

***Vir smiti* spec. nov., a new scleractinian associated pontoniine
shrimp (Crustacea: Decapoda: Palaemonidae)
from the Indo-West Pacific**

C.H.J.M. Fransen & L.B. Holthuis

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A new species of scleractinian associated pontoniine shrimp, *Vir smiti* spec. nov., is described and illustrated on the basis of specimens collected throughout the Indo-West Pacific.

Introduction

The genus *Vir* was erected by Holthuis (1952) to accommodate *Palaemonella orientalis* Dana, 1852, which differs from *Palaemonella* species in lacking an hepatic spine. *Vir orientalis* has been recorded from *Pocillopora damicornis* (Linnaeus, 1758) and several species of *Acropora* Oken, 1815. In recent years, several morphologically very similar new species of *Vir* have been described from various scleractinian corals within the family Euphylliidae Veron, 2000: *V. philippinensis* Bruce & Svoboda, 1984 and *V. colemani* Bruce, 2003, both mainly recorded from the genus *Plerogyra* Milne Edwards & Haime, 1848; *V. euphyllius* Marin & Anker, 2005 from *Euphyllia* cf. *divisa* and *V. pareuphyllius* Marin & Anker, 2005 from *Euphyllia* cf. *parancora* Veron, 1990. On the basis of more material, Marin (in press) recognized *Vir pareuphyllius* as a junior synonym of *V. euphyllius*.

In 1993, the first author recorded *Vir orientalis* from the Seychelles, occurring in association with both *Pocillopora damicornis* and *Physogyra lichtensteini* (Milne Edwards & Haime, 1851). Collections made during the last decades in the Indo-West Pacific yielded many more specimens from *Physogyra* Quelch, 1884. These specimens show small morphological differences as well as differences in colouration in comparison with other species of *Vir*. These specimens are here described as the new species *Vir smiti*.

Specimens are deposited in the collections of the National Natuurhistorisch Museum, Leiden (Previously Rijksmuseum van Natuurlijke Historie (RMNH)). The postorbital carapace length (pocl.) is used as a standard measurement indicating the size of the specimens. R is used to indicate the rostral dentition formula.

***Vir smiti* spec. nov.
(figs 1-27, 32-34)**

Vir orientalis; Fransen, 1994: 141 (except for RMNH D 42991 = *Vir orientalis* Dana, 1852)
Vir sp. Minemizu et al., 2000: 45; Marin & Anker, 2005: 128, fig. 9f.

Material.— **Philippines.**— 1 ovigerous female holotype, pcl. 3.9 mm, R=8/1; RMNH D 48539: Sta. CEB.09; Cebu Strait, W of Bohol, N side of Cabilao Island, NE of Looc; 9°53.59'N 123°46.92'E; overhanging wall with caves; scuba; 13.xi.1999; depth 15 m; on *Physogryra lichtensteini*; leg. C.H.J.M. Fransen; photo 12/8-14.— **Seychelles.**— 1 ovigerous female, pcl. 4.4 mm, R=6/1; 1 male, pcl. 3.2 mm, R=5/1; RMNH D 42804: NIOP-E, Sta. 618; Mahé, NE coast, North East Point, 04°35'S 55°28'E; intertidal to 12 m, reef flat, exposed reef slope with sparse coral cover merging into sandy bottom; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 14.xii.1992.— 1 ovigerous female, pcl. 3.3, R=7/1; RMNH D 42805: NIOP-E, Sta. 753; St Joseph atoll, NW rim, 5°24'S 53°19'E; reef slope; 20 m; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 26.xii.1992; collected by C.H.J.M. Fransen.— 1 male, pcl. 2.4 mm, R=5/1; RMNH D 42806: NIOP-E, Sta. 723; Bird Island, off N coast, 3°42'S 55°12'E; coral reef, near drop-off; 20 m; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 21.xii.1992; collected by C.H.J.M. Fransen.— 2 ovigerous females: pcl. 3.8 mm, R=6/1 and 3.9 mm, R=5/1; 1 juvenile, pcl. 1.4, R=5/0; RMNH D 42807: NIOP-E, Sta. 788; Alphonse atoll, SE part of lagoon, 7°02'S 52°44'E; reef flat and patch reefs, down to 8 m; 8 m; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 4/6.i.1993; collected by C.H.J.M. Fransen.— 1 male, pcl. 2.5 mm, R=5/1; RMNH D 42808: NIOP-E, Sta. 788; Alphonse atoll, SE part of lagoon, 7°02'S 52°44'E; reef flat and patch reefs; 8 m; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 4/6.i.1993; collected by C.H.J.M. Fransen.— 1 ovigerous female, pcl. 4.3, R=6/1; RMNH D 42809: NIOP-E, Sta. 767; Poivre atoll, N rim, 5°44'S 53°18'E; coral reef; 15 m; on *Physogryra lichtensteini* (det. B.W. Hoeksema); 29/31.xii.1992; collected by C.H.J.M. Fransen.— 1 male, pcl. 1.9 mm, R=8/0; RMNH D 42996: NIOP-E, Sta. 748; E of Mahé, E coast of Sainte Anne Island, 4°37'S 55°31'E; 10 m; 25.xii.1992.— **Indonesia.**— 2 ovigerous females: pcl. 2.5 mm, R=7/2; pcl. 2.9, R=7/1; 4 males: pcl. 2.0 mm, R=8/1; pcl. 2.2 mm, R=8/2; pcl. 2.6 mm, R=7/1; pcl. 2.7 mm, R=8/2; RMNH D 46677: N Sulawesi, Selat Lembeh, near Tandarusa, Sarena Kecil West, 01°27'N 125°13'E; sandy bank, from sandy shore to coral covered slope; 10 m; 31.x.1994; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen & J. van Egmond.— 1 ovigerous female, pcl. 3.8 mm, R=7/1; RMNH D 47478: Sta. MAL.05; Moluccas, Ambon, N coast, Manuala beach, W of Hila, 03°35'S 128°05'E; 7.xi.1996; ca. 10 m; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.— 1 male, pcl. 2.6 mm, R=8/1; RMNH D 47479: Sta. MAL.02; Moluccas, Ambon, Outer bay, N coast near Rumah Tiga, 03°40'S 128°10'E; 5.xi.1996; 4-5 m; on *Physogryra lichtensteini*; leg. C.H.J.M. Fransen.— 2 males, pcl. 2.5 mm, R=5/1; pcl. 2.8 mm, R=6/1; RMNH D 47480: Sta. MAL.05; Moluccas, Ambon, N coast, Manuala beach, W of Hila, 03°35'S 128°05'E; 7.xi.1996; ca. 15 m; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.— 1 ovigerous female, pcl. 2.3 mm, R=6/1; 2 males, pcl. 1.7 mm, R=7/1; 2.2 mm, R=7/1; RMNH D 48235: Sta. RBE.11; Moluccas, Ambon, Leitimur, Cape Nusaniwe; 12.xi.1990; 15 m; on coral; collected by C.H.J.M. Fransen; photo M.S.S. Lavaleye 3/14-17.— 1 ovigerous female, pcl. 2.8 mm, R=7/1; 1 juvenile, pcl. 1.3 mm, R=6/1; RMNH D 48238: Sta. RBE.37; Moluccas, Ambon, Hitu, Amboin Bay, outer bay, W-side of Laha; 6.xii.1990; 4 m; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen; photo M.S.S. Lavaleye.— 1 ovigerous female, pcl. 2.8, R=8/2; RMNH D 49854; BAL.20; Bali, Tulamben beach, 'Coral Garden' off hotel area, 08°16'36"S 115°35'37"E; shallow reef flat and slope, sandy slope; 20 m; 13.iv.2001; on

