve fauna of Vietnam.

Further, the species reported as *Physunio micropterus* (Morelet, 1866) is re-identified as *Uniandra contradens*. Conchologically, this is a better match of shell shape and inflation^{5,7}. *Physunio superbus* (Lea, 1843) was also reported from southern Vietnam, based on some specimens collected in Cần Thơ province. However, no specimens of this species were seen in any of the markets visited or at the rivers and canals collected during recent survey work.

Scaphula Benson, 1834, a genus of freshwater bivalves in the family Arcidae contains five species. Three species are reported from India and Myanmar¹³⁻¹⁷, but

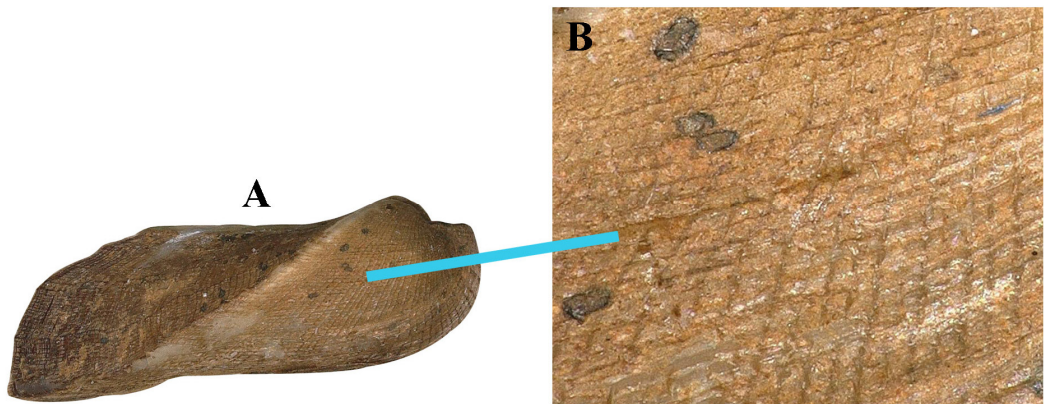


FIGURE 2. *Scaphula minuta* from Sông Bé [river], near Lê Thủy, Phước Long District, Bình Phước Province, Vietnam. NCSM 85786.1. Total shell length is 8.1 mm. (A) Outside of the right valve. (B) Close-up of the periostracal ridging on the disk of the shell, 100x magnification.

not from Thailand or Vietnam^{1,5}. *Scaphula minuta* Gosh, 1922 was described from Tale Sap or Inland Sea of Singgaora on peninsular Thailand²⁰, but was overlooked by Brandt⁵. *Scaphula pinna* Benson, 1856 has been identified as being part of the fauna of Thailand^{18,19}. *Scaphula pinna* was described from the Tenasserim River in Myanmar but there were no records of this species in Thailand⁵.

Specimens of *Scaphula pinna* have been identified from Rạch Giá, Kiên Giang Province in southern Vietnam¹¹. Those specimens came from the coast with the habitat listed as “sandy mud at 3-5 m, preferring brackish or freshwater, living attached to rocks or wood by byssus.” The shape of one of the figured specimens looks to be *Scaphula* but listed the shells as whitish, with an average size of 10-15 mm. Identification of the animal figured¹¹ is questionable and the habitat listed is very different from other reports for species of *Scaphula*¹⁴.

Live specimens of *Scaphula* were collected while turning algae-covered cobbles in a riffle with clear flowing fresh water in the Bé River near Lê Thủy, Phước

Long District, Bình Phước Province, Vietnam. Specimens were byssally attached to the undersides, and in crevices, of rocks. This was the only freshwater bivalve found at this location. There is another unpublished record of this species collected from the Đồng Nai River, Đồng Nai Province and the specimens are held in the mollusk collections of IEBR, Hanoi. The specimens collected in the two rivers in southern Vietnam are here identified as *Scaphula minuta* not *Scaphula pinna*, compare Figures 2a and 3. *Scaphula pinna* illustrated from Myanmar exhibit concentric ridges extending from the umbo to the posterior end of the shell²¹. This is in marked contrast with *S. minuta* which has raised peristral ridges in a herringbone pattern across the whole shell (Figures 2a, b, 3). Based on these observations and the shape of the posterior shell margin with a more sculptured outline (Figures 2a, 3), the illustrations of past identifications of *S. pinna* from Thailand were examined and all appear to be specimens of *S. minuta*^{18,19}. This minute species is not reported on the IUCN Red List.

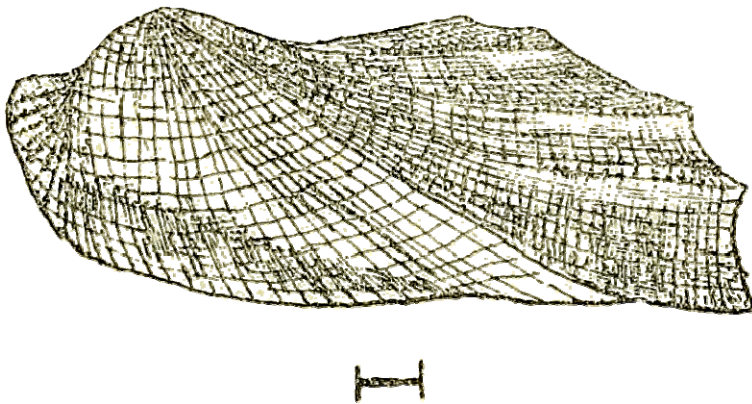


FIGURE 3. Copy of original figure of *Scaphula minuta* Gosh 1922 from southern Thailand²⁰.

