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NICOTHOE TUMULOSA A NEW SIPHONOSTOME COPEPOD PARASITIC ON THE UNIQUE DECAPOD *NEOGLYPHEA INOPINATA* FOREST AND SAINT LAURENT

By Roger F. Cressey
Department of Invertebrate Zoology
Smithsonian Institution, Washington, D.C. 20560

A new decapod crustacean representing the only known extant member of the Glypheidae was recently described by Forest and Saint Laurent (1975). This unique specimen was collected during an *Albatross* cruise in 1908 and until recently remained unidentified in the collections of the Smithsonian Institution. During an examination of that specimen, parasitic copepods were collected from the gills. That material forms the basis of this paper.

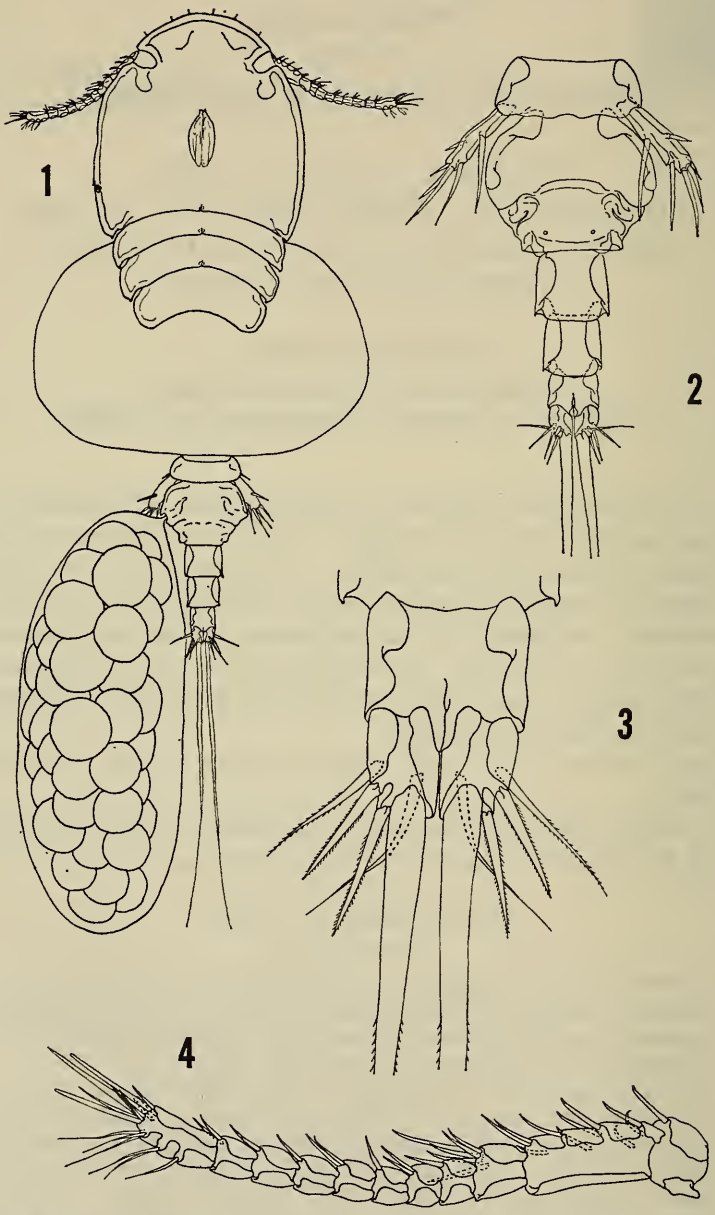
All drawings were made with the aid of a Wild drawing tube.

I wish to thank J. Forest and M. de Saint Laurent for bringing the parasitic copepods to my attention.

Nicothoe tumulosa new species
Figures 1–14

Material studied: Holotype ♀ (USNM 154661), and 5 paratype ♀♀ (4 adult, 1 immature) (USNM 154662), parasitic on the gills of decapod crustacean *Neoglyphea inopinata* Forest and Saint Laurent collected from off Malavatuan Is., Philippines, 17 July 1908, *Albatross* Sta. 5278.

