



Anaspidacea, Bathynellacea (Crustacea, Syncarida), generalised tracks, and the biogeographical relationships of South America

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The spatial evolution of South American Syncarida (Anaspidacea and Bathynellacea) and related taxa is evaluated applying a panbiogeographic approach, where Ocean basins are used to identify major patterns of intercontinental distribution. The Pacific basin, corresponding to a southern temperate track, is identified as the major evolutionary centre for *Stygocaris* (Stygocarididae), *Bathynella* (Bathynellidae), *Atopobathynella*, and *Chilibathynella* (Parabathynellidae), whereas distribution of *Nannobathynella* (Bathynellidae) and *Cteniobathynella* (Parabathynellidae) is centred on the Atlantic Ocean, belonging to a northern tropical track. It is concluded that the biotic origin of the South American Syncarida is complex, implying the existence of at least two ancestral biotas.
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Introduction

The superorder Syncarida (Crustacea, Malacostraca) represents an ancient group, as evidenced by the fossil evidence, that must have been very abundant in the sea and near-marine habitats of the Northern Hemisphere during Permo-Carboniferous (Schram & Hessler 1984). Today, its extant orders (Anaspidacea and Bathynellacea) are confined to fresh water (Delamare Deboutteville 1960b; Noodt 1960, 1965b, 1969a, 1982; Schminke 1986). Anaspidacea have been recorded from both surface and subterranean waters: Anaspididae have some stygophile species (inhabiting lakes, upland streams, weed-filled pools, and moorland pools) as well as others being strict stygobionts, whereas Koonungidae live in pools in the burrows of freshwater crayfish, so called “pholeteros” (Schminke 1986), and also have a few records from caves. On the other hand, all members of families Psammaspididae and Stygocarididae are stygobionts, and have been collected from the interstitial waters of coarse substrates and mesopsammon of lakes, rivers, and streams with gravel and sand deposits. Bathynellacea usually live in subterranean waters in the interstitial spaces between grains of sand, except two species in Lake Baikal (Bazikalova 1954) and one species from an Australian marine beach (Schminke 1972).

Although syncarids are poorly known, they have been reported from all continental areas throughout the world, with 58 genera (Table I) and more than 160 species (Noodt 1965b, 1970; Schminke 1973a, 1982, 1986, 1988a,b; Schminke & Noodt 1988; Serban 1992). Schminke (1974a)

analysed bathynellid distributional patterns from a dispersalist viewpoint, concluding that they represented one of the oldest groups of the freshwater carcinofauna.

South American Syncarida are relatively well known, in spite of the scattered samples registered, with 17 genera and 25 species (see Appendix). If we plot South American syncarids on the map (Fig. 1), it is evident that their distribution is disjunct, with species basically distributed in southern Argentina and Chile, southern Brazil and Paraguay, north-eastern Brazil, and Venezuela. It will be interesting to investigate whether a causal explanation can be given to explain this pattern.

Our objective is to investigate the distributional patterns of South America syncarid taxa, from a panbiogeographic point of view, in order to determine their biogeographic history. In addition, we intend to provide a summary of the systematic knowledge of the group, with indication of the more recent contributions.

Material and methods

Table I details the extant genera of Syncarida of the world, with indication of their distribution and selected references. Data were obtained from recent taxonomic papers, revisionary works, and monographs (Gerlach & Siewing 1956; Siewing 1956, 1958; Jakobi 1958, 1961, 1962, 1963, 1969, 1972; Delamare Deboutteville 1960a; Delamare Deboutteville & Roland 1963; Noodt 1963a,b,c, 1965a,b, 1969a,b, 1970, 1971, 1972, 1974, 1977, 1981, 1982; Williams 1965; Birstein & Ljovuschkin 1967; Brooks 1969; Swain *et al.* 1970, 1971; Schminke 1972, 1973a,b, 1974b, 1975, 1979, 1980a,b, 1982, 1986, 1987, 1988a,b; Serban *et al.* 1972; Serban 1973, 1977, 1989, 1992, 1993; Schminke & Wells 1974; Serban & Coineau 1975, 1982;

