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Revision of genus *Steindachneridion* (Siluriformes: Pimelodidae)

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After several years collecting in the type-localities and studying representative samples of genus *Steindachneridion* Eigenmann & Eigenmann, 1919 from Brazilian and foreign museums, a taxonomic revision of the Recent species of the genus is presented, including the description of a new species from the rio Iguaçu, above the great falls. *Steindachneridion* species are large sized fishes, reaching 1000 mm total length or more, and sharing some anatomical characters that, at least tentatively, support the monophyly of the genus. In addition to the general features found in the Pimelodidae, the species *S. amblyurum* (Eigenmann & Eigenmann, 1888), *S. parahybae* (Steindachner, 1877), *S. doceanum* (Eigenmann & Eigenmann, 1889), *S. scriptum* (Miranda Ribeiro, 1918), *S. punctatum* (Miranda Ribeiro, 1918), and *S. melanodermatum*, new species, share the shape of the vomer tooth plates, six to eight branched rays in the dorsal-fin, and a low number of gill-rakers. All species, except fossil ones, are redescribed and a key for their identification is provided.

Após vários anos coletando nas localidades tipo e estudando amostras representativas de museus brasileiros e estrangeiros, é apresentada uma revisão taxonômica das espécies Recentes do gênero *Steindachneridion* Eigenmann & Eigenmann, 1919, incluindo a descrição de uma espécie nova da bacia do rio Iguaçu, acima das Cataratas do Iguaçu. Em comum, os adultos de todas as espécies apresentam grande porte, até 1000 mm ou mais de comprimento padrão e compartilham alguns caracteres anatômicos discutidos neste estudo, que pelo menos preliminarmente suportam o monofiletismo do gênero. Além das características gerais de Pimelodidae, *S. amblyurum* (Eigenmann & Eigenmann, 1888), *S. parahybae* (Steindachner, 1877), S. *doceanum* (Eigenmann & Eigenmann, 1889), *S. scriptum* (Miranda Ribeiro, 1918), *S. punctatum* (Miranda Ribeiro, 1918) e *S. melanodermatum*, espécie nova, têm em comum a forma das placas dentígeras do premaxilar e do vômer, a presença de seis a oito raios divididos na nadadeira dorsal e o número reduzido de rastros branquiais. Todas as espécies, com exceção das fósseis são redescritas e uma chave de identificação é apresentada.

Key words: Sorubim catfish, Ostariophysi, Taxonomy, Endemic, Neotropics.

Introduction

The Neotropical pimelodid catfish genus *Steindachneridion* Eigenmann & Eigenmann, 1919 has not been revised for almost a century. The reasons are probably related to the fact that species of the genus are naturally scarce and relatively hard to collect, which resulted in very small samples of *Steindachneridion* species available in ichthyological collections. This has prevented an adequate assessment of the diversity within the genus, or adequate examination of the relationships of *Steindachneridion* with other pimelodids, which remains unclear (de Pinna, 1998; Lundberg & Littmann, 2003, Lundberg & Akama, 2005).

Our knowledge of the systematics of the genus *Steindachneridion* may be summed in only a few major studies since the "South American Nemathognathi" of Eigenmann & Eigenmann (1890), that offered a taxonomic revision of all families, genera and species of the Siluriformes, including a brief review of *Steindachneridion*. A synthesis of the relatively short taxonomic history of this poorly known pimelodid genus is presented below. The first described species of the genus *Platystoma parahybae* Steindachner (1877) has as type locality both the rio Paraíba do Sul (at Juiz de Fora) and rio Jequitinhonha, Minas Gerais. Eigenmann & Eigenmann (1888), studying a portion of the type material of *Platystoma parahybae*, described *Steindachneridion amblyurum* based solely on the specimens from rio Jequitinhonha and erected the genus *Steindachneria*, selecting *S. amblyurum* as type species. The generic name was preoccupied in fishes by *Steindachneria* Goode & Bean, 1888 and was posteriorly replaced by *Steindachneridion* by Eigenmann & Eigenmann (1919).

In the following year Eigenmann & Eigenmann (1889) de-

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scribed *S. doceanum* from the rio Doce, thereby extending the known distribution of genus *Steindachneridion* to eastern coastal drainages of Brazil. A complete taxonomic revision of the genus, was presented by Eigenmann & Eigenmann (1890) still under name *Steindachneria.* These authors redescribed the species *S. amblyurum*, *S. parahybae*, and *S. doceanum*, diagnosed them in a key, and included drawings of the arrangement of tooth plates on the vomer in *S. amblyurum* and *S. parahybae.*

The first fossil species *S. iheringi*, was described by Woodward (1898) from the Tertiary beds of Tremembé, São Paulo in the genus *Arius*, and later transferred to the genus *Steindachneridion* by Santos (1973). This fossil was first considered as being of Pleistocene age (Travassos & Santos, 1955), but Lima *et al*. (1985) argued for an Oligocene age. Miranda Ribeiro (1902) cited *S. parahybae* for the rio Pomba, a tributary of rio Paraíba do Sul at Rio de Janeiro State.

Miranda Ribeiro (1918) described *S. scriptum* and its "variety" *S. scriptum punctatum*, both from the rio Uruguay at Itaqui, Rio Grande do Sul State, Brazil; Britski (1969) designated a lectotype for *S. scriptum*; the type material of both forms was later studied by Garavello (unpubl.), who considered *S. punctatum* as a valid species.

Van der Stigchel (1947) misidentified specimens of *S. parahybae* collected in Porto Real, rio Paraíba do Sul, Rio de Janeiro State as *S. doceanum*. Severi & Cordeiro (1994) in a short catalog of fishes and Garavello *et al.* (1997) in a book on rio Iguaçu, mentioned the occurrence of an unidentified *Steindachneridion* species at that river basin. Oliveira & Moraes Junior (1997) presented additional data on *S. parahybae*, based on material deposited at the MNRJ, providing a diagnosis for the genus *Steindachneridion*. The most recent contribution on the systematics of genus *Steindachneridion* was the description of a second fossil species, *S. silvasantosi* by Figueiredo & Costa-Carvalho (1999). After this only Nakatani *et al.* (2001) published information about larval development of both *S. scriptum* from rio Paraná and the new species from the rio Iguaçu, and Zaniboni Filho *et al*. (2004) provided some information on the biology of *S. scriptum* from the upper rio Uruguay basin.

The purpose of the present study is to review *Steindachneridion* and to discuss its distribution, which is restricted to eastern Brazilian coastal drainages, plus the upper Paraná (including rio Iguaçu) and rio Uruguay basin. The revision of *Steindachneridion* (excluding the fossil ones), herein presented, recognizes six Recent species (including a new one). Extensive field work by the author and other Brazilian ichthyologists over the past years has shown the large-sized (up to 1000 mm SL or even more) *Steindachneridion* species as always occurring in swift-flowing, clear water rivers, running over large stony beds.

Material and Methods

Sixty-one preserved specimens of *Steindachneridion* were examined during this study. Type specimens of *S. amblyurum*, *S. parahybae*, and *S. doceanum* are deposited at MCZ, and those of *S. scriptum* at MNRJ and MZUSP, and *S. punctatum* at the MNRJ. Institutional abbreviations follow Leviton *et al.* (1985) with addition of Laboratório de Ictiologia Sistemática do Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos (LISDEBE).

Measurements were taken to the nearest millimeter with vernier calipers, with exception of standard length, predorsal distance, trunk length, distance dorsal-adipose and adipose-caudal, which were taken with a metallic meter stick. The following counts were taken: 1) number of dorsal-fin rays; 2) number of pectoral-fin rays; 3) number of anal-fin rays; 4) number of pelvic-fin rays; 5) number of caudal-fin rays; 6) number of branchiostegal rays; 7) number of gill-rakers of the first left side branchial arch. Fin counts were expressed by the common number of branched rays and its variation in parenthesis. The following measurements were taken: 1) standard length: from tip of snout to base of caudal fin (SL); 2) head length: from tip of snout to posterior margin of opercle (HL); 3) snout length: from tip of snout to anterior margin of orbit; 4) predorsal distance: from tip of snout to anterior base of first dorsal ray; 5) pre-anal distance: from tip of snout to base of anal-fin insertion; 6) length of base of adipose fin; 7) caudal peduncle depth: the shortest distance of caudal peduncle; 8) head depth: taken at occipital region; 9) body depth: at dorsal-fin origin; 10) orbital diameter: taken horizontally; 11) interorbital width: taken between eyes; 12) mouth width: width of lower jaw; 13) cleithral width: most large distance between cleithral bones; 14) head width: taken at the larger distance between opercular bones of each side; 15) pelvic width: taken at the pelvic-fin insertions; 16) internasal width: taken between anterior nostrils. Morphometric data of body, head, and fins were transformed into logarithms, a matrix of covariance was computed and a size-free canonical variate analysis (Bookstein *et al*., 1986; Reis *et al*., 1990) was carried out using the statistical package SAS-PC (1995) to distinguish some morphological traits of *S. scriptum*, *S. punctatum*, and *S. melanodermatum*. Counts are also utilized in the differential diagnosis of species.

Results

Genus *Steindachneridion* Eigenmann & Eigenmann, 1919

Steindachneria Eigenmann & Eigenmann, 1888: 137, type species *Steindachneria amblyurus* Eigenmann & Eigenmann, 1888. Name preoccupied by *Steindachneria* Goode & Bean, 1888 in fishes, replaced by *Steindachneridion* Eigenmann & Eigenmann, 1919; Eigenmann & Eigenmann, 1890: 202 (diagnosis and key); Ribeiro, 1902: 255; Ribeiro, 1911: 299 (458).

Steindachneridion Eigenmann & Eigenmann, 1919:525, Type species *Steindachneria amblyurus* Eigenmann & Eigenmann, 1888. Replacement for *Steindachneria* Eigenmann & Eigenmann, 1888; Gosline, 1945: 51 (ref.); Fowler, 1951: 602 (ref); López, Menni & Miquelarena, 1987:27 (ref.);

Burgess, 1989: 282 (ref); Lundberg *et al*., 1991: 842; Oliveira & Moraes Junior, 1997: 3 (ref); de Pinna, 1998: 314; Lundberg & Littmann in Reis *et al*., 2003: 443.

