

RESURRECTION OF *GLYPHOHESIONE* FRIEDRICH,  
1950, WITH REDESCRIPTION OF *G. KLATTI*  
FRIEDRICH, 1950 AND DESCRIPTION OF  
*G. LONGOCIRRATA* (POLYCHAETA: HESIONIDAE)

Frank Licher

*Abstract.*—The formerly monotypic genus *Glyphohesione* Friedrich, 1950 is removed from synonymy with *Synelmis* Chamberlin, 1919 and emended. The type species, *G. klatti* Friedrich, 1950, from northern European waters, is redescribed, and *G. longocirrata*, a new species from the east coast of North America, is described. *Glyphohesione* is transferred from the Pilargidae to the Hesionidae, where it was originally placed, as the pilargid stem-species might have evolved from a hesionid species by progenesis.

Friedrich (1950) described the monotypic *Glyphohesione klatti* from Helgoland and recognized it as a hesionid. Eliason (1962a, 1962b), who reported the species from the Skagerrak and Öresund, considered it to be a pilargid belonging to the genus *Ancistrosyllis* McIntosh, 1879. Pettibone (1966) transferred it to the pilargid genus *Synelmis* Chamberlin, 1919. Comparison of brain morphology of different pilargid genera caused Fitzhugh & Wolf (1990) to doubt that specimens identified as *Synelmis klatti* in the collection of the U.S. National Museum, Washington, belong to this genus, and they suggested resurrecting the older taxon *Glyphohesione* for them. In a phylogenetic analysis of the Pilargidae (note: the correct spelling is Pilargidae, not Pilargiidae (see: International Commission on Zoological Nomenclature (1985): International Code of Zoological Nomenclature, art. 35 d (ii))), Licher & Westheide (1994) argued that the species of this family might form a monophyletic group within the Hesionidae. A subfamily Pilarginae beside the "Hesioninae" Hartmann-Schröder, 1971 and "Microphthalminae" Hartmann-Schröder, 1971 should not be erected until a comprehensive revision of the Hesionidae including pilargids has been made of the "true" hesionid

taxa and is beyond the scope of the present study. The "Hesioninae" as well as the former "Hesionidae" ("Hesioninae" + "Microphthalminae") are very likely paraphyletic (Licher & Westheide 1994). The "Microphthalminae" represents a polyphyletic group (Westheide 1977). Reinvestigation of material of different species identified as *Synelmis klatti* in the course of the analysis of Licher & Westheide 1994 induced them to reestablish the old generic name.

The present paper emends the diagnosis of *Glyphohesione*, redescribes the European *G. klatti* and describes the eastern North American *Glyphohesione longocirrata*, new species.

#### Materials and Methods

For light microscopical preparations the fixed specimens (stored in 70% ethanol) were transferred into glycerine. Observations, drawings, and measurements were made by means of a LEITZ Diaplan microscope with interference-contrast optics and a camera lucida. For SEM investigations one specimen was dehydrated and critical-point dried with carbon dioxide. After sputtering with gold, it was analyzed with a JEOL JSM 820.

Material examined originates from the following museums: Gothenburg Natural History Museum (GNM); Senckenberg Museum, Frankfurt (SMF); U. S. National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); Zoological Museum, University of Copenhagen (ZMUC).

*Glyphohesione* Friedrich, 1950, emended

*Type species.*—*Glyphohesione klatti* Friedrich, 1950, by monotypy and original designation.

*Additional material examined.*—The holotype of the type species of *Synelmis* Chamberlin, 1919, *S. simplex* Chamberlin, 1919 (USNM 19480, type) and some non-type specimens of *S. albini* (Langerhans, 1881) (type locality the Canary Islands, type material lost) from the Galapagos Islands (W. Westheide coll., Osnabrück) have been examined.

*Diagnosis.*—Hesionidae with body dorsoventrally flattened; some anterior segments distinctly wider, appearing somewhat inflated. Integument smooth, without papillae. Prostomium bilobed anteriorly, with two palps consisting of palpophores fused totally with prostomium and elongated palpostyles. Three slender antennae; lateral antennae located at anterior prostomial margin, close to palps; median antenna positioned at posterior margin. Pharynx unarmed. Peristomium achaetous, with two pairs of slender tentacular cirri. Parapodia biramous. Notopodia each with elongated dorsal cirrus, one notoacicula, and one stout emergent spine-like notochaeta, the latter in median and posterior segments only. Neuropodia well developed, each with slender ventral cirrus, one neuroacicula and simple chaetae only. Pygidium with two elongated anal cirri.

