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Checklist of the fauna of mountain streams of tropical Indopacific Islands

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(Mit 5 Abbildungen)

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Abstract

A comparative survey on the ecological conditions (such as water-temperature, electric conductivity and total hardness) and on the fauna of mountain streams of isolated tropical islands of the Indopacific is presented here. For that, Continental islands, such as Madagascar, Seychelles, Sri Lanka (Ceylon), Andamans in the Indian Ocean, New Caledonia in the Southern Pacific and also Oceanic islands, such as the Comoros (Anjouan), La Réunion and Mauritius in the Indian Ocean are taken into consideration.

Résumé

Aperçu comparatif sur les conditions écologiques (température de l'eau, conductivité électrique, dureté totale) et sur la fauna des eaux courantes des montagnes des îles tropicales isolées de l'Indopacifique. Pour cela, des îles continentales, comme Madagascar, les Seychelles, Sri Lanka (Ceylon), les Andamanes dans l'océan Indien, la Nouvelle Calédonie dans l'Océan Pacifique, ainsi que des îles océaniques, comme les Comores (Anjouan), La Réunion et l'île Maurice dans l'Océan Indien sont prises en considération.

Zusammenfassung

Vergleichende Übersicht über die ökologischen Parameter (Wassertemperatur, elektrische Leitfähigkeit, Gesamthärte) und die Fauna tropischer Bergbäche auf isolierten Inseln des Indopazifik: Kontinentale Inseln, wie Madagaskar, die Granitinseln der Seychellen, Sri Lanka (Ceylon) und Andamanen im Indischen und Neukalodien im Südpazifischen Ozean sowie Ozeanische Inseln, wie die Komoren (Anjouan), La Réunion und Mauritius im Indischen Ozean.

Introduction

The literature concerning the typology and longitudinal distribution of the Meso and Macrofauna of flowing systems in mountain areas has increased in the last few decades (summaries by ILLIES, 1961a; HYNES, 1970; ILLIES & BOTOSEANU, 1963 and BOTOSEANU, 1979). In contrast to those in the temperate zones, relatively few tropical mountain areas have been investigated systematically until recent years (ILLIES, 1961b, 1964; HYNES, 1971; HYNES & WILLIAMS, 1971; BOETTGER,

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1975; HORA, 1923, 1928, 1930 and 1936; BISHOP, 1973; STATZNER, 1975 and some others). On tropical mountainous islands of the Indopacific a first survey of the longitudinal distribution and a checklist of the fauna of running waters was given by several missions of the Institute of Zoology of the University of Vienna (Austria):

Madagascar: STARMÜHLNER, 1962, 1969, 1979b and others; Sri Lanka: STARMÜHLNER, 1972; WENINGER, 1982; other results are summarized in Vol. 23 (1972), Vol. 24 (1+73), Vol. 25 (1974) and Vol. 29 (1979) of the Bulletin of the Fisheries Research Station of Sri Lanka (Ceylon); further results are published by JÄCH, 1984; STARMÜHLNER, 1977a, 1979b, 1984a, 1984b; Seychelles, Comoros (Anjouan), La Réunion, Mauritius: STARMÜHLNER, 1976b, 1976c, 1977b, 1979a; WENINGER, 1977; other results are published in Vol. 83 (1980) of the Annalen des Naturhistorischen Museum Wien; further results by MARLIER, 1977; MARLIER & MALICKY, 1979; Andaman-Islands: STARMÜHLNER, 1977c, 1982; RÜTZLER, 1978; MALICKY, 1978 (1979); WEWELKA, 1982; New Caledonia: STARMÜHLNER, 1968, 1970, 1973, 1979b; WENINGER, 1968; other results are published in the Cahiers de l'O.R.S.T.O.M., sér. Hydrobiologie, Vol. II (2), 1968; Vol. II (3/4), 1968; Vol. III (2), 1969; Vol. IX (3/4), 1970; Vol. VI (3/4), 1972; Vol. IX (2), 1975; Vol. IX (3), 1975; Vol. X (3) 1976; Different South Pacific Islands (Freshwater-Mollusca): STARMÜHLNER, 1976 a.

The collections of these missions are all stored in the Natural History Museum of Vienna in the Sections 2 (Entomology) and 3 (Mollusca and Lower Invertebrates).

Types of Islands

Since the fundamental studies of WALLACE, 1880, it is usual to distinguish between Continental and Oceanic islands: 1) Continental islands were connected in former geological times with land masses of continents. Separated since more or less geological times, the continental old islands have often conserved in flora and fauna so called „living fossils“ and have evolved many endemic families, generas and species. Examples for these old islands are Madagascar in the Indian Ocean or New Caledonia and New Zealand in the South-Pacific. Sri Lanka (Ceylon), a former part of South-India, consists in the granitic central mountains of the South-West („island on the island“) and also old so called „Gondwanic“ elements. But till the last ice-age these island was connected by land bridges with the Indian subcontinent and influenced by faunistic immigrations from the subcontinent and South East Asia. Therefore, Sri Lanka shows today a mixture of older and younger elements in his island fauna. A group of very old granitic continental islands are found in the Seychelles Archipelago (Mahé, Praslin, La Digue and some others). It is widely held from palaeomagnetic evidence that India (and Sri Lanka) moved northwards and away from the African part of the Gondwana-continent during the late Cretaceous Tertiary boundary. During these movement (about over 5 million years) the rupture of the Seychelles and India (and Sri Lanka) probably occured at the latitude of 30° S in the early Palaeocene.

The continental islands of Andamans in the Gulf of Bengal appear today as a series of hills (400–750 m altitude) and the unsubmerged portions of a continous ridge which connects the mountain ranges of Manipur-Burma belt in the North with the festoon of islands of Sumatra in the South. They consist of eocene Sedimentaries and younger volcanic serpentine Series, which have uplifted during the Pleistocene as a „young“ continental island.

New Caledonia was folded up in the late Tertiary and consists of marine sediments of the Papuan geosynclinal from New Guinea to New Zealand between Australia and Tasmania continent. In the South of New Caledonia the sediments are partly superposed by serpentine rocks from later volcanic eruptions. 2) Oceanic islands without former connections to continents or bigger land masses are to distinguish in 2a) Volcanic islands and in 2b) uplifted old coral reefs (coral-islands). In the last group mostly no freshwater biotops, such as lakes, pools, ponds or running waters are found. Volcanic islands with higher elevations are mostly relatively youthfull. In the Indian Ocean islands mountain streams are found on three islands of the Comoro-Archipelago (Anjouan, Mohéli and Mayotte; Grand

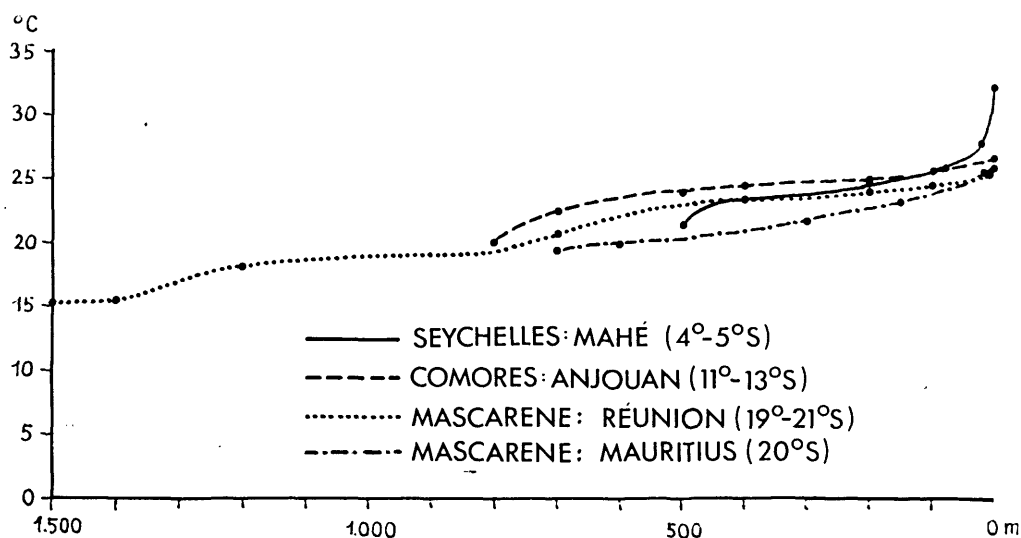


Fig. 1. Water-temperatures between headwaters and mouth in mountain streams of the islands of Mahé (Seychelles), Anjouan (Comoros), La Réunion and Mauritius (Mascarene). (After STARMÜHLNER, 1979a).