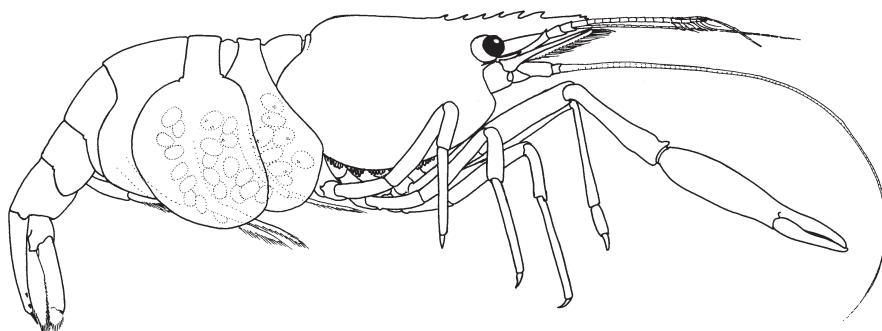


Fig. 1. *Vir smiti* spec. nov.: ovigerous female holotype, pcl. 3.9 mm, RMNH D 48539, lateral view.

Physogryra lichtensteini; collected by C.H.J.M. Fransen; film 25.– 1 female, pool. 1.9 mm, R=7/1; RMNH D 50404: BAL.22; Bali, SE-end Tulamben beach, 08°16'40"S 115°35'45"E; reef flat with drop-off and slope, sandy base; 20 m; 12.iv.2001; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen; film 23.– 1 ovigerous female (P2 missing), pool. 3.3 mm, R=5/1; RMNH D 51741: BER.01; NE Kalimantan, Berau Islands, Derawan Island, E-side, (Coral Garden), 02°17'32.0"N 118°15'43.4"E; 11.x.2003; 10 m; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.– 1 ovigerous female, pool. 3.2 mm, R=7/2; RMNH D 51742: BER.13; NE Kalimantan, Berau Islands, Sangalaki Island, reef, S-side, 02°04'46.9"N 118°23'47.3"E; 8.x.2003; 15 m; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.– 1 ovigerous female, pool. 3.8 mm, R=7/2; RMNH D 51743: BER.36; NE Kalimantan, Berau Islands, Kakaban Island, SE-side, 02°07'56.6"N 118°32'39.8"E; 21.x.2003; 5 m; on scleractinian coral *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.– 1 ovigerous female, pool. 3.4 m, R=6/1; RMNH D 51744: SER.15; Java Sea, Kepulauan Seribu (Thousands Islands), off Jakarta, Kelapa Island, NW-side, 5°39'16"S, 106°33'32"E; 13.ix.2005; on *Physogryra lichtensteini*; collected by C.H.J.M. Fransen.

Material for comparison of *Vir philippinensis* Bruce & Svoboda, 1984.—**Philippines.**— 1 ovigerous female, pool. 2.8 mm, R=7/1; 1 male, pool. 2.5 mm, R=6/2; RMNH D 48528: Sta. CEB.10; Cebu Strait, W of Bohol, SE side of Cabilao Island, SW of Talisay, 9°52.28'N 123°46.76"E; gentle slope, low coral density, much rubble; 13.xi.1999; 20 m; on *Plerogyra sinuosa* (Dana 1846); collected by C.H.J.M. Fransen; film 11/16-23.– 1 female, pool. 3.4, R=8/2; RMNH 48530: Sta. CEB.13; Cebu Strait, W of Bohol, N side of Sandingan Island, 9°51.87'N 123°47.76"E; rubble slope; 13.xi.1999; 20 m; on *Plerogyra sinuosa*; collected by C.H.J.M. Fransen; film 16/23-29.—**Indonesia.**— 1 ovigerous female, pool. 3.4 mm, R=7/1; RMNH D 51745: SER.29; Java Sea, Kepulauan Seribu (Thousands Islands), off Jakarta, Tikus Island, N-side, 5°51'13"S 106°34'43"E; 19.ix.2005; 12 m; on *Plerogyra sinuosa*; collected by C.H.J.M. Fransen; film 14.

