A new genus of nephtheid soft corals (Octocorallia: Alcyonacea: Nephtheidae) from the Indo-Pacific

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A new genus of nephtheid soft corals is described from the Indo-Pacific, 53 species are included, 34 of which are new to science: *Chromonephthea aldersladei* spec. nov., *C. bayeri* spec. nov., *C. benayahui* spec. nov., *C. braziliensis* spec. nov., *C. brevis* spec. nov., *C. cairnsi* spec. nov., *C. cobourgensis* spec. nov., *C. egmondi* spec. nov., *C. exosis* spec. nov., *C. franseni* spec. nov., *C. frondosa* spec. nov., *C. fruticosa* spec. nov., *C. goudi* spec. nov., *C. grandis* spec. nov., *C. grasshoffi* spec. nov., *C. hoeksemai* spec. nov., *C. hornerae* spec. nov., *C. imaharai* spec. nov., *C. imperfecta* spec. nov., *C. levis* spec. nov., *C. megasclera* spec. nov., *C. minor* spec. nov., *C. muironensis* spec. nov., *C. obscura* spec. nov., *C. ostrina* spec. nov., *C. palauensis* spec. nov., *C. rotunda* spec. nov., *C. simulata* spec. nov., *C. singularis* spec. nov., *C. slieringsi* spec. nov., *C. spinosa* spec. nov., *C. tentoriae* spec. nov. *C. variabilis* spec. nov., and *C. williamsi* spec. nov. The other 19 species were previously assigned to the genera *Nephthea*, *Stereonephthya*, *Dendronephthya* and *Paraspongodes*. *Spongodes costatocyanea* Burchardt, 1898 is synonymized with *C. costatofulva* (Burchardt, 1898); *Stereonephthya longicaulis* Kükenthal, 1911 with *C. curvata* (Kükenthal, 1911); *Nephthya australis* Kükenthal, 1910, with *C. rubra* (Kükenthal, 1910); *Nephthya quercus* Kükenthal, 1910 with *C. rubra* (Kükenthal, 1910); and *Nephthya granulata* Kükenthal, 1910, with *C. hartmeyeri* (Kükenthal, 1910). The morphological characters used to identify the species of *Chromonephthea* are discussed. Differences with the related genera *Nephthea*, *Litophyton*, *Stereonephthya*, *Neospongodes*, and *Dendronephthya* are mentioned. An illustrated key to the species is provided. The distribution of *Chromonephthea* species is presented and their apparent endemism is discussed.

Contents

Introduction

This is the first in a series of publications in which nephtheid genera are revised. The study on this family started around 1990 as a revision of the alcyonacean coral genus *Nephthea* Andouin, 1828. Soon after that it became obvious that the nominal genera *Litophyton* Forskål, 1775, *Neospongodes* Kükenthal, 1905, and *Stereonephthya* Kükenthal, 1905, should also be studied because these generic names proved to be used for a complex mixture of more or less closely related species. By now most type specimens of the nominal species that were classified in these four alleged genera have been re-examined. Several species proved to belong to other nephtheid genera, in one case even to another soft coral family, i.e. *Litophyton confertum* Kükenthal, 1903, now type species of *Klyxum* Alderslade, 2000, in the Alcyoniidae. A large group of species had to be included in an undescribed genus that is the subject of this paper. Ongoing molecular studies of these taxa, to be published separately, support the introduction of this new genus.

Material and methods

For the technical terms used in the descriptions I refer to Bayer et al., 1983.

Several permanent microscopic slides have been made for all species. One of a number of polyps with part of branch, one of the top of the stalk, one of the base of the stalk (fig. 1a), and a slide of polyps made transparent to study the arrangement of the sclerites (fig. 1b). These microscopic slides are stored in the RMNH coelenterate collection.

In the species descriptions a difference is made between “Surface layer base of stalk” and “Surface layer base of colony”. The latter is used for species with broken off stalk, or in case branching starts directly above the holdfast, i.e. *Chromonephthea fruticosa* spec. nov., and *C. grandis* spec. nov. The base of the stalk is the part directly above the holdfast of the colony. Sometimes the “surface layer top of stalk” had to be determined rather arbitrary, i.e. in species with a very short or without a stalk.

Sclerite drawings have been produced after the permanent microscopic slides. Measurements of the ventral and the lateral point spindles were made from the transparent polyp slides, all others from the normal microscopic slides. As most old museum specimens examined contained a large amount of broken sclerites SEM images were produced only of the recently collected material additional, and only of the sclerites of the base of the stalk / colony.

In the descriptions of the holotypes, I sometimes present drawings of sclerites of a paratype as well, when a more complete specimen became available after I had finished the drawings. This is not mentioned in the text, but in the captions of the drawings the correct specimen is always mentioned.

The amount of sclerite illustrations may seem unnecessary large at first glance,

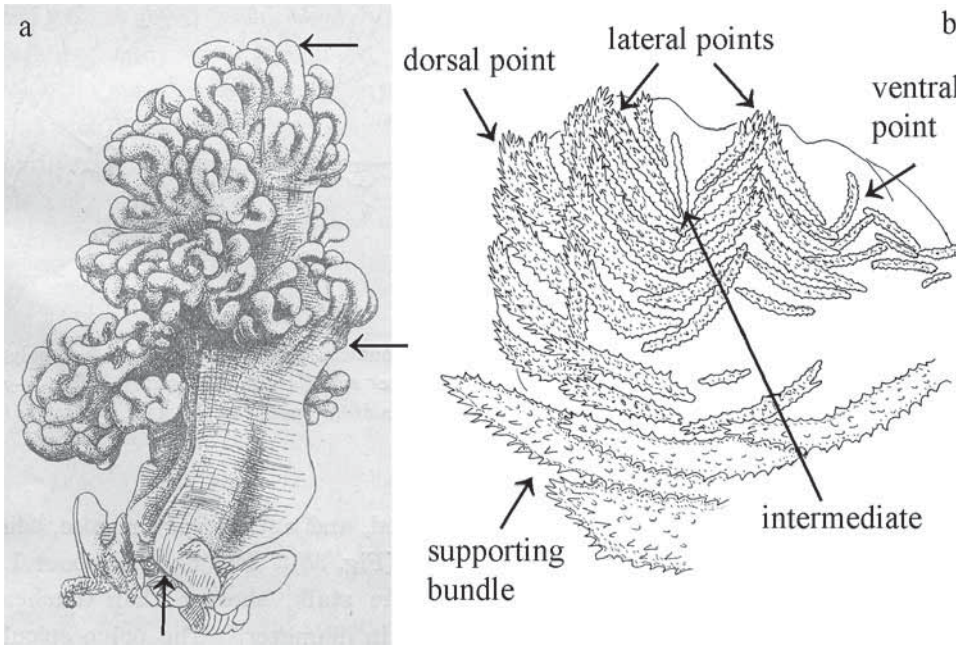


Fig. 1a. Utinomi's drawing of *C. serratospiculata*, arrows show sampling positions; 1b, lateral view polyp armature of *C. exosis* spec. nov.

but those who have studied the poorly illustrated older octocoral literature will appreciate them. In fact, none of the previously described species now referred to *Chromonephthea* could be confirmed from the relevant literature because of the lack of adequate illustrations, and / or satisfactory descriptions (see for instance *C. variabilis* spec. nov.).

All the type specimens of nephtheid species belonging to *Chromonephthea* have been re-examined and described. Additionally, material recently collected by colleagues, CRRF, the Siboga Expedition, RMNH collection, and specimens of Kükenthal's nephtheid material from the Aru islands (Indonesia), has also been included. Non type specimens previously identified as species now belonging to *Chromonephthea* were not re-examined, but are discussed in the remarks of those species.

Abbreviations

AM = Australian Museum, Sydney, Australia.
BMNH = The Natural History Museum, formerly British Museum of Natural History, London, United Kingdom.
CAS = California Academy of Sciences, San Francisco, U.S.A.
CRRF = Coral Reef Research Foundation, Palau.
DFA = Department of Fisheries, Adelaide, Australia.
MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, U.S.A.
ME = Museum of Evolution, Uppsala, Sweden.

MNRJ = Museu Nacional, Universidade do Rio Janeiro, Rio de Janeiro, Brazil.
MRF = Marine Research Foundation, Sabah, Malaysia.
ms = microscopic slides.
MZS = Musée Zoologique de Strasbourg, France.
NHMW = Naturhistorische Museum Wien, Austria.
NT = Northern Territory, Australia.
NTM = Museum and Art Gallery of the Northern Territory, Darwin, Australia.
Qld = Queensland, Australia.
QM = Queensland Museum, Brisbane, Australia.
RMNH = National Museum of Natural History (NNM), formerly Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.
SMF = Forschungsinstitut und Naturmuseum Senckenberg, Franfurt am Main, Germany.
SMBL = Seto Marine Biological Laboratory, Japan.
SMNH = Swedish Museum of Natural History, Stockholm, Sweden.
USNM = National Museum of Natural History, formerly United States National Museum), Smithsonian Institution, Washington, D.C., U.S.A.
WA = Western Australia.
WAM = Western Australian Museum, Perth, Australia.
ZMA = Zoologisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands.
ZMB = Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

Systematic part

Class **Anthozoa** Ehrenberg, 1831
Subclass **Octocorallia** Haeckel, 1866
Order **Alcyonacea** Lamouroux, 1812
Family **Nephtheidae** Gray, 1862

Chromonephthea gen. nov.

Type species.— *Chromonephthea aldersladei* spec. nov.

Diagnosis.— Nephtheids with polyp sclerites arranged in eight points, and a supporting bundle. Occasionally a pseudo-collaret is present. Dorsal point sclerites are the largest, while ventrally only some rods are present or there are no sclerites at all. Tentacles have rods or are without sclerites. Surface stalk with radiates and derivatives of these; spindles and unilateral spinose spindles can also be present. Interior of stalk with spindles, or radiates, or without sclerites. Colonies coloured or white and without zooxanthellae.

Differentiation.— The genus differs from *Nephthea* and *Litophyton* in having points and being azooxanthellate. It differs from *Stereonephthya* and *Neospongodes* in lacking rods in the polyp stalk, and from *Dendronephthya* in having the polyps standing single instead of in small bundles.

Etymology.— The genus name is derived from the Greek “chroma” (colour), referring to the conspicuous colours in many species, and the suffix “nephthea”, the type genus of the family Nephtheidae.

Characters used

Colony shape.— Most species have a distinct stalk and polyparium, consisting of stem and branches. Some species have stems arising from a common base, for instance *Chromonephthea fruticosa* spec. nov. In several species, specimens lacked most or all of the stalk resulting in a partial description. The stalk easily breaks off during collecting, probably because of limited support by sclerites.

Polyp size.— Ranging from 0.60 mm wide and 0.70 mm high (*C. bayeri* spec. nov.; *C. fruticosa* spec. nov.) to 1.40 mm wide and 1.20 mm wide (*C. serratospiculata* (Utinomi, 1951)).

Supporting bundle.— Two groups of species can be recognized, one with supporting bundle spindles showing only simple tubercles and spines, a second with spindles having complex tubercles as well. The complex tubercles are always present on the inner side of the spindles. The size of the spindles is extremely variable between polyps in a single colony; as a general rule, larger polyps have larger spindles.

Points.— All species have polyps with eight points of sclerites arranged en chevron showing bilateral symmetry. The dorsal points have the largest sclerites, spindles, which often become club-like; laterally smaller spindles are present and ventrally the smallest are found. Only in one species did the ventral side of the polyp head prove to be without sclerites, i.e. *C. bundegiensis* (Verseveldt, 1977). In four species the point spindles project beyond the polyp head, viz. *C. cornuta* Verseveldt, 1977, *C. ostrina* spec. nov., *C. sierra* (Thomson & Dean, 1931), and *C. spinosa* spec. nov.; all species with very long point spindles (> 0.60 mm long). Between the points a few intermediate sclerites are commonly found, similar in shape to the sclerites of the ventral points; however, in one species, *C. rotunda* spec. nov., they were oval in shape.

With regard to point sclerites two groups can also be recognized; one with the dorsal points having spindles with only simple tubercles and spines, the other with the dorsal point spindles having complex tubercles as well.

Tentacles.— Mostly armed with only a few rods of about 0.10 mm length. In *C. cairnsi* spec. nov., *C. formosana* (Kükenthal, 1903), *C. hirotai* (Utinomi, 1951), *C. imaharai* spec. nov., *C. inermis* (Holm, 1894), and *C. serratospiculata* (Utinomi, 1951), the tentacles are more strongly armed with more and longer rods, the largest up to 0.20 mm long. In two species the tentacles were unarmed, i.e. *C. bundegiensis* Verseveldt, 1977, and *C. exosis* spec. nov.

Branches.— The sclerites of the branches are mostly spindles without many characteristics, and were used only once as a character in an attempt to separate *C. rubra* (Kükenthal, 1910) and *C. quercus* (Kükenthal, 1910).

Surface layer of the stalk.— Possesses radiates and derivatives of these, which are highly species characteristic, although the huge intraspecific variation in shape of these sclerites makes it difficult to compare them. The derivatives can include more tuberculated radiates, eventually resulting in complex oval bodies (see *C. megasclera* spec. nov.), unilaterally spinose radiates (mostly present in the top of the stalk), enlargement and / or lengthening of one or more rays (for an extreme example of this see *C. hartmeyeri* (Kükenthal, 1910)), and a combination of these processes. As a general rule, radiates in the top of the stalk are unilaterally spinose becoming less so towards the base.

Interior of the stalk.— Two groups of species can be recognized: one with spindles

in the interior of the stalk, the other lacking these sclerites. The spindles are almost smooth or have sparse simple tubercles. In some species these spindles have many side branches, i.e. *C. egmondi* spec. nov., and *C. minor* spec. nov. Along with the big spindles, smaller ones can be present and sclerites intermediate between the interior spindles and surface radiates can be found in the subsurface layer. One species, C. *inermis* (Holm, 1894), shows radiates in the interior.

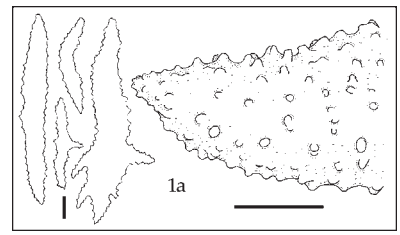
Colour.— Almost all species are brightly coloured, only a few cream, viz. *C. formosana* (Kükenthal, 1903), C. *inermis* (Holm, 1894), *C. serratospiculata* (Utinomi, 1951), several specimens of *C. rubra* (Kükenthal, 1910), and the ZMB specimen of *Stereonephthya longicaulis* (= *C. curvata*). The colour patterns proved to be of limited value for identification of *Chromonephthea* species because most species show considerable variation, some quite extreme for octocorals, i.e. *C. cobourgensis* spec. nov., and *C. variabilis* spec. nov.

Key to the species of *Chromonephthea*

Due to insufficient data *Chromonephthea eos* (Kükenthal, 1905), *Chromonephthea glomerata* (Thomson & Simpson, 1909), and *Chromonephthea lobulifera* (Holm, 1894) are not included in the key. Scales in the key are 0.10 mm.

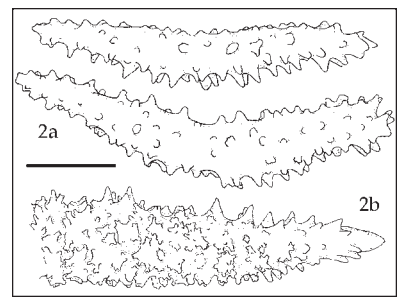
1a. Interior stalk with spindles 2

1b. Interior stalk without spindles 21



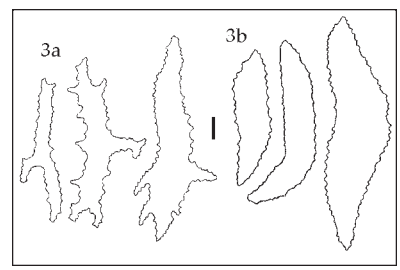
2a. Supporting bundle spindles with only simple tubercles and spines 3

2b. Supporting bundle spindles with simple and complex tubercles, and spines 9



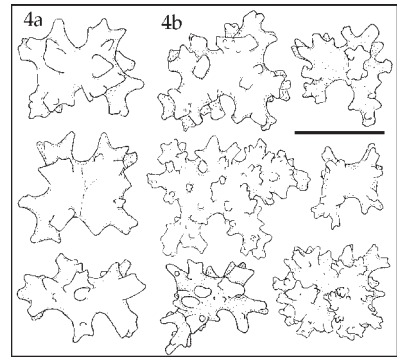
3a. Interior stalk spindles heavily branched ..... *C. minor* (**Malaysia**)

3b. Interior stalk spindles not or slightly branched 4



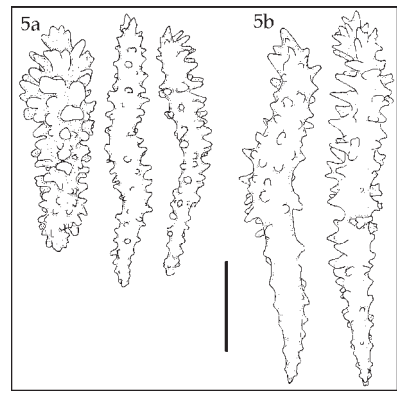
4a. Surface stalk with sparsely ornamented radiates ..... *C. aurantiaca* (**Philippines**)

4b. Surface stalk radiates with well developed tubercles 5



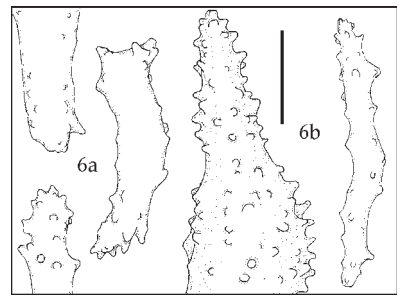
5a. Point spindles up to 0.30 mm long 6

5b. Point spindles up to 0.40 mm long 8



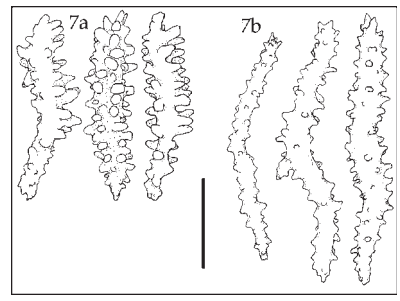
6a. Small internal stalk spindles with branched ends ..... *C. intermedia* (**Indonesia**)

6b. Small internal stalk spindles with pointed end 7



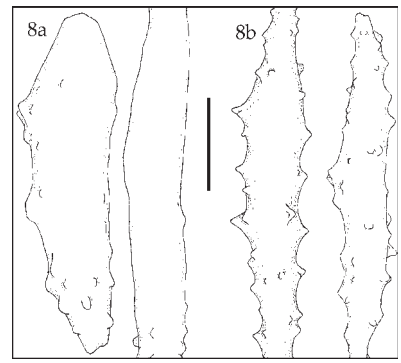
7a. Point sclerites rather wide ..... *C. rubra* (**WA**)

7b. Point sclerites slender ..... *C. williamsi* (**NT**)



8a. Small internal stalk spindles almost smooth ... . *C. imperfecta* (**Qld)**

8b. Small internal stalk spindles with sparse tuberculation ..... *C. hoeksemai* (**Indonesia**)

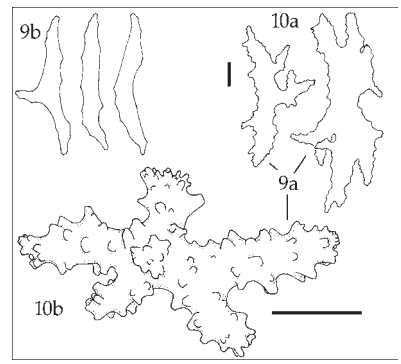


9a. Internal stalk spindles heavily branched .. 10

9b. Internal stalk pindles not or slightly branched 11

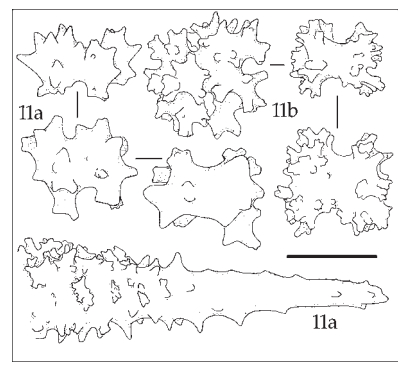
10a. The large internal stalk spindles heavily branched ..... *C. egmondi* (**Indonesia**)

10b. Only smaller internal stalk spindles heavily branched ..... *C. simulata* (**NWA**)



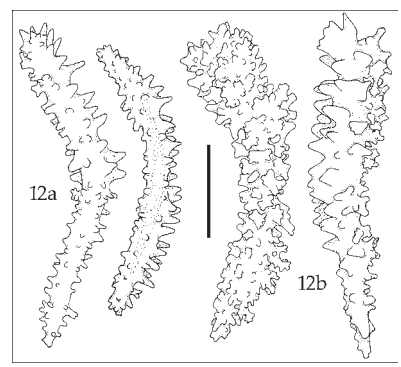
11a. Surface stalk with sparsely ornamented radiates; supporting bundle spindles with big smooth spine ..... *C. bayeri* (**Palau**)

11b. Surface stalk with radiates with well developed tubercles and spines 12



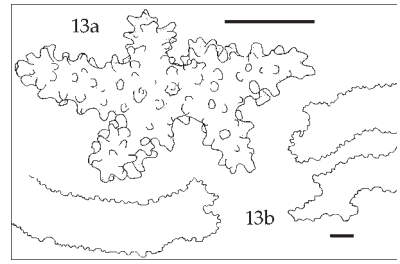
12a. Point spindles with simple tubercles only 13

12b. Point sclerites with complex tubercles 14



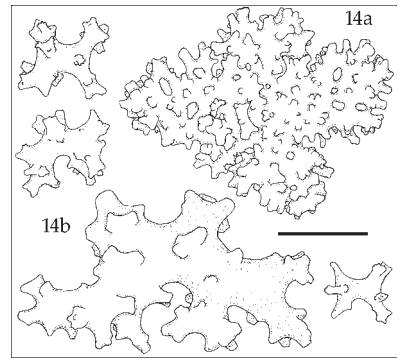
13a. Surface stalk spindles branched ..... *C. pellucida* (**Aru islands**)

13b. Surface stalk sclerites unbranched, but interior spindles with short side branches at the ends ..... *C. franseni* (**Sulawesi**)



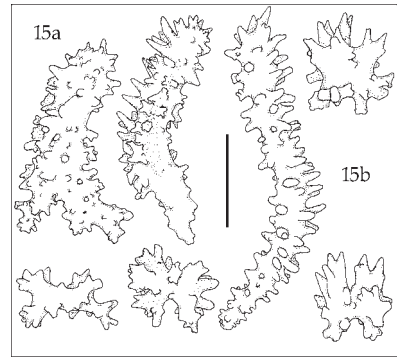
14a. Large (> 0.20 mm) irregular oval bodies in surface base stalk ..... *C. palauensis* (**Palau**)

14b. Surface base stalk radiates simple or multi-radiate bodies 15



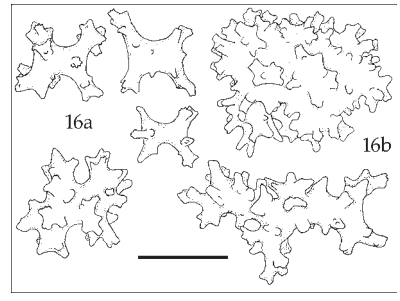
15a. Point spindles short and plump, top stalk radiates weakly unilaterally spinose ..... *C. slieringsi* (**Ambon**)

15b. Point spindles slender, top stalk radiates strongly unilaterally spinose 16



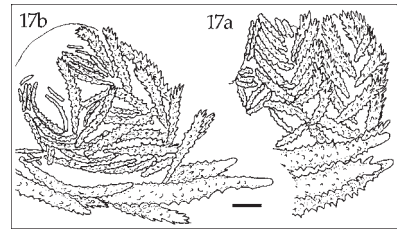
16a. Surface stalk radiates simple with simple tubercles 17

16b. Surface stalk sclerites forming multi-radiate bodies, or having complex tubercles 19



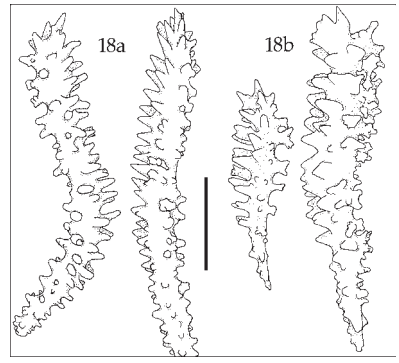
17a. Lateral points with up to 14 spindles per point; supporting bundle hardly projecting ..... *C. costatofulva* (**NEA**)

17b. Lateral points with 6-12 spindles per point; supporting bundle clearly projecting 18



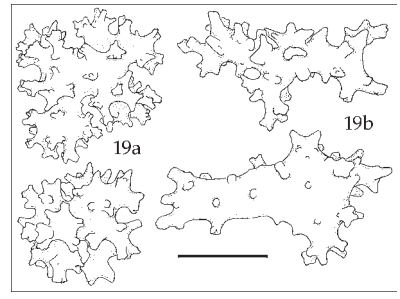
18a. Point sclerites spiny ..... *C. fruticosa* (**NT**)

18b. Point spindles leafy ..... *C. hornerae* (**NT**)



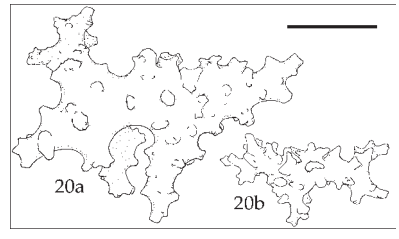
19a. Surface stalk radiates having complex tubercles ..... *C. brevis* **(NT)**

19b. Surface stalk sclerites forming multi-radiate bodies with simple tubercles 20

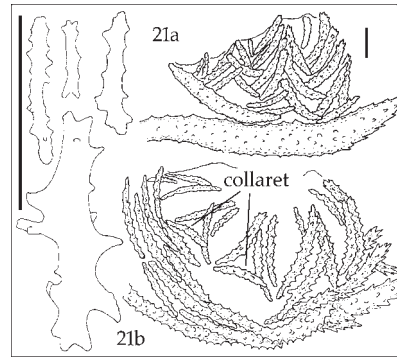


20a. Surface stalk multi-radiate bodies large (up to 0.40 mm) ..... *C. singularis* (**NT**)

20b. Surface stalk multi-radiate bodies small (up to 0.25 mm) ..... *C. grandis* (**Qld**)

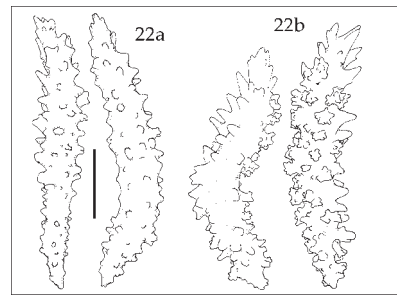


21a. Tentacle rods around 0.10 mm long, no trace of collaret 22
21b. Tentacle rods 0.15 mm or longer, often a kind of collaret present below the points 46



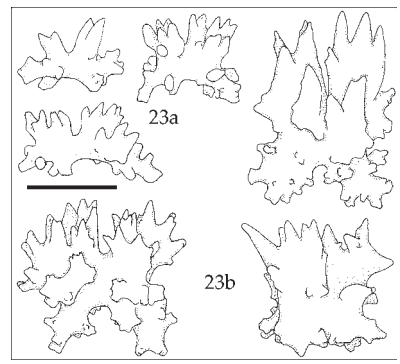
22a. Dorsal point sclerites with mostly simple tubercles 23

22b. Dorsal point sclerites with complex tubercles 25



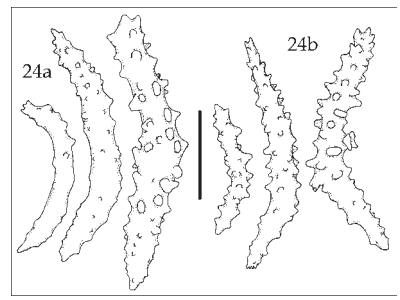
23a. Sclerites of surface top stalk weakly unilaterally spinose ..... *C. aldersladei* (**NT**)

23b. Sclerites of surface top stalk strongly unilaterally spinose 24



24a. Smaller point spindles very weakly ornamented, top stalk radiates very strongly unilaterally spinose (23b right) ..... *C. levis* (**NT**)

24b. Smaller point sclerites with simple tubercles, top stalk radiates moderately unilaterally spinose (23b left under) ..... *C. obscura* (**NT**)

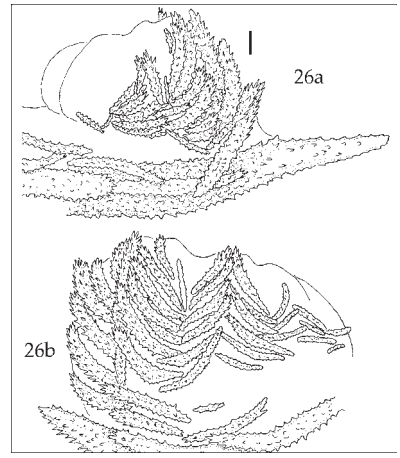


25a. Tentacles without sclerites 26

25b. Tentacles with sclerites 27

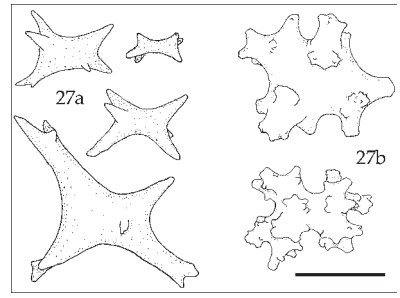
26a. Ventral point sclerites few or missing .... *C. bundegiensis* (**WA**)

26b. Ventral point sclerites 6-8 ..... *C. exosis* (**WA**)



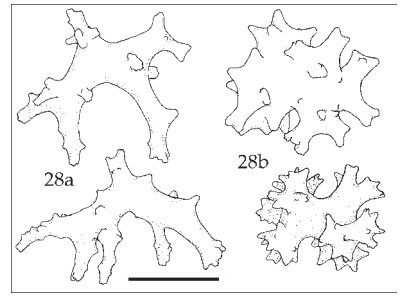
27a. Surface stalk radiates with hardly any ornamentation ..... *C. hartmeyeri* (**WA**)

27b. Surface stalk radiates with ornamentation 28



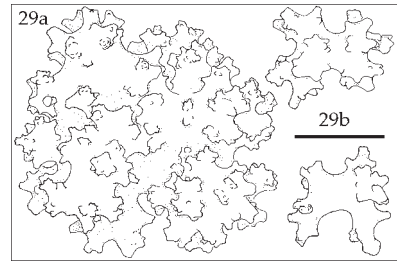
28a. Surface stalk radiates with long rays present ..... *C. grasshoffi* (**Aru Islands**)

28b. Surface stalk radiates without long rays ... 29



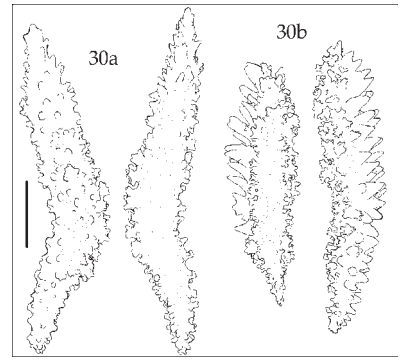
29a. Surface stalk radiates up to 0.30 mm long, forming oval bodies 30

29b. Surface stalk sclerites less than 0.30 mm long, not forming oval bodies 31



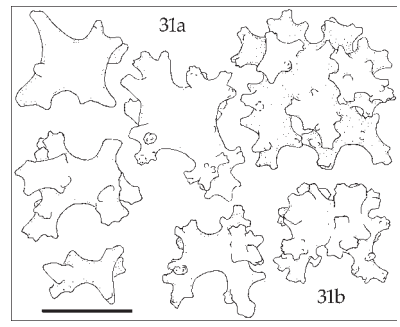
30a. Point sclerites with very few spines ..... *C. dampierensis* (**WA**)

30b. Point sclerites spiny ..... *C. megasclera* (**WA**)



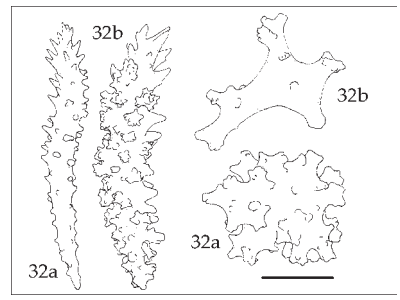
31a. Most surface stalk radiates with scarce rather simple ornamentation 32

31b. Most surface stalk radiates with complex ornamentation 33



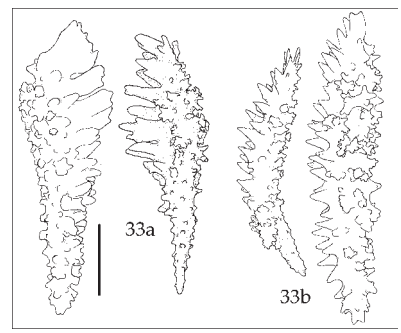
32a. Larger surface stalk radiates with complex tubercles; point spindles slender ..... *C. goudi* (**NT**)

32b. Larger surface stalk radiates also with simple tubercles; point spindles rather plump ... *C. benayahui* (**NT**)



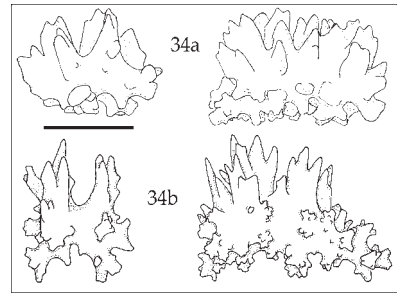
33a. Larger point spindles with leaf-like extensions 34

33b. Larger point spindles spinose 35



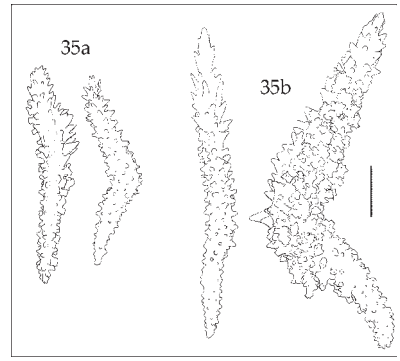
34a. Radiates of surface top stalk unilaterally leafy ..... *C. frondosa* (**WA**)

34b. Radiates of surface top stalk unilaterally spinose ..... *C. braziliensis* (**Atlantic**)



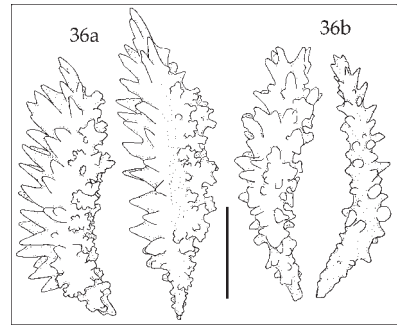
35a. Dorsal point sclerites 0.50 m long or less than 36

35b. Dorsal point sclerites longer than 0.50 mm 38



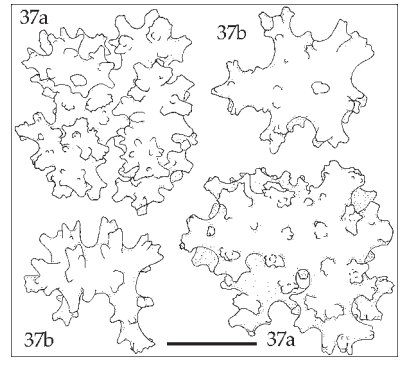
36a. Ventral points with up to 10 spindles; smaller point spindles very spinose ..... *C. tentoriaea* (**Qld**)

36b. Ventral points with up to 4 spindles; smaller point spindles moderately spiny..... 37



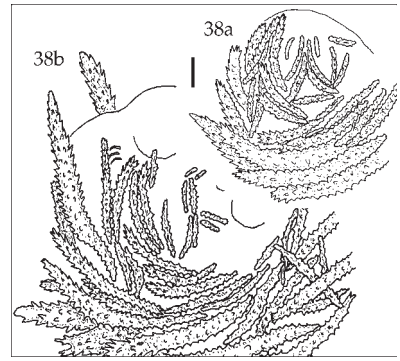
37a. Largest radiates of surface stalk up to 0.25 mm long, with complex tubercles ..... *C. curvata* (**Aru islands**)

37b. Largest radiates of surface stalk up to 0.20 mm long, with rather simple tubercles..... *C. complanata* (**WA**)



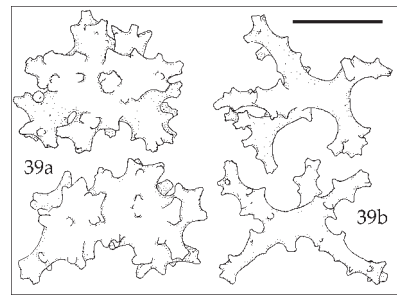
38a. Largest point sclerites less than 0.65 mm long, hardly projecting beyond polyp head 39

38b. Largest point sclerites 0.65 mm long or more, massive and clearly projecting beyond polyp head 42



39a. Larger radiates of surface base stalk with complex tubercles ..... *C. muironensis* (**WA**)

39b. Larger radiates of surface base stalk with simple tubercles 40

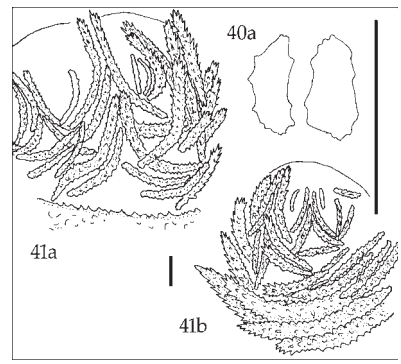


40a. Intermediate sclerites oval in shape ..... *C. rotunda* (**WA**)

40b. Not such oval shaped intermediates 41

41a. Lateral point sclerites long . *C. variabilis* (**NT**)

41b. Lateral point sclerites short ..... *C. cobourgensis* (**NT**)

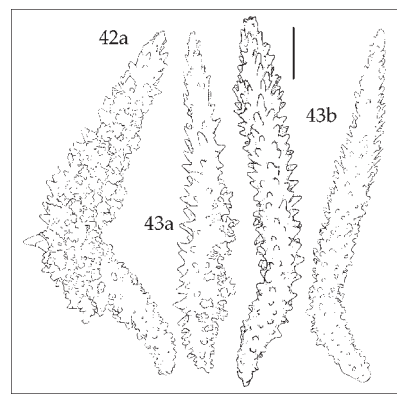


42a. Largest point sclerites thick ..... *C. sierra* (**Aru islands**)

42b. Largest point sclerites slender 43

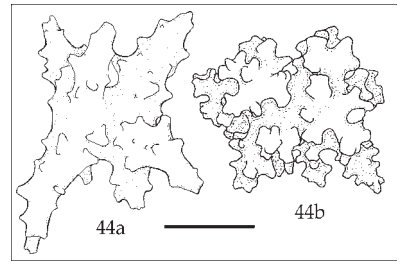
43a. Largest point sclerites with complex tubercles ..... *C. ostrina* (**NT**)

43b. Largest point sclerites with simple tubercles 44



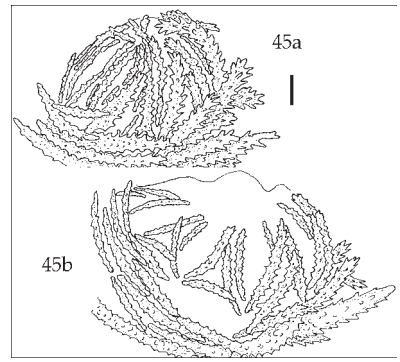
44a. Surface stalk radiates with simple tubercles ..... *C. spinosa* (**WA**)

44b. Surface stalk radiates with complex tubercles ..... *C. cornuta* (**SA**)



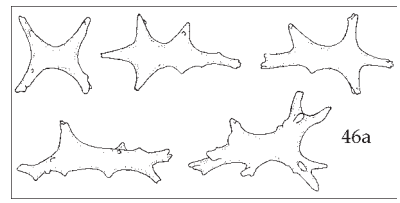
45a. Collaret missing ..... *C. formosana* (**Taiwan**)

45b. Collaret present 46



46a. Interior stalk with radiates ..... *C. inermis* (**Japan**)

46b. No interior stalk sclerites 47

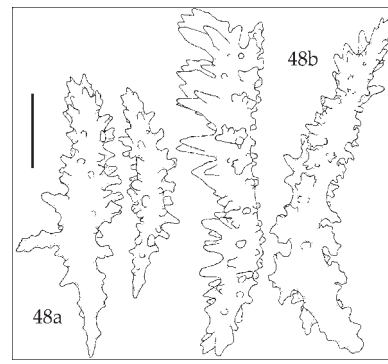


47a. No conspicuous collaret spindles ..... *C. hirotai* (**Japan**)

47b. Collaret sclerites with middle spiny part .. 48

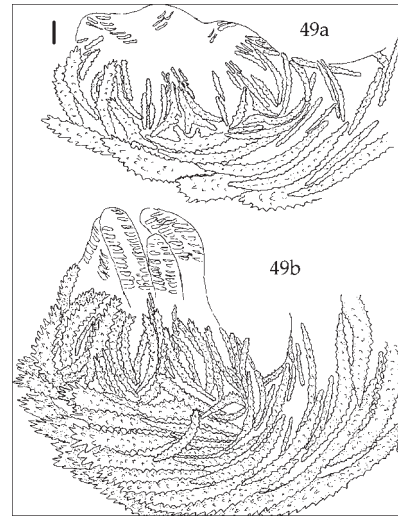
48a. Point sclerites up to 0.40 mm long, with simple tubercles ..... *C. imaharai* (**Japan**)

48b. Point sclerites 0.50 mm long or more, also with complex tubercles 49



49a. Supporting bundle modest .... *C. cairnsi* (**Japan**)

49b. Supporting bundle with many spindles .... *C. serratospiculata* (**Japan**)



Descriptions

Chromonephthea aldersladei spec. nov.
(figs 2-4a, 158-159, 162-163d)

? *Stereonephthya whiteleggi* [sic]; Utinomi, 1971: 95, fig. 6, pl. 15 fig. 6 (Darwin, harbour).
Not *Stereonephthya whiteleggi* [sic] Kükenthal, 1905: 705, fig. L2, pl. 32 fig. 57 (= *Stereonephthya*).

Material examined.— NTM C11173, **holotype**, Australia, NT, Darwin, East Arm (near boatramp), 12°29.60'S 130°53.65'E, MLW, hand, 28.x.1991, relaxed prior to fixation, coll. P. Alderslade; RMNH Coel. 32694, 4 ms of holotype; **paratypes**: NTM C11169, 1 specimen, same data as holotype; RMNH Coel. 32695, 5 ms of NTM C11169; NTM C11145, 14643-14650, 9 specimens, Australia, NT, Darwin, East Arm, 12°29.60'S 130°53.65'E, MLW, 24.x.1991, coll. J. Jan (2 specimens donated, NTM C14648 now USNM 1081587; NTM C14650 now CAS 171930); RMNH Coel. 32696, 24 ms of NTM C11145, 14643-14650, and 2 specimens; NTM C11146, 1 specimen, same data as NTM C11145; NTM C14638, 1 specimen, same data as NTM C11145; NTM C14639, 1 specimen, same data as NTM C11145; RMNH Coel. 32697, 12 ms of NTM C11146, 14638, 14639, and part of specimen NTM C11146.

Description.— The holotype is 18 cm long (fig. 162). Polyps are up to about 0.80 mm wide and 0.60 mm high.

Supporting bundle.— Not or hardly projecting (fig. 2a); the larger spindles with outer side and projecting part spiny and inner side with complex tubercles (fig. 2e). The length of these spindles is up to about 1.60 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8-12, and dorsally 14 (fig. 2a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and slightly spiny distal end. Dorsally they are up to 0.40 mm long, mostly with simple tubercles and spiny distal end, but some with complex tubercles as well (fig. 2b-c). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 2d).

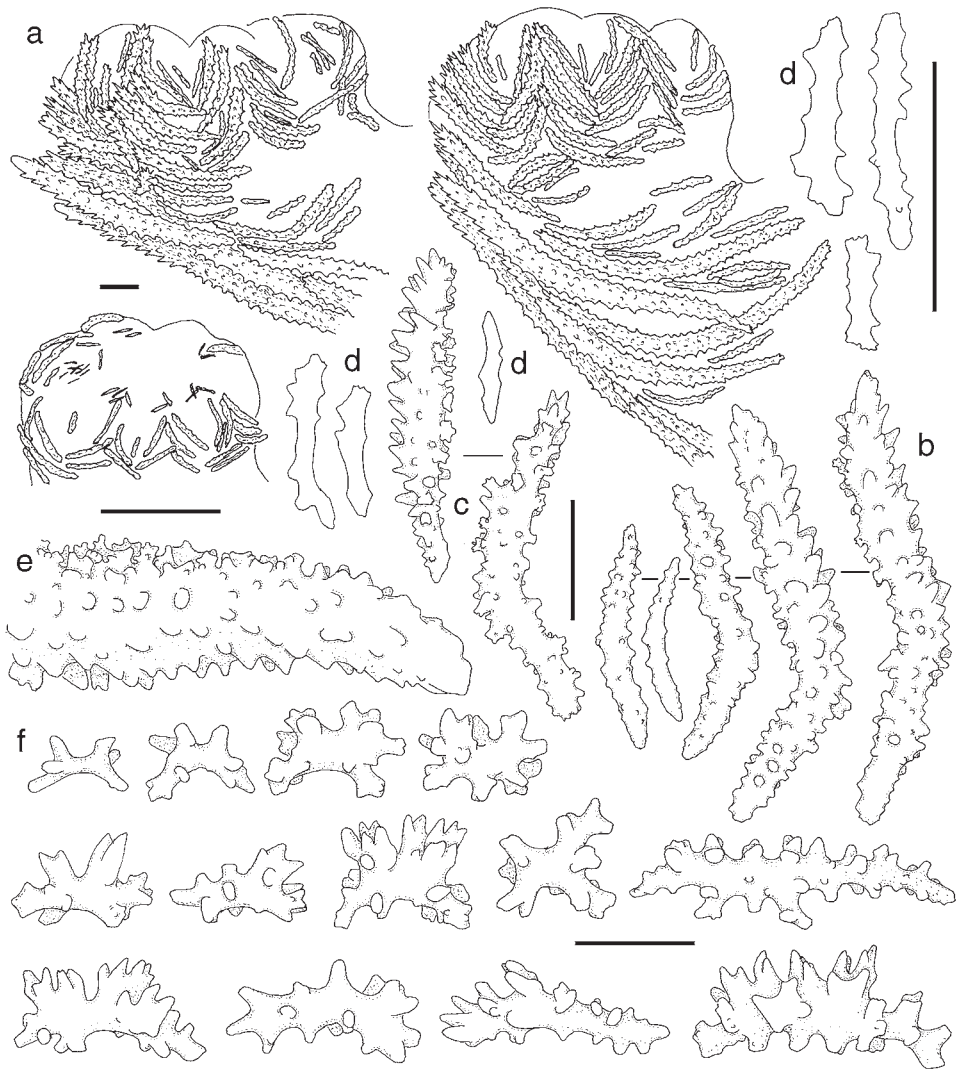


Fig. 2. *Chromonephthea aldersladei* spec. nov.; a-b, d-f, NTM C11146, c, NTM C14643; a, lateral and ventral views of polyp armature; b-c, point spindles; d, tentacular rods; e, part of supporting bundle spindle; f, sclerites of surface layer top of stalk. Scales 0.10 mm.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, with simple tubercles (fig. 2f). Furthermore, spindles up to 0.50 mm long, also with simple tubercles. Many radiates and spindles are slightly unilaterally spinose.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long (figs 3, 4a), and a few spindles, all with simple tubercles. Only few radiates are unilaterally spinose, and fewer spindles are present than in the top of the stalk.

Interior stalk.— Without sclerites.

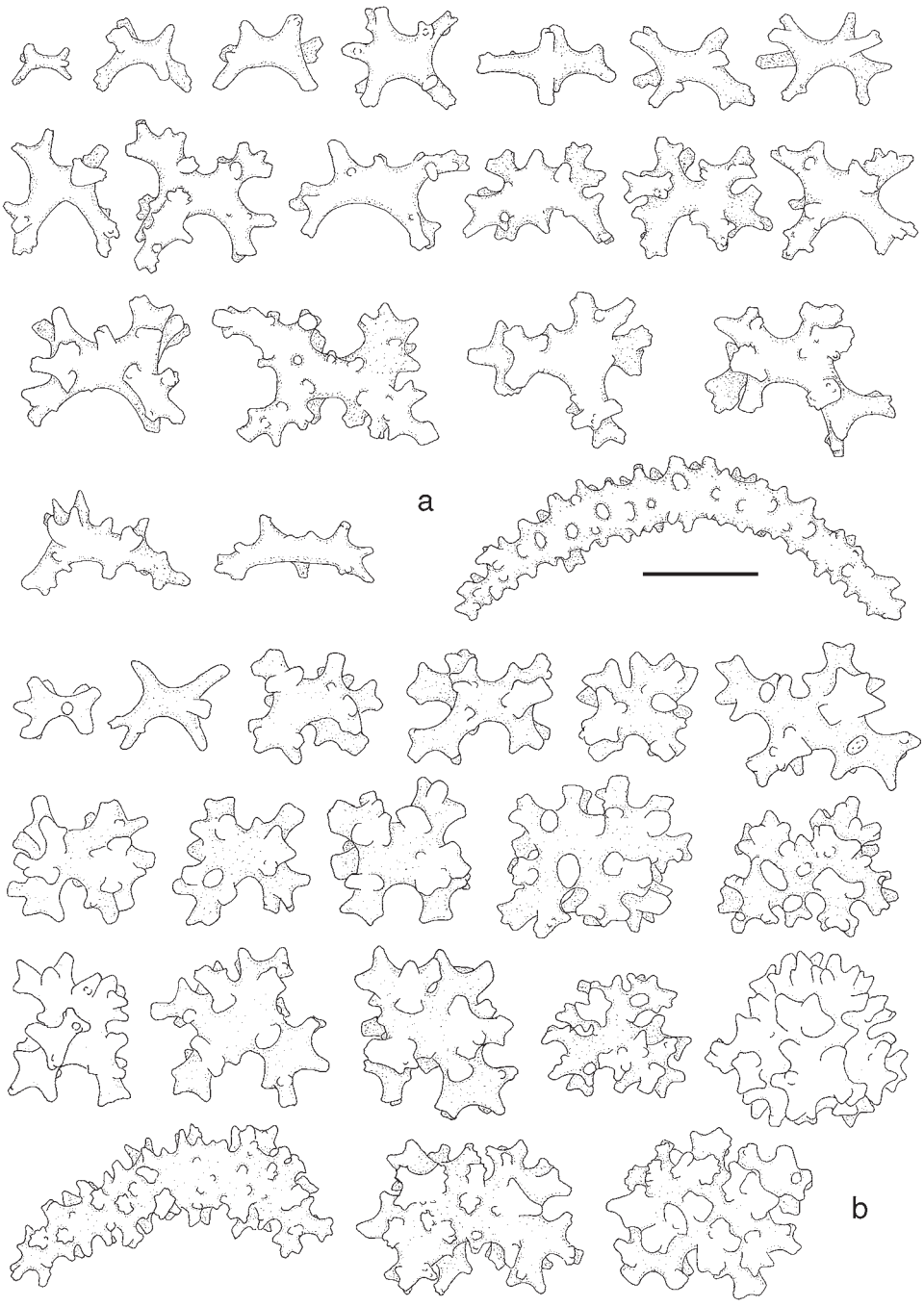


Fig. 3. *Chromonephthea aldersladei* spec. nov.; sclerites of surface layer base of stalk; a, NTM C11146; b, NTM C14643. Scale 0.10 mm.

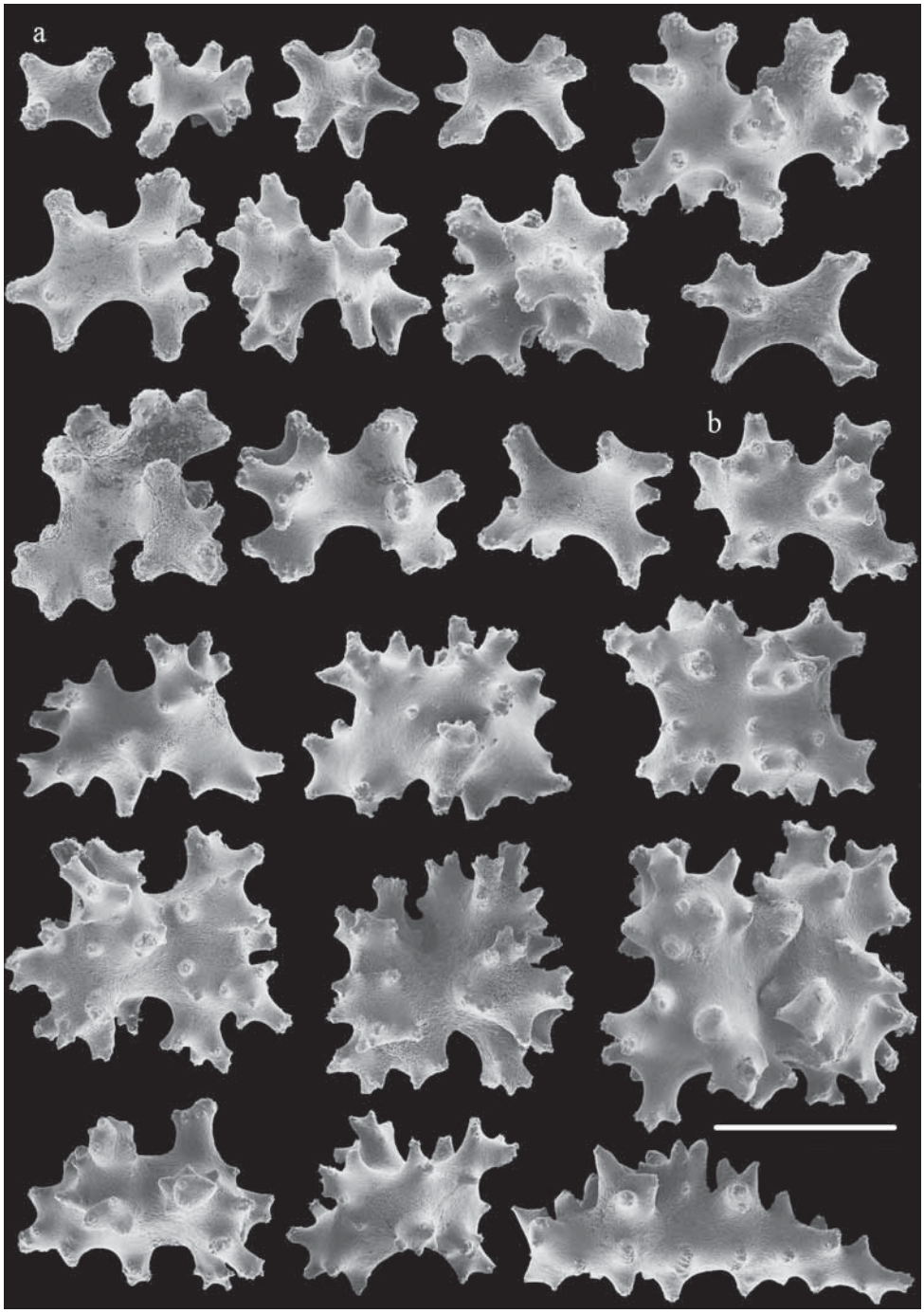


Fig. 4. Sclerites of surface layer base of stalk; a, *Chromonephthea aldersladei* spec. nov., holotype NTM C11173; b, *C. bayeri* spec. nov., holotype RMNH Coel. 32637. Scale 0.10 mm.

Colour.— Colony maroon with yellow polyps (fig. 162). Point sclerites yellow, tentacle rods colourless, all other sclerites are reddish.

Etymology.— Named after Dr Phil Alderslade, Curator of Coelenterates, NTM.

Variability.— In some specimens the stalk sclerites are slightly larger, up to 0.20 mm long (fig. 3b).

The species shows a considerable variation in colour patterns. Colonies can be pink with yellow polyps (fig. 163b), purple with yellow end branches and polyps (fig. 163d); they can have a white stalk with purple (fig. 163a) or reddish (pers. obs.) branches, or they are completely maroon with yellow polyps, as in the holotype. Several specimens with yellow, maroon or purple end branches have some orange end branches as well.

Remarks.— Utinomi (1971) identified six known *Stereonephthya* species from the surroundings of Darwin, which in my opinion all belong to the genus *Chromonephthea*. Unfortunately, Utinomi's descriptions and figures are insufficient for proper identification of a species of *Chromonephthea*, and therefore his material should be re-examined to obtain certainty about the species involved.

Only one of Utinomi's six species, identified by him as *S. whiteleggei* Kükenthal, 1905, resembles *C. aldersladei*. If the magnifications of Utinomi's drawings are correct (see Utinomi, 1971: fig. 6a-b) it has point sclerites of about the same size as in *C. aldersladei*. However, Utinomi mentioned that his material had "Cream-white stock, light purplish towards the base of the stalk", a colour pattern so far not found in *C. aldersladei*. Moreover, his specimen came from the old Darwin power station while all material of *C. aldersladei* came from the muddy reef at East Arm. Therefore, I do not exclude the possibility the magnifications given by Utinomi are incorrect and he actually described a specimen of *C. variabilis* spec. nov. (see remarks of *C. variabilis*).

Of the four species of *Chromonephthea* found in the Darwin region two lack internal spindles in the stalk, *C. aldersladei* spec. nov., and *C. variabilis* spec. nov. The latter differs from *C. aldersladei* in having much longer lateral and dorsal point sclerites (0.50-0.60 mm long versus 0.25-0.40 mm long).

C. aldersladei spec. nov. resembles *C. levis* spec. nov. and *C. obscura* spec. nov., but the latter two species have more developed unilaterally spinose radiates in the top of the stalk.

Chromonephthea aurantiaca (Verrill, 1865)
(figs 5-7, 155, 163e)

Nephthya aurantiaca Verrill, 1865: 191 (Chinese Sea, 28 fms); Gray, 1869: 129 (listed).
Not *Nephthya aurantiaca*; Burchardt, 1898: 433, pl. 31 fig. 1, pl. 32 figs 1a-c (Thursday Island); Kükenthal, 1903: 149; 1905: 715; 1910: 41 (Shark Bay, Sunday Island, Australia, 5.5 m).
Not *Spongodes aurantiacum*; Kükenthal, 1896: 116.

Material examined.— MCZ no. 404 (new no. 4208), **holotype**, North Pacific Explor. Exped., North China Sea; coll. Wm. Stimpson, rcv'd from Smithsonian Inst; USNM 60387, North Pacific Ocean, Philippines, North of Cebu, off Tanguingui Light., 11º24'45"N 124º06'E, 30 fath., Albatross sta. D-5401, 16.iii.1909, one specimen; RMNH Coel. 33370, 3 ms of USNM 60387.

Description.— The holotype is only two cm long (fig. 5), one half of which is stalk. The holdfast of the colony is clearly missing.

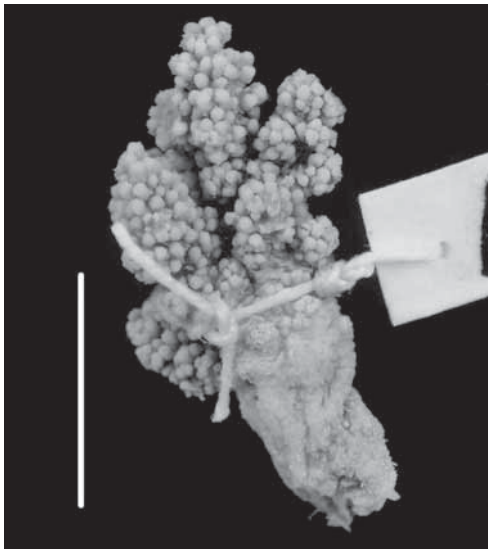


Fig. 5. *Chromonephthea aurantiaca* (Verrill, 1865); holotype MCZ no. 404 (new no. 4208). Scale 1 cm.

Supporting bundle.— Hardly projecting (fig. 7a); composed of small spindles, up to about 0.70 mm long, with simple tubercles and slightly spiny outer side and distal end (fig. 6c).

Points.— Largest point sclerites 0.35 mm long, with simple tubercles and spiny distal end (fig. 6a). Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 6b).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm in diameter (fig. 6d). Furthermore, a few spindles with simple tubercles are also present, up to at least 0.50 mm long (fig. 6e).

Surface layer base of colony.— With similar sclerites as the surface layer of the top of the stalk (fig. 6f).

Interior stalk.— Spindles with simple tubercles, up to 0.70 mm long (fig. 6g)

Colour.— Stalk greyish, branches orange, polyps yellow. Branch and supporting bundle sclerites orange, point sclerites faint yellow, tentacular rods colourless. Radiates and derivatives colourless, most spindles of surface layer of stalk pinkish.

Remarks.— Because of the small size of the holotype and in order to preserve as much as possible, the arrangement of the polyp sclerites was not examined. Many sclerites of the stalk were badly disintegrated and therefore the size and shape of these sclerites described above must be considered with some caution.

In the collection of the USNM I found one specimen (USNM 60387) referable to *C. aurantiaca*. It is also very small, 2 cm high (fig. 163e), with a slightly different colour pattern, orange with yellow polyps. It has a holdfast and the stalk sclerites (fig. 7e) are similar to those of the holotype, so apparently not much of the stalk of the latter is missing.

The description of the species could be completed using this specimen. Ventrally 6-8 spindles per point, laterally 10-12, and dorsally up to 14 (fig. 7a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and slightly spiny distal end. Dorsally they are up to 0.35 mm long, also with simple tubercles and spiny distal end (fig. 7b).

The sclerites of the stalk of *C. aurantiaca* are similar to those of *C. bayeri* spec. nov., but the latter has a projecting supporting bundle composed of spindles of which several have a smooth projecting end and complex tubercles. The interior spindles of *C. bayeri* are also different (compare fig. 6g with fig. 8f).

Burchardt (1898) identified a 2.5 cm tall specimen from Thursday Island (Australia) as *Nephthya aurantiaca*. His description does not reveal much but he mentioned that the interior had no sclerites at all. Kükenthal (1905) re-examined that material without adding information. He included in *N. aurantiaca* a specimen with the base missing from

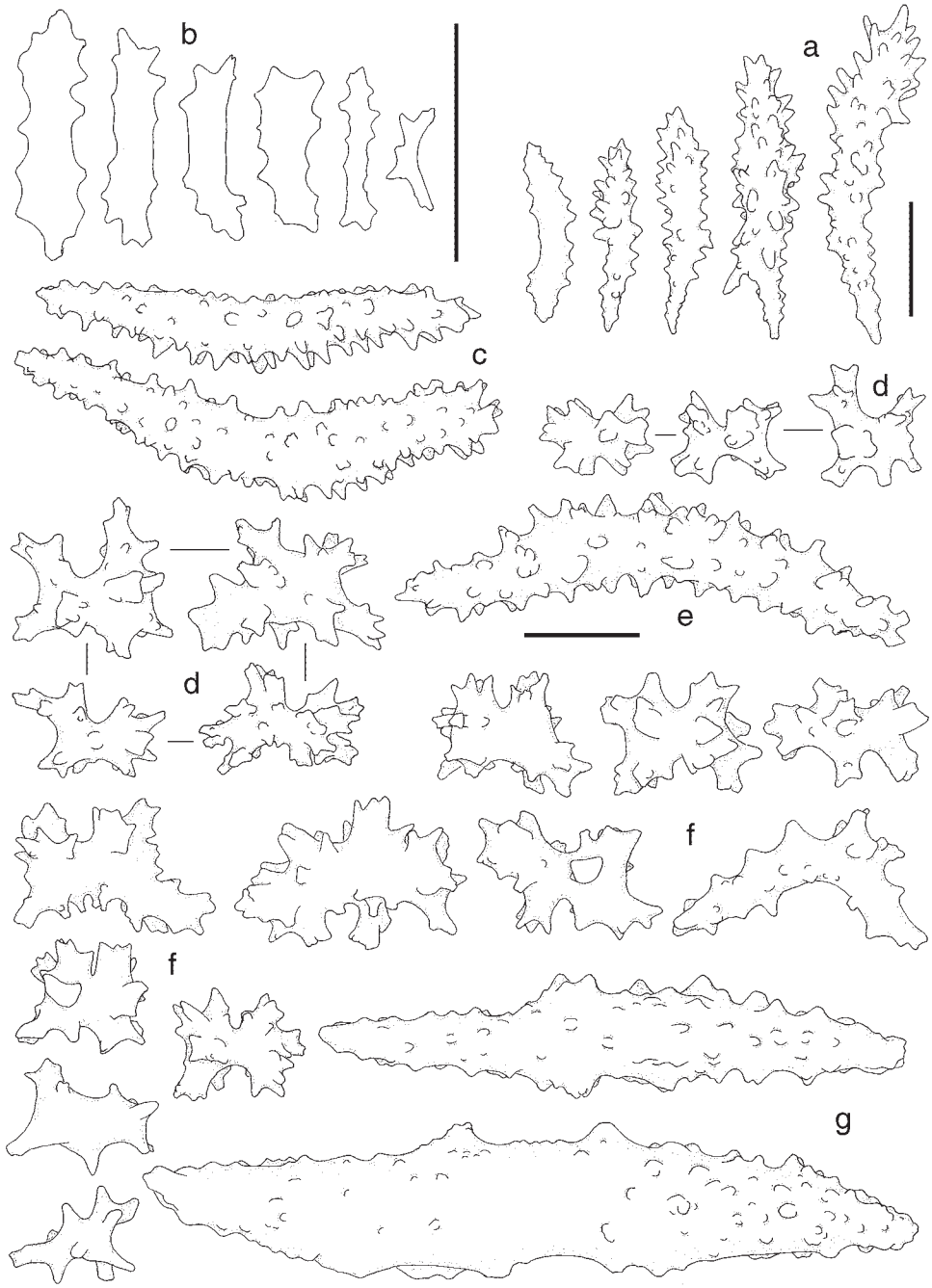


Fig. 6. *Chromonephthea aurantiaca* (Verrill, 1865); holotype MCZ no. 404 (new no. 4208); a, point spindles; b, tentacular rods; c, supporting bundle spindles; d, sclerites of surface layer top of stalk; e, spindle of surface layer top of stalk; f, sclerites of surface layer base of colony; g, spindles of interior top of stalk. Scales 0.10 mm, scale at e applies to c-g.

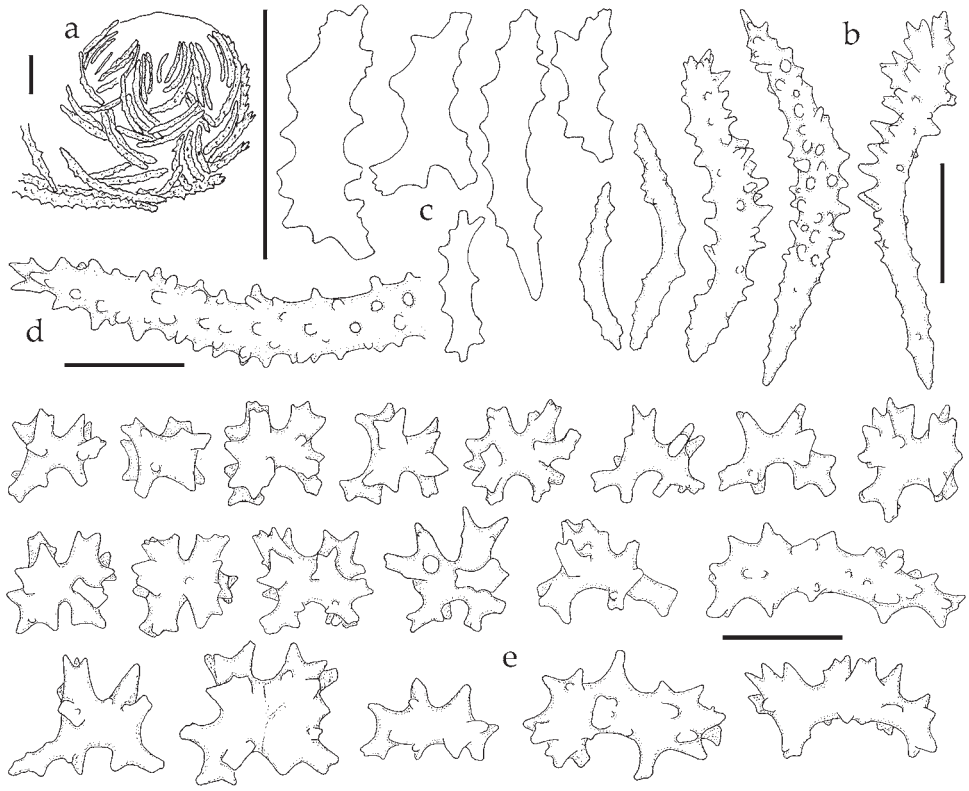


Fig. 7. *Chromonephthea aurantiaca* (Verrill, 1865); USNM 60387; a, lateral view of polyp armature; b, point spindles, c, tentacular rods; d, supporting bundle spindle (part); e, sclerites of surface layer base of stalk. Scales 0.10 mm.

the Munich museum (unknown origin) showing almost smooth internal spindles. In 1910 Kükenthal identified an 8 cm tall specimen from Shark Bay (Australia) as *N. aurantiaca*, again without giving any relevant information. Apparently both Burchardt and Kükenthal based their identifications on the colour scheme described by Verrill for *N. aurantiaca*. Considering the completely different distribution of Verrill's *N. aurantiaca* I find it very unlikely that the material found in Australia represents *N. aurantiaca*. Kükenthal's specimen of *N. aurantiaca* from Shark Bay may belong to *Chromonephthea frondosa* spec. nov. (see remarks *C. frondosa*).

Chromonephthea bayeri spec. nov.
(figs 4b, 8-9, 155, 163f, 164a-b)

Material examined.— RMNH Coel. 32637, **holotype** and 5 ms, PAL.03, Palau, E of Koror I. (Oreor I.), Arumizu Bay, Ngerikuul Basin, 07º19'10.0"N 134º30'30.0"E, 20.vii.-6.viii.2002, coll. B.W. Hoeksema; RMNH Coel. 32638, 2 **paratypes**, same data as holotype; USNM 60442, 1 **paratype**, North Pacific Ocean, Caroline Islands, Palau Islands, east side of mouth of Kaki Suido, between island xxix and east end of

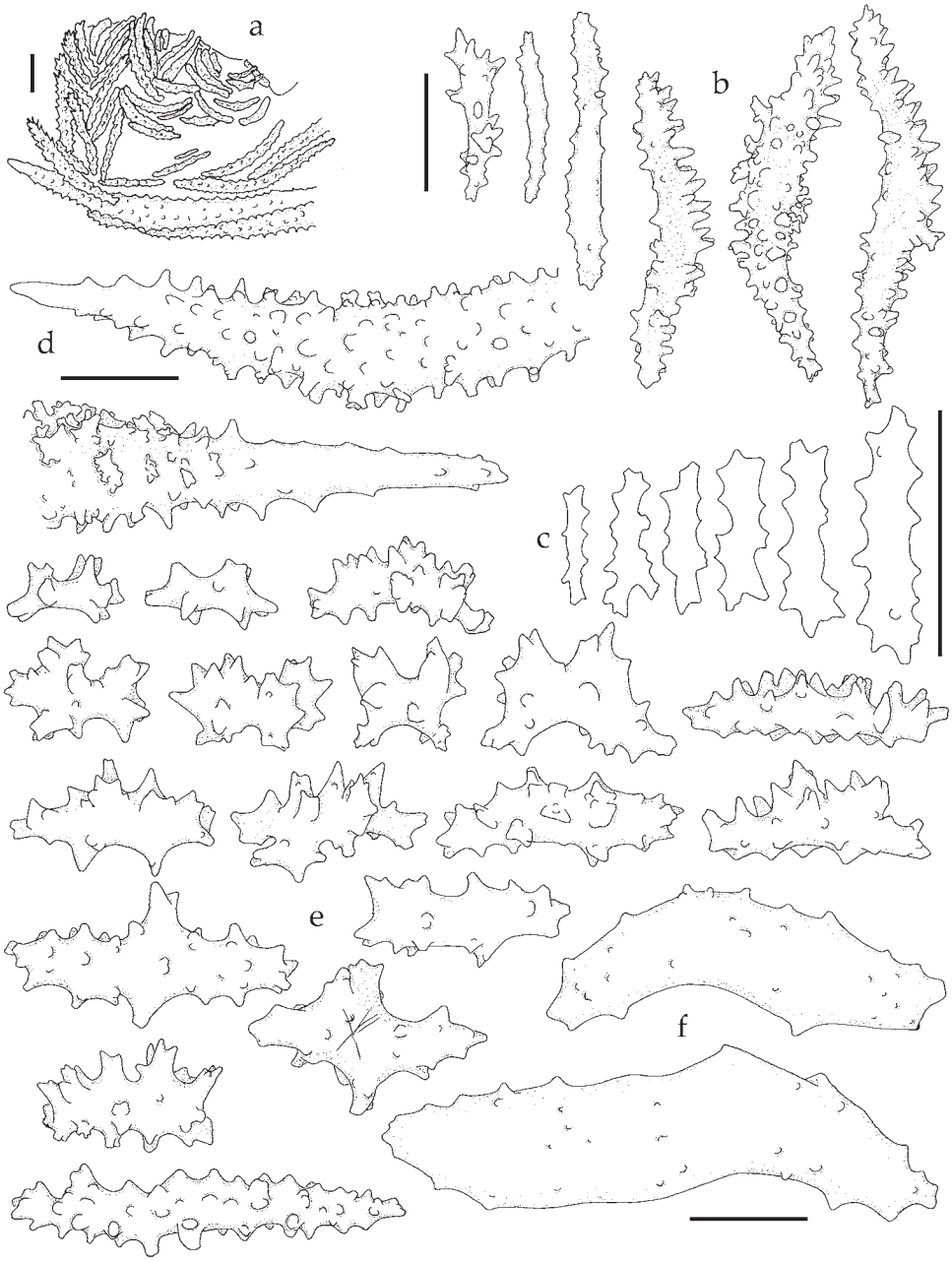


Fig. 8. *Chromonephthea bayeri* spec. nov.; holotype RMNH Coel. 32637; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites of surface layer top of stalk; f, spindles of interior top of stalk. Scales 0.10 mm, scale at f also applies to e.

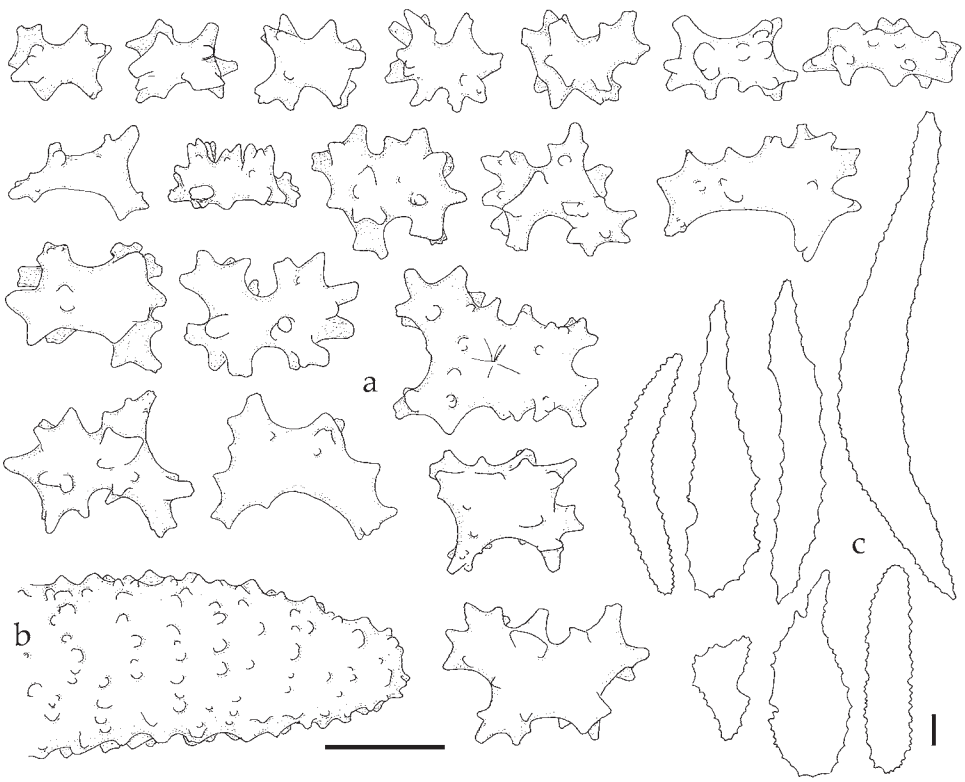


Fig. 9. *Chromonephthea bayeri* spec. nov.; holotype RMNH Coel. 32637; a, sclerites of surface layer base of stalk; b-c, spindles of interior base of stalk, b, part, c, outlines. Scales 0.10 mm.

Koror, 7º18'57"N 134º30'09"E, 3-20 ft, sta. 220, 12.x.1955, coll. F.M. Bayer et al.; RMNH Coel. 33371, 3 ms of USNM 60442; RMNH Coel. 33372, 2 **paratypes**, KOR.02, Palau, Koror, Ngerikuul Pass, E of Ngeteklou Island, pass between Ngeteklou and Ngermeuangel Islands, 07°19'13.4"N 134°31'26.8"E, depth -25 m, 21.v.2005, coll. L.P. van Ofwegen.

Description.— The holotype is 5.5 cm long and 3 cm wide (fig. 164b). Polyps are up to about 0.60 mm wide and 0.70 mm high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 8a); composed of slender spindles, the largest have complex tubercles, and often a smooth terminal spine is present (fig. 8d). Length of these spindles is up to about 1.10 mm.

Points.— Ventrally 4-6 spindles per point, laterally 10, dorsally up to 12 (fig. 8a). The smallest spindles are present ventrally, up to 0.15 mm long, with few simple tubercles. Laterally they are up to 0.20 mm long, with simple tubercles. Dorsally they are up to 0.30 mm long, with a few complex tubercles and spiny outer side and distal end (fig. 8b). A few spindles, intermediate between those of points and supporting bundle even reach a size of 0.40 mm. In between the points often a few intermediate sclerites are present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge; the largest with a few simple tubercles (fig. 8c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 8e). Most of them are slightly unilaterally spinose, and all have simple tubercles. Larger ones merge into unilaterally spinose spindles which are up to 0.30 mm long, with simple tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long, a few unilaterally spinose, all with simple tubercles (figs 4b, 9). Furthermore, a few spindles are present, up to 0.25 mm long, with simple tubercles.

Interior stalk.— Spindles, up to 1.70 mm long, many irregularly shaped (fig. 9c), all with simple sparse tubercles (fig. 9b).

Colour.— Colony with white stalk and stems, dark red branches, and yellow polyps. Point spindles yellow, sclerites of branches and supporting bundles pink; many supporting bundles with pink spindles with yellow projecting part; all other sclerites colourless.

Etymology.— Named after octocoral researcher Dr Frederick Bayer, USNM.

Remarks.— The two paratypes RMNH Coel. 32638 are similar to the holotype but of smaller size; specimen USNM 60442 is dark red with yellow polyps; one paratype of RMNH Coel. 33372 is white with yellow polyps, several supporting bundles and branches reddish; the other has a reddish stalk and supporting bundles, polyps yellow, the rest white.

Characteristic for *Chromonephthea bayeri* spec. nov. are the supporting bundle spindles with a smooth terminal spine and the simple stalk radiates. The species resembles *C. aurantiaca* (Verrill, 1865), which concerns the form of the simple radiates in the surface layer of the stalk, but it differs in having the supporting bundle made up of spindles with complex tubercles and several of those spindles having a smooth projecting end.

The other *Chromonephthea* species found in Palau, *C. palauensis* spec. nov., differs in having much stronger ornamented sclerites.

This year, during a journey to Palau, I was able to collect some specimens of *Chromonephthea bayeri* (RMNH Coel. 33372) and observe its habitat. The specimens were found in rather turbid water on a sandy bottom, growing in between specimens of a *Dendronephthya* species with the same colour pattern as *C. bayeri*. A similar kind of association I have seen at several places in Indonesia where specimens of an *Umbellulifera* species grow in between specimens of a similar looking *Dendronephthya* species.

Chromonephthea benayahui spec. nov.
(figs 10, 11, 12a, 158-159, 164c)

Material examined.— NTM C5744, **holotype**, Australia, NT, Port Essington, Orontes Reef, 11°04.00'S 132°05.50'E, 5-10 m, 19.ix.1985, coll. R. Williams; RMNH Coel. 33014, 4 ms of holotype.

Description.— The holotype is 5 cm long and 2.5 cm wide; stalk rather short (fig. 164c). Polyps are up to about 0.70 mm wide and 0.90 mm high.

Supporting bundle.— Projecting up to 0.30 mm (fig. 10a); the larger spindles with complex tubercles and spiny projecting end (fig. 10d). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-8, dorsally up to 10 (fig. 10a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles.

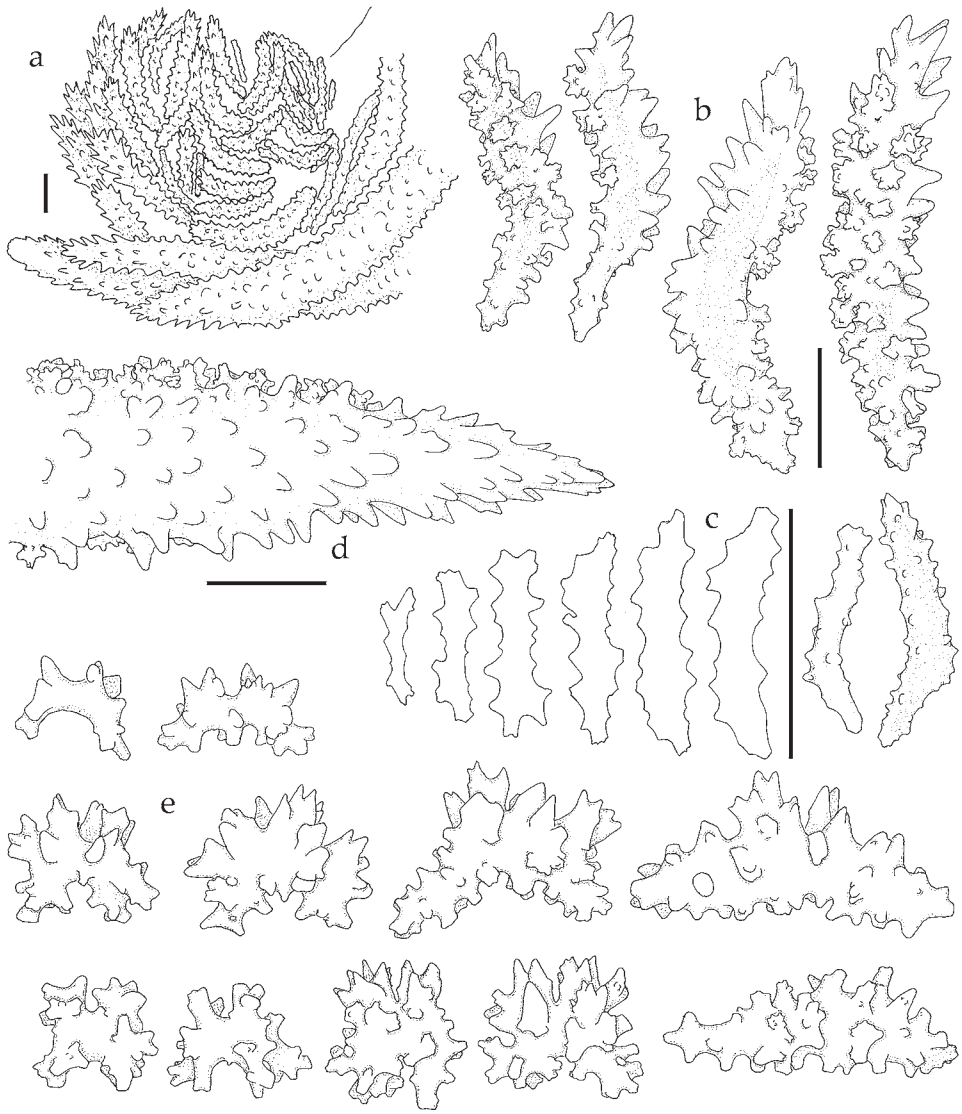


Fig. 10. *Chromonephthea benayahui* spec. nov.; holotype NTM C5744; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites of surface layer top of stalk. Scales 0.10 mm, scale at d also applies to e.

Laterally they are up to 0.30 mm long, with simple and a few complex tubercles, and with spiny distal end. Dorsally they are up to 0.40 mm long, with complex tubercles and spiny outer side and distal end (fig. 10b). Between the points often a few intermediate sclerites are present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 10c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long,

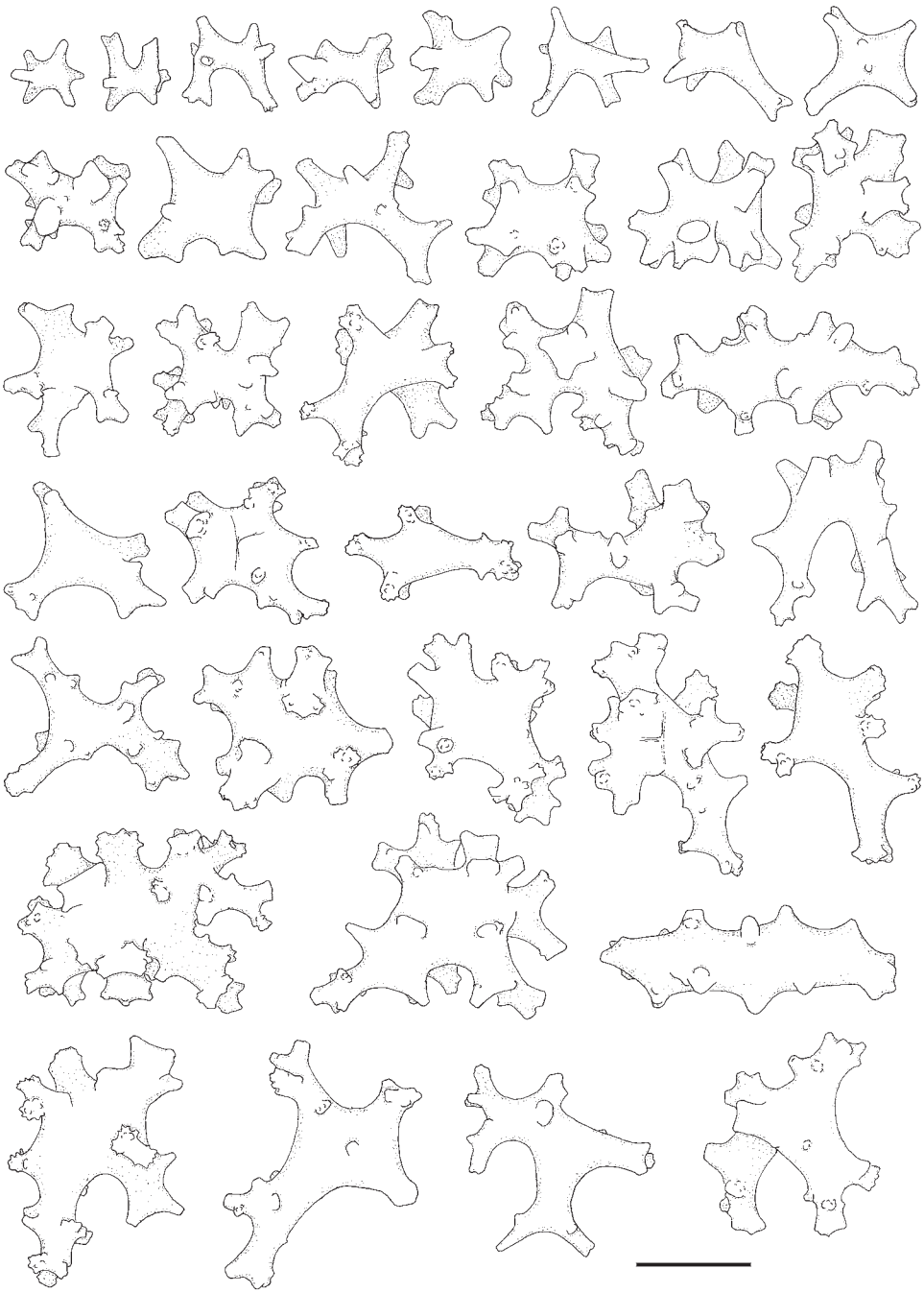


Fig. 11. *Chromonephthea benayahui* spec. nov.; holotype NTM C5744; sclerites of surface layer base of stalk. Scale 0.10 mm.

with simple tubercles (fig. 10e). Many of them are unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are present, up to 0.50 mm long, with simple tubercles (fig. 10e).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.25 mm long, all with simple tubercles (fig. 11, 12a). Furthermore, a few spindles and unilaterally spinose spindles are present, up to 0.50 mm long, with simple tubercles.

Interior stalk.— Without sclerites.

Colour.— Colony with red stalk and stem, orange end branches and white polyps. Point sclerites colourless to faint pink, supporting bundle and branch spindles faint pink. Tentacle rods colourless, stalk sclerites pink.

Etymology.— Named after octocoral researcher Dr Yahuda Benayahu, Tel Aviv University, Israel.

Remarks.— The sclerites of the stalk resemble those of *C. levis* spec. nov., but the latter species has less ornamented point sclerites and more developed unilaterally spinose radiates in the surface layer of the top of the stalk. Apart from *C. levis* three other species are described from the Cobourg peninsula, *C. cobourgensis* spec. nov., *C. fruticosa* spec. nov., and *C. goudi* spec. nov. *C. cobourgensis* differs in having larger point sclerites, up to 0.50 mm long; in having sclerites in the surface layer of the base of the stalk of with more complex tubercles and being overall more slender; and in the form of the multi-radiate bodies. *C. fruticosa* differs from *C. benayahui* in having internal stalk spindles. *C. goudi* spec. nov. differs in having more complex stalk radiates and less robust point spindles.

Chromonephthea braziliensis spec. nov.
(figs 12b, 13-15, 165)

Stereonephthya aff. *curvata*; Ferreira, 2003: 498, fig. 1.
Not *Stereonephthya curvata* Kükenthal, 1911: 324, figs 36-37, pl. 21 fig. 11 (Aru islands) (= *Chromonephthea curvata*).

Material examined.— MNRJ 3360, **holotype**, Brazil, Rio de Janeiro, Arraial do Cabo, Saco dos Cordeiros, 22°58'S 41°59.7'W, 23.v.1999, 8 m, coll. J.R. Martino; RMNH Coel. 33235, fragments used for drawings, and 5 ms, same data as holotype.

Description.— The holotype is 40 cm long, and 18 cm wide (fig. 13). Polyps are up to about 0.90 mm wide and 1.00 mm high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 14a); the larger spindles with outer side and projecting part having strong spines, the inner side with complex tubercles (fig. 14c). The projecting part in some of these spindles is smooth; they are up to 1.50 mm long.

Points.— Ventrally 2 spindles per point, laterally 6-10, and dorsally up to about 12 (fig. 14a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.45 mm long, with the outer side and distal part with big flattened spines, and the inner side with complex tubercles (fig. 14b). Between the points 1-3 rods are present, up to 0.15 mm long, with scalloped edge (fig. 14d). Tentacles almost devoid of sclerites; only at the base are a few rods present, up to 0.10 mm long, with scalloped edge (fig. 14e).

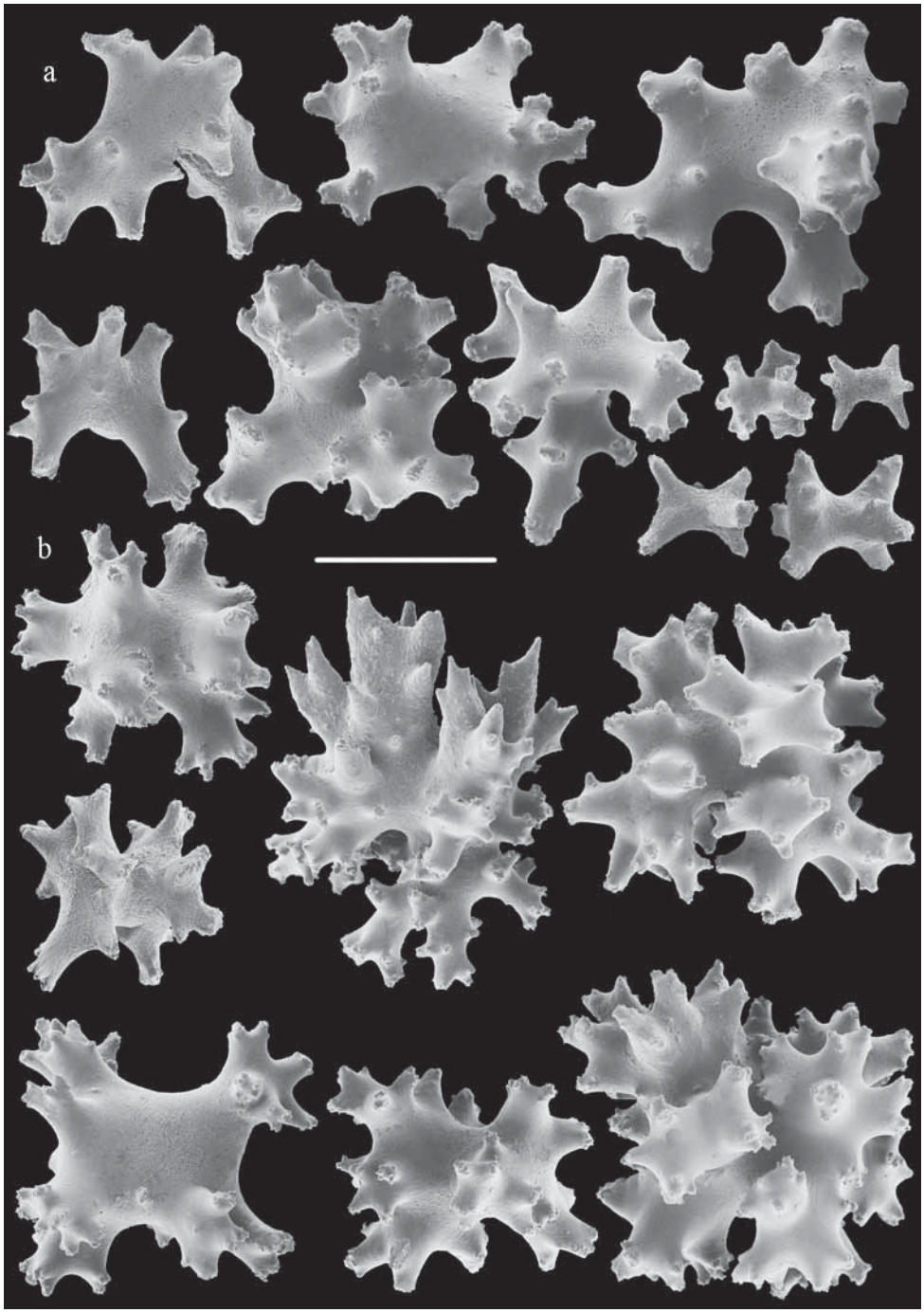


Fig. 12. Sclerites of surface layer base of stalk; a, *Chromonephthea benayahui* spec. nov., holotype NTM C5744; b, *C. braziliensis* spec. nov., holotype MNRJ 3360. Scale 0.10 mm.

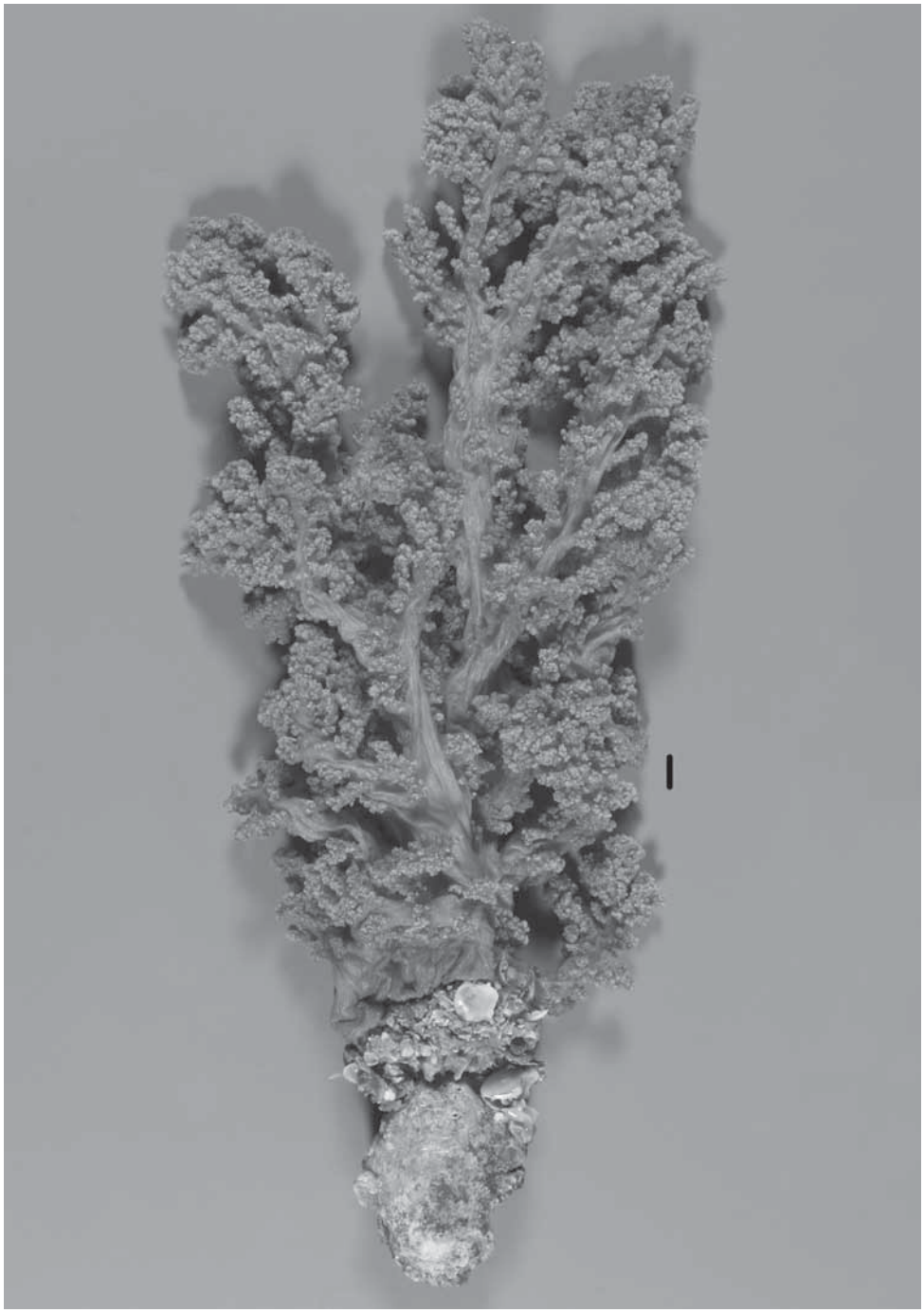


Fig. 13. *Chromonephthea braziliensis* spec. nov.; holotype MNRJ 3360. Scale 1 cm.

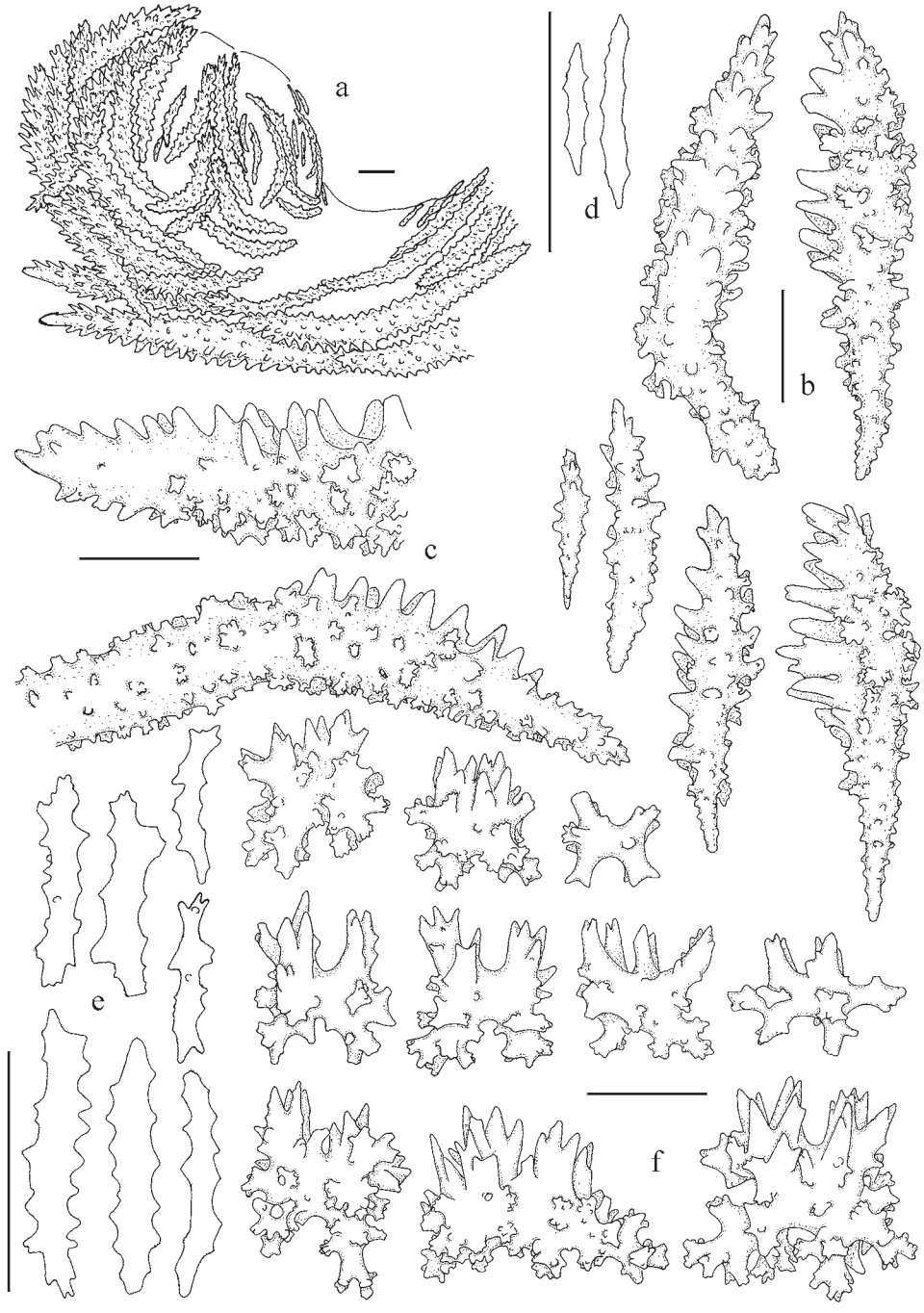


Fig. 14. *Chromonephthea braziliensis* spec. nov.; a-e, RMNH Coel. 33235, f, holotype MNRJ 3360; a, lateral view of polyp armature; b, point spindles; c, spindles of supporting bundle (part); d, intermediates; e, tentacular rods; f, sclerites of surface layer top of stalk. Scales 0.10 mm.

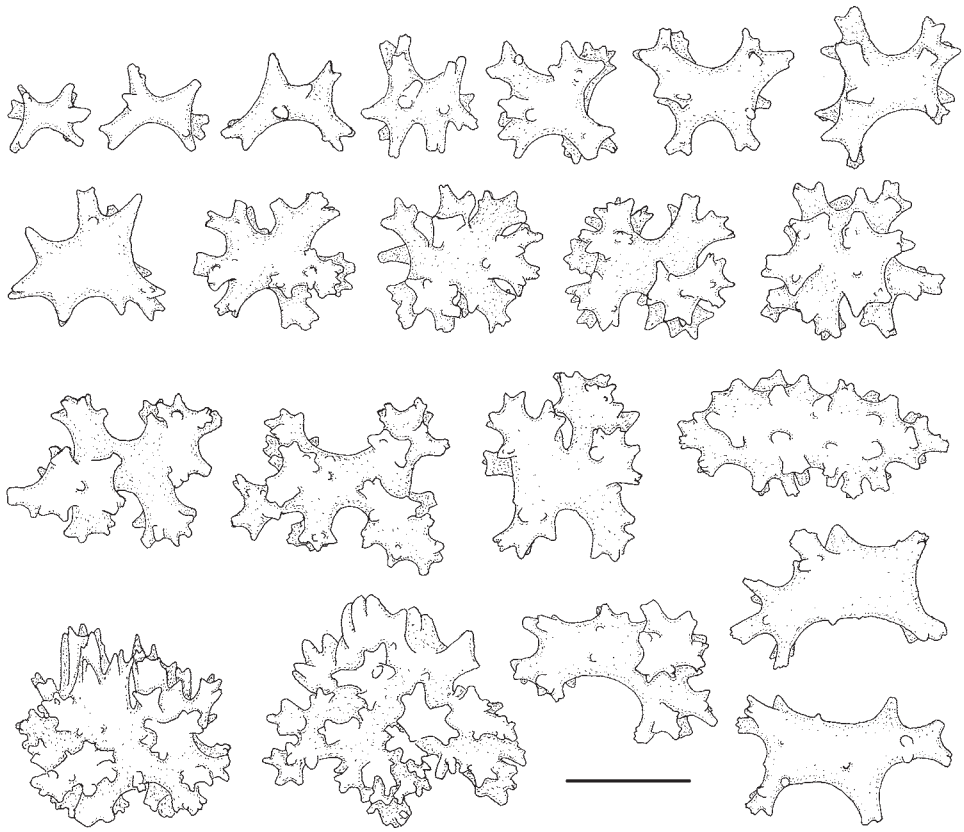


Fig. 15. *Chromonephthea braziliensis* spec. nov.; RMNH Coel. 33235; sclerites surface layer base of stalk. Scale 0.10 mm.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, most of them are strongly unilaterally spinose, the larger ones with complex tubercles (fig. 14f). A few spindles, up to 1.00 mm long, and several unilaterally spinose spindles are also present (fig. 14f), all with complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, some unilaterally spinose (figs 12b, 15), the larger ones with complex tubercles. Length of these sclerites is 0.05-0.20 mm.

