VIERAEA	**Vol. 32**	7-27	Santa Cruz de Tenerife, diciembre 2004	ISSN 0210-945X

Pelagic amphipods from the Cape Verde Islands (*TFMCBM/98* cruise, *Macaronesia 2000*-Project)

GEORGYI VINOGRADOV*, FÁTIMA HERNÁNDEZ**, ESTHER TEJERA**
& MARÍA EUGENIA LEÓN**

**A. N. Severtzov Institute of the Problems of Ecology and Evolution (RAS), Lenin Avenue, 33. Moscow 117071. Russia.*
*** Marine Biology Department. Museo de Ciencias Naturales de Tenerife (OAM). Antiguo Hospital Civil. Fuente Morales s/n. 38003 Santa Cruz de Tenerife. P.O. BOX 853. Canary Islands. Spain.*

VINOGRADOV G., F. HERNÁNDEZ, E. TEJERA & M. E. LEÓN (2004). Anfípodos pelágicos de las islas de Cabo Verde (*Campaña TFMCBM/98, Proyecto-Macaronesia 2000*). *VIERAEA* 32: 7-27.

RESUMEN: Se presentan los resultados del estudio sobre anfípodos pelágicos recolectados en las islas de Cabo Verde durante la campaña *TFMCBM/98* (septiembre de 1998). Setenta y cinco especies y sus datos biométricos se relacionan. *Amphithyrus muratus* y *Parapronoe campdelli* son citados por primera vez para el Atlántico norte.
Palabras clave: Atlántico norte, islas de Cabo Verde, plancton, anfípodos, datos biométricos.

ABSTRACT: The results of the pelagic amphipods captured from Cape Verde islands during *TFMCBM/98* cruise (September, 1998) are given. In this paper 75 species and their biometric data are relationed. *Amphithyrus muratus* and *Parapronoe campdelli* are recorded for the first time for the North Atlantic waters.
Key words: North Atlantic, Cape Verde islands, plankton, amphipoda, biometrical data.

INTRODUCTION

Pelagic amphipods, especially hyperiids, are considered a significant component of epi- and mesopelagic communities in the tropical ocean. Also, the diversity of tropical hyperiids is great. About 130 species of infraorder Physocephalata inhabit epi- and mesopelagic tropical waters; furthermore, at least 25–30 species of mainly deep-water Physosomata may be found. But there has hitherto been not enough evidence about species composition of hyperiid fauna and about their variability in different regions of the World Ocean. Some important investigations in this field appeared from 1975 (Thurston, 1976; Shulenberger, 1977; Siegel-Causey, 1982; Ramírez & Viñas, 1985; Young & Anderson, 1987; Zeidler, 1978, 1992; G. Vinogradov, 1990*a*, 1991, 1993; Lima & Valentin, 2001), but this work is not finished yet. So composing of a local list of pelagic amphipods is still important, especially for Northern Atlantic Ocean. This article is dealing with fauna of pelagic amphipods from the Cape Verde Islands.

Last time, the studies of the marine plankton of the Cape Verde has been refered, in general, to the data from the very oceanic stations near to the Islands. The Museo de Ciencias Naturales de Tenerife carried out several studies about planktonic groups working the stations into the ring-islands where we realized bathypelagic samplings (the papers are those refered to decapoda larvae and nudibranchia: Lindley & Hernández 1999a and b, 2000; Hernández *et al.*, 2000, Lindley *et al.*, 2001). Now we continue with the study of this important collection and the planktonic amphipods has been analized.

MATERIAL AND METHOD

Twenty one plankton samples (seven triple vertical hauls) were captured in coastal stations during the *TFMCBM/98 Cape Verde Cruise* onboard of the "*Corvette*", supported by the Museo de Ciencias Naturales de Tenerife in the NW of arquipelago (near of the São Vicente and São Nicolau Islands).

The hauls were realized since 1000 m of depth to surface, only one sample was realized since 500 m surface (see table I). The net was the triple WP-2 (200 µ, 56 cm Ø) with flujometer. The samples were fixed in 5% formalin and were sorted completely without aliquoting.

A total of 897 specimens of pelagic amphipods were collected, 48 gammarids and 849 hyperiids, 6 of them are completely damaged and were excluded. All specimens were taxonomic identified and included in a data base of the Departamento de Biología Marina of the Museo de Ciencias Naturales de Tenerife.

TAXONOMIC RESULTS

All the amphipods captured are considered below, together with its length, position number in the lot and sometimes sexual and mature grade characteristics (juv. = juvenile).

SUBORDER GAMMARIDEA

Superfamily Eusiroidea

Family Calliopiidae

Stenopleura atlantica Stebbing, 1888

14 spec.: N=20 (3 mm, juv.); N=99 (3 mm); N=136 (4 mm, ♂); N=162 (4.5 mm, ♀); N=212 (3.5 mm, ♀? juv.); N=217 (2.5 mm, juv.); N=313 (4 mm); N=320 (4.3 mm); N=324 (4.2 mm); N=442 (3 mm, juv.); N=722 (4.5 mm, ♂); N=750 (3.5 mm); N=756 (2.6 mm, ♂ juv.); N=899 (4 mm).

Family Eusiridae

Eusiropsis riisei Stebbing, 1899

7 spec.: N=16 (10 mm); N=41 (8 mm); N=150 (6 mm); N=489 (5.5 mm); N=524 (4.3 mm); N=702 (4 mm,); N=751 (3.7 mm).

Superfamily Lysianassoidea

Family Cyphocarididae

Cyphocaris anonyx Boeck, 1871

4 spec.: N=10 (3.2 mm, juv.); N=70 (4.5 mm, juv.); N=175 (10.6 mm); N=401 (5 mm).

Cyphocaris challengeri Stebbing, 1888

23 spec.: N=19 (4.8 mm, juv.); N=45 (3.5 mm, juv.); N=58 (3 mm, juv.); N=204 (2.6 mm, juv.); N=207 (4.5 mm, juv.); N=218 (3 mm, juv.); N=231 (4 mm, juv.); N=260 (4.5 mm, juv.); N=262 (4 mm, juv.); N=444 (4.7 mm, juv.); N=510 (3 mm, juv.); N=514 (3.7 mm, juv.); N=537 (3.2 mm, juv.); N=541 (2.8 mm, juv.); N=561 (6 mm); N=562 (4.7 mm); N=691 (3.5 mm); N=695 (3.6 mm); N=696 (5 mm); N=700 (3.7 mm); N=707 (3 mm); N=715 (2.8 mm, juv.); N=724 (6.2 mm).

REMARKS: Juvenile *C. challengeri* often with few dentae on upper side of the sword-like tooth of P V.

SUBORDER HYPERIIDEA

INFRAORDER PHYSOSOMATA

Superfamily Archaeoscinoidea

Family Archaeoscinidae

Archaeoscina steenstrupi (Bovallius, 1885)

1 spec.: N=609 (?, 1.1 mm, juv.).

Superfamily Scinoidea

Family Mimonectidae

Mimonectes loveni Bovallius, 1885

1 spec.: N=182 (3 mm, ♂).

Mimonectes sphaericus Bovallius, 1885

1 spec.: N=152 (6.7 mm, ♂).

Family Scinidae

Scina borealis (G.O. Sars, 1882)

2 spec.: N=18 (5 mm, ♀); N=43 (3.5 mm, ♀? juv.).

Scina crassicornis (Fabricius, 1775)

5 spec.: N=48 (7 mm); N=434 (7 mm); N=453 (2 mm, juv.); N=566 (?, 1.7 mm, larvae); N=752 (4.6 mm, juv.).

Scina damasi Pirlot, 1929

1 spec.: N=235 (3 mm, ♀, with 6 oval eggs 0.35×0.25 mm in marsupium).

Scina latifrons Wagler, 1926

1 spec.: N=280 (3.5 mm, ♂).

Scina rattrayi rattrayi Stebbing, 1895

1 spec.: N=810 (5 mm, ♂).

Scina rattrayi keilhacki Wagler, 1926

1 spec.: N=32 (2.2 mm).

Scina similis Stebbing, 1895

1 spec.: N=754 (2 mm).

Scina stebbingi Chevreux, 1919

1 spec.: N=248 (1.8 mm, juv.).

Scina (?)submarginata Tattersall, 1906

1 spec.: N=628 (1.2 mm, with smooth art. 2 of P V).

Scina tullbergi (Bovallius, 1885)

1 spec.: N=441 (2.7 mm).

Scina wagleri atlantis Thurston, 1976

1 spec.: N=120 (2 mm).

***Scina* sp.** (larvae)

1 spec.: N=463 (1.2 mm).

INFRAORDER PHYSOCEPHALATA

Superfamily Vibilioidea

Family Paraphronimidae

Paraphronima crassipes Claus, 1879

5 spec.: N=79 (3.7 mm); N=179 (6.5 mm); N=370 (5.5 mm); N=530 (6.1 mm); N=776 (6.2 mm).

Paraphronima gracilis Claus, 1879

1 spec.: N=495 (5 mm).