Comoro with two active volcanoes has no river erosion on the slopes). In the East of Madagascar are situated the volcanic Mascarene islands with La Réunion and Mauritius. La Réunion possesses an active and three extinct volcanoes, up to 3000 m altitude and steep slopes. Mauritius is about three million years older, the extinct volcanoes are partly eroded and the altitudes reach up only to 800 m in maximum. Many volcanic islands are in the transition of the Indian Ocean to the South Pacific, between the Malay Archipelago, New Guinea, Bismarck Archipelago South to the Solomons, New Hebrides, parts of the Fiji Archipelago, Samoa and the Society islands with Tahiti and Moorea.

Physically conditions of Mountain Island streams

Most of the mountain streams are-as consequence of the steep gradients (100–500‰; Fig. 2) torrential with waterfalls, cascades with very strong current and

a speed between 1–3 m/sec. These zones are steplike interrupted by more and lesser deeper pools with medium to low current (10–50 cm/sec). Near the borders are developed sometimes creeks with the character of stagnant waters. The formation of the bottom is a consequence of the current. In parts with very strong current he is formed by smooth granitic rocks in old continental islands, such as in the mountains of Madagscar, Sri Lanka or of Mahé (Seychelles), by porous volcanic rocks (lava, basalt) in the mountains of volcanic islands, such as Anjouan (Com-

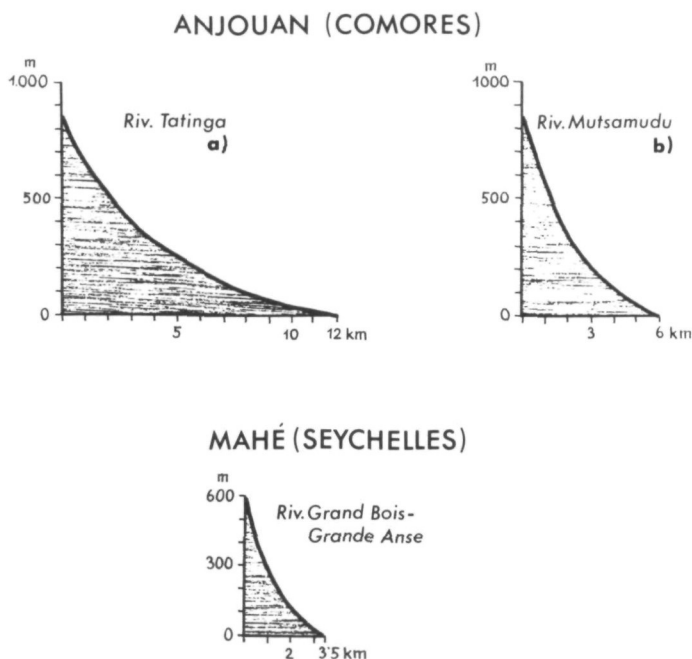


Fig. 2. Gradients of the slopes of the River Tatinga (a), River Mutsamudu (b) from Anjouan (Comoros) and of the River Grand Bois-Grande Anse from Mahé (Seychelles). Altitude: 10× higher (After STARMÜHLNER, 1979a).

oros), La Réunion and Mauritius in the Indian Ocean or New Hebrides, Solomons or Tahiti in the Pacific. In parts with medium current occur gravel and pebbles (10 cm–1 m Ø); in parts with low current are deposited grit and sand with sporadic stones. At last, in areas with the character of stagnant water are deposited sandy muds, covered with layers of vegetable debris.

The water temperatures of mountain running waters crossing the primary and secondary rain forests show no extremely amplitudes in the different seasons, respectively between day and night. The temperatures are influenced by the altitudes and the geographical latitudes North or South of the equator (see Table 1; Fig. 1, 4 and 5):

Table 1. Water-temperatures of Mountain streams of Indopacific islands

Altitude/ Latitude	Mada- gascar 12°–25° S	Sri Lanka 6°–10° N	Réunion 19°–21° S	Maurit. 20° S	Sey. 4.5° S	And. 12° N	Comor. 12° N	New. Caled. 20°–22° S
2000–1800 m	10°–12°	15°	10°					
1700–1500 m	13°–14°	17°	15°					
1400–1100 m	↓	19.6°	↓					13°
1000 m	↓	20.2°	18°					↓
900–800 m	↓	22.3°	↓				20°	15°
700–600 m	23°	24.8°	↓	19.4°			↓	
500 m	↓	25.1°	24°	↓	21.7°		↓	17°
250 m	↓	25.6°	↓	↓	↓	23°	↓	18°
100 m	25°	26°	25°	↓	↓	25°	↓	21°
50 m	↓	26.3°	↓	↓	↓	26°	↓	22°
20 m	26°	27.2°	↓	↓	↓	28°	↓	↓
mouth	28°	28°–30°	28.4°	26.3°	32.5°	30°	26°	25°

The water-temperatures are in °Celsius and average values. Abreviations: Maurit. = Mauritius; Sey. = Seychellen (Mahé); And. = Andamans; Comor. = Comoros (Anjouan); New Caled. = New Caledonia.

The lowest mean temperatures of 10–12° C was measured in the headwaters of the Ankaratra Mountains in Madagascar in altitudes between 1800 m and 2000 m; in the central mountains of Sri Lanka, the mean temperatures of the headwaters reaches about 15° C in 1800–2000 m and about 17° C in 1700–1500 m altitudes. In the same altitudes in La Réunion, the water temperature was only 15° C (in 1800–2000 m: 10° C!). In mountain streams in altitudes between 1500 and 500 m, the mean temperatures changes between 18° C and 25° C, below 500 m between 20° C and 28° C (mouth up to 30° C).

Chemically conditions of Mountain Island streams

The chemistry of mountain freshwaters is influenced by the type of the rocks of the bottom. In the old continental islands, such as Madagascar, Sri Lanka or Seychelles, the central mountains consists of old precambrian granitic rocks. In the Andamans it consists of sedimentaries and younger serpentine series and in New Caledonia it consists of old sediments, metamorphic rocks (Grauwacken) and serpentine, respectively periodite of old volcanic eruptions. In the younger oceanic islands such as the Comoros and Mascarenes, but also in many of the South-Pacific islands, the rocks consist of, basalts and different series of lavas (see Table 2).

In old Continental islands, such as Sri Lanka (Fig. 4) or some of the granitic islands of the Seychelles (Mahé, Praslin, La Digue) built by precambrian crystalline granitic rocks, the mountain surface waters are extremely poor in electrolytes, very soft and slightly acidic (pH: 5.5–6.8). These is expressed in very low values of the electrolytic conductivity between only 8.8 µS and 89 µS (mean values: 10–30 µS) and the total hardness between 0.08° dH and 2.35° dH (mean values: < 1° dH).

