

## On the Genus *Hemiclepsis* VEJDOVSKÝ, 1884, with a Key and Catalogue of the Species (Hirudinoidea: Glossiphoniidae)

By

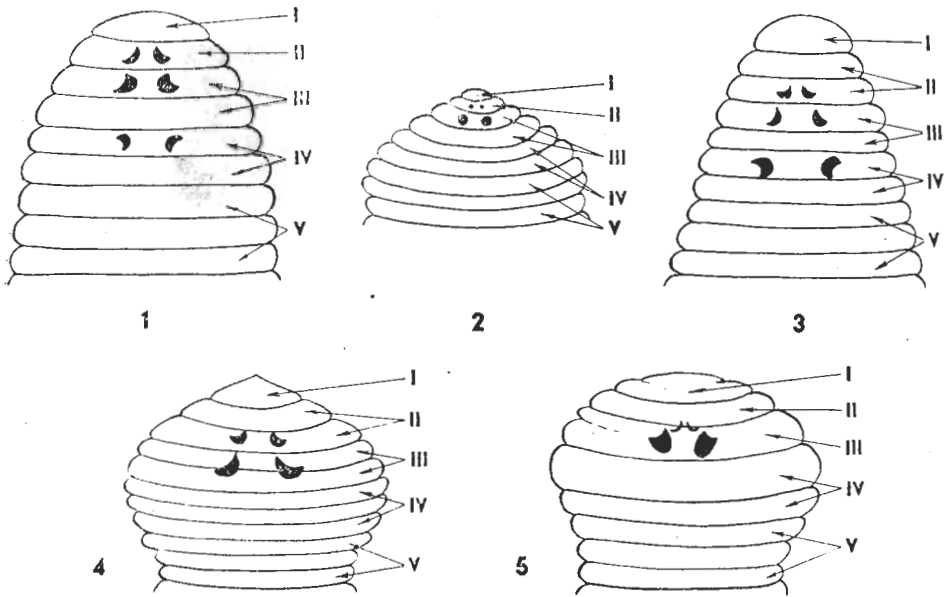
Á. SOÓS\*

The species of the genus *Hemiclepsis* VEJDOVSKÝ, comprising, so far as our present knowledge goes, only 4 species and 1 subspecies, range in the Palearctic Region and in India and only one subspecies invades the South-East Indian islands.

The genus *Hemiclepsis* was established in 1884 by VEJDOVSKÝ, in the course of his studies concerning the excretory system of the leeches for the species *Clepsine tessulata* (O. F. MÜLLER, 1774) and *Cl. marginata* (O. F. MÜLLER, 1774). Unfortunately, VEJDOVSKÝ mentioned only, in merely a footnote to his work, that these species differ so much "both in their external characters and internal structure" from the other species of the genus *Clepsine* SAVIGNY, 1822, that he establishes the genus *Hemiclepsis* for them, without, however, submitting a generic characterization of even a few words. In 1892, BLANCHARD redescribed MÜLLER's species under the name *Glossiphonia marginata*. The first characterization of the genus *Hemiclepsis* was also given by BLANCHARD in 1894, relegating to it the two species mentioned by VEJDOVSKÝ. In 1902, LIVANOW showed that the two species, together with some other ones synonymized earlier by BLANCHARD with the species *Hemiclepsis tessulata* (O. F. MÜLLER), form two well distinguishable and distinct groups. One of the groups comprises MÜLLER's *tessulata* and some other species synonymized with it earlier, as well as his new species described concurrently therein. For these, LIVANOW erected the genus *Protolepsis*. There remained in the other group merely MÜLLER's *marginata*, becoming the type-species of the genus *Hemiclepsis*.

For a long time, it was only this one species, shown from the greater part of Europe, known to belong to the genus. True, OKA had in the meantime described a number of new species in the genus, but it was found later that they had to be reassigned to other genera. Thus, OKA described in 1910 the species *Hemiclepsis kasmiana* (mentioned as *H. casmiana* in his work in 1917), then in 1917 *H. siamensis*, in 1925 *H. okadaï*, in 1928 *H. cancricola* and *H. smaragdina*, and in 1931 *H. singularis*. It was found that, with the exception of the species

\* Dr. ÁRPÁD SOÓS, Természettudományi Múzeum Állattára (Zoological Department of the Hungarian Natural History Museum), Budapest, VIII. Baross u. 13.