Family Vibiliidae

Vibilia armata Bovallius, 1887

7 spec.: N=8 (7 mm); N=36 (7 mm); N=317 (3 mm); N=403 (4 mm); N=563 (4 mm); N=760 (6.3 mm); N=784 (6.5 mm, ♂).

Vibilia propinqua Stebbing, 1888

1 spec.: N=1 (6 mm).

Vibilia viatrix Bovallius, 1887

2 spec.: N=37 (4.3 mm, juv.); N=772 (3.5 mm, juv.).

Superfamily Phronimoidea

Family Hyperiidae

Hyperietta luzoni (Stebbing, 1888)

2 spec.: N=844 (2.4 mm, ♀ with hatchlings in marsupium); N=909 (2.5 mm, ♂ juv.).

Hyperietta parviceps Bowman, 1973

2 spec.: N=475 (1 mm, juv.); N=884 (2.2 mm, ♀).

Hyperietta stebbingi Bowman, 1973

4 spec.: N=14 (3.5 mm, ♂); N=42 (3.2 mm, ♂); N=123 (3 mm, ♂); N=372 (3 mm, ♂).

Hyperietta stephenseni Bowman, 1973

34 spec.: N=72 (?, 2.5 mm, ♀ juv.); N=83 (3 mm, ♂); N=102 (3 mm, ♂); N=117 (?, 2 mm); N=125 (2.5 mm, ♂? juv.); N=141 (2.7 mm, ♀? juv.); N=143 (3 mm, ♂); N=160 (2.7 mm, ♀ juv.); N=195 (3.5 mm, ♂); N=197 (3 mm, ♀); N=200 (2.2 mm, ♀); N=203 (1.1 mm, juv.); N=206 (2.5 mm, ♂? juv.); N=208 (1.6 mm, ♀ juv.); N=314 (2.9 mm, ♂ juv.); N=344 (2 mm, ♀); N=362 (1.9 mm); N=424 (1.2 mm, juv.); N=445 (2.3 mm, ♂ juv.); N=478

(1.5 mm); N=579 (1.3 mm); N=594 (2.8 mm, ♂); N=608 (1.1 mm, ♀); N=761 (2.6 mm, ♂ juv.); N=794 (3.2 mm, ♂ juv.); N=819 (5.5 mm, ♀); N=825 (3.5 mm, ♂); N=826 (2.3 mm, ♀); N=838 (2.5 mm, ♀); N=841 (2.5 mm, ♂ juv.); N=856 (2.4 mm, ♂); N=866 (3.5 mm, ♂); N=878 (2.3 mm, ♀); N=889 (3.3 mm, ♂).

Hyperietta vosseleri (Stebbing, 1904)

31 spec.: N=52 (2 mm, ♂ juv.); N=55 (2.5 mm, ♂ juv.); N=84 (3.3 mm, ♂); N=122 (3.5 mm, ♂ juv.); N=140 (2.5 mm, ♀); N=228 (?, 1.5 mm, early juv.); N=230 (?, 1.1 mm, early juv.); N=275 (2.1 mm, ♀); N=310 (1.2 mm, juv.); N=311 (1.5 mm, juv.); N=326 (1.7 mm, ♀); N=329 (1.2 mm); N=345 (1.6 mm, ♀); N=380 (2 mm, ♀); N=381 (2 mm, ♀); N=388 (1.3 mm); N=452 (2.5 mm, ♂ juv.); N=511 (2.1 mm); N=540 (1.9 mm); N=546 (2.7 mm, ♂ juv.); N=551 (2.5 mm, ♀); N=558 (2.6 mm, ♀); N=568 (1.4 mm); N=578 (1.5 mm [also in this glass: larvae gen. sp. 0.8 mm]); N=607 (1.2 mm); N=618 (1.2 mm, juv.); N=652 (2.5 mm, ♂); N=654 (2 mm); N=662 (1.8 mm); N=804 (4.2 mm, ♂); N=868 (1.9 mm, juv.).

***Hyperietta* sp.**

6 spec.: N=259 (1.2 mm, early juv.); N=334 (?, 0.7 mm, larvae); N=451 (1.3 mm); N=480 (0.7 mm, larvae); N=491 (0.8 mm, larvae); N=834 (2 mm, juv.).

Hyperionyx macrodactylus (Stephensen, 1924)

4 spec.: N=498 (1.3 mm); N=597 (1.2 mm, ♀); N=717 (1 mm, ♀); N=731 (0.8 mm, juv.).

Hyperioides longipes Chevreux, 1900

3 spec.: N=462 (1 mm, larvae); N=773 (2.8 mm, ♀); N=850 (3.5 mm, ♂).

Lestrigonus bengalensis Giles, 1887

104 spec.: N=24 (2.2 mm, ♂ juv.); N=35 (1.6 mm, ♀); N=54 (1.5 mm, juv.); N=75 (2 mm, ♀); N=87 (2.5 mm, juv.); N=97 (1.5 mm, juv.); N=118 (2 mm, ♀); N=126 (2 mm, ♀); N=127 (2.3 mm, ♀); N=128 (2.5 mm, ♀); N=161 (2.5 mm, ♀ juv.); N=191 (4.5 mm, ♀); N=192 (1.7 mm, juv.); N=201 (1.8 mm, juv.), N=202 (2 mm, ♀? juv.), N=205 (2.3 mm, ♂ juv.); N=225 (1.3 mm, juv.); N=226 (2.5 mm, ♂ juv.); N=242 (1.5 mm, juv.); N=246 (2 mm, juv.); N=247 (1.8 mm, ♀? juv.); N=251 (1.2 mm, juv.); N=257 (2.6 mm, ♂? juv.); N=266 (3.7 mm, ♀); N=267 (1.5 mm, juv.); N=277 (2.2 mm, ♂? juv.); N=278 (2 mm, ♀? juv.); N=287 (2.6 mm, ♂ juv.with fused pereonites I–V); N=290 (1.7 mm, juv.); N=292 (?, 1 mm, juv.); N=294 (1 mm, juv.); N=295 (1 mm, juv.); N=297 (1.2 mm, juv.); N=298 (1.1 mm, juv.); N=300 (1.2 mm, ♀? juv.); N=301 (1 mm, early juv.); N=306 (?, 1.2 mm, early juv.); N=307 (?, 0.9 mm, larvae); N=312 (1.3 mm, juv.); N=328 (1.5 mm, ♀ juv.); N=330 (1.1 mm, ♀); N=333 (0.8 mm, juv.); N=341 (1.5 mm, ♀); N=342 (1.3 mm, ♀); N=349 (1.1 mm, ♀); N=358 (1.1 mm, juv.); N=361 (1.1 mm, juv.); N=367 (?, 0.7 mm, larvae); N=376 (1.5 mm, ♀); N=379 (1.1 mm); N=386 (1.3 mm, ♀); N=392 (1 mm, juv.); N=393 (0.9 mm, juv.); N=399 (1.5 mm, ♀); N=400 (1.5 mm, ♀); N=411 (1.6 mm, juv.); N=412 (?, 0.6 mm, larvae); N=416 (2 mm, ♂ juv.); N=417 (1.2 mm, ♀); N=418 (2 mm,

♂ juv.); N= 471 (1.5 mm, ♂ juv.); N=474 (1 mm, juv.); N=492 (2.5 mm, ♂); N=494 (1.5 mm, juv.); N=504 (1.5 mm, juv.); N=506 (2.5 mm, ♀); N=522 (2 mm, ♂ juv.); N=534 (2.3 mm, ♀); N=559 (2.1 mm, juv.); N=569 (1.6 mm, juv.); N=574 (1.3 mm, juv.); N=575 (2 mm, ♂ juv.); N=583 (1 mm, juv.); N=588 (1.8 mm, ♀ juv.); N=591 (1.7 mm, ♀); N=600 (2 mm, ♂ juv.); N=602 (2.5 mm, ♀); N=604 (1.7 mm, ♀); N=612 (0.9 mm, juv.); N=617 (1 mm); N=619 (1.2 mm); N=620 (0.9 mm, juv.); N=625 (0.9 mm, juv.); N=627 (0.8 mm, juv.); N=630 (?, 0.8 mm, larvae); N=634 (0.9 mm, juv.); N=653 (2.5 mm, ♀); N=655 (?, 1.5 mm, juv.); N=667 (1.2 mm, juv.); N=670 (1.3 mm, ♀); N=671 (2 mm, ♀); N=684 (1.5 mm, juv.); N=688 (0.9 mm, juv.); N=712 (1.5 mm, ♀); N=716 (1.8 mm, ♂ juv.); N=718 (1.3 mm, juv.); N=719 (1.2 mm, juv.); N=737 (2.2 mm, ♂); N=767 (2.1 mm, ♀); N=787 (2 mm, juv.); N=876 (2.1 mm, ♂ juv.); N=888 (1.8 mm, ♀ juv.); ♀); N=901 (2 mm, ♀); N=902 (3 mm, ♂).