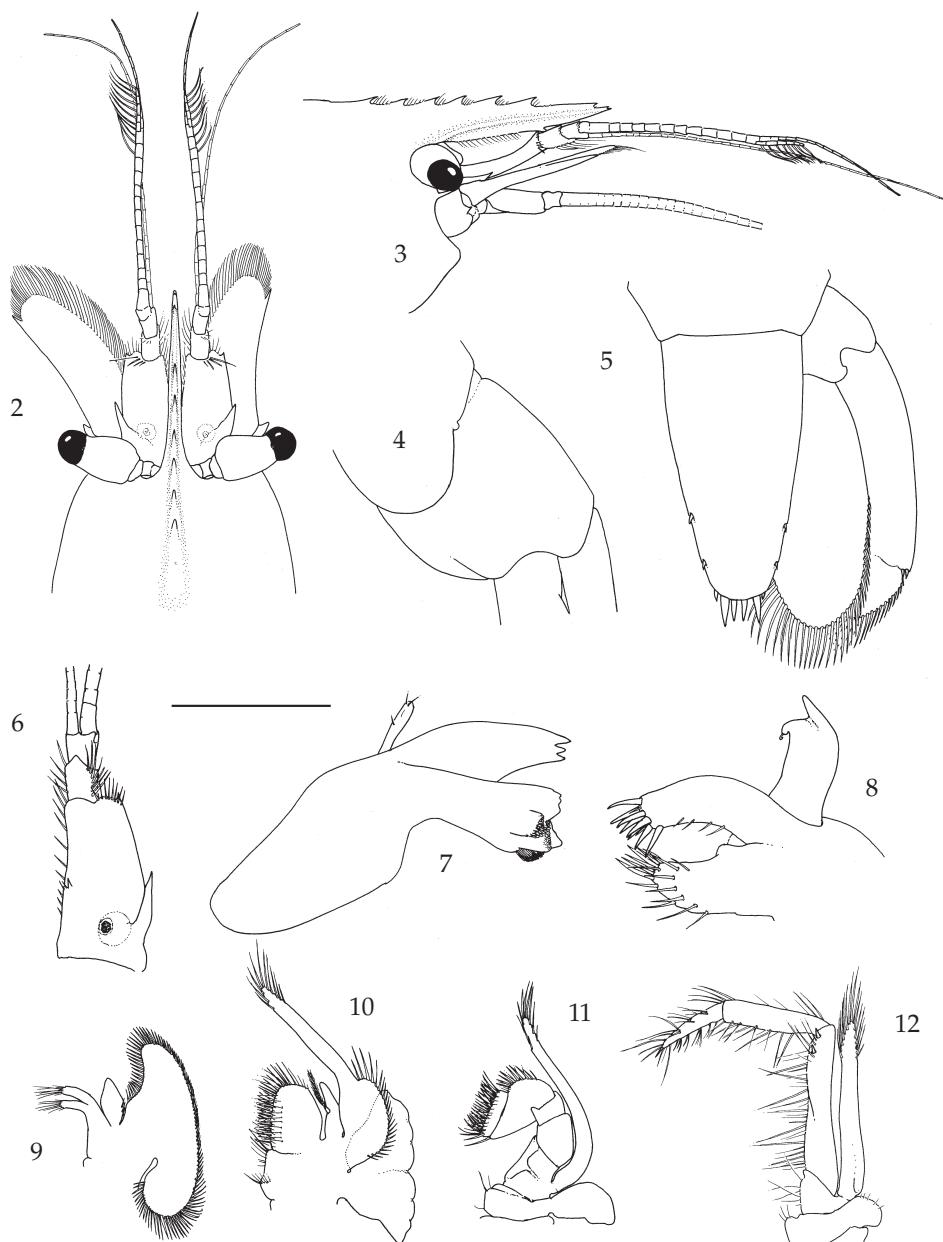
Description of ovigerous female holotype.—A small slender pontoniine shrimp of slightly compressed body form. Carapace smooth. Rostrum well developed, straight, horizontal, reaching distal margin of scaphocerite, with six acute equally spaced subequal dorsal teeth each with few short setae distally, and two small subdistal teeth slightly separated from proximal teeth, two proximalmost teeth postorbital; ventral margin with single row of short setae, with single acute tooth at level of distal margin of basal antennular segment. Carapace slightly swollen posteriorly; orbit obsolescent; inferior orbital angle slightly produced; antennal spine long, slender, acute and marginal, reaching distal margin of basicerite; anterolateral angle slightly produced, rounded.

Abdomen normal, third tergite not produced, sixth segment about 1.33 times length of fifth, 1.13 times longer than deep, with posterolateral and posteroventral angles bluntly produced; pleura of first three segments enlarged, broadly rounded, of fourth and fifth segments small, rounded.

Telson about 1.8 times longer than sixth abdominal segment, 1.8 times longer than proximal width, lateral margins convergent, sublinear, with two pairs of small subequal dorsal spines at about 0.7 and 0.9 of telson length, distal margin about 0.36 of proximal margin width, rounded, without median process, lateral spines small, similar to dorsal spines, intermediate spines robust, about 0.12 of telson length, submedian spines about 0.65 of intermediate spine length, setulose.

Eye with pigmented globular cornea, with distinct accessory pigment spot dorsally; width of cornea about 0.65 of maximum width of eyestalk; eyestalk 1.12 times longer than maximum width.

Antennula normal; basal segment of antennular peduncle clearly more the half as long as scaphocerite, with small acute ventromedial tooth, distal margin convex, with plumose setae, distolateral tooth small, not overreaching distal margin, lateral margin slightly convex, medial margin slightly concave with row of plumose setae, statocyst



Figs. 2-12. *Vir smiti* spec. nov.: ovigerous female holotype, pocl. 3.9 mm, RMNH D 48539. 2, Anterior appendages, dorsal view; 3, idem, lateral view; 4, sixth abdominal segment, lateral view; 5, telson and uropods, dorsal view; 6, antennular peduncle, ventral view; 7, left mandible, dorsal view; 8, left maxillula, ventral view; 9, left maxilla, ventral view; 10, left first maxilliped, ventral view; 11, left second maxilliped, ventral view; 12, left third maxilliped, ventral view. Scale: 1, 2 = 2 mm; 3, 4 = 1 mm; 6, 9-12 = 1.5 mm; 7, 8 = 0.6 mm.

normal; stylocerite slender, acute, reaching to half segment length; intermediate and distal segments subequal in length, together about 0.5 of basal segment length; flagella long, slender, upper flagellum biramous, proximal 13 segments fused, shorter free ramus with four segments, with ten groups of aesthetascs, longer free ramus slender, composed of 13 segments.