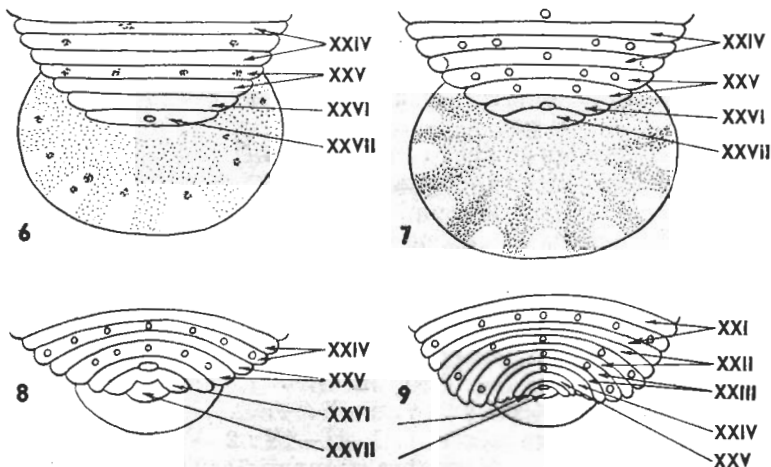
Figs. 1—5. Head region of *Hemiclepsis* species. 1: *bhatiai* BAUGH; 2: *japonica* (OKA); 3: *viridis* CHELLADURAI; 4: *marginata marginata* (O. F. MÜLLER); 5: *marginata asiatica* MOORE (1 after BAUGH, 2 after OKA, 3 after CHELLADURAI, 4—5 original)

*H. siamensis* and *H. okadai* which belong to *Placobdella* BLANCHARD, 1893 (emend. AUTRUM, 1936), all of these species are to be relegated to the genus *Batracobdella* VIGUIER, 1879; indeed, it was also discovered that *H. smaragdina* is a junior synonym of *B. paludosa* (CARENA, 1824), known since long. On the other hand, it was proved that OKA's *Placobdella japonica*, described in 1932, is a true *Hemiclepsis* taxon. Also, MOORE described in 1924 a new subspecies of the type-species under the name *H. marginata asiatica* from Kashmir. The exact range of the two subspecies is still unknown. For clarification of this problem, one would need the revision of the known specimens deriving from the Oriental Region. In 1934, CHELLADURAI described from India the third *Hemiclepsis* species, under the name *viridis*. Finally, the youngest species of the genus, *bhatiai* BAUGH, 1960, was recently described also from India.

### *Hemiclepsis* VEJDOVSKÝ, 1884 (emend. LIVANOW, 1902)

VEJDOVSKÝ (1884): Sitzungsber. königl. Böhm. Ges. Wiss. in Prag, Jahrg. 1883, p. 421 (partim). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, 9, No. 192, p. 31—32 (partim). — LIVANOW (1902): Zool. Jahrb. Syst., 17, p. 354.  
 S y n o n y m y : *Haemocharis* DE FILIPPI (1837) (nec SAVIGNY, 1822): Memoria sugli anellidi della famiglia delle Sanguisughe. Milano, p. 26.

D i a g n o s i s : Glossiphonid, generally of small, rarely medium size. Body ovate-lanceolate or claviform, opaque or more or less translucent. Head region either dilated into a permanent cephalic sucker, distinct from body, or only slightly expanded failing to form a distinct cephalic sucker. Caudal sucker circular or discoid, distinct from body, centrally attached, directed ventrad,



Figs. 6—9. Caudal region of *Hemiclepsis* species. 6: *bhatiai* BAUGH; 7: *marginata marginata* (O. F. MÜLLER); 8: *viridis* CHELLADURAI; 9: *japonica* (OKA) (6 after BAUGH, 7 original, 8 after CHELLADURAI, 9 after OKA)

always narrower than maximum body width. Colour and pattern variable, but, except *japonica* OKA, never unicoloured (when alive). Surface either smooth or with varying rows of sensory papillae.

