Senckenbergiana maritima | 25 | (4/6) | 107–113 | Frankfurt am Main, 15. 5. 1995

Redescription of *Typosyllis magnipectinis* (STORCH, 1967) from the South China Sea

(Polychaeta: Syllidae)

With 3 Text-Figures and 1 Table

FRANK LICHER & ZHIHU DING & DIETER FIEGE & RUIPING SUN

Abstract

[LICHER, F. & DING, Z. & FIEGE, D. & SUN, R. (1995): Redescription of *Typosyllis magnipectinis* (STORCH, 1967) from the South China Sea (Polychaeta: Syllidae). – Senckenbergiana marit., **25** (4/6): 107–113, 3 figs., 1 tab.; Frankfurt a. M.]

Typosyllis magnipectinis (STORCH, 1967), redescribed from Hainan Island, South China Sea, is distinguished from other *Typosyllis*-species by the following characters: compound falcigerous chaetae with a considerably enlarged secondary tooth and long serrations proximal to it ("normal falcigers"); much enlarged falcigerous chaetae of similar shape ("enlarged chaetae"); simple dorsal chaetae with bidentate tips; simple ventral chaetae with an enlarged secondary tooth and long serrations proximal to it.

Keywords: Taxonomy, Polychaeta, Syllidae, *Typosyllis, Syllis,* China.

Kurzfassung

[LICHER, F. & DING, Z. & FIEGE, D. & SUN, R. (1995): Wiederbeschreibung von *Typosyllis magnipectinis* (STORCH, 1967) aus dem Südchinesischen Meer (Polychaeta: Syllidae). – Senckenbergiana marit., **25** (4/6): 107–113, 3 Abb., 1 Tab.; Frankfurt a. M.]

Die Beschreibung von *Typosyllis magnipectinis* (STORCH, 1967) wird durch einen weiteren Fund von der Insel Hainan (Südchinesisches Meer) vervollständigt. Diese Art unterscheidet sich von anderen *Typosyllis*-Arten durch folgende Merkmalskombination: zusammengesetzte falcigere Borsten mit stark vergrößertem sekundären Zahn und subdistalen langen Härchen ("normal falcigers"); kräftigere, vergrößerte falcigere Borsten ähnlicher Struktur ("enlarged falcigers"), einfache Dorsalborsten mit bidentater Spitze und einfache Ventralborsten mit vergrößertem sekundären Zahn und subdistalen Härchen.

Introduction

During the recently-intensified sampling of the Chinese polychaete fauna, a species of *Typosyllis* with enlarged falcigers was collected by a joint expedition to Hainan Island of the First Institute of Oceanography in Qingdao and the Biological Department of the University of Osnabrück in October 1991, and again by an expedition to investigate the shallow-water biota of Hainan Island carried out jointly by the Institute of Oceanology, Academia Sinica, Qingdao and

Authors' Addresses: Mr. FRANK LICHER, Universität Osnabrück, Fachbereich 5, Spezielle Zoologie, D-49069 Osnabrück, Germany. – Dr. ZHIHU DING, First Institute of Oceanography, State Oceanic Administration, P.O. Box 98, Qingdao, P.R. China. – Dr. DIETER FIEGE, Forschungsinstitut Senckenberg, Sektion Marine Evertebraten II, D-60325 Frankfurt, Germany. – Prof. RUIPING SUN, Institute of Oceanology, Academia Sinica, Qingdao, P.R. China.

the Forschungsinstitut Senckenberg, Frankfurt, in March/April 1992. The same species was described by UEBELACKER (1984) as *Typosyllis* sp. A from the Gulf of Mexico.

The present material is assigned to *Syllis (Typosyllis) magnipectinis* STORCH, 1967, from the Red Sea, which has never been reported since it was described. As this species was described from an incomplete type, the present authors have undertaken a fuller description based on the Chinese material with a re-evaluation of its geographic range. The holotype has now been deposited in the Senckenberg Museum; the deposition of the Chinese material is cited below.