Antenna normal; basicerite armed with short acute distolateral spine; ischiocerite and merocerite normal; car pocerite subcylindrical, reaching to about half scaphocerite length; flagellum well developed; scaphocerite extending slightly beyond antennular peduncle, about 3.25 times longer than maximum width, distal margin rather small, broadly rounded, lateral margin concave with acute distolateral tooth not exceeding distal margin of lamina.

Epistome and labrum normal.

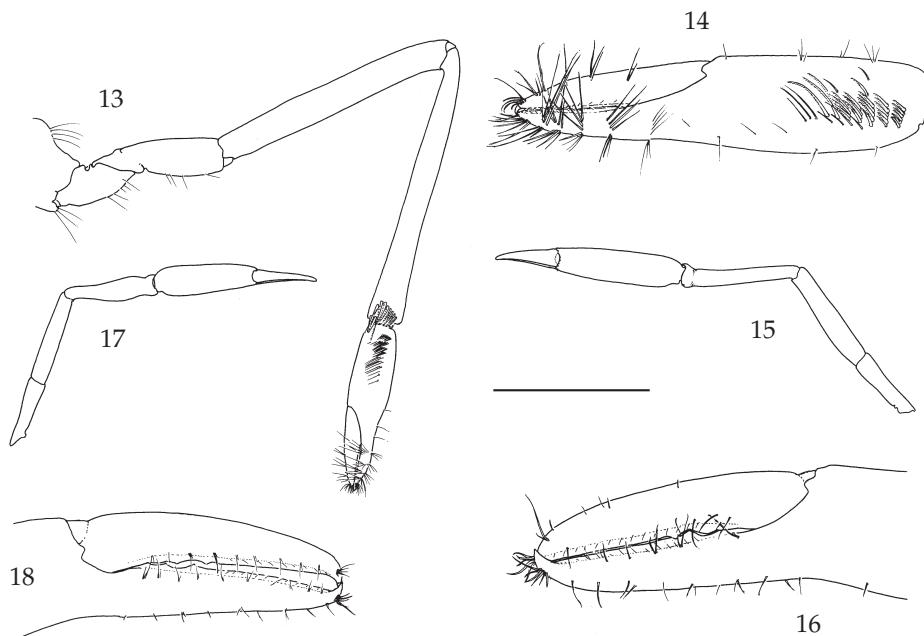
Fourth thoracic sternite with strong, broad, blunt, median process.

Fifth thoracic sternite with shallow lateral plates posteromedial of second pereiopods.

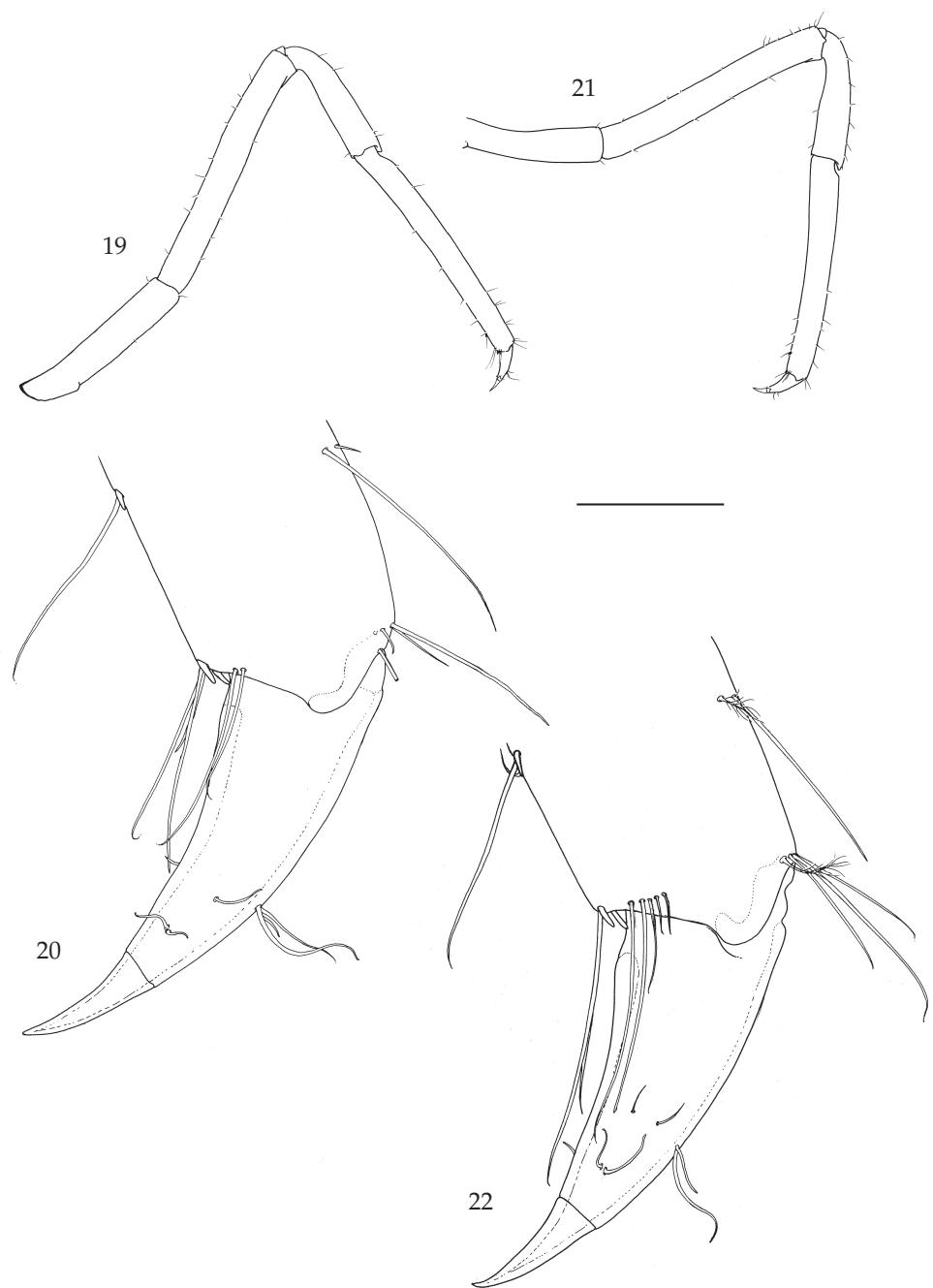
Sixth to eight thoracic sternites unarmed, increasing in width posteriorly.

