ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI
Tomus 85. Budapest, 1993 p. 19–35

Identification key to the Hungarian leeches of the subfamily Trochetinae Pawlowski, 1954, with notes on systematics of the subfamily Erpobdellinae Blanchard, 1894 (Hirudinea)

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NESEMANN, H.: Identification key to the Hungarian leeches of the subfamily Trochetinae PAWLOWSKI, 1954, with notes on systematics of the subfamily Erpobdellinae BLANCHARD, 1894 (Hirudinea). – *Annls hist.-nat. Mus. natn. hung.* 1993, **85**: 19-35.

Abstract – Until now, 25 valid species and a number of subspecies of erpobdellid leeches are known from Europe. They belong to three subfamilies, of which the Trochetinae has the highest number of taxa. The subfamilies are newly defined: 1. Erpobdellinae sensu BLANCHARD with the genera *Erpobdella* and *Nephelopsis*, 2. Trochetinae sensu PAWLOWSKI, 1954, with the genera *Dina* and *Archaeobdella*, 3. Mooreobdellinae subfam. n., according to SAWYER (1986), with the genera *Mooreobdella* and *Fadejewobdella* is described. An identification key to the six Trochetinae species of the Carpathian Basin is given and their morphological and anatomical features discussed. A new species, *Trocheta riparia* sp. n. was recently found in Pinka, Strém and Rechnitzbach (Rába river basin, Hungary, Austria), which were former tributaries of the Slavonian Lake of the Pliocene. With 49 figures.

INTRODUCTION

Since the work of Á. SOÓS (1963a, 1967), LUKIN (1962, 1976) and SAWYER (1986), a lot of new features became known about the taxonomy and systematics of West Palaearctic Erpobdelliformes (MINELLI 1978, NESEMANN 1990, SAPKAREV 1990, SKET 1989, SKET & SAPKAREV 1986). We can differentiate three different lines within the family Erpobdellidae. They are to be regarded as subfamilies, which are easily distinguished by the annulation, structure of the head and male genital system. The species can be identified by external morphology, but the form and size of the atrium and the pharyngeal pseudognaths are characteristic, too. An identification key is presented for all species of the genera *Dina* and *Trocheta*, found in freshwaters of the Carpathian Basin. It can be used for the fauna of the upper and middle reaches of the Danube river basin in Germany, Austria and Hungary.

MATERIAL AND METHODS

During 1987-1992 leeches were collected by the author at many localities of the upper and middle Danube and its tributaries. They were all killed with 15% ethylalcohol and preserved in 70% alcohol. The material is deposited in the author's collection and in the collection of the Zoological Department of the Hungarian Natural History Museum, Budapest.

SYSTEMATICS OF THE SUBORDER ERPOBDELLIFORMES SAWYER, 1986

Erpobdellidae BLANCHARD, 1894

Erpobdelliformes with more or less prominent pharyngeal pseudognaths of segment III. Northern Hemisphere. Twenty-five species are described from Europe, several of them are divided into valid subspecies, e.g. *Dina lineata*, *D. absoloni* and *Trocheta subviridis*.

I. subfamily Erpobdellinae BLANCHARD, 1894

Genera *Erpobdella* DE BLAINVILLE, 1818
Nephelopsis VERRILL, 1872

Erpobdellidae with complete homonomous five-annulate segment, primary (*a2*) and secondary (*b1*, *b2*, *b4*, *b5*) annuli (Fig. 1), testisacs numerous, lacking pharyngeal stylets, gonopores on somite XII, caudal sucker always developed. Preatrial loop of male paired ducts in somite XI. Suctoroid oral sucker with small preoral segments I-II (Fig. 9). Northern Hemisphere: Holarctic (*Erpobdella*), Nearctic (*Nephelopsis*). Four species in Europe (see Checklist).

II. subfamily Trochetinae PAWLOWSKI, 1954

Genera *Dina* R. BLANCHARD, 1892
Trocheta DUTROCHET, 1817
Archaeobdella GRIMM, 1876

Erpobdellidae with complete, heteronomous five- to nine-annulate segment, primary to quartary annuli, annulus *b6* always widened and homonomously or heteronomously subdivided (Figs 3-4), testisacs numerous, lacking pharyngeal stylets, gonopores on somite XII or XIII, female gonopore sometimes shifted in caudal direction, caudal sucker sometimes reduced (*Archaeobdella*). Preatrial loop of male paired ducts extremely long, extended and not coiled atrial horns in somite XI. Rostelloid oral sucker with large preoral segments I-II, forming a typical rostellum (Figs 7-8). Palaearctis: Palaearctic (*Dina*), West Palaearctic (*Trocheta*), Ponto-Caspian Basin (*Archaeobdella*), several monophyletic endemic taxa of the Lake Ochrid (*Dina*). In the author's opinion, the status of *Dina maoriana* MASON, 1976 from New Zealand remains unclear. Twenty species with several subspecies are known in Europe (see Checklist), but a few more seem to exist (NEUBERT & NESEMANN, in print).

III. subfamily Mooreobdellinae subfam. n.

Genera *Mooreobdella* PAWLOWSKI, 1955 (type genus)
Fadejewobdella LUKIN, 1962

Erpobdellidae with complete heteronomous five- to six-annulate segment, primary to tertiary annuli, annulus *b6* widened, lacking pharyngeal stylets, gonopores on somite XII, lacking preatrial loop of male paired ducts. Holarctis: Nearctic (*Mooreobdella*), Palaearctic Ponto-Caspian (*Fadejewobdella*). One species in Europe (see Checklist).

RESULTS AND DISCUSSION

Annulation

The erpobdellid body consists of 34 segments. They are divided up into primary (*a*), secondary (*b*), tertiary (*c*) and quartary (*d*) rings (annuli), starting from a complete five-annulated segment, e.g. *Erpobdella* (Fig. 2). All of the midbody segments with complete annulation are called somites. The genera and species of Erpobdellidae easily can be distinguished by the annulation of somites (Figs 2-4). In general, all species of the subfamily Trochetinae have a widened annulus *b6* of each somite, but this is not a taxonomic feature for all erpobdellids. The widening of *b6* originated independently in the Nearctis (Moorebdellinae) and Palaearctis (Trochetinae). In the Palaearctic group, which is regarded most probably as monophyletic origin, we can distinguish two lines. The genus *Trocheta* has a heteronomous subdividing of *b6* (Fig. 4), the two genera *Dina* and *Archaeobdella* have a homonomous subdividing of this annulus (Fig. 3).

The groups of the arhynchobdellid leeches differ in the structure and annulation of the head. It includes the first four segments of Erpobdelliformes (Figs 5-6) and five segments of Hirudiniformes. The annulation of the head region is quite different and helps to distinguish the two genera of Trochetinae, occurring in the Danube river basin.

Reproductive system and genital openings

Both the Erpobdellinae and Trochetinae subfamilies contain erpobdellid leeches with preatrial loop of male paired ducts. The ejaculatory ducts are extended anteriorly to the ganglion of somite XI. In contrast, the two genera *Fadejewobdella* LUKIN, 1962 and *Mooreobdella* PAWLOWSKI, 1955 have no pre-atrial loopes. They belong to a third related subfamliy of the Erpobdellidae.