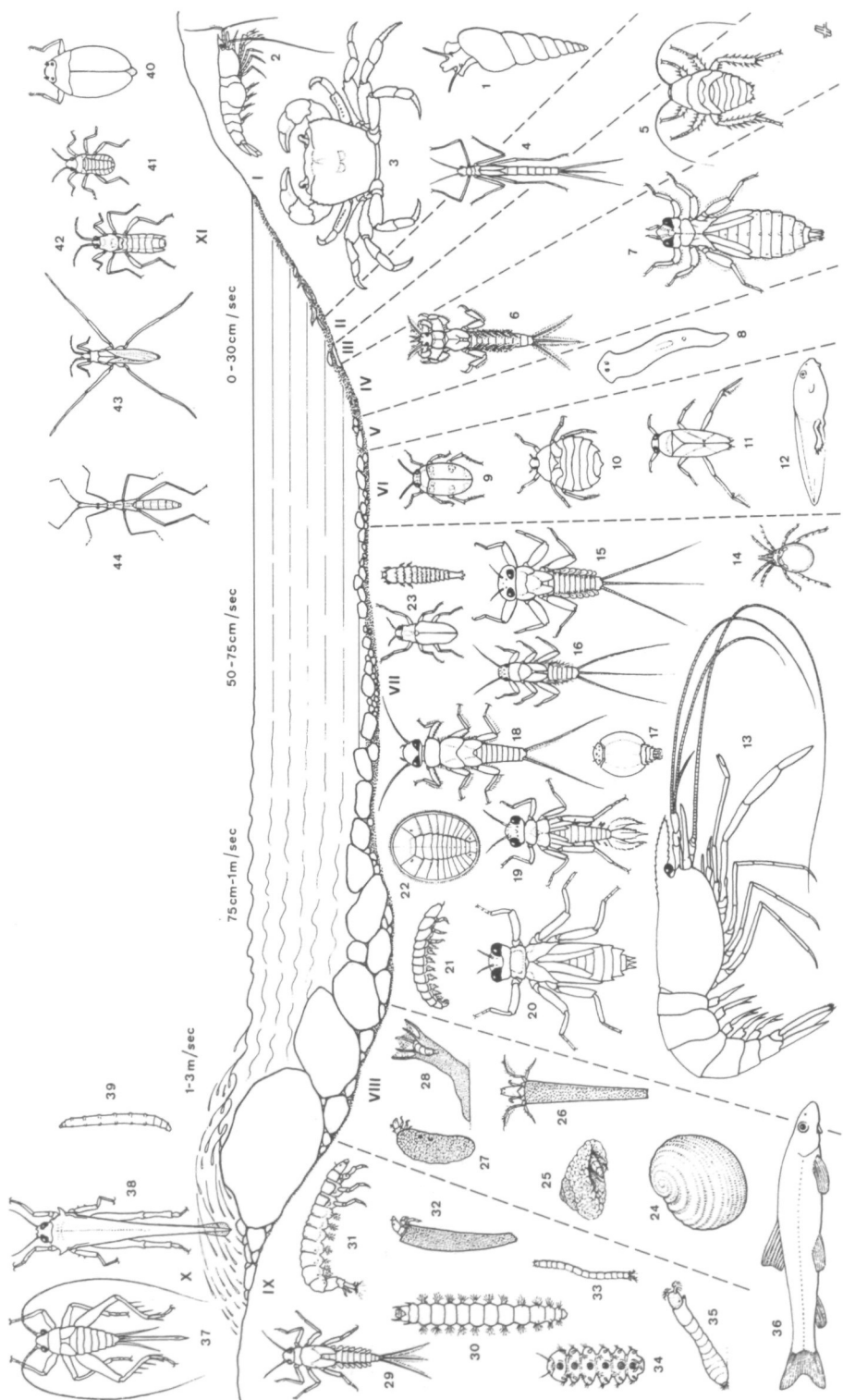


Fig. 3. Cross-Section of the Upper course of a mountain stream of Sri Lanka with schematic diagramm of the microdistribution of different characteristic animals:

I: On the surface of sand and mud, rich on deposited organic matter (banks and pools between cascades): 1: *Melanoides tuberculata*; 2: different species of small Atyidae (such as species of *Caridina* and *Atya*); 3: *Paratelfusa rugosa*.

II: On the surface of sand (bank and pools between cascades): 4: larvae of damselflies (such as *Neurobasis chinensis chinensis* and other species).

III: Under stones near the banks: 5: *Rhabdoblatta* sp. juv.

IV: Digging in sand (near the banks and in pools between cascades): 6: nymphs of *Ephemera* sp.; 7: different species of Gomphinae, such as *Paragomphus henryi*.

V: On and under the surface of stones (near the banks and in pools between cascades, but also in the medium current): 8: *Dugesia nannophallus*.

VI: Swimming in the free water of lentic areas without or with very low current (0–10 cm/sec; banks and pools between cascades): 9: *Lacconectes simoni*; 10: *Aphelocheirus clivicolus*; 11: *Enithares simplex*; 12: tadpole of the frog *Rana temporaria*

VII: On, under and between gravel in the medium current (20–50 cm/sec): 13: different species of the genus *Macrobrachium* (such as *australe*, *latimanus*; *scrabiculum*) under stones; 14: Hydrachnellae (water-mites), such as *Atractides schwoerbeli* and others; 15: nymphs of Heptageniidae, such as species of *Compsoeuriella*; 16: nymphs of Leptophlebiidae, such as *Kimminsula*, *Chloroterpes*, *Megaglena* or *Isaca*; 17: nymphs of the genus *Protopistoma*; 18: nymphs of the genus *Neoperla*; 19: larvae of *Euphaea splendens*; 20: larvae of *Zygonyx iris ceylanica*; 21: larvae of a lampyride beetle (*Luciola* or *Pyrophanes*-species); 22: larvae of dascyllide beetles from the genus *Eubrianax*; 23: larvae and imago of different species of Elmidae, such as the genera *Stenelmis*, *Ilalmelmis*, *Podelmis*, *Aruelmis*, *Ordobrevia*, *Zaitzeviaria* and others with many endemic species;

VIII: On, under and between boulders and gravel in the strong current: 24: *Paludomus (Tanalia) neritoides* (and *loricatus*); 25: case and larvae of the caddisfly-family Helicopsychidae (genus *Helicopsyche* with many endemic species); 26: case and larvae of the caddisfly-family Leptoceridae (such as the genera *Trichosetodes*, *Adicella*, *Oecetis*, *Setodinella* and others with many endemic species); 27: case and larvae of the caddisfly-family Hydropsilidae (such as the genera *Hydropsila*, *Oxyethira* and others with some endemic species); 28: tube and larvae of the chironomide genus *Rheotanytarsus*;

IX: On big boulders and on rocks in the rapids and cascades zones with very strong current (75 cm/sec–1 m/sec and more): 29: nymphs of the family Baetidae (also between floating floating algae); 30: caterpillar of the watermoth-genus *Aulacodes* sp. (protected against the strong current by membranous tubes); 31: larvae of the caddisfly family Hydropsychidae (such as the genera *Hydropsyche*, *Oestropsyche*, *Synaptopsyche*, *Macronema*, *Pseudoleptonema*, *Diplectrona*, *Diplectronella* and others with many endemic species); 32: case and larvae of the minute caddisfly family Sericostomatidae with the genus *Ceylanopsyche* and some endemic species; 33: larvae (and pupae) of Orthocladinae gen. ssp.; 34: larvae (and pupae) of Blephariceridae gen. ssp.; 35: larvae (and pupae) of different, mostly endemic species of blackflies, Simuliidae, such as *Simulium cinquestriatum*; 36: mountain barble (*Garra lamta*); X: On sprayed rocks: 37: the criquet *Paranemobius pictus*; 38: the tetrigide grasshopper *Euscelimena gavalis*; 39: larvae (and pupae) of the limoniide *Limonia* sp.

XI: On the water surface near the banks and of pools between cascades (current: 0–30 cm/sec): 40: Whirling beetle (such as species of the genera *Aulonogyrrus* and *Orectochilus*); 41: minute water criquet (genus *Microvelia* with some endemic species); 42: water criquets (species of the genera *Rhagovelia*, *Tetraripis* with some, endemic species); 43: Pond skater (species of the genera *Limnogonus*, *Limnometra*, *Meteocoris*, *Onychotrechus*, *Ptilonera*, *Rheumatogonus* and *Ventidius*; many endemic); 44: water measurer (such as *Hydrometra greeni*) (After STARMÜHLNER 1984b, Drawing: M. MIZZARO).

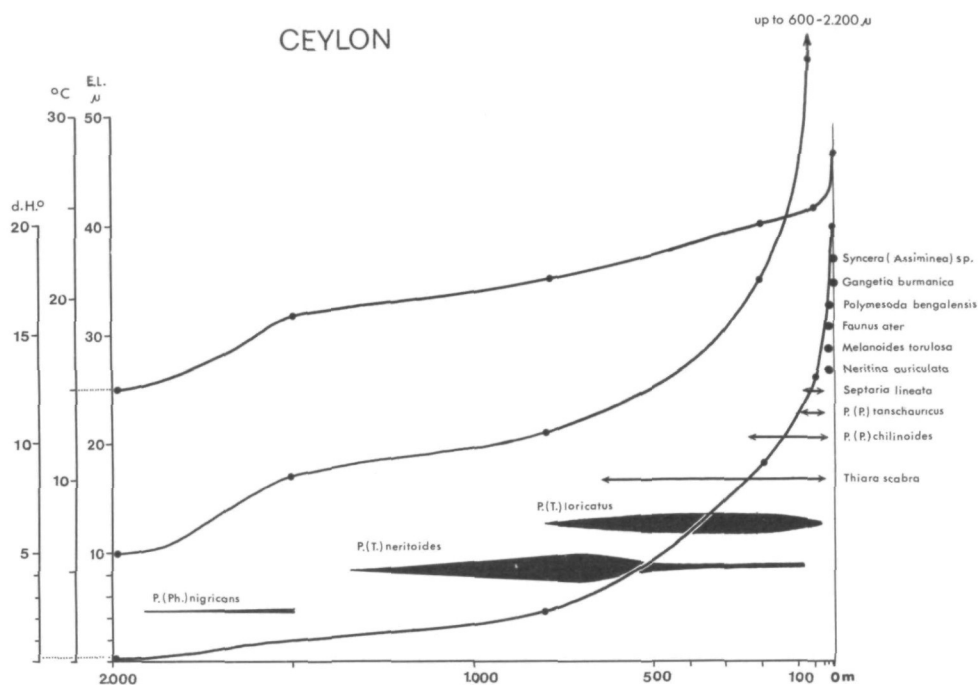


Fig. 4. Diagram showing temperature, hardness degree and electrolytic conductivity of the running waters correlated with the the longitudinal distribution of the freshwater gastropods and bivalves between headwaters and the mouth of mountain streams of Southern Sri Lanka (Temperature in °Celsius; Total hardness in °dH (German hardness degree); Electrolytic conductivity (El_{20}) in μ Siemens (at 20° Celsius) (After STARMÜHLNER, 1979b).