Material and Methods

Material was fixed either in 70 % ethanol or in 4 % Formalin diluted with seawater and later transferred to 70 % ethanol. For light microscopy, specimens were transferred into glycerol. Observations, drawings, and measurements were made using a LEITZ Diaplan microscope with interference contrast optics and a camera lucida. For SEM investigations, specimens were dehydrated via graded series of ethanol, critical point dried with CO_2, coated with Au-Pd and examined with a CamScan CS 24 SEM. The measurements are from the largest and only complete specimen, with those of the holotype given in parentheses.

The following abbreviations are used: First Institute of Oceanography, Qingdao (FIOQ); Museo Nacional de Ciencias Naturales, Madrid (MNCNM); Senckenberg Museum, Frankfurt (SMF); U.S. National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); Zoologisches Museum, Universität Hamburg (ZMH).

Description

Typosyllis magnipectinis (STORCH, 1967), redescribed

Figs. 1–3

1967 *Syllis (Typosyllis) magnipectinis* STORCH: 106–107, Figs. 4–5.

1984 *Syllis (Typosyllis)* sp. A. – UEBELACKER: 30–134, Figs. 30–126 (USNM 65692, 75306). [Not *Syllis (Typosyllis)* sp. A. – UEBELACKER: 30–134 (USNM 75308, 75312)].

Material examined: *Typosyllis (Syllis) magnipectinis* (STORCH, 1967): Red Sea, Gifatin Island group, 27°16′N, 33°56′E, coarse sand zone (holotype, incomplete specimen, SMF 4509). – South China Sea, Hainan Island, Sanya, 18°14′N, 109°30′E, 2–5 m depth, sand beach (1 complete specimen, ZMH P-22030; 1 incomplete specimen, FIOQ). – Hainan Island, Dadonghai, 29.3.92 (1 cs, SMF-SEM 57). – *Syllis (Typosyllis)* sp. A: Gulf of Mexico: MAFLA 2528C-8/77 (1 specimen, USNM 65692); SOFLA 2E-11/80 (2 specimens, USNM 75308; 2 specimens, USNM 75312); SOFLA 4A/C-7/81 (2 specimens, USNM 75306).

Other material examined: *Syllis ortizi* SAN MARTIN, 1992: Cuba, off Punta Pedernales, Isla de la Juventud, 50 m, coarse calcareous sand, (holotype, MNCNM 16.01/800; paratype, MNCNM 16.01/801).

Locus typicus: Red Sea, Gifatin Island group.

Description: Body cylindrical and elongate. Largest and complete specimen (ZMH P-22030), 97 chaetigers; length, 20.6 mm excluding palps and anal cirri; width in anterior region including parapodia, 0.5 mm (excluding parapodia, 0.3 mm). Colour: Cream white, partly transparent in ethanol, without colour pattern.

Prostomium rounded (Figs. 1A, 3A), with two patches of cilia anterolaterally. Two pairs of eyes in trapezoidal arrangement and an additional pair of ocular specks near the anterior margin. Palps 2 x longer than wide (as long as wide in holotype) and not fused. Three articulated antennae; the median with 24–26 articles (35 in holotype), inserted in the middle of the prostomium; lateral ones shorter, with 16–20 articles (17–20 in holotype). Articles usually somewhat wider than long (articulation not distinct at base in holotype). Large, ciliated nuchal organs between prostomium and tentacular segment.

Peristomium half as long as following chaetigers. Two pairs of articulated tentacular cirri, similar in shape to antennae; dorsal cirri with 28–30 articles (28–38 in holotype); ventral cirri with 16–20 articles.

Parapodia uniramous (Fig. 1C-D). Notopodia with articulated long dorsal cirri, decreasing in length posteriorly, similar in shape to antennae and tentacular cirri. Number of articles in dorsal cirri as follows (chaetiger/number of articles): 1/42–50, 2/18, 3/30, 4/42, 5/17, 6/30, 7/17, 8/15, 9/37. Dorsal cirri alternate in length regularly posterior to chaetiger nine. Articles in the anterior and median parts wider than long; in the posterior part, longer than wide.

