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Tomus 59. PARS ZOOLOGICA 1967.

On the Genus Batracobdella Viguier, 1879, with a Key and Catalogue to the Species

(Hirudinoidea: Glossiphoniidae)

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In the present paper I intend to discuss the genus *Batracobdella*, on the same considerations as those concerning the genus *Glossiphonia* treated in the preceding volume of this journal (58, p. 271—279). The genus *Batracobdella* was established by VIGUIER in 1879 for his new species *latasti* (and not *latastii*). The description of the genus had been published, in the same year, in French and later also in English, and since the generic name was written in two different versions in the two papers, authors, indeed, occasionally the same author, use alternately both. Since the first description, in French, had been published earlier, in July 1879, with the spelling, *Batracobdella*, this is the valid one, despite the more correct. *Batrachobdella*, published in September, 1879. BLANCHARD had shown later (1893, p. 7—12) that VIGUIER's species, *latasti*, is not a new species but a junior synonym of *Glossiphonia algira* MOQUIN-TANDON, 1846, hence this latter is to be regarded as the type-species of the genus.

The oldest known species belonging to the genus is *Hirudo paludosa*, described by CARENA in 1824. Since the organisation of this species is still far from being adequately known, I had studied it rather thoroughly. I intend to submit my results in a separate paper, together with the comparative anatomy of the known species of the genus.

With respect to the species, I wish to remark only that I have omitted from the Key and Catalogue, given below, the species *verrucata* FR. MÜLLER, 1844, *phalera* GRAF, 1899, and *picta* VERILL, 1872, since they have recently been reallocated by MOORE (1958) and MANN (1961) to the genus *Batracobdella*. I contend, namely, that *verrucata* still belongs to the genus *Boreobdella* JOHANSSON, 1929, (approved by MANN as late as 1953), while the two latter species are reassigned to *Placobdella* BLANCHARD, 1893 (emend. AUTRUM, 1936).

The present paper deviates insofar from the earlier one, discussing *Glossiphonia* JOHNSON, 1816, that it also contains figures of all 16 species relegated to the genus. If the figure is not original or taken from the literature but merely a sketchy reconstruction based on the description, the serial number of the figure is marked by an asterisk.

Batracobdella Viguier, 1879

Batracobdella Viguier (1879): C. R. Acad. Sci. Paris, **89**, p. 110—112.

Synonymy:
Batrachobdella Viguier (1879) (nec Caballero, 1931): Ann. Mag. Nat. Hist., (5) **4**, p. 250—251.
Clepsinides Augener (1926): Zool. Anz., **68**, p. 244—246.
Dundjibdella Sciacchitano (1939): Rev. Zool. Bot. Afr., **32**, p. 353.

Diagnosis: Glossiphonid, generally of small size. Body elongate, ovate, ovato-elliptical or sublanceolate, dorso-laterally depressed, dorsally slightly convex and ventrally nearly flat or concave. Head and sucker either not separated from body or more or less widened, respectively definitely expanded. Caudal sucker circular or discoidal, distinct from body, attached centrally, directed ventrad, sometimes with a well-formed peduncle invariably narrower than maximum body width (except *magnidiscus* Moore). Body opaque, transparent, gelatinous or soft. Colour and pattern most varying but generally unicoloured. Surface either smooth or with varying rows of sensory papillae.

Complete somite triannulate (a_1, a_2, a_3). Number of complete somites almost invariably 20 (V—XXIV). Total number of annuli between 67—72 (?74). Eyes typically one or two pairs, rarely three; in certain cases coalescence possible in various combinations. Mouth a minute pore in middle or near centre of cephalic sucker, mostly on a small, isolated papilla. Salivary glands diffuse, rarely compact. Oesophageal organ present in anatomically known species. Crop with seven (XIII—XIX) lateral diverticula (=gastric caeca); last elongated pair directed posteriorad; intestine with four pairs of intestinal sacs. 0—2 postanal annuli. Six pairs of testes intersegmental (XIII/XIV—XVIII/XIX). Genital pores separated by 2, rarely by 1 or $1^1/_2$ annuli. Atrium small, atrial cornua fusiform, bulbus ejaculatorius absent, epididymis winding or forming a loose coil. Vagina short, ovisac a simple, elongate tube, terminally exceptionally recurving.

Type-species: *Glossiphonia algira* Moquin-Tandon, 1846.

Key to the Species of the Genus Batracobdella Viguier, 1879

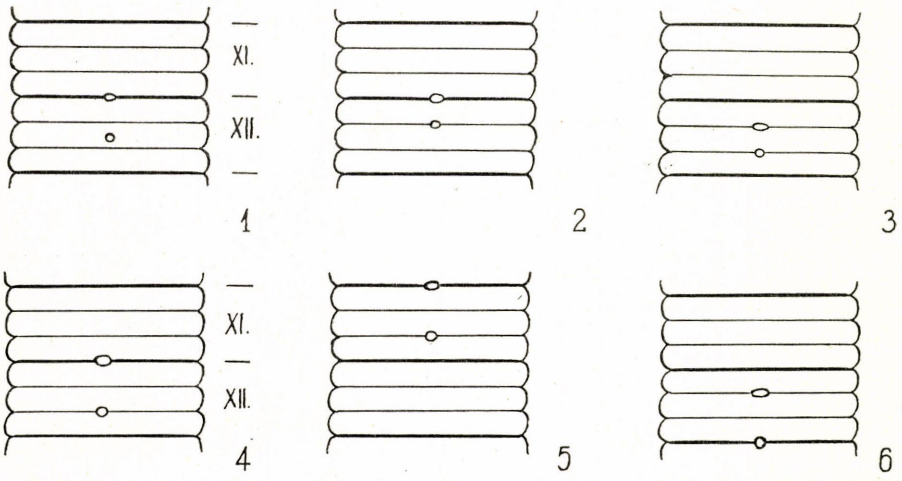
1 (12) Male and female gonopores separated by one or one and a half annuli (Figs. 1—3). Head not separated from body by a narrow, necklike constriction (Figs. 7—10, 12), except in *quadrata* Moore (Fig. 11).