Female: Body form as in Figure 1. Total length 1.24 mm. Greatest width 0.59 mm (measured at widest part of thorax). Cephalon slightly wider than long (413 μm × 389 μm). Thoracic segments fused laterally and ventrally to form a laterally expanded globular trunk with 3 dorsal plates covering most of anterior half. Surface of trunk (excluding plates) covered with many small sclerotized bumps. Thoracic segment bearing leg 5 free. Genital segment (Fig. 2) rounded, slightly wider

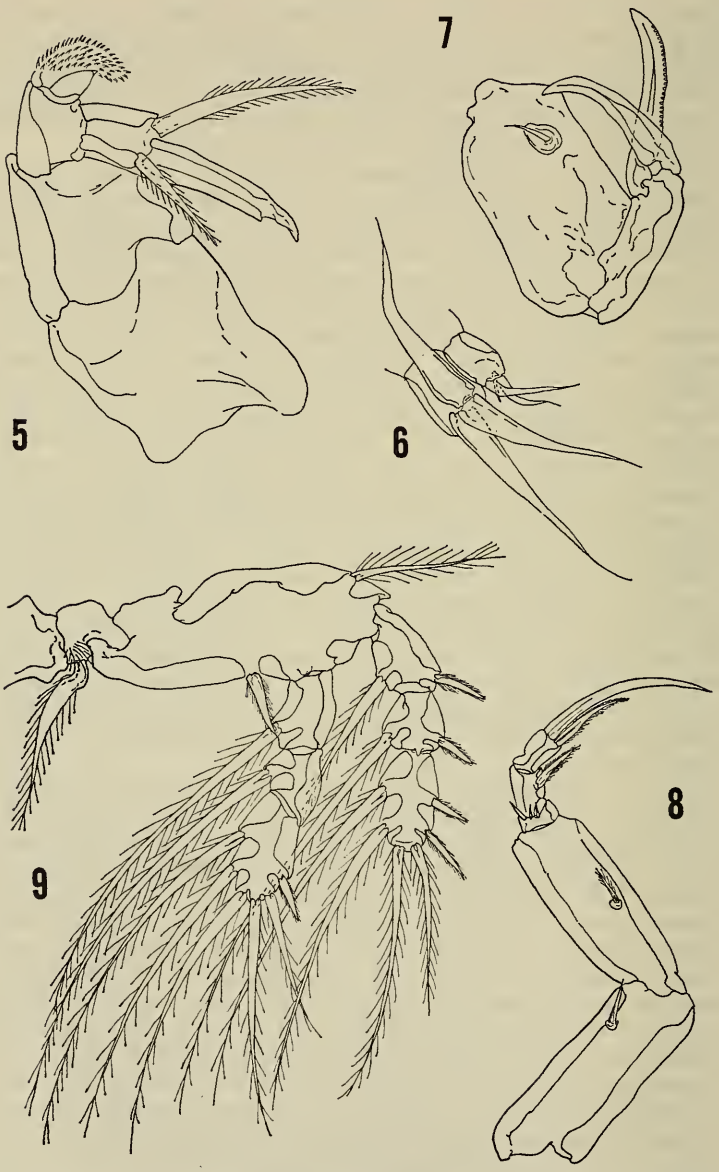


Figs. 1–4. *Nicothoe tumulosa,* new species, female: 1, Dorsal; 2, Genital segment and abdomen; 3, Caudal rami; 4, First antenna.

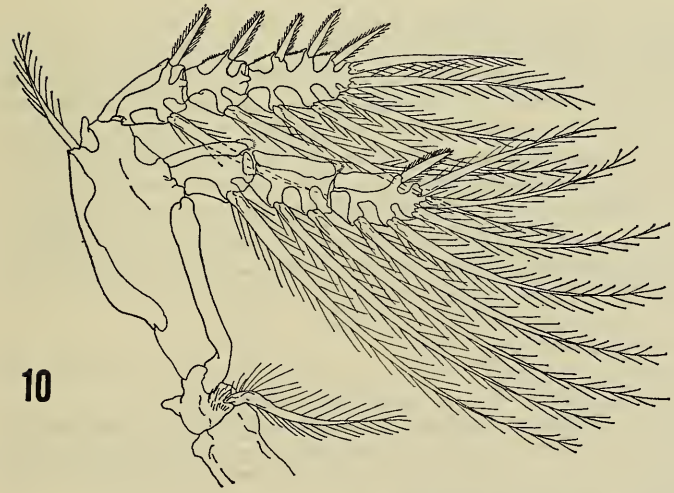
than long (171 μm × 124 μm). Abdomen (see Fig. 2) 3-segmented, each segment wider than long (77 μm × 65 μm, 65 μm × 59 μm, and 50 μm × 44 μm respectively) and with well sclerotized lateral margins. Caudal rami (Fig. 3) longer than wide (35 μm × 21 μm), well sclerotized, bearing one long seta (561 μm) and 4 short setae, all setae with short, fine, plumosities except inner subterminal seta naked.