Complete somites triannulate ( $a_1, a_2, a_3$ ). Number of complete somites varying, between 18 and 21. Total number of annuli between 65 and 72. Eyes two or three pairs. Mouth-opening usually within cephalic sucker (subterminal on *japonica* OKA). One pair of compact salivary glands. Crop with nine, exceptionally (*marginata* O. F. MÜLLER) ten or eleven, pairs of lobated gastric caeca, some situated in preclitellar region, last elongated pair directed posteriorad; intestine with four pairs of simple diverticula. One-half, one or two, postanal annuli. Testes 6, exceptionally (*marginata* O. F. MÜLLER) 10 pairs. Genital pores separated by two, rarely one and a half, annuli. Atrium small, atrial cornua fusiform, ductus ejaculatori forming a simple or a coiled preatrial loop. A distinct epididymis not distinguishable. Vagina very short, ovisacs simple, elongate, distinct tubes.

Type-species: *Hirudo marginata* O. F. MÜLLER, 1774.

### Key to the Species of the Genus *Hemiclepsis* Vejdovskij, 1884

- 1 (4) Three pairs of eyes, cephalic region only slightly expanded (Figs. 1, 3\*); one-half or two postanal annuli (Figs. 6, 8). Total number of annuli 70 or 71. Always six pairs of testes; nine pairs of gastric caeca. Genital pores separated by one and a half, or two, annuli.

\* The drawings illustrating the original specific descriptions by BAUGH, CHELLADURAI, and OKA had manifestly been made of conserved and more or less contracted specimens, hence the dilation of the cephalic region is not or hardly distinguishable on the figures taken from the works of the above authors and now published herein, though this characteristic was emphatically pointed out in the text. Unfortunately, I had no occasion to study these three species.

2 (3) Genital pores separated by one and a half annuli ( $\sigma = \text{XI/XII}$ ,  $\varphi = \text{XII}a_2$ ). One-half postanal annulus. Annulation: I—II: 1, III—IV: 2, V—XXIV: 3, XXV: 2, XXVI—XXVII: 1; total number of annuli 70. Three pairs of eyes (Fig. 1) arranged in two parallel rows in second, third and fifth annuli; second pair of eyes largest. Sensory papillae absent. Colour in preserved specimens light creamy, but 14 or 15 light brown spots on each side, arranged into longitudinal rows in intermedian positions on middle annulus ( $a_2$ ) of each somite from X. Chromatophores, arranged in irregularly distributed spots, present in medio-longitudinal field between two rows of intermediate spots. Caudal sucker (Fig. 6) about two-thirds of maximum body width. Length: 14—17 mm, width: 2—2.5 mm. Host: unknown. — India

**bhatiai** BAUGH, 1960

3 (2) Genital pores separated by two annuli ( $\sigma = \text{XI/XII}$ ,  $\varphi = \text{XII}a_2/a_3$ ); two postanal annuli. Annulation: I: 1, II—IV: 2, V—XXIV: 3, XXV: 2, XXVI—XXVII: 1; total number of annuli 71. Three pairs of eyes (Fig. 3) arranged in two sub-parallel rows in third, fourth and sixth annuli; third pair of eyes largest. Sensory papillae present, minute, uniform, in a transverse line across middle annulus ( $a_2$ ) of each somite. Colour characteristic. Dorsal surface with 15 to 25 bright pea-green longitudinal subparallel lines. A bright dark green line medio-dorsally; also 7 to 12 lines on both sides, most distinct about middle region of body. All composed of numerous, closely adjacent pigment spots. When well developed, lines distinct and continuous, otherwise appearing as dotted lines. Also ventral surface with a few lighter lines. Caudal sucker (Fig. 8) about one-fourth of maximum body width. Length: —8 mm, width: —3.7 mm. Host: frogs (*Rana hexadactyla* and *R. tigrina*). — India

**viridis** CHELLADURAI, 1934

4 (1) Two pairs of eyes; cephalic region dilated into a permanent cephalic sucker, at other times only slightly expanded (Figs. 2, 4—5). Always one postanal annulus (Figs. 7, 9). Total number of annuli 65, 67 and 72 respectively. Sensory papillae in seven longitudinal rows. Testes: 6 or 10 pairs; gastric caeca: 9, 10 or 11 pairs respectively. Genital pores separated by two annuli ( $\sigma = \text{XI/XII}$ ,  $\varphi = \text{XII}a_2/a_3$ ).