For the discussed Danubian leeches, the position of the genital openings is of taxonomic importance in distinguishing the major groups of genera and subgenera, as well as the annulation.

The majority of species of the genus *Dina* have the male and female gonopore on somite XII, they are separated mostly by two annuli (Fig. 17). The male gonopore is nearly constant in the furrow of XII *b2/a2*. The female gonopore is in XII *b5/b6* or can be shifted posteriorly on annulus *b6* or furthermore on somite XIII (endemic species of the Lake Ochrid). The two species of the subgenus *Dina* (*Relictodina*) have complete anteriorly shifted genital opening. The male gonopore is placed in the furrow of XII *b1/b2*, the female in XII *b5/b6*, the distance amounts to three annuli.

The atrium is restricted to somite XII. The atrial cornua of all sectioned species are simply curved or spirally coiled. Form and size is remarkable for the species. The biggest atrium was found in *Dina apathyi* (Figs 25-26), whereas *D. lineata* has a short erpobdellid-like atrium (Figs 12-13).

The species of the genus *Trocheta* are heterogeneous, comparing their gonopores and male genital system. With the exception of *T. subviridis*, the position of the gonopores is not varied. The male genital opening is in the furrow of XII *b2/a2*, the female

in XII *c10/d23* (or XII *b5/c23*). In contrast to these species, the distance of gonopores of *T. subviridis* is widened. The male gonopore is shifted posteriorly to somite XIII. The main differences in *Trocheta* can be found in the male genital system and the oral sucker, the position of the genital opening seems not so important for taxonomy as in the case of *Dina*. The atrium of *Trocheta* differs markedly. One of the most interesting form is that of *T. cylindrica*. Its atrium with non-coiled horns is extended from somite XII to XI instead of the ejaculatory ducts of other Trochetinae species (Figs 41-42). The same features are present in the western sister-species *T. pseudodina* Nesemann, 1990. In contrast, the atrium of *T. riparia* is extremely small and extended only on XII *c2* to XII *b2* (Figs 47-48).

Pre-oral organization, pharynx and oral sucker

All erpobdellid leeches have three remarkable pseudognaths. They are closed hyaline jaws without calcified teeth. The pseudognaths are situated in the pharyngeal folds of segment III. Caused by the strepsilaematous pharynx, two of them are in dorsolateral position (e.g. Fig. 11) and one is on the ventromedian fold. They play an important role in seizing the prey. The tips of the pseudognaths point in pharyngeal direction, whereby the prey can not escape from the oral sucker.

The development of pseudognaths and oral sucker shows two interspecific phylogenetic lines:

I. Carnivorous feeder of smaller and hemisessile prey (e.g. chironomids, Oligochaeta), suctoroid oral sucker (Fig. 9), small pseudognaths (Fig. 11) and short pre-oral segments (Erpobdellinae, *Dina lineata*).

II. Carnivorous predator of large and active prey (e.g. leeches, lumbriculids), rostelloid oral sucker, large pseudognaths and occasional accessory pseudognaths (Figs 19, 27, 34, 40, 46). The pre-oral segments, prostomium and peristomium, are forming a muscular rostellum to grasp the food (Trochetinae). The first rostellum segment sometimes bears a number (30-50) of sensillae (Figs 7-8). Their function is not yet known, but they may be used for tasting or smelling.

The intermediate status of Dina lineata

Several morphological features were presented above to explain the differences between *Erpobdella*, *Dina* and *Trocheta*. Regarding the specialization of annulation as a line of evolution, the Trochetinae are originated from Erpobdellinae ancestors. The most plesiomorphic member of Trochetinae is *Dina lineata* with simply annulated somites and widened annulus *b6* (Fig. 14). This leech shows a number of plesiomorphic features, therefore it takes place as a connecting link between Erpobdellinae and Trochetinae. The oral sucker is of suctoroid and *Erpobdella*-like character, the pseudognaths are small and the pre-oral segments do not form a typical rostellum (Fig. 11). The atrium bears short and simply curved cornua (Figs 12-13). These might be caused by the habits, but, on the other hand, show the exceptional status of this species.

DESCRIPTION OF TAXA FOUND IN THE CARPATHIAN BASIN

Dina R. BLANCHARD, 1892

Trochetinae with the following annulation of preclitellar segments (Figs 6-7): I-IV: 1, V: 2, VI: 3, VII (-XXIV): 5 (or more subdivided). Somite with widened annulus *b6*, often homonomously subdivided in c11 and c12.

Dina lineata (O. F. MÜLLER, 1774)

1774 *Hirudo lineata* O. F. MÜLLER, Vermium terrestium et fluviatilum. Havniae et Lipsiae 1(2): 49.

Smaller and slender leeches up to 40 (-70) mm length, annulation formula of somites: *b1, b2, a2, b5. b6* (often subdivided in *c11, c12*) (Fig. 14). Short and suctoroid oral sucker. Three simple and small pseudognaths (Fig. 11). Atrium restricted on somite XII, reaching from XII *b1* to XII *b2/a2*. Atrium thick, with short and simple spirally coiled cornua (Figs 12-13). Male gonopore in the furrow of XII *b2/a2*, female's on XII *b6* or in XII *c11/c12* (*b6* subdivided). Colour light reddish brown with dark paramediane stripes, neither papillae nor yellowish spots (Figs 10, 14). Western Palaearctis including Asia Minor and the Middle East. This semiaquatic species is widespread in the Carpathian Basin, known from the Alföld, Kisalföld and Vienna plain. It prefers temporarily flooded banks of lowland waters, rivers and streams as well as swampy districts of their floodplains (NESEMANN 1991).

Dina punctata JOHANSSON, 1927

1927 *Dina lineata* var. *punctata* et var. *notata* JOHANSSON, Abh. Senckenberg. naturf. Ges. 39 (3): 229, Figs 5-6.

Thicker and large leeches up to 70 (-85) mm length, annulation formula of somites variable, juvenils: *b1, b2, a2, b5, c11, c12*, large adults: *c1, c2, c3, c4, a2, c9, c10, c11, c12* (or subdivided in *d21, d22, d23, d24*) (Figs 17-18, 23). Long and rostelloid oral sucker. Pseudognaths strongly developed (Fig. 19). Atrium restricted on somite XII, reaching from XI/XII to XII *b2/a2*. Atrium thick with curved cornua and simply coiled ends (Figs 20-21). Male gonopore in the furrow of XII *b2/a2* (sometimes on XII *a2*), female invariable in XII *b5/b6* (or subdivided in XII *b5/c11*) (Figs 17-18). Colour variable, in general black (adults) or dark reddish brown (juvenils), always with one pair of dirty paramediane stripes (Figs 15-16). Yellowish or light greyish spots transversal on each annulus in two rows (Figs 22-23). Western Europe: Ebro, Garonne, Rhine, Po, upper Danube and their tributaries. In the Carpathian Basin, *D. punctata* is strongly restricted to the Northwest (Danube and Lajta). The lower distribution limit in the Danube river is in the Alföld reach downstream from Budapest (Érd, Dunaújváros). This species prefers running and fast flowings streams and rivers with gravels and stony substrate.

