

CLADOGRAM OF THE HISTIOSTOMATIDAE

Until now the Histiostomatidae consists of about 300 species. 54 genera are described, lots of them by the deutonymph only, which alone does not offer enough characters for a phylogenetic reconstruction. The following taxa are not included in my phylogenetic reconstruction (Fig.3), because suitable characters for their position were not found:

Ancyranoetus Fain & Santiago-Blay, 1993. *Anoetus* Dujardin, 1842. *Anoetoglyphus* Vitzthum, 1927. *Ameranoetus* Ide & Mahunka, 1978. *Amyzanoetus* Fain, 1976. *Austranoetus* Fain, 1976. *Bothyanoetus* Fain & Camerik, 1978. *Capronomoia* Mahunka, 1976. *Cederhjelmia* Oudemans, 1931. *Ceylanoetus* Mahunka, 1974. *Chiropteranoetus* Womersley, 1942. *Chiloanoetus* Fain, 1974. *Curculanoetus* Fain, 1974. *Conglanoetus* Mahunka, 1978. *Copronomoia* Mahunka, 1976. *Fibulanoetus* Mahunka, 1973. *Ghanoetus* Mahunka, 1973. *Hymenanoetus* Mahunka, 1963. *Insulanoetus* Sevastyanov, 1973. *Kaszabanoetus* Mahunka, 1976. *Loxanoetus* Fain, 1970. *Momorangia* Southcott, 1972. *Munduytia* Oudemans, 1929. *Ovanoetus* Fain & van Goethem, 1985. *Peripatetes* Mahunka, 1976. *Porrhanoetus* Mahunka, 1963. *Psyllanoetus* Fain & Beaucournu, 1974. *Pteranoetus* Mahunka, 1978. *Rhaphidothrix* Mahunka, 1967. *Richardanoetus* Samsinak, 1989. *Semianoetus* Mahunka. *Scheucheria* Mahunka, 1969. *Scolianoetus* Fain, 1974. *Scutanoetus* Mahunka, 1969. *Stercoranoetus* Mahunka & Mahunka-Papp, 1991. *Synanoetus* Mahunka, 1972. *Syringanoetus* Fain, 1980. *Teinokyra* Mahunka, 1973. *Traskorchestianoetus* Fain & Colloff, 1990. *Xenanoetus* Mahunka, 1969.

I do not use the genus name *Seliea* Oudemans, 1929 and retained the species name *Histiostoma pulchrum* Kramer, 1886, because this species does not differ distinctly from other *Histiostoma* species.

The cladogram of the Histiostomatidae (Fig3) was reconstructed with help of 82 morphological characters. Examined were about 70 species. About 30 species, mostly members of the paraphyletic "*Histiostoma*", were cultured for own preparations and biological observations.