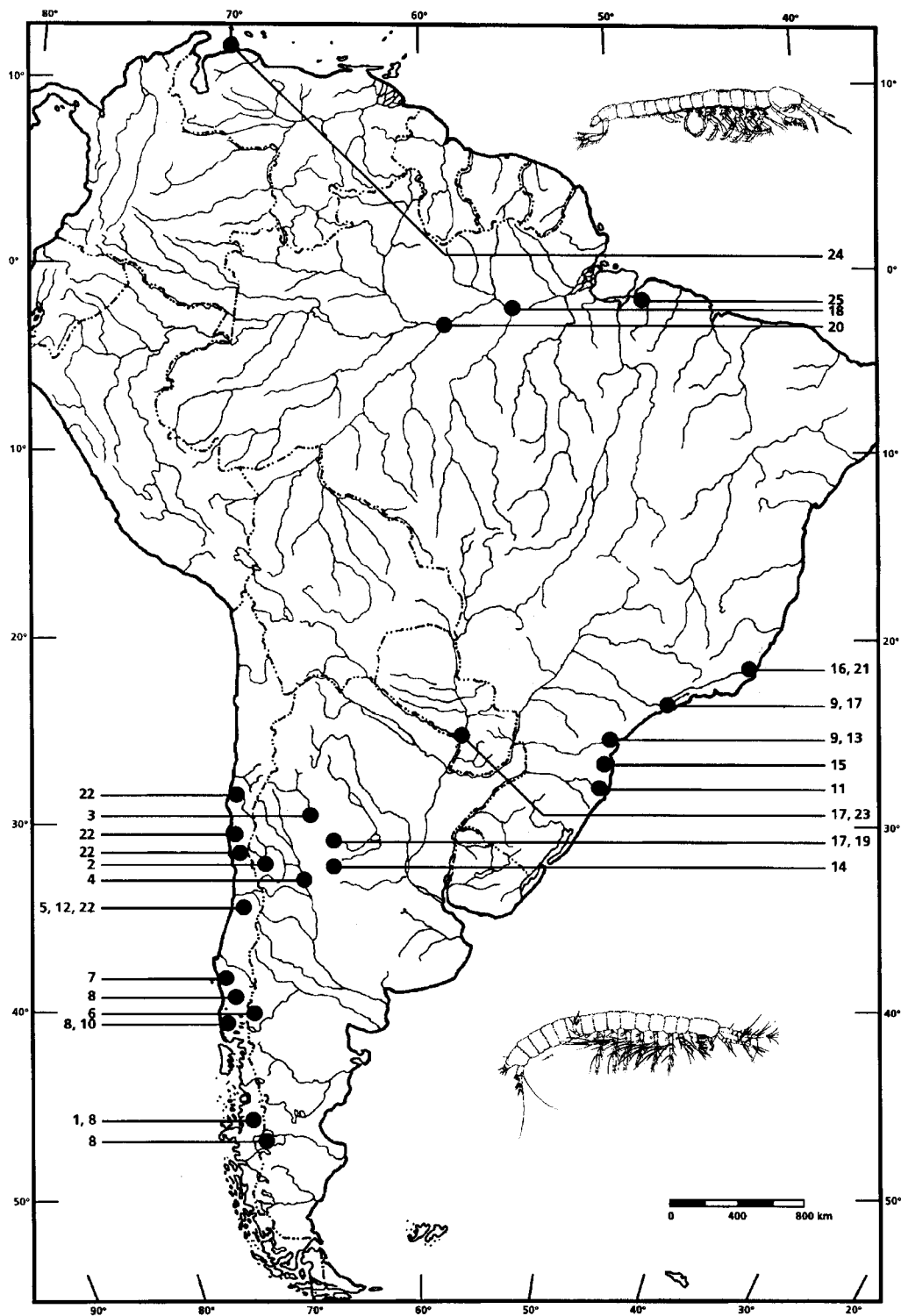


Fig. 1. Map showing localities where South American syncarids have been recorded (see Appendix for details). Habitus drawings: upper right, *Parastygocaris andina* (Anaspidacea); bottom right, *Austrobathynella patagonica* (Bathynellacea).

Delamare Deboutteville & Serban 1979; Knott & Lake 1980; Dumont 1984; Gledhill & Gledhill 1984; Serban & Leclerc 1984; Pennak & Ward 1985; Boutin & Coineau 1987; Schminke & Noodt 1988; Lopretto 1995; Grosso & Peralta 1997). Map of Fig. 1 shows the localities from which syncarid taxa have been recorded in South America (for details on these localities and their species see Appendix).

