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Marcos Di-Bernardo

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REVALIDATION OF THE GENUS *ECHINANTHERA* COPE, 1894, AND ITS CONCEPTUAL AMPLIFICATION (SERPENTES, COLUBRIDAE)*

Marcos Di-Bernardo**

RESUMO

O gênero *Echinanthera* Cope, 1894, é revalidado no presente estudo. O gênero foi descrito para conter a espécie originalmente apresentada por Cope como *Aporophis cyanopleurus*. O seu conceito é aqui ampliado com a inclusão de outras nove espécies, entre as quais todas as contidas no grupo *brevirostris*, de *Rhadinaea (sensu* Myers, 1974): *R. affinis, R. bilineata, R. brevirostris, R. occipitalis, R. persimilis* e *R. poecilopogon*. As espécies originalmente descritas como *Natrix melanostigma* Wagler, 1824, *Coluber undulatus* Wied, 1824 e *Enicognathus amoenus* Jan, 1863, são aqui também incluídas em *Echinanthera*. Uma chave dicotômica para a identificação das espécies de *Echinanthera* é apresentada. São incluídos, ainda, desenho do hemipênis de *E. cyanopleura* (espécie-tipo do gênero), mapas de distribuição e ilustrações de alguns espécimes.

ABSTRACT

The snake genus *Echinanthera* Cope, 1894 is here revalidated. The genus was described to acommodate the species originally presented by Cope as *Aporophis cyanopleurus*. Here its concept is amplified with the inclusion of nine other species, among them all those contained in the *brevirostris* group of *Rhadinaea* (*sensu* Myers, 1974): R. *affinis, R. bilineata, R. brevirostris, R. occipitalis, R. persimilis* and *R. poecilopogon*. The species originally described as *Natrix melanostigma* Wagler, 1824, *Coluber undulatus* Wied, 1824 and *Enicognathus amoenus* Jan, 1863 are here also included in *Echinanthera*. A dichotomic key for species of *Echinanthera* is presented. A drawing of the hemipenis of *E. cyanopleura* (the genus type species), distribution maps and illustrations of selected specimens are included.

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INTRODUCTION

The snake genus *Echinanthera* was described by Cope (1894) to acommodate *Aporophis cyanopleurus*, described earlier by the same author (Cope, 1885). The description of the new genus was based mainly on hemipenial features, besides pholidosis data and anatomic characters (lungs and vertebrae). One year after the description of *Echinanthera*, Cope (1895) reasserted the genus presenting again the distinctive characters and illustration of the hemipenis of a specimen of *E. cyanopleura* (the type-species). However, Boulenger (1896) synonymized *Echinanthera* to *Liophis* without justification or comments. In former papers, Boulenger (1855b, 1886) considered *Aporophis cyanopleurus* as a synonym of *Dromicus melanostigma*, and later as a synonym of *Liophis melanostigma* (Boulenger, 1894), which probably led him to regard *Echinanthera* as a synonym of *Liophis* (Boulenger, 1896). The fact that Boulenger (1885b, 1886, 1894) considered the taxa *"melanostigma"* and *"cyanopleurus"* as synonyms led to a confusing situation which persisted till the present, despite Cope's insitence (1894) in pointing these two taxa out as distinct entities easily diagnosable. All following authors adopted the concept of Boulenger (1896), and accepted as valid only the taxon *"melanostigma"*, which was placed in several genera other than *Echinanthera* (Schupp, 1913; Amaral, 1930a, b, 1936, 1977; Müller, 1968; Peters *et* Orejas-Miranda, 1970; Vanzolini, 1977; Lema *et al.*, 1980).

In his revision of the genus *Liophis*, Dixon (1980) placed *Aporophis cyanopleurus* in the synonymy of *Incertae sedis melanostigma*. However, some authors preferred the use of several generic names for the taxon *"melanostigma"* instead, such as *Dromicus* (Vanzolini, 1981), *Leimadophis* (Hoogmoed *et* Gruber, 1983; Lema *et al.*, 1985) and *Liophis* (Vanzolini, 1986; Lema, 1987, 1989; Williams *et* Wallach, 1989). The diagnostic character that enabled Dixon (1980) to remove the *"melanostigma/cyanopleurus"* group from the genus *Liophis* was essentially the hemipenial condition: single or slightly bilobed, and lacking the apical disk (versus divided with smooth apical disks in all recognized species of *Liophis*). For the same reason, *Coluber undulatus* Wied and *Enicognathus amoenus* Jan were also removed from *Liophis* by Dixon (1980) and left without generic allocation *(Incertae sedis)*. About *"undulatus"* and *"melanostigma / cyanopleurus"*, Dixon (1980) said that they possibly are related. Cope (1885) had already indicated the taxonomic relatedness between *"undulatus"* and *"cyanopleurus"* and regarded both as pertaining to the genus *Aporophis*. The relatedness of

these two species and *"Enicognathus amoenus"* was also indicated by Joseph R. Bailey, who labelled flasks with specimens at the Instituto Butantan (São Paulo, Brazil) and at the Museu Nacional (Rio de Janeiro, Brazil) with the names *"Caapora melanostigma"*, *"Caapora amoena"* and *"Caapora undulata"* (these names, however, are not available).

In his revision of the genus *Rhadinaea*, Myers (1974) divided it into eight species groups, *brevirostris* group being the only one restricted to South America and the only one whose species bear "enlarged asulcate papilae" on the hemipenis (Myers, 1974, tab. 2). This feature, which readily distinguishes the *brevirostris* group from all other groups of *Rhadinaea*, is shared by the taxa *"amoenus"*, *"cyanopleurus"*, *"melanostigma"* and *"undulatus"*, which also are restricted to South America (mainly southeastern Brazil). Cadle (1984a) studied *Rhadinaea* using molecular systematic techniques and showed that the *brevirostris* group is more related to *"Liophis" undulatus* than to the other *Rhadinaea* groups; he also reasserted Dixon's (1980) opinion that *"L." undulatus* is unrelated to other *Liophis* species (*sensu* Dixon, 1980). Later Cadle (1984b) demonstrated that *Rhadinaea* is a paraphyletic genus.