*Remarks.*—Eliason (1962a, 1962b) placed the monotypic *Glyphohesione* in *Ancistrosyllis* McIntosh, 1879, based on similarities with *Synelmis albini* (Langerhans, 1881)

(=*Ancistrosyllis albini*). However, *Ancistrosyllis* possesses a hook-shaped notochaeta, not a straight one, which is characteristic for *Synelmis*. Pettibone (1966) transferred both *A. albini* and *A. klatti* to *Synelmis*, assuming *S. klatti* to be a juvenile of *S. albini*. Pearson (1970), Hartmann-Schröder (1971), and Katzmann et al. (1974) considered *S. klatti* to be a member of *Synelmis*. Fitzhugh & Wolf (1990) investigated American material identified as *Synelmis klatti* and suggested resurrecting the original generic name.

*Glyphohesione* Friedrich, 1950 clearly differs from *Synelmis* Chamberlin, 1919 in lacking the two emergent neuropodial spines which are apomorphic for *Synelmis* (Fitzhugh & Wolf 1990, Licher & Westheide 1994). In *Glyphohesione*, dorsal cirri are longer than ventral cirri, and the dorsal cirri of the first chaetiger are longer than those of the following ones, whereas in *Synelmis* dorsal and ventral cirri of all chaetigers are subequal. In addition, this taxon is known to possess nuchal organs, which were not found in *Synelmis*, and the brain is similar to that of *Sigambra* Müller, 1858 (Fitzhugh & Wolf 1990). *Glyphohesione* clearly differs from *Sigambra* in having notopodial spines and in lacking hook-shaped notochaetae.

*Discussion.*—Licher & Westheide (1994) conclude that there are good indications that the pilargid stem-species might have evolved by progenesis from a juvenile stage of a large-bodied hesionid species. This induced them to include the family Pilargidae in the Hesionidae, a view generally adopted by earlier authors (e.g., Ehlers 1908, Fauvel 1923, Augener 1927, Monro 1933, Treadwell 1941).

According to Licher & Westheide (1994), within the pilargids *Glyphohesione* is the taxon with the highest number of plesiomorphic characters shared with juvenile hesionids, e.g., (1) possession of elongated palpostyles, (2) lateral antennae located at the anterior prostomial margin, and (3) prostomial, peristomial, parapodial and pygidial appendages elongated and well developed.

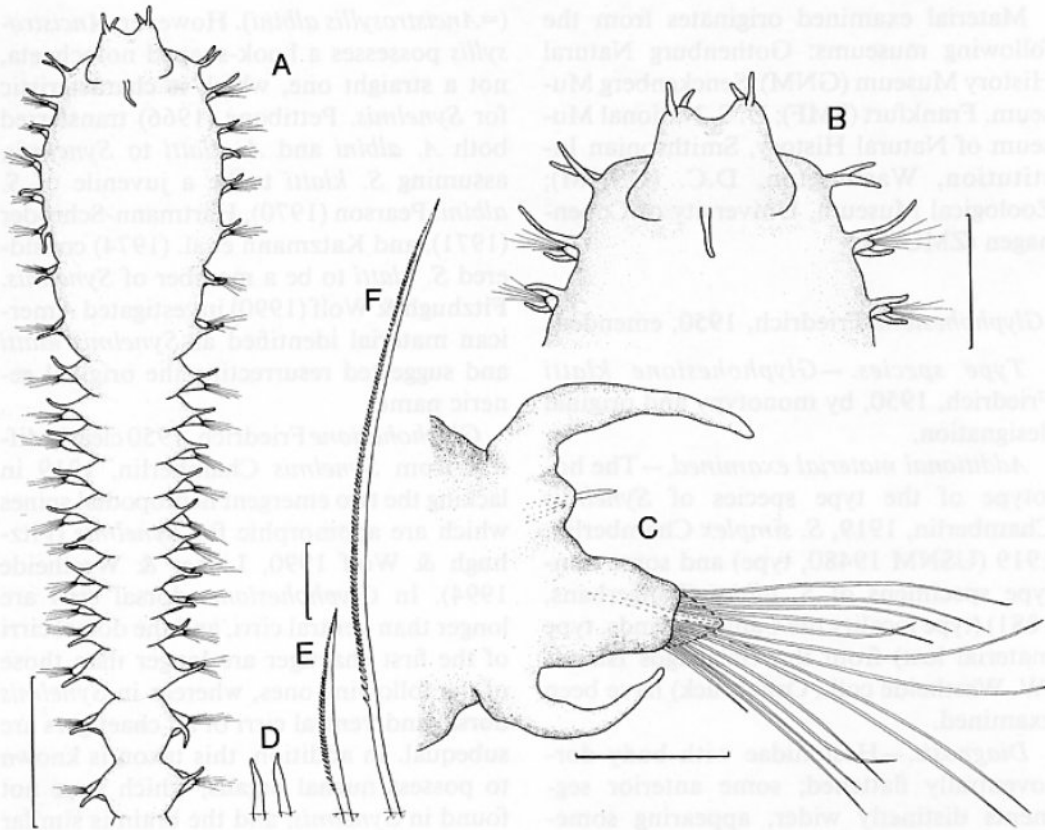


Fig. 1. *Glyphohesione klatti* Friedrich, 1950 (ZMUC POL-178). A. Anterior and median part of the body, dorsal view. B. Anterior end, dorsal view. C-F. Parapodium 21 (ZMUC POL-178-A): C. Parapodium, posterior view, half of neuropodial fascicle omitted. D. Emergent spine-like notochaetae. E. Ventralmost neurochaeta. F. Dorsalmost neurochaeta. Scales: A = 500  $\mu\text{m}$ ; B = 250  $\mu\text{m}$ ; C = 100  $\mu\text{m}$ ; D-F = 25  $\mu\text{m}$ .