Interior stalk.— Without sclerites.

Colour.— Holotype is pink with yellow polyps. Colour of point sclerites yellow; projecting supporting bundle spindles partly yellow partly pink; tentacle sclerites colourless; all other sclerites pink.

Etymology.— The species is named after the type locality Brazil.

Remarks.— Some fragments of this species were sent to me for identification (RMNH Coel. 33235) and preliminary I named it *Stereonephthya* aff. *curvata* Kükenthal, 1911. With that name, Ferreira (2003) commented “During the last 10 years, two non-

indigenous tropical coral species have been detected on the sheltered rocky shores. They include a soft coral, *Stereonephthya* aff. *curvata* (Kükenthal 1911), and a scleractinian, *Tubastraea coccinea* Lesson 1829 (Figs. 1, 2). Both species were probably introduced by oil platforms via fouling, because at least *T. coccinea* has been frequently detected on platforms and ships monitored by the author. The soft coral was detected in Arraial do Cabo about eight years ago in a shallow embayment, occurring as a colony of eight individuals. The individuals, varying from 20 to 50 cm in height, were established in a sandy, 10 m^2 area near a rocky shore (8-10 m deep). One-year monitoring and transplant experiments showed clear evidence of successful asexual reproduction and potential chemical activity, the latter evidenced by transplant experiments with direct contact with local coral species. Replicated experiments detected active chemical competition against the native octocoral *Phyllogorgia dilatata*, the dominant species in the habitat where the soft coral had established". Lages et al. (2004) reported about this chemical competition on a poster during the 10th International Coral Reef Symposium.

Dr Ferreira suspects the species was transported by an oil platform built in Singapore (pers. comm.) but in a collection of nephtheids from Singapore under examination no *Chromonephthea* species were found.

The new species resembles *Chromonephthea curvata* (Kükenthal, 1911), but has more spiny dorsal point spindles, and radiates of the surface layer of the top of the stalk have much higher spines. It also resembles *C. frondosa* spec. nov. from western Australia, but that species has stronger leaf-like projections on both the dorsal point spindles and the radiates of the surface layer of the top of the stalk.

Chromonephthea brevis spec. nov.
(figs 16-17, 18a, 158-159, 166a)

Material examined.— NTM C5164, **holotype**; Australia, NT, Bynoe Harbour, Fish Reef, 12°26.00'S 130°27.00'E, 9 m, 5.ix.1984, coll. P. Alderslade; RMNH Coel. 33004, 8 ms of holotype; NTM C14735, **paratype**, same data as holotype.

Description.— The holotype is 7 cm long and wide, stalk is very short (fig. 166a). Polyps are up to about 0.80 mm wide and 0.90 mm high.

Supporting bundle.— Projecting up to 0.30 mm (fig. 16a); the larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 16d). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8, dorsally up to 10 (fig. 16a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.35 mm long, with simple and complex tubercles and spiny outer side and distal end (fig. 16b). Between the points often a few intermediate sclerites are present. Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 16c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, some having a few complex tubercles (fig. 16e). Many of them are unilaterally spinose. Furthermore, spindles and unilaterally spinose spindles are present, up to 0.80 mm long, with simple tubercles. Often the smaller spindles have side branches.

Surface layer base of stalk.— Radiates and derivatives of these, slightly larger than

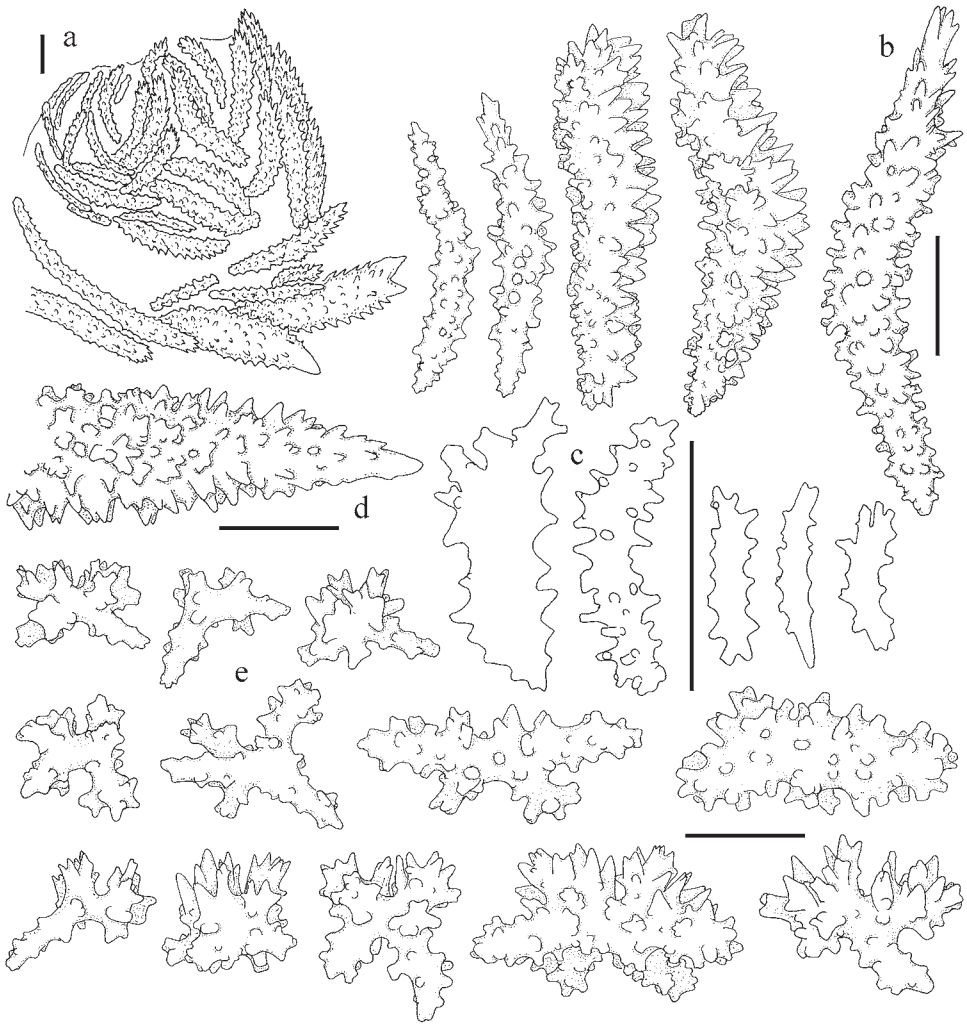


Fig. 16. *Chromonephthea brevis* spec. nov.; holotype NTM C5164; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, radiates of surface layer top of stalk. Scales 0.10 mm.

the ones of the top of the stalk, many with complex tubercles, and less unilaterally spinose (figs 17a, 18a). Here too spindles and unilaterally spinose spindles are present, up to 0.80 mm long, mostly with simple tubercles.

Interior stalk.— Unbranched spindles with simple sparse tubercles; length of the spindles up to 0.80 mm (fig. 17b).

Colour.— Colony white with orange polyps, main branches reddish. Point and supporting bundle spindles orange, tentacle rods colourless to light orange, stalk sclerites mostly colourless, some pink.

Etymology.— The Latin “brevis”, short, refers to the short stalk.

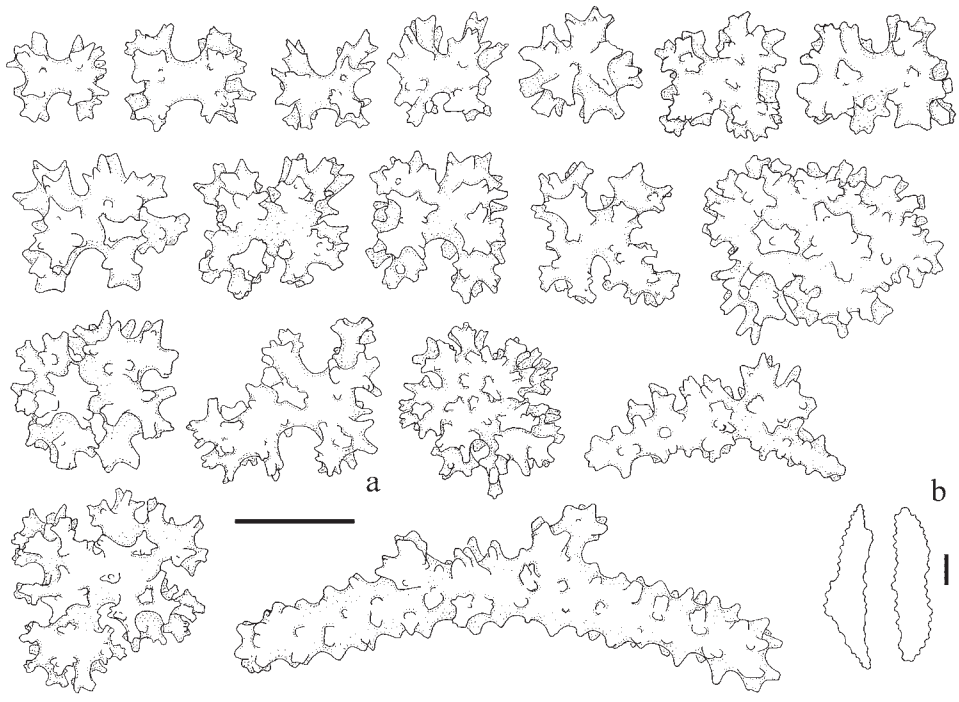


Fig. 17. *Chromonephthea brevis* spec. nov.; holotype NTM C5164; a, sclerites of surface layer base of stalk; b, spindles of interior base of stalk, outlines. Scales 0.10 mm.

Remarks.— The paratype is smaller than the holotype and also has a very short stalk. Both specimens miss the very base of the stalk but since clearly different types of sclerites are present in the top and the base of the stalk, I assume the stalk is very short and not much of it is missing.

The radiates of the stalk of *Chromonephthea brevis* resemble those of *C. grandis* spec. nov., but in the latter species they are slightly less tuberculate, and some branched bodies are present as well. Besides, *C. grandis* has slenderer, less spiny, point spindles.

The other species of *Chromonephthea* found on Fish Reef is *C. variabilis* spec. nov., a species without internal stalk spindles.

Chromonephthea bundegiensis (Verseveldt, 1977)
(figs 18b-21, 158, 160)

Stereonephthya bundegiensis Verseveldt, 1977: 216, figs 32-33, 46e (W Australia).

Material examined.— RMNH Coel. 11806, **holotype** and 4 ms, WA, Gulf of Exmouth, Bundegi Reef, side of Bommie, 14.viii.1972, 3 m, coll. N. Coleman; WAM Z29875, WA, Exmouth Gulf, sta. 17, 7.7-8 m, 15.iii.2004, 21º50.023'S 114º35.591'E; RMNH Coel. 33209, 5 ms of WAM Z29875.

Description.— The holotype is 3.5 cm long and 3.5 cm wide, with most of the stalk missing (fig. 19). Polyps are up to about 0.95 mm wide and 0.60 mm high.

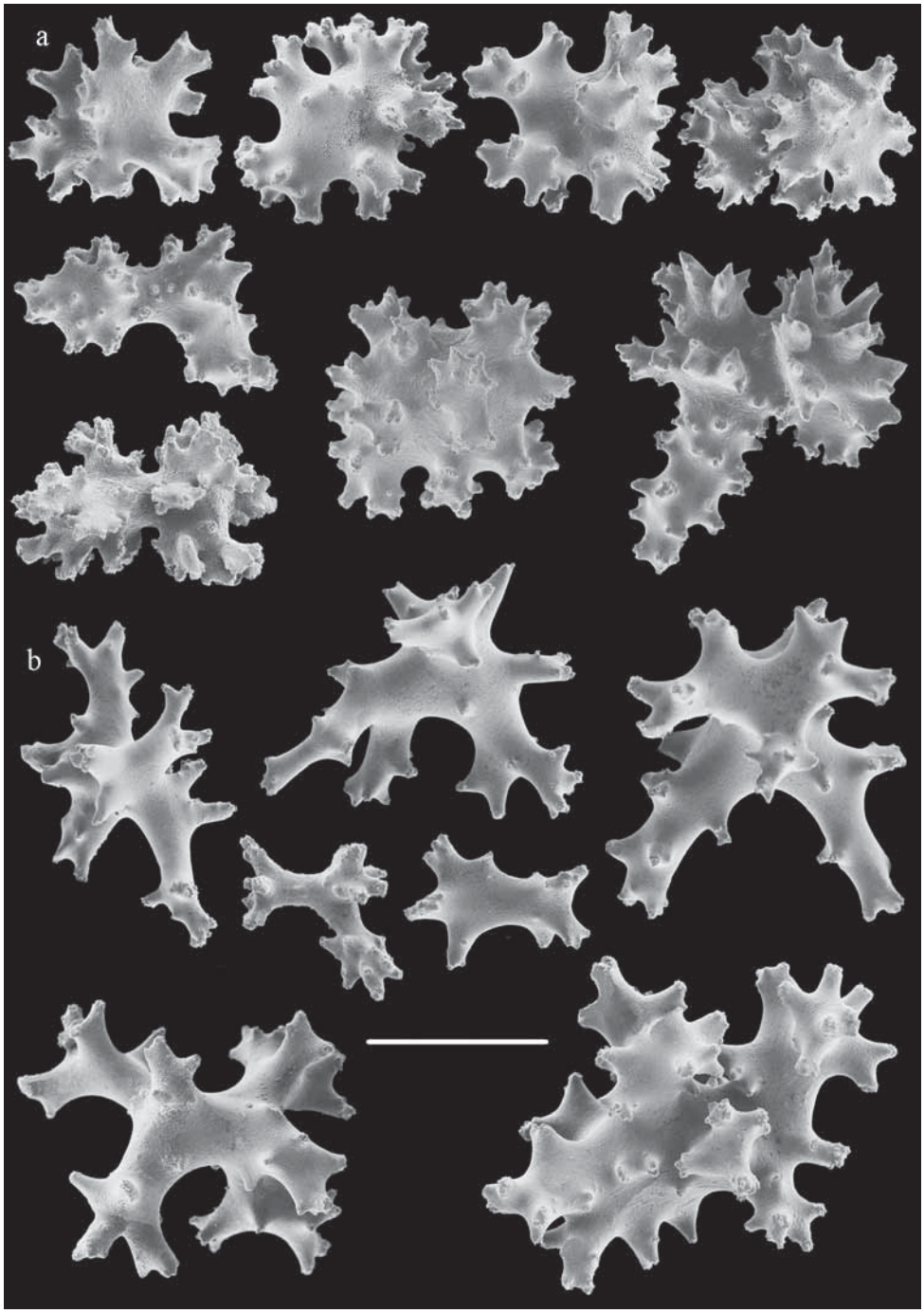


Fig. 18. Sclerites of surface layer base of stalk; a, *Chromonephthea brevis* spec. nov., holotype NTM C5164; b, *C. bundegiensis* (Verseveldt, 1977), WAM Z29875.

Supporting bundle.— Can project beyond the polyp for a distance of up to 0.50 mm (fig. 20a); larger spindles with complex tubercles and projecting part spiny (fig. 20c). Length of these spindles is up to about 1.75 mm.

Points.— Ventrally 0-3 spindles per point, laterally 6-8, dorsally 10 (fig. 20a). Point sclerites ventrally up to 0.20 mm long, with simple tubercles, laterally up to 0.30 mm long, with simple tubercles and a distal spiny end. Dorsally they are up to 0.45 mm long, with complex tubercles and distal spiny end (fig. 20b). Between the points often a few intermediate sclerites are present. Tentacles have no sclerites.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.25 mm long (fig. 21a). Many are unilaterally

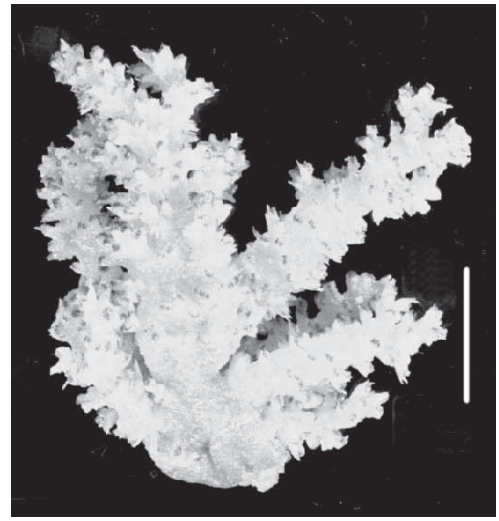


Fig. 19. *Chromonephthea bundegiensis* (Verseveldt, 1977); holotype RMNH Coel. 11806 (fig. 46e in Verseveldt, 1977). Scale 1 cm.

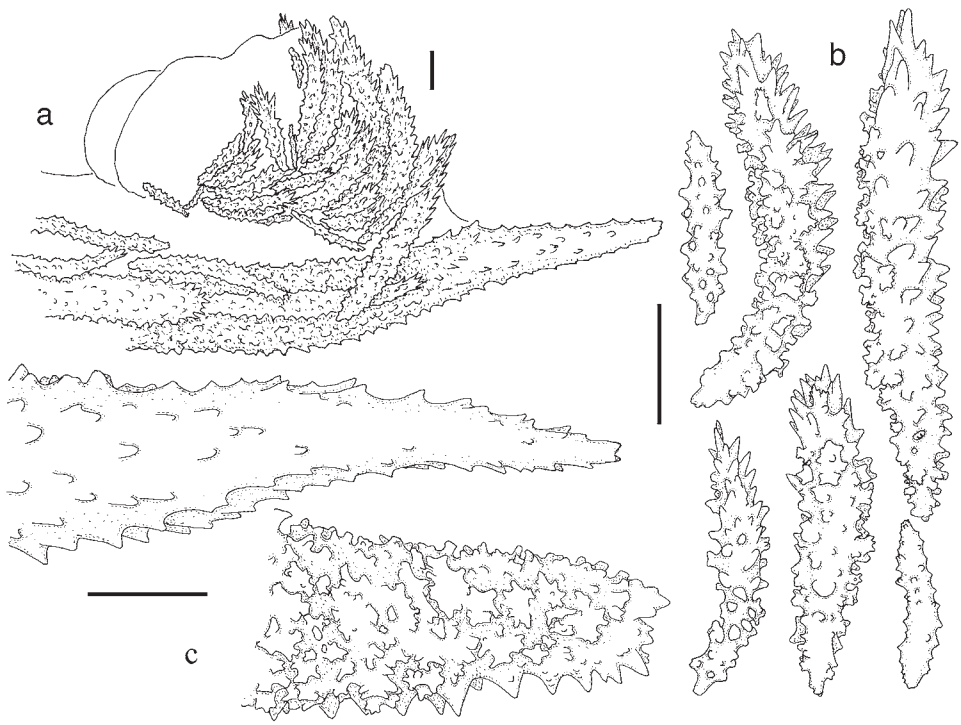


Fig. 20. *Chromonephthea bundegiensis* (Verseveldt, 1977); holotype RMNH Coel. 11806; a, lateral view of polyp armature; b, point spindles; c, spindles of supporting bundle (part). Scales 0.10 mm.

spinose and most have complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are present, up to 0.70 mm long, with complex tubercles. Finally, a number of small spindles are present, up to 0.30 mm long, with simple tubercles (fig. 21b).

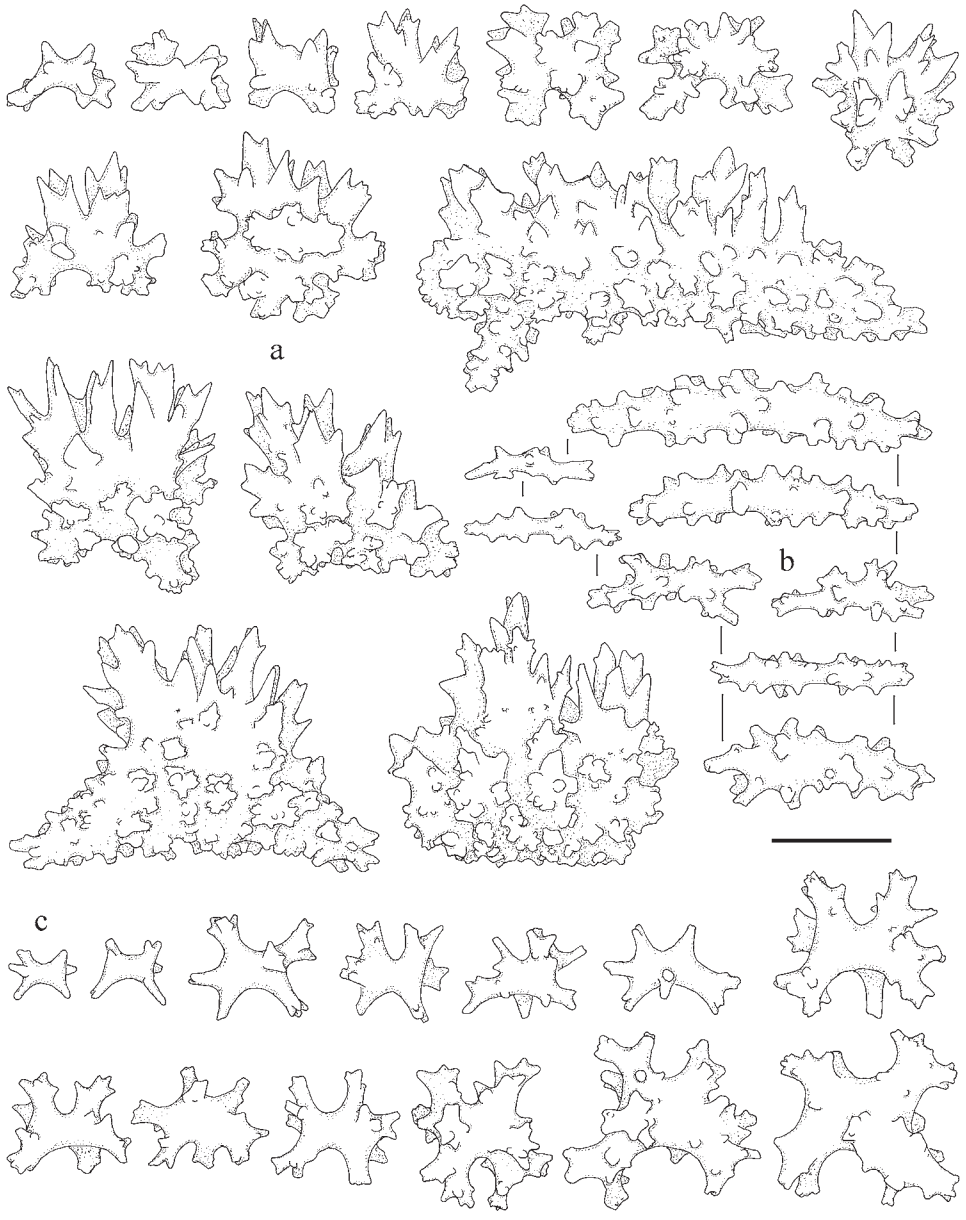


Fig. 21. *Chromonephthea bundegiensis* (Verseveldt, 1977); a-b, holotype RMNH Coel 11806; a, radiates and unilaterally spinose spindles, surface layer base of colony; b, spindles, surface layer base of colony; c, WAM Z29875, radiates, surface layer base of stalk. Scale 0.10 mm.

Surface layer base of stalk (based on WAM Z29875).— Radiates and derivatives of these, up to 0.20 mm long (figs 18b, 21c), with simple tubercles, the larger ones also with some complex tubercles; some radiates unilaterally spinose.

Interior stalk (WAM Z29875).— Without sclerites.

Colour.— Holotype with red base, yellow branches and supporting bundles, and red polyps. Point spindles pink, branch and supporting bundle spindles yellow. Surface base has colourless, pink and bicoloured sclerites. WAM Z29875 is whitish with dull reddish stalk, supporting bundle yellow or white, and red polyps.

Remarks.— Verseveldt (1977) mentioned that the holotype was deposited in the Australian Museum, Sydney, AM G14714 (Col. 61). However, for some unknown reason the holotype remained in the NNM, Leiden, stored under catalogue number RMNH 11806.

Recently collected material (WAM Z29875) with intact stalk enabled me to complete the description of this species.

This is one of the two species lacking tentacle rods, the other is *Chromonephthea exosis* spec. nov. The latter species also has similar radiates as *C. bundegiensis*, and was also found in the Exmouth Gulf. It differs in having ventral point spindles and distinctly less spiny unilaterally spinose spindles with simpler tubercles in the top of the stalk.

Chromonephthea cairnsi spec. nov.
(figs 22-23, 155, 164d)

Material examined.— USNM 90339, **holotype**, North Pacific Ocean, Japan, Shizouka, Honshu Island, Suruga Bay, Omae Zaki, 34º40'N 138º20'E, 16.v.1900, Albatross sta 3730, 62-68 m; RMNH Coel. 33373, 4 ms of holotype; USNM 90338, 4 **paratypes**, North Pacific Ocean, Japan, Shizouka, Honshu Island, Suruga Bay, Omae Zaki, 34º40'N 138º20'E, 16.v.1900, Albatross sta. 3729, 68 m; RMNH Coel. 33374, 5 ms of paratypes.

Description.— The holotype is 9 cm long and 6 cm wide; the stalk is very short, and the holdfast is lacking (fig. 164d). Polyps are up to about 1.00 mm wide and high.

Supporting bundle.— Hardly projecting (fig. 22a); the larger spindles have complex tubercles and a spiny end (fig. 23a). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally about 4 spindles per point, laterally 4-6, dorsally up to 12 (fig. 22a). The smallest spindles are present ventrally, up to 0.25 mm long, with few simple tubercles. Laterally they are up to 0.30 mm long, also with simple tubercles. Dorsally they are up to 0.50 mm long, with some complex tubercles and spiny outer side and distal end (fig. 22b-c). Below the points a kind of collaret is present; one or two horizontally placed spindles with spiny middle part (fig. 22d-e). Both point and collaret spindles often possess side branches. Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.20 mm long, with scalloped edge (fig. 22f).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, with simple tubercles (fig. 23b). Furthermore, spindles are also present, up to 0.80 mm long, with simple tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.20 mm long, many unilaterally spinose, the larger ones having complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple or complex tubercles.

Interior stalk.— Without sclerites.

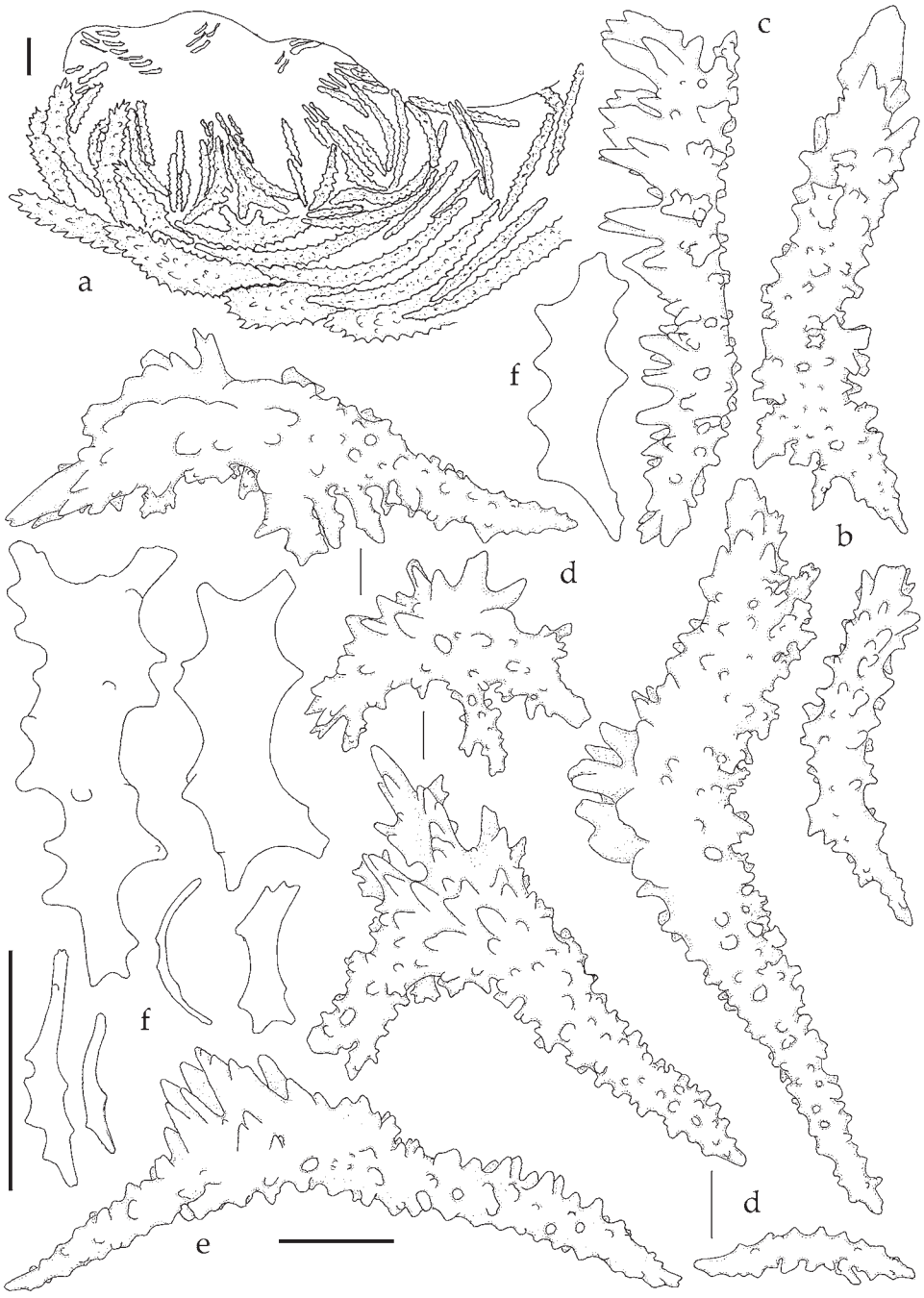


Fig. 22. *Chromonephthea cairnsi* spec. nov.; a, c, e-f, paratype USNM 90338, b, d, holotype USNM 90339; a, lateral view of polyp armature; b-c, point spindles; d-e, "collaret" spindles; f, tentacular rods. Scales 0.10 mm, that at e also applies to b-d.

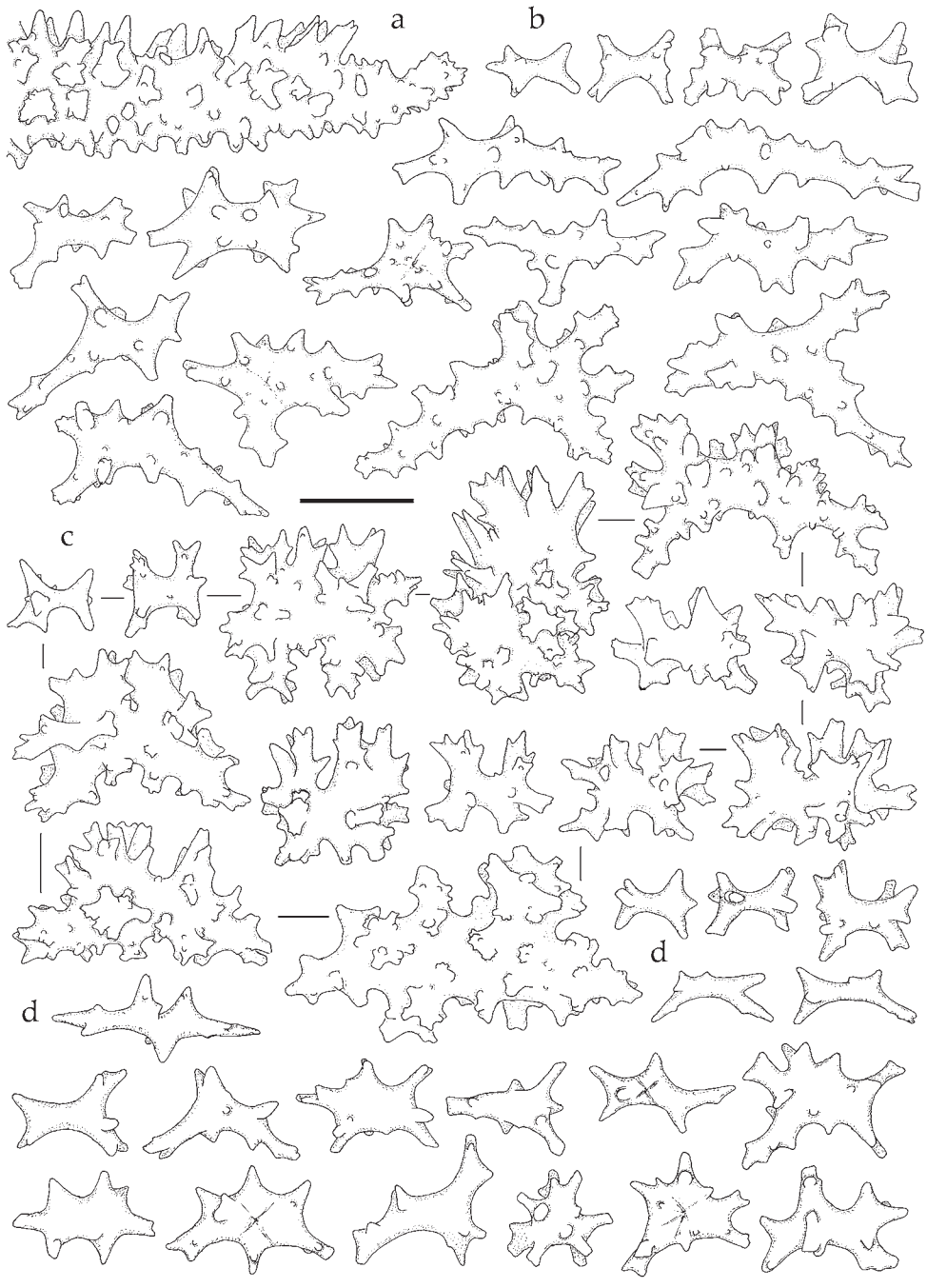


Fig. 23. *Chromonephthea cairnsi* spec. nov.; a, d, paratype USNM 90338, b-c, holotype USNM 90339; a, spindle of supporting bundle (part); b, sclerites, surface layer top of stalk; c-d, sclerites, surface layer base of colony. Scale 0.10 mm.

Colour.— Reddish to orange with yellow polyps. Point and collaret sclerites are yellow, tentacle rods colourless, all other sclerites pink.

Etymology.— Named after octocoral researcher Dr Stephen D. Cairns, USNM.

Remarks.— The holotype is the largest of the type series. The paratypes have the same colour pattern as the holotype, and all specimens have a very short stalk. In the holotype the holdfast is lacking, but one of the paratypes does have a holdfast and in this part the sclerites are much smaller, up to 0.15 mm long, and less unilaterally spinose (fig. 23d).

The sclerites of the surface layer of the base of the stalk of *Chromonephthea cairnsi* spec. nov. resemble those of *C. inermis* (Holm, 1894), but in the latter species they were found in the interior.

Chromonephthea cairnsi has collaret sclerites similar to those found in *C. serratospiculata* (Utinomi, 1951), but the latter species has a much stronger supporting bundle.

Chromonephthea cobourgensis spec. nov.
(figs 24-27a, 158-159, 166d)

Material examined.— NTM C5710, **holotype**, Australia, NT, Port Essington, Orontes Reef, sta. no. CP 78, 19 m, 16.ix.1985, coll. R. Williams; RMNH Coel. 33210, 3 ms of holotype; **paratypes**: NTM C14840, 5 specimens, same data as holotype; RMNH Coel. 33211, 7 ms of NTM C14840 (specimen with purple end branches; white specimen with yellow supporting bundle and orange polyps); NTM C3474, 27 specimens, Australia, NT, Sandy Is. No. 2, sta no. PA 14, 7-8 m, 20.x.1981, coll. P. Alderslade; RMNH Coel. 33212, 4 ms of orange specimen of NTM C3474, 3 ms of pink specimen of NTM C3474; RMNH Coel. 33213, two specimens of NTM C3474.

Description.— The holotype is 12 cm long and 3.5 cm wide (fig. 166d). Polyps are up to about 0.80 mm wide and 1.10 mm high.

Supporting bundle.— Projecting up to 0.40 mm (fig. 24a-b); the larger spindles have complex tubercles and a spiny projecting end (fig. 24f-g). Length of these spindles is up to about 1.80 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-10, dorsally up to 12 (fig. 24a-b). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.40 mm long, with simple, and a few complex tubercles, and with a spiny distal end. Dorsally the spindles are up to 0.50 mm long, with complex tubercles and a spiny outer side and distal end (fig. 24c-e). Between the points often a few intermediate sclerites are also present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 24h-i).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with complex tubercles (fig. 25a-b). Many of them are unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.40 mm long, mostly with simple tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.25 mm long, the larger ones with a few complex tubercles, becoming irregular multi-radiate bodies (fig. 25c-27a). Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.40 mm long, mostly with simple tubercles.

Interior stalk.— Without sclerites.

Colour.— See table 1.

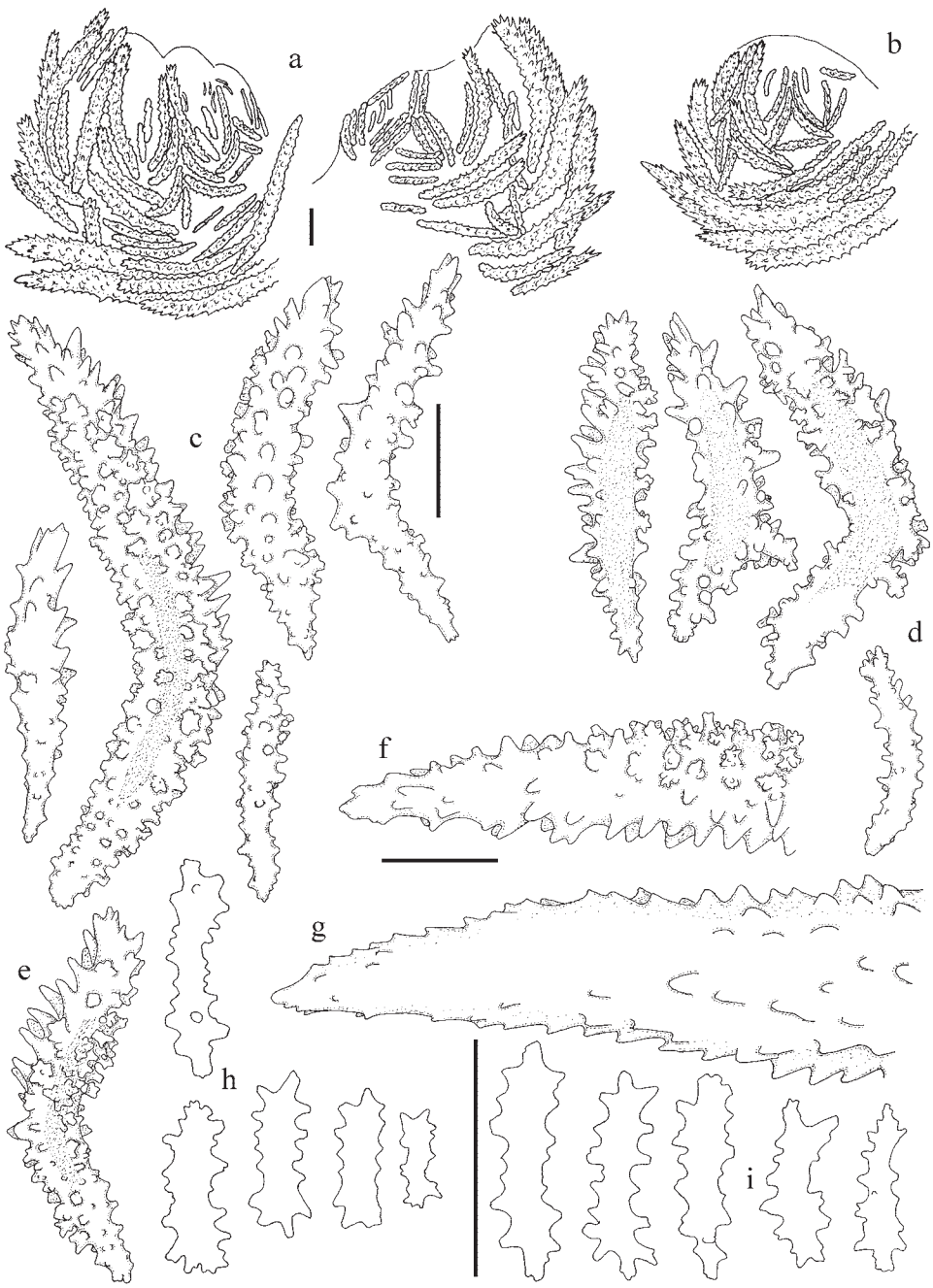


Fig. 24. *Chromonephthea cobourgensis* spec. nov.; a, c, g-h, paratype NTM C14840, b, d-f, i, paratype NTM C3474 (e, pink specimen); a-b, lateral views of polyp armature; c-e, point spindles; f-g, spindles of supporting bundle (part); h-i, tentacular rods. Scales 0.10 mm, scale at a applies to a-b, scale at c applies to c-e, scale between h and i to h-i.

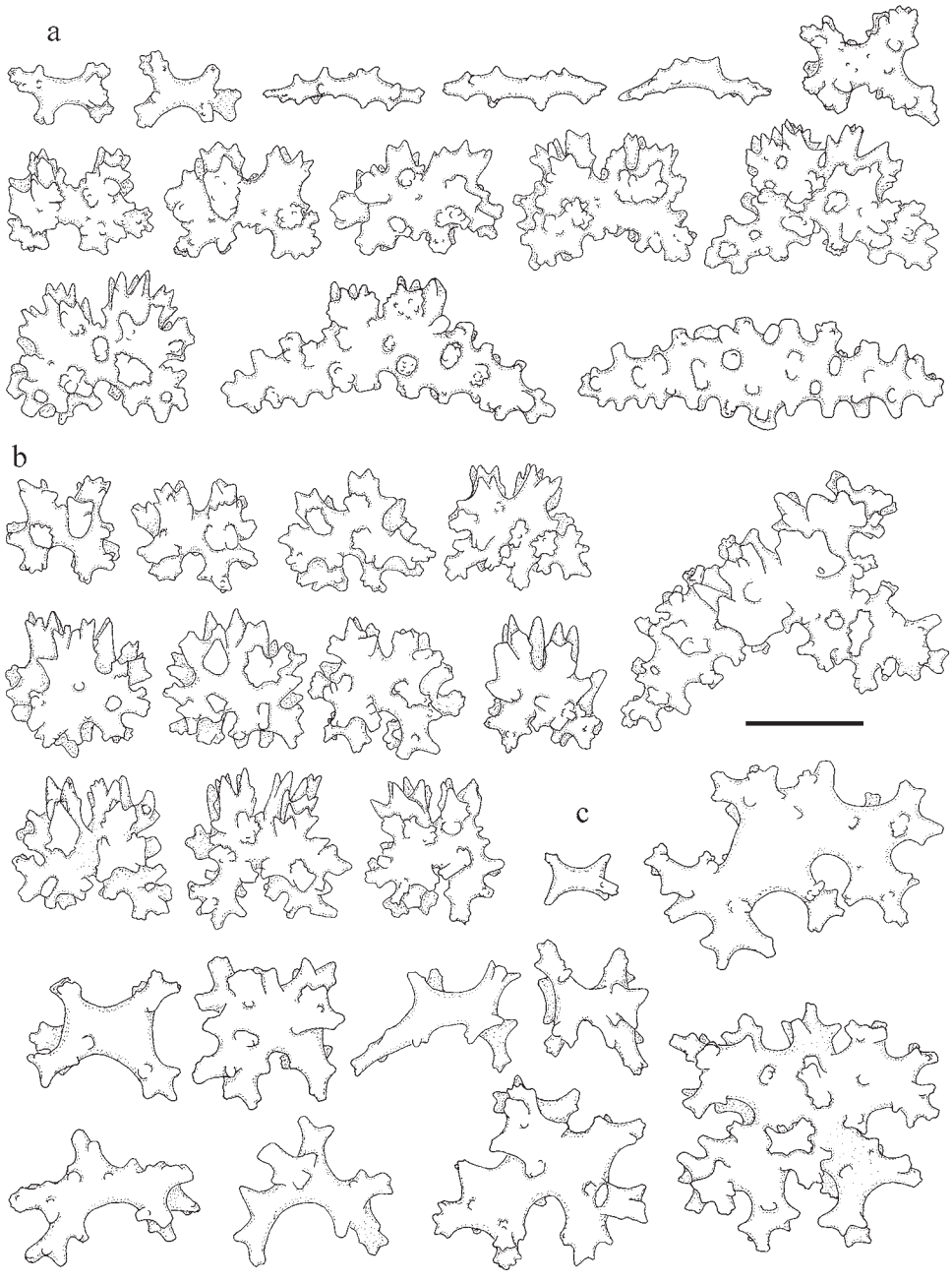


Fig. 25. *Chromonephthea cobourgensis* spec. nov.; a, paratype NTM C14840, b-c, paratype NTM C3474; a-b, sclerites, surface layer top of stalk; c, sclerites, surface layer base of stalk. Scale 0.10 mm.

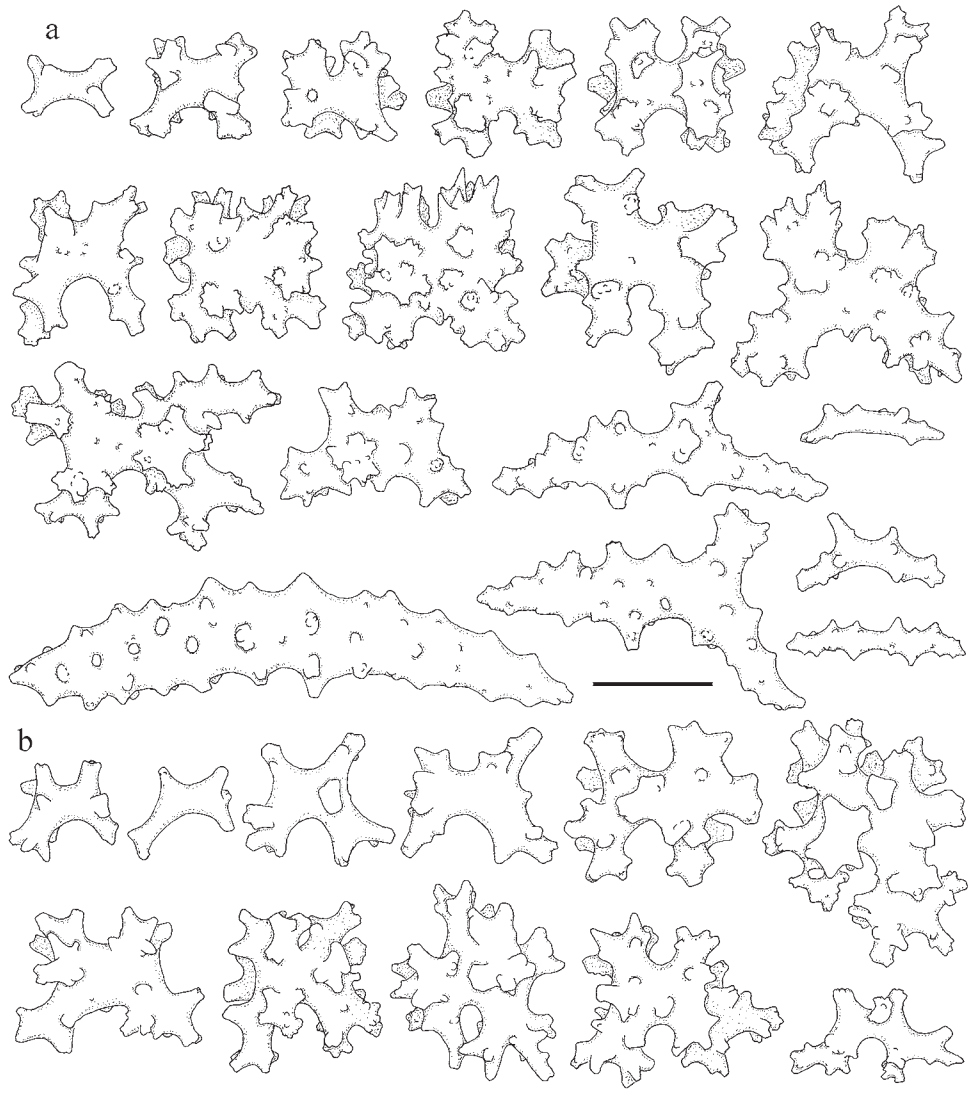


Fig. 26. *Chromonephthea cobourgensis* spec. nov.; a, paratype NTM C14840, b, paratype NTM C3474; a-b, sclerites, surface layer base of stalk. Scale 0.10 mm.

Table 1. Colour variation in *Chromonephthea cobourgensis* spec. nov.

Species	Colony colour	Points	SB	Branch	Stem	Stalk
NTM C14840	White with yellow / orange supporting bundles and orange polyps	Orange	Faint yellow / orange	Colourless	Colourless	Colourless
Holotype NTM C5710	White with orange polyps and dark red stalk	Orange	Colourless	Colourless	Pink	Pink
NTM C14840	White with yellow polyps	Yellow	Colourless	Colourless	Colourless	Colourless
NTM C14840	White with purple end branches and white polyps	Colourless to pink	Red with white projecting part	Red	Colourless, some yellowish	Colourless
NTM C14840	White with a few red supporting bundles (small specimen of few cm)	Colourless	Red or Colourless	Colourless	Colourless	Colourless
NTM C3474	Orange with yellow polyps and reddish stalk	Yellow	Yellow	Yellow	Yellow +pink	Pink
NTM C3474	Pink with orange polyps	Orange	Light purple	Light purple	Light purple	Pink
NTM C3474	Reddish / purple with yellow polyps	Yellow	Red	Red	Red	Pink

Etymology.— The species is named after the Cobourg peninsula, NT, Australia, where Orontes Reef and Sandy Island are located.

Variability.— Some variation in sclerites occurs. A few paratypes have longer point spindles, up to 0.60 mm long (fig. 24c). In one paratype a few spindles, up to about 0.50 mm long, with sparse tuberculation, were found in the base of the stalk (fig. 26a), and quite a few rods were present (fig. 26a). These spindles and rods originate from the subsurface layer as the interior had no sclerites.

Remarks.— The species is similar to *C. variabilis* spec. nov., but has more tuberculate stalk sclerites, a few multi-radiate bodies, and lacks the long lateral point sclerites. *C. fruticosa* spec. nov., was also collected at Port Essington but that species clearly differs from *C. cobourgensis* spec. nov. in having internal stalk spindles. *C. benayahui* spec. nov., also from Orontes Reef, differs from *C. cobourgensis* in having smaller point sclerites, up to 0.40 mm long. Besides, the sclerites in the surface layer of the base of the stalk of *C. benayahui* have less complex tubercles, are overall more robust, and do not form multi-radiate bodies.

Chromonephthea complanata (Kükenthal, 1910)
(figs 27b-31, 158, 160)

Nephthya complanata Kükenthal, 1910: 44, figs 7-8, pl. 2 fig. 13 (Shark Bay, Australia).
Nephthea complanata; Griffith & Fromont, 1998: 225 (type catalogue of WAM).

Material examined.— WAM Z862, 2 **syntypes**, WA, Shark Bay, NNE from the northern point of Heirisson Prong, 26º03'S 113º23'E, station 15, 18.vi.1905, 11.5-11 m; RMNH Coel. 33375, 5 ms of WAM Z862; WAM Z20501, 1 colony with most of the stalk missing, WA, Shark Bay, Cape Heirisson, 25º58.5'S 113º21.5'E, station SB48, 11.v.1981, 16.5 m, coll. L.M. Marsh, S.M. Slack-Smith & C.W. Bryce, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33376, 2 ms of WAM Z20501; WAM Z20502, 1 colony with base of stalk missing, same data as WAM Z20501; RMNH Coel. 33377, 2 ms of WAM Z20502; WAM Z29902, 1

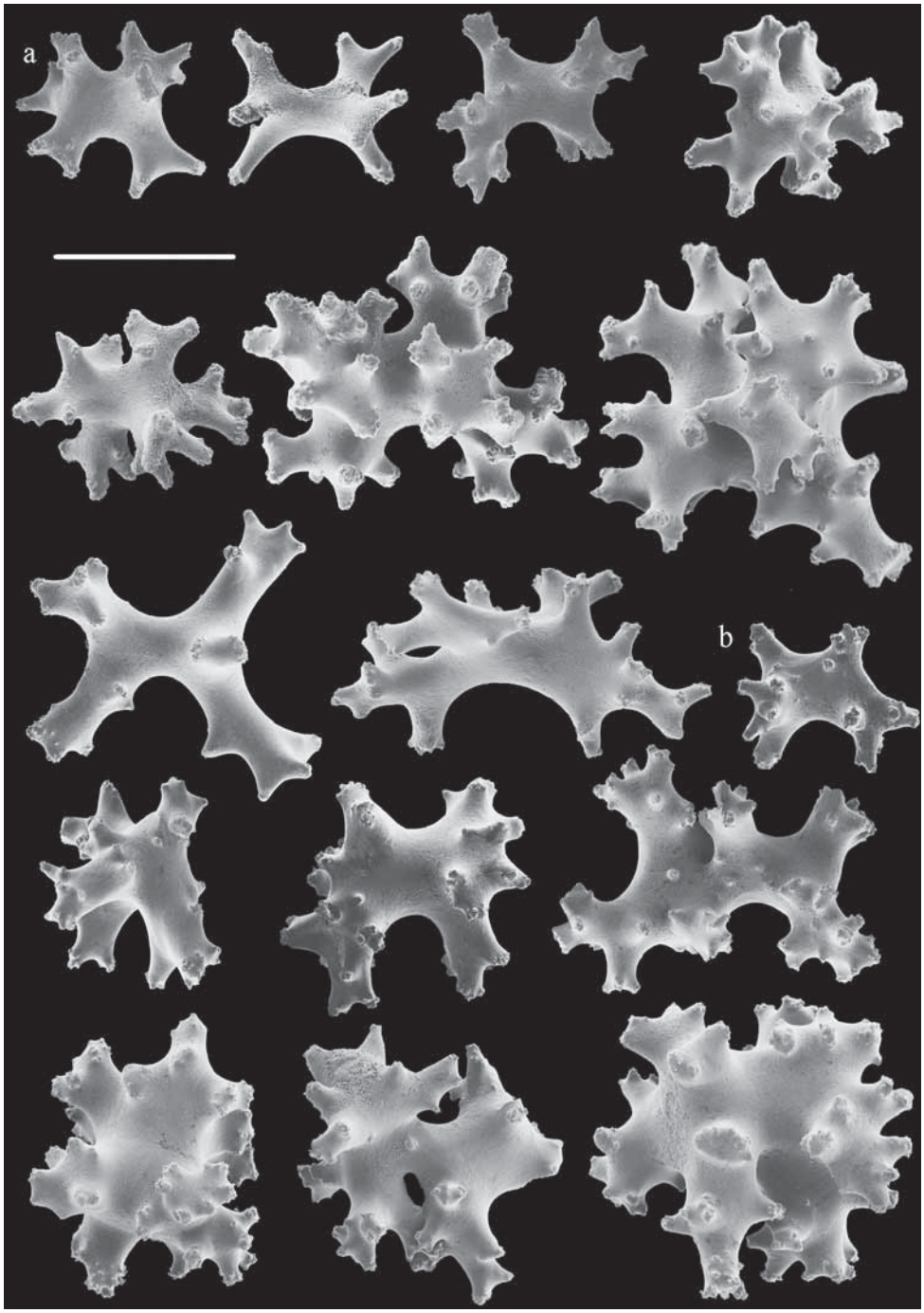


Fig. 27. Sclerites, surface layer base of stalk; a, *Chromonephthea cobourgensis* spec. nov., holotype NTM C5710; b, *Chromonephthea complanata* (Kükenthal, 1910), WAM Z29913.

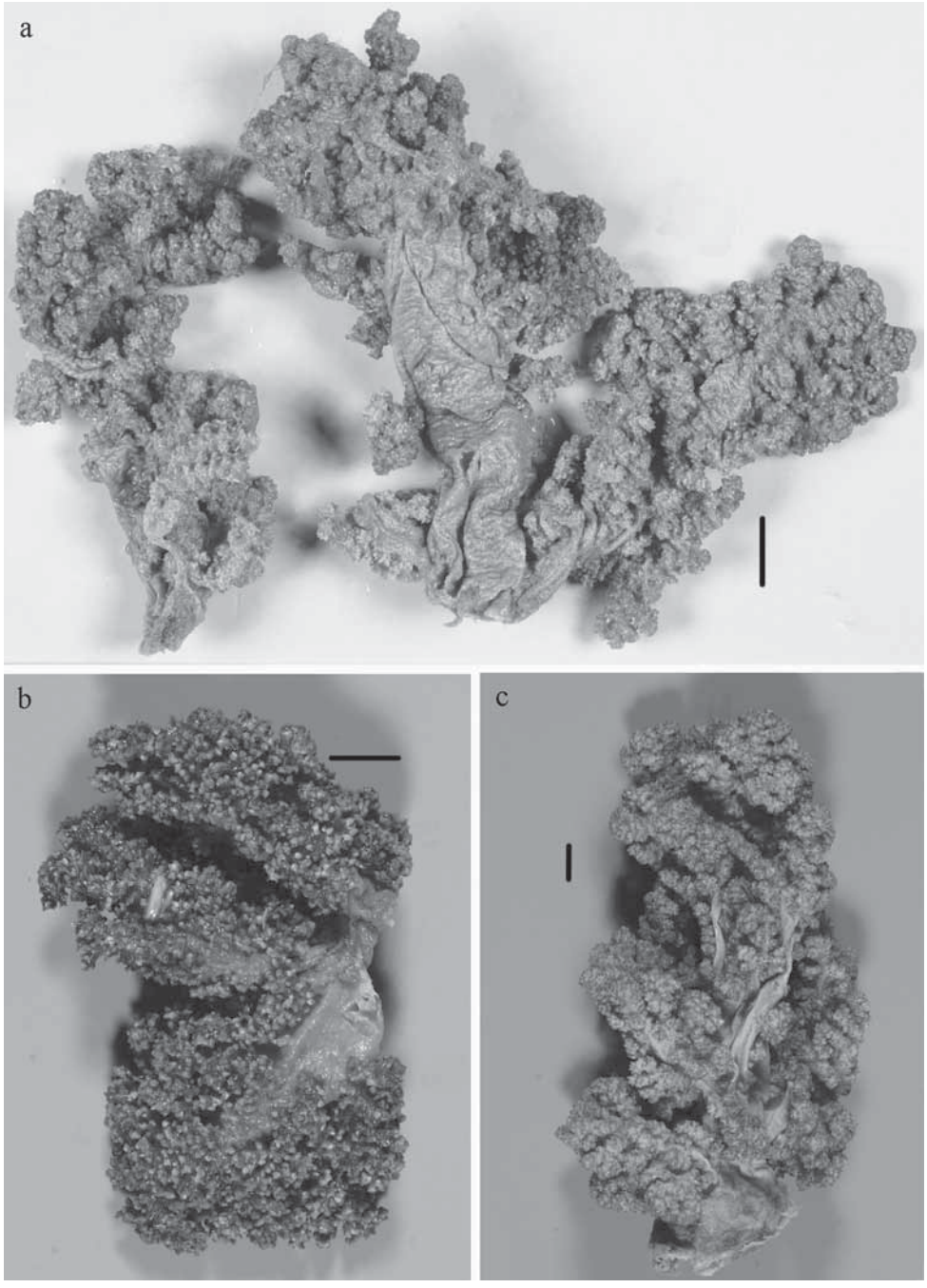


Fig. 28. *Chromonephthea complanata* (Kükenthal, 1910); a, syntypes WAM Z862, b, WAM Z29902; c, WAM Z29913. Scales 1 cm.

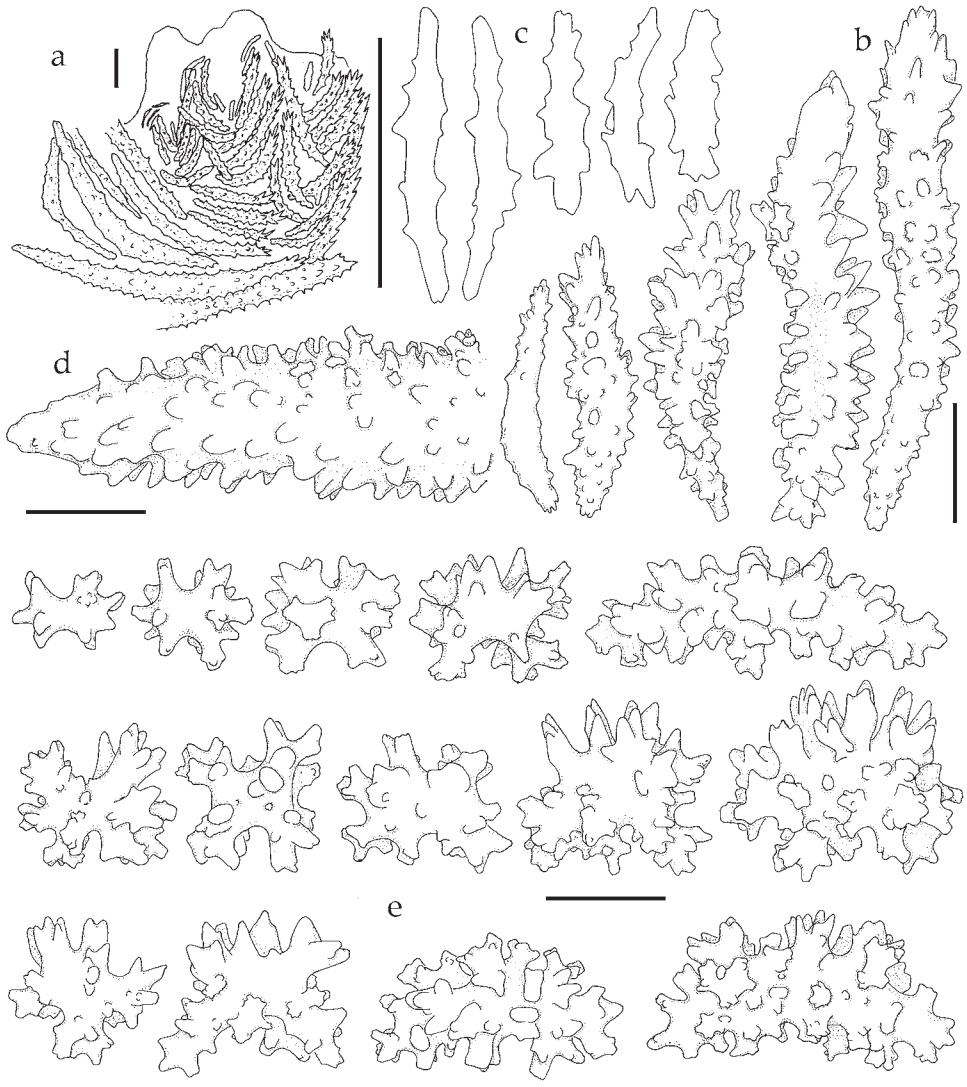


Fig. 29. *Chromonephthea complanata* (Kükenthal, 1910); syntype WAM Z862, a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

colony, without stalk, WA, Exmouth Gulf, sta. 17, 7.8-8.5 m, 5.vii.2004, 21º50.470'S 114º35.345'E; RMNH Coel. 33214, 3 ms of WAM Z29902; WAM Z29913, 1 colony, WA, Exmouth Gulf, sta. 10, specimen 44, 8. vii.2004; RMNH Coel. 33215, 4 ms of WAM Z29913.

Description.— One syntype is 8 cm long and 10 cm wide, the base of the colony missing, the second syntype is a branch (fig. 28a). Polyps are up to about 0.60 mm wide and 0.80 mm high.

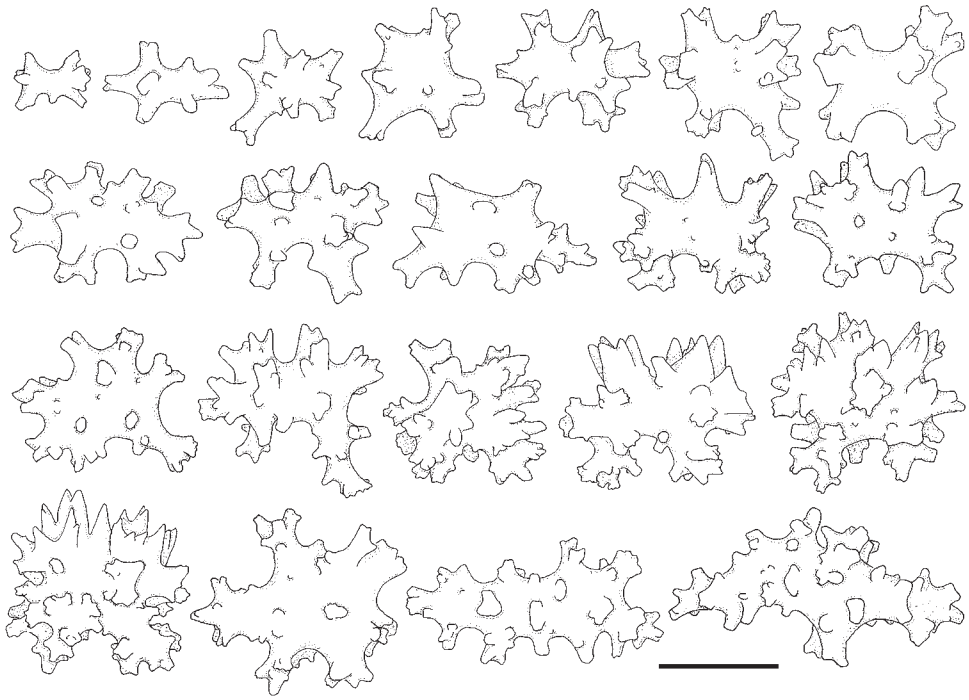


Fig. 30. *Chromonephthea complanata* (Kükenthal, 1910); syntype WAM Z862; sclerites, surface layer base of colony. Scale 0.10 mm.

Supporting bundle.— Projecting up to 0.10 mm (fig. 29a); larger supporting bundle spindles with mostly simple tubercles, though a few are complex, and with a spiny projecting end (fig. 29d). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally 2-4 spindles per point, laterally 6-10, dorsally up to 14 (fig. 29a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.35 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.50 mm long, with simple and complex tubercles and spiny outer side and distal end (fig. 29b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 29c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with a few complex tubercles (fig. 29e). Many of them are unilaterally spinose. The larger ones merge into the small spindles and unilaterally spinose spindles, which are up to about 0.30 mm long, with some complex tubercles.

Surface layer base of colony.— Similar sclerites to the surface of the top of the stalk, though less unilaterally spinose (fig. 30).

Interior stalk.— Without sclerites.

Colour.— Colony brownish. Stalk with a mixture of pink and yellow sclerites. Point sclerites pink, supporting bundle and branch sclerites yellow. Tentacle rods are colourless.

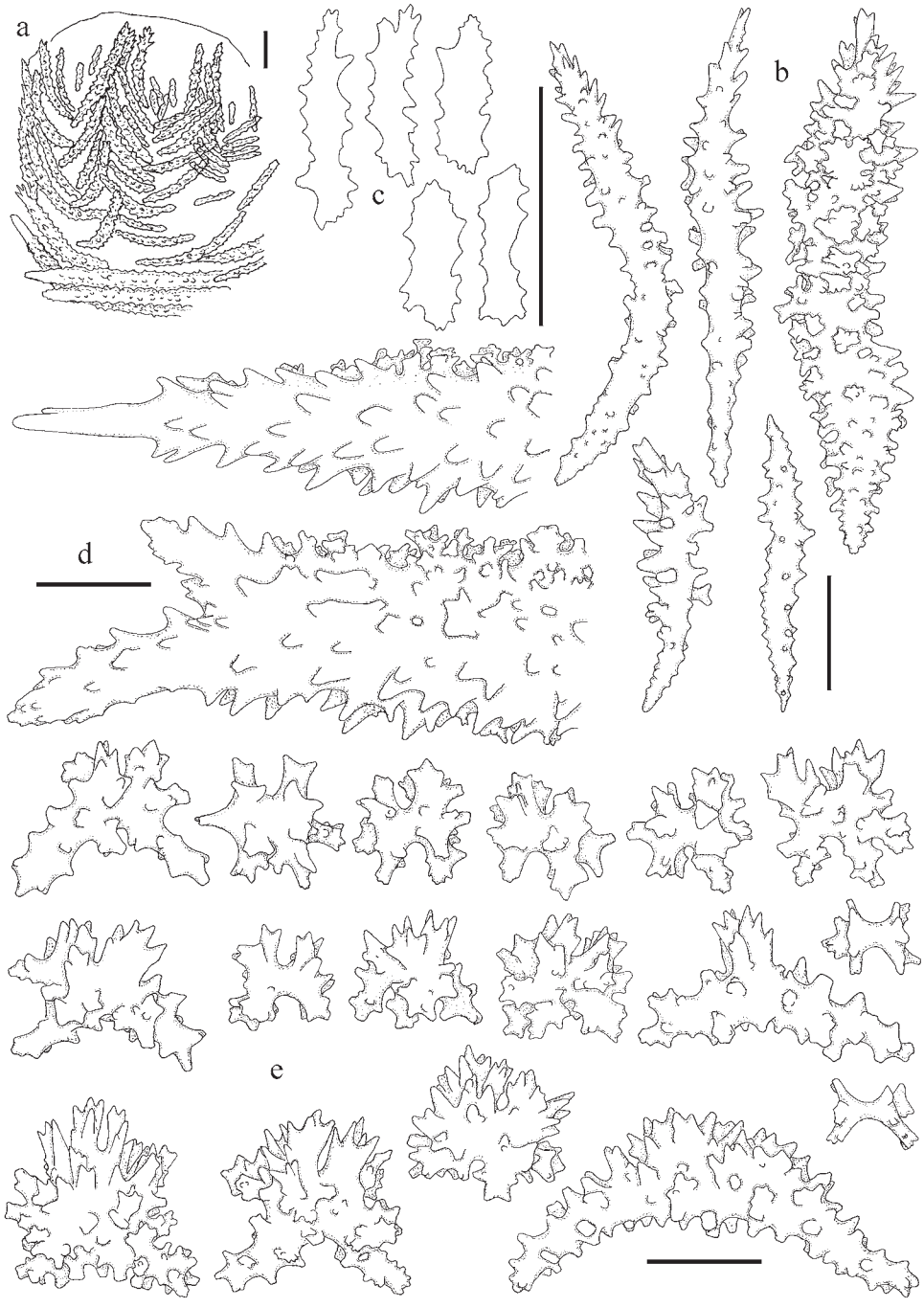


Fig. 31. *Chromonephthea complanata* (Kükenthal, 1910); WAM Z29902; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites, surface layer base of colony. Scales 0.10 mm.

Variability.— Drawings of sclerites of specimen WAM Z29902 are also presented (fig. 31). This specimen clearly has different point sclerites (compare fig. 29b with fig. 31b), but the sclerites of the top of the stalk do not differ much from other specimens of *C. complanata*. Because of the latter and the incompleteness of WAM Z29902 it is tentatively included in *C. complanata*.

Remarks.— Kükenthal (1910: 40) mentioned several specimens from two different localities in Shark Bay, the above mentioned one and "Useless Inlet, 26º08'S 113º21'E, station 19, 13.ix.1905, 7 m". In the ZMB I could not find any of the specimens of this species while all the other species described in the same publication as *C. complanata* were present. However, in the WAM two syntypes of *C. complanata* are present, which are used here for a re-description of the species. Kükenthal based his description on a 30 cm long, 20 cm wide specimen, clearly not the material under examination here.

I assume that the colour of the type specimens has faded away during the years as Kükenthal mentioned red colonies with yellow branches and red polyps. The colour of the sclerites of the present brownish material corresponds with the colour pattern mentioned by Kükenthal for the colony. WAM Z20501 is white with orange supporting bundle and yellow polyps, point sclerites yellow, supporting bundle spindles orange, base colony with colourless to faintly orange sclerites. WAM Z20502 and WAM Z29913 are white with red polyps, and point sclerites pink / reddish; in WAM Z29913 the supporting bundle spindles have a yellow projecting part, and all other sclerites are colourless; in WAM Z20502 the supporting bundle spindles are also completely colourless. WAM Z29902 is orange with purple end branches and orange polyps. Its point sclerites are yellow, supporting bundle spindles red with a yellow projecting part. The base of colony has a mixture of pink and yellow sclerites.

Kükenthal mentioned that only a few spindles were present in the base of the stalk, those being almost smooth and up to 0.60 mm long. In the WAM syntypes these were not present, undoubtedly because the base is missing. The interior of WAM Z20502, the specimen with large part of stalk present, was checked for interior sclerites, but here they were also not found. WAM Z29913 (fig. 28c), with a short but seemingly complete stalk, also showed no interior sclerites (fig. 27b).

The species is somewhat similar to *Chromonephthea curvata* (Kükenthal, 1911), but has smaller, less ornamented radiates in the stalk, 0.20 mm long versus 0.25 mm, and larger spindles in the points, 0.50 mm long versus 0.45 mm.

Chromonephthea cornuta (Verseveldt, 1977)
(figs 32-34, 158)

Nephthea cornuta Verseveldt, 1977: 210, figs 26-27, 48 (S Australia).

Material examined.— RMNH 11670, part of **holotype** and 7 ms, Saori Exped., South Australia, Wedge Isl., Shark Fin Bay, 35º10'S, 136º29'E, 29.xii.1963, coll. S.A. Sheppard, 12-15 m, on vertical face. The **holotype** is stored in the Department of Fisheries, Adelaide, Australia (DFA B1a).

Description.—The holotype is 24 cm long and 11 cm wide (fig. 32). Polyps are up to about 1.30 mm high and 0.80 mm wide.

Supporting bundle.— Can project for about 0.40 mm (fig. 33a); the larger spindles have complex tubercles and the projecting part spiny (fig. 33d). Length of these spindles is up to about 1.25 mm.

Points.— Ventrally 4 spindles per point, laterally 8-10, dorsally more (fig. 33a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.50 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 1.00 mm long, with simple tubercles and big spines (fig. 33b). A few of these dorsal point sclerites project beyond the polyp. Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 33c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.30 mm long (fig. 33e). Many of these are unilaterally spinose and most have complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.70 mm long, with complex tubercles (fig. 34a).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.30 mm long, with complex tubercles (fig. 34b). Furthermore, some spindles are also present, up to 0.70 mm long, with complex tubercles.

Interior stalk.— Without sclerites.

Colour.— Colony red with dirty white polyps. Tentacle rods are colourless, point and supporting bundle spindles yellow or colourless. Surface layer top of stalk has sclerites which are partly colourless and partly pink. Base stalk with pink sclerites.

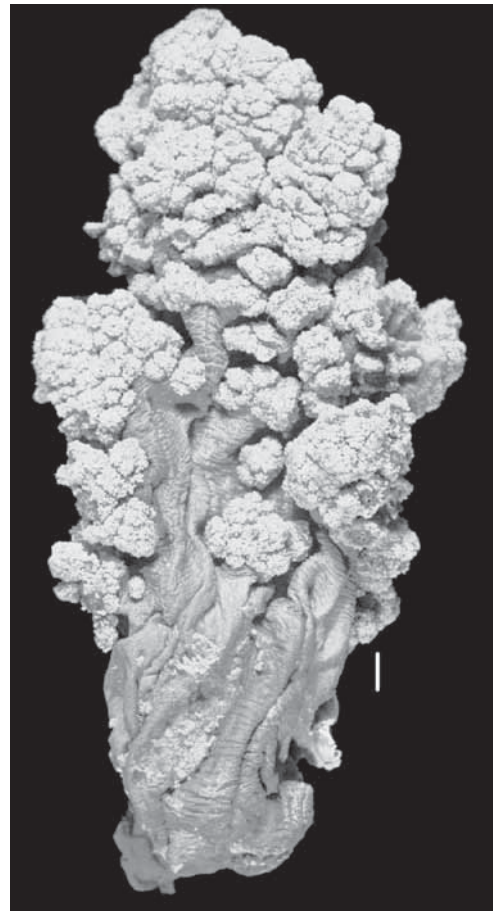


Fig. 32. *Chromonephthea cornuta* (Verseveldt, 1977), holotype DFA B1a (fig. 48 in Verseveldt, 1977). Scale 1 cm.

Remarks.— The two types of polyps mentioned by Verseveldt were not found by me. In his microscopic slides some polyps are simply somewhat distorted, others seen under different angles. Verseveldt incorrectly mentioned spiny spindles for the interior of the stalk; his microscopic slide of this part shows polyp sclerites.

In four species of *Chromonephthea* a few point spindles clearly project beyond the polyp head, viz. *C. cornuta* Verseveldt, 1977, *C. ostrina* spec. nov., *C. sierra* (Thomson & Dean, 1931), and *C. spinosa* spec. nov. *C. sierra* has much wider point spindles with complex tubercles. *C. ostrina* has similar slender point sclerites as *C. cornuta*, but also with complex tubercles. *C. spinosa* resembles *C. cornuta* most, but has quite different stalk sclerites with simple tubercles.

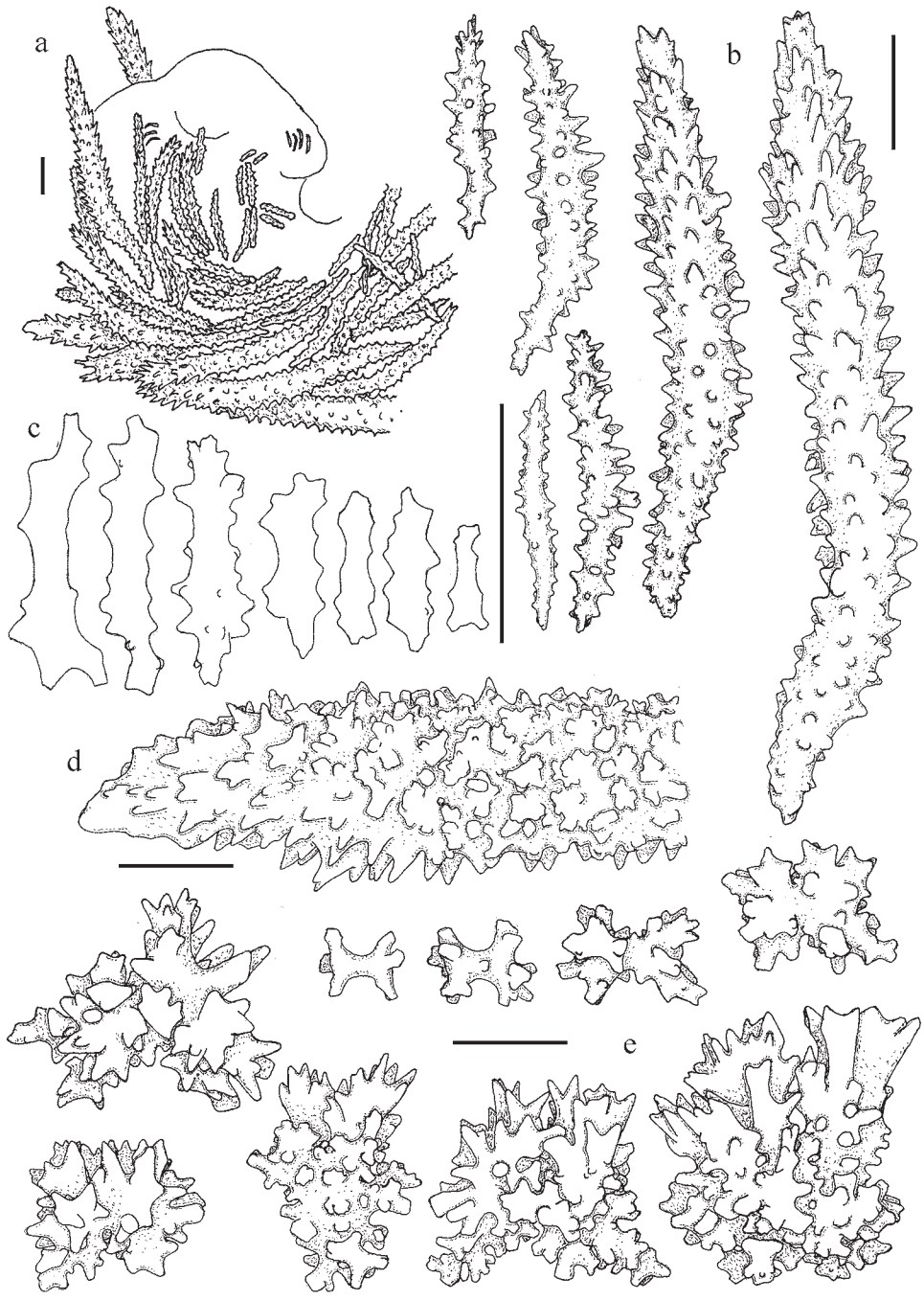


Fig. 33. *Chromonephthea cornuta* (Verseveldt, 1977); holotype DFA B1a; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

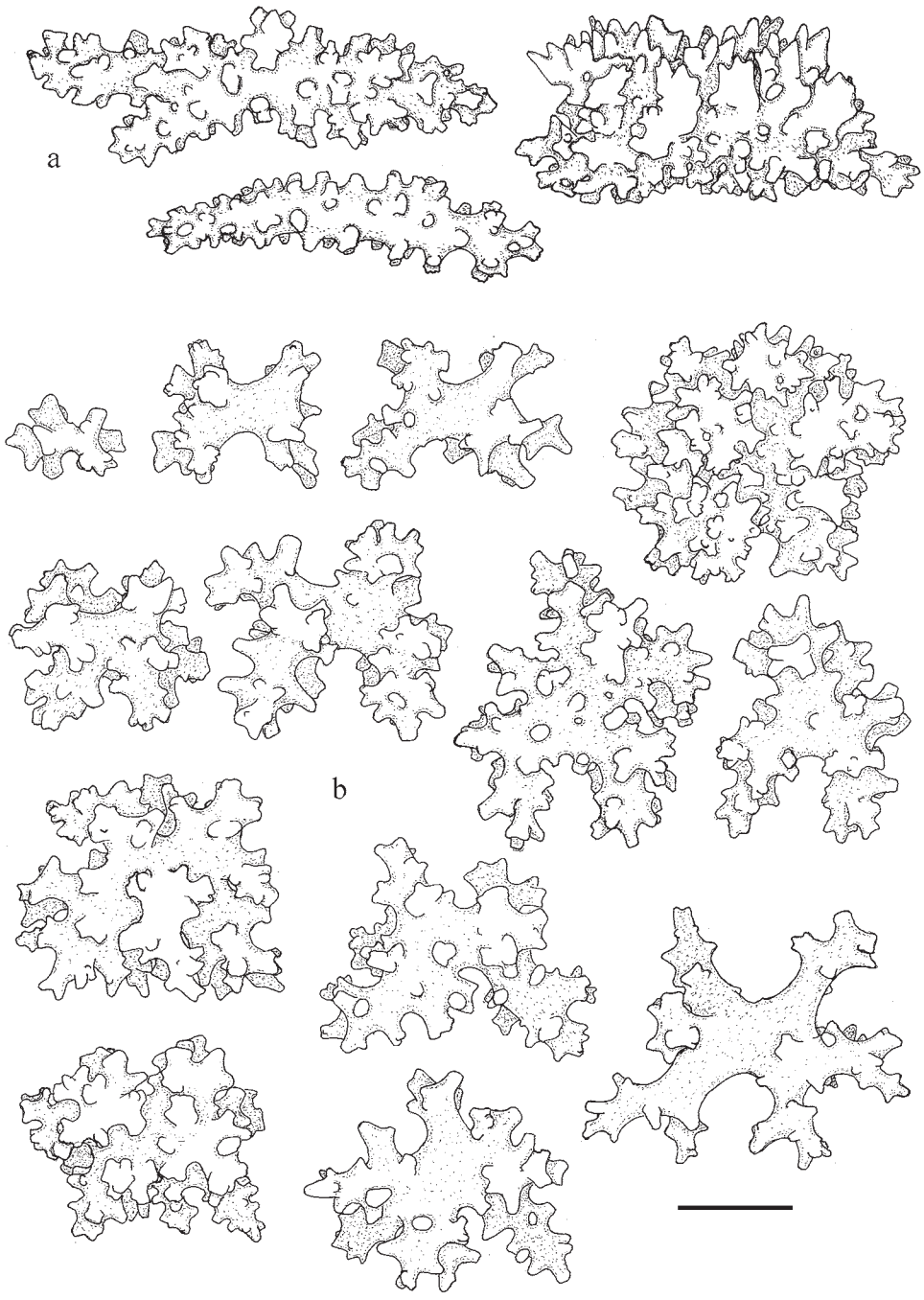


Fig. 34. *Chromonephthea cornuta* (Verseveldt, 1977), holotype DFA B1a; a, spindles, surface layer top of stalk; b, sclerites, surface layer base of stalk. Scale 0.10 mm.

Chromonephthea costatofulva (Burchardt, 1898) (figs 35-37, 158)

Spongodes costatofulva Burchardt, 1898: 440, pl. 31 figs 7-7a, pl. 32 figs 5a-c (Australia, Thursday Is., Torres Strait).

Nephthya costatofulva; Holm, 1904: 12.

Stereonephthya costatofulva; Kükenthal, 1905: 697 (re-examination of Burchardt's material).

Not *Stereonephthya costatofulva*; Utinomi, 1971: 96, fig. 7, pl. 16 fig. 2 (Australia, Darwin) = ?*C. variabilis* spec. nov.

Spongodes costatocyanea Burchardt, 1898: 441, pl. 31 fig. 8, pl. 32 figs 6a-e (Australia, Thursday Is., Torres Strait). New synonymy.

Nephthya costatocyanea; Holm, 1904: 12.

Stereonephthya costatocyanea; Kükenthal, 1905: 698 (re-examination of Burchardt's material).

Not *Stereonephthya costatocyanea*; Utinomi, 1971: 97, fig. 8, pl. 16 fig. 3 (Australia, Darwin) = ?*C. variabilis* spec. nov.

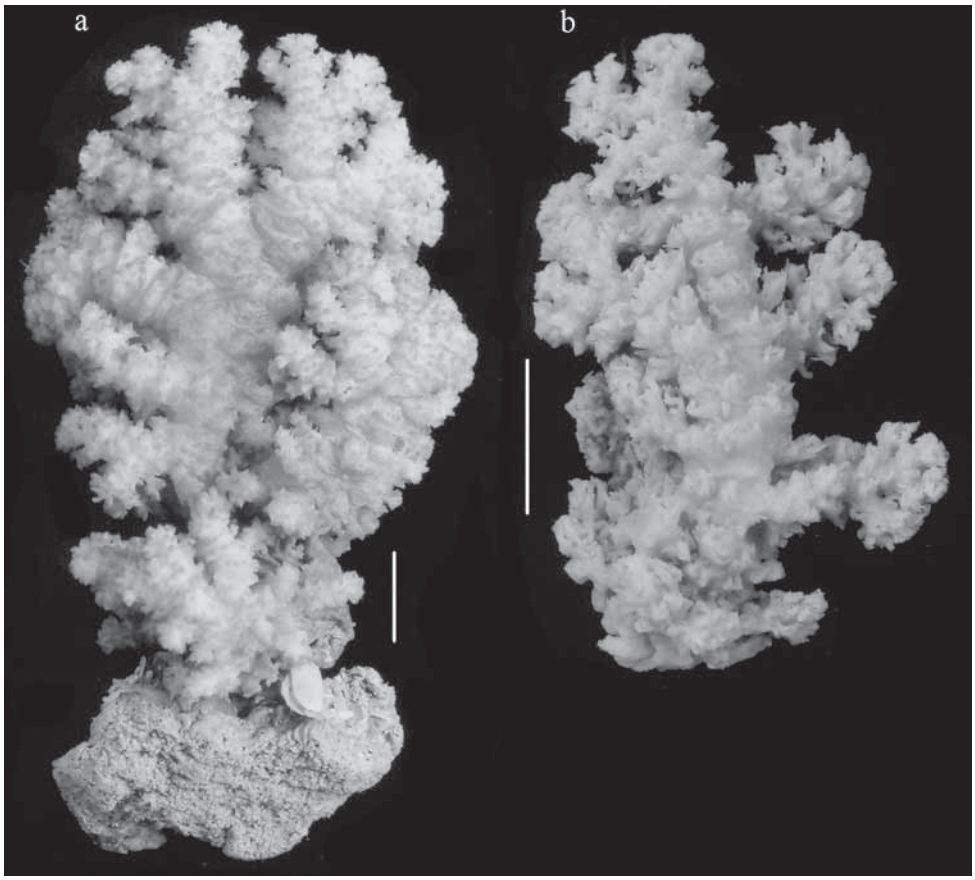


Fig. 35. *Chromonephthea costatofulva* (Burchardt, 1898); a, MSZ NS 164, b, MSZ NS 149 (holotype of *Spongodes costatocyanea* Burchardt, 1898). Scales 1 cm.

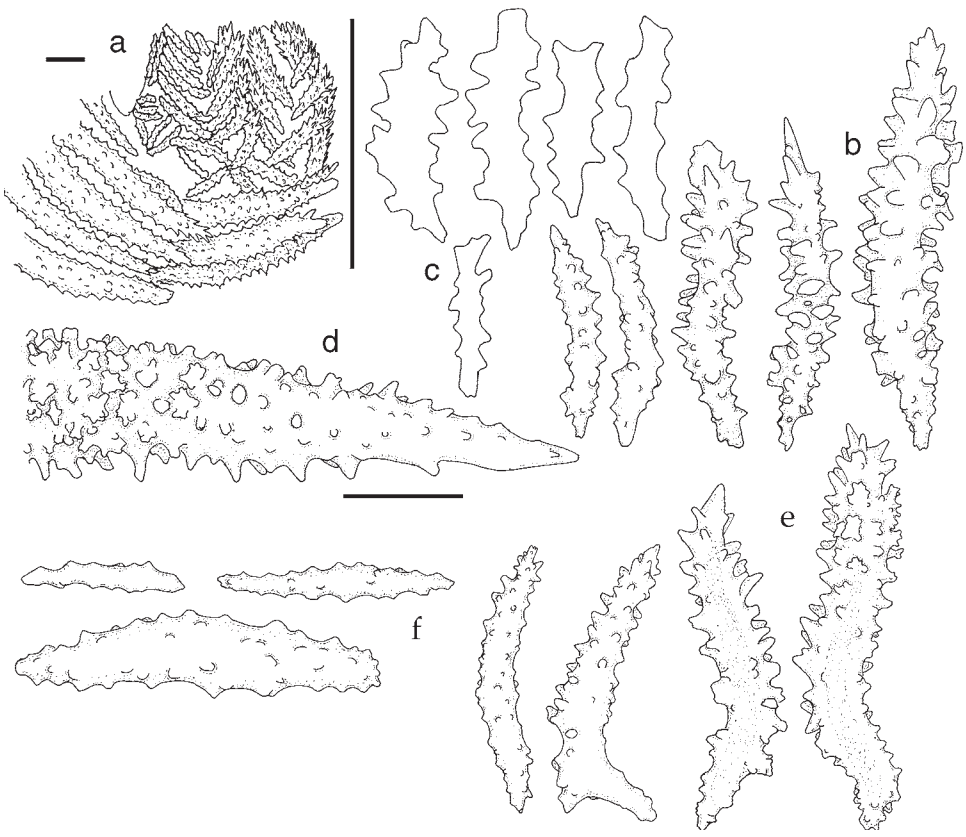


Fig. 36. *Chromonephthea costatofulva* (Burchardt, 1898); a-d, f, MSZ NS 164, e, MSZ NS 149 (holotype of *Spongodes costatocyanea*); a, lateral view of polyp armature; b, e, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); f, spindles, interior of stem. Scales 0.10 mm, that at d applies to b, d-f.

Material examined.— ZMB 6863, little fragment of **syntype** of *Spongodes costatofulva*; MZS NS 148, **syntype** of *Spongodes costatofulva*, Thursday Island, Torres Strait; RMNH Coel. 33378, 8 ms of MZS NS 148; MZS NS 164, **syntype** of *Spongodes costatofulva*, Thursday Island, Torres Strait; MZS NS 149, **holotype** of *Spongodes costatocyanea*, Thursday Island, Torres Strait; RMNH Coel. 33379, 8 ms of MZS NS 149.

Description (MZS NS 148).— The syntype is 7.7 cm long and 5 cm wide. It is attached to a piece of rock by a very short sterile stalk (fig. 35a). The polyps are up to about 1 mm high and 0.65 mm wide.

Supporting bundle.— Projecting for a distance of up to 0.20 mm (fig. 36a); larger spindles have complex tubercles, and a spiny outer side and distal end (fig. 36d), although some have a smooth distal spine. The length of these spindles is up to about 1.90 mm.

Points.— Ventral about 8-10 spindles per point, lateral 12-14, dorsal some more (fig. 36a). The ventral point spindles are up to 0.15 mm long with simple tubercles. Laterally they are up to 0.25 mm long, dorsally up to 0.35 mm. The larger point sclerites have spines on the dorsal side and distal end, and complex tubercles on the inner side (fig.

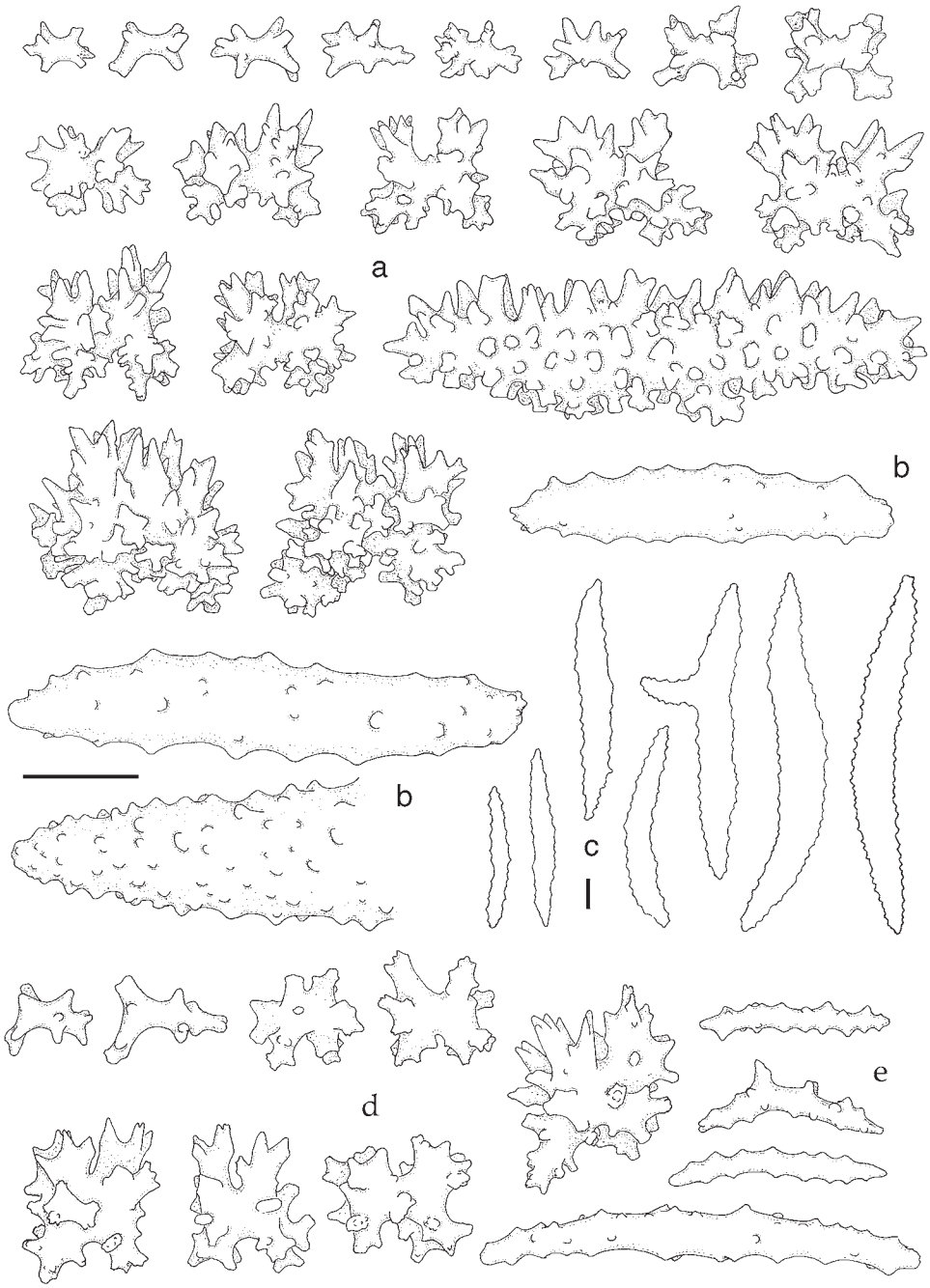


Fig. 37. *Chromonephthea costatofulva* (Burchardt, 1898); a-c, MSZ NS 164, d-e, MSZ NS 149 (holotype of *Spongodes costatocyanea*); a, sclerites, surface layer base of stalk; b, three spindles (one partly) interior of stalk; c, idem, outlines only; d, sclerites, surface layer base of colony; e, spindles, interior base of colony. Scales 0.10 mm, that at c only applies to c.

36b). Between the points one or two intermediates are present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 36c).

Surface layer top of stalk.— Because of the very short stalk it was impossible to sample the top of the stalk.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.20 mm long, many unilaterally spinose (fig. 37a). Furthermore, a few unilaterally spinose spindles are also present, up to 0.60 mm long (fig. 37a).

Interior stalk.— With spindles, up to 1.50 mm long, the smallest smooth, the larger ones with simple tubercles (fig. 37b-c).

Colour.— Colony with red stalk, yellowish stem, colourless branches and red polyps. Stalk and point sclerites orange, supporting bundle spindles partly colourless partly pink, stem sclerites yellow, and branch spindles and tentacular rods colourless.

Remarks.— The other syntype (MZS NS 164) is similar to the above described specimen but much smaller, about 4.5 cm high.

Both Burchardt and Kükenthal (1905), who re-examined Burchardt's material, considered *Spongodes costatofulva* and *S. costatocyanea* related but different species. For comparison some drawings of sclerites of *S. costatocyanea* are presented (figs 36e, 37d-e), though most were badly damaged. The main difference between the two species is the different colour pattern. *S. costatocyanea* has a white base with pink branches and orange polyps; point sclerites orange, branch and supporting bundle sclerites colourless and pink, all other sclerites colourless. Most striking difference I noticed is the presence of big internal spindles in *S. costatofulva* (fig. 37b-c), while in *S. costatocyanea* only small rods are present in the interior (fig. 37e). However, the specimen of *S. costatocyanea* has no stalk at all (fig. 35b) and *S. costatofulva* also has small rods higher up in the colony (fig. 36f). This difference can therefore be explained by sampling at different heights. As many species of *Chromonephthea* show huge colour variation I consider the different colour patterns of the two species not diagnostic and therefore I here synonymize *S. costatocyanea* with *S. costatofulva*.

Among the *Chromonephthea* species with internal stalk sclerites and supporting bundle spindles with complex tubercles, only *C. egmondi* spec. nov. and *C. slieringsi* spec. nov. have similarly sized point spindles. *C. egmondi* has branched internal stalk sclerites, and *C. slieringsi* differs in having less developed unilaterally spinose radiates.

Chromonephthea curvata (Kükenthal, 1911)
(figs 38-42, 156)

Stereonephthya curvata Kükenthal, 1911: 324, figs 36-37, pl. 21 fig. 11(Aru islands).

Stereonephthya longicaulis Kükenthal, 1911: 324, figs 38-40, pl. 21 fig. 12 (Aru islands). New synonymy.

Nephthya rubra; Kükenthal, 1911: 313, pl. 19 fig. 2 (Aru islands).

Nephthya granulata; Kükenthal, 1911: 314 (Aru islands).

Not *Nephthya rubra* Kükenthal, 1910: 48, figs 14-16, pl. 2 fig. 15 (WA, Shark Bay) (= *C. rubra* (Kükenthal, 1910)).

Not *Nephthya granulata* Kükenthal, 1910: 42, figs 5-6, pl. 2 fig. 16 (WA, Shark Bay) (= *C. hartmeyeri* (Kükenthal, 1910)).

Not *Stereonephthya* aff. *curvata*; Ferreira, 2003: 498, fig. 1 (= *C. braziliensis* spec. nov.).

Material examined.— SMF 1282, **holotype** of *Stereonephthya curvata* Kükenthal, Aru Ins., Merton leg., 1908, Kükenthal det. 1911; RMNH Coel. 33380, 4 ms of SMF 1282; SMF 1287, **syntype** of *Stereonephthya*

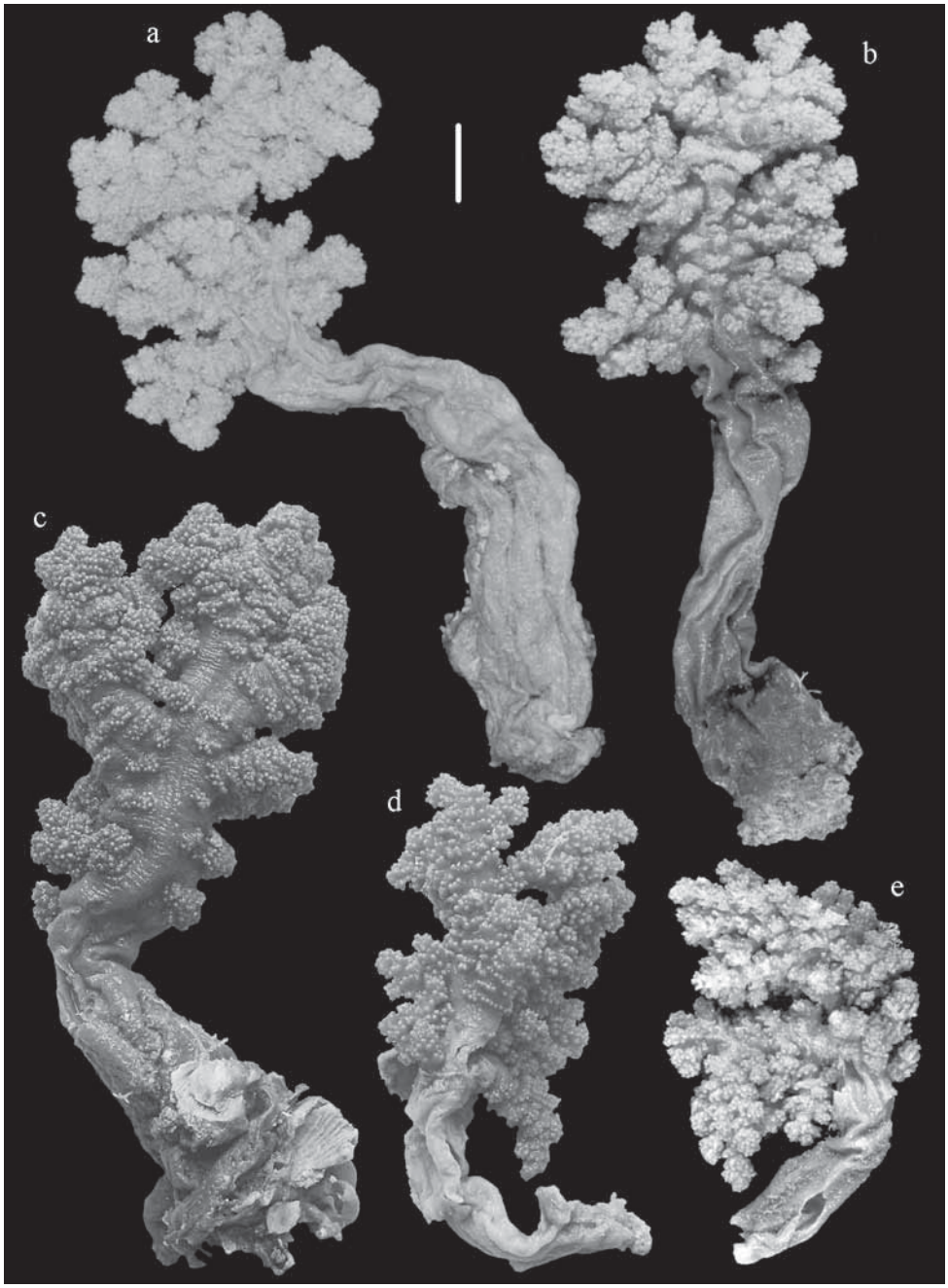


Fig. 38. *Chromonephthea curvata* (Kükenthal, 1911); a, ZMB 6865 (*Stereonephthya longicaulis*); b, SMF 1287 (*Stereonephthya longicaulis*); c, SMF 80 (*Nephthya rubra*); d, SMF 82 (*Nephthya granulata*); e, SMF 1282 (*Stereonephthya curvata*). Scale 1 cm.

longicaulis Kükenthal, Aru I., Pulu Bambu, Merton leg., 3.iv.1908, Kük det. 1911; RMNH Coel. 33381, 5 ms of SMF 1287; ZMB 6865, **syntype** of *Stereonephthya longicaulis*, Aru Inseln, Merton S., Kükth det. 1909; RMNH Coel. 33382, 4 ms of ZMB 6865; SMF 80, *Nephthya rubra*, Aru I., Pulu Bambu, dredge 11, Merton leg., 3.iv.1908, Kük. det. 1911; RMNH Coel. 33383, 4 ms of SMF 80; SMF 82, *Nephthya granulata*, Aru I., Pulu Bambu, dredge 11, Merton leg., 3.iv.1908, Kük. det. 1911; RMNH Coel. 33384, 4 ms of SMF 82.