Lestrigonus latissimus (Bovallius, 1889)

1 spec.: N=286 (3 mm, ♂ juv.).

Lestrigonus macrophthalmus (Vosseler, 1901)

47 spec.: N=68 (2 mm, ♀); N=112 (2 mm, ♀); N=119 (4.5 mm, ♂ juv.); N=142 (2 mm, ♀); N=167 (2 mm, ♀); N=193 (1.7 mm, ♀ juv.); N=244 (2.1 mm, ♀); N=323 (1.2 mm, juv.); N=327 (1.9 mm, ♂ juv.); N=346 (2.8 mm, ♀); N=352 (1.2 mm, ♀); N=354 (2 mm, ♀); N=357 (?, 1.1 mm, juv.); N=363 (?, 1.2 mm, juv.); N=384 (?, 1 mm, juv.); N=409 (1.8 mm, ♀); N=413 (2.4 mm, ♂); N=419 (1.7 mm, ♀); N=426 (1.1 mm, juv.); N=439 (1.7 mm, ♀); N=443 (2 mm, ♀); N=447 (1.5 mm, ♀); N=450 (1.8 mm, ♀); N=454 (2 mm, ♀); N=457 (1.1 mm, juv.); N=461 (1.5 mm, ♀); N=467 (0.7 mm, juv.); N=468 (1 mm, ♀ juv.); N=473 (1.6 mm, ♀); N=485 (1.7 mm, ♀); N=487 (?, 1.5 mm, juv.); N=503 (2 mm, ♀); N=521 (1.9 mm, ♀); N=570 (1.6 and 1.1 mm, juv.); N=573 (1.3 mm, juv.); N=611 (?, 0.8 mm, juv.); N=657 (2.3 mm, ♀); N=665 (1.5 mm); N=675 (1.5 mm, ♀); N=683 (?, 1 mm, larvae); N=748 (3 mm, ♂); N=777 (2.7 mm, ♂); N=839 (1.7 mm, juv.); N=846 (1.8 mm, ♀); N=864 (2.1 mm, ♀); N=867 (2.3 mm, ♀).

Lestrigonus schizogeneios (Stebbing, 1888)

10 spec.: N=23 (2.2 mm, ♂); N=134 (2.2 mm, ♀); N=180 (2.2 mm, ♀); N=368 (2.5 mm, ♂); N=405 (2 mm, ♀); N=432 (2.9 mm, ♂); N=685 (?, 1.2 mm, juv.); N=686 (1.3 mm, juv.); N=687 (1.6 mm, ♀); N=708 (1.5 mm, ♀).

***Lestrigonus* sp.**

6 spec.: N=369 (0.6 mm, juv.); N=621 (0.8 mm, larvae); N=622 (0.8 mm, juv.); N=623 (0.8 mm, larvae); N=727 (0.9 mm, larvae); N=728 (0.8 mm, larvae).

Themistella fusca (Dana, 1852)

3 spec.: N=241 (2.7 mm, juv.); N=490 (2 mm, ♀); N=509 (3.2 mm, ♂).

Phronimopsis spinifera Claus, 1879

4 spec.: N=144 (3.7 mm, ♀); N=154 (3 mm, ♀); N=240 (3 mm, ♀); N=508 (2 mm, ♀).

Larvae, gen., sp.

9 spec.: N=211 (0.8 mm [also in this glass: juv. *Parapronoe* sp.]), N=279 (1.1 mm); N=282 (0.2 mm); N=304 (0.8 mm); N=305 (0.7 mm); N=428 (0.7 mm); N=502 (0.6 mm); N=639 (0.6 mm); N=720 (0.7 mm).

Family Phronimidae

Phronima atlantica Guérin-Méneville, 1836

2 spec.: N=172 (13.5 mm, ♀ juv.); N=249 (8 mm, ♀ juv.).

Phronima colletti Bovallius, 1887

1 spec.: N=73 (8 mm, ♂ juv.).

Phronima curvipes Vosseler, 1901

1 spec.: N=188 (5.5 mm, ♂).

Phronima pacifica Streets, 1877

1 spec.: N=857 (4.7 mm, ♀).

Phronima sedentaria (Forskål, 1775)

6 spec.: N=17 (7 mm, juv.); N=61 (11.5 mm, ♀ juv.); N=245 (3.7 mm, ♀ juv.); N=315 (8 mm, ♂ juv.); N=523 (12.5 mm, ♀ juv.); N=749 (7 mm, ♂ juv.).

Phronima stebbingi Vosseler, 1901

2 spec.: N=790 (3.5 mm, ♂ juv.); N=871 (3.7 mm, ♀ juv.).

Phronimella elongata (Claus, 1862)

9 spec.: N=66 (5 mm, juv.); N=187 (6 mm, ♀); N=229 (5.9 mm, ♀); N=274 (7 mm, ♂); N=276 (8.2 mm, ♂); N=533 (7.7 mm, ♀); N=677 (8 mm, ♀); N=755 (9.3 mm, ♀); N=893 (11.5 mm, ♀).

Family Phrosinidae

Anchylomera blossevillei Milne-Edwards, 1830

1 spec.: N=762 (1.9 mm, juv.).

Phrosina semilunata Risso, 1822

15 spec.: N=95 (3 mm, ♂ juv.); N=177 (2.2 mm, juv.); N=189 (3 mm, juv.); N=377 (1.5 mm, early juv.); N=464 (1.3 mm, larvae); N=515 (2.5 mm, ♂ juv.); N=584 (2.7 mm, juv.); N=598 (0.6 mm, larvae); N=730 (1.5 mm, early juv.); N=782 (2.4 mm, ♂ juv.); N=806 (2.6 mm, juv.); N=807 (2.5 mm, juv.); N=812 (5 mm, ♀ juv.); N=820 (2 mm, juv.); N=849 (4.2 mm, ♂).

Primno brevidens Bowman, 1978

42 spec.: N=5 (5.5 mm, ♀); N=26 (4 mm, juv.); N=27 (4.4 mm, ♀ juv.); N=44 (5 mm, juv.); N=53 (3.5 mm, juv.); N=78 (5 mm, ♀); N=92 (3.5 mm, ♂); N=114 (3 mm, ♀ juv.); N=133 (4 mm, ♀); N=149 (4 mm, ♂); N=184 (3.5 mm, ♀); N=199 (3.7 mm, ♂); N=250 (4 mm, ♂); N=254 (3 mm, ♀ juv.); N=261 (2.2 mm, juv.); N=270 (4 mm, ♂ juv.); N=348 (4 mm, ♂); N=427 (?, 2 mm, juv.); N=438 (5 mm, ♀); N=470 (5 mm, ♀); N=472 (?, 1.3 mm, juv.); N=550 (3 mm, ♂); N=577 (?, 1.5 mm, juv.); N=592 (1.5 mm, juv.); N=626 (?, 2 mm, juv.); N=666 (3 mm, ♂ juv.); N=692 (6 mm, ♀); N=697 (6 mm, ♀); N=699 (5.7 mm, ♀); N=764 (4.4 mm, ♂ juv.); N=771 (3.4 mm, juv.); N=795 (3.5 mm, juv.); N=808 (3 mm, juv.); N=811 (3.5 mm, ♀ juv.); N=824 (2.7 mm, juv.); N=827 (6 mm, ♀); N=842

(2.5 mm, juv.); N=852 (3.7 mm, ♂); N=874 (3.7 mm, ♂); N=885 (4 mm, ♀); N=887 (3.7 mm, ♂); N=896 (3.5 mm, ♂).