2 (5) Male and female gonopores separated by one and a half annuli, ♂=XI/XII, ♀=XIIa_2 (Fig. 1). Of three last somites, XXV biannulate, XXVI and XXVII uniannulate (Figs. 13—14).

3 (4) Three pairs of eyes present (Fig. 7). One postanal annulus (Fig. 13). Total number of annuli 70. "The receptors are present in large numbers all over the dorsal surface of the body, and for this reason the dorsal surface appears areolated. The receptors are thickly set and form irregular rows on each annulus. Some of the receptors appear circular, others transversally oval" (Baugh, p. 296). Caudal sucker less than half of maximum width of body (Fig. 13). A pair of compact salivary glands. Preserved specimens colourless. Length: 3 mm; width: 1.5 mm. Host: unknown. — India **hardingi** Baugh, 1960

4 (3) Two pairs of eyes present (Fig. 9). No postanal annulus (Fig. 14). Total number of annuli 69. Dorsal surface entirely smooth. Caudal sucker circular, its diameter slightly greater than half of maximum width of body. Uniformly brown, but median stripe and two lateral stripes colourless. Length: 12 mm; width: 3.5 mm. Host: frogs. — China **singularis** (Oka, 1931)

5 (2) Male and female gonopores separated by one annulus (Figs. 2—3); ♂=XI/XII,

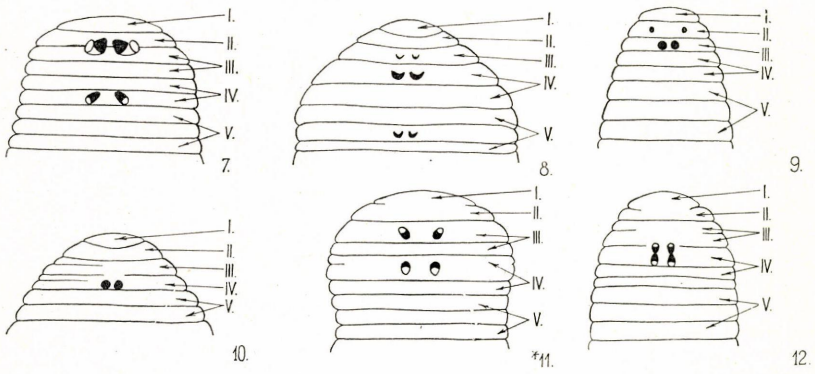


Figs. 1—6. The position of the genital pores on the species of *Batracobdella* VIGUIER. 1 = *hardingi* BAUGH and *singularis* (OKA) (♂—♀ = XI/XII—XIIa$_2$); 2 = *cancricola* (OKA) and *quadrata* MOORE (♂—♀ = XI/XII—XIIa$_1$/a$_2$); 3 = *dubia* RINGUELET and *nuda* (MOORE) (♂—♀ = XIIa$_1$/a$_2$——XIIa$_2$/a$_3$); 4 = *algira* (MOQUIN-TANDON), *amnicola* MOORE, *gemmata* (BLANCHARD), *magnidiscus* (MOORE), *mahabiri* BAUGH, *nilotica* (JOHANSSON), *paludosa* (CARENA) and *reticulata* (KABURAKI) (♂—♀ = XI/XII—XIIa$_2$/a$_3$); 5 = *lobata* (BHATIA) (♂—♀ = X/XI—XIa$_2$/a$_3$); 6 = *paludosa* (CARENA) (♂—♀ = XIIa$_1$/a$_2$—XII/XIII, according to MANN, 1954, p. 382)

♀ = XIIa$_1$/a$_2$ (*cancricola* OKA, and *quadrata* MOORE), or ♂ = XIIa$_1$/a$_2$, ♀ = XIIa$_2$/a$_3$ (*dubia* RINGUELET, and *nuda* MOORE).

6 (7) Three pairs of eyes present (Fig. 8). No postanal annulus. Last three somites of body strongly reduced, each comprising one annulus only, but annullus of somites XXV and XXVI considerably longer than that of XXVII; former two with a lateral constriction. Caudal sucker discoidal, about two-thirds of maximum body width (Fig. 15). Total number of annuli 68. Dorsal surface of body smooth in macroscopic view. Length: 9 mm; width: 2.5 mm. Host: crabs (*Potamon* sp.). — China **cancricola** (OKA, 1928)

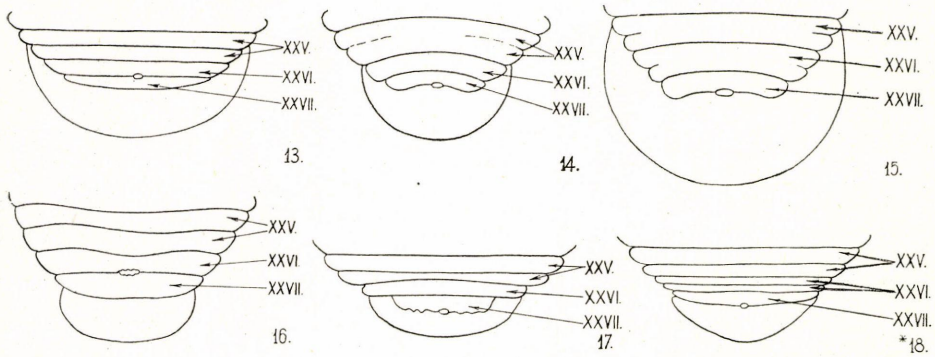
7 (6) Two or merely one pair of eyes present (Figs. 10—12). Last three somites of body not so strongly reduced, somite XXV invariably biannulated (Figs. 16—18). Total number of annuli 67, 69, or 72.