In anterior part (chaetigers 1 to 9) neuropodial lobe with a bundle of falcigerous chaetae, with 7–10 normal falcigers (decreasing in number posteriorly) (Fig. 2A–B), with secondary tooth ca. the same size as distal tooth. Blades subdistally serrated along the cutting edge, with gradation of about 1:1.3. Shafts serrated subdistally. One acuminate acicula with blunt tip.

In median part following proventriculus (chaetigers 10–90), dorsal bundles with three to seven normal falcigers, similar in shape and gradation to anterior chaetae (Fig. 2C–D, F–G). Ventral bundles with 1–3 enlarged falcigers (Figs. 2E, H; 3B), with thick shafts, ca. 2 x thicker than shafts of normal falcigers, and with thick blades with short, bent distal tooth and a prominent subtriangular secondary tooth, more than 5 x larger than the distal tooth, blade with 7–9 long and spine-like serrations, curved and directed distally. Two aciculae, of similar shape as anterior aciculae (Figs. 2I, 3C).

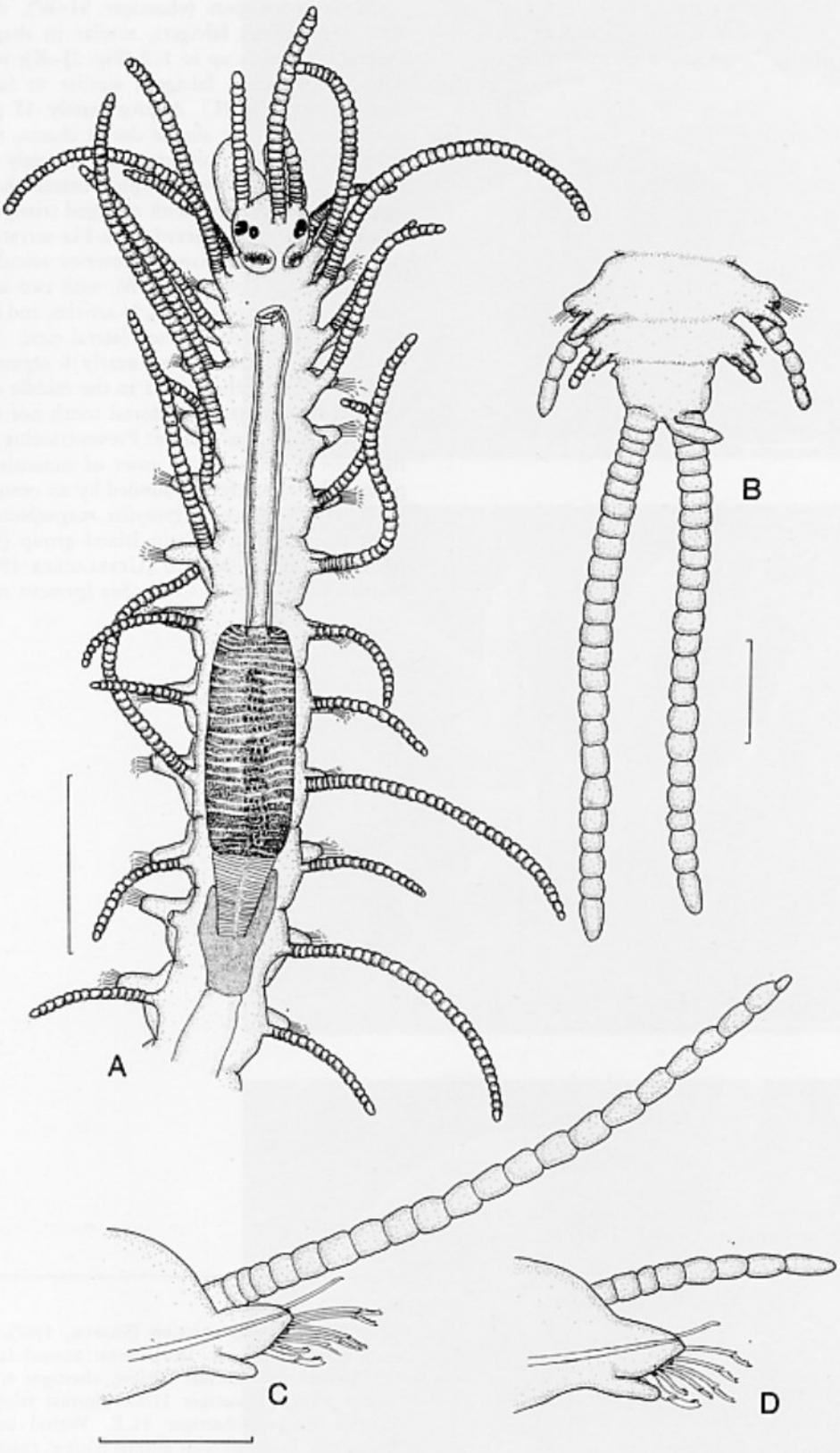
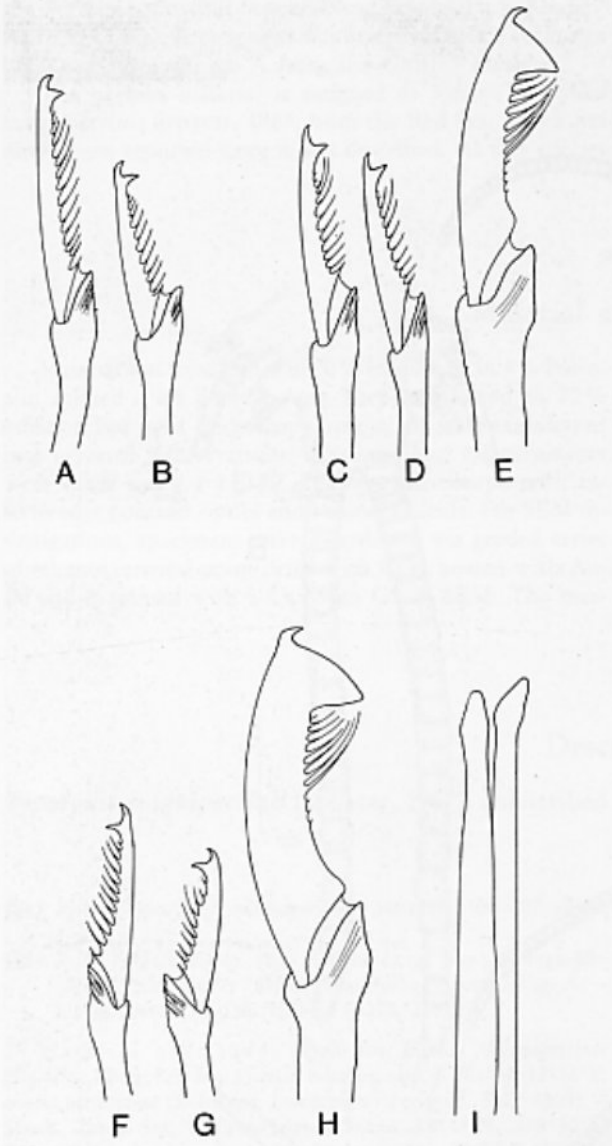


Fig. 1. *Typosyllis magnipectinis* (Storch, 1967), Hainan Island, South China Sea. – A. Anterior end, dorsal view. B. Posterior end, ventral view. C. Parapodium of chaetiger 87, posterior view. D. Parapodium of chaetiger 88, posterior view. – Scales A: 500 μm; B: 200 μm; C–D: 100 μm.