Primno latreillei Stebbing, 1888

202 spec.: N=9 (5 mm, ♀); N=34 (2.4 mm, juv.); N=62 (3 mm, juv.); N=63 (4.2 mm, juv.); N=64 (4.5 mm, ♂ juv.); N=65 (4 mm, ♂ juv.); N=67 (2.5 mm, ♂ juv.); N=69 (4 mm, ♀ juv.); N=71 (2.2 mm, ♀ juv.); N=76 (4.5 mm, ♀); N=77 (4.5 mm, ♀); N=80 (3.5 mm, ♀ juv.); N=82 (4 mm, ♀); N=85 (4 mm, ♀); N=86 (4.5 mm, ♂); N=88 (3.5 mm, ♀ juv.); N=89 (3.5 mm, ♂ juv.); N=94 (4.5 mm, ♀); N=96 (5 mm, ♀); N=98 (3.5 mm, ♀ juv.); N=100 (3.5 mm, ♂ juv.); N=101 (4.5 mm, ♀); N=104 (3 mm, juv.); N=106 (3 mm, juv.); N=108 (4.5 mm, ♀); N=109 (3 mm, ♂? juv.); N=110 (3 mm, ♀ juv.); N=111 (4 mm, ♀); N=113 (4 mm, ♂ juv.); N=115 (3.5 mm, ♂ juv.); N=116 (4 mm, ♀); N=121 (4 mm, ♂ juv.); N=129 (3 mm, ♂ juv.); N=130 (3.5 mm, ♀ juv.); N=132 (3.5 mm, ♀ juv.); N=135 (4.5 mm, ♀); N=139 (4.5 mm, ♀); N=145 (2.6 mm, dead?); N=148 (3 mm, juv.); N=153 (4 mm, ♀); N=155 (3 mm, ♂ juv.); N=157 (4 mm, ♀); N=164 (3.5 mm, ♂ juv.); N=165 (3.5 mm); N=166 (4.2 mm, ♀); N=168 (3 mm, juv.); N=171 (3.7 mm, ♂ juv.); N=173 (3.5 mm, ♀ juv.); N=176 (2 mm, juv.); N=181 (4 mm, ♀ juv.); N=183 (4 mm, ♀); N=185 (3.5 mm, ♂ juv.); N=186 (2.3 mm, juv.); N=190 (2.5 mm, juv.); N=194 (4 mm, ♀ juv.); N=198 (4 mm, ♀); N=209 (5 mm, ♀); N=214 (3 mm, juv.); N=216 (4.5 mm, ♀ juv.); N=219 (1.8 mm, juv.); N=221 (2.5 mm, ♀ juv.); N=222 (2.5 mm, ♀ juv.); N=223 (1.7 mm, juv.); N=227 (5 mm, ♀); N=232 (3 mm, ♀ juv.); N=236 (4.7 mm, ♀); N=238 (2 mm, juv.); N=239 (4 mm, ♀); N=252 (2 mm, juv.); N= 255 (2.5 mm, juv.); N=264 (2.5 mm, ♀ juv.); N=265 (4 mm, ♀); N=269 (2.5 mm, ♀ juv.); N=272 (4 mm, ♀); N=273 (5 mm, ♀); N=284 (2.5 mm, ♀ juv.); N=291 (4 mm, ♂ juv.); N=319 (4 mm, ♂); N=337 (3.8 mm, ♀); N=339 (3.5 mm); N=347 (2.5 mm, ♀); N=355 (?, 1.3 mm, juv.); N=365 (3.5 mm, ♂ juv.); N=373 (5 mm, ♀); N=414 (3.7 mm, without head); N=433 (2.2 mm); N=435 (4.5 mm, ♀); N=448 (3.2 mm, ♀ juv.); N=469 (4.5 mm, ♂); N=476 (4 mm, ♀); N=496 (2 mm, juv.); N=507 (2.1 mm, juv.); N=512 (3 mm, juv.); N=513 (2.5 mm, juv.); N=516 (4 mm, ♀); N=517 (2.3 mm, juv.); N=518 (3 mm, ♂ juv.); N=525 (4.2 mm, ♀); N=526 (?, 2.5 mm, juv.); N=527 (3 mm, juv.); N=528 (5.5 mm, ♂); N=532 (4.5 mm, ♂ juv.); N=538 (3 mm, ♀ juv.); N=539 (?, 2 mm, juv.); N=542 (2 mm, juv.); N=547 (2 mm, juv.); N=553 (3 mm, juv.); N =555 (4.5 mm, ♀); N=556 (5 mm, ♀); N=557 (3 mm, ♀ juv.); N=564 (2.6 mm, ♀ juv.); N=571 (?, 1.5 mm, juv.); N=582 (3 mm, ♀ juv.); N=585 (2 mm, juv.); N=586 (1.5 mm, juv.); N=593 (3 mm, ♀ juv.); N=595 (2 mm, juv.); N=596 (1.5 mm, juv.); N=599 (2.1 mm, ♀ juv.); N=605 (1.3 mm, juv.); N=615 (1.7 mm, juv.); N=664 (4.2 mm, ♀); N=672 (4 mm, ♀); N=673 (2 mm, juv.); N=674 (3.8 mm); N=676 (5 mm, ♀); N=678 (5 mm, ♂); N=679 (3.5 mm, ♀ juv.); N=690 (4.5 mm, ♀); N=694 (2.5 mm, ♀ juv.); N=701 (4.6 mm, ♀); N=704 (3.3 mm, ♀ juv.); N=705 (2.5 mm, juv.); N=706 (2.5 mm, juv.); N=710 (3 mm, ♂ juv.); N=711 (3.3 mm, ♀ juv.); N=714 (1.7 mm, juv.); N=723 (3.7

mm, ♂); N=759 (4.9 mm, ♀); N=763 (3.5 mm, ♀ juv.); N=765 (4.1 mm, ♀); N=766 (2 mm, juv.); N=768 (3.1 mm, ♀ juv.); N=770 (?, deformity, 3 mm); N=774 (3.7 mm, ♀); N=775 (2 mm, juv.); N=778 (3.2 mm, ♀ juv.); N=779 (3.8 mm, ♀); N=780 (4 mm, ♀); N=783 (4 mm, ♀); N=788 (3.7 mm, ♀); N=789 (3.8 mm, ♀); N=791 (4.4 mm, ♀); N=792 (4.3 mm, ♀); N=793 (3.3 mm, juv.); N=796 (3 mm, juv.); N=797 (6.5 mm, ♀); N=798 (3.5 mm, ♀ juv.); N=799 (4 mm, ♀); N=802 (2.5 mm, juv.); N=805 (2.5 mm, juv.); N=813 (2.6 mm, juv.); N=815 (3 mm, ♀ juv.); N=816 (2.8 mm, juv.); N=817 (3.1 mm, ♂ juv.); N=818 (2.5 mm, juv.); N=821 (3 mm, ♀ juv.); N=822 (2.4 mm, juv.); N=823 (3.4 mm, ♀ juv.); N=828 (4.1 mm, ♀); N=831 (3.5 mm, ♀ juv.); N=835 (3.5 mm, ♀ juv.); N=836 (3.3 mm, juv.); N=837 (5 mm, ♀); N=840 (2.9 mm, ♀ juv.); N=843 (3.5 mm, ♂ juv.); N=845 (3.3 mm, juv.); N=847 (3.3 mm, juv.); N=848 (3 mm, juv.); N=851 (3.4 mm, ♀ juv.); N=853 (2.5 mm, juv.); N=854 (4 mm, ♀); N=855 (3.6 mm, ♀); N=858 (3.5 mm, ♂ juv.); N=861 (3 mm, juv.); N=862 (3.5 mm, ♂ juv.); N=869 (3 mm, ♂ juv.); N=870 (4.3 mm, ♀); N=872 (3.4 mm, ♂ juv.); N=875 (2.5 mm, juv.); N=877 (3.5 mm, ♀ juv.); N=879 (2.7 mm, juv.); N=881 (3.5 mm, ♀ juv.); N=886 (3 mm, ♂ juv.); N=890 (3.3 mm, ♀ juv.); N=891 (2.6 mm, juv.); N=892 (5 mm, ♂); N=894 (4 mm, ♀); N=895 (3.5 mm, ♂ juv.); N=897 (3 mm, juv.); N=903 (3 mm, ♂ juv.); N=904 (4.1 mm, ♀).

***Primno* sp.** (larvae and early juveniles)

21 spec.: N=268 (1.2 mm); N=299 (1.1 mm); N=356 (1 mm); N=385 (1.1 mm); N=389 (1 mm); N=394 (1 mm); N=395 (1.1 mm); N=398 (1.3 mm); N=421 (1.2 mm); N=497 (1.5 mm); N=552 (1.6 mm); N=606 (0.7 mm); N=610 (1.1 mm); N=614 (1 mm); N=631 (0.8 mm); N=633 (0.9 mm); N=635 (0.7 mm); N=648 (0.7 mm); N=649 (1 mm); N=650 (1 mm); N=803 (2 mm).

REMARKS: Early juveniles of the genus *Primno* (< 2 mm) have distinct exopodite on the uropods III.

Larvae, gen. sp.

1 spec.: N=643 (1 mm).

Superfamily Lycaeopsoidea

Family Lycaeopsidae

Lycaeopsis themistoides Claus, 1879

6 spec.: N=103 (2 mm, ♀); N=163 (4 mm, ♀); N=281 (1.8 mm, juv.); N=340 (2.7 mm, ♀); N=689 (4 mm, ♂); N=809 (3 mm, ♀).

Lycaeopsis zamboangae (Stebbing, 1888)

3 spec.: N=31 (3.5 mm, ♀); N=57 (3 mm, ♀); N=709 (3.7 mm, ♂).

***Lycaeopsis* sp.** (larvae)

1 spec.: N=458 (0.9 mm).