Figs. 7—12. Cephalic end of *Batracobdella* species. 7 = *hardingi* BAUGH (after BAUGH); 8 = *cancricola* (OKA) (after OKA); 9 = *singularis* (OKA) (after OKA); 10 = *dubia* RINGUELET (after RINGUELET); 11 = *quadrata* MOORE (sketch); 12 = *nuda* (MOORE) (after MOORE)

8 (9) Only one pair of eyes (Fig. 10). One postanal annulus (Fig. 16). Total number of annuli 67. Number of complete somites only 19, because even somite V merely biannulate. Caudal sucker small, circular, its diameter about half of maximum body width (Fig. 16). One pair of compact salivary glands. Gastric caeca much reduced. Dorsal surface greyish-violet, ventral surface pale creamy. Dorsal surface with a dark band along paramedian line, and remnants of a longitudinal stripe on each side of median line. Length: 15 mm; width: 3.5 mm. Host: unknown. — Argentina

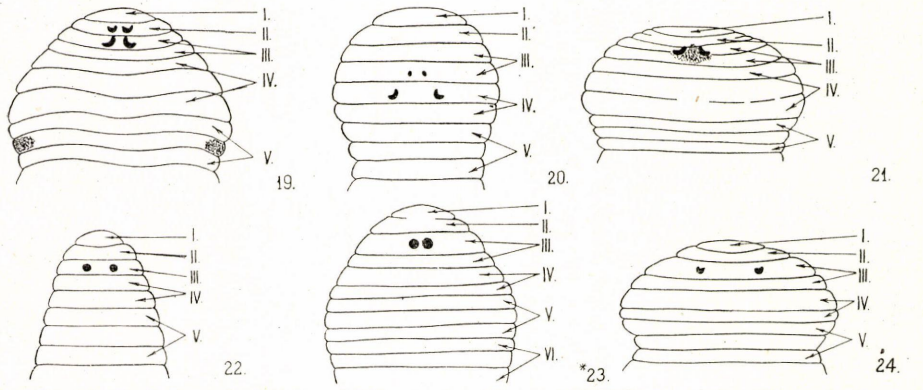
dubia RINGUELET, 1958



Figs. 13—18. Caudal end of *Batracobdella* species. 13 = *hardingi* BAUGH (after BAUGH); 14 = = *singularis* (OKA) (after OKA); 15 = *cancricola* (OKA) (after OKA); 16 = *dubia* RINGUELET (after RINGUELET); 17 = *nuda* (MOORE) (after MOORE); 18 = *quadrata* MOORE (sketch)

9 (8) Two pairs of eyes present (Figs. 11—12). No postanal annulus (Figs. 17—18).

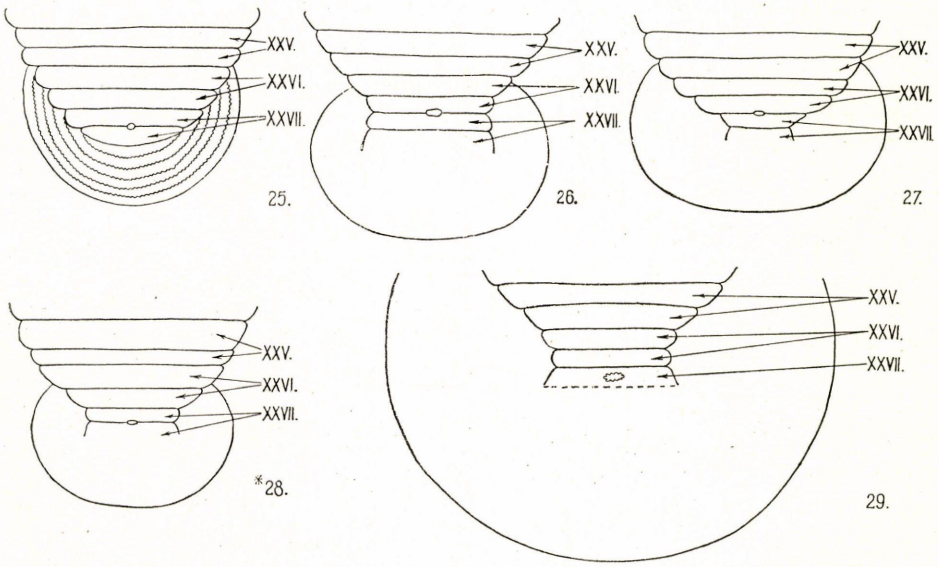
10 (11) Two pairs of eyes separated by a ring; four eyes situated in four corners of a square (Fig. 11). Margins of annulus a_2 of complete somites not carinate. Head fairly distinct, with a strongly thickened rim. Total number of annuli 72. Sensory papillae absent; no well-marked, large, cutaneous papillae, but about 30 small ones on dorsum of each annulus of median body region, and a slight median dorsal ridge bearing slightly bigger papillae on annuli a_2 and a_3. Similar papillae indicated, in intermediate series, on a_2 and a_3 and also on inner paramedians of a_2 and on outer paramedians of a_3. Caudal sucker very small, without pedicel; its diameter considerably shorter than half of maximum body width (Fig. 18).



