

**NANDUS OXYRHYNCHUS, A NEW SPECIES OF LEAF FISH  
(TELEOSTEI: NANDIDAE) FROM THE MEKONG BASIN**

**H. H. Ng, C. Vidthayanon and Peter K. L. Ng**

**ABSTRACT.** - The genus *Nandus* comprises three species. *Nandus nandus* is known throughout India and Burma, *N. nebulosus* from Peninsular Malaysia and Sundaland, and *N. oxyrhynchus*, new species, from the Mekong. *Nandus oxyrhynchus* is distinguished from other members of the genus by its deep head, sharp snout, relatively large serrations on the preopercle, details of colour pattern, and a lateral line scale count intermediate between *N. nandus* and *N. nebulosus*.

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**INTRODUCTION**

There are currently four nominal species of *Nandus*, viz., *N. nandus* (Hamilton, 1822), *N. marmoratus* Valenciennes in Cuvier & Valenciennes, 1831, *N. nebulosus* (Gray, 1834) and *N. borneensis* Steindachner, 1901, of which only two, *N. nandus* and *N. nebulosus* are recognised. *Nandus marmoratus* is an unwarranted replacement name for *N. nandus* (see Day, 1878: 129; Eschmeyer, 1990: 258) while *N. borneensis* has been synonymised under *N. nebulosus* (see Weber & de Beaufort, 1922). While examining specimens of *Nandus* identified as *N. nandus* from the Mekong river drainage in central Thailand, differences were observed in the head shape, body proportions, scale counts and size of the serrations on the preopercle between these specimens and *N. nandus* and *N. nebulosus*. These specimens are here described as belonging to a new species, *N. oxyrhynchus*.

**MATERIALS AND METHODS**

Specimens are deposited in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore, the California Academy of Sciences, San Francisco (CAS), the collection of Maurice Kottelat, Cornol, Switzerland (CMK), the

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**H. H. Ng, Peter K. L. Ng** - Department of Zoology, National University of Singapore, Kent Ridge 119260, Republic of Singapore. **C. Vidthayanon** - Aquatic Natural Resource Museum, Department of Fisheries, Kasetsart University, Chatuchak, Thailand 10900.

Kasetsart University Museum of Fisheries, Thailand (KUMF) and the National Inland Fishery Institute (presently Aquatic Natural Resource Museum), Department of Fisheries, Thailand (NIFI).

Measurements and counts taken follow that of Hubbs & Lagler (1947). Measurements of bilaterally occurring characters, such as pectoral and pelvic fin lengths, were made on the left side of the body. Branched rays of dorsal and anal fins include the posteriormost half ray (almost invariably present) as one (i.e. instead of 4 1/2 we give 5). Gill raker counts were given for those on the first gill arch. Vertebrae were counted in the manner of Kottelat & Lim (1994).

***Nandus oxyrhynchus*, new species**

(Figs. 1, 2a)

*Nandus nandus*, Taki 1974: 188; Fig. 177, 1978: 21. - Smith 1945: 488.

**Material examined.** - Holotype. ZRC 39246, 1 ex., 54.6 mm SL; Thailand: Amphoe Phrai Bung, Sisaket Province; coll. Somluck Kuntarphrung, 14 Nov.1994.

Paratypes. ZRC 39247, 2 ex., 36.4-51.0 mm SL; data as for holotype. - CMK 12201, 1 ex., 53.2 mm SL; data as for holotype. - CAS 84152, 1 ex., 48.8 mm SL; data as for holotype.

Others. NIFI 2637, 1 ex., 68.5 mm SL; Thailand: Kud Ting Marsh, Nongkhai; coll. C. Vidthayanon, Jun., 1991. - NIFI 0058, 4 ex., 57.5-62.0 mm SL, Thailand: Tha-boh market, Nongkhai; coll. J. Rattatawi, Dec.1977. - NIFI 1015, 18 ex., 21.0-65.0 mm SL, Thailand: Lamdome-noi, Ubolratchathani; coll. J. Karnasuta, Jun.1982. - KUMF 2719, 10 ex., 45.0-66.0 mm SL, Thailand: Mukdaharn; coll. Warawat et al., Dec.1973. - NIFI 0584, 12 ex., 40.0-62.0 mm SL; Thailand: Kaengkrachan Petchaburi; coll. S. Areerat, Apr.1969. - KUMF 2672, 1 ex., 39.0 mm SL; Thailand: Bung Borapet; coll. H. M. Smith, Nov.1923. - KUMF 2670, 1 ex., 59.0 mm SL; Thailand: Lopburi; coll. Somchat et al. (date unknown). - NIFI 2666, 1 ex., 56.0 mm SL; Thailand: Ayuthya; coll. C. Vidthayanon, 15 Jan.1995.