In posterior part (chaetiger 91–97), dorsal bundles with 4–6 normal falcigers, similar in shape to anterior chaetae, gradation up to 1:2 (Fig. 2J–K); ventral bundles with 2–3 enlarged falcigers, similar to falcigers in the median part (Fig. 2L). Approximately 12 posterior-most chaetigers with one simple dorsal chaeta, slender, nearly straight, indistinctly bidentate and minutely serrated below the tip (Fig. 2M). One simple ventral chaeta distinctly sigmoid and bidentate, with enlarged triangular secondary tooth, and 3–5 long curved spine-like serrations (Fig. 2N). Aciculae similar in shape to anterior aciculae (Fig. 2O).

Pygidium rounded (Fig. 1B), with two articulated anal cirri inserted ventrolaterally, 24 articles, and unpaired short anal cirrus, inserted between lateral cirri.

Pharynx extending over nearly 6 segments, from the posterior part of chaetiger 1 to the middle of chaetiger 7, with single subdistal, middorsal tooth not extending beyond the pharyngeal margin. Proventriculus between chaetigers 7–10, with 25–27 rows of muscular cells. Oesophagus short, partly surrounded by an oesophageal gland.

Distribution: *Typosyllis magnipectinis* is known from the Red Sea, Gifatin Island group (Storch 1967), from the Gulf of Mexico (Uebelacker 1984), and from Hainan Island, South China Sea (present material).

◀

Fig. 2. *Typosyllis magnipectinis* (Storch, 1967), Hainan Island, South China Sea. – A. Dorsal-most normal falciger, chaetiger 4. B. Ventral-most normal falciger, chaetiger 4. C. Dorsal-most normal falciger, chaetiger 11. D. Normal falciger adjacent to enlarged falciger, chaetiger 11. E. Ventral enlarged falciger, chaetiger 11. F. Dorsal-most normal falciger, chaetiger 25. G. Normal falciger adjacent to enlarged falciger, chaetiger 25. H. Ventral enlarged falciger, chaetiger 25. I. Acicula, chaetiger 24. J. Dorsal-most normal falciger, chaetiger 90. K. Normal falciger adjacent to enlarged falciger, chaetiger 90. L. Ventral enlarged falciger, chaetiger 90. M. Simple dorsal chaeta, chaetiger 90. N. Simple ventral chaeta, chaetiger 90. O. Acicula, chaetiger 90. – Scale A–O: 10 μm.