Dina apathyi GEDROYC, 1916

1916 *Dina apathyi* GEDROYC, Rozpr. Wiad. Muz. Dzied. Lwów 2: 82-85, Fig. 23.

Large and strong leeches up to 80 mm length, good swimmers. Annulation formula of somites constant: *b1, b2, a2, b5, b6* (Fig. 29). Long and rostelloid oral sucker. Pseudognaths strongly developed (Fig. 27). Large atrium with long and straight cornua, the ends are simply coiled (Figs 25-26). Male gonopore in the furrow of XII *b2/a2*, female in XII *b5/b6*. Ground colour dark greenish or reddish black (Fig. 24), large tranversal yellowish spots on each annulus (Figs 28-29), arranged in one row (in two rows on *b6*). Central and East Europe, Carpathian Basin, northern tributaries of the Black Sea and southeastern tributaries of the Baltic coast. *D. apathyi* inhabits slowly running rivers and streams of the lowlands. It was collected from the Danube (NESEMANN 1990, 1991) and Zagyva rivers in the Alföld and was recently found in the Strém, extremely southern Kisalföld.

Trocheta DUTROCHET, 1817

Trochetinae with the following annulation of preclitellar segments (Figs 5, 8): I-II: 1, II-V: 2, VI: 3, VII: 5, VIII (-XXIV): 7 (-9 subdivided). Somite with widened annulus *b6*, always hetreronomously subdivided in *c11*, *d23* and *d24*.

Trocheta bykowskii GEDROYC, 1913

1913 *Trocheta bykowskii* GEDROYC, Bull. internat. Acad. Cracovie, Ser. B.: 32, Figs 1-5.
1990 *Trocheta bykowskii* (partim): NESEMANN, Z. angewandt. Zool. 77 (2): 235, Figs 13a-b.

Thick and large leeches up to 80 (-140) mm length, annulation formula of somites: *c1*, *c2*, *b2*, *a2*, *b5*, *c11*, *d23*, *d24*. Long and rostelloid oral sucker. Pseudognaths strongly develloped. Pharynx with small accessory pseudognaths and folds (Fig. 34). Atrium restricted on somite XII, reaching from XII *c1/c2* to XII *b2/a2*. Atrium thick and strong with simple spirally coiled cornua (Figs 32-33). Male gonopore in the furrow XII *b2/a2*, female's in XII *b5/c11*. Colour whitish grey or light reddish transparent, sometimes pink (Figs 30-31). Nor spots neither stripes (Fig. 35). Central European mountains and hilly countries. *T. bykowskii* occurs in springs, caves and fast flowing mountain streams. The leeches prefer phreatic habitats with water temperatures lower than 15 °C. It is known from the Carpathians, the southern Alps and adjacent areas. This species was recently found in the Wienerwald mountains (Mauerbach) and in the Aggteleki-karszt (upper Bódva).

Trocheta cylindrica ÖRLEY, 1886

1886 *Trocheta cylindrica* ÖRLEY, Math. és term.-tud. Közlem. 22: 91-92.
1990 *Trocheta bykowskii* (partim): NESEMANN, Z. angewandt. Zool. 77 (2): 237, Figs 15a-b.

Very large leeches up to 180 (-220) mm length. Annulation formula of somites: *c1*, *c2*, *b2* (or subdivided in *c3*, *c4*), *a2* (or subdivided in *b3*, *b4*), *c9*, *c10*, *c11*, *d23*, *d24* (Fig. 43). Juvenils up to 25-35 mm length without visible annulation and extremely flattened body like worms (Figs 38-39), preclitellar region cylindrical (name !). Long and rostelloid oral sucker, very large and hyaline pseudognaths together with a number of (accessory) smaller ones (Fig. 40). Atrium extraordinarily elongated, reaching from XII *b2/a2* to XI *c11/d23*. Cornua without coiled ends (Figs 41-42). Male gonopore in the furrow of XII *b2/a2*, female in XII *c10/c11*. Colour black or unicoloured blackish dark red. Neither stripes nor ligth spots (Figs 36-37). Body surface rough with 30-70 transversal papillae on each annulus, irregularly arranged in two or three rows (Fig. 43). Ponto-Sarmatian species, tributaries of the Black and Egean Sea, from extremely eastern Austria to Georgia. *T. cylindrica* prefers lowland rivers and streams. It is known from all parts of the Alföld, Kisalföld and eastern Vienna plain.

Trocheta riparia sp. n.

1990 *Trocheta bykowskii* (partim): NESEMANN, Z. angewandt. Zool. 77 (2): 236, Figs 14a-b.

Localities: Pinka near Woppendorf (NESEMANN 1990): Rechnitzbach near Rechnitz, a small brook of the Gyöngyös-Perint river basin (NESEMANN 1990), Pinka between Gaas and Szentpéterfa, 1 September 1992, leg. WOSCHITZ, G. et H. NESEMANN; Pinka near Burg, 1 September 1992, leg. WOSCHITZ, G. et H. NESEMANN; Strém W Taródfa, Tö-rét, August 1992, leg. WOSCHITZ, G. et H. NESEMANN.

Holotype: Pinka near the mill of Gaas, 1 specimen. 1 September 1992, leg. WOSCHITZ, G. et H. NESEMANN, Hungarian Natural History Museum, Zoological Department, Budapest. Paratypes: from the same collection, 12 specimens.

Locus typicus: Pinka river, lower reach in Hungary and Austria between Szentpéterfa and Gaas.

Derivatio nominis: The Latin name of this species indicates its semiaquatic habitat in running waters.

D i a g n o s i s: Large leeches up to 100 mm length, annulation formula of somites: *c1, c2, b2, a2, b5* (often subdivided in *c9, c10*), *c11, d23, d24* (Fig. 49). Long and rostelloid oral sucker with small pseudognaths (Fig. 46). Atrium restricted on somite XII, reaching from XII *b2/a2* to XII *c1/c2*. Atrium very small with not coiled cornua (Figs 47-48). Male gonopore in the furrow XII *b2/a2*, female in XII *b5/c11*. Colour variable, in general black or dark reddish brown, always with one pair of dirty paramediane stripes. Light greyish and small spots tranversal on each annulus, irregularly arranged in two rows (Fig. 49). The body of this species resembles *T. pseudodina*, which is quite common in western Europe. It differs from *T. pseudodina* and *T. cylindrica* in the small size and form of the atrium, much smaller pseudognaths and dorsal colouration, which is similar to *Dina punctata* and *Dina stschegolewi*.

D i s t r i b u t i o n: Tributaries of the upper Rába river basin in Hungary and Austria (southern Burgenland), most probably in adjacent waters in Slovenia (SKET, pers. comm.). All of them were western tributaries of the Pliocene Slavonian lake, a relict water of the former Pannonian sea.