Diagnosis. Large sized pimelodid fishes, up to 1000 mm or more; head short and depressed without external exposed ossification and covered by skin; supraoccipital process not reaching the anterior nuchal plate; postcleithral and pelvic girdle short and entirely covered by thick skin. Eye small, dorsally located in the anterior surface of head and with orbital margin free. Teeth on premaxilla and dentary in villiform tooth patches grooved at medial region; vomerine teeth arranged in one or two tooth plates, the anterior arched; 12 to 17 gill-rakers on first branchial arch; dorsal-fin i,6 (7-8) rays; pectoral fin i,9 (10) rays; pelvic fin i,5 rays; anal fin i,8 (9,10) rays. Principal caudal-fin rays, i,15(14-16),i; maxillary barbel long, extending from tip of snout to base of dorsal or base of adipose fin; adipose fin base longer than anal-fin base. Caudal fin notched with the exception of *S. amblyurum*, were it is distally rounded. Ground color dark brown in *S. melanodermatum* and light brown or grayish on the remaining species; marbled, lined or dotted with dark brown lines or dots place over the head, dorsum, lateral trunk and fins.

Comparisons. *Steindachneridion* is distinguished from other genera of the Pimelodidae by a combination of features whose phylogenetic relationships are not yet fully determined. Combined characteristics shown to be useful for comparisons and for the identification of an affinity species group whose features, some of them derived, support the genus. The combination of: (1) supraoccipital process short (reduced) and externally not meeting the anterior nuchal plate; (2) tooth plates of premaxilla and dentary with villiform teeth, premaxilla and dentary with patch grooved at medial region and vomer with one or two isolated tooth plates; (3) head relatively small, covered by thick skin; (4) eyes relatively small, with orbital margin free; (5) eight branchiostegal rays; (6) seven dorsal-fin rays; (7) low dorsal fin with short dorsal fin spine, not pungent; (8) pectoral fin spine short, not pungent and with both margins devoid of serrae; (9) 12 to 17 gill-rakers on first branchial arch; (10) relative long and straight-margined adipose fin; and caudal fin notched, except in *S. amblyurum*, furnish the differential diagnosis for the genus.

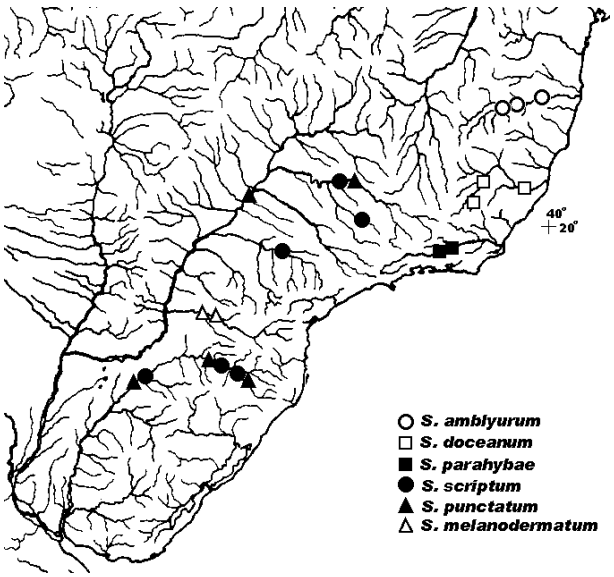

Fig. 1. Southeastern South America with the geographical distribution of *Steindachneridion* species. Each symbol may represent more than one sample.

By these characters and other expressed in the species descriptions, *Steindachneridion* shares a basal position with other genera of group A of the Pimelodidae as proposed by Lundberg *et al*. (1991). According to the hypothesis raised by the aforementioned authors, the relationships of *Steindachneridion* lies in a polytomy with other pimelodid genera, among them, *Sorubimichthys*, *Pseudoplatystoma*, *Hemisorubim*, *Brachyplatystoma*, *Sorubim* and *Platynematichthys*. On the other hand, Figueiredo & Costa-Carvalho (1999) discuss some cranial characters of the fossil species *S. silvassantosi* and suggest that it shares features with, and may be related to, the genera *Leiarius*, *Phractocephalus,* and *Lophiosilurus.* A more basal position for the genus *Steindachneridion* is suggested by Lundberg & Akama (2005) and some information about a forthcoming contribution presenting some molecular evidence that this genus may be included in the *Phractocephalus* group is available. Unfortunately the phylogenetic relationships of genus *Steindachneridion* within the family Pimelodidae are not resolved, remaining only partially known. The characters studied herein may furnish new data for comparisons and discussions, and justify the taxonomic revision of genus *Steindachneridion* Eigenmann & Eigenmann, 1919. In fact, this genus is actually included in the catfish family Pimelodidae as delimited by Lundberg & Littman (2003), a monophyletic assemblage of small to large sized fishes, currently including 29 genera and 84 species.

Nomenclatural note. *Steindachneridion* is neuter (Lundberg & Littmann, 2003), therefore, the specific names *amblyurus*, *doceana*, *scripta*, and *punctata* are emended below to *amblyurum*, *doceanum*, *scriptum*, and *punctatum.*

Distribution. Known from Southeastern Brazilian drainages of Jequitinhonha, Doce, Paraíba do Sul, upper Paraná and Uruguay rivers, Brazil (Fig. 1).

Key to the species of *Steindachneridion*.

1. Supraoccipital process elongated, extending to near or almost meeting anterior nuchal plate in dorsal view 2
1′. Supraoccipital process short, distance from anterior nuchal plate one or two times orbital diameter in dorsal view 4
2. Tooth plate on vomer in adults divided in two sections and laterally placed on palate; caudal fin distally rounded; 12-14 gill-rakers on first branchial arch; small orbit, 9.8 to 10.8% of HL and 24.2 to 28% of interorbital distance; maxillary barbel long, reaching or surpassing base of adipose-fin insertion ..... *S. amblyurum* [p. 612]

2'. Tooth plate on vomer in adults in contact or continuous in single section on palate; caudal fin notched; 12-18 gill-rakers on first branchial arch; large orbit, 10.3 to 11.7% of HL and 30.4 to 35% of interorbital distance; maxillary barbel short, when adpressed, reaching or surpassing only middle of pectoral fin 3

3. Pectoral, adipose and pelvic fins large sized; pelvic pair long, always surpassing and almost concealing anus; color pattern marbled, alternating dark brown, large bowed lines with ground yellowish lines; 18-20 gill rakers on first branchial arch ..... *S. doceanum* [p. 613]

3´. Pectoral, adipose and pelvic fins small sized; pelvic fin short, never reaching anus; color pattern combining dark brown lines with large dark brown dots on dorsum of head and trunk; 15-17 gill-rakers on first branchial arch .... *S. parahybae* [p. 610]

4. Supraoccipital process separated from the anterior nuchal plate by a space covered with thick skin, corresponding to two orbital diameters; large concentration of dark melanophores producing dark brown ground color, combined with minute black dots on dorsum of head and trunk; 16-18 gill-rakers on first branchial arch .... *S. melanodermatum* [p. 618]

4´. Supraoccipital process separated from the anterior nuchal plate by a space covered with thick skin, corresponding to one orbital diameter; ground color light gray, with large black lines or black dots irregularly distributed on dorsum of head and trunk 5

5. 15-17 gill-rakers on first branchial arch; large black lines irregularly distributed; orbit small, 21.2 to 31.7% of interorbital distance and 7.3 to 10.1% of HL ..... *S. scriptum* [p. 615]

5´.12-14 gill-rakers on first branchial arch; large black dots irregularly distributed; orbit large, 26.4 to 36.5% of interorbital distance and 8.6 to 11.7% of HL .... *S. punctatum* [p. 616]

Steindachneridion parahybae **(Steindachner, 1877)**

Fig. 2

Platystoma Parahybae Steindachner, 1877: 640, pl.9, syntypes MCZ 73213, MCZ 25521, and MCZ 7295 (examined). Type locality: rio Parahyba at Juiz de Fora; rio Jequitinhonha, Brazil.

Steindachneria parahybae: Eigenmann & Eigenmann, 1888: 137 (types); Eigenmann & Eigenmann, 1890: 204; fig. 48 (types, description) Eigenmann, 1910: 391 (ref.); Ribeiro, 1902: 255 (rio Pomba); Ribeiro, 1911: 299 (458), pl, 43 (rio Pomba).

Steindachneridion parahybae: Gosline, 1945: 51 (ref.); Fowler, 1951: 603 (rio Paraíba, rio Jequitinhonha, Uruguay); Burgess, 1989: 282; Lundberg *et al.*, 1991: 842; Oliveira & Moraes Junior, 1997: 3; Lundberg & Littmann in Reis *et al*., 2003: 443.

Diagnosis. *Steindachneridion parahybae* differs from the remaining species of the genus by the following combination of characters: supraoccipital process almost in contact with anterior nuchal plate; premaxillary tooth plates large, separated by a medial groove and curved distally; vomer in adults and juveniles with in a single plate; 16-18 gill rakers on first branchial arch; caudal fin slightly notched; orbit moderately large, 9.3 to 11.7% of HL and 26.5 to 38% of interorbital distance; maxillary barbel short, reaching or surpassing the origin of the pectoral-fin insertion; pectoral and adipose fins short; pelvic fin very short, never reaching the anus. Ground color in alcohol light grayish, abdomen whitish, large dark brown blotches irregularly distributed over head and trunk in an irregular, vermiculated or dotted pattern; caudal peduncle low, its depth 30.8 to 33.9% of HL; head depth comprising 70.8 to 86.2 of % of head width; and head width moderately large, 22 to 24.7% of SL.

Fig 2. Lateral and dorsal views of *S. parahybae.* MNRJ 12237, 384 mm SL, rio Paraíba do Sul, at confluence with rio Piabanha and rio Paraibuna, Pontal, Rio de Janeiro, Brazil.