The panbiogeographic analysis basically consists of plotting distributions of different taxa on maps, connecting their separate distributional areas together with lines called individual tracks. After these tracks are constructed, their orientation or direction can be determined using a baseline (geological feature such as an ocean or sea basin, or

other major tectonic structure, crossed by the track) or phylogenetic evidence available. Individual tracks for unrelated groups of organisms that coincide result in generalised tracks, which indicate the pre-existence of ancestral biotas, that become fragmented by tectonic and/or climatic changes. The area where two or more generalised tracks intersect is a node, which indicates that different ancestral biotic and geological fragments interrelate in space/time, as a consequence of terrain collision, docking or suturing, thus constituting a composite area. For details of the panbiogeographic methodology see Morrone & Crisci (1995). In the maps, we follow the graphical conventions proposed by Fortino & Morrone (1997).

Results

The superorder Syncarida comprises two extant orders and six families, with a total of 57 genera (Table I). Both orders are present in South America.

Within Anaspidacea, families Anaspididae, Koonungidae, and Psammaspididae are restricted to Australia and Tasmania, whereas Stygocarididae are found in South America, Australia and New Zealand (Table I). The genera present in South America are *Oncostygocaris*, *Parastygocaris*, and *Stygocaris*. The single species of *Oncostygocaris* is restricted to southern Chile, and *Parastygocaris* has three species, endemic to central Argentina (Fig. 1). *Stygocaris* has three species, one from Australia, one from New Zealand, and one from central Chile (Fig. 1); its individual track (Fig. 2) has a Pacific basin baseline.

Within Bathynellacea, both Bathynellidae and Parabathynellidae are present in South America. Bathynellidae are widely ranged in the north and south temperate areas, with three genera and four species present in South America. The monotypic genus *Austrobathynella* is restricted to the Subantarctic biogeographic province (Fig. 1). *Bathynella* comprises several species, distributed world-wide. According to Schminke (1974a), the South American species of *Bathynella*, which are restricted to the Subantarctic biogeographic province of southern Chile and Argentina (Fig. 1), are more closely related to the species of Australia and New Zealand. Its individual track (Fig. 3) also shows a Pacific basin baseline. *Nannobathynella* comprises two species: *N. marcusii* from south-eastern Brazil (Fig. 1) and *N. africana* from central Africa; its individual track has an Atlantic Ocean baseline (Fig. 4).

Parabathynellidae are widespread throughout the world, with 11 genera and 16 species in South America. *Atopobathynella* has four species, one from southern Chile (Fig. 1), one from New Zealand and Australia, one from Australia, and one from Tasmania. According to the cladistic evidence available (Schminke 1973a), the oriented track follows a sequence from Tasmania–Australia to New Zealand, and then to southern Chile (Fig. 5). The single species of *Brasilibathynella* is endemic to southern Brazil (Fig. 1). *Chilibathynella* has two known species, one from central Chile (Fig. 1) and the other from southern Australia; its track has a Pacific basin baseline (Fig. 6). *Cteniobathynella* has six species, one from south-eastern Brazil (Fig. 1), four from central Africa, and one from Israel. The cladistic relationships of these species are unknown, but according to Schminke (1973a) its sister genus is *Habrobathynella* from Madagascar. The track of *Habrobathynella-Cteniobathynella* is shown in Fig. 7. *Hexabathynella* has two South American species, one from central Argentina and the other from south-eastern Brazil (Fig. 1), four European species, one from Madagascar, two from Australia, and one from New Zealand. The only available cladogram (Schminke 1973a) does not include all the species of the genus, and some of these species occur in oligo- to polyhaline waters (Schminke 1982), so we did not include its individual track in the analysis. *Leptobathynella*, *Noodtibathynella*, *Odontobathynella*, *Parvulobathynella*, and *Psalidobathynella* are endemic to South America. *Leptobathynella* has one species from south-eastern Brazil and another from central Argentina, Paraguay, and south-

eastern Brazil (Fig. 1). *Noodtibathynella* has also two species, one from the Amazonas river and the other from central Argentina (Fig. 1). The monotypic genus *Odontobathynella* is restricted to north-eastern Brazil (Fig. 1). *Parvulobathynella* has three species, one from south-eastern Brazil, other from Paraguay, and the other from central Chile (Fig. 1). The monotypic genus *Psalidobathynella* is restricted to north-western Venezuela (Fig. 1).

One species of the African genus *Thermobathynella* has been described by Siewing (1956) for South America, namely, *T. amyxi* from north-eastern Brazil (Fig. 1). Schminke (1973a, 1986), however, doubted its generic assignment and left it as *incertae sedis*.

Individual tracks from the South American syncarid taxa analysed (Figs 2–7) were combined in two generalised tracks: a southern temperate and a northern tropical (Fig. 8).

(1) Southern temperate track. Connects southern South America, Australia, Tasmania, and New Zealand, and has a Pacific basin baseline. Syncarid taxa assigned to this generalised track are *Stygocaris*, *Bathynella*, *Atopobathynella*, and *Chilibathynella*.