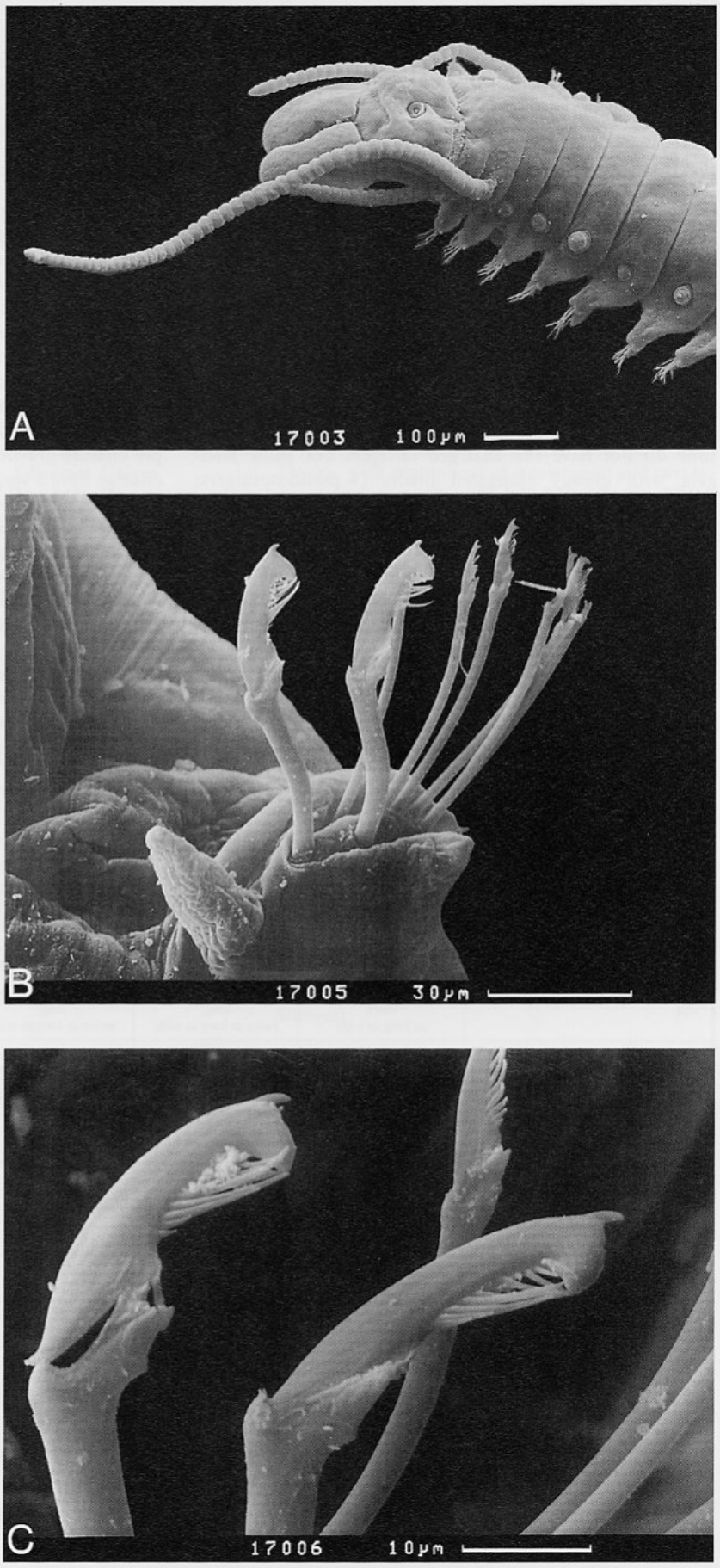


Fig. 3. *Typosyllis magnipectinis* (Storch, 1967), Hainan Island, South China Sea. – A. Anterior, dorsal view. B. Parapodium of chaetiger 79, posterior view. C. Enlarged falcigers, chaetiger 70.

Discussion

The striking character of *Typosyllis magnipectinis* (Storch, 1967), which distinguishes it from most of the numerous other *Typosyllis* species, is the strongly enlarged secondary tooth in the falcigerous chaetae as well as in the simple ventral chaetae of the posterior segments. Within the *Syllis*-complex[1]) including *Typosyllis, Ehlersia (= Langerhansia)* and *Dentatisyllis,* chaetae of this kind have only been described for the following species: *Syllis (Typosyllis)* sp. A (in: Uebelacker 1984), *Syllis ortizi* San Martin, 1992, and *Dentatisyllis carolinae* (Day 1973).

T. magnipectinis shows synonymy with some specimens from the Gulf of Mexico described by Uebelacker (1984) as *Syllis (Typosyllis)* sp. A (USNM 65692, 75306) and considered as paratypes for *Syllis ortizi* by San Martin (1992) (Tab. 1). Other specimens determined as *Syllis (Typosyllis)* sp. A (USNM 75308, 75312) by the same author do not have the enlarged falcigers but show falcigers with greatly elongated blades (= pseudospinigers; formerly called "spinigers" or "spiniger-like chaetae") typical for the genus *Ehlersia.* They represent a different species (Tab. 1).

T. magnipectinis closely resembles *Syllis ortizi* San Martin, 1992 (MNCNM 16.01/800; MNCNM 16.01/801), but differs in the length of the enlarged falciger blades relative to those of the normal falcigers. In *T. magnipectinis,* blades of enlarged falcigers are longer than those of normal falcigers. In *S. ortizi,* in contrast, blades of enlarged falcigers are shorter than those of normal falcigers – considered separately for each parapodium. The number of articles in dorsal cirri of *T. magnipectinis* is much greater (max. 42) than in *S. ortizi* (max. 18).