Table 1. Morphometrics of *S. amblyurum*, *S. doceanum* and *S. parahybae* expressed as percent of SL (2-8) and HL (9-16).

Characters	*S. amblyurum*				*S. doceanum*				*S. parahybae*			
	Range (n=5)		Mean	SD	Range (n=3)		Mean	SD	Range (n=9)		Mean	SD
	Low	High			Low	High			Low	High		
1) Standard length (mm)	261.0	334.0	291.0	-	307.0	420.0	345.7	-	250.0	384.0	306.8	-
2) Head length	27.05	29.54	28.21	0.0098	28.84	29.64	29.26	0.0040	27.39	29.50	28.06	0.0064
3) Snout length	12.01	13.60	12.60	0.0063	12.90	13.19	13.08	0.0015	12.14	13.42	12.58	0.0042
4) Predorsal distance	35.60	39.20	37.94	0.0137	38.06	40.00	38.88	0.0100	36.45	39.79	38.49	0.0105
5) Preanal distance	68.20	71.65	70.02	0.0136	69.35	71.66	70.26	0.0123	68.00	72.54	70.47	0.0148
6) Adipose length	23.26	26.41	25.05	0.0148	16.42	19.39	17.86	0.0149	15.70	21.04	18.26	0.0150
7) Scapular bridge width	17.28	24.64	21.98	0.0294	21.63	22.81	22.16	0.0060	22.58	23.74	22.98	0.0042
8) Head width	21.31	23.95	22.91	0.0101	21.95	23.23	22.45	0.0068	22.02	24.72	22.90	0.0083
9) Caudal peduncle depth	32.37	37.36	34.48	0.0205	26.15	30.95	28.62	0.0240	30.85	33.91	32.65	0.0107
10) Head depth	51.36	64.73	57.71	0.0600	41.76	59.63	51.39	0.0902	53.66	69.00	63.80	0.0520
11) Body depth	53.10	69.28	60.80	0.0719	42.86	64.18	53.91	0.1068	58.54	76.30	68.81	0.0529
12) Eye diameter	9.86	10.81	10.21	0.0038	10.32	11.74	11.20	0.0077	9.32	11.73	10.71	0.0082
13) Interorbital distance	38.51	40.60	39.46	0.0081	32.97	33.87	33.50	0.0048	29.83	36.46	32.18	0.0222
14) Mouth width	52.16	57.19	53.97	0.0205	49.15	52.09	50.86	0.0153	48.00	51.18	49.21	0.0120
15) Pelvic bridge width	40.82	45.71	43.04	0.0211	43.96	46.14	45.28	0.0117	42.68	48.89	46.79	0.0224
16) Intranasal distance	28.15	30.39	29.55	0.0087	27.14	28.41	27.75	0.0064	25.62	28.27	26.82	0.0094

Description. Morphometric data presented in Table 1; maximum body length 384 mm SL. Snout long; snout tip roughly rounded in dorsal view; 12.1 to 13.4% of SL; each pair of nostrils protruding on dorsal snout profile; anterior pair of nostrils more widely spaced apart than posterior pair. Head short and high in dorsal view, and slightly depressed in lateral view; head depth 70.8 to 86.2% of head width; head depth 15.8 to 18.9% of SL; head length 27.5 to 29.4% of SL. Dorsal profile of head almost straight from tip of snout to anterior nuchal plate; slightly elevated at orbital region; supraoccipital process almost in contact with anterior nuchal plate. Eye dorsally placed midway between snout tip and opercular opening; orbit moderately large, orbital diameter 9.3 to 11.7% of HL and 26.5 to 38% of interorbital distance.

Opercular opening large and branchial membranes joining at narrow isthmus; eight branchiostegal rays; 16-18 gill-rakers on first branchial arch. Lower region of head with arrow-like, shallow gular fold; deep grooves at lower jaw posterior margin. Mouth large and terminal; mouth width 48 to 51.1% of HL; lower jaw shorter than upper jaw; lips thin; posterior postcleithral process short, reaching vertical line passing near posterior margin of supraoccipital process; all barbels narrow and compressed; maxillary barbel very short, reaching or only slightly surpassing anterior insertion of dorsal fin when adpressed; pair of short mental and post-mental barbels on each side. Tooth plates of premaxilla and dentary with villiform teeth; premaxillary tooth plates large; abruptly narrowing and curved inward distally; single vomerine tooth plate grooved medially in adults and juveniles, circumscribed by premaxillary tooth plate; dentary plate large and distally sharp.

Body profile slight convex between posterior head and dorsal-fin origin; dorsal-fin base slanted; base of adipose fin almost straight; dorsal profile of caudal peduncle deeply concave from end of adipose fin to caudal-fin origin. Predorsal length moderately long, 36.4 to 39.7% of SL. Ventral profile of body almost straight and slightly slanted from tip of snout to end of opercular bone; slightly convex at middle abdominal region, straight at pelvic-fin insertion; base of anal fin slanted; lower caudal peduncle profile slightly concave; cross section of caudal peduncle at vertical through posterior tip of anal fin approximately oval. Dorsal-fin rays i,7 (6 or 8) first two more or less spinous; dorsal-fin base inserted in dorsal space between vertical through pectoral-fin terminus and anal-fin origin; dorsal-fin locking mechanism present. Pectoral fin short, fin tip not reaching vertical through middle dorsal-fin insertion; rays i,9 (10), posterior margin truncate; first pectoral-fin ray short and not pungent, both margins devoid of serrae. Pelvic fin short; i,5 rays, fin never reaching anus; tip of unbranched pelvic-fin ray smooth; distal margin of fin truncate; pelvic fin distant from anal-fin origin and inserted at vertical through dorsal-fin insertion, its tip not reaching anus or vertical passing through adipose-fin origin. Anal-fin rays short, i,8 (9,10), distal margin truncate; preanal distance 68 to 72.5% of SL. Caudal peduncle high, its depth 8.7 to 9.3% of SL. Caudal fin notched, dorsal lobe slightly longer than ventral lobe; principal caudal-fin rays, i,15,i.

Body and head, except orbital region covered with thick skin. Ventral surfaces of pectoral and pelvic girdle entirely covered by skin; supraoccipital process short and covered by thin skin anterior to first unbranched dorsal-fin ray, as in *S. doceanum* and *S. amblyurum*. Postcleithral process short and entirely covered by skin.

Color in alcohol. Ground color of head, dorsum, and lateral regions of body light gray, ventral region whitish; dorsal and lateral portions of head and trunk with large irregularly distributed dark brown lines, forming bold vermiculated color pattern of dark brown and light gray lines. Eye dark. Dorsal, pectoral, pelvic, anal, and adipose fins uniformly light gray with dark brown lines on rays and membranes; adipose fin with several dark brown lines; caudal fin with dark lines on base of each lobe, gray distally.

Distribution. Known from the rio Paraíba do Sul basin, eastern Brazil (Fig. 1).

Material examined Rio de Janeiro State: MCZ 7295 (syntype), 1, 278.0 mm SL, rio Paraíba do Sul, between Barra do Piraí and Três

Rios (D. Pedro II railroad), Apr 1865 (approx. 22°6'S 43°11'W). Três Rios: MNRJ 12235, 1, 265 mm SL, rio Paraibuna, at connection with rio Paraíba do Sul, Jun 1989 (approx. 22°6'S 43°11'W). MNRJ 12237, 1, 384 mm SL and MNRJ 12302, 1, 295mm SL, rio Paraíba do Sul, at confluence with rio Piabanha and rio Paraibuna, Pontal, Dec 1989 (approx. 22°7'S 43°9'W). MNRJ 12238, 1, 337 mm SL; MNRJ 12239, 1, 324 mm SL; MNRJ 12240, 1, 250 mm SL and MNRJ 12303, 1, 300 mm SL, rio Paraíba do Sul, at confluence with rio Piabanha and rio Paraibuna, Pontal, Jan 1990 (approx. 22°7'S 43°9"W). MNRJ 12301, 1, 327 mm SL, rio Paraíba do Sul, at confluence of Paraibuna and Piabanha rivers, Pontal, Oct 1989 (approx. 22°7'S 43°9"W). MNRJ 12303, 1, 300 mm SL, rio Paraibuna, at confluence with rio Piabanha and rio Paraibuna, Pontal, Feb 1990 (22°7'S 43°9'W).

Steindachneridion amblyurum (Eigenmann & Eigenmann, 1888)

Figs. 3-4

Steindachneria amblyurus Eigenmann & Eigenmann, 1888: 137, syntype MCZ 7324 (examined) Type locality: rio Jequitinhonha, Brazil.

Steindachneria amblyurus: Eigenmann & Eigenmann, 1888: 137 (types).

Steindachneria amblyura: Eigenmann & Eigenmann, 1890: 203; fig.27. Eigenmann & Eigenmann 1891: 31 (ref.); Eigenmann, 1910: 391 (ref.); Ribeiro, 1911: 300 (458).

Steindachneridion amblyura: Gosline, 1945: 51 (ref.); Fowler, 1951: 603 (ref.); Burgess, 1989: 282 (ref.).

Steindachneridion amblyurus: Lundberg & Littmann in Reis *et al*., 2003: 443.

Platystoma parahybae Steindachner (part) 1876: 640 (rio Jequitinhonha).

Diagnosis. *Steindachneridion amblyurum* differ from its congeners by the following combination of characters: supraoccipital process almost in contact with anterior nuchal plate. Premaxillary tooth plates large, grooved in median region and sharply curved in distally; tooth plate on vomer in adults and juveniles divided in two almost oval sections laterally disposed; 13-14 gill-rakers on first branchial arch. Caudal fin distally rounded; orbit small, 9.8 to 10.8% of HL and only 24.2 to 28% of interorbital distance; maxillary barbel long, reaching or surpassing the base of the adipose-fin insertion; pectoral, adipose and pelvic fins large sized; pelvic pair very long, concealing the anus; distal margin of dorsal fin almost reaching the adipose-fin insertion; adipose fin larger than anal-fin. Color in alcohol with dark brown large lines irregularly distributed on head and trunk, with large dorsal black dots between lines, over a yellowish ground color; caudal peduncle low, its depth 32.4 to 37.4% of HL; head depth low, 65.1 to 79.6% of head width; head width small, 35.6 to 38% of SL.