Figs. 19—24. Cephalic end of *Batracobdella* species. 19 = *mahabiri* BAUGH (after BAUGH); 20 = *reticulata* (KABURAKI) (after KABURAKI); 21 = *magnidiscus* (MOORE) (after MOORE); 22 = *algira* (MOQUIN-TANDON) (original); 23 = *amnicola* MOORE (sketch); 24 = *gemmata* (BLANCHARD) (after RINGUELET)

No colour; uniformly faded to a dull gray. Length: 4—4.5 mm; width: 2.5 mm. Host: unknown. — Ethiopia, Belgian Congo **quadrata** MOORE, 1939

11 (10) Two pairs of eyes situated behind, and adjacent to, one another, hence no interocular annulus present (Fig. 12); eyes of one or other side eventually coalescent. Head not separated from body. An elevated marginal crest on annulus a_2 of each complete somite, hence margins of body sharp and strongly serrate. Total number



Figs. 25—29. Caudal end of *Batracobdella* species. 25 = *mahabiri* BAUGH (after BAUGH); 26 = *reticulata* (KABURAKI) (after KABURAKI); 27 = *algira* (MOQUIN-TANDON) (original); 28 = *amnicola* MOORE (sketch); 29 = *magnidiscus* (MOORE) (after MOORE)

of annuli 69. Neither sensory nor cutaneous papillae present. Caudal sucker very small, circular, with a narrow, well-formed pedicel (Fig. 17). Colour faded to a uniform greenish-yellow. Length: 8—13.5 mm; width: 2—4 mm. Host: unknown. — China **nuda** (MOORE, 1924)

12 (1) Male and female gonopores separated by two annuli (♂— ♀ = XI/XII—XIIa$_2$/a$_3$ or X/XI—XIa$_2$/a$_3$) (Figs. 4—6). Except for *algira* MOQUIN-TANDON, and *paludosa* CARENA, head invariably and conspicuously distinct by a cervical section from body.

13 (14) All three annuli of complete somites secondarily more or less distinctly divided. Total number of annuli 74. Mouth pore subterminal; three pairs of compact salivary glands. A dark marginal spot on Va$_2$ on both sides of body. Two pairs of eyes on subtriangular head (Fig. 19). Caudal sucker circular, diameter half of maximum body width; remarkable by showing dorsally 6—8 rings with sinuous margins (Fig. 25). Length: 17.7—21 mm; width: 3.9—5.3 mm. Host: unknown. — India **mahabiri** BAUGH, 1960[1]

14 (13) Annuli of complete somites wholly uniform, without even traces of secondary subdivisions. No marginal dark spot on Va$_2$ on both sides of body. Total number of annuli not more than 72.

[1] This species will certainly have to be reassigned, if nothing more on the basis of the above characters, to the genus *Parabdella*. However, pending the examination of the species, I desist now from this action lest the already involved nomenclatoral problems of the leeches be further confused.

15 (22) Caudal sucker with a more or less well-developed pedicel (Figs. 26—29). Salivary glands diffuse. One, exceptionally two (*reticulata* KABURAKI), pairs of eyes (Figs. 20—23).

16 (17) Two pairs of eyes (Fig. 20); two postanal annuli (Fig. 26). Total number of annuli 72. Caudal sucker small, diameter slightly longer than half of maximum body width. Three longitudinal rows of sensory papillae (one median and two intermedians), a number of irregularly arranged cutaneous papillae; surface thus verrucose. Preserved specimens uniformly olive grey or greyish-brown. Length: 2.5—11 mm; width: 0.9—2.1 mm. Host: *Anodonta* (within the mantle cavity). — India **reticulata** (KABURAKI, 1921)

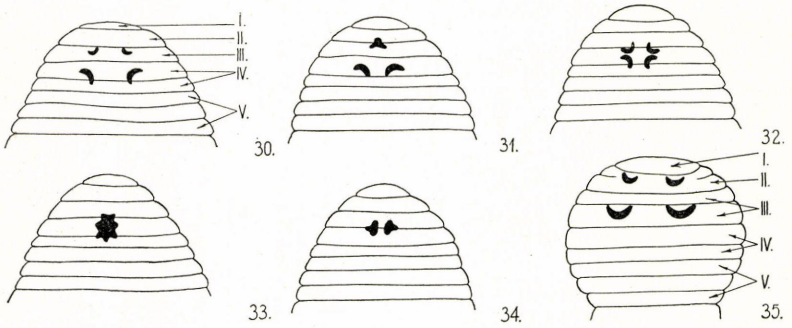
17 (16) Only one pair of eyes present (Figs. 21—23); one postanal annulus (Figs. 27—29).

18 (19) Caudal sucker very large, considerably wider than maximum body width; caudal peduncle narrow (Fig. 29). Size, form, and general proportions resembling those of *Oligobdella*. One pair of eyes on III large, directed obliquely forward, close together and either joined by loose pigment or embedded in common mass of pigment (Fig. 21). Total number of annuli 72. Colour faded, but body and sucker nearly uniformly tinted with pale rusty brown without any discernible pattern. Body and caudal sucker entirely smooth, with no trace of papillae or warts, or any sensory papillae. Length: 7.5 mm; width: 2.5 mm. Host: fishes (*Rhamdia guatemalensis decolor*, in gills; *Petentia splendida*, in mouth). — Mexico, Guatemala **magnidiscus** (MOORE, 1938)

19 (18) Caudal sucker not strikingly large, its diameter considerably smaller than, or at most as wide as, maximum body width (Figs. 27, 28).