H a b i t a t: Semiaquatic on the banks of small rivers and streams.

IDENTIFICATION KEY TO THE SPECIES

1 (2) Smaller to medium-sized leeches with cylindrical or slightly flattened body, five annuli per somite, all of them with the same width. Small pseudognaths, suctoroid oral sucker. – **Erpobdella** DE BLAINVILLE, 1818 (see PAWLOWSKI 1948, SOÓS 1963b, 1967)

2 (1) Medium-sized to large leeches with cylindrical preclitellar region and more flattened posterior part of the body, often with lateral keels. Annulus *b6* always widened. Five to nine annuli per somite. Ejaculatory ducts of male genital system with pre-atrial loops or atrial cornua in somite XI. – **Trochetinae** PAWLOWSKI, 1954

3 (7) Annulus *b6* not subdivided or homonomously subdivided in rings of the same width (e.g. *c11, c12*). – **Dina** R. BLANCHARD, 1894

4 (5) Annulus *b6* sometimes with a shallow furrow subdivided in *c11, c12*. Reddish brown colour with dark paramedian stripes. Gonopores separated by 2 or 2 1/2 annuli, male gonopore in the furrow of XII *b2/a2*, female in XII *b5/b6* or on XII *b6*. Suctoroid oral sucker, segments I-II short

Dina lineata (O. F. MÜLLER, 1774)

5 (4) Dark blackish ground colour, small yellowish spots tranversal on each annulus, irregularly arranged in two rows, one pair of dark paramedian stripes. Gonopores separated by 2 or 1 1/2 annuli. Rostelloid oral sucker, segments I-II widened

Dina punctata JOHANSSON, 1927

6 (5) Dark blackish ground colour, large yellowish spots transversal on each annulus, irregularily arranged in one row, on *b6* in two rows. Lacking dark paramedian stripes. Gonopores separated by 2 annuli. Rostelloid oral sucker, segments I-II widened

Dina apathyi GEDROYC, 1916

7 (3) Annulus *b6* widened and heteronomously subdivided in one tertiary (*c11*) and two quartary rings (*d23, d24*). Five short and three wide or seven short and two wide annuli per somite. Prominent pseudognaths, rostelliod oral sucker with strongly developed rostellum, widened segments I and II. – **Trocheta** DUTROCHET, 1817

8 (11) Large unicoloured leeches, neither dark stripes nor yellowish spots. Very large pseudognaths.

9 (10) Ground colour of the body transparent whitish grey, reddish or whitish pink. Dorsal surface smooth

Trocheta bykowskii GEDROYC, 1913

10 (9) Ground colour of the body dark black or blackish red. Dorsal surface rough, 30-50 small papillae on each annulus. The longest European leech species, often up to 200 mm total length

Trocheta cylindrica ÖRLEY, 1886

11 (8) Ground colour of the body blackish red. Small yellowish spots on each annulus, one pair of dark paramedian stripes, often melting into one another in the postclitellar region. Small pseudognaths

Trocheta riparia sp. n.

IDENTIFICATION KEY TO THE MAJOR GROUPS CONCERNING THE COLOURATION

I (IV) Trochetinae leeches with dark paramedian stripes. – **Dina lineata, Dina punctata, Trocheta riparia,** see key to the species: 4, 5, 11.

II (III) Trochetinae leeches with dark paramedian stripes, reddish or brownish groundcolour, without any yellowish spots. – **Dina lineata,** see key to the species: 4.

III (IV) Trochetinae leeches with dark paramedian stripes and yellowish spots on each annulus. – **Dina punctata, Trocheta riparia,** see key to the species: 4, 11.

IV (V) Trochetinae leeches without dark paramediane stripes. – **Dina apathyi, Trocheta bykowskii, Trocheta cylindrica,** see key to the species: 6, 9, 10.

V (VIII) Trochetinae leeches without dark paramediane stripes, unicoloured without yellowish spots. – **Trocheta bykowskii, Trocheta cylindrica,** see key to the species: 9, 10.

VI (VII) Trochetinae leeches unicoloured blackish with rough dorsal surface. – **Trocheta cylindrica,** see key to the species: 10.

VII (VI) Trochetinae leeches unicoloured whitish red or pink with smooth dorsal surface. – **Trocheta bykowskii,** see key to the species: 9.

VIII (VI) Trochetinae leeches unicoloured blackish with yellowish spots. – **Dina apathyi,** see key to the species: 6.

CHECKLIST OF THE EUROPEAN SPECIES OF THE FAMILY ERPOBDELLIDAE BLANCHARD, 1894

Subfamily **Erpobdellinae** BLANCHARD, 1894

Erpobdella octoculata (LINNAEUS, 1758)	Palaearctis
Erpobdella vilnensis LIESKIEWICZ, 1925	Central-East Europe
Erpobdella testacea SAVIGNY, 1822	West Palaearctis
Erpobdella nigricollis BRANDES, 1900	Central-East Europe

Subfamily **Trochetinae** PAWLOWSKI, 1954

Dina lineata (O. F. MÜLLER, 1774)	Palaearctis
Dina apathyi GEDROYC, 1916	Pontocaspian-Baltic basin
Dina punctata JOHANSSON, 1927	Southwest-Central Europe
Dina stschegolewi LUKIN et EPSHTEIN, 1960	Central Palaearctis
Dina absoloni JOHANSSON, 1913	Bosnia, Georgia
Dina vignai MINELLI, 1978	Turkey
Dina ohridiana SKET, 1968	Ohrid basin
Dina krilata SKET, 1989	Ohrid basin
Dina eturpshem SKET, 1989	Ohrid basin
Dina lepinja SKET et SAPKAREV, 1986	Ohrid basin
Dina svilestra SKET, 1989	Ohrid basin
Dina kuzmani SAPKAREV, 1990	Ohrid basin
Dina lyhnida SAPKAREV, 1990	Ohrid basin
Dina profunda SAPKAREV, 1990	Ohrid basin
Trocheta subviridis DUTROCHET, 1817	Southwest Europe
Trocheta bykowskii GEDROYC, 1913	Central Europe
Trocheta pseudodina NESEMANN, 1990	Western Europe
Trocheta cylindrica ÖRLEY, 1886	Pontocaspian basin
Trocheta riparia sp. n.	Central Danubian basin
Archaeobdella esmonti GRIMM, 1876	Caspian and Azovian basin

Subfamily **Mooreobdellinae** subfam. n.