(2) Northern tropical track. Connects tropical South America and tropical Africa, having an Atlantic Ocean baseline. Syncarid taxa assigned to this generalised track are *Nannobathynella* and *Habrobathynella-Cteniobathynella*.

The existence of these generalised tracks reflects the composite nature of the South American syncarid biota.

Discussion

Our results are coincident with previous studies that recognised two different biotic components within South America (Crisci *et al.* 1991b; Amorim & Tozoni 1994; Morrone 1996a,b). A pre-Cretaceous scenario for the origin of the complex patterns concerning the South American biota, with the disruption of the Pacific landmasses during Jurassic or earlier times, has been postulated by authors working with other taxa, namely, Lepidoptera and angiosperms (Grehan 1991), Diptera (Amorim & Tozoni 1994), and basal Curculionoidea (Morrone 1996a). It has been proposed that syncarids are one of the oldest groups of the freshwater fauna (Schminke 1974a) originally belonging to a cosmopolitan Permo-Triassic carcinofauna (Schram 1977).

Although data concerning distributions of several South American genera or their phylogenetic relationships with extra-American taxa are lacking, we can speculate that the closest relatives of the “southern temperate” South American taxa will be more probably found in Australia, Tasmania, and/or New Zealand. Within Anaspidacea, the presence of *Stygocarella* in New Zealand and the genera of the other three families (excluding *Stygocaris*) in Australia and Tasmania, confirms the Pacific nature of this group. In addition, “northern tropical” South American syncarids, namely, *Noodtibathynella*, *Odontobathynella*, *Psalidobathynella*, and *Thermobathynella*, will probably have their closest relatives in tropical Africa.

There are conflicting hypotheses concerning the relationships of South America with Australia, New

Table I. Extant genera of Syncarida of the world, with indication of their distribution and selected references