Description.— The holotype is 5.8 cm long and 3.5 cm wide (fig. 38e). Polyps are up to about 0.90 mm high and 0.70 mm wide.

Supporting bundle.— Hardly projecting, but some of the supporting bundle spindles may project for a distance of up to 0.20 mm (fig. 39a). The larger spindles with the outer side and the distal end with strong spines, and the inner side with complex tubercles (fig. 39e). These spindles are up to 1.10 mm long and up to 0.20 mm wide.

Points.— Ventrally only 4 spindles per point, laterally 6-8, and dorsally up to about 10 (fig. 39a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles all over. Laterally they are up to 0.30 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.45 mm long, with the outer side and the distal end with spines, and the inner side with complex tubercles (fig. 39b). Between the points 1-3 rods are present, up to 0.15 mm long, with scalloped edge (fig. 39d). Tentacles almost devoid of sclerites, only a few flattened rods are present at the base, up to 0.10 mm long, with scalloped edge (fig. 39c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, many unilaterally spinose, and the larger ones with complex tubercles (fig. 39f). A few spindles and several unilaterally spinose spindles are also present, up to 0.50 mm long, with simple tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.25 mm long, a few are unilaterally spinose, the larger ones with complex tubercles (fig. 40a).

Interior stalk.— Without sclerites.

Colour.— Colour of colony greyish with orange polyps, point sclerites orange, all other sclerites colourless.

Remarks.— The species described by Kükenthal (1911) as *Stereonephthya curvata* and S. *longicaulus* proved to be conspecific. *S. curvata* is selected here as the valid name (first reviser principle; ICZN article 24.2). *S. longicaulus* has a slightly different colour pattern, the ZMB specimen (fig. 38a) is whitish with colourless sclerites. The SMF specimen (fig. 38b) is reddish with yellow polyps, point sclerites yellow, stalk and supporting bundle sclerites pink, branch spindles and tentacular rods colourless. The sclerites of both specimens (figs 41-42a) are similar to those of *S. curvata.*

The specimen identified by Kükenthal (1911) as *Nephthya rubra* Kükenthal, 1910 (SMF 80) (fig. 38c) proved to belong to *Chromonephthea curvata*. It has the same coloration, reddish with yellow polyps, as the SMF specimen of *S. longicaulus* and was found at the same locality as that species. The sclerites of base of the stalk are presented for comparison (fig. 40b).

The specimen identified by Kükenthal (1911) as *Nephthya granulata* Kükenthal, 1910 (SMF 82) (fig. 38d) also proved to belong to *Chromonephthea curvata.* It was found at the same locality as *S. longicaulis* and *N. rubra.* It has a slightly different colour than the other material belonging to this species, a white stalk, reddish branches and yellow polyps. The sclerites of base of the stalk are presented for comparison (fig. 42b).

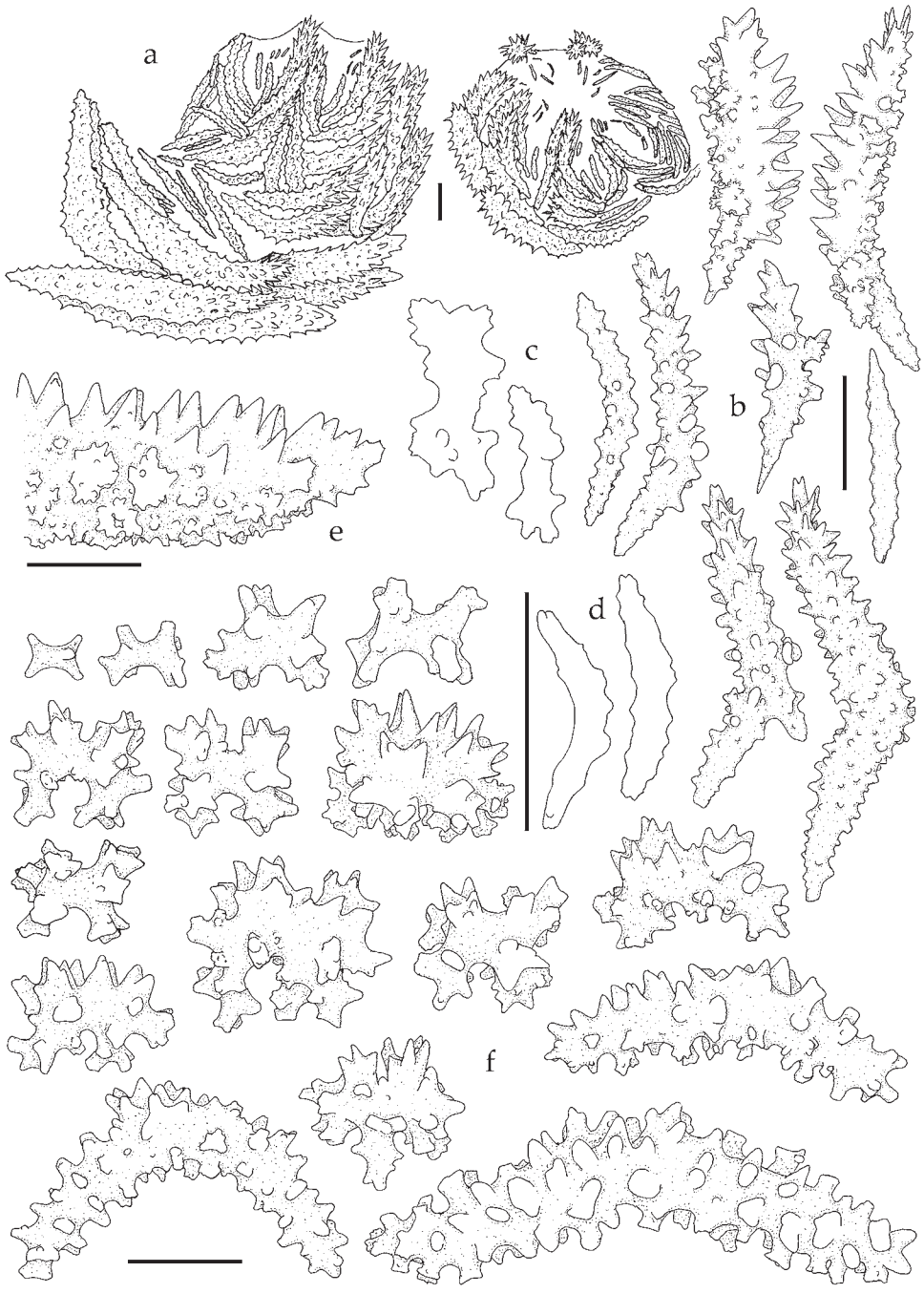


Fig. 39. *Chromonephthea curvata* (Kükenthal, 1911), holotype SMF 1282; a, lateral and top view of polyp armature; b, point spindles; c, tentacular rods; d, intermediates; e, spindle of supporting bundle (part); f, sclerites, surface layer top of stalk. Scales 0.10 mm, scale at d also applies to c.

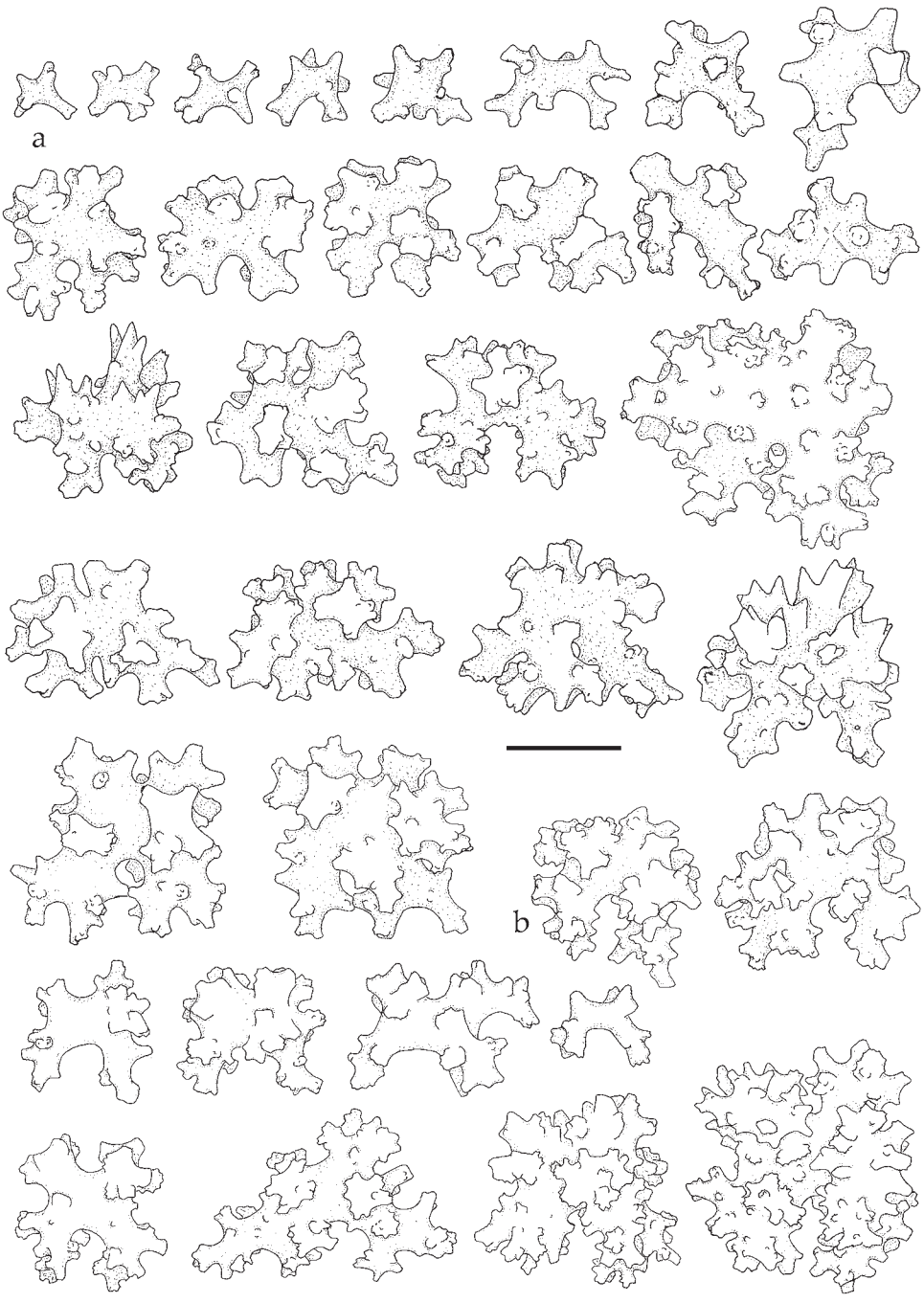


Fig. 40. *Chromonephthea curvata* (Kükenthal, 1911); a, holotype SMF 1282; b, SMF 80 (*Nephthya rubra*); sclerites surface layer base colony. Scale 0.10 mm.

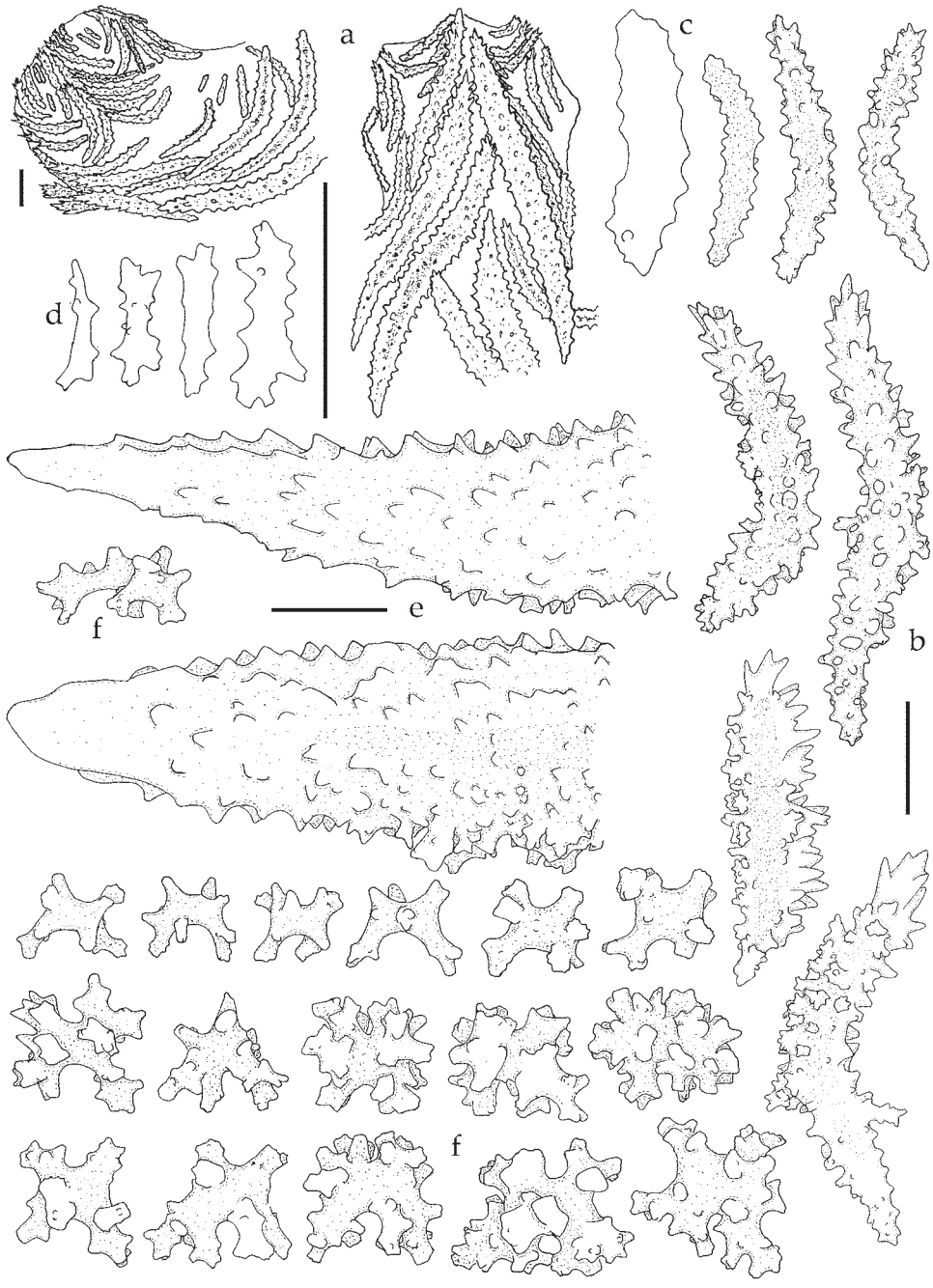


Fig. 41. *Chromonephthea curvata* (Kükenthal, 1911); SMF 1287 (*Stereonephthya longicaulis*); a, lateral and view from below of polyp armature; b, point spindles; c, intermediate; d, tentacular rods; e, spindles of supporting bundle (part); f, sclerites, surface layer top of stalk. Scales 0.10 mm, scale at d also applies to c, scale at e also applies to f.

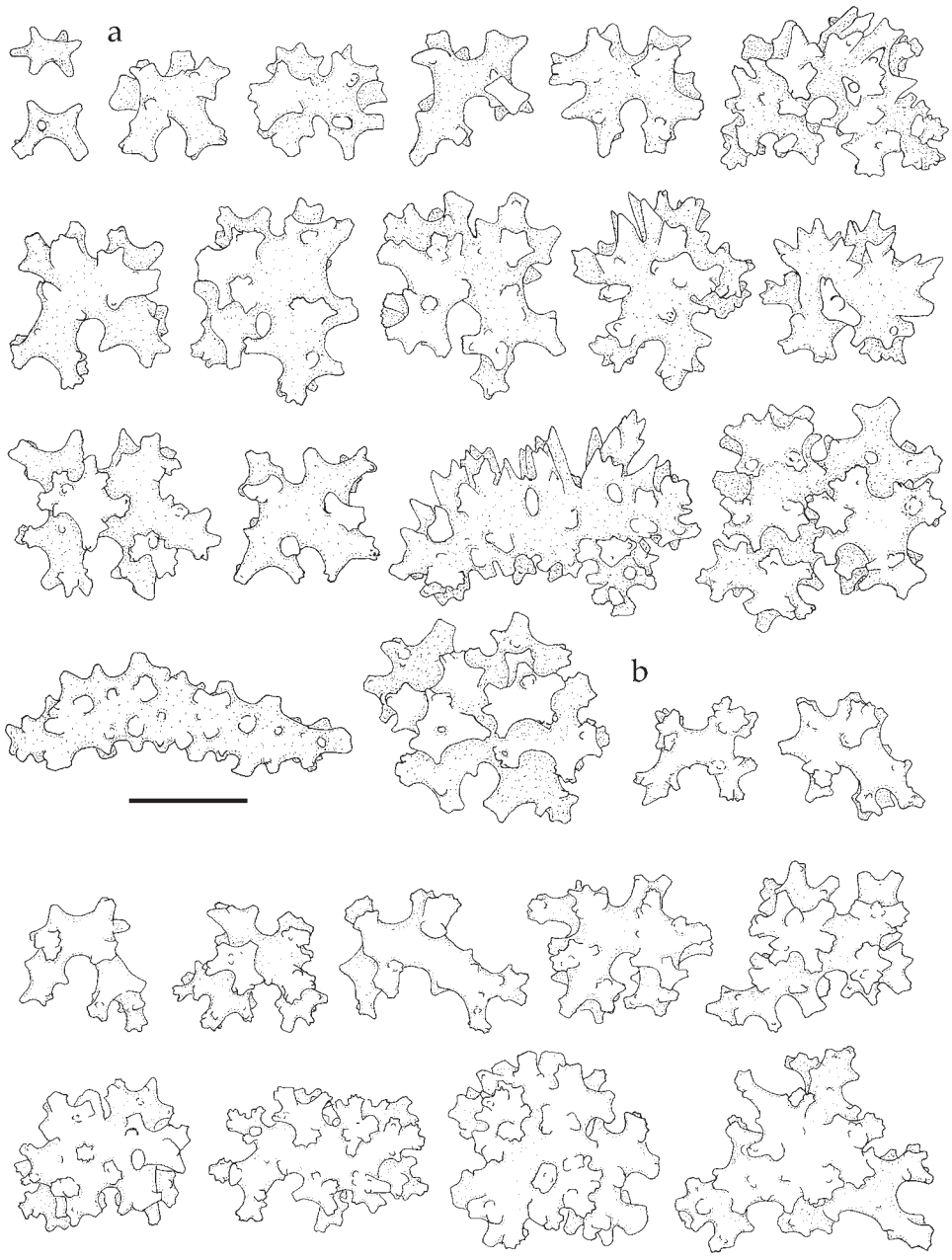


Fig. 42. *Chromonephthea curvata* (Kükenthal, 1911); a, SMF 1287 (*Stereonephthya longicaulis*); b, SMF 82 (*Nephthya granulata*); sclerites, surface layer base of stalk. Scale 0.10 mm.

The interior sclerites mentioned by Kükenthal for *S. curvata* and *S. longicaulus*, were not found by me. Maybe the sample taken was too small to include them as Kükenthal already mentioned they were scarce. However, extra sampling of *N. rubra* and *N. granulata* also did not show any interior sclerites. For the moment I conclude that *C. curvata* lacks internal stalk sclerites.

It is noteworthy that Kükenthal (1911) identified / described *C. curvata* as four different species in two different genera, while also failing to recognize that his *Stereonephthya pellucida* was actually a mixture of two different species here assigned to *Chromonephthea*; i.e., *C. pellucida* and *C. grasshoffi* spec. nov.

Chromonephthea curvata resembles *C. braziliensis* (see the remarks of the latter species).

Four other species were found around the Aru islands, *C. intermedia* (Thomson & Dean, 1931), *C. grasshoffi* spec. nov., *C. pellucida* (Kükenthal, 1911) and *C. sierra* (Thomson & Dean, 1931). *C. intermedia* and *C. pellucida* differ in having internal stalk spindles. *C. grasshoffi* has peculiar stalk radiates with slender rays, and *C. sierra* has much longer point sclerites (up to 0.65 mm long).

Chromonephthea dampierensis (Verseveldt, 1977) (figs 43-48, 158, 160)

Nephthea dampierensis Verseveldt, 1977: 212, figs 28-29, 46d (WA).
Stereonephthya armata; Verseveldt, 1977: 214, figs 30-31 (WA).
Not *Stereonephthya armata* Kükenthal, 1910: 58, figs 30-31, pl. 4 fig. 26 (WA, Shark Bay).

Material examined.— RMNH Coel. 11792, **holotype** and 7 ms, WA, Dampier Archipelago, Kendrew I., 10 m, under ledge, 19.ix.1972, coll. N. Coleman; RMNH Coel. 11809, *Stereonephthya armata*, 1 specimen and 7 ms, same data as holotype of *C. dampierensis*; NTM C11304, 1 specimen, WA, outer reef slope of Cartier Is., 12°31.40'S; 123°33.30'E, sta. no. JH.92.010, 12-23 m, SCUBA, 7.v.1992, coll. J. Hooper; NTM C11306, 1 specimen, same data as 11304; RMNH Coel. 32704, 4 ms of NTM C11306; NTM C13266, 1 specimen, WA, Exmouth Gulf, North Muiron Island, North eastern coast, 21º37.93'S 114º23.59' E, 6-11 m, 23.viii.1995, coll. S. Morrison; RMNH Coel. 32705, 3 ms of NTM C13266; NTM C13446, same data as NTM C13266; RMNH Coel. 32706, 4 ms of NTM C13446.

Description.— The holotype is about 3.5 cm long and 2 cm wide, the base of the stalk is missing (fig. 43a). Polyps are up to about 0.85 mm wide and 0.70 mm high.

Supporting bundle.— Can project beyond the polyp head for a distance of up to 0.65 mm (fig. 44a); larger spindles have complex tubercles and the projecting part spiny (fig. 45a). Length of these spindles is up to about 2.25 mm.

Points.— Ventrally 6 spindles per point, laterally 6-8, dorsally 10-12 (fig. 44a). Point sclerites ventrally up to 0.20 mm long, with simple tubercles, laterally up to 0.45 mm long, with simple tuber-

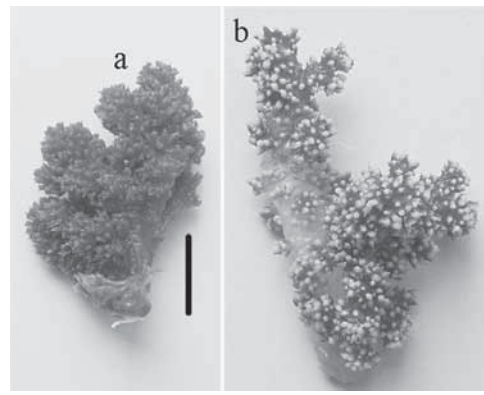


Fig. 43. *Chromonephthea dampierensis* (Verseveldt, 1977); a, holotype RMNH Coel. 11792; b, RMNH Coel. 11809 (*Stereonephthya armata*). Scale 1 cm.

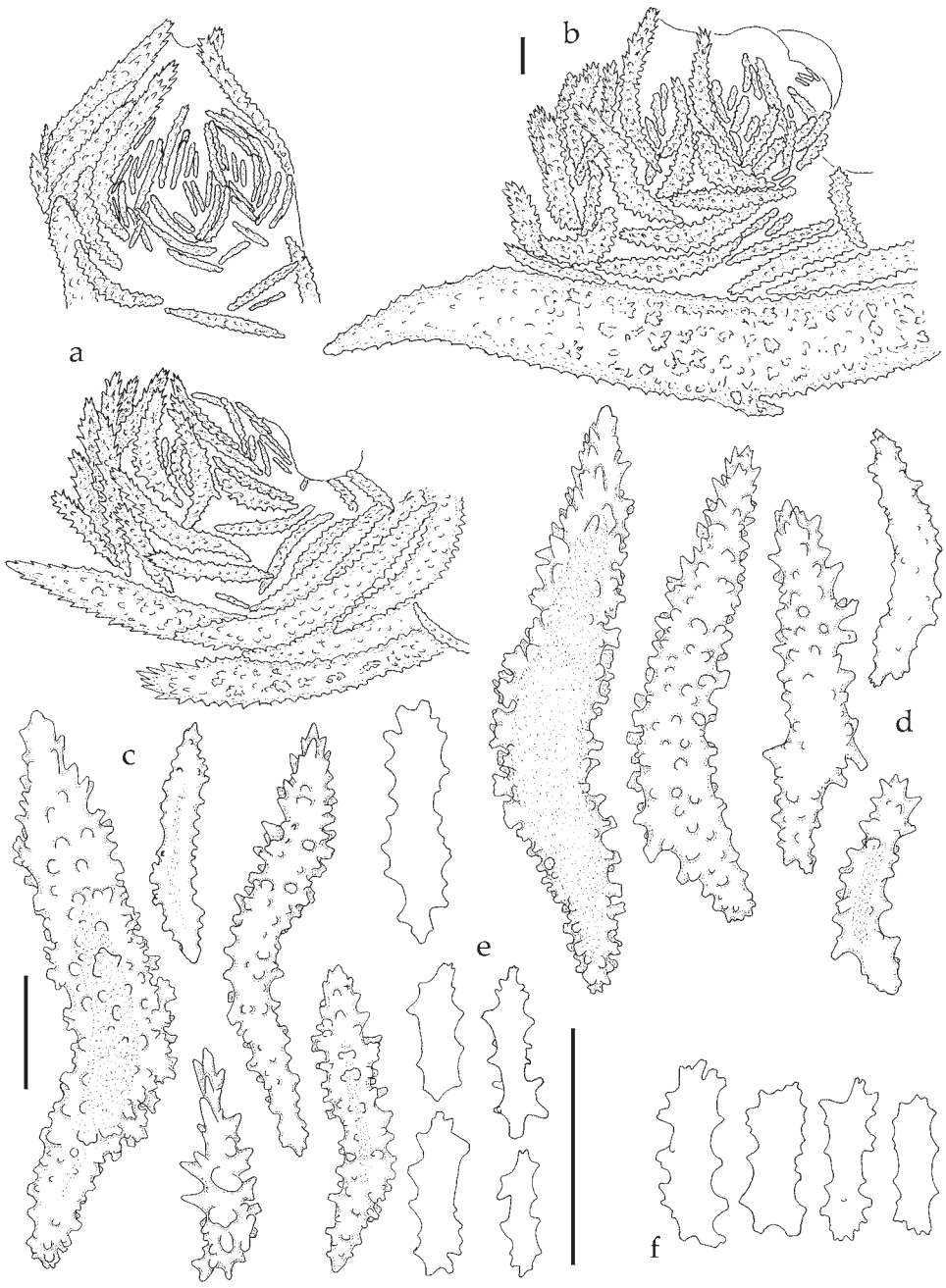


Fig. 44. *Chromonephthea dampierensis* (Verseveldt, 1977); a, ventral and lateral view of polyp armature of holotype; b, lateral view of polyp armature of RMNH Coel. 11809 (*Stereonephthya armata*); c, point spindles of holotype; d, point spindles of RMNH Coel. 11809; e, tentacular rods of holotype; f, tentacular rods of RMNH Coel. 11809. Scales 0.10 mm, that at b also applies to a, that at c also applies to d, that at e also applies to f.

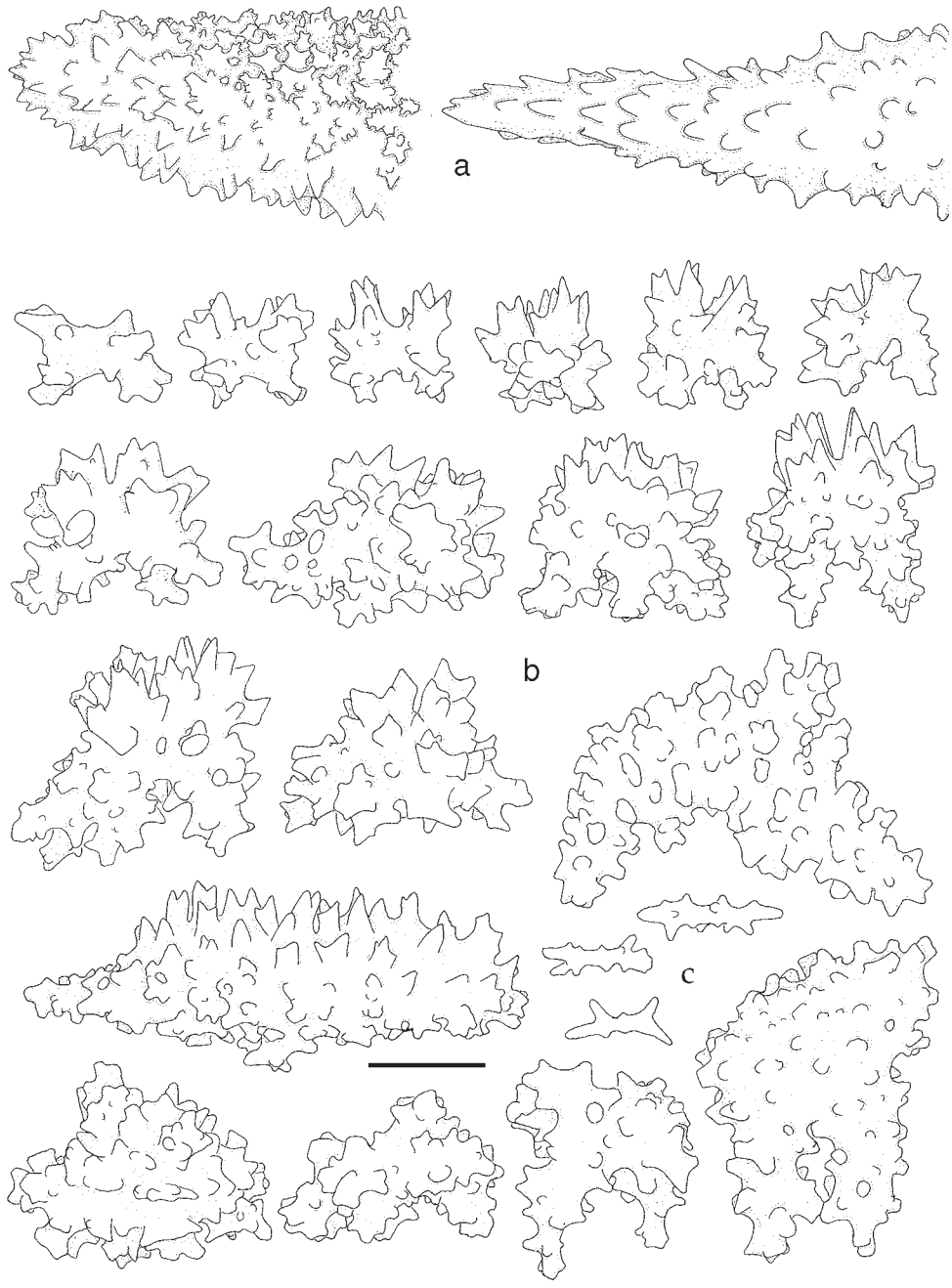


Fig. 45. *Chromonephthea dampierensis* (Verseveldt, 1977); RMNH Coel. 11792, holotype; a, spindles of supporting bundle (part); b, sclerites, surface layer base colony; c, three rods, interior base of colony. Scale 0.10 mm.

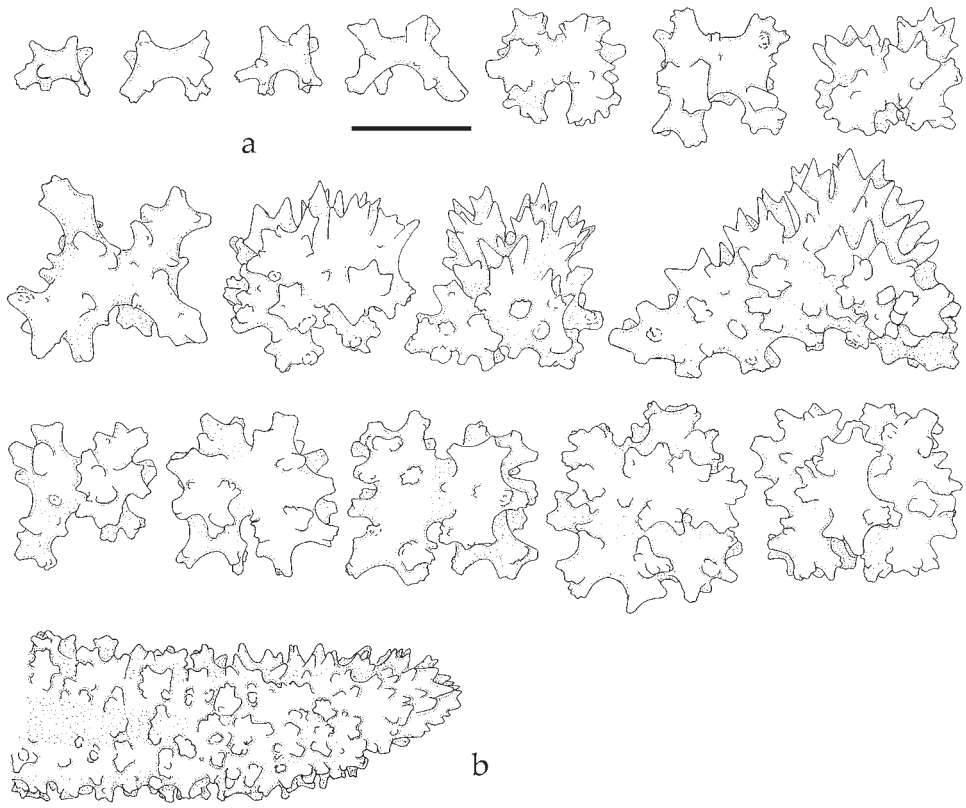


Fig. 46. *Chromonephthea dampierensis* (Verseveldt, 1977); RMNH Coel. 11809 (*Stereonephthya armata*); a, sclerites, surface layer base of colony; b, spindle of supporting bundle (part). Scale 0.10 mm.

cles and a spiny distal end. Dorsally they are up to 0.60 mm long, with complex tubercles and distal spiny end (fig. 44c). Between the points often a few intermediate sclerites are present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 44e).

Surface layer top of stalk (NTM C13446).— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with complex tubercles; many radiates unilaterally spinose (fig. 47e). Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.35 mm long.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.25 mm long (fig. 45b). Many are unilaterally spinose and most have complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.45 mm long, with complex tubercles.

Surface layer base of stalk (NTM C13446, NTM C11306).— Radiates and derivatives of these, up to 0.30 mm long, the larger ones with complex tubercles, forming irregular oval bodies; a few radiates unilaterally spinose (fig. 47f-48). Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.30 mm long.

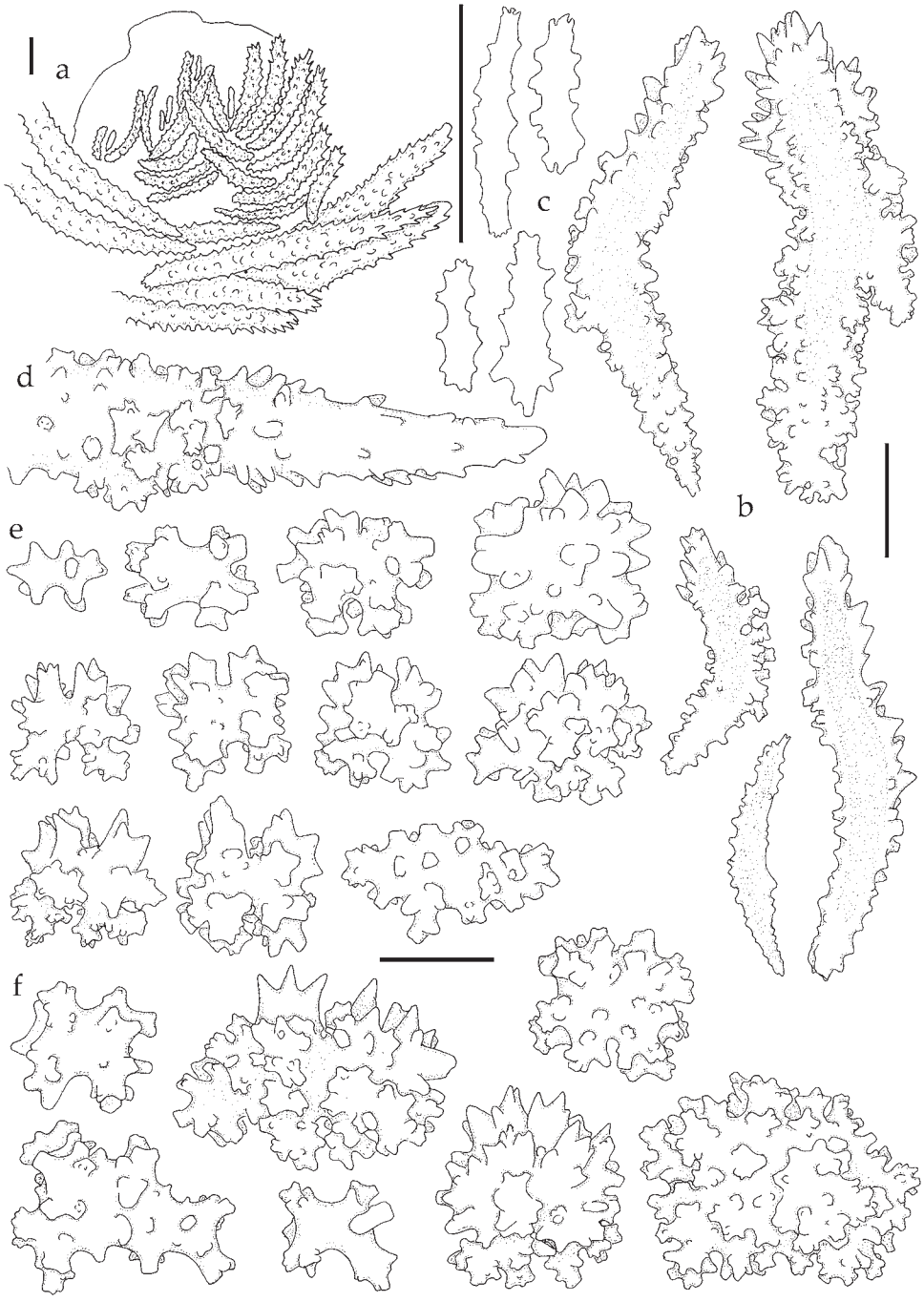


Fig. 47. *Chromonephthea dampierensis* (Verseveldt, 1977); NTM C13446; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f, sclerites, surface layer base of stalk. Scales 0.10 mm, scale above f also applies to d-e.

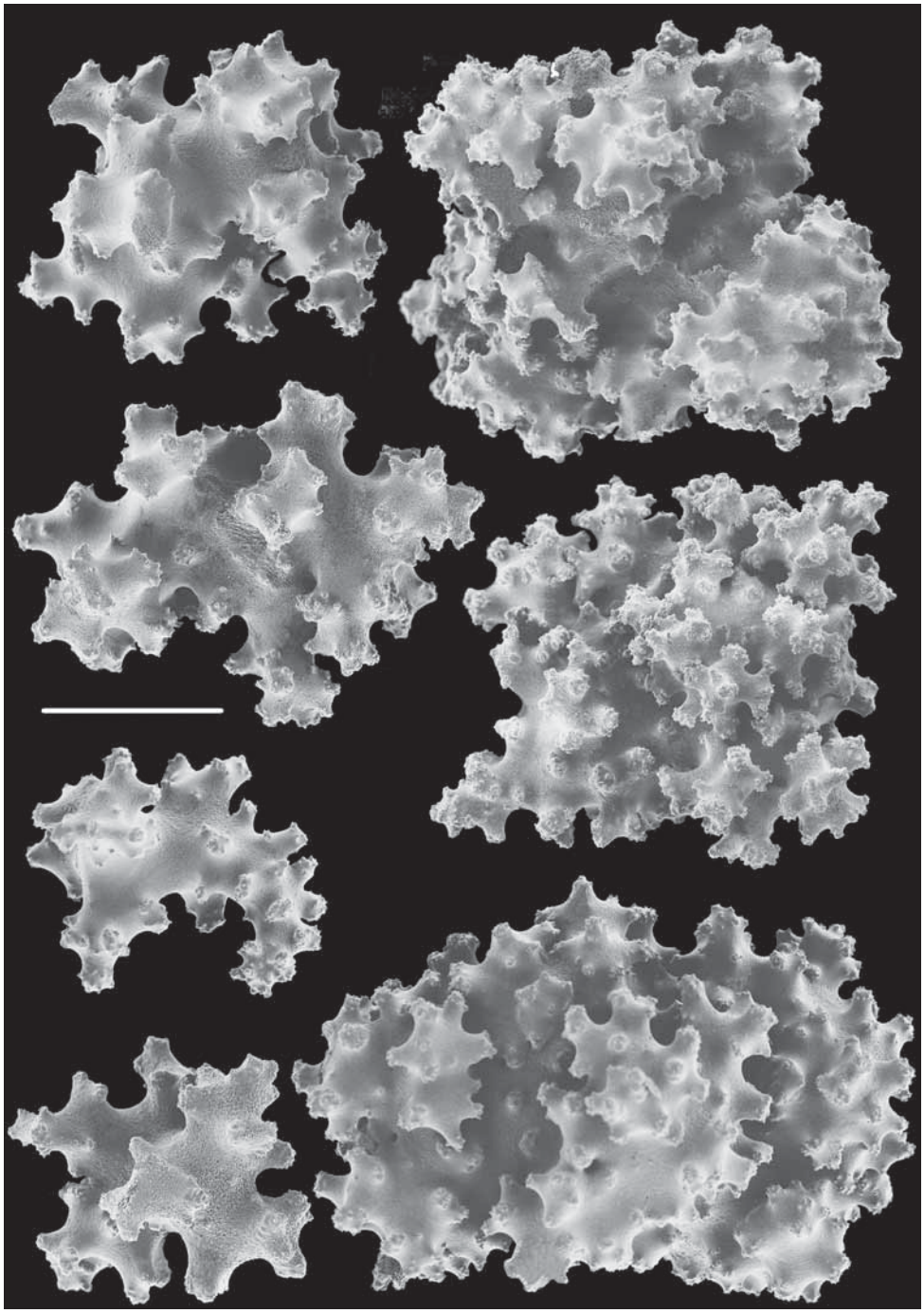


Fig. 48. *Chromonephthea dampierensis* (Verseveldt, 1977); NTM C11306, sclerites of surface layer base of stalk. Scale 0.10 mm.

Interior stalk.— Rods, 0.10-0.18 mm long, with simple tubercles (fig. 45c).

Colour.— Colony dark purple. Sclerites of stalk, supporting bundle, lateral and dorsal points pink. Ventral point spindles and intermediates opaque; tentacle rods colourless.

Remarks.— According to Verseveldt (1977) the holotype was deposited in the Australian museum (AM G14713), for reasons unknown to me it is still present in the RMNH.

Verseveldt (1977: 212) mentioned longitudinally arranged point sclerites with a length of 0.85 mm. According to me these sclerites are just some smaller supporting bundle sclerites. He also mentioned rods in the interior of the stalk. Indeed some were present in Verseveldt's microscopic slides of the type (see fig. 45c), but they were not found in the recent material and I assume they are simply artefacts or only present higher up in the stalk as Verseveldt's material clearly lacked the base of the stalk.

In the same paper Verseveldt briefly described an incomplete specimen from the same locality as *C. dampierensis* and identified it as *Stereonephthya armata* Kükenthal, 1910. It differs from *C. dampierensis* in colour and sclerites of the base of the colony. The base of the fragment is pink, stalk and stems are white, end branches red, and polyps yellow. The stalk has a mixture of colourless and pink sclerites. Supporting bundle spindles are orange, several with a yellow projecting part. Dorsal and lateral point sclerites yellow, intermediates and ventral point sclerites opaque. Tentacle rods are colourless. The sclerites of the base of the colony (fig. 46a) are less unilaterally spinose, probably because a larger part of the stalk is present in this specimen. I consider the differences between the two specimens too small to treat them as different species.

Here too, like with the holotype, it was mentioned by Verseveldt that the specimen was deposited in the Australian museum (AM G14718) but the specimen is present in the RMNH (fig. 43b).

Verseveldt wrongly depicted the specimen identified as *Stereonephthya armata* instead of the holotype of his *Nephthea dampierensis*. In his black and white figure (1977: fig. 46d) it is obvious that the stalk, the end branches and the polyps all have different colours, as mentioned for *S. armata*. Apparently this mixture of specimens was followed by an adjustment of sizes in the manuscript, Verseveldt's *S. armata* is 4.5 cm long, not 2.8 cm as suggested by the scale in his fig. 46d. That particular figure is different from the one presented here (fig. 43b). The latter is photographed from another angle and after Verseveldt's photograph was taken some branches were probably removed.

NTM C11304, C11306, C13266 and C13446 are referable to *C. dampierensis*. These colonies differ from the type in being dark red with yellow polyps; the stalk sclerites are all mostly red, and in NTM C 11306 a few pink and orange sclerites were found as well.

Characteristic for *C. dampierensis* are the big radiates with complex tubercles found in the stalk. *C. megasclera* spec. nov. also has this type of sclerites, but in that species they are even larger, and the polyps have fewer point spindles, which are more spiny.

Chromonephthea egmondi spec. nov.
(figs 49-51, 156, 166b)

Material examined.— RMNH Coel. 32635, **holotype** and 4 ms, MAL.13, Indonesia, Ambon, W coast near Larike, 03º45'S 127º56'E, gradually sloping sublittoral, large boulders and calcareous rock, large variety of corals and octocorals, light sand cover increasing downwards, diving, depth 1-26 m; 15.xi.1996, Fauna Malesiana Maluku Expedition, 1996; RMNH Coel. 32636, 2 **paratypes** and 1 ms, same data as holotype.

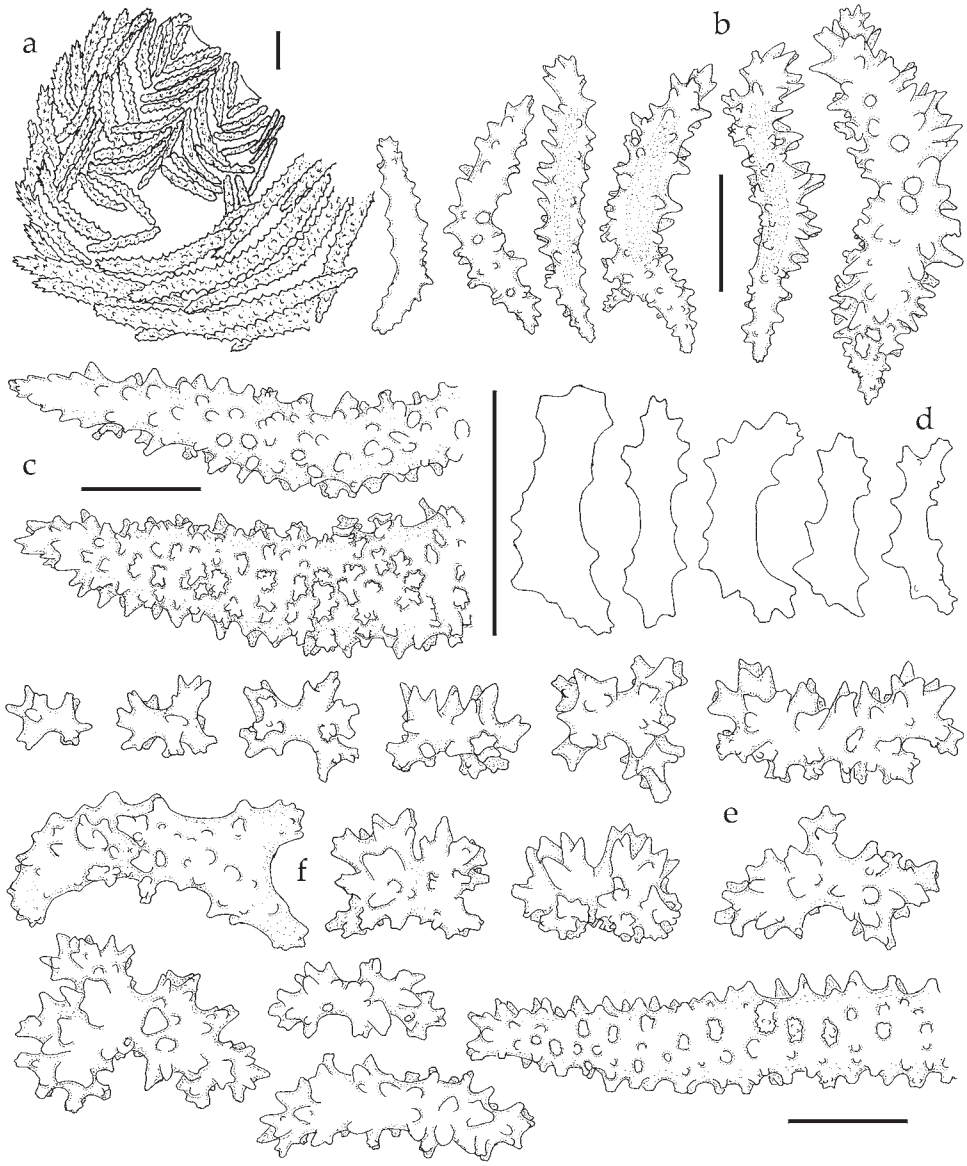


Fig. 49. *Chromonephthea egmondi* spec. nov.; holotype RMNH Coel. 32635; a, lateral view of polyp armature; b, point spindles; c, spindles of supporting bundle (part); d, tentacular rods; e, sclerites, surface layer top of stalk; f, spindle, interior top of stalk. Scales 0.10 mm.

Description.— The holotype is 3 cm long and 4.5 cm wide (fig. 166b). Polyps are up to about 0.60 mm wide and 0.90 mm high.

Supporting bundle.— Hardly projecting (fig. 49a); larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 49c). Length of these spindles is up to about 1.00 mm.

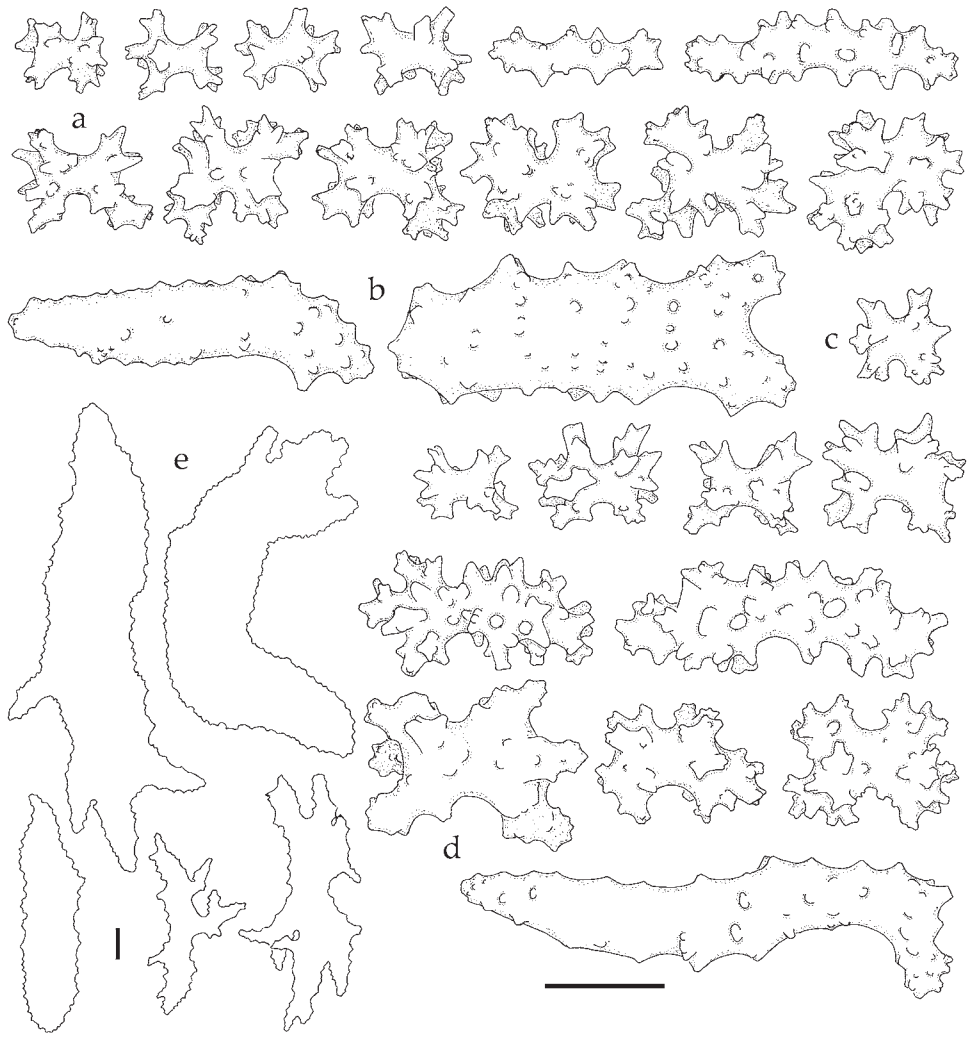


Fig. 50. *Chromonephthea egmondi* spec. nov.; a-b, holotype RMNH Coel. 32635; c-e, paratype RMNH Coel. 32636; a, c, sclerites, surface layer base of stalk; b, d-e, spindles, interior base of stalk, e, outlines only. Scales 0.10 mm, scale at d also applies to a-c.

Points.— Ventrally up to 8 spindles per point, laterally 10-14, dorsally up to 16 (fig. 49a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.40 mm long, with simple and complex tubercles and spiny outer side and distal end (fig. 49b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 49d).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, with simple tubercles (fig. 49e). Many radiates are unilaterally spinose. Furthermore,

some spindles and unilaterally spinose spindles are also present, up to 0.70 mm long, with simple tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long, all with simple tubercles, a few unilaterally spinose (figs 50a, 50c, 51a). Furthermore, a few spindles are also present, up to 0.50 mm long, with simple tubercles.

Interior stalk.— Spindles with simple sparse tubercles, many of the spindles with side branches (figs 49f, 50b, d-e). These spindles are up to 2.00 mm long.

Colour.— Colony dark red with yellow polyps. Point spindles are yellow, supporting bundle spindles reddish, often with one yellow end, stalk surface and interior sclerites are pink and colourless, and tentacle rods colourless.

Etymology.— Named after Mr Koos van Egmond, NNM technician, and participant of the NNM "Zeeteam" expeditions.

Remarks.— The paratypes are similar to the holotype. The species is characterized by the interior spindles with side branches. *C. minor* spec. nov. also has this type of internal spindles, but it has supporting bundle spindles with only simple tubercles.

Chromonephthea eos (Kükenthal, 1905)

Nephthya eos Kükenthal, 1905: 718, pl. 32 fig. 60 (W Taiwan).

Material examined.— None. Only fragments remained of the **holotype** NHMW C2372 (pers. comm. Bernard Riegl, NHMW), which were not re-examined.

Description (after Kükenthal, 1905).— Colony 3.4 cm long and 1.5 cm wide, stalk 1.8 cm high. Polyps are 0.70 mm high and 0.70 mm wide.

Supporting bundle.— Composed of spindles projecting slightly beyond the polyp head. They are up to 2.00 mm long, heavily spiny.

Polyps.— Ventral 8-10 spindles per point, 0.15 mm long. Lateral and dorsal 14-16 spindles per point, up to 0.40 mm long. Tentacles have few rods.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.12 mm long. Furthermore, a few spindles are also present, less than 0.70 mm long.

Interior stalk.— Without sclerites.

Colour.— White with red supporting bundle sclerites and orange to yellow point sclerites.

Remarks.— Till recently collected material from the type locality is available I consider it premature to examine the remaining holotype fragments.

Chromonephthea exosis spec. nov.
(figs 51b-53, 158, 160, 167a)

Material examined.— WAM Z27500, **holotype**, WA, Exmouth Gulf, Simpson Island, 22º07.15'S 114º29.39'E, 0-3 m, coll. S. Morrison, 27.viii.1995; RMNH Coel. 33216, 4 ms of holotype.

Description.— The holotype is 4.5 cm long and 2.5 cm wide (fig. 167a). Polyps are up to about 1.20 mm wide and high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 52a); larger spindles have complex tubercles and the projecting part spiny (fig. 52c). Length of these spindles is up to about 1.50 mm.

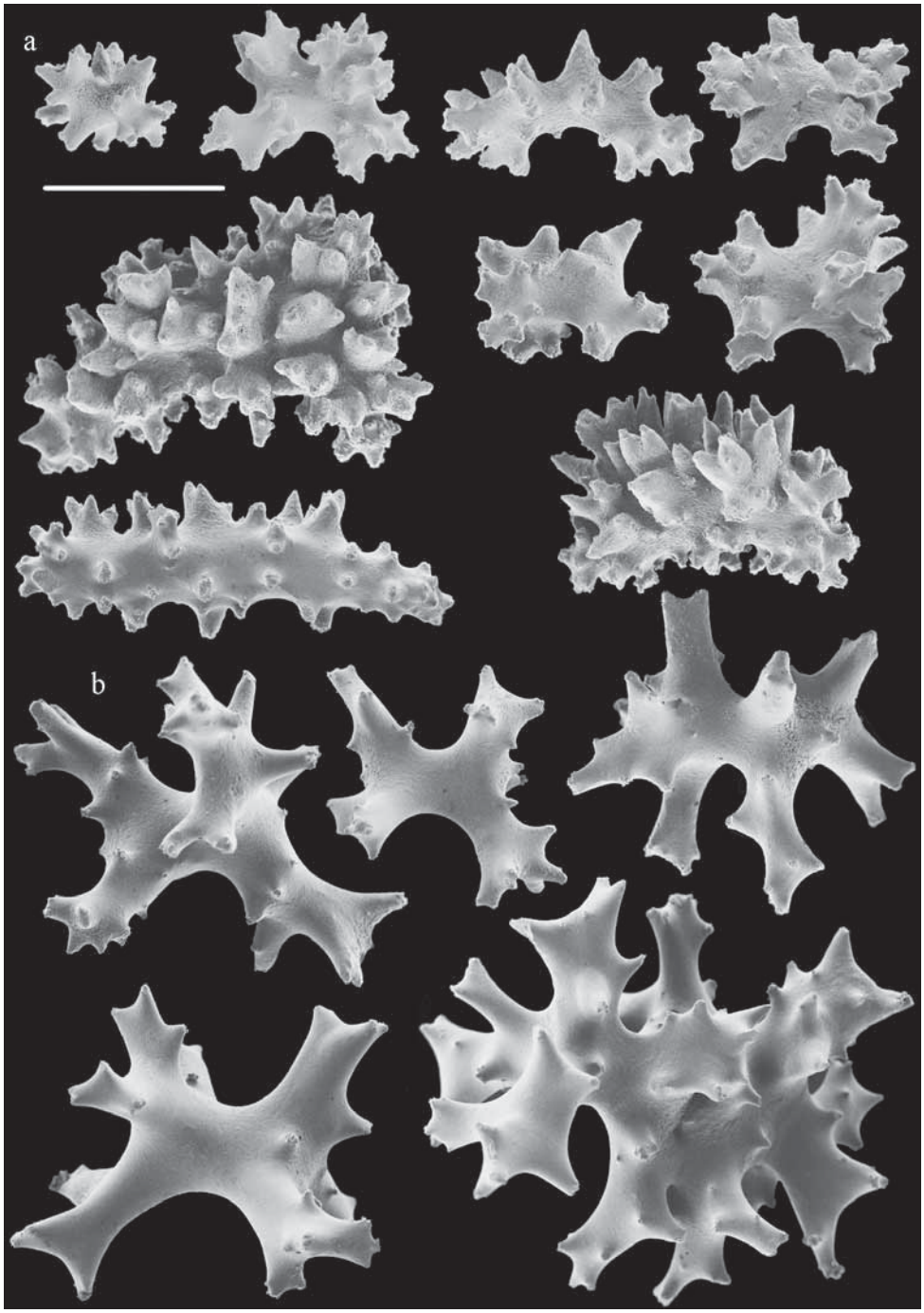


Fig. 51. Sclerites, surface layer base of stalk; a, *Chromonephthea egmondi* spec. nov., holotype RMNH Coel. 32635; b, *Chromonephthea exosis* spec. nov; holotype WAM Z27500.

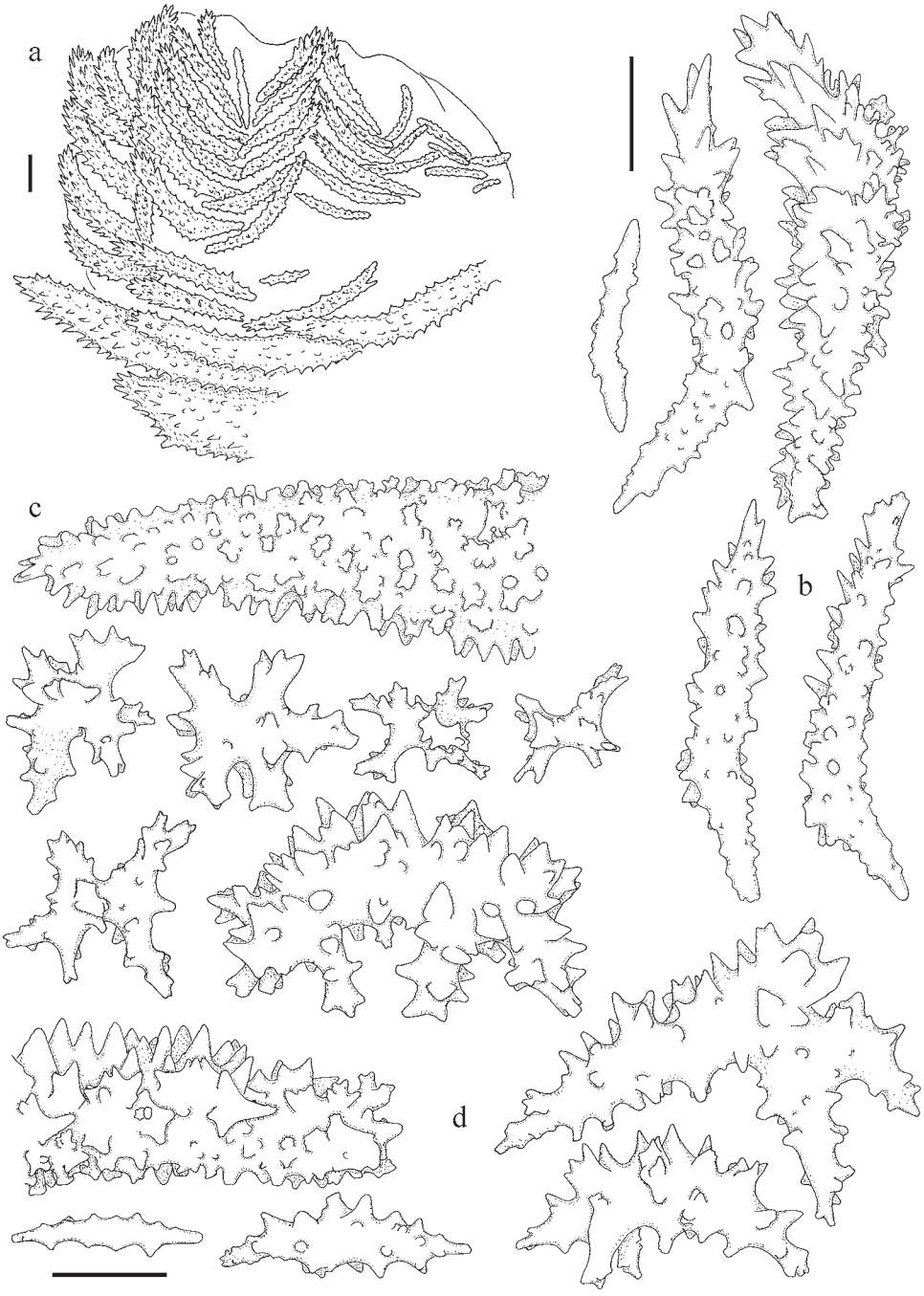


Fig. 52. *Chromonephthea exosis* spec. nov; WAM Z27500; a, lateral view of polyp armature; b, point spindles; c, spindle of supporting bundle (part); d, sclerites, surface layer top of stalk. Scales 0.10 mm, that at d also applies to c.

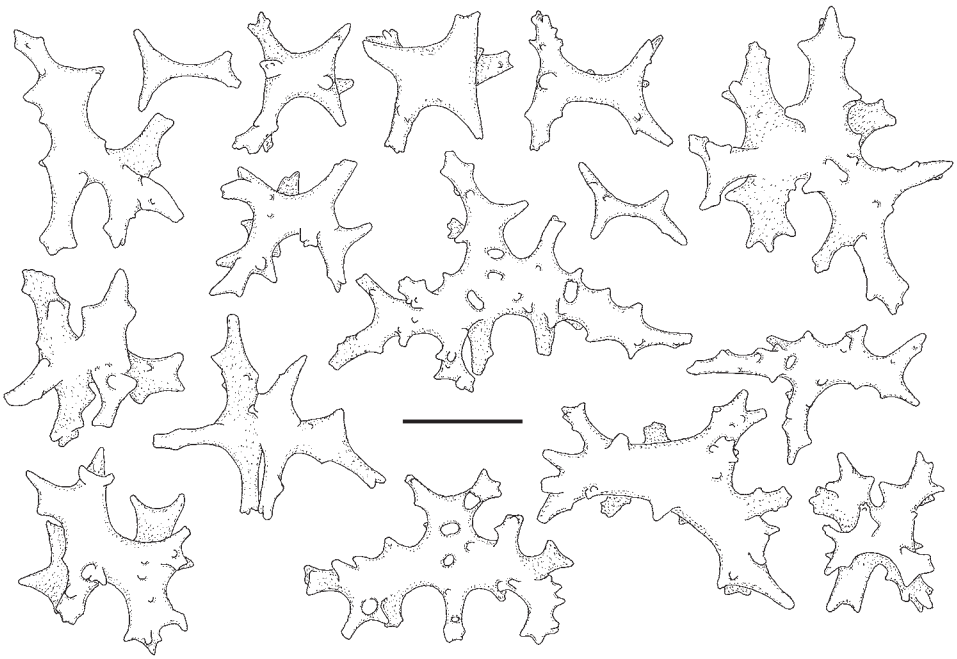


Fig. 53. *Chromonephthea exosis* spec. nov.; WAM Z27500; sclerites, surface layer base of stalk. Scale 0.10 mm.

Points.— Ventrally 6-8 spindles per point, laterally about 12, dorsally up to 14 (fig. 52a). The smallest spindles are present ventrally, up to 0.30 mm long, with simple tubercles. Laterally they are up to 0.40 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.50 mm long, with complex tubercles and spiny outer side and distal end (fig. 52b). Between the points a few to four intermediate sclerites are often present. Tentacles lacking sclerites.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, with simple tubercles (fig. 52d). Furthermore, many spindles and unilaterally spinose spindles are also present, mostly with simple tubercles, and often with side branches. They are up to about 0.85 mm long.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.30 mm long, with simple tubercles. The larger radiates becoming multi-radiate bodies (figs 51b, 53).

Interior stalk.— Without sclerites.

Colour.— Colony yellow with red polyps. Point spindles purple, base of stalk with colourless sclerites, all others yellow.

Etymology.— The Latin “exosis”, without bones, refers to the tentacles lacking sclerites.

Remarks.— This is one of the two *Chromonephthea* species without tentacle rods, the other is *C. bundegiensis* (Verseveldt, 1977), also found in the Exmouth Gulf, and with similar base stalk radiates. But *C. bundegiensis* also lacks ventral point spindles.

It is noteworthy that *C. exosis* spec. nov. has exactly the same colour pattern as the CAS 171933 paratype of *C. muironensis* spec. nov., both species from the Exmouth Gulf,

though from different islands. *C. muironensis* differs in having tentacles rods, and clearly different stalk radiates.

Chromonephthea formosana (Kükenthal, 1903)
(figs 54-56, 155)

Nephthya formosana Kükenthal, 1903: 162, pl. 7 fig. 10, pl. 9 figs 51-52 (W Taiwan).

Material examined.— NHMW C2367, the **holotype**, wrongly labelled as *Nephthya brassica;* RMNH Coel. 33385, 6 ms of holotype.

Description.— The holotype is 6 cm long and 4 cm wide (fig. 54). Polyps are up to about 0.90 high and 0.70 mm wide.

Supporting bundle.— Projecting up to 0.25 mm (fig. 55a); larger spindles have complex tubercles on the inner side and spines on the outer side, and a spiny projecting end (fig. 55d). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally and laterally about 4 spindles per point, dorsally the number could not be counted because of the rather distorted arrangement and the smaller supporting bundle spindles obscuring a view of the dorsal points (fig. 55a). The smallest spindles are present ventrally, up to 0.25 mm long, with simple tubercles. Laterally they are up to 0.35 mm long, with simple tubercles, small side branches, and a spiny distal end. Dorsally they are up to 0.60 mm long, with simple and complex tubercles, side branches, and spiny outer side and distal end (fig. 55b). Directly below the points the spindles of the supporting bundle are smaller, several having spines in the middle part, but a kind of collaret was not visible. Intermediate sclerites were not present. Tentacles have flattened rods, up to 0.20 mm long, with scalloped edge (fig. 55c).

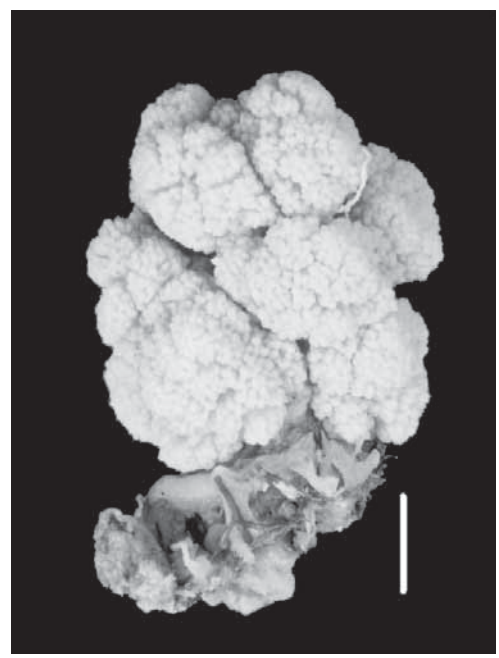


Fig. 54. *Chromonephthea formosana* (Kükenthal, 1903), holotype NHMW C2367. Scale 1 cm

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.25 mm long, many unilaterally spinose, the larger ones with complex tubercles (fig. 56a).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long, all with simple tubercles (fig. 56b).

Interior stalk.— Without sclerites.

Colour.— Colony white, all sclerites colourless.

Remarks.— Apparently labels have been mixed up in Vienna; NHMW C2373, labelled *Nephthya formosana*, clearly is *N. brassica* as depicted by Kükenthal (1903: pl. 7 fig. 11). Specimens of both *N. formosana* and *N. brassica* are not registered

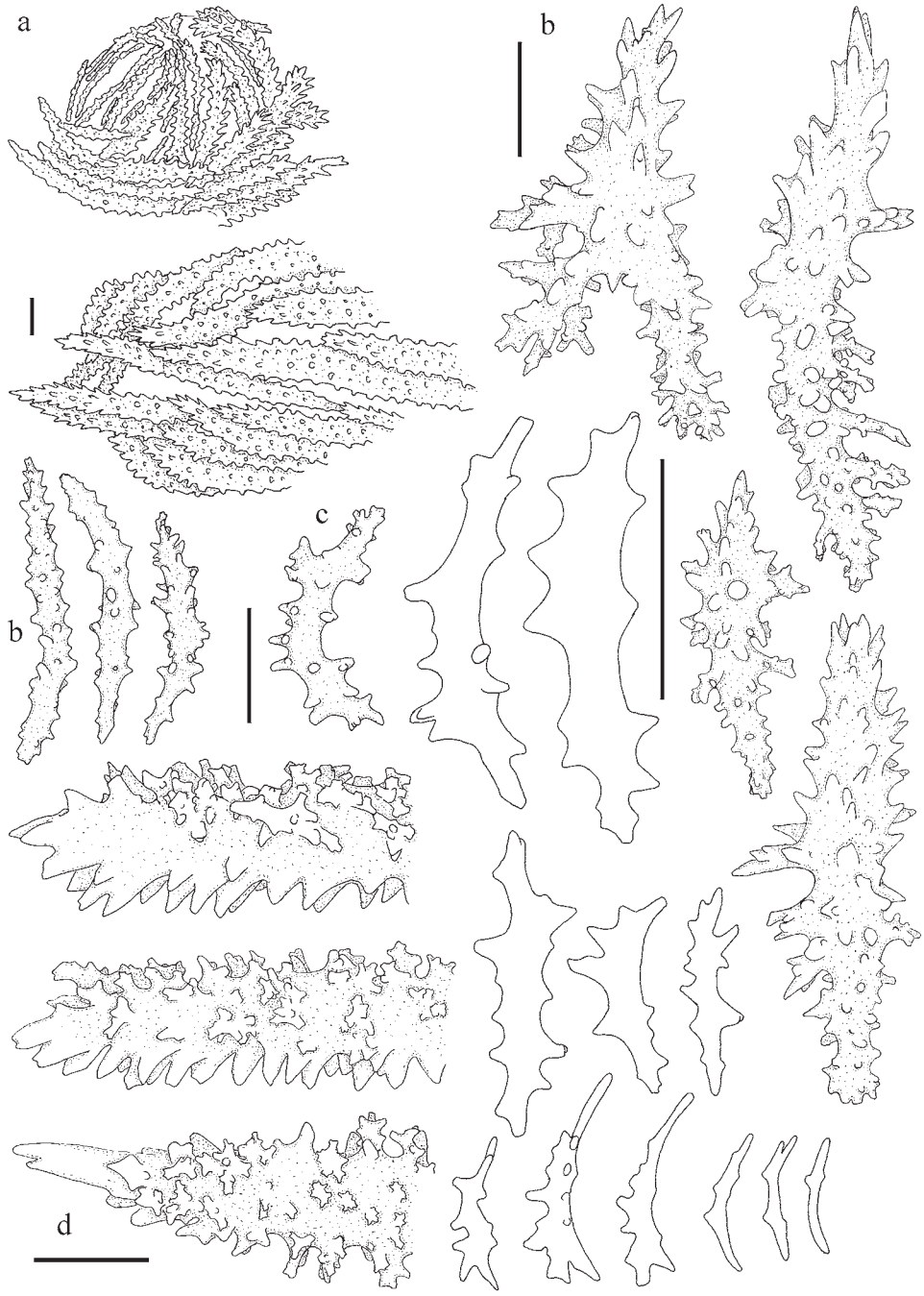


Fig. 55. *Chromonephthea formosana* (Kükenthal, 1903), holotype NHMW C2367; a, lateral view of polyp armature (top) and supporting bundle; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part). Scales 0.10 mm.

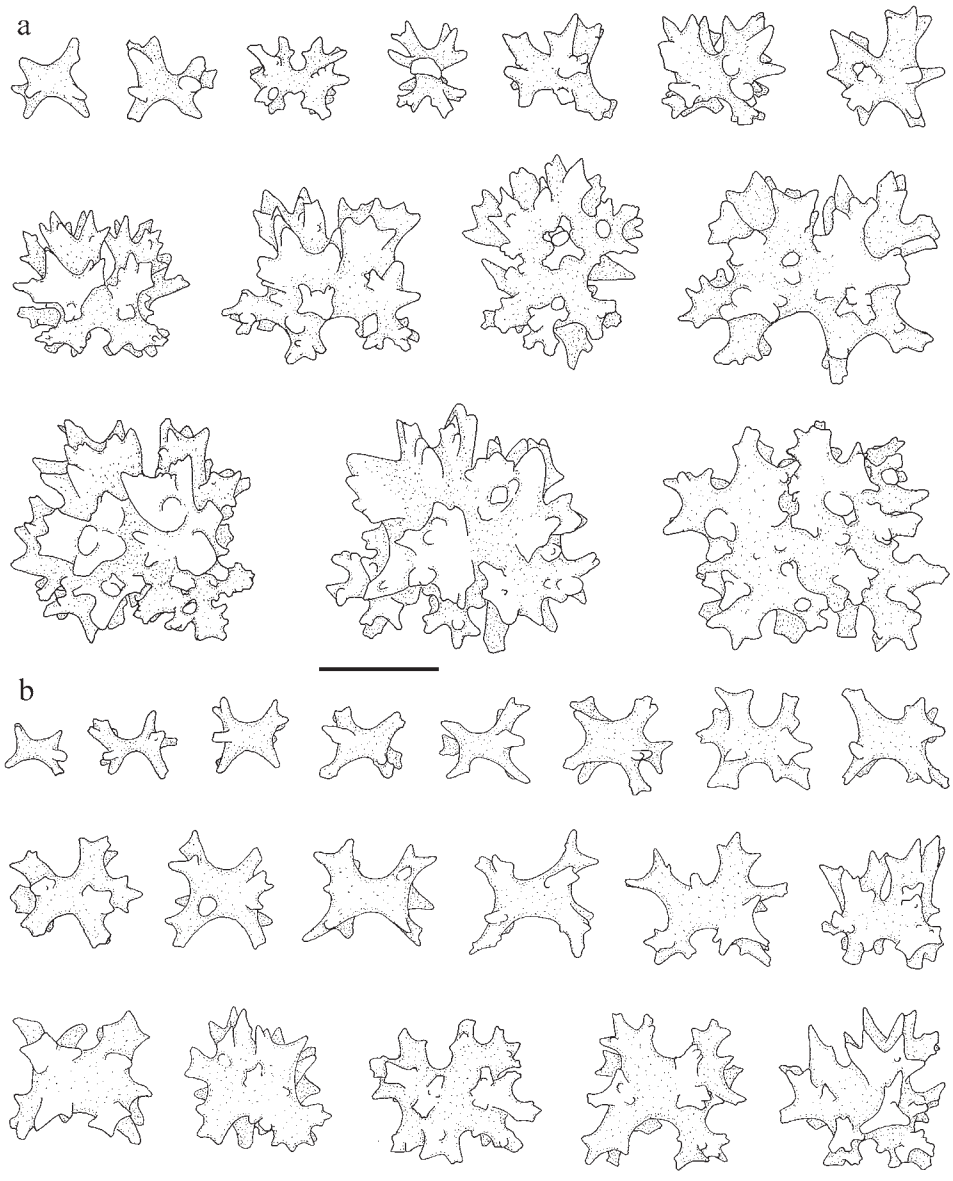


Fig. 56. *Chromonephthea formosana* (Kükenthal, 1903), holotype NHMW C2367; a, sclerites, surface layer top of stalk; b, sclerites, surface layer base of stalk. Scale 0.10 mm.

as type material, but surely are the types Kükenthal mentioned to be present in Vienna.

The species differs from other *Chromonephthea* species by having the larger point sclerites with many small side branches, combined with the total lack of spindles in the stalk.

Chromonephthea franseni spec. nov.
(figs 57-58a, 156, 167b)

Material examined.— RMNH Coel. 32050, **holotype** and 4 ms, SUL.06, Indonesia, N Sulawesi, Selat Lembeh, Pulau Lembeh, Pantai Parigi, 01°28'N 125°14'E, small fringing reef up to 20 m wide, gently sloping from beach to 10 m, deeper slope sandy to muddy to 20 m; diving & snorkeling; 15/26.x.1994.

Description.— The holotype is 28 cm long and 15 cm wide, and is part of a larger colony (fig. 167b). Polyps are up to about 0.70 mm wide and 1.00 mm high.

Supporting bundle.— Hardly projecting (fig. 57a); larger spindles have the outer side and projecting part spiny and the inner side with complex tubercles (fig. 57d). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally 4-6 spindles per point, laterally 12-14, dorsally 16 (fig. 57a). The smallest spindles are present ventrally, up to 0.10 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, dorsally up to 0.35 mm long, with simple tubercles and a spiny dorsal side and distal end (fig. 57b). Between the points a few intermediate sclerites are often present (fig. 57e). Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 57c); the largest arranged longitudinally, some smaller ones on top transverse.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 57f). Many are unilaterally spinose and most have simple tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple tubercles.

Surface layer base of stalk.— Exclusively radiates and derivatives of these, up to 0.20 mm long, with simple and complex tubercles (figs 57g, 58a), the larger ones becoming oval to squarish bodies. Only few are unilaterally spinose.

Interior stalk.— Spindles, up to 1.85 long, with rather dense simple tubercles and often some short side branches (fig. 57h).

Colour.— Colony with white stalk and stem, branches dark red, and polyps yellow. Tentacle sclerites colourless, point sclerites yellow, supporting bundle and branch sclerites orange, stalk sclerites mostly colourless, few orange.

Etymology.— Named after Dr Charles Fransen, Carcinologist at the NNM, colleague participant of NNM "Zeeteam" expeditions.

Remarks.— The sclerites of this species resemble those of *Chromonephthea pellucida* (Kükenthal, 1911), but the latter species lacks the internal spindles with side branches.

Chromonephthea frondosa spec. nov.
(figs 59-61, 158, 161, 168)

Not *Nephthya aurantiaca* Verrill, 1865: 191 (= *Chromonephthea aurantiaca*).
? *Nephthya aurantiaca*; Kükenthal, 1910: 41 (Australia, Shark Bay, Sunday Island, 5.5 m).

Material examined.— NTM C5764, **holotype**, WA, Shark Bay, SE side of Dirk Hartog Island, from the rock island, 7 m, 13.vii.1987, coll. P. Alderslade; RMNH Coel. 32707, 4 ms of holotype; **paratypes**: NTM C14640-41, 2 specimens, same data as holotype; RMNH Coel. 32708, 4 ms of one of the paratypes; WAM Z20497, 1 specimen with most of stalk missing, WA, Dirk Hartog Island, Cape Inscription, 25º29'S 112º58.5'E, station SB6, 4.v.1981, coll. L.M. Marsh, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33386, 2 ms of WAM Z20497; WAM Z20500, 1 specimen with base of stalk missing, WA, Shark Bay,

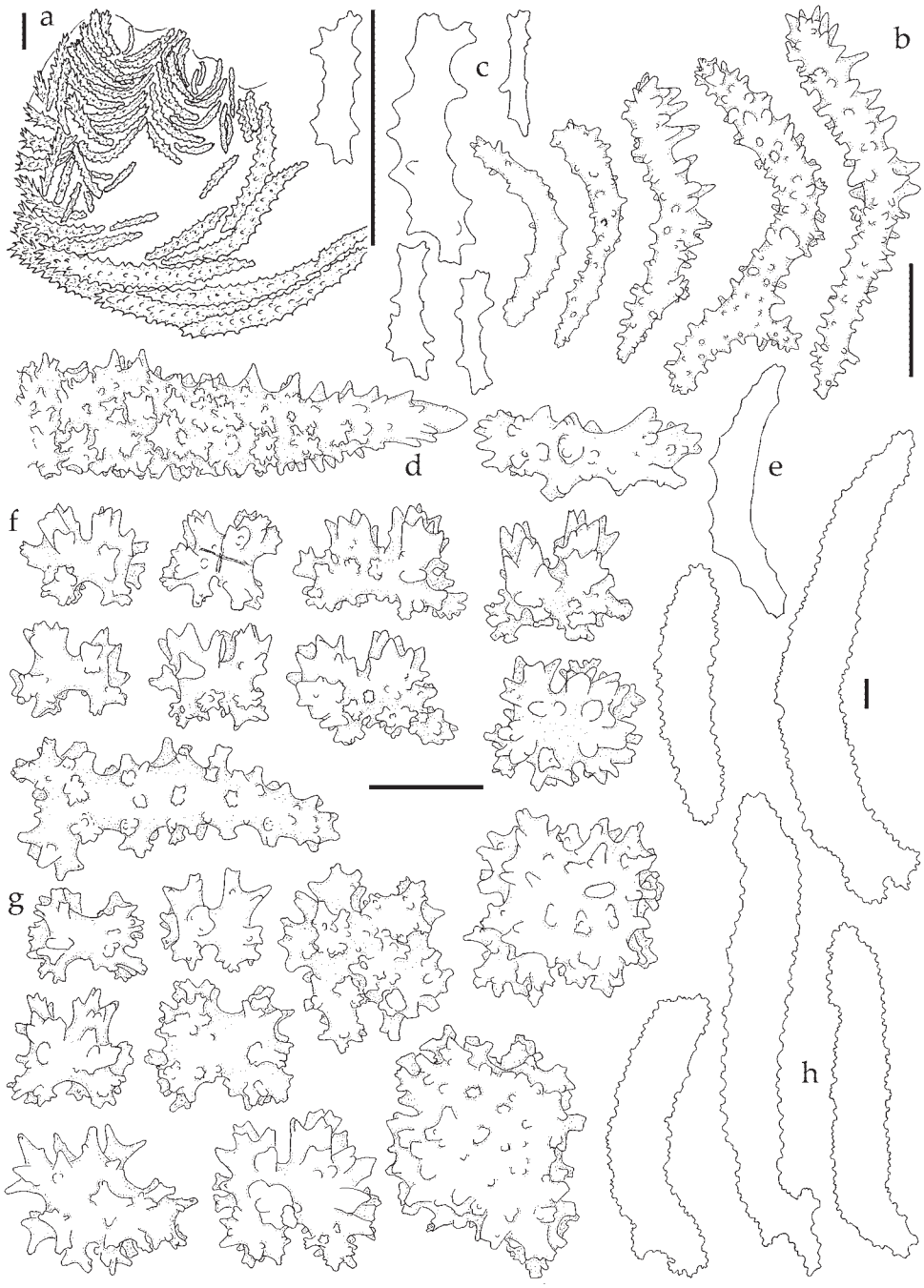


Fig. 57. *Chromonephthea franseni* spec. nov.; RMNH Coel. 32050, holotype; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, intermediate; f, sclerites, surface layer top of stalk; g, sclerites, surface layer base of stalk; h, spindles, interior of stalk, outlines only. Scales 0.10 mm, scale between f and g applies to d, f and g, scale at c also applies to e.

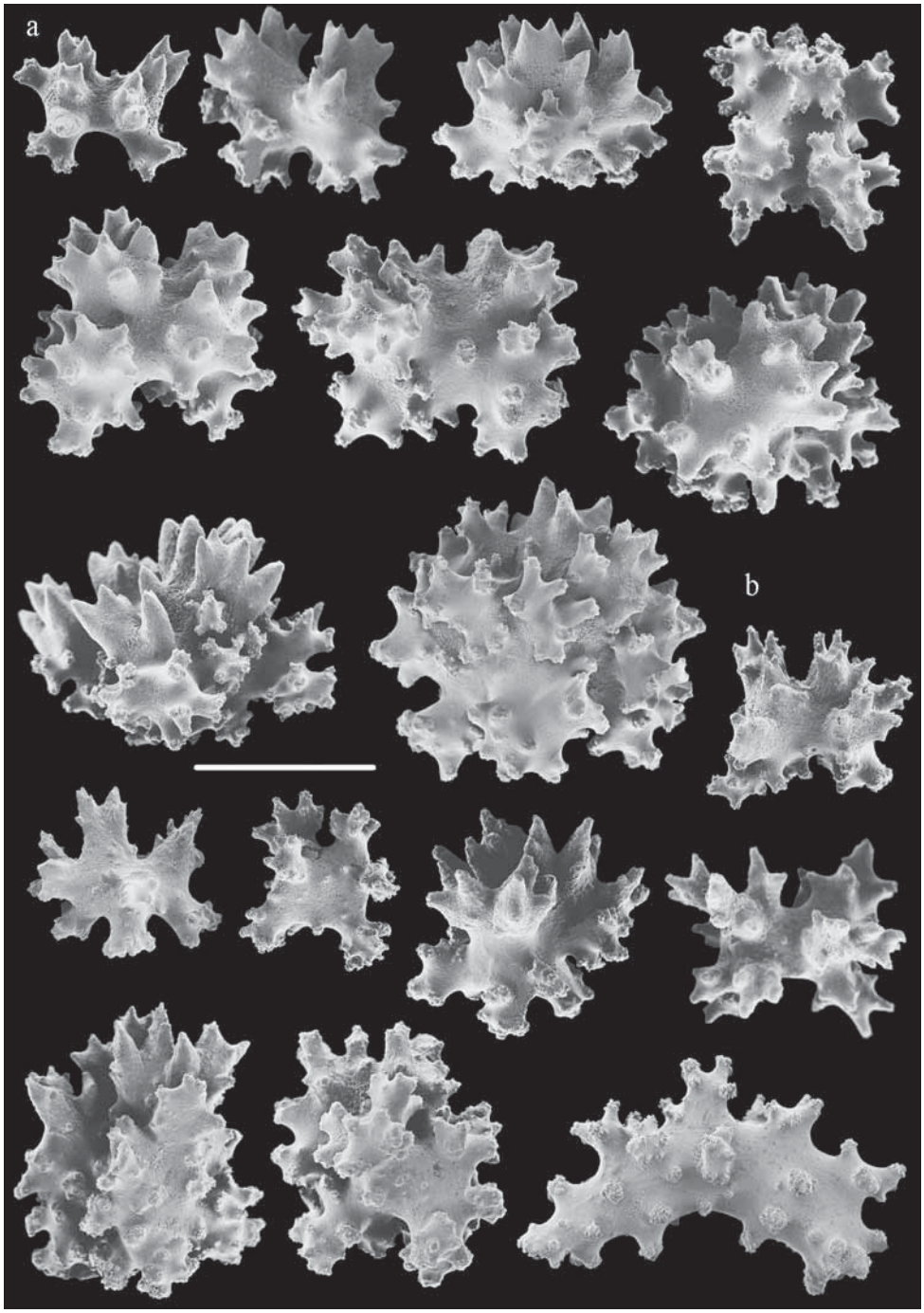


Fig. 58. Sclerites, surface layer base of stalk / colony; a, *Chromonephthea franseni* spec. nov., holotype RMNH Coel. 32050; b, *Chromonephthea fruticosa* spec. nov., holotype NTM C14839. Scale 0.10 mm.

Cape Heirrison, 25º58.5'S 113º21.5'E, station SB48, 11.v.1981, 16.5 m, coll. L.M. Marsh, S.M. Slack-Smith & C.W. Bryce, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33387, 2 ms of WAM Z20500; WAM Z20504, 1 specimen with most of stalk missing, WA, Dirk Hartog Island, 26º09'30"S 113º11'40"E, station 9, 7.iv.1979, coll. L.M. Marsh, 4.47-3.05 m, substrata: Limestone rock, sand; RMNH Coel. 33388, 2 ms of WAM Z20504; WAM Z20506, 1 specimen, same data as WAM Z20504; RMNH Coel. 33389, 3 ms of WAM Z20506.

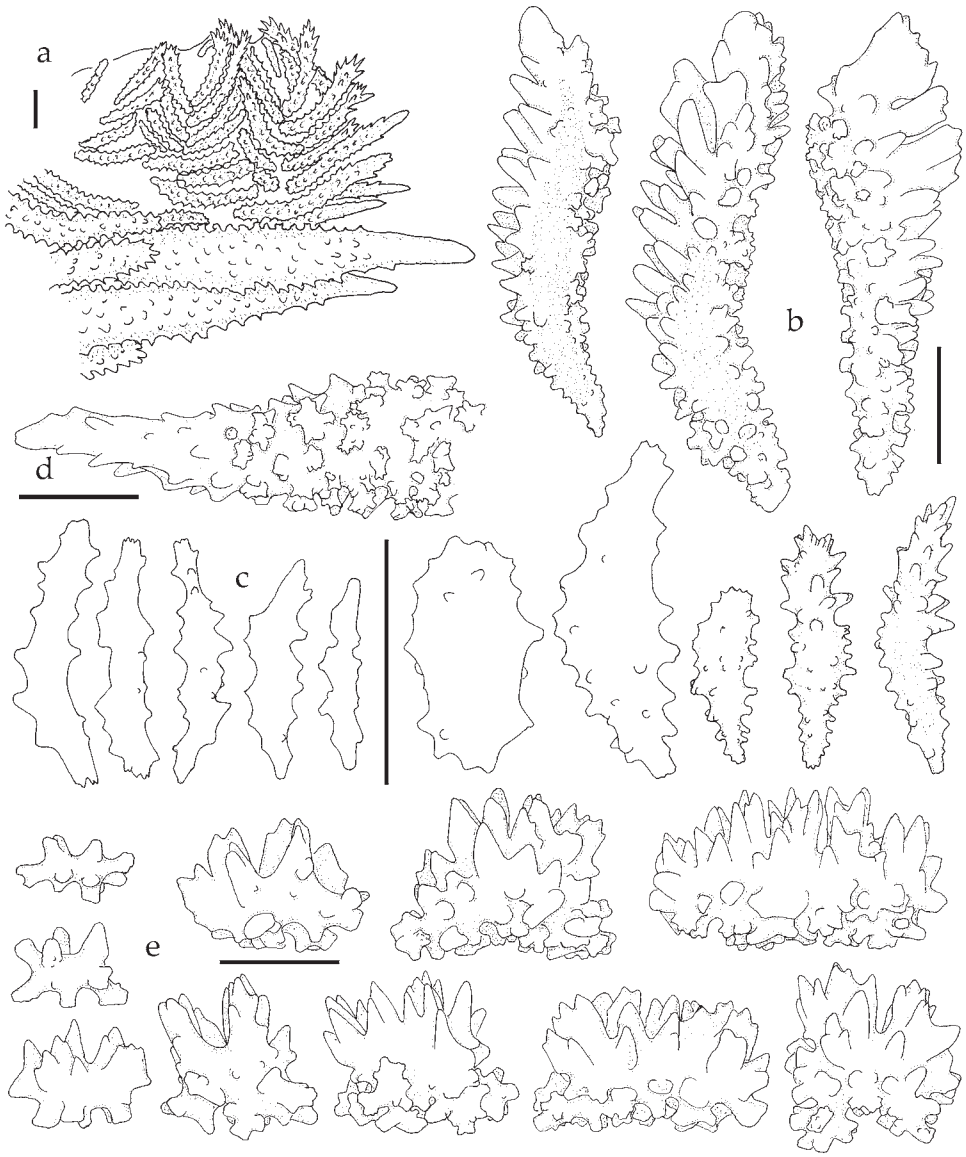


Fig. 59. *Chromonephthea frondosa* spec. nov.; holotype, NTM C5764; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm, scale at c also applies to two drawings of b.

Description.— The holotype is 14 cm long and 12 cm wide (fig. 168). Polyps are up to about 0.80 mm wide and high.

Supporting bundle.— Projecting up to 0.50 mm (fig. 59a); larger spindles have spines and complex tubercles, often a smooth terminal spine is present (fig. 59d). Length of these spindles is up to about 1.60 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8-12, dorsally up to 14 (fig. 59a). The smallest spindles are present ventrally, up to 0.20 mm long, with few simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.50 mm long, with complex tubercles and spiny outer side and distal end (fig. 59b). Often several of the dorsal spindles project slightly beyond the polyp head (fig. 59a), and they have flattened spines, becoming leaf-like. Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 59c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long (fig. 59e). Most of them are unilaterally spinose, small ones have simple tubercles and larger ones have some complex tubercles. Larger ones merge into unilaterally spinose spindles that are up to 0.40 mm long, with simple and some complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.35 mm long, larger ones with complex tubercles (figs 60-61).

Interior stalk.— Without sclerites.

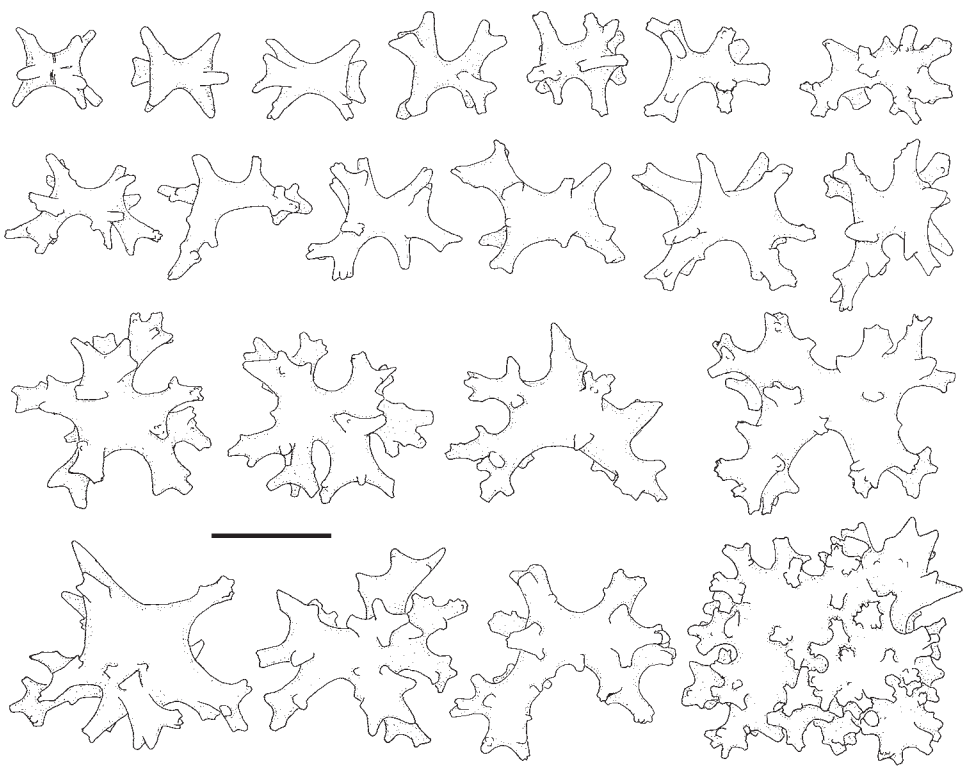


Fig. 60. *Chromonephthea frondosa* spec. nov.; holotype, NTM C5764; sclerites of base of stalk. Scale 0.10 mm.

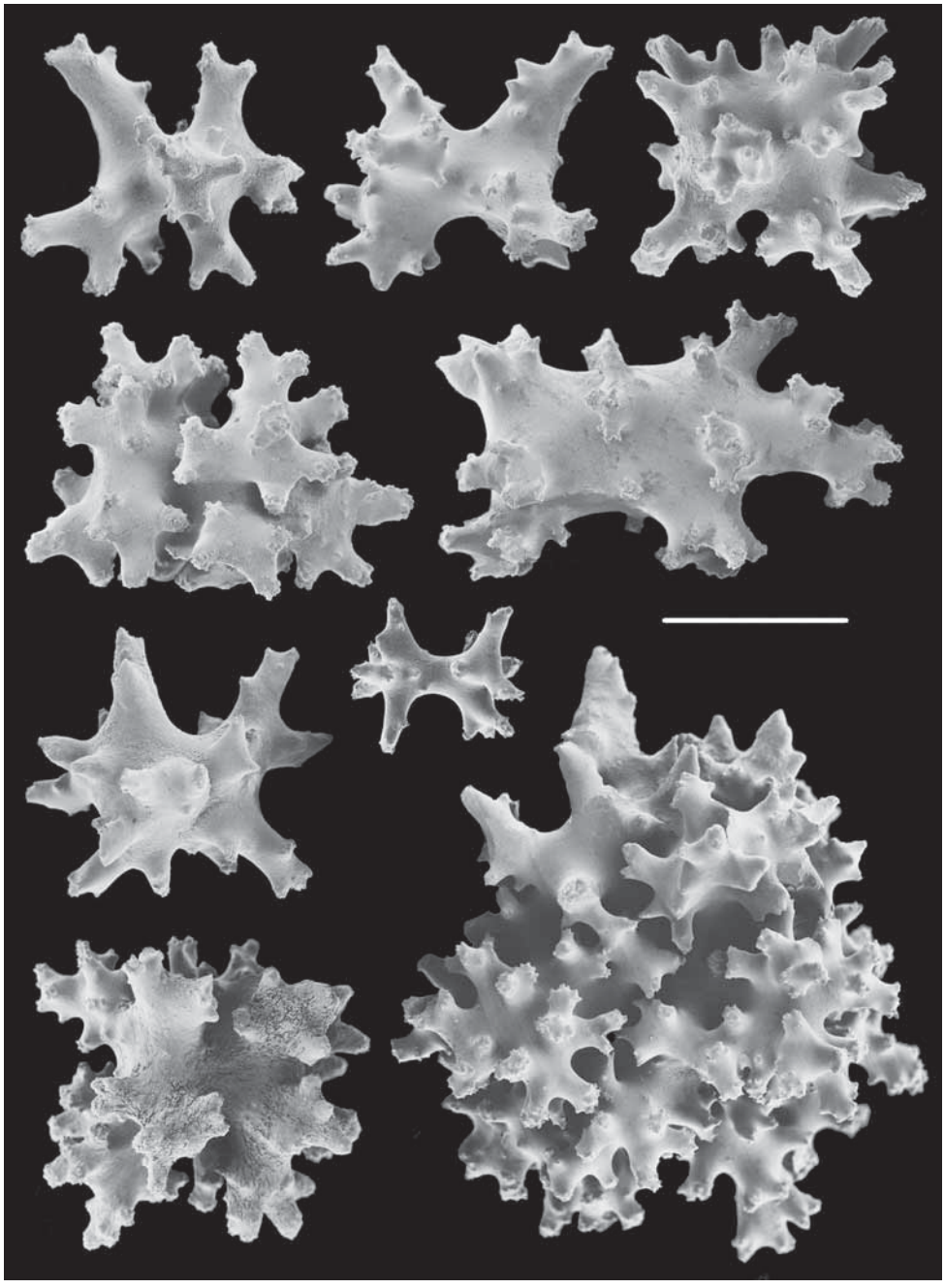


Fig. 61. *Chromonephthea frondosa* spec. nov.; holotype, NTM C5764; sclerites base of stalk. Scale 0.10 mm.

Colour.— Dark red with yellow polyps. Tentacle rods are colourless, ventral point spindles opaque, other point spindles yellow. Spindles of supporting bundle orange, often with yellow projecting part. Branches and top stalk have orange sclerites, base stalk with pink ones.

Etymology.— Latin "frondosus", leafy, refers to the leaf-like spines on the larger point spindles.

Remarks.— Characteristic for the species are the larger point sclerites with leaf-like spines, and the opaque ventral point spindles.

The paratypes NTM C14640-41 and WAM Z20506 have the same colour pattern as the holotype. WAM Z20504 is red with white polyps; sclerites pink with colourless point spindles. WAM Z20500 is white with yellow supporting bundle and red polyps; point sclerites pink, supporting bundle spindles yellow, rest colourless; WAM Z20498 is pink with yellow polyps; point and supporting bundle sclerites yellow, stalk sclerites pink.

Kükenthal (1910) identified an 8 cm tall specimen from Shark Bay (W Australia) as *Nephthya aurantiaca.* The specimen was light red with yellow polyps, a colour pattern also present in *C. frondosa*. As Kükenthal did not properly describe the sclerites re-examination of the material is needed.

Chromonephthea fruticosa spec. nov.
(figs 58b, 62-63, 158-159, 166c)

Material examined.— NTM C14839, **holotype**, Orontes Reef, Port Essington, NT, sta. no. CP 78, 19 m, 16.ix.1985, coll. R. Williams; RMNH Coel. 33217, 5 ms of holotype.

Description.— The holotype is 10 cm long and 13 cm wide. Branching starts directly above the base so hardly any stalk present (fig. 166c); the colony is photographed upside down to show this. Polyps are up to about 0.60 mm wide and 0.70 mm high.

Supporting bundle.— Projecting up to 0.40 mm (fig. 62a); larger spindles have complex tubercles on the inner side, spines on the outer side, and a spiny projecting end (fig. 62d). Length of these spindles is up to about 1.20 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-10, dorsally up to 12 (fig. 62a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles, and with a spiny distal end. Dorsally the spindles are up to 0.40 mm long, with a few complex tubercles and spiny outer side and distal end (fig. 62b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 62c).

Surface layer one cm above the common base.— Radiates and derivatives of these, up to 0.15 mm long, the larger ones with some complex tubercles (fig. 62e). Many of them are unilaterally spinose. Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.35 mm long, with simple tubercles.

Surface layer base of colony.— Radiates similar to those sampled from one cm above the base (figs 58b, 63a).

Interior stalk.— Branched and unbranched spindles with sparse, simple tubercles (fig. 63b-c), length of these spindles up to 1.60 mm.