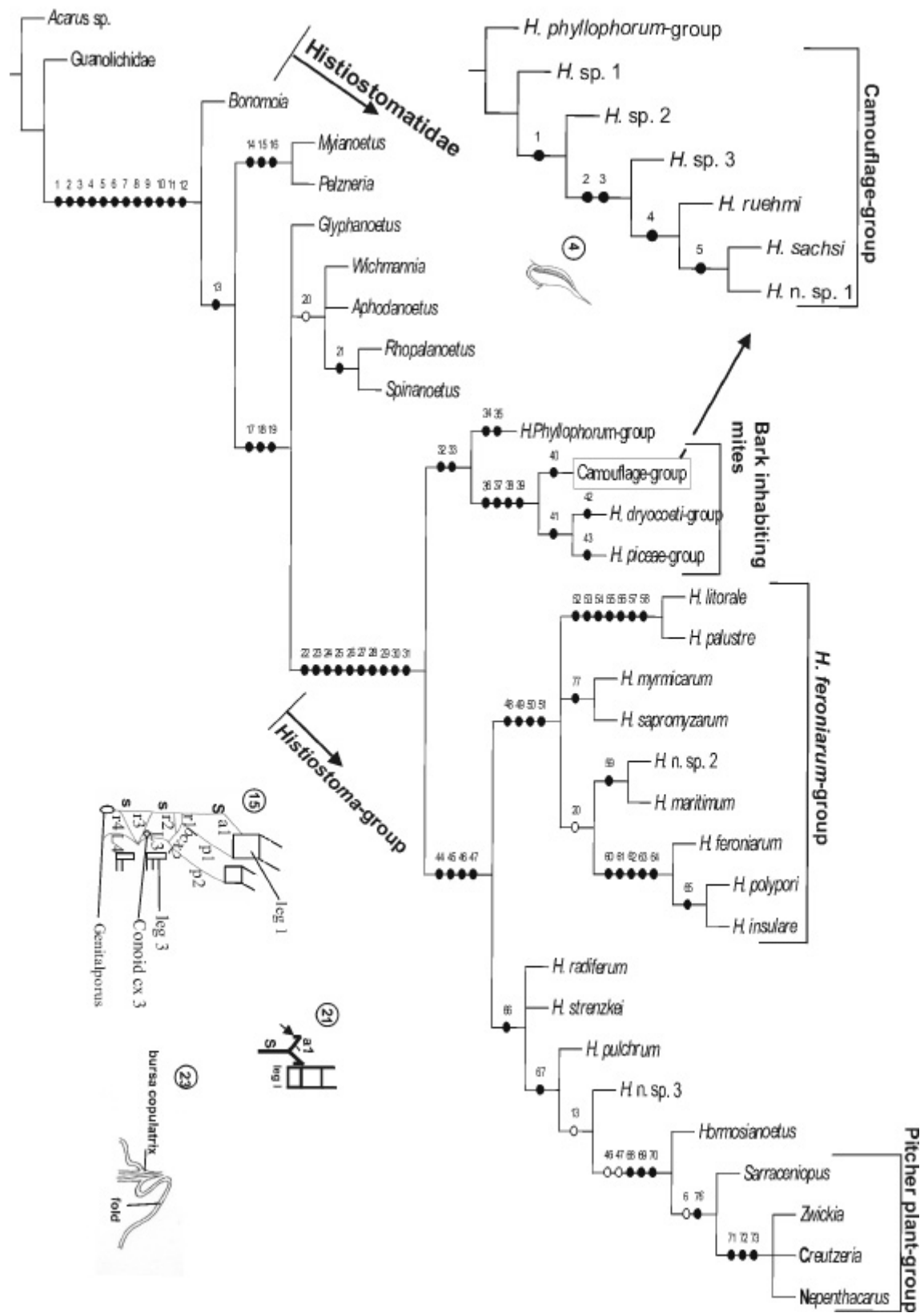


FIG3:

Depicted is the cladogram of the Histiostomatidae reconstructed by WinClada and Nona as consensus compromise (Nelsen, collapse and consensus). Black points mark apomorphies, white points homoplasious character states.

Characters of the Histiostomatidae in the big tree:

1. *Character 1:*
cuticula of non deutonymphal stages thin.
2. *Character 2:*
palp membrane existent (Fig4B).
3. *Character 3:*
second free pedipalp article elongated to anterior.
4. *Character 4:*
distal pedipalp articles directed laterally (Fig7A).
5. *Character 5:*
microorganisms in emulsion as food.
6. *Character 6:*
propodosoma shield with pattern of fields (Fig9B).
7. *Character 7:*
ringorgans (Fig) as osmoregulatory organs.
8. *Character 8:*
Clapareds organ of larvae ring formed
9. *Character 9:*
vulva of female transverse (Fig9A).
10. *Character 10:*
valvulae fusion as an apodeme like structure (Fig9A).
11. *Character 11:*
aedeagus of male displaced to posterior (Fig11D).
12. *Character 12:*
secondary articulation of deutonymph at femurs of legs III and IV (Fig15).
13. *Character 13:*
dorsal sclerites of larvae and protonymphs present (Fig18A).
14. *Character 14:*
apodemes a1 of female not touching each other.
15. *Character 15:*
apodeme L4 (Fig3) of deutonymph missing.
16. *Character 16:*
apodeme p2 (Fig18C) of female buckled directed to the vulva.
17. *Character 17:*
dorsal setae d5a change to lateral.
18. *Character 18:*
setae d6a change to anterior.
19. *Character 19:*
setae d6c change to median.
20. *Character 20:*
all ringorgans of males anterior of aedeagus.
21. *Character 21:*
apodemes a1 of deutonymphs "wing" shaped (Fig3).