20 (21) Head region not widened, continuing general outline of body, anteriorly rounded, no nuchal construction. Two eyes, situated on $IIIa_1/a_2$, removed from one another, distance between them at least twice greater than diameter of one eye (Fig. 22). Green, seldom brown to castaneous brown. Brown pattern elements often arranged in 14 longitudinal stripes, confining 13 streaks of basic colour, hence median line green. A brown spot surrounding genital pores. Three pairs of longitudinal rows (in outer paramedian, inner and outer paramarginal positions) of sensory papillae on a_2. According to VIGUIER and BLANCHARD, $\sigma^{\prime} - \varphi = 2^1/_2$, because female genital pore on XIa_3! Caudal sucker less than maximum body width (Fig. 27). Length: 7—18 mm; width: 1.5—5 mm. Host: frogs (*Discoglossus pictus, Rana ridibunda*). — Ponto-Mediterranean **algira** (MOQUIN-TANDON, 1846)

21 (20) Head slightly widened and roughly triangular, anterior border rounded, somites VI and VII slightly constricted to form a short neck. Two eyes, situated on $IIIa_1/a_2$, located near one another but not touching, distance between them smaller than diameter of one eye (Fig. 23). Colour in life brownish or olive-green, darker in middle owing to stored blood; with 6 series of white spots at sensory

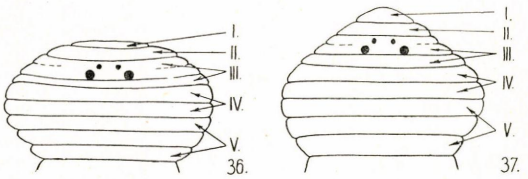


Figs. 30—35. Cephalic end of *Batracobdella paludosa* (CARENA) and *B. lobata* (BHATIA), 30—34 = = Variations in eye position in *Batracobdella paludosa* (CARENA), 30 = Typical specimen (original); 31 = German specines (after JOHANSSON); 32 = British specimen (after MANN); 33 = Polish specimen (original); 34 = Danish specimen (after BENNIKE); 35 = *lobata* (BHATIA) (after BHATIA)

papillae; colour lost in preserved specimens, but caudal sucker and peduncle conspicuously white or ashy. Caudal sucker circular, slightly more than one-half of maximum body width (Fig. 28). Length: 6—13 mm; width: 1.2—2.5 mm. Host: unknown. — Natal

amnicola MOORE, 1958

22 (15) Caudal sucker without pedicel (Figs. 39—43). Salivary glands diffuse or rarely. compact. Two, exceptionally one, pairs (*gemmata* BLANCHARD) of eyes (Figs. 24, 30—37).



Figs. 36—37. Cephalic end of *Batracobdella* species. 36 = *nilotica* (JOHANSSON) (after JOHANSSON); 37 = *tricarinata* (BLANCHARD) (after BLANCHARD)

23 (24) Only one pair of eyes (Fig. 24). No postanal annulus (Fig. 39). Colour in life violet-grey, but preocular annuli and spots of sensory papillae white. Some specimens with a longitudinal dark stripe on both sides immediately along median line. Total number of annuli 71. Sensory papillae arranged in 4 pairs of longitudinal rows on dorsal, and in 3 on ventral side, invariably on annulus a_2. Dorsal papillae situated in inner and outer paramedian, and in paramarginal, positions; ventral side with only one pair of inner paramedian row, less conspicuous than paramarginal ones. Caudal sucker ovoid, its diameter about one-third of greatest body width (Fig. 39). Salivary glands compact. End of ovisacs recurving and clavately incrassate. Length: 10—12 mm; width: 3—5 mm. Host: unknown. — Chile, Argentina, Uruguay **gemmata** (BLANCHARD, 1900)

24 (23) Two pairs of eyes (Figs 30—37); $^1/_2$, 1, or 2 postanal annuli (Figs. 40—43). Salivary glands diffuse.

25 (26) Only one-half postanal annulus (Fig. 42). Total number of complete somites 21; ovisacs segmentally lobate (Fig. 38). Colour in life pale green, with three dark brown longitudinal (one median and two intermedian) stripes; a_2 of each complete somite tinged dark, bearing 5—9 black spots; caudal sucker with concentrically arranged pigmented stripes (Fig. 42). Surface smooth, neither papillae nor sensory papillae present. Two pairs of eyes behind one another on II and $IIIa_2/a_3$ (Fig. 35). Caudal sucker circular, its diameter about two-thirds of maximum body width. Male bursa well developed, with a distinct prostata (!) section; differentiated oviducts present (Fig. 38). Length: 10 mm; width: 3 mm. Host: unknown. — India **lobata** (BHATIA, 1934)

26 (25) One or two postanal annuli (Figs. 40—41, 43). Total number of complete somites invariably 20; ovisacs tubular, never segmentally lobate.

27 (28) Head anteriorly rounded, no nuchal constriction (Fig. 30). Papillae entirely absent; prominent sensory papillae indiscernible in superior view. Total number of annuli 70. Colour in life mostly uniformly deep sea-green or brownish-green. Brown pigment cells, invariably present beside green ones (especially in anterior part of body), occasionally forming dark, indistinct spots, indeed, some specimens with a pair of dark brown longitudinal lines in inner paramedian positions, but segmentally interrupted by yellow spots occurring on sensory annulus a_2 of every segment. Yellowish spots eventually occurring also elsewhere on dorsal surface. Typically two pairs of eyes (Fig. 30); smaller first pair on III, larger second pair on IVa_1/a_2. This arrangement frequently modified by coalescence of eyes in various ways (Figs. 31—34). Caudal sucker small, circular, its diameter smaller than half of maximum body width (Fig. 41). Length: 7—20 mm; width: 2—5 mm. Host: snails; also parasitic on tadpole gills of *Pelobates fuscus*. — Palearctic Region **paludosa** (CARENA, 1824)