Colour.— Colony with white base of stalk, becoming yellowish upwards, supporting

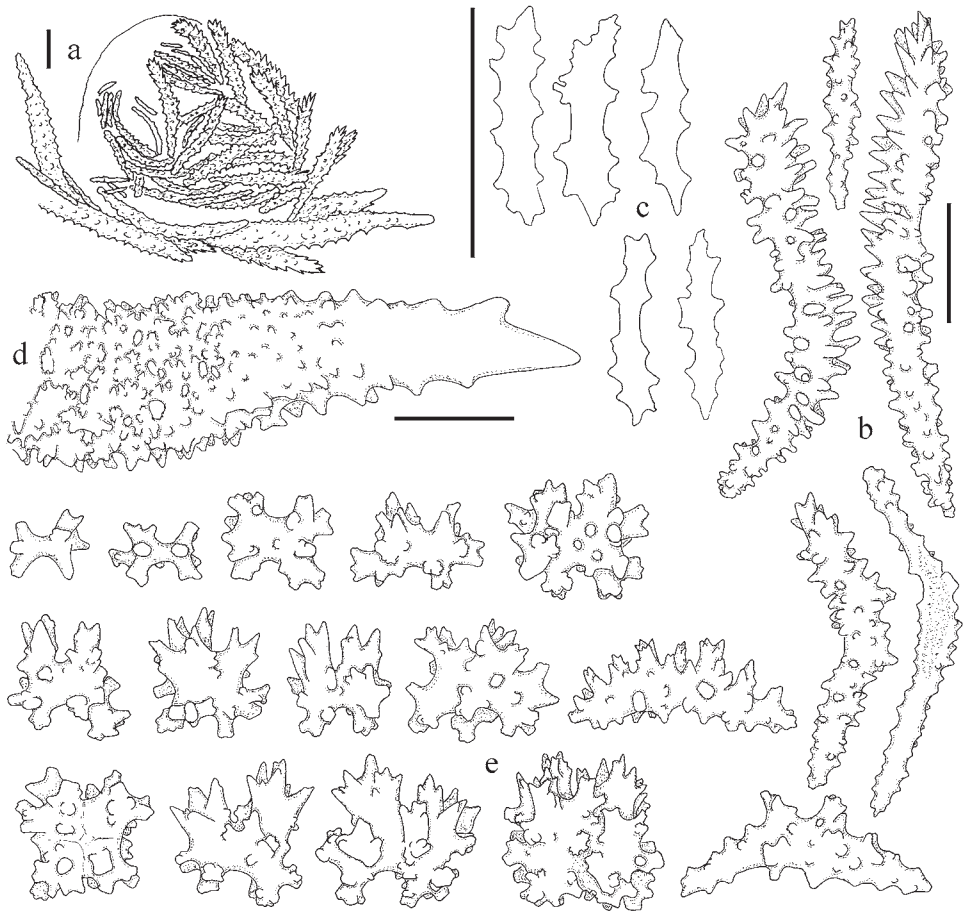


Fig. 62. *Chromonephthea fruticosa* spec. nov.; holotype, NTM C14839; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer shortly above base of colony. Scales 0.10 mm, scale at d also applies to e.

bundles red, polyps white. Point sclerites colourless to pink, supporting bundle spindles orange with colourless projecting part. Tentacle rods are colourless. Top of the stalk has colourless sclerites, some faintly yellow; base stalk with colourless sclerites.

Etymology.— The Latin "fruticosus", bushy, refers to the bush-like colony shape, in contrast to most other species, which have a stalk and therefore a tree-like colony shape.

Remarks.— At the same collection site *C. cobourgensis* spec. nov. was collected. That species clearly differs from *C. fruticosa* spec. nov. by lacking internal spindles. In *C. fruticosa* spec. nov. the radiates do not alter much in shape towards the base of the colony, probably because a real stalk is missing.

The sclerites of this species resemble those of *Chromonephthea hornerae* spec. nov., but the latter species has point spindles with leaf-like projections instead of simple spines.

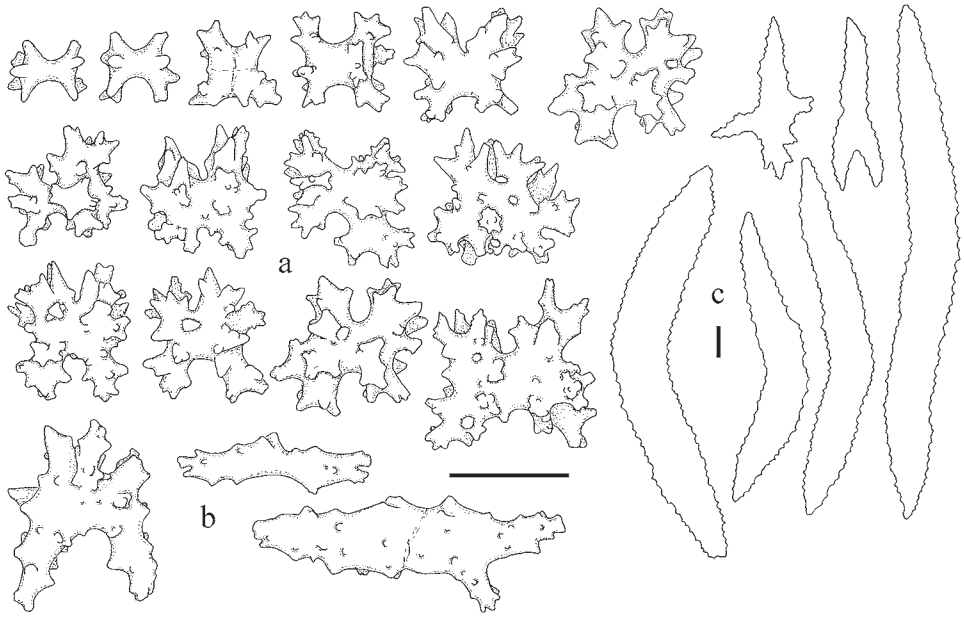


Fig. 63. *Chromonephthea fruticosa* spec. nov.; holotype, NTM C14839; a, radiates, surface layer base of colony; b-c, spindles, interior of stalk, c, outlines only. Scales 0.10 mm, scale at b also applies to a.

Chromonephthea glomerata (Thomson & Simpson, 1909) (figs 64-65, 156)

Nephthya glomerata Thomson & Simpson, 1909: 15, fig. 7 (Indonesia); Kükenthal, 1910: 39.

Material examined.— BMNH 1933.03.13.149, **syntype**, Indonesia, East Coast of Sumatra, Gaspar Strait; RMNH Coel. 33390, 3 ms of BMNH 1933.03.13.149.

Description.— The syntype examined is 2 cm long and 3.5 cm wide, the entire stalk seems to be missing (fig. 64). Polyps are up to about 1.00 high and 0.90 mm wide.

Supporting bundle.— Hardly projecting (fig. 65a); larger spindles have complex tubercles on the inner side and spines on the outer side, and a spiny projecting end (fig. 65d). Length of these spindles is up to about 1.10 mm.

Points.— Ventrally about 4 spindles per point, laterally 6-8, dorsally up to 12 (fig. 65a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.35 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.50 mm long, with mostly simple, but also a few complex tubercles, and a spiny outer side and distal end (fig. 65b). Intermediate sclerites are not present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 65c).

Base of the colony.— Radiates and derivatives of these, up to 0.15 mm long, all with simple tubercles, some slightly unilaterally spinose (fig. 65e). Small spindles and unilaterally spinose spindles with simple tubercles are most abundant. The ones that could be measured are up to 0.30 mm long; larger spindles were all broken.

Colour.— Point sclerites yellow, several supporting bundle spindles with one yellow end, all other sclerites colourless.

Remarks.— Obviously the stalk of the syntype is almost completely missing, making it doubtful whether the species belongs to *Chromonephthea*. It is possible that it concerns a species of *Stereonephthya* Kükenthal, 1905, but as no small rods in the polyp stalk could be detected, which are characteristic for species of *Stereonephthya*, I refer to it as *Chromonephthea*.

Thomson & Simpson (1909) reported only a few sclerites from the interior.

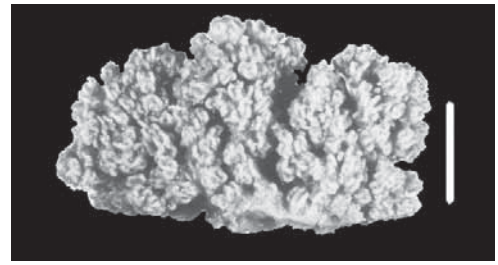


Fig. 64. *Chromonephthea glomerata* (Thomson & Simpson, 1909), syntype BMNH 1933.03.13.149. Scale 1 cm.

Chromonephthea goudi spec. nov.
(figs 66-68a, 158-159, 167c)

Material examined.— NTM C3518, **holotype**, Australia, NT, Arafura Sea, Sandy Is. No. 2, sta no. PA 16, 11°05.60'S 132°19.00'E, 6-10 m, 22.x.1981, coll. P. Alderslade; RMNH Coel. 33011, 3 ms of holotype; **paratypes**: NTM C14738, 1 specimen, same data as holotype; CAS 171931, 1 specimen, same data as holotype; RMNH Coel. 33012, 4 ms of paratype; RMNH Coel. 33013, 1 specimen, same data as holotype.

Description.— The holotype is 6 cm long and 2 cm wide (fig. 167c), at its base a branch is only connected by a small string of tissue. Polyps are up to about 0.75 mm wide and 1.00 mm high.

Supporting bundle.— Projecting up to 0.50 mm (fig. 66a); larger spindles have complex tubercles on the inner side and spines on the outer side, and a spiny projecting end (fig. 66d). Length of these spindles is up to about 1.80 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-8, dorsally up to 10 (fig. 66a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.40 mm long, with a few complex tubercles and spiny outer side and distal end (fig. 66b). Between the points a few intermediate sclerites are often present. Tentacles contain a few flattened rods, up to 0.10 mm long, with scalloped edge (fig. 66c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.25 mm long (fig. 66e). Most of them are strongly unilaterally spinose, and the larger ones have complex tubercles. Furthermore, spindles and unilaterally spinose spindles are also present, up to 0.50 mm long; the unilaterally spinose spindles have less pronounced spines than the radiates.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.20 mm long. The larger ones have complex tubercles (figs 67b, 68a). Furthermore, spindles and unilaterally spinose spindles are also present, up to 0.30 mm long (fig. 67a).

Interior stalk.— Without sclerites.

Colour.— The holotype is golden yellow, the base of the stalk somewhat reddish. Tentacle rods colourless, base of the stalk with mostly pink sclerites but some yellow, all

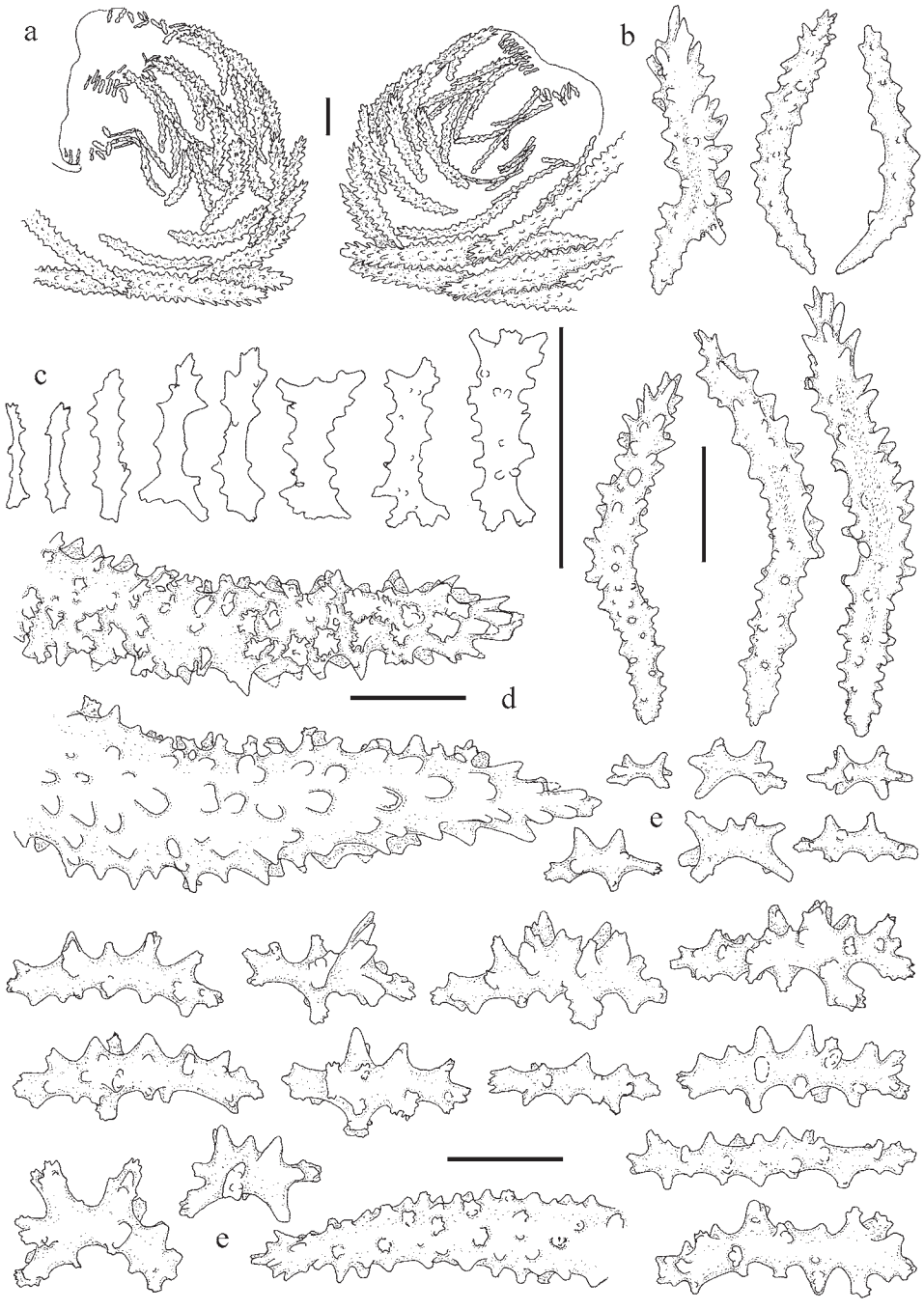


Fig. 65. *Chromonephthea glomerata* (Thomson & Simpson, 1909); syntype BMNH 1933.03.13.149; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites, surface layer base of colony. Scales 0.10 mm.

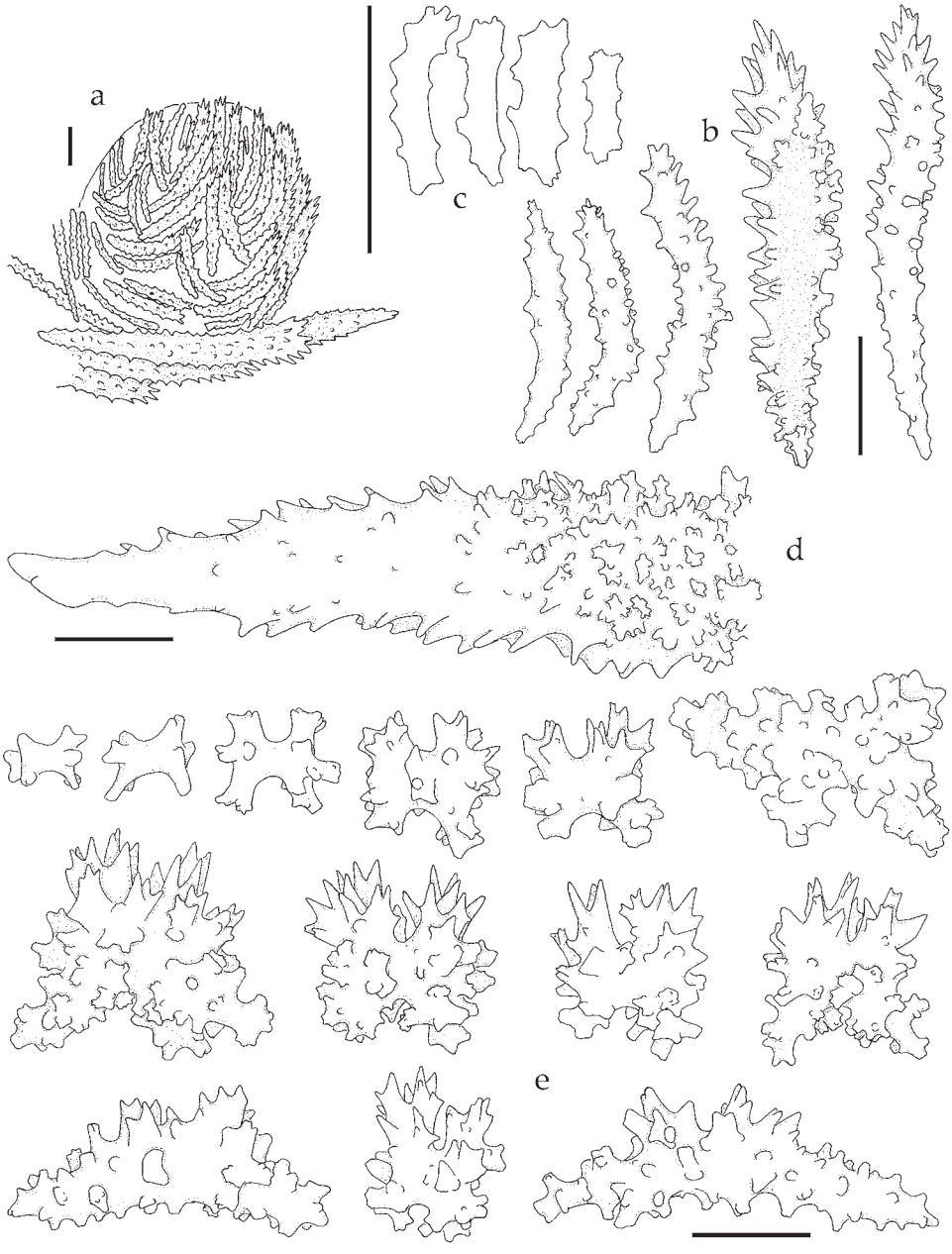


Fig. 66. *Chromonephthea goudi* spec. nov.; a, holotype NTM C3518, b-e, one of the paratypes; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

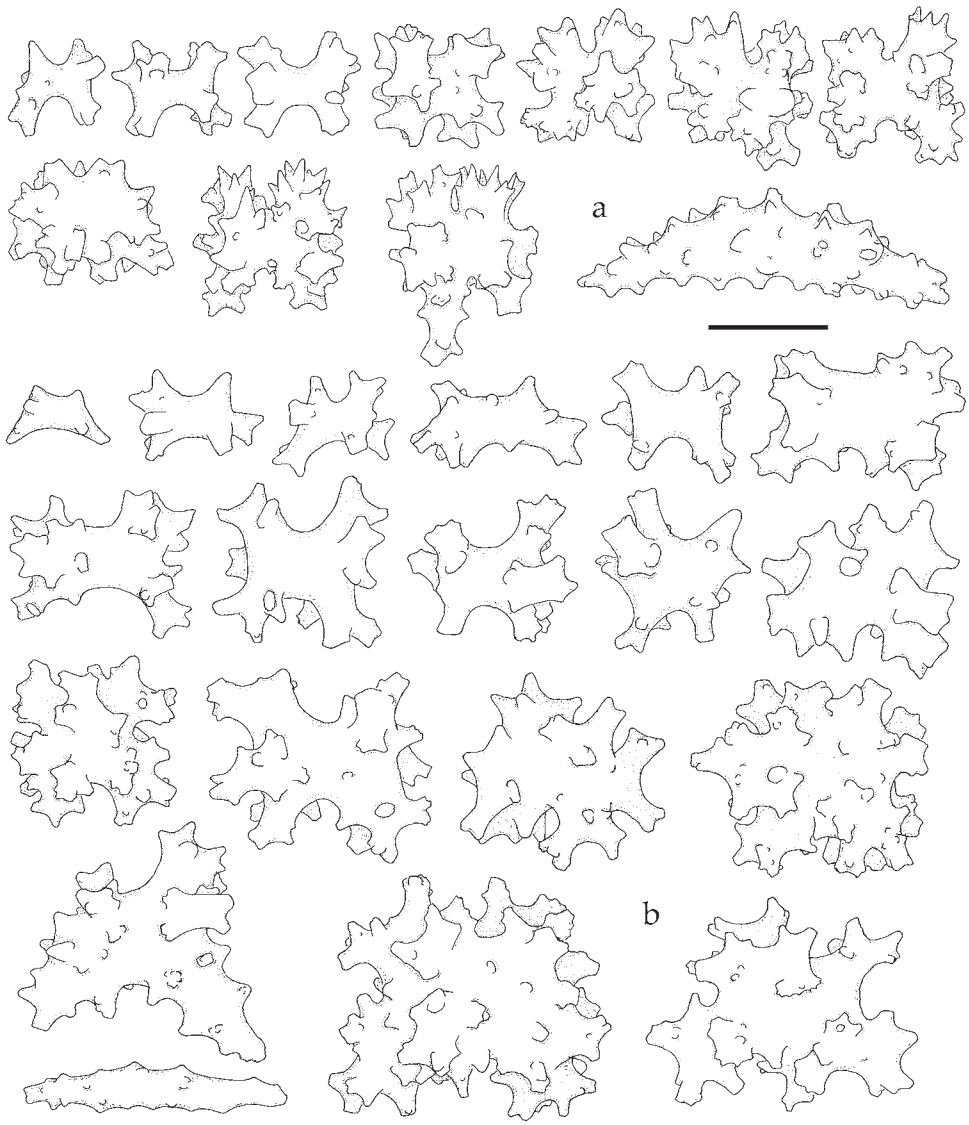


Fig. 67. *Chromonephthea goudi* spec. nov.; a-b, sclerites, surface layer base of stalk; a, one of the paratypes, b, holotype NTM C3518. Scale 0.10 mm.

other sclerites yellow. Two paratypes are completely yellow, the third is yellow with reddish end branches.

Etymology.— Named after Mr Jeroen Goud, malacologist at the NNM, and member of the NNM "Zeeteam".

Remarks.— The sclerites of *Chromonephthea goudi* are rather similar to those of *C. hornerae* spec. nov., but the species differs in showing more pronounced unilaterally

spinose radiates and lacking internal sclerites. *C. goudi* also resembles *C. benayahui* spec. nov., but differs in having more complex stalk radiates and slenderer point spindles.

Chromonephthea grandis spec. nov.
(figs 68b, 69-70, 158, 169)

Material examined.— NTM C2349, **holotype**, Australia, Qld, Gladstone, Rat Island, attached to rock on mud bottom, LWS, x.1977, coll. P. Alderslade; RMNH Coel. 32699, 9 ms of holotype.

Description.— The holotype is 30 cm long and 20 cm wide, composed of several stems arising from a common base (fig. 169). Polyps are up to about 0.70 mm wide and 0.90 mm high.

Supporting bundle.— Hardly projecting (fig. 69a); larger spindles have complex tubercles on the inner side and spines on the outer side, and a spiny projecting end (fig. 69d). Length of these spindles is up to about 1.10 mm.

Points.— Ventrally a few spindles per point, laterally 8-10, dorsally 12 (fig. 69a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.35 mm long, with complex tubercles and spiny distal end (fig. 69b). Between the points, one intermediate sclerite is often present. Tentacles have a few flattened rods, up to 0.12 mm long, with scalloped edge; the largest having simple tubercles (fig. 69c).

Surface layer of stems halfway.— Radiates and derivatives of these, up to 0.20 mm long (fig. 69e). Most of them are unilaterally spinose and the larger ones have complex tubercles. Furthermore, some unilaterally spinose spindles are also present, up to 0.75 mm long, with complex tubercles.

Surface layer shortly above the base of colony.— Radiates and derivatives of these, up to 0.20 mm long. Most of them are unilaterally spinose, the larger ones with complex tubercles (fig. 70a). A small number is less densely tuberculate, and not unilaterally spinose. Furthermore, some unilaterally spinose spindles are also present, up to 0.50 mm long, with complex tubercles.

Surface layer base of colony.— Radiates and branches bodies, the latter up to 0.25 mm long (figs 68b, 70d).

Interior stalk.— Spindles, up to 1.40 mm long, with sparse simple tubercles (figs 69f, 70b-c).

Colour.— Colony with white stems, reddish branches and yellow polyps. Point spindles yellow, supporting bundle and branch spindles orange, unilaterally spinose spindles with orange inner core, all other sclerites colourless.

Etymology.— The Latin “grandis”, large, refers to the large size of the holotype.

Remarks.— It was rather difficult to establish what type of sclerites are present in the base of the stalk as there hardly is any stalk and lots of sediment is embedded in the base.

The sclerites of this species resemble those of *C. brevis* spec. nov., but the latter species differs in lacking the multi-radiate bodies in the surface layer of the base of the stalk.

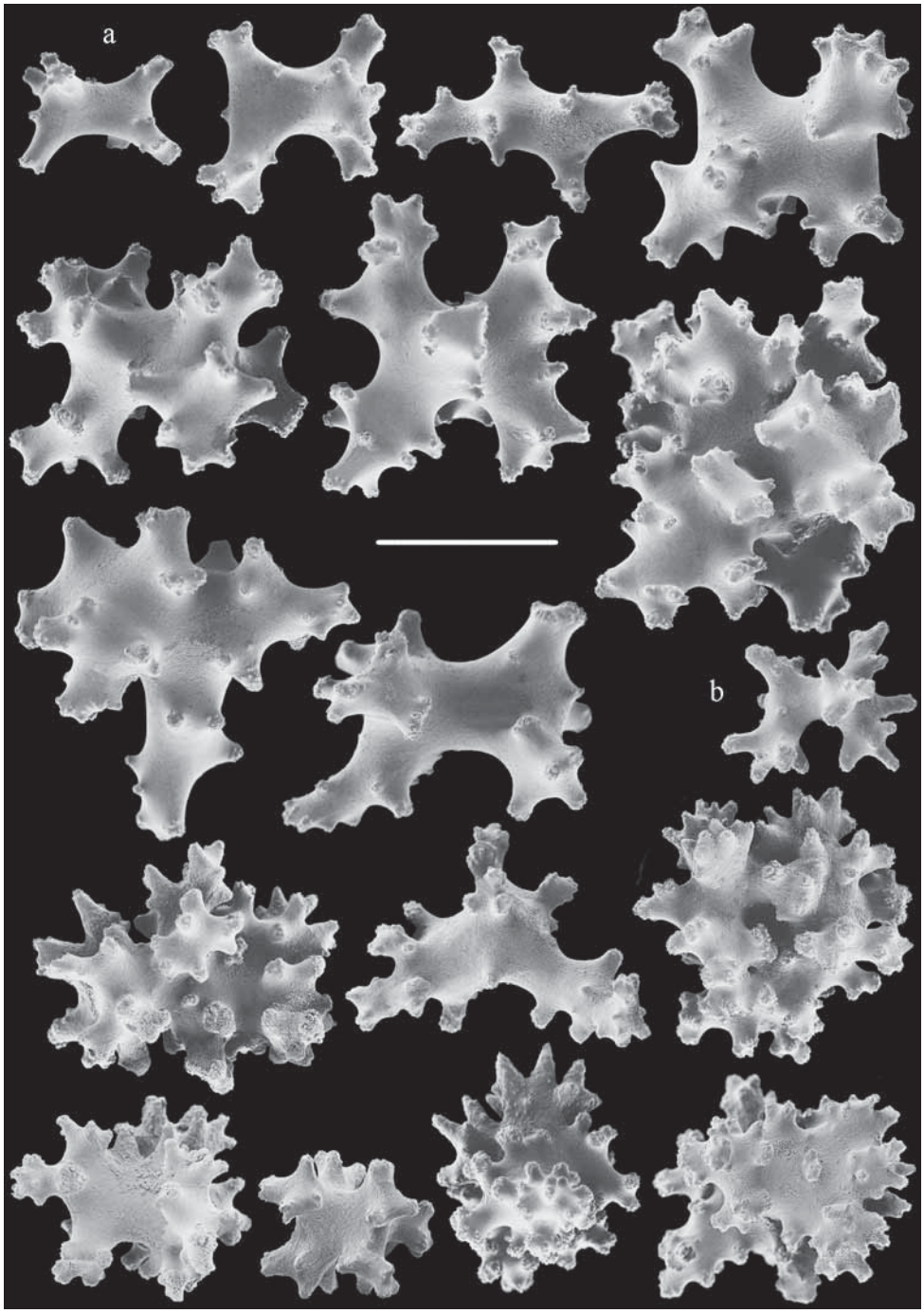


Fig. 68. Sclerites, surface layer base of stalk / colony; a, *Chromonephthea goudi* spec. nov., holotype NTM C3518; b, *C. grandis* spec. nov., holotype NTM C2349.

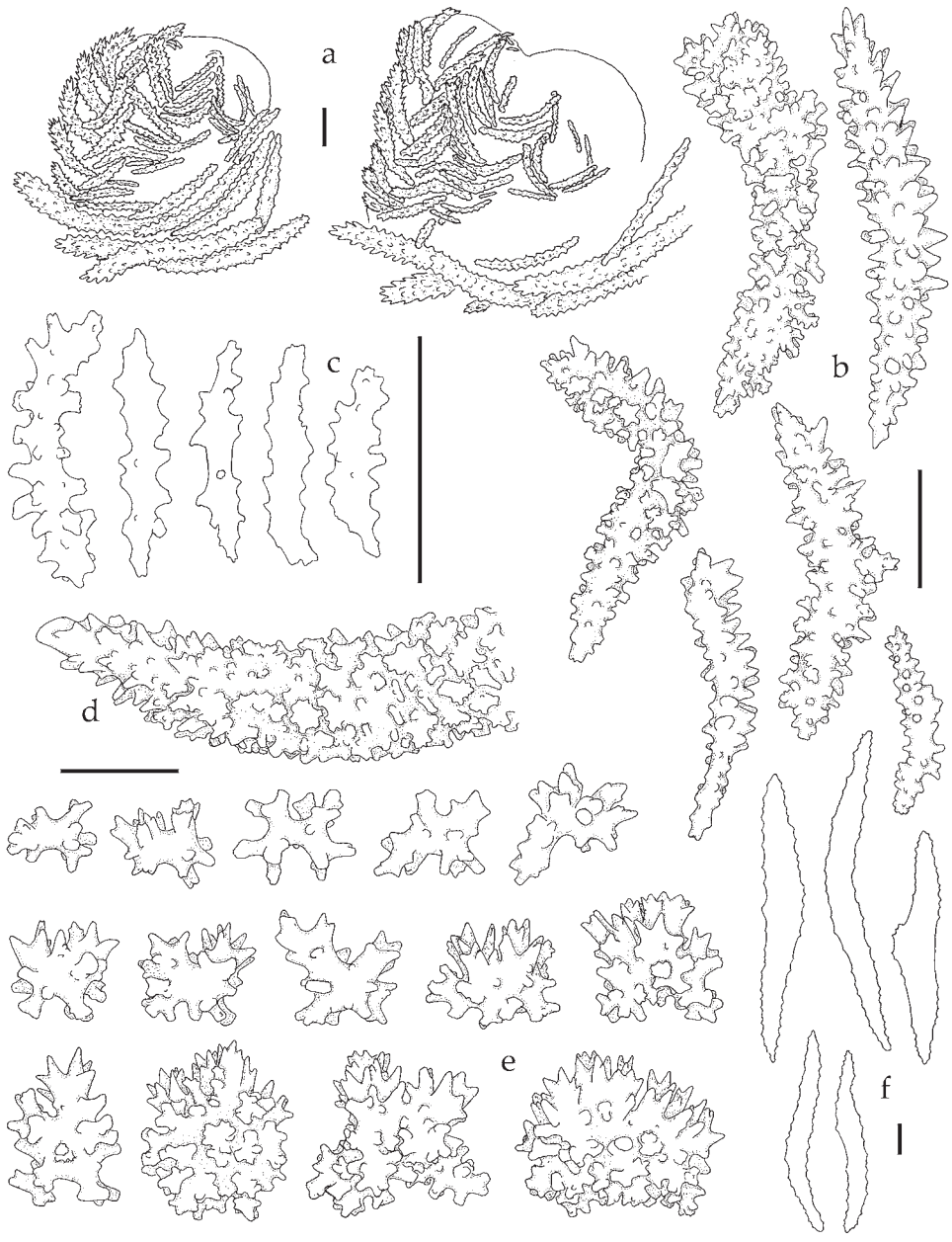


Fig. 69. *Chromonephthea grandis* spec. nov.; holotype, NTM C2349; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer of stems; f, spindles, interior of stems, outlines only. Scales 0.10 mm, scale at d also applies to e.

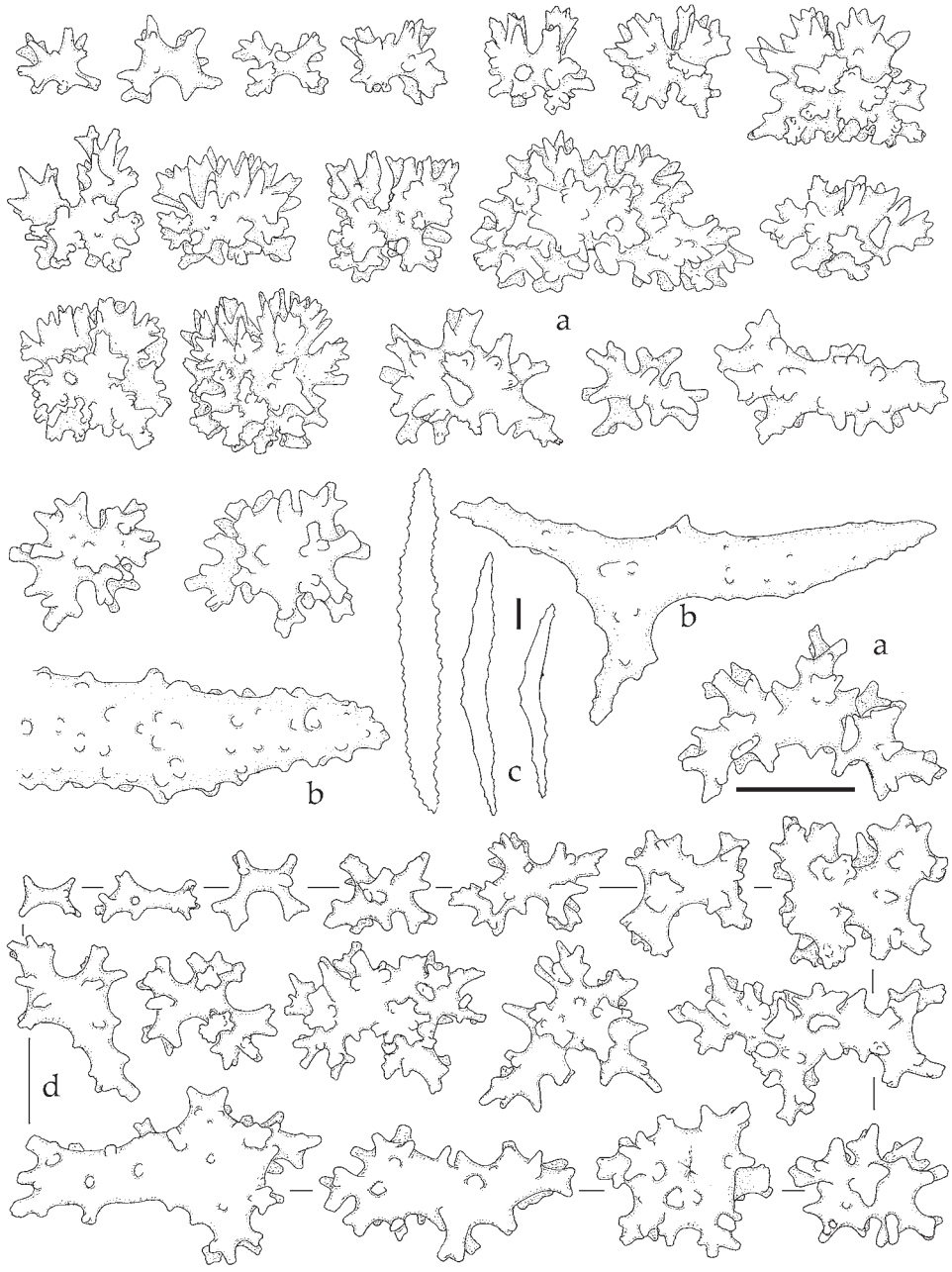


Fig. 70. *Chromonephthea grandis* spec. nov.; holotype, NTM C2349; a, sclerites, surface layer shortly above base of colony; b-c, spindles, interior base of colony, c, outlines only; d, sclerites, surface layer base of colony. Scales 0.10 mm, scale at a also applies to b and d.

Chromonephthea grasshoffi spec. nov.
(figs 71-73, 156)

Nephthya pellucida (in part) Kükenthal, 1911: 313, fig. 6, pl. 19 fig. 3 (Aru Islands).

Material examined.— ZMB 6829, **holotype** (original collection number, label: *Nephthya pyramidalis*; Kükth det 1894; Ternate; Kükth 1902); RMNH Coel. 33391, 4 ms of holotype; ZMB 11729, **paratype** (new collection number, label: *Nephthya pellucida*; Kükth det; Aru Inseln; Merton S.); RMNH Coel. 33392, 4 ms of paratype.

Description.— The holotype is 9 cm long and 3 cm wide (fig. 71a). Polyps are up to about 0.80 mm wide and 0.80 mm high.

Supporting bundle.— Projecting up to 0.30 mm (fig. 72a); larger spindles have complex tubercles on the inner side, spines on the outer side, and a spiny projecting end (fig. 72d). Length of these spindles is up to about 1.80 mm.

Points.— Ventrally about 4-6 spindles per point, laterally 6-8, dorsally up to 12 (fig. 72a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles, and a spiny distal end. Dorsally they are up to 0.50 mm long, with simple and complex tubercles and a spiny outer side and distal end (fig. 72b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 72c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with complex tubercles (fig. 72e). Many of them are unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple and complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.30 mm long,

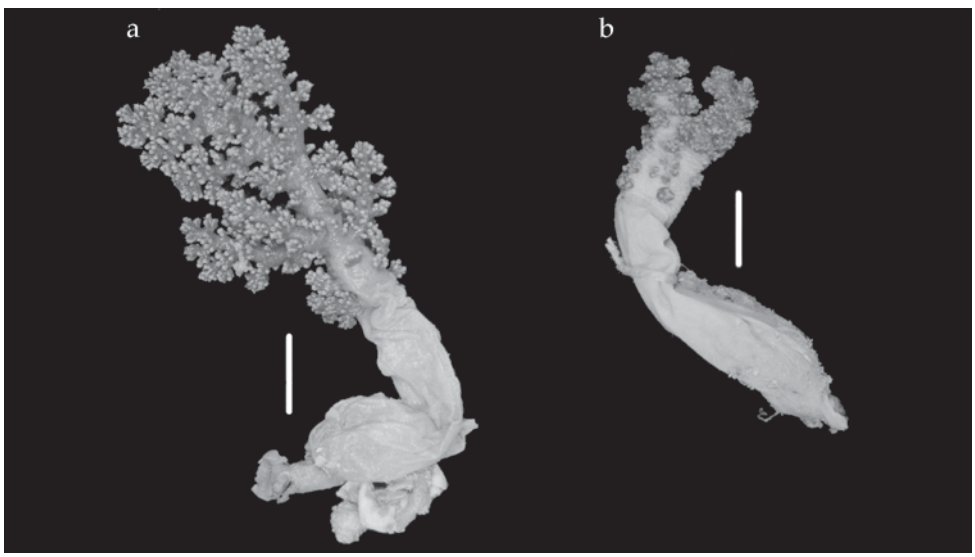


Fig. 71. *Chromonephthea grasshoffi* spec. nov.; a, holotype ZMB 6829; b, paratype ZMB 11729. Scales 1 cm.

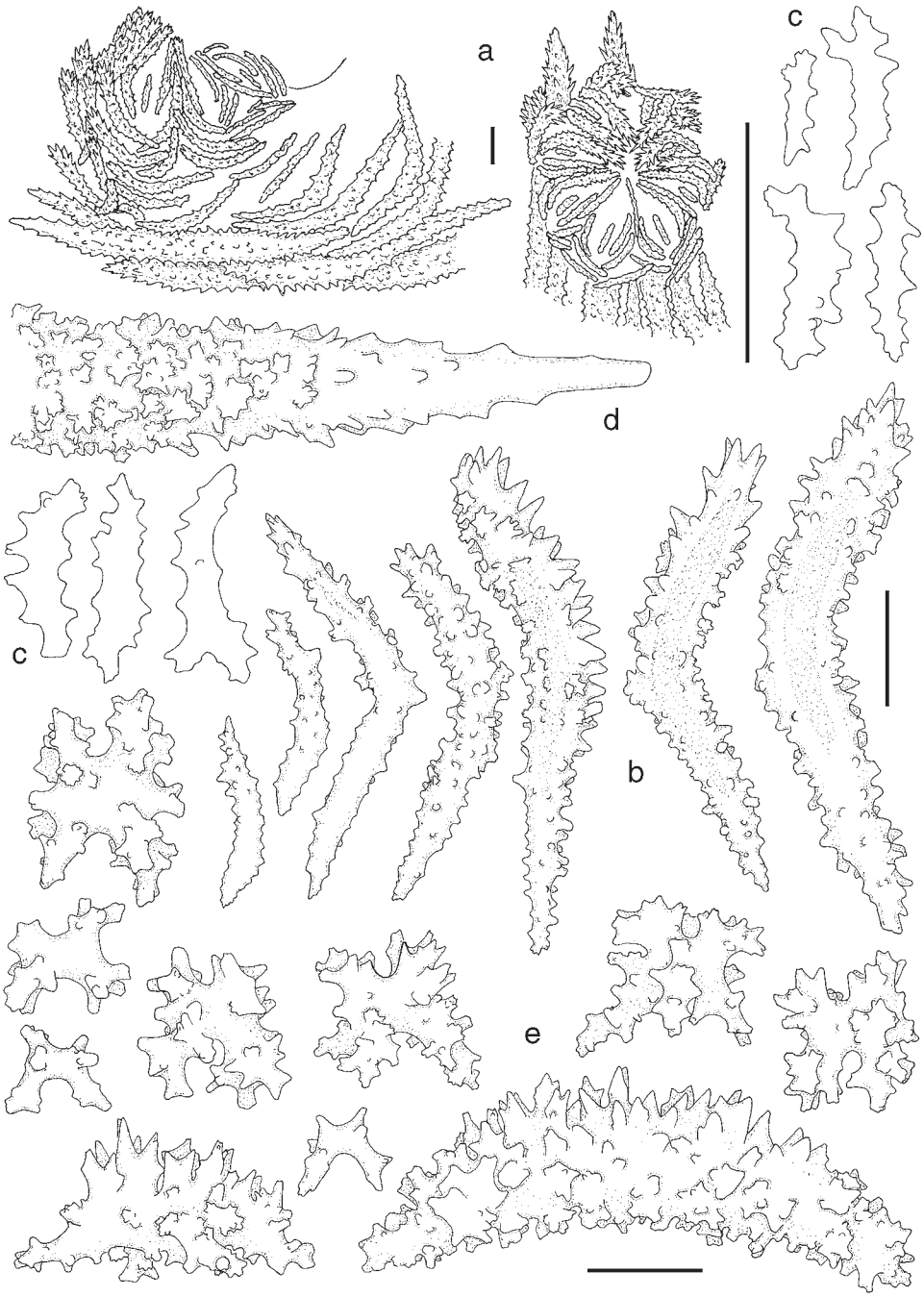


Fig. 72. *Chromonephthea grasshoffi* spec. nov.; holotype ZMB 6829; a, lateral and top view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

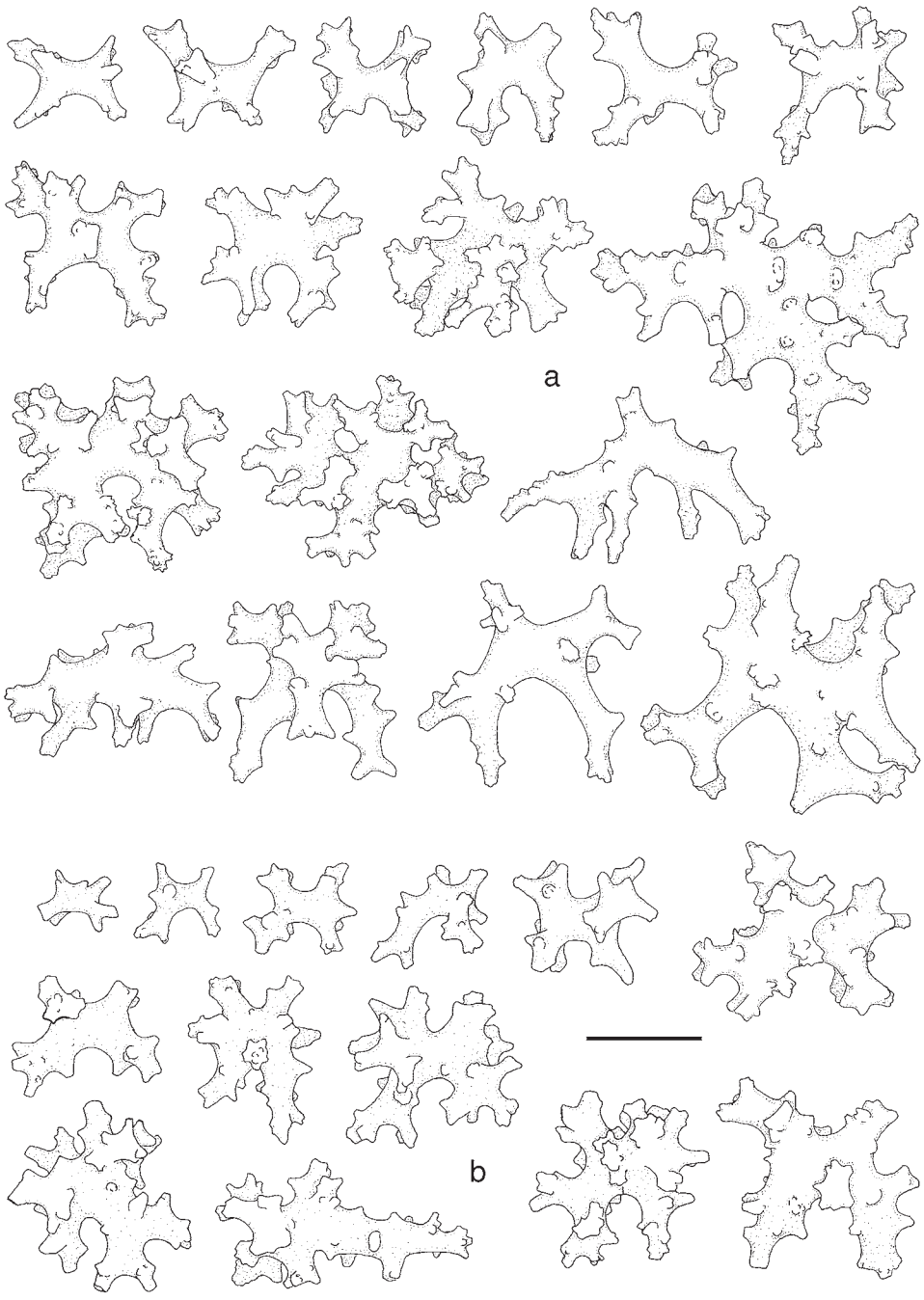


Fig. 73. *Chromonephthea grasshoffi* spec. nov.; sclerites; a, surface layer base of stalk of holotype ZMB 6829; b, surface layer base of colony of paratype ZMB 11729. Scale 0.10 mm.

the larger ones forming complex bodies with simple and complex tubercles, and long slender rays (fig. 73a).

Interior stalk.— Without sclerites.

Colour.— Colony with white stalk, red branches and yellow polyps. Point spindles yellow, branch sclerites orange, supporting bundle spindles orange, often with yellow projecting part. All other sclerites are colourless.

Etymology.— Named after octocoral researcher Dr Manfred Grasshoff, SMF.

Remarks.— Paratype ZMB 11729 is 6 cm long, showing a distinct stalk, but lacking a base. It has the same colour pattern as the holotype.

At the ZMB I found a bottle with two specimens, one label with a collection number, and two labels with different species names, viz. *N. pellucida* and *N. pyramidalis* (see material examined). At first I decided that one of these specimens had to belong to *N. pellucida* (ZMB 11729; new collection number), and the other to *N. pyramidalis* (ZMB 6829; original collection number). Subsequently I discovered the holotype of *N. pyramidalis* in Frankfurt (SMF 63). The specimen used by Kükenthal to describe *N. pellucida* was also present in Frankfurt (SMF 81, see *Chromonephthea pellucida*). Therefore, the two specimens present in Berlin are probably two of the four other syntypes of *N. pellucida* mentioned by Kükenthal (1911: 314). These four syntypes are from a different locality (E coast Aru islands) than the syntype used for the description of *N. pellucida* (N from Penambulai). After examination of the sclerites it proved that both specimens represented an undescribed species of *Chromonephthea*, which is described here as *C. grasshoffi*.

Apparently Kükenthal did not really examine the sclerites of the material of *Nephthya pellucida*. Otherwise he would have discovered that the specimens presently designated to *C. grasshoffi* spec. nov., without internal spindles, do not belong to *C. pellucida*, with internal spindles.

Four other species have been reported from the Aru islands, which are discussed in the remarks of *C. curvata* (Kükenthal, 1911).

Chromonephthea hartmeyeri (Kükenthal, 1910)
(figs 74-78, 158, 161)

Nephthya Hartmeyeri Kükenthal, 1910: 46, figs 9-10, pl. 3 fig. 19 (WA, Shark Bay).
Nephthea hartmeyeri; Griffith & Fromont, 1998: 226 (type catalogue of WAM).
Nephthya granulata Kükenthal, 1910: 42, figs 5-6, pl. 2 fig. 16 (WA, Shark Bay). New synonymy.
Not *Nephthya granulata*; Kükenthal, 1911: 314 (Aru Islands) = *C. curvata* (Kükenthal, 1911).
Not *Nephthea granulata*; Tixier-Durivault, 1970: 302 (New Caledonia, Baie Saint-Vincent); Utinomi, 1975: 240, fig. 2, pl. 1 fig. 2 (Australia, W of Broome, Rowley Shoals).

Material examined.— ZMB 5030, **syntype**, WA, Shark Bay, NNE from the northern point of Heirisson Prong, 26º03'S 113º23'E, station 15, 18.vi.1905, 11-12.5 m; RMNH Coel. 33393, 4 ms of ZMB 5030; ZMB 6815, **syntype**, WA, Shark Bay, Useless Inlet, 26º08'S 113º21'E, station 19, 13.ix.1905, 7 m; WAM Z863, a fragment of ZMB 6815; ZMB 6812, **syntype** of *N. granulata*, WA, Shark Bay, NNE from the northern point of Heirisson Prong, 26º03'S 113º23'E, station 15, 18.vi.1905, 11-12.5 m; RMNH Coel. 33394, 4 ms of ZMB 6812; ZMB 6811, **syntype** of *N. granulata*, same data as ZMB 6812; ZMB 5028, small fragment of ZMB 6812.

Description (ZMB 5030).— Syntype 30 cm long and 12 cm wide (fig. 74b). Polyps are up to about 0.80 mm wide and 0.90 mm high.

Supporting bundle.— Projecting for a distance of 0.20 mm (fig. 75a); larger spindles have complex tubercles on the inner side, spines on the outer side, and a spiny projecting end (fig. 75d). Length of these spindles is up to about 1.10 mm.

Points.— Ventrally about 4-6 spindles per point, laterally 6-10, dorsally up to 12 (fig. 75a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.45 mm long, with mostly simple but also a few complex tubercles, and spiny outer side and distal end (fig. 75b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 75c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with some complex tubercles (fig. 75e). Many of them are unilaterally spinose. Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.40 mm long, with simple tubercles (fig. 75e).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.40 mm long, almost all with hardly any tubercles (fig. 76).

Interior stalk.— Without sclerites.

Colour.— Colony white with red supporting bundles and orange polyps. Point spindles ochreous, supporting bundle spindles pink, all other sclerites colourless.

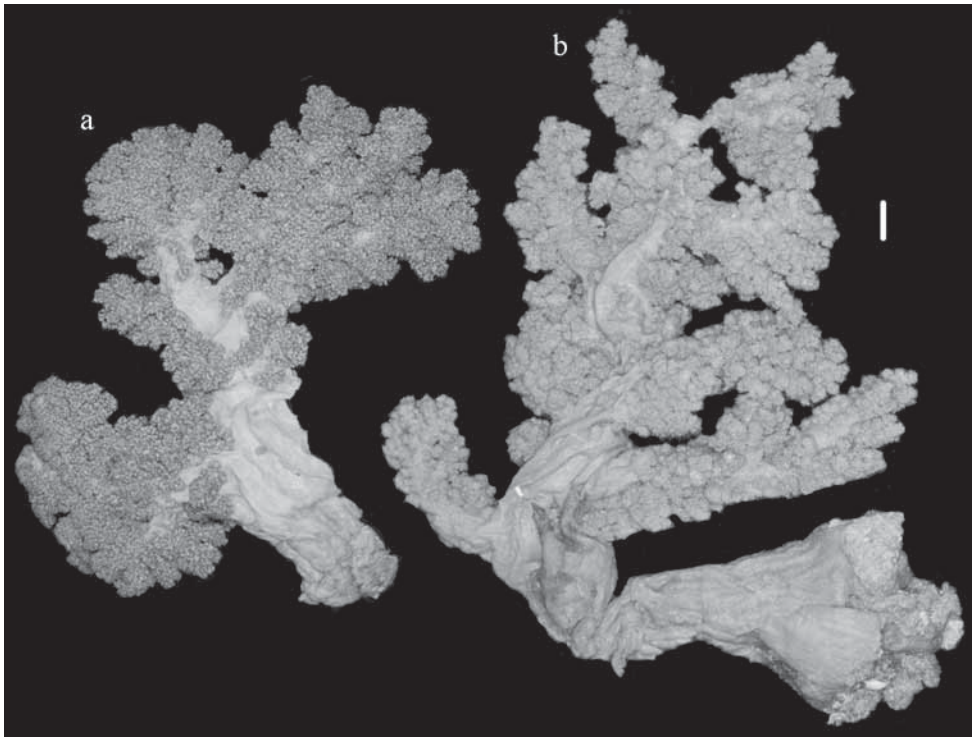


Fig. 74. *Chromonephthea hartmeyeri* (Kükenthal, 1910); a, ZMB 6812, syntype of *Nephthya granulata*; b, ZMB 5030, syntype of *N. hartmeyeri*. Scale 1 cm.

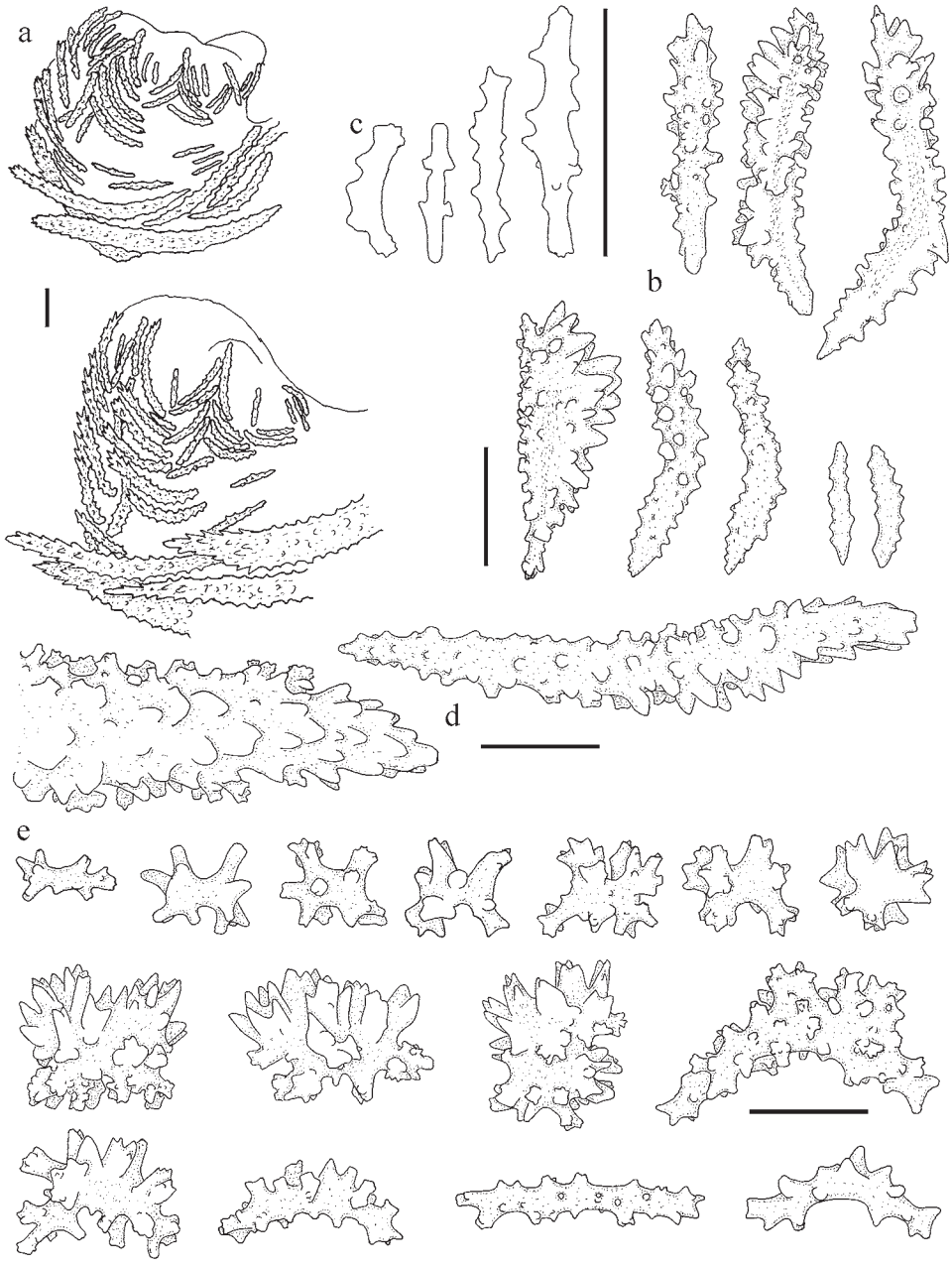


Fig. 75. *Chromonephthea hartmeyeri* (Kükenthal, 1910); syntype ZMB 5030; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindles (one partly) of supporting bundle; e, sclerites, surface layer top of stalk. Scales 0.10 mm.

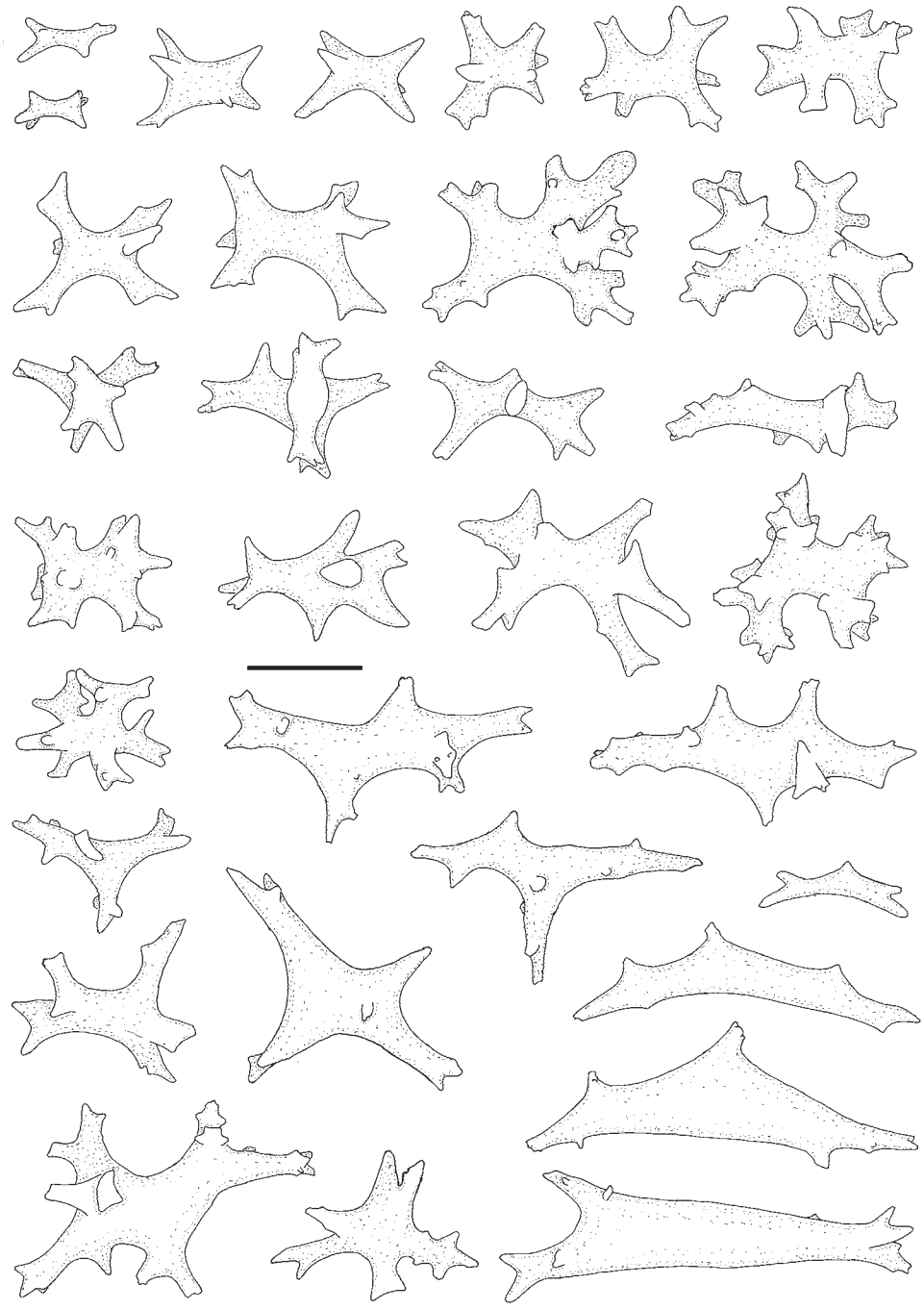


Fig. 76. *Chromonephthea hartmeyeri* (Kükenthal, 1910); syntype ZMB 5030; sclerites of surface layer base of stalk. Scale 0.10 mm.

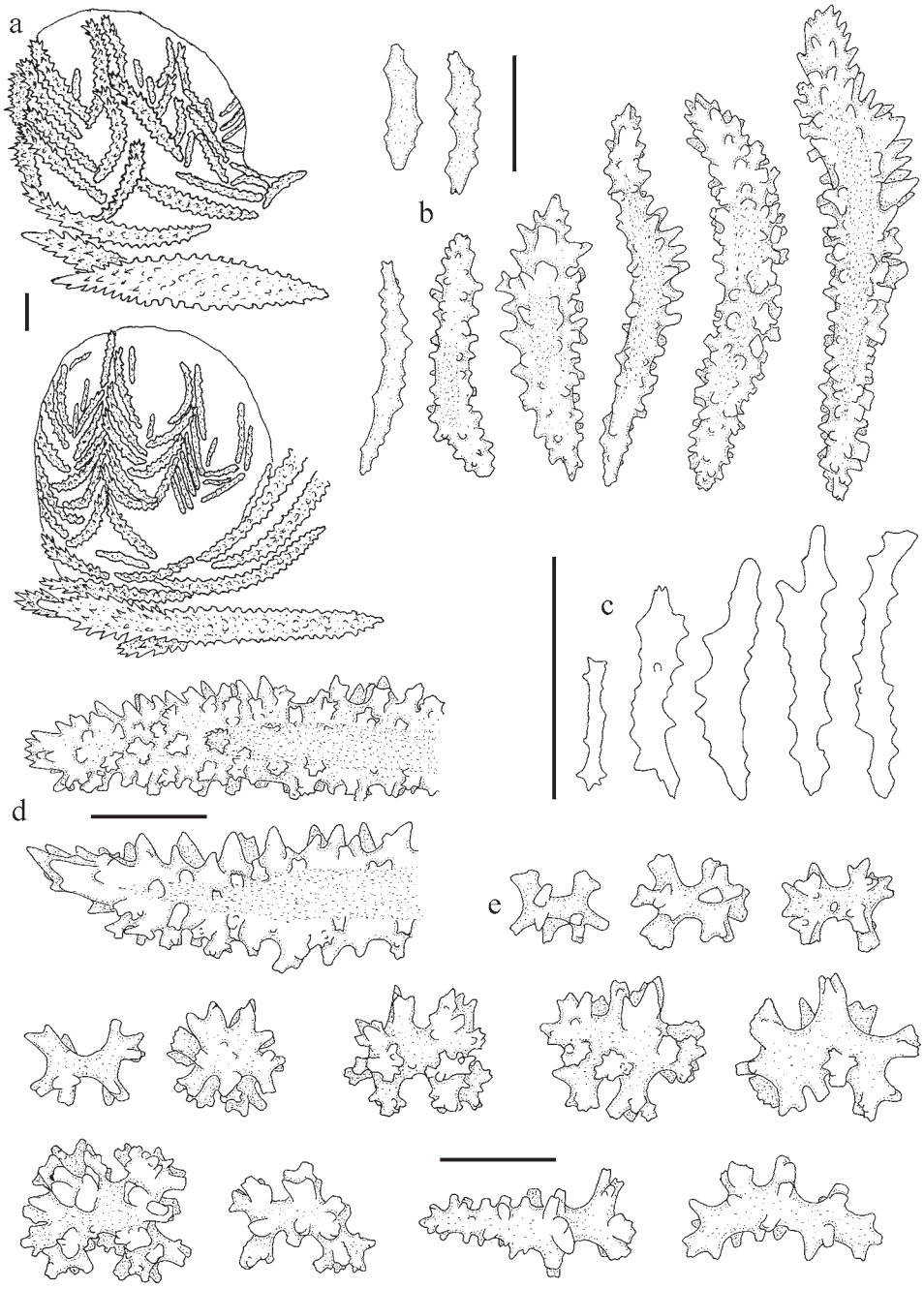


Fig. 77. *Chromonephthea hartmeyeri* (Kükenthal, 1910); ZMB 6812, syntype of *Nephthya granulata*; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

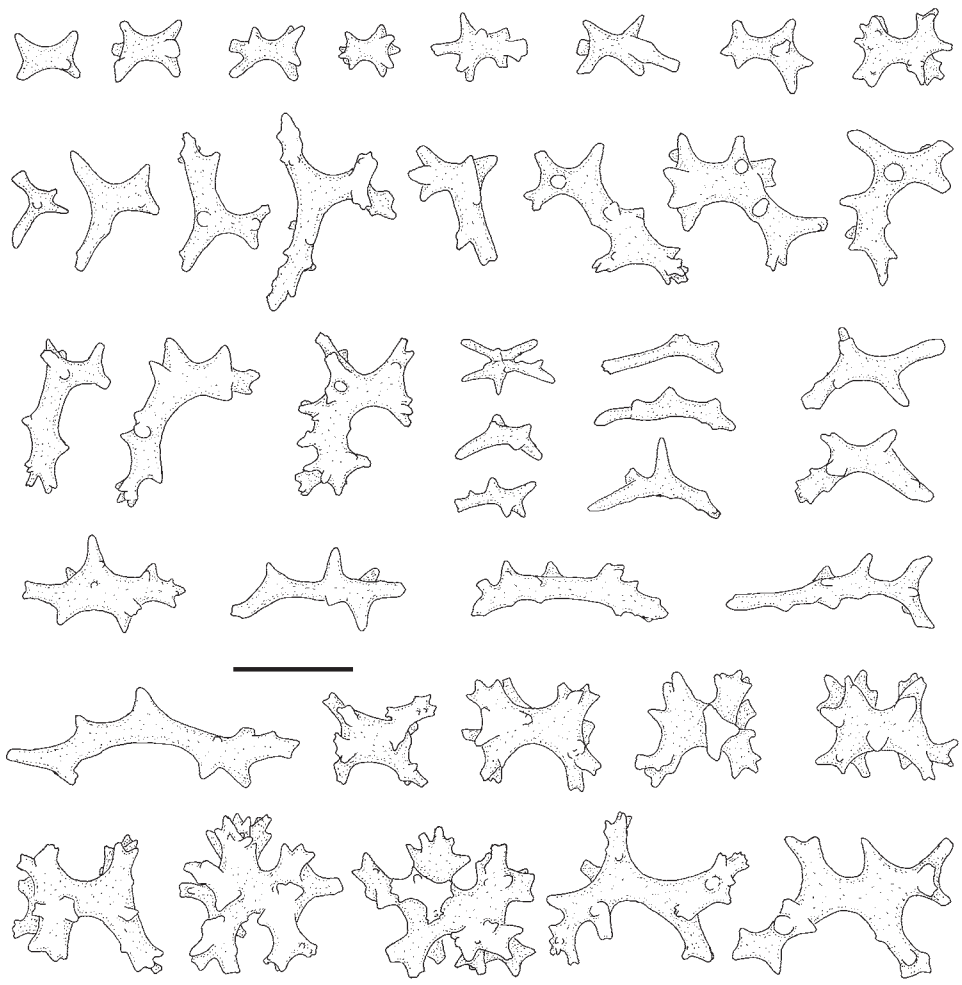


Fig. 78. *Chromonephthea hartmeyeri* (Kükenthal, 1910); ZMB 6812, syntype of *Nephthya granulata*; sclerites of surface layer base of colony. Scale 0.10 mm.

Remarks.— I consider *C. granulata* (Kükenthal, 1910) a synonym: it has the same colour pattern, same sclerite arrangement in the points, and similar top stalk radiates (see figs 77-78). It differs in having different, shorter radiates in the base of the colony. This difference can be explained by the *C. hartmeyeri* syntype having a complete stalk. Therefore, *C. hartmeyeri* is here selected as the valid name (first reviser principle; ICZN article 24.2).

The *C. granulata* syntype ZMB 6815, depicted by Kükenthal (1910: fig. 19), differs from the other material in having pink point sclerites and colourless supporting bundle spindles.

Tixier-Durivault (1970) identified two specimens from New Caledonia as *Nephthea granulata*, mentioning sclerites in the base of the stalk being 0.80-1.20 mm long. From

the very short description it is unclear to which genus they belong, but their sclerites are too large for *Chromonephthea*.

Utinomi (1975) identified a specimen from W Australia as *Nephthea granulata*. Since he mentioned that the polyps lack a regular points arrangement it can not belong to *Chromonephthea*. Due to his very short description it remains unclear to which genus the specimen belongs.

The sclerites of the stalk base of *C. hartmeyeri* are diagnostic for the species.

Chromonephthea hirotai (Utinomi, 1951)
(figs 79-81, 155)

Eunephthya hirotai Utinomi, 1951: 31, fig. 2 (Sagami Bay, Japan).
Paraspongodes hirotai; Utinomi, 1960: 22; 1962: 106; Imahara, 1996: 26.
Not *Paraspongodes hirotai*; Song, 1976: 56, pl. 2 figs 22-28; 2000: 152 (Korea).

Material examined.— Fragments of **holotype** [label: SMBL; *Eunephthya hirotai* Utinomi, 1951; 1.5 miles off Niisima, south of Sagami Bay; scrap of type; specimen present in Tokyo Univ.; Aug. 10, 1893; coll. Sadamori Hirota]; RMNH Coel. 33395, 5 ms of holotype.

Description.— Type consisting of fragments of a branch of a colony, the largest being one cm long (fig. 79b). Polyps up to about 1.00 mm wide and up to about 1.30 mm high. Polyp stalks very long, up to 2.0 mm in length.

Supporting bundle.— Hardly projecting or slightly so, in one extreme case projecting for up to 0.45 mm beyond the polyp head (fig. 80a). Largest supporting bundle spindles are up to about 1.20 mm long, with complex tubercles and a spiny distal end (fig. 80c).

Points.— Sclerites rather irregularly arranged in eight points, and several horizontally arranged, forming a kind of collaret (fig. 80a). Laterally 4-8 per point, one to two smaller intermediate sclerites can be present between two points. The number of sclerites in the ventral and dorsal points could not be established, which may explain why Utinomi also did not mention it. The smallest spindles are present ventrally, up to 0.25 mm long, with simple tubercles. Laterally they are up to 0.40 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.60 mm long, with simple and some complex tubercles and spiny distal end (fig. 81a); some small side branches are not uncommon. Tentacles have flattened rods, up to 0.20 mm long, with scalloped edge (fig. 80b).

Branches.— Rods, spindles, and a few radiates (fig. 81b). Too few present for reliable measurements but Utinomi mentioned 0.50-0.90 mm in length.

Colour.— The fragments are light red, point and supporting bundle sclerites pink, branch and tentacle sclerites are colourless.

Remarks.— Utinomi (1951) originally placed the species in the genus *Eunephthya* Verrill, 1869, together with two other new species, *E. serratospiculata* and *E. bicolor*, and another that he identified as *E. spiculosa* Kükenthal, 1906; all four from Japan. Utinomi (1960) transferred *E. hirotai*, *E. serratospiculata*, *E. spiculosa*, and *E. japonica* Kükenthal, 1906, to *Paraspongodes* Kükenthal, 1896. Apparently he overlooked that Kükenthal himself (1903: 103) already had synonymized *Paraspongodes* with *Eunephthya*. Later on Utinomi (1961: 238) corrected this, but he also stated "Kükenthal (1903-07) later abandoned this *Paraspongodes* and erroneously adopted Verrill's *Eunephthya* except for all

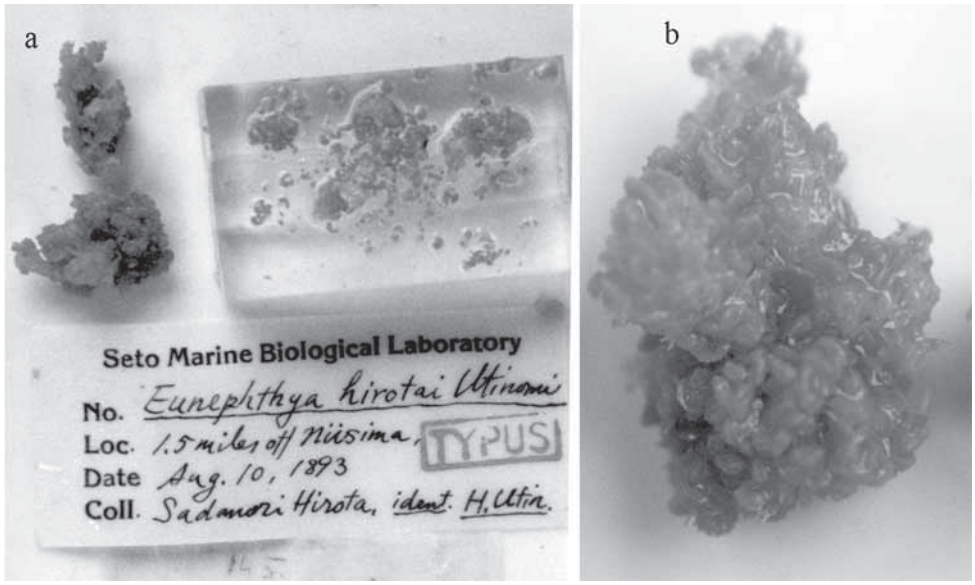


Fig. 79. *Chromonephthea hirotai* (Utinomi, 1951); a, fragments of holotype, b, one fragment enlarged.

the northern Nephtheidae", and thus resurrected the genus *Paraspongodes*. In the same paper (1961: 239) Utinomi placed his *Eunephthya bicolor* into the genus *Duva* Koren & Danielssen, 1883. This all left the genus *Paraspongodes* with five species: the type species *P. crassa* Kükenthal, 1896, *P. spiculosa* (Kükenthal, 1906), *P. japonica* (Kükenthal, 1906), *P. hirotai* (Utinomi, 1951), and *P. serratospiculata* (Utinomi, 1951).

Nevertheless, from the description and figures given by Kükenthal (1896: 132, figs 26-27) it is obvious that his *P. crassa* actually belongs to the genus *Scleronephthya* Wright & Studer, 1889. Hence *Paraspongodes* is a junior synonym of that genus. Kükenthal's *P. spiculosa* probably also belongs to *Scleronephthya*, although it is not certain whether Utinomi's specimens of *P. spiculosa* were identified correctly. *P. hirotai* and *P. serratospiculata* are here referred to *Chromonephthea*. *P. japonica* surely neither belongs to *Chromonephthea* nor to *Scleronephthya* and probably is a species of *Gersemia* Marenzeller, 1878, but this requires further examination.

The descriptions and figures of *Paraspongodes hirotai* given by Song (1976, 2000) suggest that she had a species of *Chromonephthea*, but certainly not *C. hirotai*. Song mentioned dorsal point sclerites 1.00-1.20 mm long for her specimens, twice as large as in *C. hirotai*. Song's material was not available for re-examination. In the same papers (1976: 55, 2000: 149) Song also identified *Paraspongodes spiculosa* from Korean waters. Her description of that material is unclear, and similar looking material from Singapore examined by me proved to belong to the genus *Umbellulifera* Thomson & Dean, 1931. Therefore, in my opinion, Song's *P. spiculosa* should be referred to this genus.

Together with *Chromonephthea inermis* (Holm, 1894), *C. cairnsi* spec. nov., and *C. serratospiculata* (Utinomi, 1951), the species has horizontally placed polyp sclerites in common. Both *C. cairnsi* and *C. serratospiculata* have such sclerites with a spiny middle part, whereas *C. inermis* differs in having internal radiates.

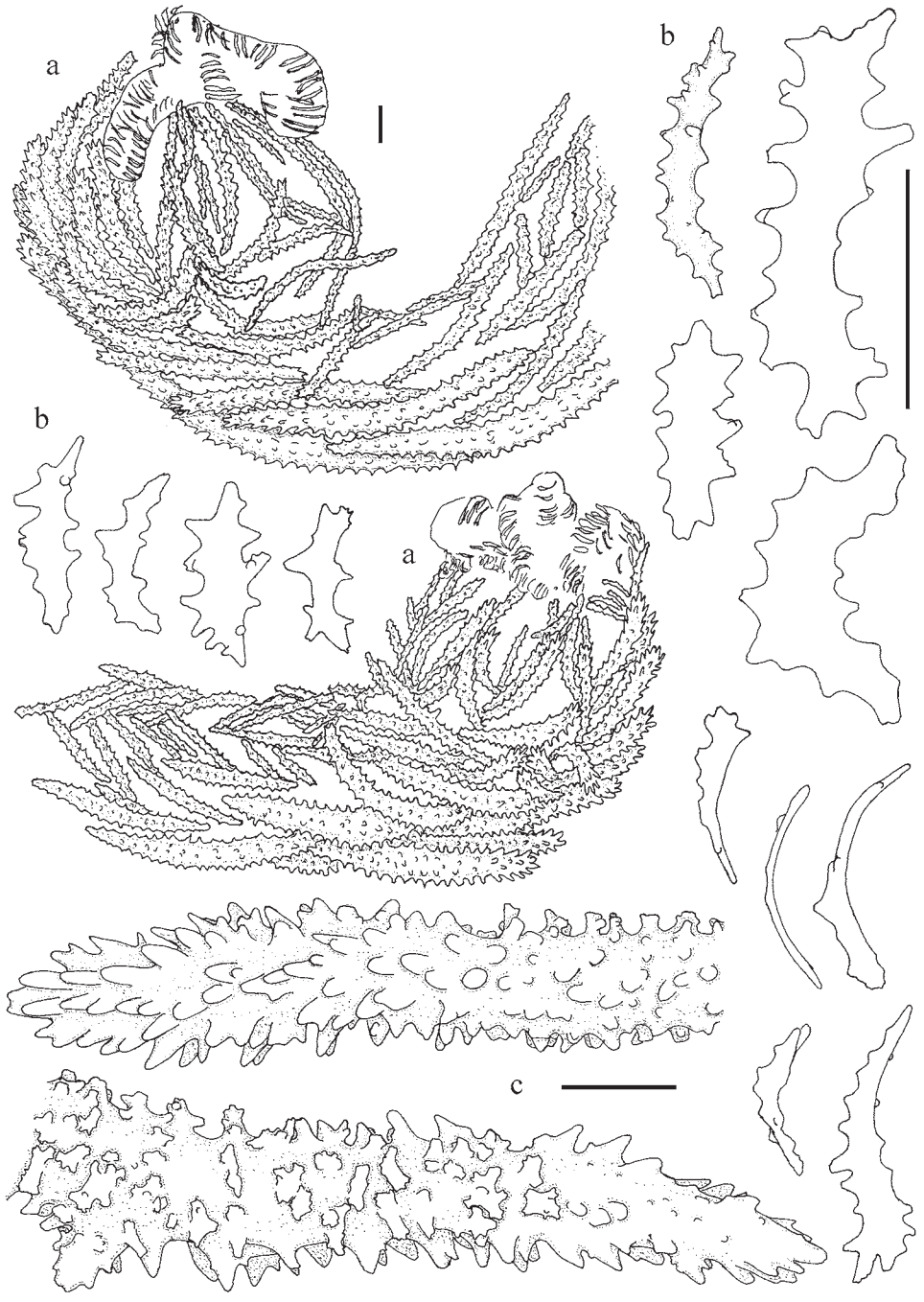


Fig. 80. *Chromonephthea hirotai* (Utinomi, 1951); holotype; a, lateral views of polyp armature; b, tentacular rods; c, spindles of supporting bundle (part). Scales 0.10 mm.

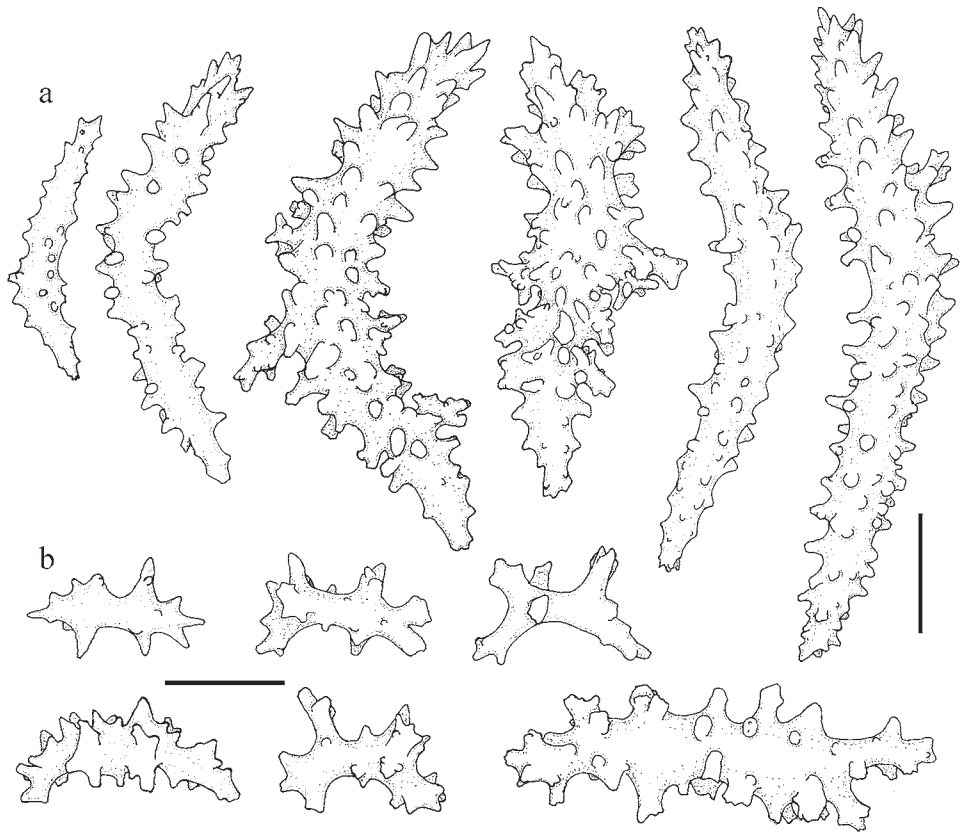


Fig. 81. *Chromonephthea hirotai* (Utinomi, 1951); holotype; a, point spindles; b, sclerites, surface layer of branch. Scales 0.10 mm.

Chromonephthea hoeksemai spec. nov.
(figs 82-84a, 156, 157, 170)

Nephthya chabrolii (in part); Thomson & Dean, 1931: 83 (Indonesia).
Dendronephthya intermedia (in part) Thomson & Dean, 1931: 107, pl. 1 figs 2, 6 (Indonesia).
Not *Nephthea chabrolii* Andouin, 1828: 49.

Material examined.— RMNH Coel. 32623, **holotype** and 5 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, W of Gusung (= Lae Lae Keke I.) (= 1 km NW of Ujungpandang), 5º07.5'S 119º23'E, coral reef, SCUBA diving, 22.viii.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; **paratypes**: RMNH Coel. 32624, 5 specimens and 3 ms, same locality, SCUBA diving, 31.v.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; NTM C14737, 1 specimen, same data as RMNH Coel. 32624; RMNH Coel. 32625, 2 specimens and 3 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, W of Lae Lae I. (= 1 km W of Ujungpandang), 5º08'S 119º23'E, coral reef, SCUBA diving, 8.vi.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32626, 1 specimen and 4 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, S of Samalona I. (= 7.5 km W of Ujungpandang), 5º07.5'S 119º20'E, coral reef, SCUBA diving, 24.viii.1994, Buginesia Program UNHAS-NNM 1994, coll.

B.W. Hoeksema; RMNH Coel. 32627, 1 specimen without base and 3 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, SW of Kudingareng Keke I. (= 14 km WNW of Ujungpandang), 5º06'S 119º17'E, coral reef, SCUBA diving, 17.v.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32628, 1 specimen and 3 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, W of Barang Caddi I. (= 11 km NW of Ujungpandang), 5º05'S 119º19'E, coral reef, SCUBA diving, 4.v.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32629, 1 specimen and 8 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, S of Barang Caddi I., SCUBA diving, 23.v.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32630**,** 1 specimen and 5 ms, Indonesia, SW Sulawesi, Spermonde Archipelago, W of Badi I. (= 20 km NNW of Ujungpandang), 4º57'S 119º17'E, coral reef, SCUBA diving, 2.vi.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32631, 1 specimen and 3 ms, same locality, SCUBA diving, 3.x.1994, Buginesia Program UNHAS-NNM 1994, coll. B.W. Hoeksema; RMNH Coel. 32632, 1 specimen and 3 ms and photograph, same locality, SCUBA diving, - 30 m, 1.xi.1994, Buginesia Program UNHAS-NNM 1994, coll. L.P. van Ofwegen & B.W. Hoeksema; ZMA COEL. 2935 (partly, 3 specimens, identified as *Nephthya chabrolii* by Thomson & Dean, 1931), Siboga sta 164, Indonesia, Galewo Strait, off Salawatti Island, 1°42.5'S 130°47.5'E, dredge, 32 m, sand and shells, 20.viii.1899; RMNH Coel. 32633, 6 ms, same data as ZMA COEL. 2935; ZMA COEL. 2454 (partly, 3 fragments, described as *Dendronephthya intermedia* by Thomson & Dean, 1931), Siboga sta 164, Indonesia, Galewo Strait, off Salawatti Island, 1°42.5'S 130°47.5'E, dredge, 32 m, sand and shells, 20.viii.1899; RMNH Coel. 32634**,** 4 ms, same data as ZMA COEL. 2454.

Description.— The holotype is 20 cm long and 15 cm wide. Several stems arise from a common base and a sterile stalk is hardly present (fig. 170a). Polyps are up to about 0.80 mm wide and 1 mm high.

Supporting bundle.— Can project for 0.20 mm (fig. 82a); larger spindles slender, with simple tubercles and a projecting part spiny (fig. 82c). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8-10, dorsally 12 (fig. 82a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.35 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.40 mm long, with simple tubercles and big spines (fig. 82b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 82d).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 82e), many of them are unilaterally spinose, and most have simple tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.55 mm long, with simple tubercles.

Surface layer base of colony.— Radiates and derivatives of these, most are up to 0.10 mm long, a few up to 0.15 mm, with simple tubercles (fig. 83a, 84a). Few are unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are present, up to about 0.40 mm long, with simple tubercles.

Interior stalk.— Almost smooth rods (fig. 83b), and spindles, up to 1.10 mm long, several with side branches (fig. 82f-g), and with simple tubercles.

Colour.— Colony orange brown with yellow polyps. Tentacle rods colourless, point spindles yellow, branch and supporting bundle spindles orange. Surface of the top of the stalk has orange to pink sclerites, base stalk also with many colourless ones.

Etymology.— Named after Dr Bert W. Hoeksema, head of the Department of Zoology, NNM, and organizer of the NNM "Zeeteam" expeditions. He collected most of the type material.

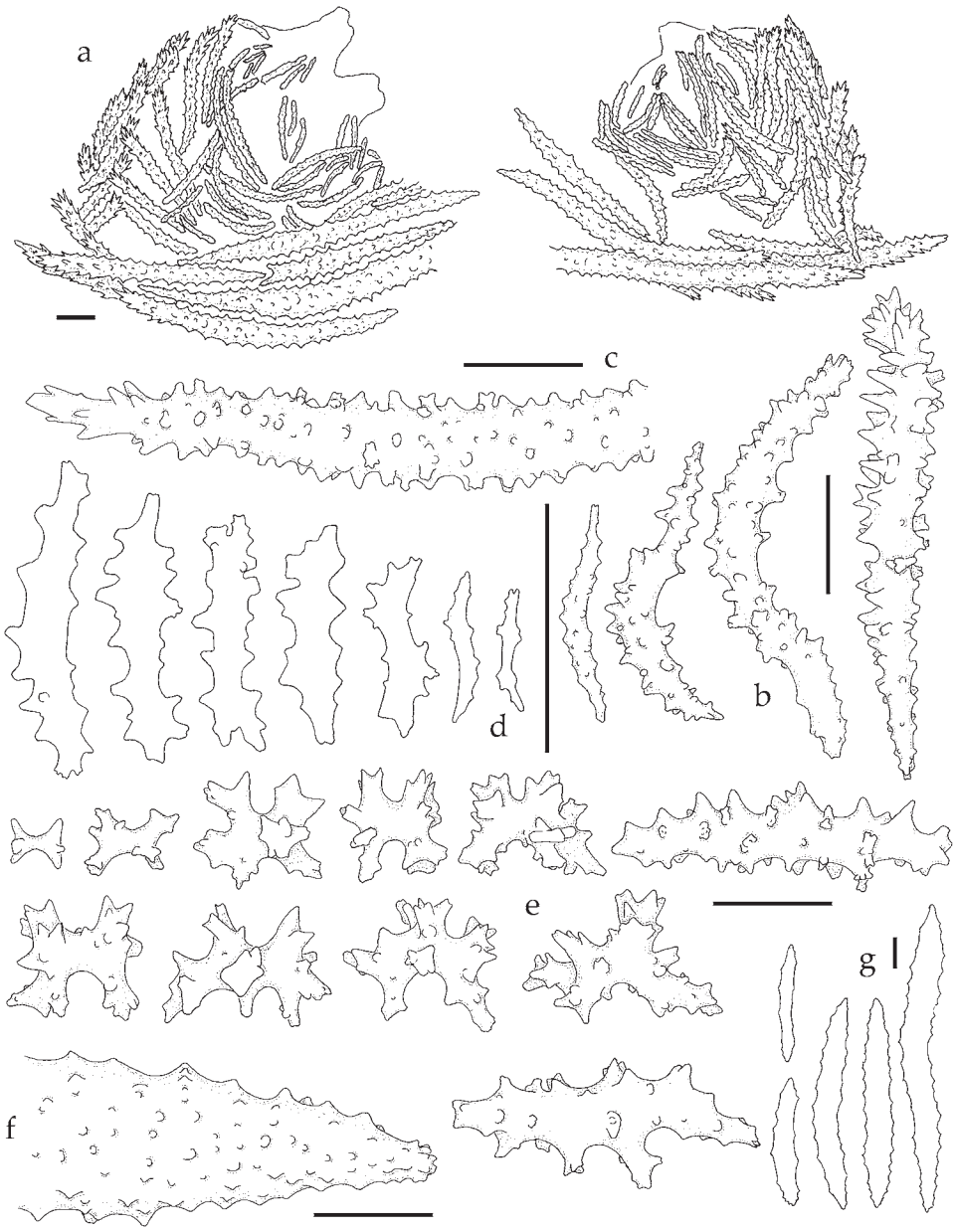


Fig. 82. *Chromonephthea hoeksemai* spec. nov.; paratype RMNH Coel. 32629; a, lateral views of polyp armature; b, point spindles; c, spindle of supporting bundle (part); d, tentacular rods; e, sclerites, surface layer top of stalk; f-g, spindles, interior top of stalk, f partly, g, outlines. Scales 0.10 mm.

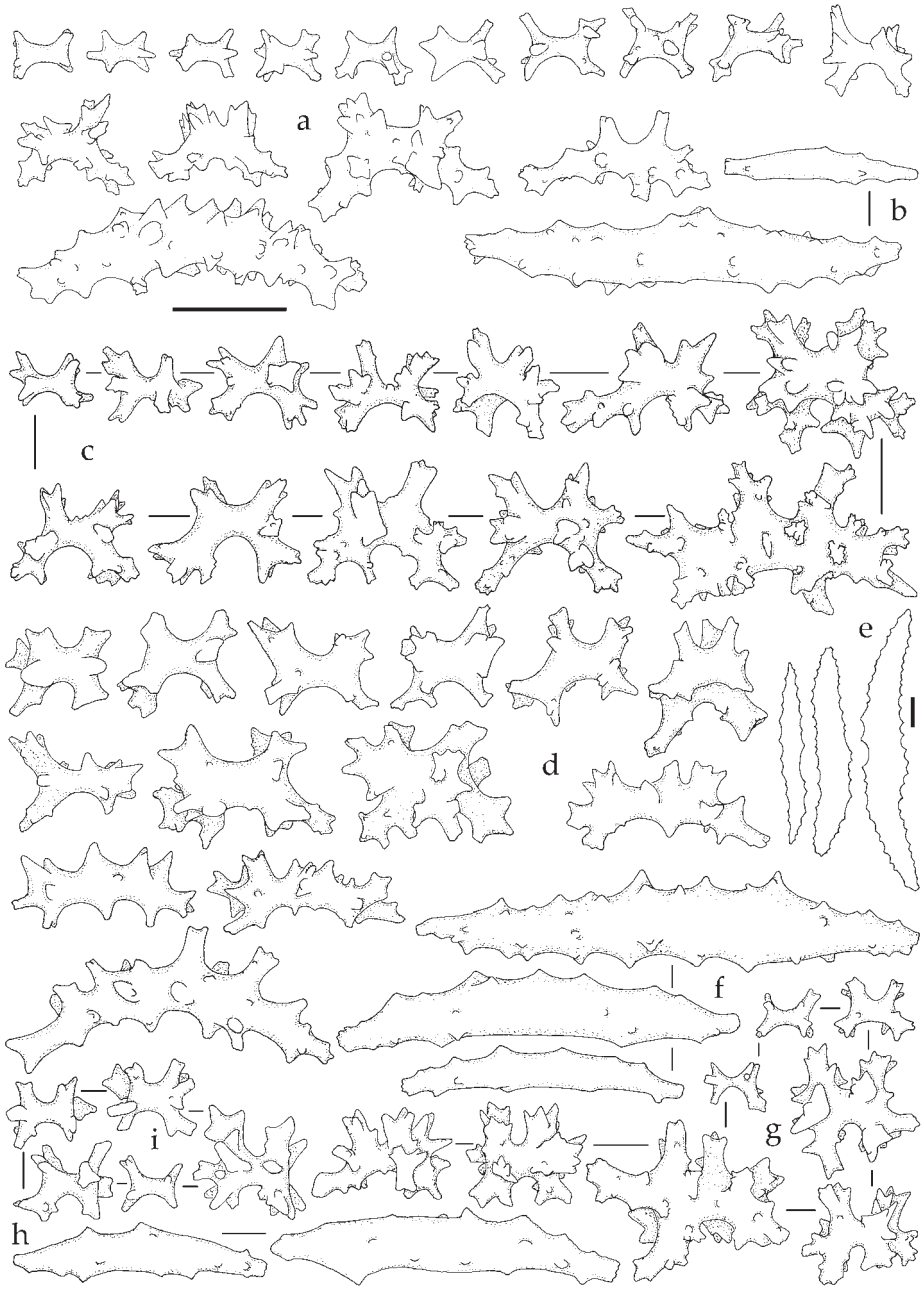


Fig. 83. *Chromonephthea hoeksemai* spec. nov.; a-b, paratype RMNH Coel. 32629; a, sclerites, surface layer base of stalk; b, sclerites, interior of base of stalk; c-f, ZMA COEL. 2935 (specimen shown in fig. 170b); c, sclerites, surface layer top of stalk; d, sclerites, surface layer base of stalk; e-f, sclerites, interior of base of stalk, e, outlines only; g-i, ZMA COEL. 2454 (Siboga sta. 164); g, sclerites, surface layer top of stalk; h, sclerites, interior top of stalk; i, sclerites, surface layer base of stalk. Scales 0.10 mm, scale at e applies to e only.

Variability.— The holotype is the largest specimen. In other specimens, the stalk and stem can be more reddish, less coloured, to even white (fig. 170b), consequently with a different mixture of coloured sclerites. Some specimens have orange supporting bundle spindles with a yellow projecting tip.

Remarks.— It is possible that Thomson & Dean (1931) mixed up their nephtheid species in the material of the Siboga Expedition (see *Chromonephthea intermedia* and *C. sierra*). ZMA COEL. 2935 consists of seven small colonies, with variable length of stalk preserved. Three of them could belong to *C. hoeksemai* spec. nov. (fig. 170b-d), four others to *C. intermedia* (Thomson & Dean, 1931) (fig. 95c-f). Three fragments of ZMA COEL. 2454, all about 1 cm long, and described as *Dendronephthya intermedia* by Thomson & Dean, 1931, could also belong to *C. hoeksemai* (see fig. 83g-i). Because of the small size of the fragments and the similarity of the two species some doubts remain about these identifications.

C. hoeksemai spec. nov. is similar to *C. intermedia* (Thomson & Dean, 1931), but differs in having more slender supporting bundle spindles, somewhat longer and more slender point spindles, and different stalk sclerites. It also resembles *C. imperfecta* spec. nov., but the latter species has almost smooth internal spindles, whereas *C. hoeksemai* spec. nov. has distinctly ornamented ones.

Chromonephthea hornerae spec. nov.
(figs 84b-86, 158-159, 176b)

Material examined.— NTM C2777, **holotype**, Australia, NT, Darwin, off East Point, 12°24.70'S 130°48.40'E, 15 m, 9.xi.1982, coll. P. Alderslade; RMNH Coel. 33003, 4 ms of holotype.

Description.— The holotype is 6 cm long and 4 cm wide, stalk hardly present (fig. 176b). Polyps are up to about 0.60 mm wide and 0.75 mm high.

Supporting bundle.— Projecting up to 0.40 mm (fig. 85a); larger spindles have complex tubercles and a projecting part spiny, occasionally a short smooth terminal spine (fig. 85d). Length of these spindles is up to about 1.60 mm.

Points.— Ventrally 6-8 spindles per point, laterally 10-12, dorsally up to 14 (fig. 85a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.35 mm long, with a few complex tubercles, and a spiny outer side and distal end (fig. 85b). Between the points a few to four intermediate sclerites are often present. Tentacles contain a few flattened rods, up to 0.12 mm long, with scalloped edge; the largest with a few simple tubercles (fig. 85c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.25 mm long (fig. 85e). Most of them are unilaterally spinose, and most have complex tubercles. Larger ones merge into unilaterally spinose spindles which are up to 0.50 mm long, with complex tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.20 mm long. The larger ones have complex tubercles (figs 84b, 86a).

Interior stalk.— Spindles, up to 1.00 mm long, with simple sparse tubercles (fig. 86b-c).

Colour.— Colony with reddish to purple stalk and main branches, end branches

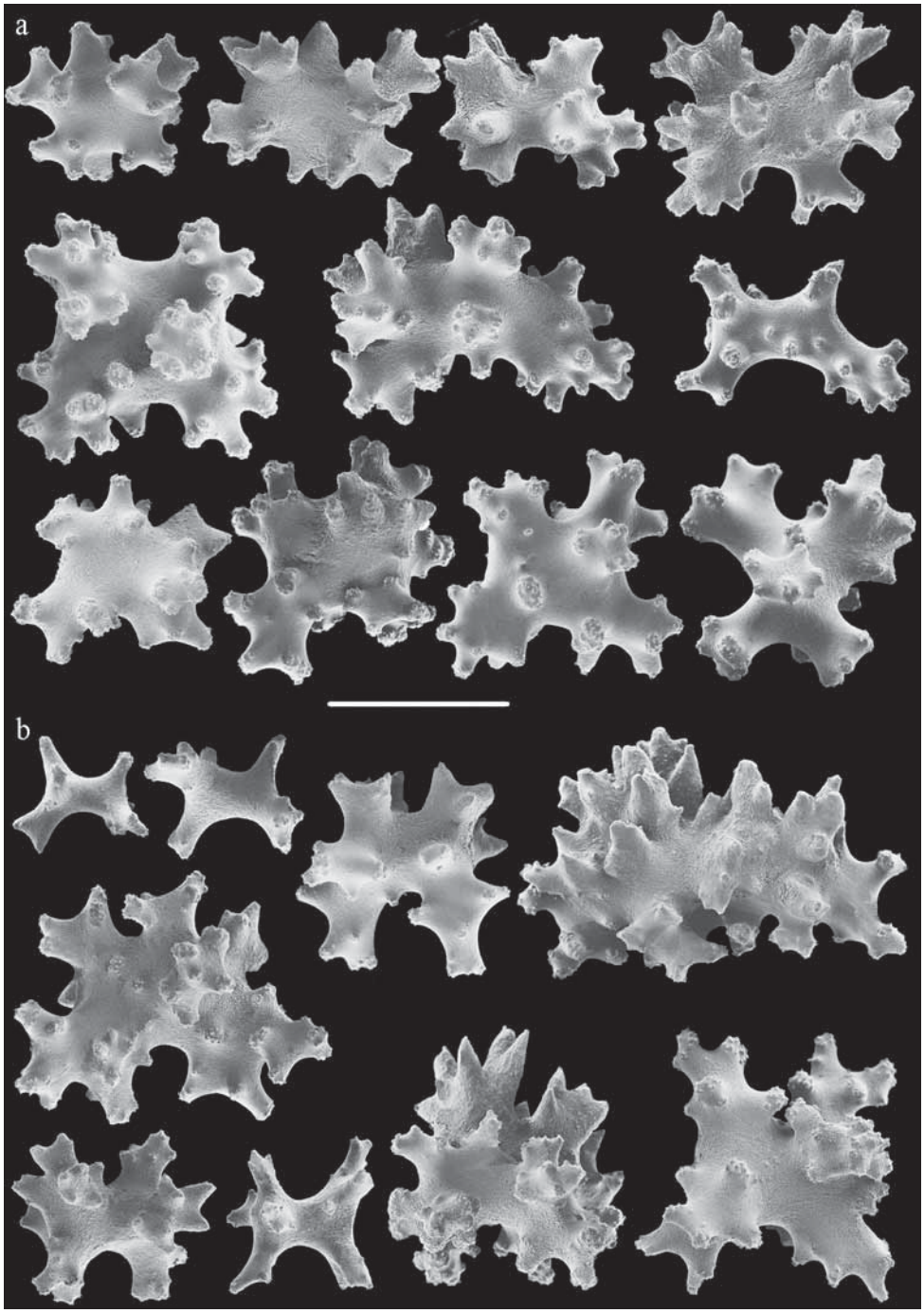


Fig. 84. Sclerites, surface layer base of stalk; a, *Chromonephthea hoeksemai* spec. nov., holotype RMNH Coel. 32623; b, *Chromonephthea hornerae* spec. nov., holotype NTM C2777. Scale 0.10 mm.

and polyps yellow, point spindles yellow, sclerites of supporting bundle faint yellow, branches with colourless sclerites. Top of the stalk with orange sclerites, base with pink ones. Interior spindles are orange.

Etymology.— Named after Ms Sue Horner, technical officer of the NTM, in appreciation of the work involved with handling all of the NTM *Chromonephthea* species on loan.

Remarks.— Probably the species has a very short stalk, hardly any remaining part is present but the sclerites sampled from the base of the colony show characteristics of those expected for the base of the stalk, viz. lacking unilaterally directed spines.