Description. Morphometric data presented in Table 1; maximum body length, 334 mm SL. Snout slender and very depressed; snout tip elliptical in dorsal view; snout length 12 to 13.6% of SL; two pair of nostrils horizontally aligned, anterior pair of nostrils in the same distance as nostrils of posterior pair; each pair of nostrils protruding on dorsal snout profile. Head long in dorsal view, very low and depressed in lateral view; head depth 65.1 to 79.6% of head width; head depth 13.8 to 18.5% of SL; head length 27 to 29.5% of SL. Dorsal profile of head almost straight from tip of snout to nuchal plate; slightly high at orbital and supraoccipital regions. Eyes dorsally placed and inserted near snout tip than opercular opening; orbit small, its diameter 9.8 to 10.8% of HL and 24.2 to 28% of interorbital distance. Supraoccipital short covered by thin skin, almost reaching nuchal plate.

Opercular opening large; branchial membranes joining to narrow isthmus; eight branchiostegal rays; 13-14 gill-rakers on first branchial arch. Lower region of head with arrow-like shallow gular fold; deep grooves at posterior margins of lower jaw. Mouth large and terminal; mouth width 52.1 to 57.1% of

Fig. 3. Lateral and dorsal views of *S. amblyurum*. MZUSP 87986, 334 mm SL, Almenara, rio Jequitinhonha, ilha Bela Vista, Minas Gerais, Brazil.

Fig. 4. Lateral view of *S. amblyurum* syntype. MCZ 7324, 380 mm SL, rio Jequitinhonha, along Jequitinhonha valley, Minas Gerais, Brazil.

HL; lower jaw shorter than upper and with thin lips; posterior postcleithral process short, reaching vertical line through posterior supraoccipital process. All maxillary barbels, narrow and depressed; maxillary barbel very long, reaching or only slightly surpassing insertion of adipose fin when adpressed; pair of short mental and post-mental barbels on each side. Tooth plates of premaxillary and dentary with villiform teeth; premaxillary tooth plate slender, medially grooved; sharply curved distally; vomerine tooth plate in adults and juveniles, divided in two small elliptical plates at median region; both circumscribed by premaxillary tooth plate; a single and elongated dentary tooth plate, distally sharp.

Body profile slight convex between head and adipose-fin origin; dorsal-fin base slanted; base of adipose fin almost straight; dorsal profile of caudal peduncle deep concave from end of adipose fin base to caudal-fin origin. Predorsal length short, 35.6 to 38% of SL. Ventral profile of body almost straight and slightly inclined from tip of snout to end of opercular bone, slightly convex or almost straight at middle inferior head and abdominal region, almost flat on pelvic-fin insertion; base of anal-fin slanted; lower caudal peduncle profile slightly concave; cross section of caudal peduncle at vertical through posterior tip of anal-fin approximately oval. Dorsal-fin rays i,7(6); dorsal-fin base inserted in the dorsal space between the vertical through the pectoral-fin terminus and the anal-fin origin; dorsal-fin locking mechanism present. Pectoral-fin long and not pungent, reaching the vertical line through middle dorsal-fin base; rays i,9(10); first pectoral-fin ray short and not pungent, both margins devoid of serrae. Pelvic fin long, i,5; inserted at vertical at end of dorsal-fin, concealing the anus and reaching the anal-fin insertion; tip of unbranched pelvic-fin ray smooth; distal margin slightly rounded. Anal-fin rays elongated i,8(9), distal margin rounded; preanal distance 68.1 to 71.6% of SL; first anal-fin ray smooth, not pungent; its distal margin rounded. Adipose fin very large, leaving a narrow space between dorsal and adipose fin; base of adipose fin almost straight. Caudal peduncle low, its depth 9.2 to 10.2% of SL. Caudal fin distally rounded, upper and lower lobes equal; principal caudal-fin rays, i,15,i.

Body and head, except orbital region, covered with thick layer of skin; scapular bridge and pelvic girdle also entirely covered by skin. Supraoccipital process and anterior nuchal plate covered by thin skin and almost in contact. Posterior postcleithral process short and entirely covered by thick skin.

Color in alcohol. Ground color of dorsal and lateral regions of body light brown; ventral region yellowish; dorsal and lateral portions of head, snout, and trunk with irregularly distributed dark brown large lines, sometimes with large black dots on dorsum; lower region of head and abdomen yellow. Eyes dark. Dorsal, pectoral, pelvic, anal and adipose fins uniformly light gray with black lines or black dots on rays and membranes; several dark brown lines and dots on adipose fin; caudal fin with dark lines and small dots on base, but distally gray.

Distribution. Known from the rio Jequitinhonha basin, Brazil (Fig. 1).

Material examined. Minas Gerais State: MCZ 7324 (syntype), 1, 380 mm SL, rio Jequitinhonha, along Jequitinhonha valley, 4 May 1866. MZUSP 87986, 1, 334 mm SL, Almenara, rio Jequitinhonha, ilha Bela Vista, 27 Feb 1989. MZUSP 87987,1, 261 mm SL, rio Araçuaí, near confluence with rio Jequitinhonha, Itira, Feb 1989. LISDEBE 1160, 3, 261-301 mm SL, Araçuaí, rio Jequitinhonha, downriver from the rio Araçuaí confluence, 17-20 Jan 1989.

Steindachneridion doceanum (Eigenmann & Eigenmann, 1889)

Figs. 5-6

Steindachneria doceana Eigenmann & Eigenmann, 1889: 30, syntypes MCZ 23792, 23793 and 23794 (examined). Type locality: rio Doce, Brazil; Eigenmann & Eigenmann, 1890: 204 (types); Eigenmann & Eigenmann, 1891: 31 (ref.); Eigenmann, 1910: 391 (ref.); Ribeiro, 1911: 299 (458) (ref.); Van der Stigchel, 1947: 67 (Rio de Janeiro).

Steindachneridion doceana: Gosline, 1945: 51 (ref.); Fowler, 1951: 603 (ref.); Burgess, 1989: 282; Lundberg *et al.*, 1991: 842; Oliveira & Moraes Junior, 1997: 3; Lundberg & Littmann in Reis *et al*., 2003: 443.

Diagnosis. *Steindachneridion doceanum* differ from the remaining species of genus by the following combination of characters: supraoccipital bone process almost in contact with anterior nuchal plate; premaxillary tooth plates large, grooved medially and distally sharp; vomerine tooth plate oval, deeply grooved medially or divided in juvenile specimens; 18 to 20 gill rakers on first branchial arch; pectoral, adipose and pelvic fins large; pelvic fin long, concealing the anus. Lips protruded; maxillary barbel short, reaching to base of unbranched pectoral-fin ray. Color pattern marbled, combining dark brown large bowed lines with ground yellowish lines in a light brown ground color. Caudal peduncle low, its depth 26.1 to 30.9% of HL; head depth low, comprising 55.8 to 79.6% of head width; head width small, 21.9 to 23.2% of SL.

Description. Morphometric data presented in Table 1; maximum body length 420 mm SL. Snout slender; snout tip almost elliptical in dorsal view; snout length 12.9 to 13.1% of SL; anterior pair of nostrils inserted more widely spaced apart than posterior pair; each pair of nostrils protruding on dorsal snout profile. Head long in dorsal view and depressed in lateral view; head low its depth 55.8 to 79.6% of head width;

Fig. 5. Lateral and dorsal views of *S. doceanum.* MZUSP 87988, 420 mm SL, Ponte Nova, rio Piranga, tributary of rio Doce, Minas Gerais, Brazil.

and 21.9 to 23.2% of SL; head length 28.3 to 29.3% of SL. Dorsal profile of head increasing in an almost straight line from tip of snout to nuchal plate; slightly elevated at the orbital region; supraoccipital process almost in contact with anterior nuchal plate. Eyes dorsally placed midway between snout tip and opercular opening; orbit large, orbital diameter 10.3 to 11.7% of HL and 30.4 to 35% of interorbital distance.

Opercular opening large and strongly curved; branchial membranes joining before forming a narrow isthmus; eight branchiostegal rays progressively reduced in size; 18-20 gill-rakers on first branchial arch. Lower region of head with an arrow like and shallow gular fold; deep grooves at posterior margin of lower jaw. Mouth terminal; mouth width 49.1 to 52.0% of HL; lower jaw shorter than upper jaw; lips thick; posterior postcleithral process short, reaching vertical line passing through terminus of supraoccipital process. All barbels, narrow and depressed; maxillary barbel short, reaching or only slightly surpassing the median region of pectoral fin when adpressed; a pair of short mental and post-mental barbels on each side. Tooth plates of premaxillary and dentary ramus with villiform teeth; premaxillary tooth plate slender, with median groove and abruptly narrowing and curved inward distally; single vomerine tooth plate grooved medially in adults; vomerine tooth plate divided into two small elliptical plates almost in contact at median region of vomer in juveniles; both vomerine tooth plates circumscribed by premaxillary tooth plate; and single elongate and distally sharp dentary tooth plate.

Body profile slight convex between posterior nuchal plate and origin of adipose fin; dorsal-fin base slanted; region between dorsal and adipose-fin origin slightly concave; dorsal profile of caudal peduncle deeply concave from end of adipose fin to origin of caudal-fin. Predorsal length long, 38 to 40% of SL. Ventral profile of body almost straight and slanted from tip of snout to end of opercular bone, slightly convex at middle inferior head and abdominal region, flat on pelvic-fin insertion; base of anal fin straight and posteriorly slanted; preanal distance 69.3 to 71.6% of SL; lower caudal peduncle profile slightly concave; adipose fin large and convex. Caudal peduncle at vertical through posterior tip of anal fin approximately rounded in crossed section. Dorsal-fin rays i,7(6); dorsal-fin base inserted in dorsal space between vertical through pectoral-fin terminus and anal-fin origin; dorsal fin locking mechanism present. Pectoral fin long, tip of fin surpassing vertical through dorsal-fin insertion; rays i,9(10); distal margin rounded; pectoral spine short and not pungent, both margins devoid of serrae. Pelvic-fin long, its tip not pungent and reaching anal-fin insertion; pelvic-fin rays i,5; its distal margin slightly rounded; pelvic-fin when adpressed concealing anus and reaching anal-fin origin. Anal-fin rays i,8(9), its distal margin rounded. Caudal peduncle low, its depth 7.7 to 9% of SL. Caudal fin slightly notched, with dorsal lobe slightly larger than ventral, fin tip slightly pointed; principal caudal-fin rays, i,15,i.