5 (6) Head region only very faintly dilated (Fig. 2). Mouth-opening subterminal. 9 pairs of gastric caeca. Two pairs of eyes on second and third annuli; first pair much smaller and nearer to one another than considerably larger second pair (Fig. 2). Annulation: I—II: 1, III—IV: 2, V—XXII: 3, XXIII: 2, XXIV: 1 (2), XXV—XXVII: 1; total number of annuli 65 (66). All sensory papillae, appearing on middle annulus ( $a_2$ ) of each somite, situated in median, inner and outer paramedial, and paramarginal positions. Most prominent papillae located along median and outer paramedial lines; occasionally only these discernible. Caudal sucker (Fig. 9) small, less than one-third of maximum body width. Unicoloured greyish-green to greyish-brown, preserved pale grey. Length: 18 mm, width: 12 mm. Host: unknown. — Japan

**japonica** (OKA, 1932)

- 6 (5) Head region dilated into a permanent cephalic sucker, distinct from body. Mouth-opening within cephalic sucker itself. 10 or 11 pairs of gastric caeca. Total number of annuli more than 66.
- 7 (8) Two pairs of subequal eyes in inner paramedian position, situated upon third and fourth annuli respectively, but second pair always somewhat larger (Fig. 4). Annulation: I: 1, II—III: 2, IV—XXIV: 3, XXV: 2, XXVI—XXVII: 1; total number of annuli 72. Ground colour pale bright brown with a greenish or reddish hue of varying intensity; however, thin margins, of body, suckers colourless or transparent; dorsal surface with seven longitudinal rows of lemon yellow spots: four spots in outer paramedian and inner paramarginal positions on middle annulus ( $a_2$ ) of each somite, further three spots, one dorso-median and two marginal, on third annulus ( $a_3$ ) of each somite. Caudal sucker (Fig. 7) about two-thirds of maximum body width, with an outer and often an inner arc of lemon yellow spots, occasionally with reddish-brown radial markings between them. Length: 10—30 mm, width: 2—7 mm. Host: chiefly fishes and amphibian larvae, but also certain molluscs. — Palearctic Region  
*marginata marginata* (O. F. MÜLLER, 1774)
- 8 (7) Two pairs of eyes, but first pair closely approximated and so minute that easily escaping observation, generally situated immediately in front of conspicuous and widely separated larger second pair of eyes (Fig. 5). Annulation considerably reduced: I—III: 1, IV: 2, V—XXIII: 3, XXIV: 2, XXV—XXVII: 1; total number of annuli 67. Colour reddish-brown or brownish-yellow, paler towards suckers. Median row of spots often coalescing to form a more or less distinct longitudinal pale yellow line; spots on middle rings, again, tending to spread laterally, forming dotted or sometimes continuous transverse stripes. Length: 5—20 mm, width: 2—6 mm. Host: unknown. — Kashmir, Sumatra  
*marginata asiatica* MOORE, 1924

### *Catalogue of the Species*

Genus: *Hemiclepsis* VEJDOVSKÝ, 1884 (emend. LIVANOW, 1902)

VEJDOVSKÝ (1884): Sitzungsber. königl. Böhm. Ges. Wiss. in Prag, Jahrg. 1883, p. 421 (partim).

1. *bhatiai* BAUGH (1960): Parasitology, 50, p. 291—295, Figs. 3—4.

Distribution: India.

2. *japonica* (OKA, 1932): Proc. Imp. Acad. Tokyo, 8, p. 51—53, Figs. A-C (*Placobdella*). — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, 4, III. Abt., 4. Buch, 1. Teil, p. 51.

Distribution: Japan.

- 3a. *marginata marginata* (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilium, Havniae et Lipsiae, 1, Pars 2, p. 46—47 (*Hirudo*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées. Montpellier, p.