First antenna (Fig. 4) 11-segmented, each armed with setae respectively as follows: 1, 10, 6, 1, 2, 1, 2, 1, 1, 2, 13 setae and 2 aesthaetes. Kabata (1967) described the armature of the terminal segment of the first antenna of *Nicothoe analata* Kabata in considerable detail and the new species described here agrees with that description. All setae on first 10 segments are short and thicker toward tip than those of last segment. Second antenna (Fig. 5) 5-segmented; first 2 stout and unarmed; third short, bearing a prominent spinulose palp; fourth short and bearing 2 plumose setae on outer distal corners; fifth much longer than wide with short distal claw; last 2 segments directed at right angle to basal 3. Mouth cone as in other members of genus with simple bladelike mandible within. First maxilla (Fig. 6) biramose; exopod bearing 2 long and 1 short setae (Kabata 1966, shows 2 short setae in *N. analata* but a second seta could not be found in the present species), endopod with 2 long anterior and 1 posterior setae. Second maxilla (Fig. 7) 2-segmented; basal segment stout, armed with a short seta near base; terminal segment bearing 2 prominent spines, outermost clawlike, innermost bladelike with row of denticles. Maxilliped (Fig. 8) 5-segmented; basal 2 segments of about equal length, each with short seta; third segment short and bearing 3 short setae (2 "denticles" in *N. analata* Kabata), fourth segment with stout, plumose seta, fifth segment with 2 prominent setae, longest recurved and clawlike, shorter finely plumose.

Legs 1–4 biramose, each ramus 3-segmented, each with 1-segmented sympod as in other species of genus. Leg 1 (Fig. 9) sympod with long plumose seta on outer edge; stout, finely plumose seta near inner base of endopod; long plumose seta near interpodal plate; exopod first segment with stout finely fringed spine at outer distal corner and plumose seta on inner margin, second segment armed as in first, third segment with 2 outer finely fringed spines and 4 terminal to inner setae; endopod first segment with inner plumose seta, second segment armed as in first, third segment with single outer fringed spine and 5 terminal to inner setae. Leg 2 (Fig. 10) sympod as in leg 1 except without finely plumose seta near inner base of endopod; exopod first 2 segments as in leg 1, last segment with 3 outer fringed spines and 5 terminal to inner setae; endopod first segment with inner seta and fringed process on outer distal corner, second segment with 2 inner setae and fringed process on outer distal corner, last segment with single fringed spine and 5 terminal to inner setae. Leg 3 (Fig. 11) sympod as in leg 2 except outer seta appears naked; exopod armed as in leg 2; endopod first 2 segments as in leg 2, last segment with 2 fringed



Figs. 5–9. *Nicothoe tumulosa*, new species, female, cont.: 5, Second antenna; 6, First maxilla; 7, Second maxilla; 8, Maxilliped; 9, First leg.



Figs. 10–11. *Nicothoe tumulosa*, new species, female, cont.: 10, Second leg; 11, Third leg.

terminal spines (longest fringed on basal third only) and 3 inner setae. Leg 4 (Fig. 12) sympod as in leg 3; exopod armed as in leg 3; endopod as in leg 3 except only 2 inner setae on last segment. Leg 5 (Fig. 13) with short seta near base of free segment; free segment with 6 setae

bearing short plumosities (outer 3 shorter than inner 3). All segments of legs 1–5 heavily sclerotized. Leg 6 absent.

Spine and setal formula of legs 1–4 as follows (Roman numerals refer to spines, Arabic to setae):

	P_1		P_2		P_3		P_4	
	exo	end	exo	end	exo	end	exo	end
seg 1	I:1	0:1	I:1	0:1	I:1	0:1	I:1	0:1
seg 2	I:1	0:1	I:1	0:2	I:1	0:2	I:1	0:2
seg 3	II:4	I:5	III:5	I:5	III:5	II:3	III:5	II:2

Spine and setal formula of legs 1–4 of all other species of *Nicothoe* (according to Kabata 1966. For convenience Kabata's symbols have been changed to conform to those above).

	P_1		P_2		P_3		P_4	
	exo	end	exo	end	exo	end	exo	end
seg 1	I:1	0:1	I:1	0:1	I:1	0:1	I:1	0:1
seg 2	I:1	0:1	I:1	0:2	I:1	0:2	I:1	0:2
seg 3	III:4	I:5	III:5	II:2	III:5	II:3	III:5	II:3

Eggs sacs typically cyclopoid, containing 50–60 eggs.