Taxa	Distribution	Selected references
Anaspidacea Calman, 1904		
Anaspididae Thomson, 1893		
<i>Allanaspides</i> Swain, Wilson, Hickman & Ong, 1970	Tasmania	Swain <i>et al.</i> (1970, 1971), Schminke (1982)
<i>Anaspides</i> Thomson, 1894	Tasmania	Williams (1965), Schminke (1982, 1986)
<i>Paranaspides</i> Smith, 1908	Tasmania	Schminke (1982)
Koonungidae Sayce, 1908		
<i>Koonunga</i> Sayce, 1907	south-eastern Australia and Tasmania	Noodt (1965 <i>b</i>), Schminke (1982)
<i>Micraspides</i> Nicholls, 1931	south-eastern Australia and Tasmania	Noodt (1965 <i>b</i>), Schminke (1982)
Psammaspididae Schminke, 1974		
<i>Eucrenonaspides</i> Knott & Lake, 1980	Tasmania	Knott & Lake (1980), Schminke (1982, 1986)
<i>Psammaspides</i> Schminke, 1974	south-eastern Australia	Schminke (1974 <i>b</i> , 1982, 1986)
Stygocarididae Noodt, 1963		
<i>Oncostygocaris</i> Schminke, 1980	southern South America	Noodt (1963 <i>b</i>), Schminke (1980 <i>a</i> , 1982, 1986)
<i>Parastygocaris</i> Noodt, 1963	southern South America	Noodt (1963 <i>b</i>), Schminke (1982, 1986)
<i>Stygocarella</i> Schminke, 1980	New Zealand	Schminke (1980 <i>a</i> , 1982, 1986)
<i>Stygocaris</i> Noodt, 1963	southern South America, south-eastern Australia, and New Zealand	Noodt (1963 <i>a,b</i>), Schminke (1980 <i>a</i> , 1982, 1986)
Bathynellacea Chappuis, 1915		
Bathynellidae Grobben, 1904		
<i>Agnathobathynella</i> Schminke, 1980	south-eastern Africa	Schminke (1986)
<i>Antrobathynella</i> Serban, 1966	Europe	Gledhill & Gledhill (1984), Schminke (1986)
<i>Austrobathynella</i> Delamare Deboutteville, 1960	southern South America	Delamare Deboutteville & Roland (1963), Schminke (1986)
<i>Baicalobathynella</i> Birstein & Ljovuschkin, 1967	eastern Asia	Birstein & Ljovuschkin (1967)
<i>Bathynella</i> Vejdovsky, 1882	North America, southern South America, Europe, eastern Asia, and Australia	Noodt (1965 <i>b</i> , 1971), Pennak & Ward (1985), Schminke (1986)
<i>Delamareibathynella</i> Serban, 1989	western Europe	Serban (1989, 1992)
<i>Gallobathynella</i> Serban, Coineau & Delamare Deboutteville, 1972	western Europe	Serban <i>et al.</i> (1972), Schminke (1986)
<i>Meridiobathynella</i> Serban, Coineau & Delamare Deboutteville, 1972	southern Europe	Serban <i>et al.</i> (1972), Serban (1977)
<i>Nannobathynella</i> Noodt, 1969	south-eastern South America and western and southern Africa	Noodt (1969 <i>b</i> , 1972, 1981), Schminke & Wells (1974), Schminke (1986)
<i>Pacificabathynella</i> Schminke & Noodt, 1988	western North America and eastern Asia	Schminke & Noodt (1988)
<i>Parameteridiobathynella</i> Serban & Leclerc, 1984	western Europe	Serban & Leclerc (1984), Schminke (1986)
<i>Pseudantrobathynella</i> Schminke, 1988	central Europe	Schminke (1988 <i>b</i>)
<i>Pseudobathynella</i> Serban, Coineau & Delamare Deboutteville, 1972	Europe	Serban <i>et al.</i> (1972), Schminke (1986)
<i>Sardobathynella</i> Serban, 1973	southern Europe	Serban (1973)
<i>Tianschanobathynella</i> Serban, 1993	western Asia	Serban (1993)
<i>Transkeithynella</i> Serban & Coineau, 1975	southern Africa	Serban & Coineau (1975)
<i>Transvaalithynella</i> Serban & Coineau, 1975	southern Africa	Serban & Coineau (1975)
<i>Vandelibathynella</i> Serban, Coineau & Delamare Deboutteville, 1972	western Europe	Serban <i>et al.</i> (1972), Schminke (1986)
<i>Vejdovskybathynella</i> Serban & Leclerc, 1984	western Europe	Serban & Leclerc (1984), Schminke (1986)
Parabathynellidae Noodt, 1965		
<i>Acanthobathynella</i> Coineau, 1967	western Africa	Schminke (1973 <i>a</i> , 1986)
<i>Afrobathynella</i> Schminke, 1976	southern Africa	Schminke (1986)
<i>Allobathynella</i> Morimoto & Miura, 1957	eastern Asia	Noodt (1965 <i>b</i>), Schminke (1973 <i>a</i> , 1986)
<i>Atopobathynella</i> Schminke, 1973	southern South America, south-eastern Australia, Tasmania, and New Zealand	Noodt (1965 <i>b</i>), Schminke (1973 <i>a</i> , 1986)
<i>Batubathynella</i> Schminke, 1973	eastern Asia	Schminke (1973 <i>a</i> , 1986)
<i>Brasilibathynella</i> Jakobi, 1958	southern South America	Schminke (1973 <i>a</i> , 1986), Noodt (1981)
<i>Chilibathynella</i> Noodt, 1963	southern South America and south-eastern Australia	Noodt (1963 <i>a</i>), Schminke (1973 <i>a</i> , 1986)
<i>Cteniobathynella</i> Schminke, 1973	south-eastern South America, central Africa, and western Asia	Schminke (1973 <i>a</i> , 1986), Noodt (1981)
<i>Ctenophallonella</i> Coineau & Serban, 1978	southern Africa	Schminke (1986)
<i>Eobathynella</i> Birstein & Ljovuschkin, 1964	Asia	Schminke (1973 <i>a</i> , 1986)
<i>Habrobathynella</i> Schminke, 1973	Madagascar	Schminke (1973 <i>a</i> , 1986)
<i>Haplophallonella</i> Serban & Coineau, 1975	western Africa	Schminke (1986)
<i>Heterodontobathynella</i> Schminke, 1973	central Africa	Schminke (1973 <i>a</i> , 1986)
<i>Hexabathynella</i> Schminke, 1972	southern South America, south-eastern Australia, New Zealand, Madagascar, and Europe	Noodt (1965 <i>a</i> , 1981), Jakobi (1972), Schminke (1973 <i>a</i> , 1986)
<i>Iberobathynella</i> Schminke, 1973	western Europe, northern Africa, and North America	Schminke (1973 <i>a</i> , 1986), Boutin & Coineau (1987)
<i>Lamtbathynella</i> Serban & Coineau, 1982	western Africa	Serban & Coineau (1982)
<i>Leptobathynella</i> Noodt, 1965	southern South America	Noodt (1963 <i>c</i> , 1965 <i>b</i> , 1972, 1981), Schminke (1973 <i>a</i> , 1986)
<i>Nilobathynella</i> Dumont, 1984	north-eastern Africa	Dumont (1984), Schminke (1986)
<i>Nipponbathynella</i> Schminke, 1973	eastern Asia	Schminke (1973 <i>a</i> , 1986)
<i>Noodtibathynella</i> Schminke, 1973	southern South America	Noodt (1965 <i>a</i> , 1981), Schminke (1973 <i>a</i> , 1986)
<i>Notobathynella</i> Schminke, 1973	south-eastern Australia and New Zealand	Schminke (1973 <i>a</i> , 1986)
<i>Nunubathynella</i> Schminke, 1976	southern Africa	Schminke (1986)
<i>Odontobathynella</i> Delamare Deboutteville & Serban, 1979	northern South America	Delamare Deboutteville & Serban (1979)