**Diagnosis.** - *Nandus oxyrhynchus* can be distinguished from all other species of *Nandus* by its deep dorsal head profile and sharp snout (vs. slender dorsal head profile and sharp snout in *N. nandus*, deep dorsal head profile and blunt snout in *N. nebulosus*) (Fig. 3), the presence of 37-42 lateral line scales interrupted at the 24th-27th lateral line scale (vs. 24-34 lateral line scales interrupted at the 17th-25th lateral line scale in *N. nebulosus*, 42-55 lateral line scales interrupted at the 30th-37th lateral line scale in *N. nandus*) and the presence of relatively large serrae on the preopercle (vs. small serrae; see Fig. 3). The preopercular serrae of *N. oxyrhynchus* seems to terminate at a more anterior point along the head compared to *N. nandus* and *N. nebulosus* (see Fig. 3).

**Description.** - Head compressed and sharp, body oblong and laterally compressed, lateral line interrupted at scale 24-27, preopercle with relatively large serrae (see Fig. 3); in %SL: head length 38.2-43.1, head width 15.4-18.2, predorsal distance 42.4-53.8, preanal length 75.0-80.7, prepelvic length 41.2-48.2, prepectoral length 39.2-50.9, body depth at anus 35.0-45.0, caudal peduncle depth 12.7-18.4, pectoral fin length 15.9-20.6, dorsal fin base 50.0-57.5, pelvic fin length 19.4-24.2, anal fin base 14.7-19.0, caudal fin length 24.4-28.9; in %HL: snout length 25.6-30.0, interorbital distance 20.7-24.3, eye diameter 24.1-26.0. Branchiostegal rays 5. Gill rakers 2+7-8. Vertebral formula 12-13+12 = 24-25. Fin ray counts: dorsal XII,10; XIII,10; XIII,11 or XIV,9; pectoral 14-15; pelvic I,6; anal III,5 or III,6; caudal 7/7=14. Scale counts: lateral line 37-42; circumpeduncular 19-22; predorsal 12-15; prepelvic 11-15.

**Colour.** - Preserved specimens have a pale brown ground colour, with 4 well-defined, broad brown stripes running across the body from the dorsum to the ventrum. A broad dark brown stripe running across the eye along the dorsum on each side of the head, another narrow dark brown stripe running from eye to throat region. Spinous dorsal, pelvic and anal fins dark brown, soft portions hyaline with a series of small, dark spots forming transverse bars; pectoral fins hyaline; caudal fin pale brown with a series of small, dark spots forming transverse bars. Fresh specimens show the same pattern, except that the colours are darker (Fig. 2a).

**Distribution.** - *Nandus oxyrhynchus* is widely distributed throughout the Mekong, Maeklong and Chaophraya basins (Laos and Thailand).

**Etymology.** - Named after its sharp snout (when compared with *N. nebulosus*). From Greek *oxys*, sharp and *rhynchos*, nose. An adjective.

**Discussion.** - The primary differences between *N. oxyrhynchus*, *N. nandus* and *N. nebulosus* have already been stated under the diagnosis. With regards the lateral line scale counts, although there is some variation for each species, the ranges do not overlap at all. To this effect, we have examined a very large series of *N. nebulosus* and several *N. nandus* of sharply differing sizes (see comparative material).

Other than the above differences, *N. oxyrhynchus* also differs from *N. nandus* by its deeper body (body depth at anus 38.7-43.8 %SL vs. 27.6-35.4), absence of a large dark brown spot on the caudal peduncle (vs. presence of the spot) and generally fewer soft anal fin rays (5-6 vs. 7-9). *Nandus oxyrhynchus* differs from *N. nebulosus* in having a longer snout of 25.6-30.5 %HL (vs. shorter snout of 18.5-26.1). The eye of *N. oxyrhynchus* is also slightly smaller than that of *N. nebulosus* (eye diameter 24.1-26.0 %HL vs. 25.8-33.1).