*Glyphohesione* is monophyletic and the adelphotaxon of the stem-species of all other pilargid genera (Licher & Westheide 1994).

Genus *Glyphohesione* Friedrich, 1950,  
resurrected  
*Glyphohesione klatti* Friedrich, 1950  
Figs. 1-2

*Glyphohesione klatti* Friedrich, 1950:171-173, figs. 1-2.

*Ancistrosyllis klatti*.—Eliason, 1962a:241; 1962b:29-32, fig. 3.

*Synelmis klatti*.—Pettibone, 1966:190-191.—Pearson, 1970:74-75, fig. 2b, c.—

Hartmann-Schröder, 1971:144-145, fig. 49.—Katzmann et al., 1974:27-28. [Not *Synelmis klatti* of Wolf 1984; not Fitzhugh & Wolf 1990 (both = *G. longocirrata*, new species)].

*Material examined*.—Kattegatt: Off Skagen, Denmark, 58°01'N, 10°52'E, 190 m, fine mud, M. E. Petersen coll., 22 Sep 1968 (ZMUC POL-178, 5 incompl. specimens; ZMUC POL-178-B, 1 incompl. SEM preparation). Laholmsbukten, off Laholm, Sweden, St. 150/417, 21 m, stiff clay and some sand, "Akka," L. A. Jägerskiöld coll., 17 Jun 1933 (GNM 11347, 1 incompl. specimen).—Skagerrak: Saltkällefjord, off Gullmaren, Sweden, 56 m, P. Bagge coll., 24

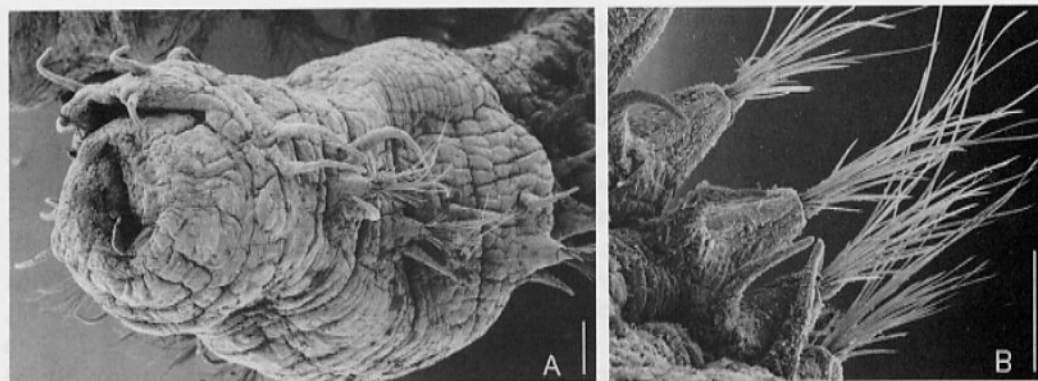


Fig. 2. *Glyphohesione klatti* Friedrich, 1950 (ZMUC POL-178-B). A. Anterior end, lateral view. B. Parapodia of median region, right side, dorsal view. Scales: A–B = 100  $\mu$ m.

Nov 1964 (GNM 12839, 1 incompl. specimen).—North Sea: Raunefjord, off Bergen, Norway, 245 m, sandy loam, Fosshagen coll., 05 Oct 1962 (GNM 12949, 2 incompl. specimens). German Bight, 54°40'N, 06°00'E, 43 m, silt and clay, M. Türkay coll., 24 May 1987 (SMF 4432, 1 incompl. specimen).—English Channel: Survey Sta. M 16T, 51°24.6'N, 08°05'W, 112 m, J. P. Hartley coll., Aug 1975 (USNM 58901, 2 incompl. specimens).

*Type locality*.—Tiefe Rinne off Helgoland, North Sea. Type material lost (H. Friedrich, pers. comm.).

*Description*.—Body robust, dorsoventrally flattened; anterior segments inflated, much wider than long, median segments about as wide as long, posterior segments longer than wide (Fig. 1A). Largest incomplete specimen (USNM 58901) with 40 segments and a length of 9.6 mm, 1.1 mm wide with parapodia (chaetiger 1), 0.8 mm wide without parapodia (chaetiger 5). (Up to 13 mm long, 0.5 mm wide for 71 segments according to Eliason 1962b:29). Color in ethanol brown. Living specimens with yellowish gut and transparent body with yellowish pigment in anterior region on posterior part of prostomium (M. E. Petersen, pers. comm.; see also fig. 3a, f in Eliason 1962b).