continued

Table I—continued

Taxa	Distribution	Selected references
<i>Parabathynella</i> Chappuis, 1926	eastern Europe	Noodt (1965b), Schminke (1973a, 1986)
<i>Parvulobathynella</i> Schminke, 1973	southern South America	Jakobi (1961), Noodt (1963c, 1965b, 1981), Schminke (1973a, 1986)
<i>Psalidobathynella</i> Schminke, 1979	northern South America	Schminke (1979, 1986), Noodt (1981)
<i>Sabahbathynella</i> Schminke, 1988	eastern Asia	Schminke (1988a)
<i>Thermobathynella</i> Capart, 1951	north-eastern South America and central Africa	Siewing (1956), Schminke (1973a, 1986), Noodt (1981)

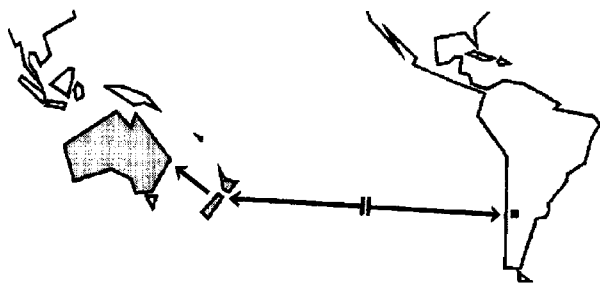


Fig. 2.

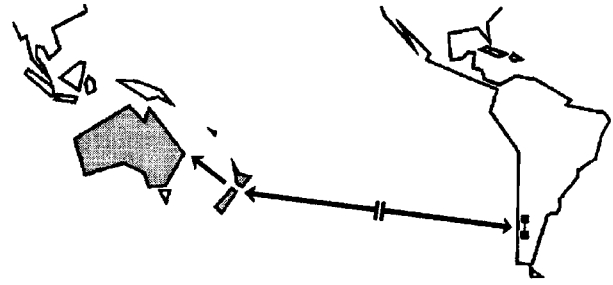


Fig. 3.

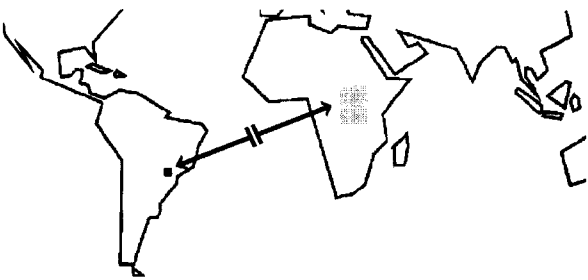


Fig. 4.

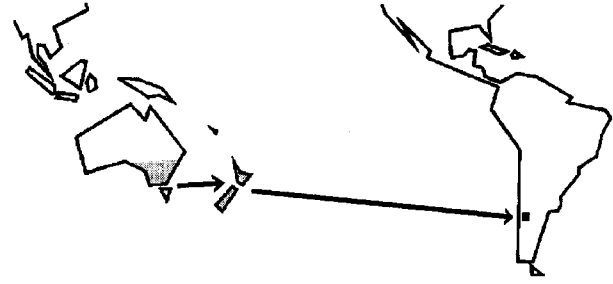


Fig. 5.

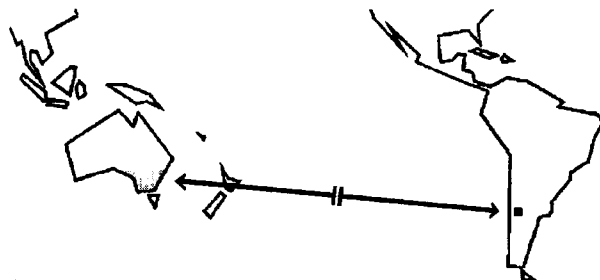


Fig. 6.