Mandible robust, with small unsegmented palp with few small simple setae; molar process stout with large angular teeth and brushes of stout setae; incisor process also stout with three large acute distal teeth.

Maxillula with upper lacinia slender, with two rows of about 8 serrulate spines and few short simple setae medially; lower lacinia moderately broad, setose distally; palp distinctly bilobed, upper lobe non-setose, lower lobe with a small, ventral, single, short, recurved seta.



Figs. 13-18. *Vir smiti* spec. nov.: ovigerous female holotype, pool. 3.9 mm, RMNH D 48539. 13, First pereiopod, left; 14, idem, chela; 15, major second pereiopod, left; 16, idem, fingers; 17, minor second pereiopod, right; 18, idem, fingers. Scale: 13 = 1.5 mm; 14 = 0.6 mm; 15, 17 = 4 mm; 16, 18 = 1 mm.

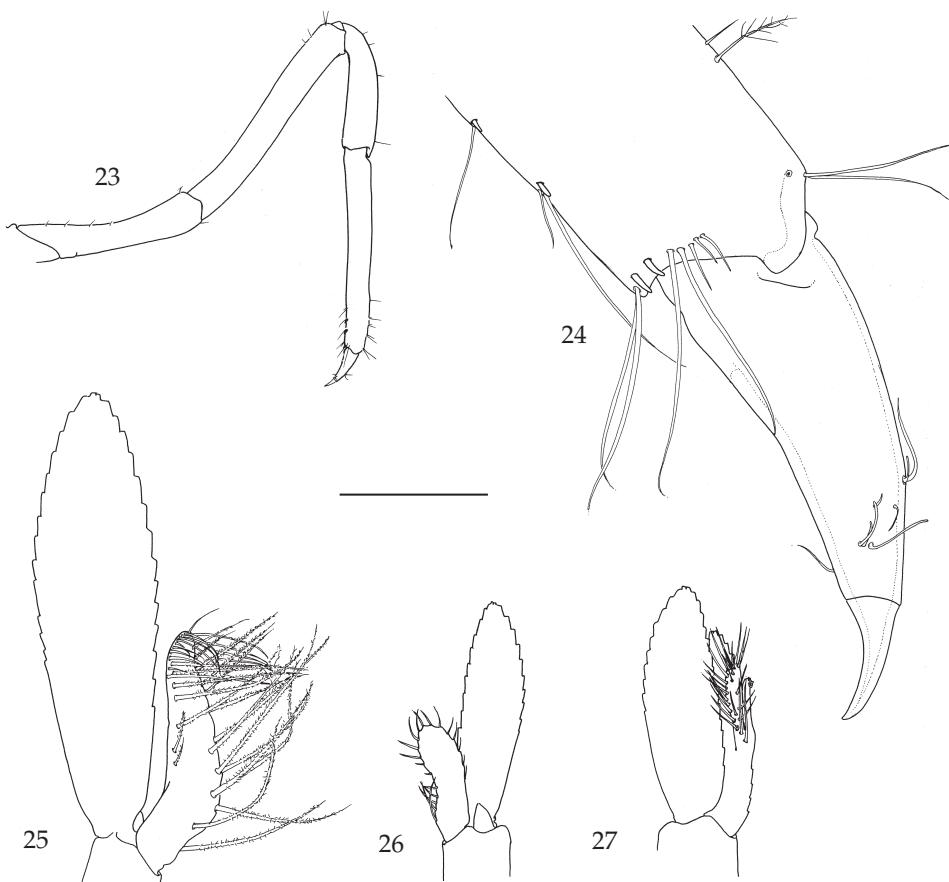


Figs. 19-22. *Vir smiti* spec. nov.: ovigerous female holotype, pocl. 3.9 mm, RMNH D 48539. 19, Third pereiopod, left; 20, idem, dactylus; 21, fourth pereiopod, left; 22, idem, dactylus. Scale: 19, 21 = 1.5 mm; 20, 22 = 0.15 mm.

Maxilla with basal endite well developed, distinctly bilobed; distal and proximal equal in length, both fringed medially by about 10 long simple setae, median border without setae; coxal endite obsolete, median margin straight, without setae; scaphognathite about twice as long as proximal width; palp well developed, basally broad, tapering distally, with few plumose setae on lateral border.

First maxilliped with basal and coxal endites distinct; basal endite broad, anterolateral border sparsely setose, medial margin straight, with numerous slender simple setae; coxal endite medially biconvex, sparsely setose; exopod well developed, flagellum with numerous plumose setae distally, caridean lobe well developed, narrow; coxa with very large bilobed exopod, anterior lobe slightly larger than posterior lobe; palp tapering distally with one large plumose seta halfway medial border.

Second maxilliped with endopod normally developed; with dactylar segment narrow, 4 times longer than broad, densely fringed with numerous coarsely serrulate,



Figs. 23-27. 23-25, *Vir smiti* spec. nov.: ovigerous female holotype, pool. 3.9 mm, RMNH D 48539. 23, Fifth pereiopod, left; 24, idem, dactylus; 25, endopod of first pleopod, left. 26, 27, *Vir smiti* spec. nov.: male paratype, pool. 2.6 mm, RMNH D 47479. 26, endopod of first pleopod, left; 27, endopod of second pleopod, left. Scale 23 = 1.5 mm; 24-27 = 0.6 mm.

spiniform, and long curled, finely serrulate setae medially; distomedial lobe of propodal segment slightly produced, rounded, with row of long slender spines and simple setae, ventrolateral margin devoid of setae except for one large seta distally; carpal segment disomedially angular, without setae, unarmed; meral segment medially excavate, without setae; basal and ischial segments fused, both segments medially excavate, without setae; exopod normal, with long plumose setae distally; coxal segment slightly produced medially, with few setae; epipod small, simple, rounded, without podobranch.