Based on the evidence presented above, and after a careful analysis of several samples of the above commented and unresolved Brazilian taxa, besides an extensive bibliographic revision, I here propose the revalidation of the genus *Echinanthera* Cope, 1894 and an amplification of its concept, with the inclusion of the species so far treated as *Liophis melanostigma, L. undulatus, Lygophis amoenus, Rhadinaea affinis, R. bilineata, R. brevirostris, R. occipitalis, R. persimilis* and *R. poecilopogon.*

MATERIAL AND METHODS

Most of the specimens examined in this study, particularly those of the *brevirostris* group of *Rhadinaea* from southeastern Brazil are listed in previous papers (Di-Bernardo *et* Lema, 1986, 1987, 1988, 1991). Data on *R. brevirostris* and *R. occipitalis* were mostly compiled from Myers' (1974) revision of *Rhadinaea*. For the other species, examined specimens are listed followed by their localities. Citation of the localities follows Vanzolini *et* Papavero (1968); names of the towns are separated from the names of more specific localities by commas; names of the Brazilian states are presented

from north to south and names of the towns in alphabetical order for each state. Specimen numbers are presented between parenthesis, in increasing numerical order for each locality. Acronyms are used for the Brazilian states (Brazil is here abbreviated as BR), from north to south: BA: Bahia, MG: Minas Gerais, ES: Espírito Santo, RJ: Rio de Janeiro, SP: São Paulo, PR: Paraná, SC: Santa Catarina, RS: Rio Grande do Sul. Acronyms for the institutional collections, except MHNCI (Museu de História Natural "Capão da Imbuia") and MCPAN (Museu de Ciências da Pontifícia Universidade Católica do Rio Grande do Sul — Coleção Anexa do Laboratório de Herpetologia), follow Leviton *et al.* (1985).

Echinanthera Cope, 1894

Echinanthera Cope, 1894. *Amer. Nat. 28:*841. Type species:: *Aporophis cyanopleurus* Cope, 1885, *Proc. Amer. Phil. Soc. 22:*191-2.

Diagnosis

Xenodontine colubrid (*sensu* Cadle, 1984a) with hemipenis single or slightly bilobate, lacking apical disks and showing a straight middorsal band without ornamentation (fig. 1).

Remarks

The species here referred to *Echinanthera* were placed in the genera *Liophis, Lygophys, Dromicus, Leimadophis* and *Rhadinaea* by several authors (*e.g.*, Di-Bernardo *et* Lema, 1986, 1987, 1988, 1991; Hoogmoed *et* Gruber, 1983; Lema, 1989; Myers, 1974; Peters *et* Orejas-Miranda, 1970; Vanzolini, 1981; Williams *et* Wallach, 1989). The first four genera were synonymized to *Liophis* by Dixon (1980), and share at least one character: hemipenis divided and with smooth apical disks. Species here placed in *Echinanthera* have single or slightly bilobate hemipenes, without apical disks, a feature which easily distinguishes this genus from *Liophis*. The genus *Rhadinaea* (*sensu* Myers, 1974) is regarded as paraphyletic (Cadle, 1984b); in the present paper, the species of the *brevirostris* group are placed in *Echinan-*

thera and are distinguished from the other seven groups of *Rhadinaea* by having a straight middorsal band without ornamentation on the hemipenis. The hemipenis of a specimen of *Echinanthera cyanopleura* (MCPAN 128), in ventral, dorsal and lateral views, illustrate well the concept here adopted for the diagnosis of *Echinanthera* (fig. 1).

Distribution

The genus *Echinanthera* is widely distributed in South America, from French Guiana to southern Uruguay (from north to south) and from the state of Paraíba, northeastern Brazil, to east Colombia (from east to west); in most of Central Brazil species of this genus are unrecorded (fig. 2).

Species contents:

Echinanthera affinis (Günther, 1858), *n. comb.*

Enicognathus melanocephalus Duméril, Bibron *et* Duméril, 1854, pp. 330-2 *(part.)*.
Dromicus affinis Günther, 1858, pp. 128-9 *(part.)*.
R. [hadinaea obtusa] Cope, 1868, p. 132 *(part.)*; 1875, p. 139 *(part.)*.
Coronella iheringii Boulenger, 1885a, pp. 194-5; 1886, p. 431.
Rhadinaea affinis, Boulenger, 1894, pp. 172-3 *(part.)*. ___ Prado, 1943, pp. 12-13, 15; 1945a, p. 74-5. __ Peters *et* Orejas-Miranda, 1970, p. 263. ___ Myers, 1974, pp. 195-200. ___ Di-Bernardo *et* Lema, 1988, pp. 223-252. ___ Sazima *et* Haddad, 1992, pp. 220, 222 (fig. 14).
Liophis affinis, Amaral, 1926, p. 104; 1930a, p. 87; 1930b, p. 170; 1936, p. 113; 1944, pp. 55-6; 1977, p. 96 ("tab." 50, figs. 1-3).

Distribution

Southeastern and southern Brazil, from southeastern Minas Gerais through Espírito Santo, Rio de Janeiro, São Paulo, Paraná and Santa Catarina, to northeastern Rio Grande do Sul (fig. 3).

Fig. 1 - Hemipenis of *Echinanthera cyanopleura* (MCPAN 128, BR, PR: Piraquara) in ventral, dorsal and lateral views.

Echinanthera amoena (Jan. 1863), *n. comb.*

E. [nicognathus] amoenus Jan, 1863, p. 60. ___ Jan *et* Sordelli, 1866, vol. 1, livr. 16, pl. 2, fig. 1.
Aporophis amoenus, Boulenger, 1894, pp. 157, 160.
Lygophis amoenus, Amaral, 1930a, p. 87; 1930b, p. 169; 1936, p. 112. ___ Peters *et* Orejas-Miranda, 1970, p. 185.
Incertae sedis amoenus Dixon, 1980, p. 5.

Distribution

Southeastern Brazil, from southern Minas Gerais to southern Paraná (fig. 4).