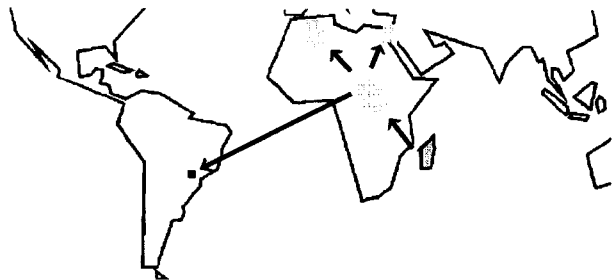


Fig. 7.

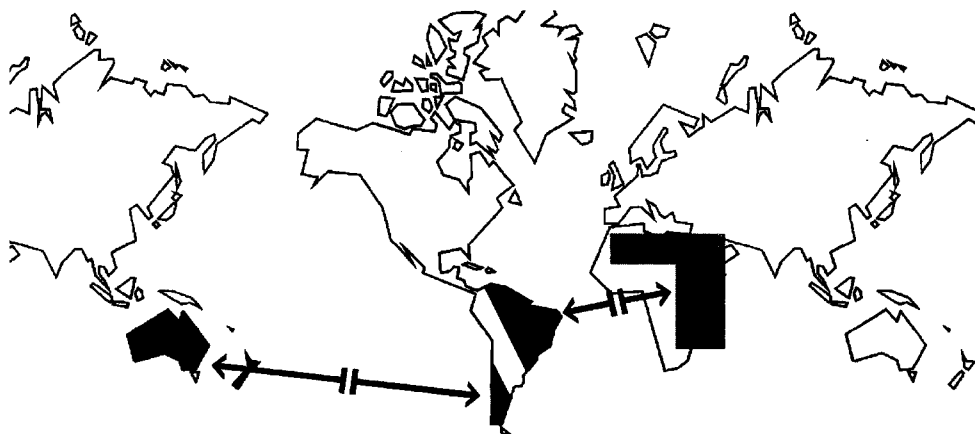


Fig. 8.

Figs. 2–8. Individual tracks (2–7). 2, *Stygocaris* (Anaspidacea: Stygocarididae); 3, *Bathynella* (Bathynellacea: Bathynellidae); 4, *Nannobathynella* (Bathynellacea: Bathynellidae); 5, *Atopobathynella* (Bathynellacea: Parabathynellidae); 6, *Chilibathynella* (Bathynellacea: Parabathynellidae); 7, *Habrobathynella-Cteniobathynella* (Bathynellacea: Parabathynellidae). 8. Generalised tracks for South American Syncarida. =: baselines.

Zealand, New Caledonia, and Africa, namely, South America–Africa, New Zealand–New Caledonia, New Zealand–Australia–South America, New Guinea–New Caledonia, and Australia–New Zealand (Nelson & Ladiges 1996). In general, cladistic biogeographic analyses have failed to produce a single pattern across the southern Pacific common to all taxa (Craw 1989; Crisci *et al.* 1991a,b; Seberg 1991; Linder & Crisp 1995; Weston & Crisp 1996). This can be due to a complex history, where South America has linked closely but at different times with the other southern areas.

According to Schram & Hessler (1984) and Schminke (1986), two marine stocks of Syncarida invaded fresh water independently, lived in surface waters, and then penetrated into the groundwater, with pedomorphosis having played a significant role (Schminke 1978, 1981a). It is possible that these invasions occurred at two different times, and thus could contribute to further complicate these biogeographic patterns. Schram & Hessler's (1984) cladogram do not allow us to support this hypothesis.

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Appendix

List of South American species of Syncarida with their localities. Numbers preceding species names refer to localities in the map of figure 1.

Order ANASPIDACEA Calman, 1904

Family STYGOCARIDIDAE Noodt, 1963

Oncostygocaris Schminke, 1980

- 1 *O. patagonica* (Noodt, 1963). CHILE. Aysén: Simpson river, about 34 km east of Puerto Aysén, mesopsammon.
Parastygocaris Noodt, 1963
- 2 *P. andina* Noodt, 1963. ARGENTINA. Mendoza: Uspallata, mesopsammon.
- 3 *P. clapsi* Grosso & Peralta, 1997. ARGENTINA. La Rioja: Aicuña river, mesopsammon.
- 4 *P. goerssi* Noodt, 1963. ARGENTINA. San Luis: 7 km west of San Luis, mesopsammon.
Stygocaris Noodt, 1963
- 5 *S. gomezmillasi* Noodt, 1963. CHILE. Santiago: Quebrada de Córdoba, near El Tabo, mesopsammon.