Fadejewobdella quinqueannulata (LUKIN, 1929)	Azovian basin

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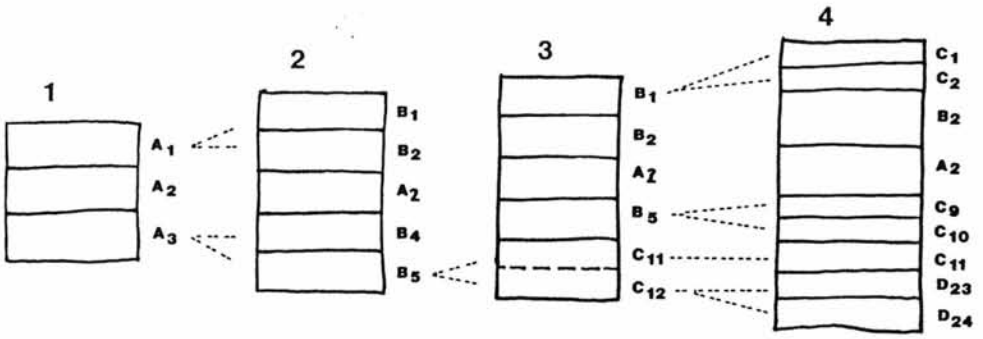
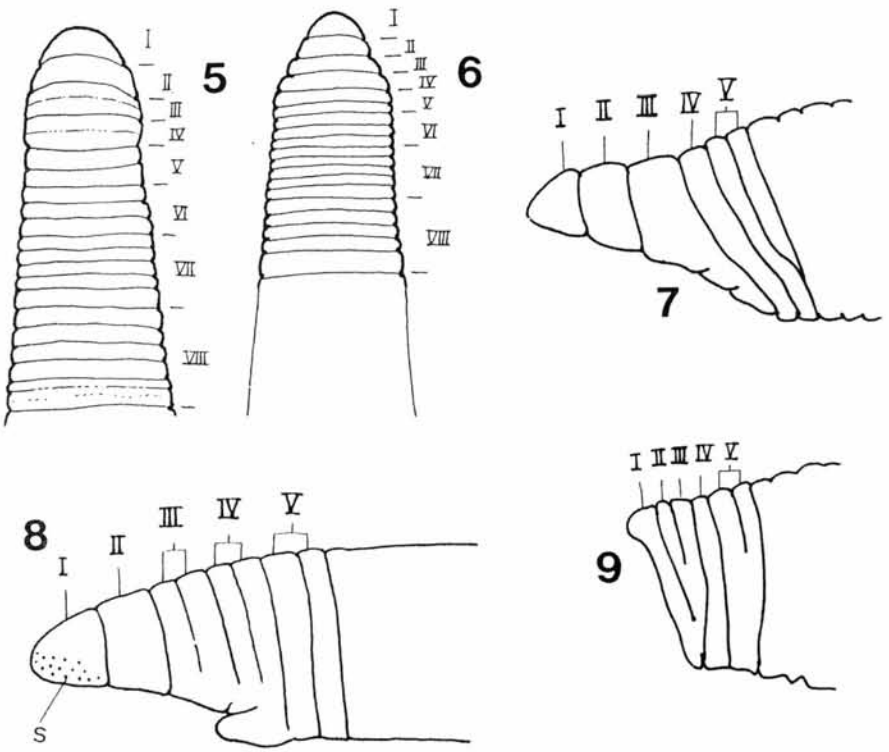
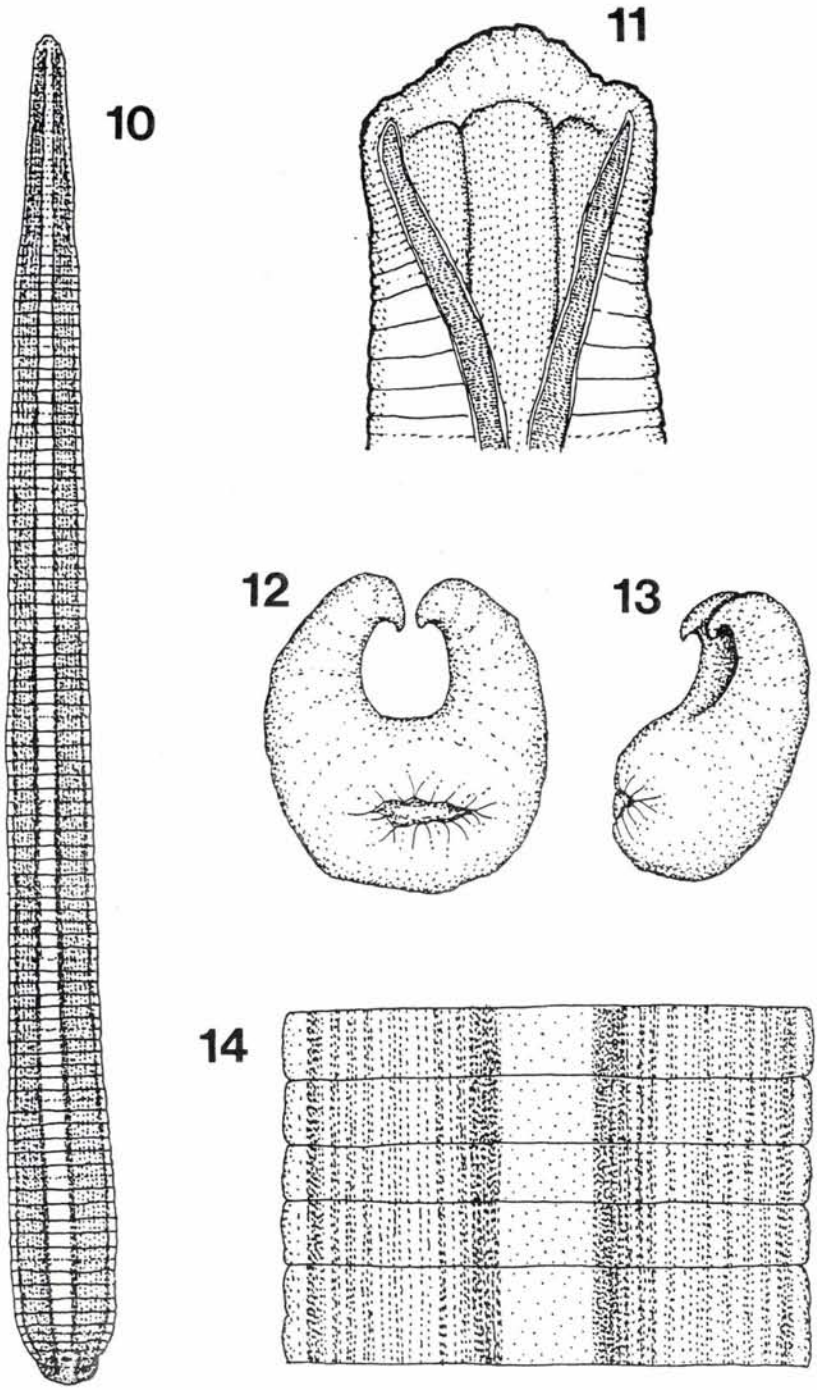