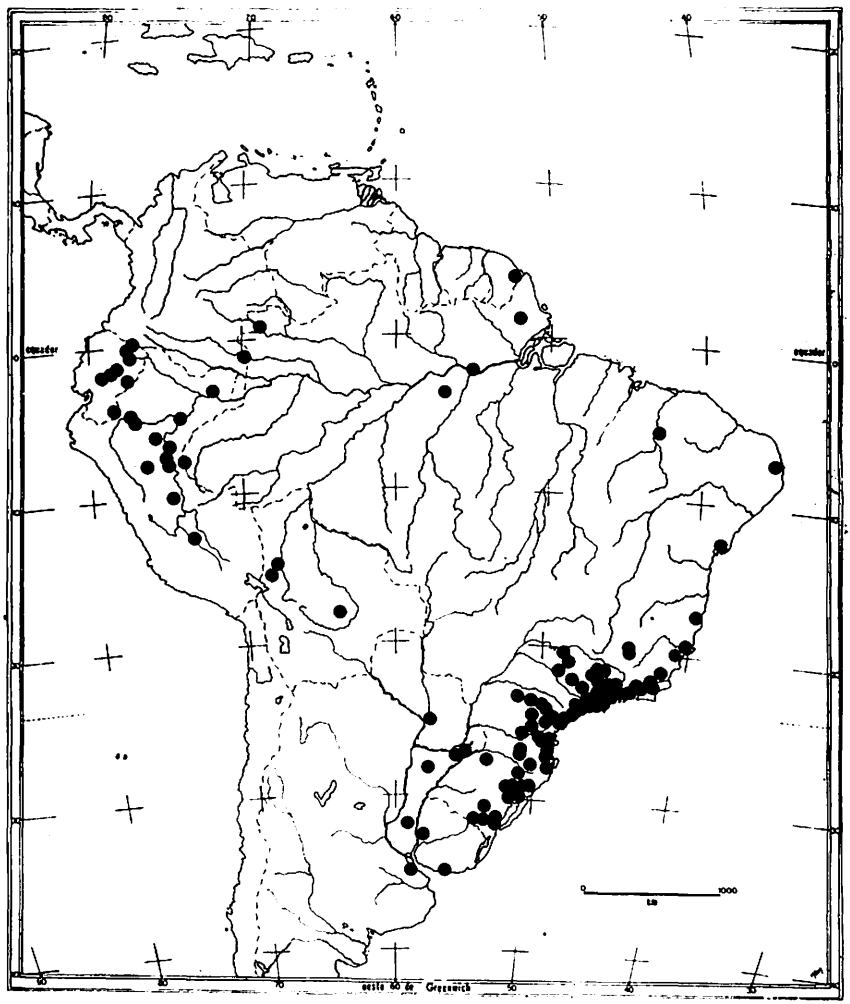

Fig. 2 - Distribution of the genus *Echinanthera*. In this map and succeedings, each symbol may represent more than one locality.

Fig. 3 - Distribution of *Echinanthera affinis*.

Echinanthera bilineata (Fischer, 1885), *n. comb.*

Enicognathus bilineatus Fischer, 1885, p. 398.
Rhadinaea poecilopogon, Boulenger, 1894, p. 173 *(part.)*. ___ Prado, 1943, p. 13 *(part.)*. ___ Peters *et* Orejas-Miranda, 1970, p. 267 *(part.)*.
Rhadinaea bilineata, Myers, 1974, pp. 200-2. ___ Pontes *et* Di-Bernardo, 1988, p. 138. ___ Di-Bernardo *et* Lema, 1991, pp. 359-92.
Liophis poecilopogon, Amaral, 1977, p. 107 *(part.)*, pl. 61.

Distribution

Southeastern and southern Brazil, from southern Minas Gerais through Espírito Santo, Rio de Janeiro, São Paulo, Paraná and Santa Catarina to northeastern Rio Grande do Sul (fig. 5).

Echinanthera brevirostris (Peters, 1863), *n. comb.*

Coronella decorata, Günther, 1859, p. 412.
E. [nicognathus] taeniolatus Jan, 1863, pp. 56, 62, 63, 117 (reprint). ___ Jan *et* Sordelli, 1866, vol. 1, livr. 16, pl. 2, fig. 4.
Dromicus brevirostris Peters, 1863, pp. 280-1.
Dromicus viperinus Günther, 1868, pp. 418-9.
Rhadinaea taeniolata, Cope, 1869, p. 154.
Coronella taeniolata, Boettger, 1888, p. 195.
Rhadinaea undulata, Boulenger, 1894, p. 174-5 *(part.)*; 1896, p. 635. ___ Nicéforo-Maria, 1942, p. 91.
Liophis undulatus, Amaral, 1930b, p. 174 *(part.)*. ___ Peters *et* Orejas-Miranda, 1970, p. 180 *(part.)*.
Rhadinaea brevirostris, Shreve, 1934, pp. 127-9. ___ Dunn, 1944, pp. 493-4. ___ Peters, 1960, p. 536. ___ Peters *et* Orejas-Miranda, 1970, p. 264. ___ Myers, 1974, pp. 202-9 *(part.)*.
Liophis brevirostris, Parker, 1935, pp. 521-2.
Urotheca brevirostris, Hoge *et* Belluomini, 1960, p. 16.