The only other species of *Chromonephthea* in the Darwin region with internal spindles is *C. brevis* spec. nov. It differs from *C. hornerae* spec. nov. in having radiates in the

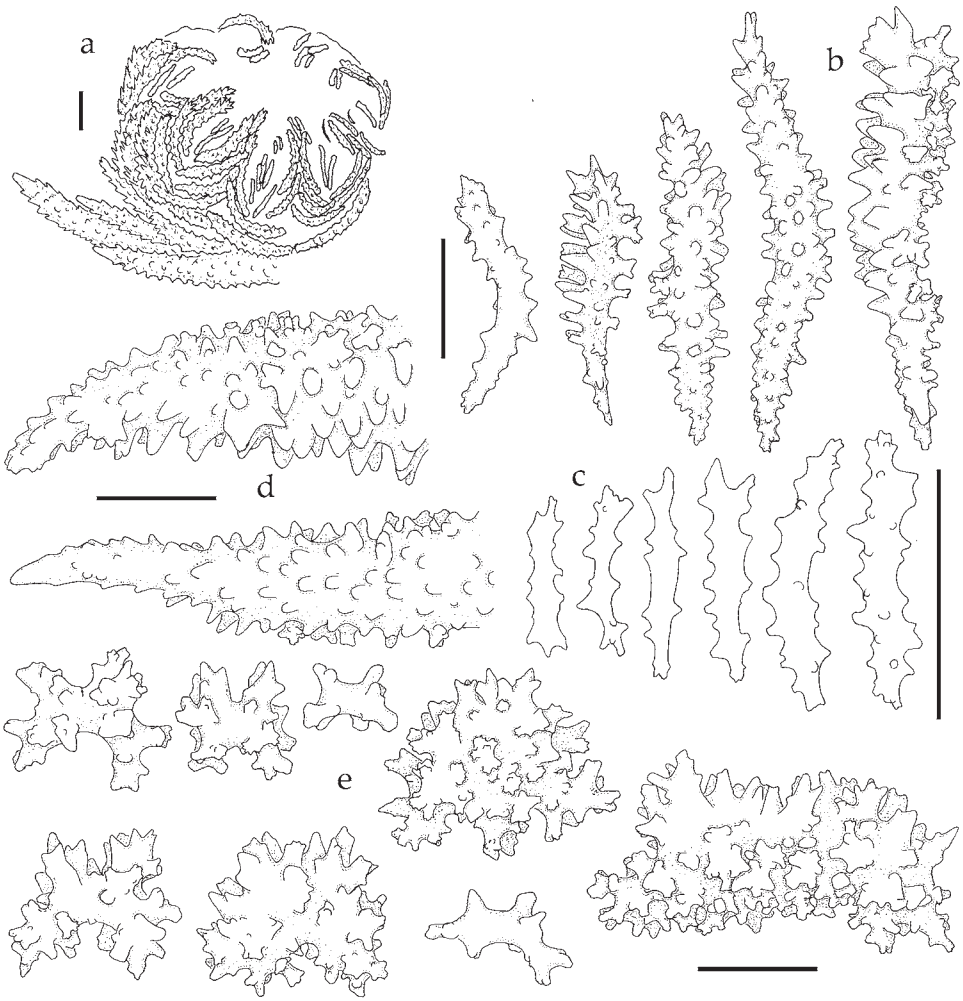


Fig. 85. *Chromonephthea hornerae* spec. nov.; holotype NTM C2777; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

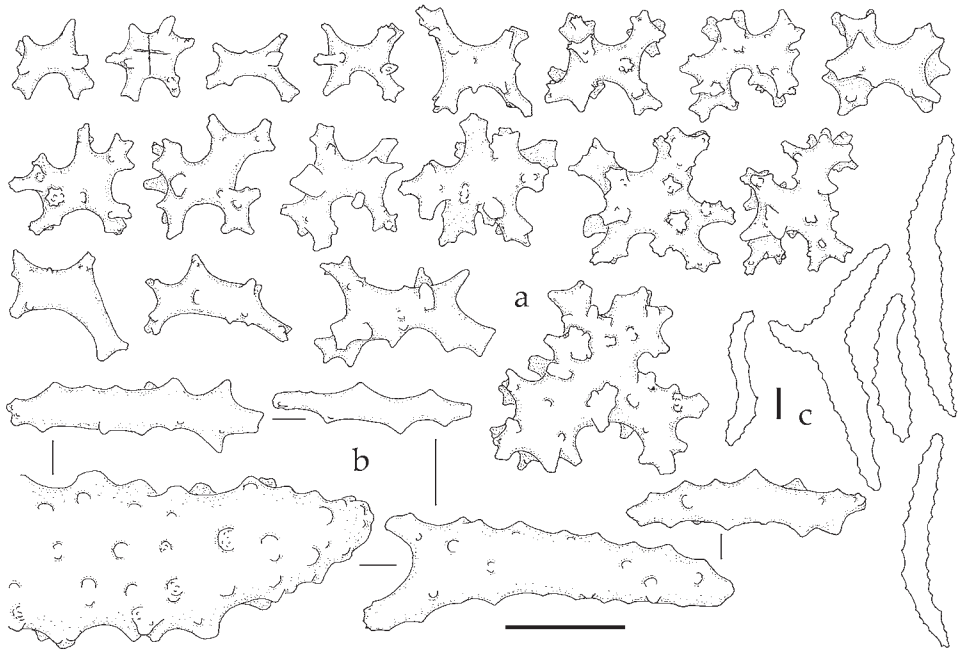


Fig. 86. *Chromonephthea hornerae* spec. nov.; holotype NTM C2777; a, sclerites of surface layer base of colony; b-c, spindles, interior of stalk, c, outlines only. Scales 0.10 mm, scale at b also applies to a.

base of the stalk that show a much more complex ornamentation, and point sclerites being wider and more spinose.

Of the six species of *Stereonephthya* that were identified by Utinomi (1971) from the Darwin region three were reported from East Point, viz. *Stereonephthya costatofulva*, *S. costatocyanea*, and *S. longicaulis*. Here they are considered to belong to *C. variabilis* spec. nov. (see description of that species).

Chromonephthea imaharai spec. nov.
(figs 87-88, 155, 175h)

Material examined.— USNM 90340, **holotype**, North Pacific Ocean, Sea of Japan, Japan, Saga, Korea Strait, eastern channel, NE of Okino Island, 34º18'30"N 130º14'30"E, Northwest Pacific Expedition, Albatross sta. 4878, 2.viii.1906, 108 m; RMNH Coel. 33396, 4 ms of holotype; USNM 1024430, **paratype**, same data as holotype; RMNH Coel. 33397, 4 ms of paratype.

Description of holotype.—The holotype is 5 cm in diameter (fig. 175h), and the stalk is almost completely missing. Polyps are up to about 0.90 mm wide and 0.80 mm high. Polyp stalks short.

Supporting bundle.— Projecting for up to 0.20 mm (fig. 87a); larger supporting bundle spindles up to 2.00 mm long, and up to 0.25 mm wide, with complex tubercles and a spiny projecting end (fig. 87f).

Points.— Ventrally about 2-4 spindles per point, laterally 2-4, dorsally up to 4-6 (fig.

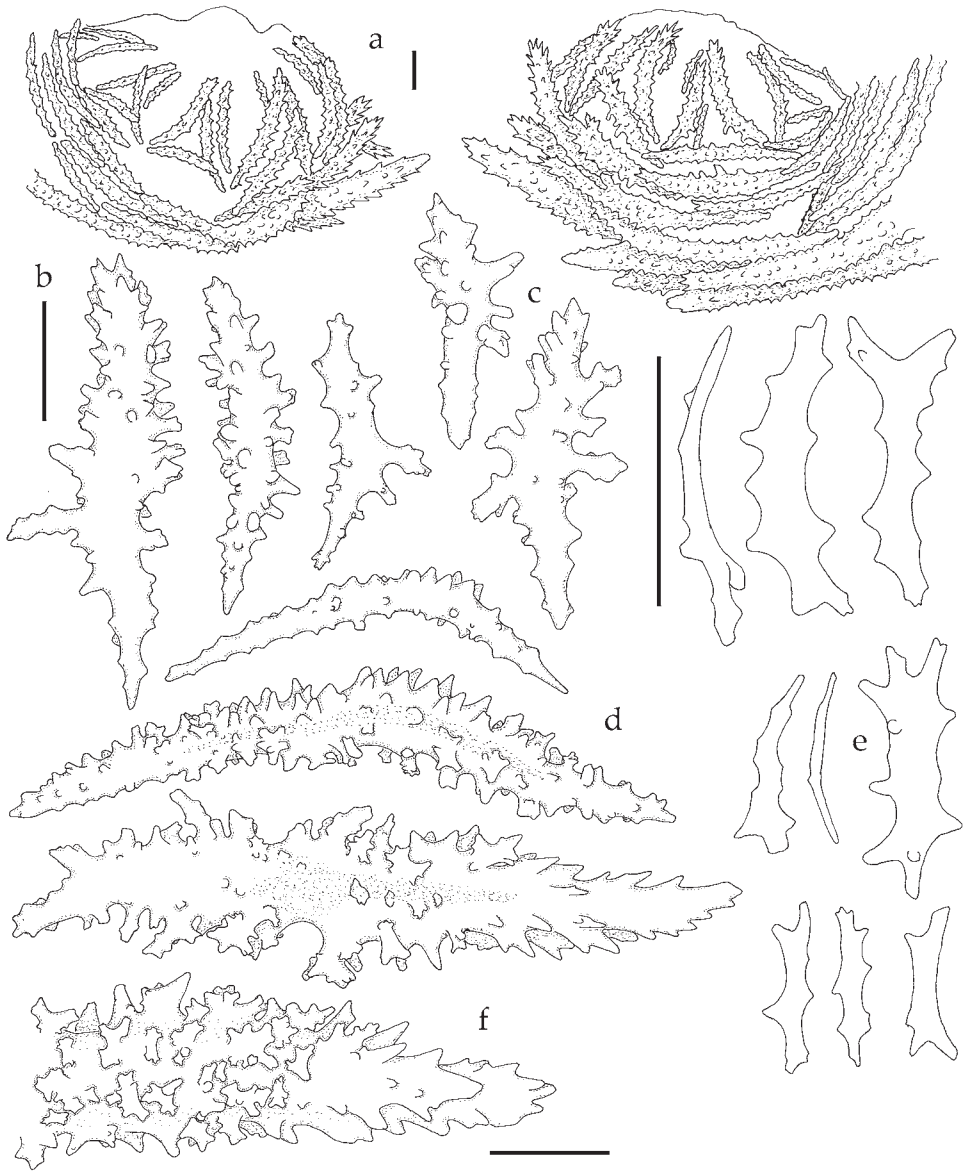


Fig. 87. *Chromonephthea imaharai* spec. nov.; holotype USNM 90340 and paratype USNM 1024430, a, lateral views of polyp armature; b-c, point spindles (c from paratype); d, "collaret" spindles; e, tentacular rods; f, spindle of supporting bundle (part). Scales 0.10 mm, scale at f also applies to d.

87a). The smallest spindles are present ventrally, up to 0.25 mm long, with few simple tubercles. Laterally they are up to 0.30 mm long, also with simple tubercles and a spiny distal end. Dorsally they are up to 0.40 mm long, with simple tubercles and a spiny outer side and distal end (fig. 87b). Below the points a kind of collaret is present, horizontally placed spindles with spiny middle part, or with one spiny end (fig. 87d). Both

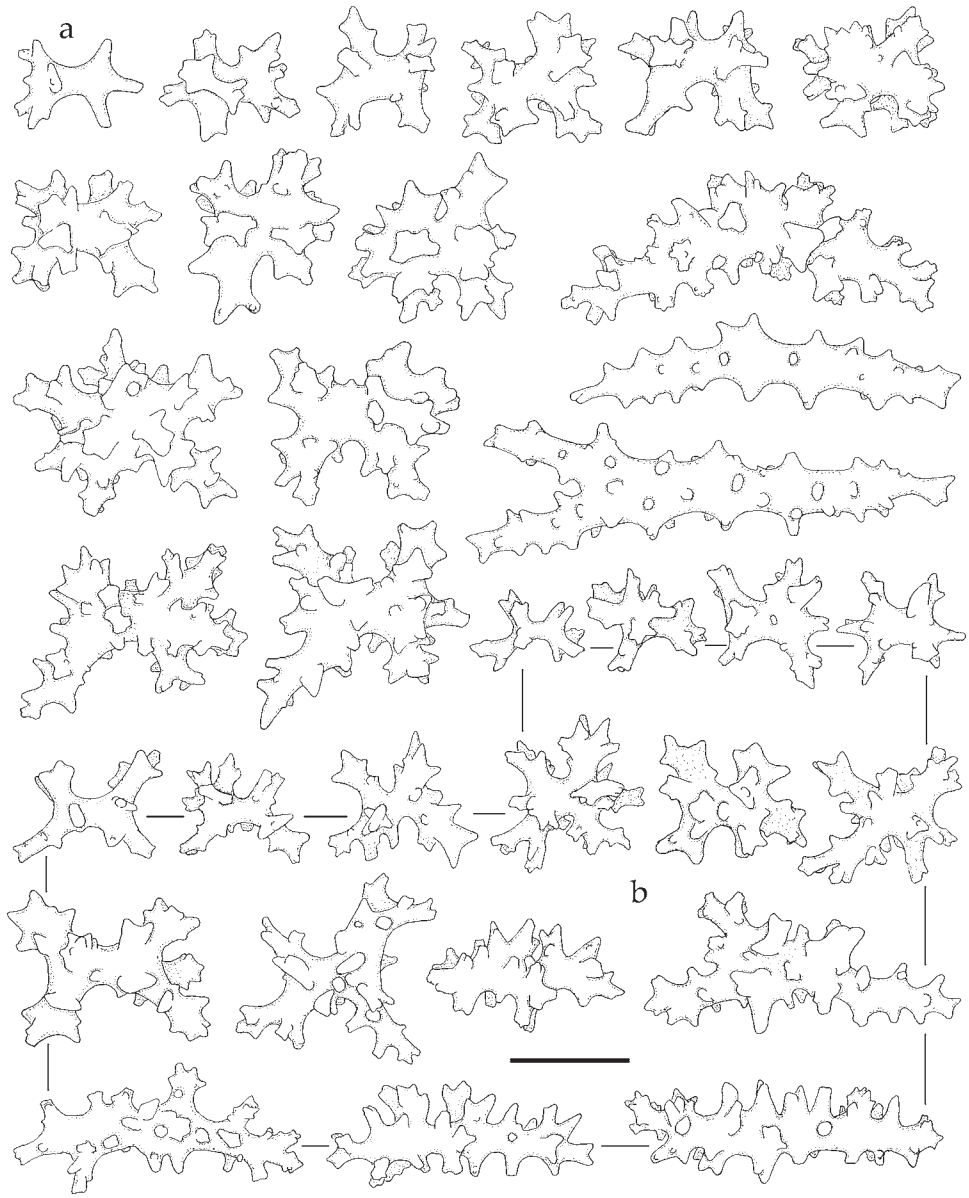


Fig. 88. *Chromonephthea imaharai* spec. nov.; holotype USNM 90340 and paratype USNM 1024430; sclerites, surface layer base of colony; a, holotype; b, paratype. Scale 0.10 mm.

point and collaret spindles often possess side branches. Between the points an intermediate sclerite may be present, up to 0.20 mm long. Tentacles have flattened rods, up to 0.20 mm long, with scalloped edge (fig. 87e).

Surface layer base of colony.— Radiates and derivatives of these, up to 0.20 mm long, many slightly unilaterally spinose, with simple tubercles (fig. 88a). Furthermore,

spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, also with simple tubercles.

Interior stalk.— Without sclerites.

Colour.— Supporting bundle spindles orange, with colourless projecting part, collaret and point sclerites yellow, all other sclerites colourless.

Etymology.— Named after octocoral researcher Dr Yukimitsu Imahara, Wakayama Prefectural Museum of Natural History, Kainan City, Japan.

Remarks.— The holotype and paratype both have the same colour, white with reddish supporting bundles and white to yellow polyps. The paratype is also lacking most of the stalk. Considering the colony shape, with branches spreading out, the species probably has a very short stalk. The paratype has somewhat smaller polyps and somewhat smaller sclerites in the base of the colony (fig. 88b).

The polyp armature of this species is similar to that of *Chromonephthea cairnsi* spec. nov., but in that species the polyp sclerites have much stronger spines. The stalk sclerites are similar to those of *C. serratospiculata* (Utinomi, 1951), but the latter has a much stronger supporting bundle.

Chromonephthea imperfecta spec. nov.
(figs 89-91a, 158, 171c)

Material examined.— QM G324171, **holotype**, Australia, Qld, Gladstone, Rat Is., 23°46.00'S; 151°19.00'E, 0.5 m, 30.viii.1974, coll. P. Alderslade; RMNH Coel. 33008, 4 ms of holotype.

Description.— The holotype is 10 cm long and 8 cm wide, and the stalk is completely missing (fig. 171c). Polyps are up to about 0.60 mm wide and 0.90 mm high.

Supporting bundle.— Hardly projecting (fig. 89a); larger spindles with simple tubercles and distal outer side spiny (fig. 89d). Length of these spindles is up to about 0.95 mm.

Points.— Ventrally 2-6 spindles per point, laterally 10-12, dorsally 14 (fig. 89a). The smallest spindles are present ventrally, up to 0.15 mm long, almost smooth, with scalloped edge. Laterally they are up to 0.25 mm long, dorsally up to 0.40 mm long, with simple tubercles and a spiny outer side and distal end (fig. 89b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 89c); the largest are arranged longitudinally, while some smaller ones on top are transverse.

Surface layer halfway up stem.— Radiates and derivatives of these, up to 0.20 mm long (fig. 89e). Many are unilaterally spinose and most have simple tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.25 mm long, mostly with simple tubercles (figs 90a, 91a). Only few are unilaterally spinose, and many are somewhat square in shape.

Interior stalk.— Spindles with simple sparse tubercles (figs 89f, 90b-c), the smaller ones almost smooth (figs 89f, 90b). Length of these spindles is up to about 1.80 mm.

Colour.— Colony dark red with yellow polyps. Tentacle rods colourless, point sclerites yellow, all other sclerites orange.

Etymology.— The Latin “imperfecta”, incomplete, refers to the absence of a stalk.

Remarks.— The specimen was tentatively identified by Verseveldt (unpublished) as *Nephthea australis* Kükenthal, 1910, a species synonymized in this paper with *Chromonephthea rubra* (Kükenthal, 1910). *C. imperfecta* spec. nov. differs from *C. rubra* in having larger stalk radiates, more slender point sclerites, and more sparsely ornamented internal stalk spindles.

The species resembles *C. costatofulva* (Burchardt, 1898). It shows somewhat similar internal spindles, and the unilaterally spinose radiates are also rather similar. However, it differs in having point and supporting bundle sclerites with simple tubercles, different

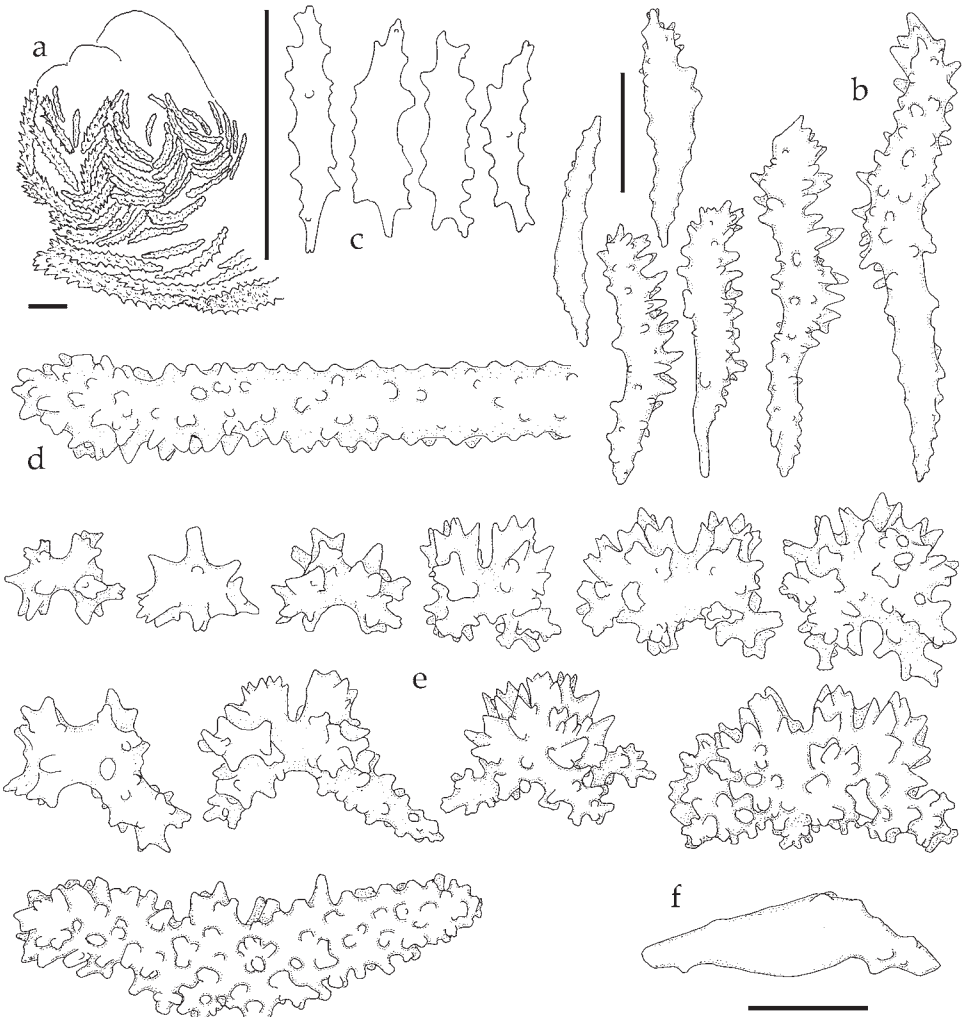


Fig. 89. *Chromonephthea imperfecta* spec. nov.; holotype QM G324171; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer halfway up stem; f, spindle, interior halfway up stem. Scales 0.10 mm, scale at f applies to d-f.

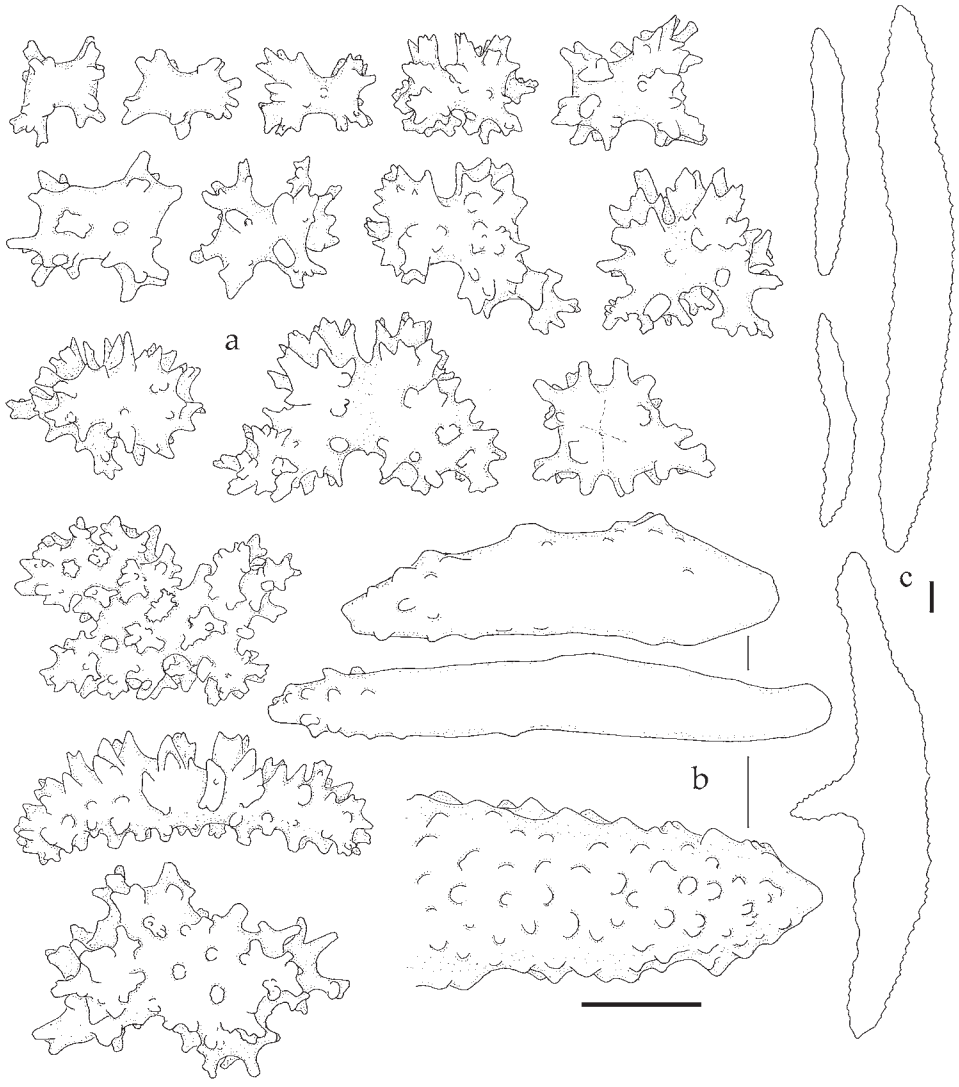


Fig. 90. *Chromonephthea imperfecta* spec. nov.; holotype QM G324171; a, sclerites, surface layer base of colony; b-c, spindles, interior base of colony, c, outlines only. Scales 0.10 mm, scale at b also applies to a.

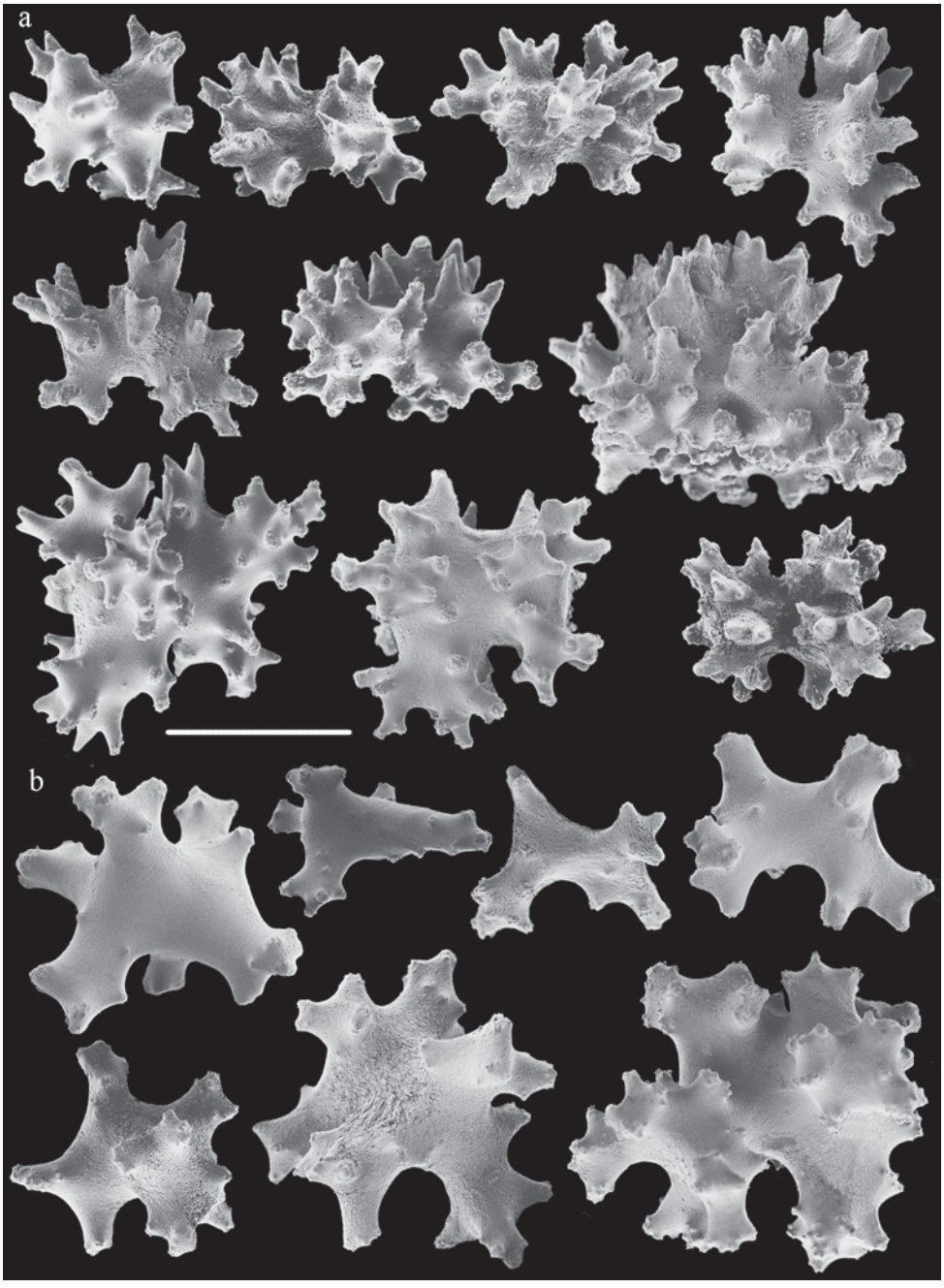


Fig. 91. Sclerites, surface layer base of colony / stalk; a, *Chromonephthea imperfecta* spec. nov., holotype QM G324171; b, *Chromonephthea levis* spec. nov.; holotype NTM C3336. Scale 0.10 mm.

colour pattern, and the presence of somewhat square derivatives of radiates. The species also resembles *C. hoeksemai*. spec. nov., but the latter has more ornamented internal spindles while its radiates are less ornamented.

Chromonephthea inermis (Holm, 1894)
(figs 92-94, 155)

Nephthya inermis Holm, 1894: 19, pl. 1 figs 4-6 (Japan).
? *Nephthya inermis*; Hickson, 1903: 487 (Maldives, Kolumadulu Atoll).
Not *Nephthya inermis*; Thomson & Dean, 1931: 87 (Indonesia).

Material examined.— Uppsala 86, **syntype**, Japan, Hirudo Strait, 35°5'N 129°16'E, 36 faden, coll. E. Suenson; RMNH Coel. 33398, 4 ms of Uppsala 86; Stockholm 1129, **syntype**, same data as Uppsala 86; RMNH Coel. 33399, 4 ms of Stockholm 1129.

Description (Stockholm 1129 and Uppsala 86).— The Stockholm syntype is 4 cm long and 3 cm wide (fig. 92a), the Uppsala syntype 5.5 cm long and wide (fig. 92b). Polyps are up to about 1.00 mm wide and high. The description of the sclerites is mostly based on the Uppsala specimen.

Supporting bundle.— Hardly projecting (fig. 93a-b); larger spindles have complex tubercles on the inner side, spines on the outer side, and a spiny projecting end (fig. 93e). Length of these spindles is up to about 1.60 mm. The innermost spindles becoming smaller and often some form a kind of collaret, with spines in the middle part of the spindles (largest spindle of fig. 93c).

Points.— Ventrally 2-6 spindles per point, laterally 4-6, dorsally up to 8 (fig. 93a-b). The smallest spindles are present ventrally, up to 0.25 mm long, with simple tubercles. Laterally they are up to 0.40 mm long, with simple tubercles, and with a spiny distal end. Dorsally the spindles are up to 0.50 mm long, with simple and a few complex tu-

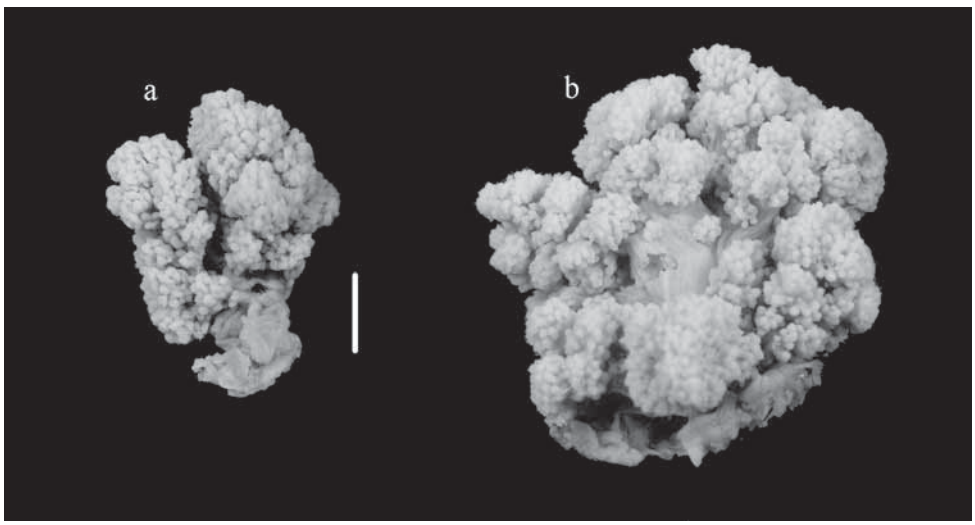


Fig. 92. *Chromonephthea inermis* (Holm, 1894); a, syntype Stockholm 1129; b, syntype Uppsala 86. Scale 1 cm.

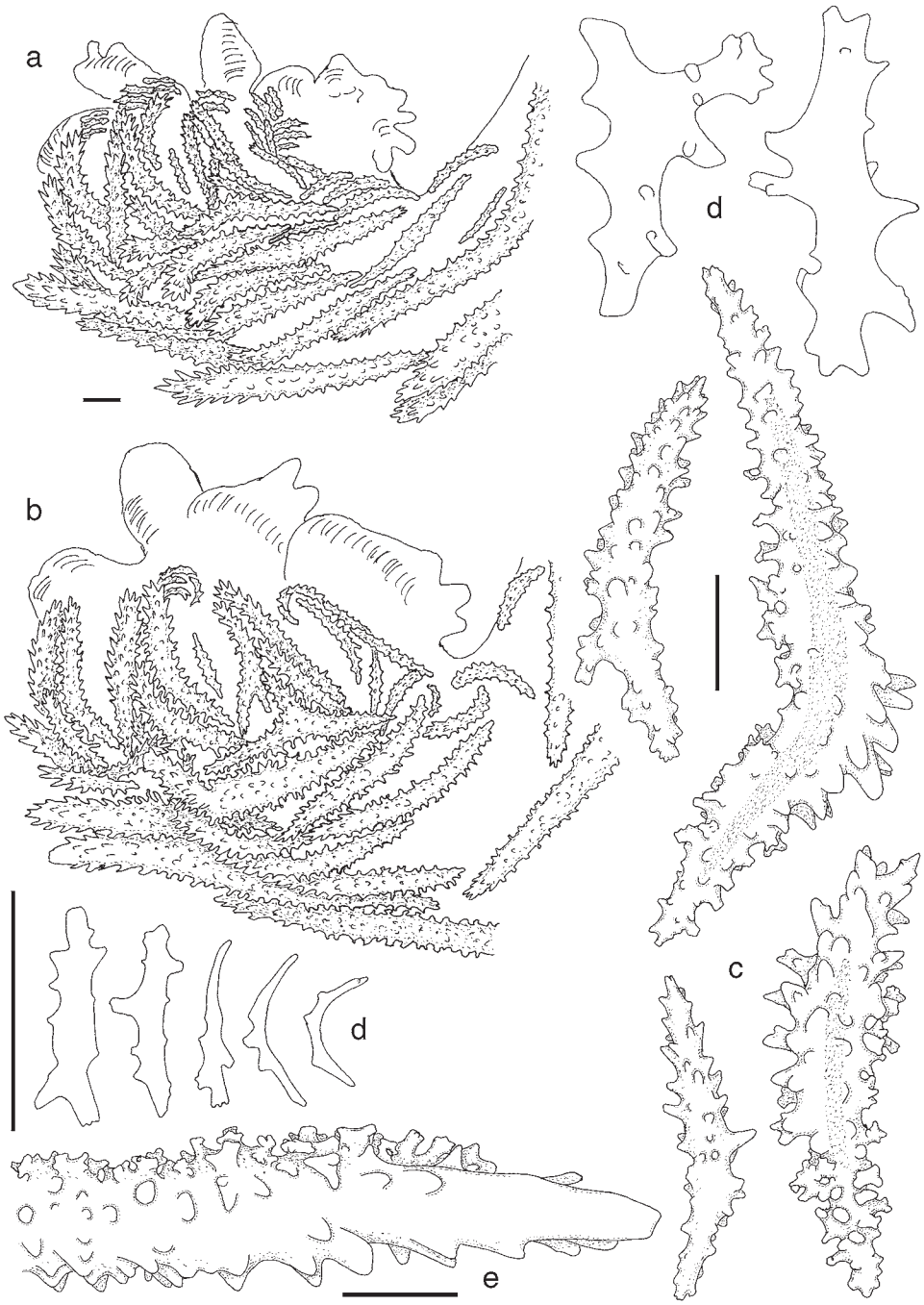


Fig. 93. *Chromonephthea inermis* (Holm, 1894); b, syntype Stockholm 1129, others syntype Uppsala 86; a-b, lateral views of polyp armature; c, point and collaret spindles; d, tentacular rods; e, spindle of supporting bundle (part). Scales 0.10 mm.

bercles and a spiny outer side and distal end (fig. 93c). Between the points an intermediate sclerite may be present. Tentacles have flattened rods, up to 0.15 mm long, with scalloped edge (fig. 93d).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with complex tubercles (fig. 94a). Several of them are slightly unilaterally

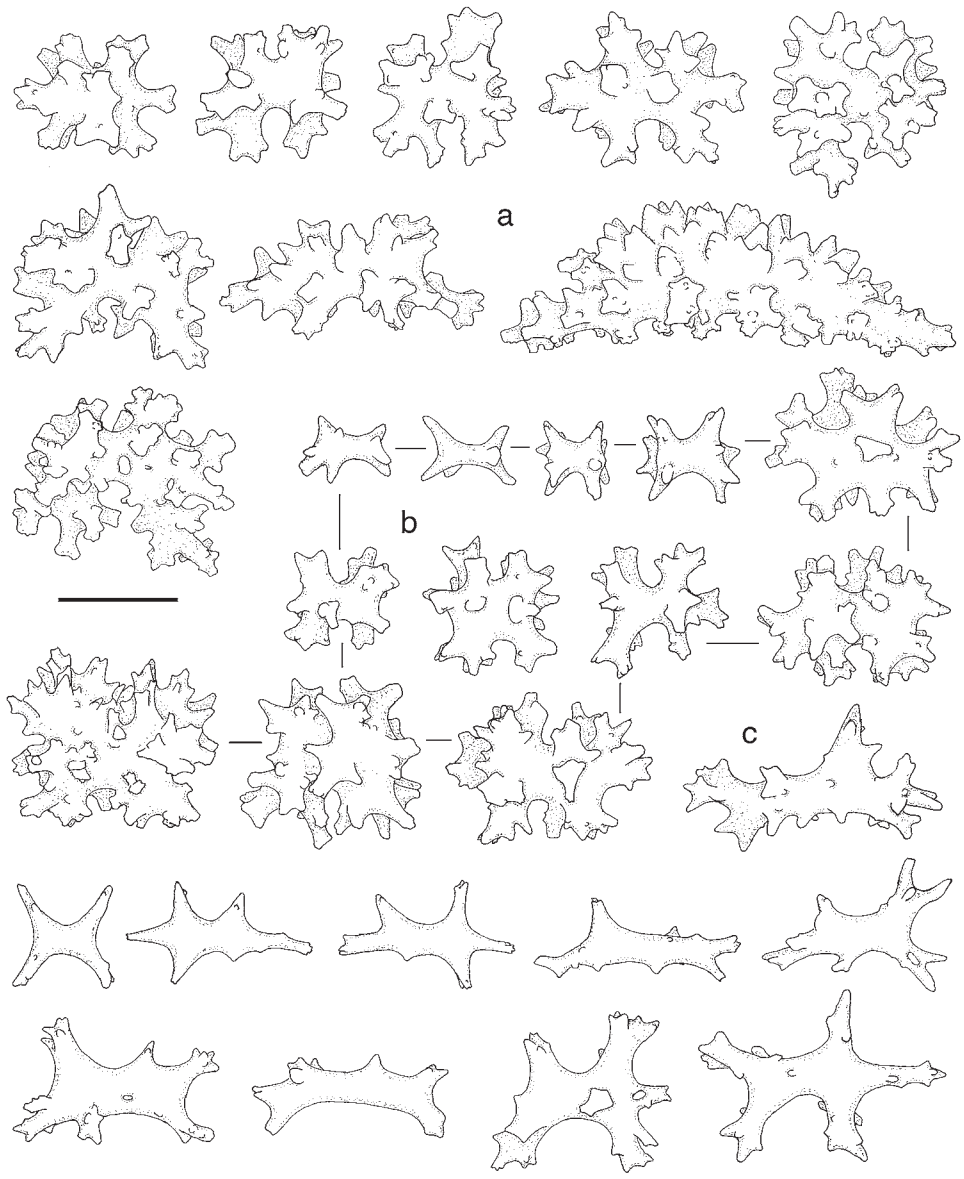


Fig. 94. *Chromonephthea inermis* (Holm, 1894); syntype Uppsala 86; a, sclerites, surface layer top of stalk; b, sclerites, surface layer base of stalk; c, sclerites of base interior. Scale 0.10 mm.

spinose. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.70 mm long, with simple and a few complex tubercles (fig. 94a).

Surface layer base of stalk.— Radiates and derivatives of these, similar to those of the top of the stalk, though less unilaterally spinose ones occur (fig. 94b).

Interior stalk.— In the base there are radiates and derivatives of these, up to 0.20 mm long, all with hardly any tubercles (fig. 94c).

Colour.— Colonies white, all sclerites colourless.

Variability.— In the Stockholm syntype the larger point sclerites often have some short side branches. For comparison the sclerite arrangement of a polyp of this syntype was also drawn (fig. 93b).

Remarks.— This is the only *Chromonephthea* species showing radiates in the interior. *Chromonephthea spinosa* spec. nov. has a few similarly shaped sclerites but these were found in the surface layer. In *Chromonephthea* it is not uncommon to find some less tuberculate radiates in the subsurface layer of the stalk, but their occurrence in the interior of *C. inermis* can be seen as an extreme example. The group of *Dendronephthya* species showing antlers in the interior may have evolved from a species such as *C. inermis*.

Hickson (1903) reported the species from the Maldives, without any description. This is a doubtful record bearing in mind the limited distribution of all species described here.

Thomson & Dean (1931) identified specimens from Indonesia as *Nephthya inermis*. Since they mentioned the canal walls with "massive 3-rayed and 4-rayed forms as well as the ordinary spindles" it cannot be *N. inermis*, because it does not have spindles in the canal walls.

Chromonephthea intermedia (Thomson & Dean, 1931)
(figs 95-98, 156, 171a-b)

Dendronephthya intermedia (in part) Thomson & Dean, 1931: 107, pl. 1 figs 2, 6 (Indonesia); van Soest, 1977: 90.
Not *Spongodes intermedia*; Tixier-Durivault & Prevorsek, 1959: 27 (Japan).
Nephthya chabrolii (in part); Thomson & Dean, 1931: 83 (Indonesia).
Not *Nephthea chabrolii* Andouin, 1828: 49.

Material examined.— ZMA COEL. 2454, *Dendronephthya intermedia*, **lectotype** (here designated), Siboga sta 272, Indonesia, Aru Islands, Dobo, 21-23.xii.1899, reef-exploration, 31 m; RMNH Coel. 33400, 6 ms of lectotype; other material: ZMA COEL. 2937, 1 specimen (identified as *Nephthya chabrolii* by Thomson & Dean, 1931), Siboga sta. 258, Indonesia, Kei islands, Tual anchorage, 12-16.xii.1899, 22 m, Lithothamnion, sand and coral, reef exploration, dredge; RMNH Coel. 33401, 5 ms of ZMA COEL. 2937; ZMA COEL. 2932, 1 specimen (identified as *Nephthya chabrolii* by Thomson & Dean, 1931), same data as ZMA COEL. 2937; RMNH Coel. 33402, 5 ms of ZMA COEL. 2932; ZMA COEL. 2933, 2 specimens (identified as *Nephthya chabrolii* by Thomson & Dean, 1931), same data as ZMA COEL. 2937; RMNH Coel. 33403, 5 ms of ZMA COEL. 2933; RMNH Coel. 2977, 1 specimen, same data as ZMA COEL. 2937; ZMA COEL. 2935, 4 specimens (identified as *Nephthya chabrolii* by Thomson & Dean, 1931), Siboga sta 164, Indonesia, Galewo Strait, off Salawatti Island; 1°42.5'S 130°47.5'E, dredge, 32 m, sand and shells. 20.viii.1899; RMNH Coel. 33404, 8 ms of ZMA COEL. 2935; RMNH Coel. 2978, 1 specimen, same data as ZMA COEL. 2935.

Description.— The lectotype is a few cm high (fig. 171a), with a spreading base. Polyps are up to about 0.60 mm wide and 0.80 mm high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 96a); larger spindles have spines on the outer surface and simple tubercles on the inner side (fig. 96c). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally 6-8 spindles per point, laterally 12-14, dorsally up to 16 (fig. 96a). The smallest spindles are present ventrally, up to 0.15 mm long, with few simple tubercles. Laterally they are up to 0.20 mm long, also with simple tubercles. Dorsally they are up to 0.25 mm long, with simple tubercles and a spiny outer side and distal end (fig. 96b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 96d). Most of them are unilaterally spinose and with simple tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.15 mm long, all with simple tubercles (fig. 96f). Furthermore, a few spindles are also present, up to 0.20 mm long, with simple tubercles.

Interior stalk.— Unbranched spindles, up to about 1.50 mm long, with simple tubercles (fig. 96e, g).

Colour.— White with orange supporting bundles and polyps. Tentacle and stalk sclerites are colourless; all others orange.

Remarks.— ZMA COEL. 2454 is a mixture of two different species, from two different Siboga stations. Here the specimen from Siboga sta 272 is chosen as the lectotype of *Dendronephthya intermedia* (= holotype of *C. intermedia*), and three tiny fragments from Siboga sta 164 are referred to *C. hoeksemai* spec. nov.

It was difficult to ascertain whether the complete stalk was present in the lectotype (fig. 171a).

Additional material from several different localities is also included in this species: ZMA COEL. 2937 (fig. 171b, whose sclerites are shown in figs 96h, 97b, d, g, i, k, 98b, d-e), two colonies of ZMA COEL. 2933, and the fragment RMNH Coel. 2978, which are whitish with reddish end branches and yellow polyps; ZMA COEL. 2932 (fig. 95a, whose sclerites are shown in figs 97a, c, f, h, j, 98a) and RMNH Coel. 2977 are whitish with orange end branches and polyps (both specimens lacking most of the stalk). One of the ZMA COEL. 2933 specimens has no stalk, and the other (figs 95b, 96i) has somewhat longer interior stalk sclerites than the lectotype, up to 2 mm long, while its polyps showed disintegrated sclerites. ZMA COEL. 2935 consists of seven small colonies, with variable length of stalk preserved. Four of them belong to this species (fig. 95c-f, whose sclerites are shown in figs 97e, 98c, f), three are identified as *C. hoeksemai* spec. nov. (fig. 170b-d).

The fragmentary nature of several of the specimens and uncertainty about stalk length in others make it difficult to identify most of the above mentioned material with certainty.

The specimen from Japanese waters identified by Tixier-Durivault & Prevorsek (1959: 27) as *Spongodes intermedia* probably also belongs to the genus *Chromonephthea*. It certainly is not *Chromonephthea intermedia* as it has large tentacle rods (up to 0.14 mm long), which seem to be typical for the Japanese *Chromonephthea* species (this publication).

Chromonephthea intermedia is similar to *C. hoeksemai* spec. nov (see remarks *C. hoeksemai*). For comparison with the other species of *Chromonephthea* from the Aru Islands see remarks of *C. curvata*.

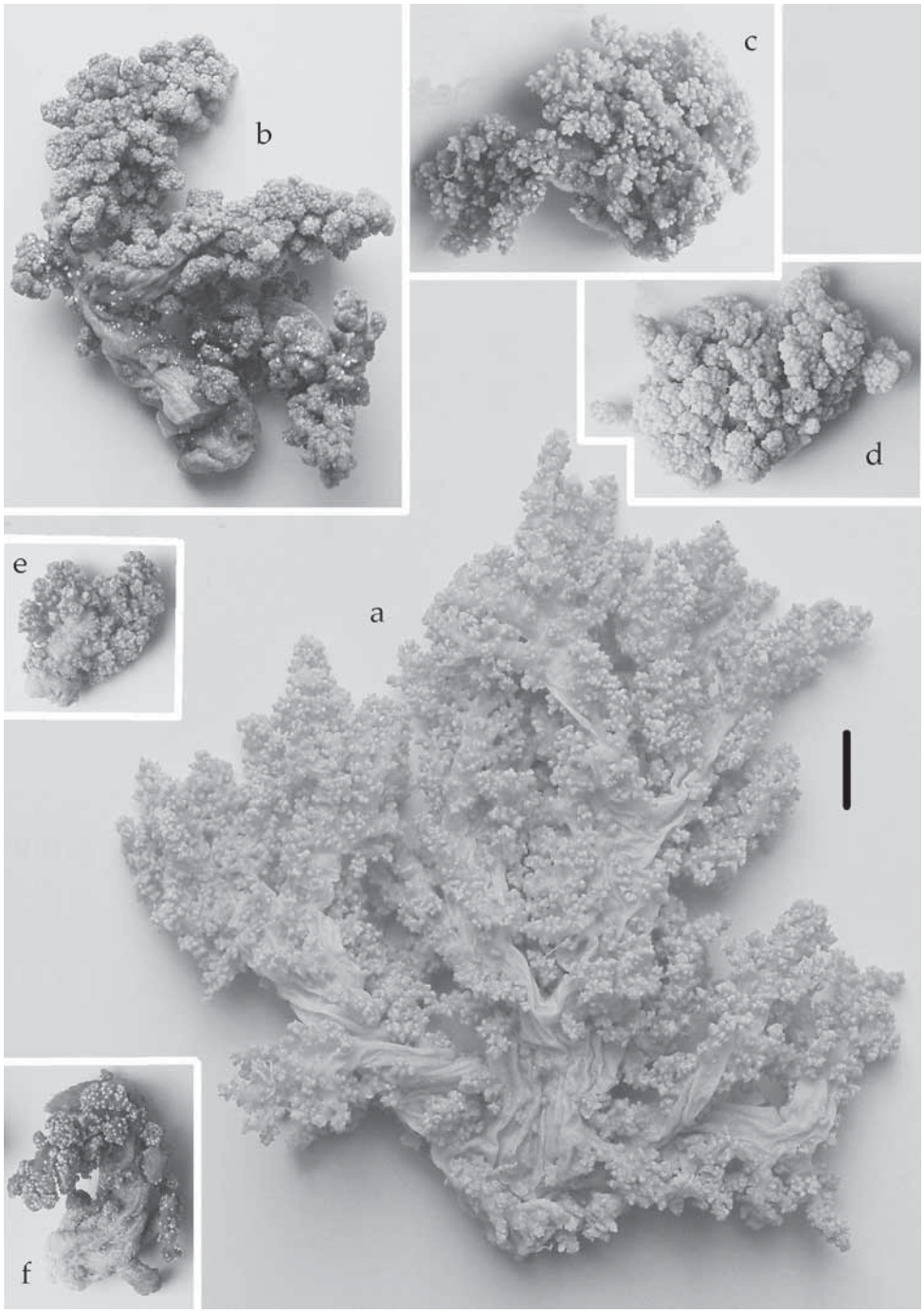


Fig. 95. *Chromonephthea intermedia* (Thomson & Dean, 1931); a, ZMA COEL. 2932; b, ZMA COEL. 2933; c-f, ZMA COEL. 2935. Scale 1 cm.

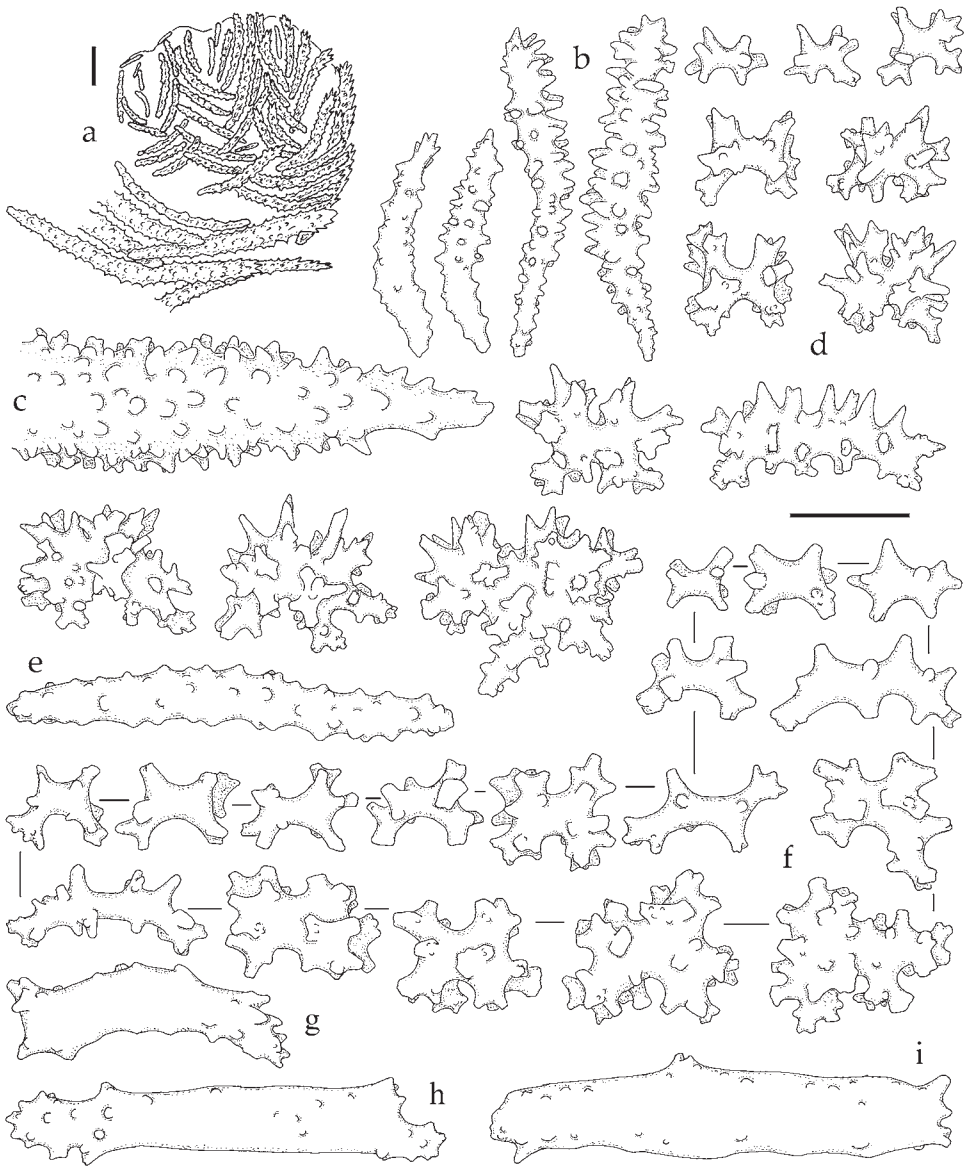


Fig. 96. *Chromonephthea intermedia* (Thomson & Dean, 1931); a-g, lectotype ZMA COEL. 2454 (Siboga sta. 272); h, ZMA COEL. 2937; i, ZMA COEL. 2933; a, lateral view of polyp armature; b, point spindles; c, spindle of supporting bundle (part); d, sclerites, surface layer top of stalk; e, spindle, interior top of stalk; f, sclerites, surface layer base of colony; g-i, spindles, interior of stalk. Scales 0.10 mm, scale at d applies to b-i.

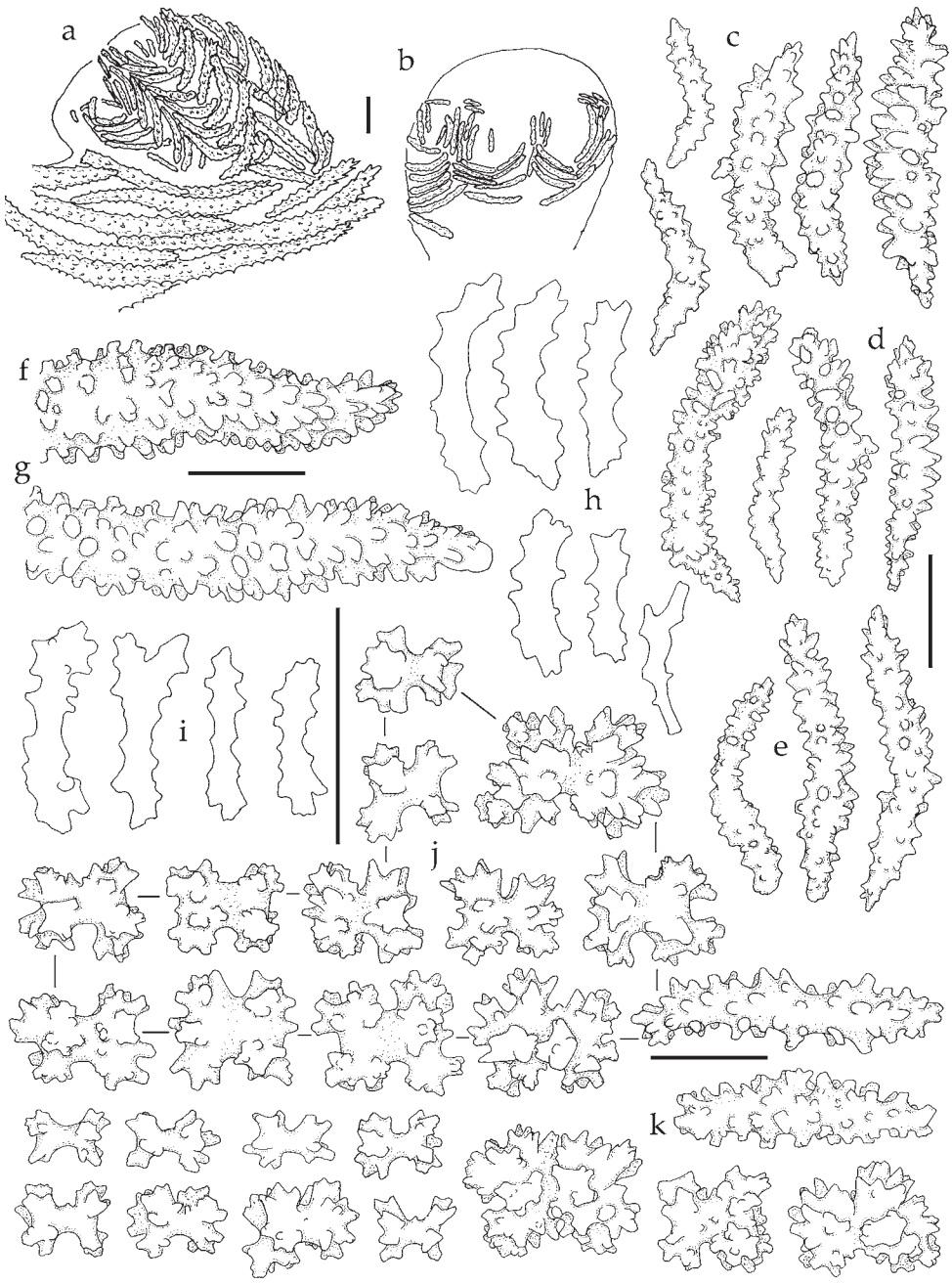


Fig. 97. *Chromonephthea intermedia* (Thomson & Dean, 1931); ZMA COEL. 2932, a, lateral view of polyp armature; c, point spindles; f, spindle of supporting bundle (part); h, tentacular rods; j, sclerites, surface layer top of stalk; ZMA COEL. 2937, b, ventral view of polyp armature; d, point spindles; g, spindle of supporting bundle (part); i, tentacular rods; k, sclerites, surface layer top of stalk; ZMA COEL. 2935 (specimen shown in fig. 95c), e, point spindles. Scales 0.10 mm, scale at k also applies to j, that at i also to h.

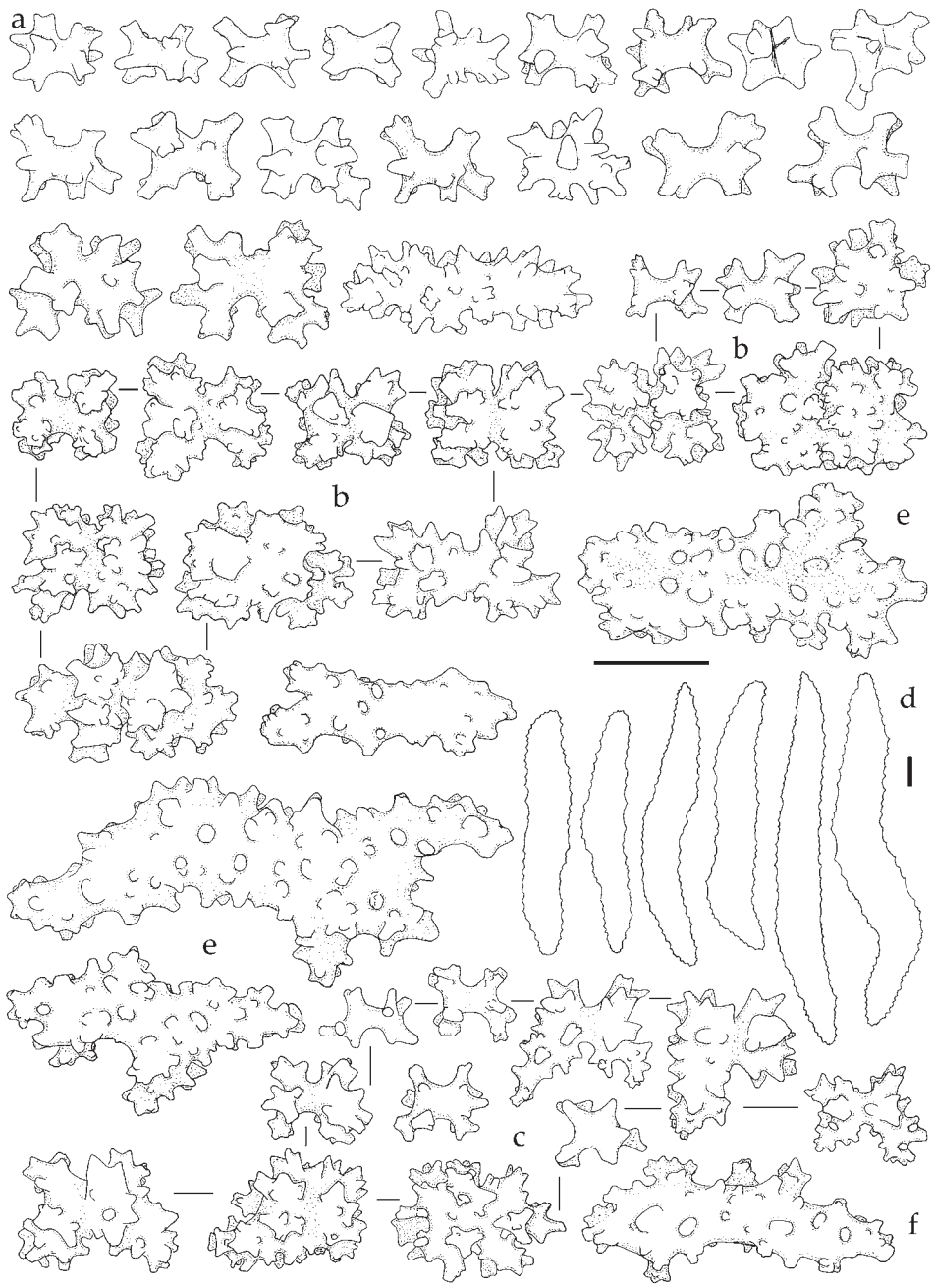


Fig. 98. *Chromonephthea intermedia* (Thomson & Dean, 1931); ZMA COEL. 2932, a, sclerites, base of colony; ZMA COEL. 2937, b, sclerites, base of colony; d, spindles, interior top of stalk, outlines only; e, spindles, interior base of stalk; ZMA COEL. 2935 (specimen shown in fig. 95c), c, sclerites, base of colony; f, spindle interior base of colony. Scales 0.10 mm, scale at d only applies to d.

Chromonephthea levis spec. nov.
(figs 91b, 99-100, 158-159, 175e)

Material examined.— NTM C3336, **holotype**, Australia, NT, Coral Bay, 5-6 m, 18.x.1987, coll. P. Alderslade; RMNH Coel. 33218, 4 ms of holotype.

Description.— The holotype is 5 cm long and 3 cm wide (fig. 175e). Polyps are up to about 0.80 mm wide and 0.60 mm high.

Supporting bundle.— Projecting up to 0.25 mm (fig. 99a); larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 99d). Length of these spindles is up to about 1.80 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-8, dorsally up to 12 (fig. 99a). The smallest spindles are present ventrally, up to 0.15 mm long, almost smooth. Laterally

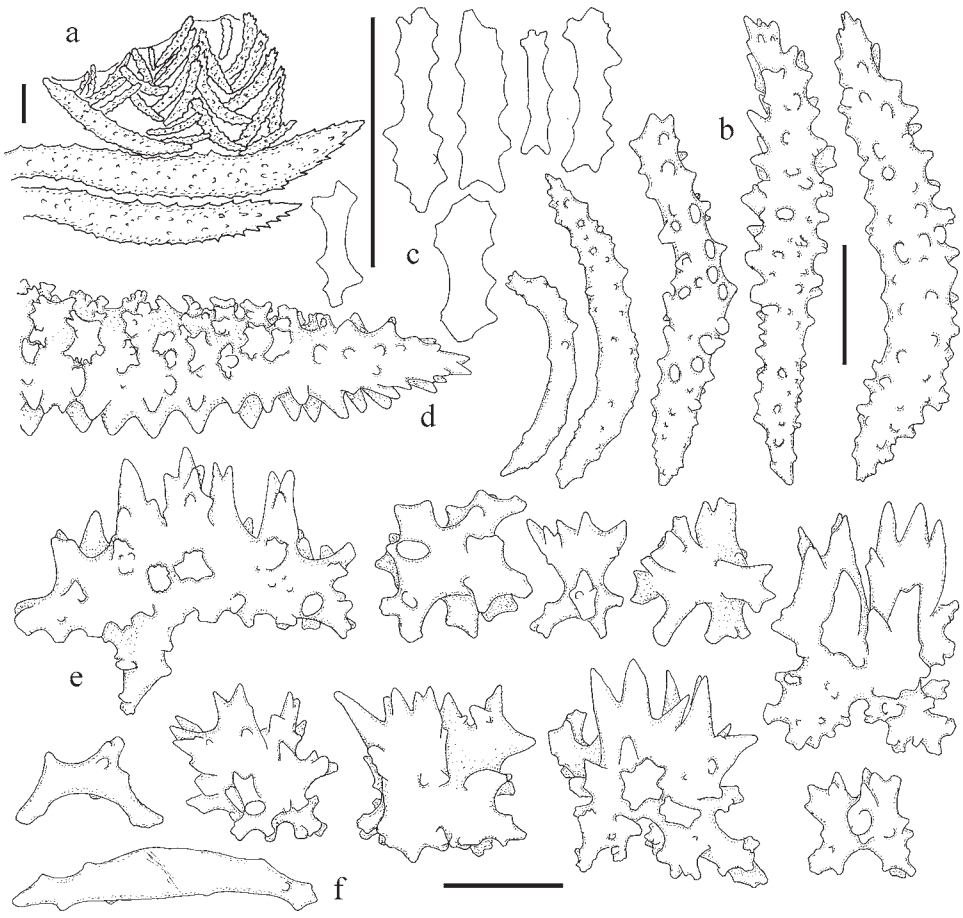


Fig. 99. *Chromonephthea levis* spec. nov.; holotype NTM C3336; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f, spindle, subsurface layer. Scales 0.10 mm, that at f applies to d-f.

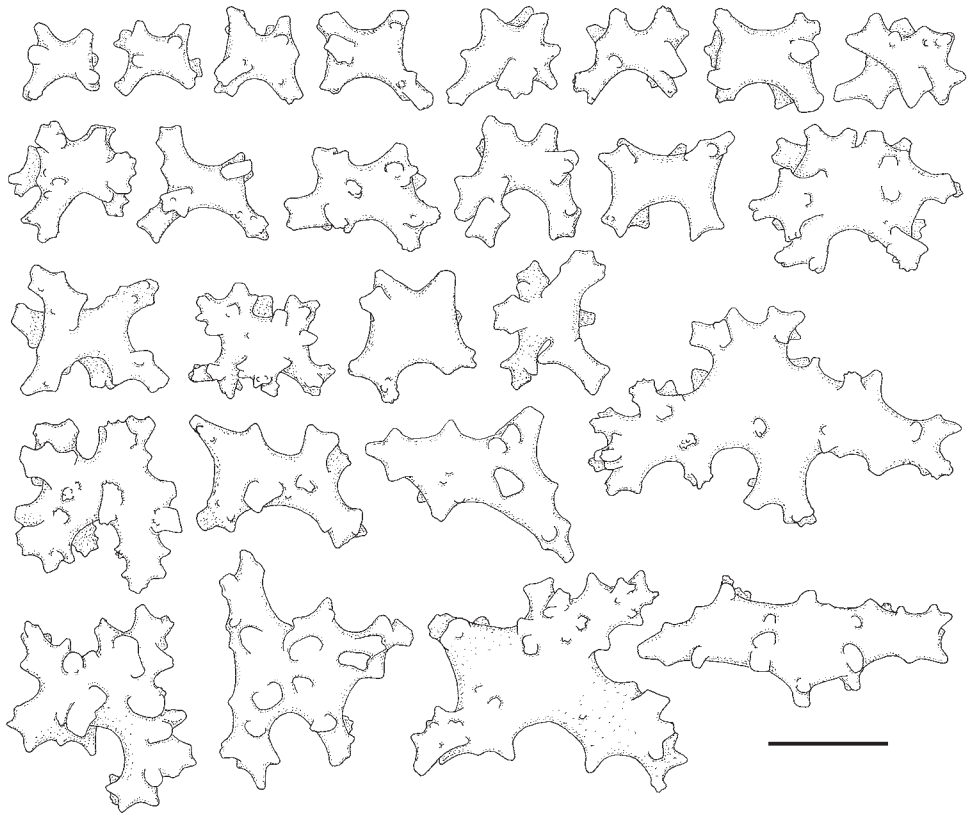


Fig. 100. *Chromonephthea levis* spec. nov.; holotype NTM C3336; sclerites, surface layer base of stalk. Scale 0.10 mm.

they are up to 0.30 mm long, with simple tubercles and a weakly spined distal end. Dorsally they are up to 0.40 mm long, with simple tubercles and weakly spiny outer side and distal end (fig. 99b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 99c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.25 mm long, with simple tubercles (fig. 99e). Several of them are strongly unilaterally spinose. Furthermore, some spindles and weakly unilaterally spinose spindles are also present, up to 0.90 mm long, with simple tubercles. Some small subsurface layer spindles were present in the permanent microscopic slide (fig. 99f). They have very few tubercles and therefore strongly resemble interior spindles. However, an extra check with a temporary slide proved the interior has no sclerites at all.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.20 mm long, all with simple tubercles (figs 91b, 100). Furthermore, a few spindles are also present, up to 0.30 mm long, with simple tubercles.

Interior stalk.— Without sclerites.

Colour.— Colony dark red with orange polyps. Spindles of points and supporting bundle orange, stalk sclerites pink, and tentacle rods colourless.

Etymology.— The Latin "levis", smooth, refers to the weakly ornamented anthocodial spindles.

Remarks.— The species is characterized by the weakly ornamented point spindles. It resembles most *C. obscura* spec. nov., but that species has the point spindles more ornamented and the radiates less spinose.

Chromonephthea lobulifera (Holm, 1894)

Spongodes lobulifera Holm, 1894: 21, pl. 1 fig.7 (Hong Kong and Korea Strait).
? *Nephthya lobulifera*; Thomson & Mackinnon, 1910: 182 (Chagos Archipelago, Egmont).

Material examined.— The type material was kept in Uppsala but seems to be lost (pers. comm. Mats Eriksson, ME).

Description (after Holm, 1894).— Largest colony from Hong Kong is 9.5 cm long, a smaller one from the Korea Strait is 4.5 cm, and a fragment from Hong Kong is 9 cm long. Polyps about 1.10 mm high and 0.95 mm wide, polyp stalks up to about 0.80 mm long.

Supporting bundle.— Projecting little or not at all. Composed of spindles up to 1.80 mm long, and 0.14 mm wide.

Points.— Dorsally with 16-20 spindles per point, ventrally only 6-8. The largest spindles are present dorsally, up to 0.45 mm long. Below the points no horizontally placed spindles are present. Tentacular rods are up to 0.12 mm long.

Surface layer base colony.— "Doppelsterne", up to 0.14 mm long, "doppelkeulen" up to about 0.20 mm long, triradiates and four-radiates up to 0.24 mm long, spindles up to 1.00 mm long.

Interior stalk.— Without sclerites.

Colour.— White with yellow (specimens from Hong Kong and Korea Strait) or yellow-red polyps (Hong Kong fragment).

Remarks.— According to the glossary (Bayer et al., 1983) "doppelsterne" are double stars, and "doppelkeulen" are double clubs. Both types of sclerites do not occur in *Chromonephthea*. As Holm reported them for *C. inermis* as well, I assume these are the sclerites that are called radiates in the present study.

The absence of horizontally placed spindles below the points differentiate this species from all the other N Pacific species, viz. *C. inermis*, *C. hirotai*, *C. serratospiculata*, *C. imaharai*, and *C. cairnsi*.

Thomson & Mackinnon (1910) mentioned *Nephthya lobulifera* from the Chagos Archipelago without giving any description. I consider their identification doubtful bearing in mind the limited distribution of all *Chromonephthea* species described in this study.

Chromonephthea megasclera spec. nov.
(figs 101-103, 158, 172)

Material examined.— WAM Z27501, **holotype**, NW Australia, Rowley Shoals, 19°19.70'S, 119°09.80'E, 50 m, dredge, sand and shellgrit, R.V."Akademik Oparin" 1987 cruise, 3rd Dredge, dredge down 12:44, 19°19.7'S, 119°08.8'E, dredge up 13:30, 19°20.6'S, 119°09.8'E, 19.viii.1987, coll. P. Alderslade; RMNH

Coel. 32544, 5 ms, same data; **paratypes**: NTM C2738, 1 specimen, Station Soela 133, Soela cruise 483, W Australia, North West Shelf, 19°05.70'S, 118°57.40'E, 82-83 m, trawl, sandy bottom, 29.viii.1983, coll. T. Ward; RMNH Coel. 32545, 2 ms, same data; NTM C2739, 1 specimen, Station Soela 127, Soela cruise 483, W Australia, North West Shelf, 19°29.00'S, 118°51.80'E, 37-38 m, trawl, sandy bottom, 30.viii.1983, coll. T. Ward; RMNH Coel. 32546, 2 ms, same data; NTM C2740, Station Soela 125, Soela cruise 483, W Australia, North West Shelf, 19°02.60'S, 119°01.00'E, 84-85 m, trawl, sandy bottom, 29.viii.1983, coll. T. Ward; RMNH Coel. 32547, 2 ms, same data; CAS 171932, 2 specimens, Station Soela 133, Soela cruise 483, W Australia, North West Shelf, 19°05.70'S, 118°57.40'E, 82-83 m, trawl, sandy bottom, 29.viii.1983, coll. T. Ward; RMNH Coel. 32548, 10 ms, same data; USNM 1081588, 2 specimens, Station Soela 111, Soela cruise 483, W Australia, North West Shelf, 19°59.20'S, 117°51.90'E, 40 m, trawl, sandy bottom, 26.viii.1983, coll. T. Ward; RMNH Coel. 32549, 4 ms, same data; WAM Z27502, 2 specimens, Station Soela 125, Soela cruise 483, W Australia, North West Shelf, 19°02.60'S, 119°01.00'E, 84-85 m, trawl, sandy bottom, 29.viii.1983, coll. T. Ward; RMNH Coel. 32550, 2 ms, same data; NTM C2744, 3 specimens, Station Soela 127, Soela cruise 483, W Australia, North West Shelf, 19°29.00'S, 118°51.80'E, 37-38 m, trawl, sandy bottom, 30.viii.1983, coll. T. Ward; RMNH Coel. 32551, 14 ms, same data; NTM C2746, 2 specimens, Station Soela 136, Soela cruise 483, W Australia, North West Shelf, 19°02.20'S, 118°04.20'E, 82-84 m, trawl, sandy bottom, 01.ix.1983, coll. T. Ward; RMNH Coel. 32552, 4 ms, same data; NTM C2747, 1 specimen, Station Soela 126, Soela cruise 483, W Australia, North West Shelf, 19°26.90'S, 118°54.20'E, 48-50 m, trawl, sandy bottom, 30.viii.1983, coll. T. Ward; RMNH Coel. 32553, 2 ms, same data; NTM C2983, 1 specimen, BCR85/8, W Australia, North West Shelf of Port Hedland, West of Broome, 19°03.08'S, 118°24.27'E; 82-88 m, 02.vi.1985, coll. B.C. Russell; RMNH Coel. 32554, 4 ms, same data; NTM C2989, 1 specimen, BCR85/7, W Australia, North West Shelf of Port Hedland, West of Broome, 19°03.08'S, 118°24.27'E; 82-88 m, coll. B.C. Russell; RMNH Coel. 32555, 4 ms, same data; NTM C3073, 1 specimen, NWS-9 (38), W Australia, N of Bedout Island, NE of Port Hedland, 19°29.40'S; 118°52.10'E, 39 m, trawl, 26.iv.1983, coll. J.N.A. Hooper; RMNH Coel. 32556, 4 ms, same data; NTM C5059**,** 1 specimen, NWS 9: W Australia, West of Port Hedland, 19°29.40'S, 118°52.10'E, 39 m, beam trawl, sand, gravel and rock, salinity 35.25%, temperature 27.0°C, 26.iv.1983, coll. J. Hooper; RMNH Coel. 32557, 5 ms, same data; NTM C5837, 2 specimens, W Australia, North West Shelf, Rowley Shoals, 19°21.00'S; 119°10.10'E, 50 m, dredge, RV "Akademik Oparin" 1987 Cruise, 4th dredge, dredge down 13:37, 19°21.00'S, 119°10.10'E (50 m), dredge up 14:20, 19°22.20'S, 119°11.10'E (50 m), 19.vii.1987, coll. P. Alderslade; RMNH Coel. 32558, 5 ms, same data; NTM C5854, 1 specimen, Australia, NT, Timor Sea, Parry Shoals, sta. no. AM 87-7, 11°12.53'S 129°42.08'E, 16 m, 15.viii.1987, coll. A. Mussig & N.C.I; RMNH Coel. 32698, 4 ms, same data; NTM C10645, W Australia, Rowley Shoals, 19°19.70'S, 119°09.80'E, 50 m, dredge, sand and shellgrit, R.V."Akademik Oparin" 1987 Cruise, 3rd dredge, dredge down 12:44, 19°19.7'S, 119°08.8'E, dredge up 13:30, 19°20.6'S, 119°09.8'E, 19.viii.1987, coll. P. Alderslade; RMNH Coel. 32559, 5 ms, same data; WAM Z27504, Australia, NT, Arafura Sea, Sta. HL90-31, sand/shell bottom, 42 m, 26.x.1990, coll. H. Larson; RMNH Coel. 33219, 4 ms, same data; NTM C11374, 1 specimen, Australia, NT, Flat Top Shoal, 12º35'S, 129º30'E, 6-14 m, dredge, 17.v.1992, coll. R. Hanley; RMNH Coel. 33002, 4 ms, same data; NTM C11375, one specimen, same data as NTM C11374.

Description.— The holotype is 32 cm long and 20 cm wide (fig. 172). Polyps are up to about 0.60 mm wide and 0.90 mm high.

Supporting bundle.— Can project for up to 0.40 mm (fig. 101a); the larger spindles with the outer side and projecting part spiny, and the inner side with complex tubercles (fig. 101d, f). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally 0-2 spindles per point, laterally 6-8, dorsally 10 (fig. 101a). The smallest spindles are present ventrally, up to 0.10 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple or complex tubercles and a spiny distal end. Dorsally they are up to 0.45 mm long, with complex tubercles and big spines (fig. 101b, e). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 101c).

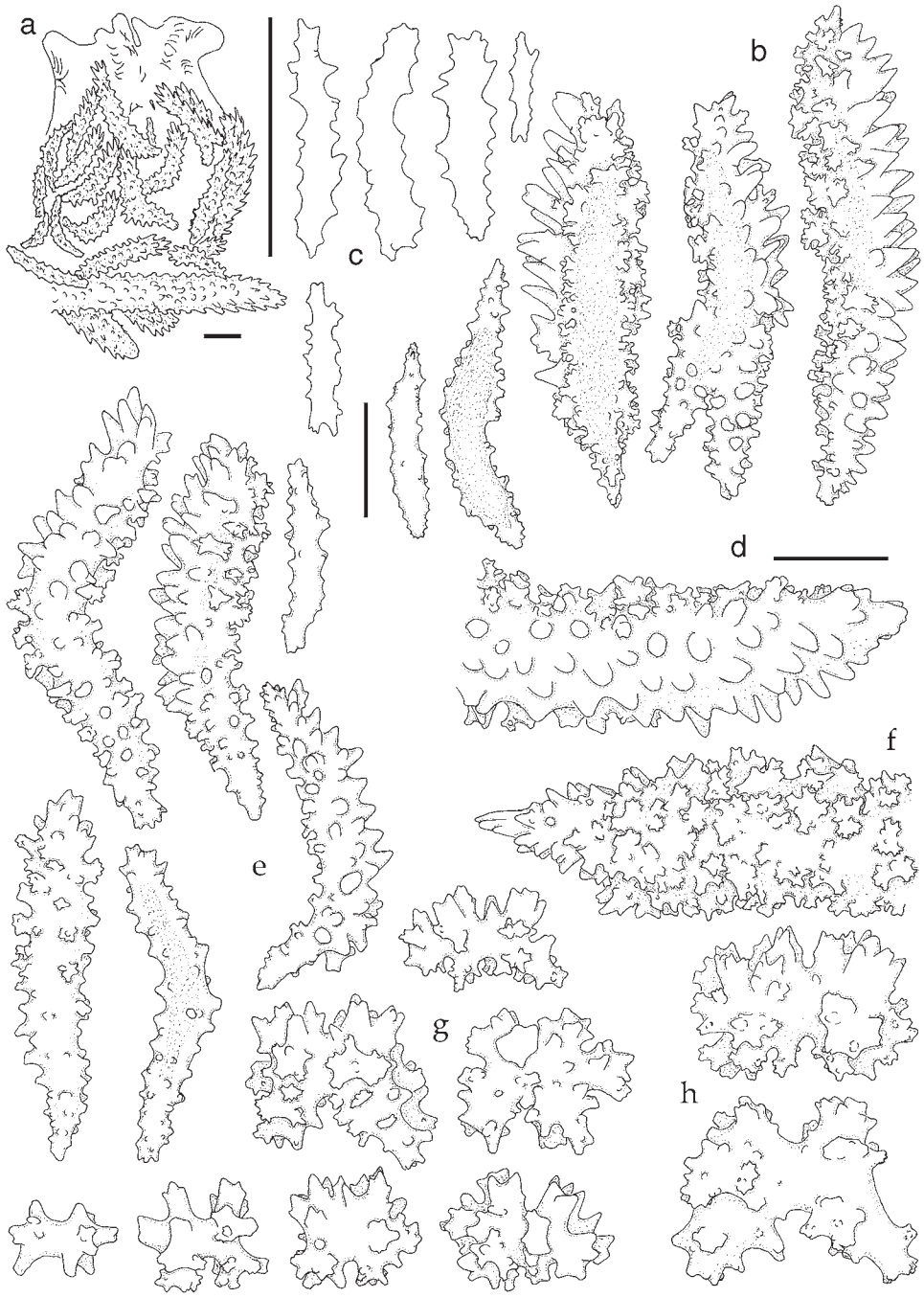


Fig. 101. *Chromonephthea megasclera* spec. nov.; CAS 171932 (a-d, h) and NTM C5837 (e-g); a, lateral view of polyp armature; b, e, point spindles; c, tentacular rods; d, f, spindles of supporting bundle (part); g, h, sclerites, surface layer top of stalk. Scales 0.10 mm, scale at b also applies to e, that at d also to f-h.

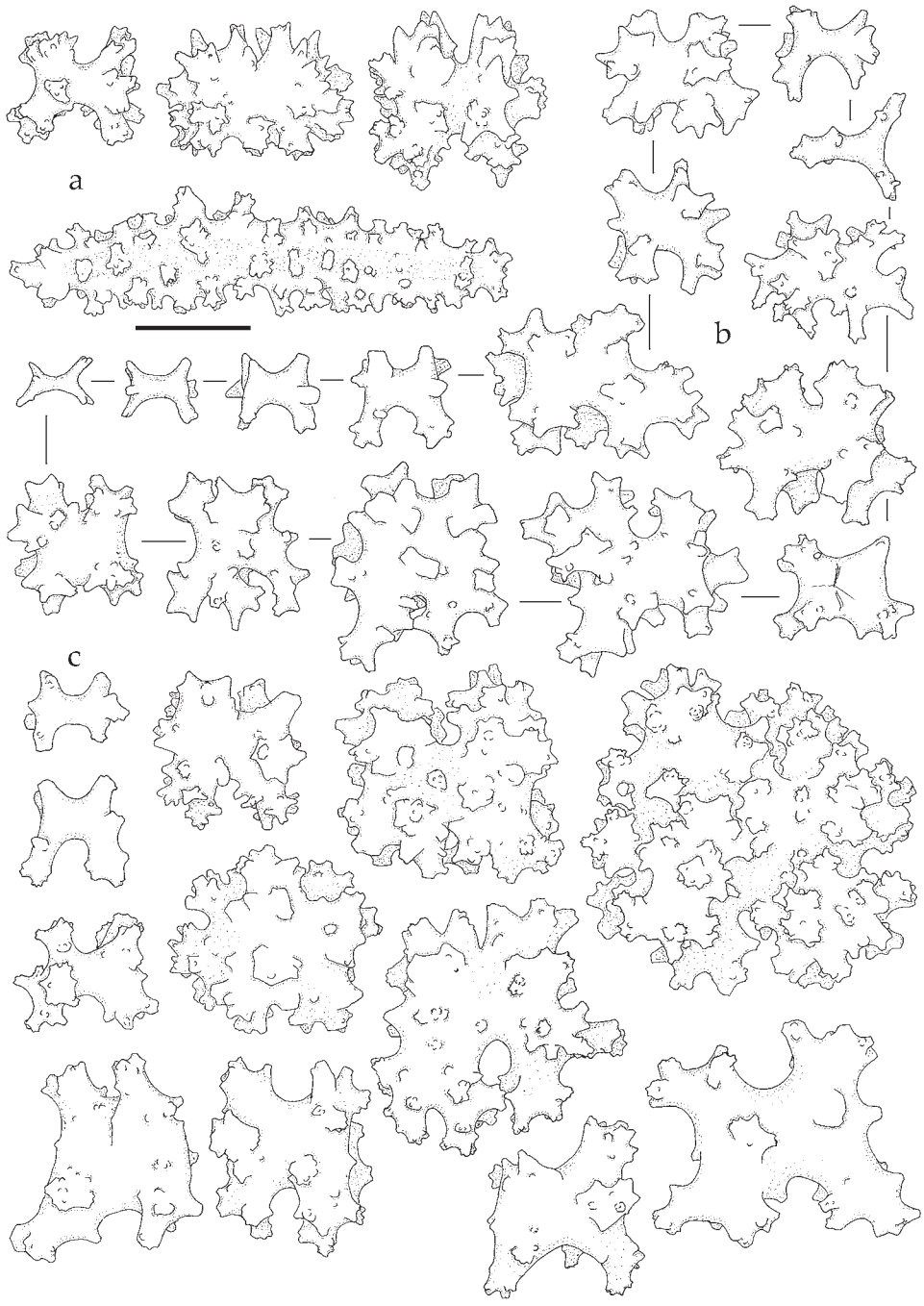


Fig. 102. *Chromonephthea megasclera* spec. nov.; CAS 171932 (a, c) and NTM C5837 (b); a, sclerites, surface layer top of stalk; b-c, sclerites, surface layer base of stalk. Scale 0.10 mm.

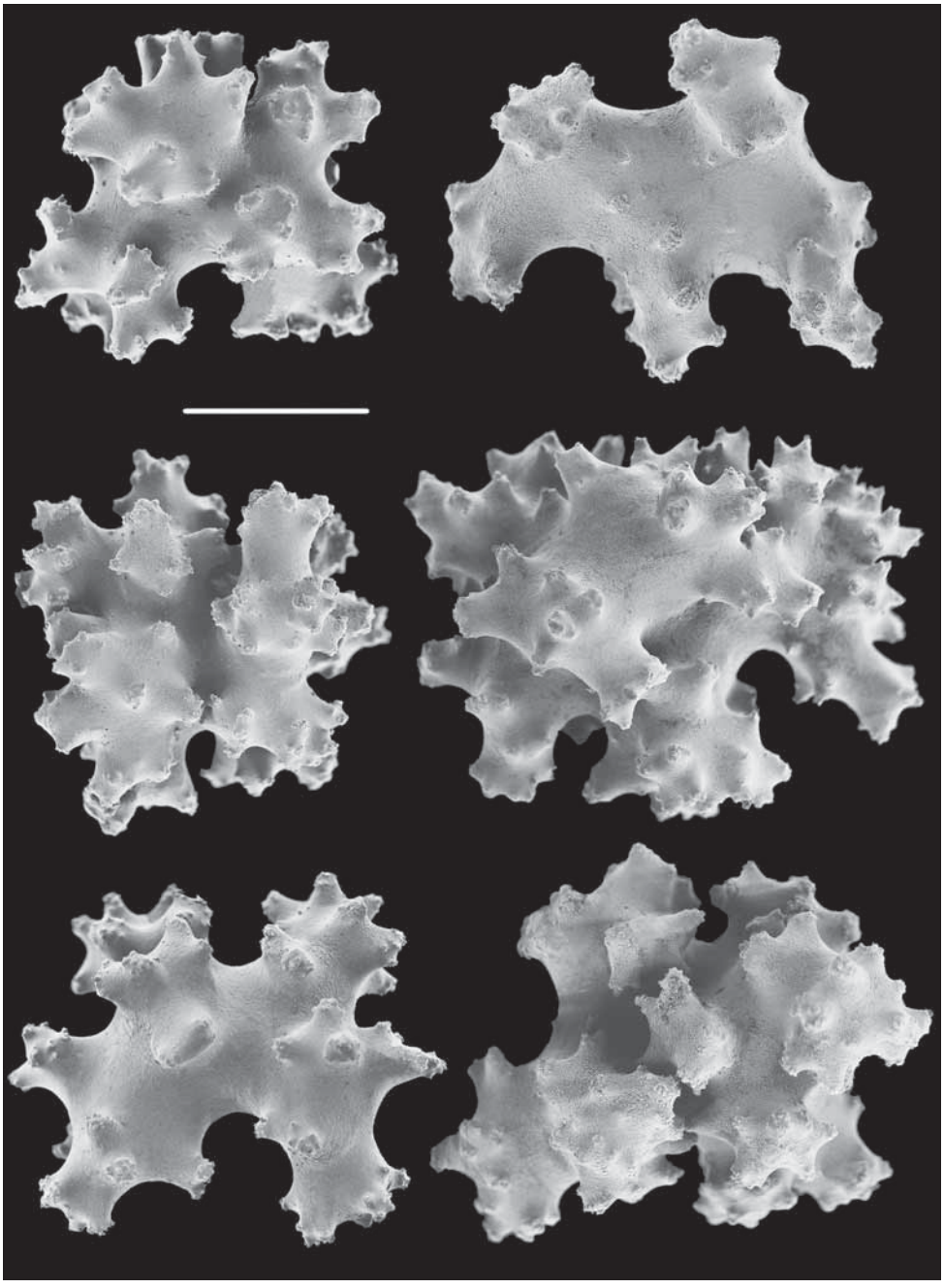


Fig. 103. *Chromonephthea megasclera* spec. nov.; holotype WAM Z27501, sclerites, surface layer base of stalk. Scale 0.10 mm.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long (fig. 101g-h, 102a). Many of these are unilaterally spinose and most have complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.55 mm long, with complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.30 mm long (the larger ones forming oval bodies), many with complex tubercles (figs 102b-c, 103). Only few are unilaterally spinose; several are less ornamented and more irregularly shaped, probably originating from somewhat deeper in the coenenchyme.

Interior stalk.— Without sclerites.

Colour.— The species shows a wide variation in colour (table 2), only the general patterns are mentioned.

Table 2. Colour variation in *Chromonephthea megasclera* spec. nov.

Species	Colony colour	Points	Branch	Stem	Stalk
CAS 171932 / USNM 1081588 / *NTM C2746 / 2744 / 2989 / **2746 / WAM Z27503 / Z27504	Cream; with colourless, *yellow or **orange polyps	Colourless, *yellow, **orange	Colourless	Colourless	Colourless
CAS 171932 / *NTM C2738 / 2740 / 5059 / 5837 / 11374 / 11375 / WAM Z27501	Cream with reddish end branches; *polyps can be yellow	Colourless, *yellow or mixtures	Pink to orange	Colourless	Colourless
NTM C2739 / USNM 1081588 / *NTM C2744 / 3073 / 2747 / 5854	Brownish / *reddish / orange; with yellow polyps	Yellow	Orange	Orange, *pink	Orange, *pink
WAM Z27502	Orange	Orange	Orange	Orange	Orange
NTM C10645	Reddish	Pink	Pink	Pink	Pink

The supporting bundle sclerites are often bi-coloured; projecting part having the same colour as the point sclerites, and the remainder having that of the branch sclerites. One USNM 1081588 specimen, grouped with cream specimens, is greyish coloured.

Etymology.— Named after the big sclerites of the surface layer of the base of the stalk, the largest found in the genus.

Remarks.—The species is characterized by the colonies having a long stalk and the large radiates of the stalk surface layer.

It is noteworthy that the holotype of *Chromonephthea simulata* spec. nov., WAM Z27507, from the same region as the second group of above table 2, has exactly the same colour pattern as that group (compare figs 172-173). *C. simulata* differs in having internal stalk spindles.

Chromonephthea dampierensis (Verseveldt, 1977) has similar large oval bodies in the stalk, but in that species the dorsal point spindles are less spinose.

Chromonephthea minor spec. nov.
(figs 104-105c, 156, 175f)

Material examined.— RMNH Coel. 33236, **holotype** and 4 ms, Malaysia, SE Sabah, Semporna region, fringing reef by channel marker No. 7 (green) 5 km SW of Semporna, 04º22.90N 118º36.24E, fringing patch reef sloping down to 5 m, then silt / rubble substrate sloping down to 20 m, 16.5 m, 19.vii.2004, coll. Nicolas J. Pilcher, CRRF # 0PHG1449-J; RMNH Coel. 33237, **paratype** and 2 ms, same data as holotype but 16.8 m, CRRF # 0PHG1450-K.

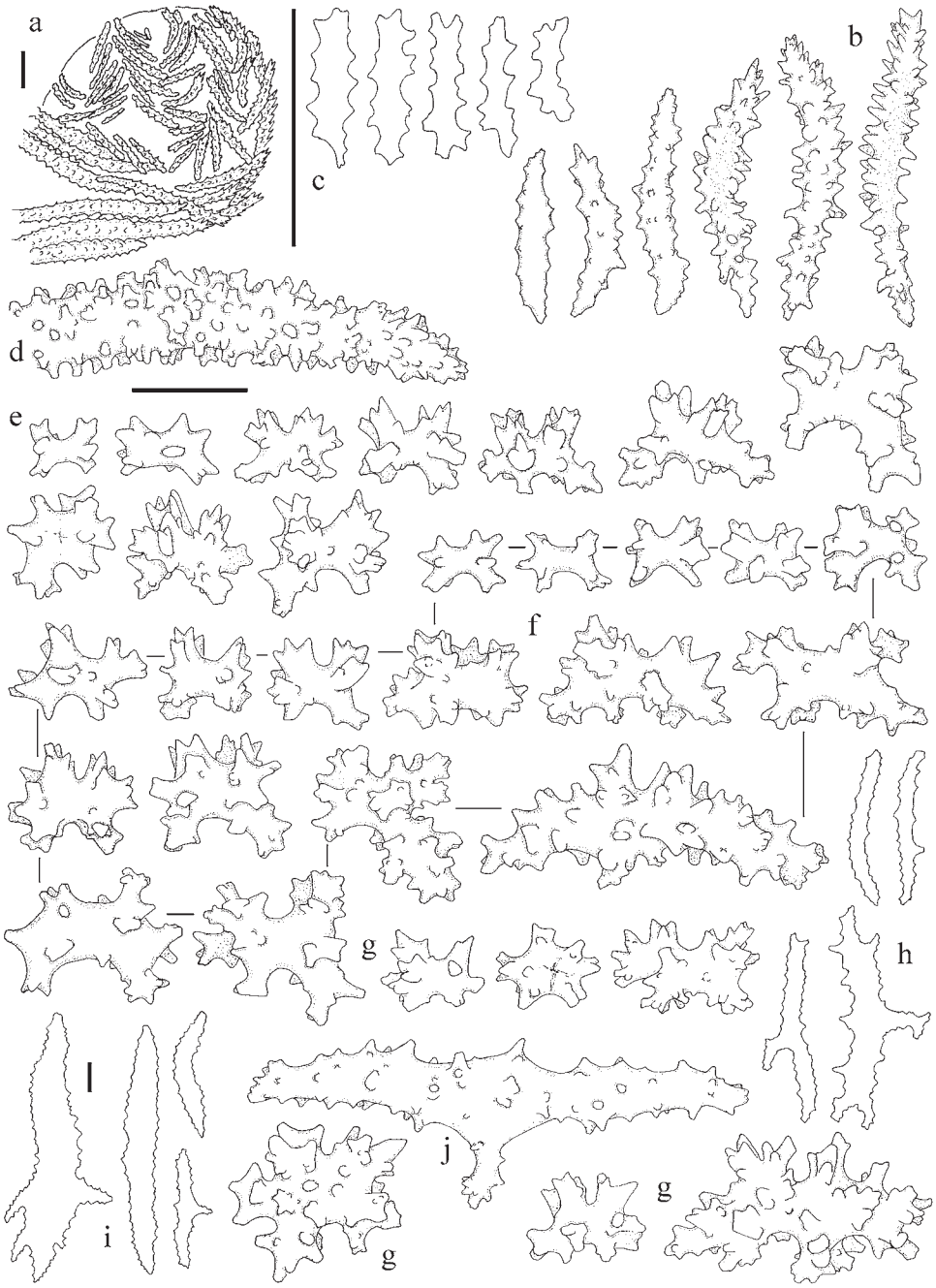


Fig. 104. *Chromonephthea minor* spec. nov.; a-f, h, holotype RMNH Coel. 33236, g, i-j, paratype RMNH Coel. 33237; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f-g, sclerites, surface layer base of colony; h-j, spindles, interior of stalk, h, i, outlines only. Scales 0.10 mm, scale at i also applies to h, scale at d to b, d-g, j.

Description.— The holotype is 5 cm long and 3 cm wide (fig. 175f). Polyps are up to about 0.60 mm wide and 0.80 mm high.

Supporting bundle.— Hardly projecting (fig. 104a); larger spindles have simple tubercles, outer side and projecting end spiny (fig. 104d). The largest spindles are up to about 1.00 mm long.

Points.— Ventrally 6-10 spindles per point, laterally 12-14, dorsally up to 16 (fig. 104a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.30 mm long, with simple tubercles and a spiny outer side and distal end (fig. 104b). Between the points a few intermediate sclerites are often present. Tentacles contain a few flattened rods, up to 0.10 mm long, with scalloped edge (fig. 104c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, mostly with simple tubercles (figs 104e). Many radiates are unilaterally spinose. Furthermore, spindles and unilaterally spinose spindles are also present, up to 0.75 mm long, with simple tubercles.

Surface layer base of colony.— Sclerites similar to those of the top of the stalk (figs 104f-g, 105a-b).

Interior stalk.— Spindles with sparse simple tubercles, many with side branches (figs 104h-j, 105c). These spindles are up to about 1.00 mm long.

Colour.— Colony dark red with yellow polyps. Point spindles yellow, branch sclerites reddish, supporting bundle spindles reddish with yellow projecting end; stalk sclerites pink, and tentacle rods colourless.

Etymology.— The Latin “minor”, smaller, refers to the small colonies and sclerites.

Remarks.— The paratype is red with orange branches and light yellow polyps; it has ochreous point spindles, orange branch and supporting bundle spindles, and reddish stalk sclerites.

Both holotype and paratype seem to lack the base of the stalk.

The supporting bundle spindles with only simple tubercles and spines, together with the heavily branched spindles of the stalk interior, characterize the species. *Chromonephthea egmondi* spec. nov. also has branched spindles in the interior but that species has supporting bundle spindles with complex tubercles.

Chromonephthea muironensis spec. nov.
(figs 105d, 106-107, 158, 160, 175c-d)

Material examined.— WAM Z27505, **holotype**, WA, Exmouth Gulf, North Muiron Island, North eastern coast, 21º37.93’S 114º23.59’E, 6-11 m, coll. S. Morrison, 23.viii.1995; RMNH Coel. 33220, 4 ms of holotype; **paratypes:** NTM C13259, 1 specimen, same data as holotype; RMNH Coel. 33221, 3 ms of paratype NTM C13259; USNM 1081589, 1 specimen, WA, Exmouth Gulf, South Muiron Island, North western coast, 21º39.45’S 114º20.72’E, 5-13 m, coll. S. Morrison, 22.viii.1995; RMNH Coel. 33222, 4 ms of paratype USNM 1081589; CAS 171933, 1 specimen, same data as holotype; RMNH Coel. 33223, 4 ms of CAS 171933.

Description.— The holotype is 4.5 cm long and wide (fig. 175d). Polyps are up to about 0.80 mm wide and 0.90 mm high.

Supporting bundle.— Projecting up to 0.30 mm (fig. 106a); larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and

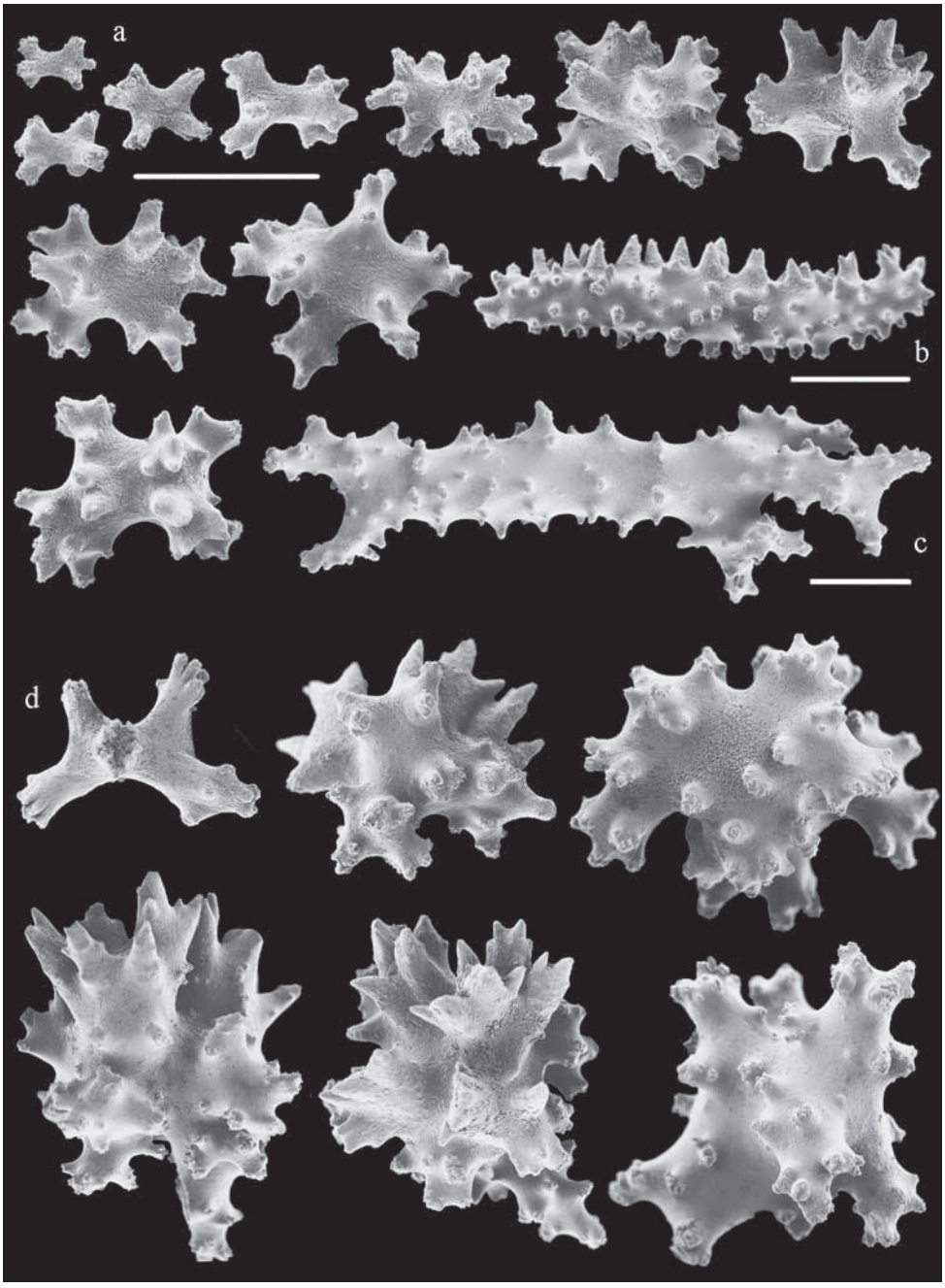


Fig. 105. Sclerites, base colony; a-c, *Chromonephthea minor* spec. nov., holotype RMNH Coel. 33236; d, *C. muironensis* spec. nov., holotype WAM Z27505; a-b, d, surface layer base of colony; c, interior stalk. Scales 0.10 mm, scale at a also applies to d.