Body and head except orbital region covered with thick skin. Ventral surfaces of pectoral and pelvic girdle entirely covered by skin; supraoccipital process short and covered by thin skin, very near the anterior nuchal plate. Posterior postcleithral process short and entirely covered by skin.

Color in alcohol. Ground color of head, dorsum and lateral region of body light gray and ventral region yellowish; dorsal and lateral portions of head and trunk with maze dark brown lines forming like a marbled color pattern, combined

Fig. 6. Lateral view of *S. doceanum*, syntype. MCZ 23794, 307 mm SL, rio Doce between Linhares and Aimorés, Espírito Santo, Brazil.

with light gray ground color extending onto all fins; lower region of head and abdomen yellowish. Eyes dark. Dorsal, pectoral, pelvic, anal and adipose fins uniformly light gray and with lines forming marbled pattern on rays and membranes; adipose fin with several dark brown lines; caudal fin with dark lines on base of each lobe, gray distally.

Distribution. Known from the rio Doce basin, Brazil (Fig 1).

Material examined. Espírito Santo State: MCZ 23794 (syntype), 307 mm SL, rio Doce between Linhares and Aimorés, 1865. Minas Gerais State: MZUSP 87988,1, 420 mm SL, Ponte Nova, rio Piranga, tributary of rio Doce, 28 May to 5 June 1995. MZUSP 87989,1, 310 mm SL, Santa Cruz do Escalvado, rio Doce, 24 Nov to 4 Dec 1995.

Steindachneridion scriptum (Miranda Ribeiro, 1918)

Fig. 7

Steindachneria scripta Miranda Ribeiro, 1918: 640 (732), lectotype: MZUSP 2286, 395 mm; paralectotype MZUSP 1236, 700 mm (dry). Type locality: Itaqui, rio Uruguay, Rio Grande do Sul State, Brazil.

Steindachneria scripta: Britski, 1969: 205 (lectotype designation).

Steindachneridion scripta: Gosline: 1945: 51 (ref.); Fowler, 1951: 604 (ref.); Burgess, 1989: 282: 842; Lundberg & Littmann in Reis *et al*., 2003: 443; López *et al*., 2003: 61; Zaniboni Filho *et al*, 2004: 111 (ref.).

Steindachneridion inscripta (error): López, Menni & Miquelarena, 1987: 27 (ref.); Sverlij *et al*., 1998: 63

Pseudopimelodus parahybae: Devincenzi & Teague, 1942: 42, fig (rio Uruguay), (misidentification of *S. scriptum*?).

Diagnosis. *Steindachneridion scriptum* differs from its congeners by having the combination of the following characters: supraoccipital process distant from anterior nuchal plate by length of one orbital diameter; premaxillary tooth plates united and with groove medially, slightly curved and sharp in distal region; vomer with single and oval shaped tooth plate; and 15 to 17 gill rakers on first branchial arch. Head depth shorter than head width (64.2 to 86.2%); and head width 21.1 to 26.0% of SL. Orbit small 21.2 to 31.7% of interorbital distance and 7.3 to 10.1% of HL; mouth large, its width 38.7 to 47.2% of HL. Lips thin, maxillary barbel long, surpassing pectoral fin tip and reaching vertical through dorsal-fin insertion. Ground color displaying body light grayish, abdomen whitish, with elongated or striated black blotches and dark dots irregularly scattered on head, trunk, rays and membrane fins. Caudal peduncle depth 32.0 to 41.5% of head length; caudal fin deeply notched; upper lobe larger than lower; both tips slightly rounded.

Description. Morphometric data presented in Table 2; maximum body length 774 mm SL. Snout large; snout tip almost rounded in dorsal view; snout length 11.8 to 13.8% of SL; each pair of nostrils slightly protruding on dorsal snout profile; anterior pair inserted more widely spaced apart than posterior pair. Head wide, almost rounded in dorsal view; head depth 64.2 to 86.2% shorter than its width and 13.7 to 19.8% of SL; head length 26.8 to 31.5% of SL. Dorsal profile of head almost straight from tip of snout to the nuchal plate; slightly depressed at the region between supraoccipital process and anterior nuchal plate; a distance near one orbital diameter long separate the supraoccipital from the nuchal plate. Eyes dorsally placed more near to tip of snout than opercular opening; orbit small, 7.3 to 10.1% of HL and 21.2 to 31.7% of interorbital distance.

Opercular opening large and strongly curved forward; branchial membranes joining at narrow isthmus; eight branchiostegal rays reduced in size; 15 to 17 gill rakers on first branchial arch. Lower region of head with an arrow-like, shallow gular fold; deep grooves on each side of lower jaw. Mouth large and terminal; lower jaw slightly shorter than upper jaw; mouth width 38.7 to 47.2% of HL; posterior postcleithral process short, reaching vertical line passing through beginning supraoccipital process; lips thin; all bar-

Fig. 7. Lateral and dorsal views of *S. scriptum*. MZUSP 88015, 690 mm SL, Jaguara, rio Grande, cachoeira Mata-Doutor, downstream of Jaguara hydroelectric power dam, São Paulo, Brazil.

bels narrow and depressed; maxillary barbel long, when adpressed, reaching vertical line passing through dorsal-fin insertion. Tooth plates of premaxillary and dentary with villiform teeth; each premaxillary and dentary bone has its own tooth patch; premaxillary tooth plates large, unite and with a median groove; abruptly narrowing and curved inward distally; single vomer tooth plate continuous, almost elliptical and circumscribed by the premaxillary tooth plate; single dentary thin tooth plate distally sharp.

Body profile deep convex between nuchal plate and caudal peduncle; base of dorsal-fin and anterior region of adipose fin straight; anterior region and insertion of adipose fin slanted; dorsal profile of caudal peduncle slightly concave from adipose fin to base of caudal-fin. Predorsal length 39.4 to 44.1% of SL. Ventral profile of body slanted from tip of snout to abdominal region, almost straight on pelvic and anal-fin insertions; lower caudal peduncle profile slightly concave. Preanal distance 70 to 75.7% of SL. Caudal peduncle at vertical through posterior tip of anal fin nearly rounded in cross-section. Dorsal-fin rays i,7(6); first two rays not pungent; dorsal fin base inserted in the dorsal space between the vertical through pectoral-fin terminus and vertical line through anal-fin origin; dorsal-fin locking mechanism present. Pectoral-fin rays i,9(10), first pectoral-fin ray not pungent and devoid of serrae; distal margin of fin straight; pectoral-fin short, when adpressed reaching vertical through base of first dorsal-fin ray. Pelvic-fin rays i,5; tip of unbranched pelvic-fin ray smooth and not pungent; slightly rounded distally; tip of pelvic-fin when adpressed surpass the anus, but not reach the anal-fin origin. Anal-fin rays i,8(9,10), pelvic-fin distal margin truncate. Caudal-fin deep notched; dorsal lobe larger than the ventral lobe and both tips slightly rounded; principal caudal-fin rays, i,15(14-16),i; caudal peduncle low, its depth 9.9 to 11.7% of SL.

Body and head except orbital region covered with thick skin; ventral surfaces of pectoral and pelvic girdle entirely covered by skin. Supraoccipital process short covered by thin skin and reaching the vertical through opercular opening; posterior postcleithral process short and entirely covered by skin.

Color in alcohol. Dorsal and lateral regions of body and head light gray and ventral region whitish; dorsal regions of head and trunk with small elongated or striated dark brown marks larger than one orbital diameter, irregularly scattered; juveniles with lateral small dark brown elongated marks and dots on dorsal surface of body. Eyes dark. Dorsal, pectoral, pelvic, anal and adipose fins uniformly dark gray with small black or dark brown elongated marks or large dots scattered on rays and membranes; adipose fin with several dark marks; caudal fin with dark dots on base of each lobe; dark gray distally.

Distribution. Known from upper rio Paraná, and rio Uruguay basins, Brazil (Fig. 1).

Material examined. Rio Grande do Sul State: MZUSP 2286 (lectotype), 395 mm and MZUSP 1236, 700 mm (paralectotype), Itaqui, rio Uruguay, 1914. MCP 12629, 1, 426 mm SL, rio Uruguay at confluence of rio Pelotas and rio Canoas, Barracão, 10-11 Dec 1988. Santa Catarina State: MCP 12993, 1, 327 mm SL, Itá, rio Uruguay, 7-8 Dec 1988. São Paulo State: MZUSP 42846, 1, rio Pardo, no date. MZUSP 88015 7, 471 to 774 mm SL, Jaguara, rio Grande, cachoeira Mata-Doutor, downstream of Jaguara hydroelectric power dam, 21-29 Jul 1988. MZUSP 88016, 4, 420-570 mm SL, Piraju, rio Paranapanema, downriver from Paranapanema hydroelectric power dam, 2 Nov 2002. MZUSP 88017, 4, 390-460 mm SL, Piraju, rio Paranapanema, downriver from Jurumirim hydroelectric power dam, 25-26 Jan 2001. LISDEBE 1161, 2, 387-490 mm SL, rio Grande at confluence with the ribeirão dos Dourados, 26 Aug to 3 Sep 1988. LISDEBE 1162, 1, 385 mm SL, Salto Grande, rio Paranapanema, near Salto Grande, Jan 1991. LISDEBE 1163, 2, 298 and 320 mm SL, Piraju, rio Paranapanema, downriver of the Paranapanema hydroelectric power dam, 6-10 Jul 2000. LISDEBE 1164, 3, 416-508 mm SL, Piraju, rio Paranapanema, downriver of the Paranapanema hydroelectric power dam, 15 Jul 2003.