133, Pl. VII, Fig. 2 (*Piscicola*). — DE BLAINVILLE (1828): Sangsues. — in: Dictionn. Sci. Nat., 57, p. 558 (*Ichthyobdella*). — DE FILIPPI (1837): Memoria sugli anellidi della famiglia delle Sanguisughe. Milano, p. 26 (*Haemocharis*). — MÜLLER (1844): Arch. Naturg., 10, p. 376, Pl. X, Fig. 14 (*Clepsine*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. 2. Edit. Paris, p. 375—379, Pl. XIV, Figs. 10—20 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, I, p. 447 (*Clepsine*). — APÁTHY (1888): Zool. Jahrb. Syst., 3, p. 787—789 (*Clepsine*). — BLANCHARD (1892): Bull. Soc. Zool. France, 17, p. 173—178, Figs. 1—2 (*Glossiphonia*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, 9, No. 192, p. 33—34, Figs. 5—6. — LIVANOW (1902): Zool. Jahrb. Syst., 17, p. 354—356. — JOHANSSON (1909): Hirudinea. — in BRAUER: Die Süßwasserfauna Deutschlands, 13, p. 71—72, Figs. 119—120. — HARDING (1910): Parasitology, 3, p. 151—154, Figs. 5—6, Pl. XIV, Figs. 28—32. — ROUSSEAU (1912): Ann. Biol. Lacustre, 5, p. 266—267. — GEDROYĆ (1915): Rozpr. Wiad. Mus. Dzied., Lwów, 2, p. 29—32, Figs. 6A—D. — KABURAKI (1921): Rec. Ind. Mus., 22, p. 694—695. — HARDING (1927): Hirudinea. — in: The Fauna of British India, including Ceylon and Burma, London, p. 83—86, Figs. 34—35, Pl. II, Figs. 1—2. — JOHANSSON (1929): Hirudinea. — in DAHL: Die Tierwelt Deutschlands, 15, p. 142, Figs. 15—16. — PAWLOWSKI (1936): Hirudinea. — in: Fauna Slodkowodna Polski, Warszawa, 26, p. 96—100, Figs. 68—70. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, 4, III. Abt., 4. Buch, 1. Teil, p. 51—52, Figs. 35—36. — BENNIKE (1943): Fol. Limnol. Scand., No. 2, p. 79—82, Fig. 17. — VERRIEST (1950): Biol. Jaarb. Dodonaea, 17, p. 207, 227, Fig. 11. — MANN (1953): Proc. Zool. Soc. London, 123, p. 386—387, 390, Figs. 20, 23. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb. (N. S.), 22, p. 190—192, Figs. 5A-B. — AUTRUM (1958): Hirudinea. — in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, 1, Lief. 7b, p. 9, Fig. 3a. — BAUGH (1960): Zool. Anz., 165, p. 476—477, Figs. 5—6. — LUKIN (1962): Hirudinea. — in: The Fauna of Ukraine, Kiev, 30, p. 88—90, Figs. 52—53.

- = *cephalota* CARENA (1821): Mem. Real. Accad. Sci. Torino, 25, p. 298—301, Pl. 12, Fig. 19 (*Hirudo*). — DE BLAINVILLE (1827): Sangsues. — in: Dictionn. Sci. Nat., 47, p. 266, Pl. XXVII, Figs. 5, 5a (*Glossobdella*, but named in plate *Ichthyobdella*).
- = *flava* DALYELL (1853): The Powers of the Creator displayed in the Creation. London, 2, p. 45, Pl. V, Figs. 1—19 (coloured) (*Hirudo*).
- = *oscillatoria* SAINT-AMAS (1825): Mém. Soc. Linn., Paris, 3, p. 193, Pl. VIII. (*Hirudo*).
- = *tessellata* MOQUIN-TANDON (1826) (nec. O. F. MÜLLER, 1774): Monographie de la famille des Hirudinées, Montpellier, p. 133 (*Piscicola*).
- = *variegata* BRAUN (1805): Systematische Beschreibung einiger Egelart. Berlin, p. 61—63, Pl. VII, Figs. 1—6 (coloured) (*Hirudo*).

Distribution: Palearctic Region, Kashmir.

- 3b. *marginata asiatica* MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, 76, p. 359—363, Pl. XXI, Fig. 24. — HARDING (1927): Hirudinea. — in: The Fauna of British India, including Ceylon and Burma, London, p. 87—88, Fig. 25. — AUGENER (1931): Arch. Hydrobiol., Suppl., 8, p. 746—747. — AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, 4, III. Abt., 4. Buch, 1. Teil, p. 52—53. — BHATIA (1939): Bull. Dept. Zool. Panjab Univ, 2, p. 10—11, Fig. 4.