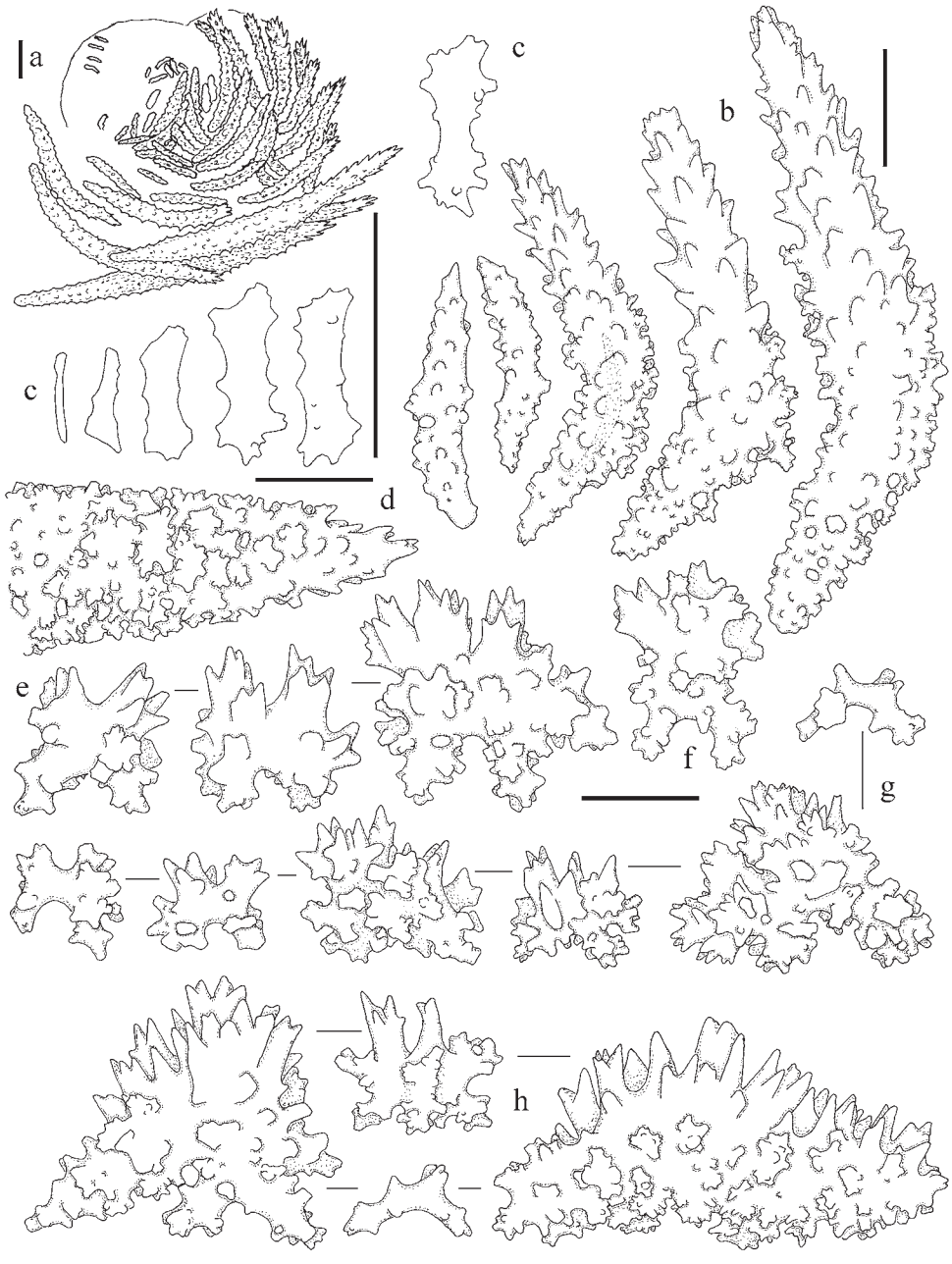


Fig. 106. *Chromonephthea muironensis* spec. nov.; a-e, holotype WAM Z27505; f, paratype NTM C13259; g, paratype USNM 1081589; h, paratype CAS 171933; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e-h, sclerites, surface layer top of stalk. Scales 0.10 mm, that at f applies to e-f.

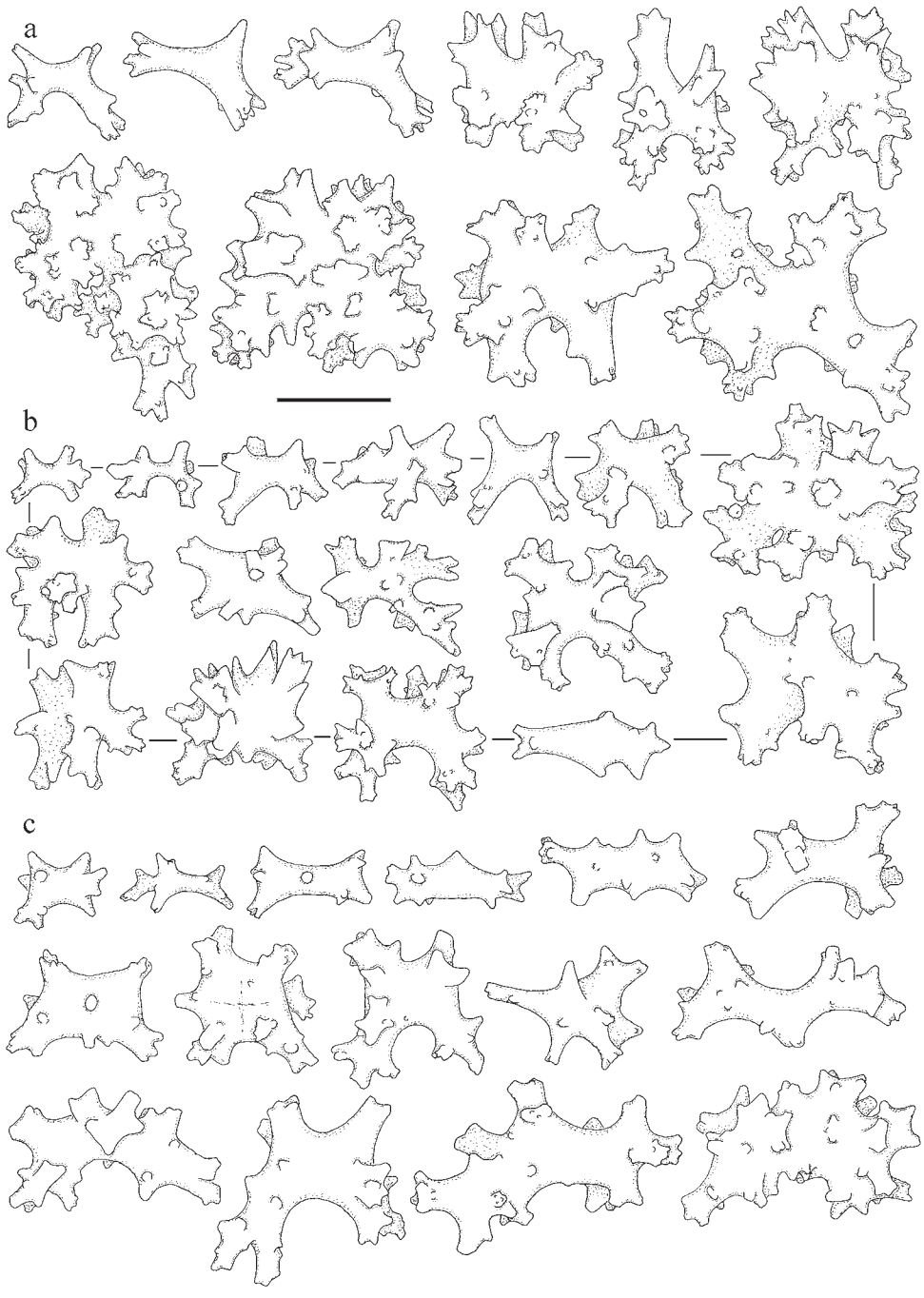


Fig. 107. *Chromonephthea muironensis* spec. nov.; a, holotype WAM Z27505; b, paratype NTM C13259; c, CAS 171933; sclerites, surface layer base of colony. Scale 0.10 mm.

a spiny projecting end (fig. 106d). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally 2 spindles per point, or simply a few horizontally placed spindles, laterally 6-8, dorsally up to 10 (fig. 106a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.40 mm long, with simple and complex tubercles and a spiny distal end. Dorsally they are up to 0.55 mm long, with complex tubercles and a spiny outer side and distal end (fig. 106b). Between the points a few intermediate sclerites are often present. Tentacles contain many sclerites, up to 0.10 mm long, with scalloped edge (fig. 106c); the largest with a few simple tubercles, the smallest are bent smooth rods.

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.30 mm long, the larger ones with complex tubercles (fig. 106e-h). Many of them are strongly unilaterally spinose. Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with complex tubercles.

Surface layer base of colony.— Radiates and derivatives of these, up to 0.30 mm long, the larger ones with complex tubercles, a few are unilaterally spinose (figs 105d, 107). Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with complex tubercles.

Interior stalk.— Without sclerites.

Colour.— Colony dark red with orange branches and red polyps. Stalk sclerites and smaller point spindles pink. Dorsal point spindles pink with yellow projecting part. Supporting bundle spindles and branch spindles yellow. Tentacle rods colourless, intermediates opaque.

Etymology.— The species is named after Muiron Island, W Australia, where all material of this species was collected.

Remarks.— The paratype NTM C13259 is pink with orange polyps; orange point sclerites, stalk with a mixture of pink and colourless sclerites. USNM 1081589 clearly lacks most of the stalk, which is yellow; the branches are orange and the polyps are reddish. The point sclerites are pink, and the supporting bundle and branch sclerites are yellow. The stalk shows a mixture of yellow and colourless sclerites. CAS 171933 (fig. 175c) is a golden yellow colony with red end branches and polyps; it is only a few centimetres high and lacks most of a stalk.

For all four specimens it is not clear how much of the stalk is missing, the paratypes have smaller stalk sclerites than the holotype (see fig. 107).

The upper stalk sclerites of all four specimens were rather broken and dirty, hence the small number of drawings of that part of the colony.

The species is somewhat similar to *C. cobourgensis* spec. nov. and *C. variabilis* spec. nov., but has more robust radiates in the stalk.

Chromonephthea obscura spec. nov.
(figs 108-109a, 158, 175g)

Material examined.— NTM C4723, **holotype**, Australia, NT, Arafura Sea, 55 m, 22.ii.1982, coll. A.J. Bruce; RMNH Coel. 33224, 6 ms of holotype.

Description.— The holotype is 5 cm long and 3 cm wide; apparently the base of the stalk is missing (fig. 175g). Polyps are up to about 0.60 mm wide and 0.80 mm high, several are partly expanded (fig. 108a, right polyp).

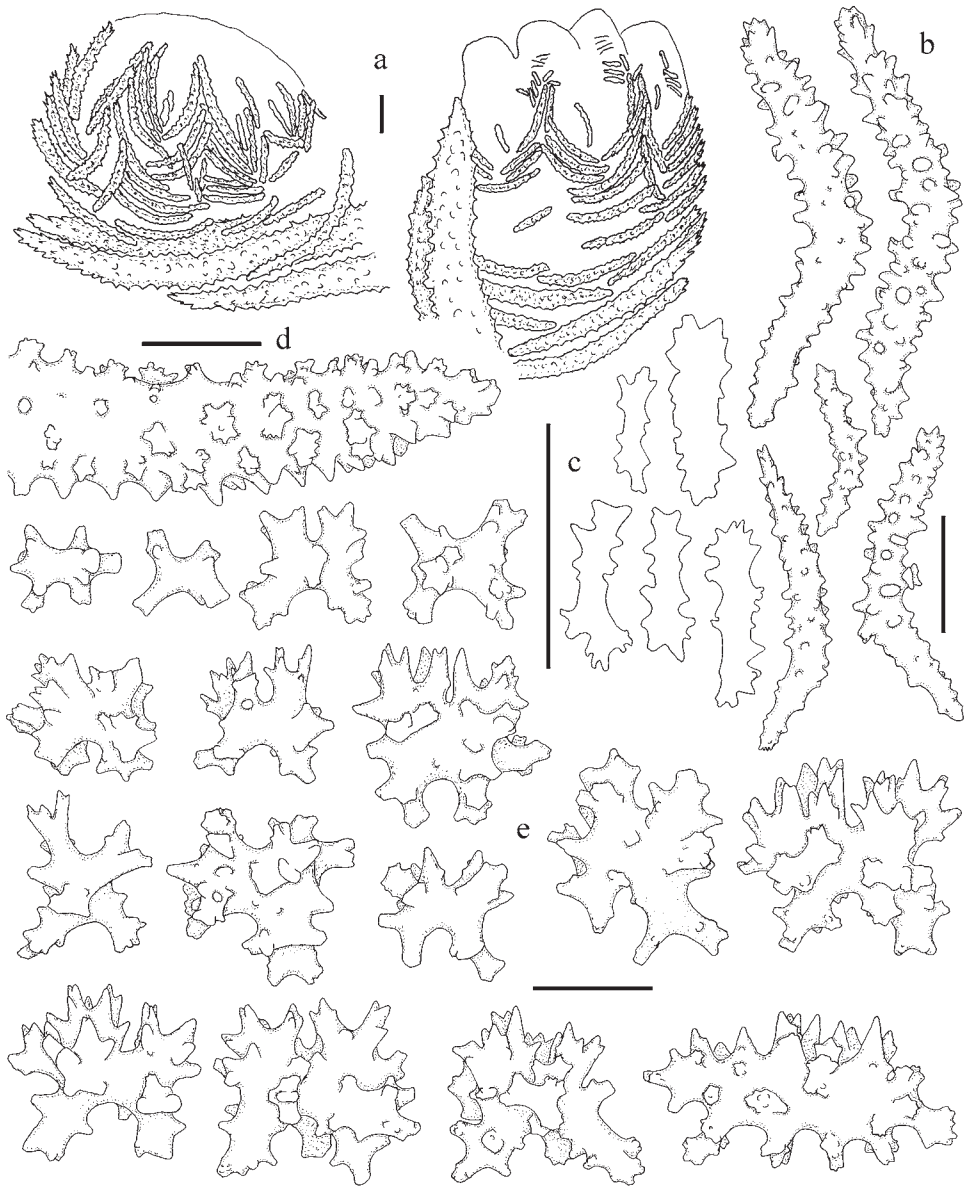


Fig. 108. *Chromonephthea obscura* spec. nov.; holotype NTM C4723; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer of stalk. Scales 0.10 mm.

Supporting bundle.— Projecting up to 0.10 mm (fig. 108a); larger spindles have a few complex tubercles, and a spiny projecting end (fig. 108d). Length of these spindles is up to about 1.60 mm.

Points.— Ventrally about 4 spindles per point, laterally 8-10, dorsally up to 14 (fig.

108a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple tubercles, and with spiny distal end. Dorsally they are up to 0.40 mm long, with simple tubercles and spiny outer side and distal end (fig. 108b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 108c).

Surface layer stalk.— Radiates and derivatives of these, up to 0.20 mm long, mostly with simple tubercles (figs 108e, 109a). Many of them are unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.70 mm long, with simple tubercles.

Interior stalk.— Without sclerites.

Colour.— Colony pink with white stalk and yellow polyps. Point spindles yellow, supporting bundle spindles pink, often with yellow projecting part. Stalk radiates colourless, stalk spindles pink.

Etymology.— The Latin "obscurus", obscure, refers to the absence of the stalk base and the consequent incomplete description.

Remarks.— Apparently the base of the stalk is missing as the microscopic slides of the top and the base of the stalk showed similar sclerites.

The polyp armature of this species is similar to that of *C. levis* spec. nov. But that species has much better developed unilaterally spinose radiates in the top of the stalk.

Chromonephthea ostrina spec. nov.
(figs 109b, 110-111, 158, 159, 175b)

Material examined.— NTM C4619, **holotype**, Australia, NT, Arafura Sea, New Year Island, 50 ft, 14.x.1982, coll. P. Alderslade; RMNH Coel. 33220, 4 ms of holotype; **paratypes**: NTM C4589, 1 specimen, same data as holotype; NTM C4613, 6 specimens, same data as holotype; RMNH Coel. 33226, 1 specimen and two ms of NTM C4613.

Description.— The holotype is 6 cm long and 3.5 cm wide (fig. 175b). Polyps are up to about 0.90 mm wide and 1.00 mm high.

Supporting bundle.— Projecting up to 0.60 mm (fig. 110a); the larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 110d). Length of these spindles is up to about 2.00 mm.

Points.— Ventrally 4-8 spindles per point, laterally about 8-10, dorsally up to 12 (fig. 110a). Mostly the points are rather irregularly arranged (fig. 110a, left). The amount of spindles present in the dorsal points could not be measured accurate, the twelve mentioned is based on one side visible with six spindles. The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.50 mm long, with simple and complex tubercles and a spiny distal end. Dorsally they are up to 0.75 mm long, with simple and complex tubercles and a spiny outer side and distal end (fig. 110b). A few of these dorsal point sclerites project beyond the polyp. Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 110c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, the larger ones with complex tubercles (fig. 110e). Furthermore, multi-radiate bodies are also present, up to 0.25 mm long, with complex tubercles, and some spindles and unilaterally spinose spindles, up to 0.50 mm long, with complex tubercles.

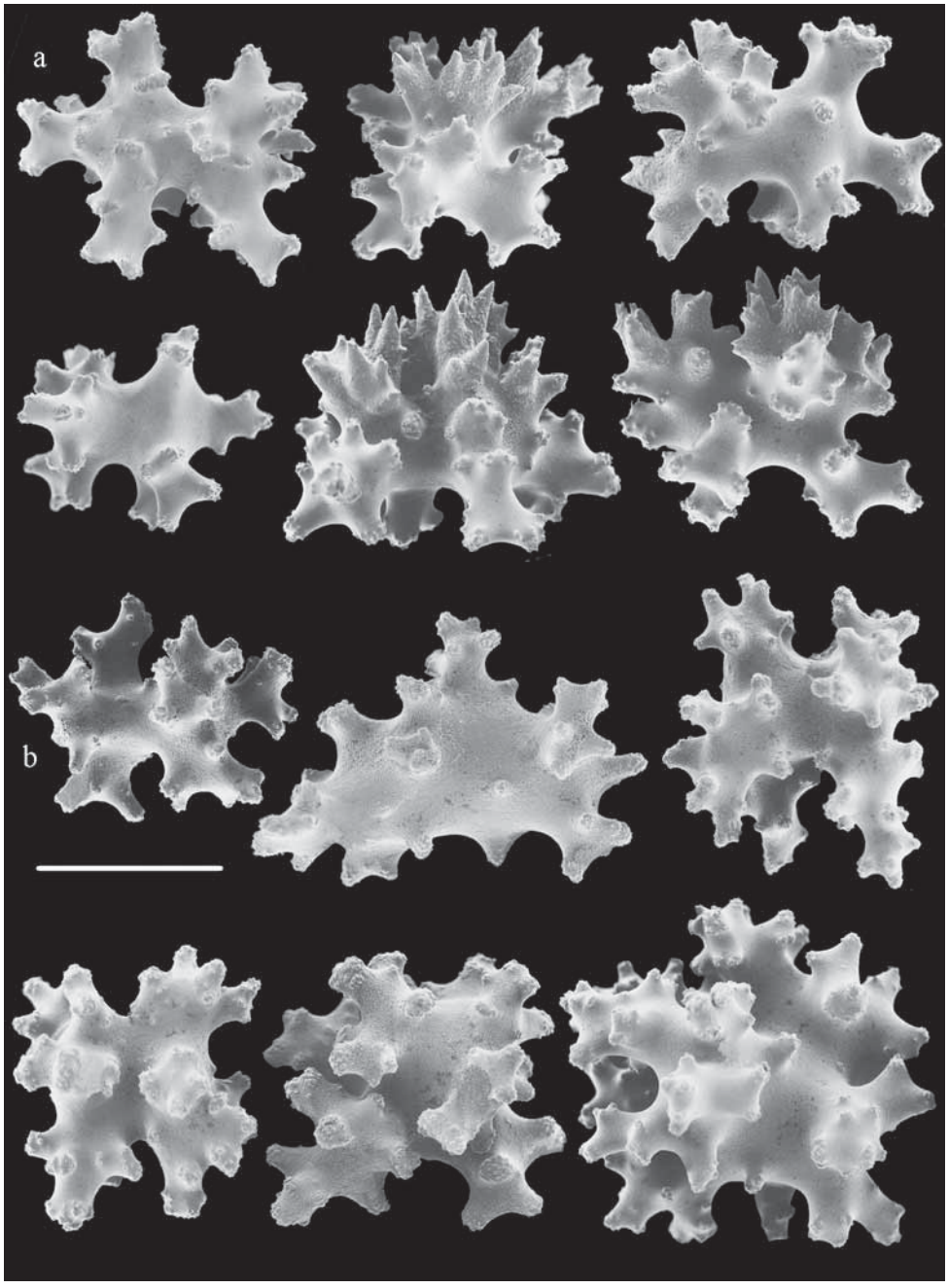


Fig. 109. Sclerites, surface layer base of colony / stalk; a, *Chromonephthea obscura* spec. nov., holotype NTM C4723; b, *C. ostrina* spec. nov., holotype NTM C4619. Scale 0.10 mm.

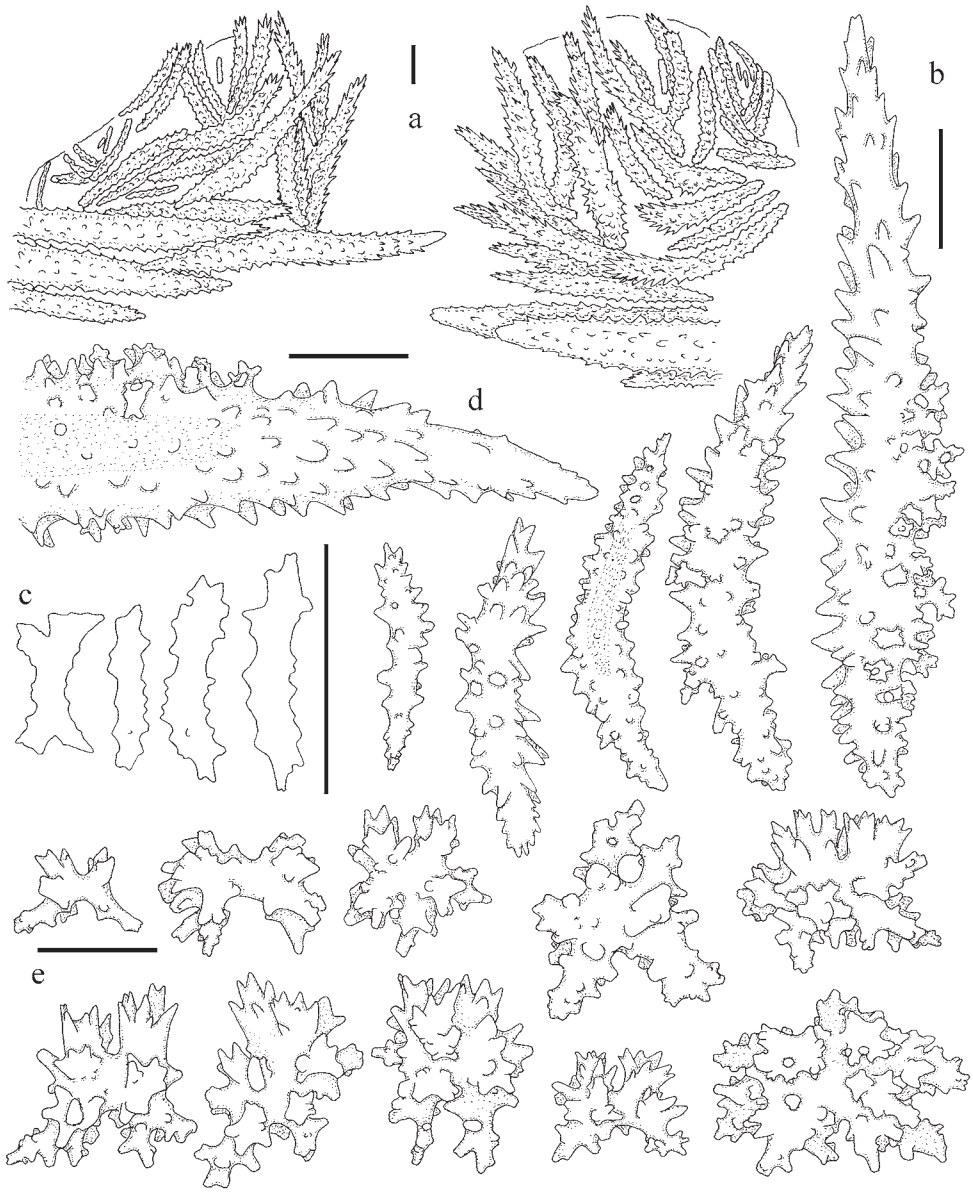


Fig. 110. *Chromonephthea ostrina* spec. nov.; holotype NTM C4619; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk. Scales 0.10 mm.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.25 mm long, the larger ones with complex tubercles (figs 109b, 111a-b). Furthermore, a few multiradiate bodies are present, similar to those of the top of the stalk.

Interior stalk.— Without sclerites.

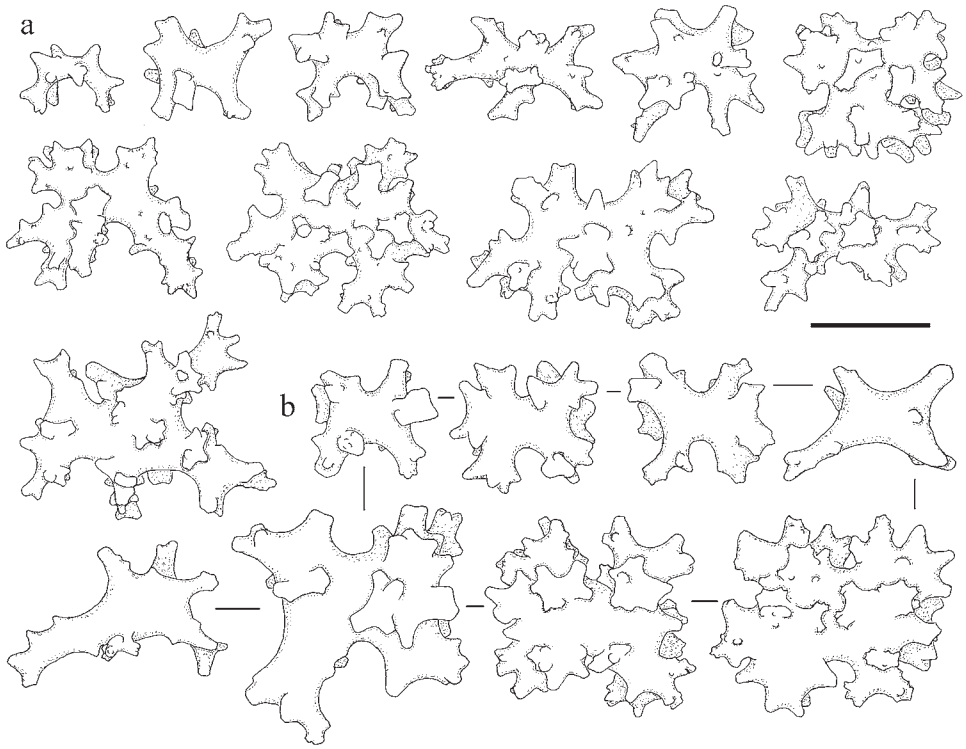


Fig. 111. *Chromonephthea ostrina* spec. nov.; a, holotype NTM C4619; b, paratype NTM C4613; sclerites, surface layer base of stalk. Scale 0.10 mm.

Colour.— Holotype white with purple polyps and pink stalk. Point and supporting bundle spindles purple, stalk with a mixture of colourless and pink sclerites, other sclerites colourless. Paratypes NTM C4613 are similar to the holotype, purple with pink stalk, or purple with yellow polyps; paratype NTM C4589 is orange with red stalk.

Etymology.— The Latin "ostrinus", purple, refers to the dominant colony colour of the material examined.

Remarks.— In four species of *Chromonephthea* a few point spindles clearly project beyond the polyp head, viz. *C. cornuta* Verseveldt, 1977, *C. ostrina* spec. nov., *C. sierra* (Thomson & Dean, 1931), and *C. spinosa* spec. nov. For a discussion of the differences between these four species see *C. cornuta*.

Chromonephthea palauensis spec. nov.
(figs 112-113b, 155, 175a)

Material examined.— NTM C14669, **holotype**, Palau, Koror/Babeldaob channel, floating bridge, 07º27.15'N 134º30.31'E, 1 m, 24.ix.2002, coll. CRRF; RMNH Coel. 33227, 5 ms of holotype.

Description.— The holotype is 13 cm high and 5 cm wide (fig. 175a). Polyps are up to about 0.60 mm wide and 0.80 mm high.

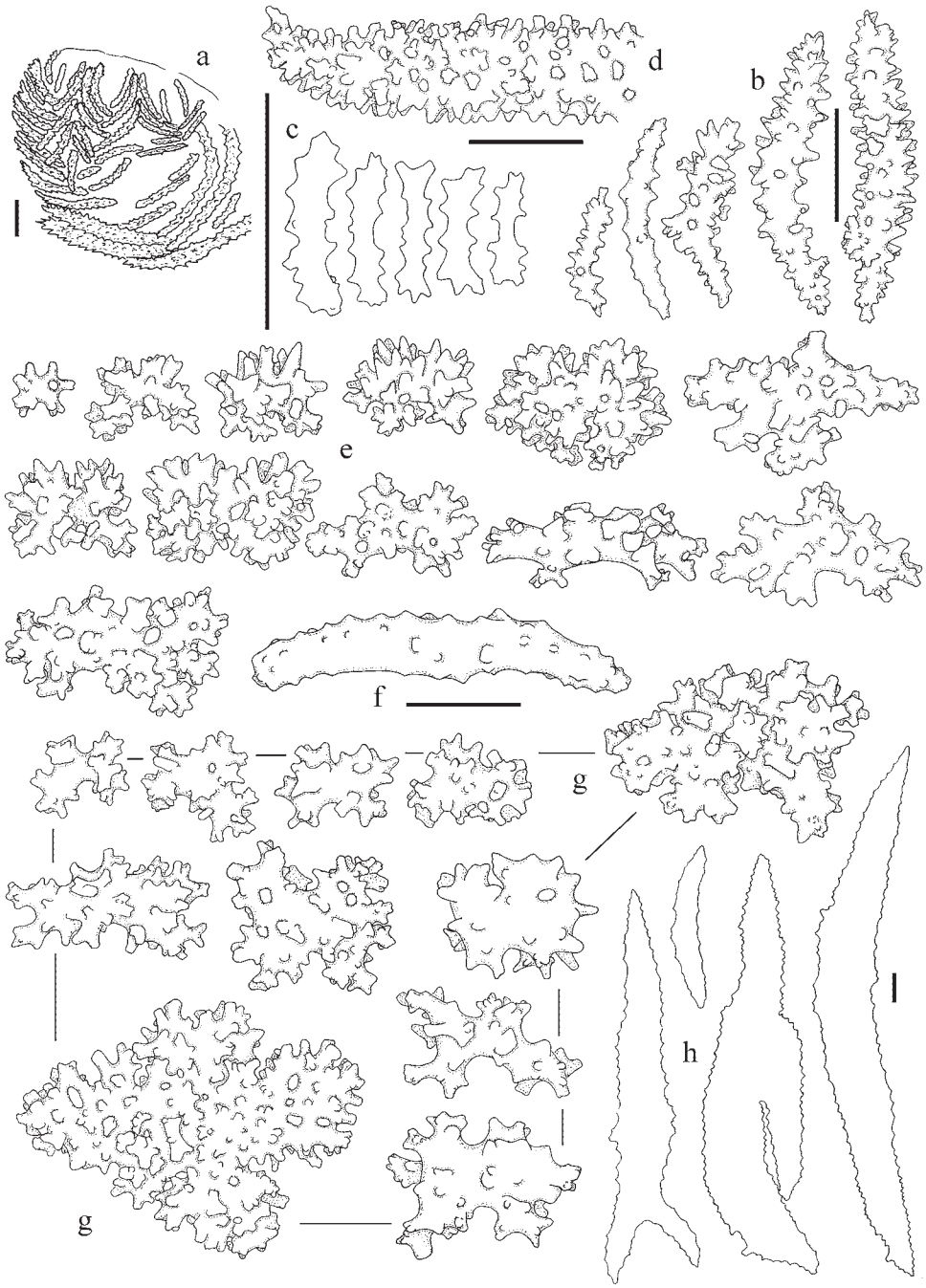


Fig. 112. *Chromonephthea palauensis* spec. nov.; holotype NTM C14669; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f, spindle, interior top of stalk; g, sclerites, surface layer base of stalk; h, spindles, interior base of stalk, outlines only. Scales 0.10 mm, scale at f also applies to e and g.

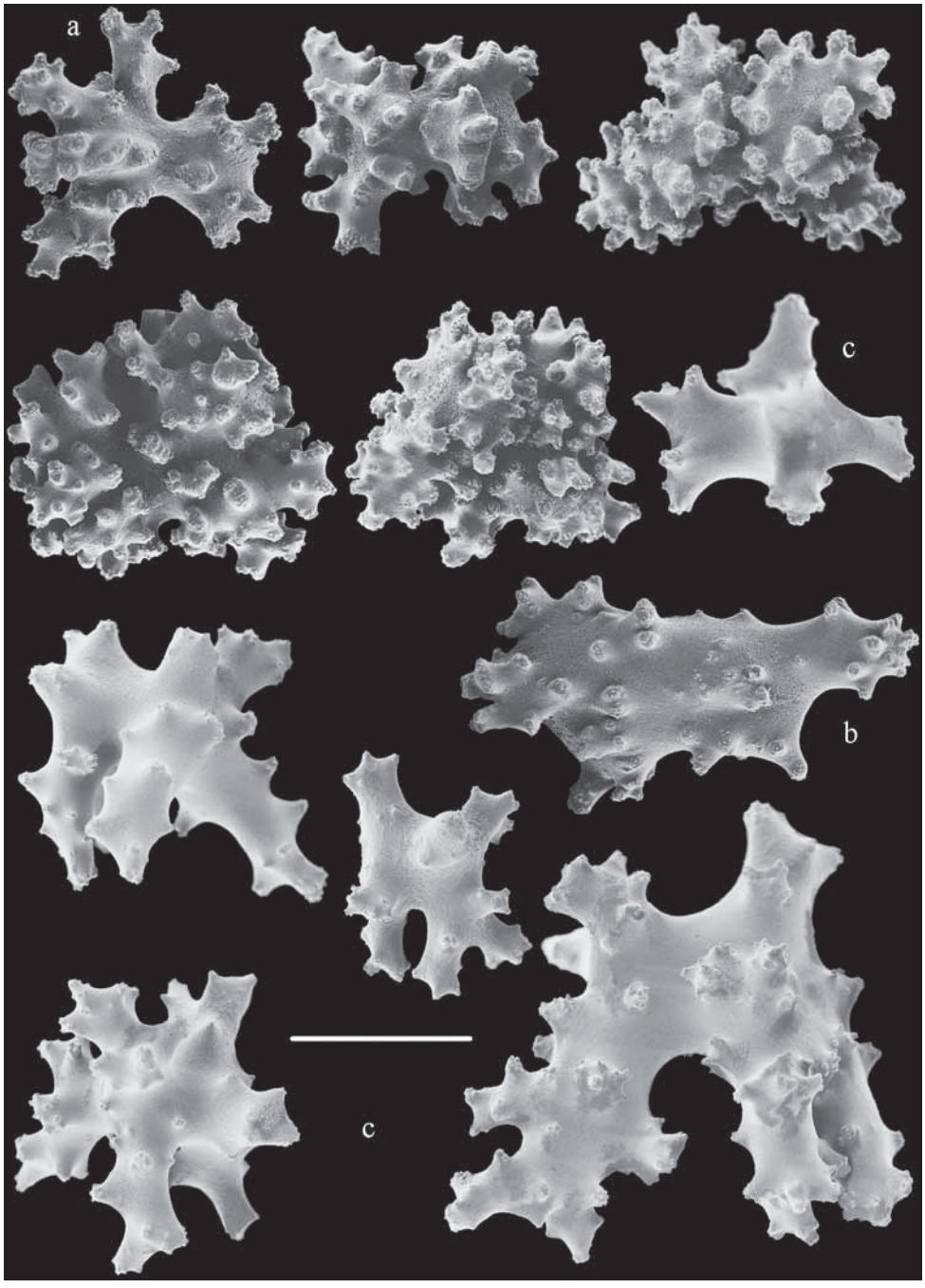


Fig. 113. Sclerites, surface layer base of stalk; a-b, *Chromonephthea palauensis* spec. nov., holotype NTM C14669; c, C. *rotunda* spec. nov., holotype WAM Z27506. Scale 0.10 mm.

Supporting bundle.— Hardly projecting (fig. 112a); larger spindles have mostly simple tubercles, but also a few complex ones on the inner side, spines on the outer side, and a spiny projecting end (fig. 112d). Length of these spindles is up to about 0.80 mm.

Points.— Ventrally about 4 spindles per point, laterally 6-10, dorsally up to 16 (fig. 112a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.30 mm long, mostly with simple tubercles, but a few complex ones are also present, and a spiny outer side and distal end (fig. 112b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 112c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, the larger ones with some complex tubercles (fig. 112e). Many of them are slightly unilaterally spinose. Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.35 mm long, with simple tubercles. Finally, branched, less tuberculate bodies also occur, up to 0.25 mm long (fig. 112e).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.30 mm long, the larger ones becoming irregular oval bodies, most tubercles simple but a few also complex (figs 112g, 113a). As in the top of the stalk, a number of subsurface sclerites show sparse tuberculation (fig. 113b).

Interior stalk.— Branched and unbranched spindles with simple sparse tubercles (fig. 112f, h), length of the spindles up to 2.00 mm.

Colour.— Colony maroon with yellow polyps. Supporting bundle spindles and top stalk sclerites orange, point spindles yellow, base stalk sclerites pink. Tentacle rods are colourless.

Etymology.— The species is named after the type locality Palau.

Remarks.— The conspicuous less tuberculate sclerites in the stalk originate from the subsurface layer. *Chromonephthea palauensis* spec. nov. resembles *C. slieringsi* spec. nov., but has supporting bundle and point spindles with fewer complex tubercles. Also, *C. slieringsi* does not show the subsurface stalk sclerites with sparse tuberculation.

Chromonephthea pellucida (Kükenthal, 1911)
(figs 114-118, 156)

Nephthya pellucida (in part) Kükenthal, 1911: 313, fig. 6, pl. 19 fig. 3 (Aru Islands).
Nephthya chabrolii (in part); Thomson & Dean, 1931: 83 (Aru Islands).
Not *Nephthea chabrolii* Andouin, 1828: 49.

Material examined.— SMF 81, **lectotype** (here designated), [label: *Nephthya pellucida* Kük; holotypus; Aru I., Parambülai, dredge 10 m; Merton leg. 2.iv.1908; Kük. 1911]; RMNH Coel. 33405, 3 ms of lectotype; **paralectotypes**: ZMB 11729 [label: *Nephthya pellucida*; Kükth det; Aru Inseln; Merton S.] = *Chromonephthea grasshoffi* spec. nov.; ZMB 6829 [label: *Nephthya pyramidalis*; Kükth det 1894; Ternate; Kükth 1902] = *Chromonephthea grasshoffi* spec. nov.; other material: ZMA COEL. 2936, 1 specimen, Siboga sta 273, Anchorage off Pulu Jedan, east coast of Aru Islands (Pearl banks), 23/26.xii.1899, 13 m, sand and shells, trawl, dredge and divers; RMNH Coel. 33406, 5 ms of ZMA COEL. 2936; ZMA COEL. 2939, 1 specimen, same data as ZMA COEL. 2936; RMNH Coel. 33407, 5 ms of ZMA COEL. 2939.

Description.— The lectotype is 8 cm long and 7 cm wide, flattened in one plane, and lacking the stalk (fig. 114a). Polyps are up to about 0.70 mm wide and 0.90 mm high.

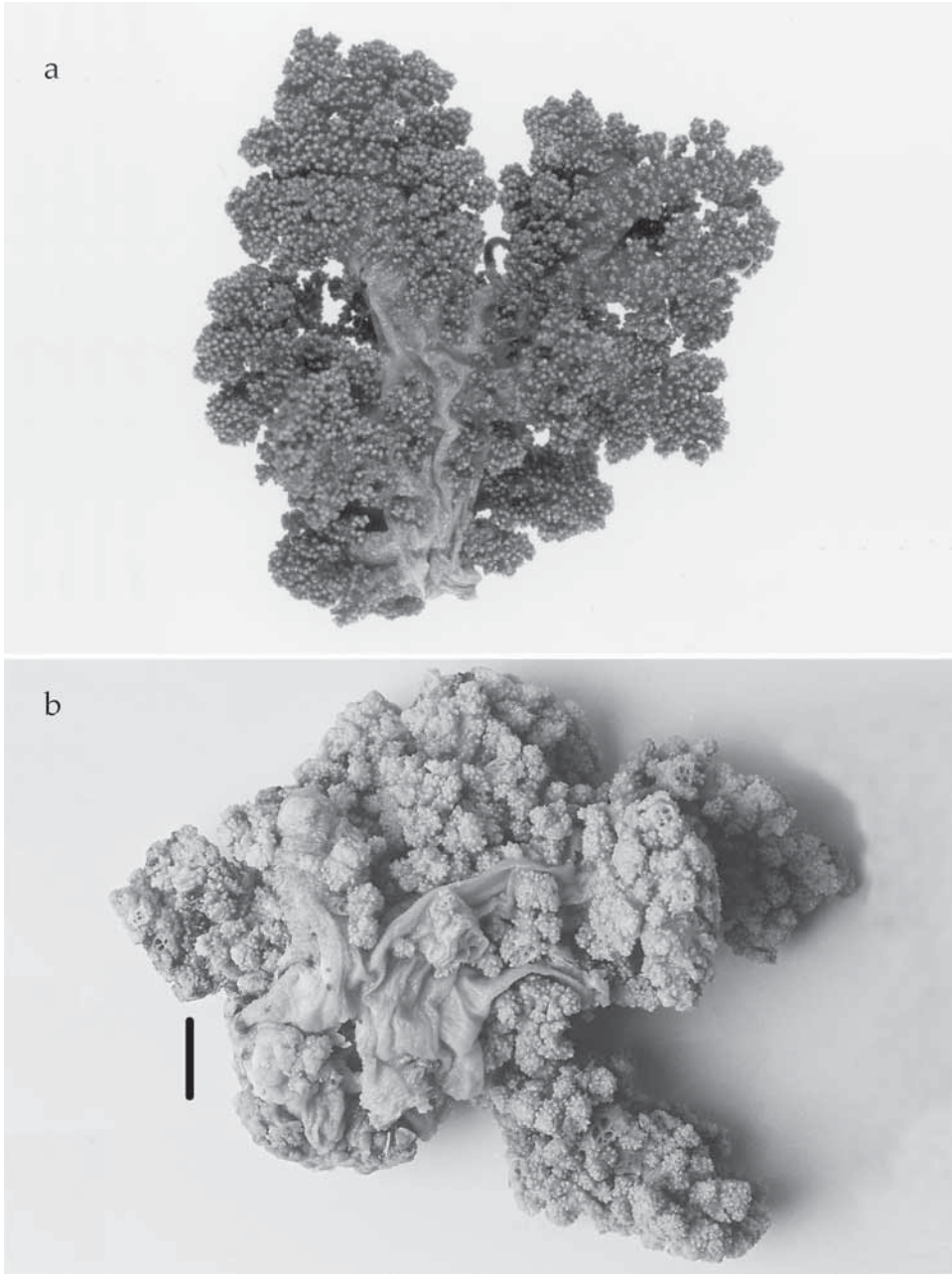


Fig. 114. *Chromonephthea pellucida* (Kükenthal, 1911); a, lectotype SMF 81; b, ZMA COEL. 2939. Scale 1 cm.

Supporting bundle.— Projecting up to about 0.20 mm (fig. 116a); the larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 116e).

Points.— Laterally with about 8-10 spindles. Ventrally rods with scalloped edge, up to about 0.15 mm long. Laterally spindles, about 0.20 mm long, with simple tubercles and a slightly spiny distal end. The largest spindles are found dorsally, up to 0.30 mm long, with spiny dorsal side and distal end (fig. 116b). Between the points an additional rod is often present, about 0.10 mm long (fig. 116c). Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 116d).

Surface layer top of stalk.— Radiates and derivatives of these, many unilaterally spinose (fig. 116f). Furthermore, small unilaterally spinose spindles are also present, the largest up to 0.55 mm long.

Surface layer base of stalk.— Missing.

Interior stalk.— Spindles, up to 1.00 mm long, with sparse simple tubercles (fig. 116g).

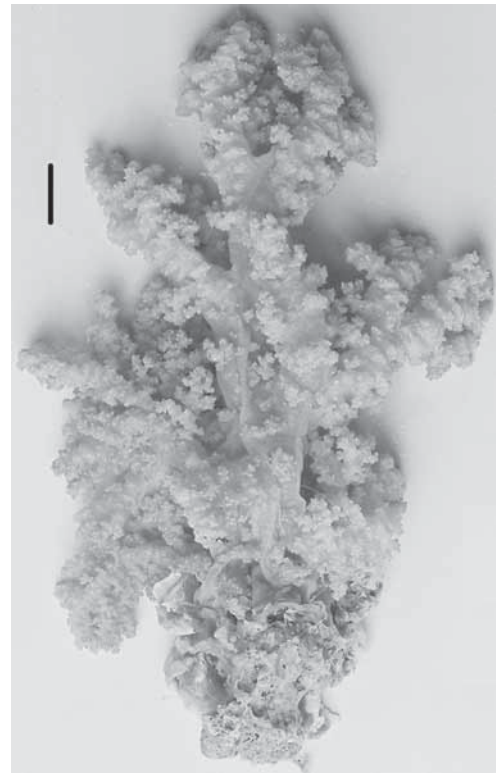


Fig. 115. *Chromonephthea pellucida* (Kükenthal, 1911), ZMA COEL. 2936. Scale 1 cm.

Colour.— Colony with red branches and supporting bundles, polyps yellow, stalk white. Supporting bundle spindles orange with a colourless distal end; point sclerites faintly yellowish, tentacular sclerites colourless. Sclerites of top of stalk colourless.

Remarks.— In the ZMB a bottle containing two specimens, two labels (see material examined), and one collection number was found. At first I decided that one of these specimens was *Nephthya pellucida* (ZMB 11729; new collection number). The other therefore had to be *N. pyramidalis* (ZMB 6829; original collection number). Both specimens have been re-examined and proved to represent *Chromonephthea grasshoffi* (see remarks *C. grasshoffi*).

Thomson & Dean (1931) identified a number of Siboga specimens as *Nephthya chabrolii* Andouin, 1828, two of them probably belonging to *C. pellucida*. They are described below.

ZMA COEL. 2936 is 13 cm long and 8 cm wide, with the base encrusting a fragment of rock and very short stalk (fig. 115). Polyps are up to about 0.70 mm wide and 0.80 mm high.

Supporting bundle.— Projecting up to 0.40 mm, larger spindles have complex tubercles (fig. 117e), a smooth terminal spine is often present. Length of these spindles is up to about 1.50 mm.

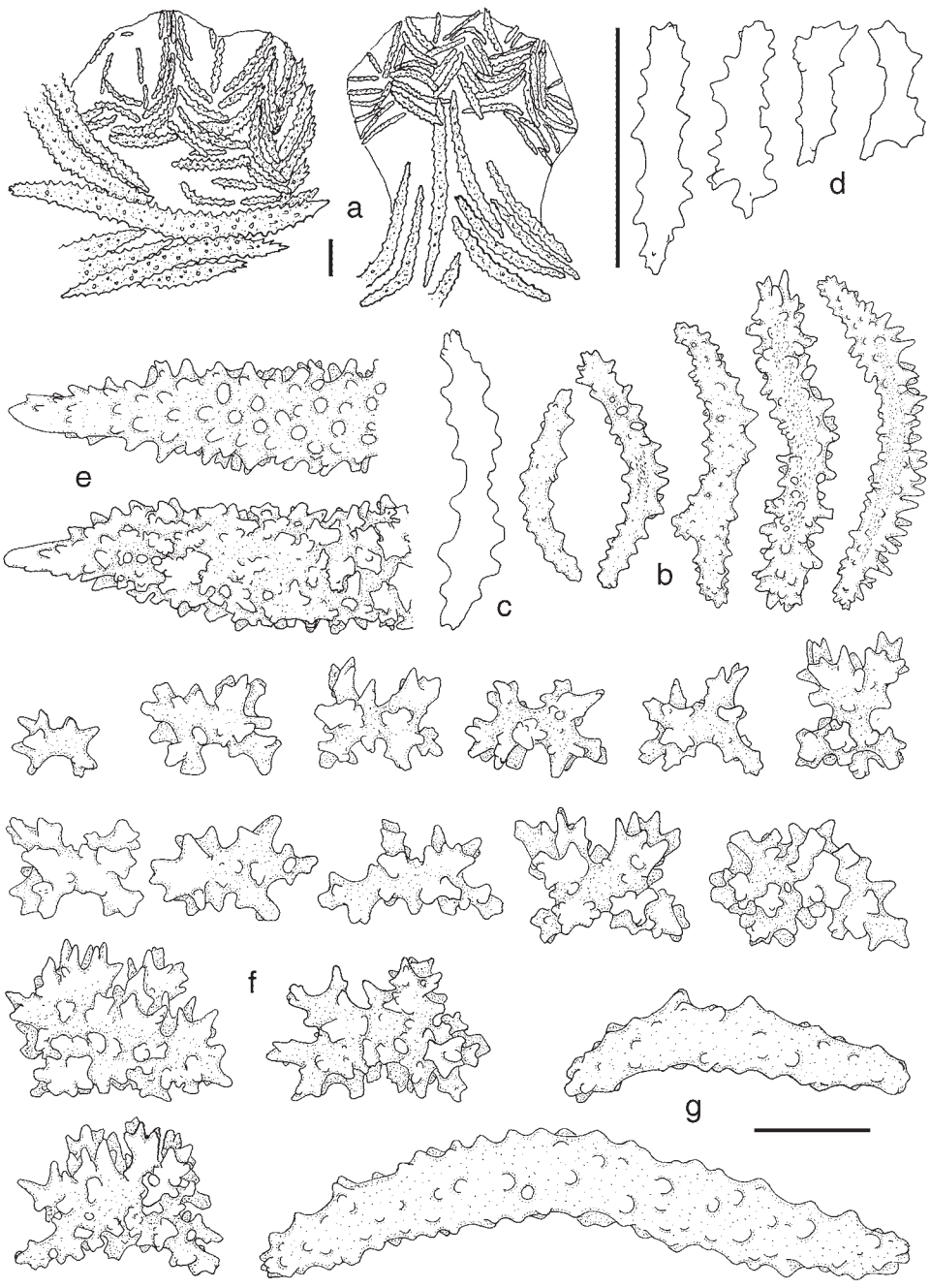


Fig. 116. *Chromonephthea pellucida* (Kükenthal, 1911), lectotype SMF 81; a, lateral and view from below of polyp armature; b, point spindles; c, intermediate; d, tentacular rods; e, spindles of supporting bundle (part); f, sclerites, surface layer base of colony; g, spindles, stalk interior. Scales 0.10 mm, scale at g also applies to b, e-f.

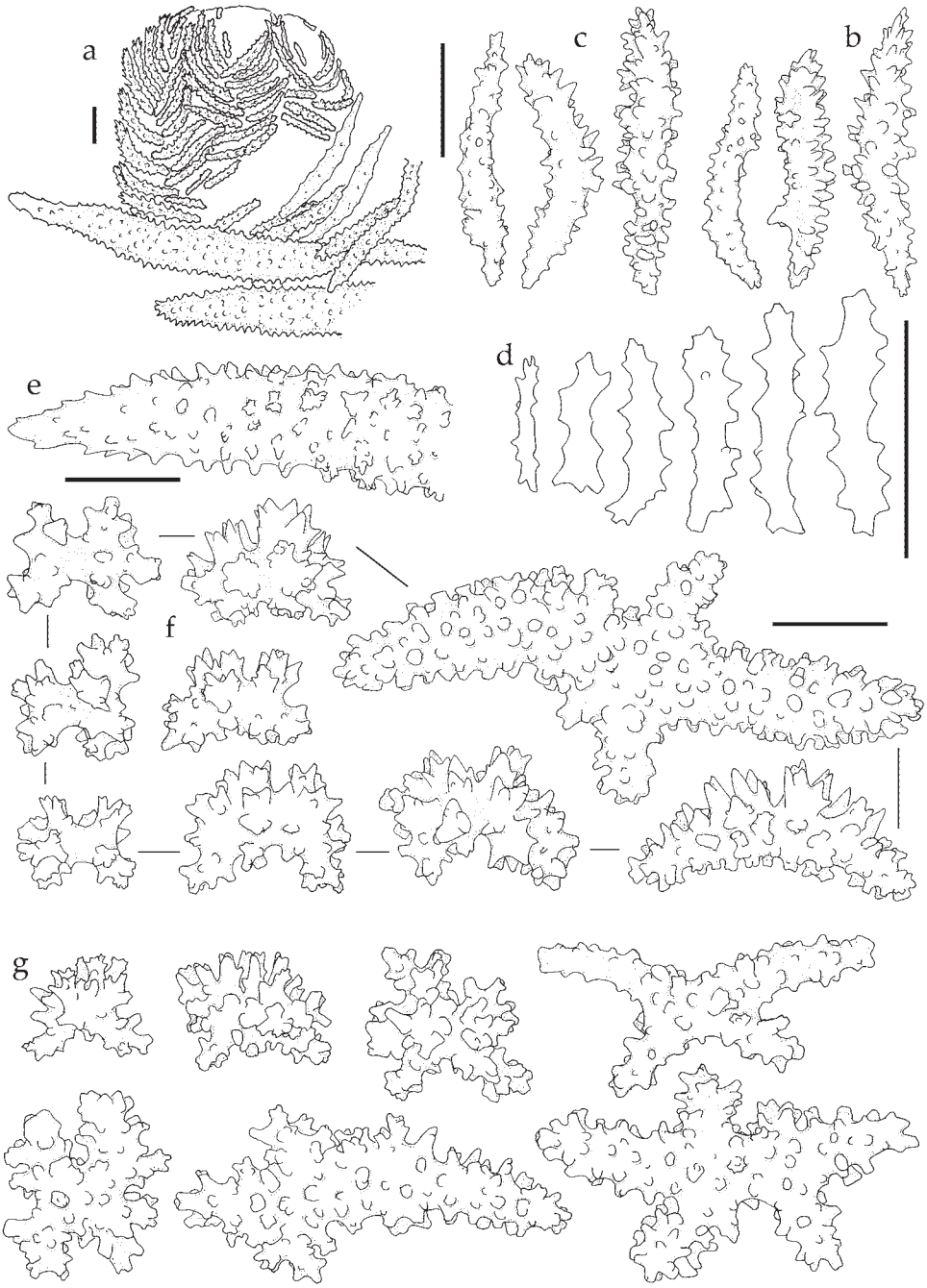


Fig. 117. *Chromonephthea pellucida* (Kükenthal, 1911); ZMA COEL. 2936; a, lateral view of polyp armature; b, point spindles; d, tentacular rods; e, spindle of supporting bundle (part); f, sclerites, surface layer top of stalk; ZMA COEL. 2939, c, point spindles; g, sclerites, surface layer top of stalk. Scales 0.10 mm.

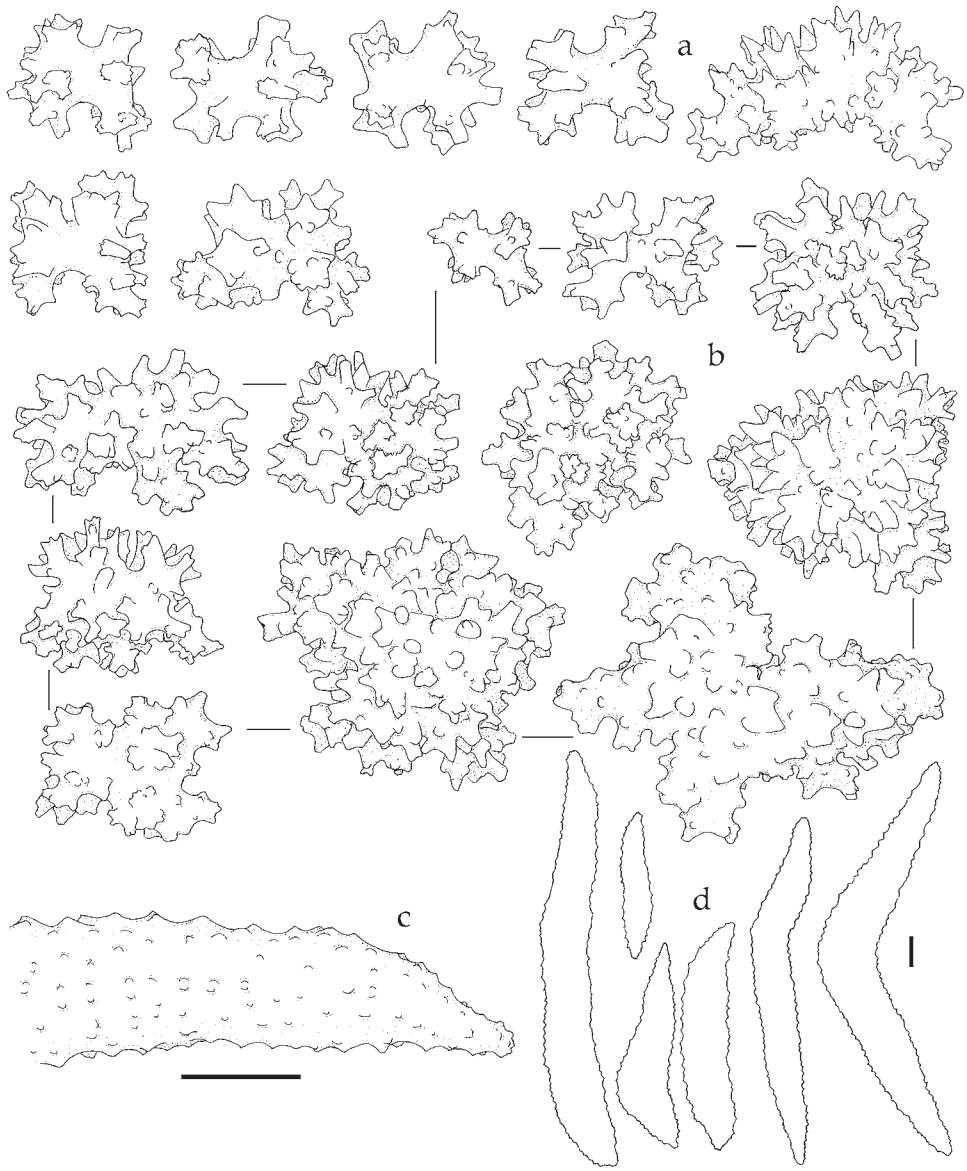


Fig. 118. *Chromonephthea pellucida* (Kükenthal, 1911); ZMA COEL. 2936; a, sclerites, base of stalk; ZMA COEL. 2939, b, sclerites, base of stalk; c, spindle of interior top stalk (part); d, spindles, interior top of stalk, outlines only. Scales 0.10 mm, scale at c applies to a-c.

Points.— Ventrally 4-6 spindles per point, laterally 10-12, dorsally up to 16 (fig. 117a). The smallest spindles are present ventrally, up to 0.15 mm long, with few simple tubercles. Laterally they are up to 0.25 mm long, also with simple tubercles. Dorsally they are up to 0.30 mm long, with simple tubercles and a spiny outer side and distal end (fig. 117b). Between the points a few intermediate sclerites are often present.

Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 117d).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 117f). Most of them are unilaterally spinose with simple tubercles. Larger ones merge into unilaterally spinose spindles that are up to 0.80 mm long, also with simple tubercles. Furthermore, spindles are also present, up to 0.80 mm long, with simple tubercles. Both the spindles and the unilaterally spinose spindles can have short side branches.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long, all with simple tubercles (fig. 118a). Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.40 mm long, with simple tubercles.

Interior stalk.— Spindles, up to 0.80 mm long, with sparse simple tubercles (fig. 118c-d).

Colour.— Colony with orange stem fading to yellow on the end branches, the encrusting base is colourless. Most point and supporting bundle spindles yellow but some orange ones also present. Tentacle and base stalk sclerites are colourless; sclerites in the top of stalk are yellow.

ZMA COEL. 2939 (fig. 114b) differs from ZMA COEL. 2936 in several aspects: 1) The colony is brownish with pale orange stalk, and all stalk sclerites are yellow; 2) the base shows large irregular bodies up to 0.30 mm long (fig. 118b); 3) interior spindles are up to 2.00 mm long. I assume the latter two differences are caused by the encrusting nature of the base of ZMA COEL. 2936.

The Siboga specimens have much in common with *C. pellucida*. They have similar polyp arrangement and sclerites. The sclerites present in the top of the stalk are also similar. They differ from *C. pellucida* in having a different colour pattern.

Unfortunately, *C. pellucida* was described using a specimen lacking the stalk almost entirely. Therefore, the microscopic slides of the base of *C. pellucida* correspond with those of the top of the stalk of the Siboga specimens. However, they did not show the larger branched spindles and unilaterally spinose spindles present in the Siboga specimens, despite Kükenthal mentioning for *C. pellucida* "In der unteren Rinde finden sich neben ganz dicken, oft einseitig mit hohen Dornen besetzten Spindlen und Dreistrahlern auch …..". Apparently I missed those sclerites in my microscopic slides of *C. pellucida*, probably caused by different sampling position as the number and length of the spindles decreases towards the base of the colony.

Chromonephthea curvata (Kükenthal, 1911), *C. grasshoffi* spec. nov., and *C. sierra* (Thomson & Dean, 1931), all described from the Aru islands, differ from *C. pellucida* in lacking internal spindles. *C. intermedia* (Thomson & Dean, 1931), also from the Aru Islands, has such internal spindles but differs in having supporting bundle spindles with simple tubercles and spines only.

The species is similar to *C. palauensis* spec. nov, but that species has branched internal stalk spindles while the surface spindles are unbranched. It also resembles *C. franseni* spec. nov., but the latter species has internal spindles with small side branches.

Chromonephthea rotunda spec. nov.
(figs 113c, 119-120, 158, 164e)

Material examined.— WAM Z27506, **holotype**, Western Australia, West of Port Hedland, sta. no. NWS.8, 19°30.90'S 118°48.70'E, 40 m, Boom trawl, 26.iv.1983, coll. J. Hooper; RMNH Coel. 33009, 4 ms of holotype.

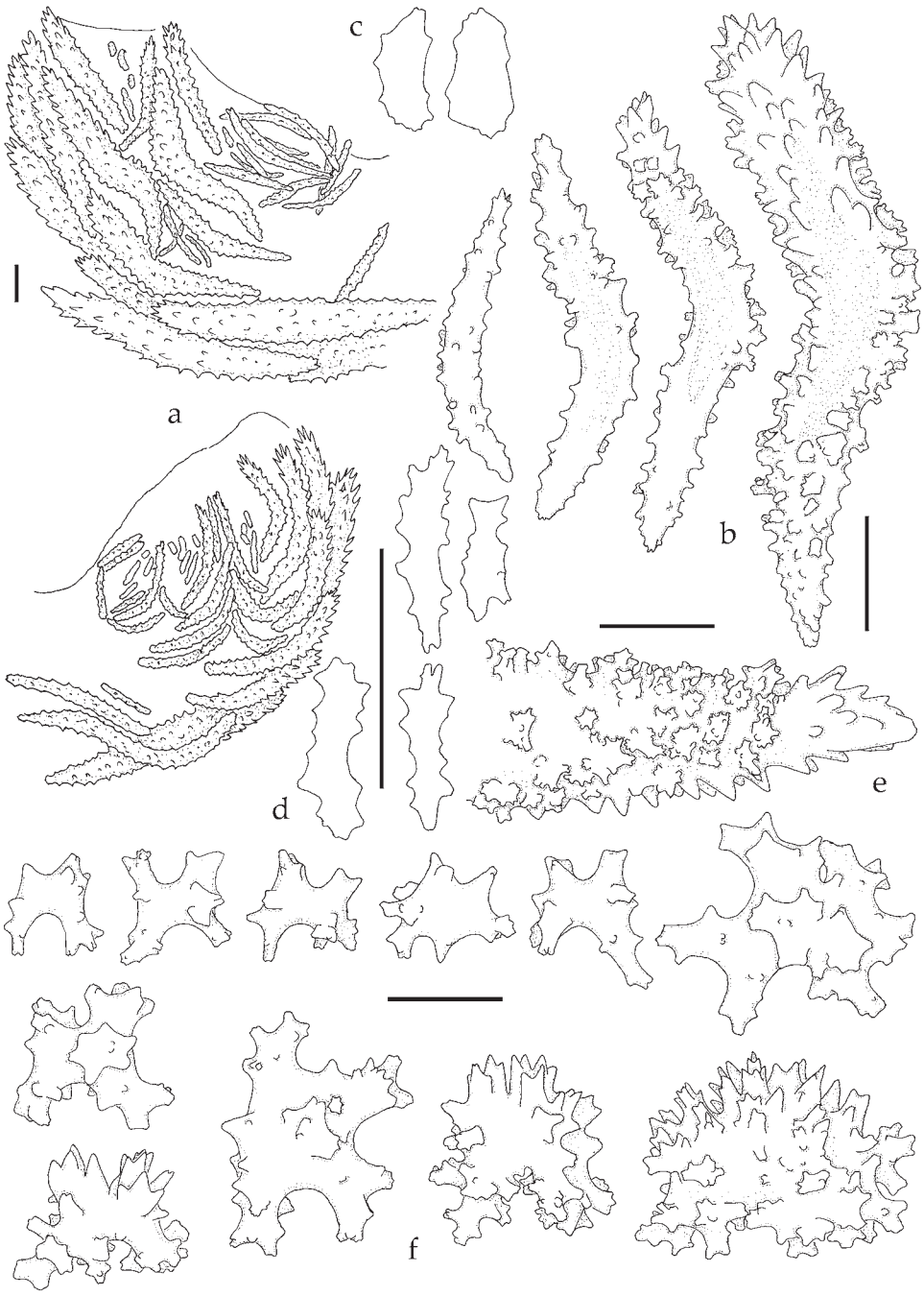


Fig. 119. *Chromonephthea rotunda* spec. nov.; holotype WAM Z27506; a, lateral views of polyp armature; b, point spindles; c, intermediates, d, tentacular rods; e, spindle of supporting bundle (part); f, sclerites, surface layer top of stalk. Scales 0.10 mm, scale at d also applies to c.

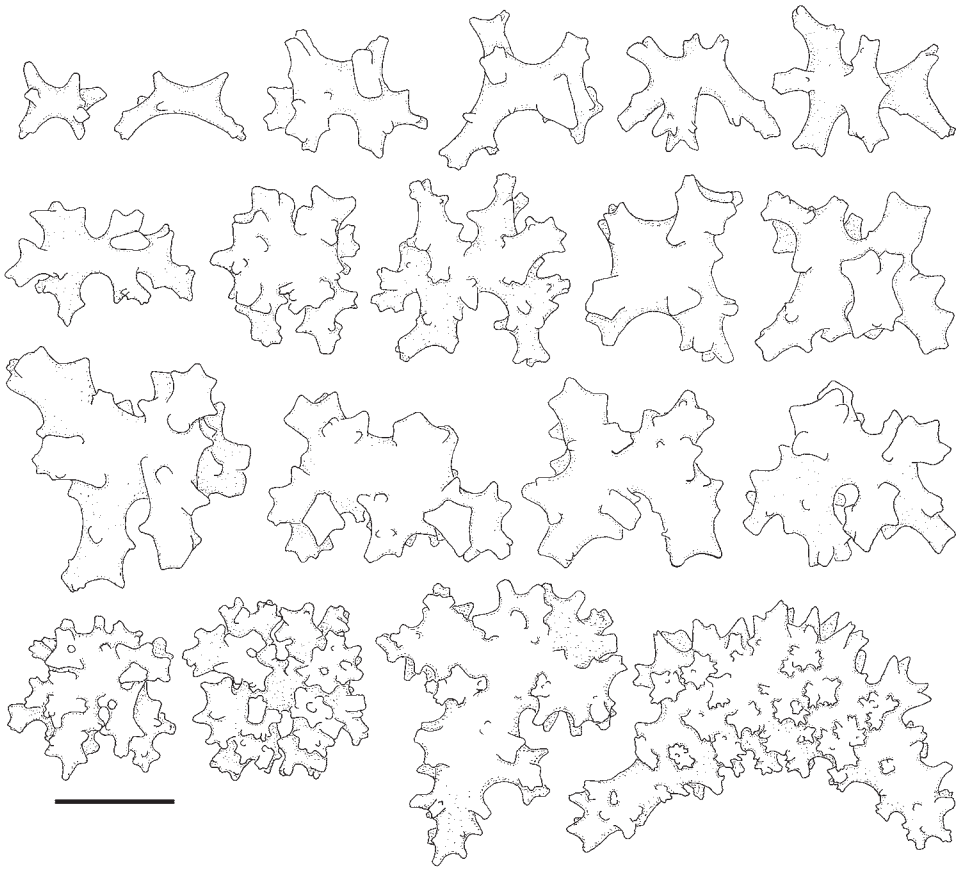


Fig. 120. *Chromonephthea rotunda* spec. nov.; holotype WAM Z27506; sclerites, surface layer base of stalk. Scale 0.10 mm.

Description.— The holotype is 7 cm long and 6 cm wide, attached to a piece of stony coral (fig. 164e). Polyps are up to about 0.75 mm wide and 1.00 mm high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 119a); larger spindles have complex tubercles and a spiny projecting part (fig. 119e). Length of these spindles is up to about 1.60 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-8, dorsally up to 10 (fig. 119a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.50 mm long, with simple and complex tubercles and a spiny distal end. Dorsally they are up to 0.60 mm long, with complex tubercles and a spiny distal end (fig. 119b). Between the points a few intermediate sclerites are present, often a couple are oval in shape (fig. 119c). Tentacles contain a few flattened rods, up to 0.10 mm long, with scalloped edge (fig. 119d).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long. Several are unilaterally spinose, and the larger ones have complex tubercles, but most have simple tubercles and no spines. Furthermore, some spindles and unilaterally spinose

spindles are also present, up to 0.35 mm long, with complex tubercles (fig. 119f).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.25 mm long, mostly with simple tubercles (figs 113c, 120). Furthermore, some spindles and unilaterally spinose spindles are also present, up to about 0.40 mm long, with complex tubercles (fig. 120).

Interior stalk.— Without sclerites.

Colour.— Cream base with reddish branches and yellow polyps. Point sclerites yellow or colourless, branch and supporting bundle sclerites pink or colourless. All other sclerites are colourless.

Etymology.— The Latin "rotunda", round, circular, refers to the shape of the intermediate sclerites of the polyps.

Remarks.—The oval intermediates of C. *rotunda* spec. nov. are unique in the genus *Chromonephthea*.

Chromonephthea rubra (Kükenthal, 1910) (figs 121-130a, 158, 160, 161)

Nephthya rubra Kükenthal, 1910: 48, figs 14-16, pl. 2 fig. 15 (WA, Shark Bay).
Not *Nephthya rubra*; Kükenthal, 1911: 313, pl. 19 fig. 2 (Aru Islands, Pulu Bambu) = *C. curvata* (Kükenthal, 1911).
Nephthya australis Kükenthal, 1910: 50, figs 17-18, pl. 3 fig. 21 (WA, Shark Bay). New synonymy.
Not *Nephthea australis*; Roxas, 1933: 414 (Philippines).
Nephthya quercus Kükenthal, 1910: 47, figs 11-13, pl. 2 fig. 14 (WA, Shark Bay). New synonymy.
Not *Nephthea quercus*; Roxas, 1933: 417 (Philippines).

Material examined.— ZMB 6832, **syntype**, WA, Shark Bay, Useless Inlet, 26º08'S 113º21'E, station 19, 13.ix.1905, 7 m; RMNH Coel. 33408, 4 ms of ZMB 6832; ZMB 6831, **syntype**, same data (however, wrong data in bottle); ZMB 5032, small fragment of syntype ZMB 6832; ZMB 6736, **holotype of *N. australis***, WA, Shark Bay, NNE from the northern point of Heirisson Prong, 26º03'S 113º23'E, station 15, 18.vi.1905, 11-12.5 m; RMNH Coel. 33409, 4 ms of ZMB 6736; ZMB 5033, small fragment of holotype of *N. australis*; ZMB 6830, **holotype of *N. quercus***, WA, Shark Bay, NNE from the northern point of Heirisson Prong, 26º03'S 113º23'E, station 15, 18.vi.1905, 11-12.5 m; RMNH Coel. 33410, 4 ms of ZMB 6830; ZMB 5031, small fragment of holotype of *N. quercus*; NTM C2982, WA, West of Broome, North West Shelf of Port Hedland, 19°03.08'S 118°24.27'E, 82-88 m, BCR85/8, 2.vi.1985, coll. B.C. Russell; RMNH Coel. 33010, 3 ms of NTM C2982; WAM Z20498, one colony without stalk, WA, Shark Bay, 26º03.25'S 113º19.4'E, station SB17, 6.v.1981, 5 m, substrate shell & shell rubble, coll. L.M. Marsh, S.M. Slack-Smith & C.W. Bryce, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33411, 2 ms of WAM Z20498; WAM Z20499, 3 specimens without stalk, or maybe just 3 branches of a colony, WA, Shark Bay, 25º35'00"S 113º15'00"E, coll. W. Poole & W. Poole, 18.3 m, vi.1962; RMNH Coel. 33412, 3 ms of WAM Z20499; WAM Z20503, one colony without stalk, WA, Shark Bay, Cape Heirrison, 25º58.5'S 113º21.5'E, station SB48, 11.v.1981, 16.5 m, coll. L.M. Marsh, S.M. Slack-Smith & C.W. Bryce, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33413, 2 ms of WAM Z20503; WAM Z20505, one colony without stalk, WA, Shark Bay, Cape Heirrison, 25º56.8'S 113º20'E, station SB49, 11.v.1981, 16.5 m, silty sand, shell grit, coll. L.M. Marsh, S.M. Slack-Smith & C.W. Bryce, FRV "Flinders" Shark Bay Expedition 1981; RMNH Coel. 33414, 3 ms of WAM Z20505; WAM Z20507, one colony without stalk, WA, Shark Bay, 25º35'00"S 113º15'00"E, station B16, 8.vii.1965, coll. FRV "Peron"; RMNH Coel. 33415, 3 ms of WAM Z20507; WAM Z29841, 2 specimens without base, WA, Shark Bay, trip 2, sta. 8, 22.1-22.3 m, 8.iii.2003, 25º06.000'S 113º22.303'E; RMNH Coel. 33228, 1 ms of WAM Z29841; WAM Z29846, one specimen without base, WA, Shark Bay, ENA survey, 13.iv.2003; WAM Z29860, one specimen without base, WA, Shark Bay, trip 4, sta. 23, 21.2-21.9 m, 25.ix.2003, 24º55.556'S 113º15.953'E; WAM Z29861, one specimen without base, WA, Shark Bay, trip 4,

sta. 24, 19.9 m, 25.ix.03, 24º57.207'S 113º11.094'E; WAM Z29879, one specimen without base, WA, Exmouth Gulf, sta. 10, 22.4-22.6 m, 16.iii.04, 21º51.815'S 114º11.902'E; RMNH Coel. 33229, 2 ms of WAM Z29879; WAM Z29898, one specimen with most of stalk missing, WA, Exmouth Gulf, sta. 12, 9.5-10 m, 5.vii.2004, 21º54.108'S 114º28.529'E; RMNH Coel. 33230, 2 ms of WAM Z29898; WAM Z29901, one specimen, WA, Exmouth Gulf, sta. 17, 7.8-8.5 m, 5.vii.2004, 21º50.470'S 114º35.345'E; RMNH Coel. 33231, 7 ms of WAM Z29901; WAM Z29910, one rather complete specimen, WA, Exmouth Gulf, sta. 10, 21.2-21.4 m, 8.vii.2004, 21º51.281'S 114º12.056'E; RMNH Coel. 33232, 2 ms of WAM Z29910.

Description (ZMB 6832).— The colony is 20 cm long, attached to a piece of rock (fig. 121b). Polyps are up to about 0.80 mm high and 0.60 mm wide.

Supporting bundle.— Hardly projecting (fig. 123a); larger spindles have simple tubercles and outer side and distal end spiny (fig. 123e). Length of these spindles is up to about 0.70 mm.

Points.— Ventrally only a few rods are present, mostly lying horizontally; laterally about 10-12 spindles, and dorsally 14-16 spindles. Ventrally the points consist of rods of 0.10 mm long, with scalloped edge. The largest point spindles are found dorsally, up to 0.25 mm long, having simple tubercles and a spiny dorsal side and distal end (fig. 123b). Between the points an additional rod is often present (fig. 123d). Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 123c).

Polyp stalk and tip of branches.— Slender spindles, up to 0.90 mm long, with simple tubercles (fig. 123f).

Surface layer top of stalk.— Radiates and derivatives of these, many slightly unilaterally spinose. Length of these sclerites is up to 0.15 mm long (fig. 123g). Furthermore, small spindles are also present, up to about 0.25 mm long.

Surface layer base of colony.— Sclerites similar to those of the top of the stalk, but the small spindles are somewhat longer, up to 0.45 mm, and many of them have side branches (fig. 124a).

Interior stalk.— Only in the base of the colony are some spindles present, up to 0.70 mm long, with simple tubercles (fig. 124b).

Colour.— Colony reddish. Point sclerites yellowish, supporting bundle sclerites orange, tentacular rods colourless, branch sclerites colourless and orange, stalk sclerites orange.

Remarks.— One syntype of *N. rubra* (ZMB 6832, fig. 121b) is a complete colony, but it lacks a real stalk, showing stems arising from a common base. Probably therefore there is hardly any difference between the sclerites in the base and somewhat higher up the colony. The other syntype of *N. rubra* (ZMB 6831; Kükenthal, 1910: fig. 15) lacks the base of the stalk.

From the drawings of the sclerites it is obvious that *Nephthya australis* Kükenthal, 1910, is the same species as *N. rubra* (compare figs 125-126 with figs 123-124). *N. australis* has a different colony colour, whitish with red polyps. The colour of the larger point sclerites is orange; supporting bundle spindles occasionally partly orange and partly colourless. All other sclerites are colourless, although occasionally an orange sclerite was found in the stalk. The holotype of *N. australis* lacks the base of the stalk (fig. 122b), which explains why the sclerites of the base of the colony (fig. 126) hardly differ from those of the top of the stalk (fig. 125e).

Nephthya quercus Kükenthal, 1910, is also very similar to *N. rubra*. Like the holotype of *N. australis* and one syntype of *N. rubra*, the holotype of *N. quercus* lacks the base of

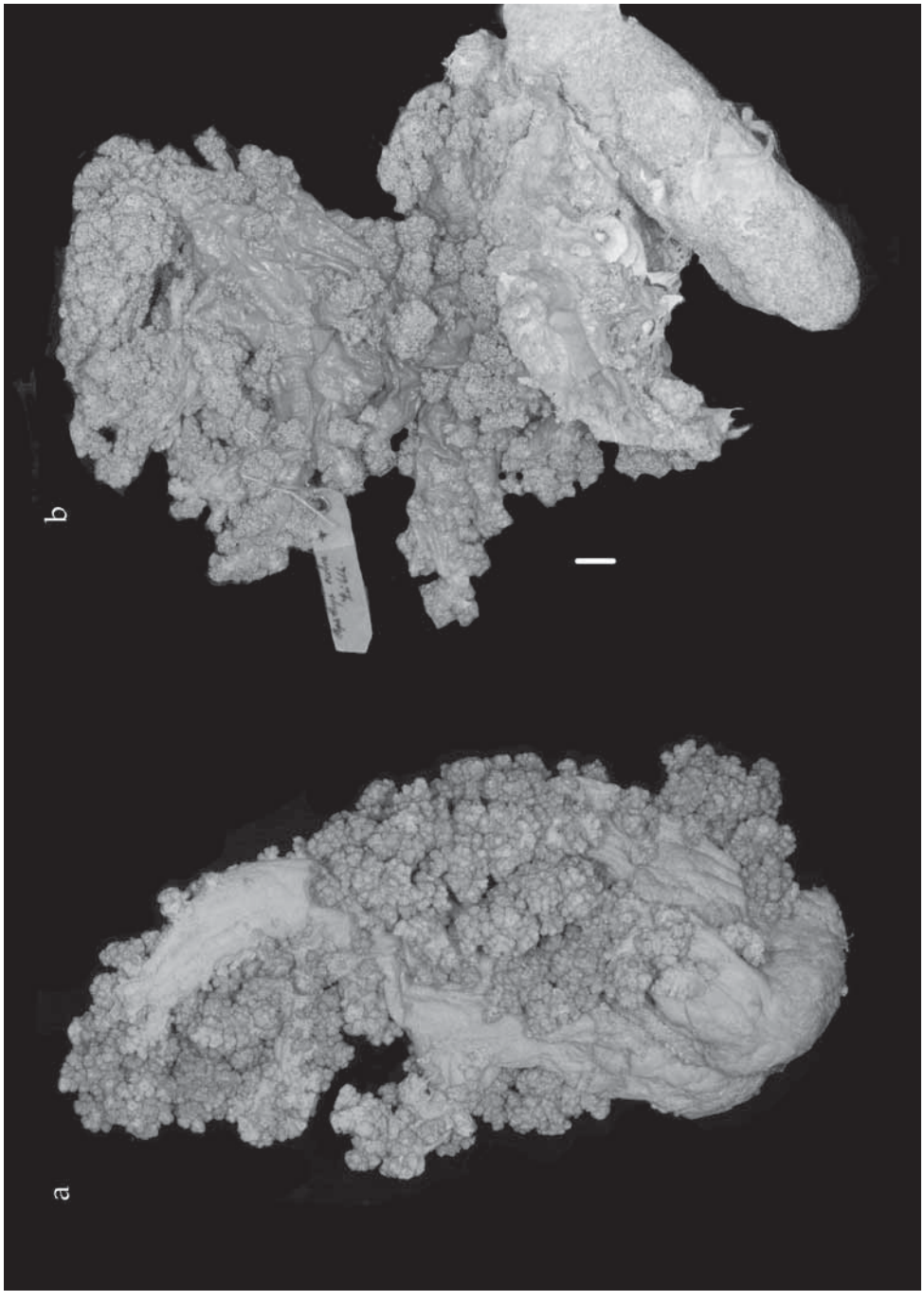


Fig. 121. *Chromonephthea rubra* (Kükenthal, 1910); a, ZMB 6830, holotype of *Nephthya quercus* Kükenthal, 1910; b, ZMB 6832, syntype of *C. rubra.* Scale 1 cm.

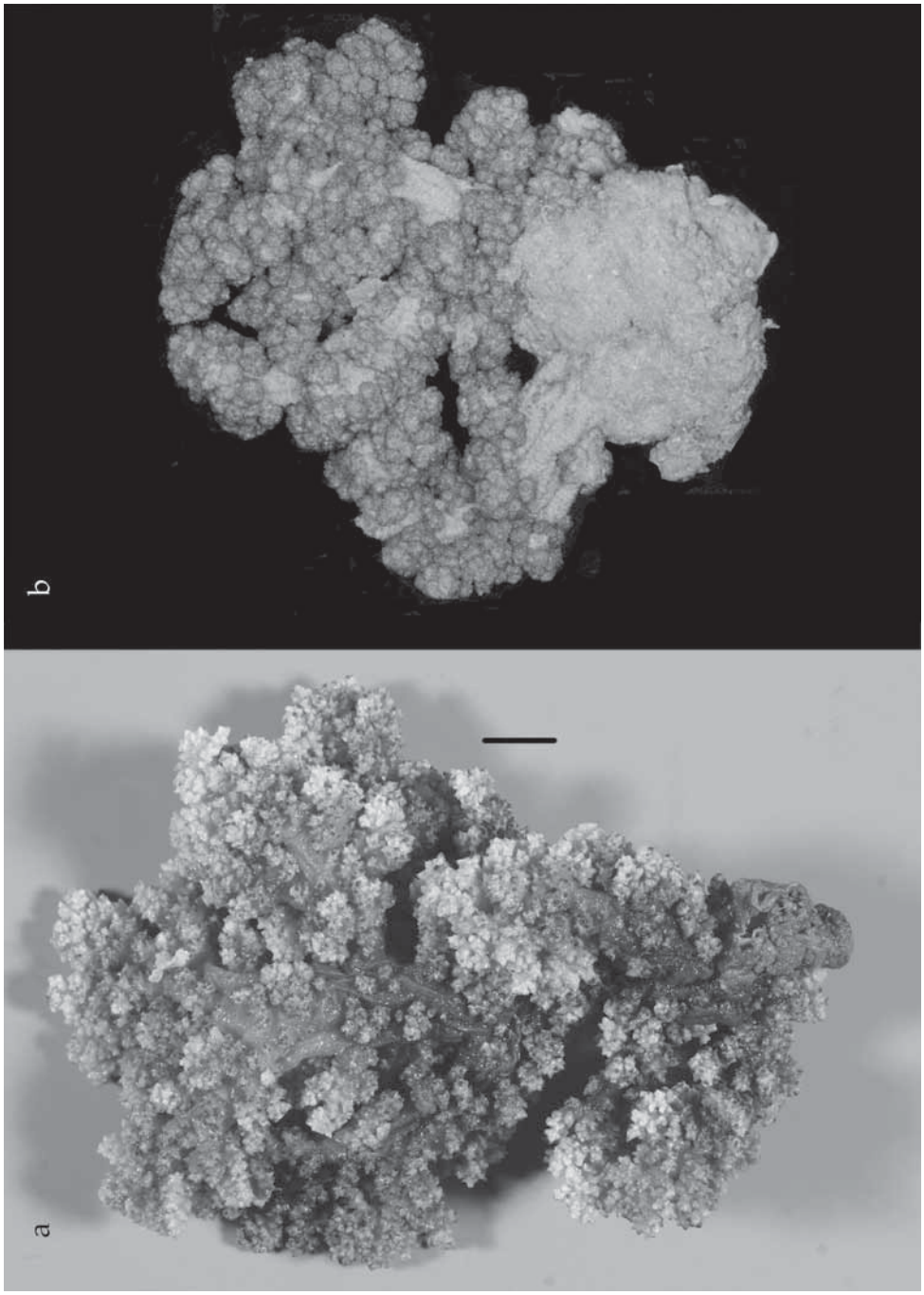


Fig. 122. *Chromonephthea rubra* (Kükenthal, 1910); a, WAM Z29901; b, ZMB 6736, holotype of *Nephthya australis* Kükenthal, 1910. Scale 1 cm.

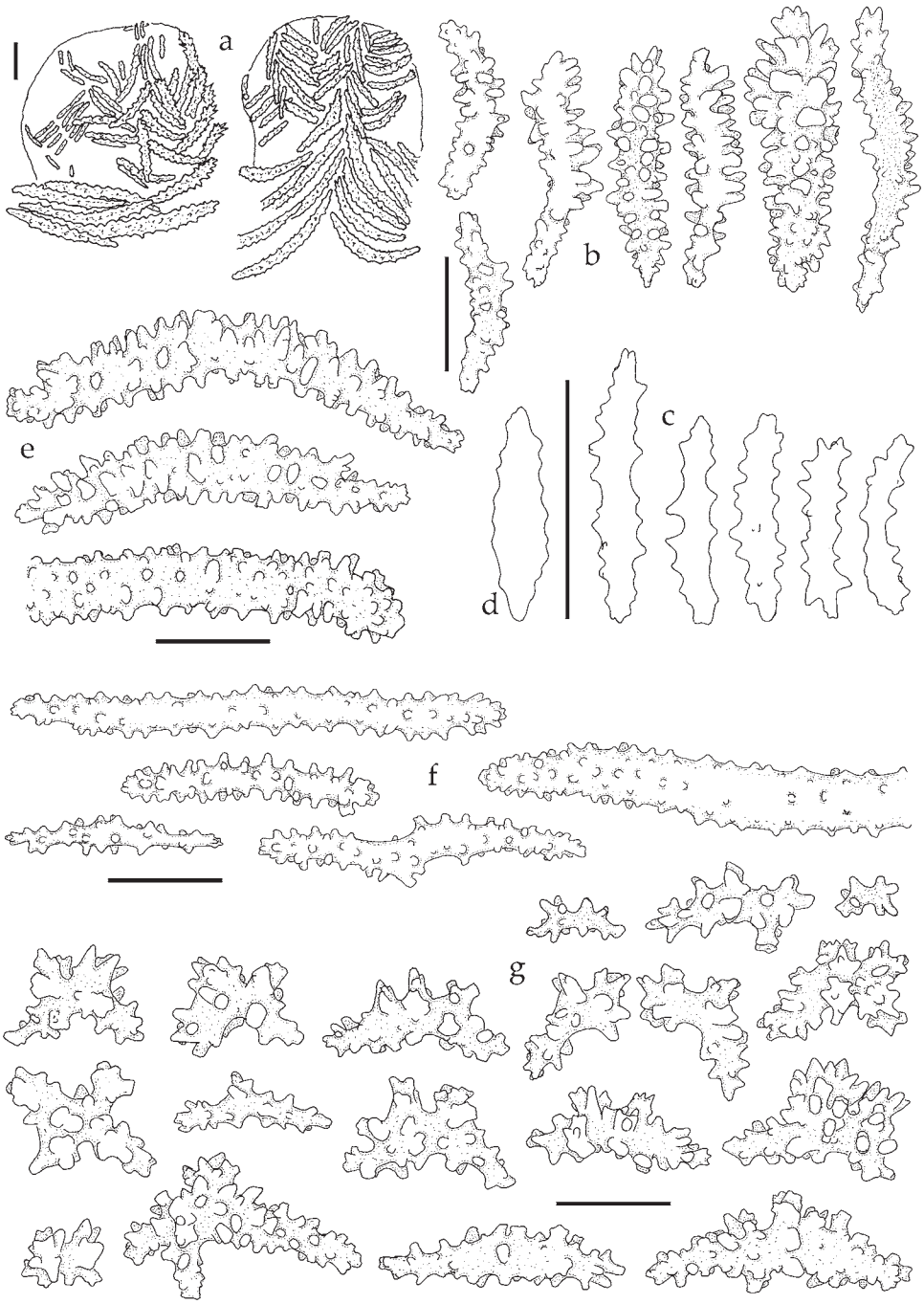


Fig. 123. *Chromonephthea rubra* (Kükenthal, 1910); syntype ZMB 6832; a, lateral and view from below of polyp armature; b, point spindles; c, tentacular rods; d, intermediate; e, spindles (one partly) of supporting bundle, f, spindles, branch surface (one partly); g, sclerites, surface layer top of stalk. Scales 0.10 mm.

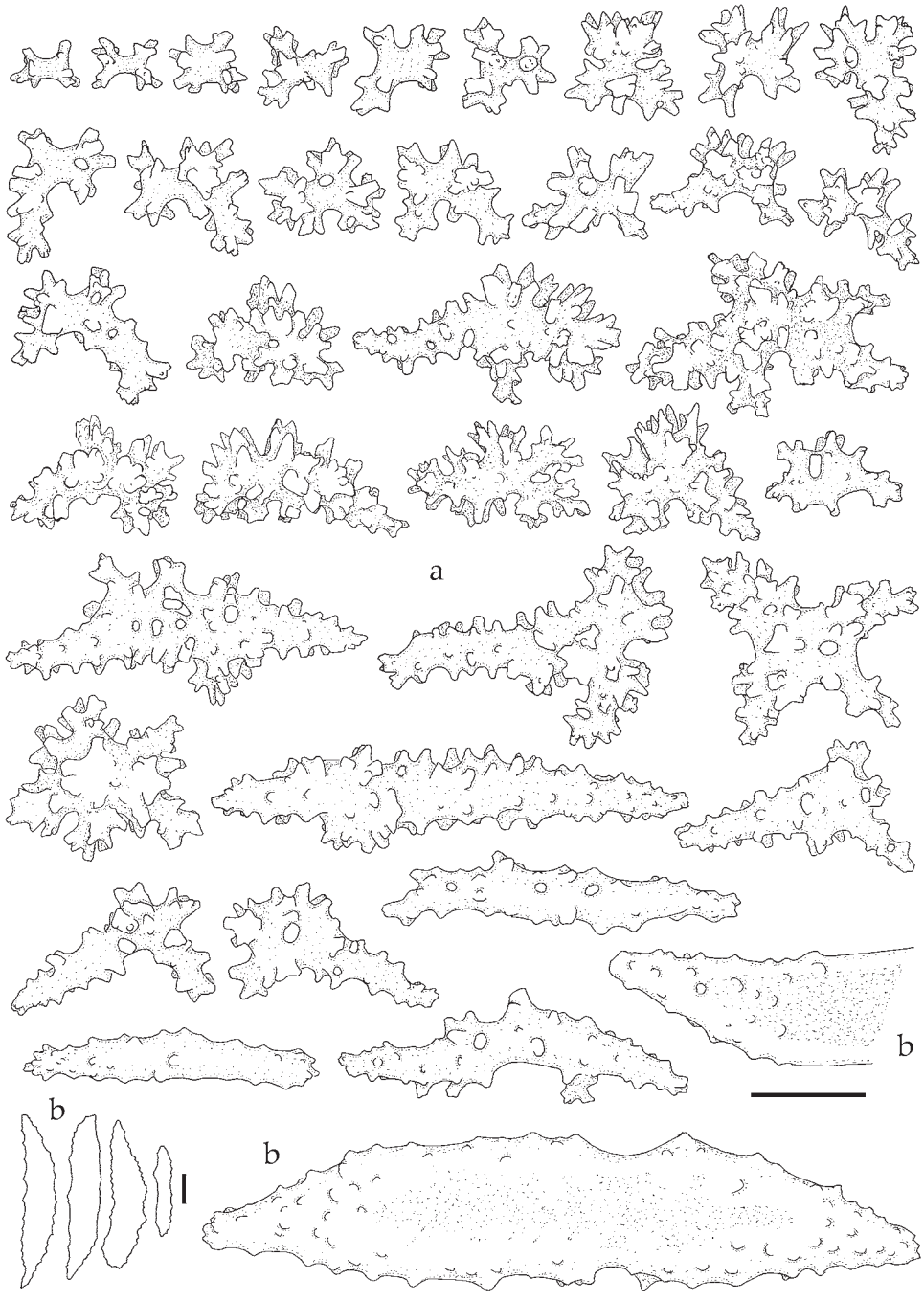


Fig. 124. *Chromonephthea rubra* (Kükenthal, 1910); syntype ZMB 6832; a, sclerites, surface layer base of colony; b, spindles, interior, four of them outlines only. Scales 0.10 mm.

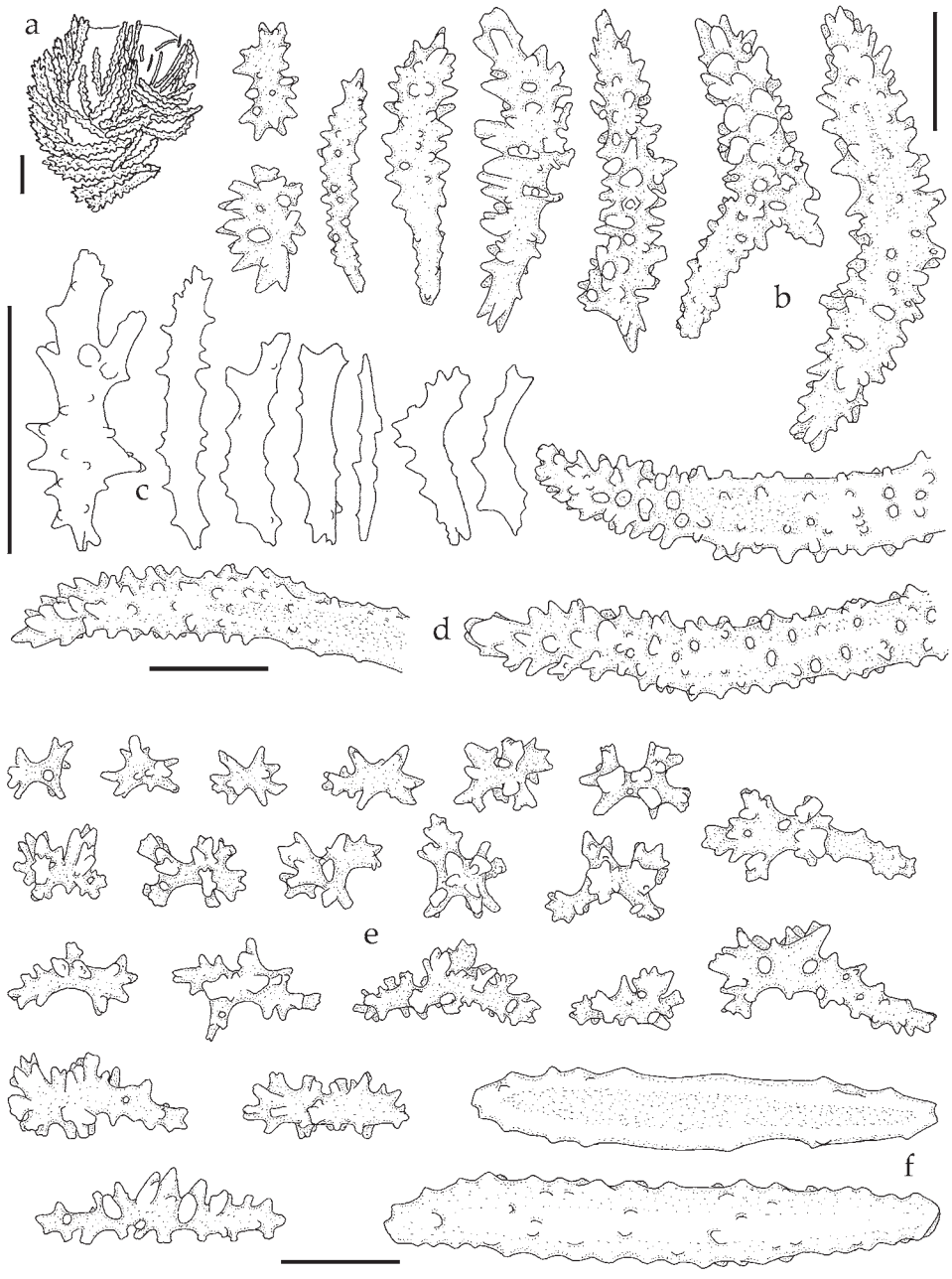


Fig. 125. *Chromonephthea rubra* (Kükenthal, 1910); sclerites of ZMB 6736, holotype of *Nephthya australis* Kükenthal, 1910; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindles of supporting bundle (part); e, sclerites, surface layer top of stalk; f, spindles, interior top of stalk. Scales 0.10 mm.

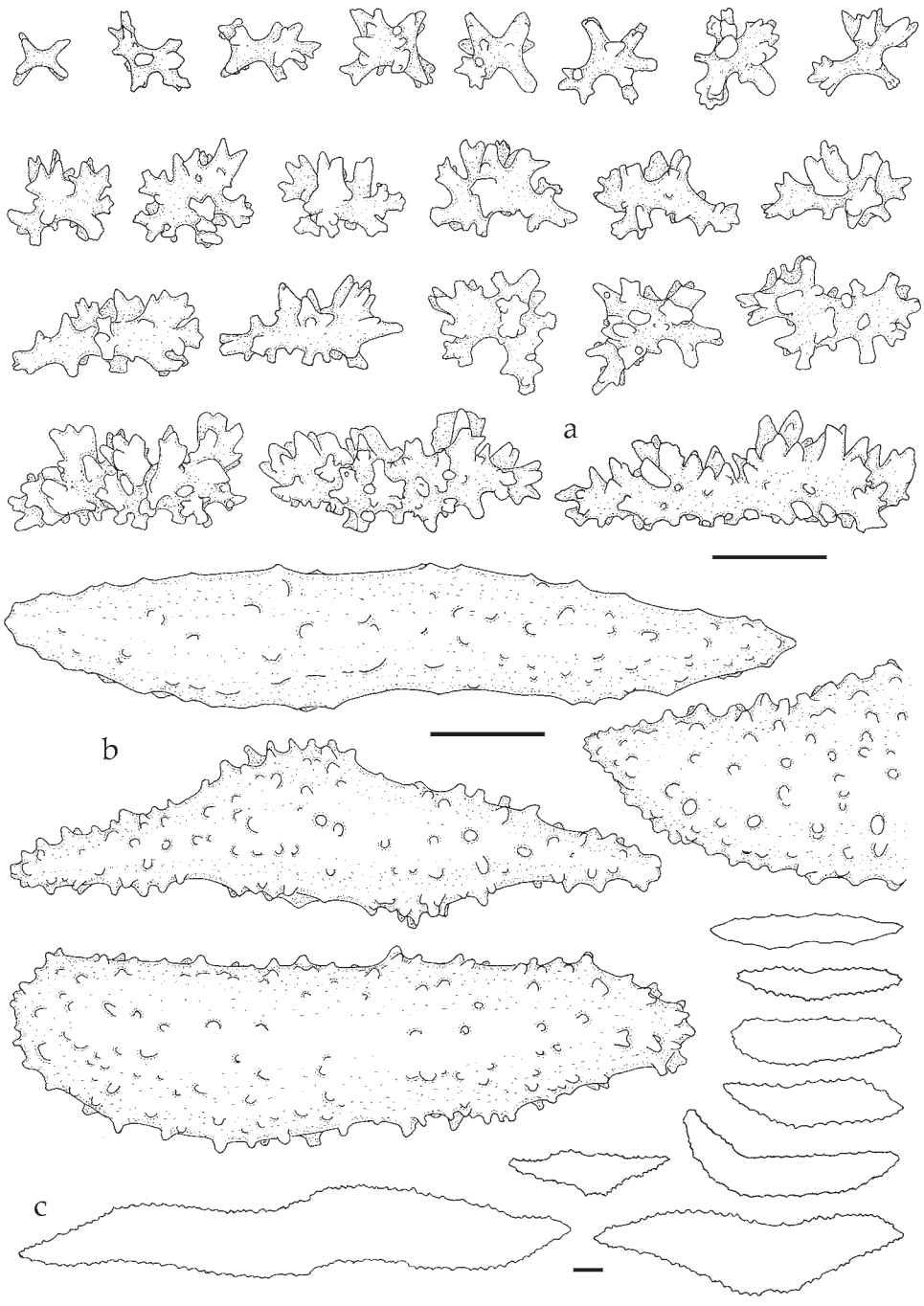


Fig. 126. *Chromonephthea rubra* (Kükenthal, 1910); sclerites of ZMB 6736, holotype of *Nephthya australis* Kükenthal, 1910; a, sclerites, base of colony, b-c, spindles, interior, c, outlines only. Scales 0.10 mm.

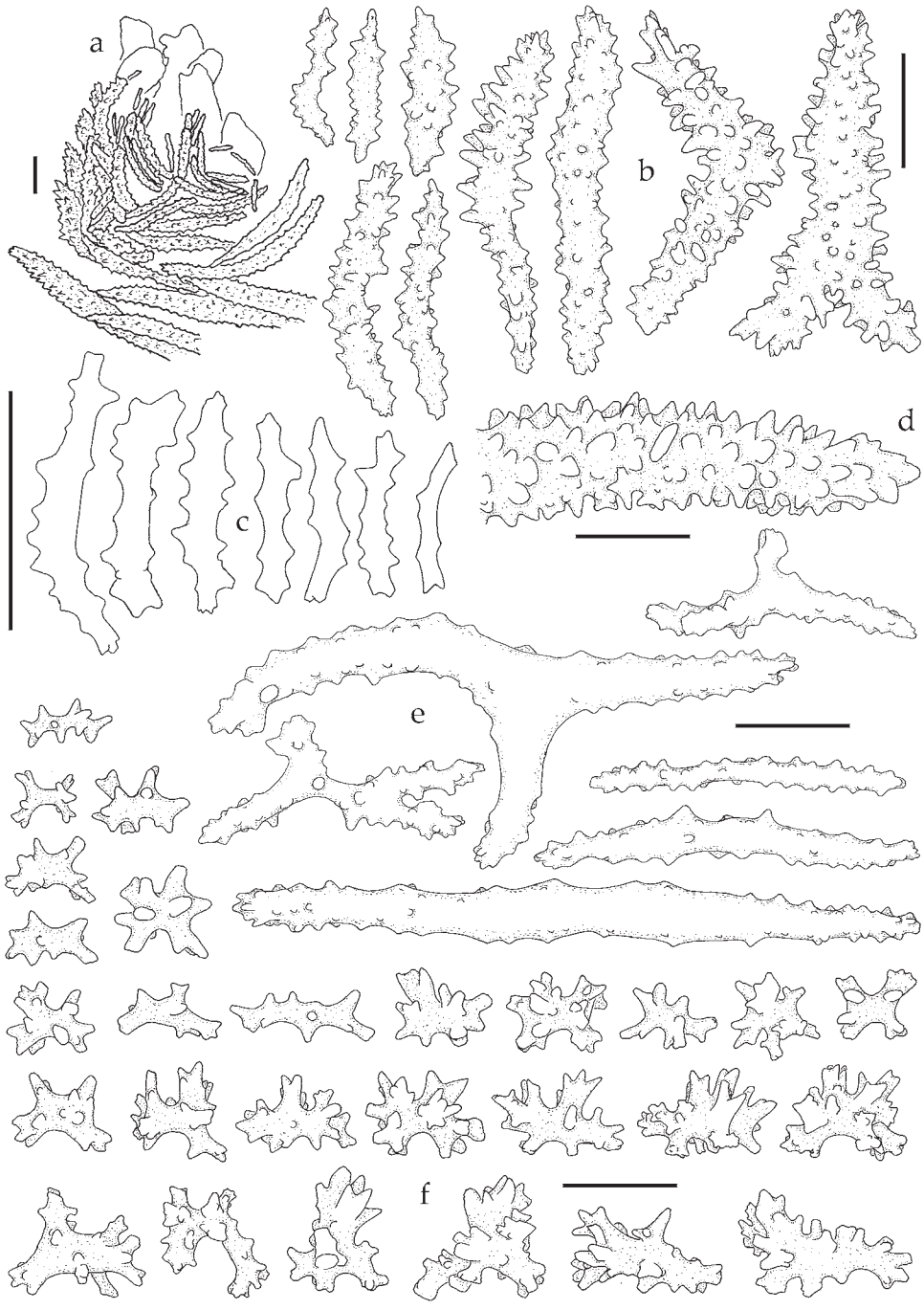


Fig. 127. *Chromonephthea rubra* (Kükenthal, 1910); sclerites of ZMB 6830, holotype of *Nephthya quercus* Kükenthal, 1910; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, spindles, branch; f, sclerites, surface layer top of stalk. Scales 0.10 mm.