Prostomium slightly wider than long, divided anteriorly by a wide furrow into two

lobes, lateral margins slightly concave (Figs. 1B, 2A). Palps with palpophores fused to prostomium and free elongate palpostyles, somewhat shorter than the lateral antennae, inserted anteroventrally. Three slender antennae, with slightly inflated bases. Lateral antennae slender, located at anterior prostomial margin; median antenna very slender, about 1.5–2 times as long as lateral ones, positioned at posterior prostomial margin. Eyes lacking. Nuchal organs not visible.

Peristomium almost as long as each of following anterior segments, dorsally fused with prostomium and encircling posterior half of latter. Two pairs subequal, slender tentacular cirri of similar shape and size as median antenna (Figs. 1B, 2A). Specimens in ethanol usually with two indistinctly delimited, brown-pigmented bulging areas on posterior part of peristomium.

Parapodia biramous, usually distinctly set apart from trunk except for some in inflated anterior region. Notopodia each with slender dorsal cirrus, extending slightly beyond tip of neuropodial lobe (Figs. 1C, 2B). Longest dorsal cirri (ca. 200  $\mu$ m) occurring in first chaetiger. Following cirri much shorter, not longer than tentacular cirri. One thin notoacicula. Parapodia of median and posterior segments with one stout emergent spine-like notoachaeta (first present on chaetigers 5–8) (Fig. 1C, D).

Neuropodia conical, each with a longer, triangular prechaetal lobe; a fan-shaped bundle of up to ca. 25 simple chaetae (Figs. 1C, 2B), decreasing in number posteriorly; and a shorter, distally truncate postchaetal lobe. Chaetae of different lengths, shorter ones stouter, all finely serrated, distally pointed with smooth, entire tips (Fig. 1E, F); serration becoming shorter distally and difficult to recognize. One neuroacicula present. Ventral cirri similar to dorsal ones but shorter, not extending beyond neuropodial lobe.

Posterior end lacking in all of the available specimens, but pygidium with two ventral filiform anal cirri according to Eliason (1962b:fig. 3j).

*Distribution.*—*Glyphohesione klatti* is known only from European waters: Öresund and Kattegat (Eliason 1962a, this paper); Skagerrak (Eliason 1962b, Bagge 1969, this paper); Tiefe Rinne off Helgoland, North Sea (Friedrich 1950); German Bight, North Sea (this paper); Loch Linnhe, Scotland (Pearson 1970); English Channel (this paper); and the Catalanian coast of the Mediterranean Sea (Katzmann et al. 1974). In northern Europe it has been taken at depths of 20–680 m and in the Mediterranean at depths of 10–185 m.

*Glyphohesione longocirrata*, new species  
Fig. 3

*Synelmis klatti*.—Wolf, 1984:29–31 to 29–35, figs. 29–29 and 29–30 (USNM 86983, 86984, 86985, 86986, 86987); Fitzhugh & Wolf, 1990:1–16 (USNM 86986).

*Material examined.*—Gulf of Mexico: off Florida: SOFLA Sta. 20A, 25°17.20'N, 82°09.44'W, 22 m, coarse sand, Apr 1981 (USNM 86985, 1 compl. specimen, holotype); SOFLA Sta. 20C, 25°17.20'N, 82°09.44'W, 22 m, coarse sand, Nov 1980 (USNM 86986, 2 specimens, paratypes); SOFLA Sta. 20E, 25°17.20'N, 82°09.44'W, 22 m, Apr 1981 (USNM 86987, 1 speci-