Distribution: Kashmir, Sumatra.

4. *viridis* CHELLADURAI (1934): Rec. Ind. Mus., 36, p. 345—353, Figs. 1—4.  
— AUTRUM (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, 4, III. Abt., 4. Buch, 1. Teil, p. 53.

Distribution: India.

#### REFERENCES

1. APÁTHY, St.: *Süßwasser Hirudineen. Ein systematischer Essay.* Zool. Jahrb. Syst., 3, 1888, p. 725—794.
2. AUGENER, H.: *Hirudinea der Deutschen Limnologischen Sunda-Expedition.* Arch. Hydrobiol., Suppl., 8, 1931, p. 733—758.
3. AUTRUM, H.: *Hirudineen.* In BRONNS: Klassen und Ordnungen des Tierreichs, 4, III. Abt., 4. Buch, 1. Teil, 1936, p. 1—95.
4. AUTRUM, H.: *Hirudinea.* In BROHMER: *Die Tierwelt Mitteleuropas*, Leipzig, 1, Lief. 7b, 1958, pp. 30.
5. BAUGH, S. CH.: *Studies on Indian Rhynchobdellid leeches. I.* Parasitology, 50, 1960, p. 287—301.
6. BAUGH, S. CH.: *Studies on Indian Rhynchobdellid leeches. II.* Zool. Anz., 165, 1960, p. 468—477.
7. BENNIKE, S. A. B.: *Contributions to the ecology and biology of the Danish fresh-water leeches (Hirudinea).* Fol. Limnol. Scand., 2, 1943, p. 1—109.
8. BHATIA, M. L.: *On some leeches from the Dal Lake, Kashmir.* Bull. Dept. Zool. Panjab Univ., 2, 1939, p. 1—17.
9. DE BLAINVILLE, H.: *Sangsues.* In: Dictionn. Sci. Nat., Paris, 47, 1827, p. 205—273.
10. DE BLAINVILLE, H.: *Sangsues.* In: Dictionn. Sci. Nat., Paris, 57, 1828, p. 365—625.
11. BLANCHARD, R.: *Courtes notices sur les Hirudinées. IV. Description de la Glossiphonia marginata (O. F. Müller).* Bull. Soc. Zool. France, 17, 1892, p. 173—178.
12. BLANCHARD, R.: *Hirudinée de l'Italie continentale et insulaire.* Boll. Mus. Zool. Anat. comp. Univ. Torino, 9, No. 192, 1894, p. 1—79.
13. BRAUN, J. F. Ph.: *Systematische Beschreibung einiger Egelarten, sowohl nach ihren äußeren Kennzeichen als nach ihrem Bau.* Berlin, 1805, pp. 74.
14. CARENA, H.: *Monographie du genre Hirudo.* Mem. Real. Accad. Sci. Torino, 25, 1821, p. 273—316.
15. CHELLADURAI, J. E.: *On a new Indian leech, Hemiclepsis viridis sp. nov.* Rec. Ind. Mus., 36, 1934, p. 345—352.
16. DALYELL, J. G.: *The powers of the creator displayed in the creation.* London, 2, 1853, pp. 450.
17. DIESING, C. M.: *Systema Helminthum.* Vindobonae, 1, 1850, p. 435—471.
18. DE FILIPPI, F.: *Memoria sugli anellidi della famiglia delle coll'Indicazione di alcune specie indigene della Lombardia.* Milano, 1837, pp. 32.
19. GEDROYĆ, M.: *Pijawki (Hirudinea) Polski. Studium Monograficzne.* Rozpr. Wiad. Mus. Dzied. Lwów, 2, 1915, p. 1—101.
20. HARDING, W. A.: *A revision of the British leeches.* Parasitology, 3, 1910, p. 130—201.
21. HARDING, W. A.: *Hirudinea.* In HARDING & MOORE: *The Fauna of British India, including Ceylon and Burma*, London, 1927, pp. XXXVIII + 302.
22. HOFFMANN, J.: *Faune hirudinéenne du Grand-Duché de Luxembourg.* Arch. Inst. Grand-Ducal Luxemb., (N. S.) 22, 1955, p. 175—211.
23. JOHANSSON, L.: *Hirudinea.* In BRAUER: *Die Süßwasserfauna Deutschlands*, 13 (2), 1909, p. 67—81.
24. JOHANSSON, L.: *Hirudinea.* In DAHL: *Die Tierwelt Deutschlands*, 15, 1929, p. 133—155.
25. KABURAKI, T.: *Notes on some leeches in the collection of the Indian Museum.* Rec. Ind. Mus., 22, 1921, p. 689—719.
26. LIVANOW, N.: *Die Hirudineen-Gattung Hemiclepsis Vejd.* Zool. Jahrb. Syst., 17, p. 339—360.