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Scott Higgins of Keyence Corp. of America is thanked for taking the picture of *Scaphula* used here while demonstrating the Keyence Digital Microscope VHX 5000 at the NC Museum of Natural Sciences, Raleigh, June 2014. Jamie Smith modified all of the photographs for this publication. Jamie Smith, Cindy Bogan and Heather Leslie reviewed a draft of the manuscript.

LITERATURE CITED

- Đặng, N.T., Thái, T.B. and Phạm, V.M. 1980. Định loại động vật không xương sống nước ngọt Bắc Việt Nam. Nhà Xuất bản Khoa học và Kỹ thuật, Hà Nội, Viet Nam. 573 pp.
- Bogan, A.E. and V.T. Do. 2013. Field research on the distribution of freshwater bivalves in northern Vietnam, November 2012. *Ellipsaria*. Newsletter for Freshwater Mollusk Conservation Society 15(1): 13-14.
- Bogan, A.E. and V.T. Do. 2014. Freshwater bivalve survey of Vietnam, Part II: Central Highlands and the Mekong Delta area. *Ellipsaria*. Newsletter for Freshwater Mollusk Conservation Society 16(2): 29-31.
- Morton, B. and G.E. Dinesen. 2010. Colonization of Asian freshwaters by the Mytilidae (Bivalvia): a comparison of *Sinomytilus harmandi* from the Tonle-Sap, Phnom Penh, Cambodia, with *Limnoperna fortunei*. *Molluscan Research* 30(2): 57-72.
- Brandt, R.A.M. 1974. The non-marine aquatic Mollusca of Thailand. *Archiv für Molluskenkunde* 105: 1-423.
- Crosse, H. and P. Fischer. 1876. Mollusques fluviatiles recueillis au Cambodge par la mission scientifique française de 1873. *Journal de Conchyliologie* 24: 313-342, pls. 10-11.
- Haas, F. 1910-1920. Die Unioniden. In: H.C. Küster, Systematisches Conchylien-Cabinet von Martini und Chemnitz. 9 (pt. 2, h. 42): 17-40, pls. 7-12.
- Haas, F. 1969. Superfamilia Unionacea. *Das Tierreich (Berlin)* 88. 663 pp.
- Thach, N.N. 2005. Shells of Vietnam. ConchBooks, Hackenheim, Germany. 338 pp., 91 color plates.
- Thach, N.N. 2007. Recently collected shells of Vietnam. L' Informatore Piceno, Ancona, Italy. 384 pp., 118 color plates.
- Thach, N.N. 2012. New records of Molluscs from Vietnam. 48HrBooks Company, Akron, Ohio. 276 pp., 151 color plates.
- Bogan, A.E. 2011. *Hyriopsis delaportei*. In: IUCN 2014 Red List of Threatened Species. Version 2014.1 [Online] Available from: <http://www.iucnredlist.org/details/171838/0> [Downloaded on 09 July 2014].
- Ram, K.J and Y. Radhakrishna. 1984. The distribution of freshwater Mollusca in Guntur District (India) with a description of *Scaphula nagarjunai* sp. n. (Arcidae). *Hydrobiologia* 119: 49-55.
- Subba Rao, N.V. 1989. Handbook Freshwater Molluscs of India. Zoological Survey of India, Calcutta, India. 289 pp.
- Nesemann, H., G. Sharma and R.K. Sinha. 2003. The Bivalvia species of the Ganga River and adjacent stagnant water bodies in Patna (Bihar, India) with special reference on Unionacea. *Acta Conchyliorum* 7: 1-43.
- Nesemann, H., S. Sharma, G. Sharma, S. N. Khanal, B. Pradhan, D.N. Shah, R.D. Tachamo. 2007. Aquatic invertebrates of the Ganga River System (Mollusca, Annelida, Crustacea [in part]. Volume 1. 263 pp., 722 figures. Published by H. Nesemann, printed by Sunil Uprety, Chandi Medit Pvt. Ltd.
- Ramakrishna and Dey, A. 2007. Handbook on Indian freshwater Molluscs. Zoological Survey of India, Kolkata. 399 pp.
- Habe, T. 1985. Freshwater arcid mussel, *Scaphula pinna* Benson from Thailand. *Chiribotan* 16(2): 47.
- Jivaluk J., Prompresri, P. and Nagachinta, A. 2007. *Freshwater molluscs of Thailand*. Department of Fisheries, Ministry of Agriculture and Cooperatives, 70 pp. In Thai.
- Gosh, E. 1922. On the anatomy of *Scaphula*, Benson, with a description of a new species. *Proceedings of the Zoological Society of London* 1922:1139-1144.
- Huber, M. 2010. *Compendium of Bivalves*. ConchBooks, Hackenheim, Germany. 901 pp.