men, paratype); MAFLA Sta. V-2531, 29°47.59'N, 86°09.29'W, 45 m, coarse sand, Aug 1977 (USNM 86983, 1 specimen, paratype).—Northwest North Atlantic Ocean: Gulf of Maine: Massachusetts, off Cape Cod: NEEB Sta. 41, 41°37.30'N, 69°15.42'W, 164 m, 27 Feb 1977 (USNM 91310, 5 specimens); NEEB Sta. 41, 41°37.34'N, 69°15.46'W, 165 m, 27 Feb 1977 (USNM 91311, 1 specimen); NEEB Sta. 41, 41°37.21'N, 69°14.54'W, 172 m, 27 Feb 1977 (USNM 91312, 1 specimen); NEEB Sta. 41, 41°37.00'N, 69°14.59'W, 165 m, 27 Feb 1977 (USNM 91313, 1 specimen); NEEB Sta. 41, 41°37.36'N, 69°15.49'W, 178 m, 17 May 1977 (USNM 91320, 1 specimen); NEEB Sta. 41, 41°36.58'N, 69°15.35'W, 175 m, 17 May 1977 (USNM 91321, 1 specimen); NEEB Sta. 42, 41°50.26'N, 69°29.30'W, 185 m, 26 Feb 1977 (USNM 91314, 1 specimen); NEEB Sta. 42, 41°50.10'N, 69°29.10'W, 185 m, 26 Feb 1977 (USNM 91315, 1 specimen); NEEB Sta. 42, 41°50.06'N, 69°29.09'W, 185 m, 26 Feb 1977 (USNM 91316, 1 specimen); NEEB Sta. 42, 41°49.53'N, 69°28.54'W, 191 m, 16 May 1977 (USNM 91322, 1 specimen); NEEB Sta. 42, 41°50.35'N, 69°29.28'W, 179 m, 16 May 1977 (USNM 91323, 2 specimens).—Georges Bank: Northern Slope: NEEB Sta. 35, 42°13.08'N, 67°34.20'W, 242 m, 19 May 1977 (USNM 91317, 1 specimen); NEEB Sta. 35, 42°13.05'N, 67°33.49'W, 243 m, 19 May 1977 (USNM 91318, 1 specimen); NEEB Sta. 35, 42°13.19'N, 67°34.36'W, 239 m, 19 May 1977 (USNM 91319, 1 specimen); Southern Slope: NEEB Sta. 16, 40°42.30'N, 67°34.26'W, 87 m, 19 Feb 1977 (USNM 91309, 1 specimen); Nantucket Shoals: NEEB Sta. 3, 40°39.38'N, 69°27.23'W, 56 m, 15 Feb 1977 (USNM 91308, 1 specimen).

*Type locality.*—Gulf of Mexico, off southern Florida, 22 m, coarse sand.

*Description.*—Body dorsoventrally flattened, with 2–4 inflated anterior segments (Fig. 3A). Largest complete specimen ex-