Immature female: The collection contained an immature female (Fig. 14) which agrees in all respects with the adult except for the lack of trunk modification typical of adult females. Kabata 1967 illustrated and discussed the immature female of *N. analata*, and as in *N. tumulosa* it also is distinguished from the adult only by the trunk modification. Measurements for the immature female as follows: length 938 μm, greatest width (cephalon) 437 μm, cephalon length 395 μm, genital segment 136 μm long and 177 μm wide, length and width of abdominal segments respectively 59 μm × 83 μm, 59 μm × 59 μm, 35 μm × 53 μm, caudal ramus 38 μm long and 24 μm wide, its longest seta 561 μm long.

Color in preserved specimens—purple.

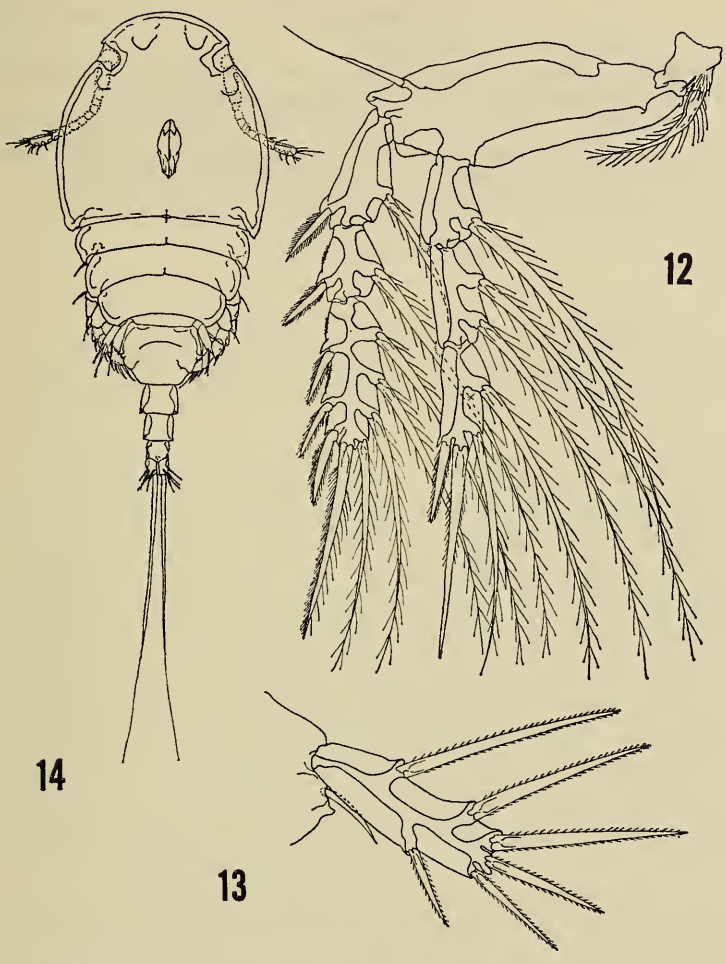
Male: unknown.

Etymology: *tumulosa*, Latin, to be full of mounds, alluding to the nature of the surface of the trunk of the adult female.

Remarks: *Nicothoe tumulosa* can be separated from all other species of the genus by the spine and setal formulae of legs 1–4 (see text description). It can be further separated by the nature of the trunk modification of the adult female.

It might be expected that the copepod would exhibit primative characters relative to the other members of the genus based on the primative nature of the host. The only condition evident in the new species suggesting this is that it has the least trunk modification of the known species. Aside from this nothing else suggests that it is ancestral or could be construed as primative relative to other *Nicothoe*.

Prior to the description of the new species the genus *Nicothoe* has been



Figs. 12–14. *Nicothoe tumulosa,* new species, female, cont.: 12, Fourth leg; 13, Fifth leg; 14, Immature female.

known only from hosts of the genus *Homarus* (*H. gammarus*) and various species of the Indo-Pacific genus *Metanephrops.*

Literature Cited

Forest, J., and M. de Saint Laurent. 1975. Présence dans la faune actuelle d'un representant du groupe mésozoique des Glyphéides: *Neoglyphea inopinata* gen. nov., sp. nov. (Crus-

tacea Decapoda Glypheidae). Comptes Rendus Acad. Sci. Paris 281(Ser.D)155–158.

Kabata, Z. 1966. *Nicothoe analata* sp. nov., a parasitic copepod from the South China Sea. Crustaceana 11(1):10–16.

———. 1967. *Nicothoe* Audouin and H. Milne-Edwards, 1826 (Crustacea, Copepoda), a genus parasitic on *Nephrops* Leach, 1816 (Crustacea, Decapoda). Zool. Meded. 42(15):147–161.