27. LUKIN, E. I.: *Hirudinea*. In: The Fauna of Ukraine, Kiew, 30, 1962, pp. 196.
28. MANN, K. H.: *A revision of the British leeches of the family Glossiphoniidae, with a description of Batracobdella paludosa (Carena, 1824), a leech new to the British fauna*. Proc. Zool. Soc. London, 123, p. 377—391.
29. MOORE, J. P.: *Notes on some asiatic leeches (Hirudinea) principally from China, Kashmir and British India*. Proc. Acad. Nat. Sci. Philadelphia, 76, 1924, p. 343—399.
30. MOQUIN-TANDON, A.: *Monographie de la famille des Hirudinées*. Montpellier, 1826, pp. 152.
31. MOQUIN-TANDON, A.: *Monographie de la famille des Hirudinées*. 2. Edit. Paris, 1846, pp. 448.
32. MÜLLER, FR.: *Über Hirudo tessulata und marginata O. F. Müll.* Arch. Naturg., 10, 1844, p. 370—376.
33. MÜLLER, O. F.: *Vermium terrestrium et fluviatilium, seu animalium infusorium, helminthicorum et testaceorum, non marinorum, succincta historia*. Havniae et Lipsiae, 1 (2), 1774, p. 37—51.
34. OKA, A.: *Synopsis der japanischen Hirudineen, mit Diagnosen der neuen Species*. Annot. Zool. Jap., 7, 1910, p. 165—183.
35. OKA, A.: *Results of a tour in the Far East. Hirudinea*. Mem. Asiat. Soc. Bengal, 6, 1917, p. 157—176.
36. OKA, A.: *Notices sur les Hirudinées d'extrême Orient. V—VII*. Annot. Zool. Jap., 10, 1925, p. 327—335.
37. OKA, A.: *Description de deux espèces Japonaises de Glossiphonia (Gl. smaragdina et Gl. lata)*. Proc. Imp. Acad. Tokyo, 4, 1928, p. 543—546.
38. OKA, A.: *Sur une nouvelle espèce d'Hemiclepsis, parasite d'un crabe fluviatile de Chine*. Proc. Imp. Acad. Tokyo, 4, 1928, p. 607—608.
39. OKA, A.: *Sur une nouvelle espèce d'Hemiclepsis, provenant de Chine*. Proc. Imp. Acad. Tokyo, 7, 1931, p. 121—123.
40. OKA, A.: *Sur une nouvelle espèce de Placobdella, P. japonica n. sp.* Proc. Imp. Acad. Tokyo, 8, 1932, p. 51—53.
41. PAWLOWSKI, L. K.: *Hirudinea*. In: Fauna Slodkowodna Polski, Warszawa, 26, 1936, pp. 134.
42. ROUSSEAU, E.: *Hirudinées d'eau douce d'Europe*. Ann. Biol. Lacustre, 5, 1912, p. 259—295.
43. DE SAINT-AMAS, B.: *Description d'une espèce nouvelle de Sangsue, l'Hirudo oscillatoria*. Mém. Soc. Linn., Paris, 8, 1825, p. 193.
44. VERRIEST, G.: *Contribution à l'étude des Hirudinées des eaux douce de la Belgique*. Biol. Jaarb. Dodonaea, 17, 1950, p. 200—243.
45. VEJDOVSKÝ, FR.: *Exkreční soustava Hirudinei*. Sitzungsab. königl. Böhm. Ges. Wiss. in Prag, Jahrg. 1883, 1884, p. 417—433.