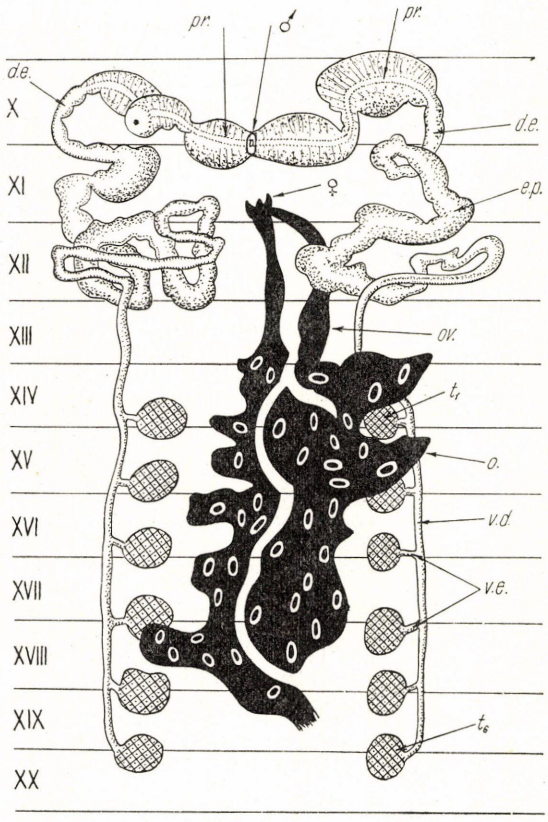


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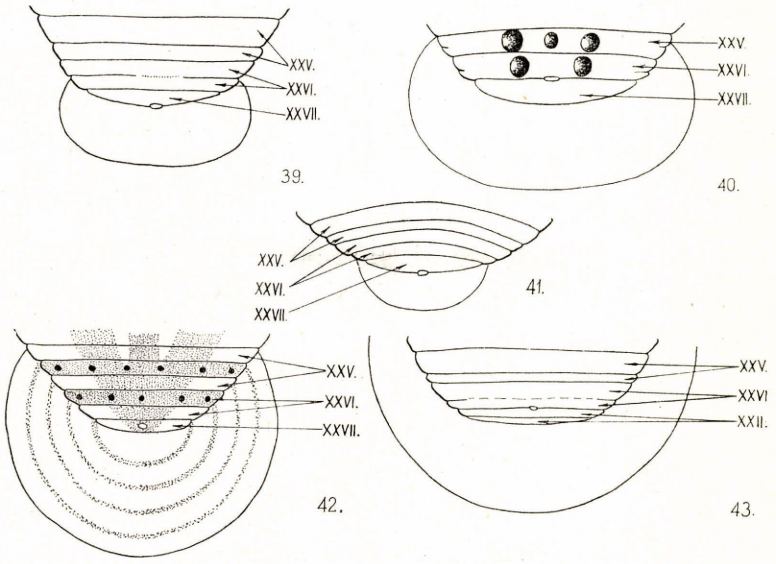
Fig. 38. Reproductive organs of *Batracobdella lobata* (BHATIA). *d. e.* = ductus ejaculatorius; *ep.* = = epididymis; *o.* = ovisac; *ov.* = oviductus; *pr.* = prostata; t_1, t_6 = testes 1st and 6th; *v. d.* = vas deferens; *v. e.* = vas efferens (after BHATIA)

28 (27) Head distinctly widened, with a conspicuous neck (Figs. 36—37). Dorsal surface at most with three longitudinal rows of sensory papillae. Two pairs of eyes on III (Figs. 36—37): one pair large, subsphaerical and very black, eyes separated from one another by a distance less than diameter of one eye; other pair very small (frequently completely overlooked), flatter, eyes close together and partly between, and in front of, large ones. A pair of diffuse or compact salivary glands. Oesophageal organ present.

29 (30) Last three somites (XXV—XXVII) extraordinarily reduced, each one uniannulate (Fig. 40). Total number of annuli 69. One postanal annulus. Rows of papillae eminent, closely crowded to form ridges. Preserved specimens uniformly faded grey. Length: 4—12 mm; width: 1.5—4 mm. Host: shells (*Spatha wahlbergi*, in gill cavity). — South, Central, and East Africa

tricarinata (BLANCHARD, 1897)

30 (29) Last three somites (XXV—XXVII) not extraordinarily reduced, each one biannulate (Fig. 43). Total number of annuli 73. Two postanal annuli. Ridges of papillae less prominent. Preserved specimens uniformly grey with a greenish tint. Length: 4.5—10 mm; width: 1.5—3 mm. Host: unknown. The Sudan, East, Central, and South Africa **nilotica** (JOHANSSON, 1909)



Figs. 39—43. Caudal end of *Batracobdella* species. 39 = *gemmata* (Blanchard) (after Ringuelet); 40 = *tricarinata* (Blanchard) (after Blanchard); 41 = *paludosa* (Carena) (original); 42 = *lobata* (Bhatia) (after Bhatia); 43 = *nilotica* (Johansson) (after Johansson)

Catalogue of the Species[2]

Genus: **Batracobdella** Viguier, 1879

(Viguier, 1879: C. R. Acad. Sci. Paris, **89**, p. 110—112)