Table 2. Electrolytic conductivity (in μ S at 20° C) and total hardness (in dH° mean values) of mountain streams of different Indopacific islands

	Sri Lanka	Seychelles	Réunion	Mauritius	Comoros	Andamans	New Caledonia	Tahiti
El_{20}	8.8–89	25–47	52–105	43–220	94–255	55–401	50–167	132
Total Hardness	0.08–2.35	0.095–0.65	1.15–8	0.28–4.25	1.9–8.4	0.8–10	2.7–4.5	4

In the continental islands with sedimentary series and old volcanic rocks, such as the Andamans in the Indian Ocean or New Caledonia (Fig. 5) in the South-Pacific, the values of El_{20} reaches up from 59 μ S to 401 μ S and from 50 μ S to 167 μ S. The total hardness reaches up from 0.8° dH to maximal 10° dH and from 2.7° dH to 4.5° dH. In the mountain streams of the younger volcanic islands, the soluble electrolyts are higher, the conductivity consists between 43 μ S and 255 μ S, the total hardness between 0.28° dH and 8.4° dH.

NEW CALEDONIA

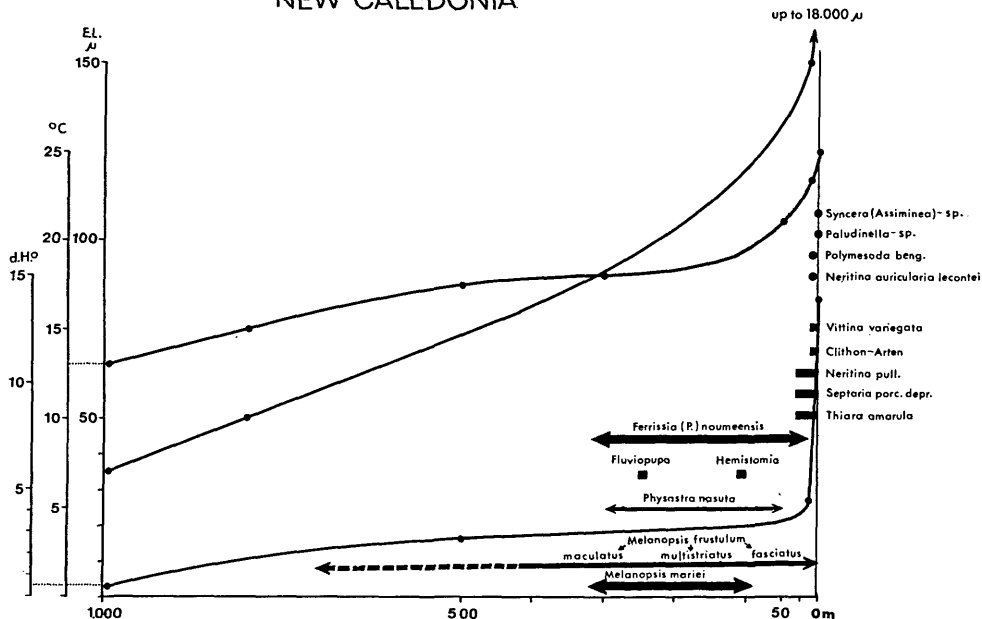


Fig. 5. Diagram showing temperature, hardness degree and electrolytic conductivity of the running waters correlated with the longitudinal distribution of the freshwater gastropods and bivalves between headwaters and the mouth of mountain streams of New Caledonia (temperature in °Celsius; Total hardness in °dH (German hardness degree); Electrolytic conductivity (El_{20}) in μ Siemens (at 20° Celsius) (After STARMÜHLNER, 1979b).

Checklist of the Fauna of Mountain Island streams: Continental Islands of the Indian Ocean

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
<i>Turbellaria</i> <i>Tricladida</i>	<i>Dugesia milloti</i>	<i>Dugesia</i> aff. <i>gonocephala</i>	<i>Dugesia</i> <i>nannophallus</i>	<i>Dugesia</i> <i>andamanensis</i>
Amphipoda	<i>Austroniphargus</i> (endem. genus and species: <i>subterraneus</i>)	—	—	—
Decapoda Reptantia	<i>Astacoides</i> <i>madagascariensis</i> (end.)	—	—	—
Natantia Caridea	2 gen: <i>Caridina</i> , <i>Atya</i> (22, partly end. species)	<i>Caridina</i> (5 species)	<i>Caridina</i> (4 species) <i>Atya spinipes</i>	<i>Caridina</i> (6 species) <i>Atya spinipes</i> ;

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
Palaemonidae	<i>Macrobrachium</i> (5 species)	<i>Macrobrachium</i> (2 species)	<i>Macrobrachium</i> (3 species)	<i>Macrobrachium</i> (5 species)
Brachyura	<i>Bottia</i> (3 end. species) <i>Hydrotelphusa</i> <i>agilis</i> ;	<i>Sesarma impressa</i>	<i>Paratelphusa</i> (2 species)	<i>Labuania finni</i> ; <i>Geosesarma</i> <i>starmühlneri</i> ; <i>Varuna litterata</i> ;
Hydracarina	<i>Atractides</i> <i>madagascariensis</i> <i>Torrenticola</i> ssp; <i>Arrenurus</i> ssp.; (most species end.)	?	<i>Atractides</i> <i>schwoerbeli</i> ; <i>Torrenticola pusta</i> ; <i>T. oxystomata</i> <i>hamata</i> ; <i>Arrenurus</i> <i>maderassi</i> ;	<i>Atractides</i> <i>angulipalpis</i> ; <i>Hydrodroma</i> <i>monticola</i> ;
Insecta Ephemero- ptera	20, mostly endemic genera and more than 50 end. species of the families: Baetidae; Lepto- phlebiidae, Heptageniidae, Oligoneuridae; Pro- sopistomatidae: <i>Proboscidiplodia</i> <i>sikorai</i> (endemic);	<i>Maheathraulius</i> <i>scotti</i> ; <i>Hagenulodes</i> <i>braueri</i> (endemic)	More than 20, most- ly endemic gen- era and about 50 end. species of the families: * Lepto- phlebiidae (<i>Kimminsula</i> , <i>Chloroterpes</i> , <i>Megaglena</i> , <i>Isaca</i>); Baetidae (<i>Baetis</i> , <i>Cloeon</i> , <i>Indo-</i> <i>baetis</i> , <i>Indo-</i> <i>cloeon</i> , <i>Pro-</i> <i>cloeon</i> , <i>Pseudo-</i> <i>cloeon</i>); Caenidae (<i>Caenis</i> , <i>Clypeocaenis</i>); Ephemerellidae (<i>Telaganodes</i>); Ephemeridae (<i>Emphemera</i>); Heptageniidae (<i>Componeuriella</i>); Oligoneuridae (<i>Chromarcys</i>); Polymitarcyidae (<i>Povilla</i> , <i>Ephoron</i>);	Baetidae, Lepto- phlebiidae (<i>Chloroterpes</i> , <i>Afronurus</i>); <i>Caenidae</i> , <i>Hep-</i> <i>tageniidae</i> , <i>Po-</i> <i>villa andamanensis</i>

* After HUBBARD, M. D. & W. L. PETERS, Ephemeroptera in Sri Lanka: An introduction to their ecology and biogeography. Monographiae Biologicae. Vol. 57: Ecology and Biogeography in Sri Lanka. Dr. W. JUNK Publ., 1948. The Hague.

MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS	
		Prosopistomatidae (<i>Prosopistoma</i>); Tricorythidae (<i>Neurocaenis</i>);		
Plecoptera	2 genera (end) 5 species (end.) (<i>Madenemura</i> , <i>Tsarenemura</i>)	absent!	2 genera and 3 species endem. <i>Neoperla angu-</i> <i>lata</i> ; <i>triangulata</i> ; <i>Phanoperla</i> sp.	absent!
Odonata Zygoptera	Many, partly en- demic genera and endemic species (<i>Pseudagrion</i> , <i>Nesolestes</i> , <i>Tato-</i> <i>cnemis</i> , <i>Oerigrion</i> and others)	Coenagrionidae; <i>Leptocnemis</i> ssp.	9 genera, 12 species (partly endemic): <i>Lestes elata</i> ; <i>Euphaea splendens</i> ; <i>Libellago greeni</i> ; <i>L.</i> <i>finalis</i> ; <i>Neurobasis</i> <i>chin. ch.</i> ; <i>Dre-</i> <i>panosticta</i> sp.; <i>Elatoneuris tenax</i> ; <i>E. centralis</i> ; <i>Pro-</i> <i>dasineura sita</i> ; <i>Ves-</i> <i>talis apicalis</i> ; <i>V.</i> <i>nigescens</i> ; <i>Copera</i> <i>marginipes</i> ;	3 genera; 3 species; <i>Ischnura</i> <i>senegalensis</i> ; <i>Agriocnemis</i> sp.; <i>Copera</i> <i>marginipes</i> ;
Anisoptera	6 genera and more than 6 endemic species: <i>Paragom-</i> <i>phus ob-</i> <i>literatus</i> ; <i>Nesocordulia</i> ssp.; <i>Zygonyx hova</i> ; <i>Z.</i> <i>ranavalonae</i> ; <i>Or-</i> <i>thetrum</i> sp.; <i>Trithemis</i> sp.	5 genera and 5 mostly endemic species: <i>Zygonyx luctifera</i> ; <i>Orthetrum stem-</i> <i>male</i> ; <i>Pantala</i> <i>flavescens</i> ; <i>Rhyo-</i> <i>themis semihyalina</i> ; <i>Gynacantha stylata</i> ;	7 genera and 8 mostly endemic species: <i>Zygonyx iris cey-</i> <i>lanica</i> ; <i>Trithemis</i> <i>festiva</i> ; <i>Tr. aurora</i> ; <i>Macromia zeylani-</i> <i>ca</i> ; <i>Heliogomphus</i> sp.; <i>Megalogom-</i> <i>phus ceylonicus</i> ; <i>Pa-</i> <i>ragomphus henryi</i> ; <i>Microgomphus wi-</i> <i>jaya</i> ;	6 genera, 8 species: <i>Trithemis</i> <i>festiva</i> ; <i>Tr. pallidinervis</i> ; <i>Orthetrum sabina</i> ; <i>Or. chrysis</i> ; <i>Neurothemis</i> <i>fluctuans</i> ; <i>Crocothemis</i> <i>servilia</i> ; <i>Pantala</i> <i>flavescens</i> ; <i>Diplacodes</i> <i>trivalis</i> ;
Trichoptera	More than 20 ge- nera with about 100, mostly en- demic species: <i>Hydropsyche</i> ; <i>Mac-</i> <i>ronema</i> ; primitive Leptoceridae; <i>Lep-</i>	5 genera and 6 en- demic species: <i>Hydromanicus</i> <i>seychellensis</i> ; <i>Helicopsyche pal-</i> <i>palis</i> ; <i>H. kantilai</i> ; <i>Ecnomus insularis</i> ;	More than 25 ge- nera with about 100, mostly en- demic species: <i>Apsilochroma</i> ; <i>Sy-</i> <i>nagapetus</i> ; <i>Hydrop-</i> <i>tila</i> ; <i>Oxyethira</i> ;	12 genera, 19 en- demic species: <i>Ecnomus</i> ; <i>Paduniel-</i> <i>la</i> ; <i>Polyplectropus</i> ; <i>Agapetus</i> ; Polycen- tropidae gen. ssp.; <i>Oecetis</i> ; <i>Setodes</i> ;

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
	<i>tonema</i> ; <i>Oecetis</i> ; <i>Polycentropus</i> ; <i>Ec-</i> <i>nomus</i> ; <i>Wormaldia</i> ; <i>Helicopsyche</i> ; <i>Cheumatopsyche</i> ; <i>Orthotrichia</i> ; <i>Pet-</i> <i>rothrinchus</i> ; <i>Psychomyia</i> ; <i>Lep-</i> <i>tocella</i> ; <i>Chimarra</i> ; <i>Anisocentropus</i> ; <i>Agapetus</i> ; Odon- toceridae, Hydop- tilidae;	<i>Leptodematopteryx</i> <i>tenuis</i> ; <i>Hughscotiel-</i> <i>la auricapilla</i> ;	<i>Pseudoneuroclepsis</i> ; <i>Ecnomus</i> ; <i>Paduniel-</i> <i>la</i> ; <i>Marilia</i> ; <i>Molan-</i> <i>na</i> ; <i>Trichosetodes</i> ; <i>Oecetis</i> ; <i>Setodinella</i> ; <i>Goerodes</i> ; <i>Helico-</i> <i>psyche</i> ; <i>Chimarra</i> ; <i>Gunungiella</i> ; <i>Pseudoleptroma</i> ; <i>Hydropsyche</i> ; <i>Di-</i> <i>plectronema</i> ; <i>Mac-</i> <i>ronema</i> ; <i>Synapto-</i> <i>psyche</i> ; <i>Ceylano-</i> <i>psyche</i> ; <i>Oestro-</i> <i>psyche</i> ;	<i>Goerodes</i> ; <i>Chimar-</i> <i>ra</i> ; <i>Cheumatop-</i> <i>syche</i> ; <i>Leptocerus</i> ;
Orthoptera	–	–	<i>Paranemobius</i> <i>pictus</i> ; <i>Euscelimena</i> <i>gavialis</i> ; <i>Rhabdoblatta</i> sp. juv.;	<i>Eucroioëttix</i> <i>edithae</i> ;
Heteroptera Rhyncho-	23 genera with ab- out 38 endemic species: <i>Agraptocorixa</i> ; <i>Si-</i> <i>gara</i> , <i>Micronecta</i> ; <i>Enithares</i> ; <i>Anisops</i> ; <i>Laccotrephes</i> ; <i>Ranatra</i> ; <i>Sphaerodema</i> ; <i>Tenagenous</i> ; <i>Gerris</i> ; <i>Limnogonus</i> ; <i>Eury-</i> <i>metra</i> , <i>Rhagovelia</i> ; <i>Microvelia</i> ; <i>Mesovelia</i> ; <i>Milotel-</i> <i>la</i> ; <i>Hydrometra</i> ; <i>Pseudambrysus</i> , <i>Naucoris</i> ; <i>Mac-</i> <i>rocoris</i> ; <i>Heleocoris</i> ; <i>Temnocoris</i> ; <i>Heb-</i> <i>rus</i> (<i>Paratimasius</i>);	Gerridae; Veliidae; Nepidae; Notonectidae; (Not determi- nated at present)	24 genera with 39 endemic species: <i>Limnogonus</i> ; <i>Met-</i> <i>rocoris</i> ; <i>Onycho-</i> <i>trechus</i> ; <i>Ptilomera</i> ; <i>Rhematogonus</i> ; <i>Ventidius</i> ; <i>Cylin-</i> <i>drostenus</i> ; <i>Tenagogonus</i> ; <i>Strongyvelia</i> ; <i>Mic-</i> <i>rovelia</i> ; <i>Pseudovelia</i> ; <i>Rhagovelia</i> ; <i>Xiphovelia</i> ; <i>Tet-</i> <i>raris</i> ; <i>Di-</i> <i>plonychus</i> ; <i>Aphelocheirus</i> ; <i>Heleocoris</i> ; <i>Cer-</i> <i>cometus</i> ; <i>Enithares</i> ; <i>Ochterus</i> ; <i>Hyd-</i> <i>rometra</i> ; <i>Timasius</i> ; <i>Hydrotrepes</i> ; <i>Tiphotrephes</i> ;	Gerridae (<i>Tenago-</i> <i>gonus nicobarensis</i> , <i>Limnogonus niti-</i> <i>mus</i> , <i>L. fossarum</i> , <i>Ptilomera harpyia</i> , <i>Calypptobates</i> n. gen., n. sp.); Veliidae (<i>Neo-</i> <i>alardus typicus</i> , <i>Mi-</i> <i>crovelia douglasi</i> , <i>Strongyvelia</i> sp., <i>Rhagovelia anda-</i> <i>mana</i> Rh. <i>suma-</i> <i>trensis</i>); Mesoveliidae (<i>Me-</i> <i>sovelia vittigera</i>); Nepidae (<i>Ranatra</i> <i>parmata</i> , <i>R. distan-</i> <i>ti</i> , <i>Laccotrephes</i> sp.); Notonectidae (<i>Eni-</i> <i>thares rogersi</i> , <i>Ani-</i> <i>sops bouvieri</i> , <i>A.</i> <i>nivea</i>); Hydrometridae (<i>Hydrometra main-</i> <i>droni</i>)