Superfamily Platysceloidea

Family Brachyscelidae

Brachyscelus crusculum Bate, 1861

29 spec.: N=6 (4 mm, ♂ juv.); N=15 (7 mm, ♂); N=25 (4 mm, ♀ juv.); N=30 (6 mm, ♂); N=74 (2.5 mm, juv.); N=105 (3.7 mm, juv.); N=107 (4 mm,

juv.); N=137 (3.5 mm, juv.); N=156 (4 mm, ♀ juv.); N=170 (3.2 mm, juv.); N=174 (4 mm, ♀ juv.); N=220 (?, 2.2 mm, early juv.); N=258 (6 mm, ♂); N=263 (3.2 mm, ♀ juv.); N=338 (3.6 mm, ♀ juv.); N=436 (5 mm, ♂); N=440 (1.7 mm, larvae); N=449 (3 mm, juv.); N=519 (3.2 mm); N=658 (4.3 mm, ♀); N=659 (1.7 mm, juv.); N=738 (5 mm, ♂); N=739 (4.5 mm, ♀); N=740 (3 mm, ♀ juv.); N=741 (5 mm, ♀); N=743 (3.5 mm, ♀); N=744 (4.9 mm, ♀); N=746 (3.5 mm, ♀); N=863 (4.9 mm, ♂ juv.).

Brachyscelus globiceps (Claus, 1879)

12 spec.: N=3 (4 mm, ♀ juv.); N=12 (4 mm, ♀ juv.); N=13 (3.6 mm, ♂ juv.); N=39 (3.5 mm, juv.); N=210 (2.7 mm, juv.); N=289 (4 mm, ♀); N=459 (1.8 mm, juv.); N=531 (9.2 mm); N=545 (2.5 mm, juv.); N=590 (1.3 mm, juv.); N=785 (2.7 mm, juv.); N=900 (3.3 mm, ♀ juv.).

Brachyscelus macrocephalus Stephensen, 1925

9 spec.: N=213 (4.5 mm, ♀ juv.); N=271 (3 mm, juv.); N=375 (1.3 mm, juv.); N=466 (2.3 mm, juv.); N=505 (2.8 mm, juv.); N=560 (5 mm, ♀, with eggs in marsupium); N=565 (?, 2.6 mm, juv.); N=587 (?, 1.5 mm, larvae); N=603 (3 mm).

Brachyscelus rapax (Claus, 1879)

12 spec.: N=49 (2.5 mm, juv.); N=50 (2.5 mm, juv.); N=243 (4.5 mm, ♀ juv.); N=256 (3.5 mm, ♂); N=359 (2.2 mm, exuvium); N=371 (1.4 mm, juv.); N=396 (2.1 mm, ♀); N=404 (2.1 mm, ♀); N=408 (1.8 mm, juv.); N=543 (4.5 mm, ♀); N=769 (3 mm, ♀ juv.); N=882 (3.4 mm, ♂).

***Brachyscelus* sp.** (larvae and early juveniles)

16 spec.: N=38 (1.7 mm); N=196 (2 mm, probably *B.crusculum*); N=224 (1 mm); N=302 (1.2 mm); N=308 (1 mm); N=332 (1.1 mm); N=335 (1 mm); N=378 (1.5 mm); N=390 (1 mm); N=397 (0.7 mm); N=422 (1.1 mm); N=429 (1 mm); N=481 (0.8 mm); N=580 (1.2 mm); N=632 (0.8 mm); N=663 (1 mm).

Family Lycaeidae

Lycaea bovallioides Stephensen, 1925

1 spec.: N=860 (3 mm, ♀ juv.).

REMARKS: *L. bovallioides* belongs to the *Lycaea pulex* complex, which includes several species of questionable validity (see Harbison & Madin, 1976 and G.Vinogradov, 1999).

Lycaea pachypoda (Claus, 1879)

9 spec.: N=46 (?, 2 mm, juv.); N=47 (?, 1.5 mm, juv.); N=316 (1.8 mm, ♀); N=318 (2 mm); N=321 (2.3 mm, ♀); N=322 (2.3 mm, ♀); N=382 (2 mm, ♀); N=549 (2.5 mm); N=629 (?, 0.6 mm, larvae).

Lycaea sp. (larvae)

2 spec.: N=455 (1.3 mm); N=698 (?, 0.8 mm).

Simorhynchotus antennarius (Claus, 1871)

2 spec.: N=460 (1.8 mm, juv.); N=482 (3.5 mm, ♀).

Family Oxycephalidae

Calamorhynchus pellucidus Streets, 1878

1 spec.: N=11 (10.5 mm, ♀ juv.).

Leptocotis tenuirostris (Claus, 1879)

1 spec.: N=873 (9.3 mm, ♂).

Oxycephalus piscator Milne-Edwards, 1830

1 spec.: N=215 (5.5 mm, ♀ juv., forma *typicus*).

Streetsia challengeri Stebbing, 1888

1 spec.: N=437 (10 mm, ♀).

Streetsia porcella (Claus, 1879)

1 spec.: N=693 (5 mm, ♀).

Family Parascelidae

Parascelus edwardsi Claus, 1879

3 spec.: N=158 (2.2 mm, ♀); N=383 (1.6 mm, ♂ juv.); N=391 (1.6 mm, ♀).

REMARKS: *Parascelus edwardsi* is very similar to *P. typhoides*. Some authors (Zeidler, 1998; Lima & Valentin, 2001) even suggested to consider this species as junior synonymy of *P. typhoides*, but here we support a conservative point of view.

Thyropus sphaeroma (Claus, 1879)

2 spec.: N=529 (4 mm, ♀); N=572 (?, 1.5 mm, larvae).

Family Platyscelidae

Amphithyrus muratus Volkov in Vinogradov, Volkov et Semenova, 1982

1 spec.: N=703 (2.8 mm, ♀).

REMARKS: *A.muratus* is very close to *A.similis* Claus, 1982, but has a shorter telson with rounded top (M. E. Vinogradov *et al*., 1982).

Paratyphis maculatus Claus, 1879

2 spec.: N=484 (2.2 mm, ♀); N=786 (3 mm, ♂).

Paratyphis parvus Claus, 1887

4 spec.: N=60 (2 mm); N=124 (2.7 mm, ♀); N=146 (3 mm); N=906 (3.4 mm, ♂).

Platyscelus crustulatus (Claus, 1879)

2 spec.: N=801 (5 mm, ♀); N=865 (3 mm, ♀).

Tetrathyrus forcipatus Claus, 1879

12 spec.: N=56 (3.5 mm, ♀); N=90 (3.3 mm, ♀); N=147 (3.7 mm, ♂); N=178 (3.5 mm, ♀); N=233 (2.2 mm, ♂); N=288 (2.2 mm, ♀ mature, with hatchlings in marsupium); N=350 (1.3 mm); N=360 (1.2 mm); N=402 (2.5 mm, ♀); N=493 (2 mm); N=499 (1.5 mm, juv.); N=753 (3.2 mm, ♂).

Larvae, gen. sp.

1 spec.: N=336 (0.8 mm).

Family Pronoidae

Eupronoe armata Claus, 1879

61 spec.: N=2 (4.5 mm, ♂); N=29 (4.5 mm, ♀ with hatchlings in marsupium); N=33 (5 mm, ♀ with eggs in marsupium); N=81 (5.5 mm, ♀); N=131 (3.2 mm, ♀); N=237 (?, 1.5 mm, early juv.); N=253 (3.2 mm, ♀); N=283 (2.7 mm, ♂? juv.); N=285 (3.5 mm, ♀); N=325 (1.8 mm, juv.);

N=343 (1.3 mm, juv.); N=351 (1.3 mm, juv.); N=353 (4.5 mm, ♂); N=364 (2 mm, ♀ juv.); N=366 (1.3 mm, larvae); N=406 (1 mm, larvae); N=407 (1.6 mm, juv.); N=410 (2.1 mm, ♀); N=415 (1.7 mm, juv.); N=425 (1.3 mm, larvae); N=430 (1 mm, larvae); N=431 (1.1 mm, juv.); N=465 (1 mm, larvae); N=477 (4.3 mm, ♀); N=479 (1.7 mm, juv.); N=483 (2.8 mm); N=486 (2.5 mm); N=520 (3.3 mm); N=535 (3.5 mm); N=536 (3 mm); N=548 (?, 2 mm, juv.); N=554 (4.3 mm); N=567 (2.1 mm, juv.); N=576 (?, 1.3 mm, larvae); N=581 (1.3 mm, juv.); N=589 (1.8 mm, aberrant specimen with 7 art. of P VII, damaged); N=601 (2.2 mm); N=636 (2 mm, aberrant specimen with 7 art. of P VII, destroyed); N=641 (1.4 mm, aberrant specimen with 7 art. of P VII); N=656 (2.5 mm, ♀ juv.); N=668 (1 mm, larvae); N=669 (2.2 mm, juv.); N=680 (4.5 mm, juv.); N=682 (1.2 mm, larvae); N=713 (1.1 mm, larvae); N=721 (1.5 mm, juv.); N=725 (1.5 mm, juv.); N=735 (5 mm, ♀); N=736 (3.5 mm, ♀); N=742 (3.7 mm, ♀); N=745 (3.8 mm, ♀); N=747 (3 mm, ♀); N=758 (4 mm, ♀ with ~10 eggs in marsupium); N=781 (3.5 mm, juv.); N=814 (1.5 mm, juv.); N=833 (1.2 mm, juv.); N=883 (3 mm, juv.); N=898 (3.3 mm, ♀); N=905 (3.9 mm, ♀); N=907 (3 mm, ♀); N=908 (2.5 mm, ♂ juv).