*Nandus nandus* is found throughout Burma and India (Talwar, 1991), *N. nebulosus* is found in Peninsular Malaysia, Sundaland and southern Thailand (Kottelat et al., 1993) while

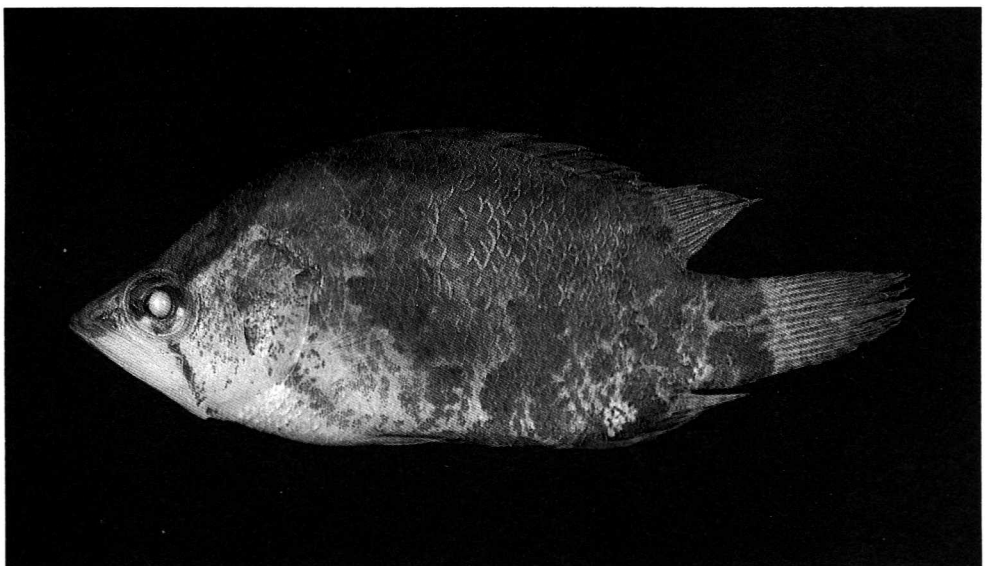
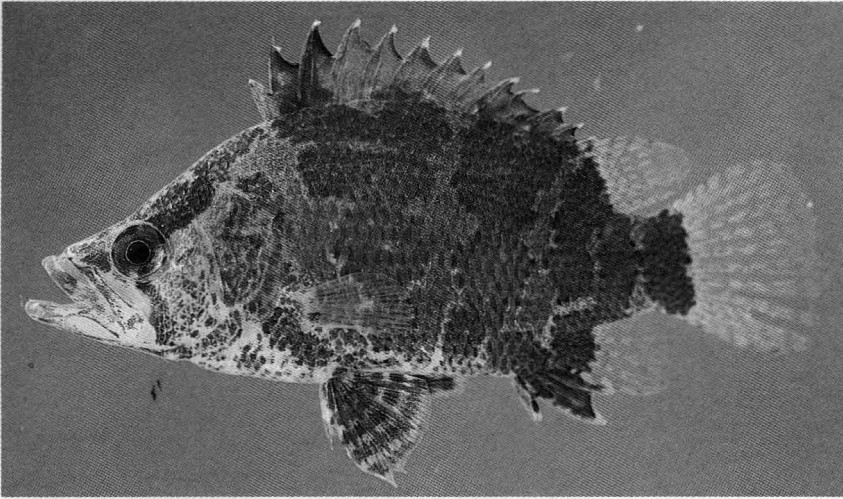
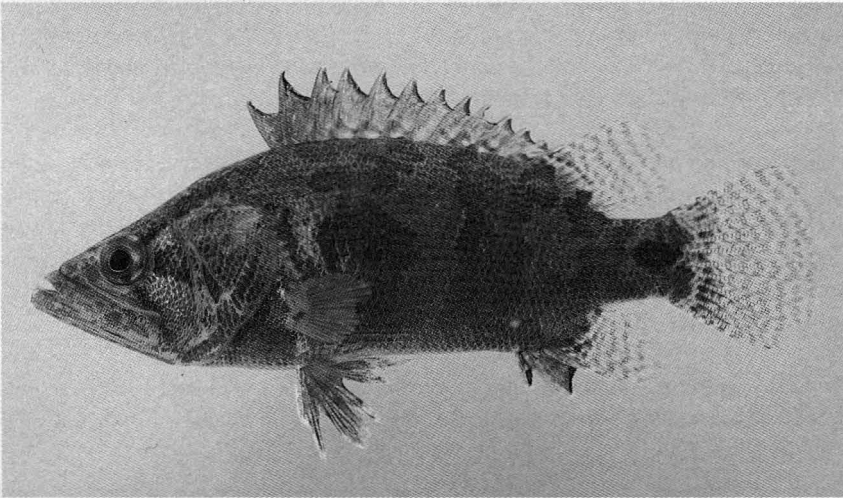