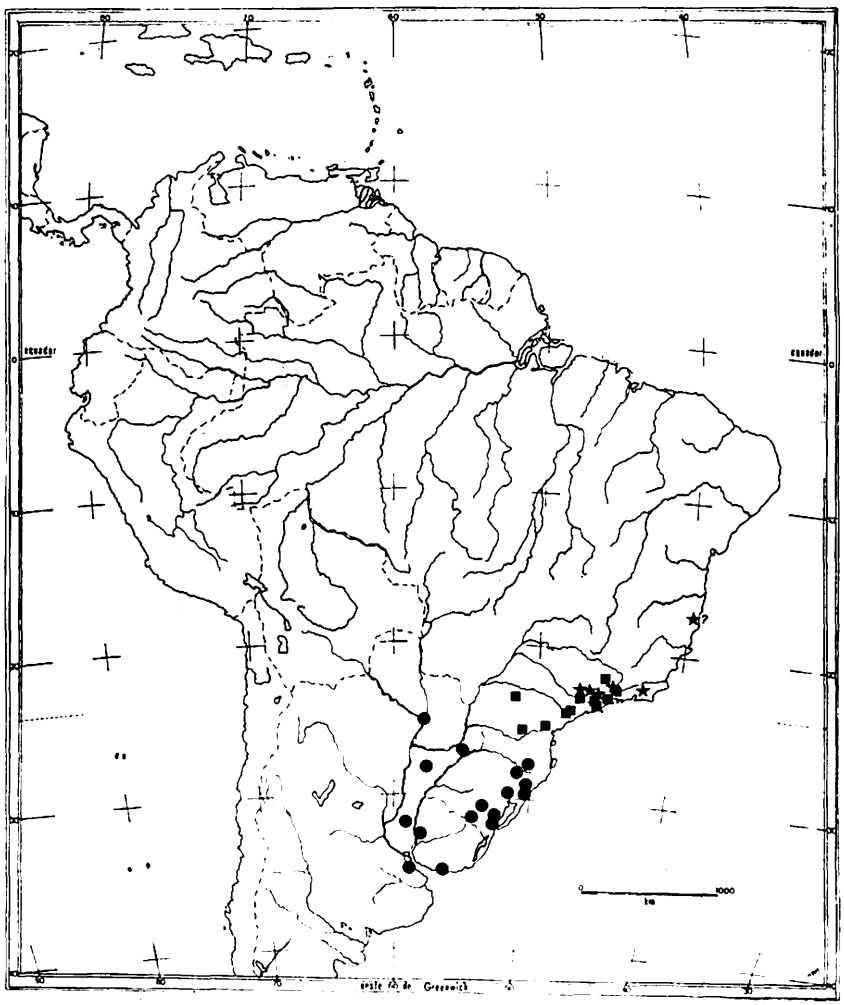

Fig. 4 - Distribution of *Echinanthera amoena* (squares), *E. melanostigma* (stars), and *E. poecilopogon* (circles).

Distribution

Along the eastern foot of the Andes, from southern Colombia to Bolivia, and eastwards through the Amazon Basin to French Guiana and Pará, Brazil *(apud* Myers, 1974:203) (fig. 6).

Echinanthera cyanopleura (Cope, 1885)

Aporophis cyanopleurus Cope, 1885, pp. 191-2.
Dromicus melanostigma, Boulenger, 1885a, p. 195; 1885b, pp. 295, 297; 1886, pp. 147-8. ___ Schupp, 1913, pp. 32-3, 41.
Liophis melanostigma, Boulenger, 1894, p. 142 *(part.).*
Echinanthera cyanopleura, Cope, 1894, p. 841; 1895, pp. 201, 216, pl. 15, fig. 7.
Leimadophis melanostigma, Amaral, 1930a, p. 86 *(part.);* 1930b, p. 166 *(part.);* 1936, p. 110 *(part.);* 1977, pp. 23, 82 ("tab." 38, figs. 1-3). ___ Müller, 1968, pp. 37-8. ___ Peters *et* Orejas-Miranda, 1970, pp. 141, 144 *(part.).* ___ Hoogmoed *et* Gruber, 1983, p. 327 *(part.).*
Incertae sedis melanostigma, Dixon, 1980, p. 7 *(part.).*
Dromicus melanostigmus, Lema *et al.,* 1980, p. 30.
Leimadophis melanostigmus, Lema *et al.,* 1985, pp. 211-2.
Liophis (?) melanostigma, Lema, 1987, p. 230.
Liophis melanostigmus Lema, 1989, p. 30.

Distribution

Southeastern and southern Brazil, from the mid-east of Espírito Santo to southeastern Rio Grande do Sul, through Minas Gerais, Rio de Janeiro, São Paulo, Paraná and Santa Catarina (fig. 7).

Echinanthera melanostigma (Wagler, 1824), *n. comb.*

Natrix melanostigma Wagler, 1824, p. 17, pl. 4, fig. 2. ___ Fitzinger, 1826, p. 892.
Dromicus pleii, Günther, 1858, p. 128.

Dromicus melanostigma, Jan *et* Sordelli, 1867, v. 2, livr. 24, pl. 5, fig. 3. ___ Vanzolini, 1981, p. xviii.
Liophis melanostigma, Boulenger, 1894, p. 142 *(part.).*
Leimadophis melanostigma, Amaral, 1930a, p. 86 *(part.);* 1930b, p. 166 *(part.);* 1936, p. 110 *(part.).* ___ Peters *et* Orejas-Miranda, 1970, pp. 141, 144 *(part.).* ___ Hoogmoed *et* Gruber, 1983, p. 327 *(part.).*
Incertae sedis melanostigma, Dixon, 1980, p. 11.

Distribution

Probably restricted to southeastern Bahia, and southwards through Espírito Santo, southeastern Minas Gerais, Rio de Janeiro and mid-east of São Paulo. The specimens here examined come from the two last mentioned states. The holotype (ZSM 199/0) is said to be from Bahia (Wagler, 1824) (fig. 4).

Echinanthera occipitalis (Jan, 1863), *n. comb.*

Coronella elegans, Günther, 1858, p. 38.
E. [nicognathus] occipitalis Jan, 1863, pp. 266, 267. ___ Jan *et* Sordelli, 1866, vol. 1, livr. 16, pl. 1, fig. 1.
Dromicus (Lygophis) Wuchereri Günther, 1863, pp. 325, 326.
Dromicus miolepis Boettger, 1891, pp. 345, 346.
Rhadinaea occipitalis, Boulenger, 1894, pp. 175-6; 1896, p. 635. ___ Boettger, 1898, p. 67. ___ Devincenzi, 1925, pp. 35-6. ___ Werner, 1929, p. 119. ___ Prado, 1945a, p. 75; 1945b, pp. 105-7. ___ Myers, 1974, pp. 209-12.
Liophis occipitalis, Amaral, 1930a, p. 89; 1930b, p. 174; 1936, p. 115; 1977, p. 106 ("tab." 60). ___ Bertoni, 1939, p. 47. ___ Peters *et* Orejas-Miranda, 1970, p. 179.

Distribution

From northeastern Peru southeastwards through Bolivia and Paraguay to northern Argentina, Uruguay and southern Brazil, then northward along the coast to northeastern Brazil; apparently absent from most of the Amazon Basin (*apud* Myers, 1974:209) (fig. 8).

Fig. 5 - Distribution of *Echinanthera bilineata*.