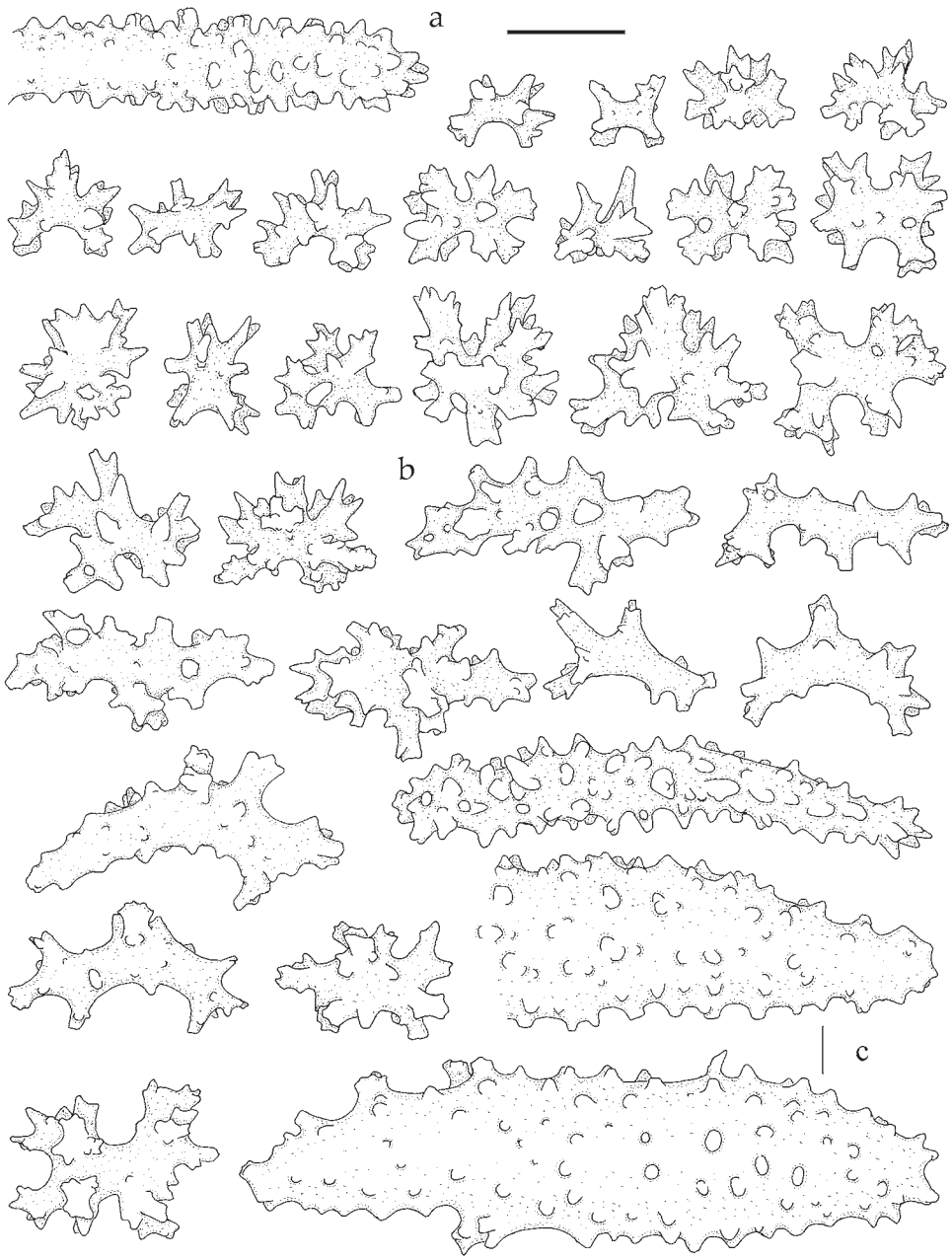


Fig. 128. *Chromonephthea rubra* (Kükenthal, 1910); sclerites of ZMB 6830, holotype of *Nephthya quercus* Kükenthal, 1910; a, spindle of supporting bundle (part); b, sclerites, surface layer base of colony; c, interior stalk spindles (one partly). Scale 0.10 mm.

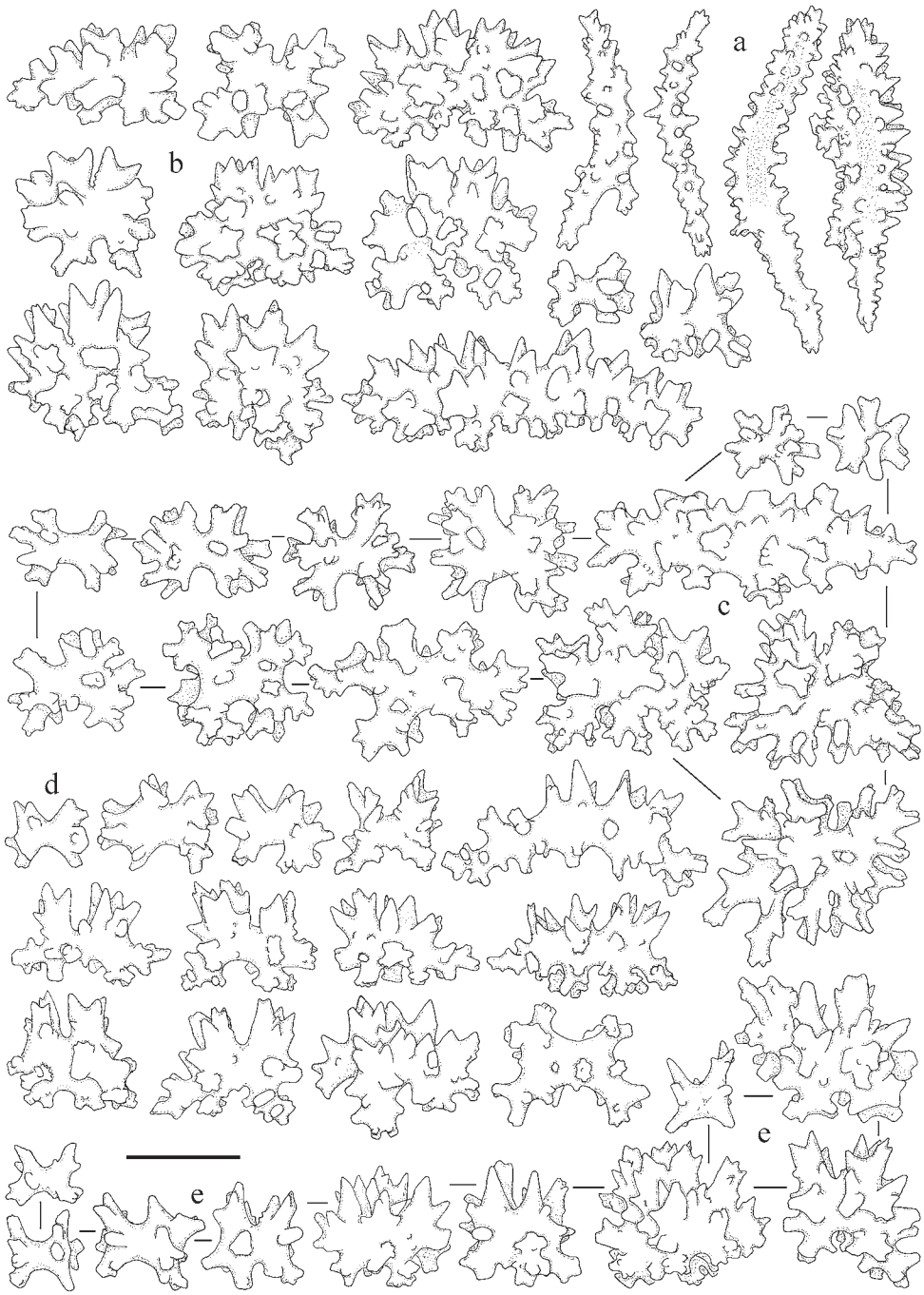


Fig. 129. *Chromonephthea rubra* (Kükenthal, 1910); a-c, WAM Z29901; d, WAM Z29898; e, WAM Z29879; a, point spindles; b, sclerites, surface layer top of stalk; c-e, sclerites, surface layer base of colony. Scale 0.10 mm.

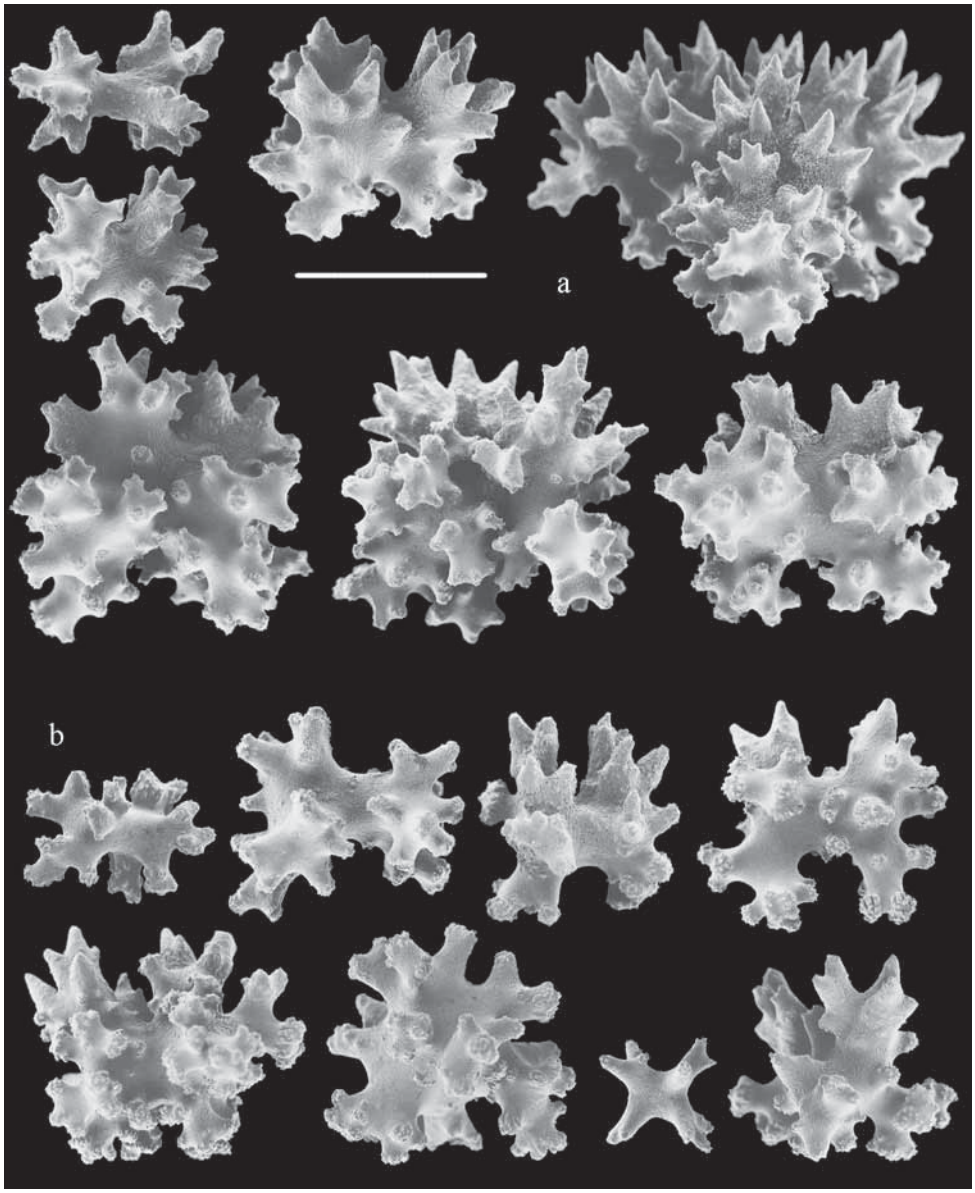


Fig. 130. Sclerites, surface layer base of colony / stalk; a, *Chromonephthea rubra* (Kükenthal, 1910), WAM Z29901; b, *C. simulata* spec. nov.; holotype WAM Z27507. Scale 0.10 mm.

the stalk (fig. 121a). This specimen is dirty white with red polyps; point and tentacular sclerites are orange, some sclerites in the surface layer of the base of the colony are pink, all other sclerites colourless. The sclerites in the surface layer of the stalk of the holotype of *N. quercus* (fig. 128b) differ from those of *N. rubra* in being slightly larger and less tuberculate. This difference could be caused by different sampling position, as the holotype of *N. quercus* lacks the very base. Therefore, I tried to find extra characters to differentiate between the two species. I found such a difference in the branches, with *N. rubra* having more tuberculate rods and spindles (fig. 123f) than *N. quercus* (fig. 127e). Realising that this difference could be due to intraspecific variation I tried to obtain recently collected material with complete stalk referable to *N. quercus*, which could possibly reveal a clear difference between *N. rubra* and *N. quercus* based on the very base of the stalk. Unfortunately, most of the recently collected material also lacks the base of the stalk (see material examined) and the difference in the branch sclerites remained inconclusive. The most complete colony was WAM Z29901, with a very short but seemingly complete stalk (fig. 122a). While the stalk of this colony shows sclerites (figs 129b-c, 130a) similar to those of the holotype of *N. quercus*, some of the base stalk sclerites (see fig. 129c, two last sclerites) were similar to some of *N. rubra* (see fig. 124a, middle one in the 4th row, first one in the 6th row).

Considering the above discussed similarity and the lack of differentiating characters I decided to synonymize *N. australis* and *N. quercus* with *N. rubra*.

Roxas (1933) identified a specimen from an unknown locality in the Philippines as *Nephthea australis*. His description is too superficial in order to interpret what he really had, but as he mentioned the specimen to be light yellowish green it cannot belong to *Chromonephthea*. He also identified a specimen from Balatero Cove, Puerto Galera, Mindoro, Philippines as *N. quercus*. This description also lacks sufficient detail to understand what he really had, but as he mentioned spindles in the base of the stalk, and the specimen did not have the typical coloration, it very likely does not belong to *Chromonephthea*.

NTM C2982 is a very small colony of only 2.5 cm long with a short stalk 0.5 cm in length; probably incomplete. The colony is red with a white stalk and yellow polyps. The sclerites resemble those of *C. rubra*, but as the base of the stalk is probably missing some doubts remain about its identity.

There is a considerable colour variation in this species. WAM Z20499, WAM Z20507, WAM Z29841, WAM Z29846, WAM Z29860, and WAM Z29861 are cream coloured with colourless sclerites. WAM Z20503 and WAM Z20505 are white with red points; point spindles orange to pink; all other sclerites colourless. In WAM Z20503 the base also has a few pink sclerites. WAM Z20498 has a white stem and branches, with red end branches and yellow polyps; base of stem reddish; point sclerites yellow, supporting bundle spindles and end branch sclerites orange; base of colony with a mixture of pink, orange and colourless sclerites. WAM Z29879 and WAM Z29898 are purple with orange supporting bundle and purple polyps. WAM Z29901 has a purple stalk and stem, end branches and supporting bundles orange, polyps red / purple; at the end branches also some completely white supporting bundles and polyps. WAM Z29910 has orange stalk and stem, purple end branches, with yellow supporting bundle and red polyps.

The species is similar to *C. williamsi* spec. nov., but the latter species has more slender point spindles.

Chromonephthea serratospiculata (Utinomi, 1951) (figs 1a, 131-132, 155)

Eunephthya serratospiculata Utinomi, 1951: 33, figs 3-4 (Japan).
Paraspongodes serratospiculata; Utinomi, 1960: 22; Imahara, 1996: 26.

Material examined.— The **holotype**, Japan, off Seto, Kii Coast, depth and data unlabelled; RMNH Coel. 33416, 4 ms of holotype.

Description.—The holotype is 3 cm long and 2 cm wide (fig. 1a). Polyps are up to about 1.40 mm high and 1.20 mm wide.

Supporting bundle.— Hardly projecting (fig. 131a); larger spindles have complex tubercles, spiny outer side and a leafy projecting end (fig. 131d). Length of these spindles is up to about 1.00 mm. The innermost ones form a kind of collaret, with spines or leafy projections in the middle part of the spindles (fig. 131c)

Points.— Laterally about 6-8 spindles per point. Because of the many overlapping sclerites present in the polyps the amount of ventral and dorsal spindles could not be established with any certainty (fig. 131a). The lateral point spindles are up to 0.40 mm long and have simple tubercles and spiny distal end. Dorsally the spindles are up to 0.80 mm long, with complex tubercles, small side branches, and spiny outer side and distal end (fig. 131b). It was impossible to see whether intermediates were present. Tentacles have flattened rods, up to 0.20 mm long, with scalloped edge (fig. 131e-f).

Surface layer top of stalk.— Spindles and unilaterally spinose spindles that were all broken and therefore not drawn; they resemble those of the base of the stalk.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.20 mm long, all with simple tubercles, several unilaterally spinose (fig. 132). Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.80 mm long, mostly with simple tubercles but several showing complex tubercles as well.

Interior stalk.— Without sclerites.

Colour.— Colony white, all sclerites colourless.

Remarks.— The holotype could not be photographed clearly and therefore the drawing of Utinomi is given (fig. 1a), magnification 2.7 x.

The polyps with crowded sclerites, several of them with leaf-like spines, resemble those of species of *Capnella* Gray, 1869. However, *C. serratospiculata* differs in being azooxanthellate, lacking interior sclerites in the stalk, and not having unilaterally leafy radiates in the surface layer of the stalk.

For comparison with the other Japanese *Chromonephthea* species see the remarks of *C. cairnsi* spec nov. and *C. imaharai* spec. nov.

Chromonephthea sierra (Thomson & Dean, 1931) (figs 133-135, 156)

Stereonephthya sierra Thomson & Dean, 1931: 147 (Indonesia); van Soest, 1977: 92, pl. 3 fig. b (list of type specimens, ZMA).

Material examined.— ZMA COEL. 3453, **holotype**, Siboga sta. 273, Anchorage off Pulu Jedan, east coast of Aru islands (Pearl banks), 23/26.xii.1899, 13 m, sand and shells, trawl, dredge and divers; RMNH Coel. 33417, 8 ms of holotype.

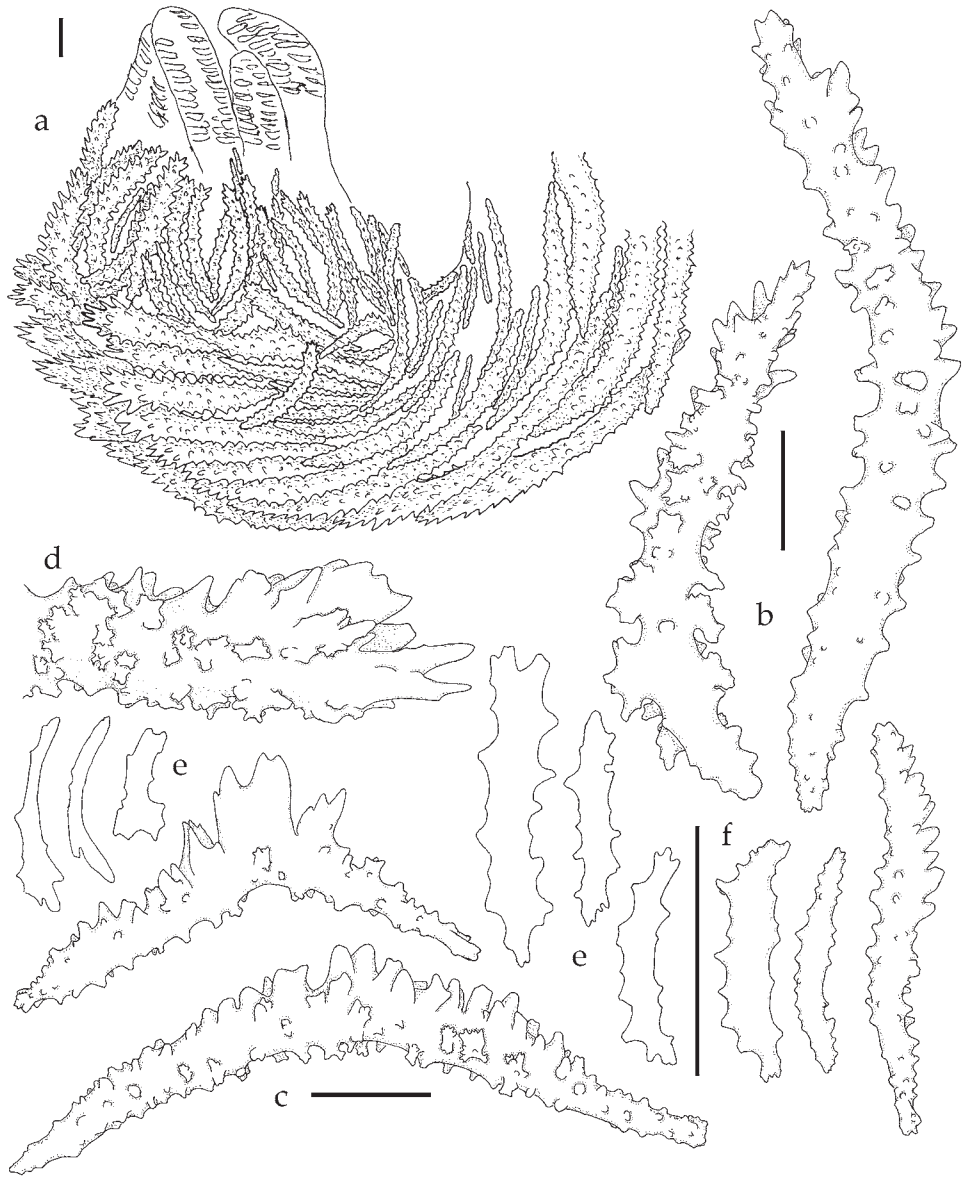


Fig. 131. *Chromonephthea serratospiculata* (Utinomi, 1951), holotype; a, lateral view of polyp armature; b, point spindles; c, "collaret" spindles; d, spindle of supporting bundle (part); e-f, tentacular rods, f shows one rod at different scale. Scales 0.10 mm, scale at c also applies to d and f.

Description.— The holotype is 12 cm long and 6 cm wide, without a holdfast and with a bent stalk (fig. 133a). Apparently a piece is broken off (fig. 133b). This piece is somewhat darker coloured. The Polyps are up to about 1.20 mm high and 0.90 mm wide.

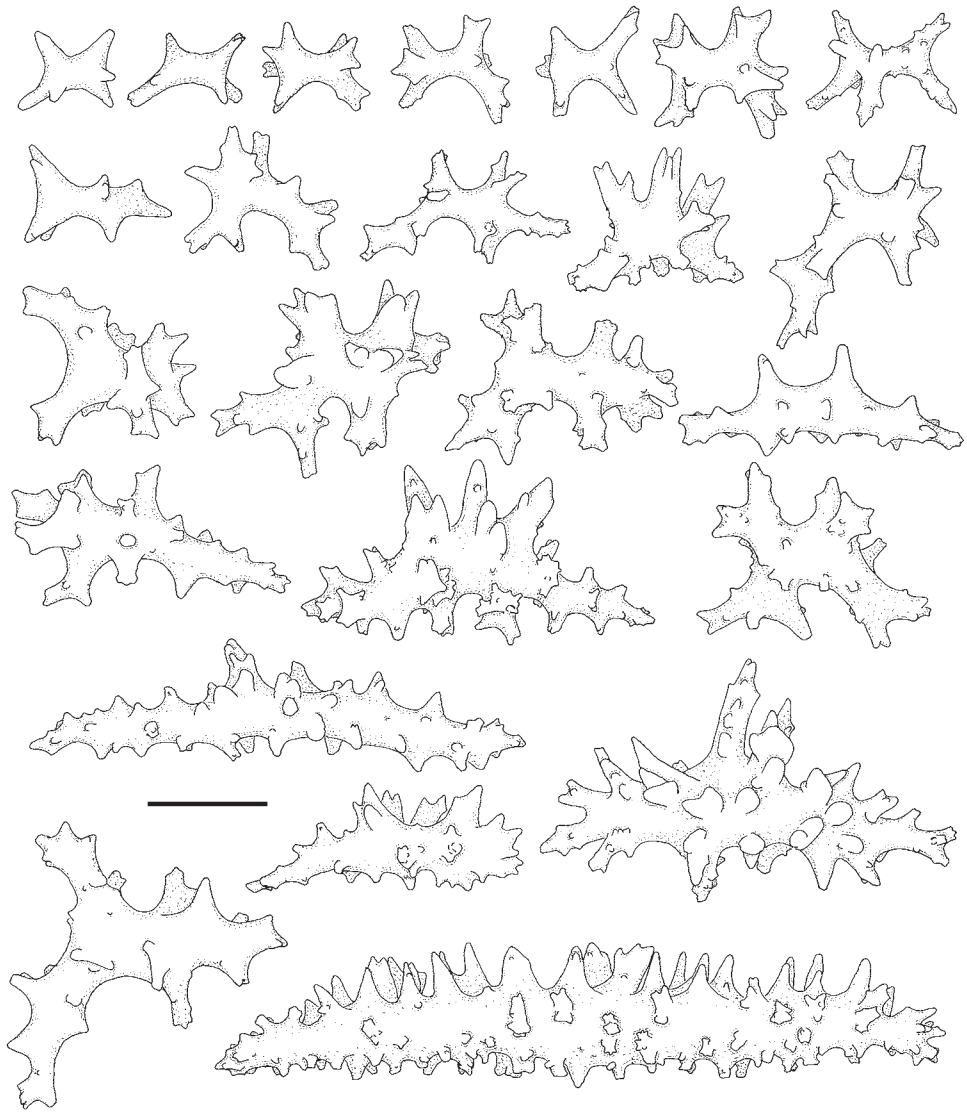


Fig. 132. *Chromonephthea serratospiculata* (Utinomi, 1951), holotype; sclerites, base of stalk. Scale 0.10 mm.

Supporting bundle.— Projecting up to 0.30 mm (fig. 134a); larger spindles have complex tubercles on the ventral side, and spines on the dorsal side and the distal tip (fig. 134d).

Points.— Laterally 4-6 spindles per point (fig. 134a), ventral and dorsal the points were not clearly visible. Lateral point spindles are up to 0.55 mm long. The largest point spindles are present dorsally, up to 0.65 mm long, with complex tubercles on the inner side, and the distal end and outer side with spines. A few of these dorsal point sclerites

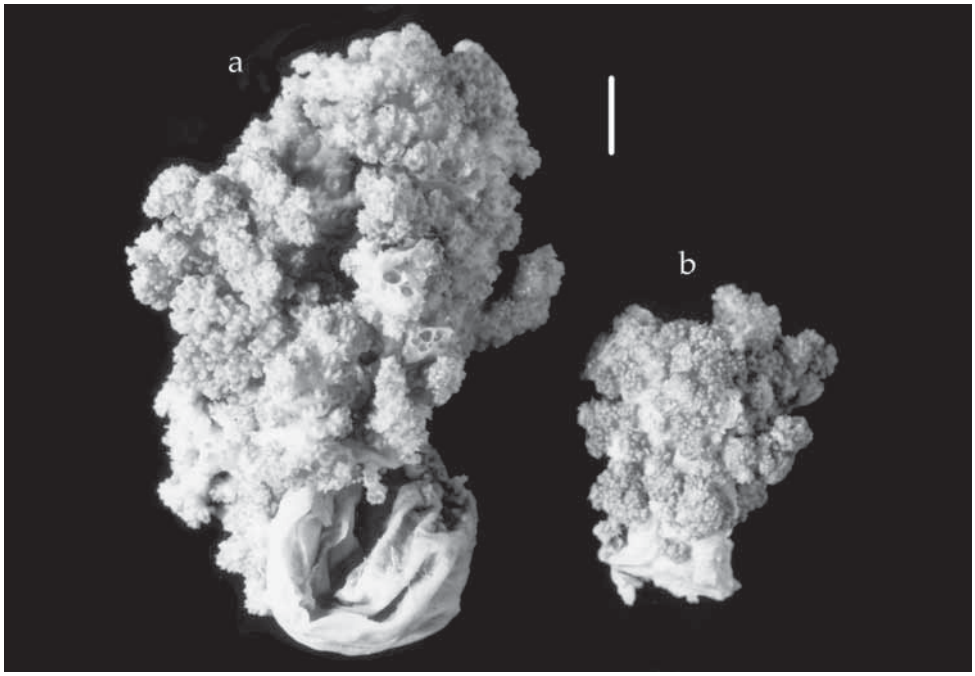


Fig. 133. *Chromonephthea sierra* (Thomson & Dean, 1931), holotype ZMA COEL. 3453; a, larger fragment; b, broken off fragment. Scale 1 cm.

project beyond the polyp. The smaller point spindles have simple tubercles only (fig. 134b). Between the points a few intermediate sclerites are often present. Tentacles with flattened rods with scalloped edge, length of these rods 0.06-0.12 mm (fig. 134c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.25 mm long, many of them unilaterally spinose (fig. 135a), and most have complex tubercles. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 1.00 mm long, with complex tubercles.

Surface layer base of stalk.— Radiates with simple or complex tubercles (fig. 135b), almost none unilaterally spinose. Length of these radiates is up to 0.25 mm.

Interior stalk.— No sclerites present.

Colour.— Colony white with pink polyps. Point sclerites orange, some supporting bundle spindles partly orange; other sclerites colourless.

Remarks.— The massive point spindles, among the largest in the genus, characterize this species. For comparison with the other species with big point spindles see the remarks of *C. cornuta*.

Chromonephthea simulata spec. nov.
(figs 130b, 136-137, 158, 173)

Material examined.— WAM Z27507, **holotype**, North-Western Australia, Rowley Shoals, 19°19.70'S; 119°09.80'E; 50 m; dredge; 19.viii.1987, coll. P. Alderslade; RMNH Coel. 32703, 6 ms of holotype.

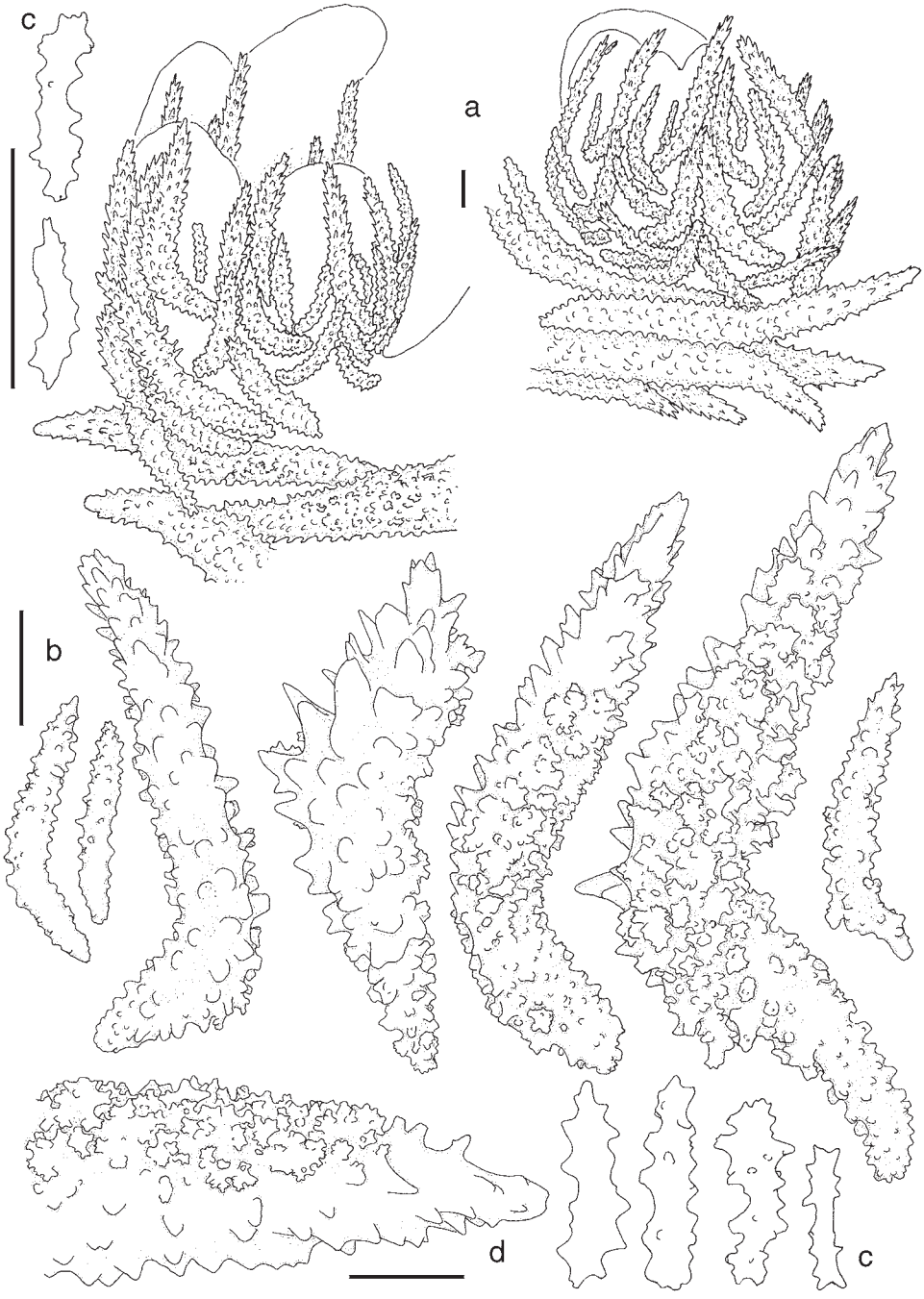


Fig. 134. *Chromonephthea sierra* (Thomson & Dean, 1931), holotype ZMA COEL. 3453; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part). Scales 0.10 mm.

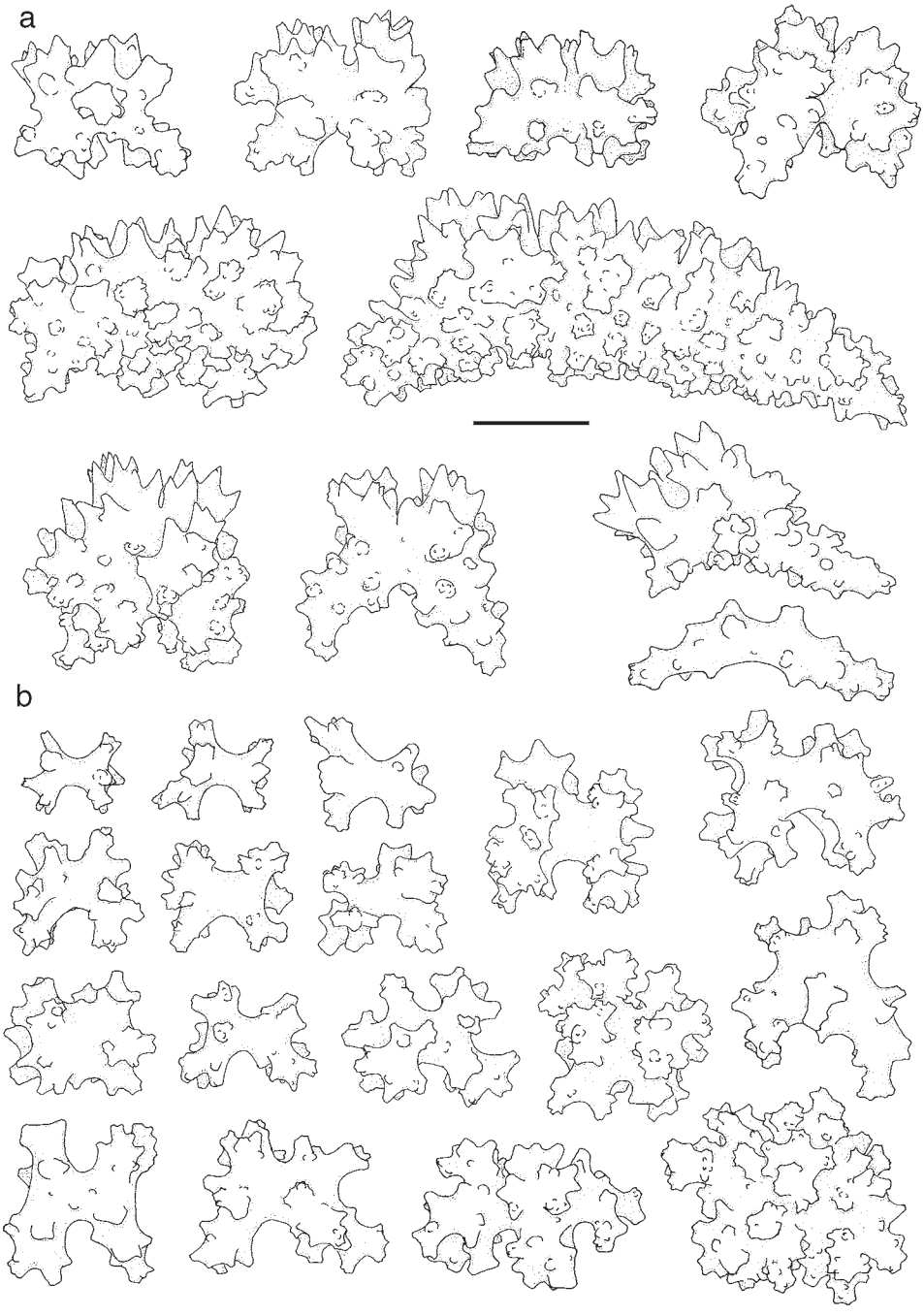


Fig. 135. *Chromonephthea sierra* (Thomson & Dean, 1931), holotype ZMA COEL. 3453; a, sclerites, surface layer top of stalk; b, sclerites, surface layer base of stalk. Scale 0.10 mm.

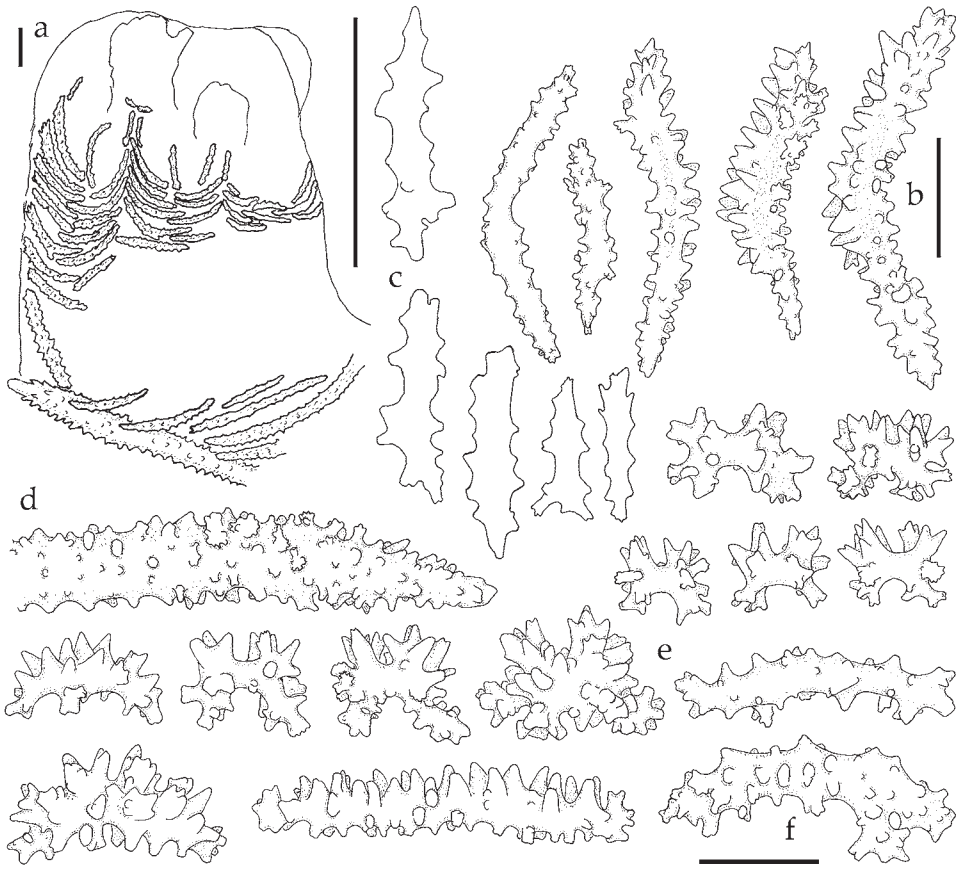


Fig. 136. *Chromonephthea simulata* spec. nov., holotype WAM Z27507; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f, spindle, interior top of stalk. Scales 0.10 mm, scale at f applies to d-f.

Description.— The holotype is 16 cm long and 15 cm wide (fig. 173). Polyps are up to about 0.80 mm wide and 1.10 mm high.

Supporting bundle.— Hardly projecting (fig. 136a); larger spindles have spines and simple tubercles, but occasionally a few complex tubercles are also present (fig. 136d). Length of these spindles is up to about 0.80 mm, width up to 0.10 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8-12, dorsally up to 16 (fig. 136a). The smallest spindles are present ventrally, up to 0.15 mm long, with few simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and a distal spiny end. Dorsally they are up to 0.30 mm long, with simple and complex tubercles and spiny outer side and distal end (fig. 136b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 136c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long (fig. 136e). Most of them are unilaterally spinose; small ones have simple tubercles,

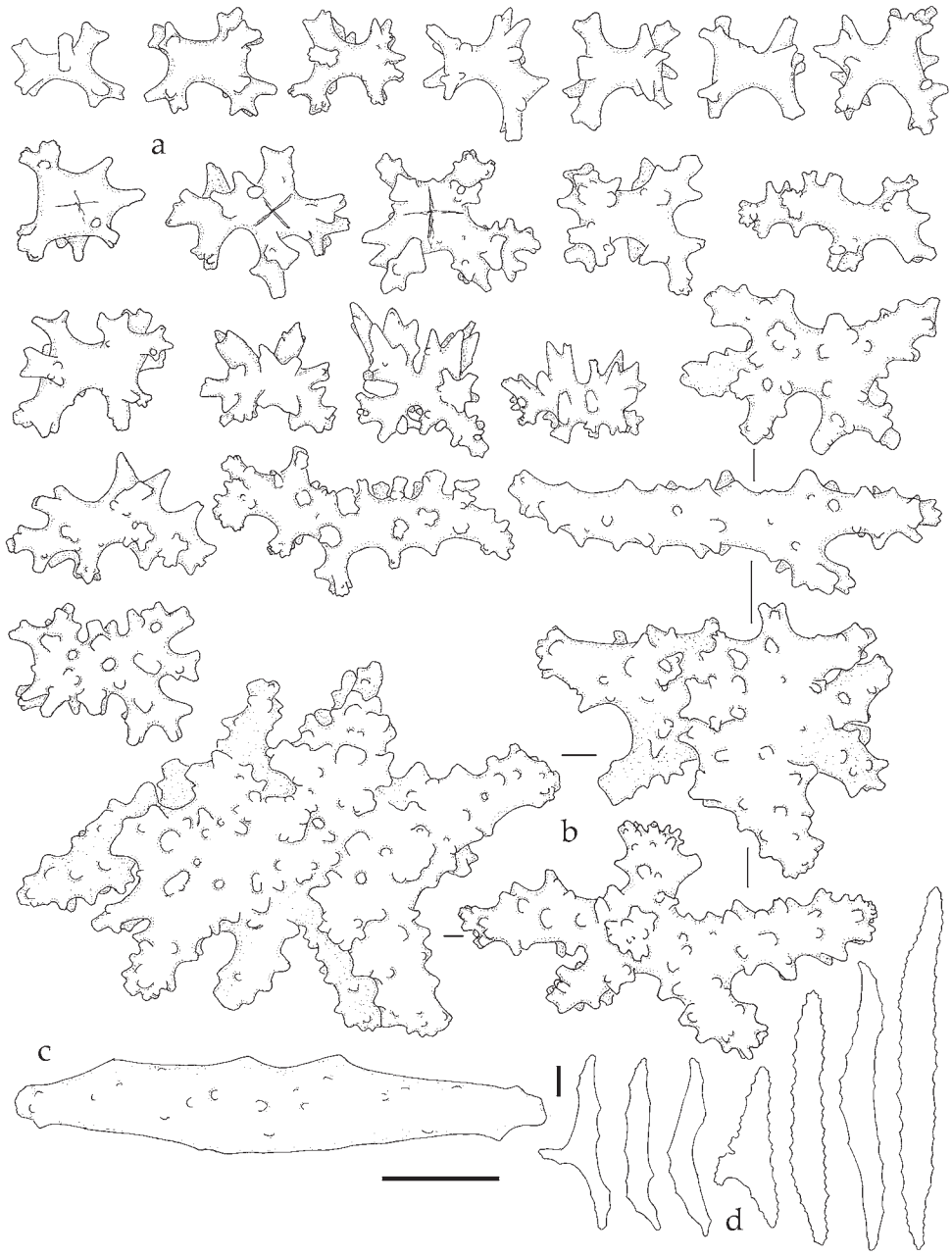


Fig. 137. *Chromonephthea simulata* spec. nov., holotype WAM Z27507; a, sclerites, surface layer base of stalk; b-d, spindles, interior base of stalk; d, outlines only. Scales 0.10 mm, that at c applies to a-c.

larger ones some complex tubercles as well. Larger ones merge into unilaterally spinose spindles, which are up to 0.55 mm long, with simple and some complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.20 mm long; small ones have simple tubercles, larger ones some complex tubercles as well, and some are unilaterally spinose. (figs 130b, 137a). Furthermore, a few spindles are also present, up to 0.40 mm long, with simple and complex tubercles.

Interior stalk.— Spindles with simple tubercles, the smaller ones bear side branches (figs 136f, 137b). These spindles are up to 2.00 mm long (fig. 137c-d).

Colour.— Colony cream with reddish end branches and white polyps. Several spindles of the supporting bundle pink, and several sclerites of the surface layer of the top of the stalk orange; all other sclerites colourless.

Etymology.— The Latin "simulata", imitate, refers to the colony shape resembling that of *C. megasclera* spec. nov., which occurs in the same region.

Remarks.— The heavily branched internal spindles characterize this species. *C. egmondi* spec. nov. also has heavily branched spindles, but they are much larger.

The colour pattern of the species is completely the same as some specimens of *C. megasclera* spec. nov., occurring in the same region. *C. simulata* differs in having heavily branched internal spindles and overall much smaller sclerites.

Chromonephthea singularis spec. nov.
(figs 138-140a, 158, 176d)

Material examined.— NTM C11867, **holotype**, Australia, NT, Cootamundra Shoals, sta. no. 2-59, 20 m, 14.v.1982, coll. R. Lockyer; RMNH Coel. 33233, 5 ms of holotype; NTM C5123, **paratype**, Australia, NT, Cootamundra Shoals, sta. no. 110/9, 25.v.1982; RMNH Coel. 33234, 3 ms, same data as paratype.

Description.— The holotype is 3.5 cm long and 4 cm wide (fig. 176d). Polyps are up to about 0.70 mm wide and 0.90 mm high.

Supporting bundle.— Projecting up to 0.30 mm (fig. 138a); larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 138d). Length of these spindles is up to about 2.00 mm.

Points.— Ventrally 4-6 spindles per point, laterally 6-8, dorsally up to 10 (fig. 138a). The smallest spindles are present ventrally, up to 0.25 mm long, with simple tubercles. Laterally they are up to 0.35 mm long, with simple tubercles and spiny distal end. Dorsally they are up to 0.60 mm long, with complex tubercles and a spiny outer side and distal end (fig. 138b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.12 mm long, with scalloped edge (fig. 138c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.30 mm long, the larger ones with complex tubercles (fig. 138e, h). Many of them are strongly unilaterally spinose. Furthermore, a few spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with complex tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.40 mm long, the larger ones becoming irregular multi-radiate bodies having complex tubercles (figs 139, 140a).

Interior stalk.— With unbranched spindles (fig. 138g) with simple sparse tubercles, length of the spindles up to 1.00 mm. Besides these spindles smaller branched spindles

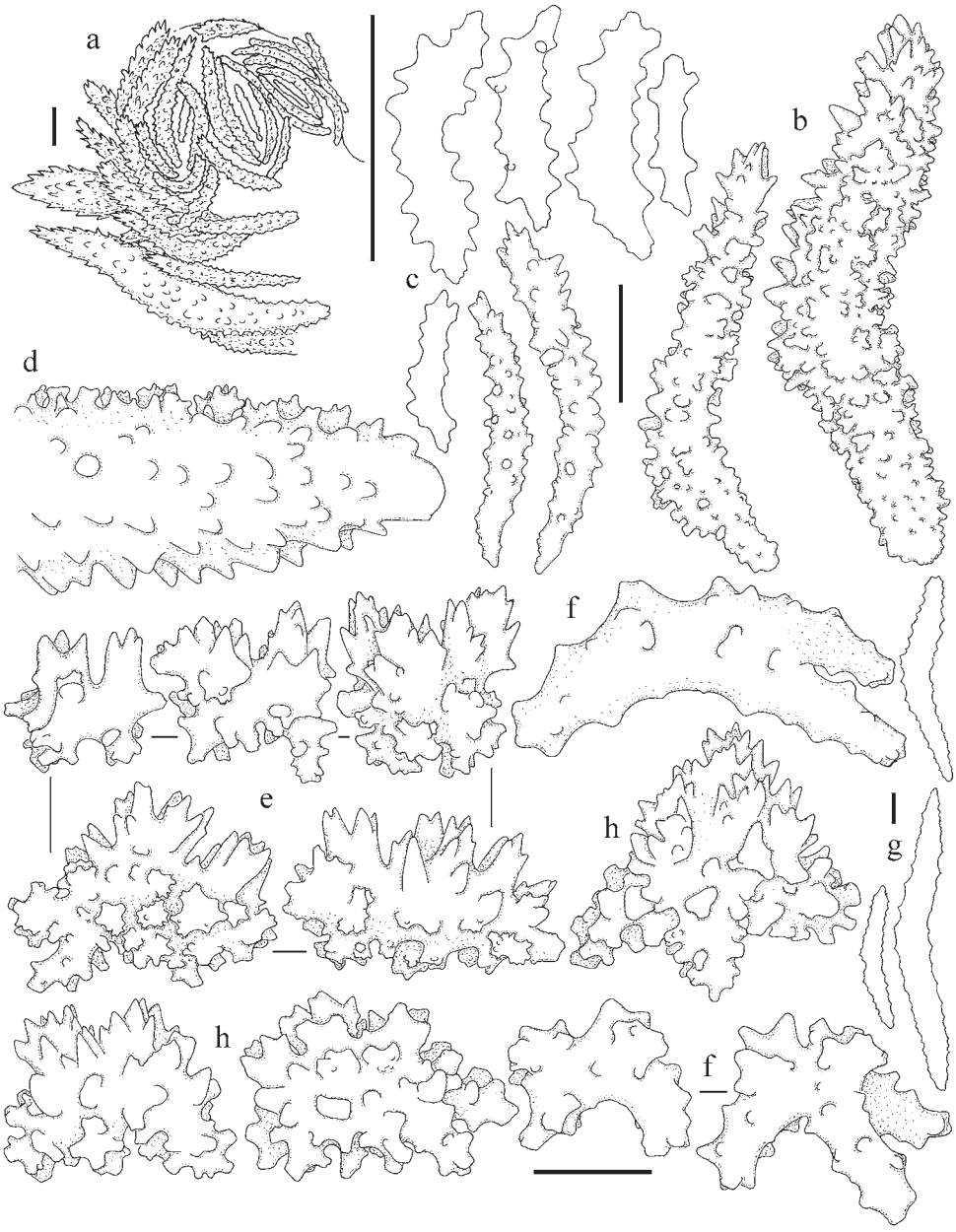


Fig. 138. *Chromonephthea singularis* spec. nov.; a-g, holotype NTM C11867; h, paratype NTM C5123; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, h, sclerites, surface layer top of stalk; f-g, spindles, interior top of stalk, g, outlines only. Scales 0.10 mm, that at f applies to d-f, h.

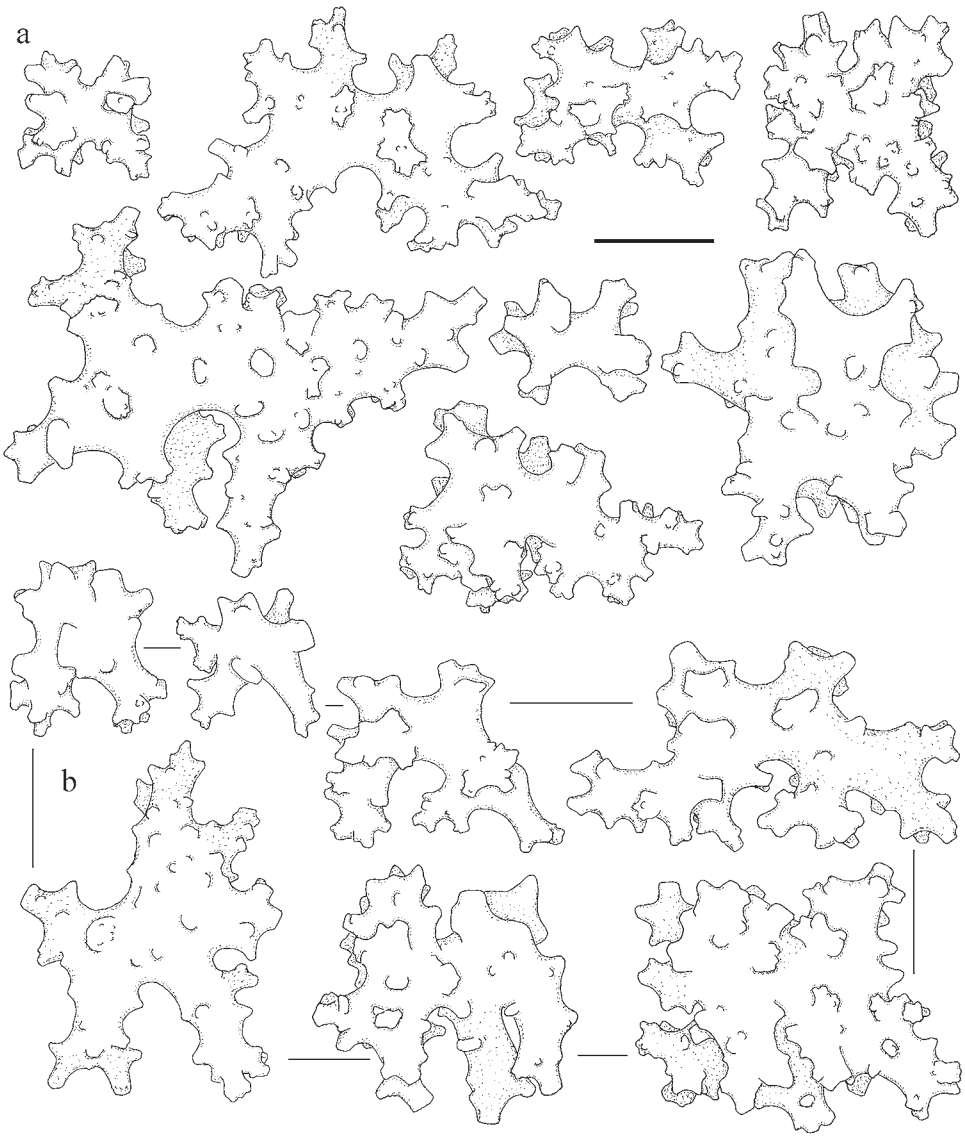


Fig. 139. *Chromonephthea singularis* spec. nov.; a, holotype NTM C11867; b, paratype NTM C5123; sclerites, surface layer base of stalk. Scale 0.10 mm.

are also present, somewhat intermediate between the larger unbranched spindles and the radiates (fig. 138f).

Colour.— Colony with pink stalk and white stem and branches; end branches dark red and polyps yellow. Stem and tentacle sclerites colourless, stalk sclerites pink, supporting bundle spindles reddish, and point spindles yellow to orange.

Etymology.— The Latin “singularis”, unique, refers to the unique combination of sclerites in the stalk.

Remarks.— The paratype is of similar size as the holotype, but reddish with yellow polyps. Base stalk with pink sclerites, higher up becoming orange. Point spindles yellow to orange, supporting bundle spindles yellow or yellow with orange projecting end. The polyp sclerites are rather disintegrated.

This is the only *Chromonephthea* species with a stalk that has large (up to about 0.40 mm) multi-radiate bodies in the surface layer, and spindles in the interior.

Chromonephthea slieringsi spec. nov.
(figs 140b-c, 141, 156, 176a)

Material examined.— RMNH Coel. 32051, **holotype** and 7 ms, SUL.17, Indonesia, N Sulawesi, Selat Lembeh, between Tanjungnanas and Teluk Kungkungan, 01°28'N 125°14'E, steep rocky shore, rockface down to 16 m, coral covered slope, scuba diving to 25 m, 24.x.1994, coll. L.P. van Ofwegen & M. Slierings; RMNH Coel. 32622, 2 **paratypes** and 4 ms, same data as holotype.

Description.— The holotype is 9 cm long and 8 cm wide, branches start at the base of the colony (fig. 176a). Polyps are up to about 0.70 mm wide and 1.00 mm high.

Supporting bundle.— Hardly projecting (fig. 141a); larger spindles have complex tubercles on the inner side, spines and simple tubercles on the outer side, and a spiny projecting end (fig. 141d). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally up to 8 spindles per point, laterally 10-14, dorsally up to 16 (fig. 141a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.30 mm long, with simple and complex tubercles and a spiny outer side and distal end (fig. 141b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 141c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.15 mm long, mostly with simple tubercles but the larger ones also with complex tubercles (fig. 141e). Many of them are unilaterally spinose. Furthermore, spindles and unilaterally spinose spindles are also present, up to 0.50 mm long, with simple and complex tubercles, and many with side branches.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.15 mm long, mostly with simple tubercles but also with complex tubercles. Many of them are unilaterally spinose (figs 140b, 141f). Furthermore, spindles and unilaterally spinose spindles are also present, up to 0.30 mm long, with simple and complex tubercles, several with side branches.

Interior stalk.— With unbranched spindles, up to 2.00 mm long, with simple tubercles (figs 140c, 141g-h).

Colour.— Colony with orange brown stalk and stems, red branches, and yellow polyps. Spindles of points yellow, supporting bundle spindles are reddish, often with one yellow end, stalk surface with a mixture of colourless, yellow and orange sclerites. Interior spindles yellow or colourless.

Etymology.— Named after Mr Chiel Slierings, NNM technician and colleague participant of the NNM "Zeeteam" expeditions.

Remarks.— The paratypes are smaller colonies but similar to the holotype. The species has much in common with *Chromonephthea egmondi* spec. nov., but that species has

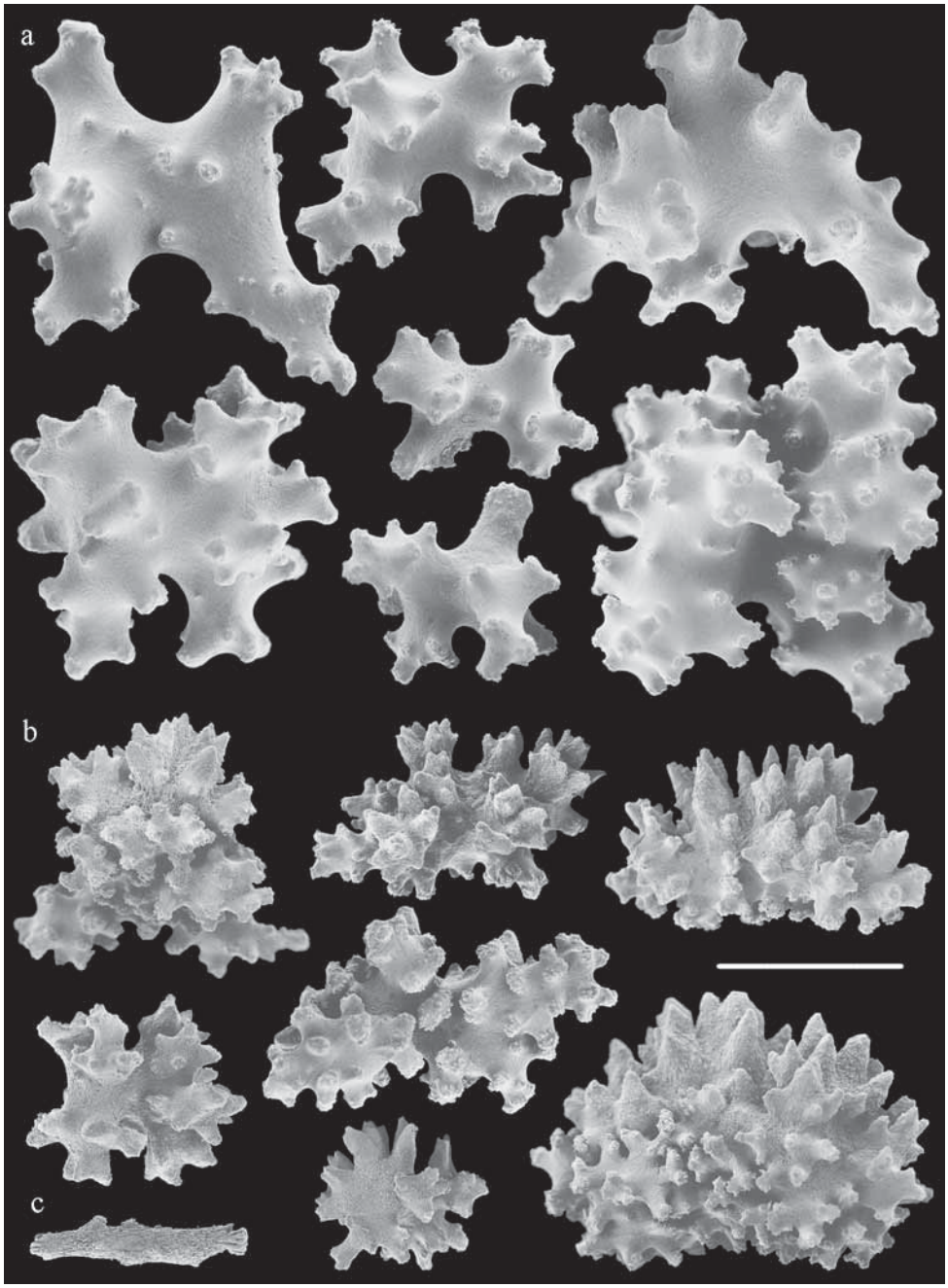


Fig. 140. Sclerites of surface layer (140a-b) and interior (140c) base of stalk; a, *Chromonephthea singularis* spec. nov., holotype NTM C11867; b-c, *C. slieringsi* spec. nov., holotype RMNH Coel. 32051. Scale 0.10 mm.

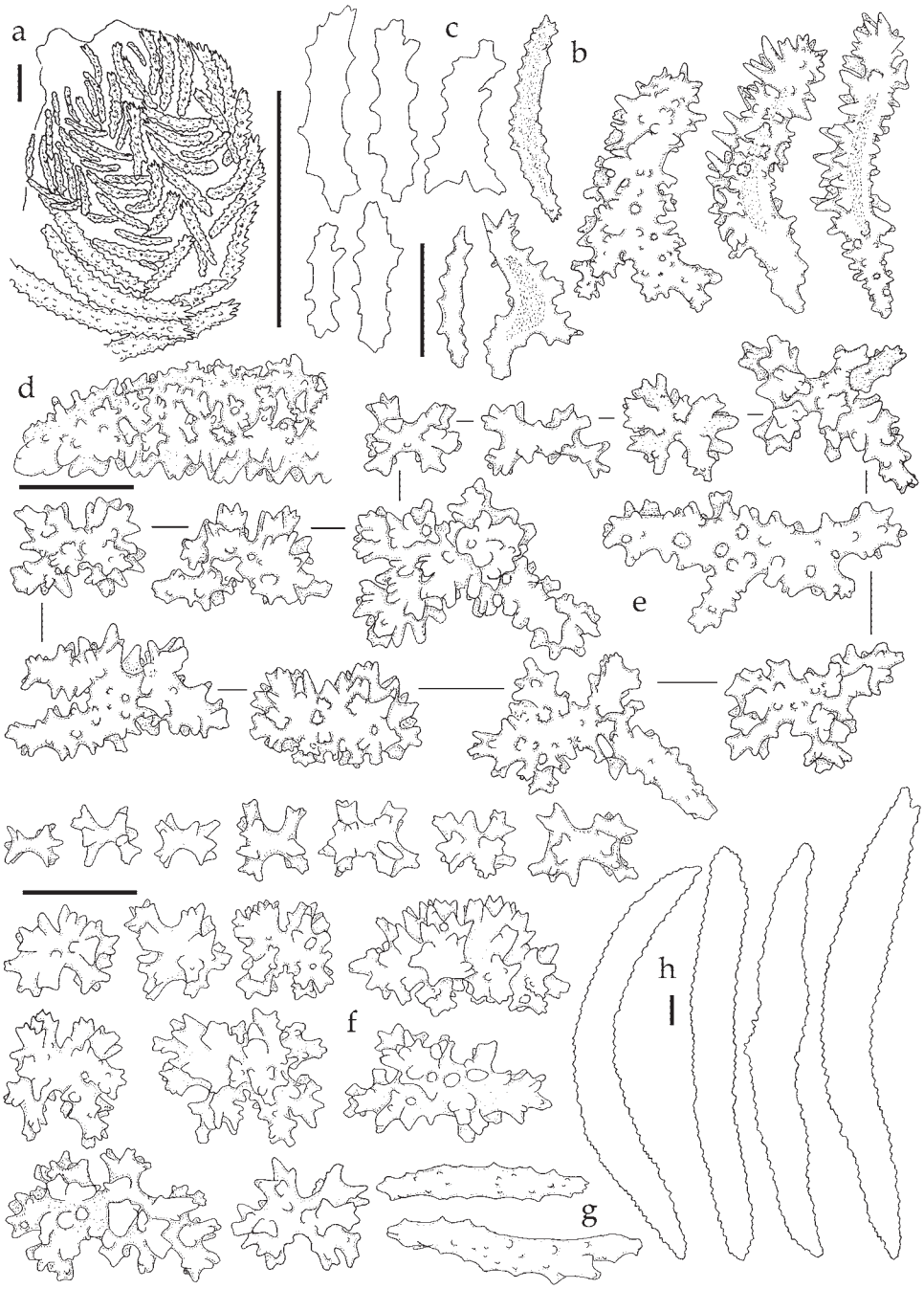


Fig. 141. *Chromonephthea slieringsi* spec. nov., holotype RMNH Coel. 32051; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer of top stalk; f, sclerites, surface layer base of stalk; g-h, spindles, interior of stalk, h, outlines only. Scales 0.10 mm, scale at f applies to e-g.

slightly bigger, less tuberculate sclerites in the surface of the stalk, and the surface spindles have less side branches. Moreover, *C. egmondi* has interior spindles with many side branches.

The species is also similar to *C. franseni* spec. nov., but the latter species has large spheroids in the base of the stalk.

Chromonephthea spinosa spec. nov.
(figs 142-144, 158, 174b)

Material examined.— WAM Z27508, **holotype**, WA, off Shark Bay, 24°55.60'S 112°50.80'E, 80-85 m; dredge; 14.vii.1987, coll. P. Alderslade; RMNH Coel. 33005, 6 ms of holotype.

Description.— The holotype is 11 cm long and 6.5 cm wide (fig. 174b). Polyps are up to about 0.60 mm wide and up to about 1.00 mm high.

Supporting bundle.— Hardly projecting (fig. 142a); larger spindles have complex tubercles and the projecting part very spiny (fig. 142d). Length of these spindles is up to about 1.50 mm.

Points.— Ventrally 2-6 spindles per point, laterally about 6-10, dorsally up to 12 (fig. 142a). The lateral and dorsal points project beyond the polyp head. The smallest spindles are present ventrally, up to 0.30 mm long, with simple tubercles. Laterally they are up to 0.50 mm long, with simple tubercles and a spiny distal end. Dorsally they are up to 0.70 mm long, with simple and some complex tubercles, and a spiny outer side and distal end (fig. 142b). Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 142c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, with simple tubercles. Furthermore, many spindles and unilaterally spinose spindles are also present, mostly with complex tubercles, several with side branches. They are up to 1.50 mm long (fig. 142e-f).

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.40 mm long, with simple tubercles. The larger ones form multi-radiate bodies (figs 143-144).

Interior stalk.— Without sclerites.

Colour.— Colony orange, tentacle rods colourless, all other sclerites yellow.

Etymology.— The Latin "spinosa", thorny, refers to the huge unilaterally spinose spindles in the top of the stalk.

Remarks.— The smaller radiates of the surface of the base of the stalk resemble antlers (fig. 143 first row), a sclerite type commonly found in the interior of the stalk of certain species of *Dendronephthya*. A temporary slide of the interior showed no sclerites, the antler-shaped sclerites are simply extreme forms of the normal radiates.

The species is characterized by the projecting point sclerites and huge unilaterally spinose spindles in the surface layer of the top of the stalk. For comparison with the other species with big point spindles see the remarks of *C. cornuta*.

Chromonephthea tentoriae spec. nov.
(figs 145-147a, 158, 174a)

Material examined.— QM G324172, **holotype**, Australia, Qld, Facing Island, Farmers Point, pools, 23°45.00'S 151°20.00'E, 2 m, 8.ix.1977, coll. K. Harada; RMNH Coel. 32700, 4 ms of holotype; **paratypes**:

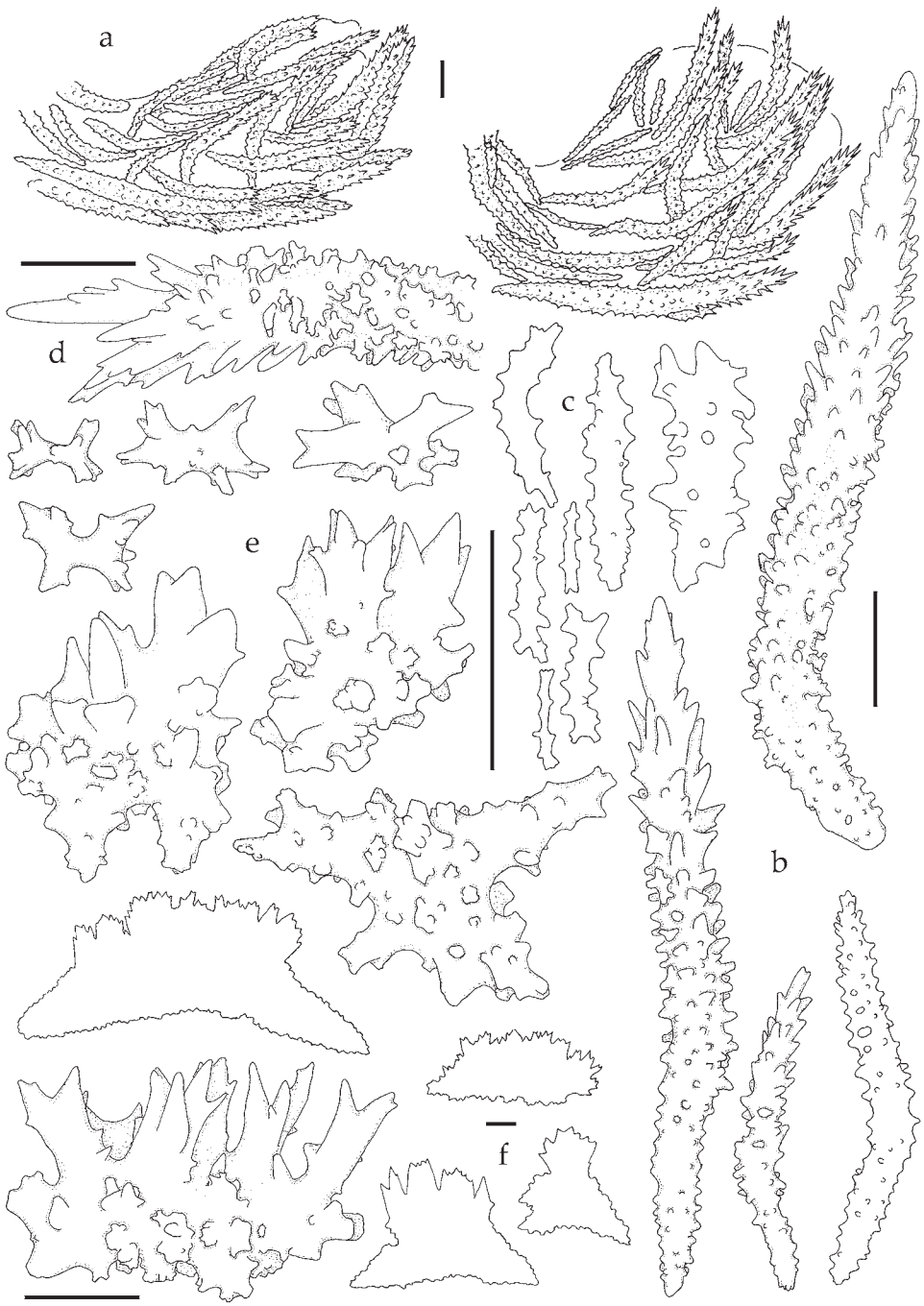


Fig. 142. *Chromonephthea spinosa* spec. nov.; holotype WAM Z27508; a, lateral views of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e-f, sclerites, surface layer top of stalk, f, outlines only. Scales 0.10 mm.

NTM C14642, 1 specimen, same data as holotype; RMNH Coel. 32701, 5 ms of NTM C14642; NTM C300, 1 specimen without base, Australia, Qld, Keppel Island, Passage rocks, 23°08.00'S 150°56.00'E, 10 m, vii.1977, coll. G. Lapraik; RMNH Coel. 32702, 5 ms of NTM C300.

Description.— The holotype is 15 cm long and 8 cm wide (fig. 174a). Polyps are up to about 0.90 mm wide and 0.90 mm high.

Supporting bundle.— Projecting up to 0.20 mm (fig. 145a); larger spindles have complex tubercles and a spiny projecting part, or occasionally a short smooth terminal spine (fig. 145e). Length of these spindles is up to about 1.60 mm, width up to 0.30 mm.

Points.— Ventrally 8-10 spindles per point, laterally 10-12, dorsally up to 14 (fig. 145a). The smallest spindles are present ventrally, up to 0.20 mm long, with simple tubercles. Laterally they are up to 0.30 mm long, with simple and complex tubercles and a spiny distal end. Dorsally they are up to 0.40 mm long, with complex tubercles and a spiny outer side and distal end (fig. 145b). Between the points a few to four intermediate

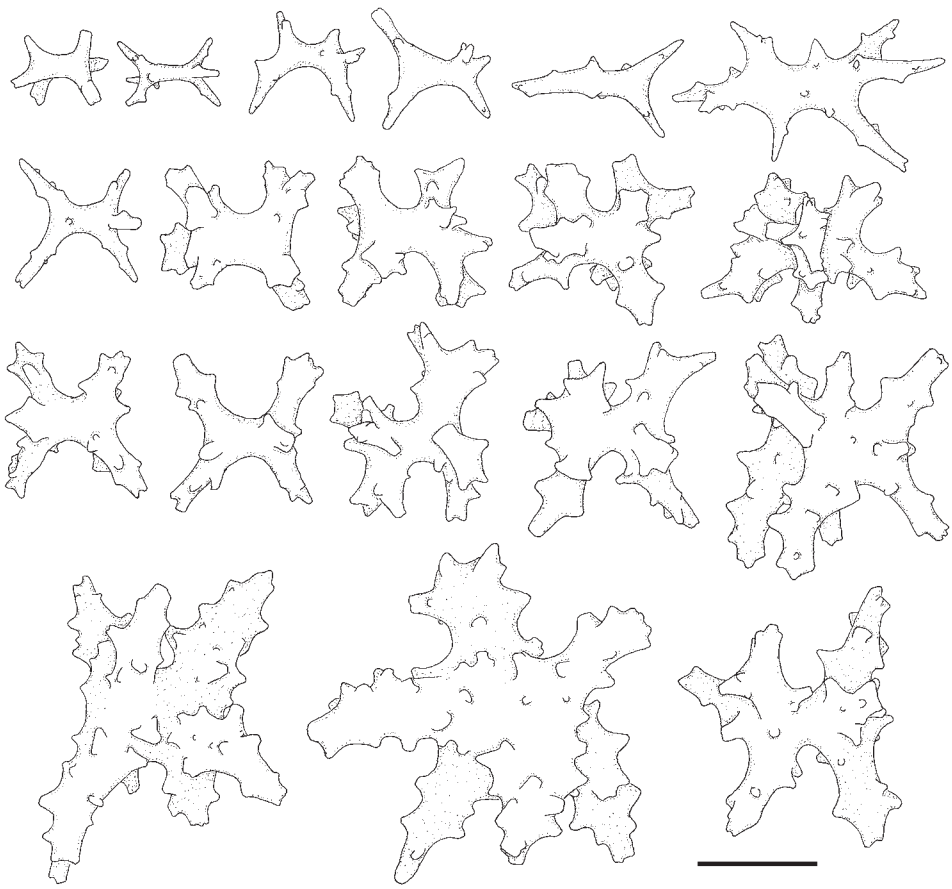


Fig. 143. *Chromonephthea spinosa* spec. nov.; holotype WAM Z27508; sclerites of surface layer base of stalk. Scale 0.10 mm.

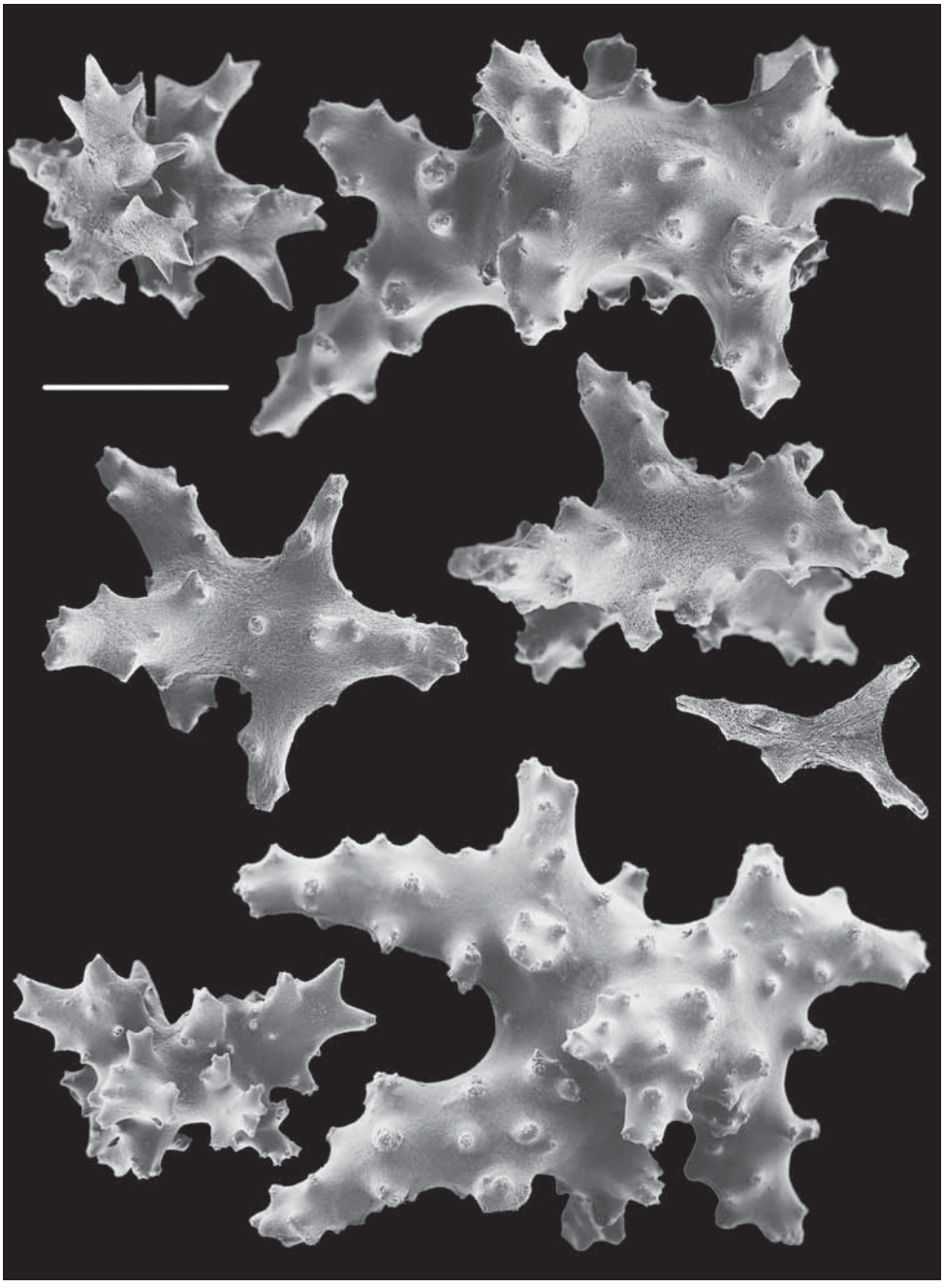


Fig. 144. *Chromonephthea spinosa* spec. nov.; holotype WAM Z27508; sclerites, surface layer base of stalk. Scale 0.10 mm.

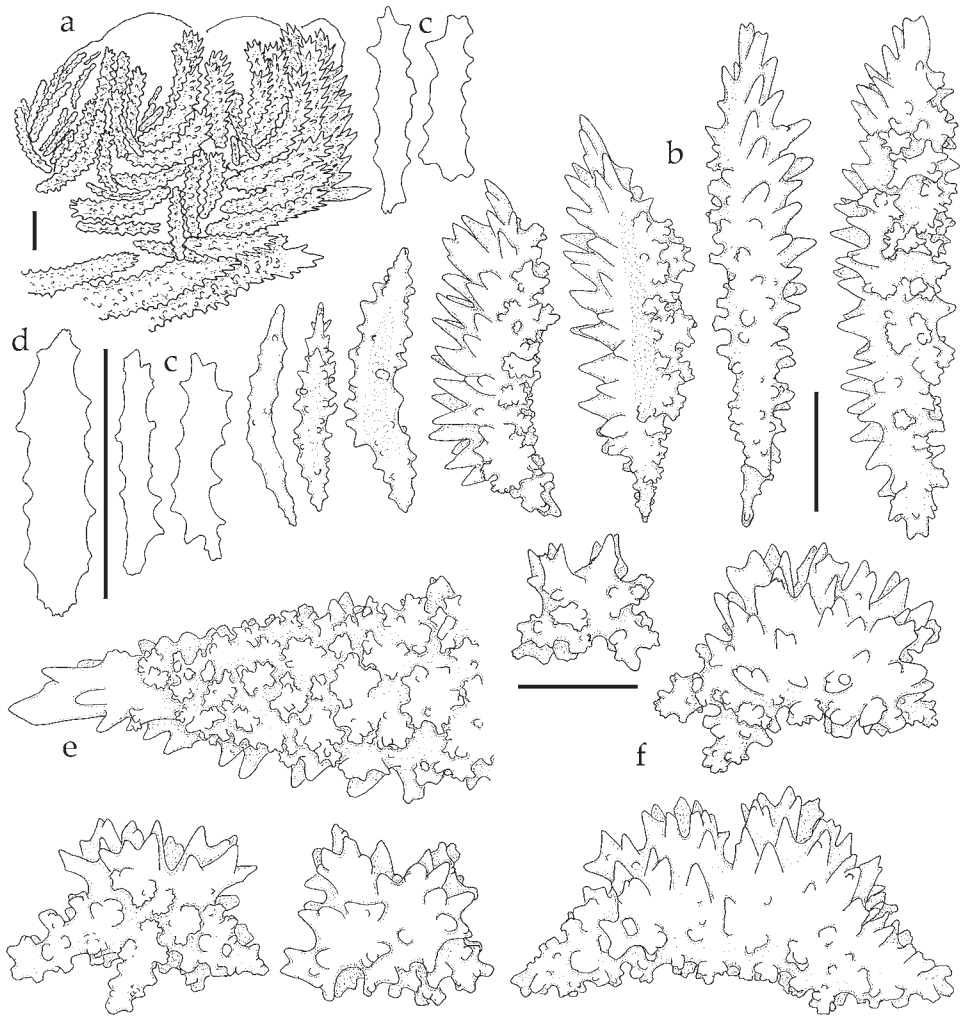


Fig. 145. *Chromonephthea tentoriae* spec. nov.; holotype QM G324172; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, intermediate; e, spindle of supporting bundle (part); f, sclerites, surface layer top of stalk. Scales 0.10 mm.

sclerites are often present (fig. 145d). Tentacles have a few flattened rods, up to 0.10 mm long, with scalloped edge (fig. 145c).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.30 mm long (fig. 145f), most of them are unilaterally spinose, and most have complex tubercles and some side branches. Larger ones merge into unilaterally spinose spindles which are up to about 1.30 mm long, with complex tubercles. A few spindles are also present, with complex tubercles and some side branches.

Surface layer base of stalk.— Radiates, up to 0.25 mm long. The larger ones have complex tubercles (figs 146-147a).

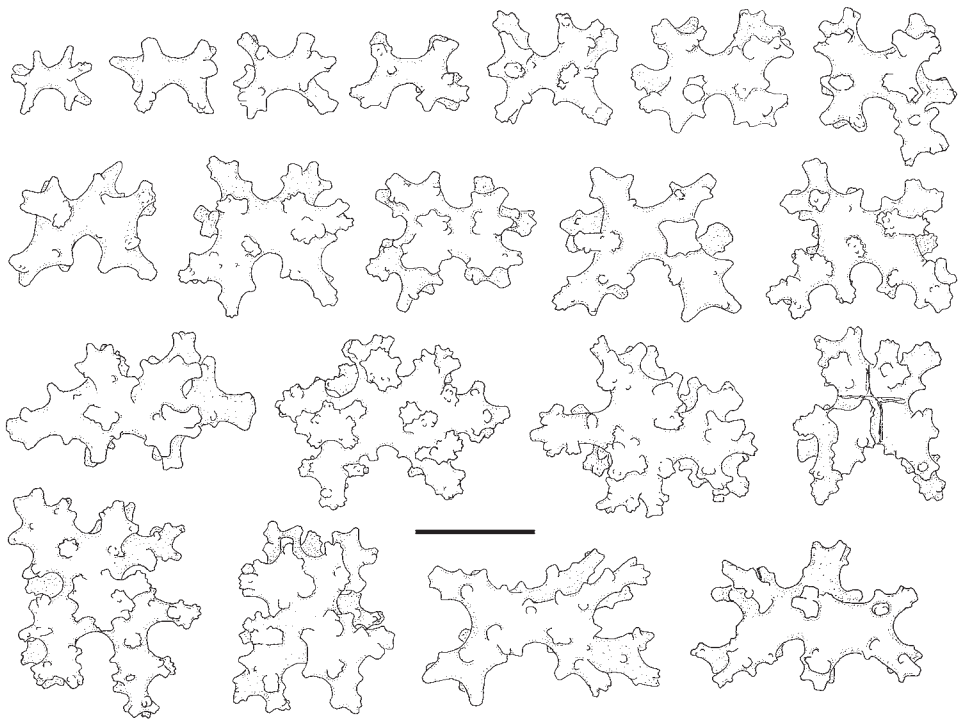


Fig. 146. *Chromonephthea tentoriae* spec. nov.; holotype QM G324172; sclerites, surface layer base of stalk. Scale 0.10 mm.

Interior stalk.— Without sclerites.

Colour.— Colony dark red with yellow polyps. Point spindles yellow, sclerites of supporting bundle, branches, and top of stalk reddish, base stalk with pink sclerites. A few spindles, intermediates between supporting bundle and point spindles, are partly yellow and partly pink. Tentacle sclerites are colourless.

Etymology.— Named after octocoral researcher Dr Tina Tentori, School of Biological Sciences, University of Sydney, Australia.

Remarks.— The paratype NTM C14642 has the same colour pattern as the holotype. NTM C300 is orange with a cream stalk. Point and supporting bundle sclerites orange, branches and top of stalk with faintly yellow and colourless sclerites, base stalk and tentacles with colourless sclerites.

The species is similar to *C. complanata* (Kükenthal, 1910) and *C. curvata* (Kükenthal, 1911), but has distinctly more ventral point spindles (up to 10 per point versus up to 4) and the point spindles are overall more spiny.

Chromonephthea variabilis spec. nov.
(figs 147b, 148-151, 158, 159, 177)

? *Stereonephthya costatofulva*; Utinomi, 1971: 96, fig. 7, pl. 16 fig. 2 (Darwin, old power house intake screens, wharf, harbour and East Point).

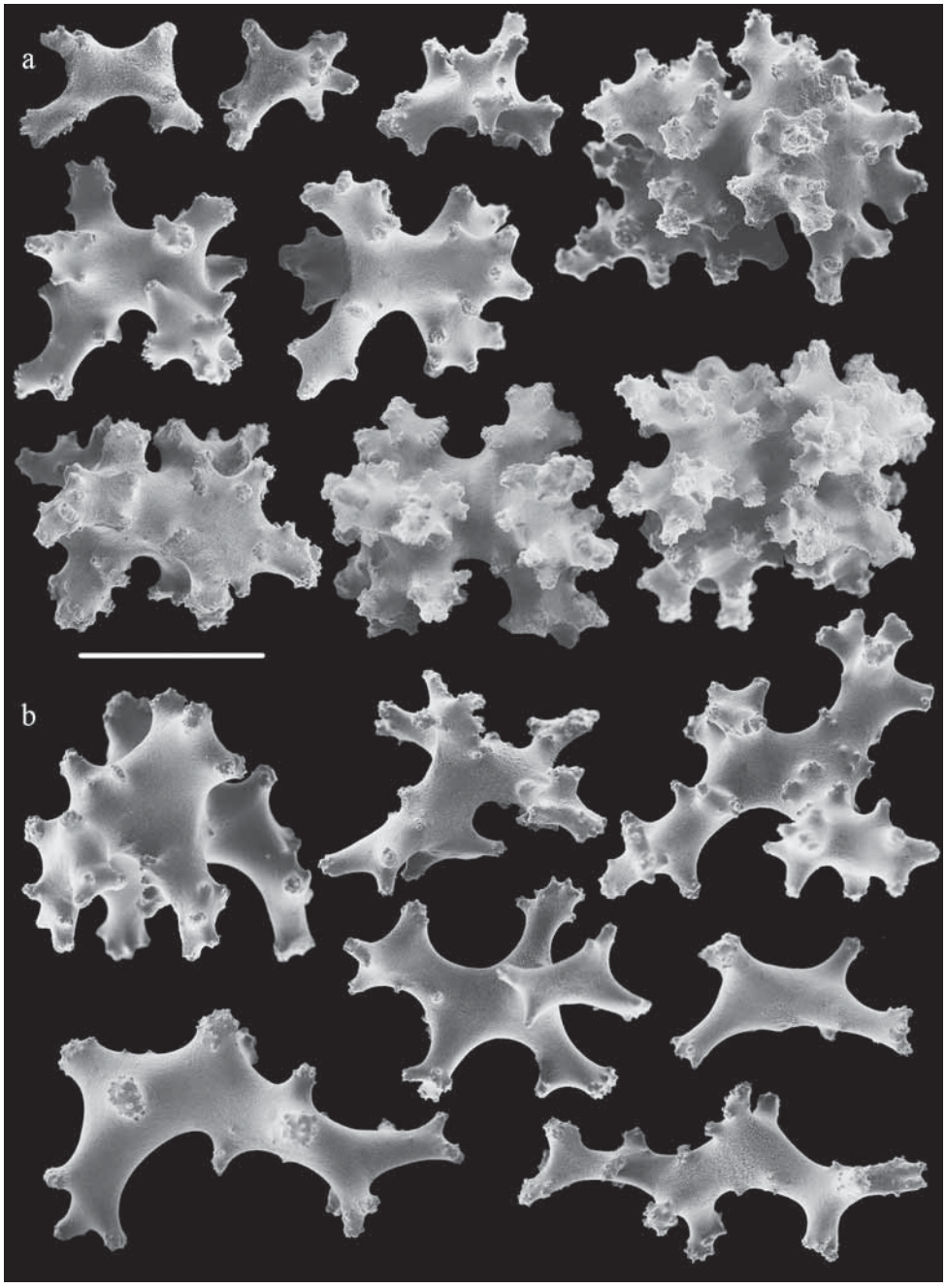


Fig. 147. Sclerites, surface layer base of stalk; a, *Chromonephthea tentoriae* spec. nov., holotype QM G324172; b, *Chromonephthea variabilis* spec. nov., holotype NTM C14309. Scale 0.10 mm.

? *Stereonephthya costatocyanea*; Utinomi, 1971: 97, fig. 8, pl. 16 fig. 3 (Darwin, East Point and Dudley Point).
? *Stereonephthya longicaulis*; Utinomi, 1971: 99, fig. 9, pl. 16 fig. 4 (Darwin, East Point).
? *Stereonephthya armata*; Utinomi, 1971: 101, fig. 10, pl. 6 fig. 5 (Darwin, wharf and harbour).
? *Stereonephthya bellissima*; Utinomi, 1971: 102, fig. 11, pl. 16 fig. 6 (Darwin, Dudley point).

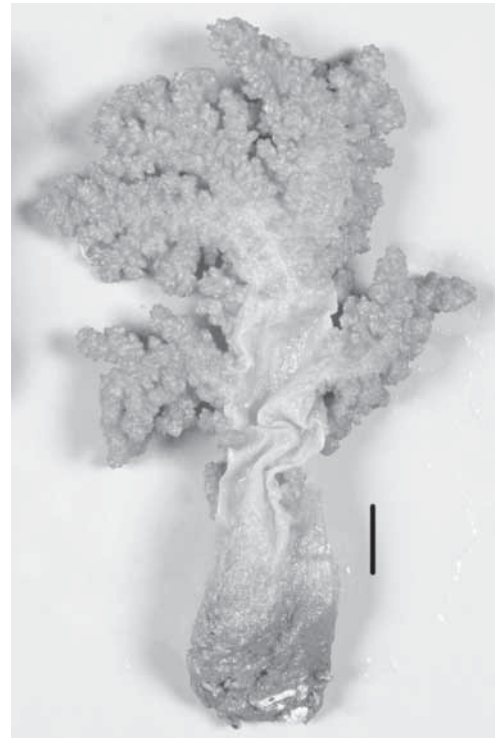


Fig. 148. *Chromonephthea variabilis* spec. nov., holotype NTM C14309. Scale 1 cm.

Material examined.— NTM C14309, **holotype**, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 9-13 m, SCUBA, coll. NTM Bioprospecting, 3.vi.2002; RMNH Coel. 32990, 5 ms of holotype; **paratypes**: USNM 1081590, 1 specimen without stalk, same data as holotype; RMNH Coel. 32991, 1 specimen, same data as holotype; NTM C14305, 3 specimens, Australia, NT, Darwin Harbour, Stevens Rock, 12º29.09'S 130º48.10'E, 12-19 m, coll. NTM Bioprospecting, 8.v.2002; RMNH Coel. 32992, 4 ms of NTM C14305; NTM C14306, 1 specimen, Australia, NT, Darwin Harbour, Stevens Rock 12º29.09'S 130º48.10'E, 12-19 m, SCUBA, coll. NTM Bioprospecting, 8.v.2002; RMNH Coel. 32993, 4 ms of NTM C14306; NTM C14307, 1 specimen, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 5-16 m, SCUBA, coll. NTM Bioprospecting, 21.v.2002; RMNH Coel. 32994, 4 ms of NTM C14307; NTM C14308, 2 specimens, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 5-16 m, SCUBA, coll. NTM Bioprospecting, 21.v.2002; RMNH Coel. 32995, 3 ms of NTM C14308; NTM C14310, 3 specimens, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 9-13 m, SCUBA, coll. NTM Bioprospecting, 3. vi.2002; RMNH Coel. 32996, 3 ms of NTM C14310; NTM C14311, 3 specimens, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 9-13 m, SCUBA, coll. NTM Bioprospecting, 3.vi.2002; RMNH Coel. 32997, 3 ms of NTM C14311; NTM C14312, 1 specimen, Australia, NT, Darwin Harbour, Plater Rock, 12º28.61'S 130º47.24'E, 9-13 m, SCUBA, coll. NTM Bioprospecting, 3.vi.2002; RMNH Coel. 32998, 3 ms of NTM C14312; NTM C2531, 1 specimen, Australia, NT, Port Patterson, Fish Reef, 12°25.50'S 130°24.60'E, 12 m, 24.xi.1982, coll. P. Alderslade; RMNH Coel. 32999, 4 ms of NTM C2531; NTM C4809, 1 specimen, Australia, NT, Port Patterson, Fish reef, 12°25.50'S 130°26.40'E, 12 m, 24.xi.1982, coll. P. Alderslade; RMNH Coel. 33000, 1 ms of NTM C4809; NTM C4811, 1 specimen, Australia, NT, Port Patterson, Fish reef, 12°25.50'S 130°26.40'E, 12 m, 24.xi.1982, coll. P. Alderslade; NTM C4815, 1 specimen, Australia, NT, Port Patterson, Fish reef, 12°25.50'S 130°26.40'E, 12 m, 24.xi.1982, coll. P. Alderslade; RMNH Coel. 33001, 4 ms of NTM C4815.

Description.— The holotype is 10.5 cm long and 6 cm wide (fig. 148). Polyps are up to about 0.80 mm wide and 1.00 mm high.

Supporting bundle.— Projecting up to 0.40 mm (fig. 149a-b); larger spindles have complex tubercles and a spiny projecting end (fig. 149g-h). Length of these spindles is up to about 1.30 mm.

Fig. 149. *Chromonephthea variabilis* spec. nov.; a, e, j, holotype NTM C14309; b, d, g, i, k, NTM C14307; c, f, l, NTM C14311; a-b, lateral views of polyp armature; c-f, point spindles; h-g, spindles of supporting bundle (part); i-j, tentacular rods; k, l, rods of polyp stalks. Scales 0.10 mm, that at a also applies to b, that at j also applies to i, that at g applies to all others.

Points.— Ventrally 2-4 spindles per point, laterally 6-8, dorsally up to 12 (fig. 149a). The smallest spindles are present ventrally, up to 0.25 mm long, with simple tubercles. Laterally they are up to 0.50 mm long, with simple and a few complex tubercles, and with a spiny distal end. Dorsally they are up to 0.60 mm long, with complex tubercles and spiny outer side and distal end (fig. 149e). Several of the larger point spindles have side branches. Between the points a few intermediate sclerites are often present. Tentacles have flattened rods, up to 0.11 mm long, with scalloped edge (fig. 149j).

Surface layer top of stalk.— Radiates and derivatives of these, up to 0.20 mm long, with simple tubercles (fig. 150a). Many of them are slightly unilaterally spinose. Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.30 mm long, with simple tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, up to 0.25 mm long, all with simple tubercles (figs 147b, 150d).

Interior stalk.— Without sclerites.

Colour.— Pink stalk with white branches and orange polyps. Point sclerites orange, supporting bundle spindles yellow with orange projecting tip. Top stalk and tentacles with colourless sclerites, base stalk with pink sclerites.

The colour pattern (table 3) of several specimens resembles that of *C. aldersladei* spec. nov., a species also found in the Darwin region.

Table 3. Colour variation in *Chromonephthea variabilis* spec. nov.

Species	Colony colour	Polyps	SB	Branch	Stem	Stalk
C14307 / C14310 / C2531	White with red polyps	Reddish	Colourless	Colourless	Colourless	Colourless
C4809 / C4815	White stalk with red branches and white polyps	Colourless	Orange	Orange	Mixture colourless, pink	Mixture colourless, pink
C4811	White stalk with pink branches and pink polyps	Pink	Colourless	Pink	Colourless, some pink	Colourless, some pink
C14305 / C14306	White to pink stalk with purple branches and yellow polyps / *some orange polyps	Yellow / *orange	Red	Red	Pink / Colourless	Pink / Colourless
C14308 / *C14312	Pink stalk with white / *yellow branches and yellow polyps	Yellow	Yellow	Colourless / *yellow	Colourless	Pink / colourless
C14309 / USNM 1081590 / RMNH Coel. 32991	Pink stalk with white / orange stem, orange branches and polyps	Orange	Yellow-orange	Orange	Colourless	Pink
C14310	Pink stalk, rest white	Colourless	Colourless	Colourless	Colourless	Pink
C14311	Purple with white / *yellow polyps	Colourless / *yellow	Purple	Purple	Pink	Pink

Etymology.— The Latin “varius”, diverse, refers to the colour pattern and sclerite variability, the largest variability found in any *Chromonephthea* species.

Variability.— The species shows a considerable variation with regards to colour of the colony and shape of the sclerites. NTM C14305 shows in the surface layer of the top of the stalk very spinose sclerites, which consequently are somewhat larger as well. In NTM C14307, the point sclerites are more slender than usual (fig. 149b, d), and there are

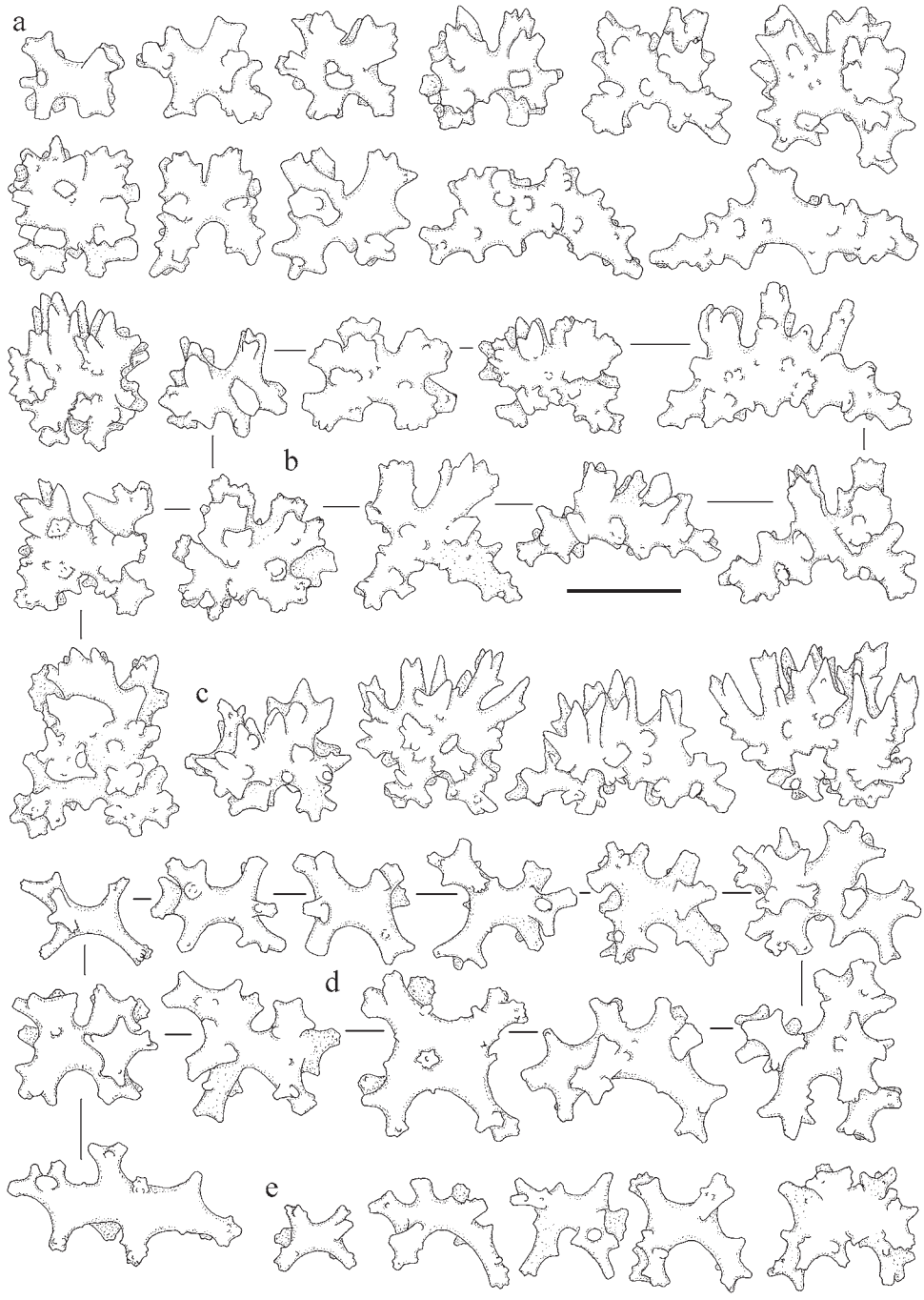


Fig. 150. *Chromonephthea variabilis* spec. nov.; a, d, holotype NTM C14309; b, e, NTM C14307; c, NTM C14306; a-c, sclerites, surface layer top of stalk; d-e, sclerites, surface layer base of stalk. Scale 0.10 mm.