T. magnipectinis differs from *Dentatisyllis carolinae* (Day 1973) (s.a., Perkins 1980) with respect to the following characters: In *T. magnipectinis* enlarged falcigers are obviously bigger than normal falcigers whereas in *D. carolinae* they are smaller or equal-sized. The number of aciculae is distinctly lower in anterior chaetigers (1–2 in *T. magnipectinis,* up to 5 in *D. carolinae).* In addition, a trepan of small pharyngeal teeth characteristic for *Dentatisyllis* is absent in *T. magnipectinis.*

Besides the species mentioned above there are some more within the *Syllis*-complex in which the compound falcigers have a secondary tooth that is considerably larger than the distal one but the blades themselves are not enlarged: (1) In *Typosyllis glarearia* Westheide, 1974 simple chaetae are not serrated subdistally and simple dorsal chaetae have a secondary and distal tooth of equal size; (2) in *Syllis cruzi* Núñez & San Martin, 1991 simple ventral chaetae lack subdistal serrations; (3) in *Ehlersia ferrugina* Langerhans, 1881 (s.a., Campoy 1982; San Martin 1984) the secondary tooth is not rounded and pseudospinigerous chaetae are present which are typical for *Ehlersia*; (4) in *Ehlersia* sp. (in: Westheide 1974) there are pseudospinigers, dorsal cirri are not articulated and the number of aciculae is different; (4) in *Langerhansia* sp. (in: Imajima 1966) there are pseudospinigers, and (6) in *Dentatisyllis junoyi* López Garcia & San Martin, 1992 there are pseudospinigers and a trepan of small pharyngeal teeth.

Table 1. Different characters of *Typosyllis magnipectinis* (Storch, 1967), *Syllis ortizi* San-Martin, 1992, and *Dentatisyllis carolinae* (Day, 1973).

Character	*Typosyllis magnipectinis* (Storch, 1967)			*Syllis ortizi* San-Martin, 1992	*Dentatisyllis carolinae* (Day, 1973)
	from the Red Sea	from the Gulf of Mexico	from the South China Sea	from Cuba, Gulf of Mexico	from Carolina
Palps	short, as long as wide	long, twice as long as wide	long, twice as long as wide	long, twice as long as wide	long, twice as long as wide
Pharynx with trepan	no	no	no	no	yes
Muscle cell rows of proventricle	27	24–27	25–27	ca. 30	?
Length of blades of enlarged falcigers in relation to those in longest normal falcigers in each parapodium	much longer	much longer	much longer	shorter	shorter or equal-sized
Simple dorsal chaetae	not present (posterior end lacking)	bidentate	bidentate	bidentate	bidentate
Aciculae: ant / med / post	2 / 2 / ?	1 / 2 / 1	1 / 2 / 1	2–3 / 1 / 1	ca. 5 / 3 / 1–2
No. of articles: median / lateral antenna	35–36 / 17–20	16–29 / 6–16	24–26 / 16	16–29 / ~ 13	35 / 25
No. of articles: dorsal / ventral tentacular cirrus	28–38 / ca. 20	18–24 / 10–16	28–30 / 16–20	ca. 18 / ca. 13	? / 22
No. of articles: long / short dorsal cirrus	35–36 / 13–15	36 / 15–18	42 / ?	18 / 5–6	30 / ?

[1]) The taxonomy within the Syllidae is very confused at the moment. While some authors, e.g. San Martin (1984, 1992) consider all the *Syllis*-, *Typosyllis*- and *Ehlersia*-species to belong to the genus *Syllis,* others plead for a concept separating it into a number of genera or subgenera. One of us (F. L.) is currently working on a revision of this complex.