Third maxilliped with endopod slender, reaching to about distal end of carpocerite; ischiomerus and basis distinct, ischiomerus about six times longer than wide, flattened and twisted, setose medially, otherwise glabrous, with two robust spines subdistally; carpal segment four times longer than wide, 0.66 of ischiomeral length, subcylindrical, with groups of long serrulate setae medially; terminal segment about half as long as ischiomeral segment, tapering distally with terminal spine, medial margin with groups of short serrulate setae; basis normal, with few simple setae along median margin; exopod well developed, reaching distal margin of ischiomerus, with numerous plumose setae distally; coxa with small medial lobe and rounded epipod laterally.

First pereiopods slender, exceeding carpocerite with carpus and chela; chela normal, slightly compressed, palm twice as long as deep, with about seven rows of cleaning setae proximoventrally, fingers about as long as palm, slender, tapering, both with about five rows of long serrulate setae and small, simple, hooked tip distally, cutting edges simple, entire; carpus about 1.7 times chela length, slender, about 7.8 times longer than distal width, tapering slightly proximally, with several cleaning setae distoventrally; merus slightly shorter than carpus, 8.0 times longer than wide; ischium and basis normal; coxa with small setose ventromedial lobe.

Second pereiopods subequal and similar; major pereiopod with chela about 1.2 times carapace length, palm smooth about 3.3 times longer than deep, slightly swollen proximally, fingers 0.5 times palm length, slender, dactylus about 5.5 times longer than proximal depth, dorsal margin slightly convex, tip hooked, acute, cutting edge with two low teeth in proximal half, distal cutting edge entire; fixed finger similar, with one large low tooth and three small at about a third of cutting edge, with 3 smaller teeth proximally; carpus about 0.6 of chela length, 4.5 times longer than distal width, tapering proximally, constricted then flared distally with blunt angular dorsal lobe; merus slightly shorter than carpus, 5.0 times longer than central width, unarmed; ischium about 0.65 length of merus, tapering proximally; basis and coxa without special features. Minor second pereiopod similar, chela about 0.85 of major chela length.

Third pereiopod slender, exceeding carpocerite by distal half carpus, propodus and dactylus; dactylus simple, slightly curved, 0.2 of propodus length, 3.2 times longer than proximal depth, corpus 2.4 times longer than proximal width, distal width 0.33 times proximal width, dorsal margin convex, with 2-3 simple setae at about 0.65 of length, ventral margin proximally slightly convex, distally concave, unarmed, without setae; unguis distinctly demarcated, about 0.35 of corpus length, simple, curved, distally acute; propodus 10 times longer than wide, slightly compressed, straight, uniform, with few small slender setae distally, with one very small blunt ventral subdistal spine and two similar spines ventrodistally; corpus normal, about half propodus length, unarmed; merus slightly longer than propodus, 8.7 times longer than wide, uniform, unarmed; ischium, basis and coxa without special features. Fourth pereiopod similar to third,

slightly shorter. Fifth pereiopod similar to fourth, slightly shorter, propodus with two subdistal ventral spines and slightly more setae distally.

Uropod slightly extending beyond terminal telson spines; protopodite robust, unarmed; exopod with lateral margin slightly convex, non-setose, with small acute postero-lateral tooth distally; endopod about as long as exopod.

Pleopods with endopods much shorter than exopods.

Ova numerous and small.

First pleopod with endopod half as long as exopod, with many long plumose setae medially.

Male (RMNH D 47479) endopod of first pleopod half as long as exopod, about 3.5 times longer than wide, with the median margin concave, distally expanded, with relatively short plumose marginal setae. Endopod of second pleopod 0.8 times length of exopod; appendix masculina well developed, with several rows of strong simple setae, overreaching appendix interna by its distal fourth.

Infraspecific variation.— The number of dorsal teeth on the rostrum varies between 5 and 8, usually the proximalmost tooth is postorbital, sometimes the two proximalmost teeth are postorbital and in one specimen none were postorbital; usually there is one ventral tooth, sometimes there are two ventral teeth and in 2 specimens no ventral teeth were present; the tip is usually bifid. The number of spines on the distoventral margin of the ischiomerus of the third maxillipeds varies between 2 and 4. The position of the proximal pair of dorsal spines on the telson varies from 0.5 of the telson length in small specimens to about 0.8 in the larger specimens. Usually only one mobile spine is present on the distolateral margin of the exopod of the uropod, in few specimens two spines were observed there. The second pair of pereiopods is more strongly developed in males than in females in relation to the carapace length.

Size.— Maximum pool. recorded for males: 3.2 mm; for females 4.4 mm; minimum pool. recorded for ovigerous females: 2.5 mm.

Colouration.— Body translucent with red-brown intestine; eyestalk with two thin longitudinal red-brown lines and few scattered white chromatophores; flagella of antennula and antenna red-brown; third maxilliped with longitudinal red-brown line; anterior appendages with scattered yellow and white chromatophores basally; first and second pereiopods translucent without or with very faint thin longitudinal red-brown line; third, fourth and fifth pereiopods with longitudinal red-brown lines; ovary and ova beige.

Host.— *Physogyra lichtensteini* (Milne Edwards & Haime, 1851), Euphyllidae, Scleractinia.

Etymology.— This species is named in honour of Mr I.J. Smit, who, for more than 40 years has given his best to the Division of Crustacea of the National Museum of Natural History at Leiden, the Netherlands, and still does. Fifteen years old, Mr Smit entered the service of the Museum on 1 August 1964 as assistant to Mr J.A.G. Delfos, who, since 1946, was the technician in charge of the collections of the Division of Crustacea. In 1964 the growth of the Crustacean collections of the Museum made it urgent that a second technical help be appointed. Mr Smit found in Mr Delfos an excellent teacher and they worked together marvellously until the retirement of Mr Delfos in 1983. Then Mr. Smit became head technician of the Division of Crustacea and continued the good work. But economic reasons made it impossible that a second technician

be appointed for the Division, although the growth of the collections would have fully justified such a move. Fortunately the computer age made administration of the collection more easy. The collection under his care was (and still is) in excellent shape, well administered and easy to consult.