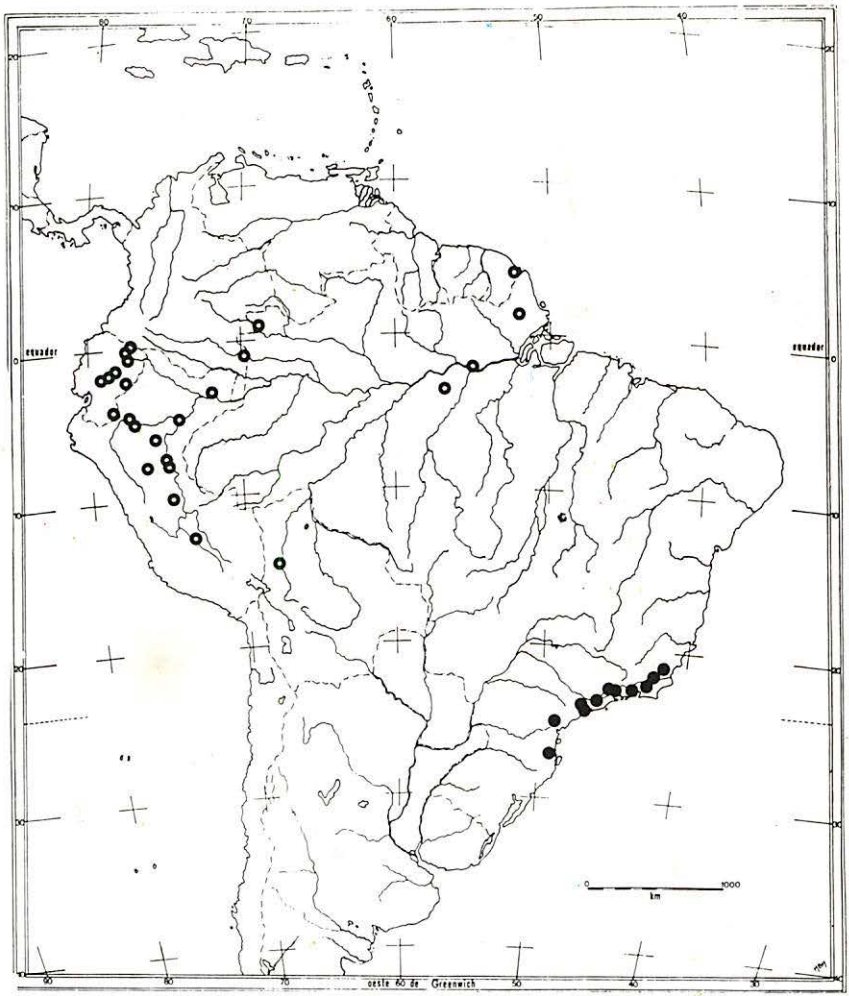

Fig. 6 - Distribution of *Echinanthera brevirostris* (open circles) and *E. persimilis* (black circles); distributional data on *E. brevirostris* were compiled from Myers (1974).

Echinanthera persimilis (Cope, 1869), *n. comb.*

E. [nicognathus] melanocephalus, Jan, 1863, pp. 266, 269-70 *(part.)*.
Rhadinaea obtusa, Cope, 1868, p. 132 *(part.)*; 1875, p. 139 *(part.)*.
Liophis persimilis Cope, 1869, p. 308.
Rhadinaea poecilopogon, Boulenger, 1894, p. 173 *(part.)*. ___ Peters *et* Orejas-Miranda, 1970, p. 267 *(part.)*.
Liophis insignissimus Amaral, 1926, pp. 103-4, pl. 1, figs. 7-9; 1930a, p. 88; 1930b, p. 172; 1936, p. 114.
Rhadinaea insignissima, Werner, 1929, p. 118.
Rhadinaea beui Prado, 1943, pp. 13-4, pl; 1945a, p. 75. ___ Peters *et* Orejas-Miranda, 1970, p. 264.
Rhadinaea insignissimus, Peters *et* Orejas-Miranda, 1970, p. 266.
Rhadinaea persimilis, Myers, 1974, pp 212-5. ___ Di-Bernardo *et* Lema, 1986, pp. 101-22.

Distribution

Species endemic to southeastern Brazil, from coastal Espírito Santo to Santa Catarina (fig. 6).

Echinanthera poecilopogon (Cope, 1863), *n. comb.*

Dromicus affinis Günther, 1858, p. 129 *(part.)*.
Rhadinaea poecilopogon Cope, 1863, pp. 100-1 ___ Boulenger, 1894, p. 173 *(part.)*. ___ Koslowsky, 1898, p. 193. ___ Devincenzi, 1925, pp. 34-5. ___ Werner, 1929, p. 118. ___ Gatti, 1955, p. 96. ___ Peters *et* Orejas-Miranda, 1970, pp. 267 *(part.)*, 268. ___ Myers, 1974, pp. 215-8 *(part.)*. ___ Lema *et* Fabián-Beurmann, 1977, p. 84. ___ Di-Bernardo *et* Lema, 1987, pp. 203-24.
E. [nicognathus] elegans Jan, 1863, pp. 266, 268-9. ___ Jan *et* Sordelli, 1866, vol. 1, livr. 16, pl. 1, fig. 3.
Dromicus melanocephalus Peters, 1863, pp. 277-8.
Coronella poecilopogon, Boulenger, 1885a, p. 194; 1886, p. 431.
Liophis poecilopogon, Amaral, 1930a, p. 89; 1930b, p. 174; 1936, p. 116 *(part.)*; 1944, pp. 55-6. ___ Bertoni, 1939, p. 47. ___ Freiberg, 1939, p. 8.

Fig. 7 - Distribution of *Echinanthera cyanopleura*.