REMARKS: All specimens (except larvae, in which some characters are not visible yet) in our material with characters of forma also known as *Eupronoe intermedia* Stebbing, 1888 (not longer than 6 mm, head ending in small beak, in males head triangular in dorsal view, article 2 of pereopod I with small anteriodistal rounded lobe, article 2 of pereopod V convex in females and slightly concave or straight in males, distal rudimentary article of pereopode VII elongate). *E. intermedia* usually (accepted here in) considered to be a junior synonymy of *E. armata*, though some authors treat them as valid separate species (Tashiro, 1978; Zeidler, 1992).

Eupronoe laticarpa Stephensen, 1825

2 spec.: N=757 (3 mm, juv.); N=800 (3.4 mm, ♀).

Eupronoe maculata Claus, 1879

1 spec.: N=93 (3 mm, juv.).

Eupronoe minuta Claus, 1879

7 spec.: N=4 (4 mm, ♀ juv.); N=28 (4.5 mm, ♀); N=59 (4.5 mm, ♀); N=91 (3.5 mm, ♀); N=159 (4.5 mm, ♀); N=420 (4.1 mm, ♀); N=651 (4.5 mm, ♀).

Parapronoe campbelli Stebbing, 1888

1 spec.: N=7 (8 mm, ♂).

Parapronoe crustulum Claus, 1879

4 spec.: N=21 (19 mm, ♀); N=22 (18 mm, ♀); N=169 (16.5 mm, ♀ with hatchlings in marsupium); N=387 (3 mm, ♀).

***Parapronoe* sp.**

3 spec.: N=211 (1.1 mm, early juv. [also in this glass: Hyperiidae larvae gen. sp.]); N=234 (5 mm, early juv.); N=446 (1.2 mm, larvae).

Pronoe capito Guérin-Méneville, 1836

5 spec.: N=40 (3.7 mm, ♂ juv.); N=151 (?, 3.5 mm, early juv.); N=488 (?, 1 mm, larvae); N=734 (4.7 mm, ♀ juv.); N=880 (2.2 mm, larvae).

Larvae, gen. sp.

1 spec.: N=374 (1 mm).

Family Tryphanidae

Tryphana malmi Boeck, 1870

4 spec.: N=51 (3 mm); N=456 (1.5 mm, juv.); N=544 (3.7 mm); N=859 (3 mm).

Unidentified larvae

Larvae, fam. gen. sp.

10 spec.: N=578 (0.4 mm [also in this glass: *Hyperietta vosseleri* 1.5 mm]); N=616 (0.7 mm); N=637 (0.6 mm); N=638 (0.8 mm); N=640 (0.8 mm); N=642 (0.5 mm); N=644 (0.7 mm); N=645 (0.6 mm); N=647 (0.4 mm); N=729 (0.8 mm).

DISCUSSION

Pelagic amphipods can be collected by means of any plankton net, but one must keep in mind that these animals have usually well-developed eyes, are active swimmers, and can therefore dodge standard nets quite efficiently (Vinogradov, 1999). But even small plankton nets may collect enough specimens and furnish a general picture of the diversity at a given site.

A total of 4 species of pelagic gammarids and 71 species of hyperiids are represented in the samples. They are warm-water or tropical, rarely circumoceanic, mainly epipelagic animals. Large species are represented mainly by juvenile individuals. Most abundant species are *Primno latreillei* (22% of total number of all collected amphipods including gammarids), *Lestrigonus bengalensis* (11%), *Eupronoe armata* (6%), *Lestrigonus macrophthalmus* and *Primno brevidens* (~5% each), *Hyperietta stephenseni, Hyperietta vosseleri* and *Brachyscelus crusculum* (3.3–3.8% each). For ranks of other species see table II. General number of hyperiid species and a role of leading species in the studied samples is similar to other results from the warm-water regions of the World Ocean (Table III), but the composition of leading species in our material is different (Table IV).

As it was shown in (Vinogradov, 1991), the hyperiid fauna of open waters of antycyclonic tropical gyres of the Pacific Ocean is relatively homogeneus. With the exception of a few details the hyperiid fauna of open warm waters of Indian Ocean has the same features (Vinogradov, 1993). But big Shulenberger's collection from the North Pacific Gyre (Shulenberger, 1977) which had been received by fine-meshed gear, include much more small Hyperiidae like *Hyperietta*, *Hyperioides*, *Lestrigonus* than two previous collections (Table IV). Nevertheless, this collections exhibit close coincidence with each other; only 5 of the 83 species recorded by Shulenberger were absent form the South Pacific Gyre collection (Vinogradov, 1991). Thurston's collection from the Canary Islands (Thurston, 1976) also had been received by fine-meshed gear. This collection has the similar features. List of its leading hyperiid species of this collection looks like such lists from the Indian and South Pacific Oceans but also include small animals like *Hyperioides longipes* (Table IV).

Our material also has the similar features, which is typical for amphipod communities of tropical pelagic domain. But the role of small forms in our material is much greater than in other cases (Tables II, IV). Even the big amphipods like Pronoidae or Phrosinidae has been represented mainly by juvenile or small specimens. The little number of big adult amphipods with the size > 5 mm in our material may be a result of avoiding of the small nets by active amphipods. But we also can not exclude the possibility that in warm inland waters of the Cape Verde Islands the ratio of small hyperiids is really higher.

Pelagic amphipods in general are indifferent to the presence of the shore, and only *Lestrigonus bengalensis* tends to inhabit coastal waters (Bowman, 1973). So it is not surprising that this species, ordinary not very abundant in the collections, is one of much numerous in our material. In other big Atlantic collections this species was most abundant in the Brazilian coastal waters (Lima & Valentin, 2001). But this species is not strictly coastal. For example it has rank 5 in collection from the open waters of the central part of the North Pacific Gyre (4.3% of collected hyperiids) (Shulenberger, 1977).

An analysis of the ratio of life-forms -group of organisms with any rate of phylogenetic parentage, with the same way of living and similar morphological organisation; such groups appear in the course of parallel and convergent evolution under the influence of similar ecological factors. Among pelagic amphipods one can recognize up to 16 such morphoecological groups (Vinogradov, 1988; 1990c). An analysis of the life-forms spectrum of a taxonomic group from the distinct area is one of the possible ways of receiving its full "portrait"- of obtained hyperiids from the *TFMCBM/98* Cape Verde cruise in terms of abundance show that about a half of a total number of collected animals (48.8%) are free-living and other are symbionts of gelatinous plankters. It is a common picture for the warm-water regions (Vinogradov, 1990*c*). Free-living animals are represented at first turn by the mantis-legged predators (in our material it is genus *Primno*) and symbionts are represented by small globular animals (females and juveniles of small Hyperiidae, Lycaeidae) and only in second turn by non-globular forms (Brachyscelidae, males of the small of Hyperiidea).

Beside these leading forms practically all other life-forms of epi- and mesoplelagic amphipods are present in our collection but some of them are less numerous than usually. So, we have only 2.5% of "barrel-bearers" (Phronimidae) but in collections from the periphery of tropical anticyclonic gyres its ratio may be as high as 17–30% (Vinogradov, 1990*c*). But in Thurston's collection off the Canary Islands we have found only 6% of the "barrel-bearers" and in Shulenberger's collection from the central part of the North Pacific Gyre = 0.8%, which is much closer to our material. It is known that in periphery of the gyres are much more numerous salpae and pyrosomes (Vinogradova, 1988), the main resource of "barrels" of Phronimidae, maybe it is a reason of founded inequality of the distribution of this life-form inside warm-water regions of the Ocean.

Another life-form which is significally less numerous in our material than in "typical" warm-waters is needle-like animals (Oxycephalidae). In our material we have only 0.6% of needle-like amphipods and in general in warm-water collections its ratio increase up to 7%. But such animals also are not numerous in Thurston's collection (0.3%) and maybe it is a feature of all (eastern) region of tropical North Atlantic Ocean. The last unusually low numerous group in our material is conglobating animals with hypertrophic lateral shield (Platyscelidae, Parascelidae). We have only 3% of such animals and ordinary in tropical regions its ratio was 9–16% (Vinogradov, 1990*c*).

But these animals are active swimmers and can easily avoid comparatively small nets which was used in the *TFMCBM/98* cruise.

The obtained meristic data in the present study, will be used for investigations in course on biometry of the Atlantic species.

Special faunistic notes

Two of the found species are of special interest:

Amphithyrus muratus was not known from the Atlantic Ocean until Lima & Valentin (2001) reported this species from the Brazilian coastal waters and was not known from the Northern Atlantic until now. So our finding strongly amplify the known area of this species.

Parapronoe campdelli was known in the Atlantic Ocean off Namibia and South Africa (Vinogradov, 1999), and our finding of this species is first in the Nortern Atlantic.

So we received a new evidence that warm-water hyperiids in general have circumtropical areas and even those species which looks like restricted in its distribution only by one or two oceans probably will be found in the tropical regions of the other oceans too (Vinogradov, 1990*b*).