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
Lepidoptera	genus and species endemic: Pyrilidae gen. ssp.	—	genus and species endemic: Pyrilidae: <i>Aulacodes</i> ssp.	genus and species endemic: Pyrilidae: <i>Aulacodes</i> ssp.
Coleoptera Dytiscidae	14 genera with 20 endemic spec.: <i>Canthydrus</i> ; <i>Laccophilus</i> ; <i>Guignotus</i> ; <i>Neptosternus</i> ; <i>Herophydrus</i> ; <i>Pachynectes</i> ; <i>Hyphydrus</i> ; <i>Copelatus</i> ; <i>Rhantus</i> ; <i>Hydaticus</i> ; <i>Eretes</i> ; <i>Rhantaticus</i> ; <i>Cybister</i> ; <i>Hydrovatus</i> ;	?	6 genera with more than 10 (end.) species in streams: <i>Guignotus flam- mulatus</i> ; <i>Canthyd- rus luctuosus</i> ; <i>Laccophilus cey- lon.</i> ; <i>L. chinensis</i> <i>inefficiens</i> ; <i>Neptos- ternus horai</i> ceyl.; <i>N. starmuehlneri</i> ; <i>N. taprobanicus</i> ; <i>N.</i> <i>sp.</i> ; <i>Lacconnectus si- moni</i> ; <i>Hydaticus</i> <i>luczonicus</i> ;	From 12 genera and 25 species known in streams: <i>Hydrovatus contor- tus</i> ; <i>H. acuminatus</i> ; <i>H. ferrugatus</i> ; <i>H.</i> <i>fuscus</i> ; <i>Guignotus</i> <i>orientalis</i> ; <i>G. incon- stans</i> ; <i>Uvarus livens</i> ; <i>Hydrocoptus subvit- tulus</i> ? <i>Canthydrus</i> <i>morsbachi</i> ; <i>Laccophilus chinen- sis</i> ; <i>L. parvulus</i> ; <i>Copelatus tene- brosus</i> ; <i>Hydaticus</i> <i>vaziranii</i> ; <i>Cybister</i> <i>tripunctatus</i> <i>asiaticus</i> ;
Hydrophi- lidae	10 genera with ab- out 14 endemic species: <i>Hydraena</i> ; <i>Anacaena</i> ; <i>Helochaeres</i> ; <i>Hydrobaticus</i> ; <i>Berosus</i> ; <i>Allecotocerus</i> ; <i>Regimbertia</i> ; <i>Enochrus</i> ; <i>Amphiops</i> ; <i>Sternolophus</i> ;	?	5–6 genera with 7–8 species (partly endem.) in streams: <i>Berosus indicus</i> ; <i>Ooclys latus</i> ; <i>Helochaeres</i> sp. <i>Paracymus</i> sp. <i>Anacaena</i> sp. <i>Pelthydrus</i> ssp. further also <i>Hydraena tubuliphallis</i> ;	found, but not de- terminated at present!
Elmidae and Dryopidae	about 15, mostly en- demic genera and more than 30 en- dem. species: <i>Potamophilinus</i> ; <i>Potamodytes</i> ; <i>Potamolatrex</i> ; <i>Pseudelmidolia</i> ; <i>Pachelmis</i> ; <i>El-</i>	?	15, mostly endemic genera with 33 endemic species: <i>Potamophilinus</i> (4 species); <i>Stenelmis</i> (2 spec.); <i>Ordobrevia</i> (2 spec.); <i>Leptelmis</i> (1 spec.);	?

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
	<i>midolia</i> ; <i>Aspidelmis</i> ; <i>Hydretus</i> ; <i>Exolimnius</i> ; <i>Lobelmis</i> ; <i>Helmintocharis</i> ; <i>Pachyelmis</i> ; <i>Elmiinae</i> gen. ssp. <i>Dryops</i> sp.		<i>Graphelmis</i> (1 spec.); <i>Unguisaeta</i> (1 spec.); <i>Ilamelmis</i> (4 spec.); <i>Cephalolimnius</i> (1 spec.); <i>Podelmis</i> (10 spec.); <i>Ohiya</i> (1 spec.); <i>Aesobia</i> (1 spec.); <i>Taprobanelmis</i> (1 spec.); <i>Zaitzeviaria</i> (2 spec.); <i>Ceradryops</i> (1 spec.); <i>Elmomorphus</i> (1 spec.);	
Helodidae	<i>Hydrocyphon</i> sp.	?	<i>Hydrocyphon atratus</i> ;	?
Psephenidae	—	—	<i>Eubrianax</i> with probably 5 species; only the larvae in streams!	Psephenidae gen. sp.
Lampyridae	—	—	<i>Luciola</i> or <i>Pyrophanes</i> sp.; only the larvae in streams!	—
Haliplidae	<i>Peltodytus</i> sp.	?	?	?
Spercheidae	<i>Spercheus</i> sp.	?	?	?
Sphaeri- diidae	<i>Coelostoma</i> sp. larvae	—	—	—
Ptilo- dactylidae	<i>Ptilodactylus</i> sp. larvae	—	—	—
Gyrinidae	4 genera with 13, endemic species: <i>Dineutus</i> ; <i>Au- lonogyrus</i> ; <i>Orec- togyrus</i> ; <i>Gyrinus</i> ;	?	2 genera, more than 10, partly en- demic species: <i>Aulonogyrus</i> ; <i>Orectochilus</i> ;	<i>Orectochilus andamanarum</i> ; <i>O. andamanensis</i> (both. endem.) <i>Gyrinus smaragdinus</i> ;

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
Megaloptera Sialidae	<i>Madachauliodes torrentiales</i> (endemic)	—	?	—
Diptera Simuliidae	1 genus with about 15, mostly en- demic species: <i>Simulium</i> ;	<i>Simulium speculiventre</i>	1 genus with 5 sub- genera and 13 en- demic spec.: <i>Simulium</i> (<i>Gom- phostilbia</i> , <i>Eusimulium</i> <i>Simulium</i> , <i>Morops</i> , <i>Byssodon</i>)	<i>Simulium striatum</i> -gr.; <i>S. consimilis</i> ; <i>S. (Gomphostilbia)</i> <i>zonatum</i> ;
Blephari- ceridae	2 endemic genera, 9 endemic species: <i>Eupauliana</i> ; <i>Pauliana</i> ;	—	endemic genera and species (not described at present)	—
Culicidae	5 genera and about 20 mostly en- demic species: <i>Anopheles</i> ; <i>Ficalbia</i> (<i>Mimomya</i>); <i>Culex</i> (<i>Lutria</i>); <i>Aedomyia</i> ;	?	<i>Aedes lineatus</i>	?
Stratiomyidae	larvae present	?	?	?
Limoniidae	<i>Eriocera</i> sp., <i>Limonia tipulipes</i> ;	<i>Limonia</i> sp.;	<i>Limonia</i> sp.;	?
Rhagionidae	<i>Atherix</i> sp.	?	?	?
Empididae	present (larvae)	?	?	?
Psychodidae	larvae present	?	?	?
Tipulidae	larvae of 4 species found, not deter- minated at pre- sent	?	?	?

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
Chironomidae	Many endemic genera and species; not determined at present	<i>Cricotopus</i> ; <i>Rheocricotopus</i> ; <i>Cardiocladius</i> ; <i>Endochironomus</i> ; <i>Dicrotendipes</i> ; Pentaneurini;	Orthoclaadiinae: many genera and species, not determined at present; <i>Rheotanytarsus</i> ssp.	<i>Larsia</i> sp.; <i>Cricotopus</i> ssp.; <i>Procladius</i> ssp.; Chironomini gen. ssp.; not determined at present;
Mollusca Gastropoda Prosobranchia	12 genera, partly endemic and 20 partly endemic species: <i>Clithon</i> ; <i>Neritina</i> (<i>Neripteron</i>); <i>N. (Vittina)</i> ; <i>Neritina (Neritina)</i> ; <i>Neritilia</i> ; <i>Septaria</i> ; <i>Hydrocena</i> ; <i>Lanistes</i> ; <i>Pila</i> ; <i>Omphalotropis</i> ; <i>Thiara</i> ; <i>Melanataria</i> ; <i>Cleopatra</i> ; <i>Melanoides</i> , (<i>Melanoides</i>);	4 genera, one species endemic: <i>Neritina (Vittina)</i> ; <i>Neritina (Neritina)</i> ; <i>Neritilia</i> ; <i>Cleopatra</i> ;	10 genera (1 sub-genus end.), 21 partly endemic species: <i>Neritina</i> (<i>Neripteron</i>); <i>Septaria</i> ; <i>Paludomus</i> (<i>Philopotamus</i>); <i>P. (Tanalia)</i> ; <i>P. (Paludomus)</i> ; <i>Tricula</i> ; <i>Thiara</i> ; <i>Melanoides</i> (<i>Melanoides</i>); <i>Melanoides</i> (<i>Stenomelania</i>); <i>Faunus</i> ; <i>Bithynia</i> ; <i>Gangetia</i> ; <i>Syncera</i> ; (Fig. 4)	4 genera, 8 species: <i>Clithon</i> ; <i>Neritina</i> (<i>Neripteron</i>); <i>Melanoides (Mel.)</i> <i>M. (Stenomelania)</i> ;
Pulmonata	<i>Lymnaea (Radix)</i> ; <i>Bulinus</i> ; <i>Anisus</i> ; <i>Afrogyrus</i> (<i>Hovorbis</i>); <i>Segmentorbis</i> ; <i>Biomphalaria</i> ; <i>Ferrissia</i> (<i>Pettancylus</i>);	<i>Lymnaea (Radix)</i> ; <i>Gyraulus</i> ;	<i>Lymnaea (Radix)</i> ; <i>Gyraulus</i> ; <i>Indoplanorbis</i> ; <i>Ferrissia</i> (<i>Pettancylus</i>);	<i>Lymnaea (Radix)</i> ; <i>Indoplanorbis</i> ;
Bivalvia	4 genera with 7 partly endemic species: <i>Aetheria</i> ; <i>Unio</i> ; <i>Nodularia</i> ; <i>Corbicula</i> ; <i>Pisidium</i> ;	—	4 genera with 7 partly endemic species: <i>Lamellidens</i> ; <i>Parreyssia</i> ; <i>Polymesoda</i> ; <i>Pisidium</i> ;	<i>Polymesoda</i> ;