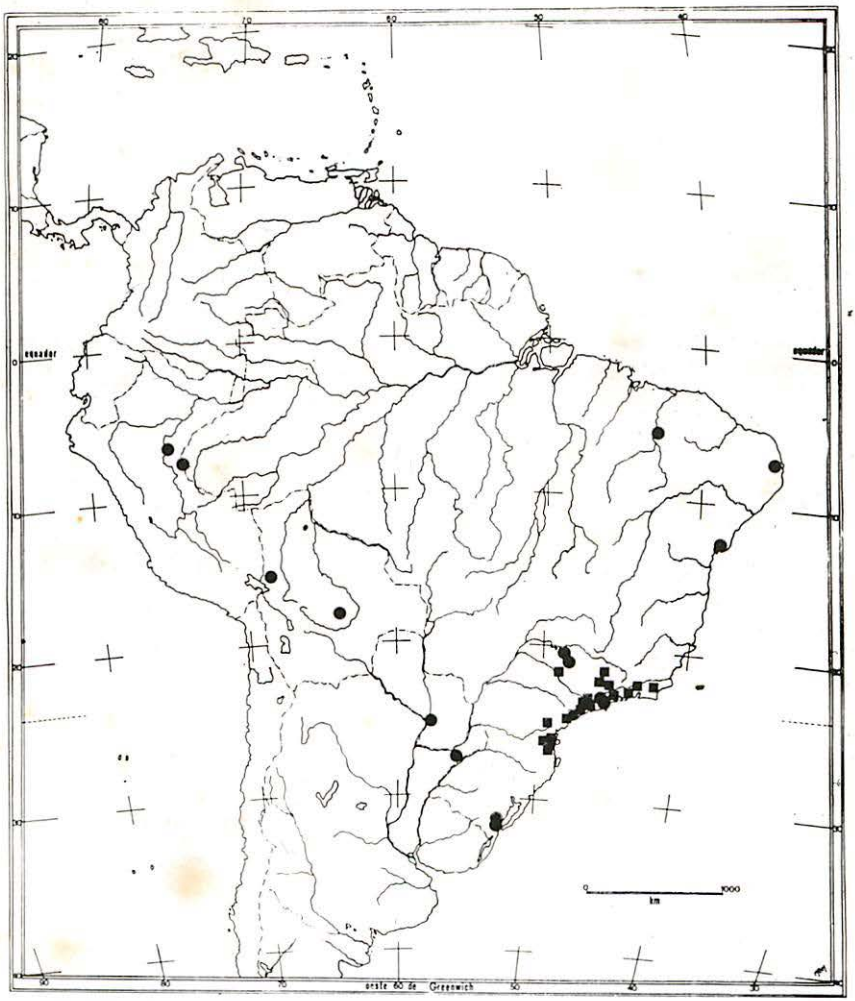

Fig. 8 - Distribution of *Echinanthera occipitalis* (circles) and *E. undulata* (squares); distributional data on *E. occipitalis* were compiled from Myers (1974).

Distribution

Southern Brazil (Santa Catarina and Rio Grande do Sul), Uruguay, northeastern Argentina and southeastern Paraguay (fig. 4).

Echinanthera undulata (Wied, 1824), ***n. comb.***

C. [oluber] undulatus Wied, 1824 (Abbildungen); 1825, p. 329. ___ Fitzinger, 1826, p. 58.
Dromicus undulatus, Peters, 1863, p. 281.
Rhadinaea undulata, Boulenger, 1894, p. 174 *(part.)*.
Rhadinaea binotata Werner, 1909, p. 223.
Liophis melanostigma, Griffin, 1916, p. 189. ___ Amaral, 1927, p. 66.
Liophis undulatus, Amaral, 1930a, p. 89 *(part.)*; 1930b, p. 174 *(part.)*; 1936, p. 116 *(part.)*; 1977, p. 108 ("tab." 68, figs. 1-3). ___ Peters *et* Orejas-Miranda, 1970, p. 180 *(part.)*. ___ Lema, 1978, p. 79.

Distribution

Southeastern and southern Brazil, from the mid-south of Rio de Janeiro and southern Minas Gerais to northeastern Santa Catarina (fig. 8).

Key to the species of Echinanthera:

1. a. Dorsal scales in 15 rows at midbody; anterior dorsal pattern with large and dark blotches that decreases gradually backwards . . . . . *Echinanthera occipitalis* (fig. 9)
   b. Dorsal scales in 17 rows at midbody; anterior dorsal pattern with or without large and dark blotches 2
2. a. A bright and well-defined line along the *canthus rostralis*, from the snout to the postocular region 3
   b. Without a bright and well-defined line along the *canthus rostralis;* on the postocular region an ill-defined light band (irregularly outlined) may occur 4

3. a. Supracephalic dark coloration turning around the oral angle, reaching and staining the posterior infralabials; red belly (in life); 13 to 15 prediastemal maxillary teeth . . . . . *Echinanthera poecilopogon* (figs. 10, 11)
   b. Supracephalic dark coloration not as above; white, yellowish or yellow belly (in life); 18 to 23 prediastemal maxillary teeth . . . . . *Echinanthera bilineata*
4. a. Dorsal scales in 15 rows at the end of the trunk; middorsal dark band usually with serrated edges, occupying the three central and a half of the adjacent rows of scales . . . . . *Echinanthera brevirostris*
   b. Dorsal scales in 17 rows counted one head length anterior to the cloaca; with or without middorsal dark band 5
5. a. Less than 20 prediastemal maxillary teeth; supralabials and chin region usually stained with black; 51 to 82 subcaudals (average: 63.7) 6
   b. More than 20 prediastemal maxillary teeth; supralabials and chin region usually immaculate; 77 to 108 subcaudals (average: 92.1) 7
6. a. More than 140 ventrals; usually with a postocular pale mark with shape variable and ill-defined outline . . . . . *Echinanthera affinis* (fig. 12)
   b. Less than 140 ventrals; without a postocular pale mark . . . . . *Echinanthera persimilis*
7. a. Dorsal scales of the fourth row with a small, light and centered dash-shaped mark that originates a continuous line from the anterior part of the trunk to the tail; dorsal scales of the adjacent rows without these marks; pair of light and small dots on the parietals usually absent 8
   b. Dorsal scales of the fourth row without the marks mentioned above; when marks occur, they are approximately rounded and followed by similar ones at least on the scales of the lower row; pair of light and small dots on the parietals usually present 9
8. a. Supracephalic dark coloration extends to the middle of the back, giving origin to a dark dorsal band that contrasts with the paravertebral ground color at least

on the neck; anterior part of the dark pleural band usually regularly edged . . . . *Echinanthera cyanopleura* (fig. *13*)

b. Supracephalic coloration like the ground dorsal color, without distinct vertebral and paravertebral bands; anterior part of the dark pleural band usually irregularly edged, giving origin to dark marks isolated one from another by groups of light scales . . . . . *Echinanthera melanostigma* (fig. *14*)

9. a. Without dark middorsal band on the neck, which may be present at the end of the trunk and on tail; at least some scales of the third row of the dorsals (or adjacents rows) with two small light dots, placed one above the other on the basal portion of each scale. Sometimes with a dark vertebral stripe beginning at the end of the first third of the trunk; without pair of light spots on the occipital region . . . . . *Echinanthera amoena* (figs. *15, 16*)

b. With dark middorsal band on the neck, usually with irregular borders; scales of the second and third rows, or more frequently of the third and fourth rows of the dorsals with alternated light dots, forming an interrup

Fig. 9 - *Echinanthera occipitalis*. Photo by Dr. I. Sazima.