Among another interest species we want to mention is the warm-water species ***Scina latifrons*** which is considered to be a rare animal.

Another species which is long time considered to be very rare is ***Lycaeopsis zamboangae***. *L. zamboangae* was known mainly from the Pacific Ocean and Red Sea (M. E. Vinogradov *et al*., 1982), from Atlantic Ocean only few specimens were reported off Madeira (Stebbing, 1888), off Açores and from 30°N (Chevreux, 1935), -On Chevreux's figure of *L. zamboangae* (CHEVREUX, 1935, Plate XIV, fig. 6) absent a characteristic notch in the anterior margin of the endopodite of uropode III – an important character of this species. These notches are present in our animals-, off Fuerteventura in the Canary Islands (Thurston, 1976). But Lima & Valentin (2001) show that this species is quite common in the Brazilian coastal waters. Three specimens of *L. zamboangae* are present in our material (0.4% of all collected hyperiids).

ACKNOWLEDGEMENTS

Special mention to the Director of the Museo de Ciencias Naturales de Tenerife, Dr. Juan José Bacallado, coordinator of the *Macaronesia 2000* project where was included the *TFMCBM/98 Cape Verde Cruise*.

BIBLIOGRAPHY

BARKHATOV, V. A. & M. E. VINOGRADOV (1988). *Hyperiid amphipods from subantarctic and adjacent areas of the central part of the Pacific*. In: Vinogradov, M. E. & M. V. Flint (Eds.). *Subantarctic zone ecosystems in the Pacific*. Nauka, Moscow. P. 228-245 (in Russian).

BOWMAN, T. E. (1973). Pelagic amphipods of the genus *Hyperia* and closely related genera (Hyperiidea: Hyperiidae). *Smithsonian Contribution to Zoology.* 136: 1-76.

CHEVREUX, E. (1935). Amphipodes provenant des campagnes du Prince Albert I[er] de Monaco. *Résultats des Campagnes Scientifiques accomplies sur son Yacht par Albert I[er], Prince Souverian de Monaco.* 90: 1-214.

HARBISON, G. R. & L. P MADIN (1976). Description of female *Lycaea nasuta* Claus, 1879 with an illustrated key to the species of *Lycaea* Dana, 1852 (Amphipoda, Hyperiidea). *Bulletin of the Marine Sciences*. 26 (2): 165-171.

HERNÁNDEZ, F., S. JIMÉNEZ, M. A. FERNÁNDEZ-ALAMO, E. TEJERA & E. ARBELO (2000). Sobre la presencia de moluscos nudibranquios planctónicos en el archipiélago de Cabo Verde. *Rev. Acad Canar. Cienc.,* XII (3 y 4): 49-54.

LIMA, M. C. G. & J. L. VALENTIN (2001). Preliminary results to the holistic knowledge of the Amphipoda Hyperiidea faunal composition off the Brazilian coast. *Journal of Plankton research*. 23 (5): 469-480.

LINDLEY, J. A. & F. HERNÁNDEZ (1999a). A previously undescribed callianassid larva from the collections of the Natural Sciences Museum of Tenerife. *Rev. Acad. Canar. Cienc.,* XI (3-4): 105-111.

LINDLEY, J. A. & F. HERNÁNDEZ (1999b). The occurrence in waters around the Canary Islands and Cape Verde Islands of *Amphionides reynaudii*, the sole species of the order Amphionidacea (Crustacea: Eucarida). *Rev. Acad. Canar. Cienc.,* XI (3-4): 113-119.

LINDLEY, J. A. & F. HERNÁNDEZ (2000). A previously undescribed zoea attributed to *Calcinus talismani* (Crustacea: Decapoda: Diogenidae). *Bocagiana* (201):1-5.

LINDLEY, J. A., F. HERNÁNDEZ, E. TEJERA & S. JIMÉNEZ (2001). Decápodos pelágicos (larvas y adultos) de las Islas de Cabo Verde (Campaña TFMCBM/98). *Rev. Acad. Canar. Cienc.,* XIII (4): 87-99.

RAMIREZ, F. C. & M. M. VIÑAS (1985). Hyperiid amphipods found in Argentine shelf waters. *Physis* (Buenos Aires), A. 43(104):25-37.

SHULENBERGER, E. (1977). Hyperiid amphipods from the zooplankton community of the North Pacific central gyre. *Marine Biology*. 42(4):375-385.

SIEGEL-CAUSEY D. (1982). *Factors determining the distribution of hyperiid Amphipoda in the Gulf of California.* Ph.D. thesis. University of Arizona, Arizona. P. 1-535.

STEBBING, T. R. R. (1888). Report on the Amphipoda collected by H.M.S. “Challenger” during the years 1873-1876. *Report of the Scientific Results of the Voyage of H.M.S. “Challenger” during the years 1873-1876.* 29: 1-1737.

TASHIRO, J. E. (1978). Comparison of *Eupronoe armata* Claus, 1879 and *Eupronoe intermedia* Stebbing, 1888 (Amphipoda, Hyperiidea). *Crustaceana*. 4 (1): 76-82.

THURSTON, M. H. (1976). The vertical distribution and diurnal migration of the Crustacea Amphipoda collecting during the SOND cruise, 1965. II. The hyperiidea and general discussion. *Journal of the Marine Biological Association of the United Kingdom.* 56:383-470.

VINOGRADOV, G. M. (1988). Life-forms of pelagic amphipods. *Zoologicheskyi Zhurnal.* 67 (12): 1765-1775 (in Russian).

VINOGRADOV, G. M. (1990a). Amphipoda (Crustacea) in the pelagic zone of the southeastern Pacific Ocean. *Trudy Instituta Okeanologii Akademii Nauk SSSR*. 124:27-104 (in Russian).

VINOGRADOV, G. M. (1990b). Hyperiidea (Amphipoda, Crustacea), rare and new for the Indian Ocean. *Trudy Instituta Okeanologii Akademii Nauk SSSR*. 124:105-111.

VINOGRADOV, G. M. (1990c). Life-forms ratio of hyperiid amphipods in different parts of the Ocean. *Okeanologiya* 30(4): 655-665 (in Russian. Translated to English in 1992 in *Oceanology of the Academy of Scitnces of the USSR (English edition)*. "1990". 30(4): 482-489).

VINOGRADOV, G. M. (1991). Hyperiid amphipod of the eastern part of the South Pacific gyre. *Marine Biology*. 109(2):259-265.

VINOGRADOV, G. M. (1993). Hyperiid amphipods from the Walters Shoal (southwestern Indian Ocean). *Arthropoda Selecta.* 2(1):41-48.

VINOGRADOV, G. M. (1999). *Amphipoda*. In: D. Boltovskoy (ed.). *South Atlantic Zooplankton.* Backhuys Publishers, Leiden. P. 1141-1240.

VINOGRADOV, M. E., A. F. VOLKOV & T. N. SEMENOVA (1982). *Hyperiid amphipods (Amphipoda, Crustacea) of the Ocean*. Nauka, Leningrad. P. 1-492 (in Russian. Translated to English in 1996: Smithsonian Institution Libraires, Washington, D.C. P. 1-621.).

VINOGRADOVA, N. G. (1988). Tunicata, or Urochordata. *Zhizn' Zhivotnykh, Vol. 2.* Prosveshchenie, Moscow. P. 256-285 (in Russian).

YOUNG, J. W. & D. T. ANDERSON (1987). Hyperiid amphipods (Crustacea: Peracarida) from a warm-core eddy in the Tasman Sea. *Australian journal of Marine and Freshwater Research*. 38(6):711-725.

ZEIDLER, W. (1978). Hyperiidea (Crustacea: Amphipoda) from Queensland waters. *Australian Journal of Zoology*, Supplement 59: 1-93.

ZEIDLER, W. (1992). Hyperiid amphipods (Crustacea: Amphipoda: Hyperiidea) collected recently from Eastern Australian waters. *Records of the Australian Museum*. 44:85-133.

ZEIDLER, W. (1998). Pelagic Amphipods (Crustacea: Amphipoda: Hyperiidea) collected from eastern and south-eastern Australian waters by the CSIRO research vessel 'Warreen' during the years 1938–41. *Records of the South Australian Museum. Monograph Series* 4, 1-143.

Fecha de recepción: 2 marzo 2004 Fecha de aceptación: 3 noviembre 2004

STATION	CODE	HAULS	DATE	HOUR	COORDENATES
CV000001	23C98N	1000-0 nocturnal	23/09/98	20:46	16° 25' 50'' N 24° 29' 02'' W
CV000002	24C98T	1000-0 diurnal	24/09/98	15:55	16° 38' 54'' N 24° 49' 22'' W
CV000003	24C98N	1000-0 nocturnal	24/09/98	20:10	16° 39' 59'' N 24° 49' 07'' W
CV000004	25C98D	1000-0 diurnal	25/09/98	12:01	16° 43' 33'' N 25° 05' 04'' W
CV000005	27C98T	1000-0 diurnal	27/09/98	17:13	16° 42' 49'' N 24° 50' 10'' W
CV000007	28B98T	500-0 diurnal	28/09/98	17:00	16° 31' 47'' N 24° 21' 22'' W
CV000006	28C98D	1000-0 diurnal	28/09/98	11:09	16° 30' 00'' N 24° 26' 32'' W

Table I.- Samplings of the *TFMCBM/98 Cape Verde* Cruise.