Steindachneridion punctatum **(Miranda Ribeiro, 1918)**

Fig. 8

Steindachneria scripta var. *punctata* Miranda Ribeiro, 1918: 642 (text).

Steindachneridion punctata: Figueiredo & Costa Carvalho, 1999: 692 (ref.).

Diagnosis. *Steindachneridion punctatum* differs from its congeners by the following combination of characters: supraoccipital process distant from anterior nuchal plate nearly one orbital diameter; premaxillary tooth plates large, united, medially grooved and curved distally; a single vomer dental plate oval, not grooved and distally circumscribed by premaxillary tooth plate in each side; 12 to14 gill rakers on first branchial arch; lips thin; maxillary barbel short, reaching or only slightly surpassing the opercular opening. Caudal peduncle depth high, 32.0 to 36.1% of head length; head depth shorter than head width (63.4 to 88.4%); and head width moderately large, 21.4 to 24.8% of SL; caudal fin slightly notched, dorsal and ventral lobes equal. Ground color of head and trunk light gray, abdomen yellowish with numerous small circular and semicircular dark brown blotches and dots irregularly scattered on head, trunk, rays and membrane fins.

Description. Morphometric data presented in Table 2; maximum body length 697 mm SL. Snout long and robust; snout tip roughly rounded in dorsal view; each pair of nostrils protruding on dorsal snout profile; anterior pair of more widely spaced apart than posterior pair. Head short and high in dorsal view, tip of snout nearly rounded in dorsal view and slightly depressed in lateral view; head depth shorter than its width 63.4 to 88.4%; head depth 15.1 to 21.7% of SL; head length 28.4 to 30.8% of SL. Dorsal profile of head almost straight from tip of snout to supraoccipital process; slightly depressed between from this point to anterior nuchal plate; supraoccipital process distant from the nuchal plate by nearly one orbital diameter

long. Eyes dorsally placed and inserted in midway from snout tip and opercular opening; orbit moderate small, its diameter 8.6 to 11.7% of HL and 26.4 to 36.5% of interorbital distance.

Opercular opening large and with branchial membranes joining at narrow isthmus; eight branchiostegal rays reduced in size; 12 to14 gill rakers on first branchial arch. Lower region of head with arrow-like, shallow gular fold; deep grooves at lower jaw distal margin. Mouth large and terminal; mouth width 43.4 to 48.0% of HL; lower jaw shorter than upper jaw; thin lips; posterior postcleithral process short, reaching vertical line through distal supraoccipital process; all barbels narrow and depressed; maxillary barbel short, when adpressed reaching or only slightly surpassing the opercular opening; a pair of short mental and post-mental barbels on each side. Tooth plates of premaxillary and dentary provided with villiform teeth; premaxillary tooth plates large, united and grooved at middle, narrowing and curved inward distally; single vomer dental plate not grooved, almost elliptical in adults and juveniles, circumscribed by the premaxillary tooth plate; dentary tooth plate thin, single and distally sharp.

Body profile slightly convex from distal head to dorsal-fin origin; dorsal-fin base and posterior region almost straight; base of adipose fin slanted; dorsal profile of caudal peduncle slightly concave from end of adipose fin to caudal-fin origin. Predorsal length 41.3 to 44.1% of SL. Ventral profile of body straight inclined from tip of snout to end of opercular bone, slightly convex at middle abdominal region, slanted on pelvic and almost straight at anal-fin insertion; lower caudal peduncle profile slightly concave; cross section of caudal peduncle at vertical through posterior tip of anal fin approximately rounded. Dorsal-fin rays i,7(6); first two rays moderately spinous; dorsal-fin base inserted in the dorsal space between vertical through pectoral-fin terminus and anal-fin origin; dorsal fin locking mechanism present. Pectoral fin short and pectoral spine not pungent; fin tip reaching vertical through first dorsal-fin ray; pectoral-fin rays i,9(10), distal margin straight inclined and both margins of unbranched pectoral ray devoid of serrae. Pelvic-fin short; i,5 rays; tip of unbranched pelvic-fin ray not pungent; when adpressed surpassing the anus, but not reaching the anal-fin origin; posterior margin of pelvic-fin slightly rounded; Anal-fin rays i,8(9,10), posterior margin semicircular. Preanal distance 69.5 to 74.6% of SL. Caudal peduncle low its depth 9.8 to 11.1% of SL. Caudal fin slightly notched, with both lobes same sized, fin tip roughly rounded; principal caudal-fin rays, i,15,i.

Body and head, except orbital region covered with thick skin; ventral surfaces of pectoral and pelvic girdle entirely covered by skin; supraoccipital process covered by thin skin, reaching vertical through distal opercular opening. Posterior postcleithral process short and entirely covered by skin.

Color in alcohol. Ground color of head, dorsum and lateral regions of body light gray and ventral region whitish; dorsal and lateral portions of head and trunk with small black and or dark brown circular or semicircular blotches; blotches shorter than one orbital diameter, irregularly scattered; lower region of head and abdomen yellowish; juveniles with lateral small dark brown dots on dorsal surface of body. Eyes dark. Dorsal, pectoral, pelvic, anal and adipose fins uniformly dark gray, small dark brown dotted on rays and membranes; adipose fin with several black or dark brown dots; caudal fin with dark spots on base of each lobe, but distally uniformly dark gray.

Distribution. Known from the upper rio Paraná, and rio Uruguay basin, Brazil (Fig. 1).

Material examined. Rio Grande do Sul State: Holotype, MNRJ 1167, 330 mm SL, rio Uruguay, Itaqui; E. Garbe, 1914. MCP 12634, 1, 437 mm SL and MCP 12635, 1, 363 mm SL, rio Pelotas, Esmeralda, on the road Garibaldi to Pinhal da Serra, 11 Dec 1988. MCP 12628, 1, 428 mm SL, rio Uruguay, Barracão at confluence of Pelotas and Canoas rivers, 10-11 Dec 1988. MCP 12847, 1, 245 mm SL, Campos Novos, rio Canoas, on the road Abdon Batista to A. Garibaldi, 22-23 Jan 1989. São Paulo State: MZUSP 23093, 2, 330 and 414 mm SL, ilha Solteira, rio Paraná, Sep 1965. MZUSP 87985, 1, 632 mm SL, Jaguara, rio Grande, Cachoeira Mata-Doutor, downstream of Jaguara hydroeletric power dam, 24-30 Jun 1988.

Fig. 8. Lateral and dorsal views of *S. punctatum.* MZUSP 87985, 632 mm SL, Jaguara, rio Grande, Cachoeira Mata-Doutor, downstream of Jaguara hydroeletric power dam, São Paulo, Brazil.

***Steindachneridion melanodermatum*, new species**
Fig. 9

Steindachneridion sp.: Severi & Cordeiro, 1994: 73 (ref.); Garavello *et al*., 1997: 71 (ref.); Nakatani *et al*.: 2001: 304 (larval diagnosis).

Holotype. MZUSP 87983, 530 mm SL, Brazil, Paraná State, municipality of Quedas do Iguaçu, rio Iguaçu, down river of the Salto Osório dam (approx. 25°35´S 53°05´W), J. C. Garavello, A. S. Soares, J. C. Soares & A. Aparecido, 30 Oct - 6 Nov 1989.
Paratypes. MZUSP 87984, 5, 381 to 532mm SL, same locality and collectors as holotype; LISDEBE 1165, 2, 474 and 512 mm SL, Brazil, Paraná State, municipality of Quedas do Iguaçu, rio Iguaçu, upriver from mouth of rio Chopim (approx. 25°35´S 53°05´W), J. C. Garavello, A. S. Soares, J. C. Soares & A. Aparecido, 9-18 Jan 1990.

Diagnosis. *Steindachneridion melanodermatum* differs from the remaining species of the genus by the following combination of characters: supraoccipital process remote from the anterior nuchal plate by a distance nearly twice the orbital diameter; premaxillary tooth plate slender, separated one from another by a medial groove and curved in distal region; a single oval vomer tooth plate, continuous and circumscribed by the premaxillary plates; 16 to 18 gill rakers on first branchial arch. Lips well developed; maxillary barbel short, reaching to base of unbranched pectoral-fin ray; pelvic fin short, when adpressed only slightly surpassing the anus, but distant from the anal-fin origin; caudal fin slightly notched, dorsal lobe slightly larger than ventral, each lobe nearly rounded distally. Ground color of head and trunk in alcohol dusk brown; abdomen whitish; tiny circular black or dark brown blotches irregularly scattered on the ground color of head and trunk, masking a black dotted pigmentation; caudal peduncle high, its depth 29.5 to 33.4% of HL; head depth nearly equal head width, 74.4 to 97.3%, and head width moderately small, 20.4 to 22.6% of SL.

Description. Morphometric data presented in Table 2; maximum body length 532 mm SL. Snout slender and robust; snout tip roughly elliptical in dorsal view; 12.1 to 13.3 % of SL; each pair of nostrils protruding on dorsal snout profile; anterior pair of nostrils nearly equidistant from each other as in posterior pair. Head long in dorsal view and slightly depressed in lateral view; head depth nearly long as head width, 74.4 to 97.3%; head depth 17.8 to 21.2% of SL; head length 28.3 to 29.5% of SL. Dorsal profile of head almost straight from tip of snout to supraoccipital process, slightly depressed at interorbital space; slight convex between this point and the dorsal-fin origin; distance between supraoccipital process and anterior nuchal plate separated by near two orbital diameter. Eyes dorsally placed and in midway between tip of snout and the opercular opening; orbit moderately small, 25.1 to 29.7% of interorbital distance and 8.6 to 9.5% of HL.