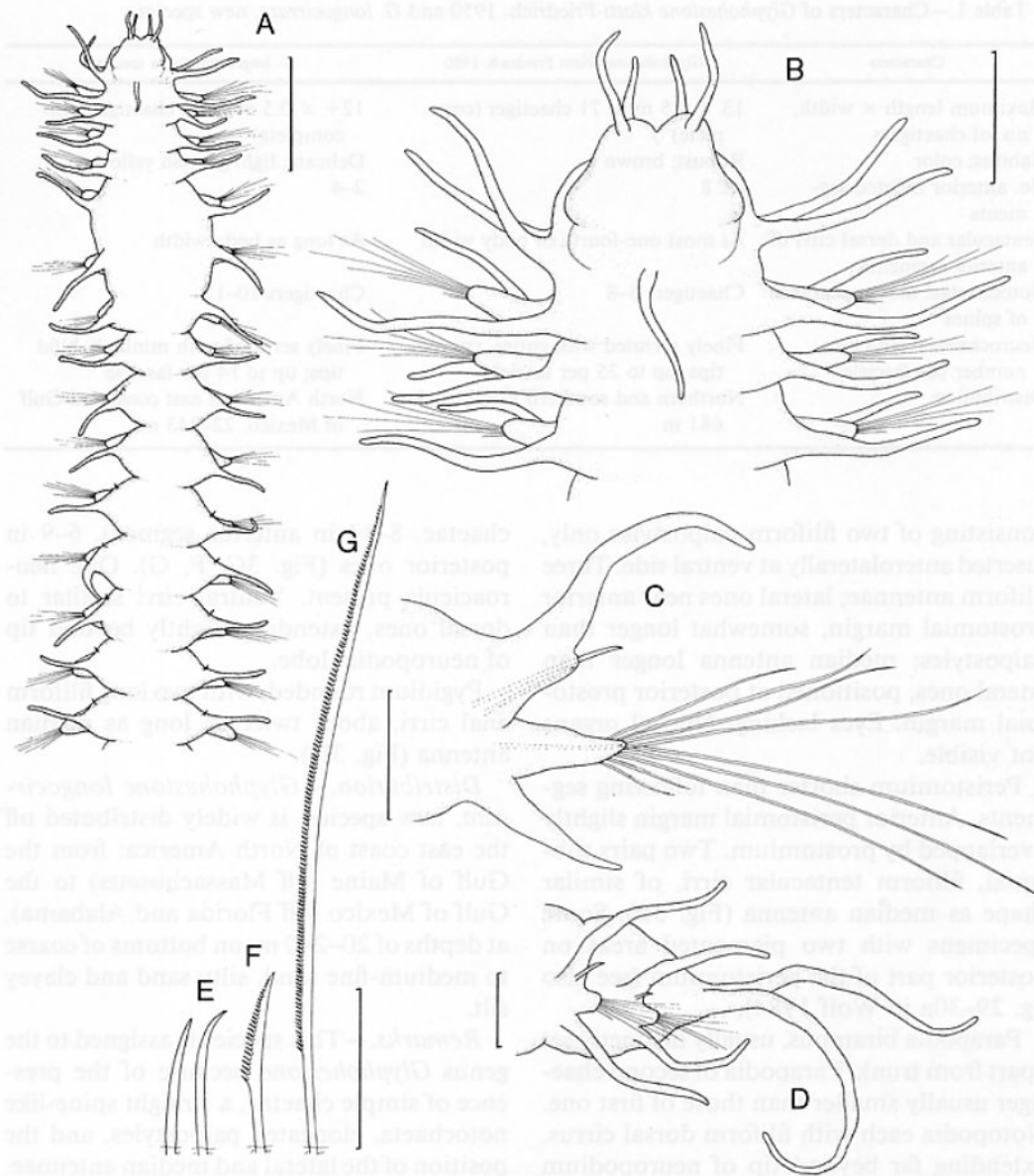


Fig. 3. *Glyphohesione longicirrata*, new species (USNM 86985, holotype). A. Anterior and median part of the body, dorsal view. B. Anterior end, dorsal view. C. Parapodium of median region, posterior view. D. Posterior end, lateral view. E-G. Posterior chaetiger: E. Emergent spine-like notochaetae. F. Ventralmost neurochaeta. G. Dorsalmost neurochaeta. Scales: A = 250  $\mu\text{m}$ ; B = 100  $\mu\text{m}$ ; C-D = 50  $\mu\text{m}$ ; E-G = 25  $\mu\text{m}$ .

aminated (USNM 86985, holotype) with 43 segments, 5.1 mm long, up to 0.5 mm wide including parapodia (chaetiger 4), 0.2–0.25 mm wide without parapodia. (Largest specimen examined by Wolf (1984) incomplete,

with 53 segments, 12.0 mm long and 0.5 mm wide.) Color in ethanol light greyish yellow, nearly transparent.

Prostomium slightly wider than long, with concave lateral margins (Fig. 3B). Palps

Table 1.—Characters of *Glyphohesione klatti* Friedrich, 1950 and *G. longocirrata*, new species.

Characters	<i>Glyphohesione klatti</i> Friedrich, 1950	<i>G. longocirrata</i> , new species
Maximum length × width, no. of chaetigers	13 × 0.5 mm, 71 chaetiger (complete)	12+ × 0.5 mm, 53 chaetigers (incomplete)
Habitus; color	Robust; brown	Delicate; light greyish yellow
No. anterior inflated segments	ca. 8	2–4
Tentacular and dorsal cirri of anterior segments	At most one-fourth of body width	As long as body width
Notochaetae: first appearance of spines	Chaetigers 5–8	Chaetigers 10–15
Neurochaetae: structure, number per fascicle	Finely serrated with entire, curved tips; up to 25 per fascicle	Finely serrated with minutely bifid tips; up to 14 per fascicle
Distribution	Northern and southern Europe, 43–681 m	North American east coast and Gulf of Mexico, 22–243 m

consisting of two filiform palpostyles only, inserted anterolaterally at ventral side. Three filiform antennae; lateral ones near anterior prostomial margin, somewhat longer than palpostyles; median antenna longer than lateral ones, positioned at posterior prostomial margin. Eyes lacking. Nuchal organs not visible.

Peristomium shorter than following segments. Anterior peristomial margin slightly overlapped by prostomium. Two pairs subequal, filiform tentacular cirri, of similar shape as median antenna (Fig. 3B). Some specimens with two pigmented areas on posterior part of the peristomium (see also fig. 29–30a in Wolf 1984).

Parapodia biramous, usually distinctly set apart from trunk. Parapodia of second chaetiger usually smaller than those of first one. Notopodia each with filiform dorsal cirrus, extending far beyond tip of neuropodium (Fig. 3C). Dorsal cirri of anterior segments nearly as long as tentacular cirri. One thin and transparent notoacicula. Parapodia of median and posterior segments with one long stout emergent spine-like notochaeta (first present on chaetigers 10–15), nearly as long as shortest neurochaetae, decreasing in length posteriorly, distinctly bent in prepygidial segment (Fig. 3D, E).

Neuropodial lobe conical, with bundle of simple serrated and distally minutely bifid

chaetae, 8–14 in anterior segment, 6–9 in posterior ones (Fig. 3C, F, G). One neuroacicula present. Ventral cirri similar to dorsal ones, extending slightly beyond tip of neuropodial lobe.

Pygidium rounded, with two long filiform anal cirri, about twice as long as median antenna (Fig. 3D).

*Distribution.*—*Glyphohesione longocirrata*, new species, is widely distributed off the east coast of North America: from the Gulf of Maine (off Massachusetts) to the Gulf of Mexico (off Florida and Alabama), at depths of 20–240 m, on bottoms of coarse to medium-fine sand, silty sand and clayey silt.