	MADAGASCAR	SEYCHELLES	SRI LANKA (Fig. 3)	ANDAMANS
Vertebrata	KIENER (1966)*	<i>Pachypanchax</i>	In mountain	6 genera with
Pisces	has noted 19 genera and 32 species as endemic in Madagascar. In mountain streams are found: <i>Agonostomus telfairi</i> , <i>Sicyopterus fasciatus</i> ; <i>Pachypanchax playfairi</i> var. <i>sakarami</i> ; species of the genera: <i>Bedotia</i> ; <i>Rheocles</i> ; <i>Rheocloides</i> ; <i>Ancharius</i> ; <i>Typhleotris</i> ; <i>Anguilla</i> ; <i>Acentrogobius</i> ; <i>Oxylapia</i> ; <i>Oryzias</i> ; <i>Batrachus</i> ; (many species restricted to distinct areas!)	<i>playfairi</i> (endemic)	streams 17 genera with 23 species, partly end.: <i>Danio</i> ; <i>Rasbora</i> ; <i>Chela</i> ; <i>Barbus</i> ; <i>Garra</i> ; <i>Noemacheilus</i> ; <i>Lepidocephalus</i> ; <i>Xenotodon</i> ; <i>Anguilla</i> ; <i>Aplocheilus</i> ; <i>Poecilia</i> ; <i>Xiphophorus</i> ; <i>Channa</i> ; <i>Ophiocephalus</i> ; <i>Glossogobius</i> ; <i>Belontia</i> ; <i>Macrognaethus</i> ;	6 spec.: <i>Aplocheilus</i> ; <i>Ophiocephalus</i> ; <i>Clarias</i> ; <i>Heteropneustes</i> ; <i>Eleotris andamanensis</i> (end.); <i>Doryichtys</i> sp. (end.)
Reptilia	—	—	<i>Natrix piscator</i> ; <i>Cerberus rhynchops</i> ;	<i>Natrix piscator</i> ; <i>Cerberus rhynchops</i> ;

*) KIENER, A., 1966. — Contribution à la biogéographie de quelques espèces ichtyozoogiques malgaches. Compt. Rendu Samm. d. Séances de la Soc. de Biogéographie. No. 373–374: 3–18.

Checklist of the Fauna of Mountain streams of Oceanic (Volcanic) Islands of the Indian Ocean

	COMOROS ANJOUAN	MASCARENES LA RÉUNION	MAURITIUS
Porifera	—	<i>Eunapius</i> sp.;	<i>Eunapius michaelensi</i> ; <i>Eunapius carteri</i> ;
Turbellaria Tricladida	<i>Dugesia milloti</i> ;	<i>Dugesia</i> aff. <i>gonocephala</i> ;	<i>Dugesia</i> aff. <i>gonocephala</i> ;

	COMOROS ANJOUAN	MASCARENES LA RÉUNION	MAURITIUS
Oligochaeta	<i>Dero (Aulophorus)</i> <i>hymanae</i> ;	?	<i>Limnodrilus</i> <i>hoffmeisteri</i> ;
Decapoda	3 genera with 5 species:	3 genera with 5 species:	3 genera with 9 species:
Natantia	<i>Caridina</i> ;	<i>Caridina</i> ;	<i>Caridina</i> ;
Caridea	<i>Atya</i> ; <i>Macrobrachium</i> ;	<i>Atya</i> ; <i>Macrobrachium</i> ;	<i>Atya</i> ; <i>Macrobrachium</i> ;
Palaemonidae			
Brachyura	–	<i>Varuna litterata</i> (only lower courses);	<i>Varuna litterata</i> (only lower courses);
Insecta	Baetidae gen. ssp.	Baetidae gen. ssp.	absent!
Ephemeroptera	<i>Prosopistoma</i> sp. <i>Chloroterpes</i> ; <i>Thraulius</i> ; (both with endem. species)	Leptophlebiidae gen. ssp. (not determinated at present)	
Plecoptera	absent!	absent!	absent!
Odonata	<i>Pseudagrion</i> <i>pontogenes</i> ;	<i>Pseudagrion</i> <i>puctum</i> ; <i>Ceriagrion</i> <i>glabrum</i> ;	Zygoptera gen. sp. (not determinated at present)
Zygoptera			
Anisoptera	<i>Trithemis kirbyi ardens</i> ; <i>Tr. arteriosa</i> ; <i>Zygonyx torrida</i> ; <i>Orthetrum julia</i> <i>falsum</i> ;	Anisoptera gen. ssp. <i>Anax imperator</i> ;	<i>Trithemis annulata</i> ; <i>Zygonyx</i> sp.; <i>Orthetrum stemmale</i> ; <i>Thalassothemis</i> <i>marchali</i> ; <i>Diplacodes</i> sp.;
Trichoptera	Hydropsychidae gen. ssp.; Sericostomatidae gen. ssp.; Lepidostomatidae gen. ssp.; not determinated at present!	Hydropsychidae gen. ssp.; Hydroptilidae gen. ssp.;	Hydropsychidae gen. ssp. Hydroptiliidae gen. ssp.
Lepidoptera	–	–	cf. <i>Aulacodes</i> sp.
Heteroptera	Veliidae gen. ssp.	Veliidae gen. ssp.	Veliidae gen. ssp.
Rhynchota	Gerridae gen. ssp.	Gerridae gen. ssp.	Gerridae gen. ssp.
	Ranatridae gen. ssp.		Ranatridae gen. ssp.
	Nepidae gen. ssp.		Nepidae gen. ssp.
	Naucoridae gen. ssp. not determinated at present!		

	COMOROS ANJOUAN	MASCARENES LA RÉUNION	MAURITIUS
Coleoptera Dytiscidae	<i>Hyphydrus distinctus</i> ; <i>Laccophilus tigrinus</i> ;	<i>Hyphydrus distinctus</i> ; <i>Laccophilus irroratus</i> ; <i>Guignotus strigicollis</i> ; <i>G. lobatus</i> ;	<i>Hyphydrus scriptus</i> ; <i>Herophydrus vittatus</i> ; <i>Hydaticus bivittatus</i> ; <i>Cybister desjardinsi</i> ;
Hydrophilidae	<i>Sternolophus solieri</i> ;	<i>Dactylosternum</i> sp.; <i>Laccobius</i> -species (endem.); <i>Paracymus chaldeus</i> ; <i>Berosus vinosi</i> ;	Hydrophilidae gen. ssp. not determinated at present!
Elmidae and Dryopidae	<i>Potamodytes africanus</i>	?	?
Hydraenidae	?	<i>Sicilicula borbonica</i> (endemic)	?
Gyrinidae	<i>Orectogyrus speculum</i> ; <i>Dineutus sinusipennis comorensis</i> (endemic);	<i>Dineutus indus olivaceus</i> ; <i>D. aereus</i> ;	<i>Gyrinus nitidulus</i> ; <i>Dineutus indus indus</i> ; <i>D. aereus</i> ; <i>D. subspinosus</i> ;
Diptera Simuliidae	Simuliidae gen. ssp. not determinated at present!	Simuliidae gen. ssp.	Simuliidae gen. ssp.
Limoniidae	<i>Limonia comorensis</i> ; (endemic)	<i>Limonia</i> sp.	—
Chironomidae	Orthoclaadiinae gen. ssp.; Chironomini gen. ssp.; <i>Rheotanytarsus</i> sp.; not determinated at present!	Orthoclaadiinae: <i>Cricotopus</i> ; <i>Rheocricotopus</i> ; <i>Eukiefferiella</i> ; <i>Smittia</i> ; <i>Cardiocladius</i> ; <i>Rheotanytarsus</i> , <i>Tanytarsus</i> ; <i>Chironomus</i> ; <i>Dicrotendipes</i> ; <i>Polypedilum</i> ;	Orthoclaadiinae: <i>Cricotopus</i> ; <i>Rheocricotopus</i> ; <i>Eukiefferiella</i> ; <i>Tanytarsus</i> ; <i>Dicrotendipes</i> ; <i>Polypedilum</i> ; <i>Cryptochironomus</i> ;
Rhagionidae	?	Rhagionidae gen. ssp.; (larvae)	?
Ephydriidae	?	Ephydriidae gen. ssp.; (larvae)	?