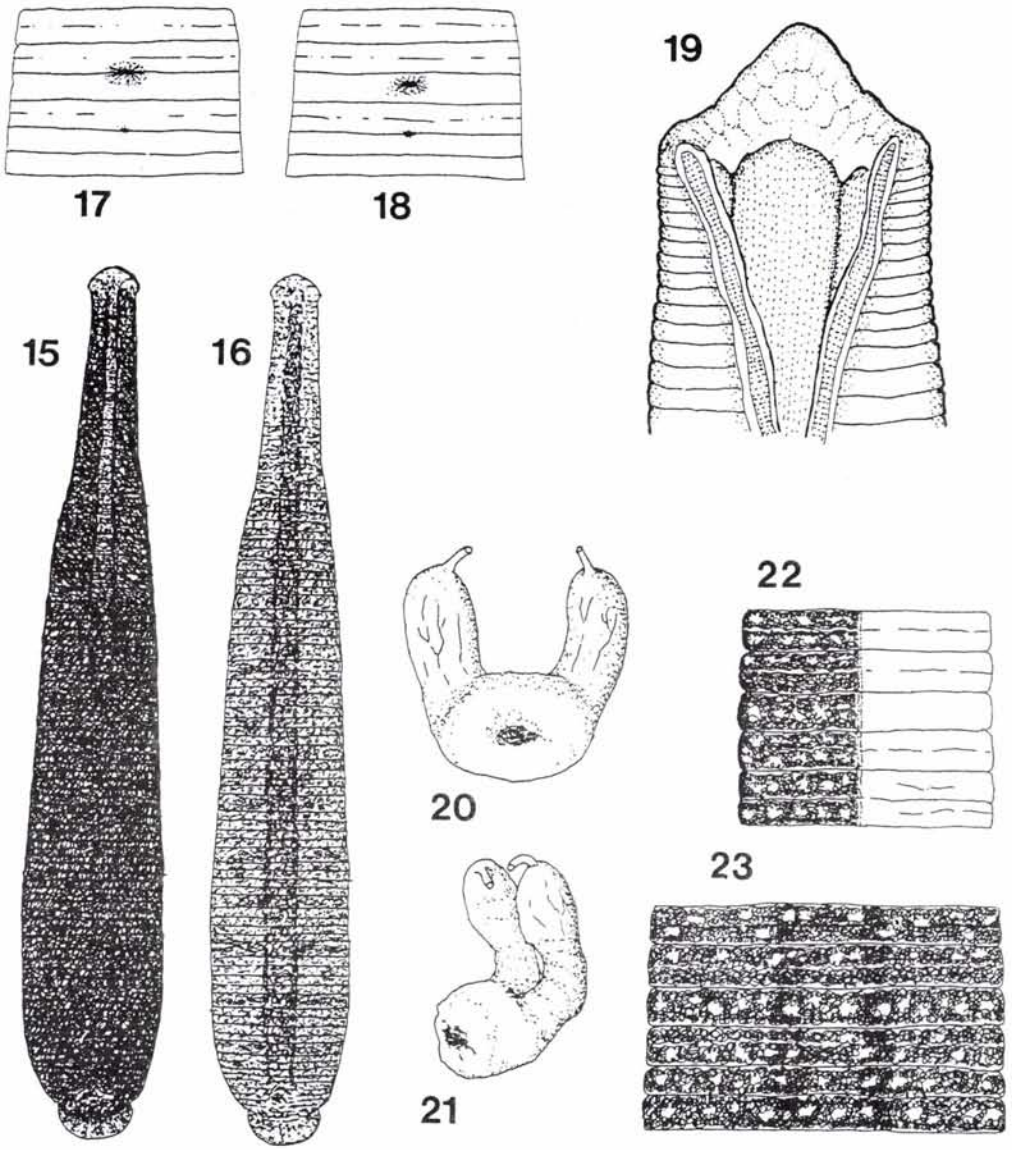
Figs 1-4. Annulation of one somite of several Euhirudinea: 1 = *Glossiphonia*, 2 = *Erpobdella*, 3 = *Dina* 4 = *Trocheta*



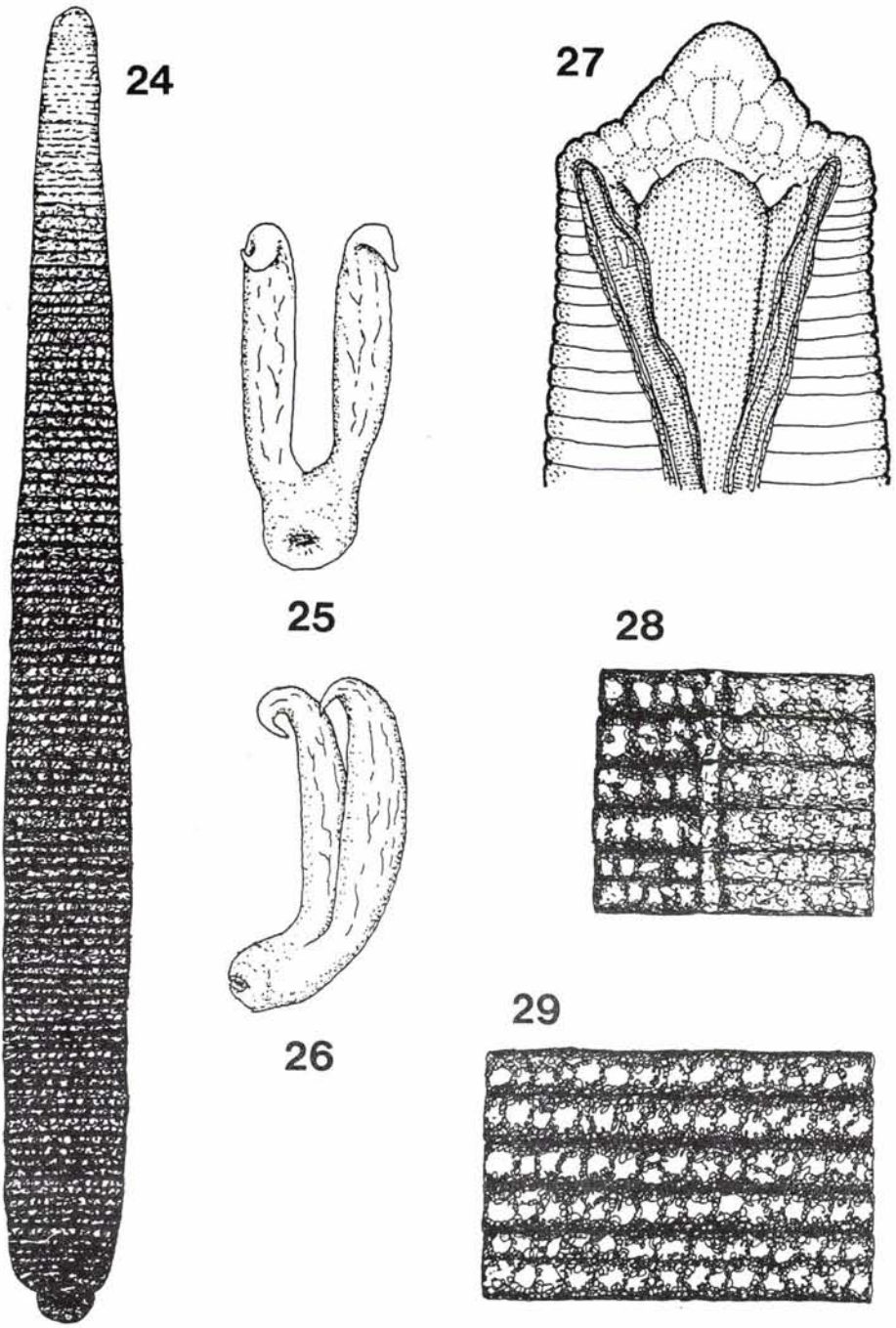
Figs 5-9. Segmentation and annulation of the head region of several Erpobdellidae: 5 = *Trocheta cylindrica*, dorsal, 6 = *Dina apathyi*, dorsal, 7 = rostelloid oral sucker of *Dina apathyi*, lateral, 8 = rostelloid oral sucker of *Trocheta cylindrica*, lateral (S = sensillae), 9 = suctoroid oral sucker of *Erpobdella nigricollis*