*Remarks.*—This species is assigned to the genus *Glyphohesione* because of the presence of simple chaetae, a straight spine-like notochaeta, elongated palpostyles, and the position of the lateral and median antennae. *Glyphohesione longocirrata*, new species, differs from *G. klatti* Friedrich, 1950 in possessing longer, more developed tentacular and dorsal cirri (Table 1). Dorsal cirri in anterior region in *G. longocirrata* are nearly as long as the body width; in *G. klatti* they are a quarter of the body width at most. In *G. longocirrata* the neurochaetae per fascicle are few and distally bifid (see Wolf 1984). Furthermore, specimens from North America have a more delicate body shape.

*Etymology.*—This species is named for its elongated tentacular and dorsal cirri.

### Acknowledgments

I am indebted to Prof. Dr. K. Fauchald, Smithsonian Institution, Washington, D. C. (USNM), for access to material and for permission to describe it. I am pleased to thank Dr. D. Eibye-Jacobsen and Dr. M. E. Petersen, Zoological Museum, University of Copenhagen (ZMUC); Dr. D. Fiege, Senckenberg Museum, Frankfurt (SMF); and Prof. Dr. L. Orrhage, Gothenburg Natural History Museum (GNM) for the kind and courteous loan of specimens. Special thanks are due to Dr. D. Rode and Dipl.-Ing. H.-J. Hemschemeier, KM-kabelmetal, Osna-brück for providing use of their SEM. Furthermore, I thank Prof. Dr. W. Westheide and Dr. G. Purschke, Universität Osna-brück, and especially Dr. M. E. Petersen (ZMUC) for their critical reviews of a preliminary draft of this paper.

### Literature Cited

- Augener, H. 1927. Polychaeten von Südost- und Süd-Australien.—Videnskabelige Meddelelser fra Dansk naturhistorisk Forening i København 83: 71–275.
- Bagge, P. 1969. Effects of pollution on estuarine ecosystems. I. Effects of effluents from wood-processing industries on the hydrography, bottom and fauna of Saltkällefjord (W. Sweden). II. The succession of the bottom fauna communities in polluted estuarine habitats in the Baltic-Skagerrak region.—Merentutkimuslaitoksen Julkaisu Havsforskningsinstitutets Skrift 228:3–118.
- Chamberlin, R. V. 1919. The Annelida Polychaeta.—Memoirs of the Museum of Comparative Zoology at Harvard College 49:1–514.
- Ehlers, E. 1908. Die bodensässigen Anneliden aus den Sammlungen der Deutschen Tiefsee-Expedition.—Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition 1897–1899, 16(1): 1–168.
- Eliason, A. 1962a. Die Polychaeten der Skagerak-Expedition 1933.—Zoologiska Bidrag från Uppsala 33:207–293.
- . 1962b. Undersökningar över Öresund, 41: Weitere Untersuchungen über die Polychaeten-fauna des Öresunds.—Lunds Universitets Årsskrift, n.f. 58(9):1–97.
- Fauvel, P. 1923. Polychètes Errantes. Faune de France 5:1–488.
- Fitzhugh, K., & P. S. Wolf. 1990. Gross morphology of the brain of pilargid polychaetes: Taxonomic and systematic implication.—American Museum Novitates 2992:1–16.
- Friedrich, H. 1950. Zwei neue Bestandteile in der Fauna der Nordsee.—Neue Ergebnisse und Probleme in der Zoologie, Festschrift Klatt, Zoologischer Anzeiger (Ergänzungsband) 145: 171–177.
- Hartmann-Schröder, G. 1971. Annelida, Borstenwürmer, Polychaeta.—Die Tierwelt Deutschlands 58:1–594.
- International Commission on Zoological Nomenclature. 1985. International Code of Zoological Nomenclature adopted by the 20th General Assembly of the International Union of Biological Sciences. International Trust for Zoological Nomenclature, London, 338 pp.
- Katzmann, W., L. Laubier, & J. Ramos. 1974. Pilargidae (Annelides Polychètes errantes) de Méditerranée.—Bulletin de l'Institut océanographique 71(1428):1–40.
- Langerhans, P. 1881. Über einige canarische Anneliden.—Deutsche Akademie der Naturforscher Nova Acta 42:93–124.
- Licher, F., & W. Westheide. 1994. The phylogenetic position of the Pilargidae with a cladistic analysis of the taxon—facts and ideas. In J. C. Dauvin, L. Laubier, & D. J. Reish, eds., Actes de la 4ème Conférence internationale des Polychètes.—Mémoires du Muséum National d'Histoire Naturelle (A) 162:223–236.
- McIntosh, W. C. 1879. On the Annelida obtained during the Cruise of H.M.S. 'Valorous' to Davis Strait in 1875.—Transactions of the Linnean Society 2(1):499–511.
- Monro, C. C. A. 1933. On a new species of Polychaeta of the genus *Pilargis* from Friday Harbor, Washington.—Annals and Magazine of Natural History 10(11):673–675.
- Müller, F. 1858. Einiges über die Annelidenfauna der Insel Santa Catharina an der brasilianischen Küste.—Archiv für Naturgeschichte 24:211–220.
- Pearson, T. H. 1970. *Litocorsa stremma*, a new genus and species of pilargid (Polychaeta: Annelida) from the west coast of Scotland with notes on two other pilargid species.—Journal of Natural History 4:69–77.
- Pettibone, M. H. 1966. Revision of the Pilargidae (Annelida: Polychaeta), including descriptions of new species, and redescriptions of the pelagic *Podarmus ploa* Chamberlin (Polynoidae).—Proceedings of the U.S. National Museum 118(3525):155–208.