Acknowledgements

We are indebted to V. Storch for the donation of the type specimen, K. Fauchald and L. Ward (USNM), and O. Soriano (MNCNM) for the friendly loan of specimens and G. San Martin (Universidad autonoma de Madrid, Spain) for the friendly arrangement of access to his material. We wish to thank W. Westheide (Universität Osnabrück) for his valuable suggestions regarding the preparation of this manuscript. F. L. and D. Z. like to thank B. Wu, W. Westheide and G. Purschke (Universität Osnabrück), and F. P. Huang (FIOQ) for various support in collecting material. They are deeply obliged to Mr. Xiong (Director, State Oceanic Administration, Hainan), for kindly providing necessary facilities. Travel grants from the Chinese National Nature Science Fund (No. 38970187) and the German Federal Ministry of Technology and Research (BMFT), and the kind assistance of E. Hongsernant (Deutsche Luft- und Raumfahrtbehörde, Köln) are gratefully acknowledged. D. F. and S. R. extend their warm thanks to Liu Riuyu (Director, Institute of Oceanology, Academia Sinica, Qingdao, IOAS), and to all participants of the expeditions for their help and logistic support. Funds for the joint expeditions of the IOAS and the Forschungsinstitut Senckenberg were provided by the Max-Planck-Gesellschaft, the Senckenbergische Naturforschende Gesellschaft and the Academia Sinica.

References

Campoy, A. (1982): Fauna de España. Fauna de Anélidos Poliquetos de la Península Ibérica. – Ediciones Universidad de Navarra S. A., Ser. biol., **7** (1) + **7** (2), 781 pp.; Pamplona.

Day, J. H. (1973): New Polychaeta from Beaufort, with a key to all species recorded from North Carolina. – NOAA Technical Report NMFS CIRC, **375**, 140 pp.; Seattle, Wash.

Imajima, M. (1966): The Syllidae (Polychaetous Annelids) from Japan. V, Syllinae (2). – Publ. Seto mar. biol. Lab., **14**: 253–294; Sirahama.

Langerhans, P. (1881): Über einige canarische Anneliden. – Nova Acta (physico-medica) Academiae Caesareae Leopoldino Carolinae Germanicae naturae Chriosorum, **42** (3): 95-124; Norimbergae.

López Garcia, E. & San Martin, G. (1992): A new species of *Dentatisyllis* (Syllidae: Polychaeta) from Cape Verde Islands, West Africa. – Proc. biol. Soc. Washington, **105** (2): 219–223; Washington, D.C.

Nuñez, J. & San Martin, G. (1991): Two new species of Syllidae (Polychaeta) from Tenerife (Canary Islands, Spain). – Bull. mar. Sci. Gulf and Caribbean, **48** (2): 236–241; Coral Gables, Fla.

Perkins, T. H. (1980): Syllidae (Polychaeta), principally from Florida, with descriptions of a new genus and twenty-one new species. – Proc. biol. Soc. Washington, **93** (4): 1080–1172; Washington, D.C.

San Martin, G. (1984): Estudio biogeográfico, faunístico y systemático de los poliquetos de la familia sílidos (Syllidae: Polychaeta) en Baleares. – Tesis Doctoral, Publicationes de la Universidad Complutense de Madrid, 529 pp.; Madrid.

— — — (1992): *Syllis* Savigny in Lamarck, 1818 (Polychaeta: Syllidae: Syllinae) from Cuba, the Gulf of Mexico, Florida and North Carolina, with a revision of several species described by Verril. – Bull. mar. Sci. Gulf and Caribbean, **51** (2): 167–196; Coral Gables, Fla.

Storch, V. (1967): Neue Polychaeten aus der Sandfauna des Roten Meeres. – Zool. Anz., **178** (1/2): 101–110; Jena.

Uebelacker, J. M. (1984): Family Syllidae Grube, 1850. – In: Uebelacker, J. M. & Johnson, P. G. [Eds.]: Taxonomic guide to the polychaetes of the Northern Gulf of Mexico: Vol. 4; Mobile, Ala. (Barry A. Vittor and Assoc.).

Westheide, W. (1974): Interstitielle Fauna von Galapagos. XI. Pisionidae, Hesionidae, Pilargidae, Syllidae (Polychaeta). – Mikrofauna des Meeresbodens, **44**: 1–146; Stuttgart.