Fig. 1. *Nandus oxyrhynchus*, ZRC 39246, holotype, 54.6 mm SL.

**a**



**b**



**c**

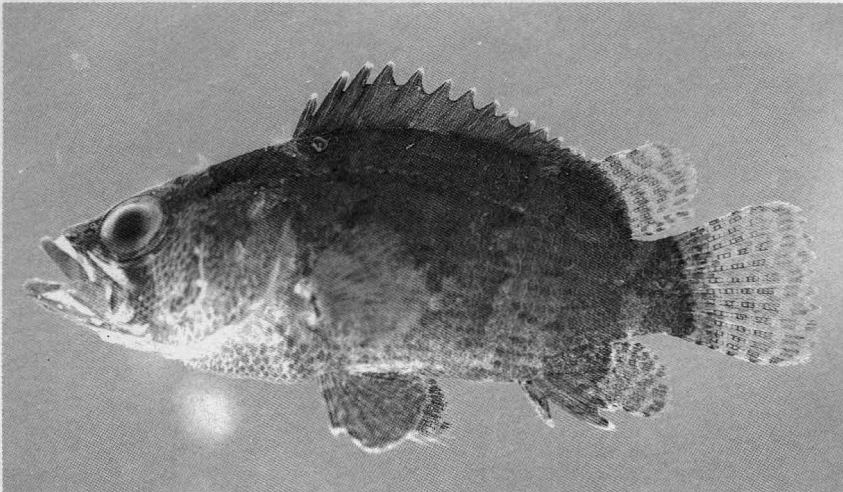


Fig. 2. Live colour patterns. a. *Nandus oxyrhynchus*, NIFI 2666, 56.0 mm SL. b. *N. nandus*, NIFI 2665, 101.0 mm SL. c. *N. nebulosus*, NIFI 2636, 60.0 mm SL.