1. **algira** (Moquin-Tandon, 1846): Monographie de la famille des Hirudinées, Paris, p. 364—366, Pl. XIII, Figs. 10—15 *(Glossiphonia)*. — Diesing (1850): Systema Helminthum, Vindobonae, **1**, p. 449—450 *(Clepsine)*. — Blanchard (1893): Ann. Soc. Espan. Hist. Nat., **22**, p. 247—253, Figs. 1—4 *(Glossiphonia)*. — Wolterstorff (1900): Zool. Anz., **23**, p. 23—27 *(Glossosiphonia)*. — Kovalevsky (1900): Mém. Soc. Zool. France, **13**, p. 66—88, Pls. III—V, Figs. 1—35 *(Helobdella)*. — plotnikov (1907): Ann. Mus. Zool. Acad. Imp. Sci St.-Pétersbourg, **10**, p. 137 *(Glossosiphonia)*. — Rousseau (1912): Ann. Biol. Lacustre, **5**, p. 274—275, Figs. 12—13 *(Helobdella)*. — Johansson (1926): Mitt. Zool. Mus. Berlin, **12**, p. 228—231 *(Batrachobdella)*. — Autrum (1936): Hirudineen. — in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt. 4. Buch, 1 Teil, p. 36—37, Fig. 25. — Lukin & Epstein (1960): Zool. Journ. Moscov, **39**, p. 1429 *(Batrachobdella)*. — Lukin (1962): Hirudinea. — in: The Fauna of Ukraine, Kiew, **30**, p. 93—95, Figs. 58—59 *(Batrachobdella)*.

= *latasti* Viguier (1879): C. R. Acad. Sci. Paris, **89**, p. 110—112. — Viguier (1879): Ann. Mag. Nat. Hist., (5) **4**, p. 250—251 *(Batrachobdella)*. — Viguier (1880): Arch. Zool. exp. gén., **8**, p. 373—390, Pl. 29—30.

[2] The catalogue does not contain the complete bibliography referring to the respective species, but only the most important ones adding new data to the original description, or presenting figures, or treating synonymic problems.

= *schottlaenderi* JOHANSSON (1926): Mitt. Zool. Mus. Berlin, **12,** p. 228 *(Placobdella)*, nomen nudum.

Distribution: North Africa, Portugal, Spain, Balearic Islands, Corsica, Crimean Peninsula.

2. **amnicola** MOORE (1958): Ann. Natal Mus., **14,** p. 313—316, Pl. VII, Figs. 5—7. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 176.

Distribution: Natal.

3. **cancricola** (OKA, 1928): Proc. Imp. Acad., Tokyo, **4,** p. 607—608, Figs. A—B *(Hemiclepsis)*. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 43.

Distribution: China.

4. **dubia** RINGUELET (1958): Acta Zool. Lilloana, Tucuman, **15,** p. 121—125, Figs. 1—6.

Distribution: Argentina.

5. **gemmata** (BLANCHARD, 1900): Ergebn Hamb. Magalh. Sammelreise 1892/1893. Hamburg, **3** (3), p. 11—12, Figs. IVa—b *(Helobdella)*. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 31—32, Pl. I, Fig. 5 *(Helobdella)*. — PINTO (1923): Rev. Mus. Paulist., **13,** p. 838—839, Fig. 29 *(Helobdella)*. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt. 4 Buch, 1 Teil, p. 17 *(Helobdella)*. — RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 223. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 182. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 51—55, Figs. 25—26.

Distribution: Chile, Argentina, Uruguay.

6. **hardingi** BAUGH (1960): Parasitology, **50,** p. 295—298, Figs. 5a—b.

Distribution: India.

7. **lobata** (BHATIA, 1934): Ann. Parasit. hum. et comp., **12,** p. 121—129, Figs. 1—4 *(Glossiphonia)*. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1 Teil, p. 40—41.

Distribution: India.

8. **magnidiscus** (MOORE, 1938): Publ. Carnegi Inst., No. **491,** p. 68—70, Figs. 1—2 *(Glossiphonia)*. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 144.

Distribution: Guatemala, Mexico.

9. **mahabiri** BAUGH (1960): Zool. Anz., **165,** p. 468—472, Figs. 1a—b, 2a—d.

Distribution: India.

10. **nilotica** (JOHANSSON, 1909): Zool. Anz., **35,** p. 152—154 *(Clepsine)* — JOHANSSON (1913): Res. Swedish Zool. Exp. Egypt and the White Nile 1901, No. **24,** p. 17—23, Fig. 6, Pl. Figs. 7—8 *(Clepsine)*. — MOORE (1933): Journ. Linn. Soc. London, Zool. **38,** p. 299 *(Glossiphonia)*. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1 Teil, p. 39—40, Figs. 28—29. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 12—13, 45, 52—53, Figs. 2—3. — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge Tervuren, Sér. **4,** Miscell. Zool., p. 279. — MOORE (1958): Ann. Natal Mus., **14,** p. 312—313, Pl. VIII. Fig. 16 *(Batrachobdella)*. — SCIACCHITANO (1959): South African Animal Life, **6,** p. 8—9. — SCIACCHITANO (1963): Monit. Zool. Ital., Firenze, **70—71,** p. 176. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 252—253.

= *dartevellei* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 355, Fig. 8 *(Dundjibdella).* — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

= *rubra* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 354—355, Fig. 7 *(Dundjibdella).* — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

= *trilineata* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 356 *(Dundjibdella).* — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

Distribution: The Sudan, East, Central, and South Africa.

11. **nuda** (Moore, 1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 354—357, Pl. XIX, Figs. 3—4, Pl. XXI, Figs. 20—23 [*Glossiphonia (Helobdella)*]. — Moore (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 175—176 [*Glossiphonia (Helobdella)*]. — Autrum (1936): Hirudineen. — in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1 Teil, p. 42.

Distribution: China.