Opercular opening large; branchial membranes joining at narrow isthmus; eight branchiostegal rays progressively reduced in size; 16-18 gill rakers on first branchial arch. Lower region of head with arrow-like, shallow gular fold; deep grooves at lower jaw distal margin. Mouth large, terminal and with thick lips; mouth width 42.2 to 47.5% in HL; lower jaw shorter than upper jaw; posterior postcleithral process short, reaching vertical through terminus of supraoccipital process; all barbels narrow and depressed; maxillary barbel long, reaching or surpassing median length of dorsal fin when adpressed; pair of short mental and post mental barbels on each side. Tooth plates of premaxillary and dentary with villiform teeth; premaxillary tooth plates slender, with a median groove, narrowing and curved inward distally; single vomer tooth plate continuous, almost elliptical and circumscribed by the premaxillary plate on each side; a single and elongated dentary tooth plate distally sharp.

Body profile almost straight from the nuchal plate to dorsal-fin; dorsal-fin base slanted and profile between dorsal-fin and adipose-fin insertion slightly concave; base of adipose fin slanted; dorsal profile of caudal peduncle deep concave between adipose and caudal fin. Predorsal length 41.4 to 44.3% of SL. Ventral profile of body slanted from tip of snout to end

Fig. 9. Lateral and dorsal views of *S. melanodermatum* holotype. MZUSP 87983, 530 mm SL, municipality of Quedas do Iguaçu, rio Iguaçu, down river of the Salto Osório dam, Paraná, Brazil.

Table 2. Morphometrics of *S. melanodermatum*, *S. scriptum* and *S. punctatum* expressed as percent of SL (2–8) and HL (9–16). Hol = Holotype.

Characters	*S. melanodermatum*					*S. scriptum*				*S. punctatum*			
	Hol	Range (n=8)		Mean	SD	Range (n=11)		Mean	SD	Range (n=7)		Mean	SD
		Low	High			Low	High			Low	High		
1) Standard length (mm)	530.0	381.0	532.0	462.6	-	327.0	774.0	581.1	-	245.0	632.0	407.0	-
2) Head length	151.2	28.32	29.58	29.00	0.0046	26.53	31.80	29.44	0.0147	28.48	30.80	29.81	0.0092
3) Snout length	64.5	12.17	13.38	12.63	0.0039	11.83	13.85	12.77	0.0063	12.37	13.30	12.78	0.0035
4) Predorsal distance	224.0	41.47	44.34	42.57	0.0084	39.44	43.67	42.14	0.0124	41.39	44.16	42.43	0.0113
5) Preanal distance	394.0	72.62	75.59	74.21	0.0098	70.00	75.71	72.43	0.0160	69.57	74.69	72.32	0.0192
6) Adipose length	97.3	17.59	20.81	18.75	0.0104	18.46	22.75	20.24	0.0153	18.43	21.07	19.89	0.0093
7) Scapular bridge width	48.1	22.42	23.45	22.89	0.0034	20.97	25.35	23.41	0.0139	22.78	24.93	23.61	0.0095
8) Head width	96.2	20.50	22.62	22.03	0.0067	21.17	26.02	22.72	0.0149	21.49	24.84	23.27	0.0105
9) Caudal peduncle depth	113.0	29.54	33.47	31.81	0.0114	32.02	41.52	36.29	0.0298	32.91	36.19	34.65	0.0142
10) Head depth	13.1	56.97	72.67	63.94	0.0450	45.17	67.35	60.25	0.0607	49.33	70.49	59.98	0.0748
11) Body depth	52.1	64.15	78.93	71.85	0.0498	55.94	82.84	68.80	0.0702	53.73	78.98	67.14	0.0759
12) Eye diameter	71.9	8.63	9.58	9.12	0.0036	7.33	10.17	8.92	0.0082	8.69	11.73	10.13	0.0096
13) Interorbital distance	120.1	31.71	35.67	33.41	0.0130	31.61	37.81	34.18	0.0206	32.13	35.67	33.60	0.0127
14) Mouth width	117.9	42.24	47.55	45.56	0.0178	38.78	47.21	43.26	0.0253	43.47	48.00	45.67	0.0160
15) Pelvic bridge width	71.0	43.04	46.96	46.05	0.0128	41.96	49.63	46.22	0.0248	41.33	48.56	45.25	0.0255
16) Intranasal distance	38.0	24.22	25.77	25.00	0.0053	23.08	26.92	25.13	0.0109	23.30	26.11	25.32	0.0103

of opercular bone; convex in abdominal region and nearly flat on pelvic and anal-fin insertions; lower caudal peduncle profile slightly concave. Caudal peduncle at vertical passing through posterior tip of anal fin approximately rounded in cross-section. Dorsal-fin rays i,7(6); the first two slightly spinous; dorsal-fin base inserted in the dorsal space at a vertical after pectoral-fin and through anal-fin origin; dorsal-fin locking mechanism present. Pectoral-fin short; first pectoral ray not pungent; both margins devoid of serrae; pectoral-fin length when adpressed, reaching before the vertical through dorsal-fin origin; i,9(10) rays; posterior margin truncate. Pelvic-fin rays i,5; tip of unbranched pelvic ray short and smooth; when adpressed only slightly surpassing the anus; distant from anal-fin origin. Distal margin of pelvic-fin roughly rounded. Anal-fin rays i,8 (9), posterior margin truncate; preanal distance 72.6 to 75.5% of SL. Caudal peduncle low, its depth 9 to 9.6% of SL. Caudal fin slightly notched, dorsal lobe slightly larger than ventral, both tip nearly rounded; principal caudal-fin rays, i,15(14),i.

Body and head, except orbital region covered with thick skin; ventral surfaces of pectoral and pelvic girdle entirely covered by skin; supraoccipital process short covered by thin skin, reaching vertical through posterior opercular opening. Posterior postcleithral process short and entirely covered by skin.

Color in alcohol. Ground color of head and dorsal regions of body black or dark brown; ventral region whitish; dorsal and lateral regions of head and dorsum with minute dark brown circular blotches or dots shorter than one orbital diameter, irregularly scattered on background; lower region of head and abdomen progressively whitish. Eyes dark. Dorsal, pectoral, pelvic, anal and adipose fins uniformly black or dark brown combined with small black or dark brown dots scattered on rays and membranes; adipose fin with several minute black or dark brown dots; caudal fin dark dotted on base of each lobe; distal regions uniformly dark.

Etymology. *Melanodermatum* after the Greek melanos = black and dermatus = skin, referring to the full dark brown ground color of body, a color pattern unique in the genus**.**

Distribution. Known from the rio Iguaçu at upper Paraná Basin, border of Paraná and Santa Catarina States, Brazil (Fig. 1).

Notes on the rio Iguaçu and localities of *S. melanodermatum*. The rio Iguaçu extends almost 1,080 km, descending approximately 830 meters from its headwaters to its mouth just a little below the Iguaçu falls at the border between Brazil, Argentina, and Paraguay. Its headwaters are situated on the eastern Serra do Mar area, which is included in the First Paranaense Plateau, near the city of Curitiba. Upriver, between the localities of Engenheiro Blay and Porto Amazonas, the rio Iguaçu includes several and extensive clear water regions, running over stony beds. As mentioned by Maack (1968) this area of rio Iguaçu drainage has very old rocky beds previous to the Devonian Period constituting the Second Paranaense Plateau. Between the localities of Porto Amazonas and União da Vitória, the river includes very old beds but also several meandrous and extensive flooded areas. Below this area, it crosses the Boa Esperança mountains and reaches the Third Paranaense Plateau, were the rocky beds are younger, including rapids and some falls towards the large Iguaçu falls before meeting the rio Paraná. The collecting localities of *S. melanodermatum* are situated at the Third Paranaense Plateau, after the Boa Esperança mountains; in these places the river has many large falls, variable depths, but it always has a very swift water flow, running over large rocky beds. Both left and right banks have native vegetation formations of open fields (campos limpos) with sparse woodlots (capões), generally concentrated near the riparian forest, in the banks of the main channel of the river and at its main tributaries. Presently, the portion of the rio Iguaçu running over the Third Paranaense Plateau is deeply modified by the dams of several hydroelectric power plants, and *S. melanodermatum* may be

found only between these dams, inhabiting stretches of the river where the natural flow of water is still preserved.

Discussion

Among the characters of external morphology mentioned by Eigenmann & Eigenmann (1890) to establish the genus *Steindachneridion*, one of the most relevant is the arrangement of the villiform tooth plates. Those are disposed in an anterior premaxillary large tooth plate and each premaxilla has its own independent plate; these meet and are fused at the symphysis on the midline; a pair of tooth plates on the vomer in *S. amblyurum* and juveniles of *S. doceanum*, but only one elongated posterior vomerine plate in *S. parahybae*, *S. scriptum*, *S. punctatum* and *S. melanodermatum. S. doceanum* possess a vomer tooth plate in an intermediate condition between *S. amblyurum* and the single plate showed by *S. parahybae*, *S. scriptum*, *S. puctatum* and *S. melanodermatum*. The paired vomerine plates in *S. doceanum* remain contiguous on juvenile and in contact on adult specimens seeming to coalesce during their ontogeny. The arrangement of vomerine tooth plates in *Steindachneridion* was considered by Eigenmann & Eigenmann (1890) to be similar to the condition found in *Duopalatinus* Eigenmann & Eigenmann, 1888. Britski (1981) when describing genus *Merodontotus* also identified the double vomer tooth plates of this genus, but considered *Merodontotus* different from *Steindachneridion* based on shape of the premaxillary tooth plates and general body shape. In spite of the similar morphology of the vomer tooth plates in *Duopalatinus*, *Merodontotus* and *Steindachneridion*, Lundberg *et al*. (1991), de Pinna (1998) and Lundberg & Akama (2005) did not confirm any hypothesis of a possible close relationship between these genera, and considered each genus as belonging to distinct groups within the Pimelodidae. Lundberg *et al*. (1991) considered *Duopalatinus* included within their *Callophysus-Pimelodus* clade while *Merodontotus* and *Steindachneridion* were considered different genera within their Group A. Lundberg & Akama (2005) also suggested a more basal position for this genus in the Pimelodidae relationships.