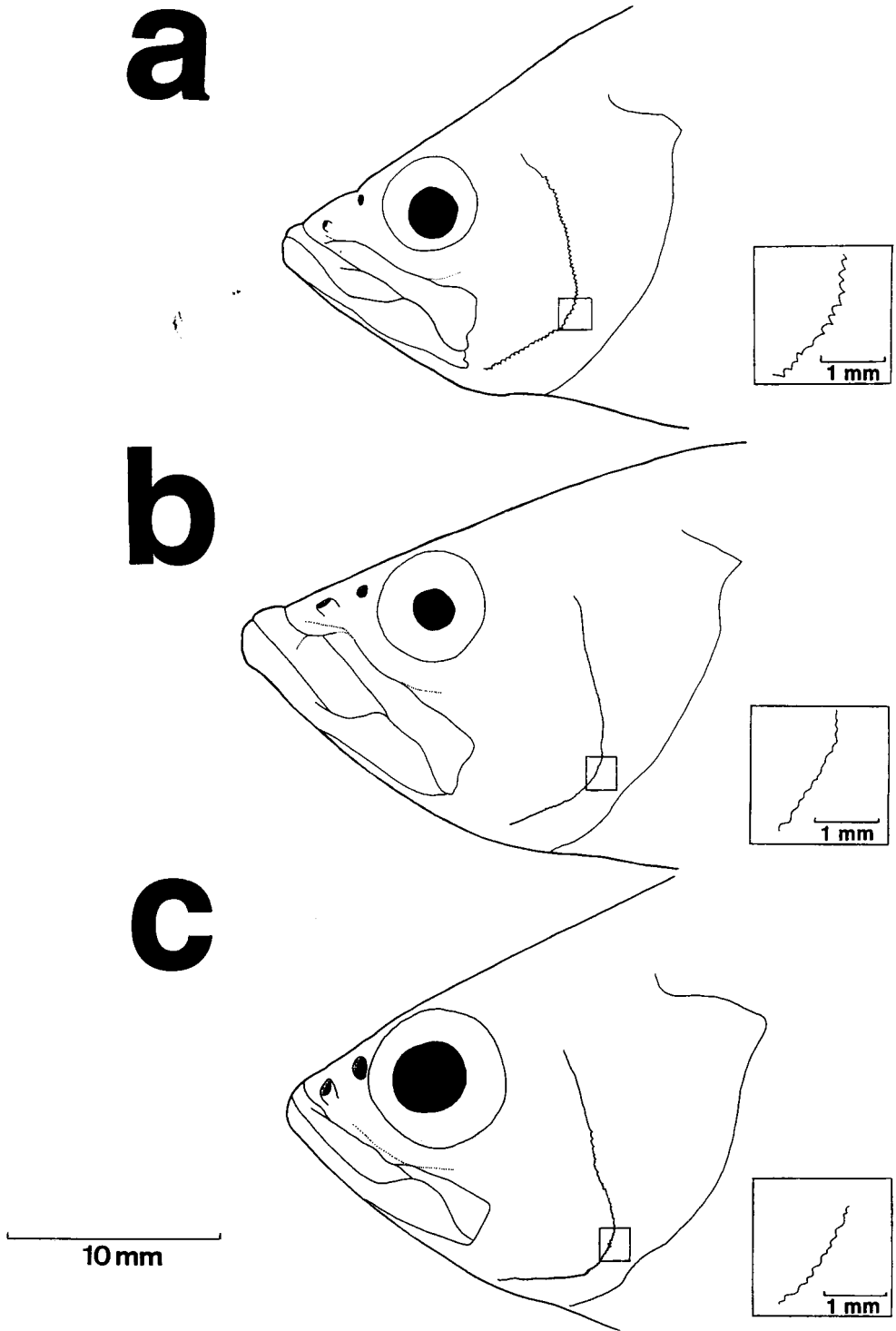


Fig. 3. Schematic illustration of lateral view of heads. a. *Nandus oxyrhynchus*, ZRC 39247, 51.0 mm SL. b. *N. nandus*, CAS 135661, 50.0 mm SL. c. *N. nebulosus*, ZRC 28536, 51.8 mm SL. Inset shows a magnified view of the serrae on the posterior preopercular margin.

*N. oxyrhynchus* is known thus far, only from the Mekong, Maeklong and Chaophraya basins. There is a slight overlap of the species ranges for *N. oxyrhynchus* and *N. nebulosus* (see Fig. 4), with both species found sympatrically in the Chaophraya and Maeklong basins.

The fish reported by Taki (1974, 1978) as *N. nandus* from the Mekong basin around Vientiane and the confluence of the Mun and Mekong rivers is clearly *N. oxyrhynchus*, as is reflected by his illustration (Taki, 1978: Fig. 177). He also commented that the fish "...are completely intermediate between *N. nandus* and *N. nebulosus* in the meristic counts..." (Taki 1974: 189) which is in fact the case for the number of lateral line scales for *N. oxyrhynchus*. Smith's (1945) report of *N. nandus* from Bung Borapet in the Chaophraya basin is also *N. oxyrhynchus*, as examination of the specimen (KUMF 2672) shows. Serène (1951) reported *N. nebulosus* from inlets leading to the Mekong. Whether his record refers to *N. oxyrhynchus* cannot be ascertained as no description was given in his account. However, considering the locality where the specimen was collected, it is most likely to be *N. oxyrhynchus* as well. Steindachner (1901) described *N. borneensis* from the Baram drainage in Sarawak, northern Borneo on the basis of only one 94 mm TL specimen. One of the key features he used to distinguish his species from *N. nebulosus* is the low lateral line scale count (27-29 vs. 30-34; data from Steindachner, 1901). We have examined specimens from the Baram area and found one (ZRC 37959; 56.1 mm SL) with a very low lateral line scale count (24), but the overall range for specimens from the Baram area (24-30) falls within that of *N. nebulosus* from Peninsular Malaysia, Borneo and Sumatra (29-34). We did not observe any other morphological differences. Steindachner (1901) himself has commented that the species may represent an aberrant form of *N. nebulosus* and thus may not be valid. As other morphometric and meristic characters of the two taxa are similar, we follow Weber & de Beaufort (1922) in synonymising *N. borneensis* under *N. nebulosus* for the moment.