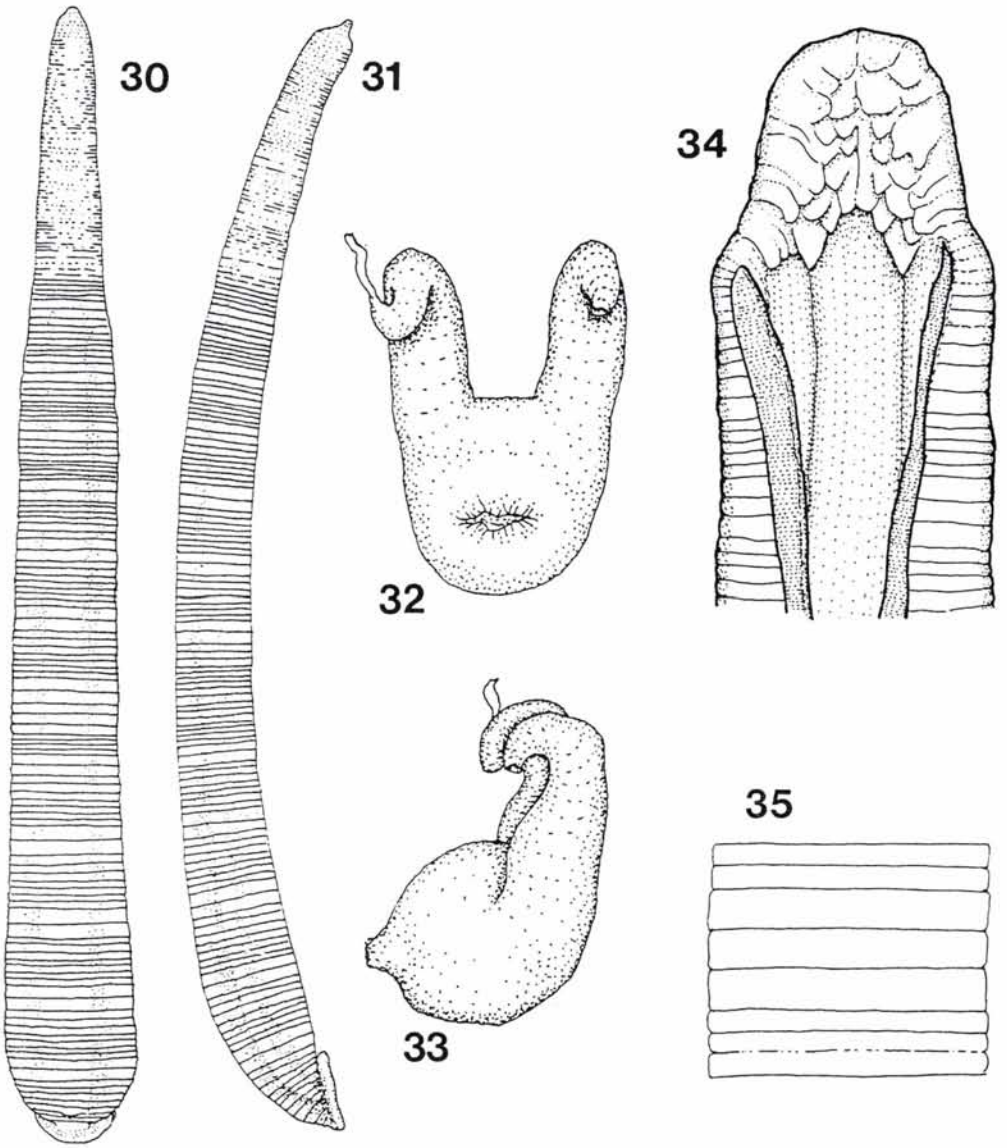
Figs 10-14. *Dina lineata*: 10 = habitus, dorsal, 11 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 12 = atrium ventral, 13 = lateral, 14 = colouration of one somite, dorsal (Stempfelbach, Vienna plain, Austria)



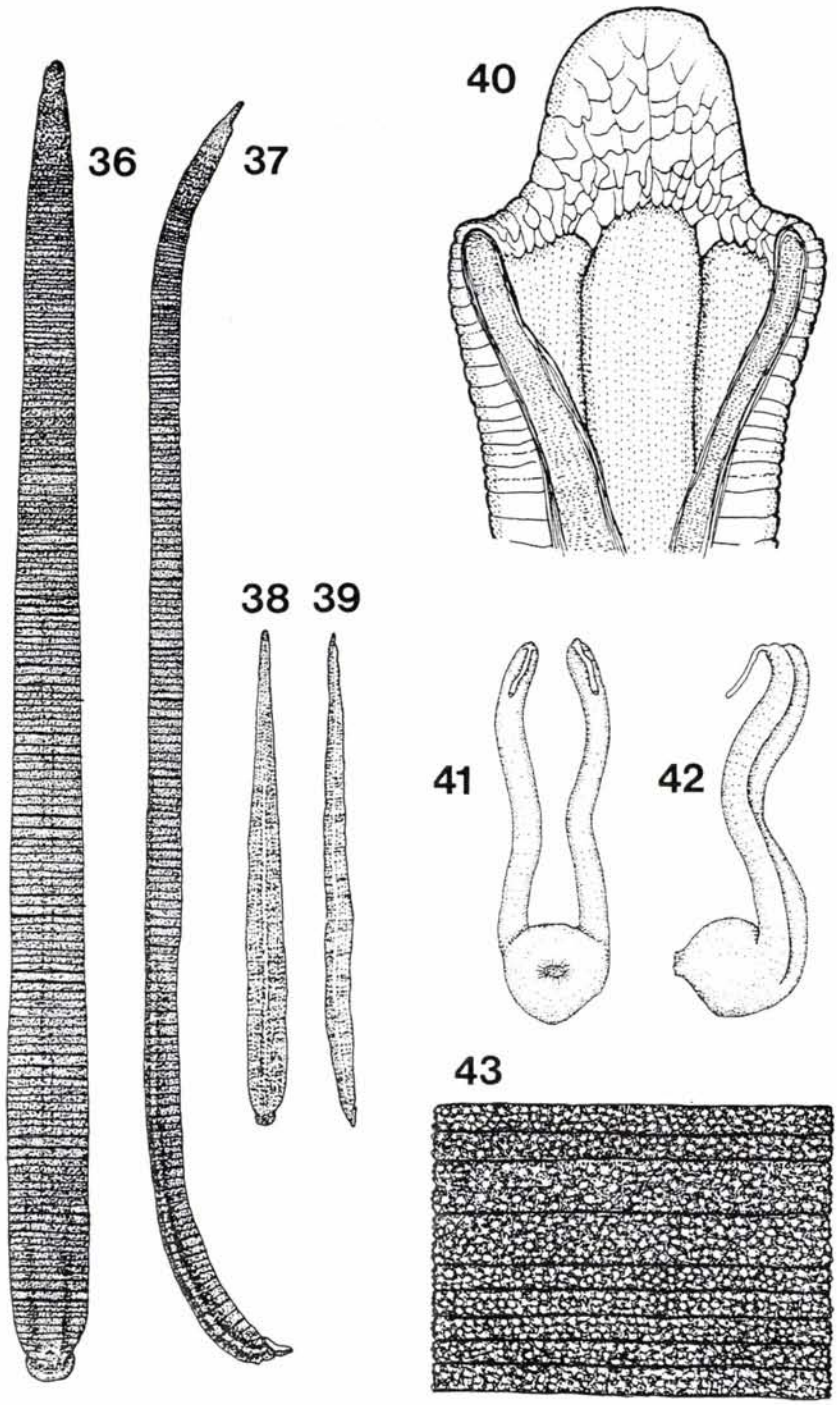
Figs 15-23. *Dina punctata*: 15-16 = habitus dorsal, 17-18 = gonopores on somite XII ventral, 19 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 20 = atrium ventral, 21 = lateral, 22 = colouration of one somite lateral, 23 = dorsal (Danube at Vác, Hungary)