Concerning the morphology of head, *S. amblyurum* presents the supraoccipital process almost in contact with the anterior nuchal plate, in a similar way as *S. doceanum* and *S. parahybae.* It differs from *S. scriptum*, *S. punctatum*, and *S. melanodermatum* where a distance of one or two orbital diameters is always present. Concerning to body form and size of fins, *S. amblyurum* differs from the remaining species of this genus by having an elongated body, combined with a narrow head and pectoral girdle. This species has elongated dorsal, pectoral, pelvic, adipose and anal fins and a pair of long maxillary barbels reaching the beginning of adipose fin, distinct from the general pattern observed in the remaining *Steindachneridion* species. *Steindachneridion amblyurum* also differs from its congeners by having a distally rounded caudal fin, contrasting with *S. doceanum*, *S. parahybae*, *S. scriptum*, *S. punctatum*, and *S. melanodermatum* where it is notched. The fin lengths also distinguish *S. parahybae* from *S. doceanum*, where the elongated pectoral, pelvic and anal fins, combined with the position of anal opening offer different conditions: while in *S. doceanum* the anal opening is positioned between the pelvic fins, in *S. parahybae*, it is positioned far distant from the pelvic fins insertion. Possessing short pectoral and pelvic fins, *S. parahybae* also differ from the remaining species of the genus.

Besides the dark-colored *S. melanodermatum*, all *Steindachneridion* species share a similar color pattern, with light grayish or brownish ground color pattern combined with dark brown, vermiculated dark stripes. Dots are also present in *S. amblyurum*, *S. doceanum* and *S. parahybae* and narrow dark brown lines or small dots in, respectively, *S. scriptum* and *S. punctatum*.

The new species *S. melanodermatum*, can be also distinguished from congeners of Paraná-Uruguay basins by several morphometric traits as can be seen in Table 3 and Fig. 10. A size-free canonical variate analysis of combined samples of *S. scriptum*, *S. punctatum* and *S. melanodermatum* reveals that the two first canonical variates account 94.7% of the variation. In the graph of individual scores (Fig. 10) for the three *Steindachneridion* species, the first canonical variate (CV 1) discriminates *S. scriptum* from *S. punctatum* and *S. melanodermatum* while CV 2 discriminates *S. melanodermatum* from the other two species. The highest canonical coefficients (Table 3) for the caudal peduncle depth (-0.7381), preanal distance (0.6205), and orbital diameter (-0.5114) indicate these characters as being the best to discriminate *S. melanodermatum* from the other species along the CV 1. In the CV 2 the greatest head length (0.4959) and scapular bridge width (0.3967) also discriminates *S. scriptum* from *S. punctatum*.

Distribution. This peculiar distribution of *Steindachneridion* species is perhaps due to several Tertiary geological events causing isolation in mostly of the east coastal rivers of Brazil (Ab´Saber, 1957), combined with some Quaternary events established the actual scenario for the distribution of this genus. The species *S. scriptum* and *S. punctatum* are restricted to the upper rio Paraná and rio Uruguay basins. The upper rio Paraná basin was considered by Vari (1992) as an endemic region for three species of the family Curimatidae: *Cyphocharax vanderi* Britski, *C. modestus* (Fernandez-Yepez) and *C. nagelii* (Steindachner). The portion of Paraná river basin is here considered to be an area drained by this river above the now drowned Sete Quedas falls. Castro & Casatti (1997) and Bockmann & Sazima (2004) also assumed this as an endemic area for the southeastern Brazilian ichthyofauna. According to Britski & Langeani (1988) for species of genus *Pimelodus* Lacépède, 1803 became isolated from the São Francisco and Tocantins drainages in early Tertiary. The same phenomenon can be verified for the rio Uruguay that became isolated from rio Paraná only in Miocene period, when the upper rio Uruguay section became isolated from the upper Paraná (Beurlen, 1970). At that time, the rio Uruguay changed its course and joined to the lower rio Paraná, after remaining

Table 3. Coefficients of the original variables in the two first canonical axis (CV).

	CV1	CV2
1) Standard length (mm)	0.3053	0.0860
2) Head length	-0.1309	0.4959
3) Snout length	0.1218	0.3439
4) Predorsal distance	0.4733	-0.1129
5) Preanal distance	0.6206	0.1970
6) Adipose length	-0.3930	0.1749
7) Caudal peduncle depth	-0.7381	0.2545
8) Head depth	0.4609	-0.3627
9) Body depth	0.4612	-0.2849
10) Orbital diameter	-0.5114	-0.0567
11) Interorbital distance	-0.2589	-0.1074
12) Mouth width	0.2182	-0.1819
13) Scapular bridge width	-0.2066	0.3967
14) Head width	-0.3420	0.0215
15) Pelvic bridge width	0.1615	-0.0897
16) Intranasal distance	-0.2419	0.0668

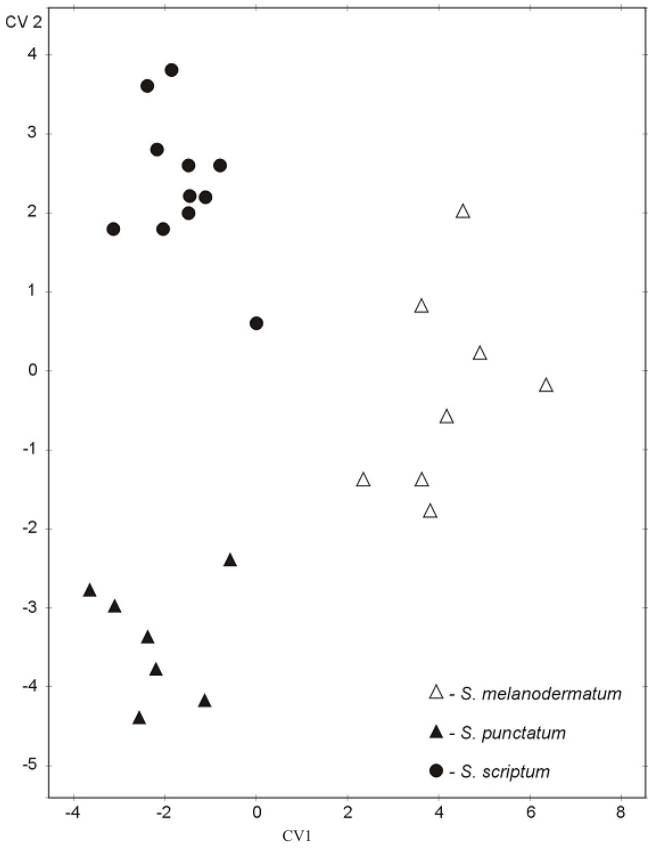

Fig. 10. Projection scores of individuals of three species of *Steindachneridion* from Paraná and Uruguay basins on the first two canonical variates, CV1 and CV2.

a great part of this period in contact with the upper rio Paraná basin. That may perhaps explain the distribution of both *S. scriptum* and *S. punctatum* in the upper rio Paraná and Uruguay basins.

Recent palynologic studies done by Lima *et al.* (1985) from Cenozoic sediments from the Taubaté basin attribute an Oligocene age for the ichthyological fossils from the Tremembé beds, at the rio Paraíba do Sul basin. The fossil *Steindachneridion iheringii* (Woodward), first considered as a Pleistocene species from the Tremembé Formation in front of the Oligocene age dated by Lima *et al.* (1985) must be considered as modern fishes. This new age for this fossil species is important for the discussion on the different endemism showed by genus *Steindachneridion*. Considering the species *S. parahybae*, *S. doceanum*, *S. amblyurum*, and the upper rio Paraná species *S. scriptum*, *S. punctatum*, and *S. melanodermatum* might have become isolated in their respective river basins by that time.

Haseman (1911) discussed the isolation caused by Iguaçu falls in most of rio Iguaçu basin, a fact reinforced by Garavello (1977) and Garavello *et al.* (1997) despite of the recent age of lower section of this river, including the Iguaçu falls. According with Bigarella & Salumuni (1957), by tectonic reactivation in the Pleistocene period, three sections of rio Iguaçu have broken up the river flow, forming large lakes in isolated compartments. This phenomenon caused isolation of different segments of the whole Iguaçu basin, with predictable consequences on the ichthyofauna. Several Characiformes species, *e.g. Psalidodon gymnodontus*, *Astyanax gymnogenys*, *Hasemania maxillaris*, *Hasemania melanura*, *Apareiodon vittatus* and *Oligosarcus longirostris*, several Siluriformes, such as *Pimelodus ortmanni*, *Rhamdia branneri*, *Glanidium ribeiroi*, *Heptapterus stewarti*, *Rhamdiopsis moreirai*, *Pariolius hollandi*, *Hypostomus derbyi*, *Trichomycterus castroi* and the *Trichomycterus* species described by Wosiacki & Garavello (2004), revealed the high level of endemism of this isolated drainage. *Steindachneridion melanodermatum* further corroborates this fact for the rio Iguaçu ichthyofauna.

The distribution of the remaining three species of the genus, *S. parahybae*, *S. doceanum*, and *S. amblyurum*, following Pflug (1969), may reflect the Quaternary isolation of the Brazilian eastern coast. *Steindachneridion doceanum* is primarily found in the main channel of rio Doce that have become isolated from the rio Doce valley only during the Quaternary; this fact was also mentioned by Menezes (1987) when studying isolated species of genus *Oligosarcus* from the eastern coast of Brazil. Due to this factor, *S. doceanum* might perhaps have become secondarily isolated from *S. amblyurum* which is endemic from rio Jequitinhonha and from *S. parahybae*, which is endemic to the rio Paraíba do Sul basin.

Comparative material examined. *Duopalatinus emarginatus*: LISDEBE 1157, 2, Alagoas State, Canindé do São Francisco, rio São Francisco, downriver of the Xingó hydroelectric power dam, 18-19 Jun 1997.LISDEBE 1159, 2 Minas Gerais State, Três Marias, rio São Francisco, downriver of Três Marias hydroelectric power dam, 20-26 Apr 1998. *Megalonema platana*: LISDEBE 1158, 1, São Paulo State, Ourinhos, rio Paranapanema, May 1993. *Merodontotus tigrinus*: MZUSP 14004 (holotype), Teotonio waterfalls, rio Madeira, Rondonia State, 10 Nov 1977.

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