	COMOROS ANJOUAN	MASCARENES LA RÉUNION	MAURITIUS
Mollusca	5 genera with 6 spec.:	7 genera with 7 spec.:	8 genera with 9 spec.:
Gastropoda	<i>Neritina</i> (<i>Vittina</i>);	<i>Neritina</i> (<i>Vittina</i>);	<i>Neritina</i> (<i>Vittina</i>);
Prosobranchia	<i>N.</i> (<i>Neritina</i>);	<i>Clithon</i> ; <i>Septaria</i> ;	<i>Neritina</i> (<i>Neripteron</i>);
	<i>Clithon</i>	<i>Neritilia</i> ;	<i>Clithon</i> ;
	(with endemic species)	<i>Omphalotropis</i> (end.);	<i>Neritilia</i> ;
	<i>Septaria</i> ; <i>Neritilia</i> ;	<i>Melanoides</i> (<i>Melan.</i>);	<i>Omphalotropis</i> ;
	<i>Melanoides</i> (<i>Melanoides</i>);	<i>Thiara</i> ;	<i>Melanoides</i> (<i>Mel.</i>);
			<i>Thiara</i> ;
			<i>Bellamya</i> ;
Pulmonata	2 genera with 2 spec.:	4 genera with 4 spec.:	3 genera with 3 spec.:
	<i>Lymnaea</i> (<i>Radix</i>);	<i>Lymnaea</i> (<i>Radix</i>);	<i>Lymnaea</i> (<i>Radix</i>);
	<i>Ceratophallus</i> ;	<i>Ferrissia</i> (<i>Pettancylus</i>);	<i>Physa</i> ;
		<i>Physa</i> ;	<i>Gyraulus</i> ;
		<i>Helisoma duryi</i>	
		(introduced)	
Vertebrata	<i>Sicyopterus</i>	<i>Sicyopterus</i>	<i>Sicyopterus</i>
Pisces	<i>lagocephalus</i> ;	<i>lagocephalus</i> ;	<i>lagocephalus</i> ;
			<i>Anguilla</i> ;
			(introduced:
			<i>Gambusia</i> ;
			<i>Poecilia</i> (<i>Lebistes</i>);
			<i>Xiphophorus</i>);
Amphibia	–	introduced:	introduced:
		<i>Bufo regularis</i>	<i>Bufo regularis</i>
		(tadpoles)	(tadpoles)

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Porifera	<i>Ephydatia multidentata</i> ;
Turbellaria	<i>Dugesia pinguis</i> ;
Tricladida	
Amphipoda	<i>Orchestia</i> (with 2 endemic species) – ripicoll; <i>Talitrus</i> (one endemic species)
Decapoda	4 genera with 11, partly endemic species:
Natantia	<i>Atya</i> ; <i>Paratya</i> ; <i>Caridina</i> ;
Caridea	
Palaemonidae	genus <i>Macrobrachium</i> ;
Oligochaeta	genera <i>Nais</i> and <i>Limnodrilus</i> with ubiquitous species;

Diptera Simuliidae	<i>Simulium neornatipes</i> ;
Hirudinea	<i>Glossosiphonia novocaledoniae</i> (species endemic);
Hydracarina	genus <i>Aspidiobates</i> with 5 endemic species;
Insecta Ephemeroptera	Represented only by the family of Leptophlebiidae with 7 endemic genera and 10 endemic species (and some subspecies): <i>Lepeorus</i> ; <i>Lepegenia</i> ; <i>Celiphlebia</i> ; <i>Tindea</i> ; <i>Peloracantha</i> ; <i>Coula</i> ;
Plecoptera	absent!
Odonata Zygoptera	8, partly endemic genera with 14 endemic species: <i>Lestes</i> ; <i>Caledopteryx</i> ; <i>Agriolestes</i> ; <i>Caledagriolestes</i> ; <i>Trineuragrion</i> ; <i>Ischnura</i> ; <i>Agriocnemis</i> ; <i>Isosticta</i> ;
Anisoptera	6, partly endemic genera with 12 partly endemic species: Libellulidae gen. ssp.; Corduliidae gen. ssp.; <i>Synthemis</i> ; <i>Orthetrum</i> ; <i>Diplacodes</i> ; <i>Hemicordulia</i> ;
Trichoptera	With exception of the genus <i>Helicopsyche</i> with 12 endemic species (dominant: <i>H. lapidaria</i>) (not determinated at present; other families with endemic genera and species: Phycophilidae; Leptoceridae; Hydropsychidae: all are very frequent in mountain streams!
Coleoptera Dytiscidae	<i>Hydaticus goryi</i> ; <i>Macroporus</i> sp.;
Hydrophilidae	<i>Stethoxus australis</i> ; Berosini gen. ssp.;
Helodidae	Helodidae gen. ssp.; not determinated at present.
Dryopidae	Dryopidae gen. ssp.; not determinated at present.
Gyrinidae	4 genera with 5, partly endemic species: <i>Gyrinus</i> ; <i>Aulonogyrus</i> ; <i>Macrogyrus</i> (genus endemic); <i>Dineutus</i> ;
Blephariceridae	3, partly endemic genera with 5 endemic species: <i>Austriacurupira</i> (<i>Curupirina</i>); <i>Nesocurupira</i> (endemic); Paltostominae gen. ssp.;
Culicidae	<i>Culex millironi</i> ;
Chironomidae	Orthoclaadiinae gen. ssp. (many genera and species!); cf. <i>Rheotanytarsus</i> ssp.; all found larvae not determinated at present!
Limoniidae	3 genera with some endemic species: <i>Dicranomyia</i> ; <i>Ormosia</i> ; <i>Rhamphidia</i> ;
Dixidae	cf. <i>Dixa</i> ssp.;
Sciomycidae	<i>Tetanocera</i> ssp.;
Muscidae	<i>Limnophora</i> ssp.;

Diptera Simuliidae	<i>Simulium neornatipes</i> ;
Tabanidae	<i>Tabanus</i> ssp.
Heteroptera Rhynchotha	10 genera with 14, mostly endemic species: <i>Limnogonus</i> ; <i>Halovelia</i> ; <i>Microrovelia</i> ; <i>Rhagovelia</i> ; <i>Mesovelia</i> ; <i>Hydrometra</i> ; <i>Valleriola</i> ; <i>Sigara</i> ; <i>Anisops</i> ; <i>Enithares</i> ;
Mollusca Gastropoda Prasobranchia (Fig. 5)	14, partly endemic genera with 23, partly endemic species: <i>Clithon</i> ; <i>Neritodryas</i> ; <i>Neritina</i> (<i>Neripteron</i>); <i>Neritina</i> (<i>Vittina</i>); <i>Neritina</i> (<i>Neritina</i>); <i>Septaria</i> ; <i>Heterocyclus</i> ; <i>Fluviopupa</i> ; <i>Hemistomia</i> ; <i>Assimineia</i> ; <i>Paludinella</i> ; <i>Melanopsis</i> ; <i>Melanoides</i> (<i>Melanoides</i>); <i>Melanoides</i> (<i>Stenomelania</i>); <i>Thiara</i> .
Pulmonata (Fig. 5)	3 genera with 4 endemic species: <i>Physastra</i> (<i>Physastra</i>); <i>Ph.</i> (<i>Glyptophysa</i>); <i>Gyraulus</i> ; <i>Ferrissia</i> (<i>Pettancylus</i>);
Bivalvia (Fig. 5)	<i>Polymesoda bengalensis</i> f. <i>sublobata</i> (in the mouthregion);
Pisces	One endemic genus and species: <i>Neogalaxias novaecaledoniae</i> (only in the south of the island in the lakes and affluents!) All other freshwater-fishes are introduced!

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