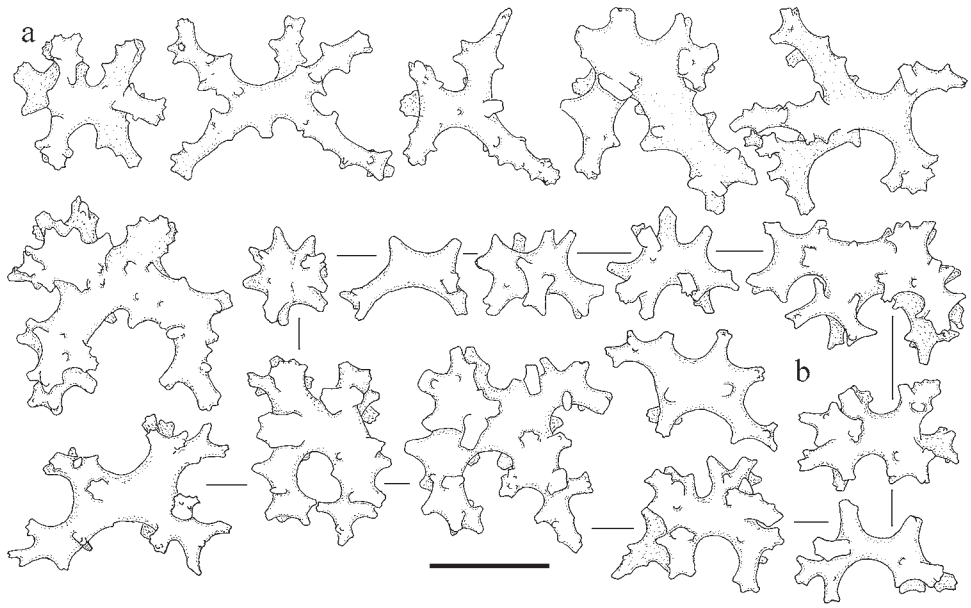


Fig. 151. *Chromonephthea variabilis* spec. nov.; a, NTM C14307; b, NTM C14306; a-b, sclerites, surface layer base of stalk. Scale 0.10 mm.

also more slender sclerites in the surface layer of the base (fig. 151a), becoming multiradiate bodies. The variation in the stalk sclerites may be caused by a different sampling position, and the more slender point sclerites in C14307 may be considered intraspecific variation.

Remarks.— It is noteworthy that small straight spinous rods are present in the polyp stalks of all specimens examined (fig. 149k-l).

Utinomi (1971) identified six *Stereonephthya* species from the surroundings of Darwin, which in my opinion all belong to the genus *Chromonephthea.* Unfortunately, Utinomi's descriptions and figures are insufficient for proper identification of a species of *Chromonephthea*, and therefore his material should be re-examined to obtain certainty about the species involved. The five species below, mentioned by Utinomi, all have polyp sclerites the size of those in *C. variabilis*. Although Utinomi mentioned that for his *S. armata* the point sclerites were only 0.35-0.43 mm long, his figure of a polyp (fig. 10a) shows them to be 0.60-0.70 mm long, if the magnification given is correct. Below I have mentioned the major differences between Utinomi's species and *C. variabilis*.

S. costatofulva differs in lacking tentacle sclerites, and in being purple with dark purple polyps composed of red point sclerites.

S. costatocyanea differs in being purple with orange polyps and having point sclerites projecting above the polyp body.

S. longicaulis has a similar colour pattern as NTM C14305 and NTM C 14306, but differs in having a few rods in the canal walls.

S. armata resembles NTM C14310, if the magnification given for the polyp is correct.

S. bellissima has a similar colour pattern as S. *costatofulva*.

As the differences mentioned above are not considered very diagnostic for species of *Chromonephthea,* and seeing the enormous colour variability in *C. variabilis,* it is very well possible all Utinomi's species actually are *C. variabilis*.

Utinomi's sixth *Stereonephthya* species from the Darwin region, *S. whiteleggi*, shows the exact same colour pattern as NTM C14307 but has much smaller polyp sclerites, and therefore is more referable to *C. aldersladei* spec. nov.

The stalk radiates of NTM C14307 (fig. 151a) resemble those of *Chromonephthea pellucida* (Kükenthal, 1911), but that species has internal stalk spindles. *C. variabilis* spec. nov. is similar to *C. cobourgensis* spec. nov., but that species does not show the large lateral point sclerites.

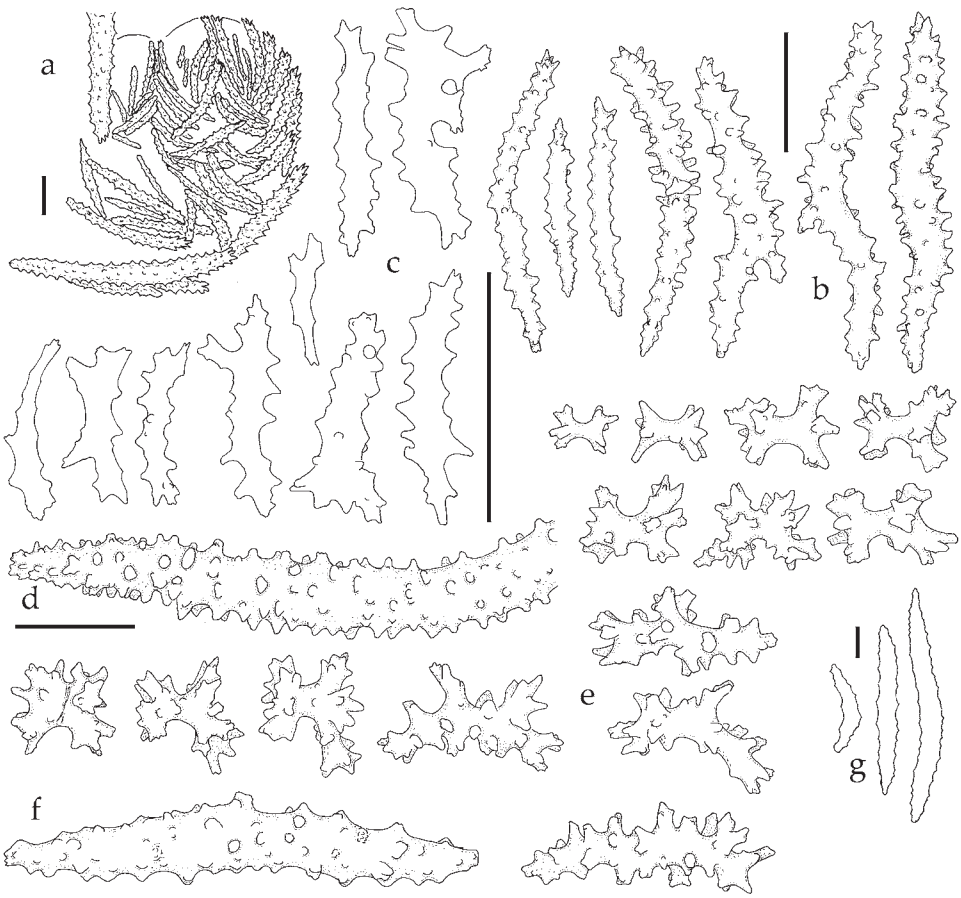


Fig. 152. *Chromonephthea williamsi* spec. nov.; paratype NTM C10189; a, lateral view of polyp armature; b, point spindles; c, tentacular rods; d, spindle of supporting bundle (part); e, sclerites, surface layer top of stalk; f-g, spindles, interior top of stalk, g, outlines only. Scales 0.10 mm, scale at d applies to d-f.

Chromonephthea williamsi spec. nov.
(figs 152-154, 158, 176c)

Material examined.— NTM C10188, **holotype**, Australia, Gulf of Carpentaria, 11°15.10'S 140°25.40'E, 56 m, dredge, 6.xii.1990, coll. P. Alderslade; RMNH Coel. 33006, 4 ms of holotype; **paratypes**: NTM C10189, 1 specimen, same data as holotype; RMNH Coel. 33007, 1 specimen and 4 ms of NTM C10189.

Description.— The holotype is 12 cm long and 5 cm wide, with a rather long stalk (fig. 176c). Polyps are up to about 0.60 mm wide and 0.80 mm high.

Supporting bundle.— Does not project (fig. 152a); larger spindles have simple tubercles and a projecting part spiny (fig. 152d). Length of these spindles is up to about 1.00 mm.

Points.— Ventrally 4-6 spindles per point, laterally 8-10, dorsally 12 (fig. 152a). The smallest spindles are present ventrally, up to 0.15 mm long, with simple tubercles. Laterally they are up to 0.25 mm long, also with simple tubercles. Dorsally they are up to 0.30 mm long, with simple tubercles and a spiny distal end (fig. 152b). Between the points one or two intermediate sclerites are often present. Tentacles have flattened rods, up to 0.10 mm long, with scalloped edge (fig. 152c); the largest arranged longitudinally, the smaller ones transverse.

Surface layer top of stalk.— Radiates and derivatives of these, mostly about 0.10 mm long, some up to 0.15 mm long (fig. 152e). Many of them are slightly unilaterally spinose and all have simple tubercles. Furthermore, some spindles and unilaterally

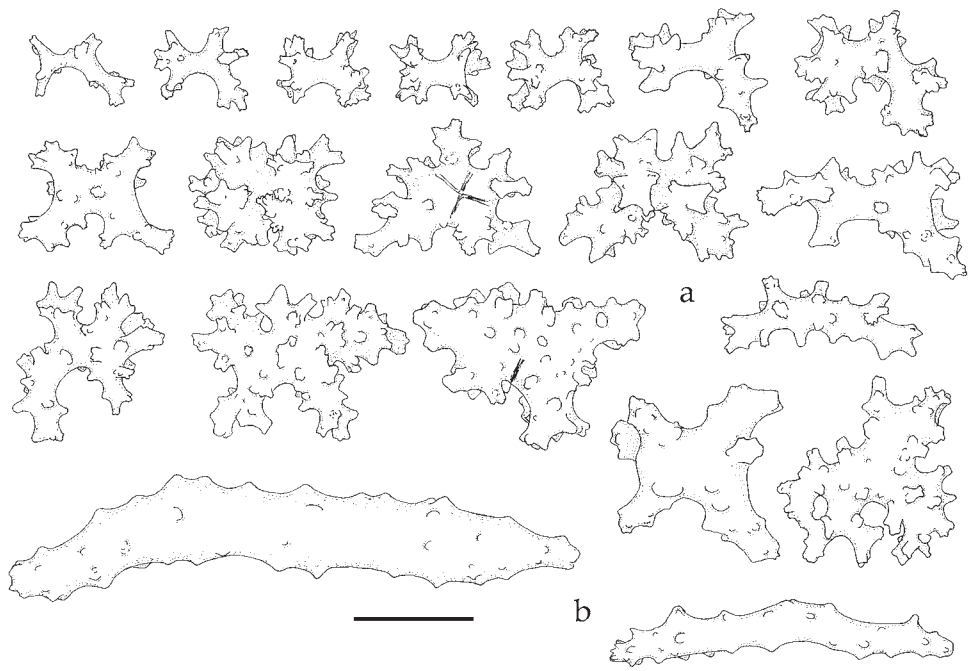


Fig. 153. *Chromonephthea williamsi* spec. nov.; paratype NTM C10189; a, sclerites of surface layer base of stalk; b, spindles, interior base of stalk. Scale 0.10 mm.

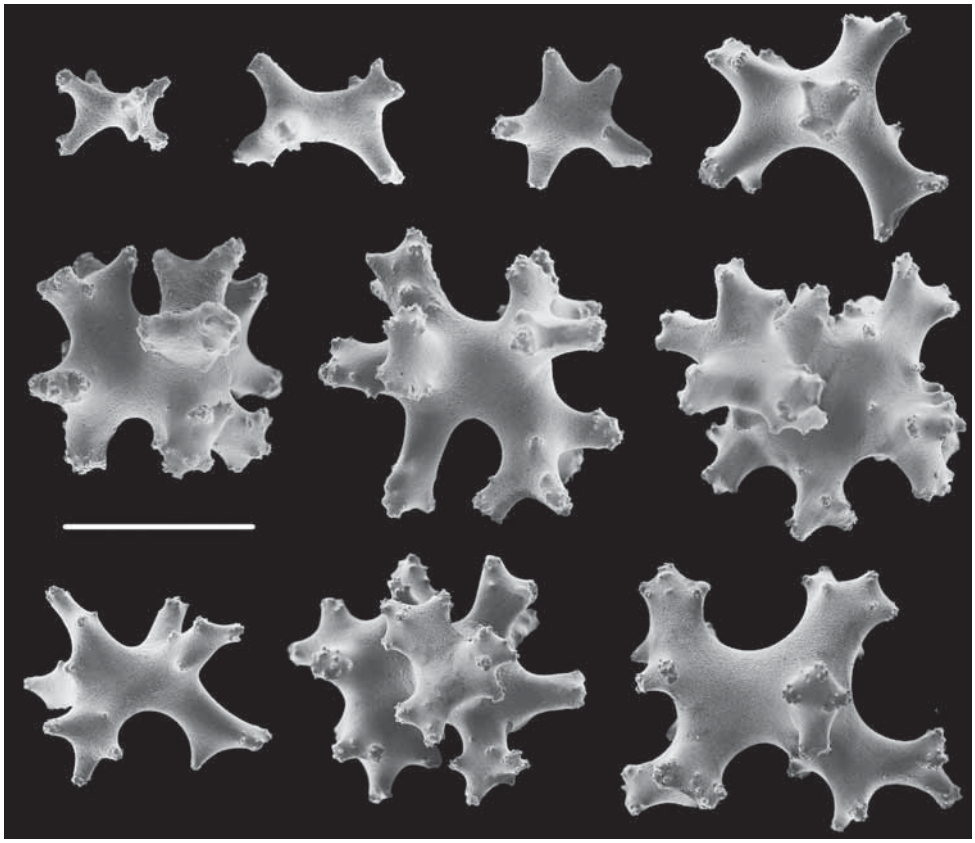


Fig. 154. *Chromonephthea williamsi* spec. nov.; holotype NTM C10188; sclerites, surface layer base of stalk. Scale 0.10 mm.

spinose spindles are also present, up to 0.25 mm long, with simple tubercles.

Surface layer base of stalk.— Radiates and derivatives of these, most are up to 0.15 mm long, a few up to 0.20 mm, with simple tubercles (figs 153a, 154). Furthermore, some spindles and unilaterally spinose spindles are also present, up to 0.25 mm long, with simple tubercles.

Interior stalk.— Spindles, up to 0.80 mm long, with sparse simple tubercles (figs 152f-g, 153b).

Colour.— Colony cream with reddish supporting bundles and yellow polyps. Point spindles yellow, supporting bundle spindles pink, colourless or bi-coloured; all other sclerites colourless.

Etymology.— The species is named after octocoral researcher Dr Gary C. Williams, curator of the Department of Invertebrate Zoology and Geology, CAS.

Remarks.— The paratypes are smaller but have the same colour pattern as the holotype.

The species is similar to *Chromonephthea rubra* (Kükenthal, 1910), but that species has more developed unilaterally spinose radiates and wider point sclerites.

Other material

USNM 75143, North Pacific Ocean, China, vicinity of Hong Kong, one specimen, 4.5 cm long, 4 cm wide, white stalk with reddish stems and branches with yellow polyps. The sclerites proved to be disintegrated and therefore the material was unfit for further study.

RMNH Coel. 14717, *Nephthea rubra*, Australia, Qld., N of Cairns, off Wangetti beach, entrance of Hartley Creek, 4.6 m, rock and algae bottom, orange when alive, 15.xii.1978, coll. H. Larson, det. J. Verseveldt, a few branches and 3 ms of a larger fragment which is kept in the AM (no. G.15069). The material at hand does not allow for a proper identification. Considering the distribution of *C. rubra* (Kükenthal, 1910) (see fig. 158) it is unlikely that Verseveldt's identification is correct. It differs from nearby found *C. costatofulva* (Burchardt, 1898) in having point and supporting bundle sclerites with simple tubercles.

Four microscopic slides of Verseveldt's collection identified by him as "*Stereonephthya costatofulva* (Burchardt)". On the slides the locality "Cebu City Philippines" is mentioned, but since it is unclear from which material these slides have been derived, they could not be used in the present study.

Distribution

Octocorals may occur in virtually all marine environments. They are found in all oceans, from the tropics to the poles, from brackish muddy areas to crystal clear oceanic environments, and from the intertidal to the abyss. The Indo-Malayan area, consisting of Indonesia, the Philippines, and New Guinea, is assumed to host the greatest species richness of octocorals (Ekman, 1953; Williams, 1993; Hoeksema & Ofwegen, 2004). From this centre of maximum diversity, species numbers decline towards higher latitudes, and towards the eastern and western rims of the Indo-Pacific.

Chromonephthea is mainly found in the Indo-West Pacific (see figs 155-161) but, so far, the highest number of species (29) was not observed in the centre of maximum diversity but in Australian waters. From the Indian Ocean, apart from the Australian west coast, no species have been reported, but during an octocoral workshop in Trivandrum, India (2005) I saw a specimen collected from Indian waters. Unfortunately, the material in question did not reach me in time to be incorporated in the present study. One species (*C. braziliensis*) was found in the Atlantic (Brazil) but this apparently concerns an invasive octocoral (see *C. braziliensis)*. Undoubtedly, collecting efforts in Australia have been most extensive, which most probably explains at least partly the many records for the genus in that region. But the restricted habitat of most *Chromonephthea* species can also play an important role.

At present, all species can be regarded as endemics, since many are found in a single locality. Although *C. cobourgensis, C. complanata, C. dampierensis, C. grasshoffi, C. hoeksemai, C. intermedia, C. megasclera, C. rubra,* C. *tentoriae*, and *C. variabilis* have somewhat larger distributions, which are still very small however, when compared with the ranges of other octocorals. A similar phenomenon was recorded by Williams & Alderslade (1999) for the genus *Paraminabea* (Alcyoniidae), though with only nine species, several of which with larger ranges, as for instance *P. aldersladei* Williams, 1992, occurring all over

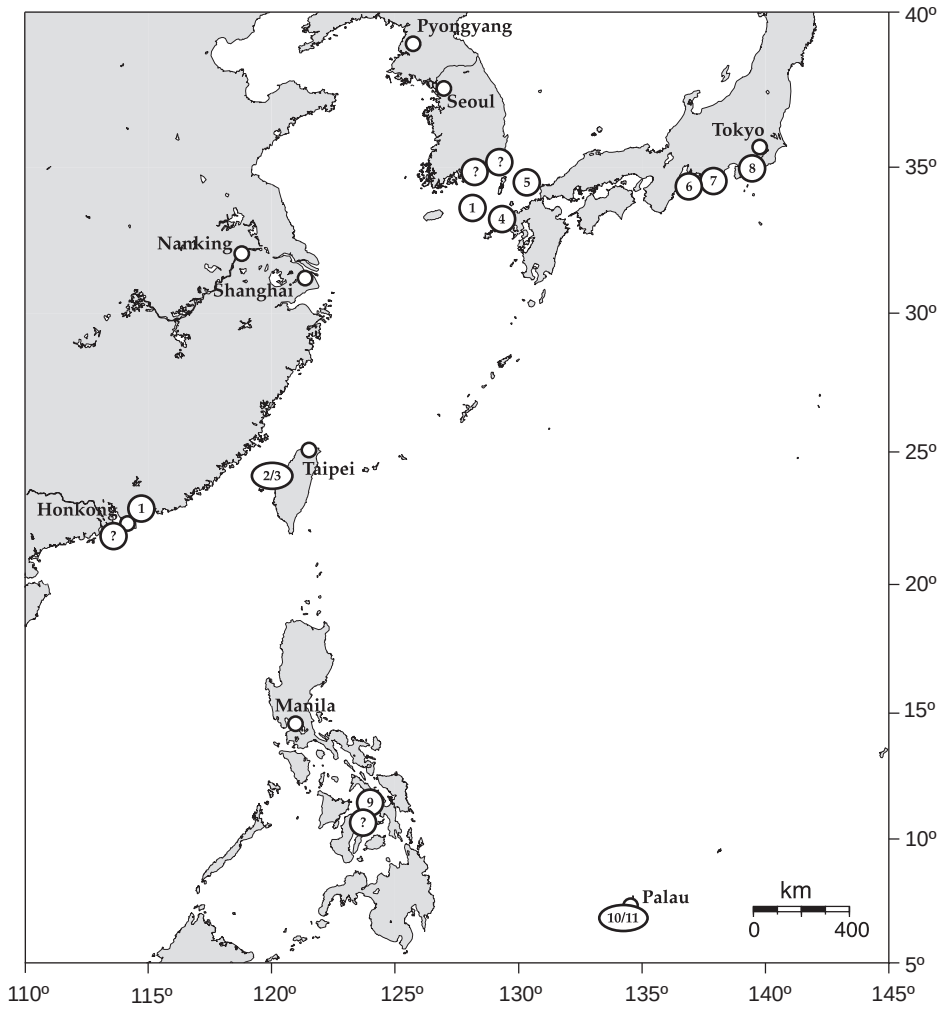


Fig. 155. Distribution *Chromonephthea* species in N Pacific: ?, *C.* spec.; 1, *C. lobulifera* (Holm, 1894); 2, *C. eos* (Kükenthal, 1905); 3, *C. formosana* (Kükenthal, 1903) 4, *C. inermis* (Holm, 1894); 5, *C. imaharai* spec. nov.; 6, *C. serratospiculata* (Utinomi, 1951); 7, *C. cairnsi* spec. nov.; 8, *C. hirotai* (Utinomi, 1951); 9, *C. aurantiaca* (Verrill, 1865); 10, *C. bayeri* spec. nov.; 11, *C. palauensis* spec. nov.

Indonesia, the Philippines, and N Australia. There might be various explanations for this high degree of endemism that seems to occur in *Chromonephthea.*

1. Incorrect classification. The extent of intraspecific variation of the species is still unclear, and actually less species, with a larger distribution, might be involved. It is known that intraspecific variation among octocorals can become obvious only after examination of a large number of specimens from a geographically broad range of localities. Benayahu et al. (1997) performed a case study on many specimens of two alleged species of *Sinularia*, unravelling their synonymy this way. Grasshoff (2001)

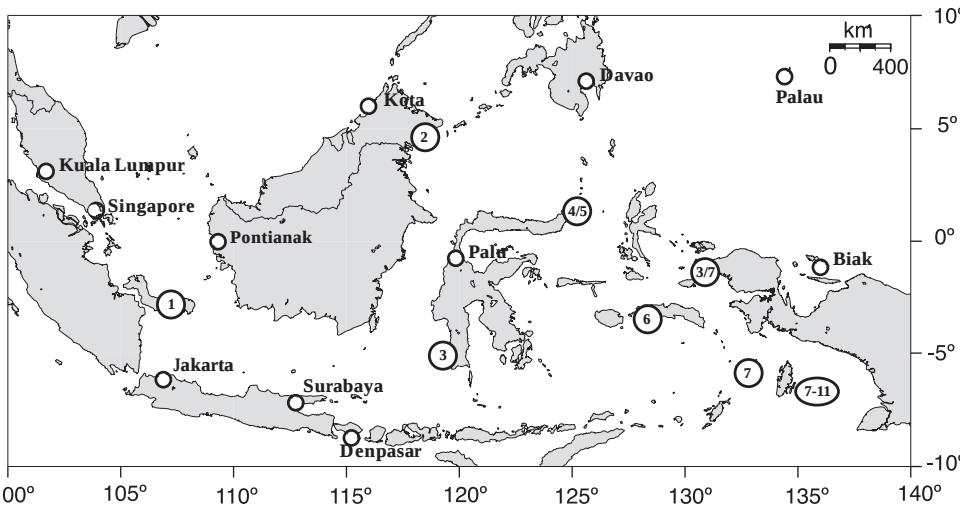


Fig. 156. Distribution *Chromonephthea* species in the Malay Archipelago: 1, *C. glomerata* (Thomson & Simpson, 1909); 2, *C. minor* spec. nov.; 3, *C. hoeksemai* spec. nov.; 4, *C. franseni* spec. nov.; 5, *C. slieringsi* spec. nov.; 6, *C. egmondi* spec. nov.; 7, *C. intermedia* (Thomson & Dean, 1931); 8, *C. curvata* (Kükenthal, 1911); 9, *C. grasshoffi* spec. nov.; 10, *C. pellucida* (Kükenthal, 1911); 11, *C. sierra* (Thomson & Dean, 1931).

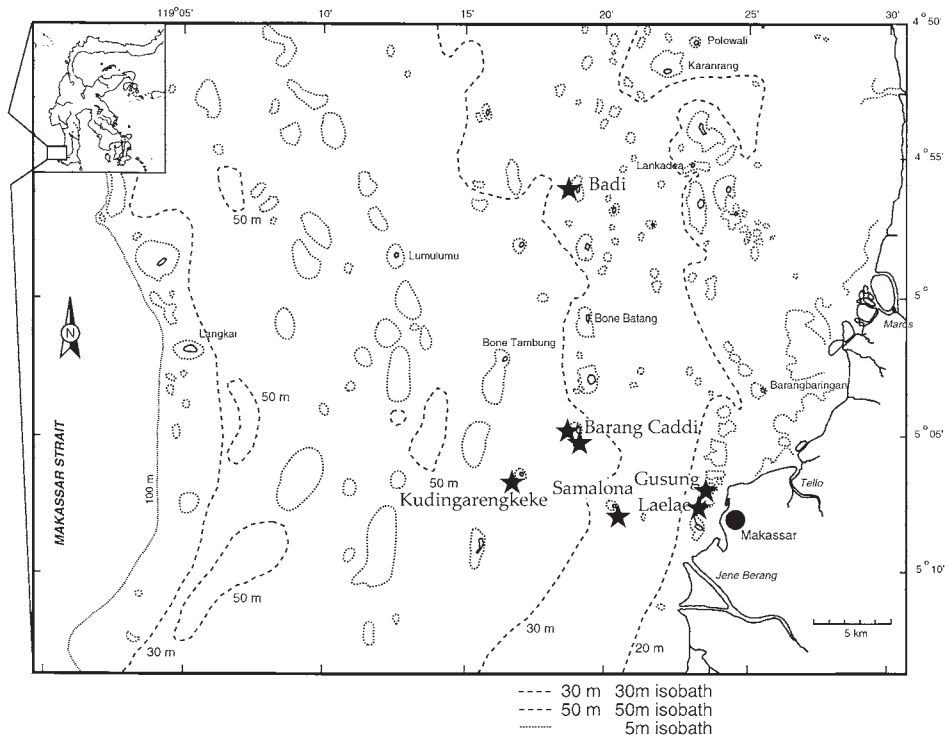


Fig. 157. Distribution of *Chromonephthea hoeksemai* spec. nov.

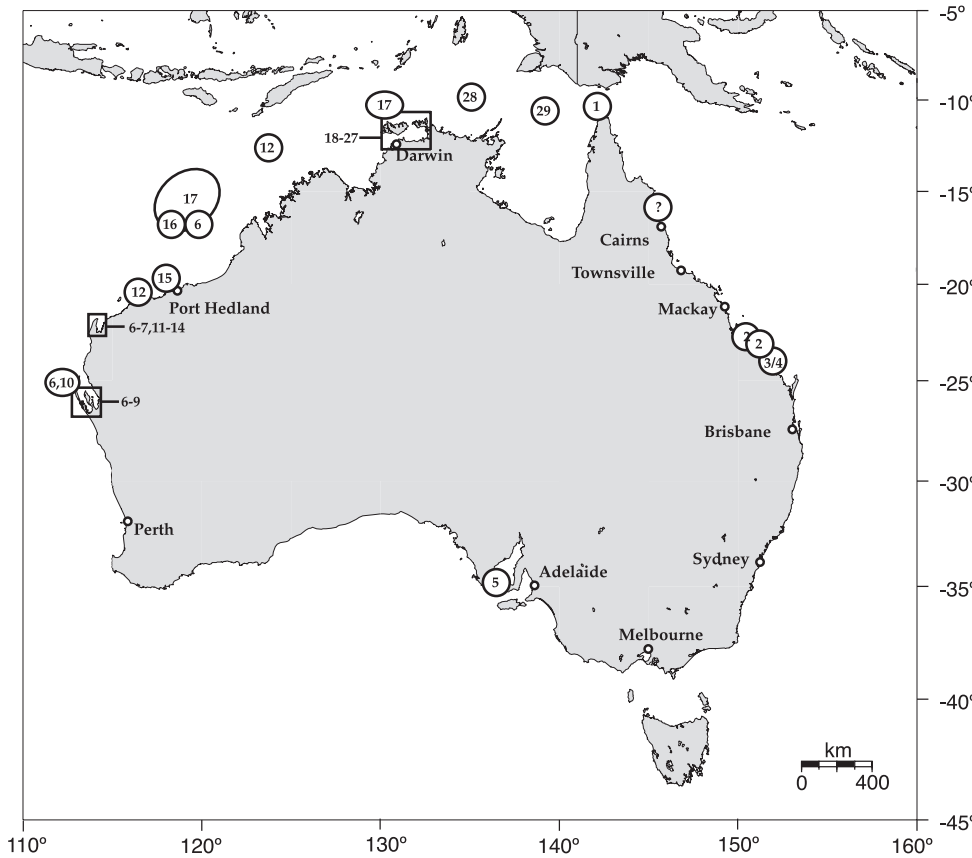


Fig. 158. Distribution *Chromonephthea* species in Australia: 1. *C. costatofulva* (Burchardt, 1898); 2, *C. tentoriae* spec. nov.; 3, *C. grandis* spec. nov.; 4. *C. imperfecta* spec. nov.; 5, *C. cornuta* Verseveldt, 1977; 6, *C. rubra* (Kükenthal, 1910); 7, *C. complanata* (Kükenthal, 1910); 8, *C. frondosa* spec. nov.; 9, *C. hartmeyeri* (Kükenthal, 1910); 10, *C. spinosa* spec. nov.; 11, *C. bundegiensis* (Verseveldt, 1977); 12, *C. dampierensis* (Verseveldt, 1977); 13, *C. exosis* spec. nov.; 14, *C. muironensis* spec. nov.; 15, *C. rotunda* spec. nov.; 16, *C. simulata* spec. nov.; 17, *C. megasclera* spec. nov.; 18, *C. brevis* spec. nov.; 19, *C. variabilis* spec. nov.; 20, *C. aldersladei* spec. nov.; 21, *C. hornerae* spec. nov.; 22, *C. levis* spec. nov.; 23, *C. benayahui* spec. nov.; 24, *C. cobourgensis* spec. nov.; 25, *C. fruticosa* spec. nov.; 26, *C. goudi* spec. nov.; 27, *C. ostrina* spec. nov.; 28, *C. obscura* spec. nov.; 29, *C. williamsi* spec. nov.

showed the sclerite variation in two nominal species of *Annella* Gray, 1858 (Subergorgiidae) as an example. At present such a study for *Chromonephthea* seems impossible until more material from each location becomes available.

In the literature *Chromonephthea rubra* (Kükenthal, 1910), originally found in Shark Bay (W Australia), is additionally mentioned by Kükenthal (1911) from the Aru islands (Indonesia). However, this record most probably refers to *C. curvata* (see remarks of *C. curvata*). Roxas (1933) reported *C. rubra* from the Philippines, but from his description it is obvious that he had not even a *Chromonephthea* species. As a consequence, also *C. rubra* cannot be referred to as an example of a widespread

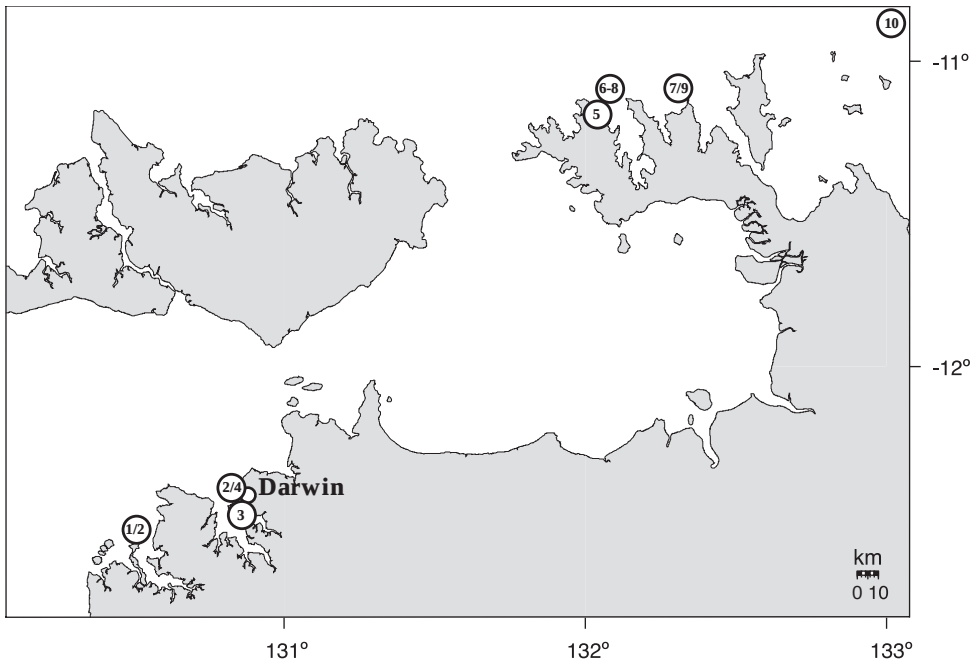


Fig. 159. Distribution *Chromonephthea* species in the Darwin region: 1, *C. brevis* spec. nov.; 2, *C. variabilis* spec. nov.; 3, *C. aldersladei* spec. nov.; 4, *C. hornerae* spec. nov.; 5, *C. levis* spec. nov.; 6, *C. benayahui* spec. nov.; 7, *C. cobourgensis* spec. nov.; 8, *C. fruticosa* spec. nov.; 9, *C. goudi* spec. nov.; 10, *C. ostrina* spec. nov.

Chromonephthea species. The larger distribution that is reported for *C. hoeksemai* is based on fragments, making reliable identification somewhat doubtful. Maybe the examination of better preserved complete specimens will show that the distribution of this species is in fact limited to SW Sulawesi (Indonesia).

2. Lack of material. The material examined was too limited to establish the proper distribution of all species involved. This is certainly the case for those species with only one specimen available, however, species of which more extensive material was studied, like *C. megasclera*, also showed very limited distributions.
3. Sampling restrictions. The species may be more widely distributed but in less easily accessible habitats. Most specimens have been collected at rather shallow depths, by hand, when snorkelling or SCUBA diving, but a number were dredged at greater depths, viz. *C. cairnsi* at 62-68 m, *C. spinosa* at 80-85 m, *C. megasclera* at 88 m, and *C. imaharai* even at 108 m. Some species might be more widely distributed in deeper water, a habitat that should get more attention in future research.
4. Restricted habitats. The habitat preferred by *Chromonephthea* species seems to restrict them to limited areas. From those cases where the collecting data included visibility and substrate it became obvious that some species were found in turbid water and rather extreme habitats: material of *C. aldersladei* at mean low tide from a

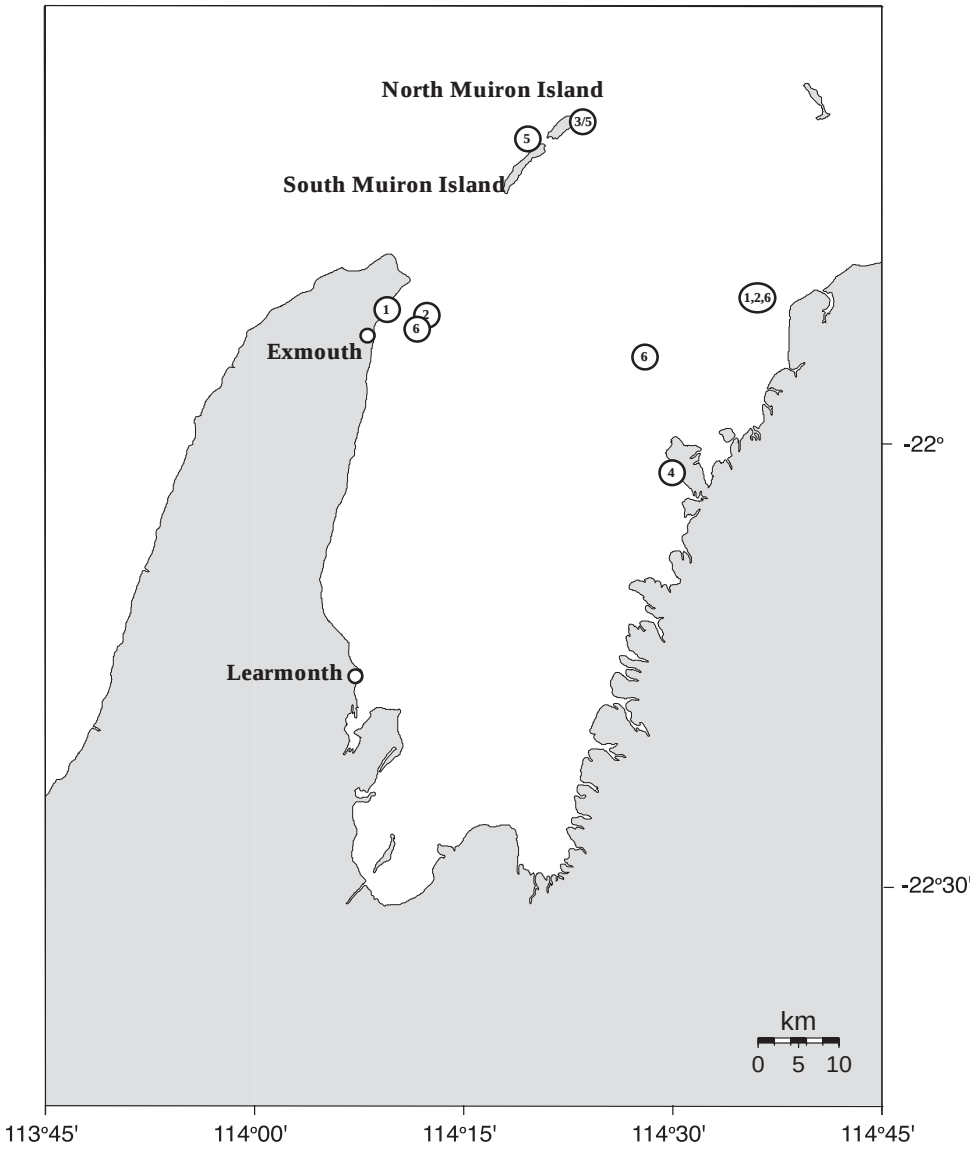


Fig. 160. Distribution *Chromonephthea* species in the Exmouth Gulf region: 1, *C. bundegiensis* (Verseveldt, 1977); 2, *C. complanata* (Kükenthal, 1910); 3, *C. dampierensis* (Verseveldt, 1977); 4, *C. exosis* spec. nov.; 5, *C. muironensis* spec. nov.; 6, *C. rubra* (Kükenthal, 1910).

muddy bank exposed to the open sun; *C. grandis* and *C. imperfecta* were found in an area where the water is often extremely turbid; C. *bayeri* in places with low visibility; *C. hoeksemai* in near-shore localities where sedimentation and turbidity is highest (see fig. 157 and Hoeksema, 1990: 427); *C. palauensis* hanging underneath a floating bridge; and *C. variabilis* in the murky waters of Darwin harbour. So far no

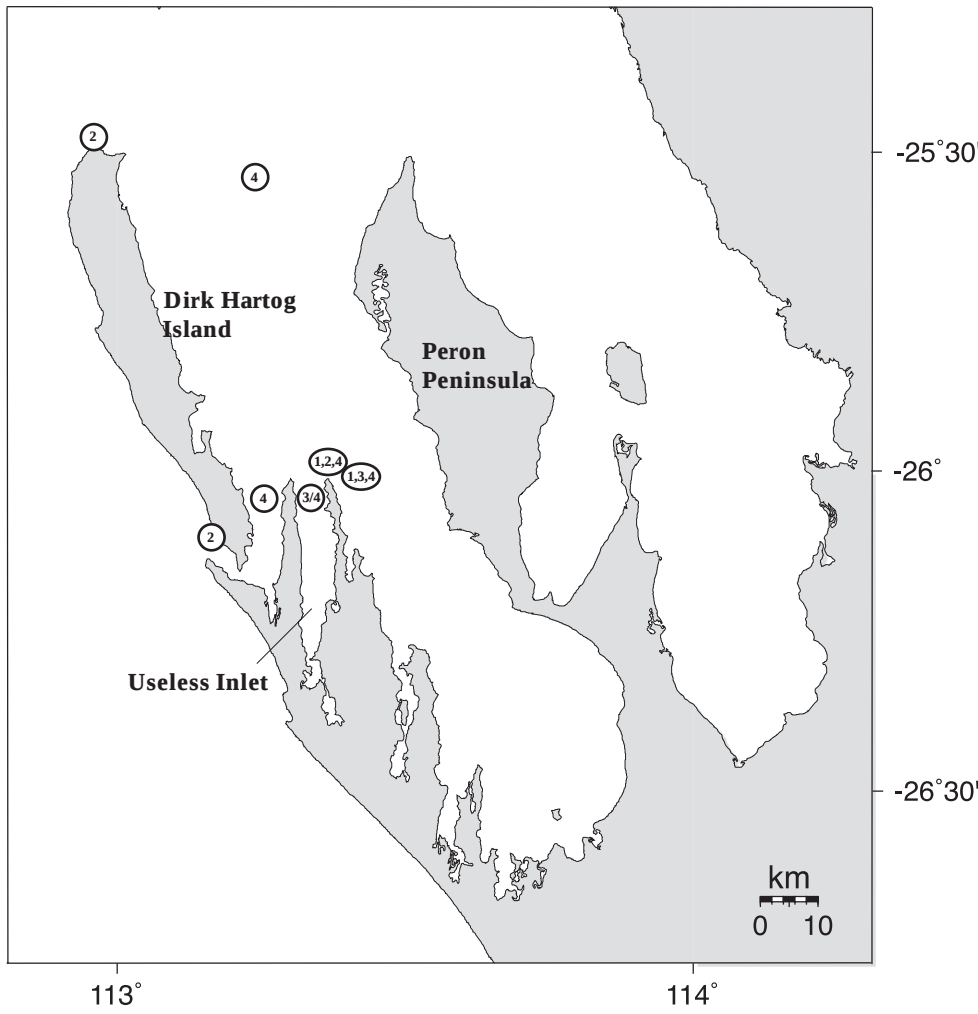


Fig. 161. Distribution *Chromonephthea* species in the Shark Bay region; 1, *C. complanata* (Kükenthal, 1910); 2, *C. frondosa* spec. nov.; 3, *C. hartmeyeri* (Kükenthal, 1910); 4, *C. rubra* (Kükenthal, 1910).

Chromonephthea species have been found on the Great Barrier Reef, and in Indonesia I have never observed them on good coral reefs but always on sandy slopes or muddy substrates. The collecting data of other species also indicated this restriction to sand / mud substrate, which limits the range of distribution.

5. Limited dispersal. The reproduction mode may limit the distribution ranges of *Chromonephthea* species. I assume species of *Chromonephthea* are brooders, as reported for species of other nephtheid genera, viz. *Litophyton*, *Nephthea*, and *Stereonephthya* (Benayahu, 1997). In this life history strategy, sperm, but not the eggs, are released freely into the water, generally a few hours after sunset. Brooded larvae are often

negatively buoyant and may settle within meters of the mother colony, which implies a limited dispersal.

In my opinion it is possible that a combination of habitat restriction and limited dispersal powers, which create isolated populations, may explain the endemism observed in *Chromonephthea*.

Ecology

Very little is known about the ecology of the *Chromonephthea* species.

Several species of *Chromonephthea* are fast growers. In Darwin harbour every two or three years the pontoons have to be cleaned from specimens of *C. variabilis* and other invertebrate fauna (see fig. 177). Large colonies, indicating fast growth in a relatively short period of time since settlement, were also found in *C. braziliensis* and *C. grandis*. *C. aldersladei* can survive periods out of the water by forming a protective mucus layer (see fig. 163a-d).

Chromonephthea species can act as fouling organisms, i.e. *C. braziliensis* assumed on oil platforms, *C. palauensis* on a floating bridge, *C. variabilis* on pontoons.

At least one species was preyed upon by an egg cowry (Gastropoda: Ovulidae), see fig. 163f, i.e. *Pseudosimnia* spec. feeding on *C. bayeri*.

Lages et al. (2004) demonstrated that crude organic extracts isolated from *C. braziliensis* acted as chemical defence against potential consumers and caused contact necrosis on the endemic gorgonian *Phyllogorgia dilatata*.

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References

Alderslade, P., 2000. Four new genera of soft corals (Coelenterata: Octocorallia), with notes on the classification of some established taxa.— Zool. Meded. Leiden 74 (16): 237-249.

Audouin, J.V., 1828. Explication sommaire des planches dont les dessins ont été fournis par M.J.C. Savigny, pour l'histoire naturelle de l'ouvrage. Déscription de l'Égypte,..., publié par les ordres de sa Majesté l'Empereur Napoleon le Grand.— Histoire Naturelle 1: 227-244.

Bayer, F.M., M. Grasshoff & J. Verseveldt, 1983. Illustrated trilingual glossary of morphological and anatomical terms applied to Octocorallia.— Leiden: 1-75.

Benayahu, Y., 1997. Developmental Episodes in Reef Soft Corals; Ecological and Cellular Determinants.— Proceedings of the 8th International Coral Reef Symposium. Coral. Reef Sym 2: 1213-1218.

Benayahu, Y., L.P. van Ofwegen & P. Alderslade, 1997. A case study of variation in two nominal species of *Sinularia* (Coelenterata: Octocorallia), *S. brassica* May, 1898, and *S. dura* (Pratt, 1903), with a proposal for their synonymy.— Zool. Verh. Leiden 323: 277-309, figs 1-30.

Burchardt, E., 1898. Alcyonaceen von Thursday Island (Torres-Strasse) und von Amboina. Zoologische Forschungsreisen in Australien und dem Malayischen Archipel. Ausgefuhrt in den Jahren 1891-1893 von Richard Semon, 5. Band, 6. Lieferung.— Denkschr. Med. Naturw. Gesellsch. Jena: 653-682, pls. 54-57.

Ekman, S., 1953. Zoogeography of the Sea.— Sidgwick and Jackson, London, i-xii, 1-417.

Ferreira, C.E.L., 2003. Non-indigenous corals at marginal sites.— Coral Reefs 22: 498.

Grasshoff, M., 2001. Taxonomy, systematics, and octocorals: to Frederick M. Bayer, October 31st, 2001.— Bull. Biol. Soc. Washington 10: 3-14, figs 1-2.

Gray, J.E., 1858. Synopsis of the families and genera of axiferous zoophytes or barked corals.— Proc. zool. Soc. London 1857: 278-294.

Gray, J.E., 1869. Notes on the Fleshy Alcyonoid Corals (*Alcyonium*, Linn., or Zoophytaria carnosa).— Ann. Mag. Natural History 3(4): 117-131.

Griffith, J.K. & J. Fromont, 1998. A catalogue of recent Cnidaria type specimens in the Western Australian Museum of Natural Science, Perth.— Records of the Western Australian Museum 19 (2): 223-239.

Hickson, S.J., 1903. The Alcyonaria of the Maldives part I. The Genera *Xenia*, *Telesto*, *Spongodes*, *Nephthya*, *Paraspongodes*, *Chironephthya*, *Siphonogorgia*, *Solenocaulon*, and *Melitodes*. In: Gardiner, J.S. (ed.).— The Fauna and Geography of the Maldive and Laccadive Archipelagoes 2 (1): 473-502, pls 26-34.

Hoeksema, B.W., 1990. Systematics and ecology of mushroom corals (Scleractinia: Fungiidae).— PhD thesis, University of Leiden: 1-471.

Hoeksema, B.W. & L.P. van Ofwegen (eds.), 2004. Indo-Malayan Reef Corals: A Generic Overview, World Biodiversity Database CD-Rom Series.— ETI, Amsterdam.

Holm, O., 1894. Beiträge zur Kenntniss der Alcyonidengattung *Spongodes* Lesson.— Zool. Jahrb. (syst) 8: 8-57, pls 1-2.

Holm, O., 1904. Weiteres über *Nephthya* und *Spongodes*.— Results Swedish Zool. Exped. to Egypt and the White Nile 1901(27): 1-18, pl. 1.

Imahara, Y., 1996. Previously recorded octocorals from Japan and adjacent seas.— Precious corals & octocoral research 4-5: 17-44.

Koren, J. & D.C. Danielssen, 1883. Nye Alcyonider, Gorgonider og Pennatulider tilhorende Norges fauna.— Bergens Museum Skrifter 2. Bergen, John Griegs Bogtrykkeri: i-ii+I-XVI+1-38, pls 1-13.

Kükenthal, W., 1896. Alcyonaceen von Ternate. In: Kükenthal, W. (ed.), Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo, im Auftrage der Senckenbergischen naturforschenden Gesellschaft ausgefürt von Dr Willy Kükenthal, Teil 2, Band.— d 1. Abhandl. Senckenb. naturf. Gesellsch. 23(1): 81-144, pls 5-8.

Kükenthal, W., 1903. Versuch einer Revision der Alcyonarien. 2. Die Familie der Nephthyiden 1. Theil.— Zool. Jahrb. (Syst.)19 (1): 99-178, pls 7-9.

Kükenthal, W., 1905. Versuch einer Revision der Alcyonaceen. 2. Die Familie der Nephthyiden. 2 Teil. Die Gattungen *Dendronephthya* n.g. und *Stereonephthya* n.g.— Zool. Jahrb. (Syst.) 21 (5/6): 503-726, pls 26-32.

Kükenthal, W., 1906. Japanische Alcyonaceen. In: Doflein, F. (ed.), Beiträge zur naturgeschicht Ostasiens.— Abhandl. math.-phys. Klasse K. Bayer. Akad. Wissensch., Suppl.-Bd. 1 (1): 9-86, figs 1-69, pls 1-5.

Kükenthal, W., 1910. Alcyonaria. 1. Teil. In: Michaelsen, W. & R. Hartmeyer (eds.).— Die Fauna Südwest-Australiens. Ergebn. Hamburger Südwest-Aust. Forschungsr. 1905, 3(1): 1-108, pls 1-4

Kükenthal, W., 1911. Alcyonarien von den Aru- und Kei-Inseln nach den sammlungen von Dr H. Merton.— Abhandl. Senckenb. naturf. ges. Frankfurt, 33(4): 307-346, figs 1-83, pls 19-23.

Lages, B.G., B.G. Fleury, C.E.L. Ferreira, R.C. Pereira, 2004. Poster at 10th International Coral Reef Symposium (Okinawa) entitled: Chemical Defense of the Exotic Coral *Stereonephthya* aff. *curvata* (Alcyonacea, Octocorallia) at Brazilian Marine Reserve.

Marenzeller, E. von, 1878. Die Coelenteraten, Echinodermen Und Wurmer Der K.K. Österreichisch-Ungarischen Nordpol-Expedition.— Denkschr. K. Akad. Wiss. Wien, Math.-Naturw. Classe 35: 357-398, pls 1-4.

Roxas, H.A., 1933. Philippine Alcyonaria, II. The Families Alcyoniidae and Nephthyidae.— Philippine Journ. Sci. 50 (4): 345-470, pls 1-5.

Sammarco, P., J.C. Coll & S. la Barre, 1985. Competitive strategies of soft corals (Coelenterata: Octocorallia). II. Variable defense responses and susceptibility to scleractinian corals.— J. Exp. Biol. Ecol. 91: 199-215.

Soest, R.W.M. van, 1977. A catalogue of the Coelenterata type specimens of the Zoological Museum of Amsterdam III. Antipatharia, Pennatulacea, Stolonifera, Telestacea, Alcyonacea.— Beaufortia 26(332): 77-98.

Song, J., 1976. A study on the classification of the Korean Anthozoa 2. Alcyonacea.— Korean J. Zool. 19(2): 51-62, pls 1-2.

Song, J., 2000. Animals of Korea Series 5 Cnidaria 2 Anthozoa.— Korea Research Institute of Bioscience and Biotechnology (Kribb), Korea, 332 pp.

Thomson, J.A. & L.M. Dean, 1931. The Alcyonacea of the Siboga Expedition with an addendum to the Gorgonacea.— Siboga-Exped. Monogr. 13d: 1-227, pls 1-28.

Thomson, J.A. & D.L. Mackinnon, 1910. Alcyonarians collected on the Percy Sladen Trust Expedition by Mr J. Stanley Gardiner. Part 2, the Stolonifera, Alcyonacea, Pseudaxonia, and Stelechotokea.— Trans. Linn. Soc. London (2) 13 (2): 165-211, pls 6-14.

Thomson, J.A. & J.J. Simpson, 1909. An account of the Alcyonarians collected by the Royal Indian Marine Survey Ship Investigator in the Indian Ocean; with a report on the species of *Dendronephthya* by W.D. Henderson. II. The Alcyonarians of the littoral area.— Calcutta, The Indian Museum: i-xvii+1-319, pls 1-9.

Tixier-Durivault, A., 1970. Les Octocoralliaires de Nouvelle-Calédonie.— L'Expedition française sur les récifs coralliens de la Nouvelle-Calédonie 4: 171-350, figs. 1-173.

Tixier-Durivault, A. & M. Prevorsek, 1959. Révision de la famille des Nephtheidae. 1. Le genre *Spongodes* Lesson, 1831.— Mém. Mus. nation. Hist. nat. (n.s.) 20: 1-151.

Utinomi, H., 1951. *Eunephthya* from Middle Japan.— Publ. Seto Marine Biol. Lab. 2(1): 27-40, figs 1-5, pl. 1.

Utinomi, H., 1960. Noteworthy Octocorals collected off the Southwest Coast of Kii Peninsula, Middle Japan. Part I, Stolonifera and Alcyonacea.— Publ. Seto Marine Biol. Lab. 8(1): 1-26, pls 1-2.

Utinomi, H., 1961. A revision of the nomenclature of the family Nephtheidae (Octocorallia: Alcyonacea). II. The boreal genera *Gersemia*, *Duva*, *Drifa* and *Pseudodrifa* (N.G.).— Publ. Seto Marine Biol. Lab. 9 (1): 229-246, figs 1-6, pl. 11.

Utinomi, H., 1962. Preliminary List of Octocorals of Sagami Bay Deposited in the Biological Laboratory of the Imperial Household.— Publ. Seto Marine Biol. Lab. 10(1): 105-108.

Utinomi, H., 1971. Intertidal alcyonarians in the vincinity of Darwin, Northern Territory, Australia.— Rec. Australian Mus 28 (5): 87-110, figs 1-12, pls 15-16.

Utinomi, H., 1975. Octocorallia collected by trawling in the Western Australia.— Publ. Seto Marine Biol. Lab. 22 (5): 237-266, pls 1-4.

Verrill, A.E., 1865. Synopsis of the polyps and corals of the North Pacific Exploring Expedition, under Commodore C. Ringgold and Captain John Rodgers, U.S.N., from 1853 to 1856. Collected by Dr. Wm. Stimpson, naturalist to the expedition. With descriptions of some additional species from the west coast of North America.— Proc. Essex Inst. Salem 4: 181-196, pls. 5-6.

Verrill, A.E., 1869. Critical remarks on Halcyonoid polyps 3.— Amer. Journ. Sci. Arts 47: 282-285.

Verseveldt, J., 1977. Australian Octocorallia (Coelenterata).— Australian Journal of Marine and Freshwater Research 28: 171-240, figs 1-49.

Williams, G.C., 1992. Revision of the soft coral genus *Minabea* (Octocorallia: Alcyoniidae) with new taxa from the Indo-West Pacific.— Proc. Cal. Acad. Sci. 48 (1): 1-26, figs 1-16.

Williams, G.C., 1993. Biotic diversity, biogeography, and phylogeny of pennatulacean octocorals associated with coral reefs in the Indo-Pacific.— Proceedings of the 7th International Coral Reef Symposium, Guam, 1992, 2: 729-735.

Williams, G.C. & P. Alderslade, 1999. Revisionary systematics of the western Pacific soft coral genus *Minabea* (Octocorallia: Alcyoniidae), with descriptions of a related genus and species from the Indo-Pacific.— Proc. Cal. Acad. Sci. 51 (7): 337-364, figs 1-16.

Wright, E.P. & T. Studer, Report on the Alcyonaria collected by H.M.S. Challenger during the years 1873-1876.— Rep. Sci. Res. Voyage Challenger Zool. 31: i-lxxvii + 1-314, 43 pls.

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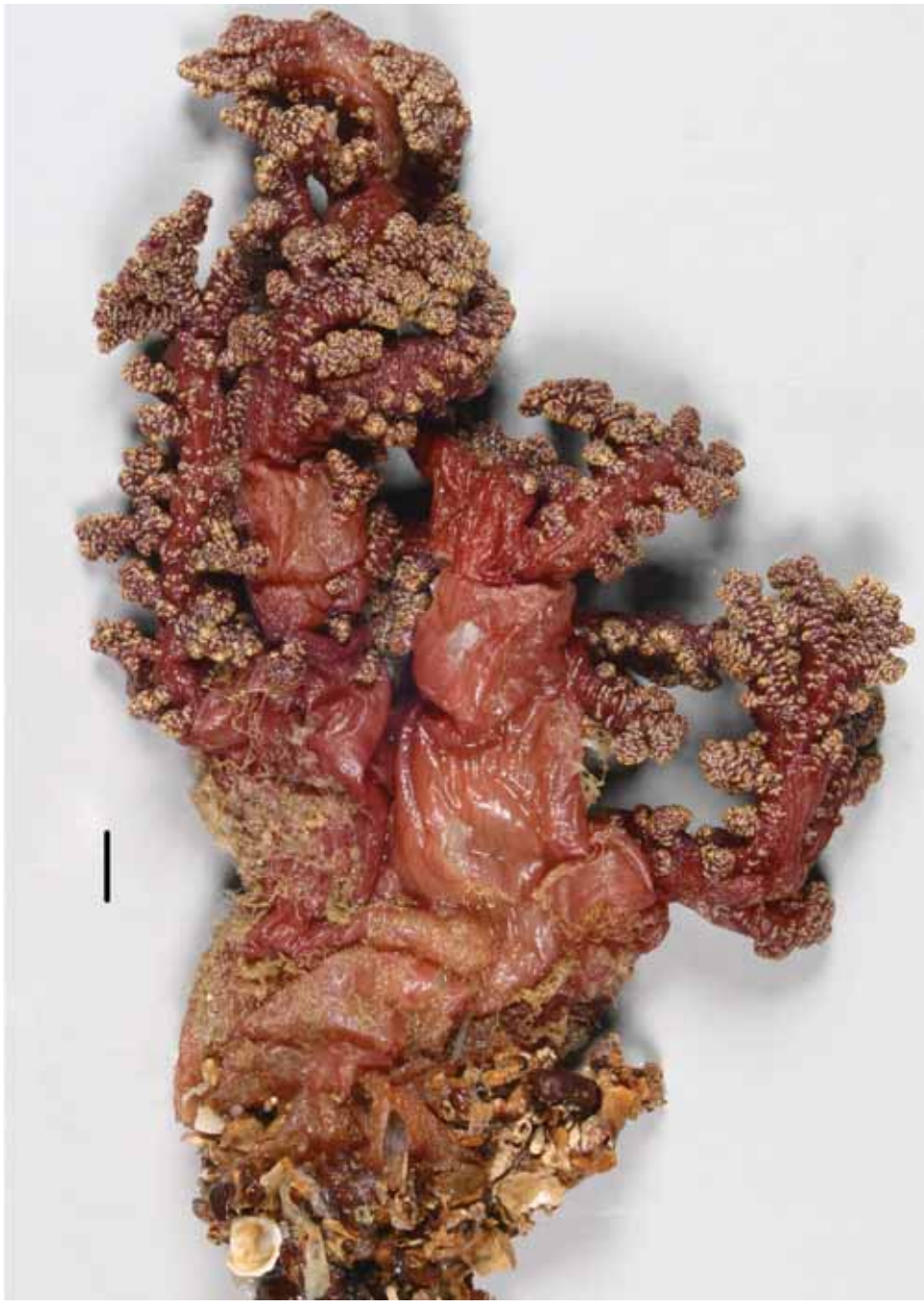

Fig. 162. *Chromonephthea aldersladei* spec. nov., holotype NTM C11173. Scale 1 cm.

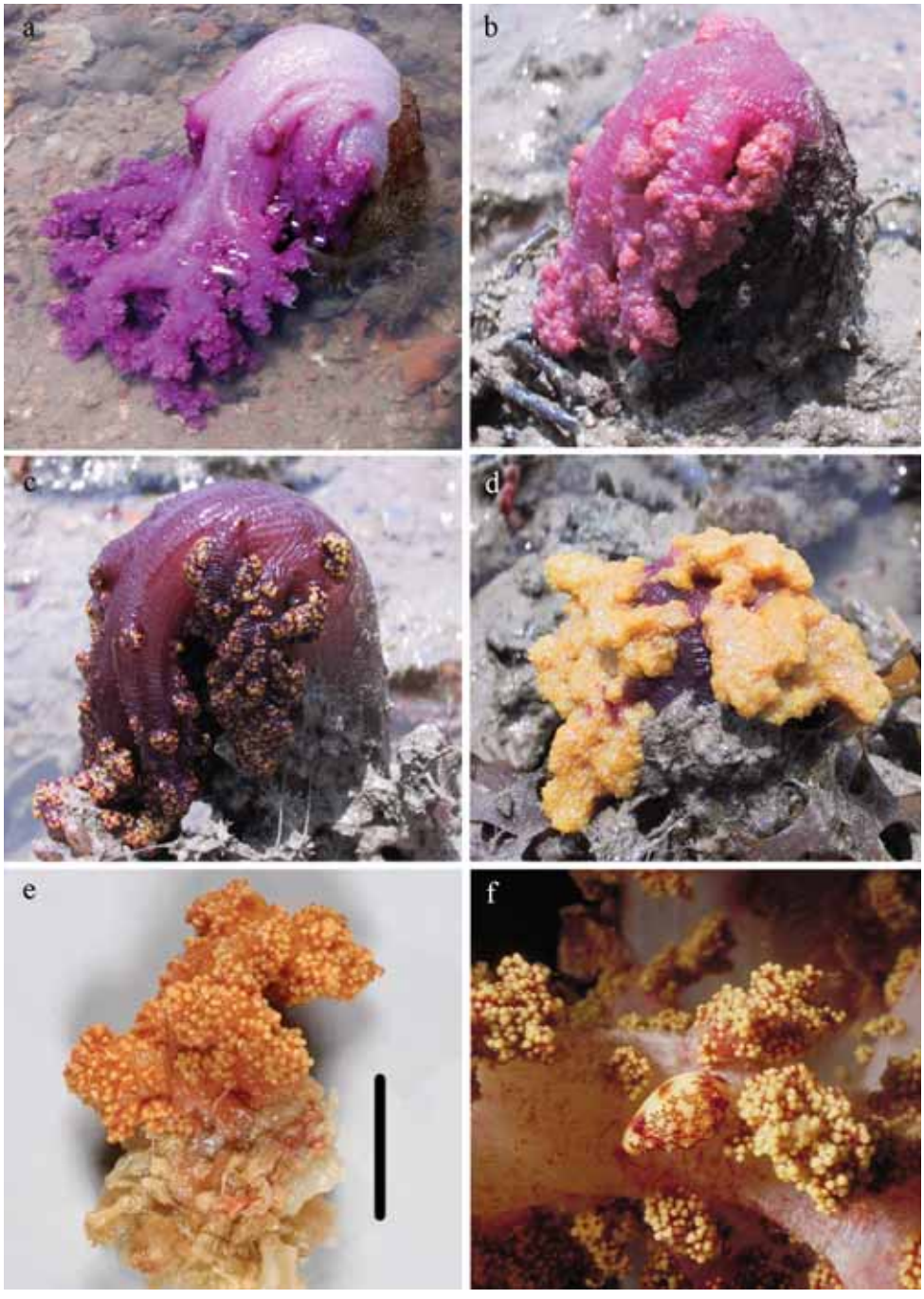

Fig. 163a-d, *Chromonephthea aldersladei* spec. nov., live colonies; e, *C. aurantiaca* (Verrill, 1865) USNM 60387; f, *Pseudosimnia* spec. on *C. bayeri* spec. nov. Scale of fig. 163e is 1 cm.

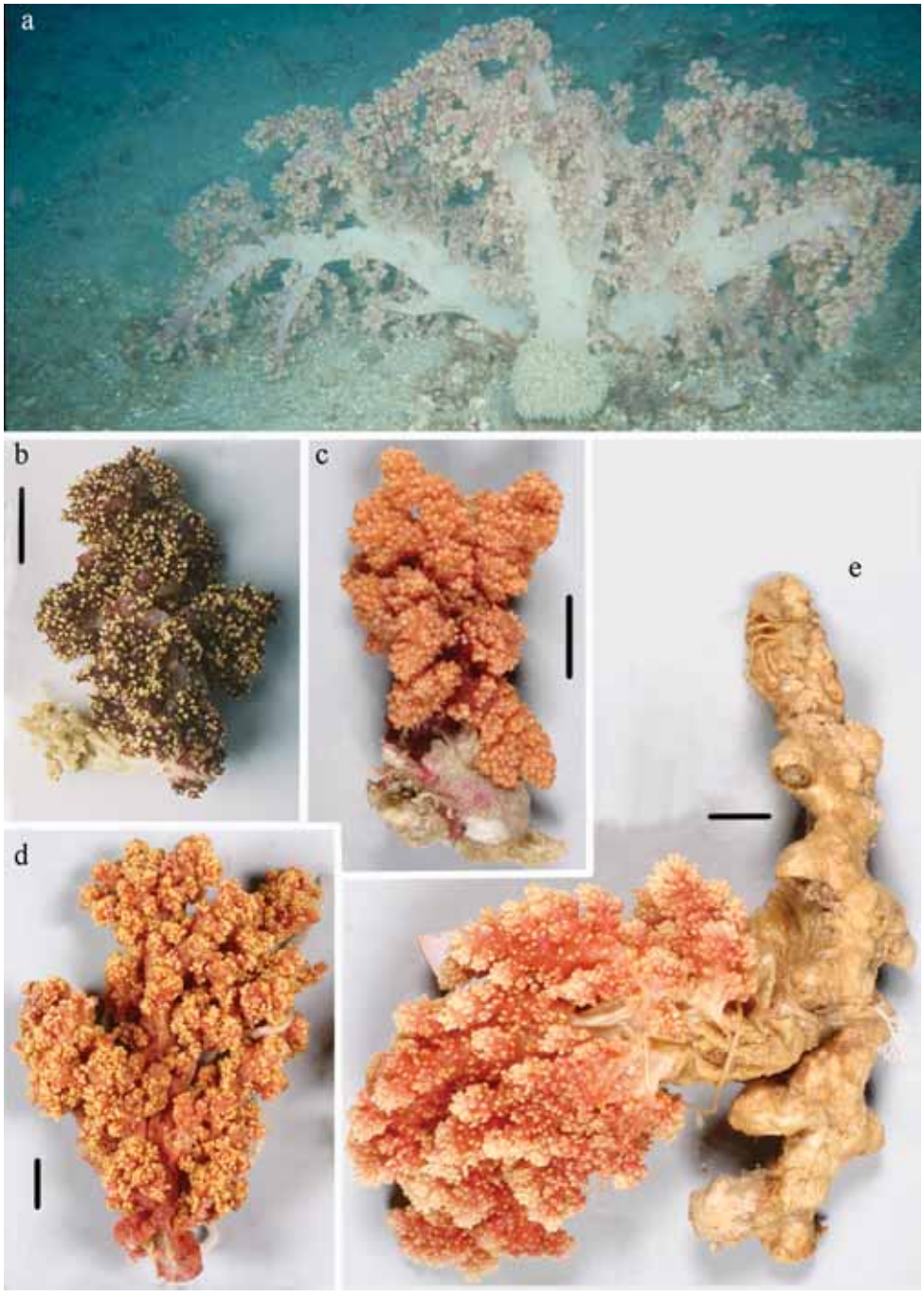

Fig. 164a-b, *Chromonephthea bayeri* spec. nov., a, live colony, b, holotype RMNH Coel. 32637; c, *C. benayahui* spec. nov., holotype NTM C5744; d, *C. cairnsi* spec. nov., holotype USNM 90339; e, *C. rotunda* spec. nov., holotype WAM Z27506. Scales 1 cm.

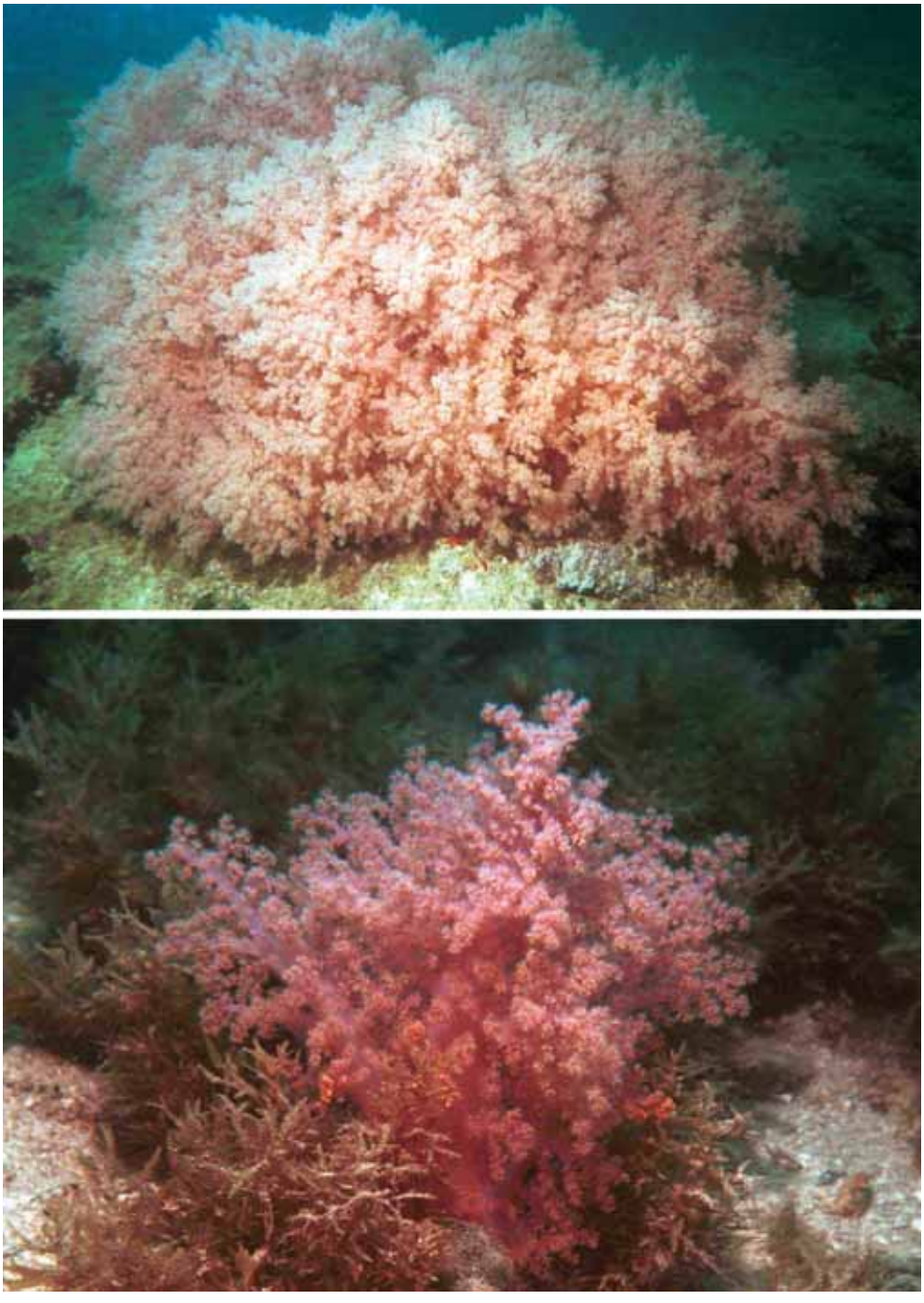

Fig. 165. *Chromonephthea braziliensis* spec. nov., live colonies.

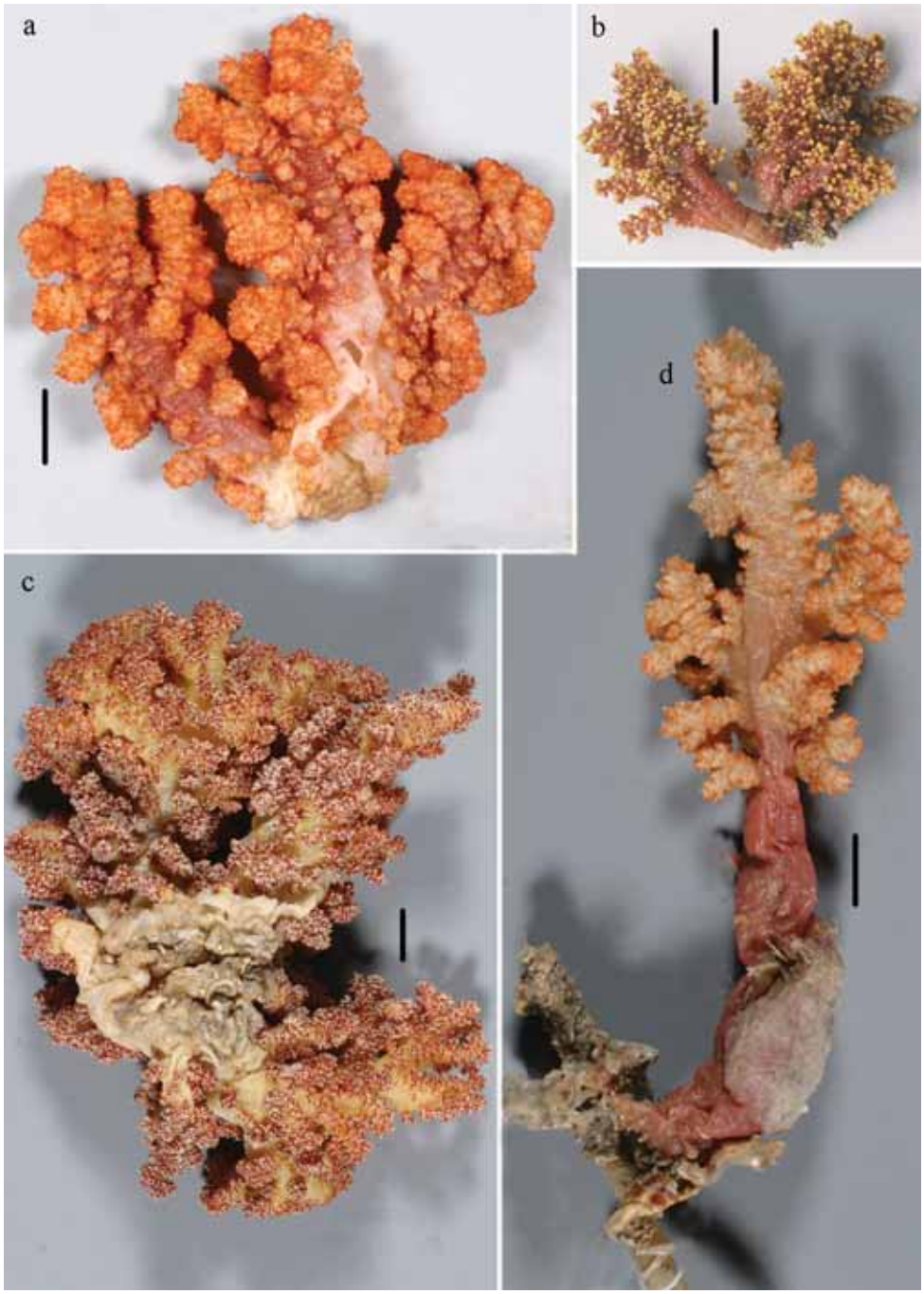

Fig. 166a. *Chromonephthea brevis* spec. nov., holotype NTM C5164; b, *C. egmondi* spec. nov., holotype RMNH Coel. 32635; c, *C. fruticosa* spec. nov., holotype NTM C14839; d, *C. cobourgensis* spec. nov. NTM C5710, holotype. Scales 1 cm.

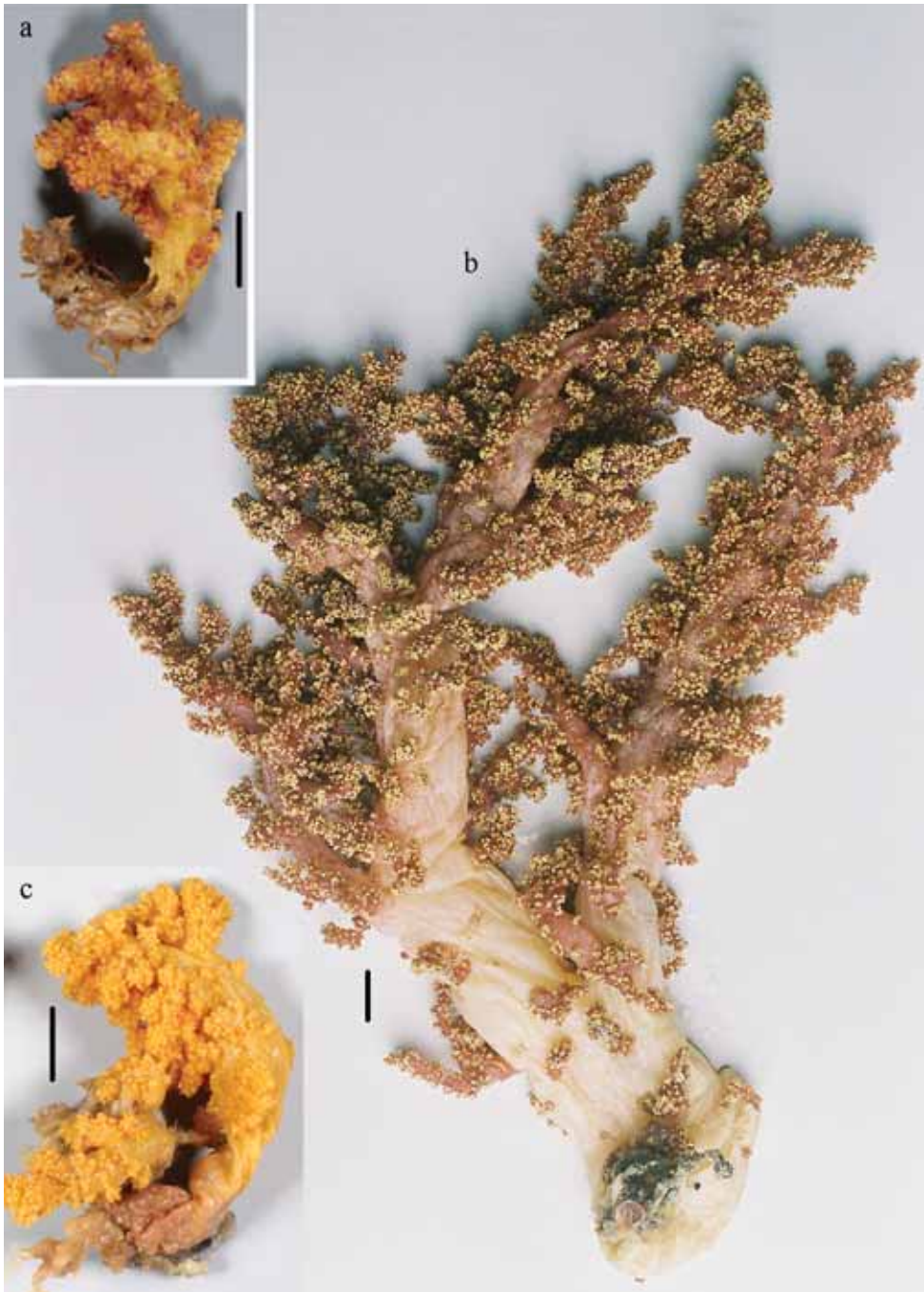

Fig. 167a. *Chromonephthea exosis* spec. nov., holotype WAM Z27500; b, *C. franseni* spec. nov., holotype RMNH Coel. 32050; c, *C. goudi* spec. nov., holotype NTM C3518. Scales 1 cm.

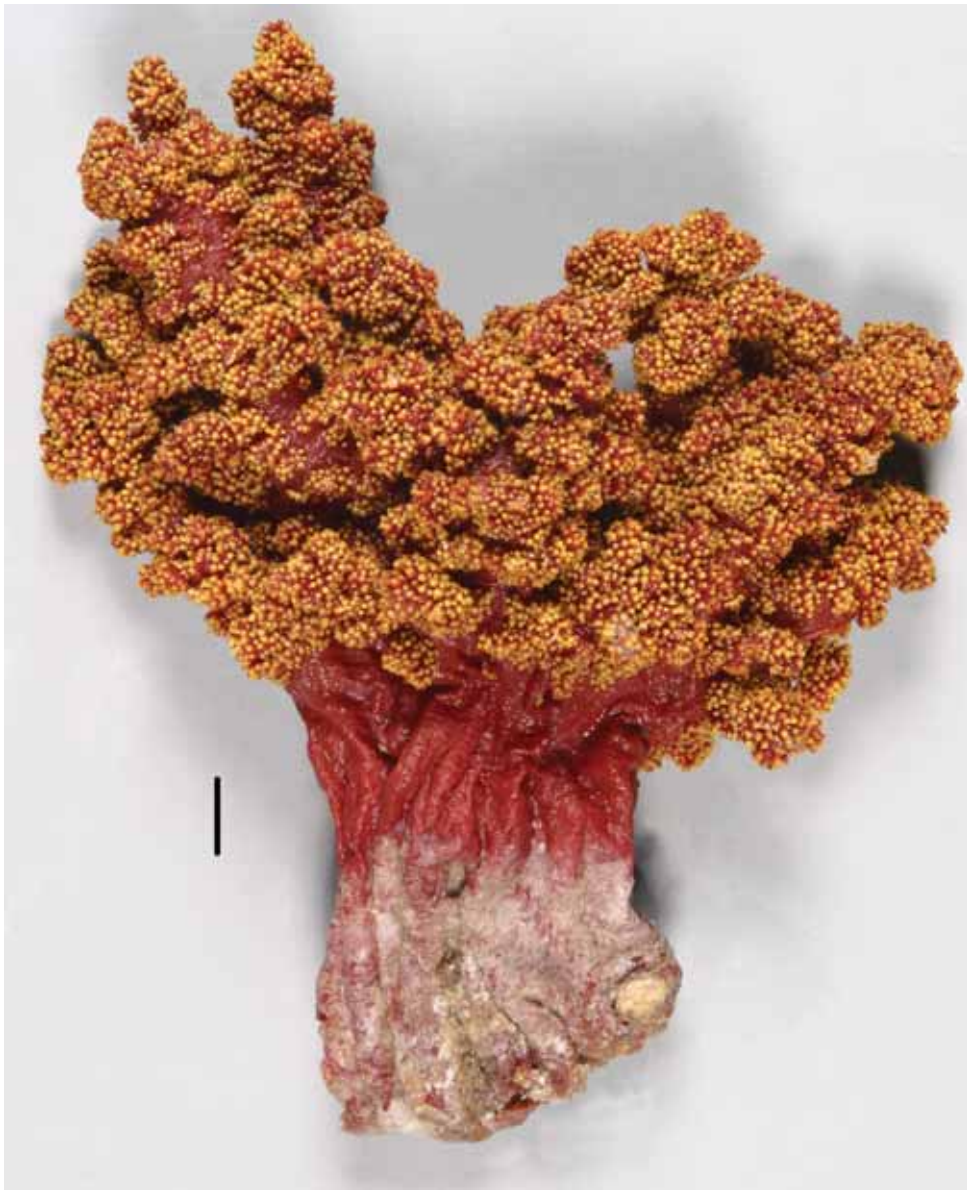

Fig. 168. *Chromonephthea frondosa* spec. nov., holotype NTM 5764. Scale 1 cm.

Fig. 169. *Chromonephthea grandis* spec. nov., holotype NTM C2349. Scale 1 cm

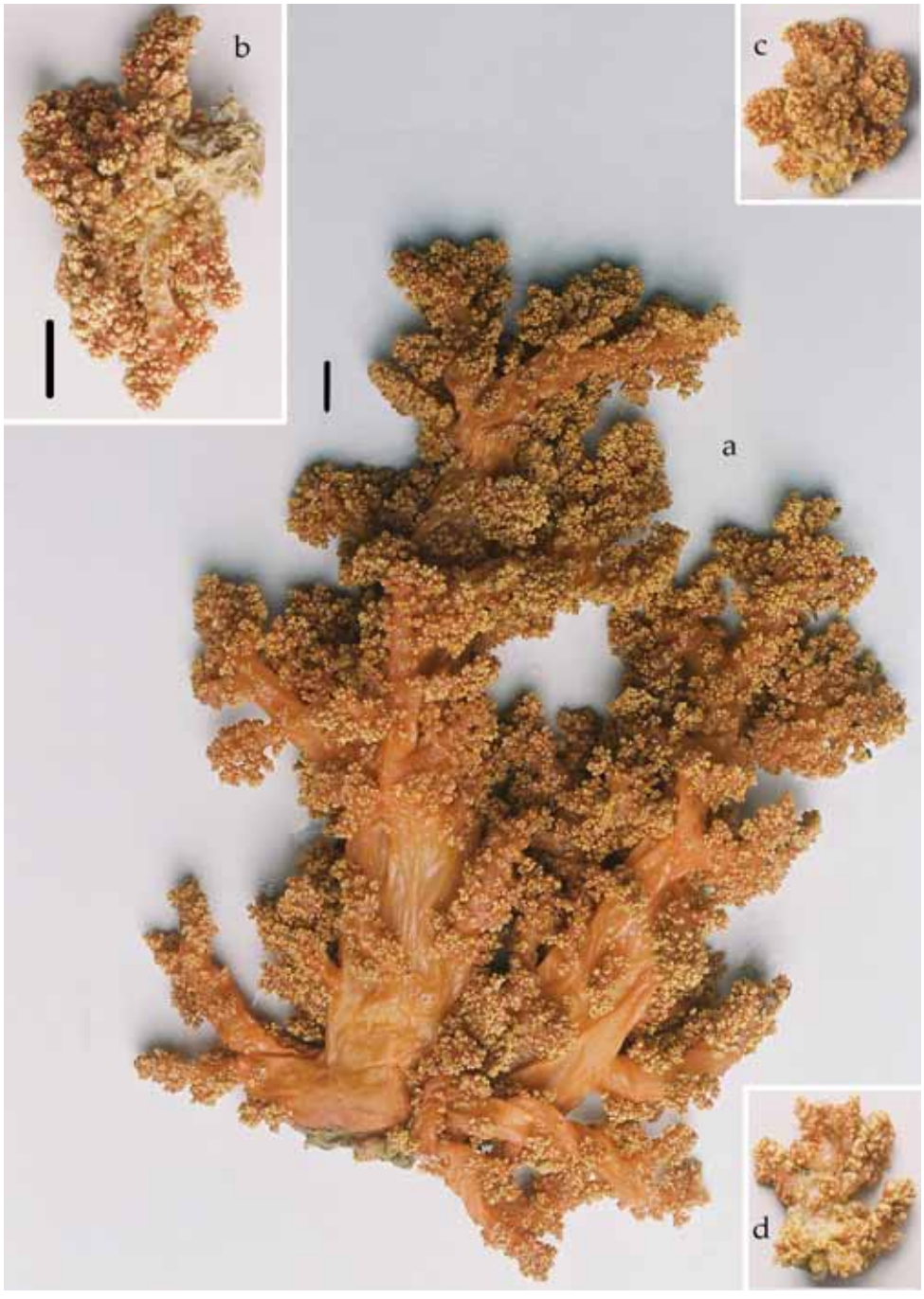

Fig. 170a. *Chromonephthea hoeksemai* spec. nov., holotype RMNH Coel. 32623; b-d, ZMA COEL. 2935, identified as *Nephthya chabrolii* by Thomson & Dean, 1931. Scales 1 cm.

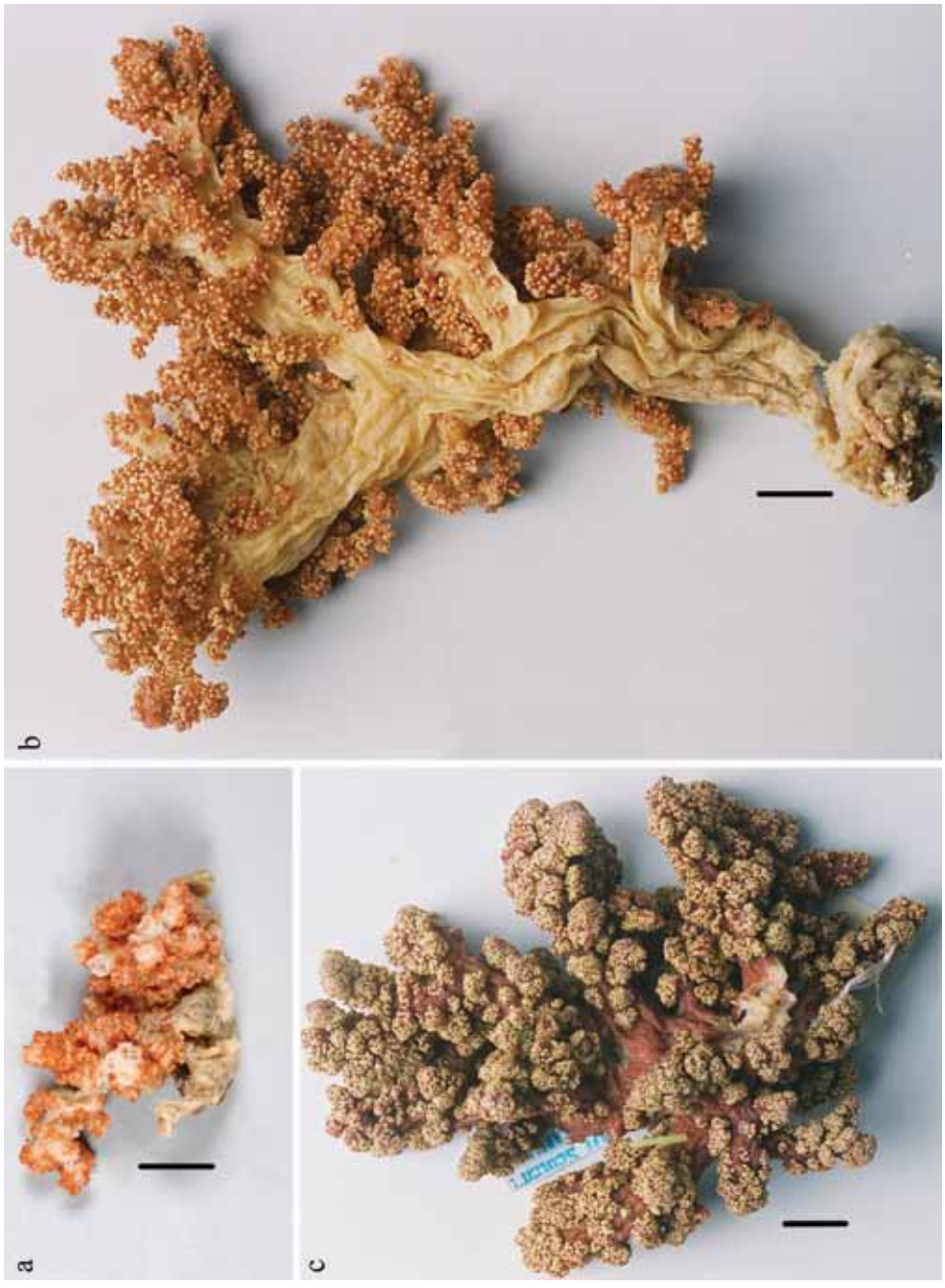

Fig. 171a. *C. intermedia* (Thomson & Dean, 1931), lectotype ZMA COEL. 2454; b, ZMA COEL. 2937; c, *C. imperfecta*, holotype QM G324171. Scales 1 cm.

Fig. 172. *Chromonephthea megasclera* spec. nov., holotype WAM Z27501. Scale 2 cm.

Fig. 173. *Chromonephthea simulata* spec. nov., holotype, WAM Z27507. Scale 1 cm.

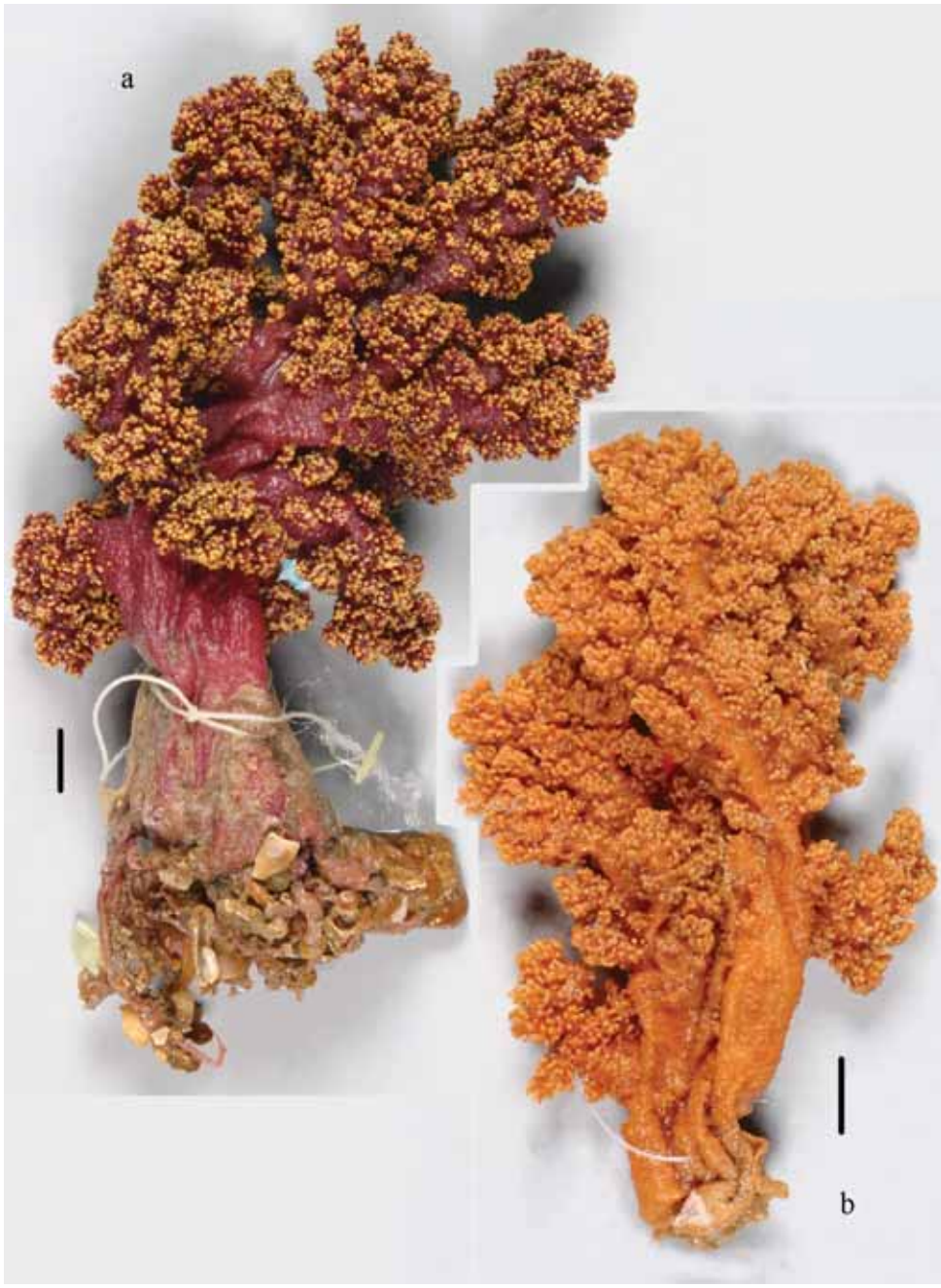

Fig. 174a, *Chromonephthea tentoriae* spec. nov., holotype QM G324172; b, *C. spinosa* spec. nov., holotype WAM Z27508. Scales 1 cm.

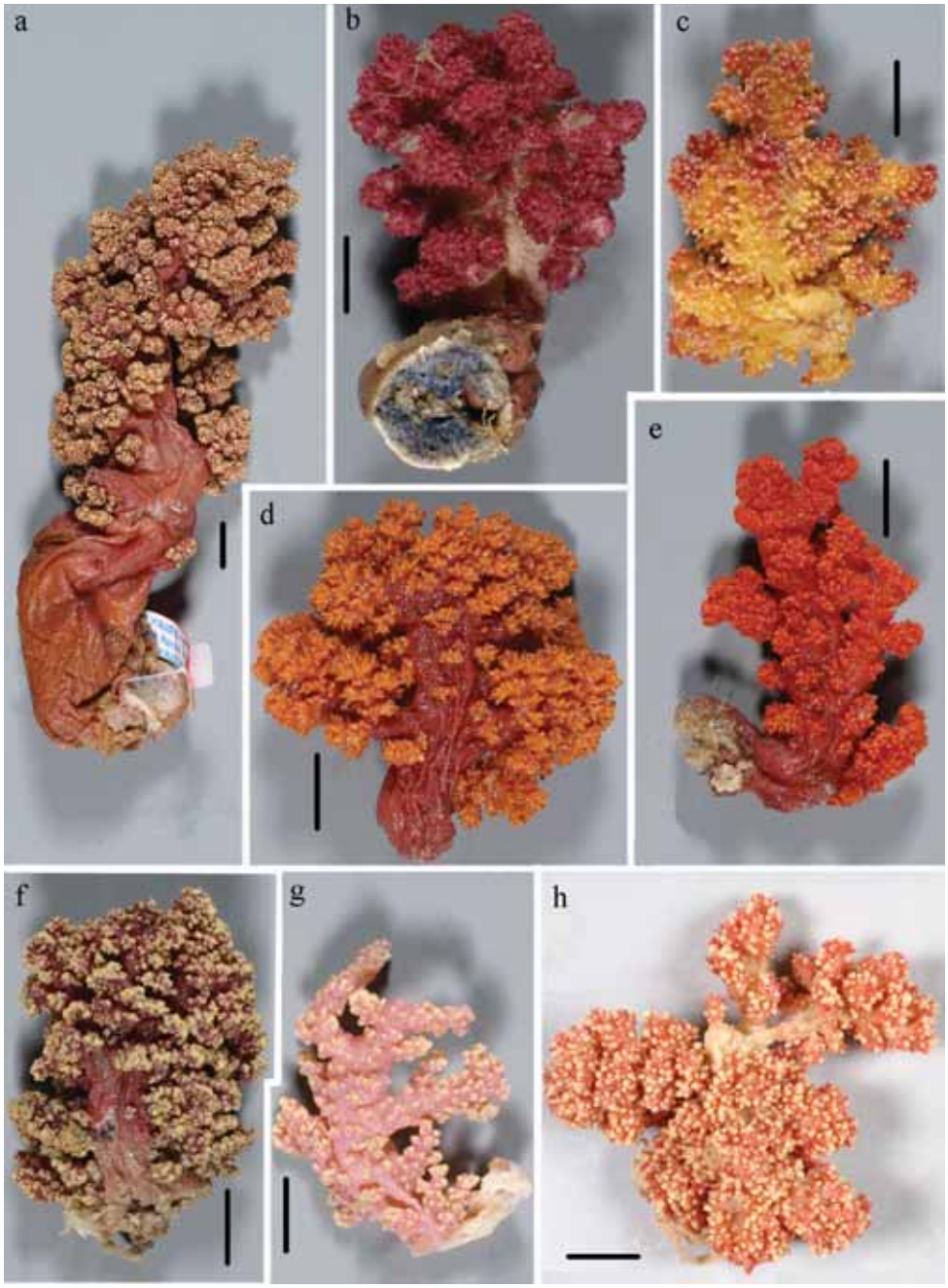

Fig. 175a, *Chromonephthea palauensis* spec. nov., holotype NTM C14669; b, *C. ostrina* spec. nov., holotype NTM C4619; c, *C. muironensis* spec. nov., paratype CAS 171933; d, *C. muironensis* spec. nov., holotype WAM Z27505; e, *C. levis* spec. nov., holotype NTM C3336; f, *C. minor* spec. nov., holotype RMNH Coel. 33236; g, *C. obscura* spec. nov., holotype NTM C4723; h, *C. imaharai* spec. nov.; holotype USNM 90340. Scales 1 cm.

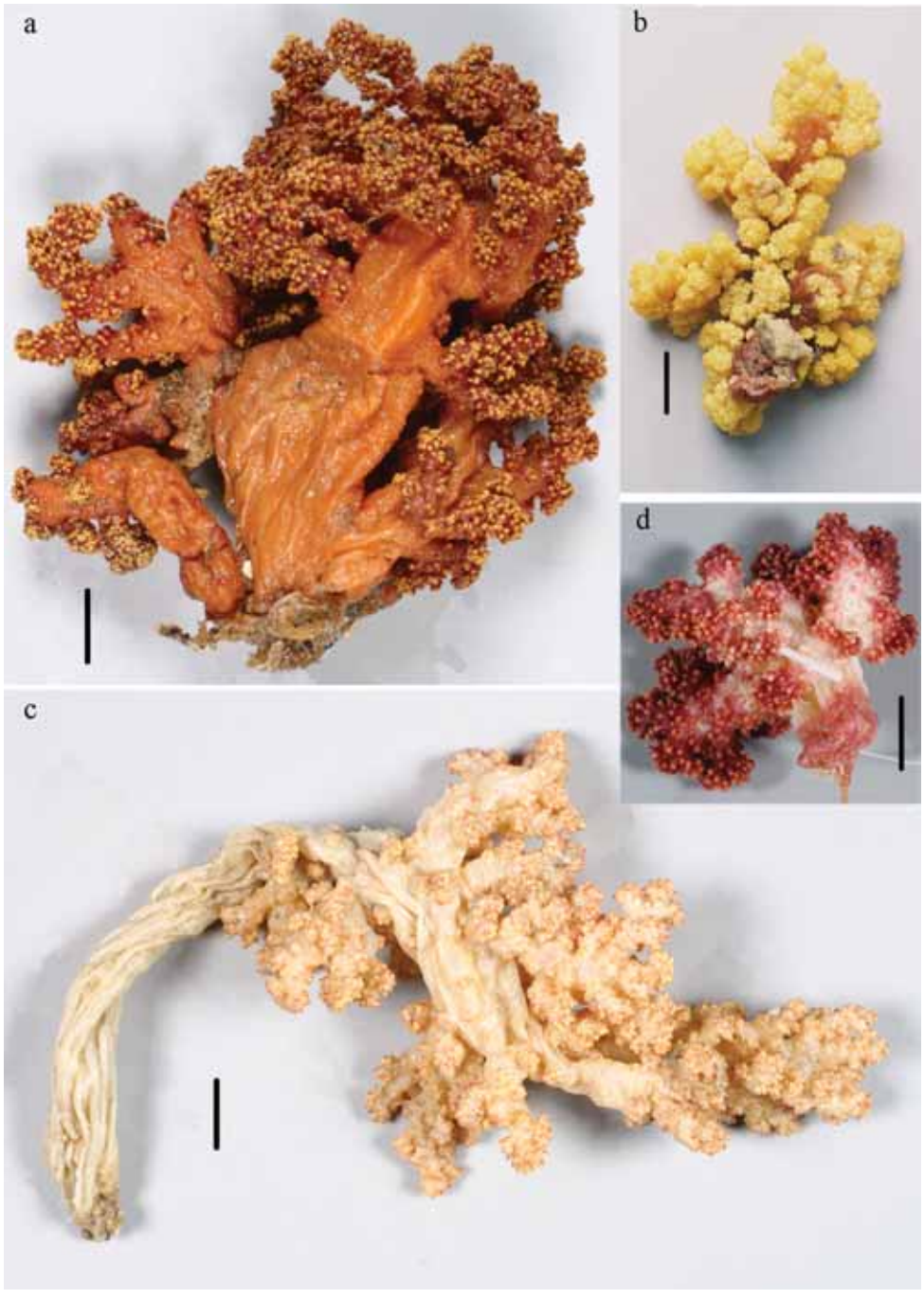

Fig. 176a, *Chromonephthea slieringsi* spec. nov., holotype RMNH Coel. 32051; b, *C. hornerae* spec. nov., holotype NTM C2777; c, *C. williamsi* spec. nov., holotype NTM C10188; d, *C. singularis* spec. nov., holotype NTM C11867. Scales 1 cm.

Fig. 177. Probably *Chromonephthea variabilis* spec. nov., specimens growing on a pontoon from Darwin harbour.