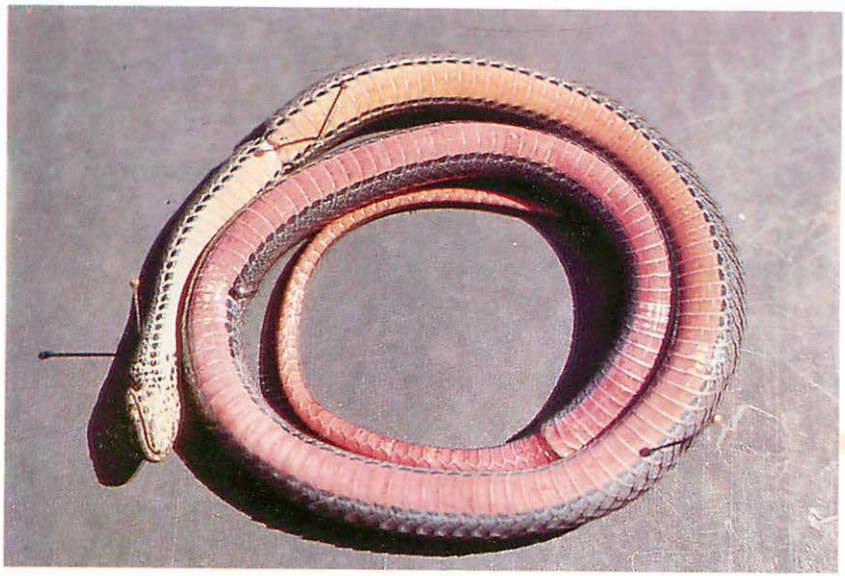

Fig. 10 - *Echinanthera poecilopogon* in ventral view.

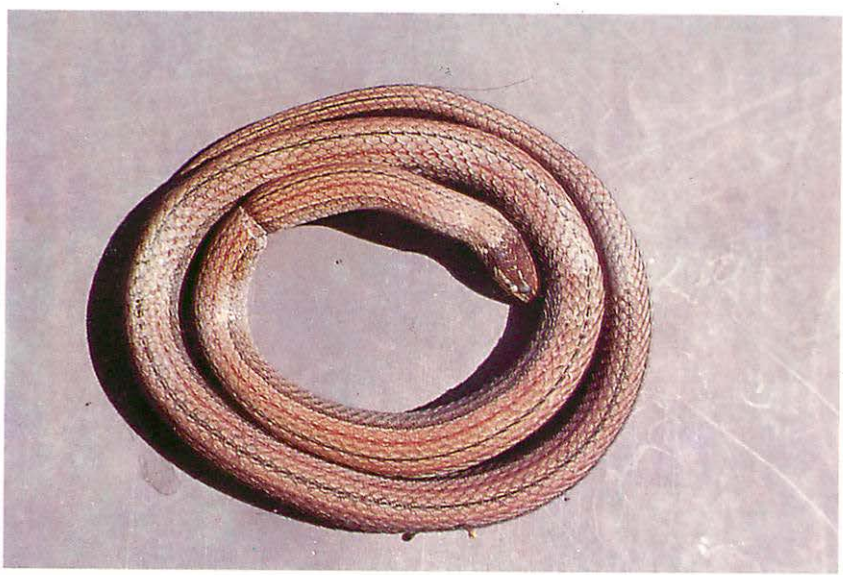

Fig. 11 - *Echinanthera poecilopogon* in dorsal view.

Fig. 12 - *Echinanthera affinis*. Photo by H. Palo Jr.

Fig. 13 - *Echinanthera cyanopleura*.

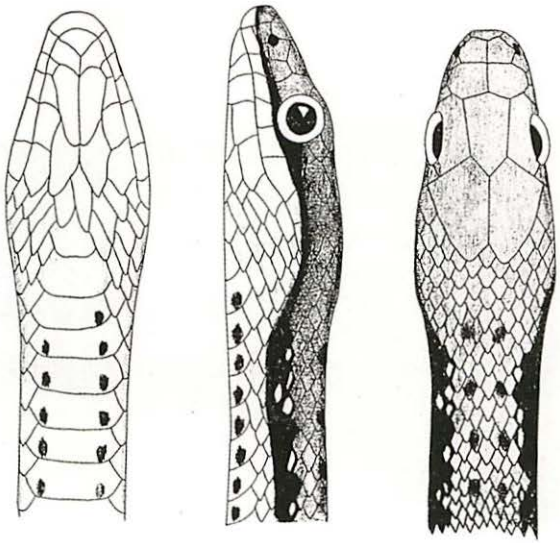

Fig. 14 - Schematic drawing of head and neck of *Echinanthera melanostigma*.

Fig. 15 - *Echinanthera amoena*. Photo by Dr. I. Sazima.

Fig. 16 - *Echinanthera amoena*. Photo by Dr. I. Sazima.

Fig. 17 - *Echinanthera undulata*. Photo by Dr. I. Sazima.

ted line along the trunk; without dark vertebral line and without pair of small and light dots on the basal portion of the scales of the third row of dorsals or adjacent scales; a pair of light spots on the occipital region . . . . . *Echinanthera undulata* (fig. *17*)

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APPENDIX

SPECIMENS EXAMINED

Echinanthera amoena

MG: Baependi (IB 335). *RJ:* Parati, Pedra Branca (MNRJ 1809, 1810). *SP:* (IB 27898); SP: Bananal (IB 9569, 10308); Caraguatatuba, Parque Estadual Serra do Mar (ZUEC 1022); Juquitiba, Pedra Lisa (IB 26406); Pindamonhangaba (IB 10048); Serra da Cantareira (IB 25632); Tremembé (IB 3093). *PR:* Arapongas (IB 10460, 10504); Dorizon (IB 1045). *Toponyms not localized:* SP: Serra do Mar, Rio Branco (IB 34161). *No locality data:* (IB 3340, 3453, 4799, 19506).