Species / Samples	**23C98N**	**24C98T**	**24C98N**	**25C98D**	**27C98T**	**28B98T**	**28C98D**	**TOTAL**
TOTAL	**48**	**182**	**77**	**63**	**335**	**64**	**122**	**891**
Primno latreillei	**14**	**72**	**31**	2	**69**	**10**	4	**202**
Lestrigonus bengalensis	4	**12**	1	3	**59**	**11**	**14**	**104**
Eupronoe armata forma *intermedia*	6	3	2	8	**24**	**12**	6	**61**
Lestrigonus macrophthalmus	1	8	2	1	**11**	9	**15**	**47**
Primno brevidens	2	**12**	7	4	**12**	4	1	**42**
Hyperietta stephenseni	1	**14**	6		7	3	3	**34**
Hyperietta vosseleri		4	3		**17**	1	6	**31**
Brachyscelus crusculum		8		**11**	6	1	3	**29**
Cyphocaris challengeri			1	2	**19**		1	**23**
Unidentified larvae					19	2	2	**23**
Primno sp. (larvae, early juv.)			1		**12**	2	6	**21**
Brachyscelus sp. (larvae, early juv.)		1		1	6	2	6	**16**
Phrosina semilunata	1	4	4		4		2	**15**
Stenopleura atlantica	2	3		2	3		4	**14**
Brachyscelus globiceps	2			4	5		1	**12**
Brachyscelus rapax	1	1	2		3	3	2	**12**
Tetrathyrus forcipatus	1	3	1		2	2	3	**12**
Lestrigonus shizogeneios		2		1	4	3		**10**
Brachyscelus macrocephalus					7		2	**9**
Lycaea pachypoda			2		2		5	**9**
Larvae Hyperiidae gen. sp.					6	1	2	**9**
Phronimella elongata	1	2	1		5			**9**
Eupronoe minuta		2	1	2	1	1		**7**
Eusiropsis riisei		1		3	2		1	**7**
Vibilia armata	2			2	1		2	**7**
Phronima sedentaria			1	2	2		1	**6**
Hypertietta sp. (larvae, early juv.)			1		1		4	**6**
Lestrigonus sp. (larvae, early juv.)					5	1		**6**
Lycaeopsis themistoides		2	2		2	1		**6**
Paraphronima crassipes	1	2			1	1		**5**
Pronoe capito		2		2			1	**5**
Scina crassicornis	1		1		1		2	**5**

Cyphocaris anonyx		1	1	1			1	**4**
Hyperietta stebbingi		1		2			1	**4**
Hyperionyx macrodactylus					3		1	**4**
Parapronoe crustulum		1		2			1	**4**
Paratyphis parvus	1	2	1					**4**
Phronimopsis spinifera		2			2			**4**
Tryphana malmi		1	1		1		1	**4**
Hyperioides longipes	1	1					1	**3**
Lycaeopsis zamboangae			1	1	1			**3**
Parapronoe sp. (larvae, early juv.)					2		1	**3**
Parascelus edwardsi		1					2	**3**
Phronima stebbingi		1	1		1			**3**
Themistella fusca					1		2	**3**
Eupronoe laticarpa	1		1					**2**
Hyperietta luzoni	1	1						**2**
Hyperietta parviceps		1					1	**2**
Lycaea sp. (larvae, early juv.)					1		1	**2**
Paratyphis maculates	1						1	**2**
Phronima atlantica		1			1			**2**
Platyscelus crustulatus		1	1					**2**
Scina borealis				2				**2**
Simorhynchotus antennarius							2	**2**
Thyropus sphaeroma					2			**2**
Vibilia viatrix	1			1				**2**
Amphithyrus muratus					1			**1**
Anchylomera blossevillei	1							**1**
Archaeoscina steenstrupi					1			**1**
Calamorhynchus pellucidus				1				**1**
Eupronoe maculata		1						**1**
Leptocotis tenuirostris		1						**1**
Lestrigonus latissimus					1			**1**
Lycaea bovallioides		1						**1**
Lycaeopsis sp. (larv.)							1	**1**
Mimonectes loveni		1						**1**
Mimonectes sphaericus		1						**1**
Oxycephalus piscator forma *typicus*					1			**1**
Paraphronima gracilis							1	**1**
Parapronoe campbelli				1				**1**
Phronima colleti		1						**1**
Phronima curvipes		1						**1**
Phronima pacifica		1						**1**
Scina damasi					1			**1**
Scina latifrons					1			**1**
Scina stebbingi					1			**1**
Scina rattrayi keilhacki				1				**1**
Scina rattrayi rattrayi			1					**1**
Scina similis	1							**1**
Scina tullbergi							1	**1**
Scina submarginata					1			**1**
Scina wagleri atlantis		1						**1**
Scina sp. (larv.)							1	**1**
Streetsia challengeri							1	**1**
Streetsia porcella					1			**1**
Vibilia propinqua				1				**1**

Table II. Distribution of amphipods between the *TFMCBM/98 Cape Verde Cruise* stations (species ranked by abundance, damaged specimens excluded).

Region	Sampling gear	N of hauls	Depth range, m	N of specimens	N of genera	N of species	% of specimens represented by 7 most abundant species	Source
Off the Cape Verde Islands	**0.25 m^2 triple net WP-2**	**7 triple vertical hauls (21 sample)**	**1000–0, sometimes 500–0**	**843**	**34**	**71**	**65.4**	**Present study**
Off Fuerteventura in the Canary Islands	1 m^2 ring-net N-113	38	up to 1000	4450	39	78 (+12)*	74.1	Thurston, 1976
Off the Brazilian coast	Bongo-type net	42	147 (max.) –0	–	27	39	–	Lima & Valentin, 2001
Walters Shoal (33°S, 44°E, Indian Ocean)	Samyshev-Aseev modification of the Isaacs-Kidd midwater trawl with mouth area 5.5 m^2 (IKSAMT)	24	up to 1000, mainly in subsurface 200-m layer	8564	35	79	77.7	Vinogradov, 1993
Nazca and Sala y Gómez Ridges (eastern part of the South Pacific Gyre)	IKSAMT	43	50–300, 300–500, 2 hauls to 1000	7198	43	119	50.9	Vinogradov, 1990*a*, 1991
Central part of the North Pacific Gyre	Bongo net	79	600–0, sometimes 1000–0	14851	42	83	68.2	Shulenberger, 1977
Gulf of California (Pacific Ocean)	1-m-net oblique hauls	731	140–0, sometimes to 1000	–	45	111	–	Siegel-Causey, 1982

*Additional twelve species were found in this region in Issaks-Kidd midwater trawl, neuston net and 1 m^2 rectangular midwater trawl (Thurston, 1976).

Table III.- Hyperiid amphipods collections from various warm-water regions of the Ocean.

Rank	**Off the Cape Verde Islands**	Off the Canary Islands	North Pacific Gyre	South Pacific Gyre*	The Walters Shoal*
1	***Primno latreillei+ brevidens***	*Primno latreillei+brevidens*	*Primno sp.*	*Phronima atlantica*	*Vibilia armata*
2	***Lestrigonus bengalensis***	*Hyperioides longipes*	*Hyperietta vosseleri*	*Phronimella elongata*	*Phronimella elongata*
3	***Eupronoe armata***	*Scina borealis*	*Hyperioides sibaginis*	*Anchylomera blossevillei*	*Brachyscelus crusculum*
4	***Lestrigonus macrophthalmus***	*Phrosina semilunata*	*Eupronoe sp.*	*Paratyphis promontori*	*Phronima atlantica*
5	***Hyperietta stephenseni***	*Phronima atlantica*	*Lestrigonus bengalensis*	*Primno brevidens+latreillei*	*Paraphronima crassipes*
6	***Hyperietta vosseleri***	*Vibilia armata*	*Scina crassicornes*	*Phrosina semilunata*	*Parapronoe campbelli*
7	***Brachyscelus crusculum***	*Paraphronima gracilis*	*Hyperioides longipes*	*Hemityphis tenuimanus*	*Phrosina semilunata*

*Samples were taken by big midwater trawls (IKSAMT) and did not include the upper 50-m layer.

Table IV.- The dominant hyperiid species in Cape Verde collection in comparison with collections off Fuerteventura in the Canary Islands (after Thurston, 1976), from central part of the North Pacific Gyre (after Shulenberger, 1977), from Nazka and Sala y Gómez Ridges, South Pacific Gyre (after Vinogradov, 1991) and from the Walters Shoal, Indian Ocean (after Vinogradov, 1993).