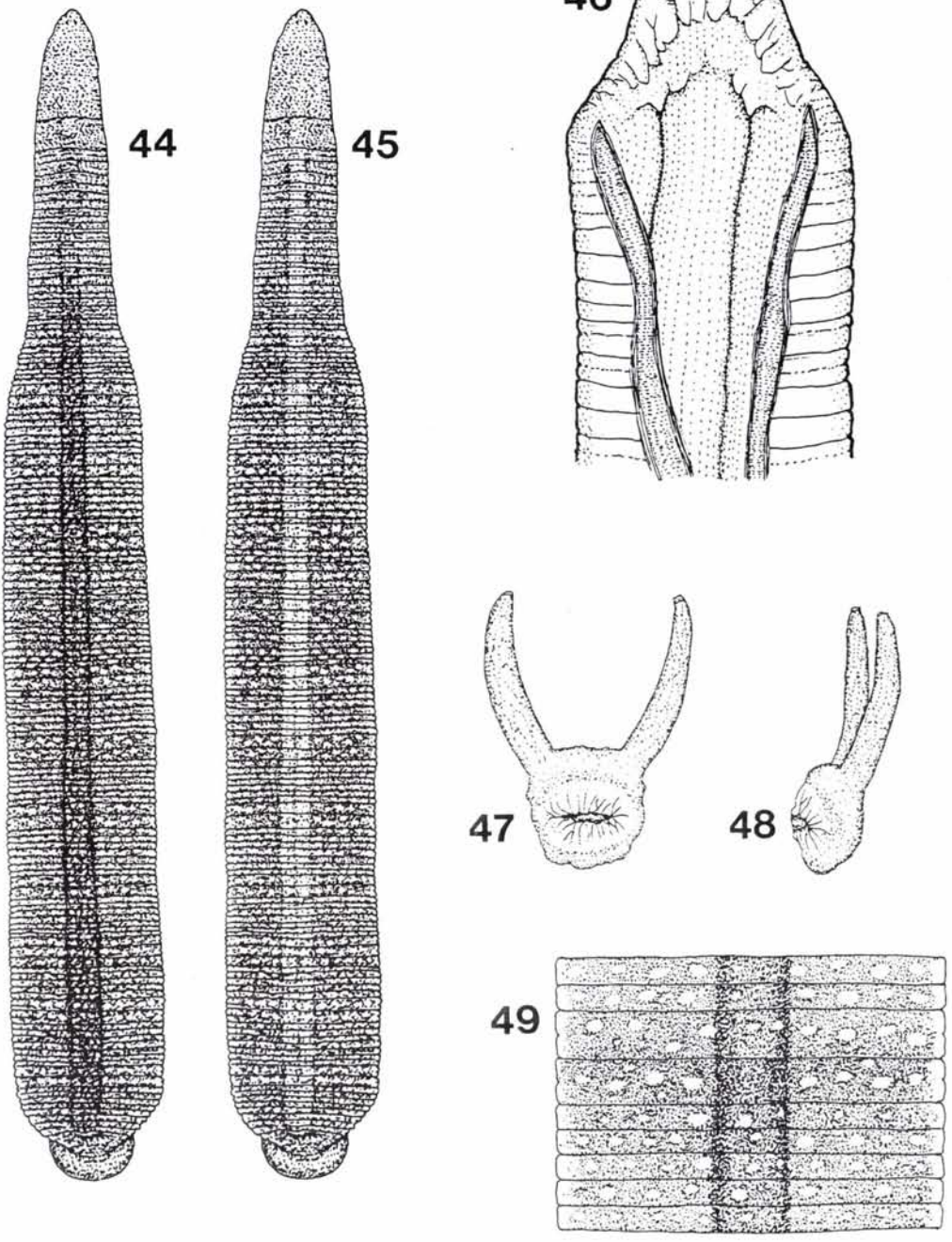
Figs 24-29. *Dina apathyi*: 24 = habitus dorsal, 25 = atrium ventral, 26 = lateral, 27 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 28 = colouration of one somite lateral, 29 = dorsal (Figs 24-26, 28-29 = Ráckevei Duna near Dunaharaszti, Hungary, Fig. 27 = Strém, Burgenland, Austria)



Figs 30-35. *Trocheta bykowskii*: 30 = habitus dorsal, 31 = lateral, 32 = atrium ventral, 33 = lateral, 34 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 35 = colouration of one somite dorsal (Figs 30-31 = Alfbach, Eifel, Germany, Figs 32-34 = Wisper, Taunus, Germany, 35 = Mauerbach, Wienerwald, Austria)



Figs 36-43. *Trocheta cylindrica*: 36 = habitus dorsal, 37 = lateral, 38 = juvenil dorsal, 39 = lateral, 40 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 41 = atrium ventral, 42 = lateral, 43 = colouration of one somite dorsal (Figs 36-37 = Kőrös near Szarvas, Hungary, Figs 38-39 = Danube at Alsógöd, Hungary, Figs 40-43 = Rába at Ikervár, Hungary)



Figs 44-49. *Trocheta riparia*: 44-45 = habitus dorsal, 46 = oral sucker with pharynx and pseudognaths, sectioned, ventral, 47 = atrium ventral, 48 = lateral, 49 = colouration of one somite dorsal (Pinka, lower reach in Hungary and Austria)