Echinanthera cyanopleura

BR: (MCN 3670). *MG:* Camanducaia (IB 29613). *ES:* Santa Tereza (MNRJ 785, 786). *RJ:* Mangaratiba (MNRJ 1851); Parati (MNRJ 787, 1807, 1808); Teresópolis (MNRJ 2972, IB 22008, 22669). *SP:* (IB 877); SP: Campo Limpo (IB 2720); Campos do Jordão (IB 23201, 23610, 45539); Campos do Jordão, Abernéssia (IB 9405); Capão Bonito (IB 27610); Cubatão (IB 40497); Embu Guaçu (IB 41360); Engenheiro Marcilac (IB 34350); Evangelista de Souza (IB 22763, 27830); Guarujá (IB 22251, 44127); Iguape (IB 1106); Juquitiba (IB 32930); Mogi das Cruzes (IB 5291); Mongaguá (IB 27778); Juquiá (IB 37760); Paranapiacaba (IB 1619); Peruíbe (IB 20799); Piedade (IB 10284); Rio Grande da Serra (IB 6479). *PR:* Antonina (IB 30503); Apucarana (MHNCI 1043); Araucária (IB 6825, 7788, 30798); Bituruna (IB 19491); Campina Grande do Sul (MHNCI 186); Campo Largo (IB 23116); Campo do Tenente (IB 6691); Castro, Terra Nova (MCN 7742); Curitiba (IB 4632, 4681, 4743, 4744, 9387); Inácio Martins (IB 23307); Mallet (IB 1007, 6837, 18973, 23429, 24316, 27923, 49452); Morretes (MHNCI 3002); Piraquara (MHNCI 3000, 3001); Rio Azul (IB 7086, 7563, 24645); Santa Cruz (MCN 7740); São José dos Pinhais (MHNCI 817); São

Mateus do Sul (MHNCI 797); União da Vitória (IB 5582, 15523, 25182); Uraí (IB 15787). *SC:* (MNRJ 1857, IB 42714); SC: Brusque (MHNCI 1890); Caçador (IB 46276); Canoinhas (IB 30402); Jaraguá do Sul (IB 6011, 8264, 10333); Joinvile (MNRJ 783, 784); Rio das Antas (IB 4515, 4972, 9902); São Bento do Sul (IB 6919, 7313, 7317); Três Barras (IB 7318); Videira (IB 16615, 25196, 27888). *RS:* Bagé (MCN 2749); Bento Gonçalves, Bairro Cohab II (MCP 1564), Cambará do Sul, Itaimbezinho (MCN 2041); Canela, Rancho Grande (MCP 305); Canela, Vila Magi (MCN 6446); Caxias do Sul (UFRGS 925, IB 29025, 29026); Estância Velha (MCN 7837); Farroupilha, Desvio Blauth (MCP 1577); Porto Alegre (MCN 1512); Porto Alegre, Bairro Partenon (MCP 2468); Porto Alegre, Bairro Sarandi (MCP 2532); Santo Antônio da Patrulha, Guarda Velha (MCP 1500); São Francisco de Paula (MCN 4619, 6445); São Leopoldo (UFRGS 924; IB 5686, 6665, MCN 7416, IB 7775, 8319); São Leopoldo, Parque Recreio (MCN 5901); Sapucaia do Sul (MCN 8853); Tenente Portela, Parque do Turvo (MCN 7201); Torres (MCN 2747); Várzea Grande (IB 10189); Viamão, Parque Saint Hilaire (MCN 2688). *Toponyms not localized:* SP: Ibera (IB 16048); RS: Alfredo Chaves (IB 9886). *No locality data:* (MCN 9525, IB 10254, 24469).

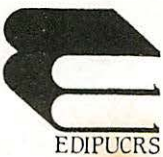
Echinanthera melanostigma

RJ: Teresópolis (IB 41042). *SP:* (IB 855); Atibaia (IB 544); Conde do Pinhal (IB 6698); Juqueri-Mirim (IB 4748); Mairiporã (IB 26779); Mogi das Cruzes (IB 30678); Nazaré Paulista (IB 31417); Paranapiacaba (IB 1640). *Toponyms not localized:* SP: Itaiguara (IB 8322); SP: Parnaíba (IB 8142).

Echinanthera undulata

MG: Camanducaia (IB 51903); Machado (IB 10998). *RJ:* Duque de Caxias (MNRJ 1852, 1853); Magé, Barreiros (MHNCI 3670); Nova Friburgo (IB 22893, 22894, 22895); Parati (MNRJ 788, 789); Petrópolis (IB 919, 21474); Teresópolis (MCN 9521). *SP:* Barueri (IB 1188); Boracéia (IB 30246); Campo Limpo (IB 19161); Campos do Jordão (IB 30313); Caraguatatuba (IB 13018, 13023, 26744, 26752); Cubatão (IB 22656, 24284); Eldorado (IB 18605); Embu (IB 29470, 29471); Guarujá (IB 22251); Ibiúna (IB 22904, 22905, 26635, 32252); Ilha Comprida (IB 52204); Itapecerica da Serra (MCP 795); Itaquaquecetuba (IB 26569); Jacareí (IB 21183); Mairinque

(IB 37384); Mogi das Cruzes (IB 45787); Piedade (IB 28561, 28562); Pindamonhangaba (IB 32723); Piquete (IB 27131); Poá (IB 23715); Registro (IB 19738, 23638); Ribeirão Pires (IB 2652, 16305, 16306); Santo André (IB 19490); Santos (IB 29453); São Bernardo do Campo (IB 28119); São Caetano do Sul (IB 27423); São José dos Campos (IB 11153, 21061, 23451); São Paulo (IB 139, 187, 792, 896, 1101, 1499, 2168, 2644, 2649, 10518, 16086, 18086, 18174, 18176, 24966, 24967); Taboão da Serra (IB 28386); Taubaté (IB 875). *PR:* Campo Largo (MHNCI 3362, IB 12074). *SC:* (MNRJ 781); Blumenau (MHNCI 2629); Corupá (IB 16020); Garuva (MHNCI 3189); Joinvile (MNRJ 775, 776, 777, 778, 779, 780, 782, IB 27766, 44589, 46466, 50273); São Bento do Sul (MCP 736). *No locality data:* (MCP 1059, 1060; MCN 9523, 9524).



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