But also in the field, Mr Smit showed his great merits. During the collecting trips of the Division to the Iberian Peninsula in early 1971, to Spain, Morocco and Portugal late 1974, to Mauritania in 1988, and to N Sulawesi in 1994, Mr Smit was a hard-working companion, always ready to do (sometimes unpleasant) jobs, never losing his good sense of humour.

It gives us great pleasure to dedicate this interesting and beautiful species of shrimp to Izak Johannes Smit.

Systematic position.— *Vir smiti* is most closely related to *Vir philippinensis* Bruce & Svoboda, 1984.

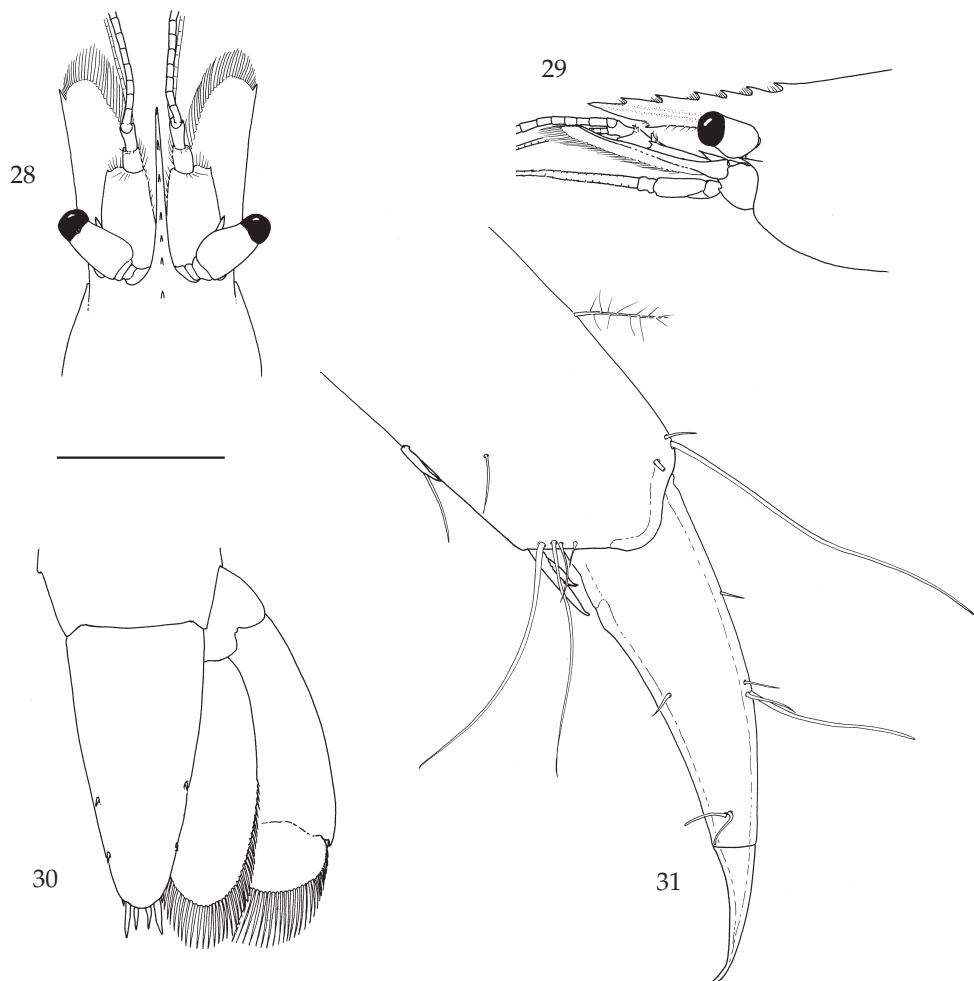
Morphological differences between *V. smiti* and *V. philippinensis*:

- Mandibular palp of *V. smiti* is unsegmented (10 mandibles checked) while two-segmented in *V. philippinensis*.
- Scaphocerite slightly longer than antennular peduncle in *V. smiti*; much longer in *V. philippinensis*. Basal segment of antennular peduncle clearly more than half as long as scaphocerite in *V. smiti*; half as long in *V. philippinensis*.
- Distal margin of scaphocerite smaller in *V. smiti* than in *V. philippinensis*.
- Distolateral tooth of basicerite of antenna short in *V. smiti*; somewhat longer in *V. philippinensis*.
- Propodus of third pereiopod with two very small blunt ventrodistal spines and with one small subdistal ventral spine in *V. smiti*; usually two well developed, more acute, ventrodistal spines in *V. philippinensis*.
- Dactyli of third, fourth and fifth pereiopods about 3.2 times longer than deep in *V. smiti*; over 3.5 times longer than deep in *V. philippinensis*.

Differences in colouration between *V. smiti* and *V. philippinensis*:

- Antennular flagella red-brown in *V. smiti*; basally purple-blue and distally red in *V. philippinensis*.
- With yellow chromatophores between eyes and anterior appendages in *V. smiti*; without yellow chromatophores in *V. philippinensis*.
- First two pereiopods completely transparent in *V. smiti*; with purple-blue longitudinal thin line in *V. philippinensis*.
- Third to fifth pereiopods with red-brown thin longitudinal lines in *V. smiti*; with purple-blue lines in *V. philippinensis*.
- Uropods transparent in *V. smiti*; lateral margin of exopod of uropods with purple-blue line in *V. philippinensis*.