Hamilton (1822: 96, pl. 30 fig. 32) described *Coius nandus* from the Ganges basin, together with a figure. Valenciennes (in Cuvier & Valenciennes, 1831) established the genus *Nandus* for a new species, *N. marmoratus*, from Bengal, but it is clear from his text that he regarded his *N. marmoratus* as conspecific with *Coius nandus* Hamilton, 1822. As already noted by Eshmeier (1990:258), *Nandus marmoratus* must be regarded as an unjustified replacement name for *Coius nandus*. *Coius nandus* is thus a senior objective synonym of *N. marmoratus*, although *N. nandus* is technically still the type species of *Nandus*.

#### **Comparative material. - *Nandus nebulosus***

THAILAND: NIFI 0584, 3 ex., 63.0-82.0 mm SL, Kaengkrachan Petchaburi; coll. S. Areerat, Apr.1969. - KUMF 2076, 1 ex., 40.0 mm SL, Ban Ang, Khao Sabab, Chantaburi; coll. H. M. Smith, Apr.1930. - KUMF 2073, 3 ex., 38.0-42.5 mm SL; Chaiya, Pumdung River Surat Thani; coll. R. Havmöller, Sept. 1926. - NIFI 2638, 2 ex., 55.0 mm SL; Phru Tohdaeng peat swamp, Narathiw; coll. T. Chukajorn, May 1983. - NIFI 2636, 19 ex., 20.8-60.0 mm SL; Phru Tohdaeng peat swamp, Narathiw; coll. C. Vidthayanon, Jan.1995. - NIFI 1990, 1 ex., 30.0 mm SL; peat swamp near Saiburi river, Narathiw; coll. M. Kottelat & T. R. Roberts, Apr.1985.

PENINSULAR MALAYSIA: ZRC 23995-23996, 2 ex., 52.1-59.5 mm SL; Trengganu: Rantau Abang 56 km. Kuantan-Kuala Trengganu road; coll. P. K. L. Ng et al., 18 Mar.1992. - ZRC 28535-28537, 3 ex., 51.8 mm SL; Selangor: 0.2 km from 45 km. Tanjong Malim-Sungei Besar road; coll. P. K. L. Ng et al., 18 Sept. 1992. - ZRC 3478, 73 ex., 17.8-60.4 mm SL; Pahang: Tasek Bera; coll. C. C. Lindsey, 29-31 Mar.1963. - ZRC 9577, 1 ex., 65.4 mm SL; Johor: Pontian; coll. P. K. L. Ng et al., 1988. - ZRC 18172, 1 ex., 47.0 mm SL; Johor: 300 m. south of 179 km. Johor Bahru-Kuantan road (Sungei Triang Besar); coll. P. K. L. Ng et al., 19 Oct.1991.

SINGAPORE: ZRC 34620, 1 ex., 45.2 mm SL; Rifle Range Road; coll. C. Y. Chang et al., 27 May 1993.

RIAU ARCHIPELAGO: ZRC 22224-22226, 3 ex., 37.5-43.4 mm SL; Pulau Batam: northwest of Sanggihung; coll. P. K. L. Ng et al., 29 Jan. 1992. - ZRC 37524, 1 ex., 53.0 mm SL; Pulau Bintan: 49 km. on highway from Tanjung Ubon to Tanjung Pinang; coll. H. H. Tan et al., 27 Apr. 1994.

SUMATRA: ZRC 310131, 1 ex., 54.6 mm SL; Bangka: 99.4 km. south of Pangkajene, 2.6 km. north of Serdang; coll. M. Kottelat et al., 3 Mar. 1992. - CMK 9647, 1 ex., 53.4 mm SL; Bangka: 28 km north of Payung on road to Pangkajene; coll. M. Kottelat et al., 5 Mar. 1993. - CMK 7329, 6