12. **quadrata** Moore (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 304—306, Pl. 26, Fig. 20. — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 45, 51—52. — Sciacchitano (1960): Rev. Zool. Bot, Afr., **61,** p. 288. — Sciacchitano (1963): Monit. Zool. Ital., Firenze, **70—71.** p. 176.

= *bomensis* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 356—357, Figs. 10—11 *(Dundjibdella).* — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

= *bomensis* var. *grisea* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 357 *(Dundjibdella).* — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

Distribution: Ethiopia, Belgian Congo.

13. **paludosa** (Carena, 1824): Mem. R. Accad. Sci. Torino, **28,** p. 331—334 *(Hirudo).* — Moquin-Tandon (1826): Monographie de la famille des Hirudinées. Montpellier, p. 103—105, Pl. IV, Fig. 3 *(Clepsine).* — de Blainville (1828): Sangsues. — in: Diction. Sci. Nat. Paris, **57,** p. 565 *(Glossobdella).* — de Filippi (1839): Giorn. Sci. medico-chirurg. Pavia, **11,** Fasc. 61, p. 6 *(Clepsine).* — Moquin-Tandon (1846): Monographie de la famille des Hirudinées, Paris, p. 371—373, Pl. XIV. Figs. 2—4 *(Glossiphonia).* — Diesing (1850): Systema Helminthum, Vindobonae, **1,** p. 452 *(Clepsine).* — Örley (1886): Mathemtermtud. Közlem., **22** (11), p. 104 *(Clepsine).* — Apáthy (1888): Zool. Jahrb. Syst., **3,** p. 773—774 *(Clepsine).* — Blanchard (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 146, p. 2—3 *(Glossiphonia).* — Blanchard (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 30—31 *(Glossosiphonia).* — Johansson (1909): Hirudinea. — in Brauer: Die Süsswasserfauna Deutschlands, H. **13,** p. 75—76, Fig. 130 *(Glossosiphonia).* — Gedroyc (1915): Rozpr. Wiad. Mus. Dzied. Lwów, **2,** p. 48—50, Figs. 12A—C *(Glossiphonia).* — Dequal (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 712, p. 2—3 *(Glossosiphonia).* — Augener (1926): Zool. Anz., **68,** p. 244—246 *(Clepsinides).* — Johansson (1929): Hirudinea. — in Dahl: Die Tierwelt Deutschlands, T. **15,** p. 144, Figs. 21a—f *(Batrachobdella).* — Pawlowski (1936): Hirudinea. — in: Fauna Slodkowodna Polski, Warszawa, **26,** p. 108—110, Figs. 75—76 *(Batrachobdella).* — Autrum (1936): Hirudineen. — in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt. 4. Buch, 1 Teil, p. 38—39, Figs. 26A—B, 27. — Pawlowski (1938): Arch. Hidrobiol. Ichtyol. Suwalki, **11,** p. 48—49 *(Batrachobdella).* — Bennike (1943): Fol. Limnol. Scand., No. **2,** p. 66—67, 76—77, Fig. C *(Bat-*

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Distribution: Europa, Afghanistan, China, Japan, North America.

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Distribution: India, Malay Peninsula.

15. **singularis** (Oka, 1931): Proc. Imp. Acad. Tokyo, **7,** p. 121—123, Figs. A—C *(Hemiclepsis)*. — Autrum (1936): Hirudineen. — in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1 Teil, p. 42—43, Fig. 31.

Distribution: China.

16. **tricarinata** (Blanchard, 1897): Hirudineen Ost-Africas. — in: Die Thierwelt Deutsch-Ost-Afrikas, **4** (2), No. 13, p. 4—5, Pl. Figs. 2a—b, 3 *(Helobdella)*. — Moore (1933): Journ. Linn. Soc. London, Zool. **38,** p. 299 *(Glossiphonia)*. — Autrum (1936): Hirudineen. — in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 18—19, Fig. 13 *(Helobdella)*. — Augener (1936): Sitzungsb. Ges. Naturf. Fr. Berlin Jahrg. **1935,** p. 391—392 *(Helobdella)*. — Moore (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 302—304, Pl. 26, Fig. 19. — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8. Sci. Zool., **16,** p. 10—12, 45, 51. — Sciacchitano (1957): Rev. Zool. Bot. Afr., **56,** p. 374. — Sciacchitano (1958): South African Animal Life, **6,** p. 8. — Sciacchitano (1961): Publ. cult. Co. Diam. Ang., Lisboa, No. **52,** p. 109—110, Figs. 1—2. — Sciacchitano (1963): Monit. Zool. Ital, Firenze, **70—71,** p. 176. — Sciacchitano (1965): Rev. Zool. Bot. Afr., **71,** p. 30.

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= *triserialis* Sciacchitano (1939): Rev. Zool. Bot. Afr., **32,** p. 353—354, Fig. 6 *(Dundjibdella)*. — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

Distribution: South, Central, and East Africa.

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   Distribution: Turkestan.
2. *kasmiana* (Oka, 1910): Annot. Zool. Jap., **7,** p. 169 *(Hemiclepsis).* — Oka (1917): Mem. Asiat. Soc. Bengal., **6,** p. 167 *(Hemiclepsis).* — Oka (1928): Proc. Imp. Acad. Tokyo, **4,** p. 64—66, Figs. A—C *(Hemiclepsis).* — Autrum (1936): Hirudineen — in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 37—38.
   Distribution: Japan, China.
3. *windhukensis* (Augener, 1936): Sitzungsb. Ges. Naturf. Ges. Fr. Berlin, Jahrg. **1935,** p. 389—390, Fig. 2 *(Clepsinides).*
   Distributions: Southwest Africa.

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