22. *Character 22:*
anterior ringorgans of females flattened (Fig17B).
23. *Character 23:*
female copulation opening consisting of a fold and elevated bursa (Fig3).
24. *Character 24:*
reduction of visible valvulae fusion (Fig17C).
25. *Character 25:*
a3 of female distinctly elongated (Fig17D).
26. *Character 26:*
reduction of male genital suckers.
27. *Character 27:*
posterior propodosoma shield of larva with omega shaped indentation (Fig18B).
28. *Character 28:*
sclerite 1 of larva anteriorly wide, posteriorly rounded (Fig18B).
29. *Character 29:*
sclerite 2 of larva compactly rounded (Fig18B).
30. *Character 30:*
sclerites 3a+b of larva fused to 3 (Fig18B).
31. *Character 31:*
sclerite 7 of larva present (Fig18B).
32. *Character 32:*
dorsal deutonymphal setae elongated to anterior (Fig19A).
33. *Character 33:*
deutonymphal apodeme bcx2 angled to lateral (Fig19B).
34. *Character 34:*
main suckers of sucker plate distinctly elongated.
35. *Character 35:*
non deutonymphal stages with enlarged tarsi.
36. *Character 36:*
adult setae d5a, d5b, d5c on cuticula elevation (Fig19D).
37. *Character 37:*
adult setae d6a on cuticula elevation (Fig19D).
38. *Character 38:*
adult setae d8a on cuticula elevation (Fig19D).
39. *Character 39:*
palpalmembrane with second ridge parallel to the cheliceral guiding structure (Fig8C).
40. *Character 40:*
dorsal setae of adults in longitudinal rows.
41. *Character 41:*
bark beetles as transporters.
42. *Character 42:*
reduction of elongated dorsal deutonymphal setae.
43. *Character 43:*
deutonymphal apodemes p1 (Fig3) free ending.
44. *Character 44:*
elongation of setae la of adult legs II (Fig23D).

45. *Character 45:*
elongation of setae ra of adult legs II (Fig23D).
46. *Character 46:*
dimorphism of males.
47. *Character 47:*
temperature sensitiveness of males and females in their development.
48. *Character 48:*
males in aggregations fighting for females.
49. *Character 49:*
lobe of palpmembrane of adults divided into two parts (WIRTH, 2003).
50. *Character 50:*
digitus fixus of adults with teeth in a characteristic arrangement (WIRTH, 2003).
51. *Character 51:*
deutonymphal apodeme r2 exist (Fig3).
52. *Character 52:*
contour of deutonymph oval.
53. *Character 53:*
deutonymphal solenidia sigma at legs III elongated.
54. *Character 54:*
deutonymphal solenidia sigma at legs IV elongated.
55. *Character 55:*
deutonymphal setae eG at legs III elongated.
56. *Character 56:*
deutonymphal apodemes L3 conspicuously elongated.
57. *Character 57:*
deutonymphal apodemes run in a pointed angle to the sternum.
58. *Character 58:*
contour of sucker plate transverse oval shaped (WIRTH, 2003).
59. *Character 59:*
female copulation opening as enlarged rounded structure.
60. *Character 60:*
male apodeme a2 medianly bent.
61. *Character 61:*
ventral cuticula elevation in males posterior of anus (Fig21B).
62. *Character 62:*
ventral setae v6 and v7 of males arranged side by side (Fig21B).
63. *Character 63:*
posterior outline of males angle shaped.
64. *Character 64:*
dorsal cuticula elevations in females bearing setae d8a and d8b.
65. *Character 65:*
posterior ringorgans of males tear shaped.
66. *Character 66:*
3 anterior pairs of conoids in the deutonymph reduced to small vestigials.
67. *Character 67:*
chelicera closely toothed with apically downsized cuticula teeth (Fig19F).
68. *Character 68:*
projection of propodosoma of deutonymph bears gnathosoma (Fig19G).

69. *Character 69:*
deutonymphal gnathosoma laterally pigmented (Fig19G).
70. *Character 70:*
empodial claws of adults conspicuously elongated (FASHING, 2002).
71. *Character 71:*
ventral apodemes a3 of female reduced to small vestigials.
72. *Character 72:*
empodial claws IV of deutonymph lost (FASHING, 2002).
73. *Character 73:*
female copulation opening displaced to terminal (FASHING, 2002).
74. *Character 74:*
digitus mobilis of the chelicera reduced to a vestigial structure.
75. *Character 75:*
ventral gnathosoma laterally closed.
76. *Character 76:*
pitcher plant acid resistance.
77. *Character 77:*
posterior ringorgans conspicuously flattened and elongated .

Characters of the Camouflage-group:

1. *Character 1:*
copulation opening conical enlarged and elevated (Fig12B).
2. *Character 2:*
dorsal setae of adults as "claw"-setae.
3. *Character 3:*
tactile camouflage by substrate holding.
4. *Character 4:*
dorsal setae of adults as "hook"- setae (Fig3).
5. *Character 5:*
all setae on elevated pedestals.