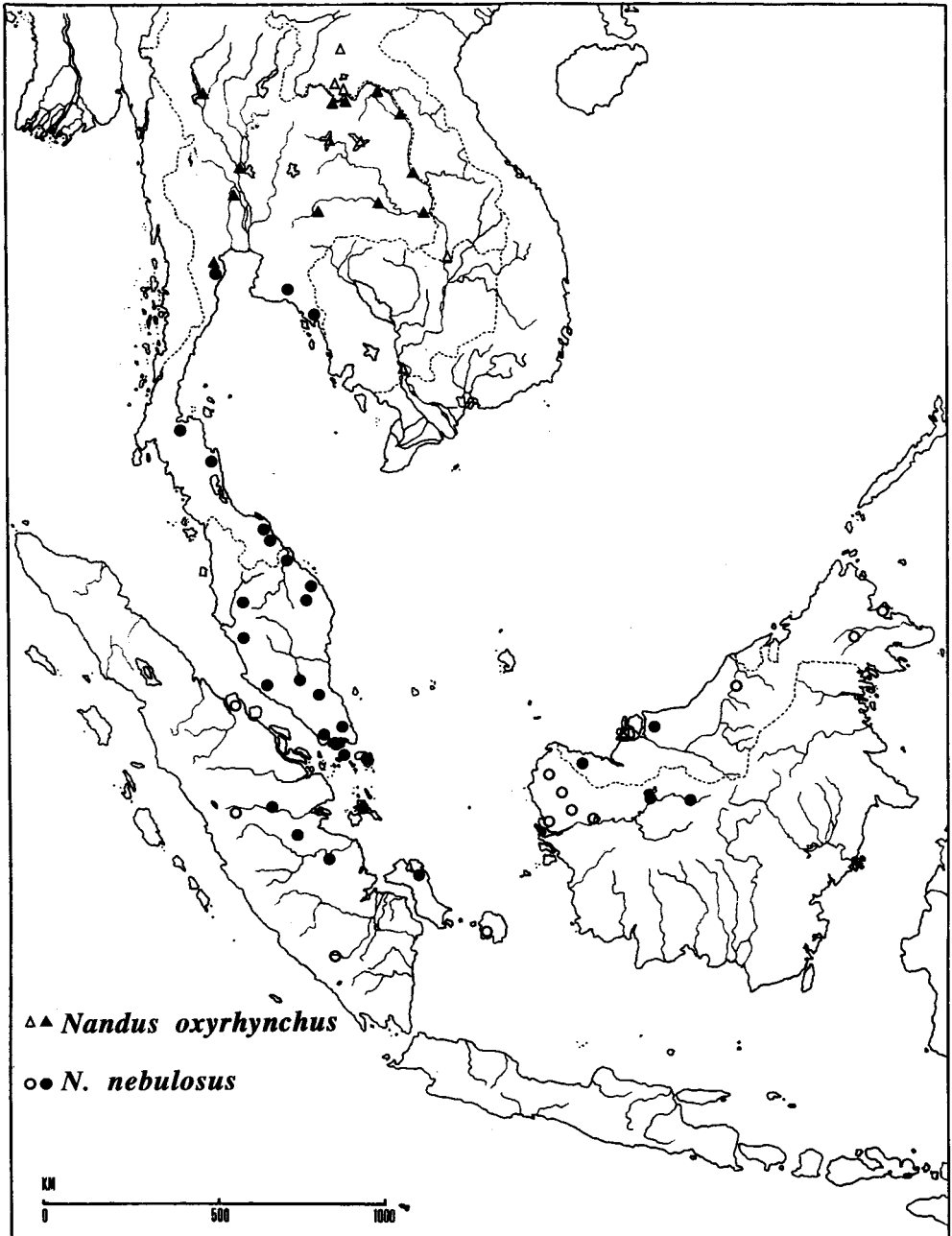


Fig. 4. Map of Southeast Asia showing the known distribution of *N. oxyrinchus* and *N. nebulosus*. Solid symbols indicate records for which specimens have been examined while outlined symbols indicate records from literature [Taki (1974), Rainboth et al. (1976) and Roberts (1989)].

ex., 19.8-38.3 mm SL; Riau Province: Sungei Siak basin, Sungei Siak Kecil, small blackwater stream entering mainstream; coll. M. Kottelat, 13 Feb.1991. - CMK 9716, 2 ex., 31.5-58.5 mm SL; Riau Province: Kab. Indragiri Hulu, Kec. Seberida, creek in rubber plantation 200 m from Sungei Cenako, 55 m north of Pangkalan Kasai; coll. F. Danielsen, 28 Sept. 1991. - CMK 11085, 2 ex., 55.8-65.0 mm SL; Jambi: Sungei Bakung, a tributary of Sungei Kembang, stream joining Danau Arang Arang and Sungei Kumpeh Hulu in Arang Arang; coll. M. Kottelat & H. H. Tan, 29 May 1994. - CMK 11154, 5 ex., 17.9-65.1 mm SL; Jambi: Danau Rasau, a blackwater lake draining to Batang Hari, opposite Kampung Rantau Panjang; coll. M. Kottelat & H. H. Tan, 1-2 Jun.1994.