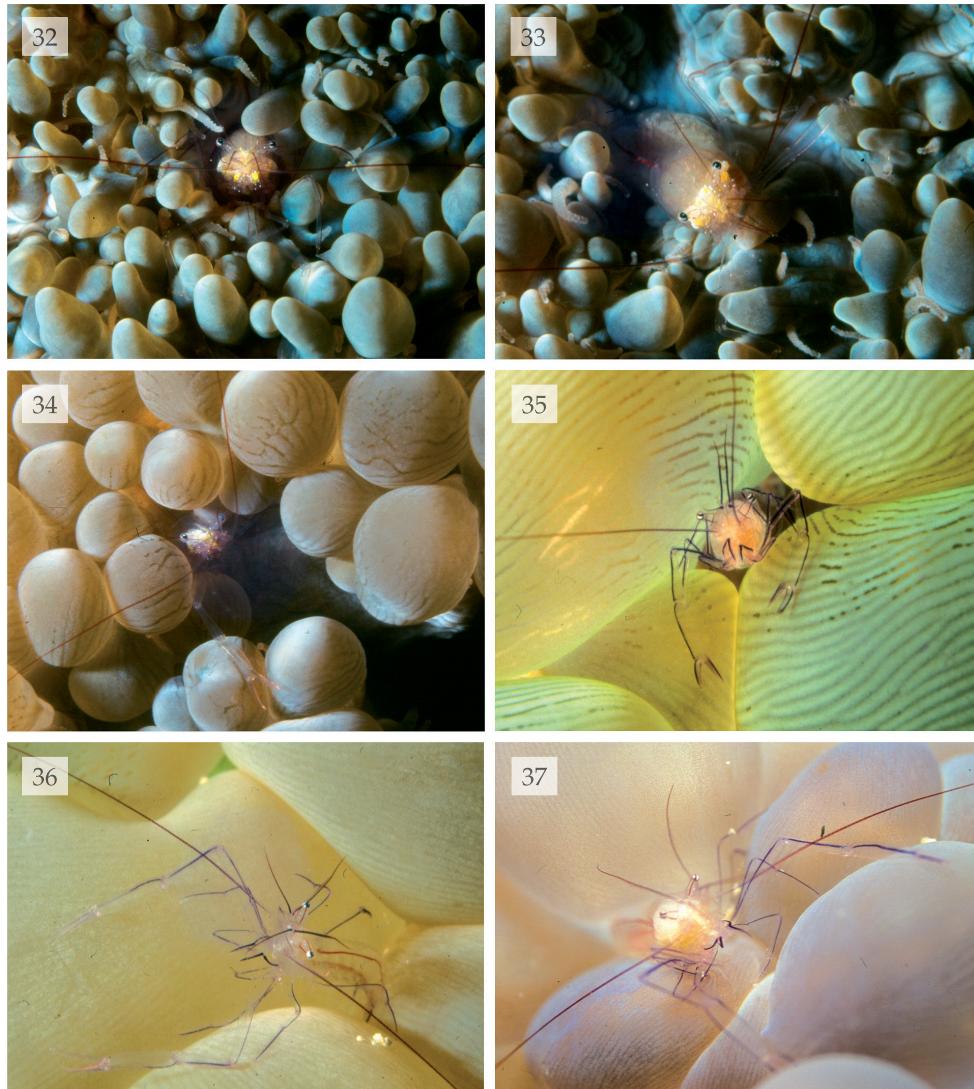
The species of *Vir* may be separated using the keys below. In these keys *V. philippinensis* and *V. colemani* have been treated as separate species. Marin & Anker (2005) indicate that these species might be conspecific. They recorded photographs of specimens with an intermediate colour pattern. However, more material of especially *V. colemani* is needed to see if the morphological differences noted by Bruce for the two species hold.



Figs. 28-31. *Vir philippinensis* Bruce & Svoboda, 1984: ovigerous female, pcl. 3.4 mm, RMNH D 51745. 28, Anterior appendages, dorsal view; 29, idem, lateral view; 30, telson and uropods, dorsal view; 31, third pereiopod, dactylus. Scale 28, 29 = 2 mm; 30 = 1 mm; 31 = 0.15 mm.

Key to the species of *Vir* based on morphological characters:

1. Third pereiopod propod with numerous setae distally; third ambulatory propod about seven times longer than wide, dactylus short and curved; R. 7/1 .. *V. orientalis*
- Third pereiopod propod sparsely setose distally, dactylus more elongate, weakly curved 2
2. Third ambulatory propod distoventrally spinulate 3
 - Third ambulatory propod without distoventral spinules *V. colemani*
3. Rostral formula R=4-5/1 *V. euphyllius*
- Rostral formula R=5-8/0-2 4



Figs. 32-37. Colour patterns and hosts: 32-34, *Vir smiti* spec. nov., *in situ* on *Physogyra lichtensteini* (Milne Edwards & Haime, 1851); 32, 33, ovigerous female holotype, pocl. 3.9 mm, RMNH D 48539; 34, female paratype, pocl. 1.9 mm, RMNH D 50404. 35-37, *Vir philippinensis* Bruce & Svoboda, 1984, *in situ* on *Plerogyra sinuosa* (Dana 1846); 35, ovigerous female, pocl. 2.8 mm, RMNH D 48528; 36, female, pocl. 3.4 mm, RMNH D 48530; 37, ovigerous female, pocl. 3.4 mm, RMNH D 51745.

4. Propodus of third pereiopod usually with two well developed, acute, ventrodistal spines *V. philippinensis*
- Propodus of third pereiopod with two very small blunt ventrodistal spines .. *V. smiti*

Key to the species of *Vir* based on their colour patterns:

1. Completely transparent (according to Kemp, 1922: 133) *V. orientalis*
- With colouration 2
2. Conspicuous white stripe between eyes; appendages transparent *V. euphyllius*
- No white stripe between eyes; appendages purple blue or red brown 3
3. Chela with purple colouration; no yellow chromatophores at base of anterior appendages; ambulatory pereiopods and flagella purple blue 4
- Chela transparent; yellow chromatophores at base of anterior appendages; pereiopods and flagella red brown *V. smiti*
4. Pereiopods with purple blue bands at articulations *V. colemani*
Pereiopods with purple blue longitudinal lines *V. philippinensis*

Discussion

In their paper on two new species of *Vir*, Marin & Anker (2005) discussed the status of various records from different coral hosts, with or without different colour patterns. The specimens recorded from *Physogryra* are now recognized as belonging to a separate species distinguishable from other species of the genus both on minor morphological and colour differences. However, several questions remain. Are the specimens recorded from *Plerogyra* (*V. philippinensis* and *V. colemani*, which show different and intermediate colour patterns), belonging to one or more species? Are the specimens with identical morphology and colour pattern occurring on different species of *Euphyllia* one or more cryptic species? To shed more light on the complex phylogenetic relations between these sympatric species a study using molecular data is in preparation.

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