Order BATHYNELLACEA Chappuis, 1915

Family BATHYNELLIDAE Grobben, 1904

Austrobathynella Delamare Deboutteville, 1960

- 6 *A. patagonica* Delamare Deboutteville, 1960. ARGENTINA. Neuquén: Currhué lake. Río Negro: P. Moreno lake.
Bathynella Vejdovsky, 1882
 - 7 *B. cautinensis* Noodt, 1965. CHILE. Cautín: Cautín river, near Temuco.
 - 8 *B. grossei grossei* Noodt, 1965. CHILE. Aysén: Simpson river, near Puerto Aysén. Valdivia: Futa river, south of Valdivia. *B. grossei coyhaiquensis* Noodt, 1971. CHILE. Aysén: Buenos Aires lake; Simpson river, near Coyhaique. Cautín: Villa Rica lake.
Nannobathynella Noodt, 1969
 - 9 *N. marcusii* Noodt, 1969. BRAZIL. São Paulo: Caverna do Diabo (Gruta de Tapagem), mesopsammon of small creek at entrance to cave; Cubatão river, mesopsammon.
- Family PARABATHYNELLIDAE Noodt, 1965
- Atopobathynella* Schminke, 1973
- 10 *A. valdiviana* (Noodt, 1965). CHILE. Valdivia: Futa river, south of Valdivia.
Brasilibathynella Jakobi, 1958

- 11 *B. florianopolis* Jakobi, 1958. BRAZIL. Santa Catarina: Florianópolis, well.
Chilibathynella Noodt, 1963
- 12 *C. clandestina* Noodt, 1963. CHILE. Santiago: Quebrada de Córdoba, near El Tabo, mesopsammon.
Cteniobathynella Schminke, 1973
- 13 *C. noodti* Schminke, 1973. BRAZIL. São Paulo: Cubatão river, near Santos, mesopsammon.
Hexabathynella Schminke, 1972
- 14 *H. szidati* (Noodt, 1965). ARGENTINA. Córdoba: Cuarto river, near Río Cuarto.
- 15 *H. paranaensis* (Jakobi, 1972). BRAZIL. Paraná: Cotinga inland, Paranaguá bay, well.
Leptobathynella Noodt, 1965
- 16 *L. camposicola* (Jakobi, 1961). BRAZIL. Rio de Janeiro: Campos, well.
- 17 *L. richerti richerti* (Noodt, 1963). ARGENTINA. Córdoba: Sierra river, La Bolsa, between Córdoba and Alta Gracia, at 36 national route. PARAGUAY. Central: Ypacarai lake, near San Bernardino, mesopsammon. *L. richerti brasiliensis* Noodt, 1972. BRAZIL. São Paulo: Cubatão river, mesopsammon.
Noodtibathynella Schminke, 1973
- 18 *N. jumboli* (Siewing, 1958). BRAZIL. Pará: Amazonas river, near Santarém, mesopsammon.
- 19 *N. neotropica* (Noodt, 1965). ARGENTINA. Córdoba: Sierra river, La Bolsa, between Córdoba and Alta Gracia, at 36 national route.
Odontobathynella Delamare Deboutteville & Serban, 1979
- 20 *O. amazonica* Delamare Deboutteville & Serban, 1979. BRAZIL. Amazonas: Amazonas river, Manaus.
Parvulobathynella Schminke, 1973
- 21 *P. camposicola* (Jakobi, 1961). BRAZIL. Rio de Janeiro: Campos, well.
- 22 *P. riegelorum* (Noodt, 1965). CHILE. Atacama: Huasco river, near Vallenar. Coquimbo: Choapa river, Fundo El Peralillo, near Illapel; Limari river. Santiago: Quebrada de Córdoba, south of Las Cruces.
- 23 *P. ypacaraiensis* (Noodt, 1963). PARAGUAY. Central: Ypacarai lake, near San Bernardino, mesopsammon.
Psalidobathynella Schminke, 1979
- 24 *P. stocki* Schminke, 1979. VENEZUELA. Falcón: Fuente de Miraca, Paraguana peninsula, spring and well.
Thermobathynella Capart, 1951
- 25 *T. amyxi* Siewing, 1956. BRAZIL. Pará: near Icoaraci, 17 km north of Belém, mesopsammon.