BORNEO: ZRC 37938, 2 ex., 80.7-62.4 mm SL; Sarawak: Sungei Gayao, ca. 40 km. from Mukah on Mukah-Sibu road; coll. M. Kottelat et al., 14 May 1995. - ZRC 37833, 1 ex., 36.6 mm SL; Sarawak: Matang Wildlife Centre, Sungei Rayu; coll. M. Kottelat et al., 5 May 1994. - ZRC 37912, 1 ex., 34.3 mm SL; Sarawak: Sungei Mantala ca. 28 km. from Mukah on Mukah-Sibu road; coll. M. Kottelat et al., 14 May 1994. - ZRC 37951, 1 ex., 35.0 mm SL; Sarawak: Sibul-Sarikei road, 2-3 km. S of Durin ferry; coll. M. Kottelat et al., 15 May 1994. - ZRC 37959, 2 ex., 31.4-56.1 mm SL; Sarawak: Sungei Tebu at 8 km., Daro-Matu road; coll. M. Kottelat & T. H. T. Tan, 14 Jun.1994. - CMK 6900, 1 ex., 45.9 mm SL; Kalimantan Barat: Kapuas River basin, Sungei Sibau where it branches about 2 km upstream of Putussibau; coll. M. Kottelat et al., 27 Apr.1990. - CMK 6922, 3 ex., 25.3-41.3 mm SL; Kalimantan Barat: Kapuas River basin, right tributary of Sungei Sibau, about 3 km upstream of Putussibau; coll. M. Kottelat et al., 28 Apr.1990. - CMK 6940, 5 ex., 19.6-54.0 mm SL; Kalimantan Barat: Kapuas River basin, Danau Temuan, a shallow blackwater lake near Nanga Embaluh; coll. M. Kottelat et al., 28 Apr.1990. - CMK 10140, 3 ex., 30.7-37.0 mm SL; Kalimantan Barat: Kapuas River basin, Sungei Piyam at about 10 km upriver of Nanga Empanang; coll. M. Kottelat et al., 5 Sept. 1993. - CMK 10158, 1 ex., 56.0 mm SL; Kalimantan Barat: Kapuas River basin, Sungei Sebadin, blackwater open area; coll. M. Kottelat et al., 6 Sept. 1993. - CMK 10264, 2 ex., 50.5-68.8 mm SL; Kalimantan Barat: Kapuas River basin, small forest tributaries of Sungei Tangit, around 0°59'31"N 112°4'21"E; coll. M. Kottelat et al., 8 Sept. 1993. - CMK 11590, 3 ex., 28.8-36.7 mm SL; Kalimantan Barat: Kapuas River basin, Sungei Letang, near Kampong Kandung Suli (Kecamatan Jongkong); coll. M. Kottelat et al., 8 Jun.1995. - CMK 11742, 4 ex., 26.9-29.3 mm SL; Kalimantan Barat: Kapuas River basin, Danau Sentarum area, Sungei Tangit upriver of Radai Tangit; coll. M. Kottelat et al., 13 Jun.1995.

*Nandus nandus* - INDIA: ZRC 38974, 1 ex., 37.2 mm SL; India: imported aquarium material purchased in Singapore; coll. H. H. Tan et al., May 1995. - CAS 135661, 5 ex., 50.0-105.0 mm SL; India: West Bengal, Pulita; coll. A. W. Herre, Apr.1937. - CAS 135682, 5 ex., 66.8-97.0 mm SL; India: West Bengal, Calcutta; coll. A. W. Herre, 12 Apr.1937.

BANGLADESH: NIFI 2665, 5 ex., 66.0-101.0 mm SL; Brahmaputra River, from aquarium dealer in Bangkok; coll. C. Vidthayanon, 10 Dec.1995.

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