Treadwell, A. L. 1941. Polychaetous annelids from the New England region, Porto Rico and Brazil.—American Museum Novitates 1138:1-4.

Westheide, W. 1977. Phylogenetic systematics of the genus *Microphthalmus* (Hesionidae) together with a description of *M. hartmanae* nov. sp. Pp. 103-113 in D. J. Reish & K. Fauchald, eds., Essays on polychaetous annelids in memory of Dr. Olga Hartman.—Allan Hancock Foundation Special Paper, Los Angeles.

Wolf, P. S. 1984. Chapter 29. Family Pilargidae Saint-

Joseph, 1899. Pp. 29-1 to 29-41 in J. M. Uebelacker & P. G. Johnson, eds., Taxonomic guide to the polychaetes of the northern Gulf of Mexico, 7(4). Final report to the Minerals Management Service, contract 14-12-001-29091. Barry A. Vittor & Ass., Mobile, Alabama.

Universität Osnabrück, Fachbereich 5, Spezielle Zoologie, D-49069 Osnabrück, Germany.

Literature Cited

Agassiz, H. 1851. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 1:1-112.

Agassiz, H. 1859. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 9:1-112.

Agassiz, H. 1862. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 12:1-112.

Agassiz, H. 1865. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 15:1-112.

Agassiz, H. 1868. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 18:1-112.

Agassiz, H. 1871. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 21:1-112.

Agassiz, H. 1874. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 24:1-112.

Agassiz, H. 1877. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 27:1-112.

Agassiz, H. 1880. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 30:1-112.

Agassiz, H. 1883. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 33:1-112.

Agassiz, H. 1886. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 36:1-112.

Agassiz, H. 1889. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 39:1-112.

Agassiz, H. 1892. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 42:1-112.

Agassiz, H. 1895. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 45:1-112.

Agassiz, H. 1898. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 48:1-112.

Agassiz, H. 1901. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 51:1-112.

Agassiz, H. 1904. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 54:1-112.

Agassiz, H. 1907. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 57:1-112.

Agassiz, H. 1910. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 60:1-112.

Agassiz, H. 1913. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 63:1-112.

Agassiz, H. 1916. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 66:1-112.

Agassiz, H. 1919. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 69:1-112.

Agassiz, H. 1922. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 72:1-112.

Agassiz, H. 1925. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 75:1-112.

Agassiz, H. 1928. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 78:1-112.

Agassiz, H. 1931. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 81:1-112.

Agassiz, H. 1934. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 84:1-112.

Agassiz, H. 1937. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 87:1-112.

Agassiz, H. 1940. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 90:1-112.

Agassiz, H. 1943. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 93:1-112.

Agassiz, H. 1946. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 96:1-112.

Agassiz, H. 1949. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 99:1-112.

Agassiz, H. 1952. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 102:1-112.

Agassiz, H. 1955. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 105:1-112.

Agassiz, H. 1958. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 108:1-112.

Agassiz, H. 1961. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 111:1-112.

Agassiz, H. 1964. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 114:1-112.

Agassiz, H. 1967. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 117:1-112.

Agassiz, H. 1970. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 120:1-112.

Agassiz, H. 1973. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 123:1-112.

Agassiz, H. 1976. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 126:1-112.

Agassiz, H. 1979. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 129:1-112.

Agassiz, H. 1982. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 132:1-112.

Agassiz, H. 1985. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 135:1-112.

Agassiz, H. 1988. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 138:1-112.

Agassiz, H. 1991. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 141:1-112.

Agassiz, H. 1994. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 144:1-112.

Agassiz, H. 1997. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 147:1-112.

Agassiz, H. 2000. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 150:1-112.

Agassiz, H. 2003. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 153:1-112.

Agassiz, H. 2006. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 156:1-112.

Agassiz, H. 2009. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 159:1-112.

Agassiz, H. 2012. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 162:1-112.

Agassiz, H. 2015. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 165:1-112.

Agassiz, H. 2018. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 168:1-112.

Agassiz, H. 2021. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 171:1-112.

Agassiz, H. 2024. *Hydrozoen von Sicilien und Sardinien*.—*Vierteljahrsschrift Naturforschenden Gesellschaft in Zürich* 174:1-112.